

# GCE CENTRAL GAS SYSTEMS



# THE GCE BUSINESS

GCE has almost 100 years of experience in the manufacture and supply of high pressure gas equipment. During this time the GCE product range has increased dramatically. Today's product portfolio fits a large variety of applications, from simple pressure regulators and blowpipes for cutting and welding to highly sophisticated gas supply systems for the medical, electronic and analytical industries.

## GCE GROUP INCLUDES FOUR BUSINESS AREAS:

- > Cutting & Welding Technologies
- > Valves
- > Healthcare
- > Druva

## ORIGINS

The origins of GCE (Gas Control Equipment) go back to the start of the 20th century when Gas Welding was first invented. The GCE group was formed as an independent company in 1987 through the merging of two of the worlds leading gas and welding companies into one independent unit. GCE has grown rapidly since its establishment and is leading the restructuring of the European gas equipment industry through mergers and acquisitions.

Through its extensive Research and Development programs GCE has set standards that have become the benchmark for the whole industry.

## GCE SERVICES

The main industrial customers for GCE are wholesalers and local distributors. However in some markets GCE distributes equipment with the full cooperation of the main gas supplier for that market.

For these companies GCE provides both commercial and technical support.

A significant part of the sales volume in this area also comes from key end user accounts such as shipyards, repair shops, OEM customers and welding machine manufacturers.

## GCE DRUVA

Specialty, industrial and fuel gases are used in various industries to initiate, stabilize and avoid chemical processes and to supply the energy need for industrial processes. These gases are often provided in highly purified form and have either flammable, toxic or corrosive properties and therefore require specific gas-regulating equipment that is leak-proof and corrosion-resistant and thus does not affect the purity, chemical properties or composition of the given gas. Pressure regulators and valves must ensure safe discharge and transportation of gases without posing any risk to users, devices or buildings. The equipment often has to withstand inlet pressures of several hundred bars and must meet the highest expectations for flow and pressure stability.

Specialty-gas regulators and valves are produced from materials such as stainless steel, brass or other metallic alloys. Proper surface treatment and coating, leak-proof connection technology and gas-resistant seals are the key elements of specialty-gas systems that either locally discharge gas or distribute it through pipelines to points of use in facilities and laboratories operating in the chemical, petrochemical, pharmaceutical and other industries.

GCE Druva has been a leader in field of specialty-gas equipment since 1967. With production and service centres in Germany, the Czech Republic and China, GCE's High Purity Division is one of the market leaders in providing system components, solutions and services for specialty, high-purity and fuel gases to engineers, designers, distributors and end-users in all corners of the globe.



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# CENTRAL GAS SUPPLY SYSTEMS FOR HIGH PURITY GASES



## PRODUCT RANGE

### STANDARD EQUIPMENT

#### FIRST PRESSURE STAGE

- Brass or stainless steel
- Cylinder pressure regulators FMD
- Single cylinder gas panels SMD:
  - > Single-stage
  - > Dual-stage
  - > With process or inert gas purging

- Multi cylinder gas manifolds BMD
  - > Single-stage, with manual switch over
  - > Single-stage, with automatic switch over
  - > With process or inert gas purging

#### SECOND PRESSURE STAGE

- Line pressure regulators LMD
- Point-of-use pressure regulators EMD
- Accessory for wall mounted supply pressure regulators:
  - > Tube fittings
  - > Hose nozzles
  - > Flame arrestors
  - > Flow meters

#### REGULATING AND SHUT-OFF VALVES

- Valves, brass:
  - > Diaphragm valves
  - > Pneumatic valves
- Valves, stainless steel:
  - > Packed valves
  - > Diaphragm valves
  - > Pneumatic valves
  - > Valve tableaus
  - > Cylinder valves

- Solenoid valves, brass + stainless steel
- Ball valves, brass + stainless steel
- Cylinder-Combivalve

### ULTRA HIGH PURITY EQUIPMENT

#### PRESSURE REGULATORS, 316L, AOD/VAR

- > Line pressure regulators
- > Supply pressure regulators

- Diaphragm valves
- Pneumatic valves

#### PROCESS PANELS (1. PRESSURE STAGE)

- ACCESSORY:**
- > Coils
  - > Screwed connections, VCR-type

#### CONNECTION ADAPTERS

- > Vacuum generators
- > Filters
- > Welding fittings

#### ELECTRIC AND ELECTRONIC DEVICES:

- > Monitoring systems

### LABORATORY EQUIPMENT

#### VALVES, BRASS AND STAINLESS STEEL:

- > Shut-off and regulating diaphragm valves
- > Point-of-use pressure regulators
- > Point-of-use equipment for laboratory furniture mounting
- > Point-of-use panels

#### ACCESSORY FOR LABORATORY FURNITURE

- > Screwed connections
- > Tube fittings
- > Hose nozzles
- > Connection adapters
- > Flame arrestors
- > Flow meter

#### INSTALLATION

### ACCESSORIES

#### CONNECTION MATERIAL

- Assembling material:
- > Tube fittings
  - > C-profile rails
  - > Valve mounting
  - > Elbow tube fittings
  - > Straight tube fittings
  - > Adapter fittings
  - > Hose nozzles

#### OTHERS

- Pressure gauges:
- > Bourdon gauges
  - > Contact gauges

#### Cylinder connections:

- > Flexibe hoses
- > Coils
- > Extension bars
- > Screwed connections

#### Accessory for wall mounted point-of-use tableaus

- > Flame arrestors
- > Flow meters
- > Filters

#### Cylinder cabinets:

- > Safety cabinets acc EN 14470-2
- > Sheet steel cabinets

#### Electric and electronic device:

- > Gas insufficiency warning system
- > Signal boxes
- > Control device
- > Gas warning systems
- > Cylinder scales
- > Gas heaters
- > Monitoring device for pressure and flow

#### Gas management:

- > Devices
- > Software
- > Gas safety systems

## INTERNATIONAL CERTIFICATION AND PRODUCT TESTING INSTITUTES

GCE high purity gas systems have been developed and certified in accordance with diverse national and international product safety guidelines. For further details please contact our offices.



The BAM – Federal Agency for materials research and testing - is a scientific, technical federal authority for the business sector of the Federal Ministry for business and technology.



TSSA is a Canadian, non-profit, self-financed; administratively-similar agency which administers and promotes the safety laws, the technical norms and the safety regulations.



GOST: Certificates and licenses are issued through the Institute and testing laboratories for quality assurance and safety, which are accredited through the Russian agency for standardisation, metrology and certification: ROSTECHREGULATION.

## SPECIALITY GAS EQUIPMENT KNOW HOW

### HIGH-PURITY GASES REQUIRE HIGH-QUALITY REGULATORS

Proper handling of expensive high-purity gases requires the highest quality of valves and pipelines, not at least of the design, planning, installation and commissioning of the entire gas distribution system.

The fulfillment of user-specific demands such as pressure stability, flow capacity and maintaining of the gas composition needs to be guaranteed in the same way as the prevention of contamination from the gas source down to the „point-of-use“.

For handling of compressed gases intensive knowledge of regulations and technical rules which form the basis for a safe layout of any gas-supply system are needed.

The quality of GCE Druva High-Purity Gas distribution system is determined by a large number of features:

- > leak-tightness,
- > dead-space-minimized design,
- > high safety due to Hastelloy diaphragms,
- > patented damping system,
- > purgeability,
- > intuitive out concept for joining and safety aspects.

These points require the same attention as the final assembly and preventive maintenance.

### CLOSE COOPERATION WITH OUR CUSTOMERS IS VERY IMPORTANT TO US

A close dialogue with our customers and designers enables us to develop products today which suit the market requirements of tomorrow.

Years of experience, the latest tests and measuring equipment and CAD-Technology build a basis for solutions beyond the usual expectations.

Advanced product quality guarantees continuous process supply and avoids unnecessary system shutdown.

Therefore the GCE Druva technology is the sure foundation for solutions matching the customer's individual needs.



Cylinder pressure regulator FMD

### FINE CONTROLLABILITY OF PRESSURE AND FLOW

The quality control of all components guarantees a problem-free, safe, process gas supply, avoids unnecessary extra costs and protects the continuing efficiency of a GCE Druva Special Gas Supply System.

Minimized leakage guarantees the necessary safety during operation ensuring, that process gases are not contaminated and ensure gas purity at the point-of-use.



Point-of-use pressure regulator EMD

### ACCURACY AND SAFETY ARE THE FOUNDATIONS FOR THE HANDLING OF HIGH PURITY GASES

The selection of gas resistant and gas neutral materials, combined with precision manufacturing on numeric controlled machining centres, guarantees the highest accuracy during the entire production process.

The mechanical manufacturing process is followed by an automated cleaning bath carefully removing any grease, emulsion, debris and solvents from the gas wetted surface.

Assembly and pressure testing is performed in clean rooms using high purity test gases.

Diverse quality inspections such as material examinations, surface roughness measurements, dimensional control, functional tests with nitrogen, pressure examinations and leakage test examinations with helium, and quality inspection of TIG-welding, safeguard the function and safety of all components and systems.



Semi-automatic manifold BMD

### PRESSURE REGULATORS, VALVES AND ACCESSORIES OF HIGH PURITY AND ACCURACY

GCE Druva products meet the special requirements of high quality pure-gas distribution systems in terms of purity, pressure stability and operational safety.

The supervision and control of the material quality is essential for quality and safety of the products. Components which undergo electro-polishing and multi stage cleaning processes achieve highest quality surface, are generally ECD-suitable and in combination with 316L, Hastelloy inner parts and properly purged, are extremely corrosion resistant.

Minimal leakage rates avoid any gas contamination and increase the safety for the operators.

Both the design of the metal diaphragm, valves and regulators as well as solely using HASTELLOY material for the diaphragms, guarantees highest safety against leakage in the regulator or damage.



Line regulator LMD

### APPLICATION AREAS FOR GCE DRUVA SPECIAL GAS EQUIPMENT

- Analysis technology
- Gas chromatography
- Atomic-Adsorption-Spectrometry
- Exhaust-gas measurement for environmental control
- Chemical process technology
- Laser technology
- Pharmaceutical industry
- Petrochemical industry
- Food / drugs sector
- Semiconductor technology
- Fibre optical industry



## QUALITY STANDARDS

### GCE QUALITY MANAGEMENT

GCE druva clean-gas systems prove its quality by performance and reliability. The production process of the regulators is certified according to ISO9001 at regular intervals. This certification is considered by GCE Druva as only one step in the long path towards not only gaining and keeping the confidence of our customers in our products but also to strengthen it. Unannounced re-audits by internal and external supervisors assure a continuous quality level.

Therefore our customers can rely on these certificates not being used as a basis to relax but as a stepping stone to new heights with regards to quality and performance. It is our aim to be a reliable partner to our customers in all questions about pure gas technology with economical solutions to their individual problems through well engineered technology.

The most important steps for the fulfillment of these expectations are: optical measurement control max. 100%,

- > microscopic and endoscopic test of all bored holes,
- > multi-stage special cleaning with DI-water cleaning process, clean air flushing and material friendly drying,
- > functional tests,
- > 6-hour-pressure test at nominal pressure ,
- > Helium-leakage-test with mass spectrometer.
- > 100% function and tightness control of basic components.

### SERVICING

To guarantee the safety, dependability and longevity of an installed special gas supply system every company should make sure that the necessary safety-related equipment-parts are tested, for condition and functionality at reasonable intervals, not more than one year, in accordance with BGV B6 §53 Article 2.



Helium leak testing

### HELIUM LEAK RATE CERTIFICATION

Helium leak testing is performed using a mass spectrometer. This technique is particularly effective at detecting and quantifying very small leaks. For example a typical regulator might have a helium leak rate of  $3 \times 10^{-9}$  mbar l/sec He equivalent. This is equal to a leak of just  $1 \text{ cm}^3$  in 30 years with a pressure difference of 1 bar at the component. Some products for the electronics industry or high corrosion service will be separately helium leak tested and certified as standard to guarantee maximum integrity. Many other components are given a guaranteed but uncertified maximum leak rate. For these components helium leak testing is available upon request and certification is an optional.

### PURGE

Purge utilises a sequence of pressurisation followed by de-pressurisation by venting. It is recommended to repeat this simple sequence 10 times.

The so called **process gas purging** uses the process gas for purging, **inert gas purging** is performed with an inert gas through a special inlet connection.

Purging with an external inert gas is an extremely important factor when changing cylinders for the following reasons:

1. Purging the gas remaining in the system before cylinder changing improves the safety level for the operator.
2. Maintaining gas purity by purging the atmospheric air which has penetrated the system after cylinder changing.
3. Purging with dry inert gas reduces humidity and extends the expected lifespan, when corrosive gases are used.

For **high purity gases** purging will remove air/moisture from the system before process gas is introduced in order to preserve the purity of the gas and to promote system reliability.

For **toxic gases** purging will remove process gas out of the system before the system is opened to atmosphere and will therefore minimise the risk of operator's exposure.

For **corrosive gases** purging will remove moisture from the system. Moisture can produce strong acids and potentially solid material which can cause system failure through corrosion and/or particular contamination.

### FLOW CAPABILITIES - PERFORMANCE CHARTS

For regulators the concept of flow coefficient is only partially useful in demonstrating the performance (Kv is dependent upon upstream and downstream pressure). GCE Druva uses, as a rule, performance charts pursuant of ISO 2503 (upstream pressure of approximately double the downstream pressure. E.g. :  $p_1 = 101 \text{ bar}$  and  $p_2 = 50 \text{ bar}$ ) as a result the performance of the GCE Druva regulator flow charts are based on a comparable test method. Since the upstream pressure of a regulator is usually higher than double the downstream pressure (pursuant ISO) the resulting actual flow rates to be expected will be considerably higher than in the ISO performance charts are showed. For more detailed information concerning maximum and minimum obtainable flow rates, dependent upon type of gas, temperature etc. - please contact our technical division.

### PRESSURE REGULATORS DENOTATION

#### CYLINDER PRESSURE REGULATORS (FMD)

Cylinder regulators are used to reduce the cylinder pressure to a lower usable level.

#### LINE PRESSURE REGULATORS (LMD)

Line regulators are designed to reduce line pressure for subsequent equipment.

#### POINT-OF-USE REGULATORS (EMD)

Point-of-use regulators are used to give maximum accuracy and shut-off capability at the Point-Of-Use - POU.

#### GAS PANELS (SMD, BMD)

Gas supply panels are installed in the gas storage area (cylinder stock room or gas cabinet). They reduce cylinder / tank pressure to the desired line pressure for in-house use. Via the subsequent piping system the gas will be guided to the point-of-use.

### ULTRA HIGH PURITY REGULATORS

These Ultra high purity regulators were specially designed to maintain the ultra high purity of the gas inside the regulators. Polished surfaces, the use of metal diaphragms, minimized dead space and specially designed seals and seats minimizes or rather eliminates the risk of out gassing and inboard diffusion or gasket contamination.

## PRODUCT SELECTION GUIDE

### QUESTIONS TO BE ANSWERED SELECTING A REGULATOR

Do you need a standard regulator/valve (gas purity < 6.0) for ultra high-purity use (higher 6.0)?  
Do you need a single-stage or dual-stage regulator?  
Do you need a purge system?  
See information on previous page.  
The construction material does not need be specified as it depends on gas type.



GCE Druva will automatically tailor its proposal to make a proposal to the chosen gas. Which outlet pressure range is required (specification in "Technical data")? Which flow rate is required (Specification on product specific flow charts, precise information for specific gases and types can be obtained from our technical department)? Do you have a 200 or a 300 bar gas supply level? Which type of inlet connection (cylinder connection) do you need, DIN or another national norm? Which kind of outlet connections do you need: tube fittings, hose nozzles etc.?

### GAS PURITY VALUES

Gas type	Purity [degrees]	Purity	Max. contamination (ppm)
Pure gas	2.5	99.5 %	5000
	3.0	99.9 %	1000
High purity gas	3.5	99.95 %	500
	4.0	99.99 %	100
	4.5	99.995 %	50
	5.0	99.999 %	10
	5.5	99.9995 %	5
Ultra pure gas	6.0	99.9999 %	1.0
	7.0	99.99999 %	0.1

### SINGLE-STAGE REGULATORS

High pressure mediums enter through the inlet of the regulator to the high pressure chamber. When the hand wheel is turned clockwise, it compresses the spring and creates a force on the diaphragm, which pushes the regulator's poppet open. This releases the gas into the low-pressure chamber, exerting an opposing force on the diaphragm which then closes the passage. Equilibrium is reached, when the spring force on the diaphragm is equal to the opposing force of the gas in the low-pressure chamber.

In a single-stage regulator, delivery pressure increases as cylinder pressure falls, because there is less gas pressure exerted on the diaphragm. Thus, frequent adjustment of the control knob is required to maintain a constant delivery pressure. Therefore a two-stage regulator is recommended for applications requiring constant outlet pressure.

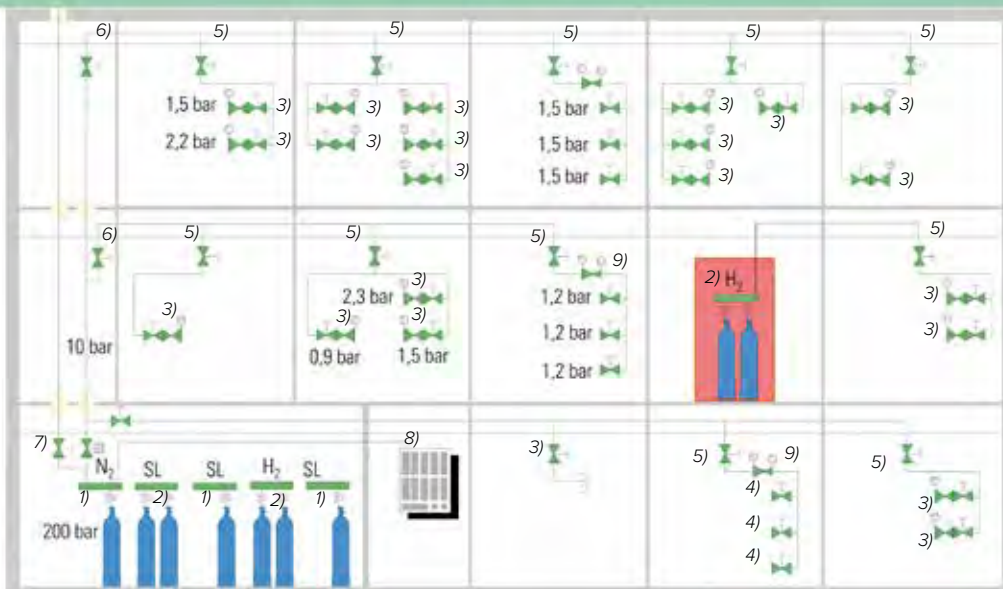
With the two stage regulator the point of use pressure stays practically constant, irrespectively of the cylinder pressure which sinks progressively as the cylinder empties.

### DUAL-STAGE REGULATORS

A dual-stage regulator functions like two single-stage regulators connected in line. The first stage reduces the inlet pressure to a preset intermediate pressure. By adjusting the control knob the second stage reduces the intermediate pressure to the desired delivery pressure.

Like the single-stage regulator, outlet pressure from the first stage of the two-stage regulator rises as cylinder pressure decreases. However, the second-stage of the dual-stage regulator regulates, according to the preset level entered with the control knob, the point of use pressure as desired. Thus, delivery pressure remains constant even as the cylinder pressure lowers, eliminating the need for frequent control knob adjustment needed for a single-stage regulator.

## CENTRAL GAS SUPPLY



- 1) Gas panel SMD,
- 2) Gas manifold BMD,
- 3) Point-of-use regulator EMD,
- 4) Point-of-use shut-off,
- 5) Room shut-off,
- 6) Floor shut-off
- 7) Central shut-off,
- 8) Gas management,
- 9) Line regulator

## ORDER CODE FOR YOUR PRESSURE REGULATORS

<b>SERIES</b>	<b>500</b>	<b>3100</b>	<b>320</b>	<b>100</b>
Purity	< 6.0	< 6.0	< 5.0	for techn. Gases and Laser gases
Application	Standard	Laboratory	diverse	diverse



**APPLICATION AREA**

FMD = cylinder pressure regulator  
 SMD = gas supply panel for 1 cylinder  
 BMD = gas supply manifold for 2 or more cylinder  
 LMD = line regulator  
 EMD = point-of-use regulator

**TYPE OF PRESSURE REDUCING**

50 = standard regulator  
 51/52 = supply into vacuum  
 54/56 = low outlet pressure  
 53 = special 300 bar inlet pressure regulators

**PRESSURE STAGES**

0 = single-stage  
 2 = dual-stage

**TYPE (IDENTIFIED BY OUTLET AND PURGING)**

- 14 = with outlet tube fitting
- 16 = outlet shut-off valve
- 18 = outlet metering valve
- 24 = panel with process gas purging
- 25 = panel with process gas purge and downstream shut-off valve
- 26 = inert gas purging
- 27 = external gas purging
- 29 = for acetylene (C<sub>2</sub>H<sub>2</sub>)
- 30 = panel with outlet shut-off valve, no purge
- 32 = panel with outlet shut-off valve, with process gas purge
- 34 = panel with semi-automatic switch-over, with external gas purging
- 35 = panel with semi-automatic switch-over, with process gas purge
- 39 = panel with semi-automatic switch-over, without purge

**MATERIAL**

B = brass  
 BC = brass chrome-plated  
 SS = stainless steel

**GAS TYPE**

**OPTIONAL**

0 = without  
 KI = contact gauge

**MATERIAL OF OUTLET FITTING**

B = brass  
 BC = chrome-plated brass  
 SS = stainless steel

**OUTLET FITTING**

N14F = 1/4" NPT f. CL3, CL6\*, CL8, CL10, CL12 (CL6 = NPT- compressed fitting for tube outside diam. 6 mm)  
 NO6, NO8, NO10 = hose nozzle for tube with inside diameter 6/8/10 mm

**CYLINDER CONNECTION**

DIN = DIN 477    UK = BS  
 A = ANSI        US = CGA  
 F = AFNOR      NL = NEN  
 B = NBN        others on request

**OUTLET PRESSURE LEVELS (DEPENDS ON SERIES TYPE)**

bar	psi
0.02 – 0.25	0.3 – 2
0.2 – 1	3 – 15
0.2 – 2 abs	3 – 30 abs
0.2 – 2.2	3 – 33
0.2 – 3	3 – 45
0.2 – 3 abs	3 – 45 abs
0.2 – 4	3 – 60
0.5 – 6	7 – 85
1 – 10.5	15 – 150
1 – 14	15 – 200
2.5 – 28	35 – 400
2.5 – 50	35 – 720
10 – 200	145 – 2900

**INLET PRESSURE (DEPENDS ON SERIES TYPE)**

	bar	psi
C =	6	85
D =	12/14	175/200
E =	40/50	600/720
F =	230	3300
G =	300	4350

**EXAMPLE ORDER CODE**

Armature	Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet	Contact gauge	Vent piping	Gas type
<b>FMD 532</b>	<b>- 14*</b>	<b>BC</b>	<b>G</b>	<b>10</b>	<b>DIN</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>A</b>	<b>GAS</b>
FMD 532	- 14	BC = brass-chrome plated	G = 300 bar	3 = 0.2 – 3 bar	DIN	CL6 (standard)	0 = without	0 = without	Please specify
	- 16	SS = stainless steel		6 = 0.5 – 6 bar	ANSI	CL 1/8"	Ki = with	A = with (only in conjunction with RV)	
				10 = 1 – 10.5 bar	AFNOR	CL 1/4"			
					NBN	BC = brass-chrome plated			
						SS = stainless steel			

\*recommended Standard model = printed in BOLD

## PRESSURE REGULATORS OVERVIEW

### CYLINDER PRESSURE REGULATORS 500 OVERVIEW

Outlet: tube fitting



Outlet: regulating valve



Outlet: shut-off valve



With inert gas purging  
Stainless steel



Type -27 with shut-off valve at outlet  
Type -26 without

#### SINGLE-STAGE - 200 BAR

##### FMD 500-14

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
6, 14, 28, 50, 200 bar  
85, 200, 400, 720, 2900 psi

##### FMD 510-14

Inlet pressure: 12 bar/ 175 psi  
Outlet pressure:  
0.2 – 2 bar abs/ 3 – 29 psi abs  
0.2 – 3 bar abs/ 3 – 45 psi abs

##### FMD 540-14

Inlet pressure: 12 bar/ 175 psi  
Outlet pressure:  
0.2 – 1 bar/ 3 – 15 psi  
0.2 – 2 bar/ 3 – 30 psi

##### FMD 500-16

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
6, 14, 28, 50, 200 bar  
85, 200, 400, 720, 2900 psi

##### FMD 510-16

Inlet pressure: 12 bar/ 175 psi  
Outlet pressure:  
0.2 – 2 bar abs/ 3 – 29 psi abs  
0.2 – 3 bar abs/ 3 – 45 psi abs

##### FMD 540-16

Inlet pressure: 12 bar/ 175 psi  
Outlet pressure:  
0.2 – 1 bar/ 3 – 15 psi  
0.2 – 2 bar/ 3 – 30 psi

##### FMD 500-18

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
6, 14, 28, 50 bar  
85, 200, 400, 720 psi

##### FMD 510-18

Inlet pressure: 12 bar/ 175 psi  
Outlet pressure:  
0.2 – 2 bar abs/ 3 – 29 psi abs  
0.2 – 3 bar abs/ 3 – 45 psi abs

##### FMD 540-18

Inlet pressure: 12 bar/ 175 psi  
Outlet pressure:  
0.2 – 1 bar/ 3 – 15 psi  
0.2 – 2 bar/ 3 – 30 psi

##### FMD 500-26/-27

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
6, 14, 28, 50, 200 bar  
85, 200, 400, 720, 2900 psi

##### FMD 510-26/-27

Inlet pressure: 12 bar/ 175 psi  
Outlet pressure:  
0.2 – 2 bar abs/ 3 – 29 psi abs  
0.2 – 3 bar abs/ 3 – 45 psi abs

##### FMD 540-26/-27

Inlet pressure: 12 bar/ 175 psi  
Outlet pressure:  
0.2 – 1 bar/ 3 – 15 psi  
0.2 – 2 bar/ 3 – 30 psi

#### DUAL-STAGE - 200 BAR

##### FMD 502-14

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
3, 6, 10.5 bar  
45, 85, 150 psi

##### FMD 522-14

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
0.2 – 2 bar abs/ 3 – 29 psi abs  
0.2 – 3 bar abs/ 3 – 45 psi abs

##### FMD 562-14

Inlet pressure: 230 bar / 3300 psi  
Outlet pressure:  
0.2 – 1 bar/ 3 – 15 psi  
0.2 – 2 bar/ 3 – 30 psi

##### FMD 502-16

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
3, 6, 10.5 bar  
45, 85, 150 psi

##### FMD 522-16

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
0.2 – 2 bar abs/ 3 – 29 psi abs  
0.2 – 3 bar abs/ 3 – 45 psi abs

##### FMD 562-16

Inlet pressure: 230 bar / 3300 psi  
Outlet pressure:  
0.2 – 1 bar/ 3 – 15 psi  
0.2 – 2 bar/ 3 – 30 psi

##### FMD 502-18

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
3, 6, 10.5 bar  
45, 85, 150 psi

##### FMD 522-18

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
0.2 – 2 bar abs/ 3 – 29 psi abs  
0.2 – 3 bar abs/ 3 – 45 psi abs

##### FMD 562-18

Inlet pressure: 230 bar / 3300 psi  
Outlet pressure:  
0.2 – 1 bar/ 3 – 15 psi  
0.2 – 2 bar/ 3 – 30 psi

##### FMD 502-26/-27

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
3, 6, 10.5 bar  
45, 85, 150 psi

##### FMD 522-27

Inlet pressure: 230 bar/ 3300 psi  
Outlet pressure:  
0.2 – 2 bar abs/ 3 – 29 psi abs  
0.2 – 3 bar abs/ 3 – 45 psi abs

##### FMD 562-27

Inlet pressure: 230 bar / 3300 psi  
Outlet pressure:  
0.2 – 1 bar/ 3 – 15 psi  
0.2 – 2 bar/3 – 30 psi

#### SINGLE-STAGE - 300 BAR

##### FMD 530-14

Inlet pressure: 300 bar/ 4350 psi  
Outlet press.:  
6, 14, 28, 50, 200 bar  
85, 200, 400, 720, 2900 psi

#### DUAL-STAGE - 300 BAR

##### FMD 532-14

Inlet pressure: 300 bar/ 4350 psi  
Outlet pressure:  
3, 6, 10.5 bar  
45, 85, 150 psi

##### FMD 530-16

Inlet pressure: 300 bar/ 4350 psi  
Outlet pressure:  
6, 14, 28, 50, 200 bar  
85, 200, 400, 720, 2900 psi

##### FMD 532-16

Inlet pressure: 300 bar/ 4500 psi  
Outlet pressure:  
3, 6, 10.5 bar  
45, 85, 150 psi

##### FMD 530-18

Inlet pressure: 300 bar/ 4350 psi  
Outlet pressure:  
6, 14, 28, 50 bar  
85, 200, 400, 720 psi

##### FMD 532-18

Inlet pressure: 300 bar/ 4350 psi  
Outlet pressure:  
3, 6, 10.5 bar  
45, 85, 150 psi

##### FMD 530-26/-27

Inlet pressure: 300 bar/ 4350 psi  
Outlet pressure:  
6, 14, 28, 50, 200 bar  
85, 200, 400, 720, 2900 psi

##### FMD 532-26/-27

Inlet pressure: 300 bar/ 4350 psi  
Outlet pressure:  
3, 6, 10.5 bar  
45, 85, 150 psi

GAS SUPPLY PANELS, SERIES 500 AND ACETYLENE

**SMD 500/530-16**

Single-stage,  
Brass or stainless steel  
Inlet pressure: 230/ 300 bar  
3300/ 4350 psi  
Outlet pressure: 14, 28, 50, 200 bar  
400, 720, 2900 psi



**SMD 502/532-16**

Dual-stage,  
Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 3, 6, 10.5 bar  
45, 85, 150 psi



**SMD 500/530-24**

Single-stage, Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 14, 28, 50, 200 bar  
200, 400, 720, 2900 psi



**SMD 500/530-25**

Single-stage  
Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 14, 28, 50, 200 bar  
200, 400, 720, 2900 psi



**SMD 500/530-27**

Single-stage, with external gas purging  
Stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 14, 28, 50, 200 bar  
200, 400, 720, 2900 psi



**SMD 502/532-24**

Dual-stage, Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 3, 6, 10.5 bar  
45, 85, 150 psi



**SMD 502/532-27**

Dual-stage, with external gas purging  
Stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 3, 6, 10.5 bar  
45, 85, 150 psi



**BMD 500/530-30**

Single-stage, manual change over system  
Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 14, 28, 50, 200 bar  
200, 400, 725, 2900 psi



**BMD 500/530-32**

Single-stage, manual change over system,  
process gas purging  
Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 14, 28, 50, 200 bar  
200, 400, 720, 2900 psi



**BMD 500/530-34**

Single-stage, semi- automatic  
change over system  
With external gas purging  
Brass or stainless steel  
Inlet pressure: 230 /300 ba  
3300/4350 psi  
Outlet pressure: 14, 50 bar  
200, 720 psi



**BMD 500/530-35**

Single-stage, semi- automatic  
change over system  
With process gas purging  
Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 14, 50 bar  
200, 720 psi



**BMD 500/530-39**

Single-stage, semi- automatic  
change over system  
Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 14, 50 bar  
200, 720 psi



**BMD 502/532-34**

Dual-stage, semi- automatic  
change over system  
With external gas purging  
Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 3, 6, 10 bar  
45, 85, 145 psi



**BMD 502/532-35**

Dual-stage, semi- automatic  
change over system  
With process gas purging  
Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 3, 6, 10 bar  
45, 85/ 145 psi



**BMD 502/532-39**

Dual-stage, semi- automatic  
change over system  
Without purging  
Brass or stainless steel  
Inlet pressure: 230 /300 bar  
3300/4350 psi  
Outlet pressure: 3, 6, 10 bar  
45, 85, 145 psi



**BMD 200-29**

Single-stage, manual change over  
system, For Acetylene, Brass  
Outlet pressure: 1.5 bar / 22 psi



**SMD 200-29**

Single-stage, For Acetylene, Brass  
Outlet pressure: 1.5 bar / 22 psi

**BMD 202-39**

Dual-stage, semi- automatic change  
over system, For Acetylene, Brass  
Outlet pressure: 1.5 bar / 22 psi



**LINE PRESSURE REGULATORS SERIES 500**

**LMD 500-01/-03**

Single-stage  
 Brass or stainless steel  
 Inlet pressure: 230 bar / 3300 psi  
 Outlet pressure:  
 0.2 – 3 / 0.5 – 6 / 1 – 14 / 2.5 – 50 bar  
 3 – 45 / 7.5 – 85 / 14 – 200 / 35 – 720 psi

**LMD 510-01/-03**

Single-stage  
 Brass or stainless steel  
 Inlet pressure: 12 bar / 175 psi  
 Outlet pressure:  
 0.2 – 2 / 0.2 – 3 bar abs.  
 3 – 22 / 3 – 45 psi abs.

**LMD 530-01/-03**

Single-stage  
 Brass or stainless steel  
 Inlet pressure: 300 bar / 4350 psi  
 Outlet pressure:  
 0.2 – 3 / 0.5 – 6 / 1 – 14 / 2.5 – 50 bar  
 3 – 45 / 7.5 – 85 / 14 – 200 / 35 – 720 psi

**LMD 545-01/-03**

Single-stage  
 Brass or stainless steel  
 Inlet pressure: 40 / 12 bar  
 - 580 / 175 psi  
 Outlet pressure:  
 12 bar version  
 20 – 250 mbar 0.3 – 3.6 psi  
 100 – 1300 mbar 1.4 – 18.8 psi  
 40 bar version  
 0.15 – 0.5 bar 2.1 – 7.2 psi  
 0.15 – 3 bar 2.1 – 44 psi

**LMD 502-03**

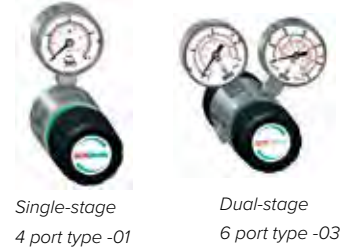
Dual-stage  
 Brass or stainless steel  
 Inlet pressure: 230 bar / 3300 psi  
 Outlet pressure:  
 0.2 – 1 / 0.2 – 3 / 0.5 – 6 / 1 – 10.5 bar  
 3 – 15 / 3 – 45 / 7.5 – 85 / 14 – 150 psi

**LMD 522-03**

Dual-stage  
 Brass or stainless steel  
 Inlet pressure: 230 bar / 3300 psi  
 Outlet pressure:  
 0.2 – 2 / 0.2 – 3 bar abs.  
 3 – 22 / 3 – 45 psi abs.

**LMD 532-03**

Dual-stage  
 Brass or stainless steel  
 Inlet pressure: 300 bar / 4350 psi  
 Outlet pressure:  
 0.2 – 1 / 0.5 – 3 / 0.5 – 6 / 1 – 10.5 bar  
 3 – 15 / 3 – 45 / 7 – 85 / 15 – 150 psi



Single-stage  
4 port type -01

Dual-stage  
6 port type -03



Single-stage  
6 port type -03



LMD 545-01  
4-Port-Type



LMD 545-03  
6-Port-Type

**POINT-OF-USE REGULATORS SERIES 500**

**EMD 500-06**

Single-stage  
 Brass or stainless steel  
 Inlet pressure: 40 bar / 600 psi  
 Outlet pressure:  
 0.2 – 1 / 0.2 – 6 / 0.5 – 10.5 bar  
 3 – 22 / 3 – 85 / 7 – 150 psi

**EMD 510-06**

Single-stage  
 Brass or stainless steel  
 Inlet pressure: 12 bar / 175 psi  
 Outlet pressure:  
 0.2 – 2 / 0.2 – 3 bar abs.  
 3 – 30 / 3 – 45 psi abs.



**LABORATORY GAS SUPPLY**

Point-of-use regulators EMD 3100  
 Single-stage  
 Brass or stainless steel  
 Inlet pressure:  
 40 bar / 600 psi  
 12 bar / 170 psi  
 Outlet pressure:  
 0.2 – 1.5 / 0.2 – 4 / 0.5 – 6 / 0.5 – 10.5 bar  
 3 – 22 / 3 – 60 / 7 – 87 / 7 – 150 psi  
 Analysis Version:  
 Inlet pressure: 10 bar / 145 psi  
 Outlet pressure: 2.2/4.4 bar – 33/66 psi



Basic body



Plate mounted



Wall mounted



Build-in



Bench mounted



Hanging version

LABORATORY GAS SUPPLY cont.

Point of Use regulator EMD 400

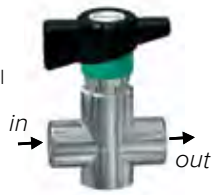


VALVE OVERVIEW

Diaphragm shut-off valve

**MVA 500/530**

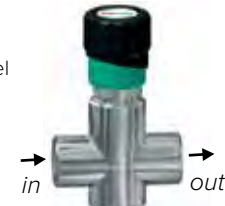
Model: In-line  
 Material: Brass chrome-plated/ Stainless steel  
 Inlet pressure: 230 /300 bar  
 3300/4350 psi  
 Nominal width: DN5 – Kv-Value: 0.25  
 Inlet/Outlet: NPT 1/4"



Diaphragm regulating and s/o valve

**MVR-A 500 G**

Model: In-line  
 Material: Brass chrome-plated / Stainless steel  
 Inlet pressure: 40 bar (O<sub>2</sub>) /50 bar  
 600/725 psi  
 Nominal width: DN2 – Kv-Value: 0.02  
 Inlet/Outlet: NPT 1/4"



Diaphragm shut-off valve

**MVA 501 G**

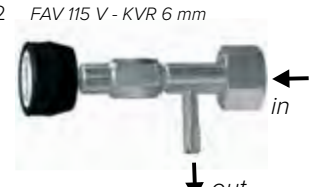
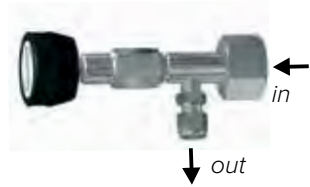
Model: In-line  
 Material: Brass / Brass chrome-plated / Stainless steel  
 Inlet pressure: 40 bar (O<sub>2</sub>) / 50 bar  
 600 (O<sub>2</sub>) / 725 psi  
 Nominal width: DN8 – Kv-Value: 0.5  
 Inlet: NPT 1/4"f or G3/8"f  
 Outlet: NPT 1/4"f or G3/8"f



Packed regulating valve

**FAV 115**

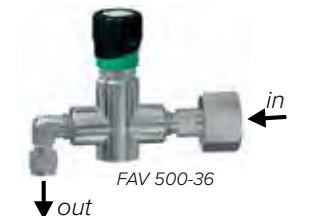
Model: Elbow design  
 Material: Stainless steel  
 Inlet pressure: 230 bar /2900 psi  
 Nominal width: DN2 - Kv-Value: 0.02  
 Inlet: cylinder connector DIN 477  
 Outlet: tube fitting 6mm  
 or hose nozzle 8 mm



Cylinder connection valve

**FAV 500-36**

Model: Elbow design  
 Material: Brass chrome-plated / Stainless steel  
 Inlet pressure: 50 bar / 725 psi  
 Nominal width: DN2 – Kv-Value: 0.02  
 Inlet: cylinder connector DIN 477  
 Outlet: tube fitting 6mm



Diaphragm shut-off valve

**MVA 400 G / 3100 G**

Model: Straight  
 Material: Brass chrome-plated / Stainless steel  
 Inlet pressure: 40 bar / 600 psi  
 Nominal width: DN5 – Kv-Value: 0.2  
 Inlet/Outlet: G3/8"f - G3/8"m



Diaphragm shut-off valve

**MVA 400 W / 3100 W**

Model: Elbow design  
 Material: Brass chrome-plated/ Stainless steel  
 Inlet pressure: 40 bar / 600 psi  
 Nominal width: DN5 – Kv-Value: 0.25  
 Inlet/Outlet: G1/4"f – G3/8"m



Diaphragm regulating valve

**MVR-A 400 W / 3100 W**

Model: Elbow design  
 Material: Brass chrome-plated / Stainless steel  
 Inlet pressure: 40 bar / 600 psi  
 Nominal width: DN2 – Kv-Value: 0.02  
 Inlet - outlet: G1/4"m – G1/4"f



Diaphragm regulating valve

**MVR-A 400 G / 3100 G**

Model: Straight  
 Material: Brass chrome-plated / Stainless steel  
 Inlet pressure: 40 bar / 600 psi  
 Nominal width: DN2 – Kv-Value: 0.02  
 Inlet - outlet: G1/4"f – G1/4"f



Cylinder connection valve

**FAV 500-37**

with gauge  
 Model: Elbow design  
 Material: Brass chrome-plated / Stainless steel  
 Inlet pressure: 50 bar / 725 psi  
 Nominal width: DN2 – Kv-Value: 0.02  
 Inlet: cylinder connector DIN 477



# HIGH PURITY REGULATORS SERIES 500

Adjustable outlet pressure range between 0.2 bar and 200 bar optional 0.2 bar abs. and 10.5 bar with the dual-stage version (series specific)

Pressure Gauge in safety model according to EN 837

Inlet pressure 230 bar optional 300 bar according to EN 837

Cylinder connection, gas specific, according to national standards like DIN, AFNOR, ... available for special gases of gas purity max. 6.0

Body in 6-port configuration

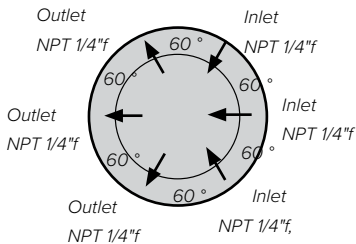
Ergonomic, clean, long lasting and ATEX compliant adjusting knob

Elgiloy diaphragm regulating and shut-off valve, protected by mesh filters 100 µm, inlet and outlet 1/4" f, seat sealing PCTFE.

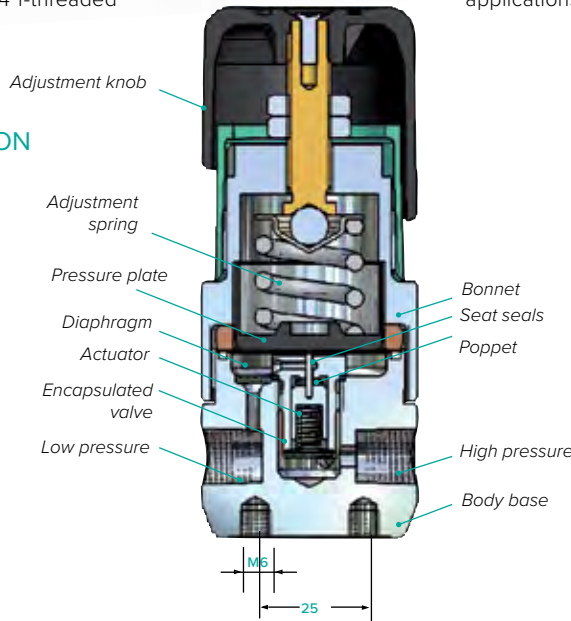
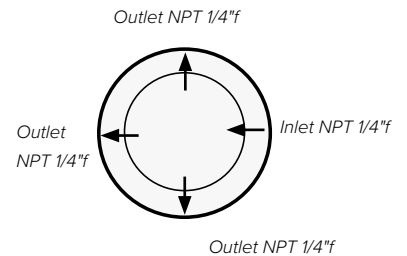
Higher safety level through integrated relief valve. Vent piping can be directly fitted on the NPT 1/4"-threaded outlet.

Higher burst and corrosion protection through the Hastelloy diaphragm. Long life expectancy through the patented damping system. Cleanliness and leak tightness satisfy all the demands of high purity applications.

## CONNECTIONS 6-PORT-VERSION (FRONTAL VIEW)



## CONNECTIONS 4-PORT-VERSION (FRONTAL VIEW)



CROSS-SECTION MD

## SERIES SPECIFIC DATA

### BODY MATERIAL

Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated.

### SEAL MATERIAL

PCTFE, FKM, EPDM, etc., dependant on gas specification and purity requirements.

### INNER PARTS

Pressure regulator unit with integrated mesh filter from 10 µm mesh opening at inlet and 100 µm at outlet.

### DIAPHRAGM

Good protection against burst and corrosion due to diaphragm material Hastelloy.

### PERFORMANCE DATA

See chart chapter at the end of this catalogue part, for different performance data please contact GCE druva.

### GUARANTEED LEAKAGE RATES

< 1×10<sup>-9</sup> mbar l/s Helium (body).  
< 5×10<sup>-6</sup> mbar l/s Helium (seat).

### WORKING TEMPERATURES

-25 °C to +70 °C / -13 °F to 158 °F

### PURITY

≤ 6.0

### CYLINDER / INLET CONNECTIONS

Compliant with national standards: DIN 477 and other connections as US-Norm CGA, British Standard BS etc. are available upon request.



# CYLINDER PRESSURE REGULATORS FMD 500-14/-16/-18



Single-stage,  
for inert, flammable and oxidizing gases and gas mixtures, purity max. 6.0,  
cylinder pressure 230 bar / 3300 psi,  
Outlet pressure range 0.2 – 200 bar / 3 – 2900 psi

### SPECIAL FEATURES

- > Diaphragm valve with 90° shut-off function (FMD 500-16) or regulating valve (FMD 500-18)
- > Diaphragm pressure regulator
- > ATEX compliant adjustment knobs

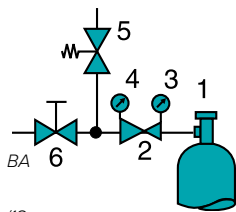
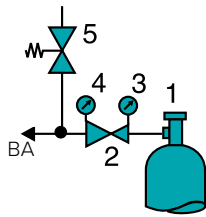
### DESCRIPTION

These pressure regulators consists of a cylinder connection, pressure regulator body, upstream and downstream pressure gauges, diaphragm shut-off valve (type -16) regulating valve (type -18), relief valve (by downstream pressure >50bar RV on request) and outlet tube fittings. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

### APPLICATION

The cylinder pressure regulator series FMD 500 offers a wide range of uses and great performance. The FMD 500-14 is the basic model. The FMD 500-16 allows shut-off of the gas flow while maintaining the pressure regulator's adjustment. The regulating valve of the FMD 500-18 allows a finer apportioning of gas flow.

### FLOW SCHEMATIC



- 1 Cylinder connection
  - 2 Pressure regulator
  - 3 Upstream pressure gauge
  - 4 Downstream pressure gauge
  - 5 Relief valve
  - 6 Downstream shut-off valve (Type -16) / regulating valve (Type -18)
- BA Process gas outlet

TECHNICAL DATA	
<b>Body:</b>	Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Seat seals:</b>	PCTFE
<b>Seal material:</b>	PCTFE (SS), PVDF (brass)
<b>Relief valve:</b>	outlet NPT1/4" f
<b>Relief valve seat seal:</b>	SS: FKM, (EPDM, FFKM)*, MS: EPDM, (FKM)*
<b>Pressure gauge range:</b>	-1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa) 0 – 25 bar (0 – 365 psi) (0 – 2500 kPa) 0 – 40 bar (0 – 600 psi) (0 – 4000 kPa) 0 – 80 bar (0 – 1150 psi) (0 – 8000 kPa) 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
<b>Basic design aspects:</b>	see page 15
<b>Weight:</b>	approx. 1.5 kg (type -14), 1.8 kg (type -16/18)
<b>Dimensions (w×h×d):</b>	approx. 225× 140× 125mm
<b>Cylinder connections:</b>	according to gas type
<b>Outlet:</b>	NPT 1/4" f, optional tube fitting

\* on request

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Contact gauge inlet	Gas type
<b>FMD 500-14 BC</b>	<b>BC</b>	<b>F</b>	<b>10</b>	<b>DIN</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>GAS</b>
FMD 500-14	BC = brass-	F = 230 bar/	6 = 0.5 – 6 bar/ 3 – 85 psi	DIN	N14F = NPT 1/4" f	0 = without	Please
FMD 500-16	chrome plated	3300 psi	14 = 1 – 14 bar/15 – 200 psi	ANSI	CL6	Ki = with	specify
FMD 500-18	SS = stainless steel		28 = 2.5 – 28 bar/ 35 – 365 psi	AFNOR	CL8		
			50 = 2.5 – 50 bar / 35 – 720 psi	NBN	CL 1/8"		
			200 = 10 – 200 bar/145 – 2900 psi (200 bar not with FMD 500-18)	BS341	CL 1/4"		
					NO6		
					CGA		
					NEN, UNI		

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CYLINDER PRESSURE REGULATORS FMD 502-14/-16/-18



Type -14



Type -16



Type -18

Dual-stage,  
for inert, flammable and oxidizing gases and gas mixtures,  
purity max. 6.0  
cylinder pressure 230 bar / 3300 psi  
Outlet pressure range 0.2 – 10.5 bar / 3 – 145 psi

### SPECIAL FEATURES

- > Outlet pressure virtually independent of inlet pressure due to dual-stage design
- > Diaphragm valve with 90°-shut-off function (FMD 502-16) or regulating valve (FMD 502-18)
- > Diaphragm pressure regulator
- > ATEX compliant adjustment knobs

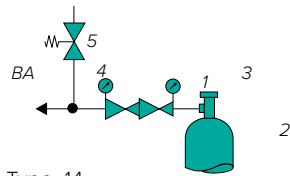
### DESCRIPTION

These pressure regulators consists of a cylinder connection, pressure regulator body, upstream and downstream pressure gauges, relief valve, diaphragm shut-off valve (type -16) diaphragm regulating valve (type -18) and outlet tube fittings. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

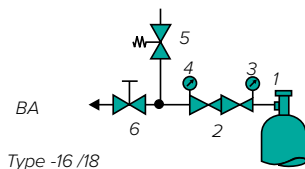
### APPLICATION

The cylinder pressure regulator series FMD 502 offers a wide range of uses and great performance. The FMD 502-16 allows shut-off/opening of the gas flow while maintaining the pressure regulator's adjustment. The FMD 502-18 allows for pressure setting as well as a finer apportioning of gas flow. The dual-stage design ensures the uniformity of the downstream pressure irrespectively of the level of the cylinder pressure.

### FLOW SCHEMATIC



Type -14



Type -16 /18

- 1 Cylinder connection
  - 2 Pressure regulator
  - 3 Upstream pressure gauge
  - 4 Downstream pressure gauge
  - 5 Relief valve
  - 6 Downstream shut-off valve (type-16) /regulating valve (type -18)
- BA Process gas outlet

TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Seat seals 1st stage:</b>	PCTFE
<b>Seat seals 2nd stage:</b>	PTFE
<b>Seal material:</b>	PCTFE (SS), PTFE (brass)
<b>Relief valve seat seals:</b>	Stainless steel: FKM, (EPDM, FFKM)* Brass: EPDM, (FKM)*
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 5 bar (-15 – 75 psi) (-100 – 500 kPa) -1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa) -1 – 18 bar (-15 – 260 psi) (-100 – 1800 kPa) 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
<b>Weight:</b>	approx. 2.1 kg (type -14), 2.4 kg (type -16/18)
<b>Dimensions (w×h×d):</b>	approx. 225×140×210 mm
<b>Cylinder connections:</b>	in compliance with DIN 477
<b>Cylinder connections:</b>	according to gas type
<b>Outlet:</b>	NPT 1/4" f, optional tube fitting

\*on request

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Contact gauge inlet	Gas type
<b>FMD 502-14 BC</b>	<b>BC</b>	<b>F</b>	<b>10</b>	<b>DIN</b>	<b>CL6</b>	<b>Ki</b>	<b>GAS</b>
FMD 502-14	BC = brass-chrome plated	F = 230 bar/ 3300 psi	1 = 0.2 – 1 bar / 3 – 15 psi 3 = 0.2 – 3 bar / 3 – 45 psi 6 = 0.5 – 6 bar / 3 – 85 psi 10 = 1 – 10.5 bar / 7 – 150 psi	DIN ANSI AFNOR NBN BS 341 CGA NEN	N14F= NPT 1/4" f CL6 CL8 CL 1/8" CL 1/4" NO6	0 = without Ki = with	Please specify
FMD 502-16	plated						
FMD 502-18	SS = stainless steel						

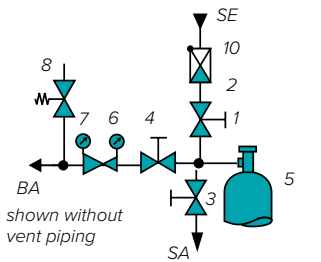
\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CYLINDER PRESSURE REGULATORS FMD 500-26/-27



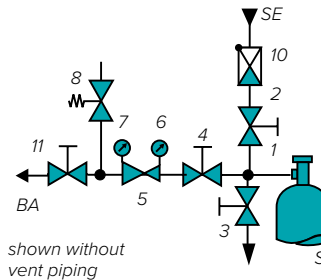
Type -26

### FLOW SCHEMATIC



Type -27

### FLOW SCHEMATIC



- 1 Cylinder connection
- 2 Purge inlet valve
- 3 Purge outlet valve
- 4 Upstream shut-off valve
- 5 Cylinder pressure regulator
- 6 Upstream pressure gauge
- 7 Downstream pressure gauge
- 8 Relief valve
- 10 Check valve
- 11 Downstream shut-off valve (only type -27)
- BA Process gas outlet
- SE Purge inlet
- SA Purge outlet

Single-stage,  
with external gas purging,  
for reactive, flammable, oxidizing and corrosive gases and gas mixtures,  
not for oxygen,  
purity max. 6.0,  
cylinder pressure 230 bar  
Outlet pressure range 0.5 – 200 bar / 7 – 2900 psi

### SPECIAL FEATURES

- > Diaphragm shut-off valve
- > Diaphragm pressure regulator
- > ATEX compliant adjustment knobs
- > Optionally with sub-atmospheric pressure regulation (FMD 510)
- > Optional gas-tight welded connections for optimum purge conditions and maximum safety

### DESCRIPTION

These pressure regulators consists of a cylinder connection, purge valve block with a check valve, purge inlet and outlet valve, pressure regulator body, upstream and downstream pressure gauges, relief valve (by downstream pressure >50bar RV on request), and outlet tube fittings, (FMD 500-27 with diaphragm shut-off valve MVA 500 G). Optionally the pressure regulator, purge valve block and cylinder connection can be joined with one another using orbital welding for a gas-tight connection. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

### APPLICATION

The cylinder pressure regulator series FMD 500 stands out for its wide range of uses and excellent performance. The upstream purge valve block allow as an external gas purging with inert gas. The purge volume is kept to a minimum (only cylinder connection) and the purge gases can be separately conveyed. Therefore this regulator is especially suited to use with reactive, flammable, oxidizing and corrosive gases. It guarantees optimum purge conditions and with toxic gases maximum safety for the application and for the operator.

TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished
<b>Seals:</b>	PCTFE
<b>Relief valve seat seals:</b>	FKM, (EPDM, FFKM) *
<b>Pressure gauge range:</b>	-1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa)
	0 – 25 bar (0 – 365 psi) (0 – 2500 kPa)
	0 – 40 bar (0 – 600 psi) (0 – 4000 kPa)
	0 – 80 bar (0 – 1150 psi) (0 – 8000 kPa)
	0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
<b>Weight:</b>	approx. 2.9 kg (type -26), 3.3 kg (type -27)
<b>Dimensions (w×h×d):</b>	approx. 310×180×125 mm
<b>Basic design aspects:</b>	see page 15
<b>Purge inlet:</b>	check valve, compressed fitting
<b>Purge outlet:</b>	NPT 1/4" f, optional compressed fitting
<b>Cylinder connections:</b>	according to gas type
<b>Outlet:</b>	NPT 1/4" f, optional compressed fitting

\*on request

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Gas type
<b>FMD 500-26</b>	<b>SS</b>	<b>F</b>	<b>3</b>	<b>DIN</b>	<b>CL6</b>	<b>Ki1</b>	<b>GAS</b>
FMD 500-26	SS = stainless steel	F = 230 bar/ 3300 psi	3 = 0.2 – 3 bar/ 3 – 45 psi 6 = 0.5 – 6 bar/ 3 – 85 psi	DIN ANSI AFNOR NBN BS 341 CGA NEN, UNI	N14F = NPT 1/4" f CL3 CL6 (standard) CL8 CL 1/8"	0 = without Ki1 = with	Please specify (no O <sub>2</sub> )

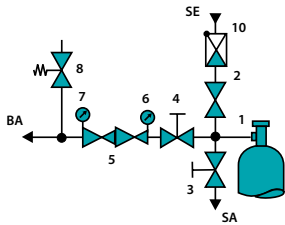
\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CYLINDER PRESSURE REGULATORS FMD 502-26/-27



Dual-stage,  
with external gas purging,  
for inert, reactive, flammable and oxidizing gases and gas mixtures, not for oxygen,  
purity max. 6.0,  
cylinder pressure 230 bar / 3300 psi,  
Outlet pressure range 0.2 – 6 bar / 3 – 85 psi

## FLOW SCHEMATIC



## SPECIAL FEATURES

- > With external gas purging
- > Optimum purge conditions with purge valve block
- > Downstream pressure virtually independent of upstream pressure due to dual-stage design
- > With diaphragm shut-off valve
- > Diaphragm pressure regulator
- > ATEX compliant adjustment knobs

## DESCRIPTION

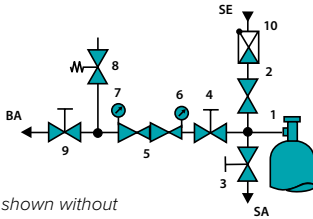
These pressure regulators consists of a cylinder connection, purge valve block with a check valve, purge inlet and outlet valve, pressure regulator body, upstream and downstream pressure gauges, diaphragm relief valve MVA 500 (only type -27), relief valve, and outlet tube fittings. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.



## APPLICATION

The pressure regulator series FMD 500 stands out for its wide range of uses and excellent performance. The dual-stage design ensures the uniformity of the downstream pressure irrespectively of the level of the cylinder pressure. The upstream purge valve block allows as an external gas purging with inert gas. The purge volume is kept to a minimum (only cylinder connection) and the purge gases can be separately conveyed. Therefore this regulator is especially suited to use with reactive, flammable, oxidizing and corrosive gases. It guarantees optimum purge conditions and with toxic gases maximum safety for the application and for the operator.

## FLOW SCHEMATIC



shown without vent piping

- 1 Cylinder connection
- 2 Purge inlet valve
- 3 Purge outlet valve
- 4 Upstream shut-off valve
- 5 Cylinder pressure regulator
- 6 Upstream pressure gauge
- 7 Downstream pressure gauge
- 8 Relief valve
- 9 Downstream shut-off valve (only type -27)
- 10 Check valve
- BA Process gas outlet
- SE Purge inlet
- SA Purge outlet

TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished
<b>Seat seals 1st stage:</b>	PCTFE
<b>Seat seals 2nd stage:</b>	PTFE
<b>Body seals:</b>	PCTFE
<b>Relief valve seat seals:</b>	FKM, (EPDM, FFKM)*
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 5 bar (-15 – 75 psi) (-100 – 500 kPa)
	-1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa)
	0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
<b>Weight:</b>	approx. 3.5 kg (type -26), 3.9 kg (type -27)
<b>Dimensions (w×h×d):</b>	approx. 310×180×230 mm
<b>Purge inlet:</b>	check valve, tube tting 6 mm
<b>Purge outlet:</b>	NPT 1/4" f, optional tube fitting
<b>Cylinder connections:</b>	according to gas type
<b>Outlet:</b>	NPT 1/4" f, optional tube fitting

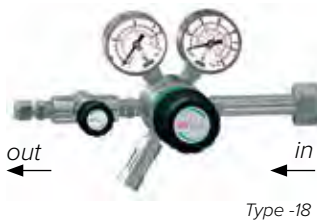
\*on request

## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Gas type
<b>FMD 502-26</b>	<b>SS</b>	<b>F</b>	<b>3</b>	<b>DIN</b>	<b>CL6</b>	<b>Ki1</b>	<b>GAS</b>
FMD 502-26	SS = stainless steel	F = 230 bar/ 3300 psi	3 = 0.2 – 3 bar / 3 – 45 psi	DIN	N14F = NPT 1/4" f	0 = without	Please specify (no O <sub>2</sub> )
FMD 502-27	steel		6 = 0.5 – 6 bar / 3 – 85 psi	ANSI AFNOR NBN BS 341 CGA NEN, UNI	CL3 CL6 (standard) CL8 CL 1/8"	Ki1 = with	

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CYLINDER PRESSURE REGULATORS FMD 510/540-14/-16/-18



Single-stage,  
for inert, flammable and oxidizing gases and gas mixtures,  
purity max. 6.0  
cylinder pressure 12 bar / 175 psi,  
FMD 510: Outlet pressure range 0.2 – 3 bar abs / 3 – 45 psi abs,  
FMD 540: Outlet pressure range 0.2 – 2 bar / 3 – 30 psi

### SPECIAL FEATURES

- > For low downstream pressure
- > Subatmospheric-pressure regulation (FMD 510)
- > Diaphragm valve with 90°-shut-off function (FMD Type -16) or regulating valve (FMD Type -18)
- > Diaphragm regulator
- > ATEX compliant adjustment knobs

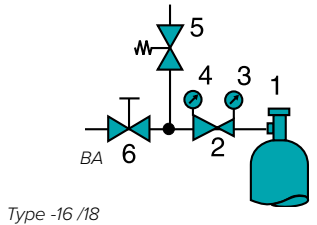
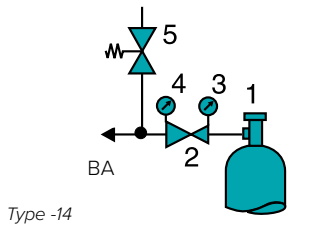
### DESCRIPTION

These pressure regulators consists of a cylinder connection, pressure regulator, upstream and downstream pressure gauges, diaphragm shut-off valve MVA 500 (type -16), regulating valve MVR 500 (type -18), relief valve and outlet tube fittings. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

### APPLICATION

The pressure regulator series FMD 510/540 reduces low upstream pressure to a very low downstream pressure: FMD 510 down to 0.2 bar absolut and is suitable for Subatmospheric-pressure regulation, the FMD 540 down to 0.2 bar. The FMD 510/540 would be selected depending on the requirements and needs of the downstream use, in regards of the shut-off or rather regulating of the gas stream and Subatmospheric-pressure regulation.

### FLOW SCHEMATIC



- 1 Cylinder connection
- 2 Pressure regulator
- 3 Upstream pressure gauge
- 4 Downstream pressure gauge
- 5 Relief valve
- 6 Downstream shut-off valve (type -16) / regulating valve (type -18)
- BA Process gas outlet

TECHNICAL DATA	
<b>Body:</b>	Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Seat seals:</b>	Stainless steel: FFKM, (EPDM)*
<b>Brass:</b>	EPDM, (FKM)*
<b>Seal material:</b>	PCTFE (stainless steel), PVDF (brass)
<b>Relief valve seat seals:</b>	Stainless steel: FKM, (EPDM, FFKM)* Brass: EPDM, (FKM)*
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 1.5 bar (-15 – 40 psi) (-100 – 150 kPa) -1 – 5 bar (-15 – 75 psi) -1 – 18 bar (-15 – 260 psi)
<b>Weight:</b>	approx. 1.5 kg (type -14), 1.8 kg (type -16/18)
<b>Dimensions (w×h×d):</b>	approx. 139×126×175 (-14), 223 (-16 and -18) mm
<b>Cylinder connections:</b>	according to gas type
<b>Outlet:</b>	NPT 1/4" f, optional tube fitting

\* on request

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Gas type
<b>FMD 510-14</b>	<b>BC</b>	<b>D</b>	<b>2</b>	<b>DIN</b>	<b>CL6</b>	<b>Ki</b>	<b>GAS</b>
FMD 510-14	BC = brass	D = 12 bar/175 psi	FMD 510:	DIN	N14F = NPT 1/4" f	0 = without	Please specify
FMD 510-16	chrome-plated		2a = 0.2 – 2 bar abs. /3 – 30 psi abs.	ANSI	CL6	Ki = with	
FMD 510-18	SS = stainless		3a = 0.2 – 3 bar abs. /3 – 45 psi abs.	AFNOR	CL8		
FMD 540-14	steel		FMD 540:	NBN	CL 1/8"		
FMD 540-16			1 = 0.2 – 1 bar/3 – 15 psi	BS 341	CL 1/4"		
FMD 540-18			2 = 0.2 – 2 bar/3 – 30 psi	CGA	NO6		
				NEN			
				UNI			

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

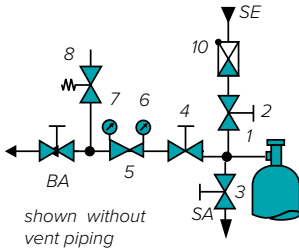
# CYLINDER PRESSURE REGULATORS FMD 510/540-26/27



Type -26

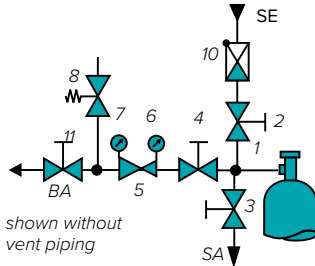
Single-stage, with external gas purging, for inert, reactive, flammable and oxidizing gases and gas mixtures,  
 purity max. 6.0, cylinder pressure 12 bar / 175 psi  
 FMD 510: Outlet pressure range 0.2 – 3 bar abs / 3 – 45 psi abs  
 FMD 540: Outlet pressure range 0.2 – 2 bar / 3 – 30 psi

## FLOW SCHEMATIC



Type -27

## FLOW SCHEMATIC



- 1 Cylinder connection
- 2 Purge inlet valve
- 3 Purge outlet valve
- 4 Upstream shut-off valve
- 5 Pressure regulator
- 6 Upstream pressure gauge
- 7 Downstream pressure gauge
- 8 Relief valve
- 10 Check valve
- 11 Downstream shut-o valve (only type-27)
- BA Process gas outlet
- SE Purge inlet
- SA Purge outlet

## SPECIAL FEATURES

- > For low downstream pressure
- > With external gas purging
- > Subatmospheric-pressure regulation (FMD 510)
- > With diaphragm shut-off valve
- > Diaphragm regulator
- > ATEX compliant adjustment knobs

## DESCRIPTION

These pressure regulators consists of a cylinder connection , purge valve block with a check valve, purge inlet and outlet valve, pressure regulator, upstream and downstream pressure gauges, diaphragm shut-off valve MVA 500 (only type-27), relief valve and outlet tube fittings. Optionally the pressure regulator, purge valve block and cylinder connection can be joined with one another using orbital welding for a gas-tight connection. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

## APPLICATION

The pressure regulator series FMD 510/540 reduces low upstream pressure to a very low downstream pressure: FMD 510 down to 0.2 bar absolut and is suitable for subatmospheric-pressure regulation, FMD 540 down to 0.2 bar. The type of regulator is selected according to the requirements of the downstream uses with regards to the shut-off or rather regulating of the gas stream. The upstream purge valve block allows for an external gas purging with inert gas. The purge volume is kept to a minimum (only cylinder connection) and the purge gases can be separately conveyed. For this reason these regulators are especially suited for use with reactive, flammable, oxidizing and corrosive gases. It guarantees optimum purge conditions and with toxic gases maximum safety for the application and for the operator.

TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished
<b>Seat seals:</b>	FFKM, (EPDM *)
<b>Seals:</b>	PCTFE
<b>Relief valve seat seals:</b>	FKM, (EPDM, FFKM) *
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 1,5 bar (-15 – 40 psi) (-100 – 150 kPa)
	-1 – 5 bar (-15 – 75 psi) (-100 – 500 kPa)
	-1 – 18 bar (-15 – 260 psi) (-100 – 1800 kPa)
<b>Weight:</b>	approx. 3.3kg (type-26), 3.7kg (type-27)
<b>Dimensions (w×h×d):</b>	approx. 310×180×230 mm
<b>Purge inlet:</b>	check valve, tube fitting 6 mm
<b>Purge outlet:</b>	NPT 1/4" f, optional tube fitting
<b>Cylinder connections:</b>	according to gas type
<b>Outlet:</b>	NPT 1/4" f, optional tube fitting

\* on request

## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Vent piping	Gas type
<b>FMD 510-26</b>	<b>SS</b>	<b>D</b>	<b>2</b>	<b>DIN</b>	<b>CL6</b>	<b>Ki</b>	<b>A</b>	<b>GAS</b>
FMD 510-26	SS = stainless steel	D = 12 bar/175 psi	FMD 510:	DIN	N14F = NPT 1/4" f	0 = without	0 = without	Please specify
FMD 510-27	steel		2 a = 0.2 – 2 bar abs. /3 – 30 psi abs.	ANSI	CL3*	Ki = with	A = with	
FMD 540-26			3a = 0.2 – 3 bar abs./3 – 45 psi abs.	AFNOR	CL6 (standard)		(Only in conjunction with RV)	
FMD 540-27			FMD 540:	NBN	CL8			
			1 = 0.2 – 1 bar / 3 – 15 psi	BS 341	CL 1/8"			
			2 = 0.2 – 2 bar /3 – 30i	CGA				
				NEN				
				UNI				

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CYLINDER PRESSURE REGULATORS FMD 522/562-14/-16/-18



Type -14



Type -16



Type -18

Dual-stage,  
for inert, flammable and oxidizing gases and gas mixtures,  
purity max. 6.0,  
cylinder pressure 230 bar / 3300 psi,  
FMD 522: Outlet pressure range 0.2 – 3 bar abs / 3 – 45 psi abs,  
FMD 562: Outlet pressure range 0.2 – 2 bar / 3 – 30 psi

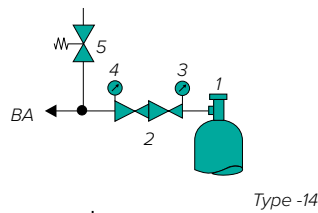
## SPECIAL FEATURES

- > For low downstream pressure
- > Subatmospheric-pressure regulation (FMD 522)
- > Downstream pressure is virtually independent of upstream pressure due to dual-stage design
- > Diaphragm valve with 90°-shut-off function (type -16) or regulating valve (type -18)
- > Diaphragm regulator
- > ATEX compliant adjustment knobs

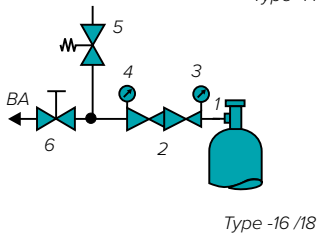
## DESCRIPTION

These pressure regulator consists of a cylinder connection, pressure regulator, upstream and downstream pressure gauges, diaphragm shut-off valve MVA 500 (only type-16), regulating valve MVR 500 (Type -18), relief valve and outlet tube fittings. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

## FLOW SCHEMATIC



Type -14



Type -16 /18

- 1 Cylinder connection
  - 2 Pressure regulator
  - 3 Upstream pressure gauge
  - 4 Downstream pressure gauge
  - 5 Relief valve
  - 6 Downstream shut-off valve (type -16) /regulating valve (type -18)
- BA Process gas outlet

## APPLICATION

The pressure regulator series FMD 522/562 reduces high upstream pressure to low downstream pressure: FMD 522 down to 0.2 bar absolute and is therefore suitable for subatmospheric-pressure regulation, the FMD 562 down to 0.2 bar. This type of regulator is selected according to the requirements of the downstream uses with regards to the shut-off or rather regulating of the gas stream.

TECHNICAL DATA	
<b>Body:</b>	Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Seat seals 1st stage:</b>	PCTFE
<b>Seat seals 2nd stage:</b>	Stainless steel: FFKM, (EPDM)*, Brass: EPDM, (FKM)*
<b>Body seals:</b>	PCTFE (Stainless steel), PVDF (Brass)
<b>Relief valve seat seals:</b>	SS: FKM, (EPDM, FFKM)* Brass: EPDM, (FKM)*
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 1.5 bar (-15 – 40 psi) (-100 – 150 kPa) -1 – 5 bar (-15 – 75 psi) (-100 – 500 kPa) 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
<b>Weight:</b>	approx. 2.1 kg (type -14), 2.4kg (type -16/18)
<b>Dimensions (w×h×d):</b>	approx. 225×140×210 mm
<b>Cylinder connections:</b>	according to gas type
<b>Outlet:</b>	NPT 1/4" f, optional tube fitting

\* on request

## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Gas type
<b>FMD 522-14 BC</b>	<b>F</b>	<b>2</b>	<b>DIN</b>	<b>CL6</b>	<b>Ki</b>	<b>GAS</b>	
FMD 522-14	BC = brass	F = 230 bar/3300 psi	FMD 522	DIN	CL6	Ki = without	Please specify
FMD 522-16	chrome-plated		2 a= 0.2 – 2 bar abs. /3 – 30 psi abs.	ANSI	AFNOR	Ki = with	
FMD 522-18	SS = stainless		3a = 0.2 – 3 bar abs. /3 – 45 psi abs.	AFNOR			
FMD 562-14	steel		FMD 562	NBN			
FMD 562-16			1 = 0.2 – 1 bar / 3 – 15 psi	BS 341			
FMD 562-18				CGA			
				NEN			
				UNI			

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter; NO... = hose connector for ... mm hose inside diameter.

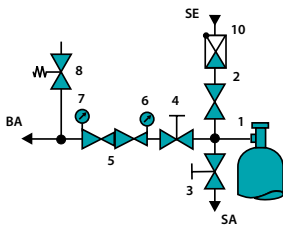
# CYLINDER PRESSURE REGULATORS FMD 522/562-26/-27



Type -26

Dual-stage, with external gas purging,  
 for inert, reactive, flammable and oxidizing gases and gas mixtures (not oxygen),  
 purity max. 6.0,  
 cylinder pressure 230 bar / 3300 psi,  
 FMD 522: Outlet pressure range 0.2 – 3 bar abs / 3 – 45 psi abs,  
 FMD 562: Outlet pressure range 0.2 – 2 bar / 3 – 30 psi

## FLOW SCHEMATIC



## SPECIAL FEATURES

- > Inert gas purging
- > Optimum purge conditions with purge valve block
- > Subatmospheric-pressure regulation (FMD 522)
- > Downstream pressure virtually independent of upstream pressure due to dual-stage design
- > Diaphragm shut-off valve
- > Diaphragm regulator
- > ATEX compliant adjustment knobs

## DESCRIPTION

These pressure regulators consists of a cylinder connection, purge valve block with a check valve, purge inlet and outlet valve, pressure regulator, upstream and downstream pressure gauges, diaphragm shut-off valve MVA 500 (only type-27), relief valve and outlet tube fittings. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

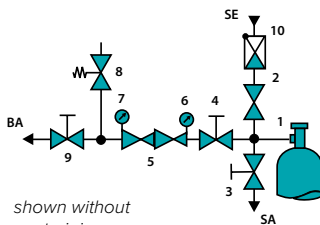


Type -27

## APPLICATION

The upstream purge valve block allows for an external gas purging with inert gas. The purge volume is kept to a minimum (only cylinder connection) and the purge gases can be separately conveyed. For this reason these regulators are especially suited to use with reactive, flammable, oxidizing and corrosive gases. It guarantees optimum purge conditions and with toxic gases maximum safety for the application and for the operator. The dual-stage design ensures the uniformity of the downstream pressure irrespectively of the level of the cylinder pressure.

## FLOW SCHEMATIC



shown without vent piping

- 1 Cylinder connection
  - 2 Purge inlet valve
  - 3 Purge outlet valve
  - 4 Upstream shut-off valve
  - 5 Pressure regulator
  - 6 Upstream pressure gauge
  - 7 Downstream pressure gauge
  - 8 Relief valve
  - 10 Check valve
  - 11 Downstream shut-off valve (only type -27)
- BA Process gas outlet  
 SE Purge inlet  
 SA Purge outlet

TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished
<b>Seat seals 1st stage:</b>	PCTFE
<b>Seat seals 2nd stage:</b>	FFKM, (EPDM *)
<b>Body seals:</b>	PCTFE
<b>Relief valve seat seals:</b>	FKM, (EPDM, FFKM *)
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 1.5 bar (-15 – 40 psi) (-100 – 150 kPa)
	-1 – 5 bar (-15 – 75 psi) (-100 – 500 kPa)
	0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
<b>Weight:</b>	approx. 3.5 (type -26) / 3.9 kg (type -27)
<b>Dimensions (w×h×d):</b>	approx. 310×180×230 mm
<b>Purge inlet:</b>	check valve, tube fitting 6 mm
<b>Purge outlet:</b>	NPT 1/4" f, optional tube connection
<b>Outlet:</b>	NPT 1/4" f, optional tube fitting
<b>Cylinder connections:</b>	according to gas type

\*on request

## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Gas type
<b>FMD 522-27</b>	<b>SS</b>	<b>F</b>	<b>2</b>	<b>DIN</b>	<b>CL6</b>	<b>Ki1</b>	<b>GAS</b>
FMD 522-26	SS = stainless steel	F = 230 bar/3300 psi	FMD 522	DIN	N14F = NPT 1/4" f	0 = without	Please specify (no O <sub>2</sub> )
FMD 522-27			2a = 0.2 – 2 bar abs. / 1 – 30 psi abs.	ANSI	CL3**	Ki = with	
FMD 562-26			3a = 0.2 – 3 bar abs. / 1 – 45 psi abs.	AFNOR	CL6 (standard)		
FMD 562-27			FMD 562	NBN	CL8		
			1 = 0.2 – 1 bar / 1 – 15 psi	BS 341	CL 1/8"		
			2 = 0.2 – 2 bar / 1 – 30 psi	CGA			
				NEN			
				UNI			

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.



# CYLINDER PRESSURE REGULATORS FMD 530-14/-16/-18



Single-stage,  
for inert, flammable and oxidizing gases and  
gas mixtures,  
purity max. 6.0,  
cylinder pressure 300 bar/ 4350 psi,  
Outlet pressure range 0.5 – 200 bar / 7 – 2900 psi

### SPECIAL FEATURES

- > For 300 bar cylinders
- > Diaphragm regulator
- > ATEX compliant adjustment knobs

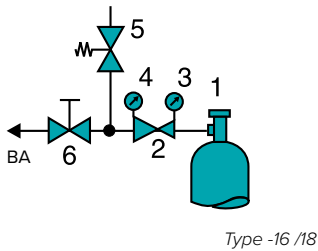
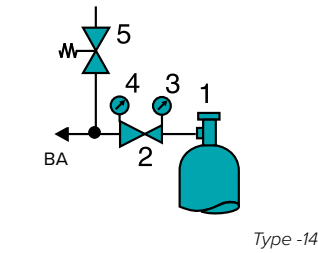
### DESCRIPTION

The FMD 530-14 consists of a cylinder connection, pressure regulator, upstream and downstream pressure gauges, relief valve (by downstream pressure >50bar RV on request) and outlet tube fittings. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

### APPLICATION

The cylinder pressure regulator series FMD 530 has a broad range of uses and excellent performance. Type-14 is the basic model for independent gas supply with 300 bar cylinder. Type-16 allows shut-off/opening of the gas flow while maintaining the pressure regulator's adjustment and type-18 allows for pressure regulating as well as a finer control of gas flow.

### FLOW SCHEMATIC



- 1 Cylinder connection
- 2 Pressure regulator
- 3 Upstream pressure gauge
- 4 Downstream pressure gauge
- 5 Relief valve
- 6 Downstream shut-off valve (type -16)  
/ regulating valve (type -18)
- BA Process gas outlet

TECHNICAL DATA	
<b>Body:</b>	Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Seat seals:</b>	PCTFE
<b>Body seals:</b>	PCTFE (Stainless steel), PVDF (Brass)
<b>Relief valve:</b>	Outlet NPT1/4"f, for downstream pressure >50bar
<b>Relief valve seat seals:</b>	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*,
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa)
	0 – 25 bar (0 – 365 psi) (0 – 2500 kPa)
	0 – 40 bar (0 – 600 psi) (0 – 4000 kPa)
	0 – 80 bar (0 – 1150 psi) (0 – 8000 kPa)
	0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
	0 – 400 bar (0 – 5800 psi) (0 – 40000 kPa)
<b>Weight:</b>	approx. 1.5 kg (type -14), 1.8 kg (type -16/18)
<b>Dimensions (w×h×d):</b>	approx. 225×140×125 mm
<b>Outlet:</b>	NPT 1/4"f. optional tube fitting
<b>Cylinder connections:</b>	according to gas type

\*on request

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Gas type
<b>FMD 530-14 BC</b>	<b>G</b>	<b>2</b>	<b>DIN</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>GAS</b>	
FMD 530-14	BC = brass	G = 300 bar /4350 psi	6 = 0.5 – 6 bar / 7 – 85 psi	DIN	N14 = NPT 1/4"f	0 = without	Please specify
FMD 530-16	chrome-plated		14 = 1 – 14 bar/15 – 150 psi	ANSI	CL3	Ki = with	
FMD 530-18	SS = stainless steel		28 = 2.5 – 28 bar / 35 – 400psi	AFNOR	CL6 (standard)		
			50 = 2.5 – 50 bar/35 – 720 psi	NBN	CL 1/8"		
			200 = 10 – 200 bar	BS 341	CL 1/4"		
			/150 – 2900 psi (not Type-18)	CGA	CL 1/4"		
				NEN	NO6		
				UNI			

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CYLINDER PRESSURE REGULATORS FMD 532-14/-16/-18



Type -14



Type -16



Type -18

Dual-stage,  
for inert, flammable and oxidizing gases and gas mixtures,  
not for oxygen,  
purity max. 6.0,  
cylinder pressure 300 bar/ 4350 psi,  
Outlet pressure range 0.2 – 10.5 bar / 3 – 150 psi

### SPECIAL FEATURES

- > For 300 bar cylinders
- > Downstream pressure is independent of the upstream pressure due to the dual-stage design
- > Higher reliability through the use of a relief valve

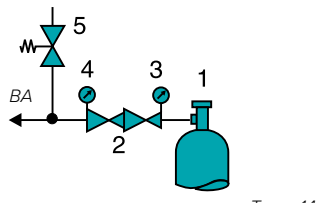
### DESCRIPTION

The FMD 532 consists of a cylinder connection, pressure regulator, upstream and downstream pressure gauges, relief valve and downstream regulating valve (FMD 532-18) or shut off valve (FMD 532-16) . The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

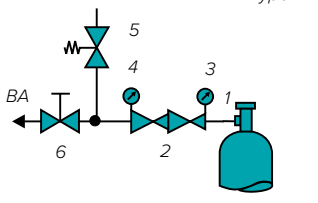
### APPLICATION

The cylinder pressure regulator series FMD 532 has a broad range of uses and excellent performance. The FMD 532-14 is the basic model for location-independent gas supply with 300 bar cylinder. The FMD 532-16 allows shut-off /opening of the gas flow while maintaining the pressure regulator's adjustment. The FMD 532-18 allows for pressure regulating as well as a finer apportioning of gas flow.

### FLOW SCHEMATIC



Type -14



Type -16 /18

- 1 Cylinder connection
  - 2 Pressure regulator
  - 3 Upstream pressure gauge
  - 4 Downstream pressure gauge
  - 5 Relief valve
  - 6 Downstream shut-off valve (type -16) / regulating valve (type -18)
- BA Process gas outlet

TECHNICAL DATA	
<b>Body:</b>	Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Dimensions (w×h×d):</b>	approx. 175×139×206 mm
<b>Seat seals:</b>	PCTFE
<b>Body seals:</b>	PCTFE (Stainless steel), PVDF (Brass)
<b>Relief valve seat seals:</b>	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*,
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	0 – 400 bar (0 – 5800 psi) -1 – 5 bar (-15 – 73 psi) -1 – 10 bar (-15 – 145 psi) -1 – 18 bar (-15 – 260 psi)
<b>Weight:</b>	approx. 2.1kg (type-14), 2.4kg (type-16/18)
<b>Dimensions (w×h×d):</b>	approx. 139×206 mm, 175 mm (-14), 223 mm (-16 and -18)
<b>Outlet:</b>	NPT 1/4" f. optional tube fitting
<b>Cylinder connections:</b>	according to gas type

\*on request

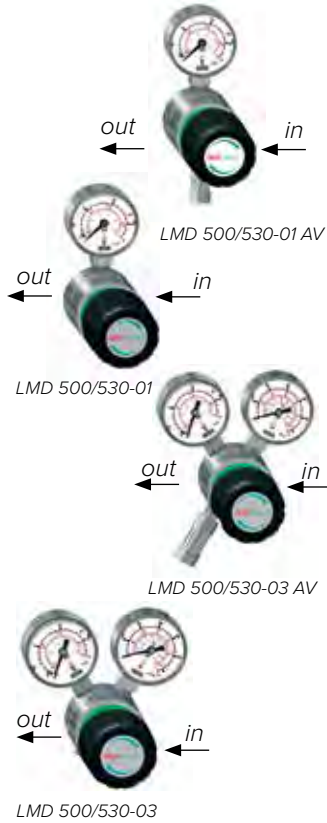
### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Gas type
<b>FMD 532-14</b>	<b>BC</b>	<b>G</b>	<b>10</b>	<b>DIN</b>	<b>CL6</b>	<b>Ki</b>	<b>GAS</b>
FMD 532-14	BC = brass	G = 300 bar /4350 psi	3 = 0.2 – 3 bar / 3 – 45 psi	DIN	N14 = NPT 1/4" f	0 = without	Please specify
FMD 532-16	chrome-plated		6 = 0.5 – 6 bar /7 – 85 psi	ANSI	CL6 (standard)	Ki = with	(no O <sub>2</sub> )
FMD 532-18	SS = stainless steel		10 = 1 – 10.5 bar /15 – 150 psi	AFNOR	CL 1/8"		
				NBN	CL 1/4"		
				BS 341	NO6		
				CGA			
				NEN			
				UNI			

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# LINE PRESSURE REGULATORS

## LMD 500/530-01/-03/-01AV/-03AV



Single-stage,  
for inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0,  
Inlet pressure LMD 500: 40 bar / 600 psi, 230 bar / 3300 psi,  
LMD 530: 300 bar / 4350 psi,  
Outlet pressure range LMD 500: 0.2 – 50 bar / 3 – 725 psi,  
LMD 530: 0.2 – 50 bar / 3 – 725 psi

### SPECIAL FEATURES

- > Excellent pressure adjustment
- > Compact design
- > 4 or 6 port configuration

### DESCRIPTION

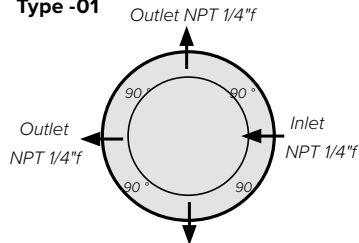
A broad application spectrum through the 4-port configuration (type -01) or 6-port-configuration (type -03), with (type -01AV, type -03AV) or without (type -01/-03) relief valve. Use the contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

### APPLICATION

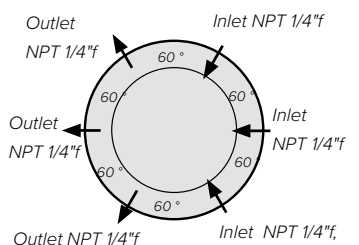
The LMD 500/530 reduces line pressure to give a lower supply pressure. Through its compact design this regulator is especially well suited for use in analytical or chemical apparatuses or processes.

### CONNECTIONS (FRONT VIEW)

#### Type -01



#### Type -03



TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Diaphragm:</b>	Hastelloy
<b>Seat seals:</b>	PCTFE
<b>Body seals:</b>	PCTFE (SS), PVDF (Brass)
<b>Relief valve seat seals:</b>	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*,
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 5 bar (-15 – 73 psi) (-100 – 500 bar) / -1 – 10 bar (-15 – 145 psi)(-10 – 1000 kPa) 0 – 25 bar (0 – 365 psi) (0 – 2500 kPa) / 0 – 40 bar (0 – 600 psi)(0 – 4000 kPa) 0 – 80 bar (0 – 1150 psi) (0 – 8000 kPa) / 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa) 0 – 400 bar (0 – 5800 psi) (0 – 40000 kPa)
<b>Weight:</b>	approx. 1.1kg (type -01), 1.2kg (type -03)
<b>Inlet/Outlet:</b>	NPT 1/4" f, optional tube fitting

\*on request

### DIMENSIONS



### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet**	Relief valve	Option contact gauge inlet	Gas type
<b>LMD 500-01</b>	<b>BC</b>	<b>E</b>	<b>3</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>AV</b>	<b>Ki</b>	<b>GAS</b>
LMD 500-01	BC = brass	LMD 500:	3 = 0.2 – 3 bar/3 – 45 psi	N14 = NPT 1/4" f	same as inlet	0 = without	0 = without	Please specify
LMD 500-03	chrome-plated	E = 50 bar / 720 psi	6 = 0.5 – 6 bar/7 – 85 psi	CL6		AV = with	Ki = with	
LMD 530-01	SS = stainless	F = 230 bar / 3300 psi	14 = 1 – 14 bar/15 – 200 psi	CL8				
LMD 530-03	steel	LMD 530:	50 = 2.5 – 50 bar/35 – 720 psi	CL10				
		G = 300 bar/4350 psi	LMD 530:	CL12				
			6 = 0.5 – 6 bar/7 – 85 psi	BC = brass				
				chrome plated				
				SS = stainless steel				

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# LINE PRESSURE REGULATORS LMD 502/532-03



Dual-stage,  
for inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0  
Inlet Inlet pressure 230 bar / 3300 psi (LMD502-03), 300 bar / 4350 psi (LMD532-03),  
Outlet pressure range 0.2 – 10.5 bar / 3 – 150 psi

### SPECIAL FEATURES

- > Downstream pressure is independent of upstream pressure
- > Precise pressure allocation
- > Space saving multi-connection possibilities

### DESCRIPTION

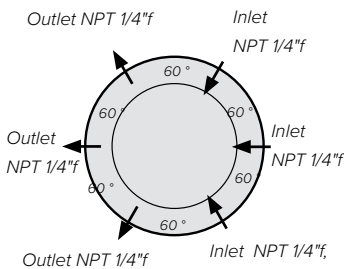
This pressure regulator reduces the upstream pressure to a lower downstream pressure. The dual-stage design ensures the uniformity of the downstream pressure irrespectively of the upstream pressure. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. A broad application spectrum through the the multiple inlet/outlet connections.

### APPLICATION

The LMD 502-03 stands out for its precise pressure allocation, minimum space requirement and uniformity of downstream pressure. For this reason this series is particularly suited to high-performance and stabil gas supply as would be needed for analytical applications or where space saving pressure regulating with short connection ways to point-of-use outlets are required.



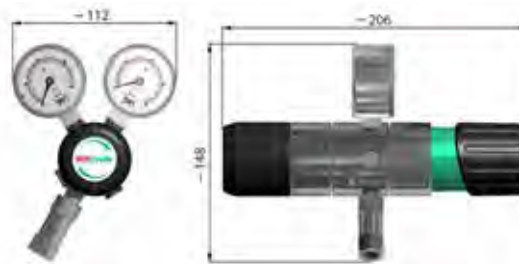
### CONNECTIONS (FRONT VIEW)



TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome- plated cleaned
<b>Diaphragm:</b>	Hastelloy
<b>Seat seals 1st stage:</b>	PCTFE
<b>Seat seals 2nd stage:</b>	PTFE
<b>Body seals:</b>	PCTFE (Stainless steel), PTFE (Brass)
<b>Relief valve seat seals:</b>	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*,
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 5 bar (-15 – 75 psi) (-100 – 500 kPa) -1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa) -1 – 18 bar (-15 – 260 psi) (-100 – 1800 kPa) 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
<b>Weight:</b>	approx. 1.8 kg (type-03)
<b>Inlet-/Outlet:</b>	NPT 1/4" f, optional tube fitting

\* on request

### DIMENSIONS



### ORDER CODE

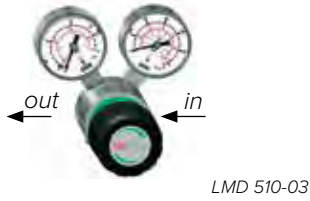
Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Relief valve	Option contact gauge inlet	Gas type
<b>LMD 502-03</b>	<b>BC</b>	<b>F</b>	<b>3</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>AV</b>	<b>Ki</b>	<b>GAS</b>
LMD 502-03	BC = brass	F = 230 bar	1 = 0.2 – 1 bar / 3 – 15 psi	N14 = NPT 1/4" f	N14 =	0 = without	0 = without	Please
LMD 532-03	chrome-plated	/3300 psi	3 = 0.2 – 3 bar / 3 – 45 psi	CL6*	NPT 1/4" f	AV = with	Ki = with	specify
	SS = stainless steel	LMD 532:	6 = 0.5 – 6 bar / 7 – 85 psi	CL8	CL6			
	steel	G = 300	10 = 1 – 10.5 bar / 15 – 150 psi	CL10	CL8			
		bar/4350 psi		CL12	CL10			
				BC = brass	CL12			
				chrome-plated	BC = brass			
				SS = stainless steel	chrome-plated			
					SS = stainless steel			

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# LINE PRESSURE REGULATORS LMD 510-01/-03 ABSOLUTE PRESSURE



Single-stage,  
for inert, reactive, flammable and oxidizing gases and gas mixtures,  
purity max. 6.0,  
Inlet pressure 12 bar/ 175 psi,  
Outlet pressure range 0.2 – 3 bar abs. / 3 – 45 psi abs.



### SPECIAL FEATURES

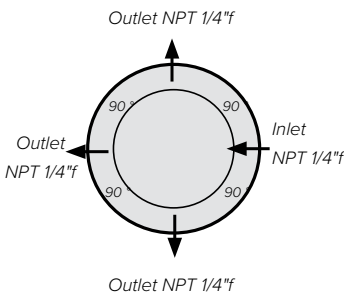
- > Subatmospheric-pressure regulation
- > Compact design
- > 4 or 6 port configuration

### DESCRIPTION

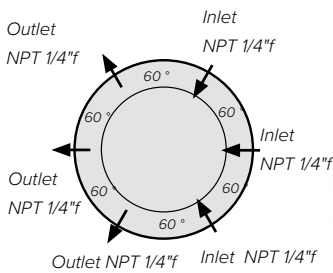
A broad application spectrum through the 4-port configuration (type -01) or 6-port-configuration (type -03). The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

### CONNECTIONS (FRONT VIEW)

#### Type -01



#### Type -03



### APPLICATION

The pressure regulator series LMD 510 reduces low upstream pressure to a very low downstream pressure down to 0.2 bar absolut and is suitable for subatmospheric-pressure regulation.

TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Diaphragm:</b>	Hastelloy
<b>Seat seals:</b>	SS: FFKM, (EPDM)*, Brass EPDM, (FKM)*
<b>Body seals:</b>	PCTFE (SS), PVDF (Brass)
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 1.5 bar (-15 – 40 psi) (-100 – 150 kPa)
	-1 – 5 bar (-15 – 75 psi) (-100 – 500 kPa)
	-1 – 18 bar (-15 – 260 psi) (-100 – 1800 kPa)
<b>Weight:</b>	approx. 1.1 kg (type -01), 1.2kg (type -03)
<b>Inlet/Outlet:</b>	NPT 1/4" f, optional tube fitting

\*on request

### DIMENSIONS



### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet**	Relief valve	Option contact gauge inlet	Gas type
<b>LMD 510-03 BC</b>	<b>BC</b>	<b>D</b>	<b>2</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>AV</b>	<b>Ki</b>	<b>GAS</b>
LMD 510-01	BC = brass	D = 12 bar	2 = 0.2 – 2 bar abs./3 – 30 psi abs.	N14 = NPT 1/4" f	N14 =	0 = without	0 = without	Please
LMD 510-03	chrome-plated	/175 psi	3 = 0.2 – 3 bar abs./3 – 45 psi abs.	CL6	NPT 1/4" f	AV = with	Ki = with	specify
	SS = stainless steel			CL8	CL6			
				CL10	CL8			
				CL12	CL10			
				BC = brass	CL12			
				chrome plated	BC = brass			
				SS = stainless steel	chrome plated			
					SS = stainless steel			

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# LINE PRESSURE REGULATORS LMD 522-03



LMD 522-03

Dual-stage,  
for inert, reactive, flammable and oxidizing gases and gas mixtures,  
purity max. 6.0,  
Inlet pressure 230 bar / 3300 psi,  
Outlet pressure range 0.2 – 3 bar abs. / 3 – 45 psi abs.

### SPECIAL FEATURES

- > Subatmospheric-pressure regulation
- > Downstream pressure is independent of upstream pressure

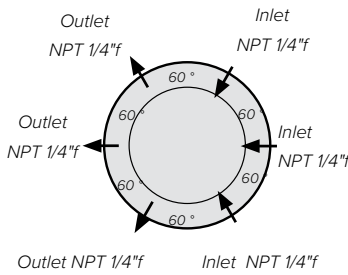
### DESCRIPTION

These pressure regulators offer a broad application spectrum through the 6-port configurations available. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

### APPLICATION

The pressure regulator series LMD 522 reduces inlet pressure to diverse very low outlet pressures down to 0.2 bar. The dual-stage design ensures that the inlet pressure remains independent of the outlet pressure. Subatmospheric-pressure regulation possible.

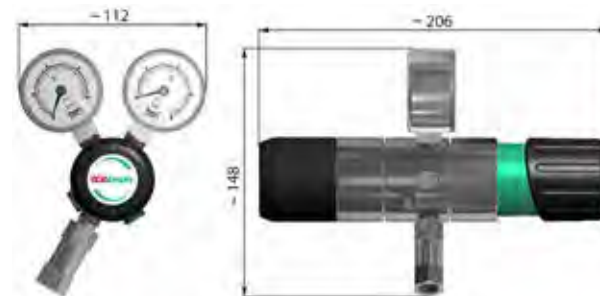
### CONNECTIONS (FRONT VIEW)



TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Diaphragm:</b>	Hastelloy
<b>Seat seals 1st stage:</b>	PCTFE
<b>Seat seals 2nd stage:</b>	Stainless steel: FFKM, (EPDM)*, Brass: EPDM, (FKM)*
<b>Body seals:</b>	PCTFE (SS), PVDF (Brass)
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 1.5 bar (-15 – 40 psi) -1 – 5 bar (-15 – 75 psi) 0 – 315 bar (0 – 4500 psi)
<b>Option:</b>	0 – 600 mbar (8.7 psi) with Ø 63 mm
<b>Weight:</b>	approx. 1.8 kg (Type -03)
<b>Inlet-/Outlet:</b>	NPT 1/4" f, optional tube fitting

\*on request

### DIMENSIONS

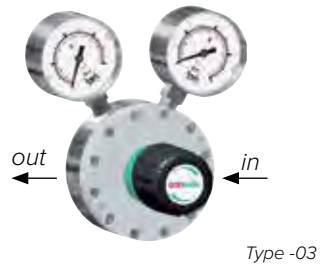
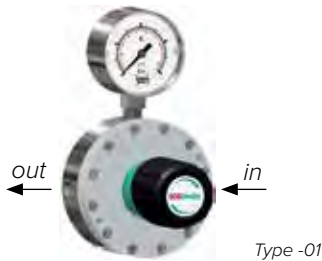


### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Relief valve	Option contact gauge inlet	Gas type
<b>LMD 522-03 BC</b>	<b>F</b>	<b>2</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>AV</b>	<b>Ki</b>	<b>GAS</b>	
LMD 522-03	BC = brass chrome-plated SS = stainless steel	F = 230 bar /3300 psi	2 = 0.2 – 2 bar abs./ 3 – 30 psi abs. 3 = 0.2 – 3 bar abs./ 3 – 45 psi abs.i	N14 = NPT 1/4" f CL6* CL8 CL10 CL12 BC = brass chrome-plated SS = stainless steel	N14 = NPT 1/4" f CL6 CL8 CL10 CL12 BC = brass chrome-plated SS = stainless steel	0 = without AV = with	0 = without Ki = with	Please specify

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# LINE PRESSURE REGULATORS LMD 545-01/-03



Single-stage,  
for inert, reactive, flammable and oxidizing gases and gas mixtures,  
purity max. 6.0,  
Inlet pressure: 12 /40 bar  
Outlet pressure range 0.02 – 3 bar

### SPECIAL FEATURES

- > Low downstream pressure
- > Very fine adjustments possible
- > Higher Flow rates

### DESCRIPTION

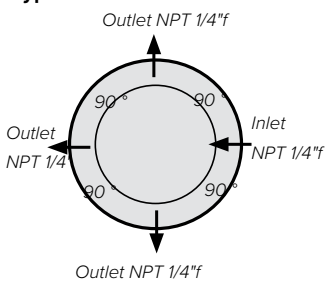
The large housing diameter of these pressure regulator allows for a large metal diaphragm and with it a very fine adjustment of the downstream pressure by comparatively high flow rates from 0.02 bar. The Pressure regulator can be supplied in either 4-Port (LMD 545-01) or 6-Port (LMD 545-03) versions.

### APPLICATION

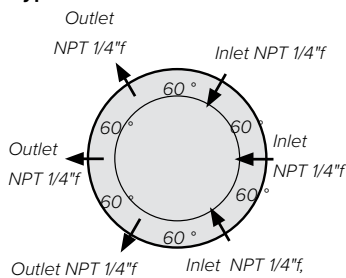
The LMD 545 reduces the line pressure by very small increments to a very low supply pressure.

### CONNECTIONS (FRONT VIEW)

#### Type -01

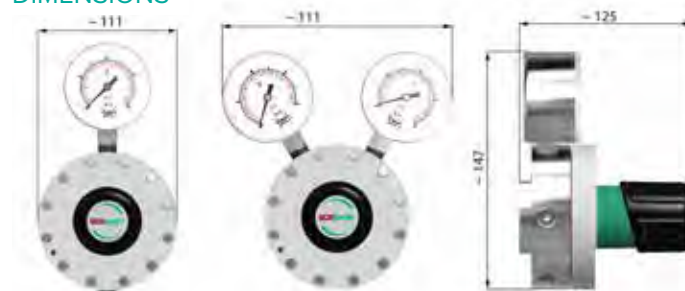


#### Type -03



TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Diaphragm:</b>	Hastelloy
<b>Upstream pressure:</b>	12 / 40 bar
<b>Configuration:</b>	4-Port-Version (Type -01) or 6 Port-Version (Type -03)
<b>Downstream pressure:</b>	<b>12 bar Version:</b> 20 – 250 mbar/ 100 – 1300 mbar 0,3 – 3,6 psi/ 1,45 – 19 psi (2 – 25 kPa/ 10 – 130 kPa)
	<b>40 bar Version:</b> 150 – 500 mbar / 150 – 3000 mbar 2,2 – 7,25 psi/ 2,2 – 44 psi (15 – 50 kPa/ 15 – 300 kPa)
<b>Basic design aspects:</b>	see page 15
<b>Seat seals:</b>	EPDM, FKM (Brass)
<b>Body seals:</b>	PCTFE, PVDF (Brass)
<b>Pressure gauge range:</b>	600 mbar / 1.5 bar / 5 bar
<b>Weight:</b>	approx. 2.4 (Type -01) / 2.5 kg (Type -03)
<b>Inlet-/Outlet:</b>	NPT 1/4" f, optional tube fitting

### DIMENSIONS

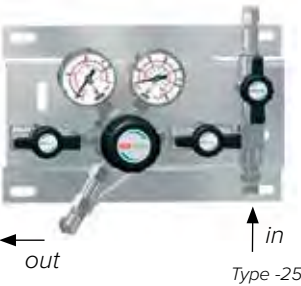
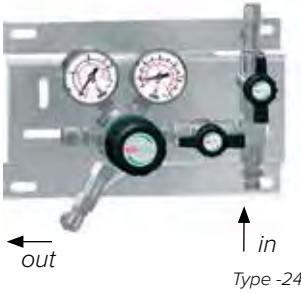
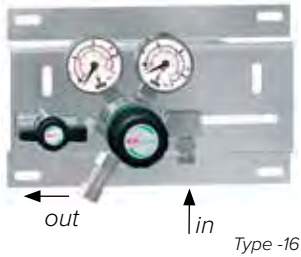


### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet**	Gas type
<b>LMD 545-01</b>	<b>BC</b>	<b>D</b>	<b>250</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>GAS</b>
LMD 545-01	BC = brass	D = 12 bar /175 psi	250 = 20 - 250 mbar /0,3 – 3,6 psi	N14 = NPT 1/4" f	N14 = NPT 1/4" f	Please specify
LMD 545-03	chrome-plated SS = stainless steel	E = 40 bar /600 psi	1300 = 100 – 1300 mbar/1,45 – 19 psi 40 bar Version: 500 = 150 – 500 mbar/2,2 – 7,25 psi 3000 = 150 – 3000 mbar/2,2 – 44 psi	CL6/CL8 BC = brass chrome-plated SS = stainless steel	CL6 BC = brass chrome-plated SS = stainless steel	

\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# GAS SUPPLY PANELS SMD 500/530-16/-24/-25 - SINGLE CYLINDER



Single-stage,  
for inert, flammable and oxidizing gases and gas mixtures,  
purity max. 6.0  
Inlet pressure 230/300 bar / 3300/4350 psi  
Outlet pressure range 1 – 200 bar / 14 – 2900 psi

### SPECIAL FEATURES

- > Gas supply panel for standard applications (Type -16)
- > Process gas purging (Type -24)
- > Process gas purging and process gas outlet shut-off valve (Type -25)

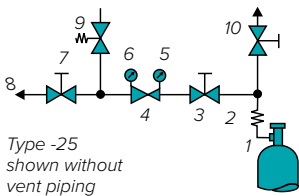
### DESCRIPTION

These gas supply panels are mounted onto a stainless steel panel and consist of a pressure regulator, inlet and outlet pressure gauges, a relief valve (by downstream pressure > 50 bar RV on request) and shut-off valves (type -16 at the outlet, type -24 at the inlet, type -25 at inlet and outlet) for the process gas. A choice of stainless steel coils or flexible high pressure hoses is available for the connection to the gas cylinder. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. Vent piping connected to the relief valve can be ordered optionally.

### APPLICATION

Gas panels are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower line pressure. Through the subsequent piping system the gas is taken to the point of use. The type -24 and -25 allows for process gas purging to be carried out while cylinders are being changed. The type-25 design allows shutting-off of gas flow during cylinder change from the panel itself. Standard application for these panels: centralized or decentralized gas supply for highly sensitive analysis devices.

### FLOW SCHEMATIC



- 1 Cylinder connection
- 2 Coil/Hose
- 3 Inlet shut off valve )
- 4 Pressure regulator - Single-stage
- 5 Upstream pressure gauge
- 6 Downstream pressure gauge
- 7 Process gas outlet shut-off valve (Type -25 only)
- 8 Process gas outlet
- 9 Relief valve
- 10 Purge outlet valve (not Type -16)

TECHNICAL DATA	
<b>Body:</b>	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
<b>Relief valve:</b>	Outlet NPT 1/4" f, downstream pressure > 50 bar RV on request
<b>Seat seals:</b>	PCTFE
<b>Body seals:</b>	PCTFE (SS), PVDF (Brass)
<b>Relief valve seat seals:</b>	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*
<b>Basic design aspects:</b>	see page 15
<b>Pressure gauge range:</b>	-1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa) 0 – 25 bar (0 – 365 psi) (0 – 2500 kPa), 0 – 40 bar (0 – 600 psi) (0 – 4000 kPa) 0 – 80 bar (0 – 1150 psi) (0 – 8000 kPa), 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa) 0 – 400 bar (0 – 5800 psi) (0 – 40000 kPa)
<b>Weight:</b>	approx. 2.5 kg (type -16) / 2.74 kg (type -24) / 3 kg (type -25)
<b>Dimensions (w×h×d):</b>	approx. 250×155×185 mm
<b>Purge outlet:</b>	NPT 1/4" f or tube fitting
<b>Inlet:</b>	NPT 1/4" f, M 14×1.5 (optional)

\*on request

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet**	Vent piping	Option contact gauge inlet	Gas type
<b>SMD 500-16</b>	<b>BC</b>	<b>F</b>	<b>14</b>	<b>N14</b>	<b>CL6 BC</b>	<b>A</b>	<b>Ki</b>	<b>GAS</b>
200 bar Versions:	BC = brass	F = 230 bar	14 = 1 – 14 bar	N14 = NPT 1/4" f	N14 = NPT 1/4" f	0 = without	0 = without	Please
SMD 500-16	chrome-plated	/3300 psi	/15 – 200 psi	M14×1.5m (optional)	CL6	A = with	Ki = with	specify
SMD 500-24	SS = stainless	G = 300 bar	28 = 2.5 – 28 bar		CL8	(Only in		
SMD 500-25	steel	/4350 psi	/35 – 400 psi		CL10	conjunction		
300 bar Versions:			50 = 2.5 – 50 bar		CL12	with RV not		
SMD 530-16			/35 – 720 psi			available for		
SMD 530-24			200 = 10 – 200 bar			Type-16)		
SMD 530-25			/145 – 2900 psi)					
						BC = brass		
						chrome-plated		
						SS = stainless steel		

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".  
\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.



# SINGLE STATION MANIFOLD SMD 530-24

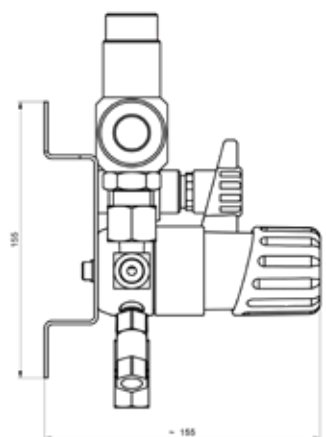
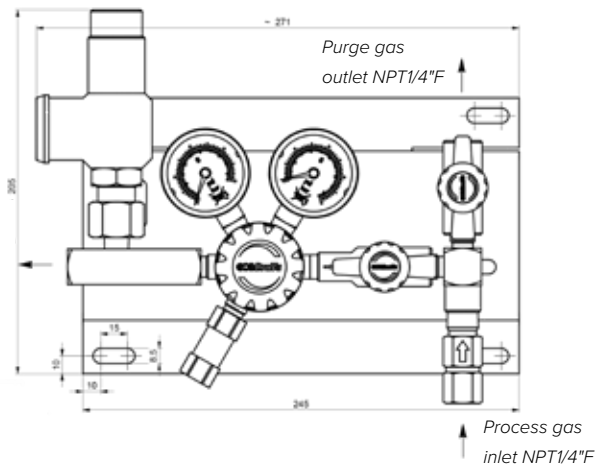
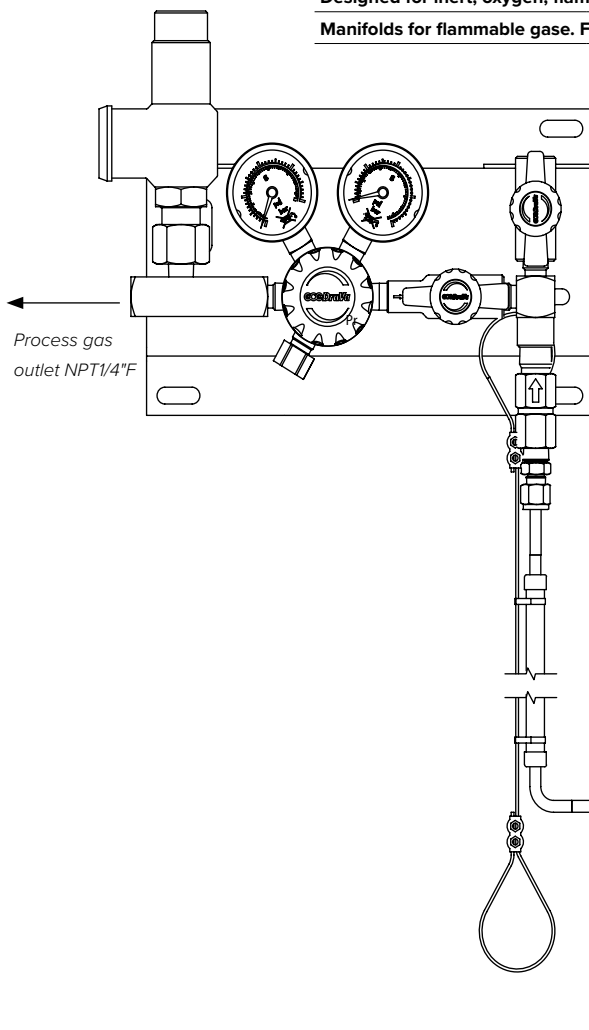


Druva Single Cylinder manifold package, fully CP-4 compliant manifold installation package.

## THE SINGLE STATION MANIFOLD PACKAGE INCLUDES

- > Up to 300 bar working pressure
- > 1 m long hose with anti-whip restraint
- > Inlet check valve
- > Inlet isolation and purge valve
- > CE-marked, CP-4 compliant line safety relief valve fitted
- > Mechanical reed contact alarm gages available upon request
- > Designed for up to 6.0 gas quality

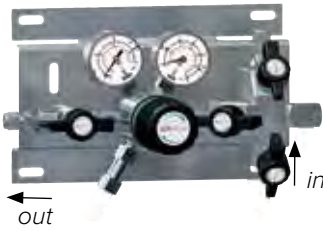
TECHNICAL DATA	
<b>Inlet pressure:</b>	approx. 2.5 kg (type -16) / 2.74 kg (type -24)/ 3 kg (type -25)
<b>Outlet pressure:</b>	approx. 250x155x185 mm
<b>Relief valve:</b>	NPT 1/4" f or tube fitting
<b>Designed for inert, oxygen, flammable and CO<sub>2</sub> gases</b>	
<b>Manifolds for flammable gas. Flashback arrestor in outlet.</b>	



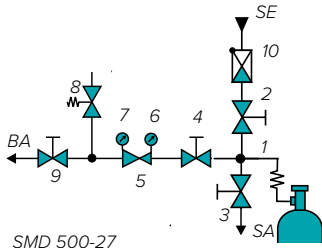
## ORDER CODE

Type	Gas type
<b>SMD 530-24</b>	<b>GAS</b>
With hose versions: S90003505 S90003506 S90003907	Without hose versions: S90004239 S90004240 S90004241
Please specify	

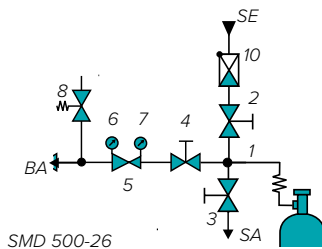
# GAS SUPPLY PANELS SMD 500/530-26/27 - SINGLE CYLINDER



## FLOW SCHEMATIC



SMD 500-27



SMD 500-26

- 1 Inlet connection
- 2 Purge inlet valve
- 3 Purge outlet valve
- 4 Upstream shut-off valve
- 5 Pressure regulator
- 6 Upstream pressure gauge
- 7 Downstream pressure gauge
- 8 Relief valve
- 9 Downstream shut-off valve
- 10 Check valve
- SE Purge inlet
- SA Purge outlet
- BA Process gas outlet

Single-stage, with external gas purging, for reactive, toxic, oxidizing and corrosive (optional Hastelloy inner parts) gas and gas mixtures, no oxygen, purity max. 6.0, Inlet pressure 230/300 bar/3300/4350 psi, Outlet pressure range 0.5 – 200 bar / 7 – 2900 psi

## SPECIAL FEATURES

- > With inert gas purging
- > Optimum purge conditions with purge valve block
- > Inlet and outlet shut-off valve
- > Optional Hastelloy inner parts for corrosive gases

## DESCRIPTION

The SMD 500-27 is mounted on a stainless steel panel and consists of a purge valve block with check valve, a purge inlet and purge outlet valves, pressure regulator, inlet and outlet pressure gauges, a relief valve and inlet and outlet shut-off valves for in- and outlet of the process gas. Stainless steel coils for connection to the gas cylinders are available. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. Vent gas piping for attachment to the relief valve can be ordered as an optional extra (by downstream pressure of >50bar RV on request).

## APPLICATION

Gas panels are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower line pressure. Through the subsequent piping system the gas is taken to the point of use. The positioning of the purge block on the inlet side reduces the purge volume to a minimum (only with cylinder connection) and allows for a separate discharge for the purge gases. The SMD 500-27 guarantees optimum purge conditions even when using toxic gases and so offers maximum safety for the user and the application. This design with external gas purging offers the following advantages:

1. Purging the residual gas in the system before a cylinder change improves personnel safety levels.
2. Maintaining gas purity by purging the atmospheric air which has penetrated the system during cylinder changing.
3. Purging with dry inert gas reduces humidity and extends the expected live span when corrosive gases are used

TECHNICAL DATA	
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished
Relief valve:	Outlet NPT 1/4" f, downstream pressure > 50 bar RV *
Seat seals:	PCTFE
Relief valve seat seals:	FKM, (EPDM, FFKM) *
Basic design aspects:	see page 15
Pressure gauge range:	-1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa), 0 – 25 bar (0 – 365 psi) (0 – 2500 kPa) 0 – 40 bar (0 – 600 psi) (0 – 4000 kPa), 0 – 80 bar (0 – 1150 psi) (0 – 8000 kPa) 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
Weight:	approx. 4.0 kg
Dimensions (w×h×d):	approx. 305×235×185 mm
Purge inlet:	check valve, Tube fitting 6 mm
Purge outlet:	NPT 1/4" f, optional tube fitting
Inlet:	NPT 1/4" f, M 14×1,5 (optional)
Outlet:	NPT 1/4" f, optional Tube fitting

\*on request

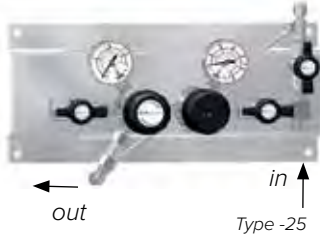
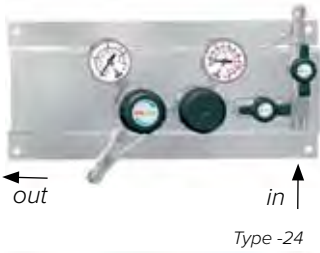
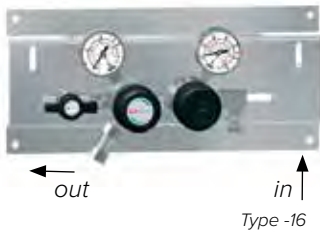
## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Option contact gauge inlet	Gas type
<b>SMD 500-27</b>	<b>SS</b>	<b>F</b>	<b>6</b>	<b>N14</b>	<b>CL6 BC</b>	<b>K11</b>	<b>K12</b>	<b>GAS</b>
200 bar Versions:	SS =	F = 230 bar	6 = 0.5 – 6 bar / 7 – 85 psi	N14 = NPT 1/4" f	N14 = NPT 1/4" f	0 = without	0 = without	Please
SMD 500-26	stainless	/3300 psi	14 = 1 – 14 bar	14 = 1 – 14 bar	CL6	K11 = with	Ki1 = with	specify
SMD 500-27	steel	G = 300 bar	/15 – 200 psi	M14x1.5m (optional)	CL8		Ki2 = with	(no O <sub>2</sub> )
300 bar Versions:		/4350 psi	50 = 2.5 – 50 bar		CL10		Ki5 = with	
SMD 530-26			/35 – 720 psi		CL12			
SMD 530-27			200 = 10 – 200 bar		SS = stainless steel			

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# GAS SUPPLY PANELS SMD 502/532-16/-24/-25 - SINGLE CYLINDER



Dual-stage, for inert and flammable gases and gas mixtures, purity max. 6.0,  
Inlet pressure 230/300 bar / 3300/4350 psi,  
Outlet pressure range 0.2 - 10.5 bar / 1 - 150 psi

### SPECIAL FEATURES

- > Downstream pressure is independent of the upstream pressure due to the dual-stage design
- > Gas supply panel for standard applications (Type -16)
- > Process gas purging (Type -24)
- > Process gas purging and process gas outlet shut-off valve (Type -25)

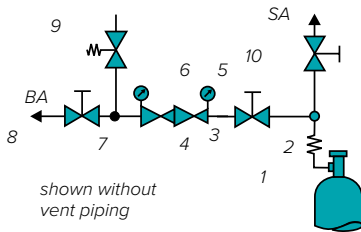
### DESCRIPTION

These gas supply panels are mounted onto a stainless steel console and consist of a pressure regulator, inlet and outlet pressure gauges, a relief valve and shut-off valve (type -16 at the outlet, type -24 at the inlet, type -25 at inlet and outlet) for the process gas. A choice of stainless steel pigtailed or flexible high pressure hoses is available for the connection to the gas cylinder. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. Vent gas piping for attachment to the relief valve can be ordered as an optional extra.

### APPLICATION

Dual station pressure regulators are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower, constant inlet pressure for the user. The type -24 allows for process gas purging to be carried out while cylinders are being changed. The type-25 design allows shutting-off of gas flow during cylinder change from the panel itself. Standard application for these panels: centralized or decentralized gas supply for highly sensitive analysis devices.

### FLOW SCHEMATIC



shown without vent piping

- Cylinder connection
- Coil/Hose
- Upstream shut-off valve (Type -24+Type -25)
- Pressure regulator - dual-stage
- Upstream pressure gauge
- Downstream pressure gauge
- Process gas outlet shut-off valve (Type -16 + Type -25)
- Process gas outlet
- Relief valve
- Purge gas outlet valve (Type -24 + Type -25)
- Purge outlet
- Process gas outlet

TECHNICAL DATA	
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Relief valve:	Outlet NPT 1/4" f
Seat seals 1st stage:	PCTFE
Seat seals 2nd stage:	PTFE
Body seals:	PCTFE (SS), PTFE (Brass)
Relief valve seat seals:	Stainless steel: FKM, (EPDM, FFKM)* Brass: EPDM, (FKM)*
Basic design aspects:	see page 15
Pressure gauge range:	-1 – 5 bar (-15 – 75 psi) (-100 – 500 kPa), -1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa) -1 – 18 bar (-15 – 260 psi) (-100 – 1800 kPa), 0 – 315 bar (0 – 4500 psi) (0 – 31500kPa) 0 – 400 bar (0 – 5800 psi) (0 – 40000 kPa)
Weight:	approx. 3.5 (Type -16) / 4.1 kg (Type -24) / 4.4 kg (Type -25)
Dimensions (w×h×d):	approx. 400×155×160 mm
Inlet:	NPT 1/4" f , M 14×1,5 (optional)
Outlet:	NPT 1/4" f, optional Tube fitting

\*on request

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Vent piping	Gas type
<b>SMD 502-16</b>	<b>BC</b>	<b>F</b>	<b>3</b>	<b>N14</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>A</b>	<b>GAS</b>
200 bar Versions:	BC = brass	F = 230 bar /3300 psi	3 = 0.2 – 3 bar /3 – 45 psi	N14 = NPT 1/4" f	N14 = NPT 1/4" f CL6, CL8	0 = without Ki = with	0 = without A = with (Only in conjunction with RV, not available for Type -16)	Please specify (no O <sub>2</sub> )
SMD 502-16	chrome-plated	G = 300 bar /4350 psi	6 = 0.5 – 6 bar /7 – 85 psi	M14×1.5m (optional)	CL10, CL12 BC = brass chrome-plated SS = stainless steel			
SMD 502-24	stainless steel		10 = 0.5 – 10.5 bar /7 – 145 psi					
SMD 502-25								
300 bar Versions:								
SMD 532-16								
SMD 532-24								
SMD 532-25								

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# SINGLE STATION MANIFOLD SMD 532-24

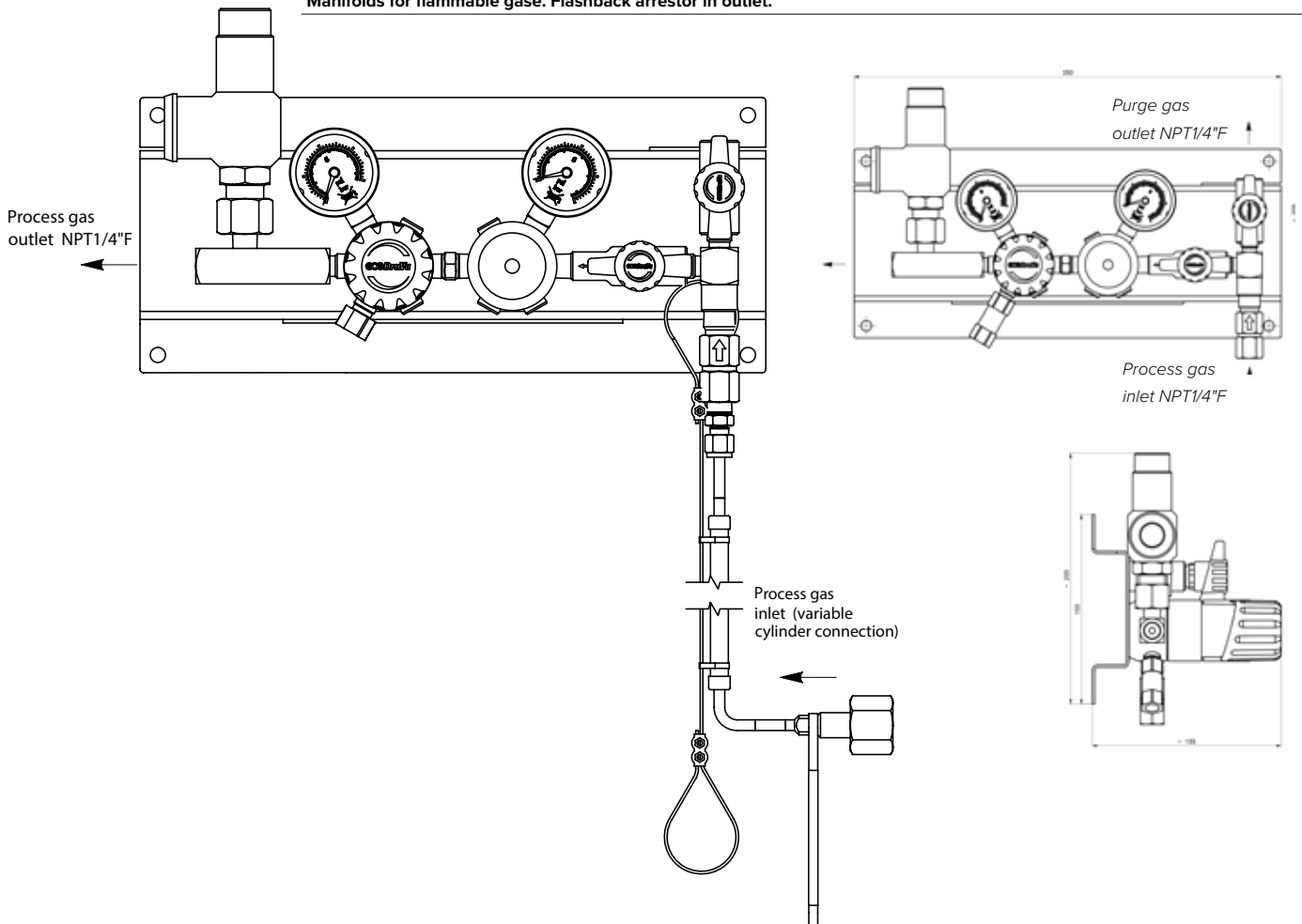
Druva Single Cylinder manifold package, fully CP-4 compliant manifold installation package.



## THE SINGLE STATION MANIFOLD PACKAGE - 2 STAGE INCLUDES

- > Up to 300 bar working pressure
- > 1 m long hose with anti-whip restraint
- > Inlet check valve
- > Inlet isolation and purge valve
- > CE-marked, CP-4 compliant line safety relief valve fitted
- > Mechanical reed contact alarm gages available upon request
- > Designed for up to 6.0 gas quality

TECHNICAL DATA	
<b>Inlet pressure:</b>	300 bar
<b>Outlet pressure:</b>	10 bar
<b>Relief valve:</b>	set to 11.2 bar
<b>Designed for inert, oxygen, flammable and CO<sub>2</sub> gases</b>	
<b>Manifolds for flammable gas. Flashback arrestor in outlet.</b>	



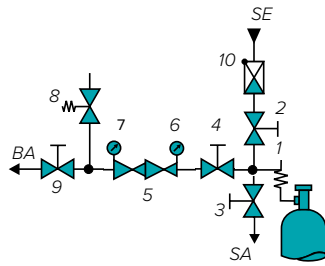
## ORDER CODE

Type	Gas type
<b>SMD 532-24</b>	<b>GAS</b>
With hose versions: S90003905 S90003908	O <sub>2</sub> , N <sub>2</sub> , He, Ar H <sub>2</sub> , Methane
Without hose versions: S90004242 S90004333	

# GAS SUPPLY PANELS SMD 502/532-26/27 - SINGLE CYLINDER



## FLOW SCHEMATIC



- 1 Inlet connection (coil, hose)
- 2 Purge inlet valve
- 3 Purge outlet valve
- 4 Upstream shut-off valve
- 5 Cylinder pressure regulator
- 6 Upstream pressure gauge
- 7 Downstream pressure gauge
- 8 Relief valve
- 9 Downstream shut-off valve
- 10 Check valve
- SE Purge inlet
- SA Purge outlet
- BA Process gas outlet

Dual-stage, with external gas purging, for reactive, toxic, highly corrosive, oxidizing and corrosive gases and corrosive gas and gas and gas mixtures, no oxygen purity max. 6.0, Inlet pressure 230/300 bar/3300/4350 psi, Outlet pressure range 0.2 - 10.5 bar/1 - 150 psi

## SPECIAL FEATURES

- > With inert gas purging
- > Optimum purge conditions with purge valve block
- > Inlet and outlet shut-off valve
- > Optional Hastelloy inner parts for corrosive gases

## DESCRIPTION

These gas supply panels are mounted onto a stainless steel console and consist of a purge valve block with a check valve, purge inlet and outlet valves, pressure regulator, upstream and downstream gauges, a relief valve and shut-off valve for in- and outlet of the process gas. Stainless steel coils are available for the connection to the gas cylinder. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. Vent gas piping for attachment to the relief valve can be ordered as an optional extra.

## APPLICATION

Dual station pressure regulators are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower pressure for the user. Through the subsequent piping system the gas is taken to the point of use. The positioning of the purge block on the inlet side reduces the purge volume to a minimum and allows for a separate discharge for the purge gases. These pressure regulators guarantees optimum purge conditions even when using toxic gases and so offers maximum safety for the user and the application. This design with inert gas purging offers the following advantages.

1. Purging the residual gas remaining in the system before a cylinder change improves personnel safety levels.
2. Maintaining gas purity by purging the atmospheric air which has penetrated the system during cylinder changing.
3. Purging with dry inert gas reduces humidity and extends the expected life span when corrosive gases are used.

TECHNICAL DATA	
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished
Relief valve:	Outlet NPT 1/4"f
Seat seals 1st stage:	PCTFE
Seat seals 2nd stage:	PTFE
Body seals:	PCTFE
Relief valve seat seals:	FKM, (EPDM, FFKM)*
Basic design aspects:	see page 15
Pressure gauge range:	-1 – 5 bar (-15 – 75 psi) (-100 – 500 kPa), -1 – 10 bar (-15 – 145 psi) (-100 – 1000 kPa) 0 – 315 bar (0 – 4500 psi) (0 – 31500kPa)
Weight:	approx. 5.1 kg
Dimensions (w×h×d):	approx. 400×235×185 mm
Inlet:	NPT 1/4"f, M 14×1,5 (optional)
Outlet:	NPT 1/4"f, optional Tube fitting

\*on request

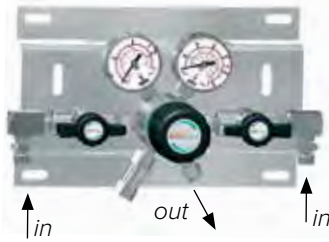
## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Option contact gauge outlet	Gas type
<b>SMD 502-27</b>	<b>SS</b>	<b>F</b>	<b>3</b>	<b>N14</b>	<b>CL6 BC</b>	<b>Ki1</b>	<b>Ki2</b>	<b>GAS</b>
200 bar Versions:	SS =	F = 230 bar	3 = 0.2 – 3 bar/ 3 – 45 psi	N14 =	N14 = NPT 1/4"f	0 = without	0 = without	Please
SMD 502-26	stainless	/3300 psi	6 = 0.5 – 6 bar/ 7 – 85 psi	NPT 1/4"f	CL6	Ki1 = with	Ki1 = with	specify
SMD 502-27	steel	G = 300 bar	10 = 0.5 – 10.5 bar	M14×1.5m	CL8		Ki2 = with	(no O <sub>2</sub> )
300 bar Versions:		/4350 psi	/7 – 145 psi	(optional)	CL10		Ki5 = with	
SMD 532-26					CL12			
SMD 532-27								

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".

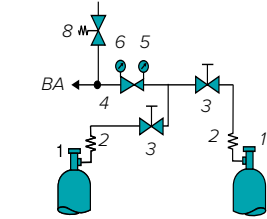
\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# GAS SUPPLY MANIFOLDS BMD 500/530-30/-32 MANUAL CHANGEOVER

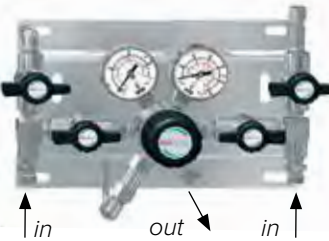


Single-stage, for inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0,  
Inlet pressure 230/300 bar / 3300/4350 psi,  
Outlet pressure range 1 – 200 bar / 14 – 2900 (3300) psi

## FLOW SCHEMATIC



Type -30



## SPECIAL FEATURES

- > Continuous gas supply even during cylinder change
- > Fast manual switch-over to the reserve side
- > Optional contact pressure gauges to monitor for gas supply failure
- > Process gas purging (BMD 500-32)
- > Connection for 2x1 cylinders, upgradable for 2x4 cylinders

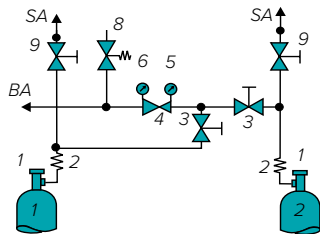
## DESCRIPTION

These gas supply panels reduce the upstream pressure from 230/300 bar to downstream pressures of 1 to 200 bar. The BMD 500/530 is mounted onto a stainless steel console and consist of a pressure regulator and inlet and outlet gauges. The upstream shut-off valve enables the uninterrupted gas supply even while changing cylinders. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. The additional purge valve permits for purging the station with internal gas and thereby maintaining the gas purity even during a cylinder change. Vent piping for connection to the relief valve (by downstream pressure >50bar RV on request) can be ordered optionally for type -32.

## APPLICATION

The manifold enables a continuous gas supply. The manifolds main advantage here is the ability to quickly change over to the reserve cylinder and the uninterrupted gas supply during the cylinder switch over. Standard application for these panels: centralized or decentralized gas supply for highly sensitive analytical devices.

## FLOW SCHEMATIC



Type -32  
(with vent piping)

- 1 Inlet connection
- 2 Coil/Hose
- 3 Process gas inlet shut-off valve
- 4 Regulator single-stage
- 5 Upstream pressure gauge
- 6 Downstream pressure gauge
- 8 Relief valve
- 9 Purge outlet valve
- SA Purge outlet
- BA Process gas outlet

TECHNICAL DATA	
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Relief valve:	Outlet NPT 1/4"f (downstream pressure > 50 bar RV *)
Seat seals:	PCTFE
Body seals:	PCTFE (SS), PVDF (Brass)*
Relief valve seat seals:	FKM, (EPDM, FFKM)*, EPDM, (FKM)*
Basic design aspects:	see page 15
Pressure gauge range:	-1-18 bar (-15 – 260 psi)(-100 – 1800 kPa), 0 – 80 bar (0 – 1150 psi) (-100 – 8000 kPa) 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa), 0-400 bar (0 – 5800 psi) (-100 – 40000 kPa)
Weight:	approx. 2.9 /3.8 kg
Dimensions (w×h×d):	approx. 400×200×185 mm (BMD 500-30) 440×200×185 mm (BMD 500-32)
Inlet:	NPT 1/4"f , M14×1.5 (optional)
Outlet:	NPT 1/4"f, optional tube fitting

\*on request

## ORDER CODE

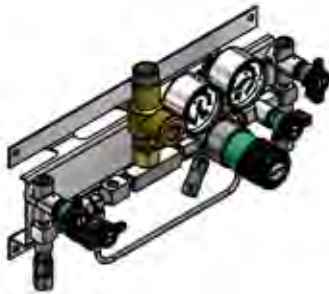
Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Option contact gauge inlet	Vent piping	Upgrade	Gas type
<b>BMD 500-30</b>	<b>BC</b>	<b>F</b>	<b>14</b>	<b>N14</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>A</b>	<b>M</b>	<b>GAS</b>
200 bar Versions:	BC = brass	F = 230 bar	14 = 1 – 14 bar	N14 =	N14 = NPT 1/4"f	0 =	0 = without	0 = without	Please
BMD 500-30	chrome-	/3300 psi	/15 – 200 psi	NPT 1/4"f	CL6, CL8	without	A = with	M2 = 2×2	specify
BMD 500-32	plated	G = 300 bar	50 = 2.5 – 50 bar	M14×1.5m	CL10, CL12,	Ki = with	(On type-32	Cylinder	
300 bar Versions:	SS =	/4350 psi	/35 – 720 psi	(optional)	BC = brass		only in	M3 = 2×3	
BMD 530-30	stainless		200 = 10 – 200 bar		chrome-plated		combination	Cylinder	
BMD 530-32	steel		/145 – 2900 psi)		SS = stainless steel		with RV)	M4 = 2×4	
								Cylinder	

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# 2x1 MANUAL CHANGE-OVER MANIFOLD BMD 500-32

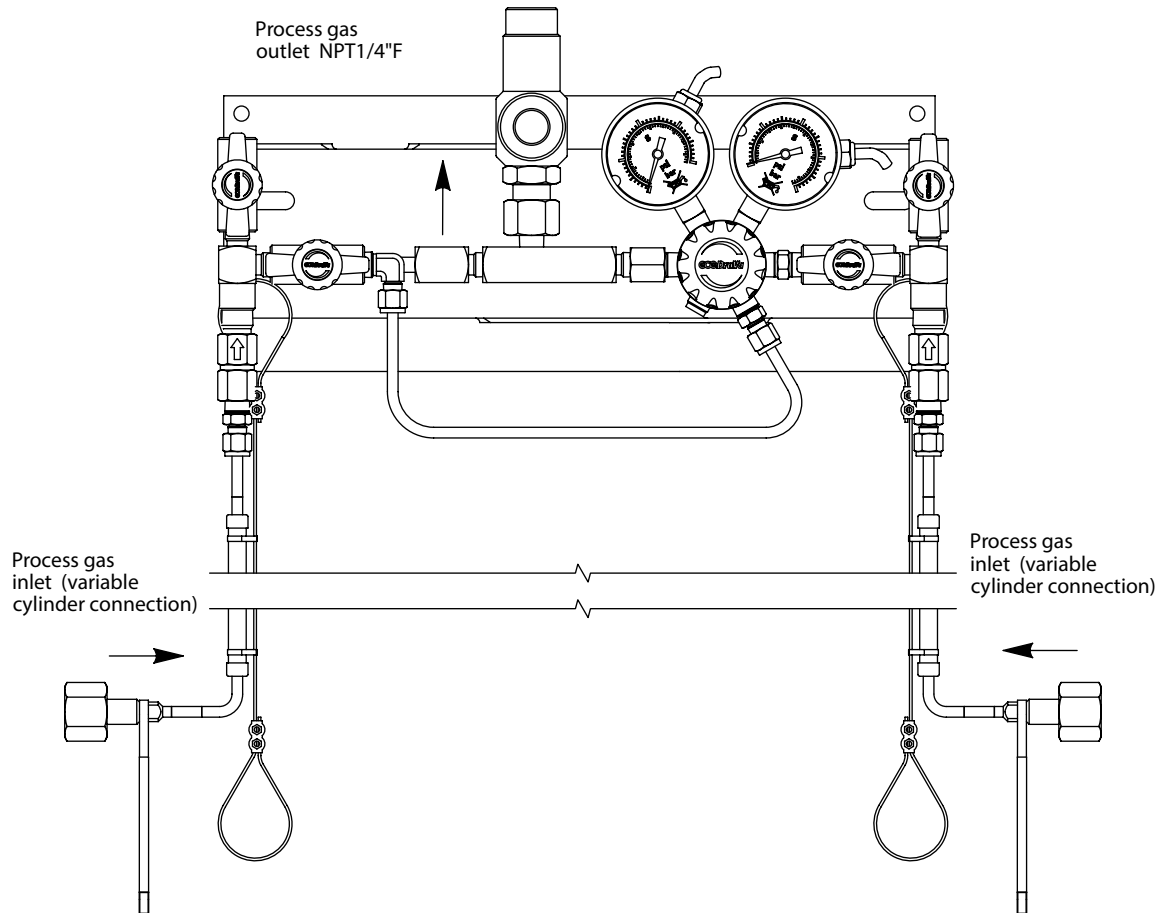
Druva 2x1 manual change-over package, fully CP-4 compliant installation package.



### THE 2x1 MANUAL CHANGE-OVER MANIFOLD PACKAGE INCLUDES

- > Up to 300 bar working pressure
- > 1 m long hose with anti-whip restraint
- > Inlet check valve
- > Inlet isolation and purge valve
- > CE-marked, CP-4 compliant line safety relief valve fitted
- > Mechanical inlet and outlet reed contact gauges
- > Designed for up to 6.0 gas quality

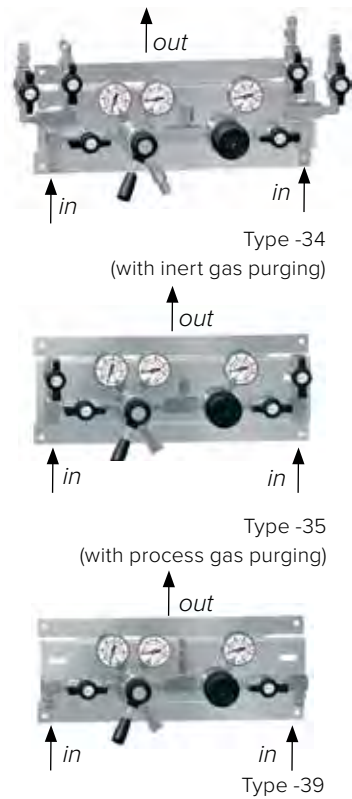
TECHNICAL DATA	
Inlet pressure:	300 bar
Outlet pressure:	0 - 10 bar
Relief valve:	set to 11.2 bar
Designed for inert, oxygen, flammable and CO <sub>2</sub> gases	
Manifolds for flammable gas. Flashback arrestor in outlet.	



### ORDER CODE

Type	Gas type
<b>BMD 500-32</b>	<b>GAS</b>
With 2 hoses , with contact gauges: S90003910 S90003911 S90003912	Inert (please specify type of gases) H <sub>2</sub> , Methane CO <sub>2</sub>
Without hoses , with contact gauges: S90004244 S90004245 S90004246	

# GAS SUPPLY MANIFOLDS BMD 500/530-34/-35/-39 SEMI-AUTOMATIC



- 1 Pressure regulator
- 2 Upstream pressure gauge
- 3 Downstream pressure gauge
- 4 Process gas valve
- 5 Purge gas outlet valve
- 5a Purge gas inlet valve
- 6 Relief valve
- 7 Coill/hose
- 8 Gas cylinder
- 9 Check valve
- 3a Middle pressure gauge
- H Lever
- BA Process gas outlet
- SA Purge gas outlet
- SE Purge gas inlet

Single-stage, for inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0, Inlet pressure 230/300 bar / 3300/4350 psi, preset Outlet pressure 14/50 bar - 200/720 psi

### SPECIAL FEATURES

- > Uninterrupted gas supply with semi-automatic
- > Indicator for active cylinder
- > Low gas alarm signal with contact gauges (optional)
- > Upgradable to max. 2x4 cylinders

### DESCRIPTION

Pressure decreases in the active cylinder (or bundle) below a preset level which causes a semi-automatic switch to switch over to the full cylinder. This is achieved by two integrated pressure regulators (preset to slightly different delivery pressure levels), connected at their outlet ports. Moving the lever towards the full bank allows for the disconnection and replacement of empty cylinders without interruption to the gas flow. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. The BMD 500-34 has an external gas purge, the BMD 500-35 an internal gas purge. Vent piping can be ordered optionally.

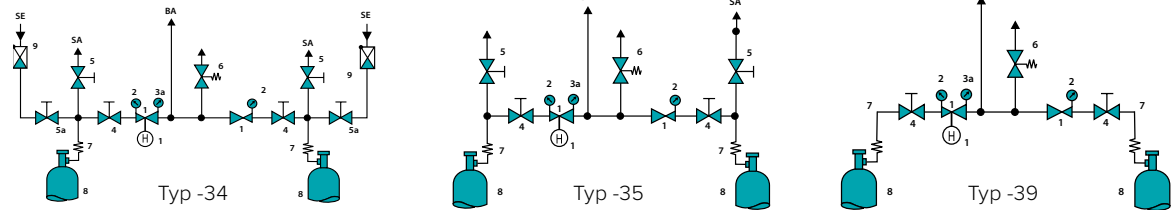
### APPLICATION

These gas supply panels, with semi-automatic switch over, are optimally used when uninterrupted gas supply is required.

TECHNICAL DATA	
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Relief valve:	Outlet NPT 1/4" f
Body seals:	PCTFE (SS), PVDF (Brass)
Seat seals:	PCTFE
Relief valve seat seals:	SS-FKM, (EPDM, FFKM)*, Brass-EPDM, (FKM)*
Pressure gauge range:	-1 – 18 bar (-15 – 260 psi) (-100 – 1800 kPa)/ 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
	0 – 400 bar (0 – 5800 psi)
Dimensions (w×h×d):	approx. 400×155×200 mm
Weight:	approx. 5.5 kg (BMD 500-35)
Preset outlet pressure:	14 bar +/- 2 bar ; 200 +/- 30 psi
Flow rate:	25 Nm <sup>3</sup> /h N <sub>2</sub> (14 bar - type at 29 bar inlet pressure.)
Purge inlet and outlet:	Tube fitting 6 mm (BMD 500-34)
Inlet:	NPT 1/4" f , M14×1.5 (optional)
Outlet:	NPT 1/4" f, optional tube fitting

\*on request

### FLOW SCHEMATIC



### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Contact gauge	Vent piping	Extension bar	Gas type
<b>BMD 500-35</b>	<b>BC</b>	<b>F</b>	<b>MSD14</b>	<b>N14</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>A</b>	<b>M</b>	<b>GAS</b>
200 bar Versions:	BC = brass	F = 230 bar	MSD14 =	N14 =	N14 F= NPT 1/4" f	0 =	0 = without	0 = without	Please
BMD 500-34	chrome-	/3300 psi	14 bar/200 psi	NPT 1/4" f	CL6, CL8*	without	A = with	M2 = 2x2	specify
BMD 500-35	plated	G = 300 bar	MSD50 =	M14x1.5m	CL10, CL12	Ki = with	(On type-35	Cylinder	
BMD 500-39	SS =	/4350 psi	50 bar/720 psi	(optional)	BC = brass		only in	M3 = 2x3 Cylinder	
300 bar Versions:	stainless				chrome-plated		combination	M4 = 2x4 Cylinder	
BMD 530-34	steel						with RV)		
BMD 530-35									
BMD 530-39									

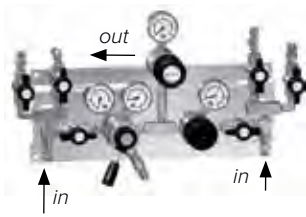
It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

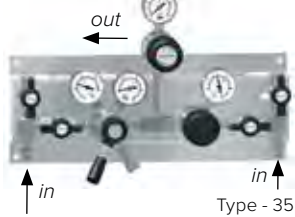


# GAS SUPPLY MANIFOLDS BMD 502/532-34/-35/-39 SEMI-AUTOMATIC

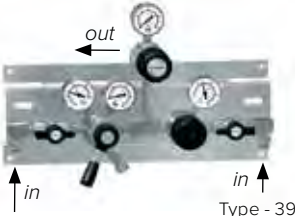
Dual-stage, for inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0, Inlet pressure 230/300 bar / 3300/4350 psi, Outlet pressure range 0.2 - 10.5 bar/1 - 150 psi



Type - 34  
(with external gas purging)



Type - 35  
(with process gas purging)



Type - 39

- 1 Pressure regulator 1st stage
- 1a Pressure regulator 2nd stage
- 2 Upstream pressure gauge
- 3 Downstream pressure gauge
- 3a Middle pressure gauge
- 4 Process gas valve
- 5 Purge outlet valve
- 5a Purge inlet valve
- 6 Relief valve
- 7 Coil/hose
- 8 Gas cylinder
- 9 Check valve
- H Lever
- BA Process gas outlet
- SA Purge outlet
- SE Purge inlet

## SPECIAL FEATURES

- > Uninterrupted gas supply with semi-automatic switch over
- > Downstream pressure is independent of the upstream pressure
- > Active cylinder indicator
- > Low gas alarm signal with contact gauges (optional)
- > Upgradable to max. 2x4 Cylinders

## DESCRIPTION

Pressure decrease in the active cylinder (or bundle) below a preset level causes a semi-automatic switch over to the full cylinder. Moving the lever towards the full bank allows for the disconnection and replacement of empty cylinders without interruption of gas supply. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. Vent piping can be ordered optionally.

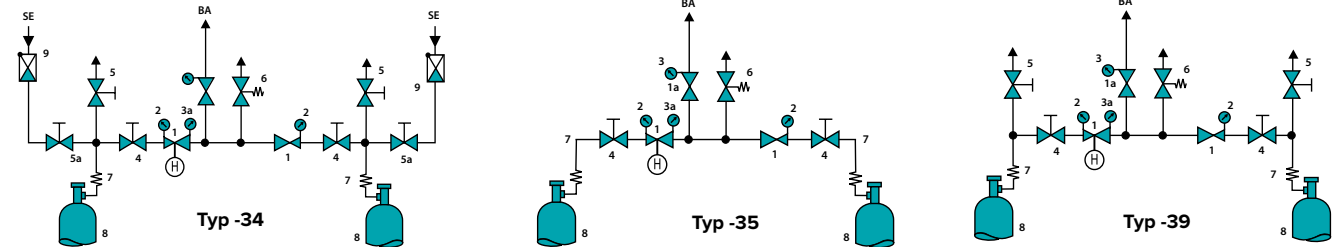
## APPLICATION

This gas supply panels are always chosen when a low and constant downstream pressure is required, independent of the changes in the upstream pressure and an uninterrupted gas supply with semi-automatic change over is needed.

TECHNICAL DATA	
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Relief valve:	outlet NPT 1/4" f
Seat seals 1st stage:	PCTFE, 2nd stage PTFE
Body seals:	PCTFE (SS), PVDF (Brass)
Relief valve seat seals:	SS-FKM, (EPDM, FFKM)*, Brass-EPDM, (FKM)*
Pressure gauge range:	-1 – 5 bar (-15 – 75 psi)(-100 – 500 kPa) , -1 – 10 bar (-15-145 psi)(-100 – 1000 kPa) -1 – 18 bar (-15 – 260 psi) (-100 – 1800 kPa), 0 – 315 bar (0 – 4500 psi)(0 – 31500 kPa) 0 – 400 bar (0 – 5800 psi) (0 – 40000 kPa)
Dimensions (w×h×d):	approx. 400×280×200 mm
Weight:	approx. 6.7 kg (BMD 502-35)
Purge inlet:	Tube fitting 6 mm (BMD 502-34)
Inlet:	NPT 1/4" f , M14×1.5 (optional)
Outlet:	NPT 1/4" f, optional tube fitting

\*on request

## FLOW SCHEMATIC



## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Contact gauge	Vent piping	Extension bars	Gas type
<b>BMD 502-35</b>	<b>BC</b>	<b>F</b>	<b>3</b>	<b>N14</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>A</b>	<b>M</b>	<b>GAS</b>
200 bar Versions:	BC = brass	F = 230 bar	3 = 0.2 - 3 bar	N14 =	N14 = NPT 1/4" f	0 =	0 = without	0 = without	Please
BMD 502-34	chrome-	/3300 psi	/3 – 45 psi	NPT 1/4" f	CL6, CL8	without	A = with	M2 = 2×2	specify
BMD 502-35	plated	G = 300 bar	6 = 0.5- 6 bar	M14×1.5m	CL10, CL12	Ki = with	(On type-35	Cylinder	(no O <sub>2</sub> )
BMD 502-39	SS =	/4350 psi	/7 – 85 psi	(optional)	BC = brass		only in	M3 = 2×3	
300 bar Versions:	stainless		10 = 1 – 10.5 bar		chrome-plated		combination	Cylinder	
BMD 532-34	steel		/15 – 150 psi		SS = stainless steel		with AV)	M4 = 2×4	
BMD 532-35								Cylinder	
BMD 532-39									

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# COMPLETE AUTOCHANGE MANIFOLD KITS 2×1 WITH SAFETY RELIEF VALVE

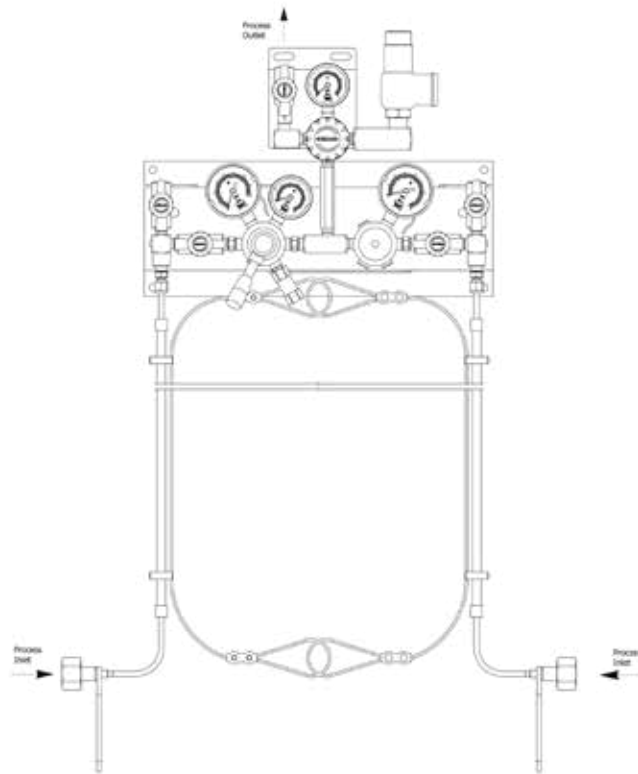
The GCE Druva 2×1 manifold series is a complete CP-4 compliant manifold installation package. Flashback arrestor fitted on flammable versions as standard.



### THE 2×1 PACKAGE INCLUDES

- > 300 bar hoses fitted with anti whip restraints
- > Contact alarm gauges - mechanical contact
- > CE marked, CP-4 compliant safety relief valve
- > Gas purity 6.0 rated manifold

TECHNICAL DATA	
<b>Inlet pressure:</b>	300 bar
<b>Outlet pressure:</b>	10 bar
<b>Relief valve:</b>	set to 11.2 bar
<b>Designed for inert, oxygen, flammable and CO<sub>2</sub> gases</b>	
<b>Manifolds for flammable gas. Flashback arrestor in outlet.</b>	



### ORDER CODE

Type		Gas type
		<b>GAS</b>
With contact gauge and without hoses:	With contact gauge and with hoses:	Inert (please specify)
S90004248	S90003841	O <sub>2</sub>
S90004249	S90003843	Flammable (P2=2,5 bar; please specify)
S90004250	S90003844	Flammable (P2=10 bar; please specify)
S90004251	S90003845	
Without contact gauges and without hoses:	Without contact gauges and with hoses:	Inert (please specify)
S90004252	S90003918	O <sub>2</sub>
S90004255	S90003920	Flammable (P2=2,5 bar; please specify)
S90004256	S90003921	Flammable (P2=10 bar; please specify)
S90004257	S90003922	

# COMPLETE AUTOCHANGE MANIFOLD KITS 2x2



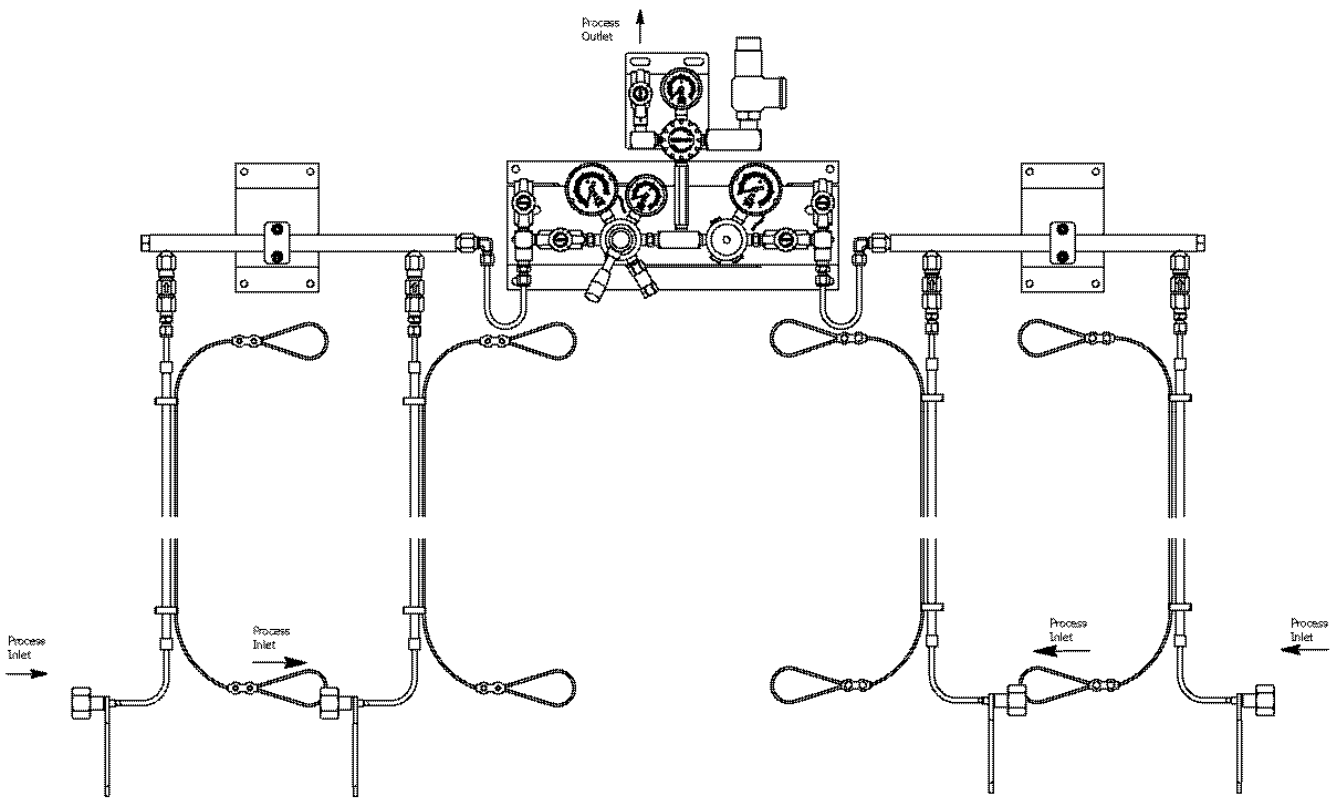
NOW  
300 BAR  
RATED

The GCE Druva 2x2 manifold series is a complete CP-4 compliant manifold installation package. Flashback arrestor fitted on flammable versions as standard.

### THE 2x2 PACKAGE INCLUDES

- > 300 bar hoses fitted with anti whip restraints
- > Contact alarm gauges - mechanical contact
- > CE marked, CP-4 compliant Seetru line safety relief valve
- > Gas purity 6.0 rated manifold

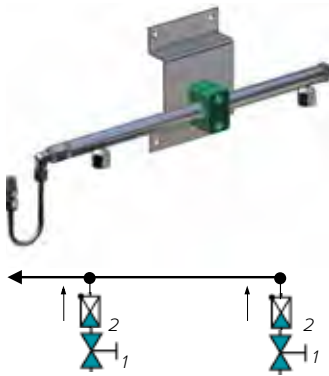
TECHNICAL DATA	
<b>Inlet pressure:</b>	300 bar
<b>Outlet pressure:</b>	10 bar
<b>Relief valve:</b>	set to 11.2 bar
<b>Manifolds for flammable gase. Flashback arrestor in outlet.</b>	



### ORDER CODE

Type		Gas type
<b>GAS</b>		
With contact gauge and without hoses: S90004330 S90004331 S90004332	With contact gauge and with hoses: S90003211 S90003213 S90003215	Inert (please specify type of gases) O <sub>2</sub> Flammable (P2 = 10 bar; please specify type of gases)
Without contact gauges and without hoses: S90004252 S90004255 S90004257	Without contact gauges and with hoses: S90003906 S90003914 S90003917	Inert (please specify type of gases) O <sub>2</sub> Flammable (P2 = 10 bar; please specify type of gases)

# EXTENSION HEADER KITS MFOLD



Extension header kit, for inert, corrosive, flammable and oxidizing gases and gas mixtures, purity max. 6.0,  
Inlet pressure 300 bar / 4350 psi

### HIGHLIGHTS

- > For 300 bar cylinders
- > Cleaned for O2 service
- > ATEX compliant
- > Suitable for ECD service
- > Modular concept

### DESCRIPTION

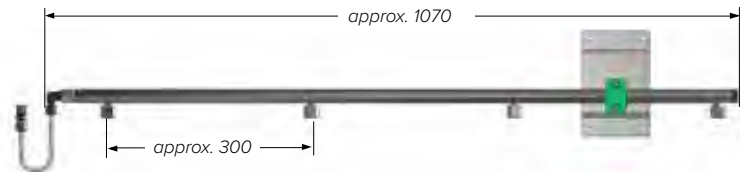
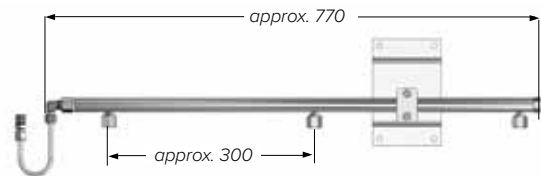
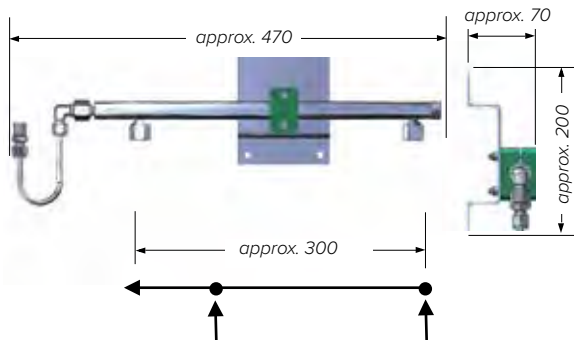
Extension header kits consist of a NPT inlets, a SS tube and a NPT outlet to the manifold. Upon request it can be equipped with non return valves and/or shut off valves on inlet. The extension kit is designed for safe handling of high purity gases.

### FLOW CHAT

- 1 Shut off valve
- 2 Non return valve



TECHNICAL DATA	
Body material:	stainless steel 316L (1.4404) specially cleaned and electropolished
Weight:	approx. 1.2kg
Dimensions (w×h×d):	470 (2inlets), 770 (3 inlets), 1070 (4 inlets)×70×200 mm
Inlet:	NPT 1/4"f
Outlet:	NPT 1/4"m



Left extension tube

Installation example

Right extension tube

### ORDER CODE

Type	Material	Inlet Ports	Shut off Valve	Check Valve	Outlet Port	Type of tube	Gas type
<b>MFOLD</b>	<b>SS</b> SS=stainless steel BC = brass*) ) Shut off valve material	<b>2 N14F</b> 2 N14F =2× NPT 1/4"f 3 N14F =3× NPT 1/4"f 4 N14F =4× NPT 1/4"f	<b>MVA</b> 0 = no valve MVA = with valve	<b>CV</b> 0 = no CV CV= CV on each inlet	<b>N14M</b> N14M = NPT 1/4 M	<b>R</b> R = right L = left	<b>GAS</b>

# POINT-OF-USE REGULATORS EMD 500/510-06



Single-stage, for inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0,

Inlet pressure: 40 bar / 600 psi / EMD 500  
12 bar / 175 psi / EMD 510

Outlet pressure range:  
EMD 500: 0.2 bar - 10.5 bar / 3 psi - 85 psi,  
EMD 510: 0.2 bar abs. - 3 bar / 3 psi abs. - 45 psi.

### SPECIAL FEATURES

- > Upstream valve with 90°-shut-off function
- > Clear open/closed indicator for shut-off valves

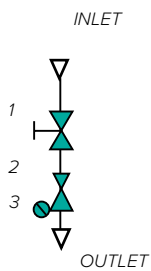
### DESCRIPTION

The EMD 500-06 consists of an upstream shut-off valve, pressure regulator, downstream gauges and Aluminium panel for wall mounting. A relief valve can be ordered as an optional extra.

### APPLICATION

The EMD 500/510-06 is designed as an access point to a central gas supply system and thereby designed as a second stage, whereby the line pressure of apparatuses from 0.2 bar absolute can be regulated downward. The EMD 510 is also suitable for sub-atmospheric pressure regulation.

### FLOW SCHEMATIC



- 1 Upstream shut-off valve
- 2 Pressure regulator
- 3 Downstream gauge

TECHNICAL DATA	
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Seat seals:	PTFE
Body seals:	PCTFE (SS), PVDF (Brass)
Basic design aspects:	see page 15
Pressure gauge range:	0 – 2.5 bar (0 – 40 psi) (0 – 250 kPa) -1 – 1.5 bar (-15 – 22 psi) (-100 – 150 kPa) -1 – 3 bar (-15 – 45 psi) (-100 – 300 kPa) 0 – 5 bar (0 – 75 psi) (0 – 500 kPa) 0 – 10 bar (0 – 145 psi) (0 – 1000 kPa) 0 – 18 bar (0 – 260 psi) (0 – 1800 kPa)
Weight:	approx. 1.95 kg
Dimensions (w×h×d):	approx. 90×260×135 mm
Inlet/Outlet:	NPT 1/4" f, optional tube fitting

### SPECIAL VARIANT WITH CHECK VALVE

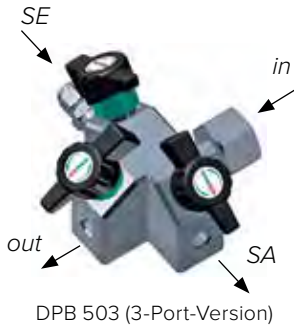
Item No.	Type	Material	Design	Inlet (bar)	Outlet (bar)
<b>S90003935</b>	EMD50006 SSE10 N14N14 CV	SS	outlet point - with check valve	40	0-10
<b>S90003934</b>	EMD50006 SSE6 N14N14 CV	SS	outlet point - with check valve	40	0-6
<b>S90003933</b>	EMD50006 SSE1,5 N14N14 CV	SS	outlet point - with check valve	40	0-1,5
<b>S90003932</b>	EMD50006 BCE10,5 N14N14 CV	BC	outlet point - with check valve	40	0-10,5
<b>S90003931</b>	EMD50006 BCE6 N14N14 CV	BC	outlet point - with check valve	40	0-6
<b>S90003930</b>	EMD50006 SSE4 N14N14 CV	BC	outlet point - with check valve	40	0-4
<b>S90003929</b>	EMD50006 BCE1,5 N14N14 CV	BC	outlet point - with check valve	40	0-1,5

### ORDER CODE

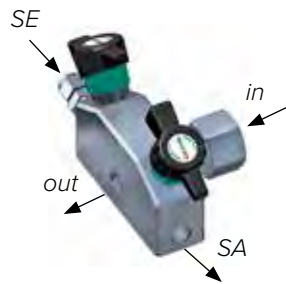
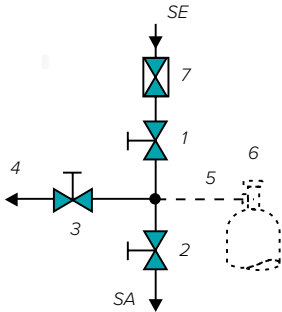
Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet*	Relief Valve	Gas type
<b>EMD 500-06</b>	<b>BC</b>	<b>E</b>	<b>1</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>AV</b>	<b>GAS</b>
EMD 500-06	BC = brass	<b>EMD 500-06:</b>	<b>EMD 500-06:</b>	N14 = NPT 1/4" f	N14 = NPT 1/4" f	0 = without	Please
EMD 510-06	chrome-plated	E = 40 bar/600 psi	1 = 0.2 – 1 bar/3 – 15 psi	CL6, CL8	CL6, CL8	A = with	specify
	SS = stainless	<b>EMD 510-06:</b>	6 = 0.5 – 6 bar/7 – 85 psi	CL10, CL12	CL10, CL12		
	steel	D = 12 bar/175 psi	10 = 1 – 10.5 bar/15 – 145 psi	BC = brass	BC = brass		
			<b>EMD 510-06:</b>	chrome-plated	chrome-plated		
			2 = 0.2 – 2 bar abs./3 – 30 psi abs.	SS = stainless steel	SS = stainless		
			3 = 0.2 – 3 bar abs./3 – 45 psi abs.	steel	steel		

\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

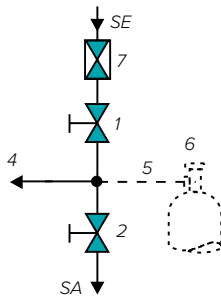
# PURGE BLOCK DPB 500



DPB 503 (3-Port-Version)



DPB 502 (2-Port-Version)



- 1 Purge gas inlet shut-off valve
- 2 Purge gas outlet shut-off valve
- 3 Shut-off valve
- 4 Process gas outlet
- 5 Cylinder connection
- 6 Gas cylinder
- 7 Check valve
- SE Purge inlet
- SA Purge outlet

For pure gases and gas mixtures, no oxygen, purity max. 6.0,  
2- or 3-port version, for manual purging,  
nominal pressure 230 bar / 3300 psi

## SPECIAL FEATURES

- > Maintaining gas purity near to the gas source
- > No contact between the process gas and the ambient air
- > Quick operation of shut-off valve with only quarter turn
- > Clearly visible open/closed position
- > Optimum purge conditions
- > Wide range of applications
- > Inlet- and outlet filters

## DESCRIPTION

The 2-Port-purge block consists of a cylinder connection, check valve, purge gas inlet and purge gas outlet shut-off valves. The 3-Port-configuration also includes a process gas shut-off valve. The regular routine surface cleansing and ensuing quality control minimises the potential of contamination.

## APPLICATION

The triple valve block is used for external gas purging of high purity or corrosive gases and ensures continued of gas purity during the cylinder switch over. This purge unit guarantees the necessary safety when toxic gases are used. The benefit of these purge blocks with its wide range of applications lies in the optimum safety for the application and for the operator.

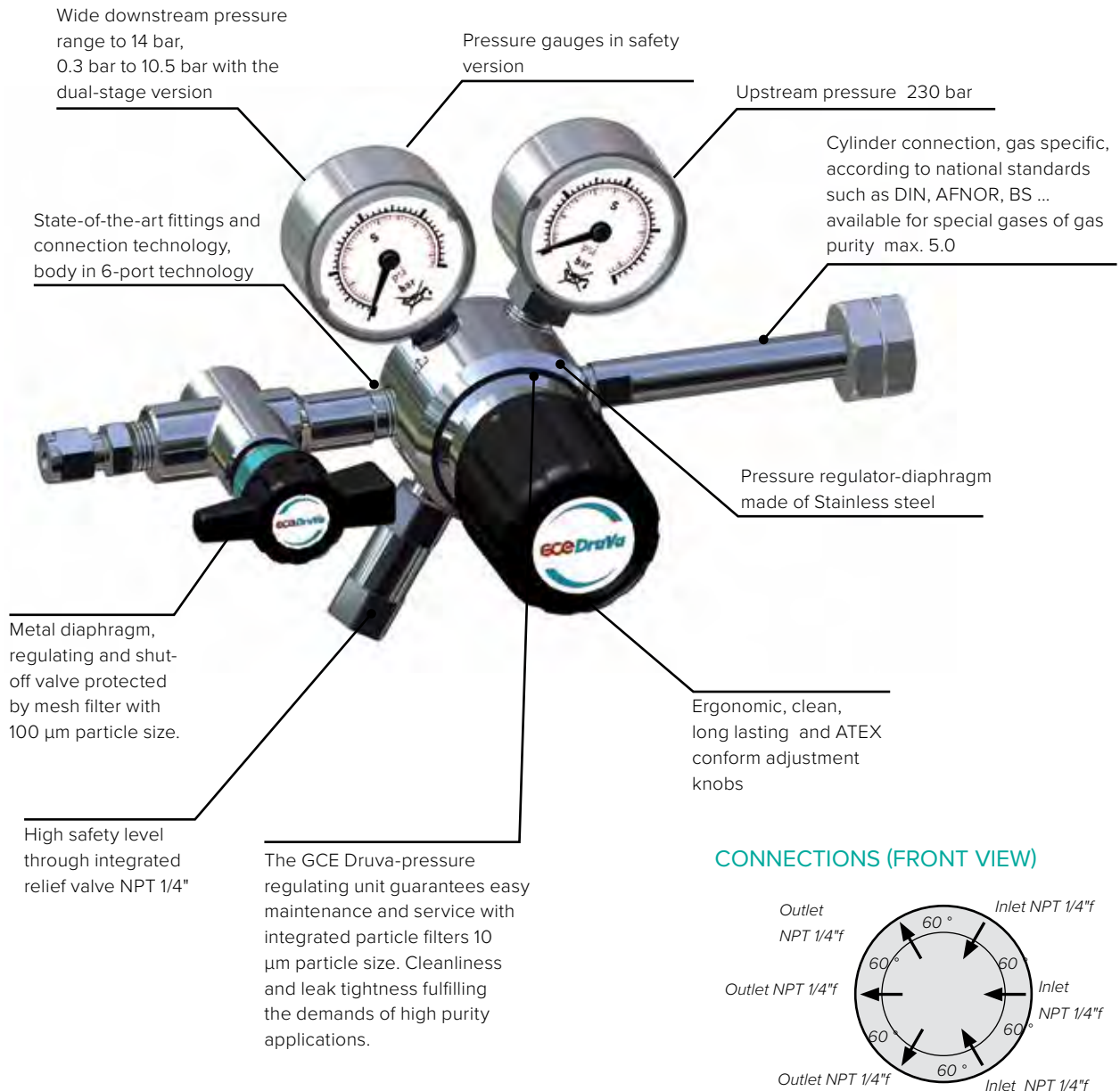
TECHNICAL DATA	
Body:	Stainless steel 1.4404 specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated (DPB502 only)
Diaphragm:	Elgiloy
Body seals:	PCTFE
Nominal width:	DN 5
KV-value:	0.15
Weight:	approx. 1.0 kg (2-port), 1.4 kg (3-port)
Dimensions:	DPB 502: approx. 80×90×150 mm DPB 503: approx. 120×90×150 mm
Inlet- and outlet filters:	100 µm mesh
Purge gas inlet:	check valve, tube fitting 6 mm
Purge gas outlet:	NPT 1/4" f, optional tube fitting
Inlet:	Cylinder connection DIN 477 longer cylinder connections optional
Outlet:	NPT 1/4" f, optional tube fitting

## ORDER CODE

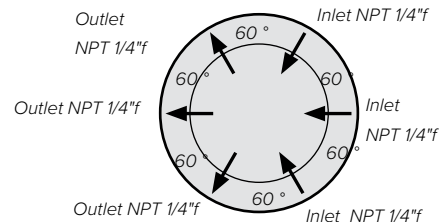
Type	Material	Inlet pressure	Inlet		Outlet*	Gas type
<b>DPB-503</b>	<b>SS</b>	<b>F</b>	<b>DIN</b>		<b>CL6</b>	<b>GAS</b>
DPB-503	SS = stainless steel	F = 230 bar/3300 psi	DIN	BS 341	N14 = NPT 1/4" f	Please specify
DPB-502	BC = brass chrome-plated (DPB502 only)		ANSI	CGA	CL6	
			AFNOR	NEN	CL8	
			NBN	UNI	CL10	
					CL12	

\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

## PRESSURE REGULATORS SERIES 320



### CONNECTIONS (FRONT VIEW)



### BASIC DESIGN ASPECTS

#### MATERIAL

Body: stainless steel 316L (1.4404) specially cleaned or brass CW614 (CuZn39Pb3) nickel-plated and chrome-plated.

#### SEALING MATERIAL

PCTFE, PTFE, FKM etc., dependent upon gas specification and purity requirements. Material is specified in "Technical data".

#### INNER PARTS

Low maintenance, service friendly regulator unit, with a 10 µm particle filter on inlet and 100 µm on the outlet.

#### DIAPHRAGM

The stainless steel material offers ample protection against damage and corrosion.

#### PERFORMANCE DATA

See performance charts, for differing pressure ranges please contact us.

#### GUARANTEED LEAKAGE RATES

< 1×10<sup>-9</sup> mbar l/s Helium (outboard).  
< 1×10<sup>-6</sup> mbar l/s Helium (across the seat).

#### WORKING TEMPERATURE

-25 °C to +70 °C / -13 °F to 158 °F

#### PURITY

≤ 5.0

#### CYLINDER CONNECTIONS

In accordance with German national standards DIN 477. Other connections such as US-Norm CGA, British Standard BS etc. are available.

# CYLINDER PRESSURE REGULATORS FMD 320-14/-16/-18 SINGLE STAGE



Type -14



Type -16



Type -18

Single-stage, for inert, flammable and oxidizing gases and mixtures, no acetylene, purity max. 5.0, cylinder pressure 230 bar / 3300 psi, Outlet pressure range 0.5 - 6 bar / 7 - 90 psi, 0.5 – 14 bar / 7 – 200 psi

### SPECIAL FEATURES

- > Diaphragm valve (FMD 320-16 with 90°-shut-off function)
- > Pressure regulator with stainless steel diaphragm
- > ATEX conform adjustment knob
- > Gauge in safety version accordance with EN 837

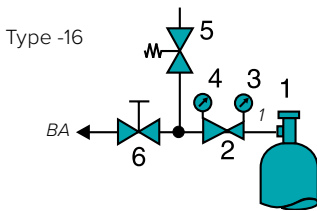
### DESCRIPTION

These pressure regulators consist of cylinder connections, pressure regulator, inlet- and outlet gauges, diaphragm shut-off valve (Type -16) regulating valve (Type -18), relief valve, tube fitting on outlet.

### APPLICATION

The FMD 320-14 is the base model. The FMD 320-16 permits shutting-off of the gas flow while maintaining the pressure regulator settings, the regulating valve on the FMD 320-18 enables a fine apportioning of the gas flow.

### FLOW SCHEMATIC



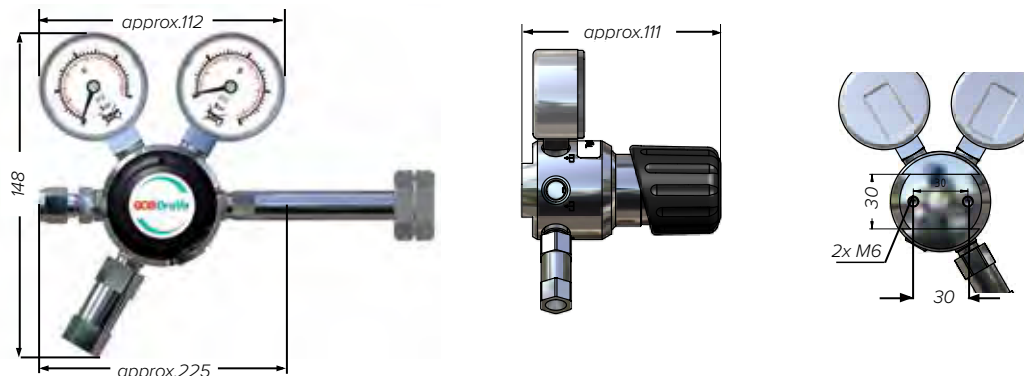
- 1 Cylinder connection
- 2 Pressure regulator
- 3 Upstream pressure gauge
- 4 Downstream pressure gauge
- 5 Relief valve
- 6 Downstream shut-off valve (only type -16) / downstream regulating valve (only type -18)

BA Process gas outlet

TECHNICAL DATA	
Body:	Stainless steel 316L (1.4404) specially cleaned or Brass CW614 (CuZn39Pb3) specially cleaned
Seat seals:	PCTFE
Body seals:	PCTFE (Stainless steel), PVDF (Brass)
Diaphragm:	Stainless steel
Leakage rate:	< 1×10 <sup>-9</sup> mbar l/s Helium (outboard) < 1×10 <sup>-6</sup> mbar l/s Helium (across the seat)
Relief valve seat seals:	SS: FKM, (EPDM*, FFKM*), Brass: EPDM, (FKM*)
Pressure gauge range:	0 – 10 bar (0 – 145 psi) (0 – 1000 kPa), 0 – 25 bar (0 – 365 psi) (0 – 2500 kPa), 0 – 315 bar (0 – 4500 psi) (0 – 31500 kPa)
Working temperature:	-25 °C to +70 °C / -13 °F to 158 °F
Weight:	approx. 1.5 kg (Type -14), 1.8 kg (Type -16/18)
Cylinder connection:	according to gas type
Outlet:	NPT 1/4" f, optional tube fitting

\*on request

### DIMENSIONS



### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Gas type
<b>FMD 320-14</b>	<b>BC</b>	<b>F</b>	<b>6</b>	<b>DIN</b>	<b>CL6</b>	<b>GAS</b>
FMD 320-14	BC = brass chrome-plated	F = 230 bar/3300 psi	6 = 0.5 – 6 bar /15 – 200 psi	DIN	0=NPT 1/4" f	Please specify
FMD 320-16	plated		14 = 1 – 14 bar / 15 – 200 psi	ANSI/ AFNOR/ NBN/BS 341/ CGA/NEN/UNI	CL6/ CL8**	
FMD 320-18	SS = stainless steel				CL 1/8" /CL 1/4" NO6 CL12	

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.



# CYLINDER PRESSURE REGULATORS FMD 322-14/-16/-18 DUAL STAGE

Dual-stage, for inert, reactive, flammable and oxidizing gases and mixtures, not suitable for acetylene,  
purity max. 5.0, cylinder pressure 230 bar / 3300 psi,  
Outlet pressure range 0,2- 3 bar/3 – 25 psi, 0,5- 6 bar/7 – 85 psi, 0,5 – 10.5 bar/7 – 150 psi



Type -14

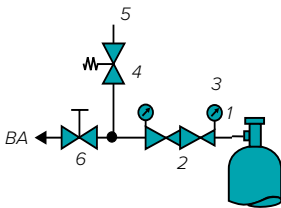


Type -16



Type -18

## FLOW SCHEMATIC



- 1 Cylinder connection
  - 2 Dual-stage pressure regulator
  - 3 Upstream pressure gauge
  - 4 Downstream pressure gauge
  - 5 Relief valve
  - 6 Downstream shut-off valve  
(only type -16)  
/ downstream regulating valve  
(only type -18)
- BA Process gas outlet

## SPECIAL FEATURES

- > Downstream pressure is independent of the upstream pressure due to the dual-stage design
- > Diaphragm valve (FMD 322-16 with 90° shut-off function)
- > Pressure regulator with stainless steel diaphragm
- > ATEX conform adjustment knob
- > Gauge in safety version accordance with EN 837

## DESCRIPTION

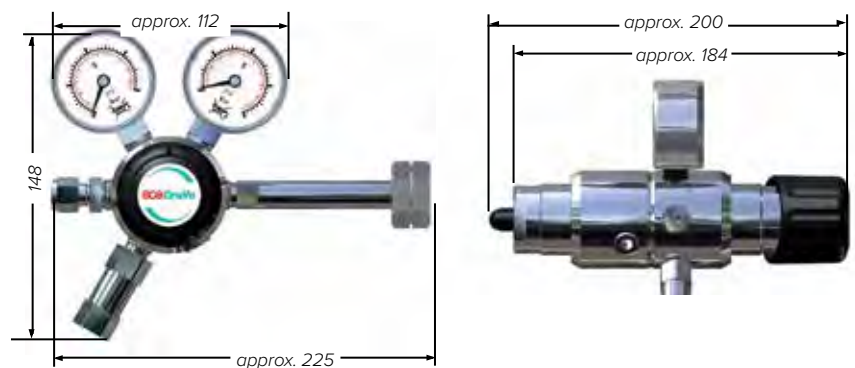
These pressure regulators consist of cylinder connections, pressure regulator, inlet- and outlet gauges, diaphragm shut-off valve (Type -16) regulating valve (Type -18), relief valve, tube fitting on outlet.

## APPLICATION

The FMD 322-14 is the base model. The FMD 322-16 permits shutting-off of the gas flow while maintaining the pressure regulator settings, the regulating valve on the FMD 322-18 enables a fine controlling of the gas flow. The dual-stage pressure regulator ensures the uniformity of the downstream pressure independent of the level of the cylinder pressure.

TECHNICAL DATA	
Body:	Stainless steel 316L (1.4404) specially cleaned or Brass CW614 (CuZn39Pb3) specially cleaned
Seat seals:	1st stage: PCTFE, 2nd stage: PTFE
Body seals:	PCTFE (Stainless steel), PVDF (Brass)
Diaphragm::	Stainless steel
Leakage rate:	< 1×10 <sup>-9</sup> mbar l/s Helium (outboard) < 1×10 <sup>-6</sup> mbar l/s Helium (across the seat)
Relief valve seat seals:	Stainless steel: FKM, (EPDM, FFKM) *
Brass:	EPDM, (FKM)
Pressure gauge range:	-1 – 10 bar (-15 – 145 psi), -1 – 18 bar (-15 – 260 psi), 0 – 5 bar (0 – 72 psi), 0 – 315 bar (0 – 4500 psi)
Weight:	approx. 2.1 kg (Type -14), 2.4 kg (Type -16/18)
Working temperature:	-25 °C to +70 °C / -13 °F to 158 °F
Basic design aspects:	see page 46
Cylinder connection:	according to gas type

\*on request



## DIMENSIONS

## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Gas type
<b>FMD 322-14</b>	<b>BC</b>	<b>F</b>	<b>6</b>	<b>DIN</b>	<b>CL6</b>	<b>GAS</b>
FMD 322-14	BC = brass chrome-plated	F = 230 bar/3300 psi	3 = 0.2 – 3 bar / 3 – 25 psi	DIN	0=NPT 1/4"f	Please specify
FMD 322-16			6 = 0.5 – 6 bar / 7 – 85 psi	ANSI/ AFNOR/ NBN/BS	CL6/ CL8**	
FMD 322-18	SS = stainless steel		10 = 1 – 10.5 bar / 15 – 150 psi	341/ CGA/NEN/UNI	CL 1/8" /CL 1/4"	
					NO6	

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# LINE PRESSURE REGULATORS

## LMD 320-01/-03/-01AV/-03AV

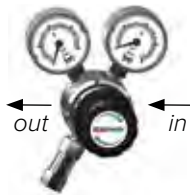
Single-stage,  
for inert, reactive, flammable and oxidizing gases and gas mixtures,  
purity max. 5.0, Inlet pressure LMD 320: 40 bar / 600 psi, optional 230 bar / 3300 psi,  
Outlet pressure range LMD 320: 0 – 14 bar / 200 psi,



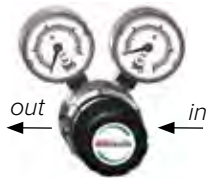
LMD 320-01 AV



LMD 320-01



LMD 320-03 AV



LMD 320-03

### SPECIAL FEATURES

- > Excellent pressure adjustment
- > Compact design
- > 4 or 6 port configuration

### DESCRIPTION

A broad application spectrum through the 4-port configuration (type -01/-1AV) or 6-Port-configuration (type -03/-03AV), which can be delivered respectively, with (type -01AV/-03AV) or without (type -01/-03) a relief valve. With type-03 and type-05 the use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

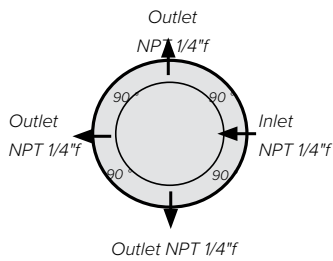
### APPLICATION

The LMD 320 reduces line pressure to give a lower supply pressure. Through its compact design this regulator is especially well suited for use in analytical or chemical apparatuses or processes.

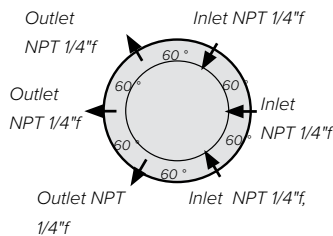
TECHNICAL DATA	
Body:	Stainless steel 316L (1.4404) specially cleaned or Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Seat seals:	PCTFE
Body seals:	PCTFE, PVDF (Brass)
Relief valve seat seals:	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*
Performance data:	see the single stage regulator
Pressure gauge range:	0 – 5 bar (-15 – 73 psi) / 0 – 10 bar (-15 – 145 psi), 0 – 25 bar (0 – 365 psi), 0 – 80 bar (0 – 1150 psi) / 0 – 315 bar (0 – 4500 psi)
Weight:	approx. 1.1kg (type -01), 1.2kg (type -03)
Inlet/Outlet:	NPT 1/4" f, optional tube fitting

\*on request

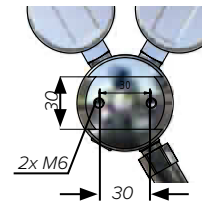
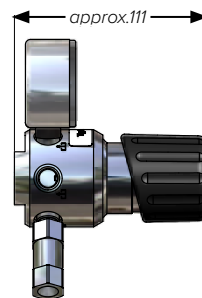
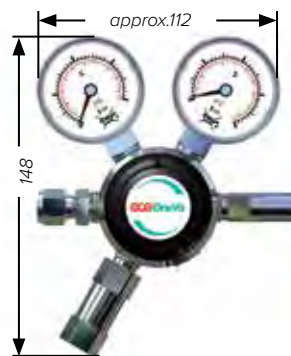
### CONNECTIONS (FRONT VIEW) TYPE -01/-01 AV



### TYPE -03/-03 AV



### DIMENSIONS

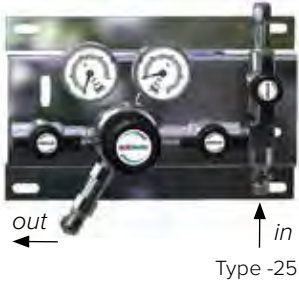
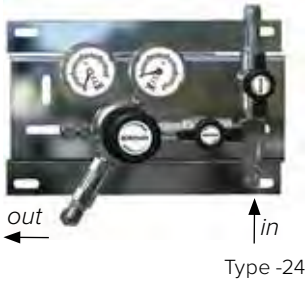
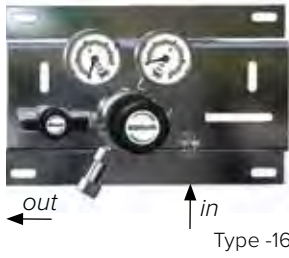


### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet**	Relief Valve	Contact gauge	Gas type
<b>LMD 320-01</b>	<b>BC</b>	<b>E</b>	<b>3</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>AV</b>	<b>Ki</b>	<b>GAS</b>
LMD 320-01	BC = brass	E = 50 bar/ 720 psi	3 = 0.2 – 3 bar/3 – 45 psi	0=NPT 1/4" f	same as inlet	0 = without	0 = without	Please specify
LMD 320-01 AV	chrome-plated	F = 230 bar/ 3300 psi	6 = 0.5 – 6 bar/7 – 85 psi	CL6, CL8, CL10, CL12		A = with	Ki = with	
LMD 320-03	SS = stainless		14 = 1 – 14 bar/15 – 200 psi	BC = brass			(only for Type - 03)	
LMD 320-03 AV	steel			chrome-plated				
				SS = stainless steel				

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# GAS SUPPLY PANELS SMD 320-16/-24/-25



Single-stage, for inert, flammable and oxidizing gases and gas mixtures, purity max. 5.0

inlet pressure 230 bar / 3300 psi, Outlet pressure range 1 – 14 bar / 14 – 200 psi

### SPECIAL FEATURES

- > Gas supply panel for standard applications (Type - 16)
- > Process gas purging (Type - 24)
- > Process gas purging and process gas outlet shut-off valve (Type - 25)

### DESCRIPTION

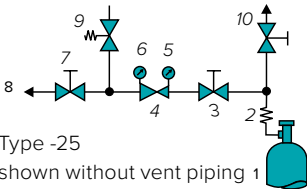
These gas supply panels are mounted onto a stainless steel panel and consist of a pressure regulator, inlet and outlet pressure gauges, a relief valve and shut-off valves (type -16 at the outlet, type -24 at the inlet, type -25 at inlet and outlet) for the process gas. A choice of stainless steel coils or flexible high pressure hoses is available for the connection to the gas cylinder. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. Vent piping connected to the relief valve can be ordered optionally.

### APPLICATION

Gas panels are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower line pressure. Through the subsequent piping system the gas is taken to the point of use.

The type -24 allows for process gas purging to be carried out while cylinders are being changed. The type-25 design allows shutting-off of gas flow during cylinder change from the panel itself. Standard application for these panels: centralized or decentralized gas supply.

### FLOW SCHEMATIC



Type -25

shown without vent piping 1

- 1 Cylinder connection
- 2 Coil/Hose
- 3 Shut off valve (not Type -16)
- 4 Pressure regulator - Single-stage
- 5 Upstream pressure gauge
- 6 Downstream pressure gauge
- 7 Process gas outlet shut-off valve (Type -25 and -16)
- 8 Process gas outlet
- 9 Relief valve
- 10 Purge outlet valve (not Type -16)

TECHNICAL DATA	
Body:	stainless steel 316L (1.4404) specially cleaned or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Relief valve:	Outlet NPT 1/4" f, downstream pressure > 50 bar RV on request
Seat seals:	PCTFE
Body seals:	PCTFE (SS), PVDF (Brass)
Relief valve seat seals:	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*
Basic design aspects:	see page 46
Pressure gauge range:	0 – 25 bar (0 – 365 psi), 0 – 315 bar (0 – 4500 psi)
Weight:	approx. 2.5 kg (type - 16) / 2.74 kg (type - 24) / 3 kg (type - 25)
Dimensions (w×h×d):	approx. 250×155×185 mm
Purge outlet:	NPT 1/4" f or tube fitting
Inlet:	NPT 1/4" f, M 14×1.5 (optional)

\*on request

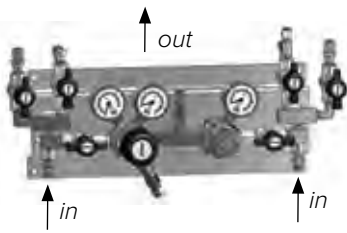
### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Contact gauge	Vent piping	Gas type
<b>SMD 320-16</b>	<b>BC</b>	<b>F</b>	<b>14</b>	<b>N14</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>A</b>	<b>GAS</b>
SMD 320-16	BC = brass	F = 230 bar/	14 = 1 – 14 bar	N14 = NPT 1/4" f	0 = NPT 1/4" f	0 = without	0 = without	Please specify
SMD 320-24	chrome-plated	3300 psi	/15 – 200 psi	M14×1.5 (optional)	CL6, CL8**	Ki = with	A = with (Only in conjunction with RV not available for Type-16)	
SMD 320-25	SS = stainless steel				CL10, CL12 BC = brass chrome-plated SS = stainless steel			

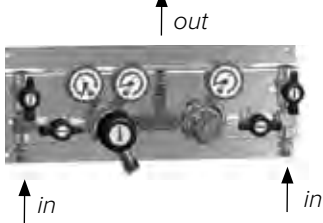
It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

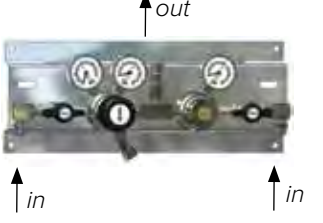
# GAS SUPPLY MANIFOLDS BMD 320-34/35/39



Type -34



Type -35



Type -39

Single-stage,  
for inert, reactive, flammable and oxidizing gases and gas mixtures,  
purity max. 5.0,  
Inlet pressure 230 bar / 3300 psi, preset Outlet pressure 14 bar – 200 psi

### SPECIAL FEATURES

- > Uninterrupted gas supply with semiautomatic switch over
- > Indicator for active cylinder
- > Low gas alarm signal with contact gauges (optional)
- > Upgradable to max. 2x4 cylinders

### DESCRIPTION

Pressure decreases in the active cylinder (or bundle) below a preset level which causes a semi-automatic switch over to the full cylinder. This is achieved by two integrated pressure regulators (preset to slightly different delivery pressure levels), connected at their outlet ports. Moving the handwheel towards the full bank allows for the disconnection and replacement of empty cylinders without interruption to the gas flow. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

### APPLICATION

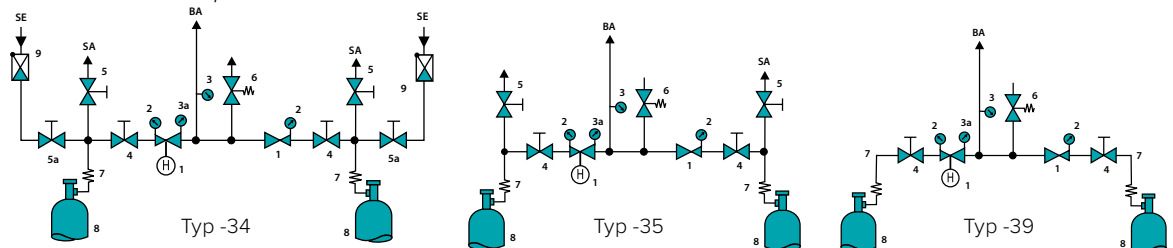
These gas supply panels, with semi-automatic switch over, are optimally used when it is when uninterrupted gas supply is required.

TECHNICAL DATA	
Body:	Stainless steel 316L (1.4404) specially cleaned or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Relief valve:	Outlet NPT 1/4" f
Body seals:	PCTFE (SS), PVDF (Brass)
Seat seals:	PCTFE
Relief valve seat seals:	SS: FKM, (EPDM, FFKM)*, Bras: EPDM, (FKM)*
Pressure gauge range:	0 – 25 bar (0 – 365 psi), 0 – 315 bar (0 – 4500 psi)
Dimensions (w×h×d):	approx. 400×155×200 mm
Weight:	approx. 5.0 kg (BMD 320-39)
Preset downstream pressure:	14 bar +/- 2 bar ; 200 +/- 30 psi
Flow rate:	20 Nm <sup>3</sup> /h N <sub>2</sub> , (14 bar - type at 29 bar inlet pressure.)
Inlet:	NPT 1/4" f, M 14×1.5 (optional)
Outlet:	NPT 1/4" f, optional tube fitting

\*on request

### FLOW SCHEMATIC

- 1 Pressure regulator
- 2 Upstream pressure gauge
- 3 Downstream pressure gauge
- 4 Process gas valve
- 5 Purge gas outlet valve
- 5a Purge gas inlet valve
- 6 Relief valve
- 7 Connection spirals/Hoses
- 8 Gas cylinder
- 9 Check valve
- 3a Middle pressure gauge
- H Change over hand wheel
- BA Process gas outlet
- SA Purge gas outlet
- SE Purge gas inlet



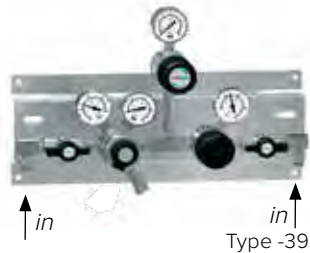
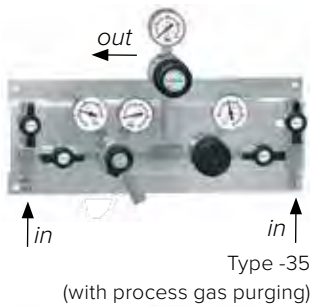
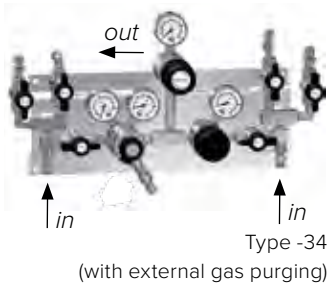
### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Contact gauge	Extension Mfold
<b>BMD 320-39</b>	<b>BC</b>	<b>F</b>	<b>MSD14</b>	<b>N14</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>M</b>
BMD 320-34	BC = brass	F = 230 bar/3300 psi	MSD14 = 14 bar/200 psi	N14 = NPT 1/4" f	O = NPT 1/4" f	O = without	O = without
BMD 320-35	chrome-plated			M14×1.5m	CL6, CL8**	Ki = with	M2 = 2×2 Cylinders
BMD 320-39	SS = stainless steel			(optional)	CL10, CL12		M3 = 2×3 Cylinders
					BC = brass		M4 = 2×4 Cylinders
					chrome-plated		
					SS = stainless steel		

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".

\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# GAS SUPPLY MANIFOLDS BMD 322-35/39 SEMI-AUTOMATIC - DUAL STAGE



- 1 Pressure regulator 1st stage
- 1a Pressure regulator 2nd stage
- 2 Upstream pressure gauge
- 3 Downstream pressure gauge
- 3a Middle pressure gauge
- 4 Process gas valve
- 6 Relief valve
- 7 Connection spirals/Hoses
- 8 Gas cylinder
- H Change over hand wheel
- BA Process gas outlet

Dual-stage,  
for inert, reactive, flammable and oxidizing gases and gas mixtures,  
purity max. 5.0,  
Inlet pressure 230 bar / 3300 psi, preset Outlet pressure 14 bar – 200 psi

### SPECIAL FEATURES

- > Uninterrupted gas supply with semiautomatic switch over
- > Indicator for active cylinder
- > Low gas alarm signal with contact gauges (optional)
- > Upgradable to max. 2x4 cylinders

### DESCRIPTION

Pressure decreases in the active cylinder (or bundle) below a preset hand wheel which causes a semi-automatic switch to switch over to the full cylinder. This is achieved by two integrated pressure regulators (preset to slightly different delivery pressure levels), connected at their outlet ports. Rotation by hand wheel with the arrow to direction of full bank allows for the disconnection and replacement of empty cylinders without interruption to the gas flow.

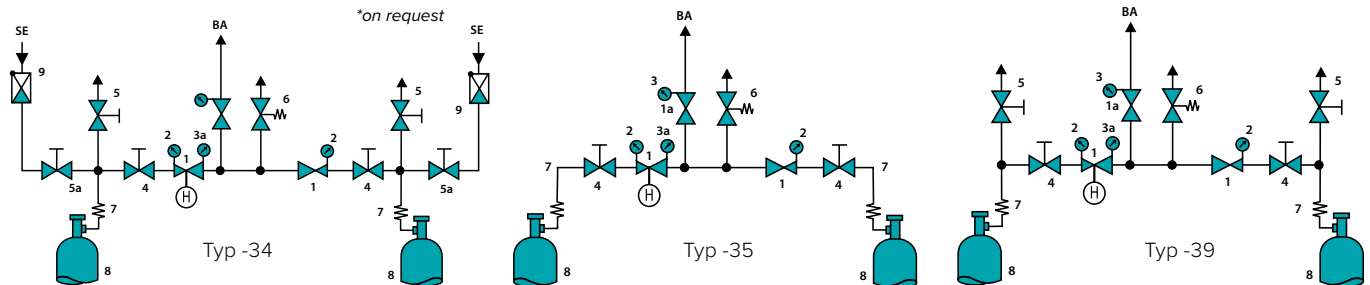
The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

### APPLICATION

These gas supply panels, with semi-automatic switch over, are optimally used when it is uninterrupted gas supply is required.

TECHNICAL DATA	
Body:	stainless steel 316L (1.4404) specially cleaned or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Relief valve:	Outlet NPT 1/4" f, downstream pressure > 50 bar RV on request
Body seals:	PCTFE (SS), PVDF (Brass)
Seat seals:	PCTFE
Relief valve seat seals:	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*
Pressure gauge range:	0 – 10 bar (0 – 145 psi)/0 – 18 bar (-15 – 260 psi)/0 – 315 bar (0 – 4500 psi)
Dimensions (w×h×d):	approx. 400×155×200 mm
Weight:	approx. 6.0 kg (BMD 322-39)
Flow rate:	10 Nm <sup>3</sup> /h N <sub>2</sub> (10 bar - type at 21 bar inlet pressure)
Inlet:	NPT 1/4" f, M 14×1.5 (optional)
Outlet:	NPT 1/4" f, optional tube fitting

### FLOW SCHEMATIC



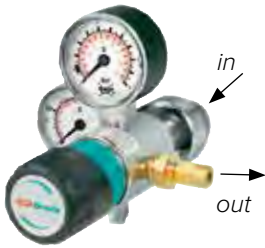
### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet**	Contact gauge	Extension M/Fold	Gas type
<b>BMD 322-39</b>	<b>BC</b>	<b>F</b>	<b>10</b>	<b>N14</b>	<b>CL6 BC</b>	<b>Ki</b>	<b>M2</b>	<b>GAS</b>
BMD 322-34	BC = brass	F = 230 bar/ 3300 psi	6 = 6 bar/ 85 psi	N14 = NPT 1/4" f	0 = NPT 1/4" f	0 = without	0 = without	Please specify
BMD 322-35	chrome-plated		10 = 10,5 bar/ 150 psi	M14×1.5 (optional)	CL6, CL8**	Ki = with	M2 = 2×2 Cylinder	
BMD 322-39	SS = stainless steel				CL10, CL12 BC = brass chrome-plated		M3 = 2×3 Cylinder M4 = 2×4 Cylinder	

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station, see accessories chapter "cylinder connection".

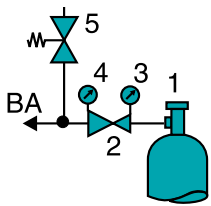
\*\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CYLINDER PRESSURE REGULATORS FMD 300-14/-18

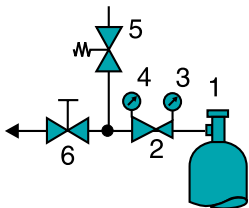


FMD 300-14

## FLOW SCHEMATIC



FMD 300-14



FMD 300-18

- 1 Cylinder connection
- 2 Pressure regulator
- 3 Upstream pressure gauge
- 4 Downstream pressure gauge
- 5 Relief valve
- 6 Downstream regulating valve (Type -18)

Single-stage,  
for inert gases and gas mixtures and oxygen,  
purity to 5.0, cylinder pressure 230 bar  
Outlet pressure range 0.2 – 12 bar / 3 – 175 psi

## SPECIAL FEATURES

- > Easy to operate
- > Inlet on back side
- > Integrated relief valve
- > Diaphragm material Hastelloy
- > Seat seals in PCTFE
- > FMD 300-18: with regulating valve

## DESCRIPTION

The FMD 300-14 consists of manual cylinder connection with knurled nut (supplied), pressure regulator, upstream pressure gauge, downstream pressure gauge, relief valve and screw connections. The FMD 300-18 has in addition a regulating valve at the outlet. The customary hose fittings and couplings are available as accessories. The inlet on the back end allows for particularly space saving installation.

## APPLICATION

The cylinder pressure regulator series FMD 300 is attractive for its high flow rate values and good regulating characteristics. The FMD 300-14 is used anywhere where gas is directly taken from the cylinder and greater flexibility for the end user when choosing a location for use.

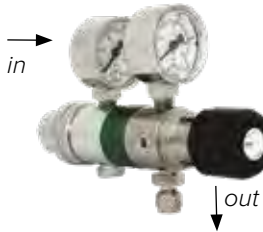
TECHNICAL DATA	
Body:	Brass, 2.0401.26 specially cleaned, nickel-plated and chrome-plated
Seat seals:	PCTFE
Relief valve:	triggered at 1.4- to 1.8- times nominal pressure
Purity:	≤ 5.0
Leakage rate:	< 1×10 <sup>-7</sup> mbar l/s Helium (outboard) < 1×10 <sup>-6</sup> mbar l/s Helium (across the seat)
Working temperature:	-25 °C to +70 °C / -13 °F to 158 °F
Filter at inlet:	50 µm
Weight:	approx. 1.12 kg (FMD 300-14) / 1.34 kg (FMD 300-18)
Dimensions (w×h×d):	approx. 140×120×115 mm ( FMD 300 without cylinder connection)
Gauge:	0 – 6, 0 – 10, 0 – 16 bar and 0 – 315 bar 0 – 85, 0 – 145, 0 – 230 psi and 0 – 4500 bar
Inlet:	Cylinder connection, gas-specific
Outlet:	Tube fitting 6 mm (standard)

## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Cylinder - conn.	Outlet*	Gas type
<b>FMD 300-14</b>	<b>BC</b>	<b>F</b>	<b>C</b>	<b>DIN9H</b>	<b>CL6</b>	<b>GAS</b>
FMD 300-14	BC = brass chrome-	F = 230 bar/3300 psi	3 = 0.2 – 3 bar /3 – 45 psi	DIN	CL3	Please specify
FMD 300-18	plated		6 = 1 – 6 bar /15 – 85 psi 12 = 1 – 12 bar /15 – 175 psi	BS other national standards	CL6 CL1/8" NO4 NO8	

\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CYLINDER REGULATOR PRIOR - DUAL STAGE



FMD PRIOR

Double-stage,  
for inert gases and gas mixtures,  
purity up to 5.0,  
Inlet pressure 200 bar / 3300 psi, Outlet pressure range 0.05 – 10 bar / 0.7 – 145 psi

### SPECIAL FEATURES

- > Superior downstream pressure adjustment
- > Hand tightening nut for cylinder connection
- > Double-stage version for constant outlet pressure
- > Precise pressure level due to metal bellows
- > 100 % helium leak-tested

### DESCRIPTION

The PRIOR is a double-stage cylinder regulator with the first stage preset and a second adjustable one to achieve a very constant pressure level independent of the inlet pressure level. This regulator is equipped with second stage bellows, which ensures high quality, outstanding performance and consistent outlet pressure.

### APPLICATION

The cylinder regulator PRIOR is designed to combine excellent pressure stability, flow rate range, safety and gas tightness. Its ergonomic design makes it easy to operate and to set the required outlet pressure. The impressive performance qualifies this regulator especially for laboratory, laser, analytic and other applications, where precise and reliable pressure levels are needed.

TECHNICAL DATA	
Housing:	Brass chrome-plated
Inlet Pressure (P1):	200 bar (2900 psi)
Regulating Range (P2):	10 bar (145 psi), 4 bar (60 psi); 1.5 bar (22 psi)
Flow max (Q):	5 Nm <sup>3</sup> /h (2.9 SCFM)
Seat stage 1:	PCTFE
Seat stage 2:	FKM
Diaphragm stage 1:	Stainless steel
Bellow stage 2:	Phospor bronze
Filter:	Stainless steel
Leakage rate:	10 <sup>-7</sup> (cm <sup>3</sup> bar/s He)
Working temperature:	-20 °C to +50 °C / -4 °F to 122 °F
Inlet:	Gas specific cyl. connector acc. to national standards
Filter at inlet:	50 µm
Weight:	1.35 kg
Outlet:	Tube fitting

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Cylinder - conn.	Outlet*	Contact gauge	Gas type
<b>PRIOR</b>	<b>BC</b>	<b>F</b>	<b>10</b>	<b>DIN1H</b>	<b>CL6</b>	<b>Ki</b>	<b>GAS</b>
PRIOR	BC = brass chrome-plated	F = 200 bar/ 2900 psi	1.5 = 0.05 – 1,5 bar /0.7 – 22 psi 4 = 0.1- 4 bar /1.5 - 60 psi 10 = 0.5 - 10 bar / 7 – 145 psi	DIN AFNOR other national standards	CL6 CL8	0 = without Ki = with	Please specify

\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

## ULTRA HIGH PURITY GAS PANELS

- > Single stage gas panel for external purged gases (special clean rooms)
- > Double stage on request
- > Including coil
- > Including purge block (manual or pneumatic actuated)
- > Gas purity max 7.0
- > Inlet pressure up to 230 bar
- > Adjustable outlet pressure
- > Components manufactured and packed in clean room 100 Fed- Class standard
- > Application: semi-conductor, university, research facility, solar industry



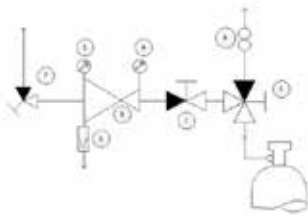


# GAS SUPPLY MANIFOLD SMD 700-25 SINGLE CYLINDER

Single stage, for none corrosive gases  
 Purity max. 7.0 Inlet pressure 200 bar / 2900 psi  
 Downstream pressure range 0, 34-10 bar / 4, 9-290 psi  
 Max. flow 30 slpm (Hydrogen 125 slpm)



## FLOW SCHEMATIC



- 1 Purge Outlet Valve
- 2 Inlet Shut Off Valve
- 3 Pressure regulator
- 4 Inlet Pressure Gauge
- 5 Outlet Pressure Gauge
- 6 Bursting Disk
- 7 Downstream Shut Off Valve
- 8 Orifice

## SPECIAL FEATURES:

- > Process gas purging and process gas outlet shut-off valve (Type -25)
- > Optional: Inlet and/ or outlet filter
- > Optional: pneumatic inlet valve
- > Optional: contact gauges or pressure transmitter
- > Optional: high flow regulator: max. flow 80 slpm (Hydrogen 240 slpm)

## DESCRIPTION

This gas supply panel is mounted on a aluminum plate and consists of a pressure regulator, inlet and outlet pressure gauges, a relief valve and shut-off valve for the process gas. A choice of stainless steel coils or flexible high pressure hoses is available for the connection to the gas cylinder. The use of contact gauges or pressure transmitters in conjunction with alarm box or gas monitoring system is possible.

## APPLICATION

Gas panels are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower working pressure. Through a piping system the gas is taken to the point of use. The type -25 design allows shutting-off the gas flow during cylinder change from the panel itself. Standard application for this panel: Centralized and decentralized gas supply.

TECHNICAL DATA	
Plate:	3.3535 AlMg3 EN AW 5754 44 eloxiert E6/EV1, WxH =350 x 250 mm
Shut-Off Valve and Purge Valve	
Material:	stainless steel 316L, electro polished
Diaphragm:	Elgilloy
Seat:	PCTFE
2 ports	
Surface finish:	Ra <sub>Average</sub> = 0,25 µm
Manual hand-knob	
Cv-value:	0,29
Connections:	¼" VCR
Pressure Regulator	
Material:	stainless steel 316L, electro polished
Diaphragm:	stainless steel 316L
Seat:	PCTFE
4 ports	
Surface finish:	Ra <sub>Average</sub> = 0,25 µm
Manual hand-knob	
Cv-value:	0,09
Connections:	¼" VCR
Gauges	
CrNi-steel, electro polished	
Diameter:	63 mm
Scale:	bar / psi

## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet	Optional
<b>SMD 700-25</b>	<b>SS</b>	<b>F</b>	<b>10</b>	<b>V14F</b>	<b>V14F</b>	<b>KI</b>
	SS = stainless steel	F = 200 bar/ 2900 psi	10 = 0,34 – 10 bar	= VCR ¼" female	= VCR ¼" female	KI = inductive contact gauges KR2 = reed contact gauge PT = Pressure Transmitter IF = Inlet filter, OF = Outlet filter IP = pneumatic inlet valve HF = high flow regulator

# GAS SUPPLY MANIFOLD BMD 700-35 SEMI-AUTOMATIC

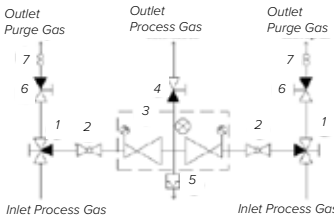


Single stage, for none corrosive gases,  
 Purity max. 7.0 Inlet pressure 200 bar / 2900 psi  
 Downstream pressure range 5, 8- 7, 9 bar / 84, 1-114, 6 psi , 9,3 – 11,4 bar / 135-165 psi  
 Max. flow 30 slpm

### SPECIAL FEATURES:

- > Inert gas purging and process gas outlet shut-off valve (Type -35)
- > Uninterrupted gas supply with semi-automatic switch over
- > Low gas alarm with contact gauges or pressure transmitter (optional)
- > Inlet and/ or outlet filter (optional)
- > Pneumatic inlet valve (optional)
- > Optional: high flow regulator: max. flow 80 slpm (Hydrogen 240 slpm)
- > Upgradable to 2x4 gas cylinders

### FLOW SCHEMATIC



- 1 3-Port Inlet Shut-Off Valve
- 2 Check Valve
- 3 Regulator with gauges
- 4 2-Port Outlet Shut-Off Valve
- 5 Bursting Disc
- 6 2-Port Outlet Purge Valve
- 7 Orifice

### DESCRIPTION

Pressure decreases in the active cylinder (or bundle) below a preset level which causes a semi-automatic switch over to the full gas cylinder. This is achieved by special regulator (preset to slightly different) delivery pressure levels (5,8 – 7,9 bar). If the arrow from handwheel points towards the full gas cylinder, a replacement of empty gas cylinder is possible without interruption of gas flow.

### APPLICATION

Gas panels are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower working pressure. This gas supply manifold with semi-automatic switch over is optimally used when uninterrupted gas supply is required.

TECHNICAL DATA	
Plate:	3.3535 AIMg3 EN AW 5754 44 eloxiert E6/EV1, WxH =700 x 250 mm
Shut-Off Valve and Purge Valve	
Material:	stainless steel 316L, electro polished
Diaphragm:	Elgilloy
Seat:	PCTFE
2 port (purge valves), 3 ports (shut-off valves)	
Surface finish:	Ra <sub>Average</sub> = 0,25 µm
Manual hand-knob	
Cv-value:	0,29
Connections:	¼" VCR
Pressure Regulator	
Material:	stainless steel 316L, electro polished
Diaphragm:	stainless steel 316L
Seat:	PCTFE
6 ports	
Surface finish:	Ra <sub>Average</sub> = 0,25 µm
Manual hand-knob with arrow for active site	
Cv-value:	0,09
Connections:	¼" VCR
Gauges	
CrNi-steel, electro polished	
Diameter:	63 mm
Scale:	bar / psi

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet	Optional
<b>BMD 700-35</b>	<b>SS</b>	<b>F</b>	<b>10</b>	<b>V14F</b>	<b>V14F</b>	<b>KI</b>

SS = stainless steel F = 200 bar/ 2900 psi 10 = 0,34 – 10 bar = VCR ¼" female = VCR ¼" female KI = inductive contact gauges  
 KR2 = reed contact gauge  
 PT = Pressure Transmitter  
 IF = Inlet filter, OF = Outlet filter  
 IP = pneumatic inlet valve  
 HF = high flow regulator

# GAS SUPPLY MANIFOLD BMD700-35 AS- FULL AUTOMATIC

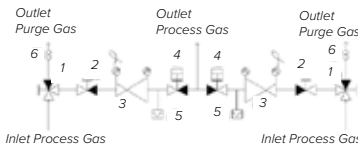
Single stage, for two or more gas cylinders, for none corrosive gases,  
 Purity max. 7.0 Inlet pressure 200 bar / 2900 psi,  
 Downstream pressure range 0, 34-10 bar / 4, 9-290 psi Max. flow 30 slpm



### SPECIAL FEATURES:

- > Inert gas purging (Type -35)
- > Uninterrupted gas supply with automatic switch over
- > Low gas alarm with contact gauges or pressure transmitter (optional)
- > Upgradable to max. 2x4 gas cylinders
- > Optional: Inlet and/ or outlet filter
- > Pneumatic valve for switch over
- > Optional: pressure transmitter
- > Optional: high flow regulator: max. flow 80 slpm (Hydrogen 240 slpm)

### FLOW SCHEMATIC



- 1 3-Port inlet Shut-Off Valve
- 2 2-Port Process Shut-Off Valve
- 3 Pressure regulator with inlet reed contact gauge and outlet gauge
- 4 Pneumatic Process Valve
- 5 Bursting Disc
- 6 Orifice

### DESCRIPTION

Pressure decreases in the active gas cylinder (or bundle) below a preset level which causes an automatic switch over through the pneumatic valves to the full gas cylinder (or bundle). The two pneumatic valves for the switch over are located after the pressure regulators and connected at their outlet ports. The pneumatic valve at the empty gas cylinder site closes and allows the replacement of empty gas cylinder without interruption of the gas flow. To guarantee automatic switch over, this gas supply manifold is used together with a switch over box.

### APPLICATION

Gas panels are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower working pressure. This gas supply manifold with automatic switch over is optimally used when uninterrupted gas supply is required.

TECHNICAL DATA	
Plate:	3.3535 AIMg3 EN AW 5754 44 eloxiert E6/EV1, WxH =700 x 250 mm
Shut-Off Valve and Purge Valve	
Material:	stainless steel 316L, electro polished
Diaphragm:	Elgilloy
Seat:	PCTFE
2 port (shut-off valve), 3 port (purge valve)	
Surface finish:	Ra <sub>Average</sub> = 0,25 µm
Manual hand-knob	
Cv-value:	0,29
Connections:	¼" VCR
Pressure Regulator	
Material:	stainless steel 316L, electro polished
Diaphragm:	stainless steel 316L
Seat:	PCTFE
4 ports	
Surface finish:	Ra <sub>Average</sub> = 0,25 µm
Manual hand-knob	
Cv-value:	0,09
Connections:	¼" VCR
Gauges	
CrNi-steel, electro polished	2,5 bar; 5 bar; 10 bar; 16 bar; 40 bar
Diameter:	63 mm
Scale:	bar / psi

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet	Automatic Switch	Contact gauge	Optional
<b>BMD 700-35 AS</b>	<b>SS</b>	<b>F</b>	<b>10</b>	<b>V14F</b>	<b>V14F</b>	<b>AS</b>	<b>KR1</b>	<b>KR2</b>
	SS = stainless steel	F = 200 bar/ 2900 psi	10 = 0,34 – 10 bar	= VCR ¼" female	= VCR ¼" female		KR1 = reed contact gauge	KI = inductive contact gauges KR2 = reed contact gauge PT = Pressure Transmitter, IF = Inlet filter, OF = Outlet filter, IP = pneumatic inlet valve, HF = high flow regulator

# POINT-OF-USE-REGULATORS EMD700-06



Single stage, for none corrosive gases,  
 Purity max. 7.0 Inlet pressure 40 bar / 580 psi  
 Downstream pressure range 1-10 bar / 14,5-145 psi

## SPECIAL FEATURES:

- > Upstream valve with 90°-shut-off function
- > Clear open close indicator for shut-off valves
- > Optional: pneumatic inlet valve
- > Outlet filter (optional)

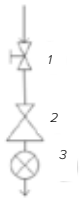
## DESCRIPTION

The EMD700-06 consists of upstream shut-off valve, pressure regulator, downstream gauge and aluminum panel for wall mounting. Relief valve and/ or outlet filter can be ordered as an option.

## APPLICATION

The EMD700-06 is designed as an access point to a central gas supply system and thereby designed by second stage.

## FLOW SCHEMATIC



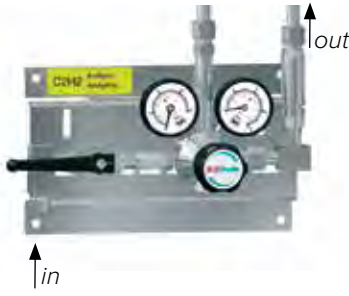
- 1 2-Port Shut-Off Valve
- 2 Pressure regulator
- 3 Gauge

TECHNICAL DATA	
Plate:	3.3535 AlMg3 EN AW 5754 44 eloxiert E6/EV1, WxH =350 x 250 mm
Shut-Off Valve and Purge Valve	
Material:	stainless steel 316L, electro polished
Diaphragm:	Elgilloy
Seat:	PCTFE
2 ports	
Surface finish:	$Ra_{Average} = 0,25 \mu m$
Manual hand-knob	
Cv-value:	0,29
Connections:	¼" VCR
Pressure Regulator	
Material:	stainless steel 316L, electro polished
Diaphragm:	stainless steel 316L
Seat:	PCTFE
2 ports	
Surface finish:	$Ra_{Average} = 0,25 \mu m$
Manual hand-knob	
Cv-value:	0,09
Connections:	¼" VCR
Gauge	
	CrNi-steel, electro polished
Diameter:	63 mm
Scale:	bar / psi

## ORDER CODE

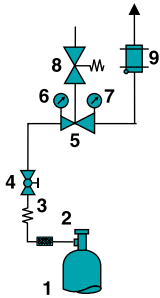
Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet	Optional
<b>EMD 700-06 SS</b>	<b>E</b>	<b>10</b>	<b>V14F</b>	<b>V14F</b>	<b>IF</b>	
	SS = stainless steel	E = 40 bar	10 = 1 – 10 bar	= VCR ¼" female	= VCR ¼" female	IF = Inlet filter

# ACETYLENE PANELS BMD/SMD 200-29

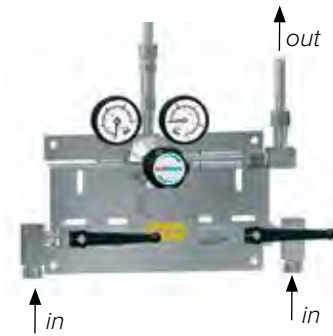


Single-stage, for acetylene,  
 Inlet pressure 25 bar  
 Outlet pressure < 1.5 bar

### FLOW SCHEMATIC



SMD 200-29



### SPECIAL FEATURES

- > Single-stage version for conventional gas usages
- > Gas failure monitoring via contact gauges and signal boxes (optional)
- > Single components with type approval
- > Connections for 1 or 2x1 cylinders
- > AAS suitable (Atomic Absorption Spectrometer)

### DESCRIPTION

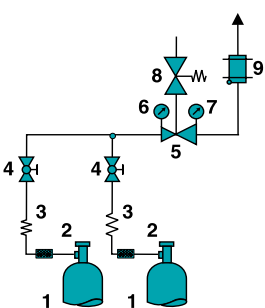
Station with inlet ball valve, upstream and downstream pressure gauges, relief valve, flashback arrestor and connections for 1 cylinder (SMD) or 2 cylinders (BMD).

### APPLICATION

As first stage of a central gas supply. This gas supply panel together with contact gauge and signal box ensures an uninterrupted gas supply. The switch-over from the empty cylinder to the full supply cylinder is operated manually. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

TECHNICAL DATA	
Upstream pressure:	25 bar
Downstream pressure:	< 1.5 bar
Body:	Brass 2.0401.26
Diaphragm:	Rubber
Flow rate:	to 1 m <sup>3</sup> /h (pa = 1.26 bar)
Working temperature:	-20 to +60 °C / -4 to 140 °F
Dimensions (w×h×d):	approx. 300×155×160 mm
Weight:	approx. 4.6/5.5 kg (SMD / BMD)
Inlet gauge:	safety gauge acc. to ISO 5171 or contact gauge KI 63-40/11 (optional)
Pressure gauge range:	0 – 40 bar, 0 – 580 psi (inlet), 0 – 2.5 bar, 0 – 36 psi (outlet)
Relief valve outlet:	Brass - Tube ø 12 mm
Safety feature:	Flashback arrestor GVA G3/8" 1h
Inlet:	W21,8×1/14"
Outlet:	Tube ø 12 mm×7 mm

### FLOW SCHEMATIC



BMD 200-29

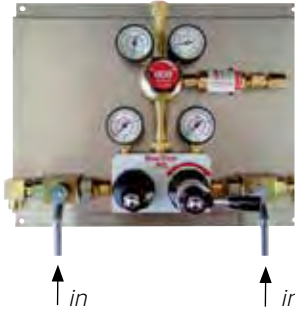
- 1 Cylinder
- 2 Cylinder valve
- 3 Connecting hose
- 4 Ball valve
- 5 Pressure regulator
- 6 Upstream pressure gauge
- 7 Downstream pressure gauge
- 8 Relief valve
- 9 GVA

### ORDER CODE

Type	Material	Outlet pressure	Outlet	Contact gauge	Gas type
<b>SMD 200-29</b>	<b>BC</b>	<b>1.5</b>	<b>12</b>	<b>KI</b>	<b>GAS</b>
SMD 200-29	B = Brass	1.5 = 1.5 bar / 22 psi	12 = Tube with 12 mm outside diameter, inside diameter 7 mm	0 = without Ki = with	C2H2
BMD 200-29			Brass - version		

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station.

# SEMI-AUTOMATIC SWITCH-OVER ACETYLENE BMD 202-39



Dual-stage,  
For acetylene,  
Inlet pressure 25 bar,  
Outlet pressure < 1.5 bar

## SPECIAL FEATURES

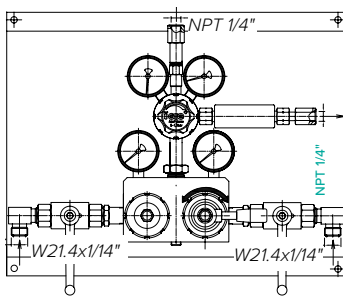
- > Uninterrupted gas supply with semi-automatic switch over
- > High flow rate
- > Low supply pressure alarm (optional)
- > Connections for 6 cylinders
- > AAS suitable (Atomic Absorption Spectrometer)

## DESCRIPTION

The gas supply panel BMD 202-39 guarantees an uninterrupted acetylene supply through the automatic switch-over from the empty side to the full reserve side. This pressure regulating station is approved for the connection of maximum 6 cylinders. A flashback arrestor is installed on the outlet side. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. The station is mounted on a stainless steel plate and equipped with stainless steel fittings on the outlet side (optional).

## APPLICATION

This gas supply panel is deployed where large amounts of acetylene are used and where the gas flow cannot be interrupted.



TECHNICAL DATA	
Upstream pressure:	25 bar
Downstream pressure, max.:	< 1.5 bar
Average switch over pressure:	approx. 4 bar
Reserve pressure:	approx. 3 bar
Flow rate:	7.5 m <sup>3</sup> /h
Upstream pressure gauge:	2 gauges (40 bar) in accordance ISO 5171 (2 contact gauges Ki 63-40/I1 optional), 1 gauge (40 bar) in accordance ISO 5171
Downstream pressure gauge:	(2.5 bar) in accordance ISO 5171
Shut-off valve:	ball valve 3/8"
Working temperature:	-20° to 60°C / -4 °F to 140 °F
Safety feature:	Flashback arrestor
Relief valve outlet:	NPT 1/4"f
Inlet:	W21,8x1/14"
Outlet:	NPT 1/4"f, optional tube fitting (SS)

## ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet*	Contact gauge	Gas type
<b>BMD 202-39</b>	<b>B</b>	<b>E</b>	<b>1.5</b>	<b>W21.8x1/14"</b>	<b>CL8 SS</b>	<b>KI</b>	<b>GAS</b>
BMD 202-39	B = Brass	E = 0 – 40 bar/ 600 psi	1.5 = 1.5 bar/22 psi	W21,8x1/14"	0 = without, CL6, CL8, CL10, CL12 Material Stainless steel (SS)	0 = without Ki = with	C2H2

It is necessary to have a gas specific connection to the gas supply for an efficient installation and use of this station.

\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# PROPANE GAS PANELS



Single cylinder station

Single or double cylinder stations,  
for propane gas cylinders up to 33 kg,  
Inlet pressure 1 – 16 bar  
Outlet pressure 50 mbar

### SPECIAL FEATURES

- > Individual parts DIN-DVGW tested
- > Double cylinder station with semi-automatic switch-over valve
- > Low gas pressure alarm (optional)

### DESCRIPTION

The single cylinder station consists of a low pressure regulator, 400 mm medium pressure hose with a safety shut-off valve and a safety relief valve. The double cylinder station consists of a low pressure regulator, a safety shut-off valve (connected upstream) and safety relief valve, 2 high pressure hoses with

cylinder connections, a support rail, semi-automatic switch-over valve PN 16, the extraction is rotationally achieved. Both stations conform to the requirements of the TRF 1996 and/or the BGV D 34§11 para. 4.

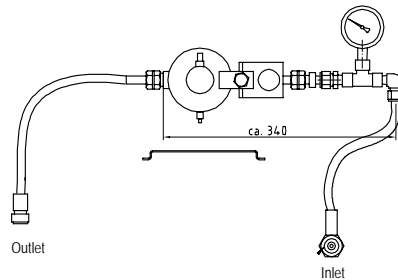


Double cylinder station  
fully mounted

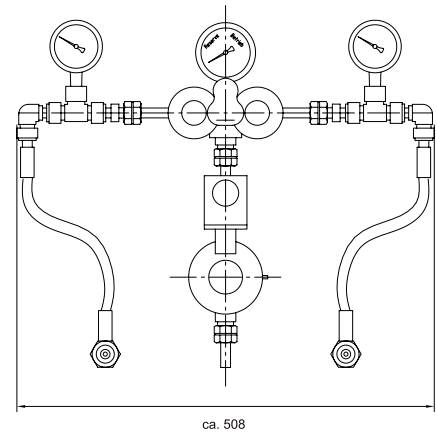


Propane hose

TECHNICAL DATA	
Upstream pressure:	16 bar
Downstream pressure:	0.05 bar
Flow rate:	max. 4 kg/h
Inlet:	Single cylinder station: cylinder connection
Double cylinder station:	hose
Outlet:	Single cylinder station: medium pressure hose
Double cylinder station:	hose connection tube ø 12 mm



Example conuguration: single cylinder station  
with contact gauges



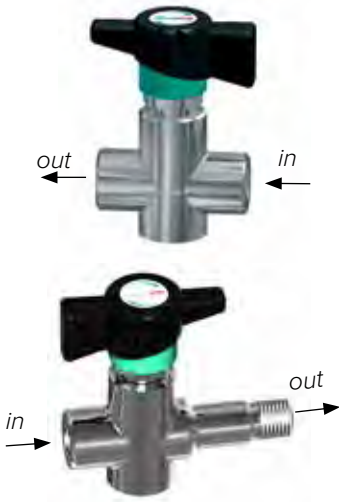
Example conuguration: double cylinder station  
with contact gauges

### ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet	Contact gauge	Gas type
<b>SMD 090</b>	<b>B</b>	<b>D</b>	<b>0.05</b>	<b>DIN1</b>	<b>CL12</b>	<b>KI</b>	<b>C3H8</b>
SMD 090	B = Brass	D = 16 bar	0.05 = 0.05 bar	DIN1 = D477#1	CL12 = CL12	0 = without	C3H8
BMD 092						Ki = with	

# DIAPHRAGM SHUT-OFF VALVES MVA 500/530

For inert, reactive, flammable and oxidizing gases and gas mixtures,  
 purity max. 6.0, Inlet pressure: MVA 500: 230 bar/ 3300 psi  
 MVA 530: 300 bar /4350 psi  
 MVA 530L: 300 bar /4350 psi



### SPECIAL FEATURES

- > Quick operation through 90° shut-off function
- > Clearly visible open/closed position
- > Increased lifespan through the fine adjustment of the closing pressure

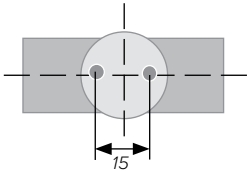
### DESCRIPTION

The diaphragm valve MVA 500 is characterized through its outstanding functional safety and high leak-tightness. The open/closed position on the valve is achieved through a 90°-turn of the handle (with a click into the end position).

### APPLICATION

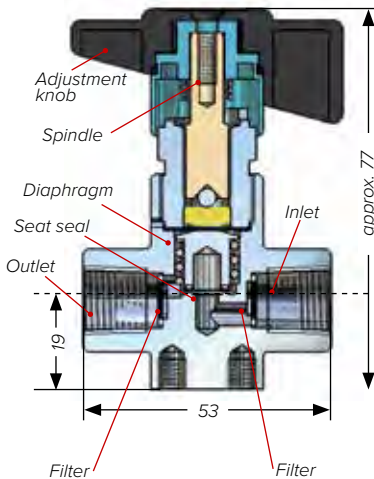
As a line shut-off in a centralized high purity gas supply. As a system component in high and low pressure areas.

### MOUNTING

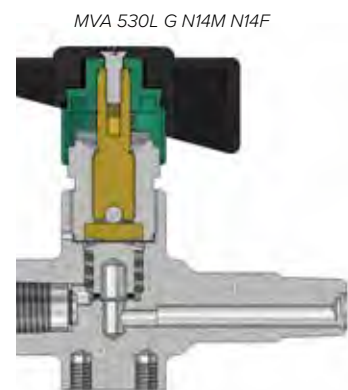
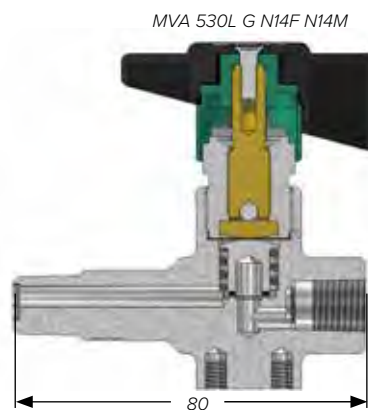


The MVA 500 has 2 bore holes M6 on the bottom.

### CROSS SECTION



TECHNICAL DATA	
Body:	Stainless steel 1.4404 specially cleaned and electro-polished or brass
	CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Elgiloy
Body seals:	PCTFE
Leakage rate:	< 1×10 <sup>-6</sup> mbar l/s Helium (seats), < 1×10 <sup>-9</sup> mbar l/s Helium (outboard)
Dimensions (w×h×d):	approx. 53×77×40 mm, MVA530L - 80×77×40
Nominal width:	DN 5
Working temperature:	-25° to 70°C / -13 °F to 158 °F
Kv-value:	0.25
Inlet/outlet filter:	100 µm mesh SS
Vacuum capable:	yes
Weight:	approx. 280 g



### ORDER CODE

Type	Material	Pressure	Inlet*	Outlet*	Gas type
<b>MVA 500G</b>	<b>BC</b>	<b>300</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>GAS</b>
200 bar Versions:	BC = brass chrome-plated	200 = 200 bar (3300 psi)	N14F = 1/4" NPT f	N14F = 1/4" NPT f	Please specify
MVA 500G		300 = 300 bar (4350 psi)	N14M = 1/4" NPT m	N14M = 1/4" NPT m	
MVA 500GL	SS = stainless steel		CL6, CL8, CL10, CL12	CL6, CL8, CL10, CL12	
300 bar Versions:			BC = brass chrome-plated	BC = brass chrome-plated	
MVA 530G			SS = stainless steel	SS = stainless steel	
MVA 530GL					

\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.



# DIAPHRAGM REGULATING VALVES MVR 500 G



For inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0,  
 Inlet pressure: 50 bar / 600 psi  
 oxygen (O<sub>2</sub>): 40 bar / 725 psi

### SPECIAL FEATURES

- > Very fine gas flow adjustment
- > Wide flow rate range for high and low pressure applications
- > Hardened stainless steel cone for a longer life span
- > High leak tightness through appropriate diaphragm construction
- > Very easily purged

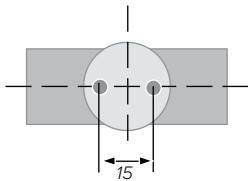
### DESCRIPTION

The regulating valve MVR 500 has a very good regulating characteristic and is very finely adjustable both by greater as also by lesser flow rate values.

### APPLICATION

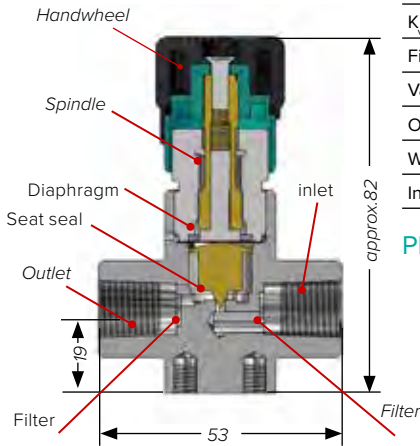
As a system component in low pressure areas. As accessory for cylinder and point-of-use regulators for fine adjustment of the gas flow. As system element in apparatus and analytical equipment.

### MOUNTING



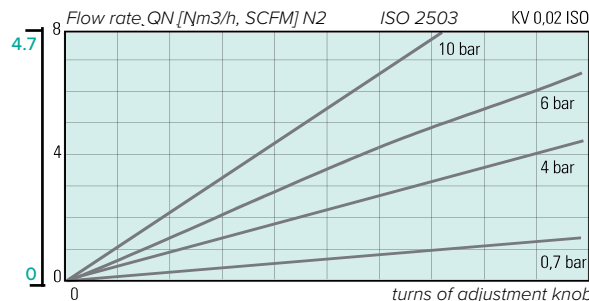
The valve has 2 bore holes M6 on the bottom.

### CROSS SECTION



TECHNICAL DATA	
Body:	Stainless steel 1.4404 specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Body seals:	hardened stainless steel cone
Diaphragm:	Elgiloy
Leakage rate:	< 1×10 <sup>-4</sup> mbar l/s Helium (seat) < 1×10 <sup>-9</sup> mbar l/s Helium (outboard)
Nominal width:	DN 2
Dimensions (w×h×d):	approx. 53×82×40 mm
Working temperature:	-25° to 70°C / -13 °F to 158 °F
K <sub>v</sub> -value:	< 0.02
Filter:	100 µm mesh on inlet and outlet, SS
Vacuum capable:	yes
Operation:	adjustment knob with approx. 10 turns
Weight:	approx. 280 g
Inlet/Outlet:	NPT 1/4" f, optional tube fitting

### PERFORMANCE DATA

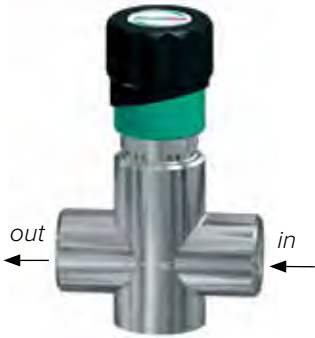


### ORDER CODE

Type	Material	Inlet pressure	Inlet*	Outlet*	Gas type
<b>MVR 500 G</b>	<b>BC</b>	<b>E</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>GAS</b>
MVR 500 G	BC = brass chrome-plated SS = stainless steel	E = 40 bar/600 psi oxygen (O <sub>2</sub> ) E = 50 bar/725 psi	N14 = NPT 1/4" f CL6, CL8 CL10, CL12 BC = brass chrome-plated SS = stainless steel	N14 = NPT 1/4" f CL6, CL8 CL10, CL12 BC = brass chrome-plated SS = stainless steel	Please specify

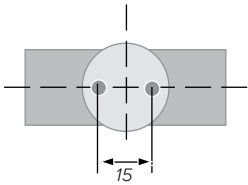
\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# DIAPHRAGM REGULATING VALVES WITH SHUT OFF FUNCTION TYPE MVR-A 500 G



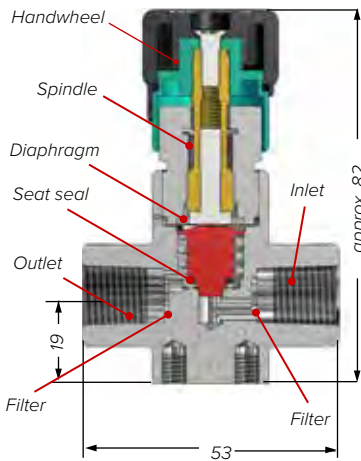
For inert, reactive, flammable and oxidizing gases and gas mixtures,  
 purity max. 6.0,  
 Inlet pressure: 50 bar / 600 psi  
 oxygen (O<sub>2</sub>): 40 bar / 725 psi

## MOUNTING



The valve has 2 bore holes M6 on the bottom.

## CROSS SECTION



## SPECIAL FEATURES

- > Very fine gas flow adjustment with special seat for shut off function
- > Wide flow rate range for high and low pressure applications
- > Hardened stainless steel cone for a longer life span
- > High leak tightness through appropriate diaphragm construction
- > Very easily purged

## DESCRIPTION

The regulating valve MVR-A 500 has a very good regulating characteristic and is very finely adjustable both by greater as also by lesser flow rate values.

## APPLICATION

As a system component in low pressure areas. As accessory for cylinder and point-of-use regulators for fine adjustment of the gas flow. As system element in apparatus and analytical equipment.

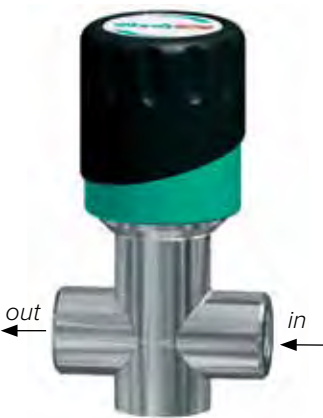
TECHNICAL DATA	
Body:	Stainless steel 14404 specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Body seals:	hardened stainless steel cone/ brass cone for SS/ BC version
Seat seal:	PCTFE
Diaphragm:	Elgiloy
Leakage rate:	< 1×10 <sup>-6</sup> mbar l/s Helium (seat) < 1×10 <sup>-9</sup> mbar l/s Helium (outboard)
Nominal width:	DN 2
Dimensions (w×h×d):	approx. 53×82×40 mm
Working temperature:	-25° to 70°C / -13 °F to 158 °F
K <sub>v</sub> -value:	< 0.02
Filter:	100 µm mesh on inlet and outlet, SS
Vacuum capable:	yes
Operation:	adjustment knob with approx. 10 turns
Weight:	approx. 280 g
Inlet/Outlet:	NPT 1/4" f, optional tube fitting

## ORDER CODE

Type	Material	Inlet pressure	Inlet*	Outlet*	Gas type
<b>MVR-A 500 G</b>	<b>BC</b>	<b>E</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>GAS</b>
MVR-A 500 G	BC = brass chrome-plated SS = stainless steel	E = 40 bar/600 psi oxygen (O <sub>2</sub> ) E = 50 bar/725 psi	N14 = NPT 1/4" f CL6, CL8 CL10, CL12 BC = brass chrome-plated SS = stainless steel	N14 = NPT 1/4" f CL6, CL8 CL10, CL12 BC = brass chrome-plated SS = stainless steel	Please specify

\* Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# DIAPHRAGM SHUT-OFF VALVES MVA 501 G



For inert, reactive, flammable and oxidizing gases and gas mixtures,  
 purity max. 6.0,  
 Inlet pressure 40 bar / 600 psi

### SPECIAL FEATURES

- > Higher flow rates
- > Leakage rate less than  $1 \times 10^{-8}$  mbar l/sec
- > Gas wetted surfaces are specially cleaned and diffusion tight

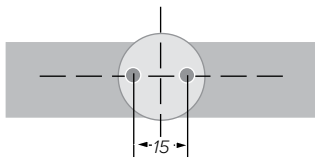
### DESCRIPTION

The diaphragm valve MVA 501 G with shut-off function enables the easy shut-off of the gas flow with the turn of an adjustment knob.

### APPLICATION

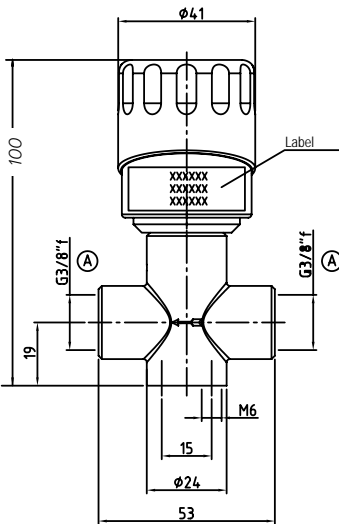
The valve is particularly suitable as system component for applications in low pressure areas for high gas flow.

### MOUNTING



The valve has 2 bore holes M6 on the bottom.

### DIMENSIONS



TECHNICAL DATA	
Body:	Stainless steel 1.4404 specially cleaned and electro-polished or Brass CW614 (CuZn39Pb3), specially cleaned or Brass CW614 (CuZn39Pb3) chrome-plated
Diaphragm:	Hastelloy C
Seals:	PCTFE
Leakage rate:	< $1 \times 10^{-6}$ mbar l/s He (seats), < $1 \times 10^{-9}$ mbar l/s He (outboard)
Nominal width:	DN 8 (only version G38F), DN5 (version N14F)
Kv-value:	0.5
Dimensions (w×h×d):	approx. 53×100×42 mm
Working temperature:	-25° to 70°C / -13 °F to 158 °F
Weight:	approx. 380 g
Turns:	approx. 1.5
Inlet filter:	100 µm mesh, SS
Vacuum capable:	yes
Inlet/Outlet:	NPT 1/4" f (SS, BC) or G3/8" f (SS, B)

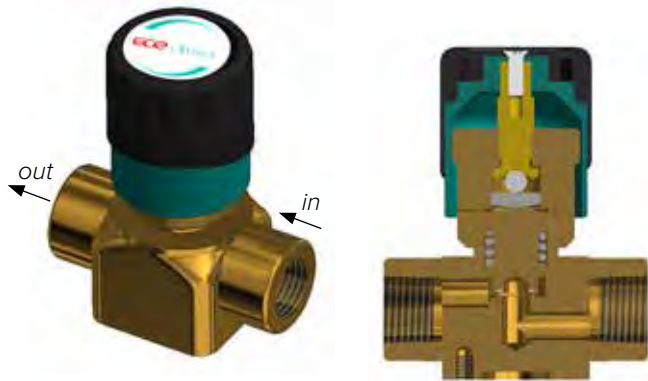
### ORDER CODE

Type	Material	Inlet pressure	Inlet*	Outlet*	Gas type
<b>MVA 501 G</b>	<b>BC</b>	<b>40</b>	<b>G38F</b>	<b>G38F</b>	<b>GAS</b>
MVA 501 G	B = brass BC = brass chrome-plated SS = stainless steel	40 bar/600 psi	G38F = G3/8" f N14F = NPT 1/4" CL6, CL8 CL10, CL12 BC = brass chrome-plated SS = stainless steel	G38F = G3/8" f N14F = NPT 1/4" CL6, CL8 CL10, CL12 BC = brass chrome-plated SS = stainless steel	Please specify

\*Tube fittings on request.

# DIAPHRAGM SHUT-OFF VALVE

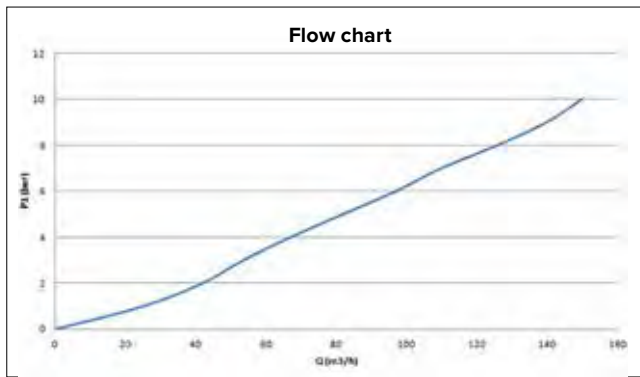
FOR PIPING SYSTEMS WITH OUTSIDE DIAMETER UP TO 25 MM/1"



Suitable for high purity, inert, flammable and oxidizing gases, max. working pressure up to 40 bar/600 psi

### SPECIAL FEATURES

- > higher flow rates
- > permanently technical tightness to outside because of Hastelloy diaphragm
- > approved in accordance with relevant sections of ISO 10297
- > hand wheel- electrostatic chargeability test
- > usable for Oxygen applications because of approved seat material
- > Suitable in piping systems with higher flow rates
- > Able to connect tubes up to 25 mm (outlet diameter)



TECHNICAL DATA	
<b>Body:</b>	brass CW614 (CuZn39Pb3)
<b>Diaphragm:</b>	Hastelloy C
<b>Seals:</b>	PVDF
<b>Leakage rate:</b>	< 5×10 <sup>-6</sup> mbar l/s He (seat), < 1×10 <sup>-9</sup> mbar l/s He (outboard)
<b>Kv-value:</b>	0.8
<b>Dimensions (w×h×d):</b>	approx. 72×90×41 mm
<b>Working temperature:</b>	-25° to 60°C
<b>Max. working pressure:</b>	40 bar
<b>Weight:</b>	approx. 0,75 kg
<b>Inlet/Outlet:</b>	NPT 1/2" female; optimal tube fittings

### TECHNICAL SPECIFICATION

- MATERIAL: BRASS (CuZn39Pb3)
- SEAL: PVDF
- MATERIAL POPET: BRASS (CuZn39Pb3)
- MATERIAL DIAPHRAGM: HASTELLOY / HASTELLOY
- INLET PRESSURE: MAX. 40 BAR
- LEAKAGE TESTED BY HELIUM
- WEIGHT: 0.75kg

### ORDERING INFORMATION

VPMA X X XX XXXX XXXX

**PORTING CODE:**  
R - RIGHT INLET

**\*GAS TYPE:**  
S - STANDARD GASES

**INLET PRESSURE:**  
E1 - 40 BAR

**PORT 5:**  
SEE THE LIST OF CONNECTIONS

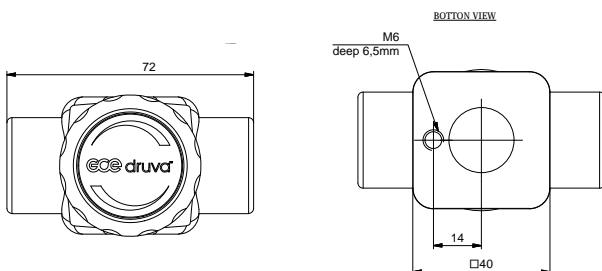
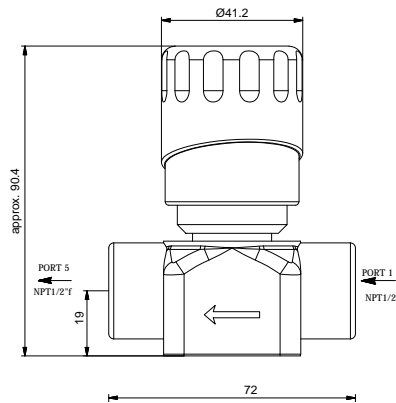
**PORT 1:**  
SEE THE LIST OF CONNECTIONS

EXAMPLE: VPMARSE1N12FN12F

### LIST OF CONNECTIONS

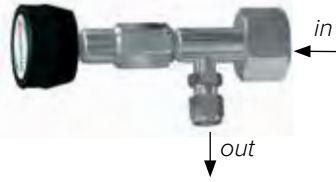
- N12F - NPT1/2" FEMALE
- M10B - COMPRESSION FITTING Ø 10MM BRASS
- M12B - COMPRESSION FITTING Ø 12MM BRASS
- M15B - COMPRESSION FITTING Ø 15MM BRASS
- M18B - COMPRESSION FITTING Ø 18MM BRASS
- M10S - COMPRESSION FITTING Ø 10MM SS
- M12S - COMPRESSION FITTING Ø 12MM SS
- M18S - COMPRESSION FITTING Ø 18MM SS
- M22S - COMPRESSION FITTING Ø 22MM SS
- M25S - COMPRESSION FITTING Ø 25MM SS
- IX6B - COMPRESSION FITTING Ø3/8" BRASS
- IX8B - COMPRESSION FITTING Ø1/2" BRASS
- I12B - COMPRESSION FITTING Ø3/4" BRASS
- IX6S - COMPRESSION FITTING Ø3/8" SS
- IX8S - COMPRESSION FITTING Ø1/2" SS
- I12S - COMPRESSION FITTING Ø3/4" SS
- I16S - COMPRESSION FITTING Ø1" SS

**\*GAS TYPE**  
DEFINED BY PRODUCT LINE AND TYPE  
(CHECK AVAILABLE GAS TYPE IN DATASHEET)

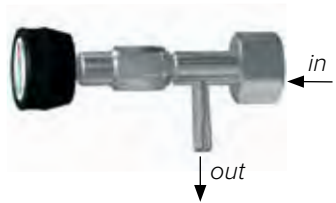


# PACKED REGULATING VALVES FAV 115 V/T

Valve with cylinder connection,  
for corrosive gases/gas mixtures, without oxygen/synthetic air,  
Inlet pressure: FAV 115V: 230 bar / 2900 psi  
FAV 115T: 10 bar / 145 psi



FAV 115 V  
- with tube fitting 6 mm



FAV 115 T  
- with hose connection 8 mm

### SPECIAL FEATURES

- > Housing and cylinder connection made out of electro-polished stainless steel
- > Regulating cone made out of hard metal
- > Stuffing box material woven PTFE
- > Angle formed, nominal width DN 2

### DESCRIPTION

These packed valves are mounted directly on the cylinder valve.

### APPLICATION

For the extraction and adjustment of corrosive gases from pressurised gas cylinders. The cylinder valve serves, for example, the constant adjustment of gases in pressureless polymerisations process.

### INFORMATION

The secure handling of highly toxic gases absolutely requires the use of valves with metal bellows or a metal diaphragm. Where constant outlet pressure and precise flow control are necessary, then choose one of the pressure regulators from the GCE Druva program.

### MOUNTING

The use of hose clips is highly recommended when using hoses. To avoid diffusion of nitrogen or helium through the hoses please consider the installation of metal tubes or make the necessary security precautions.

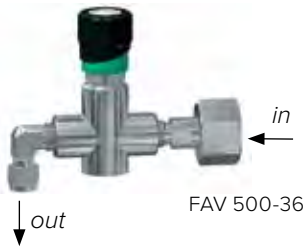
TECHNICAL DATA	
Body:	Stainless steel 1.4404 specially cleaned and electro-polished
Working temperature:	-25° to 70°C / -4 °F to 158 °F
Leakage rate:	1×10 <sup>-3</sup> mbar l/s Helium, seats and outboard
Inlet Filter:	100 µm mesh
Body seals:	PTFE
Nominal width:	DN2
Outlet:	FAV 115 V: tube fitting 6 mm FAV 115 T: hose fitting 8 mm (to max. 10 bar)

### ORDER CODE

Type	Material	Inlet pressure	Inlet	Outlet*	Gas type
<b>FAV 115V</b>	<b>SS</b>	<b>F</b>	<b>DIN</b>	<b>CL6</b>	<b>GAS</b>
FAV 115 V	SS = stainless steel	F = 230 bar/3300 psi	DIN	CL6	Please specify
FAV 115 T		for FAV 115 V	ANSI	NO8 = with hose	(no oxygen)
		10 = 10 bar for FAV 115 T	AFNOR	connection 8 mm	
			NBN	others on request	
			BS 341		
			CGA		
			NEN		
			UNI		

\*Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CYLINDER CONNECTION VALVES FAV 500-36/-37



FAV 500-36

Valve with cylinder connection,  
for inert, reactive, flammable and oxidizing gases and gas mixtures, no oxygen,  
purity max. 6.0,  
Inlet pressure 50 bar / 725 psi

## SPECIAL FEATURES

- > Cylinder connection valve in diaphragm format
- > Precise regulation of gas flow
- > Hardened stainless steel cone for longer life span
- > Optimum purge conditions through minimised dead space

## DESCRIPTION

A new generation of diaphragm valves was developed with the series MVR 500, which are characterized through its outstanding functional safety and high leak-tightness. This layout as cylinder valve FAV 500 is available with or without a gauge.



FAV 500-37

## APPLICATION

As cylinder valve for gas cylinders with a low cylinder pressure, less than 50 bar, for the adjustment of the gas flow.

TECHNICAL DATA	
Body:	Stainless steel 1.4404 specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Body seals:	hardened metal (Stainless steel), SS-cone hardened (Brass)
Diaphragm:	Elgiloy
Leakage rate:	< 1×10 <sup>-6</sup> mbar l/s He (seats) < 1×10 <sup>-9</sup> mbar l/s He (outboard)
Nominal width:	DN2
Kv-value:	< 0.02
Vacuum capable:	yes
Filter:	100 µm on inlet and outlet
Weight:	approx. 500 g (Type -36), 800 g (Type -37)
Dimensions (w×h×d):	approx. 120×90×40 mm (Type -36) approx. 180×100×40 mm (Type -37)
Operation:	approx. 10 turns
Outlet:	Tube fitting 6 mm

## ORDER CODE

Type	Material	Inlet pressure	Inlet	Outlet*	Gas type
<b>FAV 500-36</b>	<b>BC</b>	<b>E</b>	<b>DIN</b>	<b>CL6 BC</b>	<b>GAS</b>
FAV 500-36	BC = brass chrome-plated	E = 50 bar/720 psi	DIN	CL6 (standard)	Please specify
FAV 500-37	SS = stainless steel		ANSI	CL8	(no oxygen)
			AFNOR	CL10	
			NBN	CL12	
			BS 341	BC = brass chrome-plated	
			CGA	SS = stainless steel	
			NEN		
			UNI		

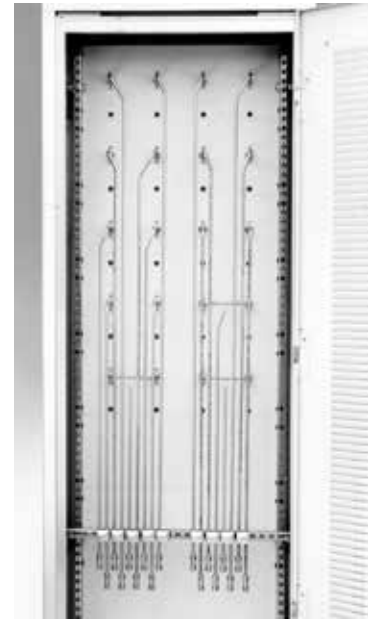
\* Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# CALIBRATION GAS MEASURING

## EXCERPT OUT OF REFERENCES FOR GCEDRUA EQUIPMENT

- AUDI
- BOSCH
- DAIMLER CHRYSLER
- FORD
- German Automobile Club
- HONDA
- HORIBA
- IAV
- MAGNETI MARELLI
- NISSAN
- OPEL
- SUZUKI
- VDO
- VOLKSWAGEN

- Belgium**
- China**
- Germany**
- Hungary**
- South Africa**
- Turkey**



Point-of-use cabinet

## GCEDRUA'S CUSTOMER SERVICE

Right from the start GCE Druva supports planning engineers, operators and users, manufacturers, general enterprises and architects offices beginning with the planning phase.

On the basis of many years of experience GCE Druva gives support for selection and organization of first and second stage pressure gas supply, for tubing and tube layout, cylinder stock rooms and monitoring devices.

## APPLICATION AREAS

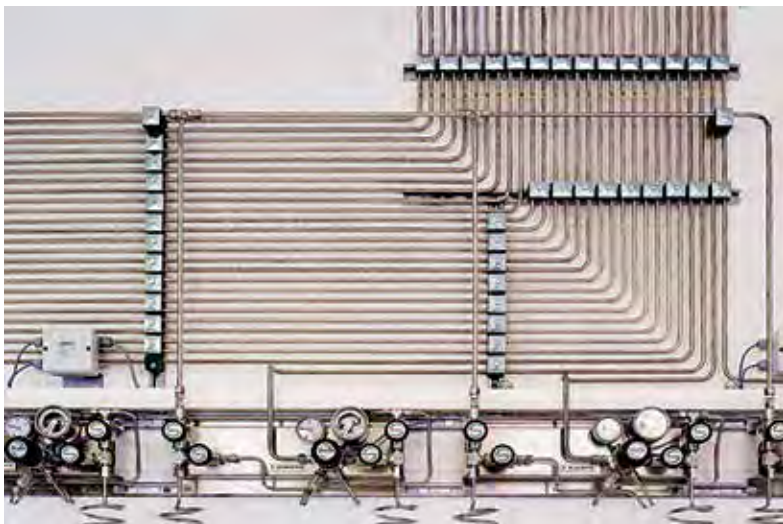
- Research and development of combustion engines
- Development and production of Catalysts
- Development of injection systems
- Control units for fundamental research
- Support for Combustion research
- Ignition system development
- Exhaust gas measuring

## SCOPE OF DELIVERY

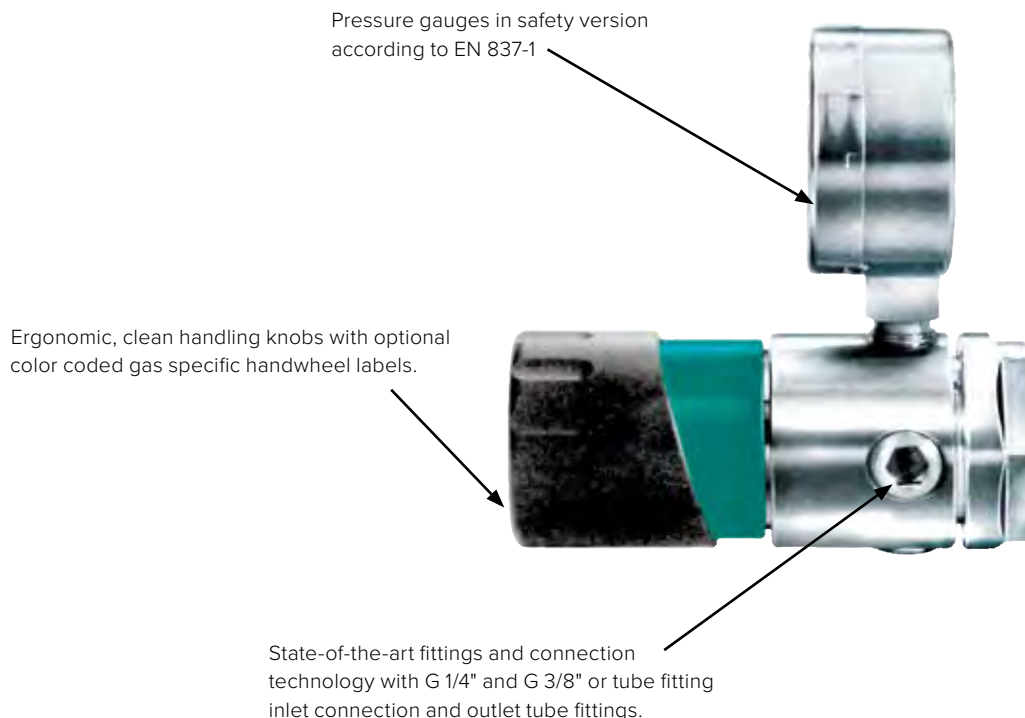
- Planning
- Point-of-use cabinet
- Central gas supply
- Tubing systems

Point-of-use cabinet with integrated low gas signalling

Central gas supply



## POINT-OF-USE REGULATORS EMD 400



**Single stage regulators at high performance.**  
**Inlet pressure 40 bar.**  
**Outlet pressure range 0,1 – 10,5 bar / 7 – 150 psi, analytical version 0,1 – 2,2 bar / 1,5 – 33 psi.**

Available in different versions and combined with angle and straight version regulating and shut-off valves, this results in a unique adaption and makes these modules suitable for the most common laboratory applications and for lab furnitures of all manufacturers: suspended versions, bench mounting, surface and inset wall assembly or mounted on plates.

### BASIC DESIGN ASPECTS\*

#### MATERIAL

stainless steel 316L (1.4404) specially cleaned and electro-polished or brass 2.0401.26.

#### SEALING MATERIAL

Seats: FKM and FFKM with stainless steel, FKM and EPDM with brass. Seals: PCTFE with stainless steel and PVDF with brass. This depends on gas specification and purity requirements. Material is specified in "Technical data".

#### INNER PARTS

Low maintenance, service friendly regulator unit, particle filter 50 µm SS-filament at the inlet.

#### DIAPHRAGM

Good protection against burst and corrosion due to diaphragm material Hastelloy.

#### PERFORMANCE DATA

See flow charts, for different pressures please contact GCE.

#### GUARANTEED LEAKAGE RATE

$\leq 1 \times 10^{-9}$  mbar l/s Helium.

#### PURITY

Cleanness and leak tightness according to the demand of high purity  $\leq 6.0$  applications.

#### WORKING TEMPERATURE

-20 °C to +70 °C / -4 to 160 °F.

#### INLET / OUTLET CONNECTIONS

Inlet G 3/8", others with adapters. Outlet tube fitting for 6 mm tube, others on demand.

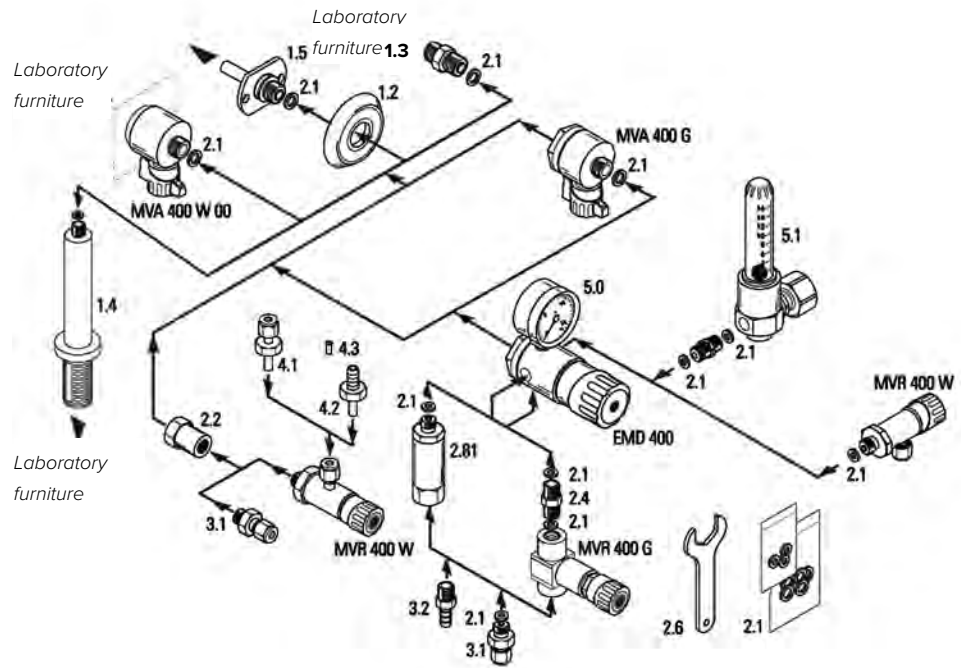
\*Different data to series specification are listed in the product specific "Technical Data".



# POINT-OF-USE REGULATOR LAB 400



EMD 400-01



NO.	TYPE	FUNCTION	MATERIAL	ART.-NO.
1.2	Closing cap	Cap to cover the wall connector (1.5).		H19006625
1.3	Adapter fitting G 3/8" m NPT1/4"	Threaded adapter fitting to connect shut-off valve resp. pressure regulator and other male threaded outlets NPT1/4"	stainless steel	H233038150
1.4	Upright pipe conn. G 1/4" f > G 1/4"m	Connector for table mounting		H28591603
1.5	Wall connector 8 mm > G 3/8"m	Mounting LabSystem components at laboratory furniture walls	brass	H23303403
1.51	Wall connector NPT1/4" f > G 3/8"m	Mounting LabSystem components to laboratory furniture walls	brass stainless steel	H23303203 H23303201
2.1	Sealing 14.0 × 9.0 × 2.0 mm (G 3/8") 11.2 × 5.5 × 1.5 mm (G 1/4")	for brass version	PVDF	H09015916 H09008916
	14.0 × 9.0 × 2.0 mm (G 3/8") 11.2 × 5.5 × 1.2 mm (G 1/4") 11.2 × 5.5 × 1.5 mm (G 1/4") 11.2 × 5.5 × 2.1 mm (G 1/4")	for stainless steel version	PCTFE PCTFE PCTFE PCTFE	H09010309 H09011809 H09008909 H09009009
2.2	Adapter fitting G 3/8" f > G 1/4" f	Reducing adapter to connect the control valve with the wall connector (1.1)	brass	H23302253

NO.	TYPE	FUNCTION	MATERIAL	ART.-NO.
2.4	Male connector G 1/4"m > G 1/4"m	To connect the control valve MVR 400 G or the flow meter SVM 400 with the pressure regulator EMD 400	brass stainless steel	A000105 H233026151
2.6	Spanner, wrench size 36	Special LabSystem Spanner for EMD 400, ZB 400, MVE 400E and MVE 400G.	steel plated	H11006401
2.81	Flame arrestor FS 400 G 1/4"f > G 1/4" m	For the use of acetylene	stainless steel	L000110
3.1	Tube fitting for EMD 400 G 1/4" > tube	Outlet screwed connection for EMD 400.	brass 1/8" brass 6 mm brass 10 mm stainless steel 1/8" stainless steel 6 mm stainless steel 10 mm	A000121U A000123U A000125U A000120U A000122U A000124U
3.2	Hose nozzle fitting for EMD 400 G 1/4" > hose nozzle	Outlet screwed connection for EMD 400, outer diameters of hose nozzles = inner diameters of hose.	brass 4 mm brass 6 mm brass 8 mm	H03825573 H03825673 H03825773
4.2	Hose nozzle fitting for SVR 400 W G 1/4" > hose nozzle	Outer diameters of hose nozzles = inner diameters of hose.	brass 4 mm brass 6 mm brass 8 mm stainless steel 4 mm stainless steel 6 mm	H03825203 H03825303 H03825403 H03825201 03825301
4.3	Supporting tube 6 x 4 mm		stainless steel	H03804401U
5.0	Pressure gauge RM 50 inlet: G 1/4"m	Enables the use of PE- resp. PTFE-hoses in tube fittings Spring-tube gauge, rating diameter 50 mm, metallic housing, precision class 2.5.	stainless steel brass	see accessory
5.1	Flow meter SVM 400, without adapter G 1/4" f > G 1/4" f	Flow indication with fine adjustment valve 0 – 60 l/h air 0 – 120 l/h air 0 – 960 l/h air 0 – 1500 l/h air		on demand

Legend:

**f** = female thread, **m** = male thread

G 1/4" f > G 1/4" m means: **inlet** G 1/4" female thread and **outlet** G 1/4" male thread.

## AVAILABLE ACCESSORY

Large range of mounting and assembling accessory (see Accessory), especially tube fittings and hose adaptors.

# POINT-OF-USE REGULATORS EMD 400/404



EMD 400-01



EMD 400-06  
wall mounted,  
inlet from top



EMD 400-42  
plate assembly,  
inlet from rear



EMD 400-41  
Bench version

Single-stage, for inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0,  
Inlet pressure 40 bar / 600 psi,  
Outlet pressure range 0.1 – 10.5 bar / 1 – 150 psi

## HIGHLIGHTS

- > ECD-suitable
- > Great variety of assembly possibilities in laboratory furniture due to the modular design of the LabSystem
- > Gas type specific colour indication labels according to EN 13792
- > Analysis version available

## FEATURES

Standard version regulator with gauge, inlet at rear, outlet downwards. May be combined with inlet shut-off valve MVA 400, wall connector, metering valve MVR 400G and MVR 400W, flashback arrestor (FBA), different gauges and diverse accessory (see previous pages).

## APPLICATION

For wall, plate, suspended and bench mounting, with great variety of combinations, covering any laboratory gas supply demand.

TECHNICAL DATA	
Body material:	stainless steel 316L (1.4404) specially cleaned and electro polished or brass CW614 (CuZn39Pb3) specially cleaned, chrome-plated
Pressure gauge range:	Type 400: 0 – 2.5/6/16 bar ( 0 – 35/85/235 psi ) Type 404: 0 – 3 / 6 bar (0 – 45/85 psi)
Weight:	0,8 kg
Inlet - outlet:	G 3/8" f - G 1/4" f

## POINT OF USE REGULATOR EMD 400-06 WALL MOUNTED WITH CHECK VALVE

Item No.	Type	Material	Design	Inlet (bar)	Outlet
<b>S93001180</b>	emd40006 sse10 g14g14 cv	SS	outlet point - with check valve	40	0-10
<b>S93001106</b>	emd40006 sse6 g14g14 cv	SS	outlet point - with check valve	40	0-6
<b>S93001179</b>	emd40006 sse1,5 g14g14 cv	SS	outlet point - with check valve	40	0-1,5
<b>S93001178</b>	emd40006 bce10 g14g14 cv	BC	outlet point - with check valve	40	0-10
<b>S93001177</b>	emd40006 bce4 g14g14 cv	BC	outlet point - with check valve	40	0-6
<b>S93001176</b>	emd40006 bce1,5 g14g14 cv	BC	outlet point - with check valve	40	0-1,5

## ORDER CODE

Type	Variation	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Gas type
<b>EMD 400</b>	<b>-01</b>	<b>BC</b>	<b>E</b>	<b>1</b>	<b>CL6 BC</b>	<b>CL6 BC</b>	<b>GAS</b>
<b>EMD 400</b> = standard	-01 = standard	BC = brass	EMD 400: E = 40 bar	EMD 400: 1 = 0.1 – 1 bar / 1 – 15 psi	G3/8 = C3/8" f G1/4 = G1/4" f	G1/4 = G1/4" f CL4, CL6, CL8	Please specify
<b>EMD 404</b> = analysis version	-06 = plate mounted -41 = bench version -42 = wall assembly -07 = 06 + FBA -10 = 06 + MVR -43 = 41 + MVR -44 = 42 + MVR	SS = stainless steel	/ 600 psi EMD 404: E = 12 bar / 175 psi	4 = 0.2 – 4 bar / 3 – 60 psi 10 = 0.5 – 10.5 bar / 7 – 150 psi EMD 404: 2,2 = 0.1 – 2.2 bar / 1.5 – 32 psi 4 = 0.5 – 4 bar / 7 – 60 psi	NPT1/4 = NPT1/4" f CL4, CL6, CL8 CL 1/4, CL 1/8" NO 1/4", NO 1/8"	CL 1/4, CL 1/8" BC = brass chrome-plated SS = stainless steel	
					BC = brass chrome-plated SS = stainless steel steelUNI		

\* Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# SHUT-OFF VALVES MVA 400 G/W

For inert, reactive, flammable and oxidizing gases and gas mixtures,  
 purity max. 6.0,  
 Inlet pressure 40 bar / 600 psi



MVA 400 G



MVA 400 W

### HIGHLIGHTS

- > Very fine flow rate adjustment
- > Hardened stainless steel cone for a longer life span
- > Gas type specific identification according to EN 13792
- > Very easily purged

### APPLICATION

These valves can be combined in many ways with the numerous components of the lab system in particular with the pressure regulator EMD 400.

### DESCRIPTION

These regulating valves are characterized by their outstanding operational reliability and extreme leak-tightness. They have very good regulating characteristics and allow for exact delivery for both very small as very large amounts of gas.

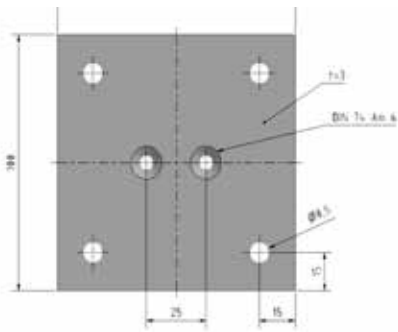
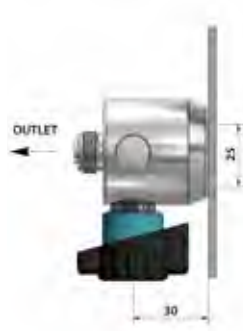
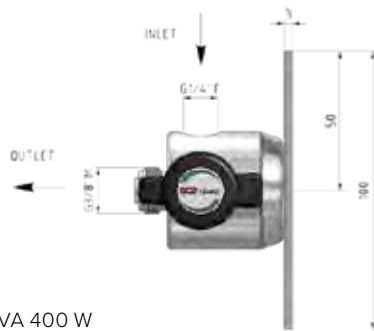


PLATE - MVA 400 W

TECHNICAL DATA	
Body:	Stainless steel 1.4301 specially cleaned and electro-polished or brass 2.0401.26 specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Body seals:	hardened stainless steel cone
Seat seals:	PCTFE
Leakage rate:	< 1×10 <sup>-6</sup> mbar l/s Helium (seat) < 1×10 <sup>-9</sup> mbar l/s Helium (outboard)
Vacuum capable:	yes
Nominal width:	DN 5
Kv-value:	< 0.2
Working temperature:	-25 °C to 70 °C / -13 °F to 158 °F
Weight:	approx. 500 g
Inlet - Outlet:	MVA 400W: G1/4" f - G3/8" m MVA 400G: G3/8" f - G3/8" m



MVA 400 W



MVA 400 G

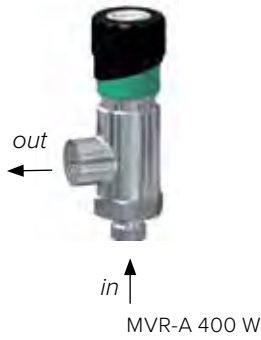


### ORDER CODE

Type	Material	Inlet pressure	Inlet*	Outlet	Gas type
<b>MVA 400 W</b>	<b>BC</b>	<b>40</b>	<b>G14F</b>	<b>G38M</b>	<b>GAS</b>
<b>MVA 400 W</b>	BC = brass chrome-plated	40 = 40 bar / 600 psi	MVA 400W: G14F = G1/4" f	MVA 400W: G38M = G3/8" m	Please specify (no oxygen)
<b>MVA 400 G</b>	SS = stainless steel		MVA 400G: G38F = G3/8" f CL6 CL8 BC = brass chrome-plated SS = stainless steel	MVA 400G: G38M = G3/8" m	

\* Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# REGULATING VALVES WITH SHUT OFF FUNCTION TYPE MVR-A 400 G/W



For inert, reactive, flammable and oxidizing gases and gas mixtures  
 Purity max. 6.0,  
 Inlet pressure 40 bar / 600 psi or 50 bar / 725 psi

### SPECIAL FEATURES

- > Very fine flow rate adjustment
- > Regulating function with with special seat for shut off function
- > Diaphragm shut-off valve
- > Hardened stainless steel cone for a longer life span
- > Very easily purged

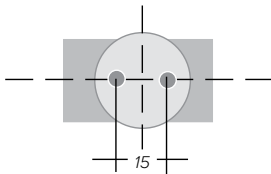
### APPLICATION

These valves can be combined in many ways with the numerous components of the lab system in particular with the pressure regulator EMD 400 and EMD 3100.

### DESCRIPTION

These regulating valves are characterized by their outstanding operational reliability and extreme leak-tightness. They have very good regulating characteristics and allow for exact delivery for both, very small and very large amounts of gas.

### MOUNTING



2 bore holes M6 are provided on the MVR-A 400 G for mounting.

TECHNICAL DATA	
Body:	Stainless steel 1.4301 specially cleaned and electro-polished or brass 2.0401.26 specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Body seals:	Hardened stainless steel cone/brass cone for SS/BC version
Seat seals:	PCTFE
Leakage rate:	< 1×10 <sup>-4</sup> mbar l/s Helium (seat) < 1×10 <sup>-7</sup> mbar l/s Helium (outboard)
Vacuum capable:	Yes
Fine metering:	Adjustment knob approx. 10 turns
Nominal width:	DN 2
Kv-value:	< 0.02
Working temperature:	-25 °C to 70 °C / -13 °F to 158 °F
Weight:	Approx. 280 g
Inlet - Outlet:	MVR-A 400 W: G1/4"m - G1/4"f MVR-A 400 G: G1/4"f - G1/4"f

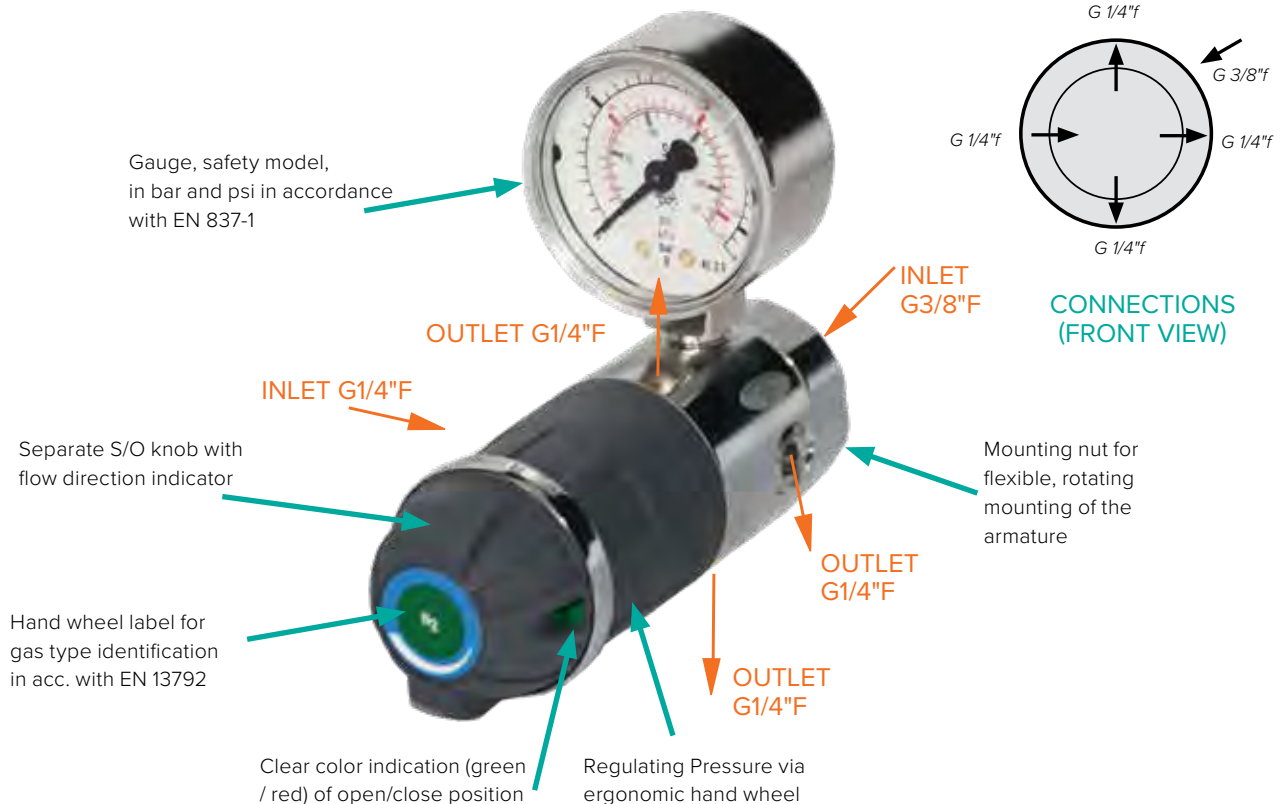


### ORDER CODE

Type	Material	Inlet pressure	Inlet*	Outlet*	Gas type
<b>MVR-A 400 W</b>	<b>BC</b>	<b>E</b>	<b>G14M</b>	<b>G14F</b>	<b>N2</b>
<b>MVR-A 400 W</b>	BC = brass chrome-plated	E = 40 bar / 600 psi	MVA-R 400W: G14M = G1/4"m	MVA-R 400W: G14F = G1/4"f	Please specify
<b>MVR-A 400 G</b>	SS = stainless steel		MVA-R 400G: G14F = G1/4"f CL6, CL8, CL10 BC = brass chrome-plated SS = stainless steel	MVA-R 400G: G14F = G1/4"f CL6, CL8 BC = brass chrome-plated SS = stainless steel N04, N06	

\*Inlet/Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

## LABORATORY PRESSURE REGULATOR EMD 3100



### PRESSURE REGULATOR WITH SHUT-OFF FUNCTION

This highly compact version of a pressure regulator combines, in a very small space, pressure regulation and shut-off function of gas flow. This is achieved through a successful combination of the pressure regulator parts with few extra shut-off components. Thereby reducing the pressure regulator and shut-off valve, normally as separate components, to a minimum. The structural size achieves the minimum dimensions. With this construction the inlet and outlet can be attached and interchanged with the greatest flexibility. The use of perfected, core components of the Series 400, available since decades, together with a few new elements ensures the performance and high quality of this construction from the beginning.

### SERIES SPECIFIC DATA

#### VERSION

Single-stage pressure regulator with high performance values  
 Inlet pressure 40 bar.  
 Downstream pressure range 0.2 - 10.5 bar / 7 - 150 psi,  
 Analysis version (EMD 3104) 0.1 - 2.2 bar / 1.5 - 33 psi.

#### MATERIAL

Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 CuZn39Pb3 nickel-plated and chrome-plated.

#### SEAL MATERIAL

Seat: FKM and FFKM with stainless steel, FKM and EPDM with brass.  
 Seals: PCTFE with stainless steel and PVDF with brass in dependent upon gas used. Material is specified in each case in the "Technical Data".

#### INNER PARTS

Low-maintenance, easy to service, pressure regulating unit, with particle-filter in stainless steel 50 µm mesh at inlet G3/8" f and 100µm at inlet G1/4" f.

### MODULAR SYSTEM FOR MAXIMUM FLEXIBILITY OF CONFIGURATION AND SCOPE OF APPLICATION

The basic version is available in the form of flush or surface wall mounting, bench mounted or hanging version. The use of system components allows for countless variations. The combination possibilities with the configurations of inlets and outlets can be tailored to the customers wishes: with regulating valve in elbow and straight versions (DN5), with additional inlet shut-off valve (in elbow or straight form), with flow meter or with diverse wall adaptors. In this modular form this point-of-use system is particularly compatible and suitable for all lab applications and lab furnishings.

#### DIAPHRAGM

Increased safety against burst and corrosion defects with the Hastelloy diaphragm.

#### GUARANTEED LEAKAGE RATES

< 1×10<sup>-9</sup> mbar l/s Helium (outboard),  
 < 5×10<sup>-6</sup> mbar l/s Helium (seat)

#### PURITY

Purity and leakage rates comply with the requirements for applications with high gas purity ≤ 6.0.

#### WORKING TEMPERATURE

-25 °C to +70 °C / -13 to 160 °F.

#### INLET / OUTLET CONNECTIONS

Inlet G 3/8" f, G 1/4" f, outlet G 1/4" f adaptors and compression fittings for metric or imperial tubes available on request.

# LABORATORY PRESSURE REGULATORS EMD 3100 - SURFACE MOUNTED



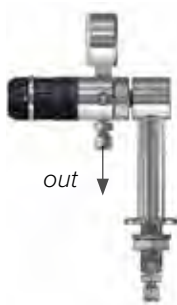
Wall mounted rear inlet straight (Version W)



Plate mounted inlet, from top (Version P)



Hanging version top inlet (Version HW)



Bench mounted bottom inlet (Version T)

Single-stage, for inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0. EMD 3100: Inlet pressure 40 bar, Outlet pressure 0.1 – 10 bar  
EMD 3104 (analytic version): Inlet pressure 12 bar, Outlet pressure 0.1 – 4.4 bar

### SPECIAL FEATURES

- > Pressure regulator with integrated shut-off function
- > Coloured identification of shut-off positions
- > Highly compact form
- > ECD-compliant
- > Ergonomic positioning of the operational elements
- > User-friendly system solutions for laboratory applications
- > Adjustment knob with gas type identification according to EN 13792
- > Analytic version optionally available

### DESCRIPTION

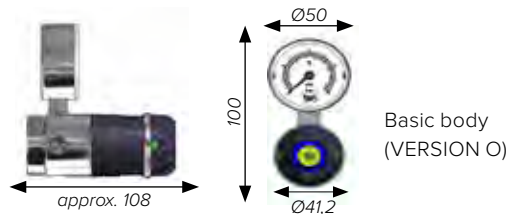
The basic version of this pressure regulator with gauge includes an integrated quick-closing function. The gas type is indicated on the front side of the pressure regulator with the appropriate decal. The wall mounting use a wall adapter or a wall mounting plate; the gas supply is brought in through the wall. Further installation versions (on mounting plates) allow for the gas supply to come from the top or the bottom. The bench mounting or the wallmounted version is simply and flexibly accomplished with the help of the same adaptor. Numerous other variations are possible.

### APPLICATION

This highly compact, space saving designed laboratory point-of-use regulator is suitable for surface wall mounting, for installation on tables or a wallmounted version as well as the installation in diverse supply channels. The systems versatile configuration options cover all the customary lab applications and fit to all laboratory furnishings. An analytic version (LAB 3104) is specially designed for low pressure applications in the automotive industry and offers extremely fine adjustment possibilities for pressure and flow rate.

TECHNICAL DATA	
Body:	Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Gauge:	Safety gauge according to EN 837-1 Nominal width 50 mm, class of accuracy 2.5
Pressure gauge range:	0 – 2.5 / 6 / 16 bar, 0 – 3 / 6 bar (Type 3104)
Dimensions (w×h×d):	Approx. 50×100×108 mm
Weight:	Approx. 0.64 kg (Basic body)
Inlet - Outlet:	G 3/8" f or G 1/4" f, G 1/4" m (depending on version) NPT1/4" f (available for version with rear wall adapter)
Temperature range:	-25 °C to +70 °C / -13 to 160 °F

### DIMENSIONS



### ORDER CODE

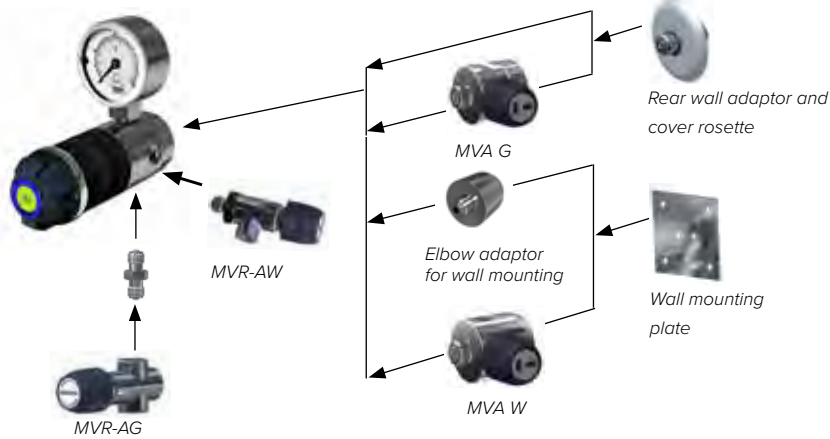
Type	Periphery	Material	Inlet pressure	Outlet pressure	Surface mounted versions	Inlet	Outlet*	Gas type
<b>EMD 3100</b>	<b>-01</b>	<b>BC</b>	<b>E</b>	<b>4</b>	<b>0</b>	<b>CL6 BC</b>	<b>CL6</b>	<b>GAS</b>
EMD 3100 = Standard	-01 = Pressure regulator (MD) -06 = MD + Pre-shut-off valve	BC = Brass Chrome plated	E = 40 bar /600 psi	EMD 3100: 4 = 0.2 – 1.5 bar / 3 – 22 psi	0 = Basic module P = Plate Mounting W = Wall Mounting T = Bench mount standard TA = Bench mount 30° angle H = Hanging version HA = Hanging version 30° angle HW = Hanging version wall adapter	G38F = G3/8" f G14F = G1/4" f NPT14F = NPT1/4" f CL4, CL6, CL8 NO 1/4", NO 1/8"	G14F = G1/4" f CL4, CL6, CL8 NO 1/4", NO 1/8" BC = brass chrome-plated steel SS = stainless steel	Please specify
EMD 3104 = Analysis version	-07 = MD + LP-flame arrestor -08 = MD + LP-MVAR -10 = MD + Pre-shut-off valve + LP-MVAR	plated SS = Stainless steel steel	D = 12 bar /175 psi (only for EMD 3104) A = 1.5 bar /22 psi **	EMD 3104: 4 = 0.2 – 4 bar / 3 – 60 psi 10 = 0.5 – 10.5 bar / 7 – 150 psi 2.2 = 0.1 – 2.2 bar / 1.5 – 32 psi 4 = 0.5 – 4 bar / 7 – 60 psi		CL4, CL6, CL8 NO 1/4", NO 1/8" CL 1/4, CL 1/8"		

\* Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter. \*\* Type A is available for Acetylene only.

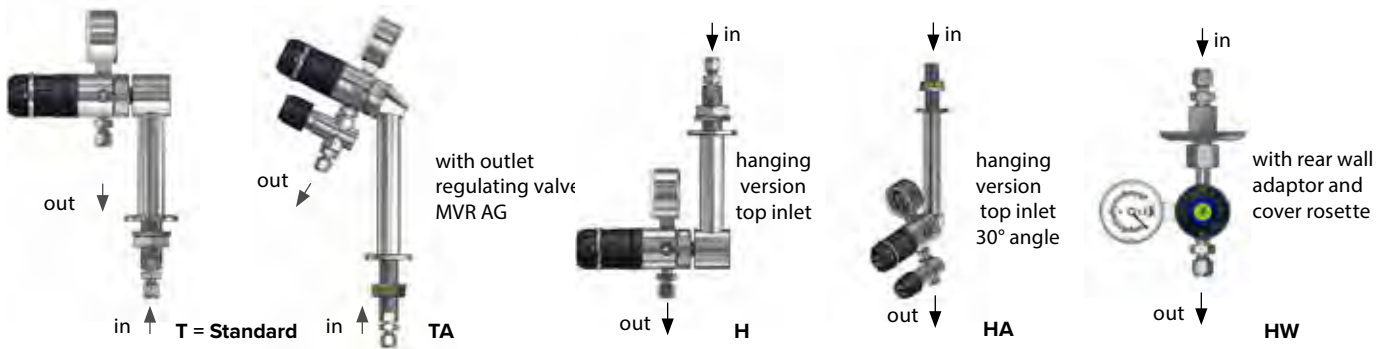
COMBINABLE WITH EMD 3100 - SHUT-OFF VALVES AND REGULATING VALVES WITH SHUT-OFF FUNCTION



EMD 3100 COMBINATION POSSIBILITIES

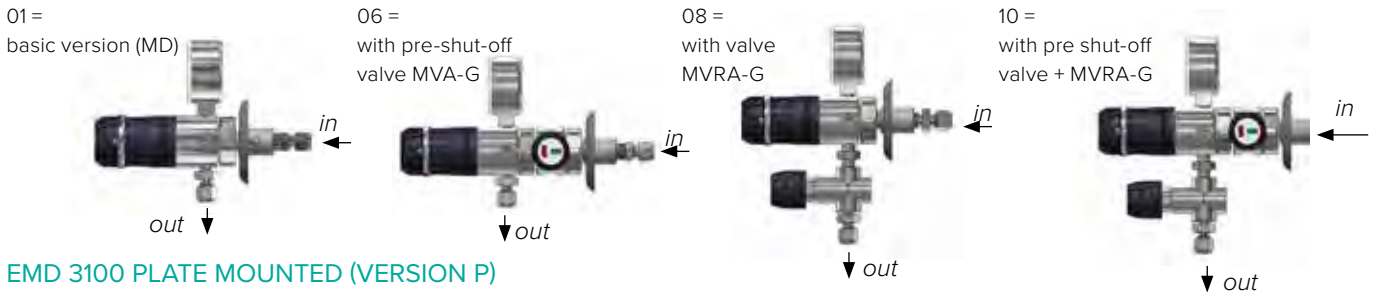


EMD 3100 AS BENCH MOUNT (VERSION T) AND HANGING VERSION (VERSION H)

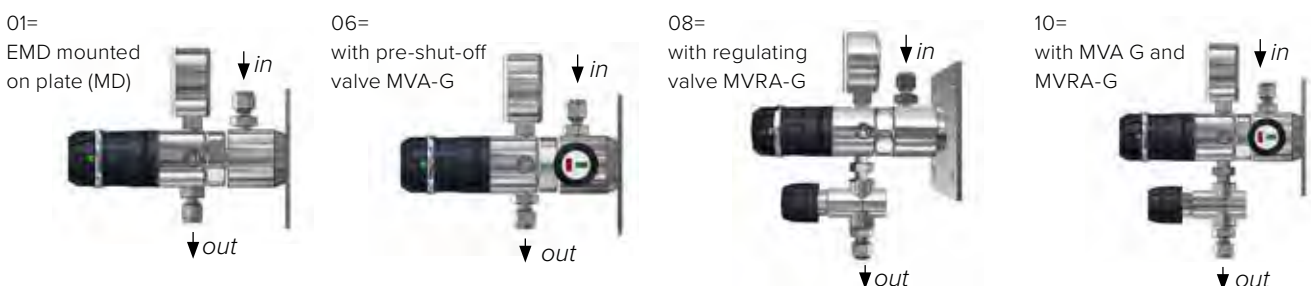


EMD 3100 WALL MOUNTED WITH REAR WALL ADAPTOR (VERSION W)

STANDARD: STRAIGHT INLET FITTING; AVAILABLE WITH ELBOW FITTING AS WELL

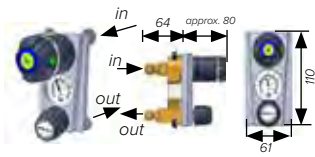


EMD 3100 PLATE MOUNTED (VERSION P)

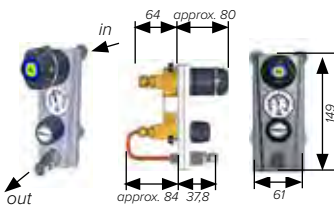




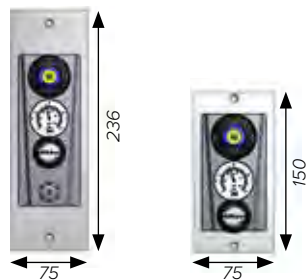
# FUMEHOOD PRESSURE REGULATOR EMD 3100 - BUILT-IN VERSIONS D AND Z



Wall mounted with cover plate inlet and outlet from behind **(Version D)**



Wall mounted with cover plate, inlet behind outlet in front **(Version Z)**



**(Version ZP)**

**(Version DP)**

Single-stage, for inert, reactive, flammable and oxidizing gases and gas mixtures, purity max. 6.0.

EMD 3100: Inlet pressure 40 bar, Outlet pressure 0.1 – 10 bar

EMD 3104 (analytic version): Inlet pressure 12 bar, Outlet pressure 0.1 – 4.4 bar

## SPECIAL FEATURES

- > Pressure regulator with integrated shut-off function
- > Coloured identification of shut-off positions
- > Highly compact form
- > ECD-compliant
- > Ergonomic positioning of the operational elements
- > User-friendly system solutions for laboratory applications components
- > Adjustment knob with gastype identification according to EN 13792
- > Analytic version optionally available
- > Easy to install

## DESCRIPTION

The built-in version is made of a single body mounted on a metal plate. It includes an integrated quick-closing function (shut-off), a regulating valve and a gauge that are all covered by a panel. Four different mounting orientation variants are available (gauge position rotated by 90° for better readability). With the most compact "Version D" the gas is supplied (inlet and outlet) from behind the cover plate. Version Z allows for Gas supply from behind as well, while the outlet is at the front and integrated in the cover panel.

## APPLICATION

This highly compact, space saving built-in version of the EMD3100 point-of-use regulator is designed to fit into walls, gas channels, fume hoods and all laboratory furniture systems. The analytic version (LAB 3104) is specially designed for low pressure applications in the automotive industry and offers extremely fine adjustment possibilities for pressure and flow rate.

TECHNICAL DATA - BASICS: PAGE 3 - DIVERGENT DATA:	
Pressure gauge range:	0 – 2.5 / 6 / 16 bar, 0 – 3 / 6 bar (Type 3104)
Dimensions (w×h×d):	<b>Version Z (D):</b> 61×149 (110)× max. 164 (144) mm
	<b>Version ZP (DP):</b> 75×236 (150)× max 164 (variable) mm
Weight:	<b>Version D(Z):</b> 1.3 kg (1.4 kg)
	<b>Version DP(ZP):</b> 1.4 kg (1.5 kg)
Inlet - Outlet:	G 1/4" f

## EMD 3100 BUILT - IN VERSION ADJUSTMENT KNOB ORIENTATION



## ORDER CODE

Type	Periphery	Material	Inlet pressure	Outlet pressure	Built-in versions	Mounting orientation	Inlet*	Outlet*	Gas type
<b>EMD 3100 -01</b>	<b>BC</b>	<b>E</b>	<b>4</b>	<b>D</b>	<b>N</b>	<b>P</b>	<b>CL6</b>	<b>CL6</b>	<b>GAS</b>
EMD 3100 -01= Pressure regulator (MD)	B = brass SS =	E = 40 bar /600 psi	EMD 3100: 1 = 0.2 – 1.5 bar	D = Inlet and outlet from behind	N = North E = East S = South W = West	./ = w/o P = Additional mounting plate	0 = G1/4" f CL6 CL8 CL10	0 = G1/4" f CL6 CL8 CL10	Please specify when ordering
EMD 3104 -08 = MD+MVAR = Analysis version	stainless steel	D = 12 bar /175 psi	EMD 3104: 10 = 0.5 – 10.5 bar A = 1.5 bar /22 psi **	Z = Inlet from behind, outlet front					

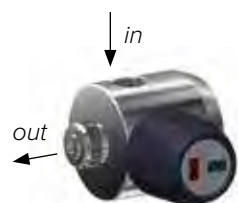
\* Inlet/Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

\*\* Type A is available for Acetylene only.

# SHUT-OFF VALVES MVA 3100 G/W

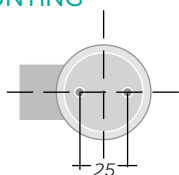


MVA 3100 G



MVA 3100 W

## MOUNTING



2 bore holes M6 are provided on the MVA 3100 W for mounting.

## In-line or elbow form

For inert, reactive, flammable and oxidizing gases and gas mixtures

Purity max. 6.0, Inlet pressure 40 bar / 600 psi

## SPECIAL FEATURES

- > Open/close with only one quarter turn, clicks into position
- > Clearly visible open/closed position
- > Wide range of applications as a modular component
- > Diaphragm shut-off valve

## DESCRIPTION

The MVA 3100 G is a straight in-line version with G3/8" inlet and outlet. The integrated connecting nut allows for mounting the valve in any position with only one gasket.

The MVA 3100 W is the elbow version with inlet from the side G1/4"f and outlet straight G3/8"m. The MVA 3100 W is mounted with 2 M6 mounting screws, 25 mm apart on the backside.

## APPLICATION

These valves can be combined in many ways with the components of the lab system EMD 3100.

TECHNICAL DATA	
Body:	Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass
	2.0401.26 pecially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Nominal width:	DN 5
Leakage rate:	< 1×10 <sup>-9</sup> mbar l/s Helium (outboard), < 1×10 <sup>-6</sup> mbar l/s Helium (seat)

TECHNICAL DATA - MVA 3100 G:	
Kv-value:	0.2
Seat seals:	PCTFE
Weight:	Approx. 600 g
Inlet/Outlet:	G 3/8"f / G 3/8"m

TECHNICAL DATA - MVA 3100 W:	
Kv-value:	0.25
Seat seals:	PCTFE
Weight:	Approx. 500 g
Inlet /Outlet:	G 1/4"f / G 3/8"m

## ORDER CODE

Type	Material	Inlet pressure	Inlet*	Outlet*	Gas type
<b>MVA 3100 G</b>	<b>BC</b>	<b>40</b>	<b>G38F</b>	<b>G38M</b>	<b>GAS</b>
MVA 3100 G	BC = brass chrome-plated	40 = 40 bar / 580 psi	G38F = G3/8"F	G38M = G3/8"M	Please specify
MVA 3100 W	SS = stainless steel		G14F = G1/4"F		
			CL6		
			CL8		
			CL10		
			CL12		
			BC = brass chrome-plated		
			SS = stainless steel		

\*Inlet/Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# REGULATING VALVES WITH SHUT OFF FUNCTION TYPE MVR-A 3100 G/W

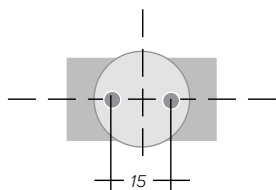


MVR-A 3100 G



MVR-A 3100 W

## MOUNTING



2 bore holes M6 are provided on the MVR-A 3100 G for mounting.

For inert, reactive, flammable and oxidizing gases and gas mixtures,

Purity max. 6.0,

Inlet pressure 40 bar / 600 psi

## SPECIAL FEATURES

- > Very fine flow rate adjustment
- > Regulating function
- > Shut-off function

## APPLICATION

These valves can be combined in many ways with the numerous components of the lab system in particular with the pressure regulator EMD 3100. Unique in this range is the patented shut-off function which is integrated into this regulating valve. Without using an additional component it allows for safe, reliable and permanent interruption of the gas flow.

## DESCRIPTION

These regulating valves are characterized by their outstanding operational reliability and extreme leak-tightness. They have very good regulating characteristics and allow for exact delivery for both, very small and very large amounts of gas.

TECHNICAL DATA	
Body:	Stainless steel 1.4301 specially cleaned and electro-polished or brass 2.0401.26 specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Body seals:	Hardened stainless steel cone
Seat seals:	PCTFE
Leakage rate:	< $1 \times 10^{-4}$ mbar l/s Helium (seat)
	< $1 \times 10^{-7}$ mbar l/s Helium (outboard)
Vacuum capable:	Yes
Fine metering:	Adjustment knob approx. 10 turns
Nominal width:	DN 2
Kv-value:	< 0.02
Working temperature:	-25 °C to 70 °C / -13 °F to 158 °F
Weight:	Approx. 280 g
Inlet - Outlet:	MVR-A 3100 W: G1/4"m – G1/4"f
	MVR-A 3100 G: G1/4"f – G1/4"f

## ORDER CODE

Type	Material	Inlet pressure	Inlet*	Outlet*	Gas type
<b>MVR-A 3100 W BC</b>	<b>BC</b>	<b>E</b>	<b>G14M</b>	<b>G14F</b>	<b>N2</b>
<b>MVR-A 3100 W</b>	BC = brass chrome-plated	E = 40 bar / 600 psi	MVA-R 400W: G14M = G1/4"m	MVA-R 400W: G14F = G1/4"f	Please
<b>MVR-A 3100 G</b>	SS = stainless steel		MVA-R 400G: G14F = G1/4"f	MVA-R 400G: G14F = G1/4"f	specify
			CL6	CL6	
			CL8, CL10	CL8	
			BC = brass	BC = brass chrome-plated	
			chrome-plated	SS = stainless steel	
			SS = stainless steel	N04	
				N06	

\* Inlet/Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# PIPE CONNECTION UNIT - PCU400W

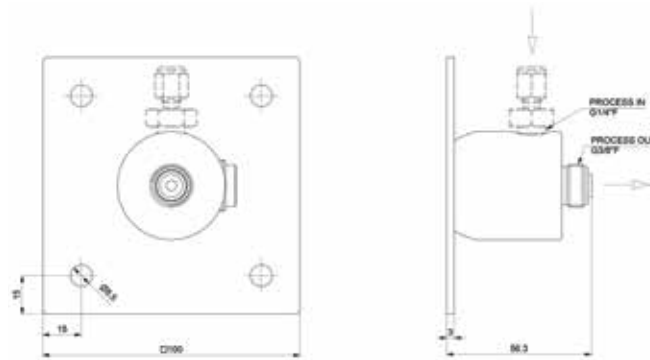
Pipe connection unit as essential part of high purity system. This unit is installed at the end of distribution line and shuts off gas flow if no other items are connected with piping system. It allows later installation of point of use systems based on our series 400 and 3100 for inert, none corrosive, flammable and oxidizing gases.

**Based on the metal diaphragm seal to the outside and a Teflon seat seal, this component can be used for gases with purity up to 6.0.**



TECHNICAL DATA	
Max. working pressure:	40 bar
Hydraulic pressure test (only type test):	230 bar
KV:	0,2
Size of valve seat:	4,0 mm
Tested endurance:	1000 cycles
Max. operating temperature:	-25°C to +70°C/ -13 to +160° F
Material gas wetted parts:	
Body - material:	2.0401.26 chrome plated
Diaphragm material:	2.4819 Gold coated
Seat material:	PCTFE
Popet material:	1.4404
Pin material:	1.4301
Spring material:	1.4310
Cleaning:	in accordance with CGA G4.1 and ASTM G93-03
Leak rate seat:	$5 \times 10^{-6}$ mbar l/s Helium
Leak rate outboard: mbar l/s Helium	$1 \times 10^{-9}$ mbar l/s Helium
Inlet port:	G1/4" female
Outlet port:	G3/8" male
Mounting holes (2x):	M6x1 mm
Option: mounting plate:	
Material mounting plate:	1.4301
Dimensions mounting plate:	100x100x3 mm (length x width x depth)
Function:	open and close with allen key

## DIMENSIONS



## ORDER CODE

Type	Material	Inlet*	Outlet*	Max. working pressure	Option	Gas type
<b>PCU400W</b>	<b>BC</b>	<b>G1/4"F</b>	<b>G3/8"M</b>	<b>E</b>	<b>P</b>	<b>N2</b>
PCU400W	BC = brass chrome-plated SS = stainless steel	CL6 CL8 CL10 B = brass BC = brass chrome-plated SS = stainless steel	CL6 CL8 CL10 B = brass BC = brass chrome-plated SS = stainless steel	E= 40 bar/600 psi	0 - no plate P - with plate	N2 O2 He ...

\*Inlet/Outlet: CL... = compressed fitting for ... mm outside diameter, NO... = hose connector for ... mm hose inside diameter.

# SIGNAL BOXES DGM-SK 2N/4N /6N /10N

## SPECIAL FEATURES

- > Optional Fax-/SMS alarm
- > Low supply pressure monitoring with contact gauges
- > Collective alarm for control room
- > Fast system overview
- > Installation outside the Ex-Zone



Signal box



Intrinsically safe barriers

## AVAILABLE ACCESSORIES

Solenoid valve control and regulator DGM-MV, relay box DGM-IT, contact gauges and operation terminal DGM-AX for gas management system, mass flow controller, cylinder scales, rupture disks, floaters, flow switch and cable monitoring.

## INSTALLATION

The housing is designed for wall mounting outside of a ex-area. Four mounting holes are provided in the back of the housing for this purpose. These can be accessed by unscrewing the cover.

## ORDER CODE

Type	Signals	Ex-protection	Power supply
<b>DGM-SK</b>	<b>O2N</b>	<b>E</b>	<b>230</b>
DGM-SK	O2N = 2 channels	0 = without	230 = 220- 250 V, 50- 60 Hz
DGM-SK	O4N = 4 channels	EX = with	110 = 110V 60 Hz
DGM-SK	O6N = 6 channels		
	O10N = 10 channels		

## Signal box,

for optical and acoustic signaling of fault reporting, 2, 4, 6 and 10-channel versions

## DESCRIPTION

The gas management signal box DGM-SK is a fault indicating unit and can monitor up to ten electrical circuits for deviation from the norm. An integrated lamp and signal horn allow for testing the correct operation of the instrument. If one or more alarm signals are triggered (e.g. gas failure) an acoustic (buzzing noise) and an optical signal (red LED) are emitted for each channel. The acoustic signal is acknowledged by pressing a button, the optical signal does not switch off until all malfunctions have been remedied. The instrument is equipped with a collective alarm to notify a main central office, a control unit or an external signalling device. Any equipment is possible for use as a signal transmitter as long as it has either a mechanical contact or an inductive-contact in accordance with DIN 19234 NAMUR.

## APPLICATION

The DGM-SK is used for all kinds of alarm signalling, predominantly for monitoring gas supply or metered flow in gas applications. Monitoring of gas supply can be done by controlling the upstream or downstream pressure (using contact gauges), the weight of the bottle or through monitoring rupture disks, dependent upon model for as many as 10 cylinders simultaneously. Flow-switches, floaters or mass flow controllers are suitable as signal transmitters for the monitoring of metered flow. In connection with these new IT relay stations individual faults can be passed on by SMS or fax. For every individual alarm you can program an individual text or an SMS and also a separate target number.

TECHNICAL DATA - CONNECTION LOAD	
Power supply:	220- 250 V AC; 50-60 Hz; 110 V AC, 60 Hz
Fuse:	3.15 mA slow-blow
Note:	defective fuses may only be replaced by the manufacturer
TECHNICAL DATA - INLETS	
Signal transmitter:	zero potential, mechanical contacts, initiators comply with DIN 19234 (NAMUR)
Effective direction:	NC (normally closed)
Connection system:	2 wires
Signal transmitter supply:	10 V max. throughout the instrument, 10 mA max. (short circuit proof)
Max. load/circuit:	330 mH/ 4.0 µF (EEx ib IIC); 1000 mH/ 30.0 µF (EEx ib IIB)
Cable monitoring (optional):	Short circuit I > 6 mA, cable break I < 80 µA
Connection cross section:	2.5 mm <sup>2</sup> max.
TECHNICAL DATA - OUTLETS (COLLECTIVE ALARM)	
Alarm output:	2* relay output ( 1 change over contact)
Contact load:	max. 220- 250 AC, 50- 60 Hz; 100 VA max. 48 V, 1A
TECHNICAL DATA - INTERNAL ALARM EQUIPMENT	
Signal lamp:	LED green 5 mm
Acoustic alarm:	Piezo buzzer, f = 3.3 kHz
Collective alarm:	via zero potential break contact
TECHNICAL DATA - AMBIENT CONDITIONS	
Ambient temperature:	0 – 40 °C
Humidity:	0 – 95 % rel. humidity, not condensing
TECHNICAL DATA - DESIGN	
Housing:	Polystyrene colour similar to RAL 7035 (light grey)
Protection category:	IP 54
Dimensions (w×h×d):	200×160×60 mm
Installation position:	upright
Cable glands:	blue: 1 each of PG 9 and PG 11; grey: 1 each of PG 11 and PG 13.5

# SOLENOID VALVES DGM MV-05 /-10

## Solenoid valve control and regulation



### ACCESSORIES

Signal box DGM-SK, relay box DGM IT and operation terminal DGM-AX for gas management system, mass flow controller, cylinder scales, rupture disks, floater, flow switch and cable monitoring.

### INSTALLATION

The housing of the solenoid valve control is designed for wall mounting. Four mounting holes are provided in the back of the housing for this purpose. These can be accessed by unscrewing the cover.

### SPECIAL FEATURES

- > Operates 5/10 solenoid valves
- > On-Off by means of a key operated switch
- > Emergency shutdown function and collective actuation
- > Collective alarm for the control room
- > Increased plant security
- > Improved user-friendliness
- > Fast system overview
- > Simple installation and operation

### DESCRIPTION

The solenoid valve control is equipped with five/ten output channels which make it possible to control and monitor solenoid valves. Furthermore there is an input channel for emergency shutdown and two zero potential signals for a higher signal such as DDC, PLC.

As soon as voltage is applied to the solenoid valve control the green operating LED lights up and signals that it is operational. The MV (solenoid valves) are activated using the key switch "On" or deactivated using the key switch "Off". If the emergency shutdown is activated, all solenoid valves are switched off and the red emergency shutdown LED flashes. In addition an acoustic signal is emitted which can be reset using the Reset button.

### APPLICATION

The solenoid valve control MV-05/MV-10 is a control unit which controls and regulates solenoid valves on individual pressure cylinders and multiple cylinder bundles. The MV-05/MV-10 has been constructed to be fail-safe using state-of-the-art technology and takes into account the relevant regulations and EC guidelines.

The solenoid valve control MV-05/MV-10 is used to actuate solenoid valves for gas cylinder stations and to monitor their functional capability. In the case of a malfunction of any solenoid valve the operator is notified both optically and acoustically on the control unit.

TECHNICAL DATA	
Power supply:	220- 250 V AC, 50- 60 Hz
Fuse:	3.15 A slow-blow solenoid valve output; 5 * relay output with 1 fine fuse protection each
Signal output:	2 * relay output (1 change-over contact)
Max. contact load AC:	220- 250 V AC, 50- 60 Hz
Max. contact load DC:	48 V , 1A
Signal lamp:	LED red, green 5 mm
Acoustic alarm:	Piezo buzzer, f = 3.3 kHz
Ambient temperature:	0 – 40 °C
Humidity:	0 – 95 % relative humidity, not condensing
Housing:	Polystyrene, colour similar to RAL 7035 (light grey)
Protection category:	IP 54
Dimensions:	240×160×90 mm (w×h×l)
Installation position:	upright, outside the Ex-area
Connection cross section:	2.5 mm <sup>2</sup> max.
Cable glands:	13 each PG11

### ORDER CODE

Type	Power supply
<b>DGM-MV-05</b>	230
DGM-MV-05 - 5 magnetic valves	220- 250 V AC, 50- 60 Hz
DGM-MV-10 - 10 magnetic valves	

# GAS MONITORING SOFTWARE GASCOM

Software for control and automated supervision of gas supply and gas stock



GasCom, main screen



GasCom, stock control and pressure levels, status displays of switching stations, initiating of purge cycles, emergency shut-offs



GasCom, graphic display of cylinder pressure with alarm functions and low supply pressure displays

## SPECIAL FEATURES

- > Visualising of system status
- > Automated control processes
- > Gas stock management
- > Fault and cost reduction
- > Statistic and archive functions
- > Flexible adaptation of the software to the customer's processes
- > Realisation of customer specified functions

## APPLICATION

The GasCom serves in monitoring the many functions of a high purity gas supply system and comes with an integrated gas management module including cylinder storage management allowing for tighter cost control. It is increasingly important to deliver coherent and customer oriented gas supply concepts to satisfy the rising cost controls and effective work scheduling. An automation concept compatible with high-purity gas supply is a fundamental component of this. The GCE Druva GasCom software leaves nothing to be desired.

## FUNCTIONS

### VISUALISING OF SYSTEM DATA

- > Display of pressure data

### SYSTEM MONITORING

- > GAS MONITORING: Sensor monitoring of cylinder, lines and extraction pressures and consumption, pressures at individual connection points, current certificate data, status display, fault and warning log files (viewable online via an internet browser)
- > individual low supply pressure alarm for each gas line with optional pressure range
- > Pressure testing with analysis for individual areas
- > Integration of supply panels and/or gas supply racks

### REMOTE CONTROL

- > Password protected dialog for flexible access right assignment in three stages: user, manager, administrator

### AUTOMATION OF CONTROL PROCESSES

- > Storage of gas cylinder data for each station
- > Generating automated order suggestions
- > E-mail order process coupled to low gas supply warnings
- > Event triggered e-mails
- > Triggering of gas equipment specific functions

### FAULT AND COST REDUCTION

- > Minimising of downtime due to "over seen" empty gas cylinders
- > Prevention of double entry mistakes (e.g. gas certificate data) through intelligent interfaces

### ARCHIVE FUNCTION AND STATISTICAL ANALYSIS

- > Where was each gas cylinder connected and at what time?
- > Logging of events and measured data
- > Variable logging intervals
- > Automatic recording of pressure in the log data
- > Automatic recording of all triggered actions in the log data
- > Automatic saving of fault and system-warnings in the log data
- > Automated documentation for quality control
- > Saving and documentation of cylinder certificates data via link-up with professional SQL-data banks
- > Gas consumption measuring

### SYSTEM REQUIREMENTS

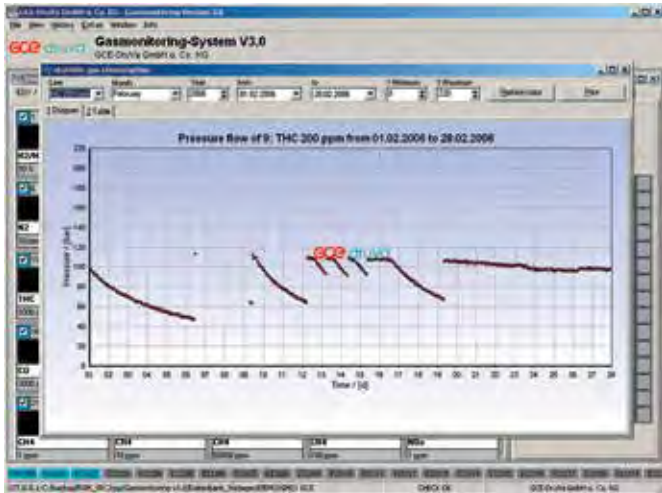
- > Standard PC, 2 GHz, 512 MB memory, Windows 7,8

### EXPANDABILITY ACCORDING TO SYSTEM REQUIREMENTS

- > Language choices German / English

### ORDER INFORMATION

Please contact GCE Druva for further information



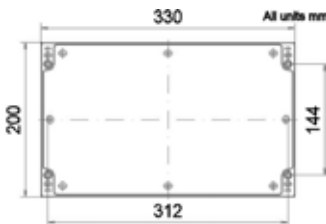
GasCom, monitoring the consumption and system leak tightness



Location-independent monitoring through the Internet or Intranet, remote diagnostics of the central gas supply, archiving of system data, order triggering



# SWITCH OVER CONTROL BOXES – ANALOGUE



## ACCESSORIES

The control box is only part of an automatic switch over. Other important elements of a fully automatic switch over are contact gauges, pneumatic valves, compressed air supply.

## INSTALLATION

The housing of the switch over control box is designed for wall mounting. Four mounting holes are provided in the back of the housing for this purpose. These can be accessed by open the cover.

This device is for controlling two solenoid valves in dependence of two measured input signals, e.g. weight (liquid gas), pressure or flow.

The basic function is to ensure a continuous supply of gas. When one of the sustentative gas cylinders reaches a critical level, the box switches supply of gas to the other side. If other side has not enough pressure, the whole supply is switched off.

The exact behavior of switching over can be configured by software settings.

The device has further 2 relays to supply potential free contacts for 2 signals: cylinder empty and failure

## DESCRIPTION

On the main screen the 2 current measured values are displayed.

In the next section the currently active solenoid valve is displayed in green. The logic ensures that there can never be 2 active solenoid valves at the same time.

The language can be changed to English or German.

If enable, the system starts supply of gas automatically (after system start or after both solenoid valves were switched off), whenever one side is above switch over level. This option is only appropriate if device is working in Auto Mode.

### TECHNICAL DATA - GENERAL

Protection	IP55, according EN 60529
Working temperature	-20 ... 50 °C (-4 ... 140 °F)
Material case	Aluminum (GD-Al Si 12 (DIN 1725))
Dimensions of case	330 mm (W) x 200 mm (H), 120 mm depth
Power supply	100V AC / 240V AC, 1 A

### TECHNICAL DATA - INPUTS

Type of external repeater	
power supply (EX version):	MINI MCR-SL-RPS-I-I [-SP] or equivalent
Type of input:	Totally 4 ,4..20mA input or digital
Number of channels:	4 channels
Protection:	ATEX (EX version)
Comment:	Sensor input can be from EX device in EX Area. The control box and the solenoid valves MUST NOT be mounted in EX zone!

### TECHNICAL DATA - OUTPUT FOR SOLENOID VALVES

Voltage:	24V DC
Max power per solenoid valve:	2 A, depending from power supply
Number of channels	2 channels
Fuse for solenoid valves	Type 5 x 20 mm
Comment:	Integrated fuse must match the connected solenoid valves, max 2 A, default value 2A

### TECHNICAL DATA - POTENTIAL FREE CONTACT

Voltage:	Up to 24V DC
Type:	Normally open (OK=contact closed)
Number of channels:	2 (cylinder empty, failure)
Max switching power:	1 A

Item No.	Type
590003910	Oxygen, Nitrogen, Helium, Argon
590003911	Flammable gases - Hydrogen, methane, Propane
590003912	Carbon Dioxide

## ORDER CODE

Type	Item No.
<b>Switch Over Control Box</b>	
SWITCH OVER CONTROL BOX 230 VAC IP55	H28321819 n.a.
100 VAC IP55	

# SWITCH OVER CONTROL BOXES – DIGITAL

This device is for controlling two solenoid valves in dependence of two measured pressures. The basic function is to ensure a continuous supply of gas. When one of the sustentative gas cylinders reaches a critical level, the box switches supply of gas to the other side. If other side has not enough pressure, the whole supply is switched off.

The exact behavior of switching over can be configured by DIP-switches inside the box.

The device has two relays to supply potential free contacts for two signals: cylinder empty and failure.



## DESCRIPTION

The device's main task is to guarantee a continuous supply of gas. So whenever a threshold is reached (empty cylinder), the device will switch to the other side, if there is enough gas in the cylinder.



## ACCESSORIES

The control box is only part of an automatic switch over. Other important elements are contact gauges, pneumatic valves, compressed air supply.

## INSTALLATION

The device's main task is to guarantee a continuous supply of gas. So whenever a threshold is reached (empty cylinder), the device will switch to the other side, if there is enough gas in the cylinder.

### TECHNICAL DATA - GENERAL

Protection:	IP67, according EN 60529 (dustproof, protection against temporary submersion)
Working temperature:	-20 ... 60 °C (-4 ... 140 °F)
Material case:	Aluminium (GD-Al Si 12 (DIN 1725))
Dimensions of case:	280 mm (W) x 170 mm (H), 90 mm depth
Power supply	
for solenoid valves:	20-30V DC (maybe higher accuracy required for solenoid valves), 1 Ampere
Electricity supply:	100 VAC / 240 VAC

### TECHNICAL DATA - INPUTS

Type of external switch amplifier:	Pepperl+Fuchs KFD2-SR2 Ex2 or Pepperl +Fuchs KCD2-SR2-Ex2
Type of input:	Inductive or electrical contact, Namur
Number of channels:	2 channels
Protection:	ATEX
Comment:	Sensor input can be from EX device in EX Area.
	The control box and the solenoid valves MUST NOT be mounted in EX zone!

### TECHNICAL DATA - OUTPUT FOR SOLENOID VALVES

Voltage:	24V DC
Max power per solenoid valve:	2 A, depending from power supply
Fuse for solenoid valves	Type 5 x 20 mm
Comment:	Integrated fuse must match the connected solenoid valves, max 2 A, default value 2A

### TECHNICAL DATA - POTENTIAL FREE CONTACT

Voltage:	Up to 24V DC
Type:	Normally open (OK=contact closed)
Number of channels:	2 (cylinder empty, failure)
Max switching power:	1 A

## ORDER CODE

Type		Art. - Nr.
<b>Switch Over Control Box</b>		
SWITCH OVER CONTROL BOX	230 VAC IP67	H28321719
	100 VAC IP67	n.a.

# SECURITY CYLINDER CABINETS

Security cabinets,  
in accordance with norm EN 14470 -2,  
for 1 to 4 50-liter-cylinders



### SPECIAL FEATURES

- > Installation in workrooms
- > Highest possible fire-protection in accordance with type class G90
- > Flexible cylinder brackets for 10L and 50L cylinder
- > Integrated air extraction
- > Flexible positioning of gas panels
- > Additional lead-thoughts for sensors, cables etc.
- > Self-sealing in case of fire

### DESCRIPTION

Safety cabinets, type tested, are manufactured in multiple wall constructions out of steel plates with embedded fire protection plates of certified, quality-controlled insulating material. Mounting rails for the armatures, cylinder brackets, etc. are included in delivery. The flexible interior fittings allow for the deployment of all standard gas cylinders. In case of fire, the cabinet contents poses no further danger and makes no contribution to the spread of fire, during a defined period. The cabinet forms a containment of the protection area around the pressure gas cylinders in accordance with TRBS 3145, TRGS 510. Integrated inlet and extraction openings close automatically in the case of fire. The identification/labelling comply with ISO 3864. During installation of the cabinets there are construction requirements to be observed: 10-times air exchange is necessary for flammable and oxidizing gases and 120-times air exchange for toxic gases. The pressure drop should not be more then maximum 150 Pa. Local potential equalization should be observed.

Note: Be aware of the weight of cabinet during transport and installation.

### APPLICATION

For secure storage of gas cylinders when: gas cylinders need to stay in the workroom even after shut-down time, it is not possible to realise the necessary protection area (acc.TRBS 3145, TRGS510) for lack of space, but continuous gas supply is essential, and/or short pipework is necessary.

### ORDER CODE

Type	Outside dimentions (WxDxH)	Fire resistance class	Accessories
<b>SC600</b>		<b>G30</b>	...
SC 600	600×617×2050 mm	G30	Contact company
SC 900	900×617×2050 mm	G90	
SC 1200	1200×617×2050 mm		
SC 1400	1400×617×2050 mm		

# PROTECTIVE CYLINDER CABINETS

Sheet steel cabinet for outdoor gas cylinder storage, for 1 – 4 50 liter cylinders.

## SPECIAL FEATURES

- > Corrosion proof steel sheet housing for use outdoors
- > Height adjustable cylinder brackets for 10L and 50L cylinder
- > Flexible armature mountings
- > Doors with air vents top and bottom
- > Grooved sheet metal floor
- > Inspection window available as accessory

## DESCRIPTION

Sheet steel cabinet are constructed as a single-walled structure with complete galvanized and plastic-coated, structured surface, offer protection from the effects of weather and unauthorised use. Ventilation in accordance with TRBS 3145 is found at the bottom of the doors and in the back wall. Connection to the on-site ventilation (NW 75) is possible. Included in delivery is mounting rails for the armatures, cylinder bracket. Available on request are: inspection windows, additional shelving, documentation pouch, etc. the flexible interior fittings allow for the storage of all standard gas cylinders.

## APPLICATION

For the safe housing of gas cylinders in outside areas.



## ORDER CODE

Type	Outside dimensions (WxDxH)	Cylinder max. (50l)	Accessories
<b>OD700</b>		<b>2</b>	...
OD 700	700x470x2150 mm	2 = 1 - 2	Contact company
OD 1000	1000x470x2150 mm	3 = 1 - 3	
OD 1350	1350x470x2150 mm	4 = 1 - 4	

# INLINE FILTER CO



Inline gas purifier with indicator

Inline filter, for applications in the chromatography, for laser resonator gases and other high purity gases, inlet pressure 11 bar / 160 psi

### SPECIAL FEATURES

- > Large number of adsorbent agents/combinations are possible
- > Maintenance of the gas purity even during the filter replacement
- > Super Clean Filter attain minimum 99.9999 purity of the gases
- > The filter are in metal and glass (with indicator)
- > Brass or stainless steel connections (1/4" or 1/8") available
- > TÜV-tested under laboratory conditions

### DESCRIPTION

The Super-Clean™ gas filter is diffusion tested, in glass/metal version and purifies gases with a flow rate of max. 12 l/min independent of the inlet quality, from hydrocarbons, oxygen and moisture (all with indicators) to a gas purity higher than 6.0. Available with or without visual display.

### APPLICATION

Super-Clean™ gas filter in glass/metal model for laser gases such as helium, oxygen and carbon dioxide, to protect the resonator as well as the high performance, top-quality laser equipment. Super-Clean™ gas filter in glass/metal model purifies die sensitive carrier gases and burner gases from gas chromatography, carrier gas for GC/MS and LC/MS system from hydrocarbons, oxygen and moisture (all with indicators). Available with or without visual display.

TECHNICAL DATA	
Gas purity at outlet:	> 6.0
Max. inlet pressure:	11 bar (160 psi) (pressure drop 0.02 bar by 3 bar 0–500 ml/min)
Inlet/outlet:	Tube fitting 1/8", on request 1/4"
Working temperature:	-40 °C to + 65 °C
Max. Flow rate:	12 l/min
Dimensions (lxd):	approx. 270x32 mm

### PERFORMANCE VALUES OF FILTRES

Type	Filtration	Used for	H <sub>2</sub> O (gr)	Cap. O <sub>2</sub> (ml)	Hydrocarb. (gr)	Approx. life span
GC - Moisture	Moisture	ITG*: He, H <sub>2</sub> , air	15	-	-	> 3 years
GC - Oxygen	Oxygen	ITG	-	2000	-	> 3 years
GC - Hydrocarb.	Hydrocarb.	ITG*: He, H <sub>2</sub> , air	-	-	24 (as n-Butane)	> 3 years
GC - Combo.	Moisture + Hydrocarb.	ITG*: He, H <sub>2</sub> , air	10	-	18 (as n-Butane)	> 2 years
GC-Triple	Moisture + Oxygen + Hydrocarb.	ITG*	4	1000	12 (as n-Butane)	> 2 years

\* ITG = Inert carrier gas

### ORDER CODE (MOVEX)

Item No.	Description
<b>Inline Filter - Stainless steel without Indicator</b>	
F000009	Filter for Moisture
F000010	Filter for Oxygen
F000011	Filter for Hydrocarbons
F000012	Combination filter : Oxygen - Moisture
F000013	Triple filter : Oxygen - Moisture - Hydrocarbons
F000014	Gas spec. (He) Triple filter : Oxygen / Moisture / Hydrocarbons
<b>Inline Filter - Glass with Indicator</b>	
F000025	Triple-indicator : Oxygen / Moisture / Hydrocarbons
F000021	Gas spec. (He) indicator Oxygen/Moisture/Hydrocarbons
F000021	Indicator Oxygen/Moisture for ICP
<b>Inline Filter Parts</b>	
F000017	Click-On Inline Super Clean™ connection 1/8"Brass (2x)
F000017	Click-On Inline Super Clean™ connection 1/8" SS (2x)
F000024	Click-On Inline Super Clean™ connection 1/4"Brass (2x)
F000022	Click-On Inline Super Clean™ connection 1/4" SS (2x)
F000042	Wall mounting accessories (4/pack)
F000041	Replacement special O-rings for "Click-On" connection ; 10/packet
F000041	Special connection for 1/4" Click-On connection

# FILTER-SETS FS

Filter-set, for pure gases, for high flow rates, inlet pressure 11 bar / 160 psi, to improve gas purity, at least to 6.0



Super Clean combination filter-set for high flow rate

## SPECIAL FEATURES

- > Only 2 filters needed for hydrocarbon-filtering in LC/MS
- > Quick and easy replacement during operation
- > Inert and diffusion tight versions
- > Early visual saturation warning

## DESCRIPTION

Filter units in metal or glass versions, diffusion tight mounted on a plate. The filter can be replaced during operation in seconds without influencing the technical or analytical performance data in any way. Cleans sensitive nitrogen generator gases in the LC/MS-Systems from hydrocarbons to a purity of > 6.0 (99.9999%).

## APPLICATION

Raises the productivity from high performance analysis equipment through the minimising of down time and malfunctions, as well as repair and maintenance costs.

TECHNICAL DATA	
Inlet /Outlet:	Brass tube fitting 1/4"
Working temperature:	-40 °C to 65 °C
Dimensions filter:	290 mm x40 mm
Dimensions 1 base plate:	80x100 mm

## PERFORMANCE VALUES OF FILTERS

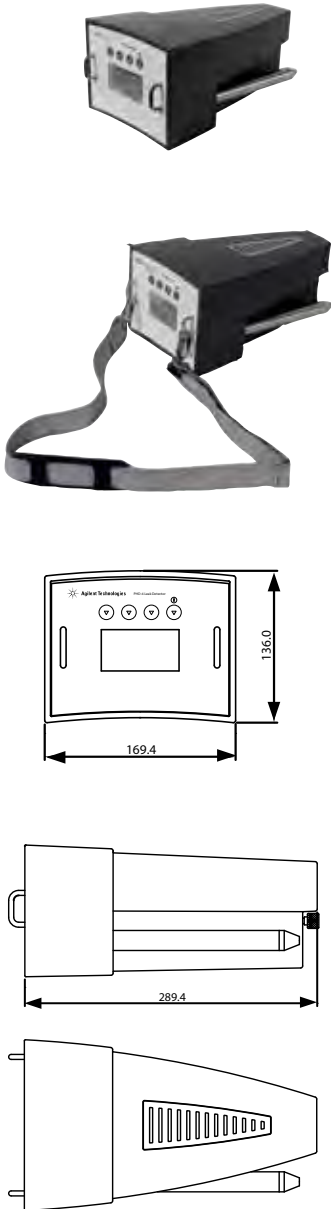
Type	Filtration	Application	Max. Flow (l/min)	H2O (gr)	O2 (ml)	Hydrocarb. (gr)	Approx. life span
GC-H2O	Moisture	Reson. Laser Gas	7	7,2	-	-	> 2 Years
GC-Oxygen	Oxygen	Reson. Laser Gas	7	-	1000	-	> 2 Years
GC-CHn	CHn	Reson. Laser Gas	7	-	-	12	> 2 Years
LC-CHn	CHn	Reson. Laser Gas	20	-	-	24	> 0,4 Years
GC-Combo.	Moisture + Oxygen	Reson. Laser Gas	7	3,5	-	6 n-butane	> 1,5 Years
GC-Triple	Moisture + Oxygen + CHn		7	1,8	500	4 n-butane	> 1 Year

## ORDER CODE

Item No.	App.	Description
<b>Base plate</b>		
F000038 (BN) F000031 (SS)	GC	Base plate for 1 filter
F000032 (SS) F000046 (BN)	GC	Base plate for 2 filter
F000035	LC	Base plate- higher flow rate - for 2 filters (N2-filtration)
F000033 (SS) F000047 (BN)	GC	Base plate for 3 filter
F000052	GC	Base plate for 4 filter
<b>Filter</b>		
F000002	GC	Filter, H2O, standard, higher flow rate, with indicator
F000003	GC	Filter, O2, standard, higher flow rate, with indicator
F000004	GC	Hydrocarbons filter, standard, higher flow rate, without indicator
	GC	Hydrocarbons filter, standard, higher flow rate, with indicator
	GC	3-filter set (Triple + 2x Hydrocarbons/moisture combo)
F000019	GC	4-filter set (Standard: oxygen, moisture + 2x charcoal)
	LC	2-filter set (Hydrocarbons 2x for LC-MS: N2 filtration) - higher flow rate: without indicator
	LC	2-filter set (Hydrocarbons 2x for LC-MS : N2 filtration) - higher flow rate: with indicator
F000036	LC	Special moisture filter; 2er Set, higher flow rate
<b>Filter cartridges with combination of adsorbents</b>		
F000005	GC	Filter, triple (O2/moisture/hydrocarbons); carrier gas filtration for FID - ECD - NPD
F000006	GC	Filter, triple: gas spec. He (O2/moisture/hydrocarbons) in GC-MS
F000007	GC	Filter, combo, higher flow rate, (hydrocarbons/moisture); burner gas application
<b>Base plate + cartridge combined with filter adsorbents</b>		
F000044	GC	FID KIT for 4 standard filter, high capacity O2, moisture, 2x hydrocarbons
F000039	GC	FID KIT for 3 filter/base plate: Triple + 2x combo filter (hydrocarbons/moisture)
F000043 (CL 1/8" B)	GC	MS KIT for He (gas spec.) ,1 filter/base plate, triple set (O2/moisture/hydrocarbons)
F000048 (CL 1/4" SS)	GC	MS, ECD-, FID-, NPD-carrier gas KIT for 1 filter/base plate, triple set (O2/moisture/hydrocarbons)
F000020	GC	Carrier gas KIT for FID, 2 pos. for air & H2 (combo set: 2x hydrocarbons/moisture)
	LC	MS KIT for 2 filter/base plate (2x hydrocarbons: N2 filtration) - higher flow rate !!: without indicator
		High flow rate special moisture filter KIT for 2 filter/base plate

# PHD-4 PORTABLE HELIUM DETECTOR

The PHD-4 is a portable compact leak detector which includes a battery for autonomous use in the field and uses helium as a tracer gas. It allows detection of very small leaks in objects where a slight helium pressure has been introduced.



### BENEFITS

- > High sensitivity to helium
- > Easy to use
- > Truly portable
- > Versatile
- > Dependable

### APPLICATION

- > Large vessels and bioreactors (Fermenters, Sterilizers, Freeze Dryers)
- > Underground pipes and storage tanks (Gas distribution lines, Under and above ground containers and storage tanks, Telecommunication and high voltage underground cable)
- > Water heating and cooling pipes (Heater exchangers and steam condensation lines, Water pipes, Radiant heating systems)
- > Airplane fuel tanks and lines (Fuel tanks, Oxygen distribution lines)
- > Components and systems for the Chemical and Petrochemical Industries,
- > Compressed air components and delivery systems, Process gas delivery lines in Semiconductor fabrication industry Part

TECHNICAL DATA	
Lowest Detectable Helium Concentration:	2 ppm (parts per million)
Lowest Detectable Helium leak:	5 x 10 <sup>-6</sup> mbar l/s
	5 x 10 <sup>-6</sup> atm cc/s
	5 x 10 <sup>-7</sup> Pa m <sup>3</sup> /s
Response Time:	< 2 sec
Recovery Time:	<10 sec (from 50 ppm to 0 ppm)
Start up time, including self check-up:	3 min approx.
Power Supply:	12 V DC, 1.2 A Rechargeable Battery included
	110-240 V, 50-60 Hz Transformer/Battery Charger included
Battery operation Time:	4 hours
Maximum Signal Drift:	10 ppm/10 min
Operating Conditions:	
Temperature:	+5°C to +35°C
Humidity:	90% maximum relative humidity
Storage Conditions Temperature:	-20°C to +60°C
Weight:	2,6 Kg (5.7 lbs)
Compliance to Norms:	CE approved, CSA/US approved

Item No.	Type	Includes
9694640	PHD-4 Complete Package (travel case)	PHD-4 Basic Unit, Spare Battery, Transformer/Battery Charger (110-240V), Carrying Strap, Probe Set, 15-pin I/O connector, CD Instruction Manual, Probe adapter
9694600	PHD-4 Basic Package	PHD-4 Basic Unit, Transformer Battery Charger (110-240 V), Carrying Strap, 15-pin I/O connector, CD Instruction Manual, Probe adapter
9694660	PHD-4 Replacement Part Kit	Sampling Pump with Fittings, Probe with Sampling Line, Tip Probe Filter, Internal Filter (Kit of 5 units)

### ACCESSORIES

Item No.	Type
9693515	Probe Set
9693540	Capillary leak with refillable reservoir and gauge
9693525	Probe with 10 meter maximum Sampling Line
9693520	Telescoping Extension Probe

## INDIVIDUAL REPLACEMENT PARTS



Item No.	Type
SR 03.702609	Spare Battery
SR 03.702888	Transformer/Battery Charger (110-240V)
SR 03.702513	Sampling Pump with Fittings SR
SR 03.702538	Probe with Sampling Line
SR 28.900012-01	Tip Probe Filter
SR 03.702959	Internal Filter (Kit of 5 units)
SR 03.702791	Carrying Strap
SR 03.702894	15-pin I/O connector
SR 03.702890	Travel Case
SR 03.703054	PHD-4 Probe adapter
VSPHD4BAG	Protective Bag (pictured at left)



# SAFETY RELIEF VALVE FOR 6.0 GASES

Spring loaded,  
direct acting safety relief valve for venting excess pressure from receivers,  
pipelines and other equipment to be used in combination with GCE pressure  
regulators of the first pressure stage.



SV805



SV805-ES

### BENEFITS

- > According to 2014/68/EC
- > Suitable for 6.0 gases
- > Individual opening pressure, up to 21 bar (305 psi)
- > TÜV-certification of pressure setting
- > Available in brass (hexagon nut) or stainless steel
- > Sealing material EPDM
- > Compact size for easy installation
- > Inlet connections NPT 1/4"
- > Protective dust cap
- > Adaptor for connection to ventilation pipe

### APPLICATION

- > The Safety Relief Valves SV805 and SV805-ES can be installed directly into a pipeline system or via a console with a gas control panel
- > The SRV is available as separate item or mounted on a console
- > The SRV can be added to existing gas supply systems
- > Position independant installation (vertical/horizontal)

### STANDARDS

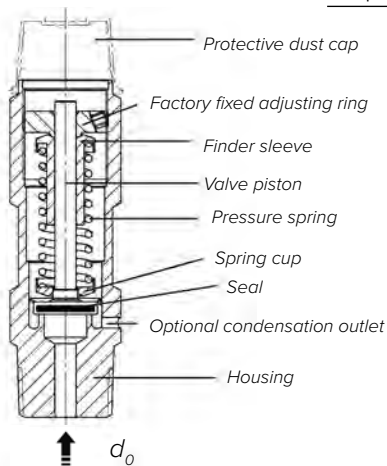
- > Manufactured and certified according to EN ISO 4126-1
- > Company certified according to ISO 9001, ISO 14001 and 2014/68/EC Module H
- > CE-marked according to: 2014/68/EC

*Other models, options and accessories available on request.*

*Please identify the individual gases, temperature, opening pressure, inlet connection requesting for quotations!*

TECHNICAL DATA	
Manual ventilation:	-
Opening pressure:	6/9/15/21 bar (87/130,5/217,5/304,6 psi)
Gases:	High purity gases, except toxic or corrosive
Leakage rate:	<5×10 <sup>-6</sup> mbar l/s (valve seat) at nominal working pressure of the CGS
Material:	Housing and metal parts made of brass or stainless steel, pressure spring made of stainless steel, valve seal gas-specific
Width across flats:	27 mm
Weight:	approx. 260 g
Marking:	CE0045, TÜV*SV*08-931
Drill hole (d <sub>0</sub> ):	6.0 mm
Temperature range:	-20°C to +60°C (depending on gas type and valve seat)
Adapter:	for connection to ventilation pipe at the outlet

### CROSS-SECTIONAL VIEW



### FLOW CAPACITY FOR AIR AT 23 °C/73.4 °F (VALID ONLY FOR ATMOSPHERIC PRESSURE)

Opening pressure	6 bar (87 psi)	9 bar (130,5 psi)	15 bar (217,5 psi)	21 bar (304,6 psi)
<b>Volume flow</b>	85.4 m <sup>3</sup> /h	122.3 m <sup>3</sup> /h	196.5 m <sup>3</sup> /h	318.9 m <sup>3</sup> /h
<b>Working pressure</b>	4 bar (60 psi)	6 bar (90 psi)	10.5 bar (150 psi)	14 bar (200 psi)

SRV, MOUNTED



BRASS



SS



SV805



SV805-ES

Item No. SRV mounted	Opening pressure bar (psi)	Material + Dimensions, WxHxD in mm	Adaptor Inlet (f.)	SRV, Outlet (f.)
S9000101122	6 (88)	Brass, 132x100x102	1/4" NPT	M24x1
S9000101124	9 (131)	Brass, 132x100x102	1/4" NPT	M24x1
S9000101123	15 (218)	Brass, 132x100x102	1/4" NPT	M24x1
S9000101125	21 (305)	Brass, 132x100x102	1/4" NPT	M24x1
S9000101126	6 (88)	Stainless Steel, 138x100x102	1/4" NPT	M24x1
S9000101128	9 (131)	Stainless Steel, 138x100x102	1/4" NPT	M24x1
S9000101127	15 (218)	Stainless Steel, 138x100x102	1/4" NPT	M24x1
S9000101129	21 (305)	Stainless Steel, 138x100x102	1/4" NPT	M24x1

SRV, SEPARATE

Item No. SRV mounted	Opening pressure bar (psi)	Material + Length	Inlet (f.)	Outlet (f.)
S9000101106	6 (88)	Brass, 90 mm	1/4" NPT	M24x1
S9000101117	9 (131)	Brass, 90 mm	1/4" NPT	M24x1
S9000101103	15 (218)	Brass, 90 mm	1/4" NPT	M24x1
S9000101119	21 (305)	Brass, 90 mm	1/4" NPT	M24x1
S9000101116	6 (88)	Stainless Steel, 96,5 mm	1/4" NPT	M24x1
S9000101118	9 (131)	Stainless Steel, 96,5 mm	1/4" NPT	M24x1
S9000101110	15 (218)	SStainless Steel, 96,5 mm	1/4" NPT	M24x1
S9000101120	21 (305)	Stainless Steel, 96,5 mm	1/4" NPT	M24x1

ADAPTER FOR CONNECTION TO VENTILATION PIPE AT THE OUTLET

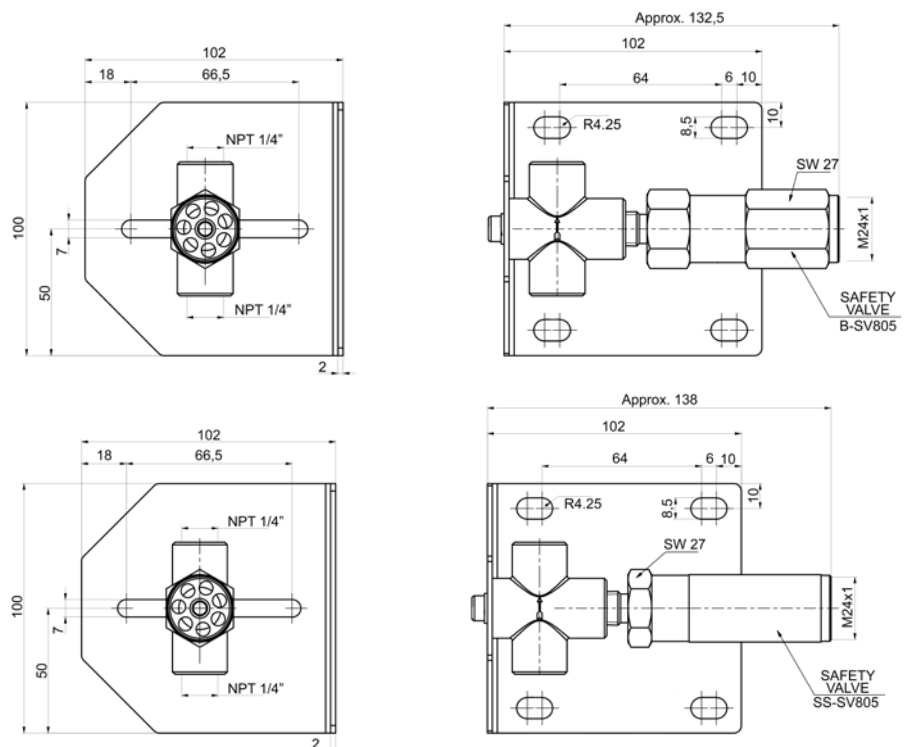
Item No.	Material	Inlet (f.)	Outlet (f.)
S9000101102	Brass (B)	M24x1	1/2" NPT
S900010112	Stainless Steel (SS)	M24x1	1/2" NPT

PLATE MOUNTING ADAPTOR

Item No.	Material	Inlet (f.)	Outlet (f.)
H23318303	Brass (B)	1/4" NPT	1/4" NPT
H233182151	Stainless Steel (SS)	1/4" NPT	1/4" NPT

MOUNTING PLATE, SEPARATE

Item No.	Material
H18176901	Plate-SS L200 W100 T2 MM



# CYLINDER SCALE



Cylinder scale



Panel / Flush - mounting case



Wall mounting case



Electronic scales,  
for the level metering of gas cylinders,  
with alarm output for low supply pressure alarm

### SPECIAL FEATURES

- > Very flat construction
- > Metering range to 135 kg
- > 0.1 % accuracy and high temperature resistance
- > High protection class IP 65 for outdoor use and high humidity
- > 3 alarm outputs on display unit

### DESCRIPTION

These electronic scales are delivered together with display unit and connection cable. The indicating device offers 3 alarm outputs to the display unit for the low supply pressure alarm.

### APPLICATION

For indoor or outdoor use in gas cabinets. The flat design of these scales allows for the installation even under spatially restricted conditions. The high protection class allows for deployment even where heavy condensation occurs. The scales fulfil the highest EMV requirements to guarantee a safe, fault-free and exact operation.

TECHNICAL DATA - SCALES	
Measuring range:	27 / 45 / 136 kg - 60 / 100 / 300 lbs
Measuring range:	140 kg
Dimensions:	approx. 234×234×35 mm
Sensor material housing:	Aluminium/Chrome nickel steel
Working temperature:	-15 to 50 °C (compensated temperature range)
Accuracy:	< 0.1 % of range
Nonlinearity:	< 0.05 % of range
EX-protection:	ATEX, category 3G, EEx nA/nL II C T4 /T5
Protection class:	IP 65(NEMA 4) accord. to IEC 60 529
Dielectric strength:	500 DC V
Auxiliary power:	15 - 30 DC V
Max. output:	< 30 mA
Signal output:	4 ... 20 mA, 2-wire

TECHNICAL DATA - DISPLAY	
Housing:	Polycarbonate, black
Dimensions:	approx. 48×96×98.5 mm
Display size:	45×92 mm
Protection class:	IP 66
Weight:	approx. 600 g
Alarm outlets:	switching output
Switching behavior:	break cutter and shutter, adjustable with keyboard
Power rating:	230 V AC, 3 A
Power consumption:	10 VA
Working temperature:	0 - 50 °C
Auxiliary power:	AC 230 V 50/60 Hz

Item No.	Description
<b>H28756019</b>	Cylinder Scale
<b>H28756119</b>	Digital display - wall mounting
<b>H28510319</b>	Digital display - panel mounting

# CONTACT GAUGES KI 50 - NPT 1/4"

Contact gauge with inductive contact (KI), for visual and acoustic warning of low gas supply pressure and to monitor the cylinder pressures; for inert, combustible, oxidizing and corrosive gases and gas mixtures, nominal pressure maximum 300 bar



## SPECIAL FEATURES

- > Construction conforms to safety regulations EN 837-01
- > Switching point is freely adjustable in marked area (45°)
- > Pressure display at location and signal transmission for recording measured data
- > Ex-protection is possible in conjunction with corresponding signal box

## DESCRIPTION

These pressure measuring instruments have a robust chrome nickel steel/cooper-zinc-alloy housing in accordance with DIN 16063. When the gas cylinder is empty and by sinking cylinder pressure an inductive contact switch is activated. The switch point, i.e. the pressure level at which the signal should be triggered is freely adjustable within a sector of 45° (at 315 bar type e.g. 38 bar).

To set the switch point the pressure level marking is simply adjusted to the desired switch point.

## APPLICATION

Panel and manifolds can be fitted out with contact gauges as an optional. Contact gauges combine the advantages of a local display with the demand for an electric signal transmission. This allows for - in conjunction with special signal boxes - the optical and acoustic warning signal by low gas supply pressure or the monitoring of the line pressure with freely adjustable threshold.

## NOTICE ABOUT ELECTRICAL CONNECTIONS

The polarity must be taken into consideration when connecting as the inductive contact is an active electronic component, The KI 50 can only be operated with a special amplifier.

Suitable for operation are: Signal boxes DGM-SK 60 2/4/6/10 Ex \*, switch amplifier WE 77/Ex \*.

\* The deployment of contact gauges in ex-zone 1 is possible with these instruments. When connecting the contact gauges to an existing fault alarm system it is important to check, in the technical manual, if the operation of NAMUR-Initiators is possible.

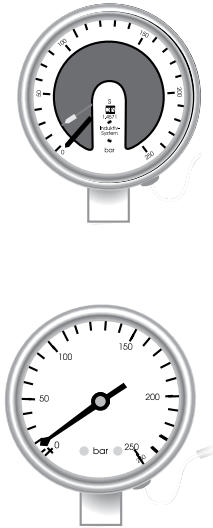
In case of doubt please contact the manufacturer of your equipment

TECHNICAL DATA	
Measuring element:	Bourbon tube
Diameter:	50 mm
Design:	Chemical-safety version DIN 16063
Housing:	CrNi-steel/copper-zinc-alloy
Measuring element:	CrNi-steel 1.4571, circular form/copper-zinc-alloy
Inspection glass:	Polycarbonate
Accuracy:	Class 2.5 (EN 837-1)
Wrench size:	14 mm
Nominal pressure:	230 bar/ 300 bar
Display range:	see gauge scale
Threshold:	Freely adjustable in marked range (45° of the display range from p = 0 originating)
Gas suitability:	All gases
Contact:	inductive slit sensor (in accordance with NAMUR)
Working temperature:	ambient: -25°C to +70°C measuring medium maximum +100°C
Protection class:	II 2 G EEx ia IIC T6, PTB 99 ATEX 2219 X
Switching hysteresis:	+/- 5 % (SEW)
Control behavior:	Contact type 1 (I), contact of low impedance with increasing pressure
Dimensions (Ø×d×h):	50×35×70 mm
Connection:	NPT 1/4"m outside thread

Item No.	Type/Contact-Type	Material	Display range bar	psi	kPa
<b>H28191103</b>	KI 50-315/i1	BC	0 – 315	0 – 4500	0 – 31500
<b>H28191101</b>	KI 50-315/i1	SS	0 – 315	0 – 4500	0 – 31500
<b>H28191203</b>	KI 50-400/i1	BC	0 – 400	0 – 5800	0 – 40000
<b>H28191201</b>	KI 50-400/i1	SS	0 – 400	0 – 5800	0 – 40000

# CONTACT GAUGES KI 63, KR 63 - NPT 1/4"

Contact gauge, with inductive contact (KI) or mechanical reed contact (KR), for visual and acoustic warning of low gas supply pressure, to monitor the line pressure, nominal pressure maximal 200 bar



### SPECIAL FEATURES

- > Construction conforms to safety regulations of the BG- chemical industry
- > Switching point freely adjustable
- > One or two switching point models
- > Pressure display and signal transmission for recording measured data
- > Ex-protection is possible in conjunction with corresponding signal box SK 60

### DESCRIPTION

These pressure measuring instruments have a robust chrome nickel steel housing in safety version in accordance with DIN 16006. When the gas cylinder nears empty and by sinking cylinder pressure an inductive contact switch is activated (KI 63) or respectively a mechanical reed contact (KR 63). The switch point, i.e. the pressure level at which the signal should be triggered, is freely adjustable. Both the gauge KI 63 as well as KR 63 are available with one or two switch points and with different contact types. To set the switch point the pressure level marking is adjusted by turning the bayoneting to the left and removing the viewing glass. The desired value for the switching point is obtained by adjusting the red marking on the outside scale edge. Afterwards the viewing glass is replaced using the bayonet ring.

TECHNICAL DATA	
Measuring element:	Bourbon tube
Diameter:	63 mm
Design:	Chemical-safety version
Material:	Housing: SS 1.4301, parts in contact with the measuring medium: SS 1.4571
Accuracy:	Class 1.6
Working temperature:	-25°C to +70°C /-13 °F to 158 °F
Display range:	see gauge scale
Threshold:	Freely adjustable over the whole scale range
Gas suitability:	All gases
Connection:	NPT 1/4"m or VCR 1/4"f

TECHNICAL DATA - KI 63	
Contact:	inductive contact accord. to NAMUR
Connection:	also G 1/4"m for Acetylene: KI 63-40 I1
Protection class:	II 2 G EEx ia IIC T6, PTB 99 ATEX 2219 X
Switching hysteresis :	max 2.5%
Control behavior :	Contact type 1 (I1), contact of low impedance with increasing pressure Contact type 2 (I2), contact of high impedance with increasing pressure
Dimensions (Ø×d×h):	63×58×90 mm

TECHNICAL DATA - KR 63	
Contact:	Reed contact, magnet. actuated inert gas contact
Applied load:	10 W / 100 V / 0.5 A
Switching hysteresis:	max 2.5%
Control behavior KR 63:	Contact type 1 (R1), contact is interrupted by decreasing pressure Contact type 2 (R2), Contact is interrupted by increasing pressure
Minium switching margin	
K1/K2 (KR 63-2):	35% of the display range
Dimensions (ø×d×h):	63×50×90 mm

Item No.	Type/Contact-Type	Material	Display range bar	psi	kPa
<b>H28945601</b>	KI 63- 15 / i2	SS	-1 – 15	-14,5 – 220	-100 – 1500
<b>H28940901</b>	KI 63- 100 / i1	SS	0 – 100	0 – 145	0 – 10000
<b>H28941101</b>	KI 63- 250 / i1	SS	0 – 250	0 – 3600	0 – 25000
<b>H28900801</b>	KR 63-15 / r2	SS	-1 – 15	-14,5– 220	-100 – 1500
<b>H28974801</b>	KR 63-100 / r1	SS	0 – 100	0 – 1450	0 – 10000
<b>H28974101</b>	KR 63- 250 / r1	SS	0 – 250	0 – 3600	0 – 25000

# OTHER ACCESSORIES



## PRESSURE TRANSMITTER 4-20MA FOR ALMOST ALL MEDIA AND FOR APPLICATIONS IN HAZARDOUS AREAS

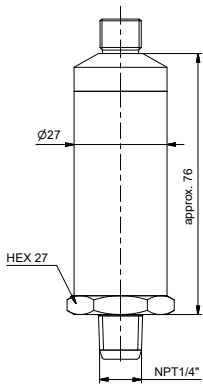
Designed for the highest industrial requirements in hazardous areas and feature the common approvals, such as ATEX, IECEx, FM and CSA, as well as a SIL rating per IEC61508/ IEC61511 for use in the process industry.

For almost all media

For applications in hazardous areas

Oxygen cleaned

- > 0...25 bar and 0...400 bar (0...360 psi and 0...5456 psi)
- > Internal sealing elements are completely avoided, so that the unit can be used with almost all media.
- > All wetted parts are manufactured from stainless steel and are fully welded.



### ELECTRICAL CONNECTOR

- 1= Supply
- 2= No Connect
- 3= Return
- 4= No Connect

### ACCESSORIES

Connection Cable  
COM003703



Pin No.	Wire color
1	Brown
3	Blue
No connect	Black

Item No.	Material	Pressure range	Mechanical Connection	Electrical Connection	Special Feature
H28397401	SS = stainless steel	0 400bar	¼" NPT Male	M12x1	Oxygen clean EX Area
H28397301	SS = stainless steel	0 25bar	¼" NPT Male	M12x1	Oxygen clean EX Area

### ACCESSORIES

Item No.	Denomination	Length
COM003703	Cable M12x1 - 4 pins	2 m

TECHNICAL DATA	
<b>Performance</b>	
Accuracy:	<math>\leq \pm 0,50\% \text{ of span}</math>
Output signal:	4...20mA
Operating temperature medium:	-15°C to +70°C
Operating temperature ambient:	-15°C to +70°C
Manufacture's information and certificates:	SIL 2, Functional safety, MTTF:>100 years China RoHS directive
Long term stability	<math>\leq \pm 0,2\% \text{ of span/year}</math>
<b>Mechanical Configuration</b>	
Pressure Port	¼" NPT Male
Electrical Connection	M12x1 – 4 pin
Parts in Contact with Gas	Stainless Steel
Enclosure	IP65 (IP 68 also available)
Power Supply	24 VDC
Vibration resistance	20 g
Shock resistance:	1,000 g
Approvals:	ATEX, IECEx, FM, CSA, SIL rating per IEC61508/ IEC 61511

## PRESSURE TRANSMITTER 4-20 mA NON CORROSIVE GASES AND OXYGEN



Small compact pressure transmitter with good performance  
 For inert, non-corrosive gases and gas mixtures, Oxygen  
 Not for Hydrogen and EX-Areas  
 Oxygen clean  
 > 0...25 bar and 0...400 bar (0...360 psi and 0...5456 psi)  
 > High proof pressures  
 > Broad choice of outputs  
 > RoHS Compliant

### BASIC DIMENSIONS



Item No.	Material	Pressure range	Mechanical Connection	Electrical Connection	Special Feature
<b>H28397001</b>	SS = stainless steel	0 - 400bar	¼" NPT Male	M12x1	Oxygen clean
<b>H28397101</b>	SS = stainless steel	0 - 25bar	¼" NPT Male	M12x1	Oxygen clean

TECHNICAL DATA	
<b>Performance</b>	
<b>Long Term Drift:</b>	0.2% FS/YR (non-cumulative)
<b>Accuracy:</b>	0.25%FS
<b>Thermal Error:</b>	0.83%FS/100°F (1.5% FS/100°C)
<b>Compensated Temperatures:</b>	-40°C to +125°C
<b>Operating Temperatures:</b>	-40°C to +125°C
<b>Zero Tolerance:</b>	0.5% of span
<b>Span Tolerance:</b>	0.5% of span
<b>Fatigue Life:</b>	Designed for more than 100 M cycles
<b>Mechanical Configuration</b>	
<b>Pressure Port:</b>	¼" NPT Male
<b>Electrical Connection:</b>	M12x1 – 4 pin
<b>Parts in Contact with Gas:</b>	17-4 PH Stainless Steel
<b>Enclosure:</b>	IP67 (IP65 for electrical code G)
<b>Supply Voltage:</b>	2 Volts above full scale to 30 V DC max @ 4.5mA (6.5mA at output version)
<b>Vibration:</b>	40G peak to peak sinusoidal (Random Vibration: 20 to 100 Hz @ approx.. 40G) Peak per MIL-STD-810E
<b>Shock:</b>	Withstands free fall to IEC 68-2-32 procedure 1
<b>Approvals:</b>	CE, conform to European Pressure Directive, Fully RoHS compliant UL recognized files # E219842 & E174228
<b>Weight:</b>	35 grams
<b>Output signal:</b>	4...20mA

### ELECTRICAL CONNECTOR

- 1= Supply
- 2= No Connect
- 3= Return
- 4= No Connect

### ACCESSORIES

Connection Cable  
 COM003703



Pin No.	Wire color
1	Brown
3	Blue
No connect	Black

## SAFETY GAUGES G 1/4"

With G1/4"m connection, accuracy class 2.5



Item No.	Type	RM	Material	Display range			
				bar	psi	kPa	
H28150103	RM 50- 1.5 G	1.1	Brass / NI-CR	-1 – 1.5	-14.5 – 21	-100 – 150	
H28150101	RM 50- 1.5 G	1.1	SS	-1 – 1.5	-14.5 – 21	-100 – 150	
H28170103	RM 50- 2.5 G	1.5	Brass / NI-CR	0 – 2.5	0 – 35	0 – 250	
H28170101	RM 50- 2.5 G	1.5	SS	0 – 2.5	0 – 35	0 – 250	
H28170303	RM 50- 6 G	7.5	Brass / NI-CR	0 – 10	0 – 145	0 – 1000	
H28170301	RM 50- 6 G	7.5	SS	0 – 10	0 – 145	0 – 1000	
H28170503	RM 50- 16 G	1.8	Brass / NI-CR	0 – 25	0 – 360	0 – 250	
H28170501	RM 50- 16 G	1.8	SS	0 – 25	0 – 360	0 – 250	
H28256003	RM 50- 1.5 G	1.1	Brass / NI-CR	-1 – 1.5	-14.5 – 21	-100 – 150	R
H28176001	RM 50- 1.5 G	1.1	SS	-1 – 1.5	-14.5 – 21	-100 – 150	R
H28176103	RM 50- 2.5 G	1.5	Brass / NI-CR	0 – 2.5	0 – 35	0 – 250	R
H28176101	RM 50- 2.5 G	1.5	SS	0 – 2.5	0 – 35	0 – 250	R
H28176303	RM 50- 6 G	7.5	Brass / NI-CR	0 – 10	0 – 145	0 – 100	R
H28176301	RM 50- 6 G	7.5	SS	0 – 10	0 – 145	0 – 100	R
H28176403	RM 50- 10 G	13.5	Brass / NI-CR	0 – 18	0 – 260	0 – 1800	R
H28176401	RM 50- 10 G	13.5	SS	0 – 18	0 – 260	0 – 1800	R
H28176503	RM 50- 16 G	18	Brass / NI-CR	0 – 25	-14.5 – 360	0 – 250	R
H28176501	RM 50- 16 G	18	SS	0 – 25	-14.5 – 360	0 – 250	R

Gauge with inlet at 6 o'clock, other configurations on request! R = back entry

## SAFETY GAUGES RM 50, NPT1/4"

With inlet below, accuracy class 2.5



Item No.	Type	RM	Material	Display range			
				bar	psi	kPa	
H28160103	RM 50- 1.5 NPT	1.1	Brass / NI-CR	-1 – 1.5	-14.5 - 21	-100 – 150	
H28160101	RM 50- 1.5 NPT	1.1	SS	-1 – 1.5	-14.5 - 21	-100 – 150	
H28160303	RM 50- 5 NPT	3.7	Brass / NI-CR	-1 – 5	-14.5 - 70	-100 – 500	
H28160301	RM 50- 5 NPT	3.7	SS	-1 – 5	-14.5 - 70	-100 – 500	
H28160403	RM 50- 10 NPT	7.5	Brass / NI-CR	-1 – 10	-14.5 – 145	-100 – 1000	
H28160401	RM 50- 10 NPT	7.5	SS	-1 – 10	-14.5 – 145	-100 – 1000	
H28160603	RM 50- 18 NPT	13.5	Brass / NI-CR	-1 – 18	-14.5 – 260	-100 – 1800	
H28160601	RM 50- 18 NPT	13.5	SS	-1 – 18	-14.5 – 260	-100 – 1800	
H28160703	RM 50- 25 NPT	18	Brass / NI-CR	-1 – 25	-14.5 – 360	-100 – 2500	
H28160701	RM 50- 25 NPT	18	SS	-1 – 25	-14.5 – 360	-100 – 2500	
H28160903	RM 50- 80 NPT	60	Brass / NI-CR	0 – 80	0 – 1150	0 – 800	
H28160901	RM 50- 80 NPT	60	SS	0 – 80	0 – 1150	0 – 800	
H28161103	RM 50- 315 NPT	230	Brass / NI-CR	0 – 315	0 – 4500	0 – 31500	
H28161101	RM 50- 315 NPT	230	SS	0 – 315	0 – 4500	0 – 31500	
H28161203	RM 50- 400 NPT	300	Brass / NI-CR	0 – 400	0 – 5800	0 – 40000	
H28161201	RM 50- 400 NPT	300	SS	0 – 400	0 – 5800	0 – 40000	

### TECHNICAL DATA - SAFETY GAUGE

Accuracy classes: 2.5 / 1.6, safety level: according with EN 837, diameter: 50 mm (2") / 63 mm (2.48"), Material: Brass nickel-plated and chrome-plated CW614N (CuZn39Pb3), CW508L (CuZn37); CW453K (CuSn8) (Bourdon tube) depending on pressure range , stainless steel 316L (1.4404)

## FLASH BACK ARRESTORS



Item No.	Type	Inlet × Outlet	Material	Gas/max. pressure (bar)				
				A*	H	M	O	P
L000337	FS400	G1/4"m × G 1/4"f	Brass	-	10	12	-	8
L000454	FS400	G1/4"m × G 1/4"f	Brass-Cr	1.5	3.5	-	15	-
L000110	FS500	NPT1/4" × NPT1/4"m	SS	1.5	3.5	5	15	5
B000096	FS500	NPT1/4"m × NPT1/4"f	Brass-Cr	1.5	3.5	-	15	-
B000492	FS500	NPT1/4" × NPT1/4"f	SS	1.5	3.5	5	-	5
B000614	FS500	NPT1/4"m × NPT1/4"f	Brass	-	9	12	-	-
B000643	FS500	NPT1/4" × NPT1/4"f	SS	1.5	4	5	-	-
B000892	FS500	NPT1/4" × NPT1/4"f	Brass	1.5	10	12	-	12

\*) Acetylene C<sub>2</sub>H<sub>2</sub> (A), Hydrogen H<sub>2</sub> (H), Methane CH<sub>4</sub> (M), Oxygen O<sub>2</sub> (O), Propane C<sub>3</sub>H<sub>8</sub> (P)



## CYLINDER CONNECTIONS DIN 477

Complete, for FMD series 500 + 320, outlet NPT 1/4"m



Item No.	Type	Material	Connection thread
H03028855	FA 1	Brass / NI-CR	W 21.8 × 1/14" LH
H030288113	FA 1	SS	W 21.8 × 1/14" LH
H030289113	FA 5	SS	W 1" × 1/8" LH
H03029055	FA 6	Brass / NI-CR	W 21.8 × 1/14"
H030290113	FA 6	SS	W 21.8 × 1/14"
H030291113	FA 7	SS	G 5/8"
H030292113	FA 8	SS	W 1" × 1/8"
H03029355	FA 9	Brass / NI-CR	G 3/4
H030293113	FA 9	SS	G 3/4
H03029455	FA 10	Brass / NI-CR	W 24.32 × 1/14"
H030294113	FA 10	SS	W 24.32 × 1/14"
H030295113	FA 11	SS	R 3/8"
H03029855	FA 13	Brass / NI-CR	R 5/8"
H030298113	FA 13	SS	R 5/8"
H030296113	FA 14	SS	M 19 × 1.5 LH

## CYLINDER CONNECTIONS UNI 1144

Complete, for FMD series 500 + 320, outlet NPT1/4"m



Item No.	Type	Material	Connection thread
H03613764	FA UNI4 (UNI 4408)	SS	W 1 × 1/8"
H03608355	FA UNI1H (UNI 4405)	Brass / NI-CR	W 20 × 1/14" LH
H03608364	FA UNI1H (UNI 4405)	SS	W 20 × 1/14" LH
H03608155	FA UNI2 (UNI 4406)	Brass / NI-CR	W 21.7 × 1/14"
H03608164	FA UNI2 (UNI 4406)	SS	W 21.7 × 1/14"
H03608055	FA UNI5 (UNI 4409)	Brass / NI-CR	W 21.7 × 1/14"
H03608064	FA UNI5 (UNI 4409)	SS	W 21.7 × 1/14"
H03610450	FA UNI8 (UNI 4412)	Brass / NI-CR	W 24.51 × 1/14"
H03610401	FA UNI8 (UNI 4412)	SS	W 24.51 × 1/14"
H03616155	FA UNI6 (UNI 4410)	Brass / NI-CR	W 30 × 1/14"
H03616164	FA UNI6 (UNI 4410)	SS	W 30 × 1/14"
H03613064	FA UNI3 (UNI 4407)	SS	W 30 × 1/14" LH

## CYLINDER CONNECTIONS BS 341

Complete, for FMD series 500 + 320, outlet NP1/4"m



Item No.	Type	Material	Connection thread
H03610664	FA BS 341 No. 10	SS	G 1/2"
H03754901	FA BS 341 No. 2	SS	G 5/8" LH
H03603101	FA BS 341 No. 3	SS	G 5/8"
H03753373	FA BS 341 No. 4	Brass / NI-CR	G 5/8" LH
H03612701	FA BS 341 No. 3	SS	G 5/8" LH
H03753273	FA BS 341 No. 3	Brass / NI-CR	G 5/8"
XL2196	FA BS 341 No. 6	SS	G 5/8"
H03912764	FA BS 341 No. 13	SS	11/16" 20 TPI
H03755773	FA BS 341 No. 8	Brass / NI-CR	0.860" × 14 TPI
H03755701	FA BS 341 No. 8	SS	0.860" × 14 TPI

## CYLINDER CONNECTIONS NEN 3268

Complete, for FMD Series 500 + 320, inlet see below, outlet NPT 1/4"m

Item No.	Type	Material	Connection thread
H03609655	FA LU 1	Brass / NI- CR	W 21.8 × 1/14" LH
H036096117	FA LU 1	SS	W 21.8 × 1/14" LH
H03609856	FA LU 4	Brass / NI- CR	W 1" × 1/8" LH
H036098113	FA LU 4	SS	W 1" × 1/8" LH
H03608673	FA RI 2	Brass / NI- CR	G 5/8"
H036086151	FA RI 2	SS	G 5/8"
H03609555	FA RU 1	Brass / NI- CR	W 21.8 × 1/14"
H036095117	FA RU 1	SS	W 21.8 × 1/14"
H03610055	FA RU 3	Brass / NI- CR	W 24.32 × 1/14"
H036100117	FA RU 3	SS	W 24.32 × 1/14"
H03609756	FA RU 4	Brass / NI- CR	W 1"
H036097113	FA RU 4	SS	W 1"
H03608755	FA RU 6	Brass / NI- CR	W 28.806 × 1/14"
H036087117	FA RU 6	SS	W 28.806 × 1/14"
H036094113	FA LU Ø	SS	M 19 × 1,5 LH



## CYLINDER CONNECTIONS AFNOR

Complete, for FMD series 500+320, outlet NPT 1/4"m

Item No.	Type	Material	Connection thread
H03303473	FA C	Brass / NI-CR	ø 21.7 × 1.814
H033034151	FA C	SS	ø 21.7 × 1.814
H03608873	FA E	Brass / NI-CR	ø 21.7 × 1.814 LH
H036088151	FA E	SS	ø 21.7 × 1.814 LH
H03608973	FA F	Brass / NI-CR	ø 22.91 × 1.814
H036089151	FA F	SS	ø 22.91 × 1.814



## CYLINDER CONNECTIONS CGA

Complete, for FMD series 500 + 320, outlet NPT 1/4"m

Item No.	Type	Material	Inlet
H03614573	FA CGA 320	Brass / NI- CR	0.825" – 14 NGO RH EXT
H03614501	FA CGA 320	SS	0.825" – 14 NGO RH EXT
H03607673	FA CGA 350	Brass / NI- CR	0.825" – 14 NGO LH EXT
H03607601	FA CGA 350	SS	0.825" – 14 NGO LH EXT
H03619273	FA CGA 540	Brass / NI- CR	0.903" – 14 NGO RH EXT
H03619201	FA CGA 540	SS	0.903" – 14 NGO RH EXT
H03750073	FA CGA 580	Brass / NI- CR	0.965" – 14 NGO RH INT
H03750001	FA CGA 580	SS	0.965" – 14 NGO RH INT
H03607473	FA CGA 590	Brass / NI- CR	0.965" – 14 NGO LH INT
H03607401	FA CGA 590	SS	0.965" – 14 NGO LH INT



## HIGH PRESSURE COIL

In accordance with national standards, with hexagon nut, coil tube  $\varnothing$  6 mm. Material SS. Outlet, swivel nut M14  $\times$  1.5 mm or NPT 1/4"m. Pigtail tubing allows for connection of the gas panel with gas supply in a limited spatial area. Other variants of connection pipes on request.



Item No. M14 $\times$ 1.5f	Item No. NPT1/4"m	Inlet DIN
H27415664	H27448064	FA 1
H27415764	H27433264	FA 5
H27415864	H27427364	FA 6
H27416944	H27462464	FA 7
H27415964	H27446364	FA 8
H27416064	H27433464	FA 9
H27414564	H27433564	FA 10
H27416164	H27433664	FA 11
H27416264	H27433764	FA 13
H27416364	H27433864	FA 14

Item No. M14 $\times$ 1.5f	Item No. NPT1/4"m	Inlet DIN 477-5
H27451064	H27462201	FA 54
H27451264	H27505564	FA 57
H27451364	H27995301	FA 59
H27450760	H27516760	FA 54 H
H27450960	H27519660	FA 57 H
H27448264		FA 59 H

Item No. M14 $\times$ 1.5f	Item No. NPT1/4"m	Inlet CGA
	H279977151	296
H27420862		320
	H275176151	346
H27459064	H274398151	350
H27446764	H275141151	540
H27420962	H274399151	580
H27423062		590

Item No. M14 $\times$ 1.5f	Item No. NPT1/4"m	Inlet UNI 11144
	H27512964	4405
H27421864	H27507464	4406
H27421964	H27507564	4409
	H2751434151	4410
H27460064	H27507601	4412

Item No. M14 $\times$ 1.5f	Item No. NPT1/4"m	Inlet AFNOR
H27454201	H27454201	B
H274348151	H274348151	C
H274349151	H274349151	E
H27429250	H27429250	F
H27461101	H27461101	G

Item No. M14 $\times$ 1.5f	Item No. NPT1/4"m	Inlet BS 341
H27422464	H27428964	BS 3
	H27999164	BS 4
H27999264	H27212601	BS 8
H27430264	H274689151	BS 14
	H275142151	BS 15

## HIGH PRESSURE COIL

Item No. M14×1.5f	Item No. NPT1/4"m	Inlet NEN
H27460864	H27425062	LU1
H27212064	H27425364	LU4
H27438164	H274254151	RI2
H27420562	H27425862	RU1
H27420662	H27425562	RU3
	H27425164	RU4
	H27425262	RU6

## SPIRAL COIL

In accordance with national standards, tube  $\varnothing$  1/8", with hex nut, outlet NPT 1/4"m, material SS.  
Other variants of connection pipes on request.

Item No. NPT1/4"m	Inlet DIN
H27430564	FA 1
H27430664	FA 5
H27430764	FA 6
H27431064	FA 9
H27431164	FA 10
H27431264	FA 11
H27432264	FA 13
H27431364	FA 14

Item No. NPT1/4"m	Inlet UNI 11144
H27115664	4405
H27461264	4406
H27457964	4409
H27995764	4410
H27458864	4412

Item No. NPT1/4"m	Inlet AFNOR
H27460701	B
H27432001	C
H27435801	E
H27435901	F
H27506101	G

Item No. NPT1/4"m	Inlet BS 341
H27448401	BS 3
	BS 4
H27450101	BS 8
H27432764	BS 10
H27521264	BS 13
H274880151	BS 14
H274880151	BS 15

Item No. NPT1/4"m	Inlet NEN
	LU1
H27458664	LU4
	RI2
H274572113	RU1
	RU3
H274571113	RU4
	RU6



## FLEXIBLE HOSES

In accordance with EN ISO 10380 bar, with hex nut. Material SS. Inlet see below, outlet M14×1.5f mm or NPT 1/4"m. For safety reasons the flexible corrugated pipe comes equipped with a safety lines, which prevent uncontrolled whipping in the case of a hose breakage. The advantage of the corrugated pipe is a maximum mobility in relation to the gas supply.



Outlet M14,5x1,5 mm Item No.	Outlet NPT 1/4" m Item No.	Inlet DIN	Length
H27427264	H27429564	FA 1	1 m
H27428464	H27449064	FA 5	1 m
H27427764	H27429064	FA 6	1 m
H27428564	H27444864	FA 7	1 m
H27440064	H27431464	FA 8	1 m
H27428764	H27432164	FA 9	1 m
H27427664	H27428164	FA 10	1 m
H27440164	H27435664	FA 13	1 m
H27428864	H27506264	FA 14	1 m
H27428064	H27435464	FA 1	1.5 m
H27447364	H27458164	FA 5	1.5 m
H27427864	H27428364	FA 6	1.5 m
H27428664	H27212264	FA 7	1.5 m
H27447064	H27435564	FA 8	1.5 m
H27427464	H27429362	FA 9	1.5 m
H27427564	H27429664	FA 10	1.5 m
H27427964	H27451664	FA 11	1.5 m
H27429864	H27505364	FA14	1.5m
H27438764	H27451864	FA 1	3 m
H27444564	H27459164	FA 6	3 m
H27439664	H27451964	FA 10	3 m
H27446264	H27995164	FA 13	3 m
H27447964	-	FA 14	3 m
H27507701	H27508064	FA 54	1 m
		FA 57	1 m
	H27515701	FA 59	1 m
H27507801	H27506801	FA 54	1.5 m
H27462701	H27521301	FA 57	1.5 m
H27343101	H27515601	FA 59	1.5 m
H27995201		FA 54	3.0 m
		FA 57	3.0 m
		FA 59	3.0 m

Outlet M14,5x1,5 mm Item No.	Outlet NPT 1/4" m Item No.	Inlet CGA	Length
H27427264	H27519501	296	1 m
H27428464	H27485364	320	1 m
H27427764	H275179151	346	1 m
H27428564	H27514564	350	1 m
H27440064	H275177151	540	1 m
H27428764	H27514664	580	1 m
H27427664	H27518001	590	1 m
H27440164		296	1.5 m
H27428864	H27456064	320	1.5 m
H27428064		346	1.5 m
H27447364	H27520901	350	1.5 m
H27427864	H27521601	540	1.5 m
H27428664	H27516964	580	1.5 m
H27447064	H27521101	590	1.5 m

Item No. M14×1.5f	Item No. NPT1/4"m	Inlet UNI 11144	Length
	H27343064	4405	1 m
	H27437564	4406	1 m
	H27343764	4409	1 m
	H27342964	4410	1 m
	H27342864	4412	1 m
	H27342464	4405	1.5 m
	H27342664	4406	1.5 m
	H27507064	4409	1.5 m
	H27343864	4410	1.5 m
	H27342564	4412	1.5 m
		4405	3 m
		4406	3 m
		4409	3 m
		4410	3 m
	H27343564	4412	3 m

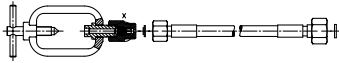
Item No. M14×1.5f	Item No. NPT1/4"m	Inlet AFNOR	Length
	H275197151	B	1 m
	H274357151	C	1 m
	H274421151	E	1 m
	H274420151	F	1 m
	H274522151	G	1 m
		B	1.5 m
	H274357151	C	1.5 m
	H274437151	E	1.5 m
H274521151		F	1.5 m
		G	1.5 m
		B	3 m
	H274599151	C	3 m
	H27515502	E	3 m
	H274424151	F	3 m
		G	3 m

Outlet M14,5x1,5 mm Item No.	Outlet NPT 1/4" m Item No.	Inlet BS 341	Length
<b>H27453101</b>	<b>H27415201</b>	BS 3	1 m
<b>H27457501</b>	<b>H27343201</b>	BS 4	1 m
	<b>H27508764</b>	BS 8	1 m
	<b>H27515064</b>	BS 14	1 m
	<b>H27515164</b>	BS 15	1 m
<b>H27461701</b>	<b>H27415301</b>	BS 3	1.5 m
<b>H27461001</b>	<b>H27515401</b>	BS 4	1.5 m
	<b>H27507864</b>	BS 8	1.5 m
<b>H27461364</b>		BS 14	1.5 m
	<b>H27507964</b>	BS 15	1.5 m
	<b>H27436501</b>	BS 3	3 m
	<b>H27343401</b>	BS 4	3 m
		BS 8	3 m
		BS 14	3 m
		BS 15	3 m

Item No. M14x1.5f	Item No. NPT1/4"m	Inlet UNI 11144	Length
	<b>H27444964</b>	LU1	1 m
	<b>H27449164</b>	LU4	1 m
	<b>H274425151</b>	RI2	1 m
	<b>H27441764</b>	RU1	1 m
	<b>H27442962</b>	RU3	1 m
	<b>H27447664</b>	RU4	1 m
	<b>H27447764</b>	RU6	1 m
	<b>H27445364</b>	LU1	1.5 m
		LU4	1.5 m
		RI2	1.5 m
		RU1	1.5 m
		RU3	1.5 m
		RU4	1.5 m
		RU6	1.5 m
	<b>H27486064</b>	LU1	3 m
		LU4	3 m
	<b>H274861151</b>	RI2	3 m
		RU1	3 m
		RU3	3 m
		RU4	3 m
		RU6	3 m

## ACETYLENE HIGH PRESSURE HOSES

With check valve and cylinder connection. Other connections on request.



Item No.	Connection
19037002001	DIN 477- 3
19037002002	DIN 477- 12
19037002003	CGA 300
19037002004	AFNOR Type H
19037002005	UNI 4411

## TUBE FITTINGS, STRAIGHT



Item No.	Type	Material
H03005103U	NPT 1/4"m × 1/8"	Brass
H03006103U	NPT 1/4"m × 1/4"	Brass
H03001103U	NPT 1/4"m × 6 mm	Brass
H03002103U	NPT 1/4"m × 8 mm	Brass
H03003003U	NPT 1/4"m × 10 mm	Brass
H03004003U	NPT 1/4"m × 12 mm	Brass
H03005101U	NPT 1/4"m × 1/8"	SS
H03006101U	NPT 1/4"m × 1/4"	SS
H03001101U	NPT 1/4"m × 6 mm	SS
H03002101U	NPT 1/4"m × 8 mm	SS
H03003001U	NPT 1/4"m × 10 mm	SS
H03004001U	NPT 1/4"m × 12 mm	SS
A000121U	G1/4"m × 1/8"	Brass / NI-CR
L000268U	G1/4"m × 1/4"	Brass / NI-CR
A000123U	G1/4"m × 6 mm	Brass / NI-CR
A000162U	G1/4"m × 8 mm	Brass / NI-CR
A000125U	G1/4"m × 10 mm	Brass / NI-CR
A000127U	G1/4"m × 12 mm	Brass / NI-CR
A000120U	G1/4"m × 1/8"	SS
L000264U	G1/4"m × 1/4"	SS
A000122U	G1/4"m × 6 mm	SS
A000161U	G1/4"m × 8 mm	SS
A000124U	G1/4"m × 10 mm	SS
A000126U	G1/4"m × 12 mm	SS
H03206103U	G 3/8"m × 1/4"	Brass
H03019303U	G 3/8"m × 6 mm	Brass
H03823803U	G 3/8"m × 8 mm	Brass
H03818603U	G 3/8"m × 10 mm	Brass
H03831103U	G 3/8"m × 12 mm	Brass
H03866301U	G 3/8"m × 1/8"	SS
H03889701U	G 3/8"m × 1/4"	SS
H03019301U	G 3/8"m × 6 mm	SS
H03823801U	G 3/8"m × 8 mm	SS
H03818601U	G 3/8"m × 10 mm	SS
H03831101U	G 3/8"m × 12 mm	SS

## TUBE FITTINGS, ELBOW 90°



Item No.	Type	Material
H03001203U	NPT 1/4"m × 6 mm	Brass
H03002303U	NPT 1/4"m × 8 mm	Brass
H03085203U	NPT 1/4"m × 10 mm	Brass
H03096403U	NPT 1/4"m × 12 mm	Brass
H03001201U	NPT 1/4"m × 6 mm	SS
H03002301U	NPT 1/4"m × 8 mm	SS
H03085201U	NPT 1/4"m × 10 mm	SS
H03096401U	NPT 1/4"m × 12 mm	SS

G1/4"m × 6, 8, 10, or 12 mm in brass and stainless steel on request !



## TUBE FITTINGS, T-SHAPE



Item No.	Type	Material
H03814703U	3 × 1/8" Tube	Brass
H03900703U	3 × 1/4" Tube	Brass
H03001303U	3 × 6 mm Tube	Brass
H03002803U	3 × 8 mm Tube	Brass
H03003303U	3 × 10 mm Tube	Brass
H03004103U	3 × 12 mm Tube	Brass
H03814701U	3 × 1/8" Tube	SS
H03900701U	3 × 1/4" Tube	SS
H03001301U	3 × 6 mm Tube	SS
H03002801U	3 × 8 mm Tube	SS
H03003301U	3 × 10 mm Tube	SS
H03004101U	3 × 12 mm Tube	SS

## TUBE FITTINGS, TUBE END 6 M



Item No.	Type	Material
H03849603U	6 mm × 1/8"	Brass
H03826103U	6 mm × 3 mm	Brass
H03826203U	6 mm × 4 mm	Brass
H03849601U	6 mm × 1/8"	SS
H03826101U	6 mm × 3 mm	SS
H03826201U	6 mm × 4 mm	SS

*Other Tube stub connections available on request !*

## HOSE NOZZLES, G-THREAD



Item No.	Type	Material
H03825573U	G1/4"m × 4 mm	Brass / NI-CR
H03825673U	G1/4"m × 6 mm	Brass / NI-CR
H03825773U	G1/4"m × 8 mm	Brass / NI-CR
H03825501U	G1/4"m × 4 mm	SS
H03825601U	G1/4"m × 6 mm	SS

## HOSE NOZZLES, HOSE END 6 MM



Item No.	Type	Material
H03825203U	6 mm × 4 mm	Brass
H03825303U	6 mm × 6 mm	Brass
H03825403U	6 mm × 8 mm	Brass
H03825201U	6 mm × 4 mm	SS
H03825301U	6 mm × 6 mm	SS

## ADAPTORS



Item No.	Type	Material
H03017803U	NPT 1/4"m × G 1/4"m	Brass
H03014853U	NPT 1/4"m × G 1/4"f	Brass / NI-CR
H03017801U	NPT 1/4"m × G 1/4"m	SS
H03014801U	NPT 1/4"m × G 1/4"f	SS
H03012801U	NPT 1/4"m × VCR 1/4"m	SS
H03013801U	NPT 1/4"m × VCR 1/4"f	SS

## HEXAGON BLIND PLUGS



Item No.	Type	Material
H220032151	NPT 1/4"m	SS
H220121151	G 1/4"m	SS
H220197151	G 3/8"m	SS

## GASKETS FOR G-THREADING

Minimum order 25 pcs. PVDF, 10 pcs. PCTFE



Item No.	Type	Size	Material
H09011816	11.2 × 5.5 × 1.2 mm	G 1/4"	PVDF
H09008916	11.2 × 5.5 × 1.5 mm	G 1/4"	PVDF
H09011716	11.2 × 5.5 × 1.8 mm	G 1/4"	PVDF
H09015716	11.2 × 5.5 × 2.1 mm	G 1/4"	PVDF
H09011809	11.2 × 5.5 × 1.2 mm	G 1/4"	PCTFE
H09008909	11.2 × 5.5 × 1.5 mm	G 1/4"	PCTFE
H09011709	11.2 × 5.5 × 1.8 mm	G 1/4"	PCTFE
H09009009	11.2 × 5.5 × 2.1 mm	G 1/4"	PCTFE
H09008915	11.2 × 5.5 × 1.5 mm	G 1/4"	PTFE
H09015916	14 × 9 × 2 mm	G 3/8"	PVDF
H09010309	14 × 9 × 2 mm	G 3/8"	PCTFE

## GASKETS FOR CYLINDER CONNECTIONS

For cylinder connections in accordance with DIN 477 ( minimum order 25 pcs. PVDF, 10 pcs. PCTFE)



Item No.	FA-Nr.	Material
H09015816	1, 6, 7, 9, 10, 12, 13	PVDF
H09010109	1, 6, 7, 9, 10, 12, 13	PCTFE
H09010216	5, 8	PVDF
H09010209	5, 8	PCTFE
H09015916	11, 14	PVDF
H09010309	11, 14	PCTFE

## GLOVES, TRANSPARENT

Single-use, minimum order 25 pcs.

Item No.	Material	Size
W619000	Latex	S, or 6 – 7
W619100	Latex	M, or 7 – 8
W619200	Latex	L, or 8 – 9
W656100	Latex strengthened	9 – 9 1/2
W649400	Plastic, white	XL

## GASKETS FOR M14×1.5 MM

Minimum order 25 pcs.

Item No.	Type	Material	Dimensions
H17000112	O- Ring	EPDM	6 × 2 mm
H17000111	O- Ring	FKM	6 × 2 mm
H09001116	Seal	PVDF	10 × 6 × 2 mm
H09001109	Seal	PCTFE	10 × 6 × 2 mm

## CHECK VALVES



Item No.	Material	Inlet	Outlet
<b>H45002060</b>	SS/ FKM	M 14 × 1.5 mm	NPT 1/4"m
<b>H03882603</b>	Brass/ Buna	NPT 1/4"f	NPT 1/4"m
<b>H03882601</b>	SS/ Viton	NPT 1/4"f	NPT 1/4"m
<b>B000638</b>	SS/ FKM	6 mm	NPT 1/4"m
<b>B000727</b>	SS/ EPDM	6 mm	NPT 1/4"m

## RELIEF VALVES

Direct acting, spring loaded valve, to safely release excess pressure.

Inlet NPT 1/4"m, outlet NPT 1/4"f,



Item No.	Type	Material	Activating Pressure
<b>B000637</b>	AV 500 BC 3,1 N14MN14F EPDM	Brass/ NI+CR/ EPDM	3,1 bar
<b>B000778</b>	AV 500 SS 3,1 N14MN14F FKM	SS/ FKM	3,1 bar
<b>B000645</b>	AV 500 BC 9,2 N14MN14F EPDM	Brass/ NI+CR/ EPDM	9,2 bar
<b>B000646</b>	AV 500 SS 9,2 N14MN14F FKM	SS/ FKM	9,2 bar
<b>B000631</b>	AV 500 BC 16,2 N14MN14F EPDM	Brass/ NI+CR/ EPDM	16,2 bar
<b>B000632</b>	AV 500 SS 16,2 N14MN14F FKM	SS/ FKM	16,2 bar
<b>B000636</b>	AV 500 BC 65 N14MN14F EPDM	Brass/ NI+CR/ EPDM	65 bar
<b>B000635</b>	AV 500 SS 65 N14MN14F FKM	SS/ FKM	65 bar

## PLASTIC HOSES

Available in lengths of 10 m

Item No.	Inside $\phi$ × outside $\phi$	Material
<b>H28800019</b>	6 mm × 4 mm	Polyethylene
<b>H27505015</b>	6 mm × 4 mm	Teflon
<b>H27505115</b>	8 mm × 6 mm	Teflon
<b>H27505215</b>	10 mm × 8 mm	Teflon

## VALVE MOUNTINGS

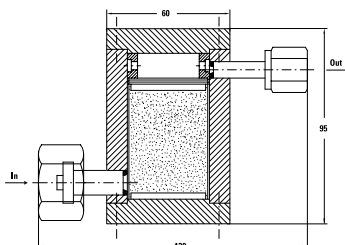
For valves MVA 500, MVK 41, MVR 500, MVA 501

Item No.	Type	Material
<b>H05018204</b>	For wall mounting	Aluminium
<b>H05023905</b>	Retaining bracket	Steel

## MOISTURE FILTERS

Recommended for chloric gases such as HCL, BF<sub>3</sub>, etc.

Item No.	Type	Description
<b>H51000164</b>	TF 750	Filter housing filled with molecular sieve
<b>H03108364</b>	TF 750	Filter insert



## FLOW METERS, WITH REGULATING VALVE

With metering valve, delivery includes conversion table, inlet/outlet NPT 1/4" f

### AIR



Item No.	Type	Material	Flow rate [l/h] at 1 bar (20°C)
H28030070	DK 800	Brass/ FKM	6 – 60
H28028270	DK 800	Brass/ FKM	25 – 250
H28028370	DK 800	Brass/ FKM	50 – 500
H28033170	DK 800	Brass/ FKM	240 – 2400
H28030060	DK 800	Brass/ VITON	6 – 60
H28028260	DK 800	Brass/ VITON	25 – 250
H28028360	DK 800	Brass/ VITON	50 – 500
H28033160	DK 800	Brass/ VITON	240 – 2400

### N<sub>2</sub> AND H<sub>2</sub>

Item No.	Type	Material	Flow rate [l/h]
H28032970	DK 800 for N2	Brass/ VITON	600 – 6000 at 1 bar (20°C)
H28032360	DK 800 for H2	SS/ VITON	16 – 160 at 2 bar

## HEATING SLEEVE

For FMD series 230 and 500. illustration with FMD 500-14.



Item No.	Type	Description
H28650119	ZB 500- Sleeve	230 V/ 90 W
H28650019	ZB 500- Sleeve	115 V/ 90W

## CYLINDER HOLDER



Item No.	Type	Description
H03110301	FH	profiled stainless steel sheet with belt
H03050220	Belt	replacement belt for cylinder holder

## ADJUSTMENT KNOBS FOR PRESSURE

### REGULATORS AND VALVES

Item No.	Type
H111004201	Replacement adjustment knob pressure regulator, black, Series 500
H110073201	Replacement adjustment knob shut-off valve, 90° black, Series 500
H110080201	Replacement adjustment knob regulating valve, black, Series 500
H040520204	Guide sleeve for replacement adjustment knob, Series 500
H110060204	Guide sleeve for valve, Series 500
H22005219	Screw for Series 500
321813960150	Replacement adjustment knob pressure regulator, black, Series 230
311112220612	Screw for Series 230
H110090210	Replacement adjustment knob pressure regulator, Series LAB 3000
H110091210	Replacement adjustment knob shut-off valve, Series LAB 3000
H110092210	Replacement adjustment knob regulating valve, Series LAB 3000

## SERVICE

Type
<b>Electrochemical</b> polishing of metal parts
Ultrasonic Cleaning
<b>Orbital Welding</b> of stainless steel
Flow rate measuring
<b>Repair Training</b> for pressure regulator and valves
<b>Service contracts</b> for high purity gas systems

## LABELS, SERIES 500, ADJUSTMENT KNOB + VALVE

For valve and pressure regulator adjustment knob, GCE Druva models

Item No.	Type	Material	Diameter
<b>H21003604</b>	for adjustment knob	PVC	ø 30 mm
<b>H21027304</b>	for valve	PVC	ø 17 mm

## LABELS, SERIES 3100, 400 AND 500

For valve and pressure regulator adjustment knobs, colour coding in accordance with DIN 12920

Type	Material	Diameter	Note
<b>Label for valve</b>	PVC	ø 17 mm	Indicate gas type
<b>Label for adjustment knob</b>	PVC	ø 30 mm	Indicate gas type

## LABELS FOR SMD/ BMD/ EMD

Gas specific, connection thread: 80 mm × 25 mm, please indicate gas type!

Item No.	Type	Material
<b>H210495xx*</b>	Self-adhesive laminate	PVC

## LEAK-DETECTION SPRAY

Item No.	Type	Description	
<b>W619600</b>	Leak detection spray	400 ml Canister	DVGW

## TEFLON TAPES

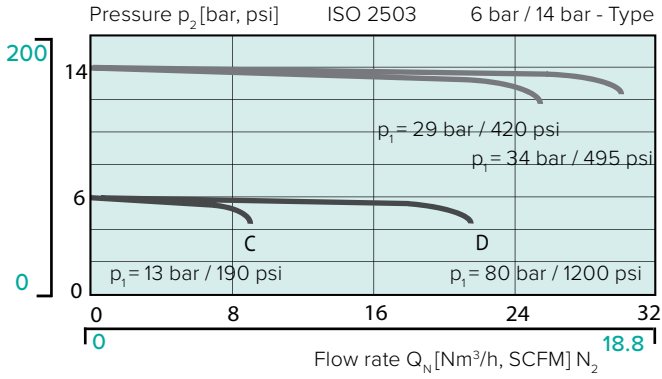
Item No.	Type	Material	Description
<b>W635600</b>	Teflon tape, width 1.5	PTFE	12 m × 12 mm × 0.1 mm
<b>W635500</b>	Teflon tape, width 1.6	PTFE	13.7 m × 12.3 mm × 0.1 mm

\*Contact us

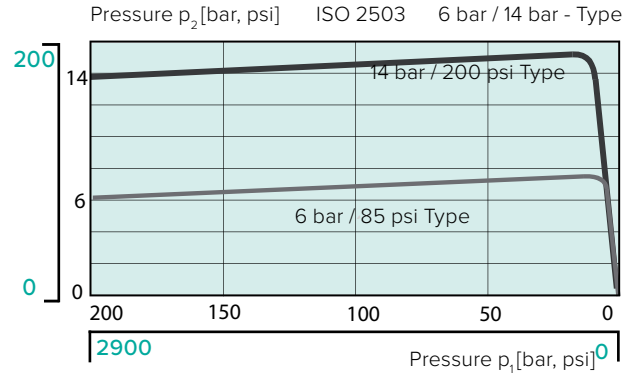
## PERFORMANCE CHARTS

### FMD + LMD 500

#### FLOW RATE CURVES

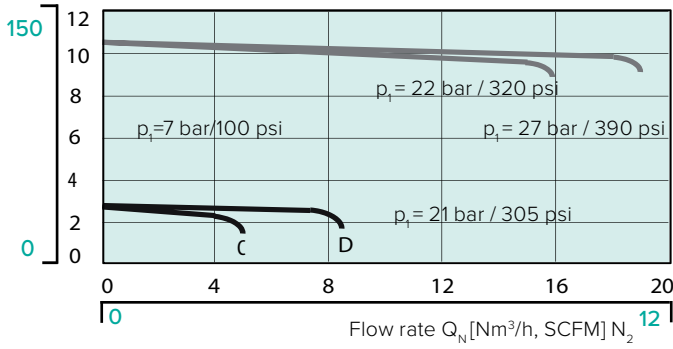


#### DYNAMIC DECOMPRESSION CURVE

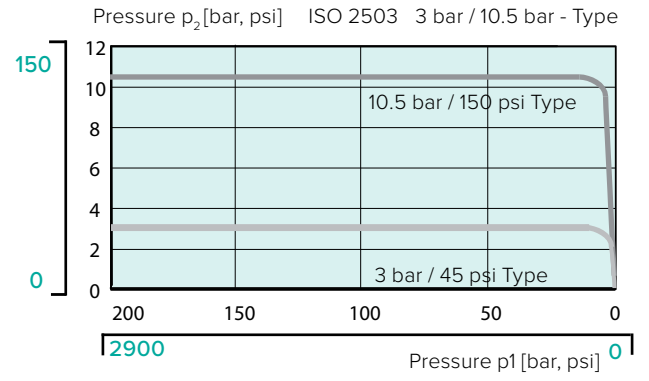


### FMD + LMD 502

Pressure  $p_2$  [bar, psi] ISO 2503 3 bar / 10.5 bar - Type

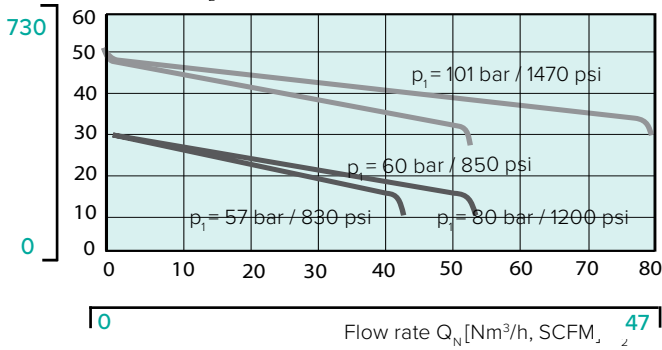


#### DYNAMIC DECOMPRESSION CURVE

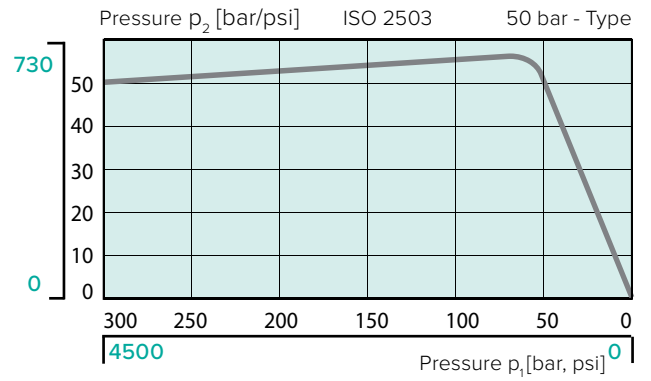


### FMD 530

Pressure  $p_2$  [bar, psi] ISO 2503 28 bar / 50 bar - Type

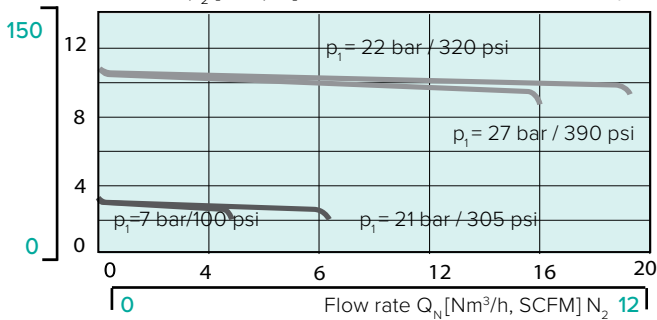


#### DYNAMIC DECOMPRESSION CURVE

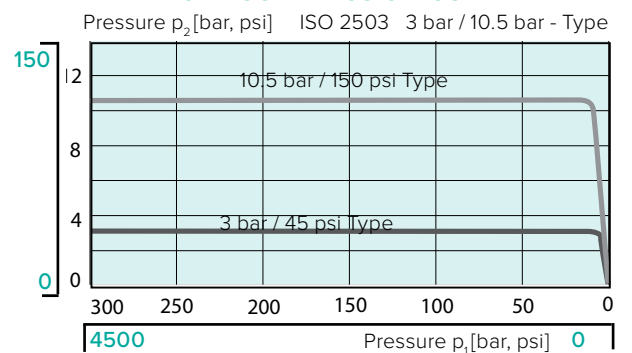


### FMD 532

Pressure  $p_2$  [bar, psi] ISO 2503 3 bar / 10.5 bar - Type



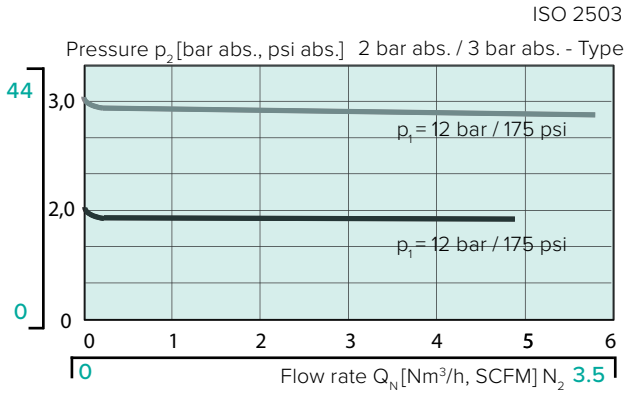
#### DYNAMIC DECOMPRESSION CURVE



## PERFORMANCE CHARTS

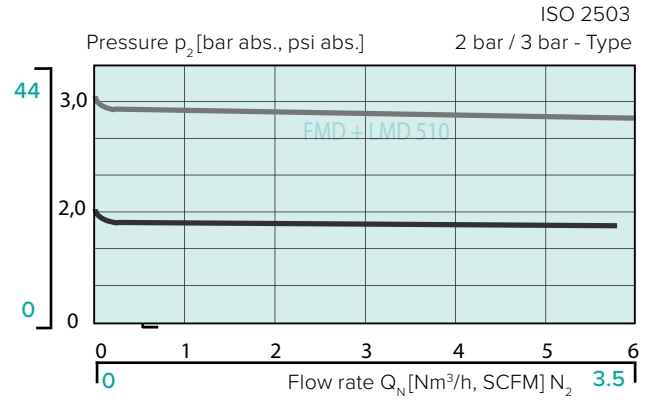
### FMD + LMD 510

#### FLOW RATE CURVES

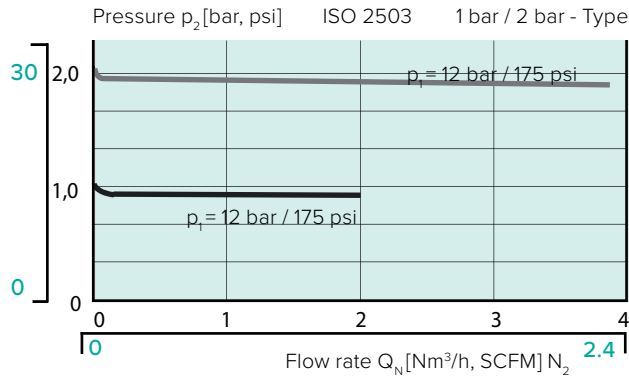


### FMD + LMD 522

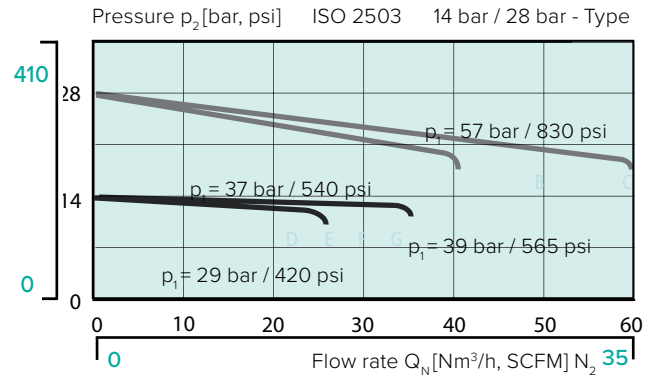
#### FLOW RATE CURVES



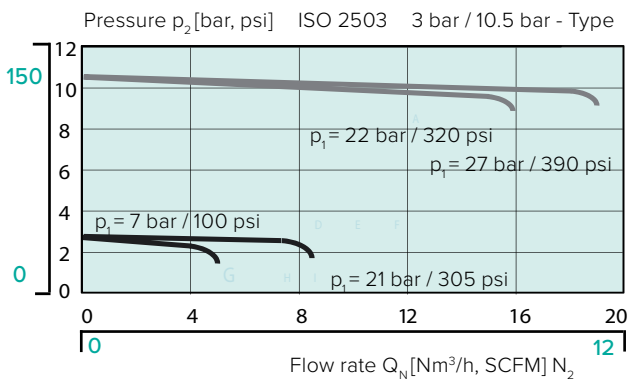
### FMD 540



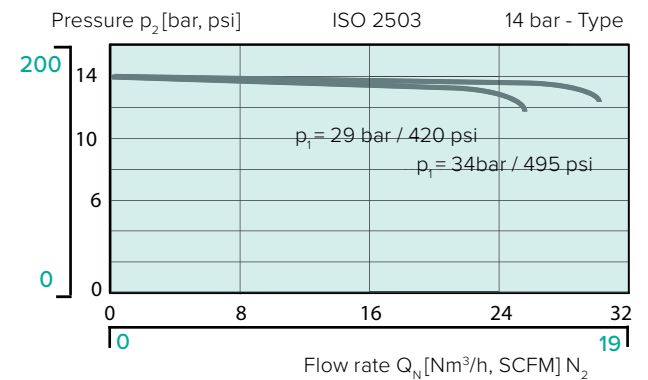
### SMD 500-16



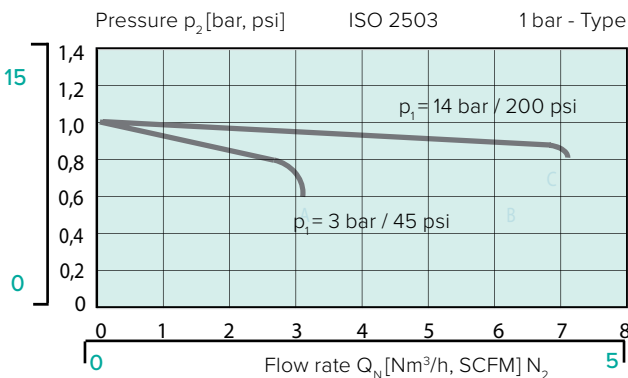
### SMD 502-16



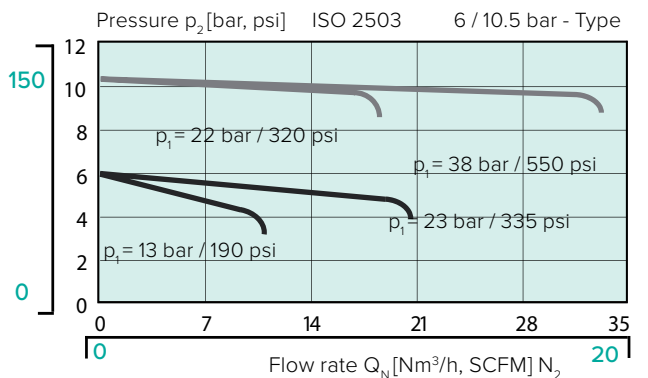
### BMD 500-30



### EMD 500

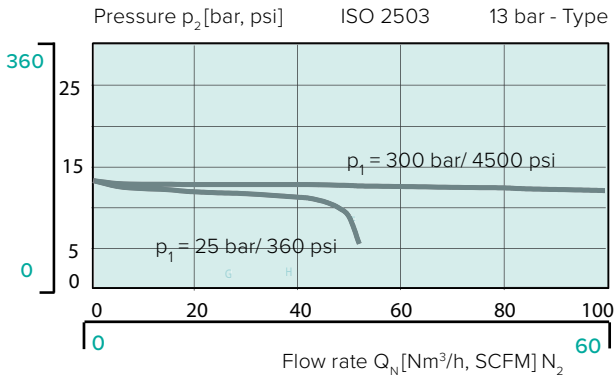


### EMD 500

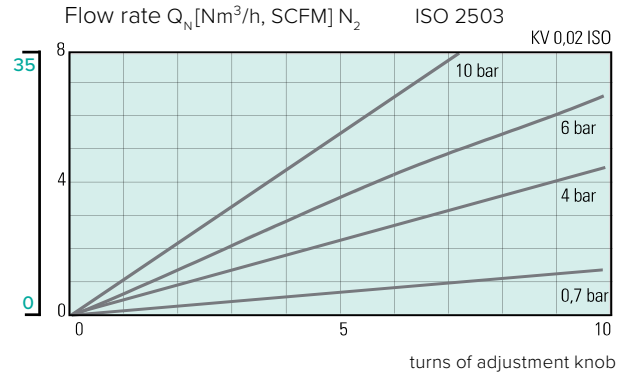


## PERFORMANCE CHARTS

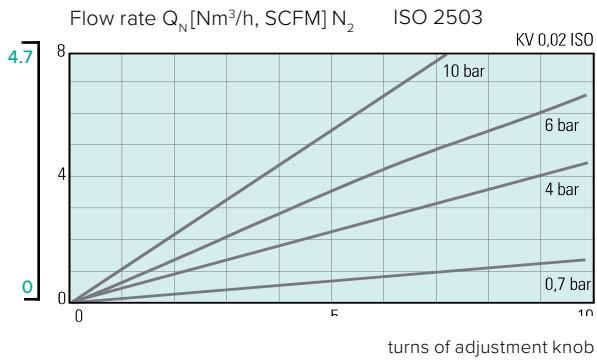
### FMD 100-14



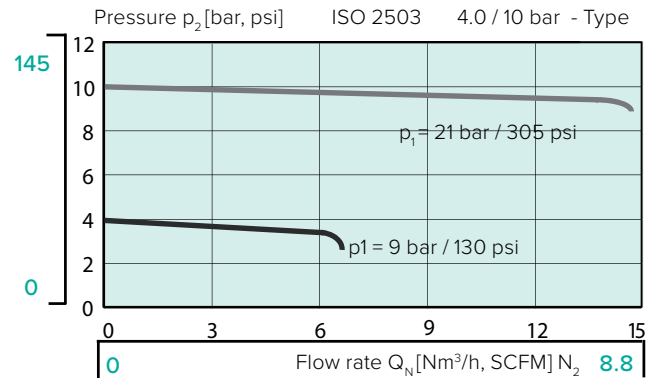
### FAV 500



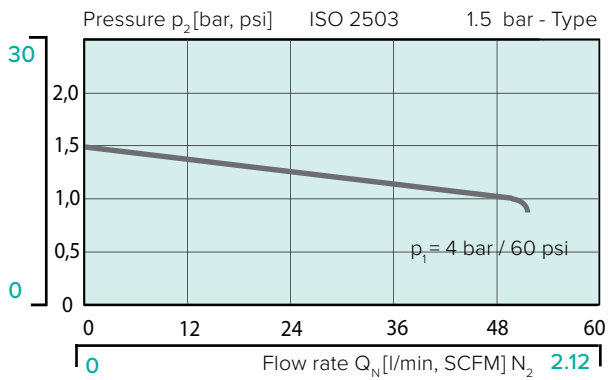
### MVR 500 G/W



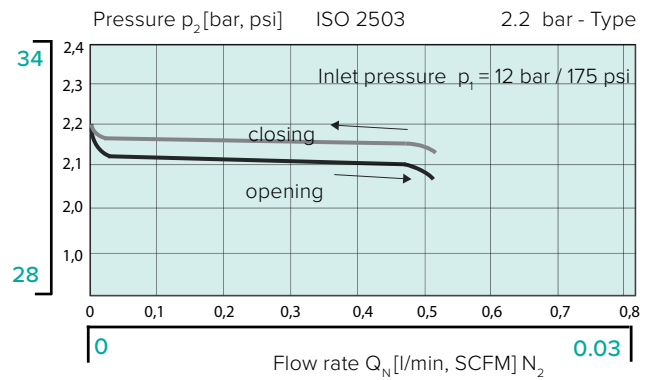
### LAB 3100



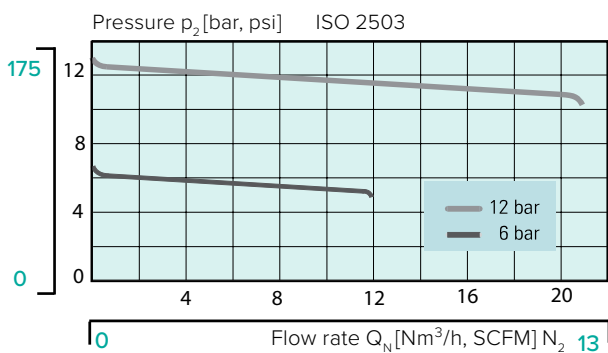
### LAB 3100



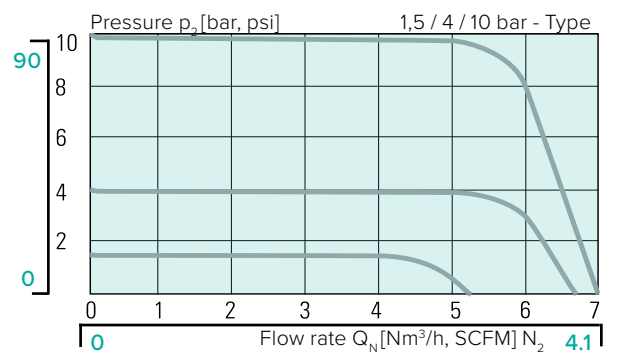
### LAB 3104



### FMD 300



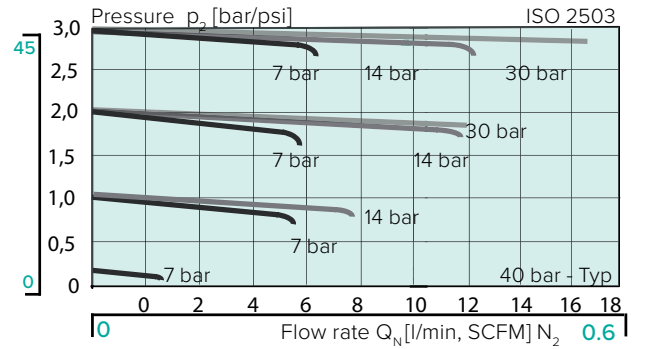
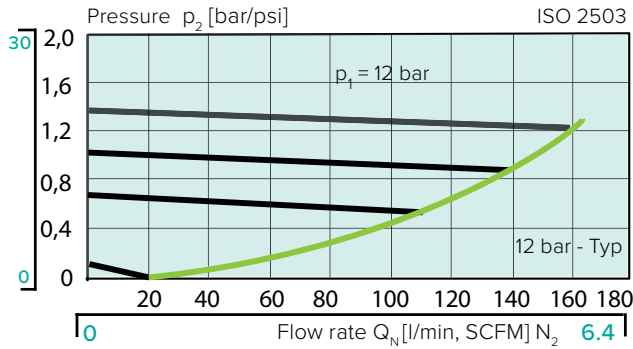
### FMD PRIOR



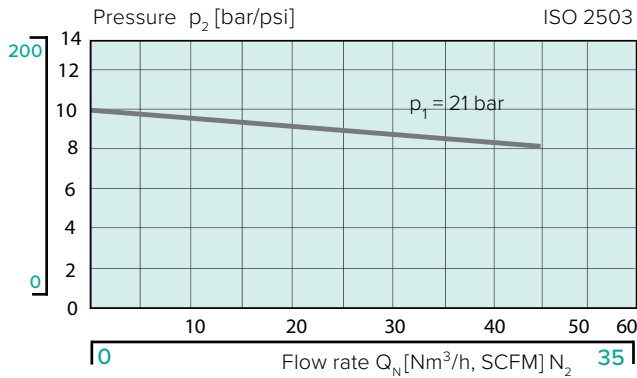


## PERFORMANCE CHARTS

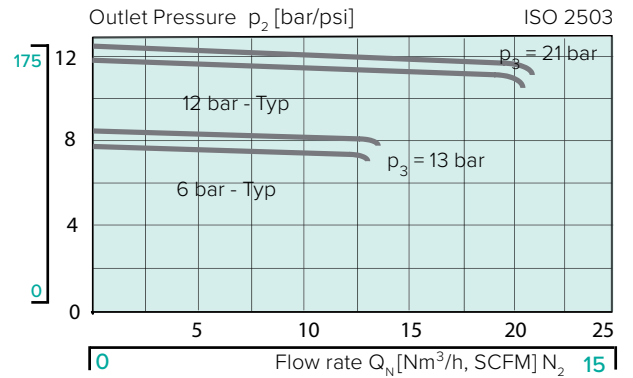
### LMD 545



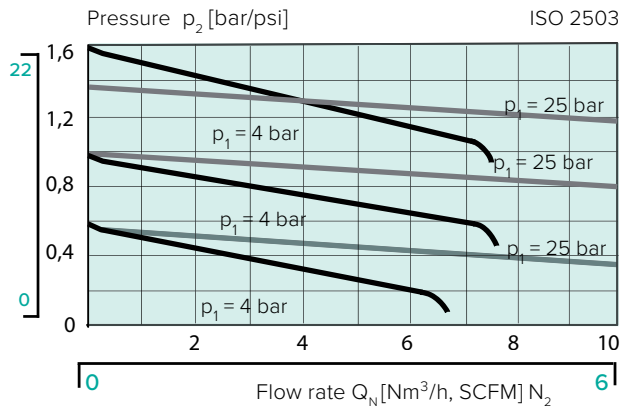
### FMD 230



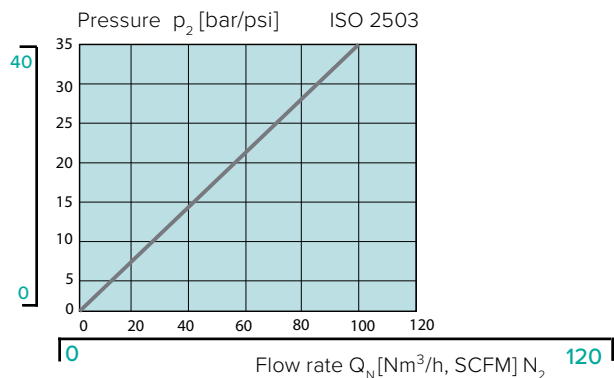
### BMD 500-35



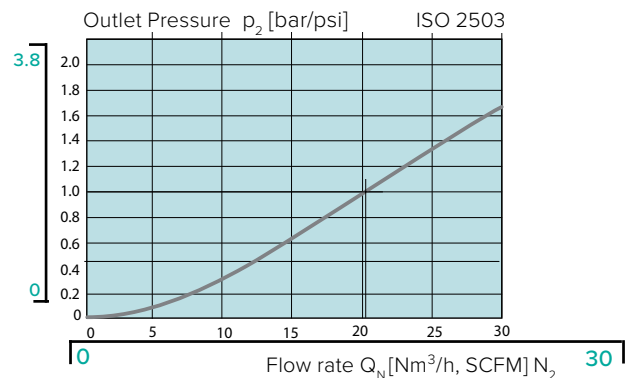
### BMD 202-39



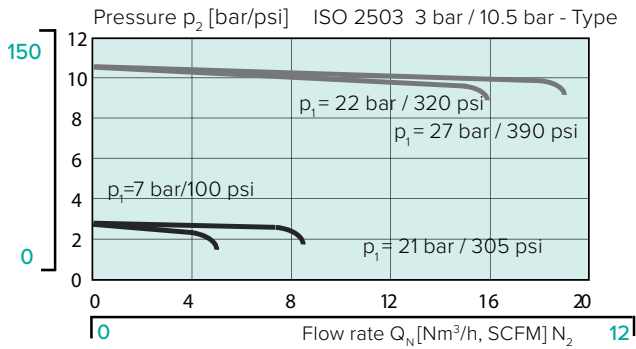
### MVA 500



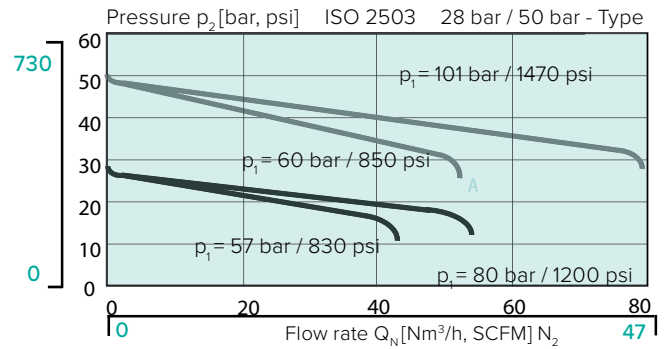
### MVA 501



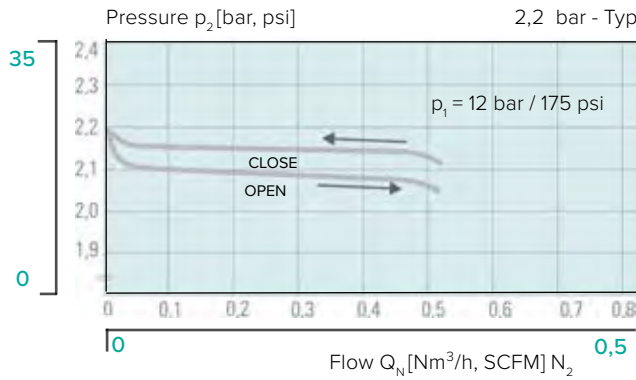
### FMD 320



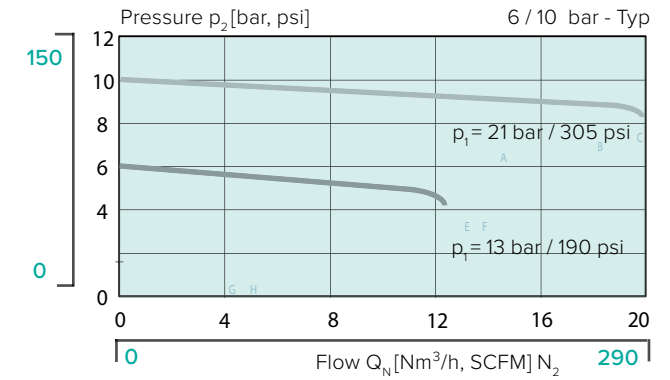
### FMD 322



### EMD 404



### EMD 400



## RECOMMENDATIONS FOR STAINLESS STEEL TUBING

MAXIMUM ALLOWABLE WORKING PRESSURE [PSI] FOR INCH SIZES STAINLESS STEEL TUBE											
Tube- Outside-Ø [inch]	Tube wall thickness [inch]										
	0,028	0,035	0,049	0,065	0,083	0,095	0,109	0,120	0,134	0,156	0,188
1/8	8500										
3/16	5400										
1/4	4000	5100									
5/16		4000	5800								
3/8		3300	4800								
1/2		2600	3700	5100							
5/8			2900	4000	5200						
3/4			2400	3300	4200	4900					
7/8			2000	2800	3600	4200	4800				
1				2400	3100	3600	4200	4700			
1 1/4					2400	2800	3300	3600	4100	4900	
1 1/2						2300	2700	3000	3400	4000	4900
2							2000	2200	2500	2900	3600

MAXIMUM ALLOWABLE WORKING PRESSURE [BAR] FOR METRIC STAINLESS STEEL TUBE														
Tube- Outside-Ø [mm]	Tube wall thickness [mm]													
	0.8	1	1.2	1.5	1.8	2	2.2	2.5	2.8	3	3.5	4	4.5	5
6	310	420												
8		310	390	520										
10		240	300	400										
12		200	250	330										
14		160	200	270	340									
15		150	190	250	310	360								
16			170	230	290	330								
18			150	200	260	290	320							
20			140	180	230	260	290	330						
22			140	160	200	230	260	300	340					
25					180	200	230	260	290	320				
28						180	200	230	260	280	330			
30						170	180	210	240	260	310			
32						160	170	200	220	240	290	330		
38							140	160	190	200	240	270	310	
50										150	180	210	240	270

Note: For gas applications select a tube wall thickness to the left of the corresponding allowed limit value. All tables serve as recommendations only. In any case, the relevant applicable guidelines, practises and norms, the condition of the materials and the surface must be taken into account.

Tube material: Top-quality, completely annealed hydraulic tubing of stainless steel (type 304, 304/304L, 316, 316/316L, 317, 317/317L) (seamless or welded and drawn) in accordance with ASTM A269 or A213 or comparable. The grade must not be more than 90 HRB or 200 HV. The tube must be scratch free and be suitable for bending and crimping. Tolerances of the outside diameter, by tubes with an outside diameter of 1/16 inch, may be maximum ± 0,003 inch.

## RECOMMENDATIONS FOR COPPER TUBING

MAXIMUM ALLOWABLE WORKING PRESSURE [PSI] FOR INCH TUBE IN COPPER										
Tube- Outside-Ø [inch]	Tube wall thickness [inch]									
	0.028	0.03	0.035	0.049	0.065	0.083	0.095	0.109	0.12	0.134
1/8	2700	3000	3600							
3/16	1800	1900	2300	3400						
1/4	1300	1400	1600	2500	3500					
5/16			1300	1900	2700					
3/8			1000	1600	2200					
1/2			800	1100	1600	2100				
5/8				900	1200	1600	1900			
3/4				700	1000	1300	1500	1800		
7/8				600	800	1100	1300	1500		
1				500	700	900	1100	1300	1500	
1 1/8					600	800	1000	1100	1300	1400

MAXIMUM ALLOWABLE WORKING PRESSURE [BAR] FOR METRIC TUBE IN COPPER										
Tube- Outside-Ø [mm]	Tube wall thickness [mm]									
	0.8	1	1.2	1.5	1.8	2	2.2	2.5	2.8	3
6	110	140	170	220						
8		100	120	160						
10		80	100	130						
12		60	80	100	130	140				
14		50	60	90	110	120				
15			60	80	100	110	120			
16				70	90	100	110	120		
18				60	80	90	100	110		
20				60	70	80	90	100	110	
22				50	60	70	80	90	100	
25				40	50	60	70	80	90	100
28					40	50	60	70	80	90

Note: For gas applications select a tube wall thickness to the left of the corresponding allowed limit value (in the green shaded area). All tables serve as recommendations only. In any case, the relevant applicable guidelines, practises and norms, the condition of the materials and the surface must be taken into account.

The permitted operational pressure are calculated with an S-value from 6000 psi (41.3 MPa) for ASTM B75 and ASTM B88 tube at -28 to 37°C (-20 to 100°F), as also specified in ASME B31.3 and ASME B31.1.

Material recommendation: Top-quality, soft-annealed, seamless copper tubing, ASTM B75 and EN 1057 or comparable.

## UNIT CONVERSION

VOLUMES						
	cm <sup>3</sup>	Litri	m <sup>3</sup>	(inch) <sup>3</sup>	(foot) <sup>3</sup>	gal
cm <sup>3</sup>	1	10 <sup>-3</sup>	10 <sup>-6</sup>	0.061	3.53x10 <sup>-5</sup>	2.642x10 <sup>-4</sup>
Liter	1000	1	10 <sup>-3</sup>	61.02	0.0353	0.2642
m <sup>3</sup>	10 <sup>6</sup>	1000	1	6.1x10 <sup>4</sup>	35.31	2.642x10 <sup>2</sup>
in <sup>3</sup> (inch)	16.39	1.64x10 <sup>-2</sup>	1.64x10 <sup>-5</sup>	1	5.79x10 <sup>-4</sup>	4.33x10 <sup>-2</sup>
ft <sup>3</sup> (foot)	2.83x10 <sup>4</sup>	28.32	0.0283	1.728x10 <sup>3</sup>	1	7.481
gal	3.785x10 <sup>3</sup>	3.785	2.83x10 <sup>-3</sup>	2.31x10 <sup>-2</sup>	0.1337	1

VOLUME FLOW								
	m <sup>3</sup> /h	l/h	ml/h	(foot) <sup>3</sup> /min SFPM	gal/min	(foot) <sup>3</sup> /s SFPS	l/s	cm <sup>3</sup> /s
m <sup>3</sup> /h	1	10 <sup>3</sup>	10 <sup>6</sup>	0.589	4.403	9.808x10 <sup>-3</sup>	0.2778	277.78
l/h	10 <sup>-3</sup>	1	10 <sup>3</sup>	5.887x10 <sup>-4</sup>	4.403x10 <sup>-3</sup>	9.808x10 <sup>-6</sup>	2.778x10 <sup>-4</sup>	0.2778
ml/h	10 <sup>-6</sup>	10 <sup>-3</sup>	1	5.887x10 <sup>-7</sup>	4.403x10 <sup>-6</sup>	9.808x10 <sup>-9</sup>	2.778x10 <sup>-7</sup>	2.778x10 <sup>-4</sup>
ft <sup>3</sup> /min	1.699	1.699x10 <sup>3</sup>	1.699x10 <sup>6</sup>	1	7.481	1.667x10 <sup>-2</sup>	0.4719	4.720x10 <sup>2</sup>
gal/min	0.227	2.271x10 <sup>-2</sup>	2.271x10 <sup>-5</sup>	0.133 67	1	2.228x10 <sup>-3</sup>	6.309x10 <sup>-2</sup>	63.09
ft <sup>3</sup> /s	1.019x10 <sup>-2</sup>	1.019x10 <sup>-5</sup>	1.019x10 <sup>-8</sup>	60	4.4877x10 <sup>-2</sup>	1	28.32	2.832x10 <sup>4</sup>
l/s	3.6	3.6x10 <sup>3</sup>	3.6x10 <sup>6</sup>	2.119	15.85	0.0353	1	10 <sup>3</sup>
cm <sup>3</sup> /s	3.6x10 <sup>-3</sup>	3.6	3.6x10 <sup>3</sup>	2.119x10 <sup>-3</sup>	1.585x10 <sup>-2</sup>	3.531x10 <sup>-5</sup>	10 <sup>-3</sup>	1

PRESSURE UNITS													
	bar	mbar	μbar	Pa	kPA	MPa	kp/mm <sup>2</sup>	kp/cm <sup>2</sup>	atm	mm Hg	m Ws	mm Ws	psi
bar	1	10 <sup>3</sup>	10 <sup>6</sup>	10 <sup>5</sup>	100	0.1	1.019x10 <sup>-2</sup>	1.019	0.986	7500x10 <sup>2</sup>	10.197	1.020x10 <sup>4</sup>	14.514
mbar	10 <sup>-3</sup>	1	10 <sup>3</sup>	100	0.1	10 <sup>-4</sup>	1.020x10 <sup>-5</sup>	1.020x10 <sup>-3</sup>	9.869x10 <sup>-4</sup>	0.750	1.020x10 <sup>-2</sup>	10.200	1.4514x10 <sup>-2</sup>
μbar	10 <sup>-6</sup>	10 <sup>-3</sup>	1	0.1	10 <sup>-4</sup>	10 <sup>-7</sup>	1.020x10 <sup>-8</sup>	1.020x10 <sup>-6</sup>	9.869x10 <sup>-7</sup>	7.5x10 <sup>-4</sup>	1.2x10 <sup>-5</sup>	1.2 10 <sup>-2</sup>	1.4514x10 <sup>-5</sup>
Pa	10 <sup>-5</sup>	10 <sup>-2</sup>	10	1	10 <sup>-3</sup>	10 <sup>-6</sup>	1.02x10 <sup>-7</sup>	1.02x10 <sup>-5</sup>	9.869x10 <sup>-6</sup>	7.501x10 <sup>-3</sup>	1.02x10 <sup>-4</sup>	0.10 <sup>2</sup>	1.4514 10 <sup>-4</sup>
kPA	10 <sup>-2</sup>	10	10 <sup>4</sup>	10 <sup>3</sup>	1	10 <sup>-3</sup>	1.02x10 <sup>-4</sup>	1.02x10 <sup>-2</sup>	9.869x10 <sup>-3</sup>	7.501	0.10 <sup>5</sup>	1.02x10 <sup>2</sup>	0.1451
MPa	10	10 <sup>4</sup>	10 <sup>7</sup>	10 <sup>6</sup>	10 <sup>3</sup>	1	0.10 <sup>5</sup>	10.197	9.869	7.501x10 <sup>3</sup>	1.02x10 <sup>2</sup>	1.02x10 <sup>5</sup>	1.451x10 <sup>2</sup>
kp/ mm <sup>2</sup>	980.7	9.807x10 <sup>4</sup>	9.807x10 <sup>7</sup>	9.807x10 <sup>6</sup>	9807	9.807	1	10 <sup>5</sup>	96.784	7.356x10 <sup>4</sup>	1000	10 <sup>6</sup>	1.423x10 <sup>3</sup>
kp/cm <sup>2</sup>	0.9807	980.7	9.807x10 <sup>5</sup>	9.807x10 <sup>4</sup>	98.07	9.807x10 <sup>-2</sup>	0.01	1	0.968	7.356x10 <sup>2</sup>	10	10 <sup>4</sup>	14.23
atm	1.013	1013	1.013x10 <sup>6</sup>	1.013x10 <sup>5</sup>	1.013x10 <sup>2</sup>	0.101	1.033x10 <sup>-2</sup>	1.033	1	76x10 <sup>2</sup>	10.332	1.033x10 <sup>4</sup>	14.7
mm Hg	1.333x10 <sup>-3</sup>	1.333	1333	1.333x10 <sup>2</sup>	0.133	1.333x10 <sup>-4</sup>	1.36x10 <sup>-5</sup>	1.36x10 <sup>-3</sup>	1.36x10 <sup>-3</sup>	1	1.36x10 <sup>-2</sup>	13.6	1.934x10 <sup>-2</sup>
m Ws	9.807x10 <sup>-2</sup>	98.07	9.807x10 <sup>4</sup>	9.807x10 <sup>3</sup>	9.807	9.807x10 <sup>-3</sup>	10 <sup>3</sup>	0.1	9.678x10 <sup>-2</sup>	7.356x10 <sup>1</sup>	1	10 <sup>3</sup>	1.423
mm Ws	9.807x10 <sup>-5</sup>	9.807x10 <sup>-2</sup>	98.07	9.807	9.807x10 <sup>-3</sup>	9.807x10 <sup>-6</sup>	10 <sup>6</sup>	10 <sup>-4</sup>	9.678x10 <sup>-5</sup>	7.356x10 <sup>-2</sup>	10 <sup>-3</sup>	1	1.423x10 <sup>-3</sup>
psi	0.0689	68.9	6.89x10 <sup>4</sup>	6.89x10 <sup>3</sup>	6.89	6.89x10 <sup>-3</sup>	7.028x10 <sup>-4</sup>	7.028x10 <sup>-2</sup>	6.803x10 <sup>-2</sup>	51.703	0.703	7.032x10 <sup>2</sup>	1

## GASES AND THEIR PROPERTIES

Gas	Formula	Flow rate rel. to N2	Cylinder pressure (20 °C) bar	Cylinder pressure (68 °F) psi	Cylinder connection accord. DIN 477	Gas type
Acetylene	C2H2	1.09	18	261	3	b
Ammonia	NH3	1.3	8.6	125	6	g/k
Argon	Ar	0.85	200	2900	6	i
Boron trifluoride	BF3	0.67	200	2900	8	g/k
Butadiene	C4H6	0.75	2.5	36	1	b/g
Butane	C4H10	0.72	2,1	30	1	b
Butylene	C4H8	0.73	2,6	38	1	b
Chlorine	Cl2	0,65	6,4	93	8	g/k
Hydrogen chloride	HCl	0,91	43	624	8	g/k
Deuterium	D2	2,6	100	1450	1	b
Nitrous Oxide	N2O	0,83	54,2	786	11	o
Air	DL	1	200	2900	13	o
Ethylene	C2H4	1,02	68	986	1	b/o
Ethane	C2H6	0,98	38	551	1	b/o
Helium	He	2,6	200	2900	6	i
Carbon Dioxide	CO2	0,83	53,7	780	6	o
Carbon monoxide	CO	1	151	2190	5	b/g
Krypton	Kr	0,59	200	2900	6	i
Methane	CH4	1,35	200	2900	1	b
Neon	Ne	1,12	200	2900	6	i
Propane	C3H8	0,83	8,3	120	1	b
Propylene	C3H6	0,87	10,3	149	1	b
Test gas					14	o
Oxygen	O2	0,96	200	2900	9	o
Sulphur dioxide	SO2	0,7	3,3	48	7	g/k
Sulphur hexafluoride	SF6	0,45	22,2	322	6	o
Hydrogen sulphide	H2S	0,91	18	261	5	b/g/k
Nitrogen	N2	1	200	2900	10	o
Nitric oxide	NO	0,96	50	725	8	g/k
Synthetische air	SL	1	200	2900	9	o
Tetrafluoromethane	CF4	0,57	100	1450	6	g/o
Hydrogen	H2	3,7	200	2900	1	b/o
Xenon	Xe	0,47	50	725	6	i

Key: b = flammable gas, i = Inert gas, g = toxic, k = corrosive, o = other

## CYLINDER CONNECTIONS ACCORDING TO DIN 477

Nr. DIN 477	Connection thread	Gases
1	W21.80×1/14" LH	1.3-Butadiene, Butane, 1-Butylene, Deuterium, Ethane, Ethene, Ethylene, Isobutane, Isobutylene, Methane, Propane, Propylene, Hydrogen
3	Yoke connection	Acetylene
5	W1"×1/8" LH	Carbon monoxide, Hydrogen sulphide
6	W21.80×1/14"	Ammonia, Argon, Helium, Carbon dioxide, Krypton, Neon, Sulphur hexafluoride, Tetrafluoromethane (R14), fluoroform (R23), Xenon
7	G 5/8"	Sulphur dioxide
8	1"	Boron trifluoride, Chlorine, Hydrogen chloride, Nitric oxide, Nitrogen monoxide,
9	G 3/4"	oxygen, test gas (with oxygen > 21 %)
10	W24.32×1/14"	Nitrogen
11	G 3/8"	Nitrous oxide (Normal connection)
13	G 5/8"	Pressurised air
14	M19×1.5 LH	Test gas (with oxygen < 21 %)

## DIN 477-Part 5, 315 bar

54	15.9 / 20.1	W30×2	non flammable, non toxic and non oxidising gases and gas mixtures
55	15.2 / 20.8	W30×2	non flammable, toxic and corrosive gases and gas mixtures
56	16.6 / 19.4	W30×2	pressurised air
57	15.2 / 20.8	W30×2 LH	flammable, non toxic gases and gas mixtures
58	15.9 / 20.1	W30×2 LH	flammable, toxic and corrosive or non corrosive gases and gas mixtures
59	17.3 / 18.7	W30×2	oxygen and oxidising, non toxic, non corrosive gases and gas mixtures
60	18 / 18	W30×2	oxidising, toxic and/or corrosive gases and gas mixtures



# APTECH GAS DELIVERY COMPONENTS





## SINGLE STAGE REGULATORS

Series	Model	Material	Hastelloy Internal	Tied Diaphragm	Inlet PSI/BAR	Outlet Max PSI/BAR	Absolute	C <sub>v</sub> STD/OPT	Flow SLPM STD/OPT	Connection Size Inch	Connection Type
AP	1000	S VAR	o	o	3500 / 241	150 / 10 150 / 10 500 / 35		0.09 / 0.15	30 / 100	1/4, 3/8	W
AZ		S	o	W							
AK		S, B	o	N							
AP	1100	S VAR	o		300 / 21	100 mm Hg to 10 psig	o	0.05	1	1/4, 3/8	W
AZ		S	o	W							
AP	1500	S VAR	o	o	3500 / 241 4500 / 310 opt	150 / 10		0.09	30	1/4, 3/8	W
AZ		S	o	W							
AK		S, B	o	N							
AP	1400T	S VAR	o	o	2300 / 159 3000 / 207 opt	150 / 10	o	0.45	400	1/4, 3/8, 1/2	W
AZ		S	o	W							
AK		S, B	o	N							
AP	1200	S VAR	o	o	1700 / 117 3000 / 207 opt	150 / 10		0.9 / 1.1	800 / 1500	1/4, 3/8, 1/2, 3/4	W
AZ		S	o	W							
AK		S, B	o	N							
AP	1300	S VAR	o		300 / 21	150 / 10		1.1	1100	1/4, 3/8, 1/2, 3/4	W
AZ		S	o	W							
AK		S	o	N							
AZ	9200	S		o	300 / 21	150 / 10		1.6	2000	3/4, 1	W
AK		S		o							N
AP	9000	S	o	o	1700 / 117 3000 / 207 opt	300 / 21		3	2000	1/2, 3/4, 1	W
AP	9100	S	o	o	800 / 55	150 / 10		4	5000	1/2, 3/4, 1	W

## MINI REGULATORS

Series	Model	Material	Hastelloy Internal	Tied Diaphragm	Inlet PSI/BAR	Outlet Max PSI/BAR	Absolute	C <sub>v</sub> STD/OPT	Flow SLPM STD/OPT	Connection Size Inch	Connection Type
AP	500	S VAR	o		150 / 10	100 / 7	o	0.06 / 0.1	15 / 30	1/4, 3/8	W, IGS
AP	5200	S VAR	o	o	150 / 10	100 / 7	o	0.07 / 0.15	30 / 100	1/4, 3/8	W, IGS

## TWO STAGE REGULATORS

Series	Model	Material	Hastelloy Internal	Tied Diaphragm	Inlet PSI/BAR	Outlet Max PSI/BAR	Absolute	C <sub>v</sub> STD/OPT	Flow SLPM STD/OPT	Connection Size Inch	Connection Type
AP	1700	S VAR	o	o	3500 / 241	100 / 7		0.05	15	1/4, 3/8	W
AK		S, B	o	o	4500 / 310 opt	200 / 14					N
AP	5200	S VAR	o	o	3500 / 241	120 / 8		0.1	250	1/4, 3/8	W

Please review applicable data sheets prior to making final product selection. All specifications subject to change without notice.

o : Optional    o : Standard    W : Welded    N : Threaded or Compression    IGS : Surface mount (C & W seal)

## PNEUMATICALLY ACTUATED REGULATORS

Series	Model	Material	Hastelloy Internal	Tied Diaphragm	Inlet PSI/BAR	Outlet Max PSI/BAR	C <sub>v</sub> STD/OPT	Flow SLPM STD/OPT	Connection Size Inch	Connection Type
AP	10PA	S VAR	◦		3500 / 241	150 / 10	0.09 / 0.15	30 / 100	1/4, 3/8	W
AZ		S	◦	W						
AK		S, B	◦	N						
AP	15PA	S VAR	◦	◦	3500 / 241	150 / 10	0.09	30	1/4, 3/8	W
AZ		S	◦	W						
AK		S, B	◦							
AP	14PA	S VAR	◦	◦	2300 / 159 3000 / 207 opt	150 / 10	0.45	400	1/4, 3/8, 1/2	W
AZ		S	◦	W						
AK		S, B	◦	N						
AP	12PA	S VAR	◦	◦	1700 / 117 3000 / 207 opt	150 / 10	0.9 / 1.1	1200	1/4, 3/8, 1/2	W
AZ		S	◦	W						
AK		S, B	◦	N						
AP	90 PA	S	◦	◦	1700 / 117	150 / 10	3	3000	1/2, 3/4, 1	
AP	91 PA	S	◦	◦	800 / 55	150 / 10	4	7000	1/2, 3/4, 1	

## CROSSOVER MANIFOLDS

Series	Model	Material	Hastelloy Internal	Tied Diaphragm	Inlet PSI/BAR	Outlet Max PSI/BAR	C <sub>v</sub> STD/OPT	Gauge	Connection Size Inch	Connection Type
AP	M6	S VAR	◦	◦	3500 / 241	275 / 19	0.09	◦	1/4, 3/8	W
AK	M6	S, B	◦	◦				◦		1/4
AK	M8	S, B	◦	◦	3500 / 241	250 / 17	0.05	◦	1/4	N

## HIGH PRESSURE REGULATORS

Series	Material	Inlet PSI/BAR	Outlet Max PSI/BAR	Pneumatically Actuated	C <sub>v</sub> STD/OPT	Flow SLPM STD/OPT	Connection Type
KT10	S VAR	10,000 / 690	10,000 / 690	◦	0.06 / 0.12	1/4	N
		4000 / 280	4000 / 280				W*
		6000 / 414	6000 / 414				N
KT12		6000 / 414	2500 / 172	◦	0.8 / 2.0	1/2, 3/4	N
	S VAR	5000 / 345					

## BACK PRESSURE REGULATORS

Series	Model	Material	Operating Pressure Max PSI/BAR	C <sub>v</sub> STD/OPT	Flow SLPM STD/OPT	Connection Type
BP	1000	S VAR	300 / 21	0.3	1/4, 3/8	W*
		S, B			1/4	N

### Material description

S VAR : 316L SS VAR      S : 316L SS      B : Brass      \*KT10 Welded      \*BP1000 Welded N

Please review applicable data sheets prior to making final product selection.  
All specifications subject to change without notice.

◦ : Optional    ◦ : Standard    W : Welded    N : Threaded or Compression    IGS : Surface mount (C & W seal)

## PNEUMATIC VALVES

Series	Model	Material	Pressure Rating PSI / BAR	Type* Actuation	C <sub>v</sub> STD/OPT	Connection Size Inch	Connection Type	Two Step Metered and Full Flow	LOTO
AP	3540	S VAR	145 / 10	NC	0.29	1/4, 3/8	W, IGS		◦
AZ		S					W		
AK		S					N		
AP	3542	S VAR	125 / 9	NC	0.29	1/4, 3/8	W		
AZ		S					W		
AK		S					N		
AP	3550	S VAR	300 / 21	NC	0.29	1/4, 3/8	W		
AZ		S					W		
AK		S					N		
AP	3571	S VAR	125 / 9	NC	0.29	1/4, 3/8	W, IGS	◦	◦
AZ		S					W		
AK		S					N		
AP	3580	S VAR	250 / 17	NO	0.29	1/4, 3/8	W, IGS		◦
AZ		S					W		
AK		S					N		
AP	3000	S VAR	3000 / 207	NC	0.23 / 0.28	1/4, 3/8	W		◦
AZ		S					W		
AK		S					N		
AP	3080	S VAR	3000 / 207	NO	0.23	1/4, 3/8	W		◦
AZ		S					W		
AK		S					N		
AP	3004	S VAR	3700 / 255	NC	0.23	1/4, 3/8	W		◦
AZ		S					W		
AK		S					N		
AP	3007	S VAR	300 / 21	NC	0.23	1/4, 3/8	W		◦
AZ		S					W		
AK		S					N		
AP	4540	S VAR	125 / 9	NC	0.5	1/4, 3/8	W, IGS		◦
AZ		S					W		
AK		S					N		
AP	4542	S VAR	250 / 17	NO	0.5	1/4, 3/8	W, IGS		
AZ		S					W		
AK		S					N		
AP	4550	S VAR	3000 / 207	NC	0.5	1/4, 3/8	W		
AZ		S					W		
AK		S					N		
AP	4571	S VAR	3000 / 207	NO	0.5	1/4, 3/8	W		◦
AZ		S					W		
AK		S					N		
AP	4580	S VAR	3700 / 255	NC	0.5	1/4, 3/8	W		◦
AZ		S					W		
AK		S					N		
AP	4000	S VAR	3700 / 255	NC	0.35	1/4, 3/8	W		◦
AZ		S					W		
AK		S					N		
AP	3113	S VAR	1300 / 90	NC	1.0	1/4, 3/8	W		◦
AP	3130	S VAR	3000 / 207	NC	0.7	1/4, 3/8	W		◦
AP	3700	S VAR	250 / 17	NC	2.8	1/4, 3/8	W		
AP	3708	S VAR	250 / 17	NO	2.8	1/4, 3/8	W		

\*NC = Normally closed, NO = Normally open

Please review applicable data sheets prior to making final product selection.  
All specifications subject to change without notice.

◦ : Optional    ◦ : Standard    W : Welded    N : Threaded or Compression    IGS : Surface mount (C & W seal)

LOTO : Lockout / tagout

## MANUAL VALVES

Series	Model	Material	Pressure Rating PSI / BAR	Type Actuation	Open / Closed Indication	C <sub>v</sub> STD/OPT	Connection Size Inch	Connection Type	LOTO
AP	3600	S VAR	3000 / 207	Knob, multi turn		0.29	1/4, 3/8	W	
AZ		S						W	
AK		S						N	
AP	3604	S VAR	3700 / 255	Knob, multi turn		0.29	1/4, 3/8	W	
AZ		S						W	
AK		S						N	
AP	3625	S VAR	3000 / 207	Lever, 1/4 turn	◦	0.29	1/4, 3/8	W, IGS	◦
AZ		S						W	
AK		S						N	
AP	3624	S VAR	3700 / 255	Lever, 1/4 turn	◦	0.29	1/4, 3/8	W	
AZ		S						W	
AK		S						N	
AP	3627	S VAR	4500 / 310	T Handle, 1/4 turn	◦	0.29	1/4	W	
AZ		S						W	
AK		S						N	
AP	3650	S VAR	3000 / 207	Knob, 1/4 turn	◦	0.23 / 0.28	1/4, 3/8	W	
AZ		S						W	
AK		S						N	
AP	3652	S VAR	3000 / 207	Knob, 1/4 turn	◦	0.23	1/4, 3/8	W	
AZ		S						W	
AK		S						N	
AP	3657	S VAR	3000 / 207	Knob, pull turn	◦	0.23	1/4, 3/8	W	◦
AZ		S						W	
AK		S						N	
AP	4600	S VAR	300 / 21	Knob, multi turn		0.23	1/4, 3/8	W	
AZ		S						W	
AK		S						N	
AP	4625	S VAR	250 / 17	Lever, 1/4 turn	◦	0.5	1/4, 3/8, 1/2	W	◦
AZ		S						W	
AK		S						N	
AP	4650	S VAR	3000 / 207	Knob, 1/4 turn	◦	0.5	1/4, 3/8, 1/2	W	
AZ		S						W	
AK		S						N	
AP	4652	S VAR	3000 / 207	Knob, 1/4 turn	◦	0.5	1/4, 3/8	W	
AZ		S						W	
AK		S						N	
AP	4657	S VAR	3700 / 255	Knob, pull turn	◦	0.5	1/4, 3/8, 1/2	W	◦
AZ		S						W	
AK		S						N	
AP	3100	S VAR	3000 / 207	Knob, multi turn		0.7 / 1.3	1/2	W	
AP	3125	S VAR	3000 / 207	Lever, 1/4 turn		1.0	1/2		◦
AP	3150	S VAR	1300 / 90	Knob, 1/4 turn		1.0	1/2	W	
AP	3157	S VAR	1300 / 90	Knob, pull turn		1.0	1/2	W	
AP	3800	S VAR	250 / 17	Knob		2.8	3/8, 1/2, 3/4	W	
AP	3900	S VAR	250 / 17	Knob, pull turn		2.8	3/8, 1/2, 3/4	W	

\*NC = Normally closed, NO = Normally open

◦ : Optional    ◦ : Standard    W : Welded    N : Threaded or Compression    IGS : Surface mount (C & W seal)    LOTO : Lockout / tagout

### METAL SEATED VALVES

Model	Material	Pressure Rating PSI / BAR	Type Actuation	C <sub>v</sub> STD/OPT	Connection Size Inch	Connection Type
AP 3200	S VAR	125 / 9	Pneumatic, NC	0.27	1/4, 3/8	W
AP 3260	S VAR	125 / 9	Knob, multi turn	0.27	1/4, 3/8	W

### CHECK VALVE

Model	Material	Pressure Rating PSI / BAR	C <sub>v</sub>	Cracking Pressure PSI / BAR	Connection Size Inch	Connection Type
AP 64	S VAR	3500 / 241	0.4 max	3 / 0.23	1/4	W

### VACUUM GENERATORS

Model	Material	Vacuum Efficiency In Hg / Torr	Modules*	Connection Size Inch	Connection Type
AP 7	S VAR	26 / 100		1/4, 3/8	W
AP 70	S VAR	26 / 100			
AP 71	S VAR	26 / 100	•		
AP 72	S VAR	26 / 100	•	1/4, 3/8	W

\*Monoblock vacuum generator, N2 supply valve and check valve

### FLOW SWITCHES

Model	Material	Pressure Max PSI / BAR	Trip Points SLPM @ 100 psi N <sub>2</sub>	Connection Size Inch	Connection Type
AP 74	S VAR	3500 / 267	2, 5, 10, 25, 50, 100	1/4	W
AP 74B	S VAR	3500 / 241	225, 350, 500, 950	1/2	W
		2400 / 163	1100, 1650, 2600	3/4	W
		2200 / 152	3000, 4000	1	W
		1300 / 90	5000, 6000	1-1/2	W

### SERIES FEATURES

Model	Cleanroom Assembly	N <sub>2</sub> Testing	Helium Testing	Connection Type				Material	EP	Surface Finish STD / OPT in μ inches
				W Face Seal	W Tube Stub	N NPT	N Compression			
AP	•	•	•	•				SVAR	•	15 / 10, 7, 5 Ra max
AZ	•	•	•	•				S	•	10 Ra avg
AK		•				•		S, B		63 Ra avg
KT		•				•		S, B		63 Ra avg

◦ : Optional    • : Standard    W : Welded    N : Threaded or Compression

# ULTRA CLEAN PRODUCTS

## BY DESIGN\*

- > No particle generating sliding or abrading parts in the flow path
- > Minimal surface area and internal volume
- > Proper surface chemistry and low Ra values
- > Only metal seals to atmosphere
- > All internal threads isolated from media



## BY MANUFACTURING\*

- > Certified Class 100 Clean Room for welding, cleaning, assembly, test and packaging operations
- > Hot DI cleaning and bake out
- > Rigorous 100% inspection, verification and testing at each manufacturing step

## BY **APT**tech

- > Uncompromising quality, performance and reliability
- > Renown delivery, service and support
- > Custom monoblock integrated component configurations
- > Special fitting, porting, testing and dimension options
- > Utmost flexibility to customer's needs





# MASS FLOW CONTROLLER





# MASS FLOW CONTROLLER PROGRAM

## WORLD LEADER IN FLOW TECHNOLOGY FOR OVER 35 YEARS

With AERA® and SAM® Mass Flow Controllers these product ranges apply as a world leader in flow technology for over 35 years. The success is based on many properties that were in charge of developing MFC: A fast, repeatable, accurate, reliable, field-proven technology; absolute and differential pressure control, enabling stable

process control; last but not least multi-gas, multi-range, pressure-insensitive and live-gas certified MFCs. Our customers, often market leaders in their industry, verify the top quality of our products integrating both series into gas handling system solutions of the highest quality standard demand.

### Aera

Worldwide, the AERA® brand is synonymous with high-quality, high-performing designs that are backed by exceptionally responsive customer service. AERA®'s has an outstanding reputation for digital MFC reliability and performance with shipments of over 100 000 digital MFC units.

#### SERIES R7700/R7800

AERA® 7700 delivers precise flow control, while offering the economic benefits of elastomer seals. AERA® 7800 shows precise flow control as well as the corrosion resistance and high leak integrity of metal seals.

#### SERIES DR980

AERA® DR980 deliver performance excellence and operational versatility.

#### SERIES TRANSFORMER®

AERA® Transformer will transform your process, providing superior flexibility and efficiency for improved yield, higher productivity, and lower cost of ownership.

#### SERIES PI-980®

The AERA® PI-980® pressure-insensitive MFC's anticipate the increasing demands of next-generation manufacturing and reduce gas panel footprint and cost.

### SAM

From the release of the first of our MFCs, SAM® brand high-performance mass flow controllers continue in the tradition of perfection. High corrosion resistance and stable control performance are possible thanks to our waveform diaphragm made of Ni-Co alloy.

#### SERIES F

SAM® controllers that are equipped with these technologies enjoy a well deserved reputation from globally recognized customers. Real SAM®-brand products are highly valued as premium performance design.

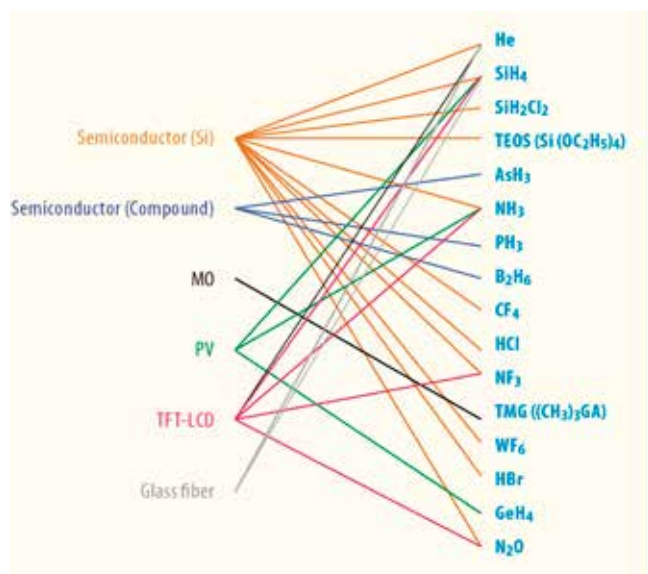
#### SERIES FX

While inheriting the tradition of our earlier Mass Flow Controllers, the FX series is a bold advance into the next generation. The major element of innovation is the combination of technologies derived from the G series. Not such advanced as G with its full scale PI function, they have greater PI performance as the F series.

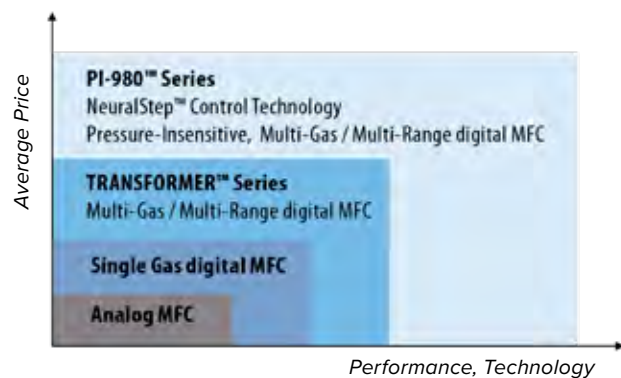
#### SERIES G

This SAM® G design is positioned to play a major role in the next generation of controllers. The G series is an all-in-one mass flow controller that meets or exceeds the next generation of requirements, a step ahead of the competition. These advances are in response to our customers' needs for high level functions.

## MOST FREQUENTLY REQUESTED GAS TYPES



## AERA TECHNOLOGY DEVELOPMENT



## MFC APPLICATION AREAS

Analytical Instruments, Biopharmaceuticals, Catalysis, Cell culture and fermentation control, Chemical Engineering, Fiber optics, Fuel cells, Glass coating, Industrial, Life Sciences, Medical device, Modified Atmosphere Packaging (MAP), Optoelectronics, Petrochemical, Photovoltaics, Process Industry, Quality control, Semiconductors, Solar cells, Surface Technology.

# ULTIMATE TECHNOLOGY

## NOW DESIGNED TO PLAY A MAJOR ROLE IN NEXT GENERATION OF CONTROLLERS

### MFC QUALITY AND PRECISION

ACCURACY - REPEATABILITY - HIGH LEAK INTEGRITY - TEMPERATURE STABILITY - LOW ZERO DRIFT - SPEED

AERA® and SAM® Mass Flow Controllers enjoy a well deserved reputation from globally recognized customers. They are valued as a premium performance design. Advanced products have been developed in close contact with our customer's needs for functions meeting or even exceeding the next generation of requirements of high performance and highest product quality:

Multi-Range and Multi-Gas functionality, guaranteed control accuracy with the actual gas, Pressure Insensitivity function and built-in Shut-Off-Valves. Complete Digital Remote Control with extended program functionality like Flow-Rate-Verification are appropriate steps to receive ongoing good marks from our customers caused from limiting investment and precise flow control.

## THERMAL SENSOR TECHNOLOGY

### FLOW SENSING

- > Consists of two heated resistance wires wound around the outside of a thin walled capillary tube.
- > The resistance of the coils is known at given temperatures.
- > The coils are connected in a bridge circuit and supplied with regulated current.
- > Changes in the bridge resistance are related to mass flow rate, thus creating the basis value for control.

Our flow rate sensor, another key component in MFC's, employs a coil type thermal sensor based on technology we have been accumulating for half a century, thus resulting in extreme reliability.

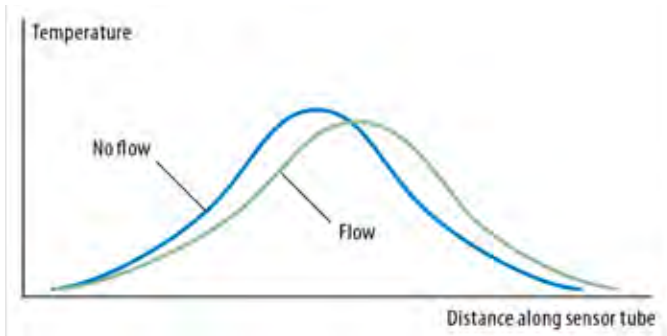


Fig.: Flow and temperature change

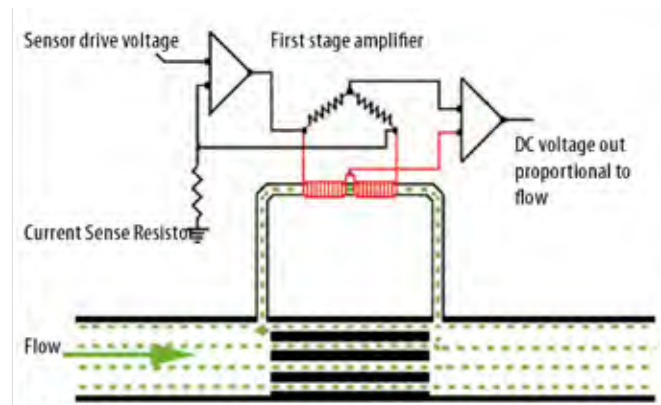


Fig.: Flow measuring with wheatstone bridge

## SYSTEM SOLUTIONS

Gas handling applications vary f.e. from flame control over atmosphere control to plasma control. Precise gas and gas mixtures mass flow into process chambers therefore enable sophisticated gas treatment for high end products to be manufactured. Because the need of a flow rate guarantee to be able to generate reproducible processes is absolutely indispensable, AERA® and SAM® system engineering delivers convincing packages. Modular, compact installations, leak proofed device, highly developed multi functionality systems are - not really surprising - future proofed and a safe investment.

## GAS PANEL TECHNOLOGY TRENDS

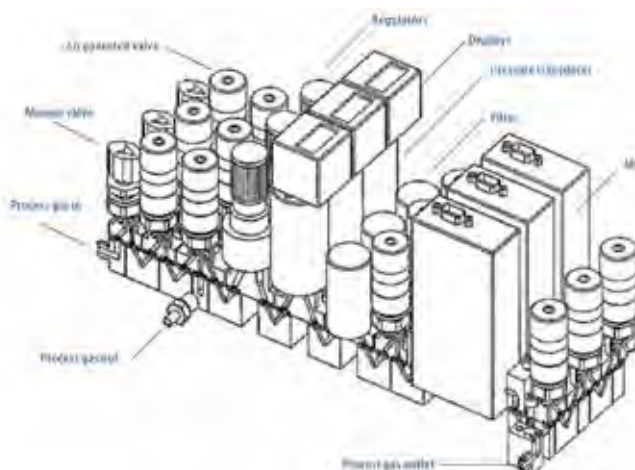


Fig.: System integration with modular, compact installations

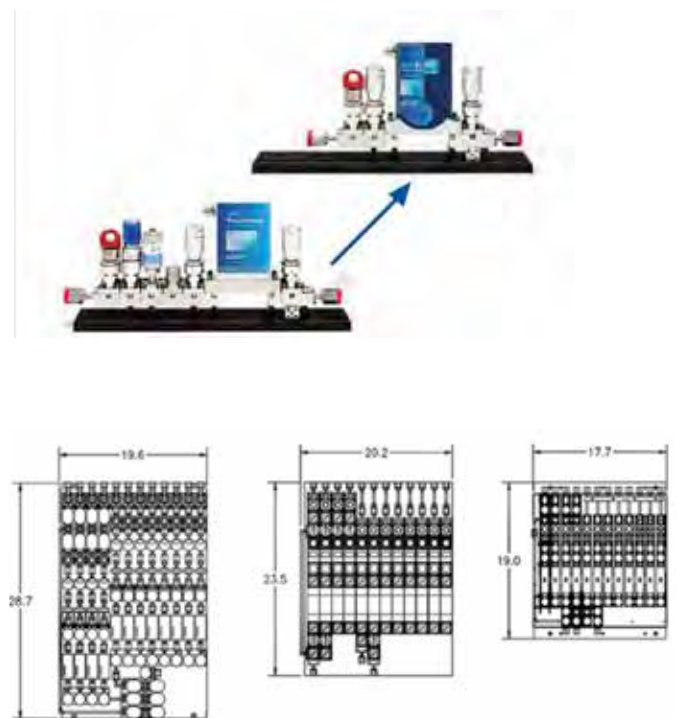


Fig.: Progressive system miniaturization

# SOFTWARE / CONTROL

## CONTROL - CONSOLES - CONNECTORS

Depending on the model, the set point value and actual value signals can be predefined and fed back either by analog or digital communication: analog via standard signal interface or digital via RS-232/RS-422 or field bus interface (Profibus, Device Net, Ethernet). The digital RS-232 or RS-422 interface is required for communication with the Mass Flow Controller software (device dependent). The microprocessor controlled electronics

provide significant benefits: they reduce drift and offset occurrences of the components and enable softwarebased control of the most important processes. The relevant data for this (calibration curves, correcting functions, control functions, etc.) can be stored in the memory. Operator consoles are available in two different models (RO 120, ROD-4A) - each one suitable for certain functions and number of control channels.

Single channel unit: RO 120 Readout Unit is capable to supply power to a single MFC, controlling flow rate and providing readouts of the flow rate.

Multi channel unit: The ROD-4A is an operating unit for up to four mass flow controllers in combination with analog or digital MFC, which correspond to the available connections. The operation can be executed via keypad

at the front panel of the device or interface RS232 via PC alternatively. In order to maintain the preset mixture of gases at changing flow rates the ROD-4A has a master/slave function.



Fig.: Readout units RO 120 and ROD-4a front view

## FIELD PROGRAMMABILITY

The Programming Window allows to be configured the connected MFC recognized on the Search Window. This window allows you to send a gas type, CF type and full scale to an individually specified MFC. Reading the configured data in the MFC, printing the read data and reading/writing data file is also available on this window.

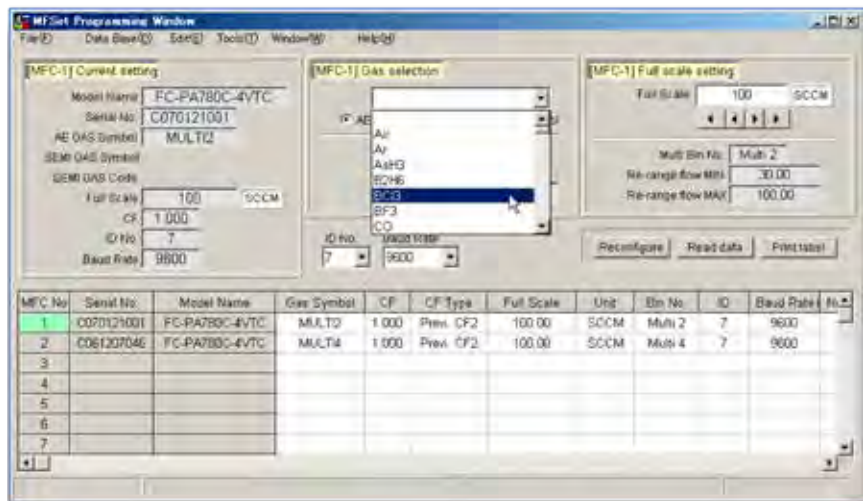


Fig.: GUI Programming window

## DEVICENET™ COMMUNICATION

DeviceNet™ is a field network world wide recognized, and it is approved as a standard sensor bus by the SEMI. Field devices can be connected using serial communication in place of an I/O connection, allowing transfer of a large volume of data effectively. The DeviceNet™ specifications are administrated by the ODVA (Open DeviceNet™ Vendor Association, Inc.) a non-profit body established to promote the spread of this system world-wide.

### BENEFITS

- > No need of AD / DA / O board which can decrease configuration and set up costs.
- > Only network cables are needed reducing cabling costs.
- > With power supply of +24 VDC no need of ±15 VDC for MFC.
- > DeviceNet™ specifications follow international standards opening lots of control devices available from multiple vendors.

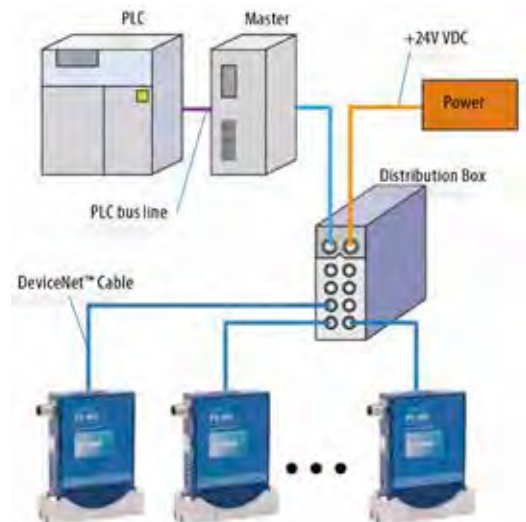
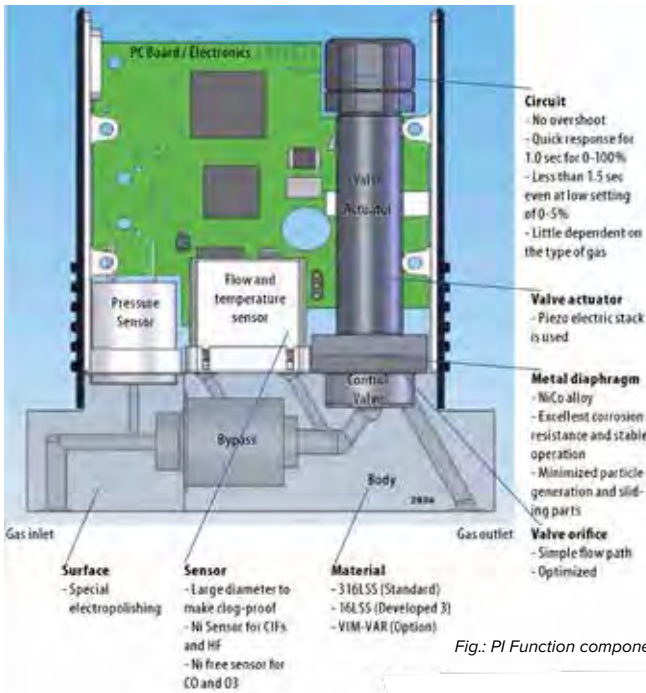


Fig.: DeviceNet connected device

# IMPLEMENTED FUNCTIONS

## PRESSURE INSENSITIVE FUNCTION

The PI (Pressure Insensitive) function improves the controller's ability to tolerate variations in the primary pressure. This function improves durability and is currently highly desired in mass flow controllers. Upstream gas supply pressure changes may cause ordinary mass flow controllers to fluctuate in pressure because the MFC tries to maintain control as it detects pressure change at the flow rate sensor. Therefore, any current mass flow controller, without this regulator, is directly influenced by fluctuation in the gas supply inlet pressure, and the actual flow rate will change instantly by a large amount.



## MULTI-GAS / MULTI-RANGE FUNCTION

A conventional mass flow controller only guarantees the flow rate accuracy with N<sub>2</sub> gas and one controller would only handle one type of gas and one full scale flow rate range. This means, that customers need to have a dedicated mass flow controller for each system, and for each process recipe.

To get the flow rate conditions for your actual gas using a conventional MFC, a conversion factor must be used as a coefficient to convert the flow rate. The reference values for these coefficients have been based of a variety of values, including calculated values, actually measured values, and empirical values. And, these were merely guidelines or reference values with some gas types.

With flow controllers equipped with the MG/MR function, you can have up to a lot of user recipes to match the intended flow range, and you can change the gas type and flow rate to match the actual gas you want to handle by changing the metering conditions instantly connecting the MFC to a personal computer.

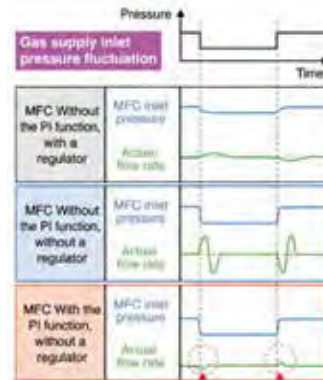
Our actual gas flow rate accuracy warranty system backs up this MG/MR function. With MG/MR mass flow controllers, in addition to the flow rate reference for N<sub>2</sub> gas (that ensures conformance with the national standard using the conventional gravimetric method), we installed full scale actual gas metering and exhaust gas processing facilities at our factory. Using these facilities, measurement is made for each type of gas at each full-scale range, and record the data. This is then used as actual gas data.

### SIMPLE USE OF THE MG/MR CONVERSION PROGRAM

Gas type and flow rate can be converting using an MG/MR with a simple GUI interface conversion program. Connect the mass flow controller to a personal computer using a digital communication cable, first select the gas type, and then flow rate units. A the flow rate range will appear, change it and the setting is complete.

### PI BENEFITS

- > Smaller fluctuations in the actual flow rate
- > More stable gas flow to the chamber improves process results and yield
- > Faster response enables new processes and faster throughput



*Fig.: PI function and pressure fluctuation*

### HOW DOES A PI-FUNCTION WORK?

An additional pressure sensor measures the fluctuations in gas pressure before it reaches the flow sensor.

Then NeuralStep - an additive control algorithm - makes the valve adjustment to keep the flow stable and accurate before the pressure fluctuation reaches the flow sensor.

This interrupts the feedback from the flow rate sensor to the control valve, and keeps the control valve opening at an optimum level.

### WHAT IS THE RESULT OF PI-FUNCTION?

Output flow rate and pressure change will be significantly reduced in both the amount and timing. Downstream processing will be less influenced.

### BENEFITS

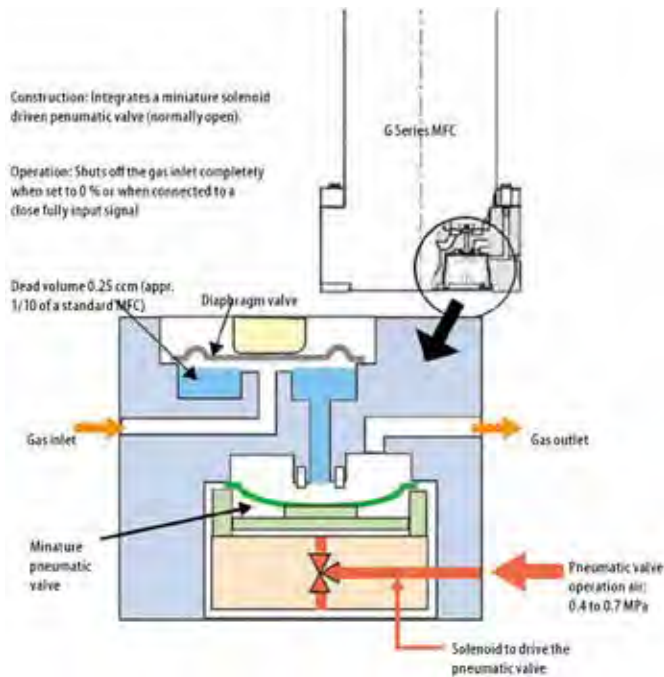
- > Allows one mass flow controller to handle two or more gas types and ranges
- > The need for dedicated devices is reduced to only a few models
- > Reduces the capital investment and inventory liability
- > Performance (precision and response) can be maintained after gas change
- > MG/MR is the biggest achievement that digital technology brought to MFC



*Fig.: Progressive system miniaturization*

# IMPLEMENTED FUNCTIONS

## VALVE SHUT-OFF FUNCTION



The major purpose of the valve-shut-off function is to reduce the gas purge time that is required to vent residual gas in the space between the downstream pneumatic valve and the mass flow controller valve. The ordinary flow rate control valve installed in a mass flow controller cannot shut-off the gas completely. In order to overcome this problem, a valve is integrated near the downstream flow rate control valve, to enable the Valve Shut-off Function. This pneumatic valve is a normally fully open type. It absolutely shuts off all gas with a setting of 0% or when a close fully signal is received. Also the volume of gas leaking (that could cause a gas surge) will be approximately 1/10 that in a combination of an ordinary mass flow controller and pneumatic valve.

### BENEFITS

- > VSO reduces the gas purge time
- > Reduction of gas that can surge into a chamber
- > Shorten the gas purge time needed to achieve a stable flow rate
- > Provides productivity improvements
- > Reduces the amount of wasted expensive gas

## FLOW RATE VERIFICATION FUNCTION

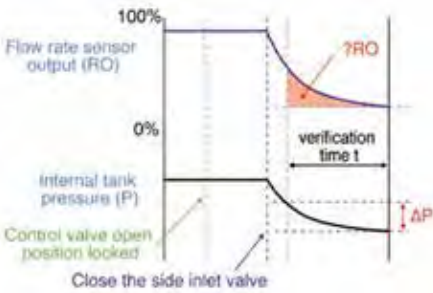


Fig.: Flow rate verification

The requirements for flow rate accuracy and repeatable performance of MFCs are constantly growing. In manufacturing semiconductor devices, where process margins are tight and stopping operation of the devices is not allowed, it must be possible to evaluate the performance of the mass flow controller without removing it from the gas circuit.

Flow rate verification is a method for verifying changes in the flow rate over time. It compares reference data for normal operation when starting to the current flow rate verification results at certain intervals.

### OPERATION

A tank with an integrated pressure sensor and a side inlet valve are the main items used for verification. At the beginning of the verification the MFC temporarily stops the normal flow rate control and locks the opening position of the flow rate control valve. Next, the side inlet valve closes.

The chart below shows the relationship between the internal tank pressure P and the flow rate sensor output RO, with time on the horizontal axis and pressure and output on the vertical axis. After closing the side inlet valve, P and RO change as shown below. The amount of flow rate deviation (the verification value), can be obtained from the ratio between flow rate when starting to use the MFC, and the results of the verification calculation after a certain period has elapsed.

Operation uses a special program on a personal computer. Another method is a stand alone operation using the MFC by itself. With this method, the zero reset switch on top of the main housing is used for the verification and the verification results are shown on the LCD. This method does not need a personal computer. The third method controls the operation with commands from a system. In any of these methods, the basic operation procedures are the same. You can easily calibrate a periodically verified flow rate.

### BENEFITS

- > You can identify risks that might otherwise cause significant damage to your products
- > Verifying changes in the flow rate over time
- > Verification can be checked on a personal computer display or on the LCD
- > Prolongs the life of the mass flow controller
- > Contributes to maintaining planned maintenance cycles

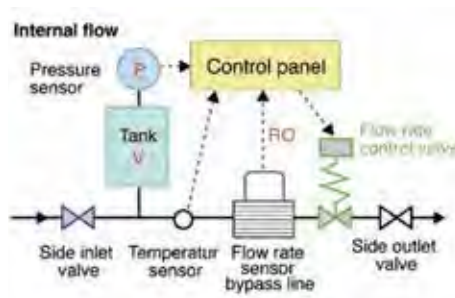


Fig.: Flow calibration

# MFC SERIES AERA®

## ANALOG MASS FLOW CONTROLLER FC-R7700

Precise, economical, elastomer-sealed design. As the field-proven standard for a range of applications, AERA® FC-R7700 series delivers precise flow control, while offering the economic benefits of elastomer seals.

### FEATURES

- > Elastomer seals
- > VCR®, VCO®, and Swagelok® compatible connections
- > Full-scale flow ranges from 10 SCCM to 200 slm
- > Normally-closed or normally open solenoid control valve
- > Leak integrity of 1x10<sup>-6</sup> atm-cc/sec of He

### HIGHLIGHTS

For process and equipment engineers working in the semiconductor, flat panel display, data storage, industrial vacuum, and industrial coating markets, this series provides high reliability and superior performance for non-corrosive gas applications, including CVD, PVD, etch, ion implantation, sputtering, thermal oxidation, optical glass coating, optical fiber, surface treatment, and other coating processes.

### BENEFITS

- > Fast response < 2 sec flow setting time between set points
- > Easy integration - standard connectors and dimensions



## DIGITAL/ANALOG MASS FLOW CONTROLLER FC-DR980

Leading digital Multi-Gas/Multi-Range MFC, providing superior versatility in various systems. AERA® FC-DR980 series deliver performance excellence and operational versatility, resulting in significant cost savings and ease of use.

### FEATURES

- > Multi-Gas/ Multi-Range selection
- > Multi mode operation: analog, analog/digital and digital modes for operation with any control system
- > Highly sensitive, rapid response and small diameter sensor
- > Piezoelectric control valves
- > Multiple alarm and diagnostic capabilities
- > Metal seals with a leak integrity of 1x10<sup>-10</sup>
- > Electro-polished and ultra-cleaned gas-wetted surfaces

### HIGHLIGHTS

Easily field-programmable to run various gas types. For quick gas and full-scale reassignment. Multiple output options enable analog or digital control. For comprehensive monitoring and control capabilities, RS-485 communications (RS-232 with converter), combined with a full range of diagnostic and alarm functions, put operational parameters at your fingertips.

### BENEFITS

- > Superior accuracy, repeatability and stability
- > Significant cost savings
- > Superior operational versatility
- > Superior reliability



## ANALOG MASS FLOW CONTROLLER FC-R 7800

Precise, reliable, metal-sealed corrosion resistant design AERA® FC-R7800 series delivers precise flow control, as well as the corrosion resistance and high leak integrity of metal seals, to suit the majority of gas-controlled applications.

Convenience-enhancing features, such as standard electrical connectors and standardized critical dimensions allow quick-and-easy replacement of existing mass flow controllers (MFCs).

### FEATURES

- > Metal seals
- > Corrosion resistance
- > VCR®, VCO®, and Swagelok® compatible connections
- > Full-scale flow ranges from 10 SCCM to 200 slm
- > Normally-closed or normally open solenoid control valve
- > Leak integrity of 1x10<sup>-10</sup> atm-cc/sec of He

### HIGHLIGHTS

Corrosion resistant design. Superior results - high-quality thin-film characteristics. Suits the majority of gas-controlled applications. Convenience-enhancing features, such as standard electrical connectors and standardized critical dimensions allow quick-and-easy replacement of existing mass flow controllers with no installation hassles.

### BENEFITS

- > Fast response < 1 sec flow settling time between set points
- > Easy integration — standard connectors and dimensions
- > Outstanding reliability
- > Superior results — high-quality thin-film characteristics



# MFC SERIES AERA®

## DIGITAL/ANALOG MASS FLOW CONTROLLER TRANSFORMER

Transforms your process with greater flexibility and lower cost of ownership. Suitable for a variety of applications, including CVD, PVD, diffusion and etch, TRANSFORMER mass flow controllers (MFCs) and mass flow meters (MFMs) will transform your process, providing superior flexibility and efficiency for improved yield, higher productivity, and lower cost of ownership.

### FEATURES

- > All-metal seals and ultra-pure design
- > Multi-gas, multi-range selection
- > Fast response
- > Field programmable
- > Wide range of gas selection without recalibration
- > Long term zero point stability
- > Multiple alarm and diagnostic capabilities

### HIGHLIGHTS

Advanced sensor and valve technology, field-proven platform components and high-speed, digital circuitry deliver very precise gas flow control. TRANSFORMER enables film deposition and etch characteristics that are not only extremely uniform, but also highly repeatable. Designed with field-proven AERA® platform components and high-speed digital circuitry, Transformer has achieved superior reliability performance with < 0.5% zero drift over one year and superior repeatability of 0.2% of full scale. Comprehensive communication and control functions include flow, valve and CPU alarms, gas-flow totalizing and ramping control, system override capabilities and in-situ gas and range customization. TRANSFORMER'S outstanding technology capabilities reduces overall costs by cutting inventory requirements (Just 8 TRANSFORMERS can replace hundreds of spares and part numbers).

### BENEFITS

- > Outstanding accuracy, repeatability, and stability
- > Superior reliability
- > Comprehensive communication and control
- > Easy integration
- > Substantial cost savings
- > World-class service and support
- > Just eight multi-gas, multi-range Transformer MFCs can replace hundreds of spares and part numbers



# DIGITAL/ANALOG MASS FLOW CONTROLLER FC-PI 980

Next-generation PI technology for tomorrow's manufacturing demands. With industry-leading flow control technology, AERA® PI-980 Series pressure-insensitive MFCs anticipate the increasing demands of next-generation semiconductor manufacturing processes, including etch, CVD, PVD and diffusion.

### FEATURES

- > All-metal seals and ultra-pure design
- > Pressure-insensitive operation
- > Integrated self diagnostics
- > High accuracy and repeatability
- > Integrated gas panel components
- > Live gas certified, multi-gas, multi-range configuration
- > Field programmable
- > DeviceNet™, RS-485, and analog control

### HIGHLIGHTS

This innovative technology platform provides faster response, greater gas-flow stability and superior real-time process control when compared to previous technologies. High-flow stability delivers greater chamber-to-chamber process repeatability for improved production yields. Its design integrates traditional thermal flow architecture with a pressure and temperature sensor, and Neural Step control technology. This creates a single, compact delivery package, eliminating the need for a number of costly gas panel components traditionally utilized. Multi-gas, multi-range functionality dramatically reduces supporting inventory requirements, further enhancing cost efficiency. In addition to integrated diagnostics, this next-generation MFC technology has been combined with our field-proven D980 series product platform design to increase system uptime and make trouble shooting quick and easy.

### BENEFITS

- > Improved gas delivery performance and production yields
- > Easy integration on tool
- > Substantial gas panel cost savings
- > Reduced gas panel footprint
- > Real-time communication and control
- > World-class service and support



## MFC SERIES AERA®

OVERVIEW MASS FLOW CONTROLLERS 

Model	FC-R 7700	FC-R 7800	FC-DR980	Transformer	FC-PI 980
<b>Type</b>	Analog MFC	Analog MFC	Analog/digital MFC	Analog /digital MFC	Analog/digital MFC
<b>Short</b>	Precise, economical, elastomer-sealed design	Precise, reliable, metal-sealed design	Providing superior versatility in various systems	Transform your processes with greater flexibility and lower cost of ownership	Next-generation PI technology for tomorrow's manufacturing demands
<b>Functions</b>			MG/MR	MG/MR	PI
<b>Control modes</b>	Analog 0 - 5V	Analog 0 - 5V	Analog 0 - 5V / DeviceNet™ and RS485	Analog 0 - 5V / DeviceNet™ and RS485	Analog 0 - 5V / Ethernet, DeviceNet™ and RS485
<b>Specialties</b>		Corrosion resistant design. Superior results - high-quality thin-film characteristics.	Multiple alarm & diagnostic capabilities. Multi-gas, multi-range, multi-mode.	Field programmable. Wide range of gases without recalibration. Comprehensive communication and control	Pressure insensitive. Superior real-time process control. Real time communication and control. Live gas certified.
<b>Flow range</b>	0,01-200 SLM	0,01-200 SLM	0,01 - 50 SLM	0,01 - 30 SLM	0,005 - 100 SLM
<b>Normal operating pressure</b>	5 bar / 70 psi	5 bar / 70 psi	5 bar / 70 psi	5 bar / 70 psi	7 bar / 100 psi
<b>Response time</b>	< 2 sec	< 1 sec	< 1 sec	< 1 sec	< 1 sec
<b>Accuracy</b>	< 1,0 % of FS*	< 1,0 % of FS*	< 0,25% FS/ 1% of SP**	< 0,25% FS/ 1% of SP**	< 0,25% FS/ 1% of SP**
<b>Stability</b>	< 0,5 % / 1 % of FS*	< 0,5 % / 1 % of FS	Superior < 0,5 % of FS	Superior < 0,5 % of FS	Superior < 0,5 % of FS
<b>Repeatability</b>	< 0,2 % of FS	< 0,2 % of FS	< 0,15 % of FS	< 0,2 % of FS	< 0,25 % of FS
<b>Sealing</b>	Elastomer design	Metal design	Metal design	Metal design	Metal design
<b>Leak integrity</b>	1x10 <sup>-6</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He
<b>Connections</b>	VCR®, VCO® and Swagelok® comp.	VCR®, VCO® and Swagelok® compatible	VCR®, IGS (C or W seal)	VCR®, IGS (C or W seal)	VCR®, IGS (C or W seal)
<b>Control valve</b>	NO or NC solenoid	NO or NC solenoid	NO or NC piezoelectric	NO or NC solenoid	NO or NC piezoelectric
<b>Alarm and diagnostics</b>	3113	S VAR	Multiple capabilities	Multiple capabilities	Multiple capabilities
<b>Easy integration</b>	Standard connectors and dimensions	Standard connectors and dimensions	3000 / 207	Replacing other brands—with no installation hassles	Easy integration on tool
<b>Cost aspects</b>	Effective and precise design	Allows quick-and-easy replacement of existing mass flow controllers	Dramatically reduction of spare inventory	Reduces overall costs by cutting inventory requirements, can replace any other MFC used in the process, regardless of gas type	Substantial gas panel cost savings. Increasing system uptime and make troubleshooting easy

\* ) FS = Full scale, value depends on model. \*\* ) SP = Setpoint, value depends on setting: <25% of FS: 0,25 % of FS, 25-100 % of FS: 1% of SP.

## RESPONSE OR SETTLING TIME

The time that it takes, for actual flow, it to stabilize after a set point change has been made.

## REPEATABILITY

Another primary factor is the repeatability of actual flow for an MFC or from one MFC to another at any set point.

## LINEARITY

Linearity is the straightness of the curve of actual flow vs. set point, in other words, accuracy over the entire flow range.

## STABILITY

Stability refers to the ability of an MFC to maintain stable flow levels through short-term effects such as pressure and temperature changes, and through longterm effects such as aging of the component parts.

## ZERO DRIFT

Zero drift is the most common complaint of MFC users. It is a time-dependent shifting of the zero calibration point from its original zero value to an offset value, and is generally caused by aging effects of various electrical components on the PC board as well as by aging of the sensor windings. The aging phenomenon that results in zero drift not only causes a shift in the zero calibration point but also a shift of the entire curve of control voltage vs. flow.

Zero drift has been essentially eliminated in AERA® flow products. The typical zero drift of our MFCs is less than 0.5% of full-scale flow over a period of one year. This is the result of using the highest-quality sensor wire and electrical components on the PC board. Perhaps more importantly, the sensors assembled in our MFC, are subjected to extreme burn-in procedure and stringent, multiple QC inspections to screen out all marginal components.

Thus means, we do not hide the zero drift move, we prevent it.



# MFC SERIES SAM®

## DIGITAL/ANALOG MASS FLOW CONTROLLERS SERIES SFC-F SAM

SFC-F is the basic series of compact digital MFCs.

### FEATURES

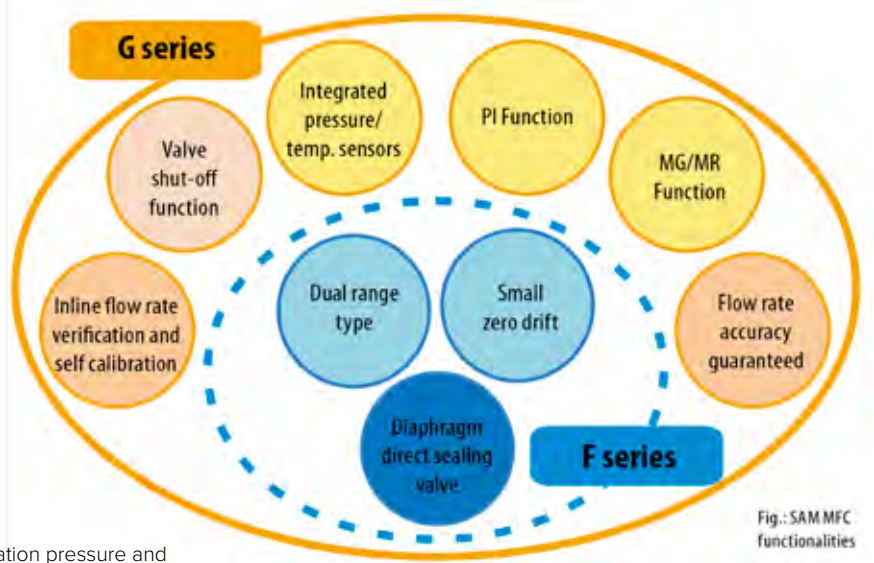
- > Diaphragm direct sealing valve
- > Original digital control method
- > High accuracy by digital multi-point calibration
- > High accuracy at low flow set-points
- > Long-time stability of zero
- > Minimized dead space
- > No need to switch gas piping
- > A wealth of data resources available
- > Very low differential pressure < 10 Torr available
- > Simple valve structure allows high Cv-value reserve despite compact dimensions

### BENEFITS

- > Outstanding control characteristics
- > Large amounts of data are available
- > MFC selection according to service gas type, operation pressure and temperature conditions

### ALL IN ONE FUNCTIONALITY

With SAM's advanced technologies, such as its reliable diaphragm valve structure, digital control, etc., the G series offers innovative features that can be used for a variety of new functions. Hitachi Metals is developing a product lineup that best meets user's needs, such as an all-in-one mass flow controller that includes all the functions along with models that include only desired functions.



### SECTIONAL VIEW

The G series controllers are all-in-one mass flow controllers ready for the next generation of requirements for guaranteed accuracy with the actual gas, MG/MR, PI, valve shut off, and flow rate verification.

# MFC SERIES SAM®

## SERIES SFC-1480F

SFC-1480F Series is a basic series of compact digital Mass Flow Controllers offering very low flow.

### FEATURES

- > Very fast response < 0,7-1,2 sec flow settling time
- > Metal / rubber seals
- > Flow 1 SCCM - 20 SLM (12 models available)
- > Leak integrity <  $1 \times 10^{-11}$  Pa m<sup>3</sup>/s He (Viton 10<sup>-8</sup>)

### BENEFITS

- > Monitoring of operation using digital interface is possible
- > Minimal particle generation
- > Long operation life



## SERIES SFC-1480/2480FX

This highly advanced SAM® brand model with advanced sensor and valve technology, field-proven components and high-speed, digital circuitry delivers precise flow control even at very low flow rate down to 1 SCCM.

### FEATURES

- > Multi-gas, multi-range selection
- > Pressure-insensitive operation
- > Diaphragm direct sealing valve
- > Extremely reliable coil type thermal sensor
- > Guaranteed precision
- > Extremely corrosion-proof with stable control waveform NiCo alloy diaphragm
- > Unique, special electro-polished surfaces
- > High corrosion resistance
- > Low flow rates available (1 SCCM)
- > Comprehensive alarm functions

### BENEFITS

- > Outstanding accuracy, repeatability, and stability
- > Impressive alarm and diagnostic functions
- > Comprehensive communication and control
- > Superior reliability flexibility
- > Greater flexibility and lower cost of ownership

## SERIES SFC-1580/1680FF

SFC-1580/1680F series is the high temperature version of compact digital Mass Flow Controllers.

### FEATURES

- > Higher operating temperature 150 °C
- > Built-in structure to prevent recondensation
- > Fast response < 1 sec flow settling time
- > Metal seals
- > Flow 10 SCCM - 30 SLM (14 models available)
- > Leak integrity <  $1 \times 10^{-11}$  Pa m<sup>3</sup>/s He

### HIGHER OPERATING TEMPERATURES

### BENEFITS

- > Application into high temperature processing
- > Easy integration - standard connectors and dimensions

### HIGHLIGHTS

A separate control unit with heat proofed connection, a lower sensor heating temperature, and high temperature piezo-stack are used. A simple valve structure, which does not compress and expand gas, prevents re-condensation.



### HIGHLIGHTS

A separate control unit with heat proofed connection, a lower sensor heating temperature, and high temperature piezo-stack are used. A simple valve structure, which does not compress and expand gas, prevents re-condensation.

Implemented Functions

MG / MR PI



DN

# MFC SERIES SAM<sup>®</sup>

## OVERVIEW F SERIES **SAM**

Model	SFC 1460 F	SFC 1470 F	SFC 1480 F	SFC 1580/1680 F	SFC 1570/1670 F
<b>Short</b>	Compact low flow model	Compact quick response models	Compact quick response models	High temperature, quick response models, recondensation preventing	High temperature, quick response models
<b>Flow range</b>	0,001-0,01 SLM	Flow customer specified	10 - 20 SLM	0,01-30 SLM	Flow customer specified
<b>Specialties</b>	Very low flow, vacuum serving. Minimized dead space and particle generation.	Very low differential pressure less than 0,2 psi. Minimized dead space and particle generation.	Very low flow, vacuum serving. Minimized dead space and particle generation.	Very low flow, vacuum serving. Minimized dead space and particle generation.	Very low differential pressure less than 0,2 psi. Minimized dead space and particle generation.
<b>Operating pressure</b>	7 - 44 psi	Customer specified	7 - 44 psi	7 - 44 psi	Customer specified
<b>Operating Temperature °C</b>	5 - 50°C	5 - 50°C	5 - 50°C	5 - 80°C / 150°C (1680F)	5 - 80°C / 150°C (1670F)
<b>Response time</b>	< 2 sec	< 1 sec	< 1 sec	0,7 - 1,2 sec	0,7 - 1,2 sec
<b>Control valve</b>	NC or NC piezoelectric	NC or NC piezoelectric	NC or NC piezoelectric	NC or NC piezoelectric	NO piezoelectric
<b>Leak integrity</b>	1x10 <sup>-10</sup> atm-cc/sec of He (rubber sealing 1x10 <sup>-8</sup> )"	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He

## OVERVIEW FX- AND G-SERIES **SAM**

Normal operating pressure: 7 - 44 psi, Operating temperature: 5 - 50°C, Response time:< 1 sec, Surface treatment: Special electropolishing.

Model	SFC 1480/2480 FX	SFC 1480/2480 G1	SFC 1480/2480 G2	SFC 1480/2480 G3	SFC 1480/2480 G4
<b>Type</b>	Digital MFC/MFM	Digital MFC/MFM	Digital MFC/MFM	Digital MFC/MFM	Digital MFC/MFM
<b>MG/MR function</b>	x	x	x	x	x
<b>PI function</b>	x	x	x	x	x
<b>Valve shut-off function</b>			x	x	x
<b>Flow rate verification function</b>					x
<b>LCD display unit</b>		x		x	x
<b>Flow range</b>	0,001 - 50 SLM	0,005 - 50 SLM	0,005 - 50 SLM	0,005 - 50 SLM	0,005 - 50 SLM
<b>Communication</b>	DeviceNet™, RS-485, RS232 and analog	DeviceNet™, RS-485, RS232 and analog	DeviceNet™, RS-485, RS232 and analog	DeviceNet™, RS-485, RS232 and analog	DeviceNet™, RS-485, RS232 and analog
<b>Specialties</b>	Extremely reliable thermal coil sensor. Reduced particular contamination, high corrosion resistance, outstanding control performance. LCD display (temp, pressure, set, output)	PI function reduces gas supply inlet pressure fluctuation influence in the actual flow rate. LCD display (temp, pressure, set, output)	100% shut-off valve reduces gas surge into a chamber and gas purge time, provides productivity improvements. LCD display (temp, pressure, set, output)	Including features of G1 + G2; G3 offers a LCD display unit. LCD display (temp, pressure, set, output)	Outstanding top model offering all available functions. LCD display (temp, pressure, set, output)
<b>Control valve</b>	NO or NC piezoelectric	NO pneumatic	NO pneumatic	NO pneumatic	NO pneumatic
<b>Sealing</b>	metal design	metal design	metal design	metal design	metal design
<b>Leak integrity</b>	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He	1x10 <sup>-10</sup> atm-cc/sec of He
<b>Connections</b>	W/C/H1G seal, 1/4" HMJ male	W/C/H1G seal, 1/4" HMJ male	W/C/H1G seal	W/C/H1G seal	W/C/H1G seal
<b>Alarm and diagnostics</b>	Comprehensive alarm and diagnostic functions	Comprehensive alarm and diagnostic functions, LED display	Comprehensive alarm and diagnostic functions, LED display	Comprehensive alarm and diagnostic functions, LED display	Comprehensive alarm and diagnostic functions, LED display

# MFC SERIES SAM®

## DIGITAL/ANALOG MASS FLOW CONTROLLERS SERIES G1 - G4

From the release of the first SAM® Flow controller, SAM® controllers continue in the tradition of perfection. Now SAM® brand G models satisfy the demand for the next generation of semiconductor production meeting or exceeding the next generation of requirements. The MG/MR function handles two or more gases and ranges and reduces the capital investment and inventory liability. Even though G series provide a flow rate accuracy guarantee for the actual gas type, the precision and response of the flow can be maintained after any change. PI function reduces gas supply inlet pressure fluctuation influence on flow rate by sensing changes with a supplementary incorporated pressure sensor. From there control valve will be kept opening at optimum level.

Usually a pneumatic control valve is installed up and down stream to shut of gas stream completely if necessary. But sometimes leaking gas may be left over in-between. To avoid unwanted gas surge because of that, a positive shut-off valve function (VSO) with an ultra-small pneumatic valve linked to the control valve has been integrated. Wherever process margins are tight and the interruption of ongoing processes is not possible, MFC's performance must be possible to be evaluated without removing it from the gas circuit. In line flow verification and self calibration functions (FVF) turns that demand into reality, integrating a verification system (tank and integrated pressure sensor and side inlet valve) and reporting deviations by comparing measured with previously recorded data. By that, risks may be identified soonest without causing damage and the MFC's life might be prolonged.

An LCD display (temp, pressure, set, output) easifies any necessary control routines.

G series achieves superior reliability performance with < 0.5 % zero drift over one year and superior repeatability of 0.01 % of full scale.

### SERIES 1480/2480 G1

G1 models satisfy the demand for the next generation of semiconductor production.

#### FEATURES

- > Multi-gas, multi-range selection
- > Pressure-insensitive operation
- > Valve shut-off function
- > LCD display (temp, pressure, set, output) easifies control routines

#### BENEFITS

- > Great inlet pressure change insensitivity
- > Allows one mass flow controller to handle two or more gas types and ranges
- > The need for dedicated devices is reduced to only a few models
- > Reduces the capital investment and inventory liability
- > Performance maintained after gas change

Comprehensive communication and control functions include flow, valve and CPU alarms, gas-flow totalizing and ramping control, system override capabilities and in-situ gas and range customization. G's outstanding technology capabilities reduces overall costs by cutting inventory requirements.

#### FEATURES

- > Guaranteed control accuracy
- > Integrated pressure/temperature sensors
- > xtremely corrosion-proof with stable control waveform NiCo alloy diaphragm
- > Diaphragm direct sealing valve
- > Unique, special electro-polished surfaces
- > High corrosion resistance
- > Comprehensive alarm functions

#### BENEFITS

- > Outstanding repeatability, accuracy and stability
- > Impressive alarm and diagnostic functions
- > Comprehensive communication and control
- > Superior reliability flexibility
- > Greater flexibility and lower cost of ownership

#### HIGHLIGHTS

G1 has achieves superior reliability performance with < 0.5 % zero drift over one year and superior repeatability of 0.01 % of full scale. Comprehensive communication and control functions include flow, valve and CPU alarms, gas-flow totalizing and ramping control, system override capabilities and in-situ gas and range customization. G's outstanding technology capabilities reduces overall costs by cutting inventory requirements.

### SERIES 1480/2480 G2

G2 models satisfy the demand for the next generation of semiconductor production.

#### FEATURES

- > Multi-gas, multi-range selection
- > Valve shut-off function
- > Self calibration function

#### BENEFITS

- > Shortening gas purge time needed
- > Complete gas shut-off
- > Gas leaking volume 1/10 related to that with a standard combination (MFC and pneumatic valve)
- > Reduction of gas surge
- > Allows one mass flow controller to handle two or more gas types and ranges
- > The need for dedicated devices is reduced to only a few models
- > Reduces the capital investment and inventory liability
- > Performance maintained after gas change



Implemented Functions  
MG / MR PI  
VSO

DN



Implemented Functions  
MG / MR PI VSO  
FVF

DN

# MFC SERIES SAM®

## SERIES 1480/2480 G3

G1 models satisfy the demand for the next generation of semiconductor production.

**FEATURES**

- > Multi-gas, multi-range selection
- > Pressure-insensitive operation PI
- > LCD display (temp, pressure, set, output) easifies control routines
- > Self calibration function

**BENEFITS**

- > Great inlet pressure change insensitivity
- > Allows one mass flow controller to handle two or more gas types and ranges
- > The need for dedicated devices is reduced to only a few models
- > Reduces the capital investment and inventory liability
- > Performance maintained after gas change
- > Shortening gas purge time needed
- > Complete gas shut-off
- > Gas leaking volume 1/10 related to that with a standard combination (MFC and pneumatic valve)
- > Reduction of gas surge
- > Allows one mass flow controller to handle two or more gas types and ranges
- > The need for dedicated devices is reduced to only a few models
- > Reduces the capital investment and inventory liability
- > Performance maintained after gas change

## SERIES 1480/2480 G4

G4 models is **the most advanced MFC** meeting or exceeding the demand of the actual and also the next generation of semiconductor production.

**FEATURES**

- > Multi-gas, multi-range selection
- > Pressure-insensitive operation
- > Valve shut-off function
- > In-line integrated flow verification system
- > Self calibration function
- > LCD display (temp, pressure, set, output) easifies control routines

**BENEFITS**

- > Great inlet pressure change insensitivity
- > Allows one mass flow controller to handle two or more gas types and ranges
- > The need for dedicated devices is reduced to only a few models
- > Reduces the capital investment and inventory liability
- > Performance maintained after gas change
- > Shortening gas purge time needed
- > Complete gas shut-off
- > Gas leaking volume 1/10 related to that with a standard combination (MFC and pneumatic valve)
- > Reduction of gas surge
- > Allows one mass flow controller to handle two or more gas types and ranges
- > The need for dedicated devices is reduced to only a few models
- > Reduces the capital investment and inventory liability
- > Performance maintained after gas change



Implemented Functions  
**MG / MR PI  
 VSO**

**DN**



Implemented Functions  
**MG / MR PI VSO  
 FVF**

**DN**

# CALIBRATION - SERVICE - MAINTENANCE: PRECISE, QUICK AND CLOSE TO OUR CUSTOMERS

## REPAIR, CLEANING AND CALIBRATION OF MFC'S

Based upon a long experience in solid state, plasma and high-frequency technologies the laboratory's main purposes of activity are technological and technical sophisticated solutions as well as quick, professional assistance especially by:

- > Technology acceptance test in our facilities
- > Cooperation with leading equipment suppliers for the vacuum thin film technology and related components as for example high frequency power supplies
- > Collaboration with Research centers and Universities with the latest measuring and analysis equipment.

## FACILITIES, EQUIPMENT

Clean rooms for assembly and repair of processing equipment.

## MEASURING EQUIPMENT AND POWER SUPPLIES

- > RF / VHF measuring instruments.
- > RF / VHF power supply up to 100 MHz.
- > Optical emissions spectroscopy.
- > Temperature array sensors.
- > Vacuum measuring instruments.

## SERVICE AND SUPPORT FOR OUR CUSTOMERS

- > Repair, change calibration, re-calibration, full-service, upgrade-service.
- > Repair of regenerated and used devices.
- > 24 h service seven days a week.





# CENTRAL GAS SUPPLY SYSTEMS FOR MEDICAL GASES





# GAS MANIFOLDS AND STABILIZERS



## GAS MANIFOLD MC25

The gas cylinder manifold MC25 has a capacity of 25 m<sup>3</sup>/h and is primarily intended for small and medium-sized hospitals. The gas cylinder pressure is regulated in two steps. The change-over between operating side and reserve side is made automatically without any differences in the operating pressure.

The alarm signal comes from the pressure switches to the alarm unit.

The alarm signals from the alarm unit can be forwarded directly to a monitoring desk.

Function control and service can be carried out without interruption in the gas supply.

### SPECIFICATION

#### MC25 INCLUDES THE FOLLOWING COMPONENTS:

- > Gas manifold MC25
- > Gas alarm including power supply
- > Evacuating kits for collecting pipe
- > Shut-off valve for distribution line
- > HP filters
- > Collecting pipe for 2x1 cylinder

#### FOR A COMPLETE MC25 MANIFOLD ADD:

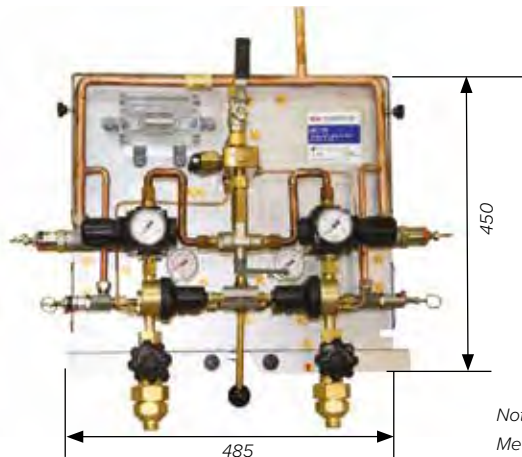
- > High pressure collecting pipe set (high pressure valves, filters and non-return valves)
- > High pressure hoses with safety wire
- > Cylinder retaining brackets (included in gas cylinder collecting pipe set)
- > Gas name sign

(For more information, please see Accessories pages 166-170)

Item No.	Denomination	Gas	PRV	Alarm
0727315	MC25 – 2x1	O <sub>2</sub>	Manual activation	C44
0727316	MC25 – 2x1	Air	Manual activation	C44
0727317	MC25 – 2x1	N <sub>2</sub> O, CO <sub>2</sub>	Manual activation	C44

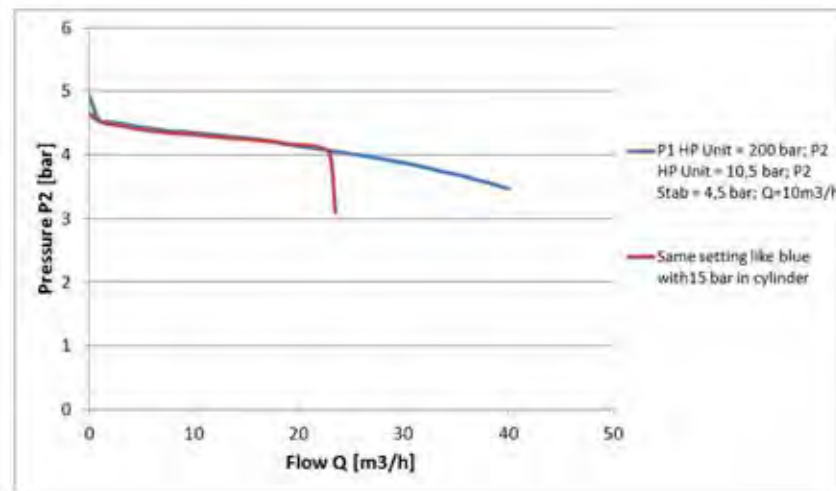
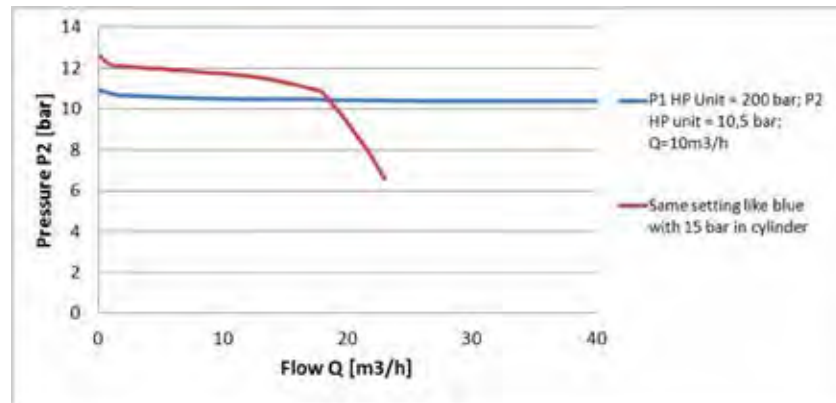
TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> , (all medical gases)
<b>Nominal flow:</b>	25 m <sup>3</sup> /h
<b>Inlet nominal pressure:</b>	200 bar (20 000 kPa)
<b>Outlet nominal pressure:</b>	4,5 bar (setting range 0,5–6 bar)
<b>Intermediate nominal pressure:</b>	12 bar (setting range 9–16 bar)
<b>Inlet connection:</b>	W21,8x1/14" M
<b>Outlet connection:</b>	G1/2" M + soldering piece pipe ø 10, ø 15 mm
<b>Outlet pressure relieve valve:</b>	6,8 bar
<b>Intermediate pressure relieve valve:</b>	17 bar
<b>Pressure relieve valve pipe dimension:</b>	ø 15 mm
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1-2 (Electromagnetic compatibility)
	present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS



Note!  
Measurements in mm.

FLOW CHARTS OF MANIFOLD MC25 PRESSURE CHARACTERISTIC





## GAS MANIFOLD MM40 - HP UNIT

Manifold MM40 HP unit is an automatic manifold. It is working on the principal of different pressures between the operation and reserve regulator. By the manual lever, the operator can decide which side will be the operational side and which will be the reserve side. When the operating side is empty, the manifold will without any action start to supply gas from the reserve side with the lower regulator pressure and fulfill the requests to supply without interrupting the flow.

MM40 HP unit manifolds together with a stabilizer should be used as second and third source of gas in systems with liquid gas tank. For hospitals without liquid gas tanks it is possible to use manifold MM40 HP unit together with a stabilizer as first and second source, and in connection with a third source (MM90 Standby) it will provide a final solution to fulfill ISO 7396-1 and national installation standards.

Manifolds are supplied with an alarm system which increases safety to maximal level and informs the hospital personal about each non standard situation.

Gas Alarm C44 is a standard accessory. The gas alarm C44 gives visual and audible indications.

It acts as a surveillance system and sounds the alarm when the following happens:

1. Leaking reserve side
  2. Empty position (High/Low distribution pressure when connected to a Stabilizer)
  3. Change operation side
  4. High intermediate pressure
- > The gas alarm C44 is able to communicate with other equipment through relays.
  - > The alarm has a battery back-up for 30 minutes of operation.
  - > Manifold MM40 HP unit is only first stage of regulation and must be installed together with a Stabilizer which will stabilize the final pressure used in the hospital gas outlets.
  - > GCE medical manifolds are CE-marked and fulfill the ISO 7396-1 standard.

### SPECIFICATION

#### MM40 INCLUDES THE FOLLOWING COMPONENTS:

- > MM40 HP unit Manifold
- > Gas alarm C44
- > Purge valves
- > HP filters
- > Shut-off valve for distribution line to stabilizer

#### FOR A COMPLETE MM40 HP UNIT MANIFOLD ADD:

- > Collecting pipe set (high pressure valves, non-return valves and high pressure components)
- > Cylinder retaining brackets (included in gas cylinder collecting pipe set)
- > High pressure hoses with safety wire
- > Plug for close collecting pipeline
- > Gas name sign
- > Stabilizer

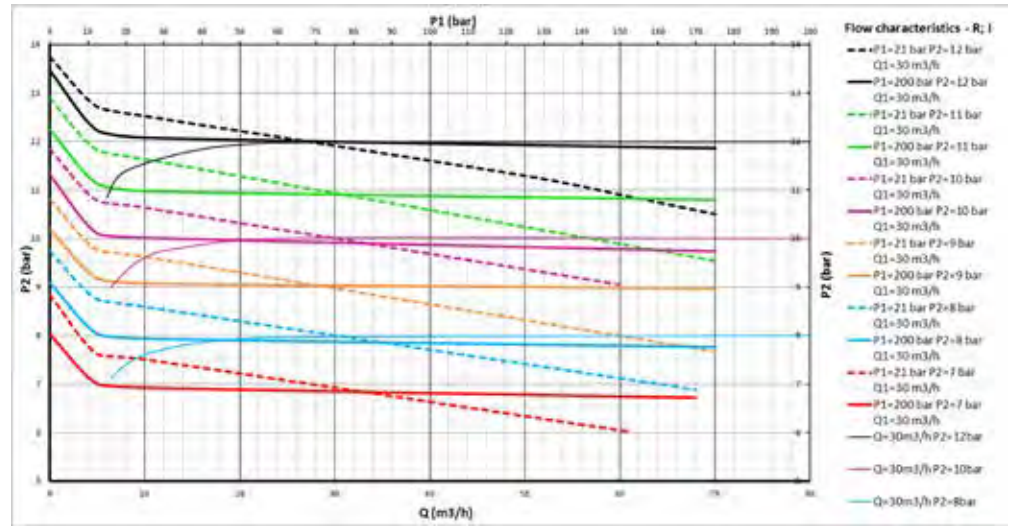
(For more information, please see accessories pages 166-170)

Item No.	Denomination	Gas	PRV	Alarm
0727330	MM40 – HP unit 2x1	O <sub>2</sub> , Air, N <sub>2</sub>	Standard	C44
0727331	MM40 – HP unit 2x1	O <sub>2</sub> , Air, N <sub>2</sub>	Manual activation	C44
0727334*	MM40 – HP unit 2x1	O <sub>2</sub> , Air, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub>	Standard	–
0727335	MM40 – HP unit 2x1	N <sub>2</sub> O, CO <sub>2</sub>	Standard	C44
0727336	MM40 – HP unit 2x1	N <sub>2</sub> O, CO <sub>2</sub>	Manual activation	C44

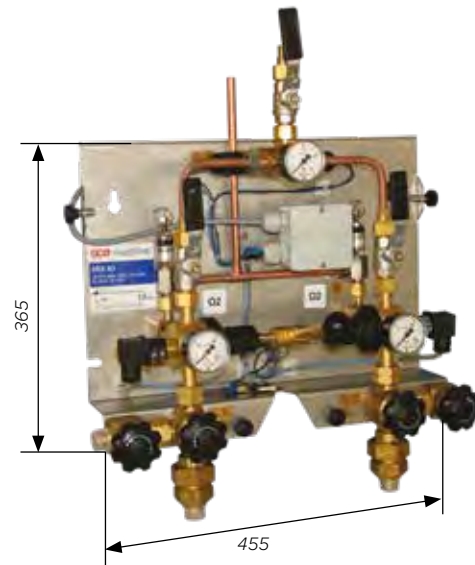
\*basic version without electric sensors

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Nominal flow:</b>	40 m <sup>3</sup> /h
<b>Inlet nominal pressure:</b>	200 bar
<b>Outlet nominal pressure:</b>	12 bar (setting range 9–16 bar)
<b>Inlet connection:</b>	W21,8x1/14"M
<b>Outlet connection:</b>	G1/2"M + soldering piece pipe ø 10, ø 15 mm
<b>Pressure relieve valve:</b>	17 bar
<b>Pressure relieve valve pipe dimension:</b>	ø 10 mm
<b>Purge valves connection:</b>	W21,8x1/14"M
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1-2 (Electromagnetic compatibility)
	present SIS HB 370 and HTM 02-01

FLOW CHART OF MANIFOLD MM40 PRESSURE CHARACTERISTIC



BASIC DIMENSIONS



Note!  
Measurements in mm.



## LINE REGULATOR

A stabilizer is a pressure reduction unit with the task to equalize the eventual pressure variation in the hospital pipeline system to ensure a correct pressure from the terminal units.

The stabilizer makes it possible to distribute gas with a different pressure to departments and buildings in the hospital area. In some cases it is needed to deliver a higher pressure from the main gas manifold to compensate for small pipe dimensions. In those cases the Stabilizer should be mounted as close as possible before the first terminal unit, to ensure a correct pressure to the patient.

### SPECIFICATION

**LINE REGULATOR INCLUDES THE FOLLOWING COMPONENTS:**

- > Line regulator

**FOR A COMPLETE LINE REGULATOR ADD:**

- > Plastic cover for locking

- > Alarm unit (included if ordered together with HP unit)

Item No.	Denomination	Gas type	Inlet*
0727333	LINE REG	O <sub>2</sub> , N <sub>2</sub> O, Air, CO <sub>2</sub> , N <sub>2</sub>	LH
K141621	LINE REG	O <sub>2</sub> – AFNOR	LH
K141631	LINE REG	O <sub>2</sub> – AFNOR	RH
K141622	LINE REG	N <sub>2</sub> O – AFNOR	LH
K141632	LINE REG	N <sub>2</sub> O – AFNOR	RH
K141623	LINE REG	Air – AFNOR	LH
K141633	LINE REG	Air – AFNOR	RH
K141629	LINE REG	Air-800 – AFNOR	LH
K141639	LINE REG	Air-800 – AFNOR	RH
K141624	LINE REG	N <sub>2</sub> – AFNOR	LH
K141625	LINE REG	CO <sub>2</sub> – AFNOR	LH

\*LH = inlet from left side; RH = inlet from right side

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, Air-800, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Nominal flow:</b>	40 m <sup>3</sup> /h
<b>Inlet nominal pressure:</b>	16 bar (1600 kPa)
<b>Outlet nominal pressure:</b>	4,5 bar (setting range 0,5–10 bar)
<b>Inlet connection:</b>	G1/2" M + soldering piece pipe ø 12 mm
<b>Outlet connection:</b>	G1/2" M + soldering piece pipe ø 12 mm
<b>Pressure sensors:</b>	Optional (Pressure switches; Transmitters 0–50 mV; 4–20 mA)
<b>Emergency QC inlet:</b>	Optional QC by national standards
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1-2 (Electromagnetic compatibility) present HTM 02-01

### BASIC DIMENSIONS



## GAS MANIFOLD MM40 – STABILIZER

Manifold MM40 – STABILIZER is a second stage pressure reduction unit with the task to equalize the eventual pressure variation in the hospital pipeline system to ensure a correct pressure from the terminal units.

MM40 – STABILIZER is only a second stage reduction unit where the primary gas supply is provided by high pressure gas manifolds (such as MM40 – HP Unit). In case of a signal for pressure deviation in relation to the alarm settings, the alarm can easily be displayed on a gas alarm unit. It is also possible to send information to the central operation control. The stabilizer can be delivered with either pressure transmitter 4–20 mA, pressure transmitter 0–50 mV or with pressure switches. Gas reduction unit MM40 – STABILIZER must always be installed in compliance with the standards EN ISO 7396-1 and the appropriate national standards.

### SPECIFICATION

#### MM40 STABILIZER INCLUDES THE FOLLOWING COMPONENTS:

- > MM40 Stabilizer Manifold

#### FOR A COMPLETE MM40 STABILIZER MANIFOLD ADD:

- > Plastic cover for locking
- > Alarm unit (included if ordered together with HP unit)

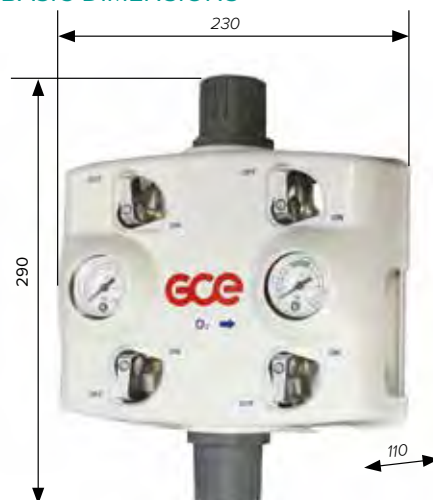
Item No.	Denomination	Gas	PRV	Alarm
0727329	MM40 – Stabilizer	O <sub>2</sub> , N <sub>2</sub> O, Air, CO <sub>2</sub> , N <sub>2</sub>	–	–
0727337	MM40 – Stabilizer	Air–800	–	–
0727332	MM40 – Stabilizer	O <sub>2</sub> , N <sub>2</sub> O, Air, CO <sub>2</sub> , N <sub>2</sub>	Manual Activation	Pressure switch
0727344	MM40 – Stabilizer	O <sub>2</sub> , N <sub>2</sub> O, Air, CO <sub>2</sub> , N <sub>2</sub>	Manual Activation	4-20mA

### ACCESSORIES

Item No.	Denomination
COM001002	Lockable cover

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, Air–800, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Nominal flow:</b>	40 m <sup>3</sup> /h
<b>Inlet maximal pressure:</b>	20 bar (2000 kPa)
<b>Outlet nominal pressure:</b>	4,5 bar (setting range 0,5–10 bar)
<b>Inlet connection 1:</b>	G1/2" M + soldering piece pipe ø 12 mm
<b>Inlet connection 2:</b>	Optional (G1/2" M + soldering piece pipe ø 12 mm)
<b>Outlet connection:</b>	G1/2" M + soldering piece pipe ø 12 mm
<b>Pressure relieve valve:</b>	Optional (6,8 bar; outlet pipe ø 15 mm)
<b>Pressure sensors:</b>	Optional (Pressure switches; Transmitters 0–50 mV; 4–20 mA)
<b>Emergency QC inlet:</b>	Optional QC by national standards
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1-2 (Electromagnetic compatibility) present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS



Note!  
Measurements in mm.

## GAS MANIFOLD MM90 - HP UNIT FULLY AUTOMATIC



The MM90 HP unit medical manifold is intended for use in hospital pipeline systems as medical gas source. Together with MM90, always use an alarm providing all alarms according to standard (like gas alarm C44). As 2nd stage is recommended to use a stabilizer. The manifold will deliver gas from the operating bank to the manifold pressure regulator until the cylinders are exhausted. At that point the supply will switch to the reserve bank and the empty bank can be replenished. The object gives uninterrupted gas supply. Gas Alarm C44 is a standard accessory. The gas alarm C44 gives visual and audible indication. It surveils and the alarm sounds when the following happens:

1. Change operation side/Leaking on reserve side
2. High operation pressure
3. Low operation pressure
4. Empty position (High/Low distribution pressure when connected to a Stabilizer)

The gas alarm C44 is able to communicate with other equipment through relays. The alarm has a battery back-up for 30 minutes of operation.

### SPECIFICATION

#### MM90 INCLUDES THE FOLLOWING COMPONENTS:

- > MM90 HP unit Manifold
- > Gas alarm C44
- > Purge valves
- > HP filters

#### FOR A COMPLETE MM90 HP UNIT MANIFOLD ADD:

- > Collecting pipe set (high pressure valves, and non-return valves / high pressure components)
- > Cylinder retaining brackets (included in gas cylinder collecting pipe set)
- > High pressure hoses with safety wire
- > Plug for close collecting pipeline
- > Gas name sign
- > Stabilizer

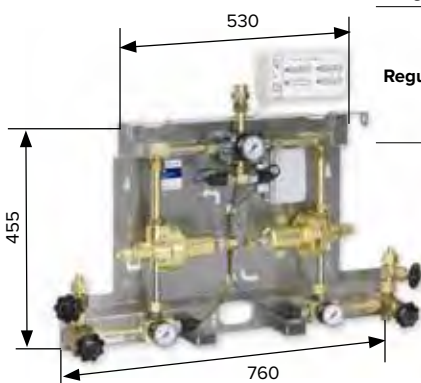
(For more information, please see accessories pages 166-170)

Item No.	Denomination	Gas	PRV	Alarm
0727301	MM90 – HP unit AUTO 2x1	O <sub>2</sub>	Standard	C44
0727302	MM90 – HP unit AUTO 2x1	Air	Standard	C44
0727303	MM90 – HP unit AUTO 2x1	N <sub>2</sub> O, CO <sub>2</sub>	Standard	C44
0727308*	MM90 – HP unit AUTO 2x1	O <sub>2</sub> , N <sub>2</sub> O, Air, CO <sub>2</sub> , N <sub>2</sub>	Standard	–
0727309	MM90 – HP unit AUTO 2x1	O <sub>2</sub>	Standard	Pressure switch
0727310	MM90 – HP unit AUTO 2x1	Air	Standard	Pressure switch
0727311	MM90 – HP unit AUTO 2x1	N <sub>2</sub> O, CO <sub>2</sub>	Standard	Pressure switch

\*basic version without electric sensors

TECHNICAL DATA	
Gases:	O <sub>2</sub> , Air, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
Nominal flow:	90 m <sup>3</sup> /h
Inlet nominal pressure:	200 bar (20 000 kPa)
Outlet nominal pressure:	9 bar (setting range 9–15 bar)
Inlet connection:	W21,8x1/14" M
Outlet connection:	G3/4" F + soldering piece pipe ø 22 mm
Pressure relieve valve:	16 bar
Pressure relieve valve pipe dimension:	ø 10 mm
Purge valves connection:	W21,8x1/14" M + soldering piece pipe ø 10 mm
Regulatory status:	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1-2 (Electromagnetic compatibility)
	present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS



Note!  
Measurements in mm.

## GAS MANIFOLD MM90 - HP UNIT



The MM90 HP unit medical manifold is intended for use in hospital pipeline systems as medical gas source. Together with MM90, always use an alarm providing all alarms according to standard (like gas alarm C44). As 2nd stage is recommended to use a stabilizer. The manifold will deliver gas from the operating bank to the manifold pressure regulator until the cylinders are exhausted. At that point the supply will switch to the reserve bank and the exhausted bank can be replenished. The object gives uninterrupted gas supply. Gas Alarm C44 is a standard accessory. The gas alarm C44 gives a visual and audible indication. It surveils and the alarm sounds when the following happens:

1. Change operation side
2. Leaking on reserve side
3. High operation pressure
4. Low operation pressure

The gas alarm C44 is able to communicate with other equipment through relays. The alarm has a battery back-up for 30 minutes of operation.

### SPECIFICATION

#### MM90 INCLUDES THE FOLLOWING COMPONENTS:

- > MM90 HP unit Manifold
- > Gas alarm C44
- > Purge valves
- > HP filters

#### FOR A COMPLETE MM90 HP UNIT MANIFOLD ADD:

- > Collecting pipe set (high pressure valves, and non-return valves / high pressure components)
- > Cylinder retaining brackets (included in gas cylinder collecting pipe set)
- > High pressure hoses with safety wire
- > Plug for close collecting pipeline
- > Gas name sign
- > Stabilizer

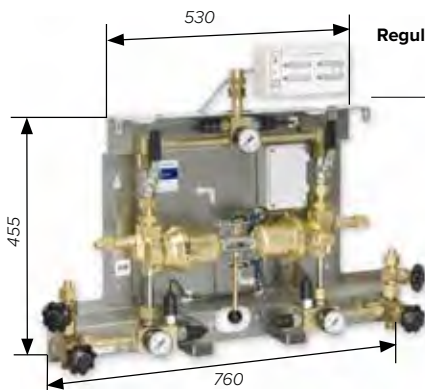
(For more information, please see accessories pages 166-170)

Item No.	Denomination	Gas	PRV	Alarm
0727304	MM90 – HP unit 2x1	O <sub>2</sub>	Standard	C44
0727305	MM90 – HP unit 2x1	Air	Standard	C44
0727306	MM90 – HP unit 2x1	N <sub>2</sub> O, CO <sub>2</sub>	Standard	C44
0727313*	MM90 – HP unit 2x1	O <sub>2</sub> , Air	Manual activation	MC7701
0727314*	MM90 – HP unit 2x1	N <sub>2</sub> O, CO <sub>2</sub>	Manual activation	MC7701
0727327**	MM90 – HP unit 2x1	O <sub>2</sub> , N <sub>2</sub> O, Air, CO <sub>2</sub> , N <sub>2</sub>	Standard	–

\*in accordance HB370; \*\*basic version without electric sensors

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Nominal flow:</b>	90 m <sup>3</sup> /h
<b>Inlet nominal pressure:</b>	200 bar (20 000 kPa)
<b>Outlet nominal pressure:</b>	9 bar (setting range 9–15 bar)
<b>Inlet connection:</b>	W21,8x1/14”M
<b>Outlet connection:</b>	G3/4”F + soldering piece pipe ø 22 mm
<b>Pressure relieve valve:</b>	16 bar
<b>Pressure relieve valve dimension:</b>	ø 10 mm
<b>Purge valves connection:</b>	W21,8x1/14”M + soldering piece pipe ø 10mm
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC Complies with EN ISO 7396-1 (Central Gas Supply Systems) Complies with EN 60601-1-2 (Electromagnetic compatibility) present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS



Note!  
Measurements in mm.





## GAS MANIFOLD MM90 - STANDBY BACKUP

The manifold MM90 STANDBY is designed to be used as a third source of supply in medical central gas systems. The manifold will deliver gas when the nominal supply system pressure falls below a set level (7 bar). This is a back up source.

Together with MM90 STANDBY always use the MM90 HP unit and alarm providing all alarms according to standard (like Gas alarm C44). As 2nd stage it is recommended to use a stabilizer.

Gas Alarm C44 is a standard accessory. The Gas alarm C44 gives visual and audible indication.

It surveils and the alarm sounds when the following happens:

1. Too high outlet pressure
2. Too low outlet pressure
3. Empty cylinder

The Gas alarm C44 is able to communicate with other equipment through relays. The alarm has a battery back-up for 30 minutes of operation.

### SPECIFICATION

#### MM90 STANDBY INCLUDES THE FOLLOWING COMPONENTS:

- > MM90 STANDBY Manifold with pressure switches
- > Purge valves
- > HP filters

#### FOR A COMPLETE MM90 STANDBY MANIFOLD ADD:

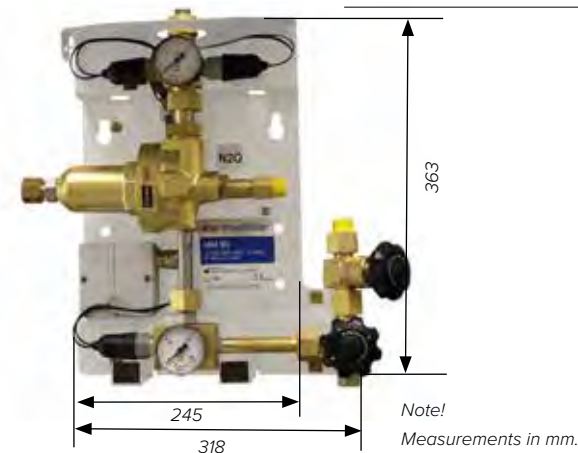
- > Gas alarm C44
- > Collecting pipe set (high pressure valves, and non-return valves / high pressure components)
- > Cylinder retaining brackets (included in gas cylinder collecting pipe set)
- > High pressure hoses with safety wire
- > Plug for close collecting pipeline
- > Gas name sign
- > Stabilizer

(For more information, please see accessories pages 166-170)

Item No.	Denomination	Gas	PRV	Alarm
0727307	MM90 STANDBY	O <sub>2</sub> , Air	Standard	Pressure switches
0727312	MM90 STANDBY	N <sub>2</sub> O, CO <sub>2</sub>	Standard	Pressure switches
0727338	MM90 STANDBY	N <sub>2</sub> O, CO <sub>2</sub>	Manual activation	Pressure switches

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Nominal flow:</b>	90 m <sup>3</sup> /h
<b>Inlet nominal pressure:</b>	200 bar (20 000 kPa)
<b>Outlet nominal pressure:</b>	7 bar (setting range 7–15 bar)
<b>Inlet connection:</b>	W21,8x1/14"M
<b>Outlet connection:</b>	G3/4"F + soldering piece pipe ø 22 mm
<b>Pressure relive valve:</b>	16 bar
<b>Pressure relive valve pipe dimension:</b>	ø 10 mm
<b>Purge valves connection:</b>	W21,8x1/14"M + soldering piece pipe ø 10 mm
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1-2 (Electromagnetic compatibility)
	present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS





## GAS MANIFOLD DUPLEX (MC80)

The MC80 gas manifold is suitable for medium to large sized hospitals. It has a flow capacity of up to 200 m<sup>3</sup>/h and is conveniently designed in modules. The MC80 reduces the gas pressure in two steps to a constant distribution pressure. Service and tests can be carried out with no disturbance in the supply of gas to the gas distribution system.

### THE DUPLEX MC80 CONSISTS OF THE THREE FOLLOWING UNITS:

#### 1. MC80 - HP UNIT

This module contains two regulators with pressure relieve valves and it is connected to two various cylinder banks with high pressure hoses. When the cylinder bank, which has been connected for operation, has been emptied the other duty side is automatically connected.

#### 2. MC80 - STABILIZER

The stabilizer makes the operating pressure in the distribution system remain constant. The module contains two regulators with pressure relieve valves. Since the gas pressure is reduced in two steps the drop in pressure, when changing from the operating cylinder to the other bank of cylinders, is kept to a minimum. The unit is prepared for connection to a liquid oxygen supply tank (LOX).

#### 3. GAS ALARM SYSTEM - based on the product variant

Alarm systems from GCE are user friendly solutions, with simple control and lots of extra functionality. It surveils electronically and the alarm sounds when the following happens:

1. Too high or too low distribution pressure,
2. Too high intermediate pressure,
3. Leakage on the reserve gas cylinder bank,
4. When change of operating side has been effected,
5. Weak back up battery.

When connected to a liquid tank the following disturbances will be reported:

1. Too high or too low distribution pressure,
2. Too high intermediate pressure,
3. Leakage from the reserves,
4. When change of operating side has been effected.

The product is either equipped with an alarm system or a sensor only (as stated in column "Alarm" in the product table below).

### SPECIFICATION

#### DUPLEX (MC80) INCLUDES THE FOLLOWING COMPONENTS:

- > MC80 – HP Unit
- > MC80 – Stabilizer
- > Alarm or just sensor based on item in column "Alarm"
- > Evacuating kits for collecting pipe
- > Shut-off valve for the distribution line
- > HP filters

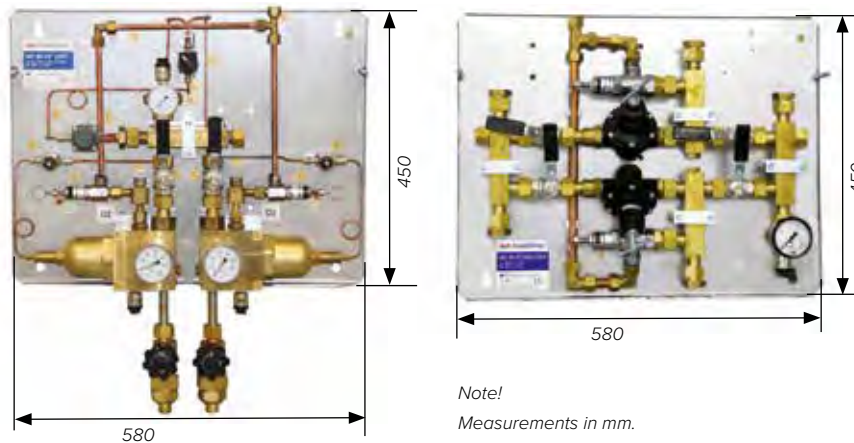
#### FOR A COMPLETE DUPLEX (MC80) STANDBY MANIFOLD ADD:

- > Collecting pipe set (high pressure valves, and non-return valves, high pressure components)
- > High pressure hoses with safety wire
- > Gas name sign
- > Connection pipe 90 degree
- > Extension pipes if needed

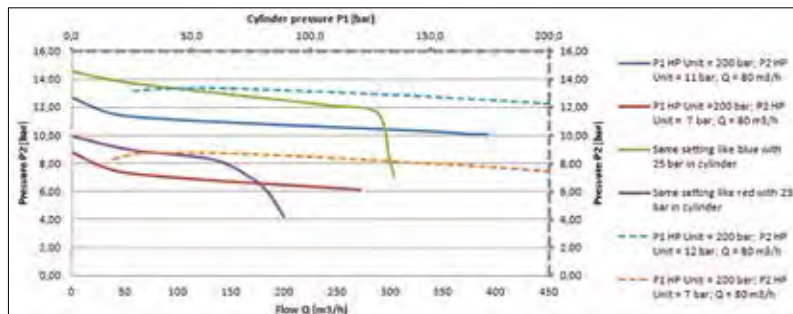
(For more information, please see accessories pages 166-170)

Item No.	Denomination	Gas	PRV	Alarm
0727318	DUPLEX 2x1	O <sub>2</sub>	Manual activation	MC7701
0727319	DUPLEX 2x1	Air	Manual activation	MC7701
0727320	DUPLEX 2x1	N <sub>2</sub> O/CO <sub>2</sub>	Manual activation	MC7701
0727365	DUPLEX 2x1	ALL	Manual activation	TOUCH
0727321	MC80 HP 2x1	O <sub>2</sub>	Manual activation	0–50 mV
0727322	MC80 HP 2x1	Air	Manual activation	0–50 mV
0727323	MC80HP 2x1	N <sub>2</sub> O/CO <sub>2</sub>	Manual activation	0–50 mV
0727324	MC80 STAB	O <sub>2</sub>	Manual activation	0–50 mV
0727325	MC80 STAB	Air	Manual activation	0–50 mV
0727326	MC80 STAB	N <sub>2</sub> O/CO <sub>2</sub>	Manual activation	0–50 mV
0727339	MC80 STAB	ALL	Manual activation	Contact gauge
0727340	MC80 STAB	ALL	Manual activation	4–20 mA

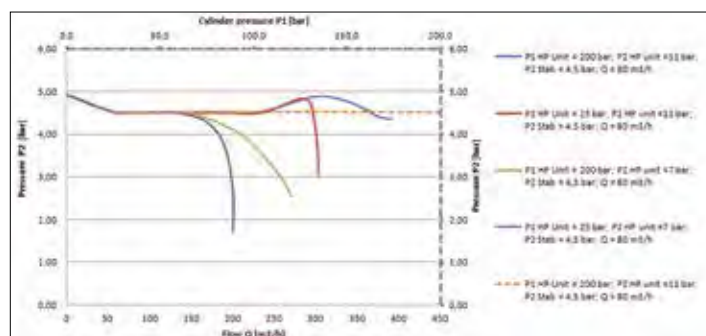
TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Nominal flow:</b>	200 m <sup>3</sup> /h
TECHNICAL DATA - HIGH PRESSURE UNIT MC80	
<b>Inlet nominal pressure:</b>	200 bar (20 000 kPa)
<b>Outlet nominal pressure:</b>	12 bar (setting range 10–16 bar)
<b>Inlet connection:</b>	W21,8×1/14" M
<b>Outlet connection:</b>	G3/4" F
<b>Pressure relieve valve:</b>	17 bar
<b>Pressure relieve valve pipe dimension:</b>	ø 10 mm
<b>Purge valves connection:</b>	W21,8×1/14" M + pipe ø 15 mm
TECHNICAL DATA - STABILIZER MC80	
<b>Inlet maximal pressure:</b>	20 bar (2000 kPa)
<b>Outlet nominal pressure:</b>	4,5 bar (setting range 0,5–6 bar)
<b>Inlet connection:</b>	G3/4" F
<b>Outlet connection:</b>	G3/4" F
<b>Pressure relieve valve:</b>	6,8 bar
<b>Pressure relieve valve pipe dimension:</b>	ø 15 mm
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC Complies with EN ISO 7396-1 (Central Gas Supply Systems) Complies with EN 60601-1-2 (Electromagnetic compatibility) present SIS HB 370 and HTM 02-01



**FLOW CHART: MC80 - HP UNIT**



**FLOW CHART: SET MC80 - STABILIZER + MC80 - HP UNIT**



## GAS MANIFOLD MC80 - STABILIZER



Manifold MC80 – STABILIZER is a second stage pressure reduction unit with the task to equalize the eventual pressure variation in the hospital pipeline system to ensure a correct pressure from the terminal units. MC80 – STABILIZER is only second stage reduction unit where the primary gas supply is provided by high pressure gas manifolds (such as MC80, MM90 or liquid oxygen tank (LOX)). When there is a signal for pressure deviation in relation to the alarm settings, the alarm can easily be displayed on a gas alarm unit. It is also possible to send information to the central operation control. The stabilizer can be delivered with a pressure transmitter 4–20 mA, a pressure transmitter 0–50 mV or with a contact gauge.

The gas reduction unit MC80 – STABILIZER must always be installed in compliance with the standards EN ISO 7396-1 and the appropriate national standards.

### SPECIFICATION

**MC80 STABILIZER INCLUDES THE FOLLOWING COMPONENTS:**

- > MC80 Stabilizer Manifold

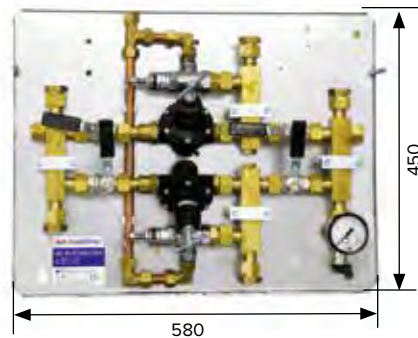
**FOR A COMPLETE MC80 STABILIZER MANIFOLD ADD:**

- > Alarm unit (included if ordered together with HP unit)
- > Ball valve DN15 with welding adaptors

Item No.	Denomination	Gas	PRV	Alarm
0727324	MC80 STAB	O <sub>2</sub>	Manual activation	0–50 mV
0727325	MC80 STAB	Air	Manual activation	0–50 mV
0727326	MC80 STAB	N <sub>2</sub> O, CO <sub>2</sub>	Manual activation	0–50 mV
0727339	MC80 STAB	ALL	Manual activation	Contact gauge
0727340	MC80 STAB	ALL	Manual activation	4–20 mA

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Nominal flow:</b>	200 m <sup>3</sup> /h
<b>Inlet maximal pressure:</b>	20 bar (2000 kPa)
<b>Outlet nominal pressure:</b>	4,5 bar (setting range 0,5–6 bar)
<b>Inlet connection:</b>	G3/4" F
<b>Outlet connection:</b>	G3/4" F
<b>Pressure relieve valve:</b>	6,8 bar
<b>Pressure relieve valve pipe dimension:</b>	ø 15 mm
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1-2 (Electromagnetic compatibility)
	present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS



Note!  
Measurements in mm.



## GAS MANIFOLD MC150 - STABILIZER

MC150 - STABILIZER is a second stage pressure reduction unit with the task to equalize the eventual pressure variation in the hospital pipeline system to ensure a correct pressure from the terminal units. MC150 - STABILIZER is a second stage reduction unit where the primary gas supply is provided by high pressure gas manifolds (such as MC80, MM90 or liquid oxygen tank (LOX)). When there is a signal for pressure deviation in relation to the alarm settings, the alarm can easily be displayed on a Gas alarm unit. It is also possible to send information to the central operation control. The stabilizer can be delivered with either pressure transmitter 4-20 mA, pressure transmitter 0-50 mV or with contact gauge. The gas reduction unit MC150 - STABILIZER must always be installed in compliance with the standards EN ISO 7396-1 and the appropriate national standards.

### SPECIFICATION

**MC150 STABILIZER INCLUDES THE FOLLOWING COMPONENTS:**

- > MC150 Stabilizer Manifold

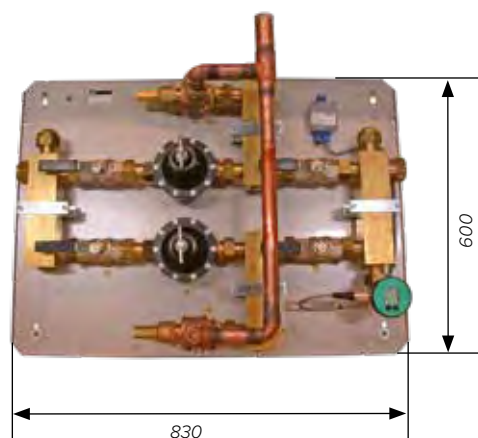
**FOR A COMPLETE MC150 STABILIZER MANIFOLD ADD:**

- > Alarm unit (included if ordered together with HP unit)

Item No.	Denomination	Gas	PRV	Alarm
325397706	MC150 STAB	O <sub>2</sub>	Manual activation	Contact gauge
325397707	MC150 STAB	O <sub>2</sub> , Air, N <sub>2</sub>	Manual activation	4-20 mA

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, N <sub>2</sub> , N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Nominal flow:</b>	360 m <sup>3</sup> /h
<b>Inlet maximal pressure:</b>	20 bar (2000 kPa)
<b>Outlet nominal pressure:</b>	4,5 bar (setting range 0,5–6 bar)
<b>Inlet connection:</b>	2x G1 1/2" F+soldering piece pipe ø 35 mm
<b>Outlet connection:</b>	2x G1 1/2" F+soldering piece pipe ø 35 mm
<b>Pressure relieve valve:</b>	6,8 bar
<b>Pressure relieve valve pipe dimension:</b>	ø 35 mm
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1-2 (Electromagnetic compatibility)
	present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS



Note!  
Measurements in mm.

## GAS MANIFOLD SIMPLEX MMR

The Simplex MMR gas manifold is suitable for such health care where the capacity requirement is limited, such as laboratories and small health care clinics, veterinary etc. This gas manifold consists of only one group of cylinders.

The regulator is mounted in the collection unit. Each inlet connection has a filter, a non-return valve and a shut-off valve. This arrangement makes it possible to use one cylinder at a time.

In order to obtain a stable outlet pressure this gas manifold is equipped with a preset two-stage regulator. On the high pressure side of the regulator there is a contact gauge the signal of which can be carried further to an alarm unit.

### SPECIFICATION

#### SIMPLEX MMR INCLUDES THE FOLLOWING COMPONENTS:

- > Gas cylinder manifold Simplex MMR
- > Collecting pipe Manyflow block for three hoses
- > Gas evacuation kits for collecting pipe

#### FOR A COMPLETE SIMPLEX MMR ADD:

- > Gas alarm C44
- > Pressure relieve valve with manual activation
- > High pressure hoses with safety wire
- > Cylinder retaining brackets (included in gas cylinder collecting pipe set)
- > Gas name signs
- > Pressure relieve valve

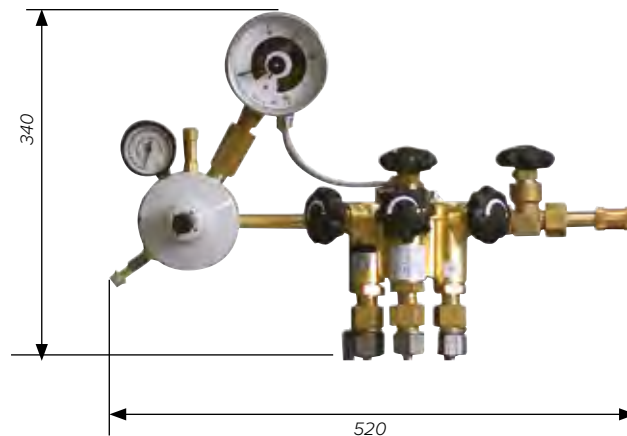
(For more information, please see accessories pages 166-170)



Item No.	Denomination	Gas	PRV	Alarm
325397702	Simplex MMR	O <sub>2</sub> , Air, N <sub>2</sub> , Ar, N <sub>2</sub> O, CO <sub>2</sub>	Standard integrated	Contact gauge

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, N <sub>2</sub> , Ar, N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Nominal flow:</b>	30 m <sup>3</sup> /h
<b>Inlet nominal pressure:</b>	200 bar (20000 kPa)
<b>Outlet nominal pressure:</b>	5 bar (setting range 4–5 bar)
<b>Inlet connection:</b>	W21,8x1/14" M
<b>Outlet connection:</b>	G3/8" M
<b>Pressure relieve valve:</b>	6 bar
<b>Pressure relieve valve pipe dimension:</b>	ø 8 mm
<b>Purge valves connection:</b>	W21,8x1/14" M+pipe ø 15 mm
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1-2 (Electromagnetic compatibility)
	present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS



Note!  
Measurements in mm.

# HIGH PRESSURE GAS MANIFOLD ACCESSORIES

GCE can supply a complete range of high pressure accessories making it possible to install a medical gas supply system. All accessories are designed and manufactured according to the relevant standard for high pressure systems. The high pressure pipe components are manufactured in the following materials: stainless steel AISI 316 L and brass CuZn39Pb3, and they are tested at 360 bar. Cylinder holders for cylinders and connecting pipes are manufactured in AISI 316.

## COLLECTION PIPE LINE

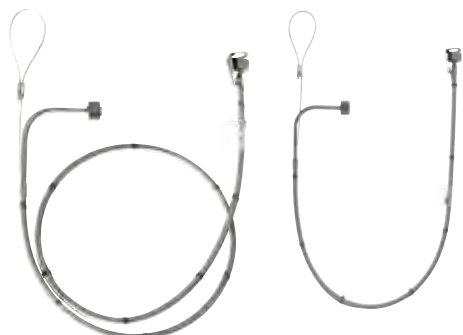


Collecting pipe sets are prepared for GCE HP manifold units. These sets are increasing the inlet points for HP cylinders or bundles. It is possible to connect the collecting pipelines serially and can be used in combination.

### THE SET CONTAINS:

- > High Pressure Valve
- > Non Return Valve
- > Collection Pipe

Item No.	Denomination	Application
0733003	1 cylinder collection pipe set, without cylinder holder	Back up manifold
0733004	2 cylinders collection pipe set, without cylinder holder	Back up manifold
0733005	4 cylinders collection pipe set, without cylinder holder	Back up manifold
0733000	2x1 cylinder collection pipe set	Cylinder bundles
0733001	2x2 cylinders collection pipe set	Cylinder bundles
0733002	2x4 cylinders collection pipe set	Cylinder bundles
0733006	2x1 cylinder collection pipe set+cylinder holders	Gas cylinders
0733007	2x2 cylinders collection pipe set+cylinder holders	Gas cylinders
0733008	2x4 cylinders collection pipe set+cylinder holders	Gas cylinders



## HIGH PRESSURE HOSES

Medical high pressure hoses are used to connect cylinders or cylinder bundles to gas supply systems. The high pressure hose is intended to be used with a pressure of up to 230 bar maximum. Pressure tested at 345 bar.

The hose is equipped with a safety wire.

### HANDLING

The high pressure hose should be transported, stored, installed and maintained according to Instruction of Use. Maximum life time after installation is 5 years.



Item No.	Gas	Length (mm)	Inlet connection	Outlet connection
325197641	O <sub>2</sub>	1250	W21,8x1/14"RH	W21,8x1/14"RH
325197651	O <sub>2</sub>	2000	W21,8x1/14"RH	W21,8x1/14"RH
325197642	N <sub>2</sub> O	1250	R3/8"RH	W21,8x1/14"RH
325197652	N <sub>2</sub> O	2000	R3/8"RH	W21,8x1/14"RH
325197643	Air, Air-800	1250	R5/8"RH	W21,8x1/14"RH
325197653	Air, Air-800	2000	R5/8"RH	W21,8x1/14"RH
325197644	N <sub>2</sub> /Ar	1250	W24,32x1/14"RH	W21,8x1/14"RH
325197654	N <sub>2</sub> /Ar	2000	W24,32x1/14"RH	W21,8x1/14"RH
325197645	CO <sub>2</sub>	1250	W27x2"RH	W21,8x1/14"RH
325197655	CO <sub>2</sub>	2000	W27x2"RH	W21,8x1/14"RH

TECHNICAL DATA	
<b>Tube:</b>	Acid-proof Stainless Steel (AISI 316)
<b>Plait:</b>	Stainless Steel (AISI 304)
<b>Wire:</b>	Stainless Steel (AISI 304)
<b>Nut and tightening material:</b>	Acid-proof Stainless Steel (AISI 316)
<b>Case and Oetiker:</b>	Stainless Steel (AISI 304)
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN ISO 21969 (High Pressure Flexible Connection)

## CONNECTING PIPES FOR CYLINDER MANIFOLDS

Connecting pipes with retaining brackets of stainless steel, for 1–4 cylinders.

Item No.	Connecting threads	Length (mm)	Number of cylinders
<b>325197218</b>	W21,8x1/14"RH EXT-INT	289	1
<b>215191072</b>	W21,8x1/14"RH EXT-INT	579	2
<b>215191073</b>	W21,8x1/14"RH EXT-INT	1159	4



## CYLINDER RETAINING BRACKETS

Cylinder retaining brackets, completely made of stainless steel, for 1 or 2 cylinders.

Item No.	Length (mm)	Number of cylinders
<b>215191074P</b>	260	1
<b>215191075P</b>	550	2



## CONNECTION PIPES FOR CYLINDER PACK MANIFOLDS

Item No.	Connecting threads	Length (mm)	Number of cylinders
<b>215191012</b>	W21,8x1/14"RH EXT-INT	289	1
<b>215191013</b>	W21,8x1/14"RH EXT-INT	579	2
<b>215191014</b>	W21,8x1/14"RH EXT-INT	1159	4



## EXTENSION PIPES

Item No.	Connecting threads	Length (mm)
<b>215191011</b>	W21,8x1/14"RH EXT-INT	700



## GAS EVACUATION VALVE KIT

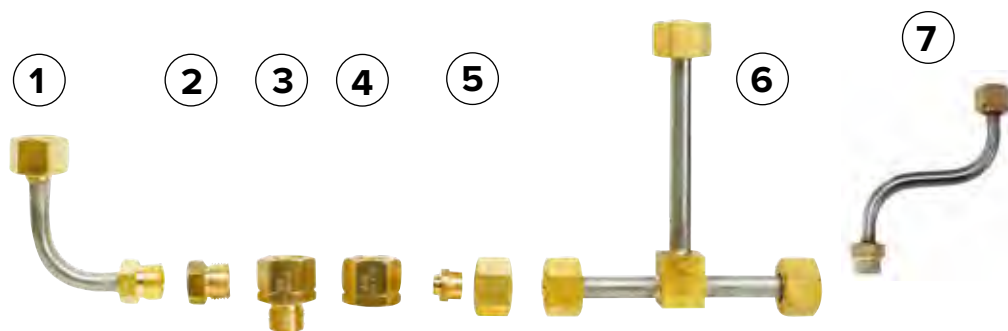
Item No.	Inlet connection	Outlet connection pipe (mm)
<b>325199080</b>	W21,8x1/14" INT	ø 15





## CONNECTING COMPONENTS FOR CYLINDER MANIFOLDS

Item No.	Description	Thread	Position
215191010	Connection pipe 90°	W21,8x1/14" EXT-INT	1
215191077	Blind plug	W21,8x1/14" EXT	2
215191068	Adaptor	W21,8x1/14" LH/ RH EXT-INT	3
200059835P	Coupling nut	W21,8x1/14" LH/RH INT-INT	4
215191080	End plug with nut	W21,8x1/14" INT	5
215191085	T-pipe for DUPLEX	W21,8x1/14" INT-INT-INT	6
215191126	S-pipe	W21,8x1/14" EXT-INT	7
202502362	Aluminium washer 50 pcs	16x12,5x1,5 mm	
325111032P	Copper washers 10 pcs	18x12,7x1,5 mm	



## NON-RETURN VALVES FOR CONNECTION PIPES

Item No.	Denomination	Inlet	Outlet
215191044	Non-return valve for connection pipes	W21,8x1/14"RH EXT	W21,8x1/14"RH INT

## HIGH PRESSURE FILTER

Item No.	Denomination	Inlet	Outlet
9459650P	High pressure filter	W21,8x1/14"RH EXT	W21,8x1/14"RH INT

## HIGH PRESSURE VALVES 300 BAR

Item No.	Denomination	Inlet	Outlet
0765001	SOV DN4	W21,8x1/14"RH	W21,8x1/14"LH

Item No.	Denomination	Inlet	Outlet
BV777097	BV300 DN8	W21,8x1/14"RH	W21,8x1/14"RH

## GAS SIGNS



## LAMINATED LABELS

Item No.	Label description	Country	Dimensions
700325847	ANDNINGSOXYGEN	SE	297x210 mm
700325143	MEDISINSK OKSYGEN	NO	297x210 mm
700325297	MEDICINSK OXYGEN	DK	297x210 mm
700325145	HAPPI	FI	297x210 mm
700325848	LUSTGAS	SE	297x210 mm
700325185	MEDISINSK LYSTGASS	NO	297x210 mm
700325132	DINITROGENOXID	DK	297x210 mm
700325164	DITYPPIOKSIDI	FI	297x210 mm
700325328	MEDICINSK LUFT	SE	297x210 mm
700325162	MEDISINSK LUFT	NO	297x210 mm
700325853	AIR	DK	297x210 mm
700325146	ILMA	FI	297x210 mm
700325849	MEDICINSK KOLDIOXID	SE	297x210 mm
700325757	MEDISINSK KARBONDIOKSID	NO	297x210 mm
700325851	MEDICINSK KULDIOXID	DK	297x210 mm
700325852	CO2	FI	297x210 mm

## INDICATION PANELS

Item No.	Denomination
215190287	Indication panel



## PRESSURE RELIEVE VALVE MEDICAL PIPELINE SYSTEMS

The pressure relieve valve is used in medical pipeline systems to ensure that the pressure does not exceed 6,8 bar. The pressure relieve valve should be mounted on outgoing pipelines on Simplex MMR or can be mounted on other pipelines.

### PRESSURE RELIEVE VALVE TUBE MOUNTING

Item No.	Gas	Relief Pressure	Inlet connection	Outlet connection
325197387	Medical gases and Air	6,8 bar	G3/4"F	G3/4"F



### PRESSURE RELIEVE VALVE SIMPLEX MMR MOUNTING

Item No.	Gas	Relief Pressure	Inlet connection	Outlet connection
325197306	Medical gases and Air	6,8 bar	G3/8"F	G3/4"F

TECHNICAL DATA	
Evacutaion flow:	200 m <sup>3</sup> /h
Evacutaion outlet pipe:	ø 15 mm
Relief pressure:	6,8 bar
Material:	brass, copper, stainless steel, rubber
Pressure class:	PN16
Regulatory status:	Degreased for Oxygen use no CE-marking

# PRESSURE MONITOR



## PRESSURE MONITOR

The pressure monitor makes sure that the lower distribution pressure for nitrous oxide compared to oxygen is kept.

The lower nitrous oxide pressure will be maintained according to standards even when the emergency supply is used through quick connectors or central emergency supply. The pressure monitor is equipped with a digital pressure monitor unit monitoring the current gas pressures, and giving all the visual and acoustic alarms required by standards. The signal to the gas alarm comes from pressure transmitters. The visual and audible signals can be sent to a manned area, if it is required.

The following gases are under surveillance: breathing Oxygen, Nitrous Oxide, Air and instrument Air. The alarm is indicated by an acoustic and visual signal at the same time as the exact cause of the alarm is written on the display. This happens if the gas pressure rises above or sinks below the set maximum or minimum limits respectively.

The pressure monitor is also equipped with a bayonet coupling for breathing oxygen, nitrous oxide, breathing air, and instrument air. When necessary, it is possible to connect spare gas to these.

Item No.	Denomination	Inlet pipe	Outlet pipe	ES pipe	Alarm
0732818	O2, AIR	ø 15	ø 15	–	MC7701
0732819	O2, N2O, AIR	ø 15	ø 15	–	MC7701
0732820	O2, N2O, Air, Air–800	ø 15	ø 15	–	MC7701
0732821*	O2, AIR with ES	ø 15	ø 15	ø 15	MC7701
0732822*	O2, N2O, Air with ES	ø 15	ø 15	ø 15	MC7701
0732823*	O2, N2O, Air, Air–800 with ES	ø 15	ø 15	ø 15	MC7701
0732846	O2, AIR with ES	ø 15	ø 15	ø 15	TOUCH
0732854	O2, AIR	ø 22	ø 22	–	TOUCH
0732855	O2, N2O, AIR	ø 22	ø 22	–	TOUCH
0732856	O2, N2O, AIR, AIR-800	ø 22	ø 22	–	TOUCH
0732857	O2, AIR	ø 22	ø 22	ø 22	TOUCH
0732858	O2, N2O, AIR with ES	ø 22	ø 22	ø 22	TOUCH
0732859	O2, N2O, AIR, AIR-800 with ES	ø 22	ø 22	ø 22	TOUCH

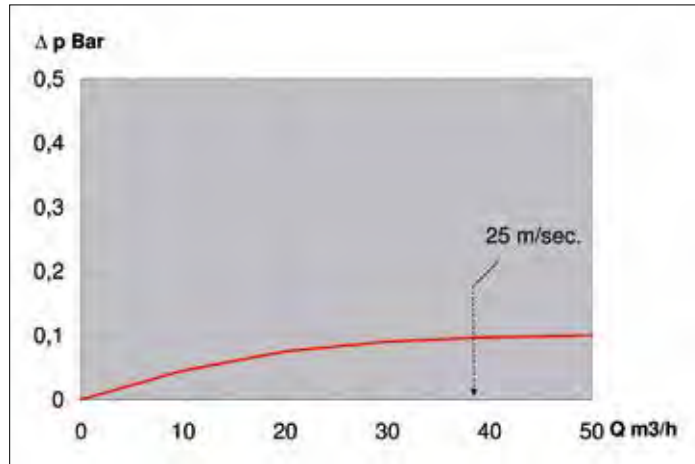
\*With central emergency supply from below

## ACCESSORIES - EMERGENCY SUPPLY HOSES

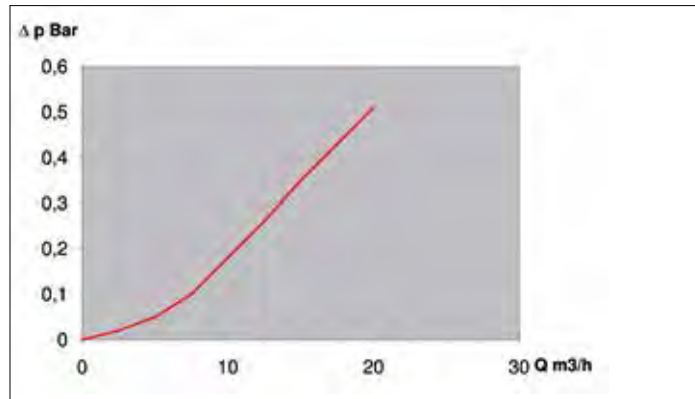
Item No.	Gas	Length	Inlet conn.	Outlet conn.
325197814	O <sub>2</sub>	1,3 m	SW NUT G3/8" – 6 mm	QC SS straight
325197815	N <sub>2</sub> O	1,3 m	SW NUT G3/8" – LH	QC SS straight
325197816	Air	1,3 m	SW NUT G3/8" – 8 mm	QC SS straight
325197817	Air–800	1,3 m	SW NUT G3/8"	QC SS straight

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , N <sub>2</sub> O, Air, Air–800, CO <sub>2</sub> , N <sub>2</sub> , VAC (all medical gases)
<b>Number of gases:</b>	2 to 4 valves (DN15)
<b>Working pressure:</b>	4–5 bar (breathing gases) 7–10 bar (instrumental gases) (-0,4)–(-0,9) bar (vacuum)
<b>Maximum pressure:</b>	16 bar
<b>Safety regulator capacity at 3 bar:</b>	150 l/min
<b>Tube dimension:</b>	ø 15x1 mm, ø 22x1 mm
<b>Emergency QC inlets:</b>	QC by national standards
<b>Pressure gauges:</b>	0–16 bar
<b>Pressure sensors:</b>	Transmitters 0–50 mV (special order); 4–20 mA Complies with Medical Devices Directive 93/42/EEC
<b>Regulatory status:</b>	Complies with EN ISO 7396-1 (Central Gas Supply Systems) Complies with EN 60601-1-2 (Electromagnetic compatibility) and present SIS HB 370

PRESSURE MONITOR – PRESSURE DROP CHARACTERISTIC

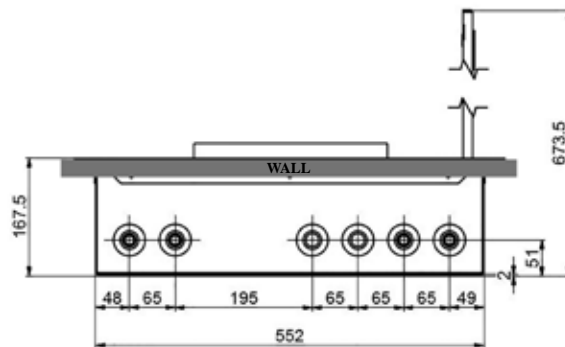


Pressure drop test. Inlet pressure 5 bar.  
Standard - input - output pipe, variants with ES.

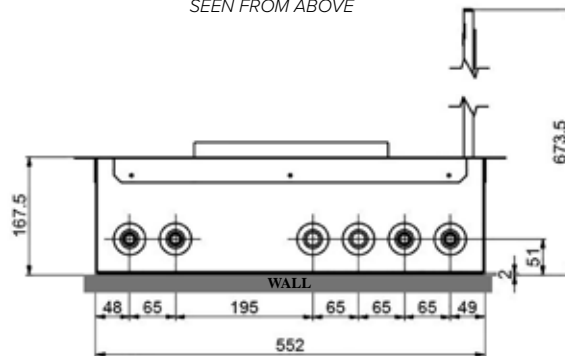


Pressure drop test. Inlet pressure 5 bar.  
Emergency QC inlets.

BASIC DIMENSIONS



4 VALVE BOX RECESSED  
SEEN FROM ABOVE



4 VALVE BOX SURFACE MOUNTED  
SEEN FROM ABOVE

Note!  
Measurements in mm.

# PRESSURE WATCH

## PRESSURE WATCH

The Pressure Watch has the same shut off function as an ordinary Emergency Shut-Off Valve Box. Behind the plexiglass you can find quick couplings and gauges. The quick couplings are used to connect spare cylinders with regulators and emergency supply hoses.

To inform the hospital staff regarding gas failures the Pressure Watch is equipped with sensors for one of the following alarm systems: 1) – pressure switches that you connect to Gas alarm C44, 2) – pressure transmitters 4–20 mA that you connect to gas alarm TOUCH or directly to the hospital central computer system.

The Pressure Watch is delivered with 300 mm connection tubes and each box has been test pressurized and controlled for tightness. The Pressure Watch has large ergonomical handles.

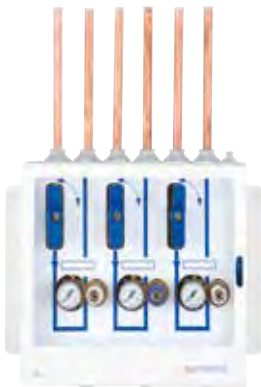
If mounted in a recessed way, the emergency shut-off valve box fits walls with 70 mm beam.

With a 90 mm beam there is extra space (23,5 mm) behind the valve box usable for e.g. fire isolation.

All models, also with four or five gases, fit between the beams in a CC-60 wall. The box is gas-tight which prevents gas accumulation inside the wall.

The product is CE-marked according to EN ISO 7396-1.

It is important that the boxes are placed so that they are easily available for authorized personnel. The front door shall be sealed. In order to avoid mistakes the boxes shall be clearly and distinctly instead of marked with the type of gas. A sign showing which section the box serves must be placed in its immediate vicinity. The valves are open when the handles are in vertical position in line with the printed marking on the plate. To close the valves you turn the handle 90 degrees clockwise.



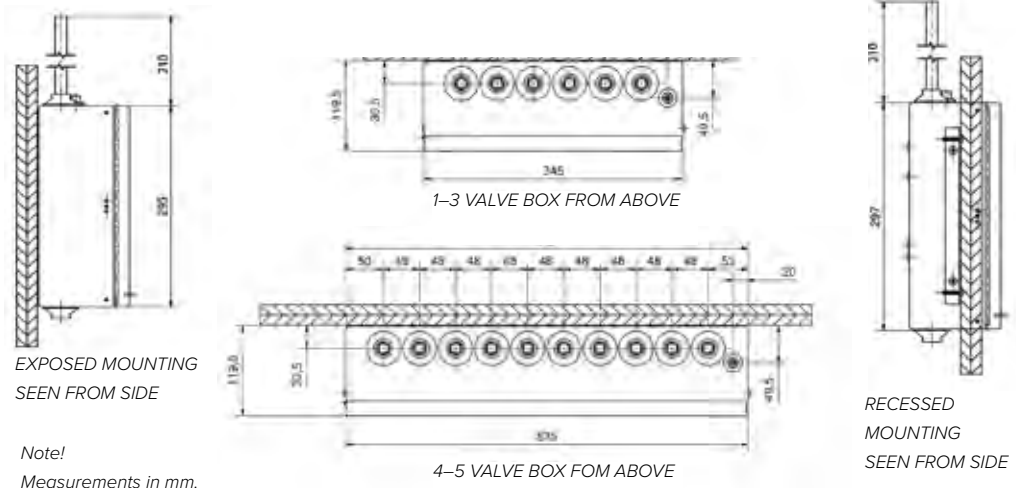
## PRESSURE WATCH DN15 WITH PRESSURE SWITCHES

Item No.	No. of valves DN15	Gas	Inlet/Outlet pipe mm
325397726	1	O <sub>2</sub>	ø 15
325397727	2	O <sub>2</sub> , Air	ø 15
0732828	2	O <sub>2</sub> , VAC yel	ø 15
325397728	3	O <sub>2</sub> , N <sub>2</sub> O, Air	ø 15
0732824	3	O <sub>2</sub> , Air, VAC yel	ø 15
325397729	4	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800	ø 15
0732825	4	O <sub>2</sub> , N <sub>2</sub> O, Air, VAC yel	ø 15
325397730	5	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, CO <sub>2</sub>	ø 15
0732831	5	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, VAC yel	ø 15

## PRESSURE WATCH DN15 WITH TRANSMITTER 4-20 mA

Item No.	No. of valves	Gas	Inlet/Outlet pipe mm
325397861	1	O <sub>2</sub>	ø 15
325397862	2	O <sub>2</sub> , Air	ø 15
325397863	3	O <sub>2</sub> , N <sub>2</sub> O, Air	ø 15
325397858	3	O <sub>2</sub> , Air, VAC red	ø 15
325397864	4	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800	ø 15
325397865	5	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, CO <sub>2</sub>	ø 15

## BASIC DIMENSIONS



Note!  
Measurements in mm.



## PRESSURE WATCH DN20 WITH PRESSURE SWITCHES

Item No.	No. of valves	Gas	Inlet/Outlet pipe mm
0732829	1	Air-800	ø 22
0732802	2	O <sub>2</sub> , Air	ø 22
0732826	2	Air-800, N <sub>2</sub> O	ø 22
0732830	2	O <sub>2</sub> , VAC yel	ø 22
0732804	3	O <sub>2</sub> , N <sub>2</sub> O, Air	ø 22
0732803	3	O <sub>2</sub> , Air, Air-800	ø 22
0732805	3	O <sub>2</sub> , Air, VAC red	ø 22
0732827	3	O <sub>2</sub> , Air, VAC yel	ø 22

## PRESSURE WATCH DN20 WITH TRANSMITTER 4-20 mA

Item No.	No. of valves	Gas	Inlet/Outlet pipe mm
0732806	2	O <sub>2</sub> , Air	ø 22
0732808	3	O <sub>2</sub> , N <sub>2</sub> O, Air	ø 22
0732807	3	O <sub>2</sub> , Air, Air-800	ø 22
0732809	3	O <sub>2</sub> , Air, VAC red	ø 22

## PRESSURE WATCH DN20 EMERGENCY SOURCE WITH PRESSURE SWITCHES

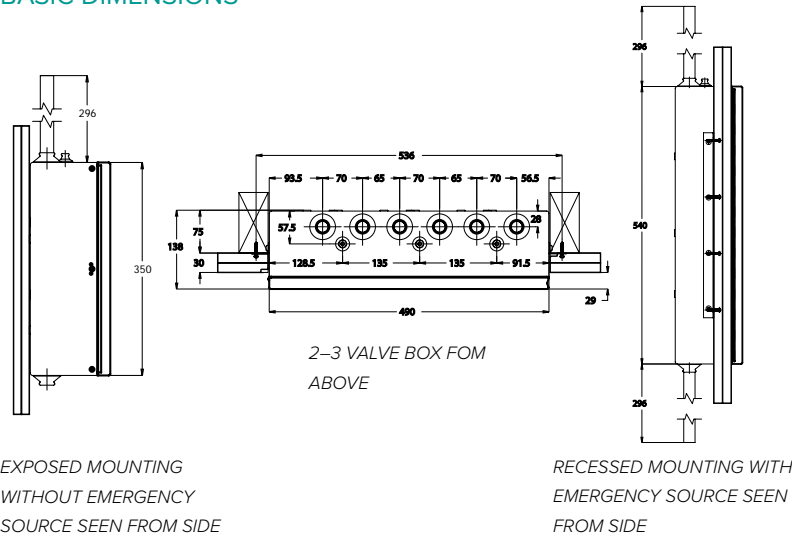
Item No.	No. of valves	Gas	Inlet/Outlet pipe mm
0732810	2	O <sub>2</sub> , Air	ø 22
0732812	3	O <sub>2</sub> , N <sub>2</sub> O, Air	ø 22
0732811	3	O <sub>2</sub> , Air, Air-800	ø 22
0732813	3	O <sub>2</sub> , Air, VAC red	ø 22

## PRESSURE WATCH DN20 EMERGENCY SOURCE WITH TRANSMITTER 4-20 mA

Item No.	No. of valves	Gas	Inlet/Outlet pipe mm
0732814	2	O <sub>2</sub> , Air	ø 22
0732816	3	O <sub>2</sub> , N <sub>2</sub> O, Air	ø 22
0732815	3	O <sub>2</sub> , Air, Air-800	ø 22
0732817	3	O <sub>2</sub> , Air, VAC red	ø 22

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, CO <sub>2</sub> , N <sub>2</sub> , VAC (all medical gases)
<b>Number of gases:</b>	(ø 15×1) 1 to 5 valves (DN15)
	(ø 22×1) 1 to 3 valves (DN20)
<b>Working pressure:</b>	4–5 bar (breathing gases)
	7–10 bar (instrumental gases)
	(-0,4)–(-0,9) bar (vacuum)
<b>Maximum pressure:</b>	16 bar
<b>Tube dimension:</b>	ø 15×1 mm
	ø 22×1 mm
<b>Emergency QC inlets:</b>	QC by national standards
<b>Pressure gauges:</b>	0–16 bar
<b>Pressure sensors:</b>	Pressure switches; Transmitters 0–50 mV (special order); 4–20 mA
	Complies with Medical Devices Directive 93/42/EEC
<b>Regulatory status:</b>	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS



Note!  
Measurements in mm.



## SLIDE ZONE CONTROL UNITS



Zone control units are used in medical gas systems to control the output pressure of the supply source to the medical equipment and patients and when necessary, to isolate between the supply source and the utilization points.

The anthracite grey coloured tempered glass panel used in the SLIDE zone control unit has a chic appearance and fits in perfectly with various interior designs in hospitals.

SLIDE Zone Control Unit, the new zone service unit, is designed to reflect contemporary design with simple lines and a sophisticated rectangular shape. Because of its aluminium body structure, the product gains light weightness and has a long life term. A smooth and semi-transparent glass cover makes it easy to clean and ensures maximum hygiene.

Opening up with a slide rail system the unit is space saving in corridors. Equipped with an integrated alarm system, either as LED or TOUCH variant, the unit ensures maximum functionality and is very user-friendly.

The hidden lock system keeps the zone control unit safe from unwanted manipulation and can be broken in case of emergency. One spare breakable piece of the lock can be found inside the unit.

The lock system is hidden and can be broken in case of emergency. One spare breakable piece of the lock is found in the unit.

The gas pressure gauges, gas names and alarms can be read without opening the front panel.

The alarm interface can be reached without opening the lock and control buttons such as “test” and “mute” can be used easily.

Glass stoppers are installed at 2 different stages and lift the glass properly during service processes.

There is a proper separation between the gas and alarm compartments.

In addition to the gas cutting valves, the gas blocks have manual physical isolation units, in compliance with EN standards.

Depending on request, SLIDE may be surface or flush mounted and with or without alarm system.

### TECHNICAL DATA

#### GAS CONTROL STRUCTURAL FEATURES

Brass monoblock body, physical separation part, oilfree - suitable to oxygen

Equipped with a ball valve, pressure switch or pressure transmitter and manometer / vacuum meter

Gas specific emergency serv. feeding inlet at output  
(NIST, DIN, AFNOR, BS,UNI, SS, CZ type for O<sub>2</sub>, Med.Air, Surg.Air, Vac, N<sub>2</sub>O, Entonox (O<sub>2</sub>/N<sub>2</sub>O), CO<sub>2</sub>)

**Gas types:** Oxygen, Medical Air, Surgical Air, Vacuum, Nitrous oxide, Entonox Mix Gas (O<sub>2</sub>/N<sub>2</sub>O), Carbon dioxide

**Inlet and outlet pressure:** 10 bar  
-1 bar (for vacuum)

Units are not intended for use in regions endangered by explosion

Units are designed for continuous operation

#### ORDINARY APPLIANCE

**Protection Class:** 1  
**Type of Protection:** Covered Construction (IP 21)

**Council Guidelines:** Class IIb

**BASIC REGULATIONS** EN ISO 7396-1  
EN ISO 9170-1

# GAS ALARM



## GAS ALARM - GCE TOUCH

The purpose of alarm systems is to inform hospital personal about none standard pressure deviation in the hospital medical gas systems. It is one of the most important security products among medical gas systems. It ensures that downtime, pressure changes, etc. will be indicated and that the hospital staff is informed so that they can act according to hospital instructions.

The gas alarm GCE TOUCH is an alarm that has all necessary functions for an early detection of these problems. GCE TOUCH is very easy to operate with its clear and straight forward menu layout. It is a user-friendly alarm based on a 7" LCD touch screen display with graphic buttons, simple control and with lots of extra functionality. GCE TOUCH has a GSM module for transmitting an alarm situation directly to the hospital engineers and the ability to communicate through an Ethernet connection. The SMS module can send information about the alarm status to up to 10 mobile phone numbers. As GCE TOUCH has a log function to store all emergency situations it is possible to find historical data if necessary.

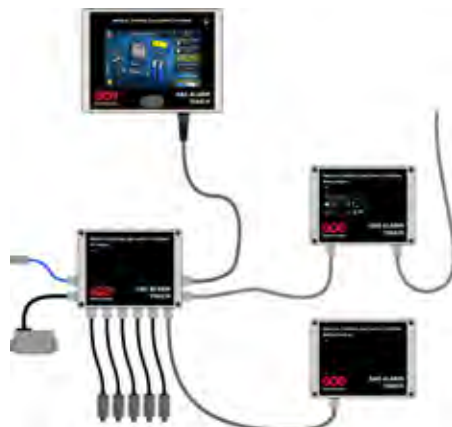
GCE TOUCH gas alarm fulfills ISO 7396, national installation standards, and all relevant electrical standards as EN 60601-1, EN 60601-1-2, which guarantee safety usage in hospitals.

GCE TOUCH contains:

- > Manifold local alarm
- > Pressure monitor alarm
- > Pressure watch alarm
- > Section gas alarm

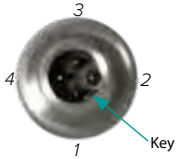
For more information, please contact our sales and product support

TECHNICAL DATA	
<b>Display:</b>	7" LCD Touch screen
<b>Analog inputs:</b>	10x; 4–20mA; 2 wires connection
<b>Digital inputs:</b>	8x; log0<2 VDC; log 1>4 VDC; 2 wires + ground
<b>Switching outputs:</b>	27,6 VDC
<b>Relay output:</b>	3x; NO/NC/GND potential free contacts
<b>Acoustic alarm:</b>	440Hz/880Hz; min 57dB
<b>Log database:</b>	Min. 1000 items
<b>Communication:</b>	1x Ethernet - Modbus TCP
	1x GSM module
	1x USB for service purposes
<b>Power supply:</b>	100–240 VAC; 50–60 Hz; max 60 VA
<b>Backup battery:</b>	Optional accessories; external 2x12 VDC
<b>Enclosure:</b>	IP65 for I-O Module, Power supply, Battery box
<b>Working temperature:</b>	10–40 °C
<b>Dimensions L × W × H</b>	
<b>Display part:</b>	225x190x60 mm
<b>I–O Module:</b>	210x150x75 mm
<b>Power supply:</b>	210x150x75 mm
<b>Battery backup:</b>	210x150x75 mm
<b>Regulatory status</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN 60601-1 (Electrical safety)
	Complies with EN 60601-1-2 (EMC – Electromagnetic compatibility)





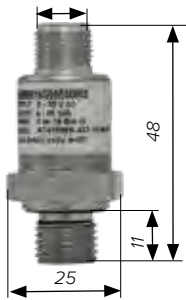
ELECTRICAL CONNECTOR



- 1 = +IN
- 2 = N/C
- 3 = 0V
- 4 = PE

BASIC DIMENSIONS

M12x1 - 4 pins



Note!  
Measurements in mm.

ACCESSORIES



- |                |                   |
|----------------|-------------------|
| <b>Pin No.</b> | <b>Wire color</b> |
| 1              | Brown             |
| 2              | White             |
| 3              | Blue              |
| 4              | Black             |

PRESSURE TRANSMITTER 4-20 mA

Small compact pressure transmitter with good performance.  
Suitable for mobile applications when vibration reliable sensors are needed.  
Compact connectors.  
> High Proof Pressure  
> RoHS Compliant  
> All-stainless steel parts  
> Degreased for Oxygen

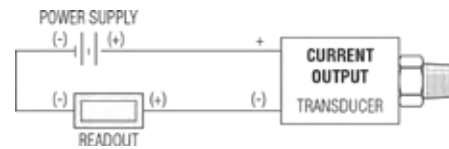
Item No.	Pressure range	Proof pressure	Burst pressure	Thread	Connector
SPK36410001	(-1)-0 bar	10 bar	15 bar	G1/4" EXT	M12x1 - 4 pins
SPK36410002	0 - 16 bar	48 bar	640 bar	G1/4" EXT	M12x1 - 4 pins
SPK36410003	0-250 bar	500 bar	2500 bar	G1/4" EXT	M12x1 - 4 pins

ACCESSORIES

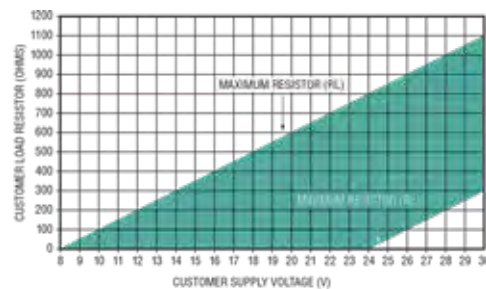
Item No.	Denomination	Length
SPK36410004	Cable M12x1 - 4 pins	2 m

TECHNICAL DATA	
<b>Performance:</b>	
<b>Long Term Drift:</b>	0.2% FS/YR (non-cumulative)
<b>Accuracy:</b>	0.25% FS
<b>Thermal Error:</b>	±1.5% max, ±1% typical / 100°C
<b>Compensated Temperatures:</b>	-40°C to +120°C
<b>Operating Temperatures:</b>	-40°C to +120°C
<b>Zero Tolerance:</b>	±0.5% of span
<b>Span Tolerance:</b>	±0.5% of span
<b>Fatigue Life:</b>	Designed for more than 100 M cycles
<b>Mechanical Configuration:</b>	
<b>Current Output 2-wire:</b>	4-20 mA
<b>Supply Voltage:</b>	8 - 30 VDC
<b>Pressure Port:</b>	G1/4" Male
<b>Parts in contact with gas:</b>	Stainless Steel
<b>Electrical Connection:</b>	M12x1 - 4 pin
<b>Enclosure:</b>	IP67
<b>Vibration:</b>	BSEN 60068-2-6 (FC) Sine (20G); BSEN 60068-2-64 (FH) Random (14.1 Grms)
<b>Shock:</b>	BSEN 60068-2-27 (Ea) (50G, 11ms)
<b>Approvals:</b>	CE, RoHS
<b>EMC Approvals:</b>	
<b>Emissions and Immunity tests:</b>	EN61326-1 and EN61326-2-3

WIRING DIAGRAM



CURRENT OUTPUT MODE (LOAD RESISTOR RANGE)





## GAS ALARM - MC7701

This alarm gives visual and audible indications as well as status messages in plain language. When used with a manifold, the following conditions are surveilled:

1. Too high or too low distribution pressure,
2. Too high intermediate pressure,
3. Leakage on the non-operating gas cylinder bank,
4. When change of operating side has been effected.

When connected to a liquid tank the following disturbances will be reported:

1. Too high or too low distribution pressure,
2. Too high intermediate pressure
3. Leakage on the non-operating gas cylinder bank.
4. When change of operating side has been effected.

When used with a pressure monitor or pressure watch the following conditions are surveilled: Too high or too low distribution pressure.

The MC7701 is able to communicate with another equipment through a serial link RS485, Modbus RTU and / or relays. The alarm has a battery back-up for 30 minutes of operation.

Item No.	Denomination
325197497P	Digital pressure monitor MC7701 UNILARM

## ACCESSORIES

Item No.	Denomination
325112696P	Cable with Hirsman contact 3m
325112698P	Cable with cable connectors 3 m
325112496	Backup batteries MC7701
325110804P	Pressure Transmitter 0–50 mV G1/8" 0–16 bar
325110528P	Pressure Transmitter 0–50 mV G1/8" 0–25 bar
325110527P	Pressure Transmitter 0–50 mV G1/8" 0–250 bar

TECHNICAL DATA	
Power supply:	230 VAC; 0,3A/24 VAC; 1,3 A
Backup battery:	10,8 V
Power Consumption:	15 VA
Enclosure:	IP65
Working temperature:	10–40 °C
Relay outputs:	14 potential free contacts
Relay output max. rating:	125 VAC; 60 VDC/1A/62,5 VA/30 W
Serial communication:	Modbus RTU
Display languages:	Swedish, Norwegian, Danish, Finnish, English and Hungarian
Regulatory status:	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	EMC tested in accordance EN 60601-1-2 (Emission and immunity)

## BASIC DIMENSIONS



Note!  
Measurements in mm.



## GAS ALARM - G4

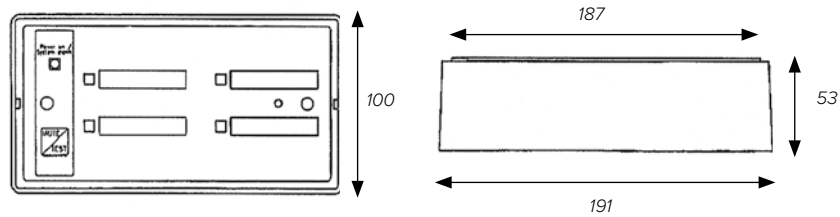
The alarms are summation alarms for both high and low pressure. In addition to this, a failure in the computer communication system, or a damaged signal cable (for example cut off) is also indicated. The loudness of the sound can be adjusted by using the potentiometer placed behind the covering lid. At delivery the sound is set at medium.

The gas alarm G4 is available in two different designs, for recessed mounting and for exposed mounting. The display will show any of eight languages chosen from stickers enclosed. The alarm is equipped with a rechargeable battery in case of power failure.

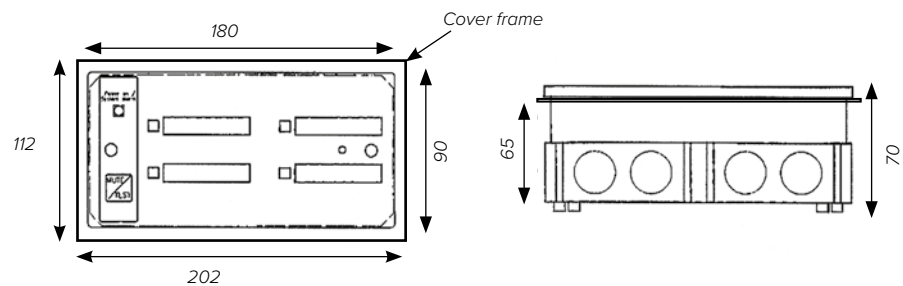
Item No.	Denomination
325197713	Gas alarm G4 recessed mounting
325197714	Gas alarm G4 exposed mounting

TECHNICAL DATA	
<b>To be used only together with digital Gas alarm - MC7701</b>	
<b>Maximum units in serial connection:</b>	10 units
<b>Backup battery:</b>	9 V
<b>Working temperature</b>	10-40 °C
<b>Power supply:</b>	From MC 7701 (15V; 4,5 VA)
<b>Recommended cable:</b>	Signal cable 0,75 mm <sup>2</sup> Computer wire like Alpha type 5472C or similar
<b>Maximum cable length:</b>	400 m (between alarms)
<b>Regulatory status</b>	Complies with Medical Devices Directive 93/42/EEC Complies with EN ISO 7396-1 (Central Gas Supply Systems) EMC tested in accordance EN 60601-1-2 (Emission and immunity)

### EXPOSED MOUNTING



### RECESSED MOUNTING



Note!  
Measurements in mm.



## GAS ALARM - C44

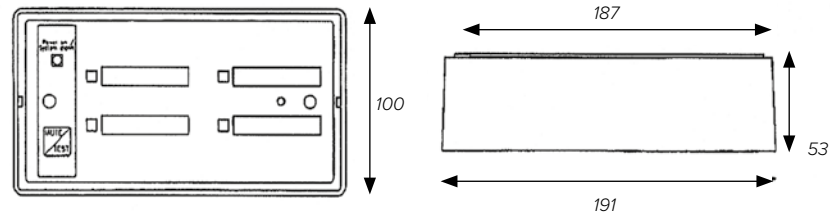
Gas Alarm C44 is a gas pressure alarm intended for small gas manifolds, stabilizers and for example contact gauges/pressure switches connected directly to the main line. The C44 is a microprocessor based alarm for 4 alarm channels and is connected to the pressure sensing device with volt free contacts, for example contact gauges or pressure switches. Alarm C44 is voltage fed with 11,5 VAC. Supply voltage is fed by the enclosed transformer. Visible from the front is an integrated push button TEST/MUTE. If there is no alarm condition, all the light emitting diodes and the buzzer can be tested when the button is pushed. Should there be an alarm condition, the signal will be suppressed for 15 minutes. If an alarm has been silenced and a new one occurs, the MUTE function is cleared and the signal comes back until the cause has been attended to and the MUTE button is pushed again.

Alarm C44 is equipped with an environmental-friendly rechargeable NiMH back-up battery. The sound volume is adjustable via a potentiometer placed behind the cover. At delivery the sound volume is set at medium.

Item No.	Denomination
32519771P	Gas alarm C44 exposed mounting

TECHNICAL DATA	
<b>Power supply:</b>	230 VAC; 14VA/11,5 VAC; 0,9 A
<b>Backup battery:</b>	9 V
<b>Power Consumption:</b>	about 3,5 VA
<b>Working temperature:</b>	10–40 °C
<b>Relay outputs:</b>	4 potential free contacts
<b>Relay output max. rating:</b>	125 VAC; 60 VDC/1A/62,5 VA/30 W
<b>Recommended cable:</b>	Signal cable 0,25 mm <sup>2</sup> Feed cable 0,75 mm <sup>2</sup>
<b>Maximum cable length:</b>	3 m (alarm-pressure switches)
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC Complies with EN ISO 7396-1 (Central Gas Supply Systems) EMC tested in accordance EN 60601-1-2 (Emission and immunity)

## EXPOSED MOUNTING



*Note!*  
Measurements in mm.

# SHUT-OFF VALVE BOX

For safety and service reasons a central gas system must be equipped with shut-off valves placed so that the gas supply can easily be interrupted. The valves are mounted in a box. The emergency shut-off valve boxes should be placed so that the gas can be shut off section wise. This means that the boxes should be positioned before each ward, operating unit, part of ward for critical treatment and individual surgeries. The emergency shut-off valve box is delivered with connection tubes and each box has been test pressurized and leakage tested. The emergency shut-off valve has large ergonomical handles.

If mounted in a recessed way, the emergency shut-off valve box fits walls with 70 mm beam. With a 90 mm beam there is extra space (23,5 mm) behind the valve box usable for e.g. fire isolation.

All models, also with four or five gases, fit between the beams in a CC-60 wall. The box is gas-tight which prevents gas accumulation inside the wall. The product is CE-marked according to EN ISO 7396-1.

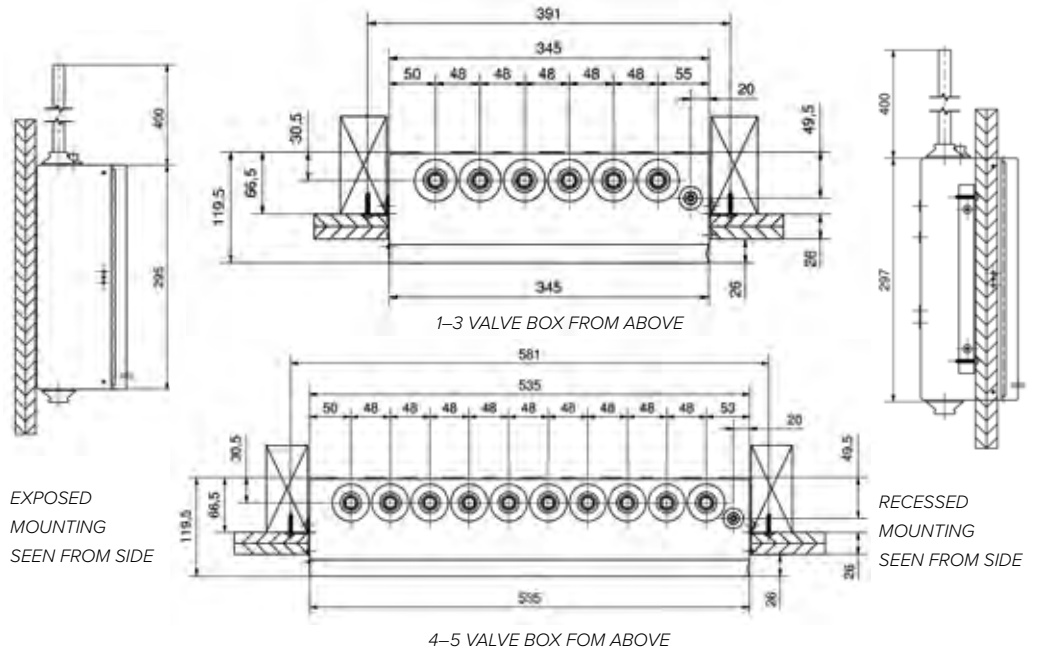
It is important that the boxes are placed so that they are easily available for authorized personnel. The front door shall be sealed. In order to avoid mistakes the boxes shall be clearly and distinctly marked with the gas type. A sign showing which section the box serves must be placed in its immediate vicinity. The valves are open when the handles are in vertical position in line with the printed marking on the plate.

## SHUT-OFF VALVE BOX DN15

Item No.	Type	Inlet pipe	Outlet pipe
325397721	1 valve DN15	ø 15	ø 15
325397722	2 valves DN15	ø 15	ø 15
325397723	3 valves DN15	ø 15	ø 15
325397724	4 valves DN15	ø 15	ø 15
325397725	5 valves DN15	ø 15	ø 15



### BASIC DIMENSIONS



Note!  
Measurements in mm.

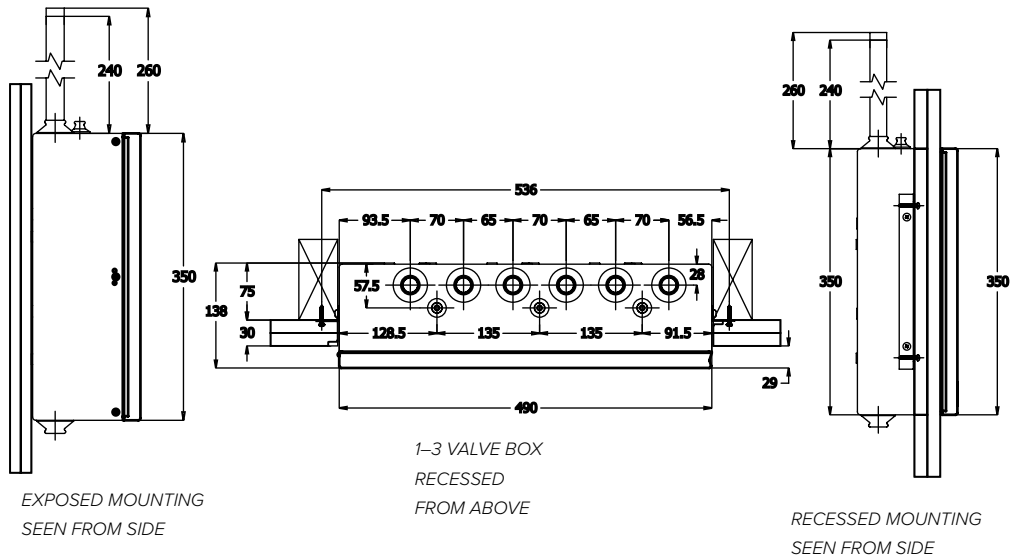


## SHUT-OFF VALVE BOX DN20

Item No.	Type	Inlet pipe	Outlet pipe
0732703	1 valve DN20	ø 22	ø 22
0732701	2 valves DN20	ø 22	ø 22
0732702	3 valves DN20	ø 22	ø 22

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, CO <sub>2</sub> , N <sub>2</sub> , VAC (all medical gases)
<b>Number of gases:</b>	(ø 15x1) 1 to 5 valves (DN15) (ø 22x1) 1 to 3 valves (DN20) 4-5 bar (breathing gases)
<b>Working pressure:</b>	7-10 bar (instrumental gases) (-0,4-(-0,9) bar (vacuum)
<b>Maximum pressure:</b>	16 bar
<b>Tube dimension:</b>	ø 15x1 mm ø 22x1 mm
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC Complies with EN ISO 7396-1 (Central Gas Supply Systems) present SIS HB 370 and HTM 02-01

### BASIC DIMENSIONS



Note!  
Measurements in mm.



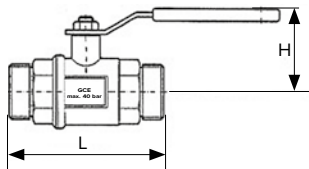
## MEDICAL SHUT OFF VALVES



To meet safety requirements, the gas supply to operating rooms etc must be fitted with a device to allow instant shut off. To allow maintenance the gas supply must be controlled by section. To achieve the demands of safety and maintenance, shut-off valves should be fitted in every main line, riser and branch line in the pipework system.

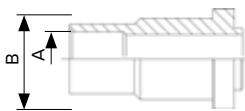
The valves are degreased and blown clean. They can be equipped with unions to be soldered to the copper piping. Before delivery each valve is individually leak tested. The ball is sealed with washer of PTFE. The stem is sealed with two silicon O-rings or PTFE washer. The valve housings are sealed with an EPDM quality O-ring. No maintenance – the ball valve does not need services, when necessary the whole valve is exchanged.

### SHUT-OFF VALVE INCL 2 PCS WASHER

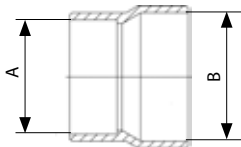


Item No.	Thread	Valve	L (mm)	H(mm)
325196767	G1/2" EXT	DN10	67	46
325196768	G3/4" EXT	DN15	77	48
325197794	G1" EXT	DN20	100	52
325196770	G1 1/4" EXT	DN25	115	54
325397236	G1 1/2" EXT	DN32	132	72
325397237	G2" EXT	DN40	145	84

### CONNECTION PARTS (2 CONNECTION NUTS AND 2 CONNECTION PIECES)



Item No.	Material	Valve	A/B mm
325196910	Red brass SS 5204	DN10	10/15
325196911	Red brass SS 5204	DN10	12
325196912	Red brass SS 5204	DN15	15/22
325196913	Red brass SS 5204	DN15	18
325197795	Red brass SS 5204	DN20	22/28
325196914	Red brass SS 5204	DN25	22/35
325196915	Red brass SS 5204	DN25	28
325197324	Red brass SS 5204	DN32	35/42
325197325P	Red brass SS 5204	DN40	42/48



### CONNECTION PARTS (SOLDERING ADAPTER DN40-DN50 2 PCS)

Item No.	Material	A/B mm
325196776	Red brass SS 5204	48/54

Order both DN 40 and DN 50 for union enlargement.

### SPARE PARTS

Item No.	Denomination	Valve	Thread
325110373P	Washer, 10 pcs	DN10	–
325100729P	Washer, 10 pcs	DN15	–
325113389P	Washer, 10 pcs	DN20	–
325100730P	Washer, 10 pcs	DN25	–
201241192P	O-ring, EPDM, 5 pcs	DN32	–
201241193P	O-ring, EPDM, 5 pcs	DN40	–
202502266	Connection nut, 2 pcs	DN10	G1/2" INT
202502268	Connection nut, 2 pcs	DN15	G3/4" INT
325113373P	Connection nut, 2 pcs	DN20	G1" INT
202502270	Connection nut, 2 pcs	DN25	G1 1/4" INT
325112281P	Connection nut, 1 pce	DN40	G2" INT

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , Air, N <sub>2</sub> , Ar, N <sub>2</sub> O, CO <sub>2</sub> (all medical gases)
<b>Material valve housing:</b>	Nickel plated brass
<b>Ball:</b>	Chrome plated brass
<b>Stem:</b>	Nickel plated brass
<b>Max working pressure:</b>	40 bar (4000 kPa)
<b>Tighten proof:</b>	(-1)–50 bar [(-100)–5000 kPa]
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply System)
	Complies with EN 331 (Manually operated ball valves)



## NON RETURN VALVE

The non return valve unit is intended for use in medical central gas systems to secure that gas does not flow back from the equipment and pipes through the central gas system. This is very important for example when technical air is taken from medical air pipes for use in laboratories.

The non return valve unit consists of a non return valve (NRV) with a flow direction arrow, lockable medical shut off valves, soldering pieces, nuts and a gasspecific medical quick coupling (QC) for medical breathing air. This design makes the NRV very easy to test. The QC can also be used for checking the pressure, doing leak tests and take gas samples. The NRV unit can also be delivered with QC for instrumental air.

For more information please contact our sales and product support

### NON RETURN VALVE UNIT

Item No.	Denomination	Total Length
329000825	Non return valve unit O2 DN15	415 mm
325397676	Non return valve unit AIR DN15	415 mm
329000826	Non return valve unit Air-800 DN15	415 mm
325397677	Non return valve unit AIR DN25	505 mm
325397777	Non return valve unit Air-800 DN25	505 mm
325397678	Non return valve unit AIR DN40	932 mm

### SEALING BETWEEN NON RETURN VALVE AND CONNECTING PIECE

Item No.	Denomination
944610218P	DN15 O-ring, 10 pcs
325112713P	DN25 Sealing, 10 pcs
325112880P	DN40 O-ring, 10 pcs

TECHNICAL DATA	
Opening pressure:	0,06 bar (6 kPa)
Pressure class:	PN16
Regulatory status:	Degreasing for Oxygen use no CE-marking

# TERMINAL UNITS - MEDIUNITS



Recessed version



Exposed version



Installation plug

## TERMINAL UNIT - MEDIUNIT (DIN)

Medical terminal units provide quick and easy connection of hospital ward gas equipment to the hospital gas source. The type of medical gas outlets are decided by national standards in each country and sometimes from local requests in each hospital. GCE complies with ISO 7396 and national installation standards with secure products where every product is fully tested in production. Our Medical gas outlets are in accordance with ISO EN 9170-1, ISO EN 9170-2 international standards.

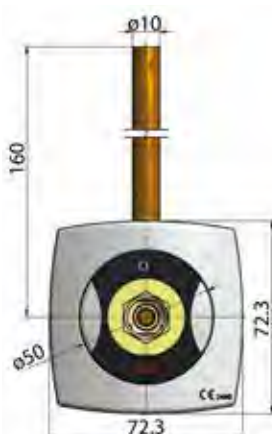
- > Wall housing is compatible with all GCE MediUnit standards like DIN, BSI, SS, CZ
- > All functional components are from brass
- > Simple installation
- > Fast connection and disconnection
- > Designed for medical environment, small size and easy to clean
- > Complies with colour coding and description by standard
- > After 10 years it is possible to upgrade the units with a special upgrade pack
- > Recessed and exposed versions
- > Bed head installation version (customized solution on request)

Item No.	Denomination	Type	Marking
<b>0732201046</b>	O <sub>2</sub> – RECESSED	Pipe ø 10 mm	O <sub>2</sub>
<b>0732201049</b>	N <sub>2</sub> O – RECESSED	Pipe ø 10 mm	N <sub>2</sub> O
<b>0732201047</b>	AIR – RECESSED	Pipe ø 10 mm	AIR
<b>0732201050</b>	CO <sub>2</sub> – RECESSED	Pipe ø 10 mm	CO <sub>2</sub>
<b>0732201048</b>	VAC – RECESSED	Pipe ø 10 mm	VAC
<b>0732201051</b>	O <sub>2</sub> – EXPOSED	Pipe ø 10 mm	O <sub>2</sub>
<b>0732201054</b>	N <sub>2</sub> O – EXPOSED	Pipe ø 10 mm	N <sub>2</sub> O
<b>0732201052</b>	AIR – EXPOSED	Pipe ø 10 mm	AIR
<b>0732201055</b>	CO <sub>2</sub> – EXPOSED	Pipe ø 10 mm	CO <sub>2</sub>
<b>0732201053</b>	VAC – EXPOSED	Pipe ø 10 mm	VAC

## INSTALLATION TOOLS

Item No.	Denomination
<b>MP_00345</b>	QC installation keys
<b>MP_00324</b>	Button remover
<b>MP_01157ST</b>	Pendants/bedhead unit – installation tool
<b>0732040</b>	Installation plug (10 pcs)

## BASIC DIMENSIONS



Note!  
Measurements in mm.

TECHNICAL DATA	
Gases:	O <sub>2</sub> , N <sub>2</sub> O, Air, CO <sub>2</sub> , N <sub>2</sub> , VAC
Dimensions:	Height: 73 mm, Width: 73 mm, Depth: 63 mm
Working pressure:	4–5 bar (breathing gases)
	7–10 bar (instrumental gases)
Maximum pressure:	(-0,4)–(-0,9) bar (vacuum)
	20 bar
Regulatory status:	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN ISO 9170-1 (Terminal units)
	Complies with EN ISO 9170-2 (Terminal units for AGSS)
	Complies with DIN 13260-2 (DIN gas specific connections)
	present HTM 02-01

## TERMINAL UNIT - MEDIUNIT (SS)

Medical terminal units provide quick and easy connection of hospital ward gas equipment to the hospital gas source. The type of medical gas outlets are decided by national standards in each country and sometimes from local requests in each hospital. GCE complies with ISO 7396 and national installation standards with secure products where every product is fully tested in production. Our Medical gas outlets are in accordance with ISO EN 9170-1, ISO EN 9170-2 international standards.

- > Wall housing is compatible with all GCE MediUnit standards like DIN, BSI, SS, CZ
- > All functional components are from brass
- > Simple installation
- > Fast connection and disconnection
- > Designed for medical environment, small size and easy to clean
- > Complies with colour coding and description by standard
- > After 10 years it is possible to upgrade the units with a special upgrade pack
- > Recessed and exposed versions
- > Bed head installation version (customized solution on request)



Recessed version



Exposed version



Installation plug

Item No.	Denomination	Country	Type	Marking
0732200073	O <sub>2</sub> – RECESSED	SE	Pipe ø 10 mm	ANDNINGSOXYGEN
0732200076	N <sub>2</sub> O – RECESSED	SE	Pipe ø 10 mm	LUSTGAS
0732200074	AIR – RECESSED	SE	Pipe ø 10 mm	ANDNINGSLUFT
0732200078	AIR-800 – RECESSED	SE	Pipe ø 10 mm	INSTRUMENTLUFT
0732200077	CO <sub>2</sub> – RECESSED	SE	Pipe ø 10 mm	MEDICINSK KOLDIOXID
0732200075	VAC – RECESSED	SE	Pipe ø 10 mm	GASUTSUG
0732200079	AGSS – RECESSED	SE	Pipe ø 10 mm	GASUTLOPP
0732200080	O <sub>2</sub> – EXPOSED	SE	Pipe ø 10 mm	ANDNINGSOXYGEN
0732200083	N <sub>2</sub> O – EXPOSED	SE	Pipe ø 10 mm	LUSTGAS
0732200081	AIR – EXPOSED	SE	Pipe ø 10 mm	ANDNINGSLUFT
0732200085	AIR-800 – EXPOSED	SE	Pipe ø 10 mm	INSTRUMENTLUFT
0732200084	CO <sub>2</sub> – EXPOSED	SE	Pipe ø 10 mm	MEDICINSK KOLDIOXID
0732200053	VAC – EXPOSED	SE	Pipe ø 10 mm	GASUTSUG
0732200086	AGSS – EXPOSED	SE	Pipe ø 10 mm	GASUTLOPP

For other configurations (DK, FI, NO) please contact Sales and Product Support

## INSTALLATION TOOLS

Item No.	Denomination
MP_00345	QC installation keys
MP_00324	Button remover
MP_01157ST	Pendants/bedhead unit – installation tool
0732040	Installation plug (10 pcs)

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, CO <sub>2</sub> , N <sub>2</sub> , Ar, AGSS, VAC
<b>Dimensions:</b>	Height: 73 mm, Width: 73 mm, Depth: 63 mm
<b>Working pressure:</b>	4–5 bar (breathing gases) 7–10 bar (instrumental gases) (-0,4) – (-0,9) bar (vacuum)
<b>Maximum pressure:</b>	20 bar
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC Complies with EN ISO 7396-1 (Central Gas Supply Systems) Complies with EN ISO 9170-1 (Terminal units) Complies with EN ISO 9170-2 (Terminal units for AGSS) Complies with SS 8752430 (SS gas specific connections) present SIS HB 370 and HTM 02-01

## BASIC DIMENSIONS



Note!

Measurements in mm.



Split view

## TERMINAL UNIT - MEDIUNIT (BSI)

Medical terminal units provide quick and easy connection of hospital ward gas equipment to the hospital gas source. The type of medical gas outlets are decided by national standards in each country and sometimes from local requests in each hospital. GCE complies with ISO 7396 and national installation standards with secure products where every product is fully tested in production. Our Medical gas outlets are in accordance with ISO EN 9170-1, ISO EN 9170-2 international standards.

- > Wall housing is compatible with all GCE MediUnit standards like DIN, BSI, SS, CZ
- > All functional components are from brass
- > Simple installation
- > Fast connection and disconnection
- > Designed for medical environment, small size and easy to clean
- > Complies with colour coding and description by standard
- > After 10 years it is possible to upgrade the units with a special upgrade pack
- > Recessed and exposed versions
- > Bed head installation version (customized solution on request)



Recessed version



Exposed version



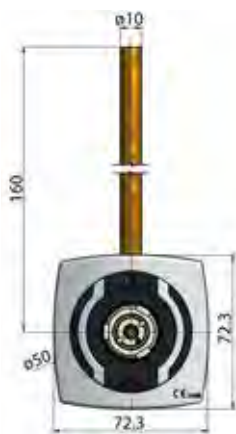
Installation plug

Item No.	Denomination	Type	Marking
0732202001	O <sub>2</sub> – RECESSED	Pipe ø 10 mm	O <sub>2</sub>
0732202013	N <sub>2</sub> O – RECESSED	Pipe ø 10 mm	N <sub>2</sub> O
0732202014	O <sub>2</sub> /N <sub>2</sub> O – RECESSED	Pipe ø 10 mm	O <sub>2</sub> /N <sub>2</sub> O
0732202011	AIR – RECESSED	Pipe ø 10 mm	AIR
0732202015	AIR-800 – RECESSED	Pipe ø 10 mm	AIR-800
0732202012	VAC – RECESSED	Pipe ø 10 mm	VAC
0732202016	O <sub>2</sub> – EXPOSED	Pipe ø 10 mm	O <sub>2</sub>
0732202019	N <sub>2</sub> O – EXPOSED	Pipe ø 10 mm	N <sub>2</sub> O
0732202020	O <sub>2</sub> /N <sub>2</sub> O – EXPOSED	Pipe ø 10 mm	O <sub>2</sub> /N <sub>2</sub> O
0732202017	AIR – EXPOSED	Pipe ø 10 mm	AIR
0732202021	AIR-800 – EXPOSED	Pipe ø 10 mm	AIR-800
0732202018	VAC – EXPOSED	Pipe ø 10 mm	VAC

## INSTALLATION TOOLS

Item No.	Denomination
MP_00345	QC installation keys
MP_00324	Button remover
MP_01157ST	Pendants/bedhead unit – installation tool
0732040	Installation plug (10 pcs)

## BASIC DIMENSIONS



Note!  
Measurements in mm.

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , N <sub>2</sub> O, O <sub>2</sub> /N <sub>2</sub> O, Air, Air-800, VAC
<b>Dimensions:</b>	Height: 73 mm, Width: 73 mm, Depth: 63 mm
<b>Working pressure:</b>	4–5 bar (breathing gases) 7–10 bar (instrumental gases) (-0,4)–(-0,9) bar (vacuum)
<b>Maximum pressure:</b>	20 bar
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC Complies with EN ISO 7396-1 (Central Gas Supply Systems) Complies with EN ISO 9170-1 (Terminal units) Complies with EN ISO 9170-2 (Terminal units for AGSS) Complies with BS 5682 (BSI gas specific connections) present HTM 02-01



Recessed version



Exposed version



Installation plug

## TERMINAL UNIT - MEDIUNIT (CZ)

Medical terminal units provide quick and easy connection of hospital ward gas equipment to the hospital gas source. The type of medical gas outlets are decided by national standards in each country and sometimes from local requests in each hospital. GCE complies with ISO 7396 and national installation standards with secure products where every product is fully tested in production. Our Medical gas outlets are in accordance with ISO EN 9170-1, ISO EN 9170-2 international standards.

- > Wall housing is compatible with all GCE MediUnit standards like DIN, BSI, SS, CZ
- > All functional components are from brass
- > Simple installation
- > Fast connection and disconnection
- > Designed for medical environment, small size and easy to clean
- > Complies with colour coding and description by standard
- > After 10 years it is possible to upgrade the units with a special upgrade pack
- > Recessed and exposed versions
- > Bed head installation version (customized solution on request)

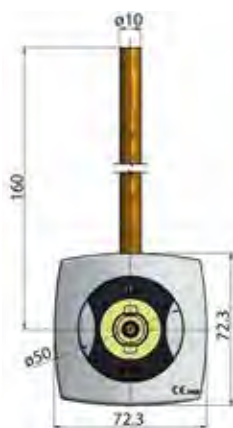
Item No.	Denomination	Type	Marking
0732203026	O <sub>2</sub> – RECESSED	Pipe ø 10 mm	O <sub>2</sub>
0732203029	N <sub>2</sub> O – RECESSED	Pipe ø 10 mm	N <sub>2</sub> O
0732203027	AIR – RECESSED	Pipe ø 10 mm	AIR
0732203030	CO <sub>2</sub> – RECESSED	Pipe ø 10 mm	CO <sub>2</sub>
0732203028	VAC – RECESSED	Pipe ø 10 mm	VAC
0732203031	O <sub>2</sub> – EXPOSED	Pipe ø 10 mm	O <sub>2</sub>
0732203034	N <sub>2</sub> O – EXPOSED	Pipe ø 10 mm	N <sub>2</sub> O
0732203032	AIR – EXPOSED	Pipe ø 10 mm	AIR
0732203035	CO <sub>2</sub> – EXPOSED	Pipe ø 10 mm	CO <sub>2</sub>
0732203033	VAC – EXPOSED	Pipe ø 10 mm	VAC

## INSTALLATION TOOLS

Item No.	Denomination
MP_00345	QC installation keys
MP_00324	Button remover
MP_01157ST	Pendants/bedhead unit – installation tool
0732040	Installation plug (10 pcs)

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, CO <sub>2</sub> , VAC
<b>Dimensions:</b>	Height: 73 mm, Width: 73 mm, Depth: 63 mm
<b>Working pressure:</b>	4–5 bar (breathing gases) 7–10 bar (instrumental gases) (-0,4)–(-0,9) bar (vacuum)
<b>Maximum pressure:</b>	20 bar
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC Complies with EN ISO 7396-1 (Central Gas Supply Systems) Complies with EN ISO 9170-1 (Terminal units) Complies with EN ISO 9170-2 (Terminal units for AGSS) Complies with CSN 85 2762 (Czech gas specific connections) present HTM 02-01

## BASIC DIMENSIONS



Note!  
Measurements in mm.



Recessed version



Exposed version - with lid



Exposed version - without lid



Maintenance valve



Installation plug

### BASIC DIMENSIONS



Note!  
Measurements in mm.

## TERMINAL UNIT - MEDIUNIT (AFNOR)

Medical terminal units provide quick and easy connection of hospital ward gas equipment to the hospital gas source. The type of medical gas outlets are decided by national standards in each country and sometimes from local requests in each hospital. GCE complies with ISO 7396 and national installation standards with secure products where every product is fully tested in production. Our Medical gas outlets are in accordance with ISO EN 9170-1, ISO EN 9170-2 international standards.

- > All functional components are from brass
- > Simple installation
- > Fast connection and disconnection
- > Air-800 with parking position
- > Designed for medical environment, small size and easy to clean
- > Complies with colour coding and description by standard
- > Maintenance valve with filter
- > Recessed and exposed versions
- > Bed head installation version (customized solution on request)

Item No.	Denomination	Type	Marking
0732204017	O <sub>2</sub> – RECESSED	Pipe ø 10 mm	O <sub>2</sub>
0732204018	N <sub>2</sub> O – RECESSED	Pipe ø 10 mm	N <sub>2</sub> O
0732204019	AIR – RECESSED	Pipe ø 10 mm	AIR
0732204020	AIR-800 – RECESSED	Pipe ø 10 mm	AIR-800
0732204021	CO <sub>2</sub> – RECESSED	Pipe ø 10 mm	CO <sub>2</sub>
0732204022	N <sub>2</sub> – RECESSED	Pipe ø 10 mm	N <sub>2</sub>
0732204023	VAC – RECESSED	Pipe ø 10 mm	VAC
0732204001	O <sub>2</sub> – EXPOSED	Pipe ø 10 mm	O <sub>2</sub>
0732204008	N <sub>2</sub> O – EXPOSED	Pipe ø 10 mm	N <sub>2</sub> O
0732204003	AIR – EXPOSED	Pipe ø 10 mm	AIR
0732204009	AIR-800 – EXPOSED	Pipe ø 10 mm	AIR-800
0732204002	CO <sub>2</sub> – EXPOSED	Pipe ø 10 mm	CO <sub>2</sub>
0732204010	N <sub>2</sub> – EXPOSED	Pipe ø 10 mm	N <sub>2</sub>
0732204004	VAC – EXPOSED	Pipe ø 10 mm	VAC
0732204069	O <sub>2</sub> – EXPOSED - LID	Pipe ø 10 mm	O <sub>2</sub>
0732204072	N <sub>2</sub> O – EXPOSED - LID	Pipe ø 10 mm	N <sub>2</sub> O
0732204070	AIR – EXPOSED - LID	Pipe ø 10 mm	AIR
0732204074	AIR-800 – EXPOSED - LID	Pipe ø 10 mm	AIR-800
0732204073	CO <sub>2</sub> – EXPOSED - LID	Pipe ø 10 mm	CO <sub>2</sub>
0732204071	VAC – EXPOSED - LID	Pipe ø 10 mm	VAC

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, CO <sub>2</sub> , N <sub>2</sub> , VAC
<b>Dimensions:</b>	Height: 73 mm, Width: 73 mm, Depth: 63 mm
<b>Working pressure:</b>	4–5 bar (breathing gases) 7–10 bar (instrumental gases) (-0,4)–(-0,9) bar (vacuum)
<b>Maximum pressure:</b>	20 bar
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC Complies with EN ISO 7396-1 (Central Gas Supply Systems) Complies with EN ISO 9170-1 (Terminal units) Complies with EN ISO 9170-2 (Terminal units for AGSS) Complies with NF S 90-116 (Afnor gas specific connections) Complies with FD S 90-119 (Afnor Air-800 gas specific connection) present HTM 02-01

## TERMINAL UNIT - MC70 (SS)



GCE gas outlets type MC 70 generation are self-sealing, i.e. they close automatically when a connected apparatus is removed. The gas outlets are furnished with a quick connection valve which means that the desired apparatus can be connected or disconnected by means of a simple one-step motion.

The MC 70 gas outlets may be recessed in the wall or mounted in a panel.

All MC 70 gas outlets have the same design but different colour codings and labels for different gases and of course gas specific non-interchangeable quick connection valves.

Special efforts have been made to make the maintenance of the gas outlets as easy as possible.

- > No special tools
- > Maintenance valve of ball-type
- > Few components

Furthermore the MC70 are made according to standard SS EN 8752430 for quick connections and international standard SS EN ISO 9170-1 for terminal units. This means that the gas components are non-interchangeable in every maintenance connection point.

The gas outlet is delivered with separate packages for quick connection valve, valvebody, plastic cover with name plate, push-release plate etc. To make installation easier, the valve body has a tightening plug mounted for convenient pressure testing.

All necessary mounting details such as brackets, screws etc. are included in the packages. Detailed instructions are also part of the delivery. When mounting the gas outlet in a recessed way the gas outlet can be mounted either in the front wall or in the rear wall, depending on which is first set up. Recessed and exposed installation set is necessary ordered separately.

Item No.	Denomination	Type	Marking
<b>325397281</b>	O <sub>2</sub> – BEDHEAD	Pipe ø 8 mm	O <sub>2</sub>
<b>325397282</b>	N <sub>2</sub> O – BEDHEAD	Pipe ø 8 mm	N <sub>2</sub> O
<b>325397283</b>	AIR – BEDHEAD	Pipe ø 8 mm	Air
<b>325397284</b>	VAC – BEDHEAD	Pipe ø 8 mm	VAC yellow
<b>325397285</b>	AGSS – BEDHEAD	Pipe ø 8 mm	AGSS purple
<b>325397286</b>	AIR-800 – BEDHEAD	Pipe ø 8 mm	Air-800
<b>325397287</b>	N <sub>2</sub> – BEDHEAD	Pipe ø 8 mm	N <sub>2</sub>
<b>325397288</b>	CO <sub>2</sub> – BEDHEAD	Pipe ø 8 mm	CO <sub>2</sub>

### FOR RECESSED MOUNTING ADD

Item No.	Denomination
<b>325396031</b>	Recessed installation set

### FOR EXPOSED MOUNTING ADD

Item No.	Denomination
<b>325396034</b>	Exposed installation set

### INSTALLATION TOOL

Item No.	Denomination
<b>325197290</b>	Combi tool

### SERVICE KIT

Item No.	Denomination
<b>325197222</b>	Sparepart kit



TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, CO <sub>2</sub> , N <sub>2</sub> , Ar, AGSS, VAC
<b>Dimensions:</b>	Diameter: 90 mm, Depth: 60 mm
<b>Working pressure:</b>	4–5 bar (breathing gases)
	7–10 bar (instrumental gases)
	(-0,4) – (-0,9) bar (vacuum)
<b>Maximum pressure:</b>	20 bar
<b>Regulatory status:</b>	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
	Complies with EN ISO 9170-1 (Terminal units)
	Complies with EN ISO 9170-2 (Terminal units for AGSS)
	Complies with SS 8752430 (SS gas specific connections) present SIS HB 370

## LABELS MC70

Item No.	Denomination	Languages
548234A26760	Circular Label O <sub>2</sub> White 85/55 TU SS	–
325113069	Circular Label MEDICINSK OXYGEN White 85/55 TU SS	SE
548234A26770	Circular Label N <sub>2</sub> O Blue 85/55 TU SS	–
325113070	Circular Label DINITROGENOXID N <sub>2</sub> O Blue 85/55 TU SS	DK
325113071	Circular Label MEDICINSK LUFT Black/White 85/55 TU SS	SE
548234A26780	Circular Label Air Black/White 85/55 TU SS	–
548234A37600	Circular Label Air-800 Black/White 85/55 TU SS	–
325113074P	Circular Label MEDICINSK KULDIOXID Grey 85/55 TU SS	DK
548234A26790	Circular Label VAC Red 85/55 TU SS	–
325113072	Circular Label VAC Red 85/55 TU SS	DK
548234A26800	Circular Label VAC Yellow 85/55 TU SS	–
548234A40850	Circular Label GASUTLOPP Blue/Brown 85/55 TU SS	SE
548234A40860	Circular Label GASUDLØB Blue/Brown 85/55 TU SS	DK
548234A40870	Circular Label GASSUTLØP Blue/Brown 85/55 TU SS	NO
548234A40880	Circular Label KAASUJEN POISTO Blue/Brown 85/55 TU SS	FI
548234A26810	Circular Label AGSS Purple 85/55 TU SS	–

## TERMINAL UNIT - AFNOR

MEDICONNECT DC allow a safe and fast connection of medical devices to an existing pipeline system (flowmeter, vacuum regulators,...)

These terminal units can be manufactured to be either surface or recessed mounted, for a whole range of medical gases:

- > oxygen
- > medical air
- > vacuum
- > nitrous oxide
- > nitrogen
- > carbon dioxide



Item No.	Denomination	Type	Marking
K007061	O <sub>2</sub> – EXPOSED	Pipe ø 10 mm	O <sub>2</sub>
K007062	VAC – EXPOSED	Pipe ø 10 mm	Vide
K007063	N <sub>2</sub> O – EXPOSED	Pipe ø 10 mm	N <sub>2</sub> O
K007064	AIR – EXPOSED	Pipe ø 10 mm	AIR
K007065	N <sub>2</sub> – EXPOSED	Pipe ø 10 mm	N <sub>2</sub>
K007066	CO <sub>2</sub> – EXPOSED	Pipe ø 10 mm	CO <sub>2</sub>
K007070	AIR-800 – EXPOSED	Pipe ø 10 mm	AIR-800
K007081	O <sub>2</sub> – RECESSED	Pipe ø 10 mm	O <sub>2</sub>
K007082	VAC – RECESSED	Pipe ø 10 mm	VAC
K007083	N <sub>2</sub> O – RECESSED	Pipe ø 10 mm	N <sub>2</sub> O
K007084	AIR – RECESSED	Pipe ø 10 mm	AIR

## INSTALLATION TOOL

Item No.	Denomination
K007091	Multi-functions Spanner

## SERVICE KIT

Item No.	Denomination	Type
SPK36810038	Check valve assy, ø 7 mm	O <sub>2</sub> /N <sub>2</sub> O /Air /CO <sub>2</sub>
SPK36810040	Check valve assy, ø 8 mm	VAC /N <sub>2</sub> /O <sub>2</sub> +CO <sub>2</sub>
SPK36810041	Check valve assy, ø 6 mm	O <sub>2</sub> +N <sub>2</sub> / O <sub>2</sub> +N <sub>2</sub> O
K292404	Housing check valve	All gases
K303099	Quick coupling sealing washer	All gases

TECHNICAL DATA	
<b>Gases:</b>	O <sub>2</sub> , N <sub>2</sub> O, Air, Air-800, CO <sub>2</sub> , N <sub>2</sub> , VAC
<b>Dimensions:</b>	65x65, Depth: 50 mm
	4–5 bar (breathing gases)
<b>Working pressure:</b>	7–10 bar (instrumental gases)
	(-0,4)–(-0,9) bar (vacuum)
<b>Maximum pressure:</b>	20 bar
	Complies with Medical Devices Directive 93/42/EEC
	Complies with EN ISO 7396-1 (Central Gas Supply Systems)
<b>Regulatory status:</b>	Complies with EN ISO 9170-1 (Terminal units)
	Complies with NF S90-116 (AFNOR gas specific connections)
	Complies with FD S90-119 (AFNOR – AIR-800 gas specific connections)

# BED HEAD UNITS

Bed head units are primarily needed in patient rooms in medical facilities. Depending on their purpose, these units are equipped with medical gas outlets, high voltage and low voltage distribution of electricity, media sockets etc. Next to standard units GCE druvaMED is able to provide customized solutions regarding design and shape to meet the special demands for delivery rooms, recovery rooms and intensive care units. Part of the bed head units may be direct, indirect or night lighting, with fluorescent lamps or LED technology. The bed head units have a characteristic and ergonomic design that has proven itself for over more than 45 years now in medical facilities all over the world. The design can be customized to meet the overall appearance of the interior, architectural requirements and to the desires of the health care personnel. The materials used in the bed head units are designed to endure intense use and harsh conditions that can often be found in medical fields. This means the bed head units and available accessories are built to last and fit for the job!



## HORIZONTAL BED HEAD UNITS

### TECHNICAL DATA - HORIZONTAL BED HEAD UNIT WITH LIGHTING

<b>Length:</b>	Standard for 1 bed 1650 mm		
<b>Height / depth</b>	RN07-DN0	RN07-DN1	RN07-DN2
<b>(without medical rails with medical rails):</b>	113 mm / 190 mm 113 mm / 225 mm	305 mm / 190 mm 305 mm / 225 mm	305 mm / 190mm 305 mm / 225mm
<b>Weight (at a standard length for one bed):</b>	15 kg	20 kg	25 kg
<b>Load wall:</b>	550 N, 110 Nm	600 N, 110 Nm	650 N, 110 Nm
	Direct		
<b>Lighting (fluorescent tube or LED):</b>	Indirect		
	Night		
<b>Accessories:</b>	Accessories GCE Mediline and others for ISO medical rail (10 x 25 mm)		
<b>Load capacity medical rail:</b>	max. 20 kg		
<b>Electro-equipment:</b>	Sockets of different colours with light even without the design according to national standards (BS, ...) jack bush, RJ45 data connector, telephone connections, panel nurse / patient etc.		
<b>Gas outlets:</b>	All types of GCE Mediunit gas outlets according to national standards (DIN, AFNOR, BS, SS ...), media leads from both sides from behind (rarely from top)		
<b>Material design:</b>	Anodized aluminium profiles with removable lids, which can be in colour RAL		



RN07-DN1



RN07-DN2

RN07-DN0



- 1 - high voltage electric sockets
- 2 - medical rail

RN07-DN1



- 1 - high voltage electric sockets
- 2 - medical gas quick outlets
- 3 - medical rail

RN07-DN2



- 1 - high voltage electric sockets
- 2 - medical gas quick outlets
- 3 - medical rail



RN07-DN3

TECHNICAL DATA - HORIZONTAL BED HEAD UNIT WITHOUT LIGHTING		
<b>Length:</b>	Standard for 1 bed 1650 mm	
<b>Height / depth</b>	RN07-DN3 single channel	RN07-DN3
<b>(without medical rails with medical rails):</b>	190 mm / 80 mm 275 mm / 130 mm	370 mm / 80 mm 455 mm / 130 mm
<b>Weight (at a standard length for one bed):</b>	16 kg	25 kg
<b>Load wall:</b>	1050 N, 110 Nm	1050 N, 110 Nm
<b>Accessories:</b>	Accessories GCE Mediunit and others for ISO medical rail (10 x 25 mm)	
<b>Load capacity medical rail:</b>	max. 20 kg	
<b>Electro-equipment:</b>	Sockets of different colours with light even without the design according to national standards (BS, ...) jack bush, RJ45 data connector, telephone connections, panel nurse / patient etc.	
<b>Gas outlets:</b>	All types of GCE Mediunit gas outlets according to national standards (DIN, AFNOR, BS, SS ...), media leads from both sides from behind (rarely from top)	
<b>Material design:</b>	Anodized aluminium profiles with removable lids, which can be in colour RAL	



RN07-DN3, single channel



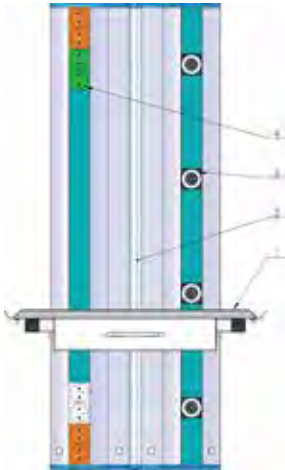
RN07-DN3, single channel, design for child care units



RN07-DN3Z, flush mounted version



## VERTICAL BED HEAD UNITS



### ZS07

- 1 - shelf
- 2 - rod for shelves and other accessories
- 3 - medical gas quick outlets
- 4 - high voltage electric sockets

TECHNICAL DATA - VERTICAL BED HEAD UNIT WITHOUT LIGHTING (SUPPLY COLUMNS)		
<b>Length:</b>	Standard 1000 mm	
<b>Width / depth:</b>	ZS07	ZS07L
	370 mm / 150 mm	165 mm / 260 mm
<b>Weight (at a standard length):</b>	30 kg	45 kg
<b>Load wall:</b>	900 N, 200 Nm	1450 N, 1200 Nm
<b>Accessories:</b>	Accessories GCE Mediiline and others for rod *28	
<b>Load capacity stainless steel rod:</b>	max. 40 kg	max. 60 kg
<b>Electro-equipment:</b>	Sockets of different colours with light even without the design according to national standards (BS, ...) jack bush, RJ45 data connector, telephone connections, panel nurse / patient etc.	
<b>Gas outlets:</b>	All types of GCE Mediunit gas outlets according to national standards (DIN, AFNOR, BS, SS ...), media leads from both sides from behind (rarely from top)	
<b>Material design:</b>	Anodized aluminium profiles with removable lids, which can be in colour RAL	



ZS07



ZS07L

COLOUR TABLE RAL					
RAL 1000 Green-Beige	RAL 1013 Oyster White	RAL 1017 Saffron Yellow	RAL 6019 Pastel Green	RAL 6025 Fern Green	RAL 6027 Light Green
RAL 1018 Zink Yellow	RAL 1028 Melon Yellow	RAL 1034 Pastel Yellow	RAL 7035 Light Grey	RAL 8023 Orange Brown	RAL 9002 Grey White
RAL 2003 Pastel Orange	RAL 3015 Light Pink	RAL 5011 Light Blue	RAL 9003 Signal White	RAL 9005 Jet Black	RAL 9006 White Aluminium
RAL 5024 Pastel Blue	RAL 6002 Leaf Green	RAL 6018 Yellow Green	RAL 9010 Pure White	RAL 9016 Traffic White	RAL 3020 Traffic Red

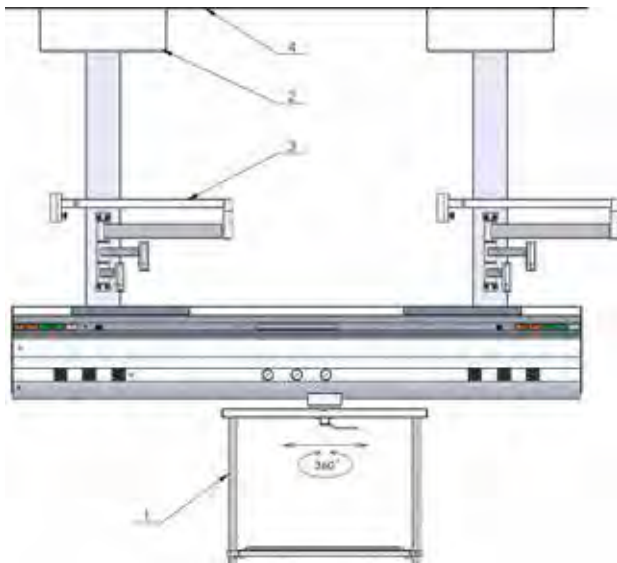
For more information and variants please contact our sales and product support

# MEDICAL BEAMS

Medical beams are a special kind of bed head unit. Instead of attached to the wall, a medical beam is mounted to the ceiling for maximum flexibility for patient positioning. Medical beams, like wall mounted bed head units, can be equipped with medical gas outlets and electricity supply at optimal distance to the patients bed. They are mainly used in specialized medical workplaces like CCU, ICU and operating theatres. The medical beam can be fitted with a large range of accessories: Spot lamps placed on a medical rail, refracted arms, telescopic rods with curtain, medical rails, positional (night) lights or other accessories depending on the needs and requirements of the workplace concerned. Thanks to its design it ensures an optimal use of space on the one hand, as well as being safe for the patient and the medical staff on the other.



TECHNICAL DATA - MEDICAL BEAMS			
<b>Length profile with equipment standard for 1 bed:</b>	ZMP07	ZMP07 double side	ZMP07 laminar
	1950 mm	1950 mm	3000 mm one side
<b>Height / depth without legs (without medical rails with medical rails):</b>	320 mm / 280mm	320 mm / 460mm	320 mm / 280mm
	320 mm / 315mm	320 mm / 530mm	320 mm / 315mm
<b>Length of legs:</b>	max. 2000 mm		
<b>Weight (at a standard length for one bed):</b>	max 150 kg	max 175 kg	max 300 kg
<b>Load ceiling (from one leg):</b>	5300 N, 2100 Nm		
	8000 N, 2100 Nm		
	5300 N, 2100 Nm		
<b>Lighting (fluorescent tube or LED):</b>	Direct		
	Indirect		
	Night		
<b>Accessories:</b>	Accessories GCE Mediline and others for ISO medical rail (10 x 25 mm) and shelving rods *28		
<b>Load capacity medical rail:</b>	max. 20 kg		
<b>Electro-equipment:</b>	Sockets of different colours with light even without the design according to different national standards (BS, ...) jack bush, RJ45 data connector, telephone connections and etc.		
<b>Gas outlets:</b>	All types of GCE Mediunit gas outlets according to national standards (DIN, AFNOR, BS, SS ...)		
<b>Material design:</b>	Steel with powder coating surface / Anodized aluminium profiles with removable lids, which can be in colour RAL		



- 1 - rotary roller with shelf
- 2 - ceiling cover
- 3 - arms for accessories
- 4 - suspended ceiling depth



COLOUR TABLE RAL					
RAL 1000 Green-Beige	RAL 1013 Oyster White	RAL 1017 Saffron Yellow	RAL 6019 Pastel Green	RAL 6025 Fern Green	RAL 6027 Light Green
RAL 1018 Zink Yellow	RAL 1028 Melon Yellow	RAL 1034 Pastel Yellow	RAL 7035 Light Grey	RAL 8023 Orange Brown	RAL 9002 Grey White
RAL 2003 Pastel Orange	RAL 3015 Light Pink	RAL 5011 Light Blue	RAL 9003 Signal White	RAL 9005 Jet Black	RAL 9006 White Aluminium
RAL 5024 Pastel Blue	RAL 6002 Leaf Green	RAL 6018 Yellow Green	RAL 9010 Pure White	RAL 9016 Traffic White	RAL 3020 Traffic Red

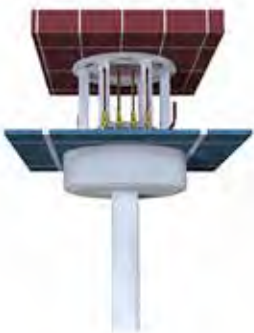
For more information and variants please contact our sales and product support



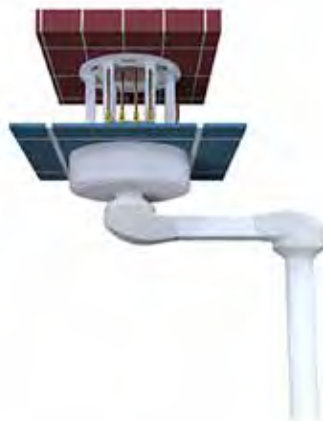
# CEILING PENDANT

Ceiling pendants are designated for supply of medical gases, electric current and low current from the ceiling to the workplace of the medical specialists. They are primarily used in operating theatres, ARD, and ICU. The rotary pendant is terminated by a source column and a removable shelf is applied as a holder of medical devices.

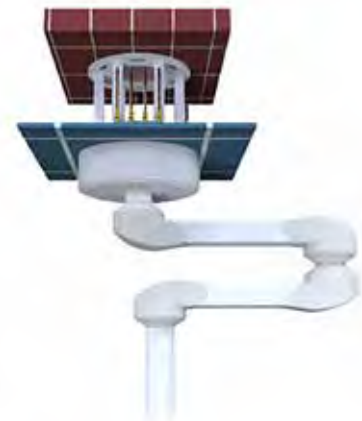
Rotary joints combined with a horizontal and swing arm can be controlled to any intermediate position within a room using an electric drive. All the rotary joints of the arms are thereby fitted with manually operated position interlock.



**PS07**



**OK07-16**



**OK07-28**

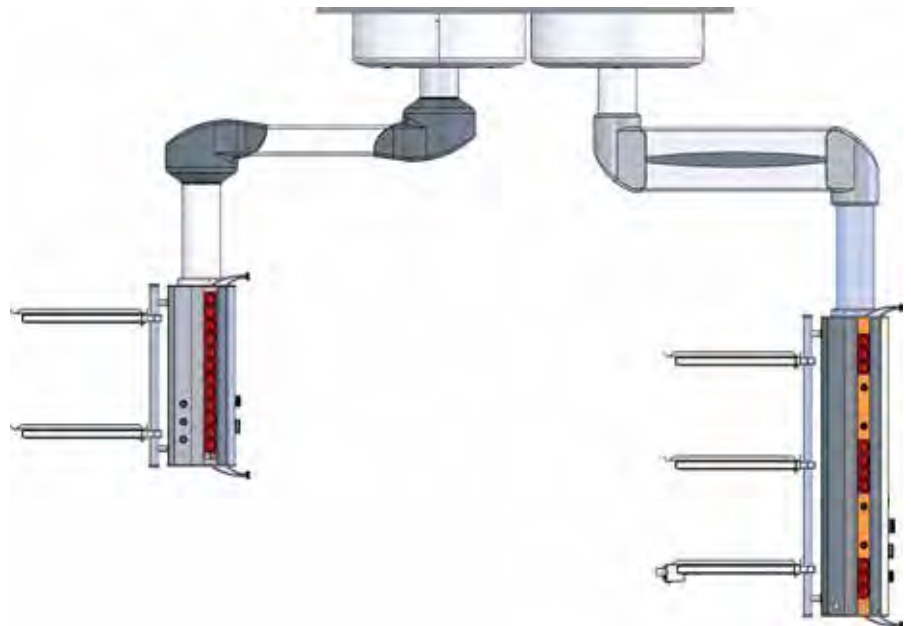


OK07-57, source column L

TECHNICAL DATA - CEILING PENDANTS WITH HEIGHT ADJUSTABLE ARMS		
<b>Total length of arm:</b>	OK07-55	OK07-57
	800 mm	1200 mm 1400 mm 1600 mm 1800 mm
<b>Length source column with medical rails:</b>	Source column A	Source column L
	790 mm	690mm
	890 mm	1090 mm
	990 mm 1090 mm	1290 mm 1590 mm
<b>Width / Depth source column with medical rails and rods (column L):</b>	410mm / 190mm	448 mm/ 328 mm
<b>Weight:</b>	205 kg	240 kg
<b>Load ceiling:</b>	3600 N, 3600 Nm	4000 N, 5500 Nm
<b>Accessories:</b>	Accessories GCE Mediline and others for ISO medical rail (10 x 25 mm) and shelving rods *28	
<b>Electro-equipment:</b>	Sockets of different colours with light even without the design according to national standards (BS, ...) jack bush, RJ45 data connector, telephone connections and etc.	
<b>Gas outlets:</b>	All types of GCE Mediunit gas outlets according to national standards (DIN, AFNOR, BS, SS ...)	
<b>Material design arm / source column:</b>	Steel with powder coating surface / Anodized aluminium profiles with removable lids, which can be in colour RAL	



OK07-55, source column L



Tandem option of ceiling pendants,  
left side OK07-16 (not height adjustable), right side OK07-55



OK07-16, source column A

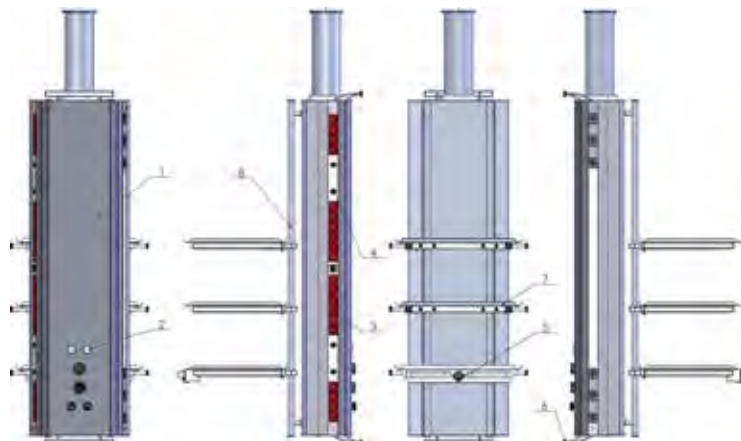
TECHNICAL DATA - CEILING PENDANTS WITH ROTARY ARMS OK07 AND SOURCE COLUMNS A AND L			
<b>Type of arms:</b>	OK07-05	OK07-16	OK07-28
<b>Length arms:</b>	According to customer requirements	450 mm 600 mm 800 mm 1000 mm	2x 450 mm 2x 600 mm 2x 800 mm max. total length 1800 mm
<b>Length source head with medical rails:</b>	Source column A		Source column L
	790 mm 890 mm 990 mm 1090 mm		690 mm 1090 mm 1290 mm 1590 mm
<b>Width / Depth source column with medical rails and rods (column L):</b>	410 mm / 190 mm		448 mm / 328 mm
<b>Weight ceiling pendant:</b>	125 kg	175 kg	225 kg
<b>Load ceiling:</b>	3500 N, 700Nm	3300 N, 2900 Nm	3800N, 9500 Nm
<b>Accessories:</b>	Accessories GCE Mediline and others for ISO medical rail (10 x 25 mm) and shelving rods *28		
<b>Electro-equipment:</b>	Sockets of different colours with light even without the design according to national standards (BS, ...) jack bush, RJ45 data connector, telephone connections and etc.		
<b>Gas outlets:</b>	All types of GCE Mediunit gas outlets according to national standards (DIN, AFNOR, BS, SS ...)		
<b>Material design arm / source column:</b>	Steel with powder coating surface / Anodized aluminium profiles with removable lids, which can be in colour RAL		



OK07-28, source column L



- 1 - back column cover
- 2 - air motor outlet and AGSS outlet
- 3 - high voltage electrical outlet
- 4 - jack bushes (earthing)
- 5 - arm motion control
- 6 - medical rail
- 7 - shelf
- 8 - rod for shelves and other accessories



Source column L



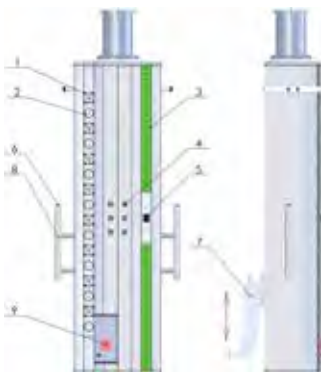
OK07-28, source column Z

TECHNICAL DATA - CEILING PENDANTS WITH ROTARY ARMS OK07 AND SOURCE COLUMN Z			
<b>Type of arms:</b>	OK07-05	OK07-16	OK07-28
<b>Length arms:</b>	According to customer requirements	450 mm 600 mm 800 mm 1000 mm	2x 450 mm 2x 600 mm 2x 800 mm max. total length 1800 mm
<b>Load ceiling:</b>	3600 N, 3600 Nm	3300 N, 2900 Nm	3800N, 9500 Nm
<b>Weight ceiling pendant:</b>	125 kg	175 kg	225 kg
<b>Length source column:</b>	1300 mm		
<b>Width / Depth source column with side handles:</b>	540mm / 395mm		
<b>Load holder of anaesthesiology machine:</b>	max. 200 kg		
<b>Accessories:</b>	Accessories GCE Mediline and others for ISO medical rail (10 x 25 mm)		
<b>Electro-equipment:</b>	Sockets of different colours with light even without the design according to national standards (BS, ...) jack bush, RJ45 data connector, telephone connections and etc.		
<b>Gas outlets:</b>	All types of GCE Mediunit gas outlets according to national standards (DIN, AFNOR, BS, SS ...)		
<b>Material design arm / source column:</b>	Steel with powder coating surface / Anodized aluminium profiles with removable lids, which can be in colour RAL		



PS07, source column A

TECHNICAL DATA - STATIONARY CEILING PENDANT PS07	
<b>Total length leg:</b>	max. 1000 mm
<b>Length source head (without / with medical rails):</b>	700 mm / 790 mm 800 mm / 790 mm 900 mm / 990 mm 1000 mm / 1090 mm
<b>Width / Depth source head:</b>	410 mm / 190 mm
<b>Weight:</b>	125 kg
<b>Load ceiling:</b>	2800 N, 700 Nm
<b>Accessories:</b>	Accessories GCE Mediline and others for ISO medical rail (10 x 25 mm) and shelving rods *28
<b>Electro-equipment:</b>	Sockets of different colours with light even without the design according to national standards (BS, ...), jack bush, RJ45 data connector, telephone connections and etc.
<b>Gas outlets:</b>	All types of GCE Mediunit gas outlets according to national standards (DIN, AFNOR, BS, SS ...)
<b>Material design arm / source column:</b>	Steel with powder coating surface / Anodized aluminium profiles with removable lids, which can be in colour RAL



Source column Z

- 1 - medical gas quick outlets
- 2 - gauges
- 3 - high-voltage electric sockets
- 4 - jack bushes (earthing)
- 5 - lift control of machine holder
- 6 - arm motion control
- 7 - holder of anaesthesiology machine
- 8 - handle with control button
- 9 - air motor outlet and AGSS outlet

COLOUR TABLE RAL					
RAL 3000 Green Beige	RAL 1013 Oyster White	RAL 1017 Laffron Yellow	RAL 6019 Pastel Green	RAL 6025 Firm Green	RAL 6027 Light Green
RAL 3018 Zink Yellow	RAL 1028 Melon Yellow	RAL 3034 Pastel Yellow	RAL 7035 Light Grey	RAL 8023 Orange Brown	RAL 9002 Grey White
RAL 2003 Pastel Orange	RAL 8015 Light Pink	RAL 5012 Light Blue	RAL 9003 Signal White	RAL 9005 Jet Black	RAL 9006 White Aluminium
RAL 5028 Steel Blue	RAL 6007 Leaf Green	RAL 6038 Noble Green	RAL 9010 Pure White	RAL 9016 Traffic White	RAL 3025 Traffic Red

For more information and variants please contact our sales and product support

# COMPACT SPRING BALANCED ARMS

Ceiling pendants with compact spring balanced swivel arms have a wide range of usage: they are holders of surgical luminaire, cameras, monitors, X-ray apparatus safety screens, and many other specialized devices. The wall mounted version can be used even for carrying televisions in patient's room.



## SPR 10- 1 (SINGLE)



- Load capacity: max 28 kg
- Weight (without spacer): 30 kg
- Adjusting the compact arm height [°]: + 35, - 55
- Rotation range in axes a, b, c [°]: 360 / (320, 334, 325)\*
- Surface finish: powder coating RAL 9002, 9010
- Interrupted cable / uninterrupted cable – slip ring\*

## SPR 10- 2 (DUO)

- Load capacity: max 56 kg
- Weight (without spacer): 42 kg
- Adjusting the compact arm height [°]: + 35, - 55
- Rotation range in axes a, b, c [°]: 360 / (320, 334, 325)\*
- Surface finish: powder coating RAL 9002, 9010
- Interrupted cable / uninterrupted cable – slip ring\*



## SPR 10- 3 (TRIO)



- Load capacity: max. depending on the length of the arms and load distribution
- Weight (without spacer): max 55 kg
- Adjusting the compact arm height [°]: + 35, - 55
- Rotation range in axes a, b, c [°]: 360 / (320, 334, 325)\*
- Surface finish: powder coating RAL 9002, 9010
- Interrupted cable / uninterrupted cable – slip ring\*

## SPR 10-4 (QUATRO)

- Load capacity: max. depending on the length of the arms and load distribution
- Weight (without spacer): max 65 kg
- Adjusting the compact arm height [°]: + 35, - 55
- Rotation range in axes a, b, c [°]: 360 / (320, 334, 325)\*
- Surface finish: powder coating RAL 9002, 9010
- Interrupted cable / uninterrupted cable – slip ring\*



## SPR 10-1W (SINGLE-WALL)



- Load capacity: max. depending on the length of the arms and load distribution
- Weight: 25 kg
- Adjusting the compact arm height [°]: + 35, - 55
- Rotation range in axes a, b, c [°]: 180, 360, 360 / (320, 334, 325)\*
- Surface finish: powder coating RAL 9002, 9010
- Interrupted cable / uninterrupted cable – slip ring\*

\* In the case where the arms are equipped with devices requiring uninterrupted cable wiring, the range of rotation in the axes is limited by the stops.

## SPR 11- 1 (SINGLE)

- Load capacity: max. depending on the length of the arms and load distribution
- Weight (without spacer): 14 kg
- Adjusting the compact arm height [°]: + 35, - 55
- Rotation range in axes a, b, c [°]: 360 / (320, 334, 325)\*
- Surface finish: powder coating RAL 9002, 9010, 9005
- Interrupted cable / uninterrupted cable – slip ring\*



## SPR 11- 2 (DUO)



- Load capacity: max. depending on the length of the arms and load distribution
- Weight (without spacer): 20 kg
- Adjusting the compact arm height [°]: + 35, - 55
- Rotation range in axes a, b, c [°]: 280, 360, 360 / (280, 330, 330)\*
- Rotation range in axes a, b, c lower arm [°]: 360, 360, 360 (330,330, 330)\*
- Surface finish: powder coating RAL 9002, 9010, 9005
- Interrupted cable / uninterrupted cable – slip ring\*

## SPR 11- 1W (SINGLE-WALL)

- Load capacity: max. depending on the length of the arms and load distribution
- Weight: 9 kg
- Adjusting the compact arm height [°]: + 35, - 55
- Rotation range in axes a, b, c [°]: 180, 360, 360 (180, 334, 325)\*
- Surface finish: powder coating RAL 9002, 9010, 9005
- Interrupted cable / uninterrupted cable – slip ring\*



\* In the case where the arms are equipped with devices requiring uninterrupted cable wiring, the range of rotation in the axes is limited by the stops.

# ACCESSORIES

Accessories for bed head units, medical beams and ceiling pendants are used for retrofitting and enhancement of the utility value. They are modifiable and combinable exactly according to user requirements.



## RAMP WITH BAR FOR COMPACT SPRING BALANCED ARMS

Ramps with bars for the compact spring balanced arms SPR10 and SPR11 are a significant help everywhere, where a patient's health condition requires simultaneous use of many medical devices. The medical devices can be fitted on the bar beneath the ramp, thanks to which they are hanging in the air and therefore not taking space on the floor. Its advantage is further the extension of the electrical peripheries. It is possible to place them either on the wall, or on the installed medical beams.



## EXAMINATION LED LAMP

A small light with LED chip illumination and cone-shaped shade serves for basic examinations within inpatient rooms. The randomly movable arm is very advantageous. It is not limited by individual joints and therefore enables the user to set the lamp to the most favourable positions.



## SHELF WIRE BASKETS

Medical work places require storage areas for surgical instruments and other medical material needed for surgeries or patient care. Shelf systems can be executed as pendant beneath the bed head unit, bridge or rotary complex. Baskets can be combined with the shelf systems based on the needs of the customer. Shelf wire baskets are only available in stainless steel finishing.



## MEDICAL RAILS FOR INFUSION AND SHELF BARS

Not only all medical source units can be equipped with universal medical rails, but other specialized medical workplaces can be equipped with them, too. With the use of holders, bearing bars for baskets and infusion hangers, shelves and other accessories can be attached to the rails.



## MEDICAL RAILS FOR THE WALLS

Not only all medical source units can be equipped with universal medical rails, but other specialized medical workplaces can be equipped with them, too. With the use of holders, bearing bars for baskets and infusion hangers, shelves and other accessories can be attached to the rails.



## MONITOR HOLDER

The monitor holder is used with the holders VESA 75/75 and VESA 100/100 to attach the monitor onto compact spring balanced arms SPR10 and SPR11.

The monitor holder is available as variant with or without a shelf for keyboard and mouse.



## HANGING SHELF WITH OR WITHOUT DRAWER, WITH MEDICAL RAILS



Medical departments need, in addition to the supply of medical gases and electricity through ceiling pendants, bed head units and medical beams, storage space for surgical instruments and other medical equipment and material. Shelf systems can be designed as suspension, bridge or swiveling solution. Other mounting possibilities are the medical rails or the rods. Shelf systems can be modified according to the users requirements, load capacity and dimensions of the shelves are selectable. They are available in classic tin design with powder coated surface in color according to the customer or in stainless steel.

## SHELF ON MEDICAL RAIL



A shelf on a medical rail is used as swap space for ordinary medical supplies and equipment which is for medical personnel immediately at hand. The shelf can be mounted to standard medical rails.

## REFRACTED ARMS



Refracted hangers are a huge help wherever the patients condition requires the use of many devices simultaneously. Apparatuses can be placed on the hangers that are higher in the air and do not take up space on the ground. The refracted arms can hold many other accessories, especially infusion rods, holders for infusion pumps, dispensers and monitors. They can be located both on the wall as well as on already installed end units of medical gases.

## INFUSION RACK



Infusion racks serve to support up to four infusion bags and bottles. They can be attached to all types of Medical Beams, Ceiling Pendants and bed head units. Their application is wide and is an integral part of the end units of medical gases in intensive care and other departments.

## CABLE HOLDER FOR MEDICAL RAIL



The cable holder with attachment to a medical rail is used to organize cable bundles and oxygen hoses next to medical beds. It is available in two sizes.

# IMPORTANT INFORMATION AND RECOMMENDATIONS

## SAFETY INSTRUCTIONS

The objective of the company GCE is not only customer satisfaction with reliable products but also safe operation of all equipment associated with medical gases. Therefore it is necessary to observe all instructions for the use and, particularly, the following safety principles:

1. Concentrated oxygen should not come into contact with oils, grease and impurities to prevent its self-ignition.
2. Pressure cylinders shall be always secured against fall, exposure to heat and manipulation by unauthorized persons.
3. Smoking and open fire manipulations are strictly prohibited in the proximity of pressure cylinders or gas equipment.
4. Personnel working with classified gas equipment should be properly trained.

## CERTIFICATION



GCE has introduced and certified its quality management system according to ISO13485:2003 for medical devices. The products meet the requirements of the EU Directive 93/42/EEC and they are certified and provided with the CE mark. Any requirements for other technical parameters shall be discussed with the manufacturer.

# CERTIFICATES





# CENTRAL GAS SUPPLY SYSTEMS FOR INDUSTRIAL GASES



# CENTRAL GAS SUPPLY SYSTEM SCHEME

## POINT OF USE SYSTEM, SECOND PRESSURE STAGE

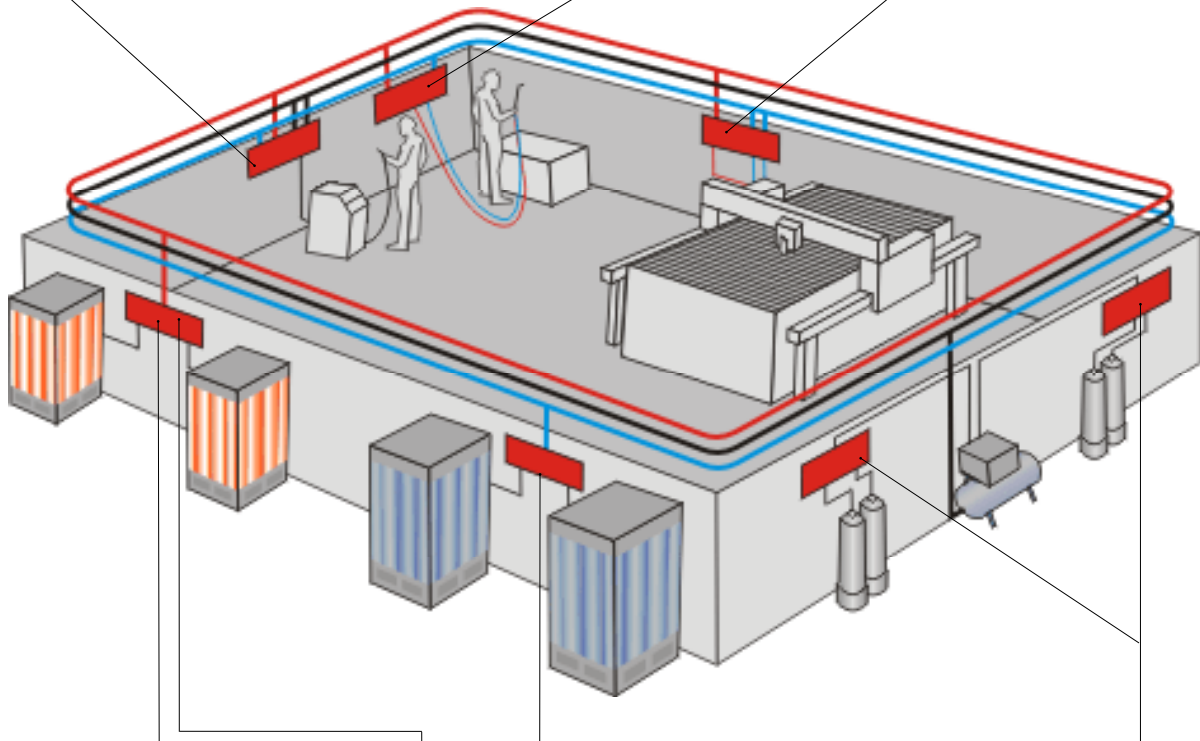
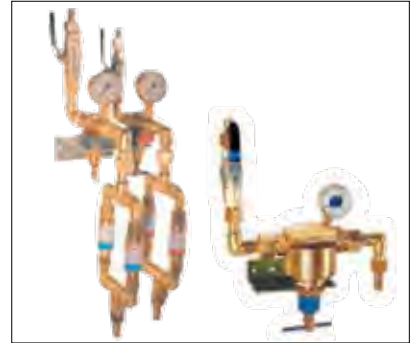
UNISSET+



DINSET



HF-SET



20 m<sup>3</sup>/h



100 m<sup>3</sup>/h



250 m<sup>3</sup>/h














MANUAL CHANGE OVERS





SMP - SAFETY MAINTENANCE PANEL,  
ACCESSORIES ON ONE PANEL

# LOW FLOW MANIFOLDS DRUVA TEC RANGE





MANIFOLDS FOR INDUSTRIAL GAS SUPPLY SYTEMS		
	WITHOUT PURGE SYSTEM	WITH PURGE SYSTEM
<p><b>ONE SOURCE</b></p> <p><b>MTLX</b></p>	 <p><i>Q1 = 20 m<sup>3</sup>/h</i></p>	 <p><i>Q1 = 20 m<sup>3</sup>/h</i></p>
<p><b>TWO SOURCES MANUAL CHANGEOVER</b></p> <p><b>MTLM</b></p>	 <p><i>Q1 = 20 m<sup>3</sup>/h</i></p>	 <p><i>Q1 = 20 m<sup>3</sup>/h</i></p>
<p><b>TWO SOURCES SEMIAUTOMATIC</b></p> <p><b>MTLS</b></p>	 <p><i>Q1 = 20 m<sup>3</sup>/h</i></p>	 <p><i>Q1 = 20 m<sup>3</sup>/h</i></p>
<p><b>THREE SOURCES MANUAL CHANGEOVER</b></p> <p><b>MTLT</b></p>	 <p><i>Q1 = 20 m<sup>3</sup>/h</i></p>	 <p><i>Q1 = 20 m<sup>3</sup>/h</i></p>
<p><b>SPARE PARTS</b></p>	<p><b>VTLI</b>      <b>VTLF</b>      <b>VTLA</b></p> 	<p><b>LTLJ</b>      <b>LTLX</b>      <b>LTLF</b></p> 
	<p><b>PLATES</b></p> 	

# MIDDLE FLOW MANIFOLDS DRUVA TEC RANGE

MANIFOLDS FOR INDUSTRIAL GAS SUPPLY SYTEMS		
	WITHOUT PURGE SYSTEM	WITH PURGE SYSTEM
<p><b>ONE SOURCE</b></p> <p><b>MTMX</b></p>	 <p><i>Q1=100 m³/h</i></p>	 <p><i>Q1=100 m³/h</i></p>
<p><b>TWO SOURCES MANUAL CHANGEOVER</b></p> <p><b>MTMM</b></p>	 <p><i>Q1=100 m³/h</i></p>	 <p><i>Q1=100 m³/h</i></p>
<p><b>THREE SOURCES MANUAL CHANGEOVER</b></p> <p><b>MTMT</b></p>	 <p><i>Q1=100 m³/h</i></p>	 <p><i>Q1=100 m³/h</i></p>
<p><b>TWO SOURCES SEMICHANGEOVER</b></p> <p><b>MTMS</b></p>	 <p><i>Q1=100 m³/h</i></p>	 <p><i>Q1=100 m³/h</i></p>
<p><b>SPARE PARTS</b></p>	<p><b>VTMI</b>   <b>VTMF</b>   <b>VTLA</b></p> 	<p><b>LTMJ</b>   <b>LTMM</b>   <b>LTMF</b></p> 
	<p><b>PLATES</b></p> 	

# SAFETY MAINTENANCE PANELS











## SAFETY MAINTENANCE PANELS FOR INDUSTRIAL GAS SUPPLY SYSTEMS

MAX	MID	MIN
 <p><b>STLMAXD2DFB</b></p>	 <p><b>STLMID</b></p>	 <p><b>STLMIN</b></p>
 <p><b>STLMAXD2SFB</b></p>		






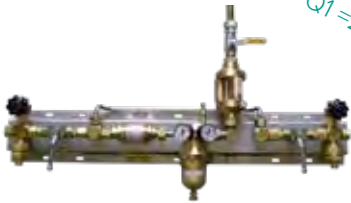



# HIGH PRESSURE MANIFOLDS OVERVIEW

MU LINE		
	COMPRESSED GASES	C <sub>2</sub> H <sub>2</sub>
Gas manifolds for small- and middle-flow applications. Simple manifolds and manual changeover units, semi-automatic and automatic units.		
<b>MU70</b> <b>MU70-M</b>	 <p><i>Q1 = 45 m<sup>3</sup>/h</i></p>	 <p><i>Q1 = 10 m<sup>3</sup>/h</i></p> <p>according to ISO 14114:2018</p>
<b>MU400-M</b> <b>MU400-M PROPANE</b>	 <p><i>Q1 = 250 m<sup>3</sup>/h</i></p>	 <p><i>Q1 = 25 m<sup>3</sup>/h</i></p>
M70 LINE		
	COMPRESSED GASES	C <sub>2</sub> H <sub>2</sub>
Gas manifolds for small- and middle-flow applications. Simple manifolds and manual changeover units, semi-automatic and automatic units.		
<b>MM70-1</b>	 <p><i>Q1 = 45 m<sup>3</sup>/h</i></p>	 <p><i>Q1 = 1 m<sup>3</sup>/h</i></p> <p>according to ISO 14114:2014</p>
<b>MM70-2</b>	 <p><i>Q1 = 45 m<sup>3</sup>/h</i></p>	 <p><i>Q1 = 1 m<sup>3</sup>/h</i></p> <p>according to ISO 14114:2014</p>
<b>MA70</b>	 <p><i>Q1 = 45 m<sup>3</sup>/h</i></p>	 <p><i>Q1 = 5 m<sup>3</sup>/h</i></p> <p><b>MAXIFLOW</b> according to ISO 14114:2014</p>





# HIGH FLOW MANIFOLDS DRUVA TEC RANGE

## M400 LINE

COMPRESSED GASES		C <sub>2</sub> H <sub>2</sub>
ONE SOURCE	 <p>Q1 = 250 m<sup>3</sup>/h</p> <p><b>MM400-1</b></p>	 <p>Q1 = 25 m<sup>3</sup>/h</p> <p><b>MM400-1</b></p> <p>according to ISO 14114:2018</p>
TWO SOURCES MANUAL CHANGEOVER	 <p>Q1 = 250 m<sup>3</sup>/h</p> <p><b>MM400-2</b></p>	 <p>Q1 = 25 m<sup>3</sup>/h</p> <p><b>MM400-2</b></p> <p>according to ISO 14114:2018</p>
TWO SOURCES SEMICHANGEOVER	 <p>Q1 = 250 m<sup>3</sup>/h</p> <p><b>MS400</b></p>	

## MB LINE

Gas manifolds range with compact inlet Manyflow valve block. Reliable solution for different gases and many applications.

THREE SOURCES MANUAL CHANGEOVER	 <p>Q1 = 45 m<sup>3</sup>/h</p> <p><b>MB70</b></p>	 <p>Q1 = 10 m<sup>3</sup>/h</p> <p><b>MB70</b></p> <p>according to ISO 14114:2018</p>
THREE SOURCES MANUAL CHANGEOVER	 <p>Q1 = 250 m<sup>3</sup>/h</p> <p><b>MB400</b></p>	 <p>Q1 = 25 m<sup>3</sup>/h</p> <p><b>MB400</b></p> <p>according to ISO 14114:2018</p>

# OUTLET POINTS OVERVIEW

## DINSET

- > Outlet points for different gases and applications
- > Dincontrol regulator type
- > Design with pressure gauges, flow gauges or flowmeters
- > Available with different outlet pressure and flow rate ranges
- > Single, double or triple units



## UNISSET

- > Outlet points for different gases and applications
- > Unicontrol regulator type
- > Design with pressure gauges, flow gauges or flowmeters
- > Available with different outlet pressure and flow rate ranges
- > Single, double or triple units



## UNISSET+

- > Outlet points with steel protection
- > Unicontrol regulator type
- > Design with pressure gauges, flow gauges or flowmeters
- > For different outlet pressure and flow rate ranges

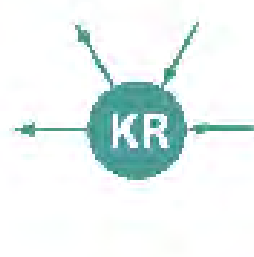
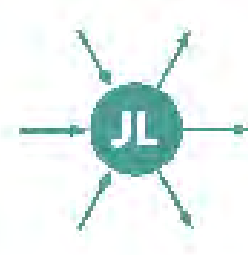
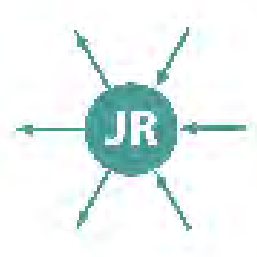
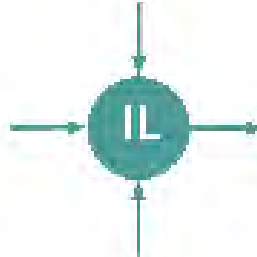
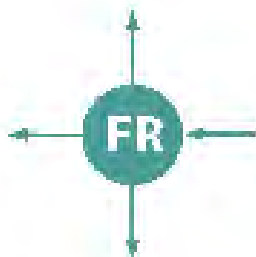
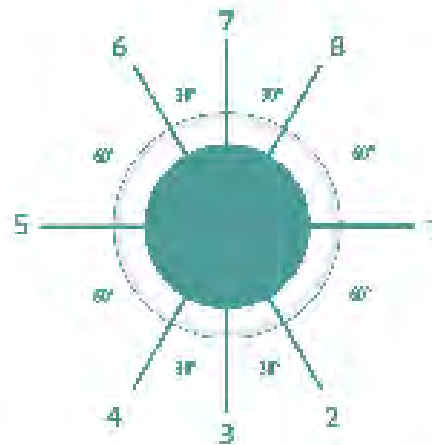


## HF-SET

- > High flow outlet points for 100 Nm<sup>3</sup>/h or 200 Nm<sup>3</sup>/h
- > S100 and S200 regulators
- > For oxygen and fuel gases
- > Different versions as single or triple units
- > Designed especially for oxygen cutting machines and other high-flow applications



PORTING CODES

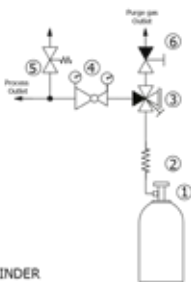


# MANIFOLDS FOR INDUSTRIAL GAS SUPPLY SYSTEMS

- LOW FLOW RANGE
- MTLX - ONE SOURCE



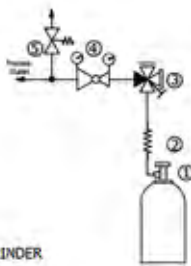
Manifold for one cylinder with process gas purging system



- 1 - GAS CYLINDER
- 2 - COIL
- 3 - INLET SHUT-OFF VALVE
- 4 - PRESSURE REGULATOR WITH IN/OUT GAUGE
- 5 - RELIEF VALVE
- 6 - PURGE OUTLET VALVE



Manifold for one cylinder without process gas purging system



- 1 - GAS CYLINDER
- 2 - COIL
- 3 - INLET SHUT-OFF VALVE
- 4 - PRESSURE REGULATOR WITH IN/OUT GAUGE
- 5 - RELIEF VALVE

Manifold used in supply systems for industrial, inert, flammable, oxidizing gases and gas mixtures. Not usable for corrosive or toxic gases and gas mixtures.

**SPECIAL FEATURES:**

- > Metal diaphragm for valves and regulators
- > Compact design
- > Valves - designed and approved in accordance with relevant sections of EN ISO 10297 (including O2 - ignition test for main shut off valve)
- > Regulator - designed and approved regarding ISO7291 (including O2- ignition test)
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC
- > Connection hoses or connection pigtaills are not described in this data sheet

**TECHNICAL SPECIFICATION OF PANELS:**

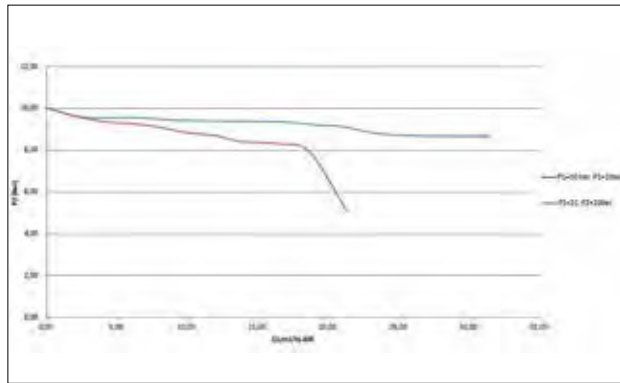
- > Consists of two parts (plates)
- > Easy installation of ground plate (without weight of manifold)
- > Attach front plate and fix by one screw only.
- > Front plate with mounting hole for replacement of gauges

TECHNICAL DATA - REGULATOR	
<b>Working temperatures:</b>	-20°C to + 60 °C
<b>Inlet/outlet ports:</b>	NPT ¼" female
<b>Leakage rate seat:</b>	less than 50 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 10 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	2xM6
<b>Materials gas wetted parts:</b>	
<b>Regulator body:</b>	BRASS (2.0401.26)
<b>Regulator diaphragm:</b>	Hastelloy (2.4819)
<b>Regulator seat:</b>	PCTFE
<b>Regulator popet:</b>	BRASS (2.0371)
<b>Contact gauges available - please contact us</b>	
<b>Max. inlet pressure:</b>	300 bar
<b>Delivery pressures:</b>	10 bar, 20 bar, 40 bar, 100 bar
<b>Pressure gauge rates (pressure rates):</b>	25 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar); 160 bar (100 bar); 200 (315 bar); 400 bar (300 bar);
<b>Cracking pressure relief valves:</b>	15,4 bar (10 bar); 30,8 bar (20 bar); 61,6 bar (40 bar); 154 bar (100 bar)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.2
	Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.3
	Test of functionality of each item
<b>Approvals during development:</b>	Type test regarding ISO 7291
	O2 ignition test regarding ISO 7291
	Approval for all none metallic O2 - wetted parts which were not part of O2 ignition test
	Electrostatic chargeability test

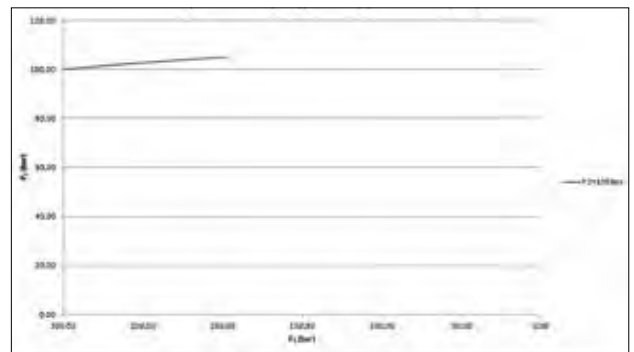
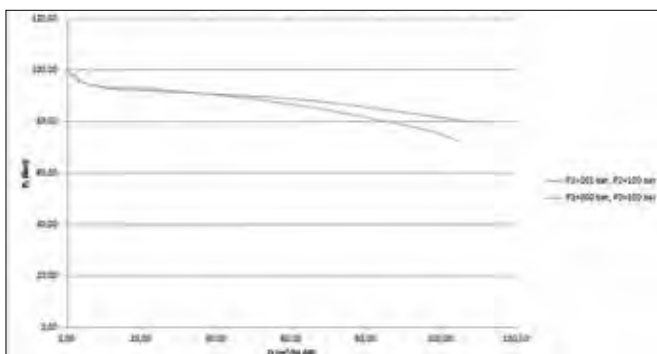
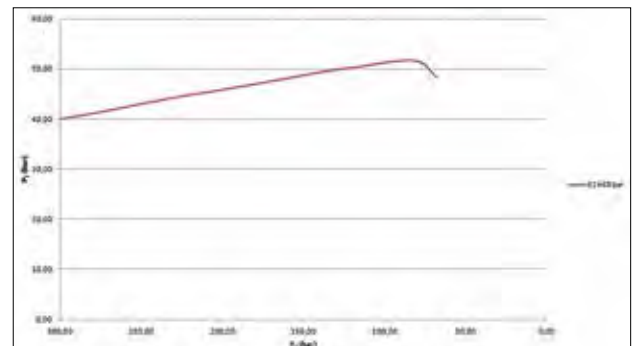
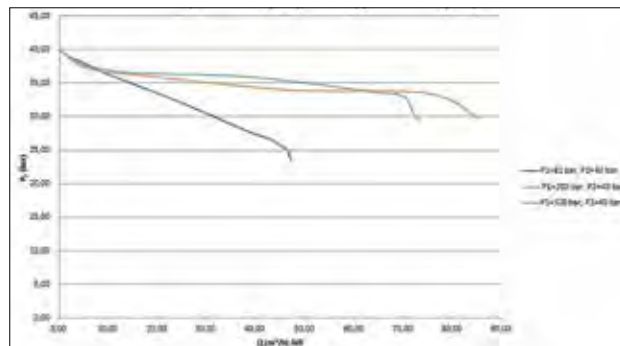
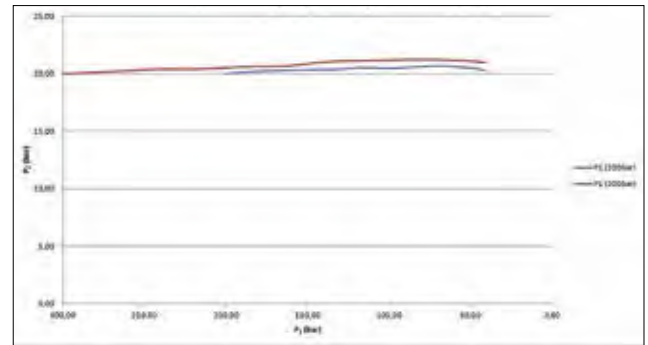
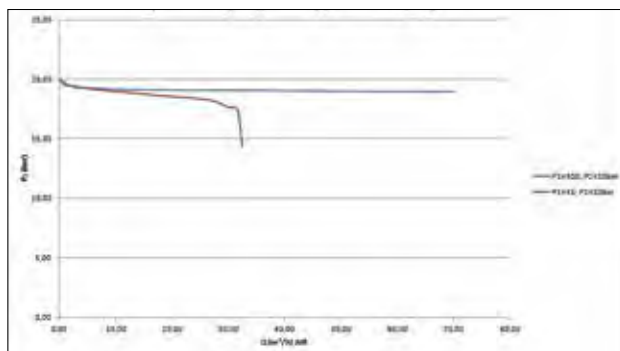
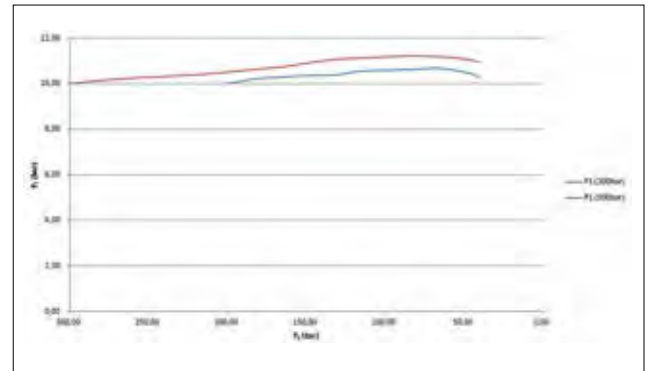
TECHNICAL DATA - VALVES	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 1/4" female
<b>Max. working pressure:</b>	300 bar
<b>Kv-value:</b>	0,25
<b>Seat diameter:</b>	5 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	4- port version: 1 x Hastelloy (2.4819), 1 x Elgiloy (2.4711) 2- port version: 2xElgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.26)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item Test of functionality of each item
<b>Approvals during development:</b>	Type test accordance with relevant sections of EN ISO 10297 (including O2 ignition test for main shut off valve) Electrostatic chargeability test

TECHNICAL DATA - PLATES	
<b>Ground plate:</b>	Material 1.4301 (grinded) Option for attaching safety wire of hoses with special trap against loosening Grounding bolt Openings on top and in bottom of ground plate allows installations "behind" manifold
<b>Front plate:</b>	Material 1.4301 (grinded) Mounting hole for possible replacement of gauges Free space for additional installer label (for instance remark for next maintenance)
<b>Marking on panel:</b>	Sign of our range (druvaTEC) QR - code Label with link to our home page to find IFU, data sheet and other technical documents

FLOW CURVES



DYNAMIC EXPANSION CURVES



P1 - inlet pressure, P2- outlet pressure

DRAWINGS

**ORDERING INFORMATION**

MTLX X XX XX XX XX XXXX XXXX X XXXX XXXX

**EXAMPLE: MTLXSGXE111BTN14FM06B1M06BN14F**

**RELIEF CONNECTION:**  
SEE THE LIST OF CONNECTIONS

**PURGE CONNECTION:**  
0000 - WITHOUT PURGING  
SEE THE LIST OF CONNECTIONS

**PURGING:**  
0 - WITHOUT PURGING  
1 - PURGE WITH PROCESS GAS

**PROCESS INLET CONNECTION:**  
SEE THE LIST OF CONNECTIONS

**PROCESS INLET CONNECTION:**  
M14M - METRIC M14X1.5 M  
M14N - METRIC M14X1.5 N  
W24L - W24X1/4 M LH  
W24R - W24X1/4 M RH

**GAS TYPE:**  
S - STANDARD GASES

**INLET PRESSURE:**  
F4 - 60 BAR  
FX - 200 BAR  
GX - 300 BAR

**OUTLET PRESSURE:**  
DZ - 10 BAR  
E0 - 20 BAR  
E1 - 40 BAR  
E2 - 100 BAR

**INLET GAUGE TYPE:**  
BT - BOURDON TUBE  
I1 - INDUCTIV CONTACT I1  
R5 - REED CONTACT R5

**OUTLET GAUGE TYPE:**  
BT - BOURDON TUBE  
I2 - INDUCTIV CONTACT I2  
R2 - REED CONTACT R2  
I1 - INDUCTIV CONTACT I1  
R5 - REED CONTACT R5

**LIST OF CONNECTIONS**

N14F - NPT1/4" FEMALE  
M08B - COMPRESSION FITTING Ø 6MM BRASS  
M088 - COMPRESSION FITTING Ø 8MM BRASS  
M108 - COMPRESSION FITTING Ø 10MM BRASS  
M12B - COMPRESSION FITTING Ø 12MM BRASS  
M08S - COMPRESSION FITTING Ø 6MM SS  
M088S - COMPRESSION FITTING Ø 8MM SS  
M108S - COMPRESSION FITTING Ø 10MM SS  
M128S - COMPRESSION FITTING Ø 12MM SS  
I4B8 - COMPRESSION FITTING Ø3/8" BRASS  
I4B8S - COMPRESSION FITTING Ø3/8" BRASS  
I4B8 - COMPRESSION FITTING Ø1/2" BRASS  
I4B8S - COMPRESSION FITTING Ø1/2" BRASS  
I4S - COMPRESSION FITTING Ø1/4" SS  
I4S5 - COMPRESSION FITTING Ø3/8" SS  
I4S5 - COMPRESSION FITTING Ø1/2" SS

**GAS TYPE**  
DEFINED BY PRODUCT LINE AND TYPE  
(CHECK AVAILABLE GAS TYPE IN DATASHEET)

**1 - GAS CYLINDER**  
**2 - COIL**  
**3 - INLET SHUT-OFF VALVE**  
**4 - PRESSURE REGULATOR WITH IN/OUT GAUGE**  
**5 - RELIEF VALVE**  
**6 - PURGE OUTLET VALVE**



Link to product configurator



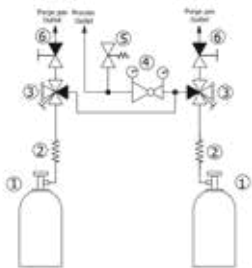
# MANIFOLDS FOR INDUSTRIAL GAS SUPPLY SYSTEMS

## - LOW FLOW RANGE

## - MTLM - TWO SOURCES WITH MANUAL CHANGE OVER SYSTEM



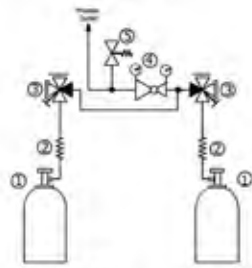
Manifold for two cylinders with manual change over system and including process gas purging system



- 1 - GAS CYLINDER
- 2 - COIL
- 3 - INLET SHUT-OFF VALVE
- 4 - PRESSURE REGULATOR WITH IN/OUT GAUGE
- 5 - RELIEF VALVE
- 6 - PURGE OUTLET VALVE



Manifold for two cylinders with manual change over system, process gas purging system not included



- 1 - GAS CYLINDER
- 2 - COIL
- 3 - INLET SHUT-OFF VALVE
- 4 - PRESSURE REGULATOR WITH IN/OUT GAUGE
- 5 - RELIEF VALVE

Manifold used in supply systems for industrial, inert, flammable, oxidizing and gas mixtures. Not usable for corrosive, toxic gases and gas mixtures.

### SPECIAL FEATURES:

- > Switching between two sources by manual valve actuation
- > Metal diaphragm for valves and regulators
- > Compact design
- > Valves - designed and approved in accordance with relevant sections of EN ISO 10297 (including O<sub>2</sub> - ignition test for main shut off valve)
- > Regulator - designed and approved regarding ISO7291 (including O<sub>2</sub>- ignition test)
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC
- > Connection hoses or connection pigtailed are not described in this data sheet

### TECHNICAL SPECIFICATION OF PANELS:

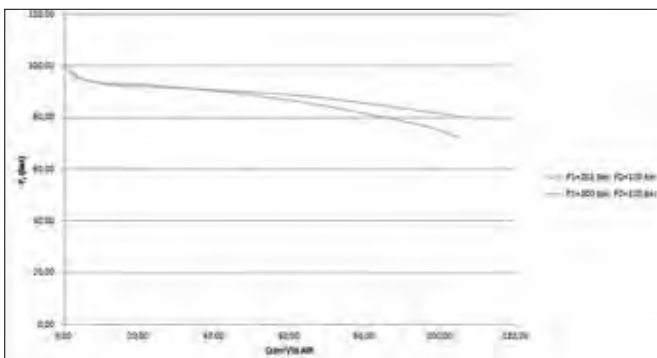
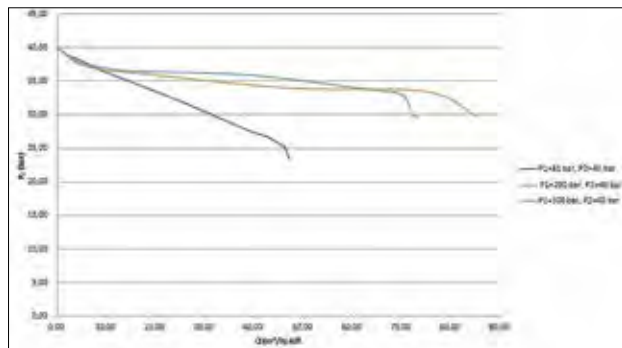
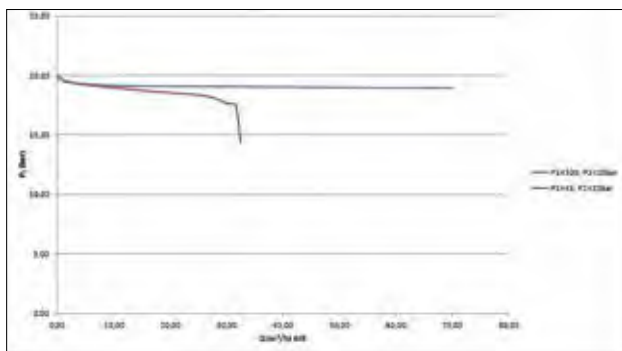
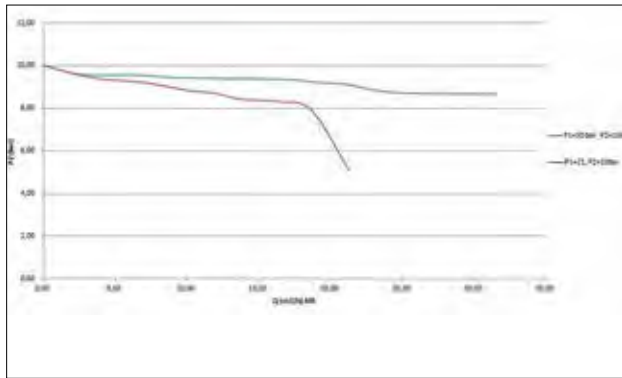
- > Consists of two parts (plates)
- > Easy installation of ground plate (without weight of manifold)
- > Attach front plate and fix by one screw only.
- > Front plate with mounting hole for replacement of gauges

TECHNICAL DATA - REGULATOR	
<b>Working temperatures:</b>	-20°C to + 60 °C
<b>Inlet/outlet ports:</b>	NPT ¼" female
<b>Leakage rate seat:</b>	less than 50 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 10 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	2xM6
<b>Materials gas wetted parts:</b>	
<b>Regulator body:</b>	BRASS (2.0401.26)
<b>Regulator diaphragm:</b>	Hastelloy (2.4819)
<b>Regulator seat:</b>	PCTFE
<b>Regulator popet:</b>	BRASS (2.0371)
<b>Contact gauges available- please contact us</b>	
<b>Max. inlet pressure:</b>	300 bar
<b>Delivery pressures:</b>	10 bar, 20 bar, 40 bar, 100 bar
<b>Pressure gauge rates (pressure rates):</b>	25 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar); 160 bar (100 bar); 200 (315 bar); 400 bar (300 bar);
<b>Cracking pressure relief valves:</b>	15,4 bar (10 bar); 30,8 bar (20 bar); 61,6 bar (40 bar); 154 bar (100 bar)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.2 Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.3 Test of functionality of each item
<b>Approvals during development:</b>	Type test regarding ISO 7291 O <sub>2</sub> ignition test regarding ISO 7291 Approval for all none metallic O <sub>2</sub> - wetted parts which were not part of O <sub>2</sub> ignition test Electrostatic chargeability test

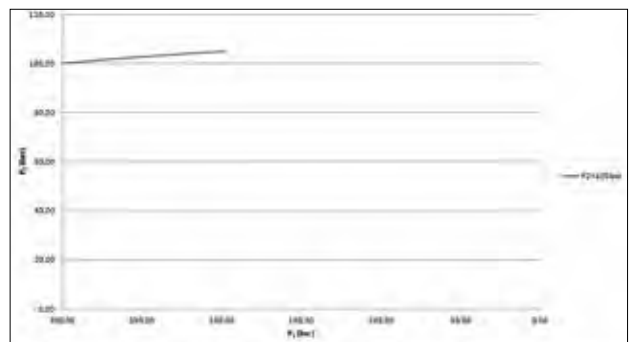
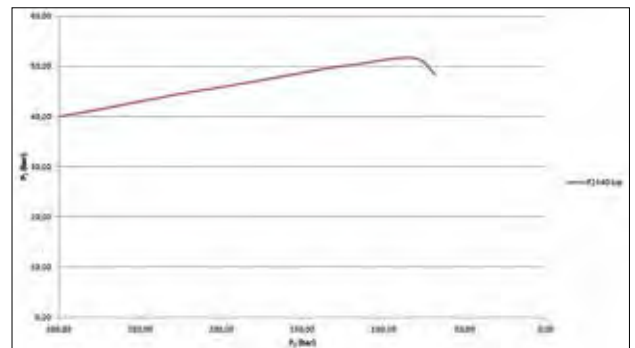
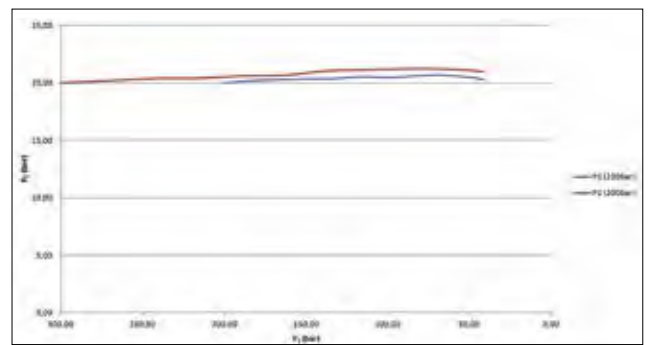
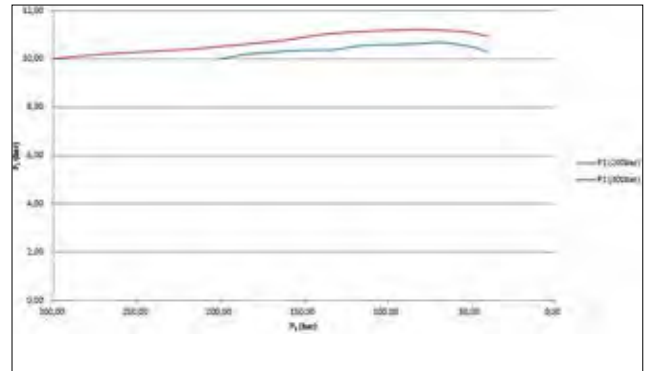
TECHNICAL DATA - VALVES	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 1/4" female
<b>Max. working pressure:</b>	300 bar
<b>Kv-value:</b>	0,25
<b>Seat diameter:</b>	5 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	4- port version: 1 x Hastelloy (2.4819), 1 x Elgiloy (2.4711) 2- port version: 2xElgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.126)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) Seat leakage test with dry air of each item Test of functionality of each item
<b>Approvals during development:</b>	Type test accordance with relevant sections of EN ISO 10297 (including O2 ignition test for main shut off valve) Electrostatic chargeability test

TECHNICAL DATA - PLATES	
<b>Ground plate:</b>	Material 1.4301 (grinded) Option for attaching safety wire of hoses with special trap against loosening Grounding bolt Openings on top and in bottom of ground plate allows installations "behind" manifold
<b>Front plate:</b>	Material 1.4301 (grinded) Mounting hole for possible replacement of gauges Free space for additional installer label (for instance remark for next maintenance)
<b>Marking on panel:</b>	Sign of our range (druvaTEC) QR - code Label with link to our home page to find IFU, data sheet and other technical documents

FLOW CURVES

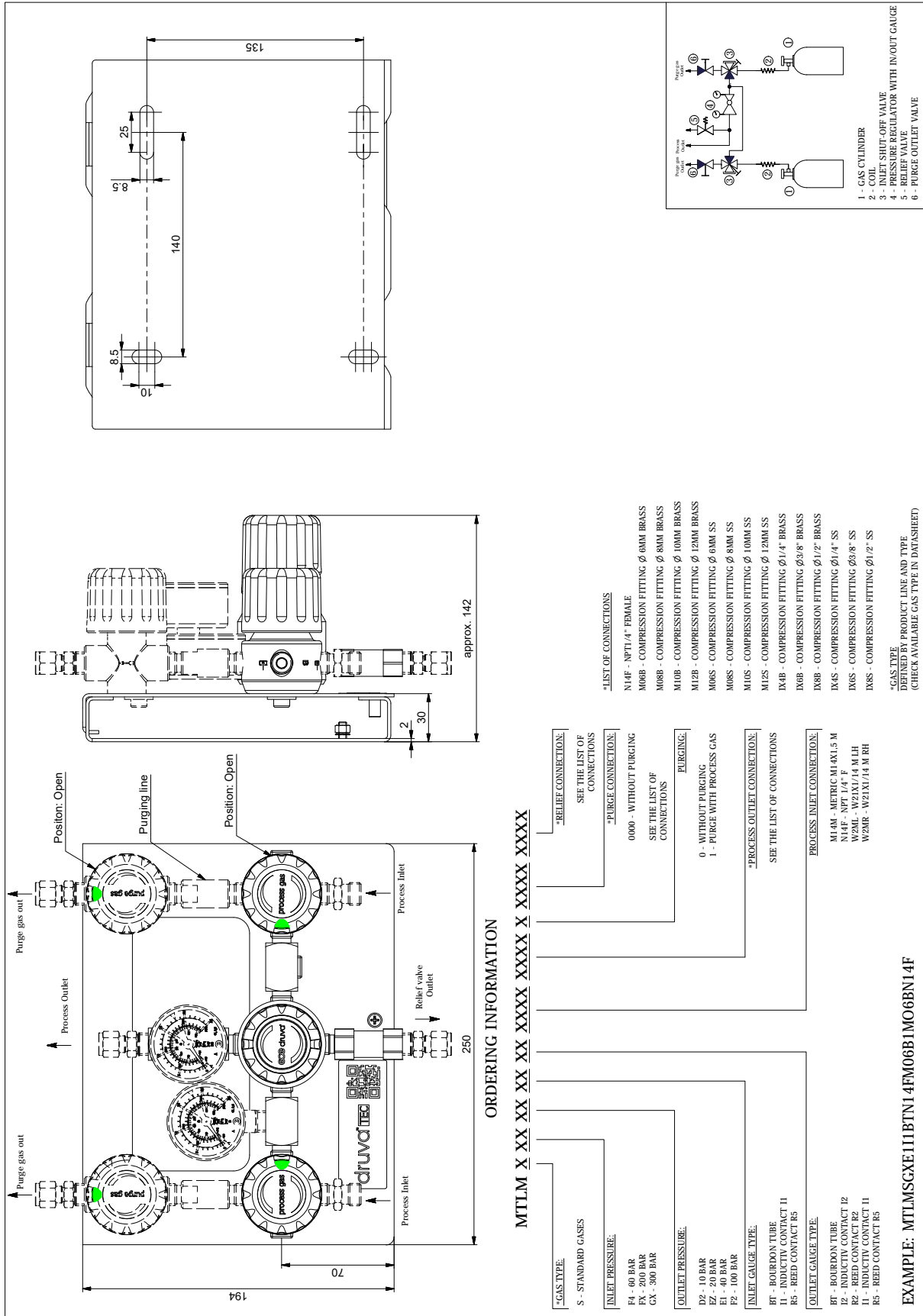


DYNAMIC EXPANSION CURVES



P1 - inlet pressure, P2- outlet pressure

DRAWINGS



Link to product configurator

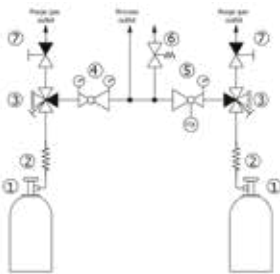
# MANIFOLDS FOR INDUSTRIAL GAS SUPPLY SYSTEMS

- LOW FLOW RANGE

- MTLs - TWO SOURCES WITH SEMIAUTOMATIC CHANGE OVER SYSTEM



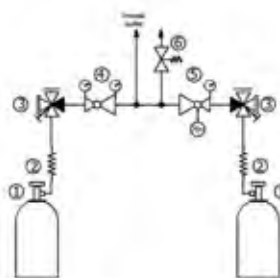
Manifold for two cylinders with semiautomatically change over system and including process gas purging system



- 1 - GAS CYLINDER
- 2 - COIL
- 3 - INLET SHUT-OFF VALVE
- 4 - PRESSURE REGULATOR WITH IN/OUT GAUGE
- 5 - FIXED PRESSURE REGULATOR WITH IN GAUGE
- 6 - RELIEF VALVE
- 7 - PURGE OUTLET VALVE



Manifold for two cylinders with semiautomatic change over system, process gas purging system not included



- 1 - GAS CYLINDER
- 2 - COIL
- 3 - INLET SHUT-OFF VALVE
- 4 - PRESSURE REGULATOR WITH IN/OUT GAUGE
- 5 - FIXED PRESSURE REGULATOR WITH IN GAUGE
- 6 - RELIEF VALVE

Manifold used in supply systems for industrial, inert, flammable, oxidizing gases and gas mixtures. Not usable for corrosive or toxic gases and gas mixtures.

### SPECIAL FEATURES:

- > Semiautomatic switching between two sources by using pressure difference between two regulators
- > Metal diaphragm for valves and regulators
- > Compact design
- > Valves - designed and approved in accordance with relevant sections of EN ISO 10297 (including O<sub>2</sub> - ignition test for main shut off valve)
- > Regulator - designed and approved regarding ISO7291 (including O<sub>2</sub>- ignition test)
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC
- > Connection hoses or connection pigtaills are not described in this data sheet

### TECHNICAL SPECIFICATION OF PANELS:

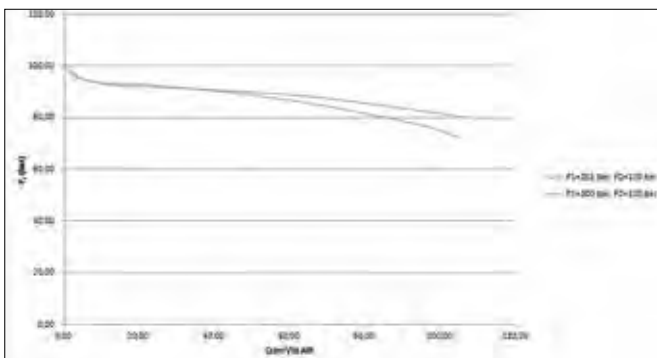
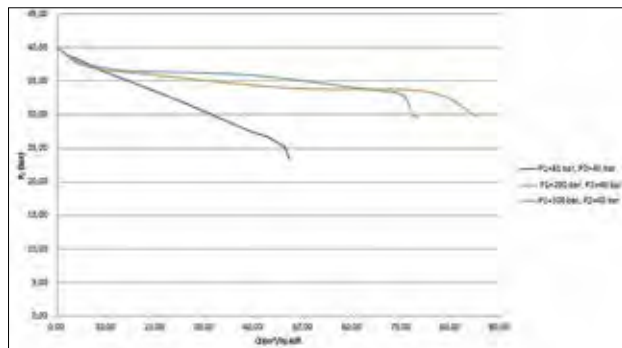
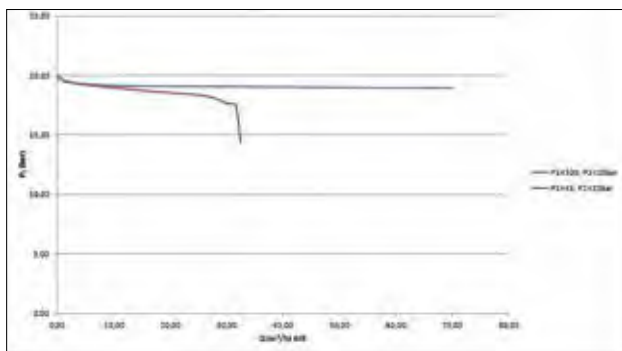
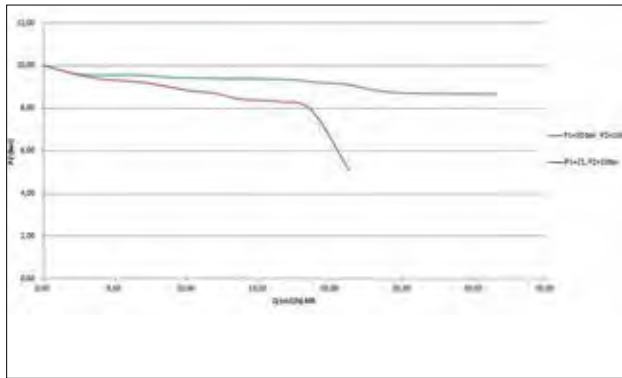
- > Consists of two parts (plates)
- > Easy installation of ground plate (without weight of manifold)
- > Attach front plate and fix by one screw only.
- > Front plate with mounting hole for replacement of gauges

TECHNICAL DATA - REGULATOR	
<b>Working temperatures:</b>	-20°C to + 60 °C
<b>Inlet/outlet ports:</b>	NPT 1/4" female
<b>Leakage rate seat:</b>	less than 50 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 10 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	2xM6
<b>Materials gas wetted parts:</b>	
<b>Regulator body:</b>	BRASS (2.0401.26)
<b>Regulator diaphragm:</b>	Hastelloy (2.4819)
<b>Regulator seat:</b>	PCTFE
<b>Regulator popet:</b>	BRASS (2.0371)
<b>Contact gauges available- please contact us</b>	
<b>Max. inlet pressure:</b>	300 bar
<b>Delivery pressures:</b>	10 bar, 20 bar, 40 bar, 100 bar
<b>Pressure gauge rates (pressure rates):</b>	25 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar); 160 bar (100 bar); 200 (315 bar); 400 bar (300 bar);
<b>Cracking pressure relief valves:</b>	15,4 bar (10 bar); 30,8 bar (20 bar); 61,6 bar (40 bar); 154 bar (100 bar)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.2 Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.3 Test of functionality of each item
<b>Approvals during development:</b>	Type test regarding ISO 7291 O <sub>2</sub> ignition test regarding ISO 7291 Approval for all none metallic O <sub>2</sub> - wetted parts which were not part of O <sub>2</sub> ignition test Electrostatic chargeability test

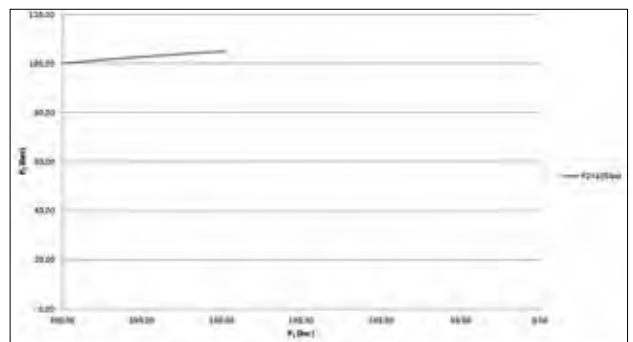
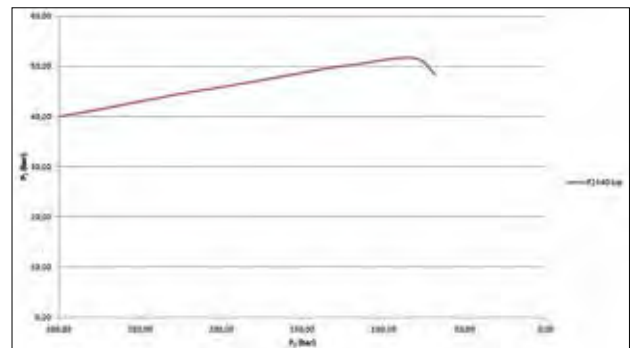
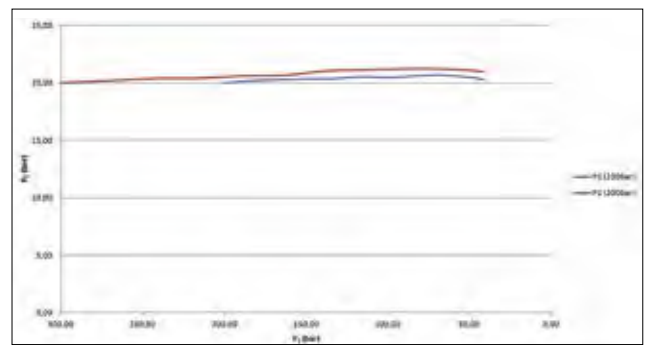
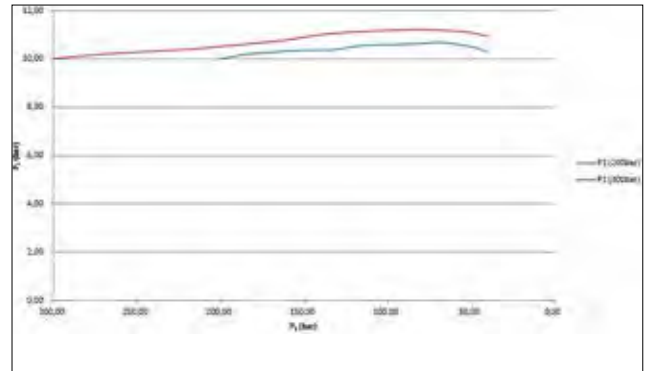
TECHNICAL DATA - VALVES	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 1/4" female
<b>Max. working pressure:</b>	300 bar
<b>Kv-value:</b>	0,25
<b>Seat diameter:</b>	5 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	4- port version: 1 x Hastelloy (2.4819), 1 x Elgiloy (2.4711) 2- port version: 2×Elgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.126)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item Test of functionality of each item
<b>Approvals during development:</b>	Type test accordance with relevant sections of EN ISO 10297 (including O2 ignition test for main shut off valve) Electrostatic chargeability test

TECHNICAL DATA - PLATES	
<b>Ground plate:</b>	Material 1.4301 (grinded) Option for attaching safety wire of hoses with special trap against loosening Grounding bolt Openings on top and in bottom of ground plate allows installations "behind" manifold
<b>Front plate:</b>	Material 1.4301 (grinded) Mounting hole for possible replacement of gauges Free space for additional installer label (for instance remark for next maintenance)
<b>Marking on panel:</b>	Sign of our range (druvaTEC) QR - code Label with link to our home page to find IFU, data sheet and other technical documents

FLOW CURVES



DYNAMIC EXPANSION CURVES



P1 - inlet pressure, P2- outlet pressure

DRAWINGS

**ORDERING INFORMATION**

MTLS X XX XX XX XX XXXX XXXX X XXXX XXXX

**\*GAS TYPE:**  
S - STANDARD GASES

**INLET PRESSURE:**  
F4 - 60 BAR  
FX - 200 BAR  
CX - 300 BAR

**OUTLET PRESSURE:**  
DZ - 10 BAR  
EZ - 20 BAR  
E1 - 40 BAR  
F2 - 100 BAR

**INLET GAUGE TYPE:**  
BT - BOURDON TUBE  
I1 - INDUCTIV CONTACT I1  
R5 - REED CONTACT R5

**OUTLET GAUGE TYPE:**  
BT - BOURDON TUBE  
I2 - INDUCTIV CONTACT I2  
R2 - REED CONTACT R2  
I1 - INDUCTIV CONTACT I1  
R5 - REED CONTACT R5

**\*RELIEF CONNECTION:**  
SEE THE LIST OF CONNECTIONS

**\*PURGE CONNECTION:**  
0000 - WITHOUT PURGING  
SEE THE LIST OF CONNECTIONS

**PURGING:**  
0 - WITHOUT PURGING  
1 - PURGE WITH PROCESS GAS

**\*PROCESS OUTLET CONNECTION:**  
SEE THE LIST OF CONNECTIONS

**PROCESS INLET CONNECTION:**  
M14M - METRIC M1 4X1.5 M  
N14F - NPT 1/4" F  
W2M1 - W2X1/14 M LH  
W2M1R - W2X1/14 M RH

**\*LIST OF CONNECTIONS**

**\*RELIEF CONNECTIONS**  
N14F - NPT 1/4" FEMALE  
M06B - COMPRESSION FITTING Ø 6MM BRASS  
M08B - COMPRESSION FITTING Ø 8MM BRASS  
M10B - COMPRESSION FITTING Ø 10MM BRASS  
M12B - COMPRESSION FITTING Ø 12MM BRASS  
M06S - COMPRESSION FITTING Ø 6MM SS  
M08S - COMPRESSION FITTING Ø 8MM SS  
M10S - COMPRESSION FITTING Ø 10MM SS  
M12S - COMPRESSION FITTING Ø 12MM SS  
IX4B - COMPRESSION FITTING Ø1/4" BRASS  
IX8B - COMPRESSION FITTING Ø3/8" BRASS  
IX8 - COMPRESSION FITTING Ø1/2" BRASS  
IX4S - COMPRESSION FITTING Ø1/4" SS  
IX8S - COMPRESSION FITTING Ø3/8" SS  
IX8S - COMPRESSION FITTING Ø1/2" SS

**\*GAS TYPE**  
DEFINED BY PRODUCT LINE AND TYPE  
(CHECK AVAILABLE GAS TYPE IN DATASHEET)

**EXAMPLE:** MTLSSGXZE11BTN14FM06B1M06BN14F

**1 - GAS CYLINDER**  
**2 - COIL**  
**3 - INLET SHUT-OFF VALVE**  
**4 - PRESSURE REGULATOR WITH IN/OUT GAUGE**  
**5 - FIXED PRESSURE REGULATOR WITH IN GAUGE**  
**6 - RELIEF VALVE**  
**7 - PURGE OUTLET VALVE**



Link to product configurator



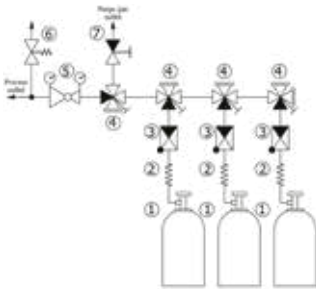
# MANIFOLDS FOR INDUSTRIAL GAS SUPPLY SYSTEMS

## - LOW FLOW RANGE

## - MTLT - THREE SOURCES WITH MANUAL CHANGE OVER SYSTEM



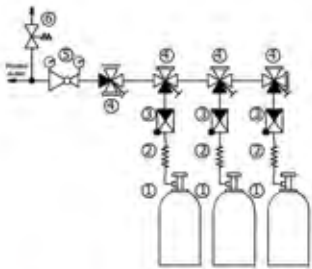
Manifold for three cylinders with manual change over system and including process gas purging system



- 1 - GAS CYLINDER
- 2 - COIL
- 3 - CHECK VALVE
- 4 - INLET SHUT-OFF VALVE
- 5 - PRESSURE REGULATOR WITH IN/OUT GAUGE
- 6 - RELIEF VALVE
- 7 - PURGE OUTLET VALVE



Manifold for three cylinders with manual change over system process gas purging system not included



- 1 - GAS CYLINDER
- 2 - COIL
- 3 - CHECK VALVE
- 4 - INLET SHUT-OFF VALVE
- 5 - PRESSURE REGULATOR WITH IN/OUT GAUGE
- 6 - RELIEF VALVE
- 7 - PURGE OUTLET VALVE

Manifold used in supply systems for industrial, inert, flammable, oxidizing gases and gas mixtures. Not usable for corrosive or toxic gases and gas mixtures.



### SPECIAL FEATURES:

- > Switching between three sources by manual valve actuation
- > Metal diaphragm for valves and regulators
- > Compact design
- > Valves - designed and approved in accordance with relevant sections of EN ISO 10297 (including O<sub>2</sub> - ignition test for main shut off valve)
- > Regulator - designed and approved regarding ISO7291 (including O<sub>2</sub>- ignition test)
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC
- > Connection hoses or connection pigtailed are not described in this data sheet

### TECHNICAL SPECIFICATION OF PANELS:

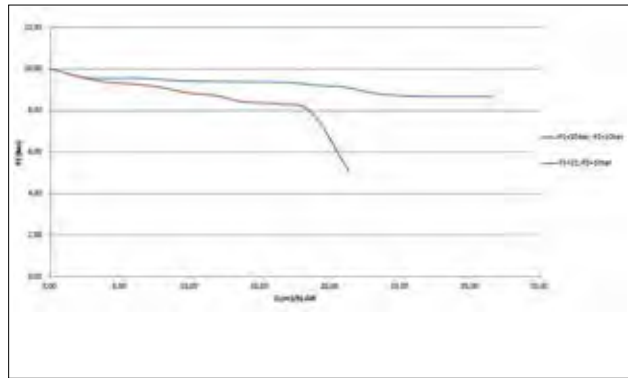
- > Consists of two parts (plates)
- > Easy installation of ground plate (without weight of manifold)
- > Attach front plate and fix by one screw only
- > Front plate with mounting hole for replacement of gauges

TECHNICAL DATA - REGULATOR	
<b>Working temperatures:</b>	-20°C to + 60 °C
<b>Inlet/outlet ports:</b>	NPT ¼" female
<b>Leakage rate seat:</b>	less than 50 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 10 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	2xM6
<b>Materials gas wetted parts:</b>	
<b>Regulator body:</b>	BRASS (2.0401.26)
<b>Regulator diaphragm:</b>	Hastelloy (2.4819)
<b>Regulator seat:</b>	PCTFE
<b>Regulator popet:</b>	BRASS (2.0371)
<b>Contact gauges available- please contact us</b>	
<b>Max. inlet pressure:</b>	300 bar
<b>Delivery pressures:</b>	10 bar, 20 bar, 40 bar, 100 bar
<b>Pressure gauge rates (pressure rates):</b>	25 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar); 160 bar (100 bar); 200 (315 bar); 400 bar (300 bar);
<b>Cracking pressure relief valves:</b>	15,4 bar (10 bar); 30,8 bar (20 bar); 61,6 bar (40 bar); 154 bar (100 bar)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.2
	Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.3
	Test of functionality of each item
<b>Approvals during development:</b>	Type test regarding ISO 7291
	O <sub>2</sub> ignition test regarding ISO 7291
	Approval for all none metallic O <sub>2</sub> - wetted parts which were not part of O <sub>2</sub> ignition test
	Electrostatic chargeability test

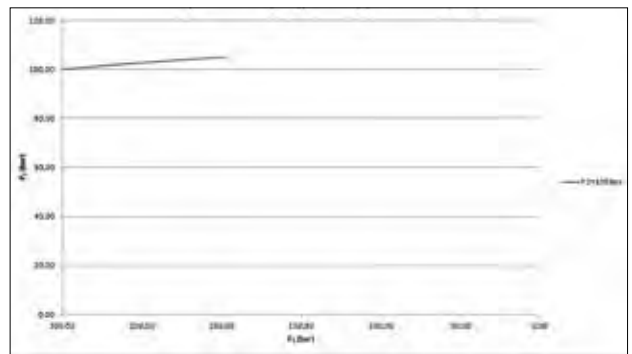
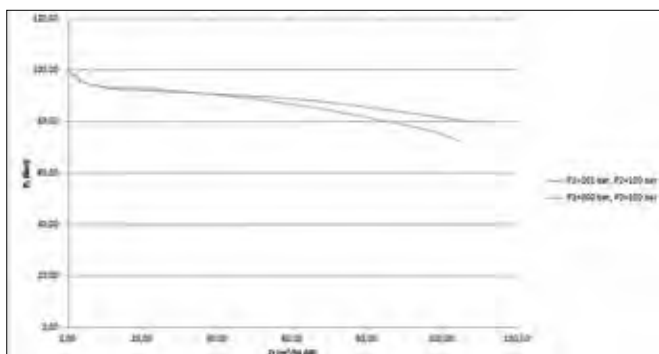
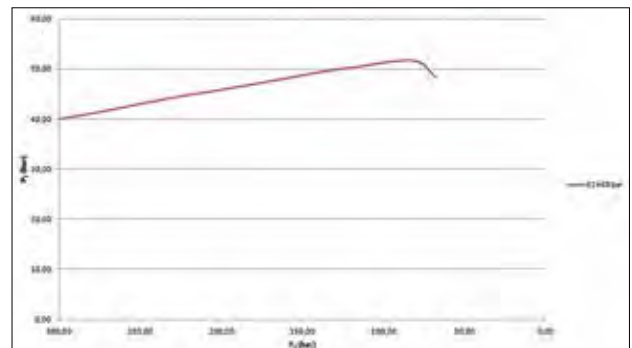
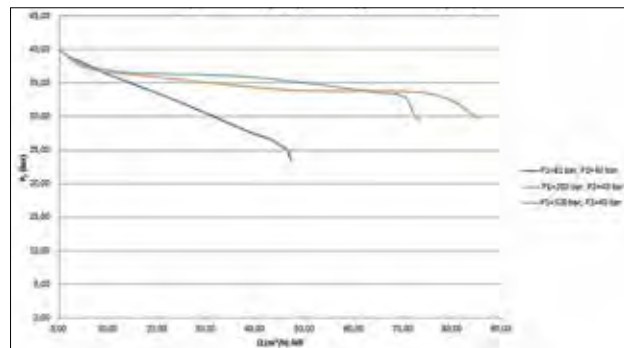
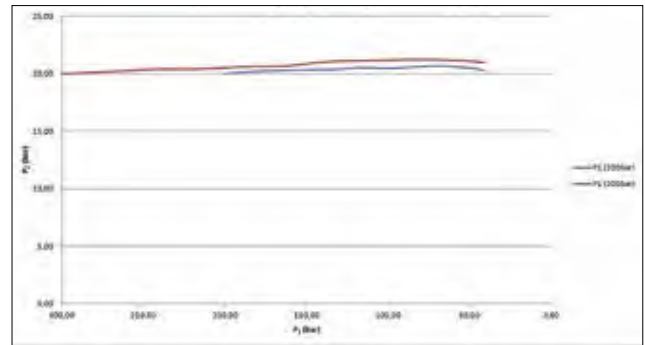
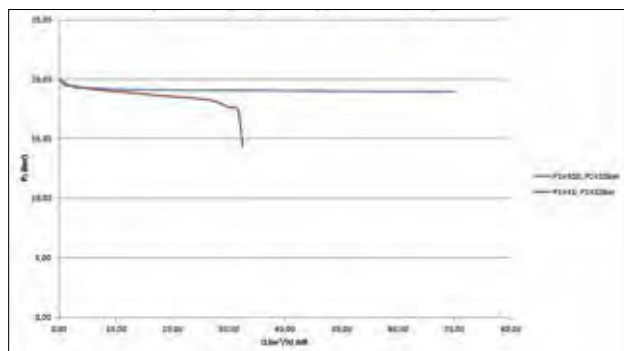
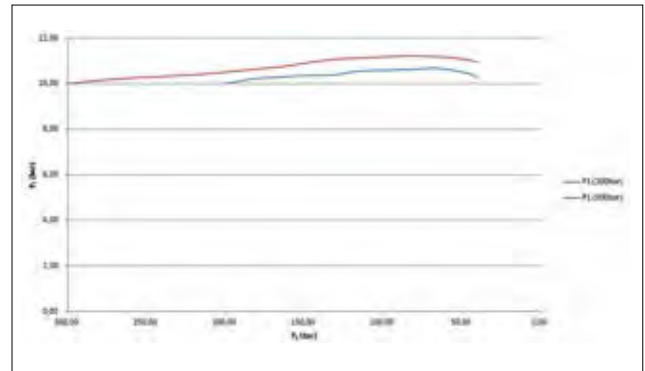
TECHNICAL DATA - VALVES	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 1/4" female
<b>Max. working pressure:</b>	300 bar
<b>Kv-value:</b>	0,25
<b>Seat diameter:</b>	5 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	4- port version: 1 x Hastelloy (2.4819), 1 x Elgiloy (2.4711) 2- port version: 2xElgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.126)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item Test of functionality of each item
<b>Approvals during development:</b>	Type test accordance with relevant sections of EN ISO 10297 (including O2 ignition test for main shut off valve) Electrostatic chargeability test

TECHNICAL DATA - PLATES	
<b>Ground plate:</b>	Material 1.4301 (grinded) Option for attaching safety wire of hoses with special trap against loosening Grounding bolt Openings on top and in bottom of ground plate allows installations "behind" manifold
<b>Front plate:</b>	Material 1.4301 (grinded) Mounting hole for possible replacement of gauges Free space for additional installer label (for instance remark for next maintenance)
<b>Marking on panel:</b>	Sign of our range (druvaTEC) QR - code Label with link to our home page to find IFU, data sheet and other technical documents

FLOW CURVES



DYNAMIC EXPANSION CURVES



P1 - inlet pressure, P2- outlet pressure

DRAWINGS

**ORDERING INFORMATION**

MTLT X XX XX XX XX XXXX XXXX X XXXX XXXX

**GAS TYPE:**  
S - STANDARD GASES

**INLET PRESSURE:**  
F4 - 60 BAR  
FX - 200 BAR  
CX - 300 BAR

**OUTLET PRESSURE:**  
D2 - 10 BAR  
EZ - 20 BAR  
E1 - 40 BAR  
E2 - 100 BAR

**INLET GAUGE TYPE:**  
BT - BOURDON TUBE  
I1 - INDUCTIV CONTACT I1  
RS - REED CONTACT RS

**OUTLET GAUGE TYPE:**  
BT - BOURDON TUBE  
I2 - INDUCTIV CONTACT I2  
R2 - REED CONTACT R2  
I1 - INDUCTIV CONTACT I1  
RS - REED CONTACT RS

**RELIEF CONNECTION:**  
SEE THE LIST OF CONNECTIONS

**PURGE CONNECTION:**  
0000 - WITHOUT PURGING  
SEE THE LIST OF CONNECTIONS

**PURGING:**  
0 - WITHOUT PURGING  
1 - PURGE WITH PROCESS GAS

**PROCESS OUTLET CONNECTION:**  
SEE THE LIST OF CONNECTIONS

**PROCESS INLET CONNECTION:**  
M14M - METRIC M4x1,5 M  
N14F - NPT 1/4" F  
N14M - NPT 1/4" M  
W2MR - W2x1,1/4" M RH

**EXAMPLE:** MTLTSGXEZ11BTN14FM06B1MO6BN14F

**\*LIST OF CONNECTIONS**

N14F - NPT 1/4" FEMALE  
M06B - COMPRESSION FITTING Ø 6MM BRASS  
M08B - COMPRESSION FITTING Ø 8MM BRASS  
M10B - COMPRESSION FITTING Ø 10MM BRASS  
M12B - COMPRESSION FITTING Ø 12MM BRASS  
M06S - COMPRESSION FITTING Ø 6MM SS  
M08S - COMPRESSION FITTING Ø 8MM SS  
M10S - COMPRESSION FITTING Ø 10MM SS  
M12S - COMPRESSION FITTING Ø 12MM SS  
IX4B - COMPRESSION FITTING Ø1/4" BRASS  
IX8B - COMPRESSION FITTING Ø3/8" BRASS  
IX8S - COMPRESSION FITTING Ø1/2" BRASS  
IXMS - COMPRESSION FITTING Ø1/4" SS  
IXMS - COMPRESSION FITTING Ø3/8" SS  
IXMS - COMPRESSION FITTING Ø1/2" SS

**\*GAS TYPE**  
DEFINED BY PRODUCT LINE AND TYPE  
(CHECK AVAILABLE GAS TYPE IN DATASHEET)

**1 - LIST OF CONNECTIONS**

1 - GAS CYLINDER  
2 - COIL  
3 - CHECK VALVE  
4 - INLET SHUT-OFF VALVE (XIN: 3XOUT)  
5 - SHUT-OFF VALVE (3XIN: 1XOUT)  
6 - PRESSURE REGULATOR WITH IN/OUT GAUGE  
7 - RELIEF VALVE  
8 - PURGE OUTLET VALVE



Link to product configurator

# SINGLE STAGE PRESSURE LINE REGULATOR IN INDUSTRIAL GAS SUPPLY SYSTEMS

## - LTLM - LOW FLOW RANGE



4-port line regulator  
2 x inlet; 2 x outlet



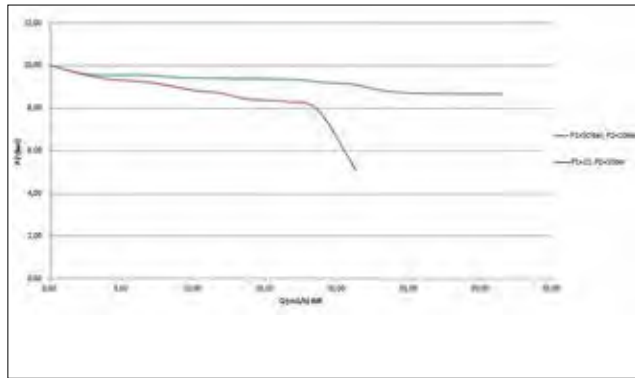
4- port single stage pressure line regulator used in supply systems for industrial, inert, flammable, oxidizing gases and gas mixtures. Not usable for corrosive or toxic gases and gas mixtures.

### SPECIAL FEATURES

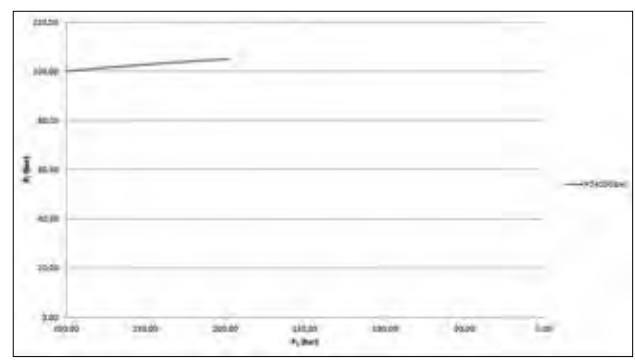
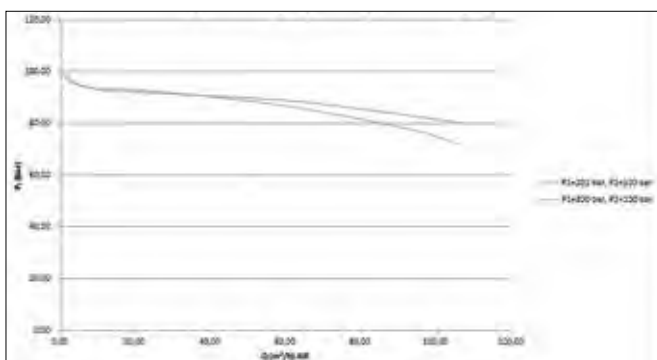
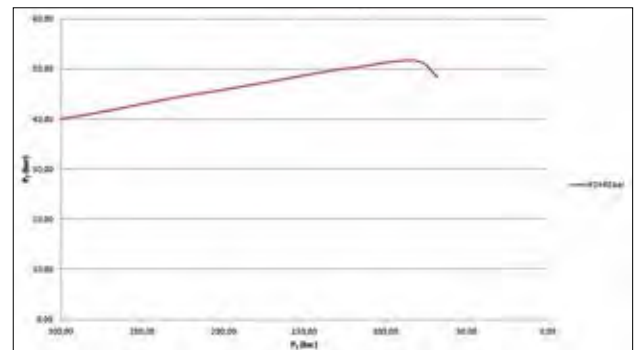
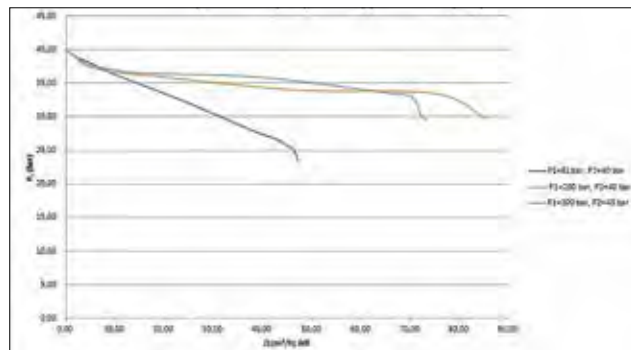
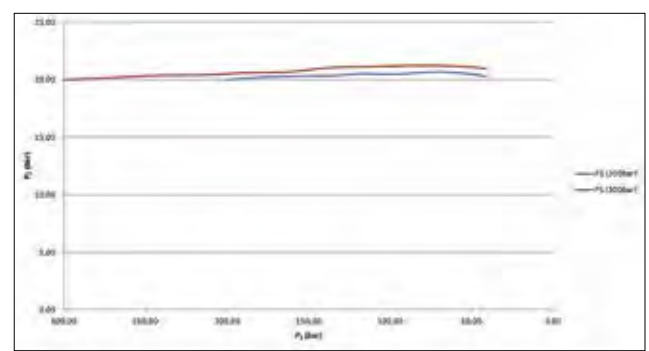
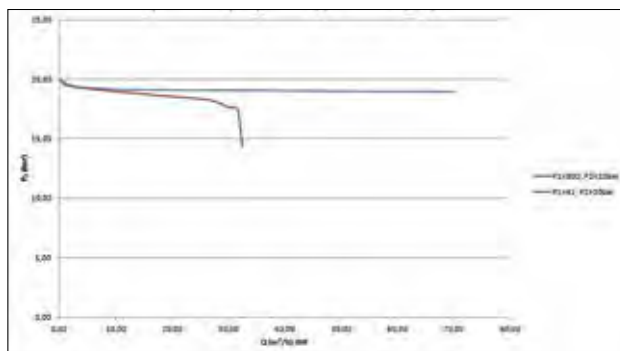
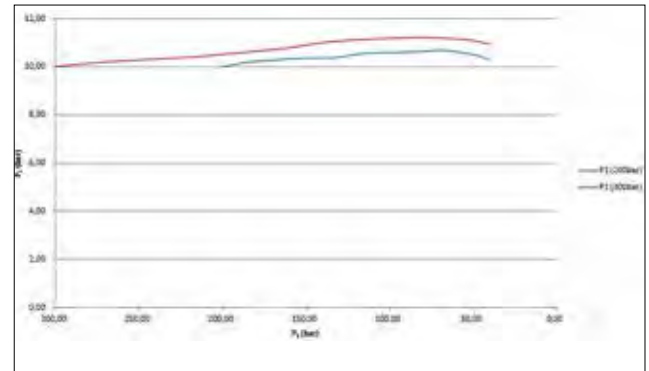
- > Metal diaphragm regulator
- > Compact design
- > Single stage version
- > Excellent pressure adjustment
- > Designed and approved regarding ISO7291 (including O<sub>2</sub>- ignition test)
- > Relief valve in delivery pressure side available
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

TECHNICAL DATA	
<b>Working temperatures:</b>	-20°C to + 60 °C
<b>Inlet/outlet ports:</b>	NPT ¼" female
<b>Leakage rate seat:</b>	less than 50 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 10 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	2xM6
<b>Materials gas wetted parts:</b>	
<b>Regulator body:</b>	BRASS (2.0401.26)
<b>Regulator diaphragm:</b>	Hastelloy (2.4819)
<b>Regulator seat:</b>	PCTFE
<b>Regulator popet:</b>	BRASS (2.0371)
<b>Pressure rates ine regulator:</b>	
<b>Max. inlet pressure:</b>	300 bar
<b>Delivery pressures:</b>	10 bar, 20 bar, 40 bar, 100 bar
<b>Cracking pressure relief valves:</b>	15,4 bar (10 bar); 30,8 bar (20 bar); 61,6 bar (40 bar); 154 bar (100 bar)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.2 Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.3 Test of functionality of each item
<b>Approvals during development:</b>	Type test regarding ISO 7291 O <sub>2</sub> ignition test regarding ISO 7291 Approval for all none metallic O <sub>2</sub> - wetted parts which were not part of O <sub>2</sub> ignition test Electrostatic chargeability test - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727 - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

FLOW CURVES



DYNAMIC EXPANSION CURVES



P1 - inlet pressure, P2- outlet pressure

DRAWINGS

**FRONT VIEW**  
 PROCESS IN (left), PROCESS IN (right), RELIEF VALVE OUTLET (right), PROCESS OUT (left)  
 Dimensions: 19, 103 (approx.), 111 (approx.)

**BOTTOM VIEW**  
 PROCESS IN (left), PROCESS IN (right)  
 Dimensions: 30, 2 X M6 (6.5 MM DEEP)

**ORDERING INFORMATION**  
**L T L M X X X X X X X X 00 00 XXXX XXXX XX XXXX**

- GAZE CODE:**  
 X - DUAL INLET (R + L)
- STAGE:**  
 5 - SINGLE STAGE
- SUCK TYPE:**  
 5 - STANDARD GAZE
- INLET PRESSURE:**  
 P1 - 60 BAR  
 P2 - 100 BAR  
 CK - 300 BAR
- OUTLET PRESSURE:**  
 L2 - 15 BAR  
 L3 - 20 BAR  
 E1 - 40 BAR  
 P2 - 100 BAR
- INLET GAZE TYPE:**  
 00 - WITHOUT (PORTING H)
- RELIEF CONNECTION:**  
 00H - WITHOUT (FLANGED)  
 \*SEE THE LIST OF CONNECTIONS
- SAFETY DEVICE:**  
 00 - WITHOUT (NPT/FEMALE)  
 01 - WITH (NPT/FEMALE)  
 RV - PRESSURE RELIEF VALVE
- PROCESS INLET CONNECTION:**  
 \*SEE THE LIST OF CONNECTIONS
- PROCESS INLET CONNECTION:**  
 \*SEE THE LIST OF CONNECTIONS
- OUTLET GAZE TYPE:**  
 00 - WITHOUT (PORTING H)

**LIST OF CONNECTIONS**

- N14F - NPT1/4" FEMALE
- M6B - COMPRESSION FITTING Ø 6MM BRASS
- M8B - COMPRESSION FITTING Ø 8MM BRASS
- M10B - COMPRESSION FITTING Ø 10MM BRASS
- M12B - COMPRESSION FITTING Ø 12MM BRASS
- M8S - COMPRESSION FITTING Ø 6MM SS
- M10S - COMPRESSION FITTING Ø 8MM SS
- M12S - COMPRESSION FITTING Ø 10MM SS
- M15 - COMPRESSION FITTING Ø 12MM SS
- IX4B - COMPRESSION FITTING Ø1/4" BRASS
- IX6B - COMPRESSION FITTING Ø3/8" BRASS
- IX8B - COMPRESSION FITTING Ø1/2" BRASS
- IX4S - COMPRESSION FITTING Ø1/4" SS
- IX6S - COMPRESSION FITTING Ø3/8" SS
- IX8S - COMPRESSION FITTING Ø1/2" SS

**\*GAS TYPE**  
 \*SEE THE LIST OF CONNECTIONS  
 (CHECK AVAILABLE GAS TYPE IN DATASHEET)

**EXAMPLE: L T L M X S G X E 1 0 0 0 0 M 0 6 B M 0 6 B R V M 0 6 B**



Link to product configurator

# SINGLE STAGE PRESSURE LINE REGULATOR IN INDUSTRIAL GAS SUPPLY SYSTEMS

## - LTLF - LOW FLOW RANGE



4-port line regulator  
1 x inlet; 3 x outlet



4- port single stage line regulator used in supply systems for industrial, inert, flammable, oxidizing gases and gas mixtures. Not usable for corrosive or toxic gases and gas mixtures.

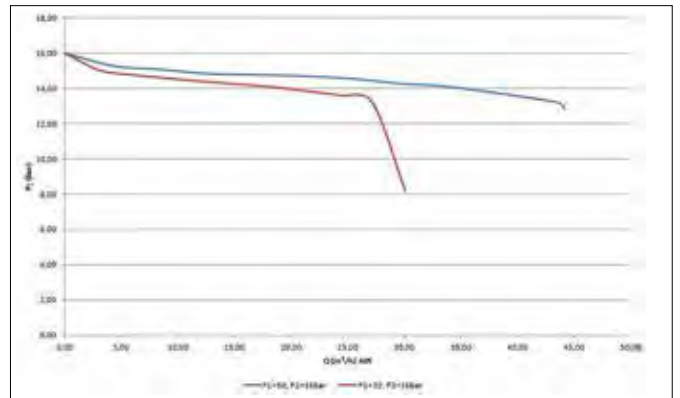
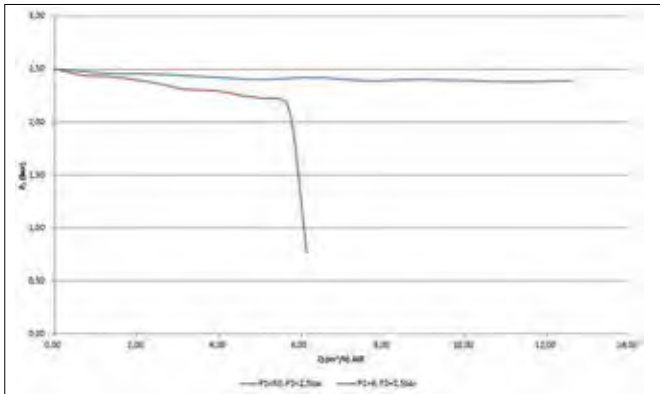
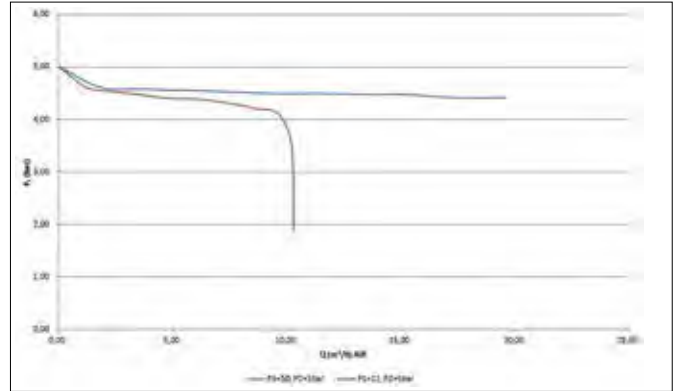
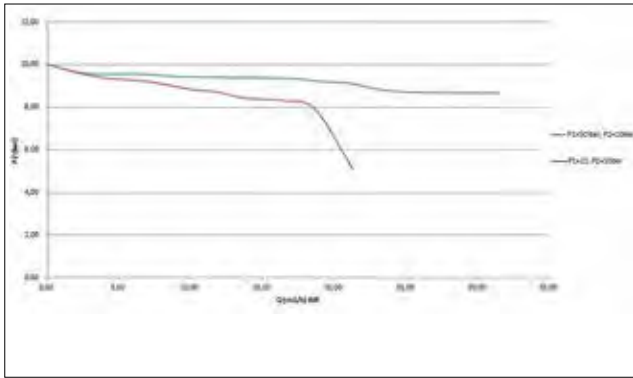
### SPECIAL FEATURES

- > Metal diaphragm regulator
- > Compact design
- > Single stage version
- > Excellent pressure adjustment
- > Designed and approved regarding ISO7291 (including O<sub>2</sub>- ignition test)
- > Relief valve in delivery pressure side available
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

TECHNICAL DATA	
<b>Working temperatures:</b>	-20°C to + 60 °C
<b>Inlet/outlet ports:</b>	NPT ¼" female
<b>Leakage rate seat:</b>	less than 50 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 10 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	2xM6
<b>Materials gas wetted parts:</b>	
<b>Regulator body:</b>	BRASS (2.0401.26)
<b>Regulator diaphragm:</b>	Hastelloy (2.4819)
<b>Regulator seat:</b>	PTFE
<b>Regulator popet:</b>	BRASS (2.0371)
<b>Pressure rates line regulator:</b>	
<b>Max. inlet pressure:</b>	50 bar
<b>Delivery pressures:</b>	2,5 bar; 5 bar; 10 bar; 16 bar; 40 bar
<b>Pressure gauge rates (pressure rates):</b>	5 bar (2,5 bar); 10 bar (5 bar); 18 bar (10 bar); 25 bar (16 bar); 65 bar (40 bar)
<b>Contact gauges available- please contact us</b>	
<b>Cracking pressure relief valves:</b>	3,9 bar (2,5 bar); 7,7 bar (5 bar); 15,4 bar (10 bar); 24,6 bar (16 bar)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.2 Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.3 Test of functionality of each item
<b>Approvals during development:</b>	Type test regarding ISO 7291 O <sub>2</sub> ignition test regarding ISO 7291 Approval for all none metallic O <sub>2</sub> - wetted parts which were not part of O <sub>2</sub> ignition test Electrostatic chargeability test - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727 - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC



FLOW CURVES



DRAWINGS

**RIGHT INLET - (R)**

**LEFT INLET - (L)**

**ORDERING INFORMATION**

**LTLF X X X XX X XX XXXX XXXX XX XXXX**

<p><b>PORTING CODE:</b> R - RIGHT INLET L - LEFT INLET</p> <p><b>STAGES:</b> S - SINGLE STAGE</p> <p><b>*GAS TYPE:</b> S - STANDARD GASES</p> <p><b>INLET PRESSURE:</b> EX - 50 BAR</p> <p><b>OUTLET PRESSURE:</b> B1 - 2.5 BAR C1 - 5 BAR D2 - 10 BAR E9 - 10 BAR</p> <p><b>INLET GAUGE TYPE:</b> 00 - WITHOUT (4 PORT)</p>	<p><b>RELIEF CONNECTION:</b> 0001 - WITHOUT (PLUGGED) *SEE THE LIST OF CONNECTIONS</p> <p><b>SAFETY DEVICE:</b> 00 - WITHOUT (NPT1/4" FEMALE) 01 - WITHOUT (PLUGGED) BT - BOURDON TUBE I2 - INDUCTIV CONTACT I2 R2 - REED CONTACT R2 I1 - INDUCTIV CONTACT I1 R5 - REED CONTACT R5</p> <p><b>PROCESS OUTLET CONNECTION:</b> *SEE THE LIST OF CONNECTIONS</p> <p><b>PROCESS INLET CONNECTION:</b> *SEE THE LIST OF CONNECTIONS</p> <p><b>OUTLET GAUGE TYPE:</b> 00 - WITHOUT (NPT1/4" FEMALE) 01 - WITHOUT (PLUGGED) BT - BOURDON TUBE I2 - INDUCTIV CONTACT I2 R2 - REED CONTACT R2 I1 - INDUCTIV CONTACT I1 R5 - REED CONTACT R5</p>	<p><b>*LIST OF CONNECTIONS</b></p> <p>N14F - NPT1/4" FEMALE M06B - COMPRESSION FITTING Ø 6MM BRASS M08B - COMPRESSION FITTING Ø 8MM BRASS M10B - COMPRESSION FITTING Ø 10MM BRASS M12B - COMPRESSION FITTING Ø 12MM BRASS M06S - COMPRESSION FITTING Ø 6MM SS M08S - COMPRESSION FITTING Ø 8MM SS M10S - COMPRESSION FITTING Ø 10MM SS M12S - COMPRESSION FITTING Ø 12MM SS IX4B - COMPRESSION FITTING Ø1/4" BRASS IX8B - COMPRESSION FITTING Ø3/8" BRASS IX16B - COMPRESSION FITTING Ø1/2" BRASS IX4S - COMPRESSION FITTING Ø1/4" SS IX8S - COMPRESSION FITTING Ø3/8" SS IX16S - COMPRESSION FITTING Ø1/2" SS</p> <p><b>*GAS TYPE</b> DEFINED BY PRODUCT LINE AND TYPE (CHECK AVAILABLE GAS TYPE IN DATASHEET)</p>
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**EXAMPLE: LTLFRSSEXD200BTM06BM06BRVM06B**



Link to product configurator

# SINGLE STAGE PRESSURE LINE REGULATOR IN INDUSTRIAL GAS SUPPLY SYSTEMS

## - LTLJ - LOW FLOW RANGE



6-port line regulator  
3 x inlet; 3 x outlet



6- port single stage pressure line regulator used in supply systems for industrial, inert, flammable, oxidizing gases and gas mixtures. Not usable for corrosive or toxic gases and gas mixtures.

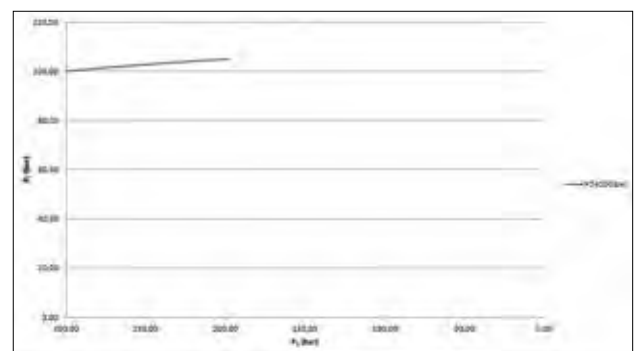
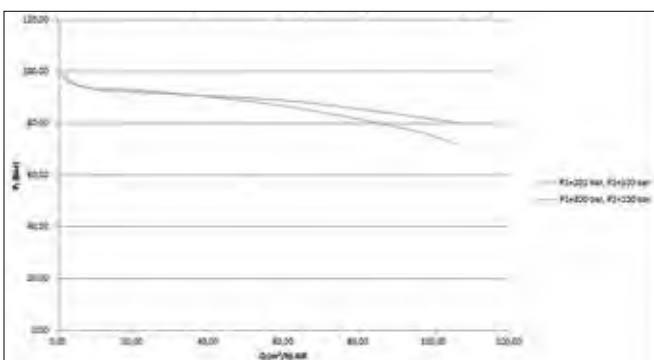
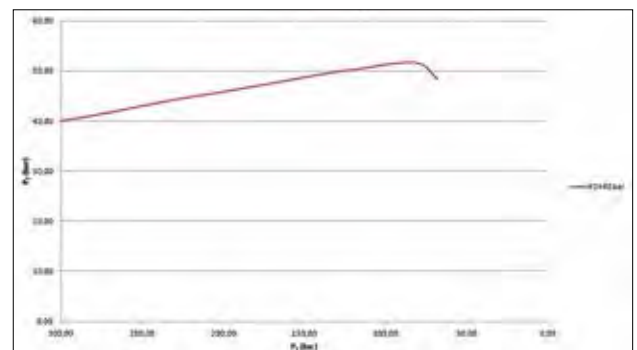
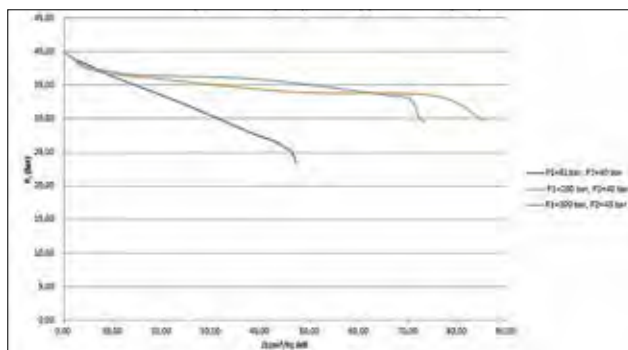
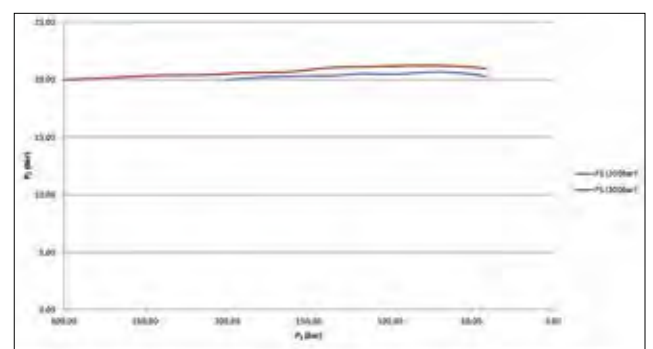
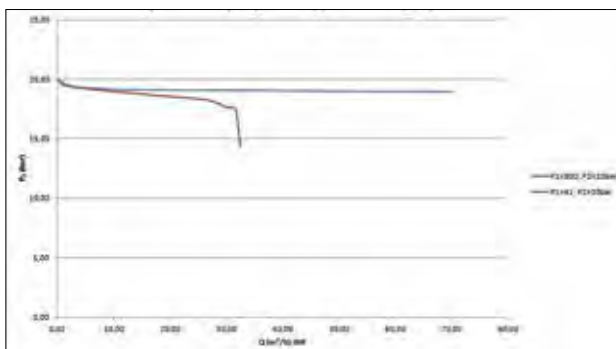
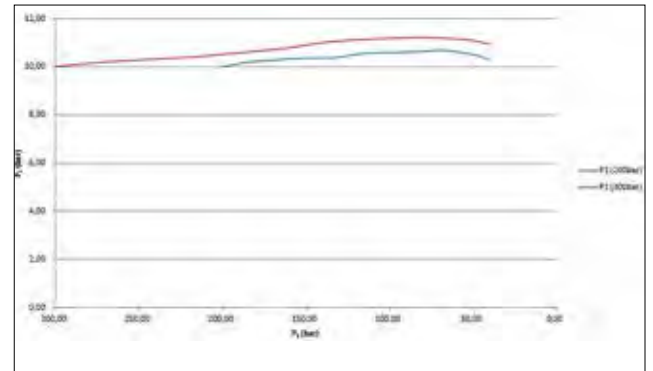
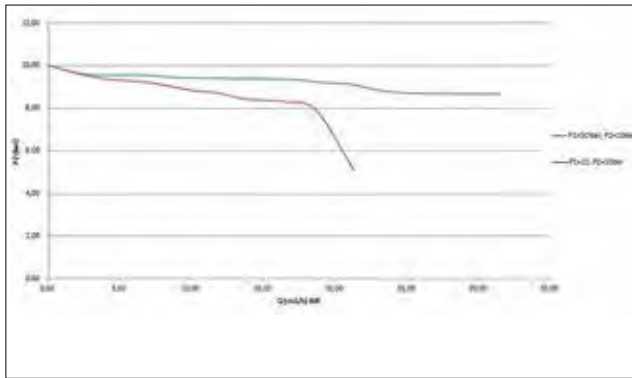
### SPECIAL FEATURES

- > Metal diaphragm regulator
- > Compact design
- > Single stage version
- > Excellent pressure adjustment
- > Designed and approved regarding ISO7291 (including O<sub>2</sub>- ignition test)
- > Relief valve in delivery pressure side available
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

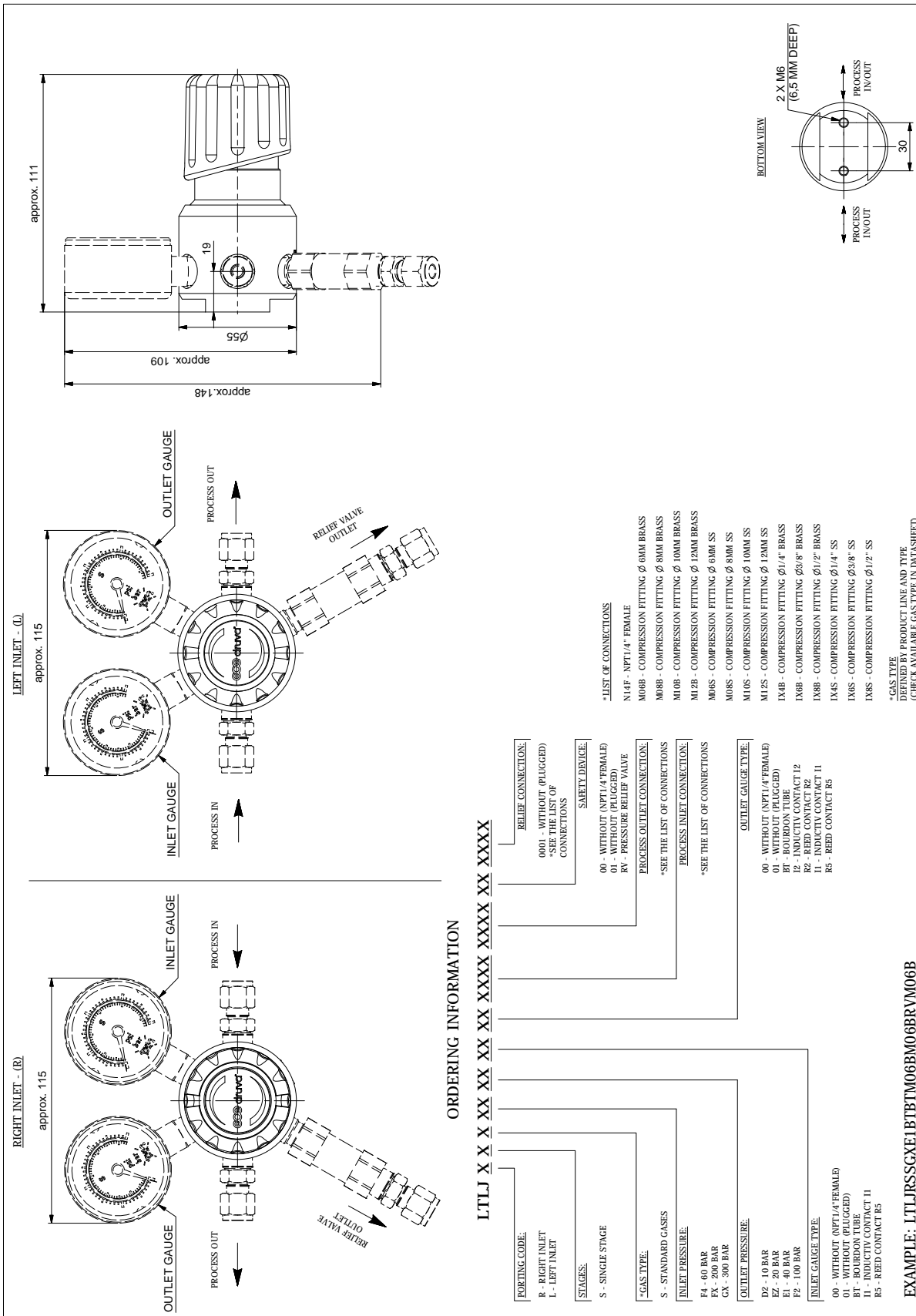
TECHNICAL DATA	
<b>Working temperatures:</b>	-20°C to + 60 °C
<b>Inlet/outlet ports:</b>	NPT ¼" female
<b>Leakage rate seat:</b>	less than 50 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 10 cm <sup>3</sup> /h (23°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	10 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	2xM6
<b>Materials gas wetted parts:</b>	
<b>Regulator body:</b>	BRASS (2.0401.26)
<b>Regulator diaphragm:</b>	Hastelloy (2.4819)
<b>Regulator seat:</b>	PCTFE
<b>Regulator poppet:</b>	BRASS (2.0371)
<b>Pressure rates line regulator:</b>	
<b>Max. inlet pressure:</b>	300 bar
<b>Delivery pressures:</b>	10 bar, 20 bar, 40 bar, 100 bar
<b>Pressure gauge rates (pressure rates):</b>	25 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar); 160 (100 bar); 200 (315 bar) 400 bar (300 bar)
<b>Contact gauges available- please contact us</b>	
<b>Cracking pressure relief valves:</b>	15,4 bar (10 bar); 30,8 bar (20 bar); 61,6 bar (40 bar); 154 bar (100 bar)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.2 Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item regarding ISO 7291 5.2.7.3 Test of functionality of each item
<b>Approvals during development:</b>	Type test regarding ISO 7291 O <sub>2</sub> ignition test regarding ISO 7291 Approval for all none metallic O <sub>2</sub> - wetted parts which were not part of O <sub>2</sub> ignition test Electrostatic chargeability test - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727 - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

FLOW CURVES

DYNAMIC EXPANSION CURVES



DRAWINGS



Link to product configurator

# METAL DIAPHRAGM SHUT OFF VALVE FOR USING IN INDUSTRIAL GAS SUPPLY SYSTEMS

## - VTLA - LOW FLOW RANGE

2-port valve  
1 x inlet; 1 x outlet



Two port metal diaphragm shut off valve used in supply systems for industrial, inert, flammable, oxidizing gases and gas mixtures. Not usable for corrosive or toxic gases and gas mixtures.

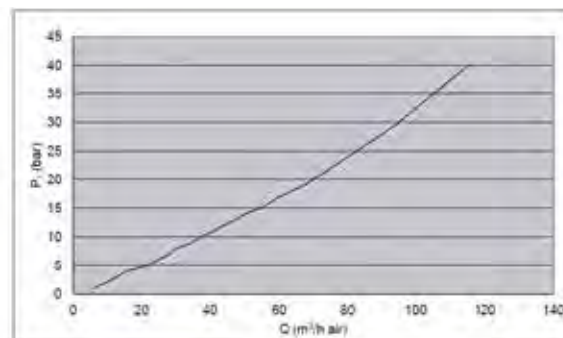


### SPECIAL FEATURES:

- > Quick operation through 90° shut-off function
- > Handwheel indicates open/closed position (red/green)
- > Metal diaphragm valve
- > Compact design
- > Designed and approved in accordance with relevant sections of EN ISO 10297
- > O<sub>2</sub>- ignition test regarding EN ISO 10297 for main shut off valve
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

TECHNICAL DATA	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 1/4" female
<b>Max. working pressure:</b>	300 bar
<b>Kv-value:</b>	0,25
<b>Seat diameter:</b>	5 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	100 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Weight:</b>	0,30 kg
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	1 x Hastelloy (2.4819), 1 x Elgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.126)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item Test of functionality of each item
<b>Approvals during development:</b>	Type test accordance with relevant sections of EN ISO 10297 O <sub>2</sub> ignition test regarding EN ISO 10297 for main shut off valve Electrostatic chargeability test - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727 - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

### FLOW CHART- FLOW VERSUS PRESSURE DROP:



DRAWINGS

**ORDERING INFORMATION**

**VTLA X X XX XXXX XXXX**

<b>PORTING CODE:</b> R - RIGHT INLET	<b>PORT 5</b> SEE THE LIST OF CONNECTIONS
<b>*GAS TYPE:</b> S - STANDARD GASES	<b>PORT 1</b> SEE THE LIST OF CONNECTIONS
<b>INLET PRESSURE:</b> F1 - 130 BAR (Brass fittings only) GX - 300 BAR (SS fittings only)	

Basic valve rated for 300 bar

**EXAMPLE: VTLARSGXN14FN14F**

**LIST OF CONNECTIONS**

- N14F - NPT1/4" FEMALE
- 0001 - WITHOUT (PLUGGED)
- M06B - COMPRESSION FITTING Ø 6MM BRASS
- M08B - COMPRESSION FITTING Ø 8MM BRASS
- M10B - COMPRESSION FITTING Ø 10MM BRASS
- M12B - COMPRESSION FITTING Ø 12MM BRASS
- M06S - COMPRESSION FITTING Ø 6MM SS
- M08S - COMPRESSION FITTING Ø 8MM SS
- M10S - COMPRESSION FITTING Ø 10MM SS
- M12S - COMPRESSION FITTING Ø 12MM SS
- IX4B - COMPRESSION FITTING Ø1/4" BRASS
- IX6B - COMPRESSION FITTING Ø3/8" BRASS
- IX8B - COMPRESSION FITTING Ø1/2" BRASS
- IX4S - COMPRESSION FITTING Ø1/4" SS
- IX6S - COMPRESSION FITTING Ø3/8" SS
- IX8S - COMPRESSION FITTING Ø1/2" SS

\*GAS TYPE  
DEFINED BY PRODUCT LINE AND TYPE  
(CHECK AVAILABLE GAS TYPE IN DATASHEET)



Link to product configurator

# METAL DIAPHRAGM SHUT OFF VALVE FOR USING IN INDUSTRIAL GAS SUPPLY SYSTEMS

## - VTLF - LOW FLOW RANGE



4-port valve  
1 x inlet; 3 x outlet



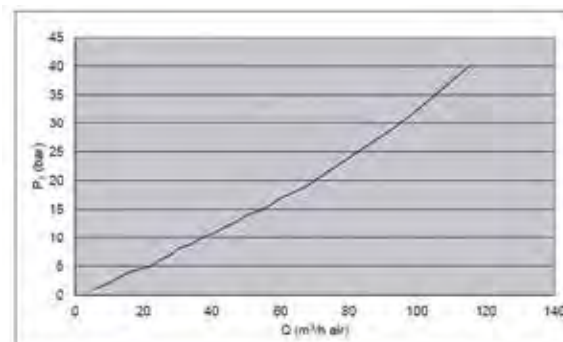
4-port metal diaphragm shut off valve used in supply systems for industrial, inert, flammable, oxidizing gases and gas mixtures. Not usable for corrosive or toxic gases and gas mixtures.

### SPECIAL FEATURES:

- > Quick operation through 90° shut-off function
- > Handwheel indicates open/closed position (red/green) Metal diaphragm valve
- > Compact design
- > Designed and approved in accordance with relevant sections of EN ISO 10297
- > O<sub>2</sub>- ignition test regarding EN ISO 10297 for main shut off valve
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

TECHNICAL DATA	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 1/4" female
<b>Max. working pressure:</b>	300 bar
<b>Kv-value:</b>	0,25
<b>Seat diameter:</b>	5 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	100 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Weight:</b>	0,62 kg
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	1 x Hastelloy (2.4819), 1 x Elgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.26)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item Test of functionality of each item
<b>Approvals during development:</b>	Type test accordance with relevant sections of EN ISO 10297 O <sub>2</sub> ignition test regarding EN ISO 10297 for main shut of valve Electrostatic chargeability test - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727 - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

### FLOW CHART- FLOW VERSUS PRESSURE DROP:



DRAWINGS

**PORT 7**  
**PORT 5**  
**PORT 3**  
**PORT 1**

$\varnothing 50$

**BOTTOM VIEW**

30

2 X M6  
(6,5 MM DEEP)

approx. 78

19

**ORDERING INFORMATION**

**VTLF X X XX XXXX XXXX XXXX XXXX**

**PORTING CODE:**  
 R - RIGHT INLET

**\*GAS TYPE:**  
 S - STANDARD GASES

**INLET PRESSURE:**  
 F1 - 130 BAR (Brass fittings only)  
 GX - 300 BAR (SS fittings only)  
 Basic valve rated for 300 bar

**PORT 7**  
 SEE THE LIST OF CONNECTIONS

**PORT 5**  
 SEE THE LIST OF CONNECTIONS

**PORT 3**  
 SEE THE LIST OF CONNECTIONS

**PORT 1**  
 SEE THE LIST OF CONNECTIONS

**LIST OF CONNECTIONS**

N14F - NPT1/4" FEMALE  
 0001 - WITHOUT (PLUGGED)  
 M06B - COMPRESSION FITTING  $\varnothing$  6MM BRASS  
 M08B - COMPRESSION FITTING  $\varnothing$  8MM BRASS  
 M10B - COMPRESSION FITTING  $\varnothing$  10MM BRASS  
 M12B - COMPRESSION FITTING  $\varnothing$  12MM BRASS  
 M06S - COMPRESSION FITTING  $\varnothing$  6MM SS  
 M08S - COMPRESSION FITTING  $\varnothing$  8MM SS  
 M10S - COMPRESSION FITTING  $\varnothing$  10MM SS  
 M12S - COMPRESSION FITTING  $\varnothing$  12MM SS  
 IX4B - COMPRESSION FITTING  $\varnothing$ 1/4" BRASS  
 IX6B - COMPRESSION FITTING  $\varnothing$ 3/8" BRASS  
 IX8B - COMPRESSION FITTING  $\varnothing$ 1/2" BRASS  
 IX4S - COMPRESSION FITTING  $\varnothing$ 1/4" SS  
 IX6S - COMPRESSION FITTING  $\varnothing$ 3/8" SS  
 IX8S - COMPRESSION FITTING  $\varnothing$ 1/2" SS

**\*GAS TYPE**  
 DEFINED BY PRODUCT LINE AND TYPE  
 (CHECK AVAILABLE GAS TYPE IN DATASHEET)

**EXAMPLE: VTLFRSGXN14FN14FN14FN14F**



Link to product configurator



# METAL DIAPHRAGM SHUT OFF VALVE FOR USING IN INDUSTRIAL GAS SUPPLY SYSTEMS

## - VTLI- LOW FLOW RANGE



4-port valve  
3 x inlet; 1 x outlet



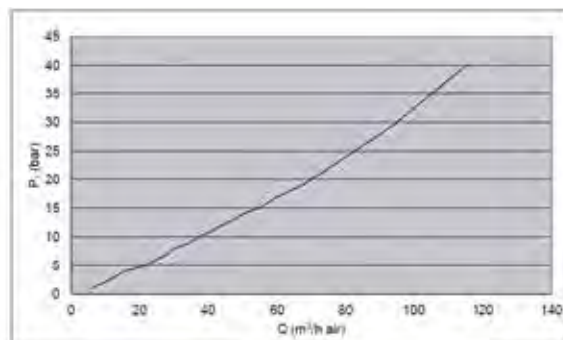
4-port metal diaphragm shut off valve used in supply systems for industrial, inert, flammable, oxidizing gases and gas mixtures. Not usable for corrosive or toxic gases and gas mixtures.

### SPECIAL FEATURES:

- > Quick operation through 90° shut-off function
- > Handwheel indicates open/closed position (red/green)
- > Metal diaphragm valve
- > Compact design
- > Designed and approved in accordance with relevant sections of EN ISO 10297
- > O<sub>2</sub>- ignition test regarding EN ISO 10297 for main shut off valve
- > Electrostatic chargeability test
  - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
  - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

TECHNICAL DATA	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 1/4" female
<b>Max. working pressure:</b>	300 bar
<b>Kv-value:</b>	0,25
<b>Seat diameter:</b>	5 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	100 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Weight:</b>	0,63 kg
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	1 x Hastelloy (2.4819), 1 x Elgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.26)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item Test of functionality of each item
<b>Approvals during development:</b>	Type test accordance with relevant sections of EN ISO 10297 O <sub>2</sub> ignition test regarding EN ISO 10297 for main shut of valve Electrostatic chargeability test - fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727 - usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

### FLOW CHART- FLOW VERSUS PRESSURE DROP:



DRAWINGS

**PORT 7**  
**PORT 5**  
**PORT 3**  
**PORT 1**

$\varnothing 50$

**BOTTOM VIEW**

2 X M6  
(6,5 MM DEEP)

30

approx. 78

19

**ORDERING INFORMATION**

**VTLI X X XX XXXX XXXX XXXX XXXX**

**PORTING CODE:**  
 R - RIGHT INLET

**\*GAS TYPE:**  
 S - STANDARD GASES

**INLET PRESSURE:**  
 F1 - 130 BAR (Brass fittings only)  
 GX - 300 BAR (SS fittings only)  
 Basic valve rated for 300 bar

**PORT 7**  
 SEE THE LIST OF CONNECTIONS

**PORT 5**  
 SEE THE LIST OF CONNECTIONS

**PORT 3**  
 SEE THE LIST OF CONNECTIONS

**PORT 1**  
 SEE THE LIST OF CONNECTIONS

**LIST OF CONNECTIONS**

- N14F - NPT1/4" FEMALE
- 0001 - WITHOUT (PLUGGED)
- M06B - COMPRESSION FITTING  $\varnothing$  6MM BRASS
- M08B - COMPRESSION FITTING  $\varnothing$  8MM BRASS
- M10B - COMPRESSION FITTING  $\varnothing$  10MM BRASS
- M12B - COMPRESSION FITTING  $\varnothing$  12MM BRASS
- M06S - COMPRESSION FITTING  $\varnothing$  6MM SS
- M08S - COMPRESSION FITTING  $\varnothing$  8MM SS
- M10S - COMPRESSION FITTING  $\varnothing$  10MM SS
- M12S - COMPRESSION FITTING  $\varnothing$  12MM SS
- IX4B - COMPRESSION FITTING  $\varnothing$ 1/4" BRASS
- IX6B - COMPRESSION FITTING  $\varnothing$ 3/8" BRASS
- IX8B - COMPRESSION FITTING  $\varnothing$ 1/2" BRASS
- IX4S - COMPRESSION FITTING  $\varnothing$ 1/4" SS
- IX6S - COMPRESSION FITTING  $\varnothing$ 3/8" SS
- IX8S - COMPRESSION FITTING  $\varnothing$ 1/2" SS

**\*GAS TYPE**  
 DEFINED BY PRODUCT LINE AND TYPE  
 (CHECK AVAILABLE GAS TYPE IN DATASHEET)

**EXAMPLE: VTLIRSGXN14FN14FN14FN14F**



Link to product configurator

# SAFETY AND MAINTENANCE PANELS FOR INDUSTRIAL GAS SUPPLY SYSTEMS - STLMAX



## DRUVATEC LOW-FLOW RANGE- MAXIMAL- VERSION

for industrial, inert, flammable, oxidizing gases and gas mixtures.  
Not usable for corrosive or toxic gases and gas mixtures.

### SPECIAL FEATURES:

On a Safety and Maintenance Panel, both safety-related components and maintenance-related systems of a central, industrial gas supply are combined.

#### SAFETY RELATED COMPONENTS:

- > **safety device with multiple functions** for flammable, oxidizing gases designed in single or redundant version, exchangeable without disassembly of the panel
- > **safety relief valve** designed and adjusted based on worst case scenario measurements of DruvaTEC Low Flow manifold regulators
- > **pressure indication port** for monitoring of pipeline pressure, separate lockable, gauges are exchangeable without disassembly of the panel

#### MAINTENANCE-RELATED SYSTEMS:

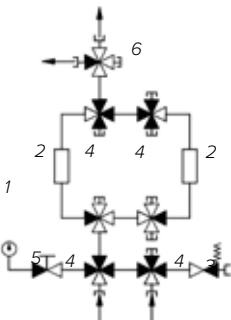
- > inlet port for connecting external source
  - as a second supply source to avoid system downtime during maintenance at manifolds
  - as a test gas inlet port for pressure test of piping system after installation or during maintenance
  - existing additional valve for releasing of pressure in piping system

#### PANEL CONSISTS OF TWO PLATES

- Easy installation of ground plate without weight of complete safety and maintenance panel
- Simple hang front plate including safety and maintenance panel
- Fixing front plate by only one bolt



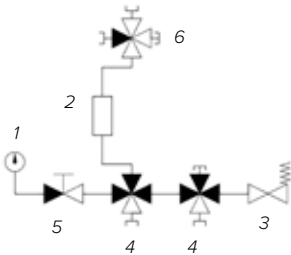
Maximal version  
- redundant safety devices



- 1- Pressure measure element (gauge, contact gauge, pressure transmitter)
- 2- Safety device with multiple functions for flammable gases or Oxygene
- 3- Safety relief valve
- 4- Shut off valve type VTMF000
- 5- Shut off valve type VTLA000
- 6- Shut off valve type VTMI000



Maximal version  
- single safety device



- 1- Pressure measure element (gauge, contact gauge, pressure transmitter)
- 2- Safety device with multiple functions for flammable gases or Oxygene
- 3- Safety relief valve
- 4- Shut off valve type VTMF000
- 5- Shut off valve type VTLA000
- 6- Shut off valve type VTMI000

TECHNICAL DATA	
Nominal working pressure:	10 bar
Maximal allowable working pressure:	11,5 bar
Nominal flow rate:	20 m <sup>3</sup> /h
Test after production	100% functionality
	100% seat leakage test
	100% pressure test

TECHNICAL DATA - VALVES VTLA		
Working temperature:	-20°C to + 60°C	
Inlet/Outlet ports:	NPT 1/4" female	
Max. working pressure:	300 bar	
Kv-value:	0,25	
Seat diameter:	5 mm	
Leakage rate seat:	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut)	Compressed Air
Leakage rate outside:	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut)	Compressed Air
Filter inlet:	100 µm mesh	
Filter outlet ports:	100 µm mesh	
Mounting holes:	M6	
Weight:	0,30 kg	
Valve body:	BASS (2.0401.26)	
Valve diaphragm:	2 x Elgiloy (2.4711)	
Valve seat:	PCTFE	
Valve popet:	BASS (2.0401.26)	
Tests in production:	Pressure test with dry air (ISO 8573 [1:2:2]) of each item	
	Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item	
	Test of functionality of each item	
	Type test accordance with relevant sections of EN ISO 10297	
	O2 ignition test regarding EN ISO 10297 for main shut off valve	
	Electrostatic chargeability test	
Approvals during development:	- fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727	
	- usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC	

TECHNICAL DATA - VALVES VTMF, VTMI	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 3/8" female
<b>Max. working pressure:</b>	40 bar
<b>Kv-value:</b>	0,35
<b>Seat diameter:</b>	7 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	100 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Weight:</b>	0,62 kg
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	1 × Hastelloy (2.4819), 1 × Elgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.26)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item
	Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item
	Test of functionality of each item
	Type test accordance with relevant sections of EN ISO 10297
<b>Approvals during development:</b>	O <sub>2</sub> ignition test regarding EN ISO 10297 for main shut off valve
	Electrostatic chargeability test
	- fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
	- usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

TECHNICAL DATA - SAFETY RELIEF VALVE	
<b>P.E.D. 2014/68/EU and AD2000 (A2) approved</b>	
<b>Cracking pressure:</b>	13 bar
<b>Seat diameter:</b>	9,5 mm
<b>Inlet thread:</b>	NPT ½" male
<b>Outlet thread:</b>	NPT ¾" female
<b>Working temperature rate:</b>	-20°C up to 60°C
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	Brass (C83600)
<b>Seat:</b>	CW614N
<b>Seal:</b>	Viton
<b>Inner plunger:</b>	CW614N

**TECHNICAL DATA - SAFETY DEVICE WITH MULTIPLE FUNCTIONS****FLAMMABLE GASES**

according Standards EN 730-1 and ISO 5175:

Included safety elements inside are flame arrestor, temperature sensitive cut- off valve and dust filter

<b>Maximum working pressure:</b>	10 bar
<b>Cracking pressure:</b>	10 mbar
<b>Working temperature range:</b>	-20 °C up to 70 °C
<b>Maximum flow rate:</b>	more than 20 m <sup>3</sup> /h
<b>Material body:</b>	brass (2.0401)
<b>Material Internal spring:</b>	stainless steel 1.4301

**OXYGENE**

according Standards EN 730-1 and ISO 5175:

Included safety elements inside are flame arrestor, temperature sensitive cut- off valve and dust filter

<b>Maximum working pressure:</b>	10 bar
<b>Cracking pressure:</b>	10 mbar
<b>Working temperature range:</b>	-20 °C up to 70 °C
<b>Maximum flow rate:</b>	more than 20 m <sup>3</sup> /h
<b>Material body:</b>	brass (2.0401)
<b>Material Internal spring:</b>	stainless steel 1.4310

**TECHNICAL DATA - PRESSURE INDICATION PORT - GAUGE****OPTION GAUGE**

based on requirement of EN 837 (safety gauge without baffle wall)

Suitable for max. steady working pressure 75% of max. scale value

<b>Nominal size:</b>	50 mm
<b>Inlet connection:</b>	NPT ¼" male
<b>Cleaned for:</b>	
<b>Scale range (bar):</b>	16 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar)
<b>Accuracy class:</b>	2,5
<b>Temperature range:</b>	-20°C up to 60 °C

**Material**

<b>Pressure element:</b>	brass
<b>Pressure inlet connection:</b>	brass nickel plated
<b>Dial:</b>	Aluminum
<b>Pointer:</b>	Aluminum
<b>Case:</b>	stainless steel polished
<b>Window:</b>	plastic crystal clear

**TECHNICAL DATA - PRESSURE INDICATION PORT - OPTION REED CONTACT GAUGE**

based on requirement of EN 837 (safety gauge with baffle wall and blow out back- S3)

Suitable for max. steady working pressure 75% of max. scale value

<b>Nominal size:</b>	50 mm
<b>Inlet connection:</b>	NPT ¼" male
<b>Cleaned for:</b>	Oxygene
<b>Scale range (bar; psi):</b>	16 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar)
<b>Accuracy class:</b>	2,5
<b>Temperature range:</b>	-20°C up to 60 °C
<b>Material</b>	
<b>Pressure element:</b>	stainless steel
<b>Pressure inlet connection:</b>	stainless steel
<b>Dial:</b>	Aluminum
<b>Pointer:</b>	Aluminum
<b>Case:</b>	stainless steel blank
<b>Window:</b>	plastic crystal clear
<b>Electrical data contacts:</b>	operating voltage U max. = 24 V DC/AC
	Current input: I <sub>max.</sub> = 0,4 A
	Breaking capacity: P max. = 8W/8 VA
<b>Contact type:</b>	RK 1.1, normally open, contact opens by decreasing value
	RK 1.2, normally open, contact closes by decreasing value

**TECHNICAL DATA - PRESSURE INDICATION PORT - OPTION INDUCTIVE CONTACT GAUGE**

based on requirement of EN 837 (safety gauge with baffle wall and blow out back- S3)

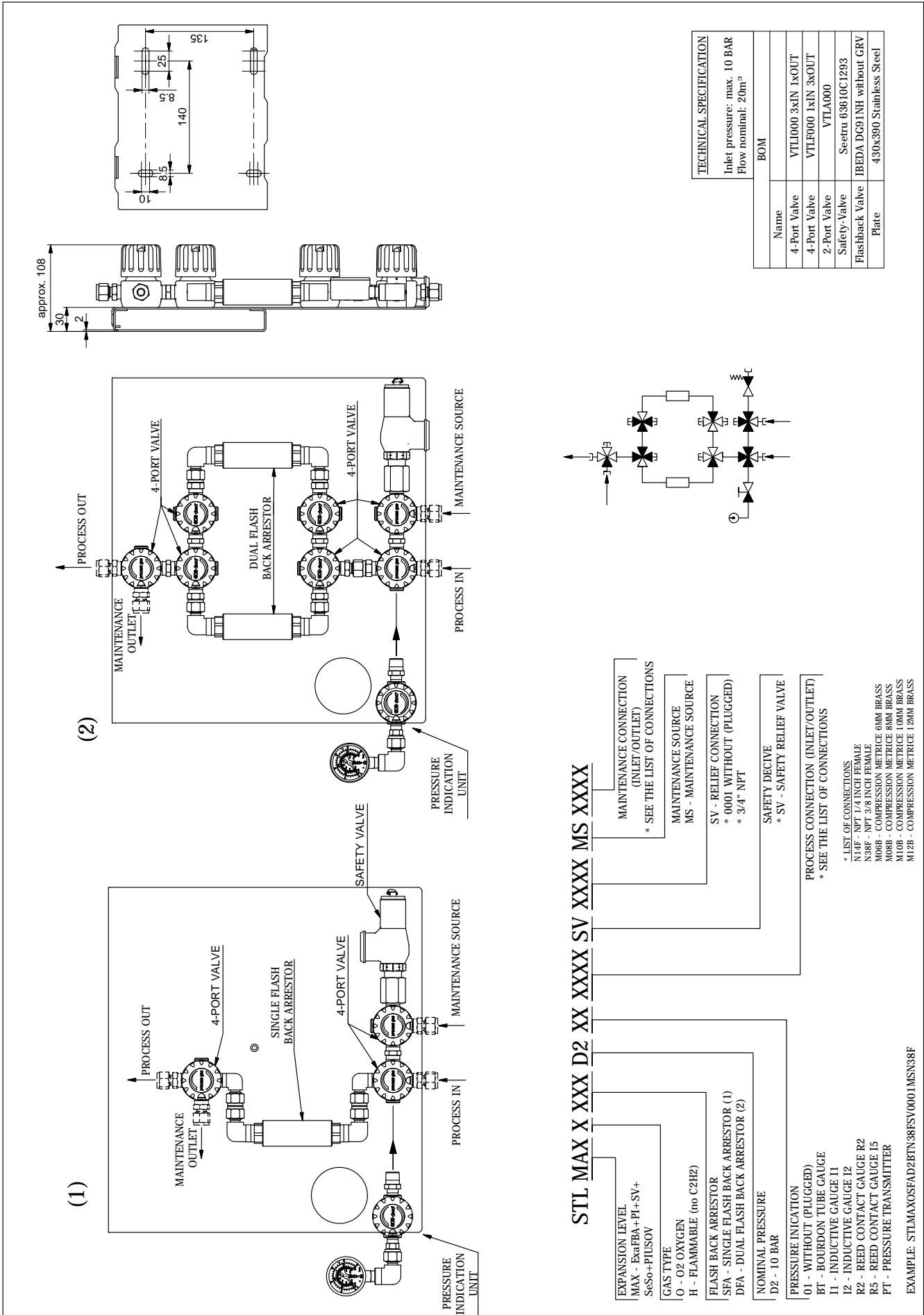
Suitable for max. steady working pressure 75% of max. scale value

<b>Nominal size:</b>	50 mm
<b>Inlet connection:</b>	NPT ¼" male
<b>Cleaned for:</b>	Oxygene
<b>Scale range (bar; psi):</b>	16 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar)
<b>Accuracy class:</b>	2,5
<b>Temperature range:</b>	-20°C up to 60 °C
<b>Material</b>	
<b>Pressure element:</b>	stainless steel
<b>Pressure inlet connection:</b>	stainless steel
<b>Dial:</b>	Aluminum
<b>Pointer:</b>	Aluminum
<b>Case:</b>	stainless steel blank
<b>Window:</b>	plastic crystal clear
<b>Electrical data contacts:</b>	operating voltage U nominal = 8,2 V DC
	Current input contact closed: > = 3 mA
	Current input contact open: <= 1 mA
<b>Contact type:</b>	IK 1.1, inductive contact, contact opens by decreasing value
	IK 1.2, inductive contact, contact closed by decreasing value

TECHNICAL DATA - PRESSURE INDICATION PORT - OPTION PRESSURE TRANSMITTER	
<b>FOR INERT, NON-CORROSIVE GASES AND GAS MIXTURES, OXYGEN</b> (Not for flammable gases, not useable in EX-Areas)	
<b>Long Term Drift:</b>	0,2% Full Scale/YR (non-cumulative)
<b>Accuracy:</b>	0,25% Full Scale
<b>Thermal Error</b>	0,83% Full Scale/100°F (1,5% Full Scale/100°C)
<b>Compensated Temperatures</b>	-40°C to +125°C
<b>Operating Temperatures</b>	-40°C to +125°C
<b>Zero Tolerance</b>	0,5% of span
<b>Span Tolerance</b>	0,5% of span
<b>Fatigue Life</b>	Designed for more than 100 M cycles
<b>Mechanical Configuration:</b>	stainless steel
<b>Pressure Port</b>	¼" NPT Male
<b>Electrical Connection</b>	M12x1 – 4 pin
<b>Parts in Contact with Gas</b>	Stainless Steel
<b>Enclosure</b>	IP67 (IP65 for electrical code G)
<b>Supply Voltage:</b>	2 Volts above full scale to 30 V DC max @ 4.5mA (6.5mA at output version)
<b>Vibration:</b>	40G peak to peak sinusoidal (Random Vibration: 20 to 100 Hz @ aprox.. 40G) Peak per MIL-STD-810E
<b>Shock:</b>	Withstands free fall to IEC 68-2-32 procedure 1
<b>Approvals:</b>	CE, conform to European Pressure Directive, Fully RoHS compliant UL recognized files # E219842 & E174228
<b>Weight:</b>	35 grams
<b>Output signal:</b>	4...20mA
<b>FOR FLAMMABLE GASES, USEABLE IN EX-AREAS</b>	
<b>Material gas wetted parts:</b>	Stainless steel, fully welded.
<b>Accuracy:</b>	</= +/- 0,50% of span
<b>Output signal:</b>	4...20mA
<b>Operating temperature medium:</b>	-15°C to +70°C
<b>Operating temperature ambient:</b>	-15°C to +70°C
<b>Manufacture's information</b>	SIL 2, Functional safety, MTTF:>100 years and certificates China RoHS directive
<b>Long term stability</b>	</= +/- 0,2% of span/year
<b>Mechanical Configuration</b>	
<b>Pressure Port:</b>	¼" NPT Male
<b>Electrical Connection</b>	M12x1 – 4 pin
<b>Parts in Contact with Gas:</b>	Stainless Steel
<b>Enclosure:</b>	IP65 (IP 68 also available)
<b>Power Supply:</b>	24 VDC
<b>Vibration resistance:</b>	20 g
<b>Shock resistance:</b>	1,000 g
<b>Approvals:</b>	ATEX, IECEx, FM, CSA, SIL rating per IEC61508/ IEC 61511



Link to product configurator

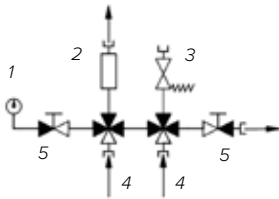




# SAFETY AND MAINTENANCE PANELS FOR INDUSTRIAL GAS SUPPLY SYSTEMS - STLMID



Middle version



- 1-Pressure measure element (gauge, contact gauge, pressure transmitter)
- 2-Safety device with multiple functions for flammable gases or Oxygene
- 3-Safety relief valve
- 4-Shut off valve type VTMF000
- 5-Shut off valve type VTLA000

## DRUVATEC LOW- FLOW RANGE- MIDDLE- VERSION

for industrial, inert, flammable, oxidizing gases and gas mixtures.  
Not usable for corrosive or toxic gases and gas mixtures.



### SPECIAL FEATURES:

On a Safety and Maintenance Panel, both safety-related components and maintenance-related systems of a central, industrial gas supply are combined.

#### SAFETY RELATED COMPONENTS:

- > **safety device with multiple functions** for flammable, oxidizing gases
- > **safety relief valve** designed and adjusted based on worst case scenario measurements of DruvaTEC Low Flow manifold regulators
- > **pressure indication port** for monitoring of pipeline pressure, separate lockable, gauges are exchangeable without disassembly of the panel

#### MAINTENANCE-RELATED SYSTEMS:

- > inlet port for connecting external source
  - as a second supply source to avoid system downtime during maintenance at manifolds
  - as a test gas inlet port for pressure test of piping system after installation or during maintenance
  - existing additional valve for releasing of pressure in piping system

#### PANEL CONSISTS OF TWO PLATES

- Easy installation of ground plate without weight of complete safety and maintenance panel
- Simple hang front plate including safety and maintenance panel
- Fixing front plate by only one bolt

TECHNICAL DATA	
<b>Nominal working pressure rates:</b>	10; 20; 40 bar
<b>Maximal allowable working pressure:</b>	11,5 bar, 21,2 bar, 51,7 bar
<b>Nominal flow rate:</b>	20 m <sup>3</sup> /h (at 20 bar)
<b>Test after production</b>	100% functionality
	100% seat leakage test
	100% pressure test

TECHNICAL DATA - VALVES VTLA	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 1/4" female
<b>Max. working pressure:</b>	300 bar
<b>Kv-value:</b>	0,25
<b>Seat diameter:</b>	5 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	100 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Weight:</b>	0,30 kg
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	2 x Elgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.26)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item
	Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item
	Test of functionality of each item
	Type test accordance with relevant sections of EN ISO 10297
	O2 ignition test regarding EN ISO 10297 for main shut off valve
	Electrostatic chargeability test
<b>Approvals during development:</b>	- fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
	- usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

TECHNICAL DATA - VALVE VTMF	
<b>Working temperature:</b>	-20°C to + 60°C
<b>Inlet/Outlet ports:</b>	NPT 3/8" female
<b>Max. working pressure:</b>	40 bar
<b>Kv-value:</b>	0,35
<b>Seat diameter:</b>	7 mm
<b>Leakage rate seat:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Leakage rate outside:</b>	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut) Compressed Air
<b>Filter inlet:</b>	100 µm mesh
<b>Filter outlet ports:</b>	100 µm mesh
<b>Mounting holes:</b>	M6
<b>Weight:</b>	0,62 kg
<b>Valve body:</b>	BRASS (2.0401.26)
<b>Valve diaphragm:</b>	1 × Hastelloy (2.4819), 1 × Elgiloy (2.4711)
<b>Valve seat:</b>	PCTFE
<b>Valve popet:</b>	BRASS (2.0401.26)
<b>Tests in production:</b>	Pressure test with dry air (ISO 8573 [1:2:2]) of each item
	Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item
	Test of functionality of each item
	Type test accordance with relevant sections of EN ISO 10297
<b>Approvals during development:</b>	O <sub>2</sub> ignition test regarding EN ISO 10297 for main shut off valve
	Electrostatic chargeability test
	- fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727
	- usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC

TECHNICAL DATA - SAFETY RELIEF VALVE	
<b>P.E.D. 2014/68/EU and AD2000 (A2) approved</b>	
<b>Cracking pressure:</b>	13 bar, 24 bar, 57 bar (based on pressure version)
<b>Seat diameter:</b>	9,5 mm
<b>Inlet thread:</b>	NPT ½" male
<b>Outlet thread:</b>	NPT ¾" female
<b>Working temperature rate:</b>	-20°C up to 60°C
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	Brass (C83600)
<b>Seat:</b>	CW614N
<b>Seal:</b>	Viton
<b>Inner plunger:</b>	CW614N

**TECHNICAL DATA - SAFETY DEVICE WITH MULTIPLE FUNCTIONS****FLAMMABLE GASES**

according Standards EN 730-1 and ISO 5175:

Included safety elements inside are flame arrestor, temperature sensitive cut- off valve and dust filter

Maximum working pressure:	10 bar
Cracking pressure:	10 mbar
Working temperature range:	-20 °C up to 70 °C
Maximum flow rate:	more than 20 m <sup>3</sup> /h
Material body:	brass (2.0401)
Material Internal spring:	stainless steel 1.4301

**OXYGENE**

according Standards EN 730-1 and ISO 5175:

Included safety elements inside are flame arrestor, temperature sensitive cut- off valve and dust filter

Maximum working pressure:	10 bar
Cracking pressure:	10 mbar
Working temperature range:	-20 °C up to 70 °C
Maximum flow rate:	more than 20 m <sup>3</sup> /h
Material body:	brass (2.0401)
Material Internal spring:	stainless steel 1.4310

**TECHNICAL DATA - PRESSURE INDICATION PORT - GAUGE**

based on requirement of EN 837 (safety gauge without baffle wall)

Suitable for max. steady working pressure 75% of max. scale value

Nominal size:	50 mm
Inlet connection:	NPT ¼" male
Cleaned for:	
Scale range (bar):	16 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar)
Accuracy class:	2,5
Temperature range:	-20°C up to 60 °C

**Material**

Pressure element:	brass
Pressure inlet connection:	brass nickel plated
Dial:	Aluminum
Pointer:	Aluminum
Case:	stainless steel polished
Window:	plastic crystal clear

**TECHNICAL DATA - PRESSURE INDICATION PORT - OPTION REED CONTACT GAUGE**

based on requirement of EN 837 (safety gauge with baffle wall and blow out back- S3)

Suitable for max. steady working pressure 75% of max. scale value

<b>Nominal size:</b>	50 mm
<b>Inlet connection:</b>	NPT ¼" male
<b>Cleaned for:</b>	Oxygene
<b>Scale range (bar):</b>	16 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar)
<b>Accuracy class:</b>	2,5
<b>Temperature range:</b>	-20°C up to 60 °C
<b>Material</b>	
<b>Pressure element:</b>	stainless steel
<b>Pressure inlet connection:</b>	stainless steel
<b>Dial:</b>	Aluminum
<b>Pointer:</b>	Aluminum
<b>Case:</b>	stainless steel blank
<b>Window:</b>	plastic crystal clear
<b>Electrical data contacts:</b>	operating voltage U max. = 24 V DC/AC
	Current input: I <sub>max.</sub> = 0,4 A
	Breaking capacity: P max. = 8W/8 VA
<b>Contact type:</b>	RK 1.1, normally open, contact opens by decreasing value
	RK 1.2, normally open, contact closed by decreasing value

**TECHNICAL DATA - PRESSURE INDICATION PORT - OPTION INDUCTIVE CONTACT GAUGE**

based on requirement of EN 837 (safety gauge with baffle wall and blow out back- S3)

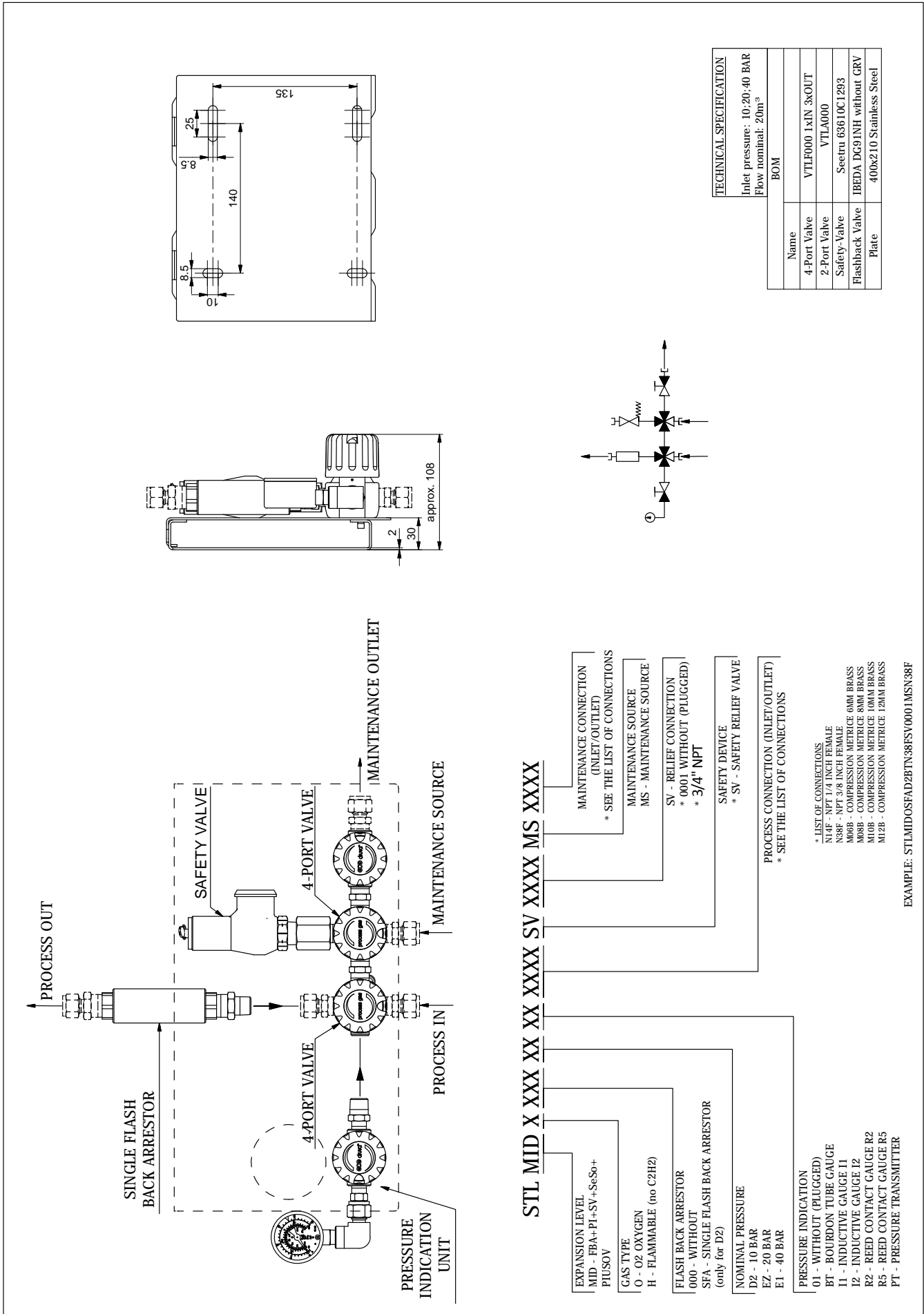
Suitable for max. steady working pressure 75% of max. scale value

<b>Nominal size:</b>	50 mm
<b>Inlet connection:</b>	NPT ¼" male
<b>Cleaned for:</b>	Oxygene
<b>Scale range (bar; psi):</b>	16 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar)
<b>Accuracy class:</b>	2,5
<b>Temperature range:</b>	-20°C up to 60 °C
<b>Material</b>	
<b>Pressure element:</b>	stainless steel
<b>Pressure inlet connection:</b>	stainless steel
<b>Dial:</b>	Aluminum
<b>Pointer:</b>	Aluminum
<b>Case:</b>	stainless steel blank
<b>Window:</b>	plastic crystal clear
<b>Electrical data contacts:</b>	operating voltage U nominal = 8,2 V DC
	Current input contact closed: > = 3 mA
	Current input contact open: <= 1 mA
<b>Contact type:</b>	IK 1.1, inductive contact, contact opens by decreasing value
	IK 1.2, inductive contact, contact closed by decreasing value

TECHNICAL DATA - PRESSURE INDICATION PORT - OPTION PRESSURE TRANSMITTER	
<b>FOR INERT, NON-CORROSIVE GASES AND GAS MIXTURES, OXYGEN</b> (Not for flammable gases, not useable in EX-Areas)	
<b>Long Term Drift:</b>	0,2% Full Scale/YR (non-cumulative)
<b>Accuracy:</b>	0,25% Full Scale
<b>Thermal Error</b>	0,83% Full Scale/100°F (1,5% Full Scale/100°C)
<b>Compensated Temperatures</b>	-40°C to +125°C
<b>Operating Temperatures</b>	-40°C to +125°C
<b>Zero Tolerance</b>	0,5% of span
<b>Span Tolerance</b>	0,5% of span
<b>Fatigue Life</b>	Designed for more than 100 M cycles
<b>Mechanical Configuration:</b>	stainless steel
<b>Pressure Port</b>	¼" NPT Male
<b>Electrical Connection</b>	M12x1 – 4 pin
<b>Parts in Contact with Gas</b>	Stainless Steel
<b>Enclosure</b>	IP67 (IP65 for electrical code G)
<b>Supply Voltage:</b>	2 Volts above full scale to 30 V DC max @ 4.5mA (6.5mA at output version)
<b>Vibration:</b>	40G peak to peak sinusoidal (Random Vibration: 20 to 100 Hz @ aprox.. 40G) Peak per MIL-STD-810E
<b>Shock:</b>	Withstands free fall to IEC 68-2-32 procedure 1
<b>Approvals:</b>	CE, conform to European Pressure Directive, Fully RoHS compliant UL recognized files # E219842 & E174228
<b>Weight:</b>	35 grams
<b>Output signal:</b>	4...20mA
<b>FOR FLAMMABLE GASES, USEABLE IN EX-AREAS</b>	
<b>Material gas wetted parts:</b>	Stainless steel, fully welded.
<b>Accuracy:</b>	</= +/- 0,50% of span
<b>Output signal:</b>	4...20mA
<b>Operating temperature medium:</b>	-15°C to +70°C
<b>Operating temperature ambient:</b>	-15°C to +70°C
<b>Manufacture's information</b>	SIL 2, Functional safety, MTTF:>100 years and certificates China RoHS directive
<b>Long term stability</b>	</= +/- 0,2% of span/year
<b>Mechanical Configuration</b>	
<b>Pressure Port:</b>	¼" NPT Male
<b>Electrical Connection</b>	M12x1 – 4 pin
<b>Parts in Contact with Gas:</b>	Stainless Steel
<b>Enclosure:</b>	IP65 (IP 68 also available)
<b>Power Supply:</b>	24 V DC
<b>Vibration resistance:</b>	20 g
<b>Shock resistance:</b>	1,000 g
<b>Approvals:</b>	ATEX, IECEx, FM, CSA, SIL rating per IEC61508/ IEC 61511



Link to product configurator



**TECHNICAL SPECIFICATION**  
 Inlet pressure: 10;20;40 BAR  
 Flow nominal: 20m<sup>3</sup>

BOM	
Name	
4-Port Valve	VTLF000 1xIN 3xOUT
2-Port Valve	VTLA000
Safety-Valve	Seetru 63610C1293
Flashback Valve	IBEDA DG91NH without GRV
Plate	400x210 Stainless Steel

**STL MID X XXX XX XX XXXX SV XXXX MS XXXX**

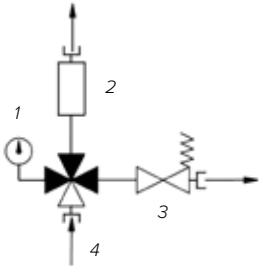
- EXPANSION LEVEL  
MID - FRA+PI+SV+SeSo+PIUSOV
- GAS TYPE  
O - O<sub>2</sub> OXYGEN  
H - FLAMMABLE (no C2H<sub>2</sub>)
- FLASH BACK ARRESTOR  
000 - WITHOUT  
SFA - SINGLE FLASH BACK ARRESTOR (only for D2)
- NOMINAL PRESSURE  
D2 - 10 BAR  
EZ - 20 BAR  
E1 - 40 BAR
- PRESSURE INDICATION  
01 - WITHOUT (PLUGGED)  
BT - BOURDON TUBE GAUGE  
I1 - INDUCTIVE GAUGE I1  
I2 - INDUCTIVE GAUGE I2  
R2 - REED CONTACT GAUGE R2  
R5 - REED CONTACT GAUGE R5  
PT - PRESSURE TRANSMITTER
- MAINTENANCE CONNECTION (INLET/OUTLET)  
\* SEE THE LIST OF CONNECTIONS
- MAINTENANCE SOURCE  
MS - MAINTENANCE SOURCE
- SV - RELIEF CONNECTION  
\* 0001 WITHOUT (PLUGGED)  
\* 3/4" NPT
- SAFETY DEVICE  
\* SV - SAFETY RELIEF VALVE
- PROCESS CONNECTION (INLET/OUTLET)  
\* SEE THE LIST OF CONNECTIONS
- \* LIST OF CONNECTIONS  
N14F - NPT 1/4 INCH FEMALE  
N38F - NPT 3/8 INCH FEMALE  
M06B - COMPRESSION METRICE 6MM BRASS  
M08B - COMPRESSION METRICE 8MM BRASS  
M10B - COMPRESSION METRICE 10MM BRASS  
M12B - COMPRESSION METRICE 12MM BRASS

EXAMPLE: STLIMIDOSFAD2BTN38FSV0001MSN38F

# SAFETY AND MAINTENANCE PANELS FOR INDUSTRIAL GAS SUPPLY SYSTEMS - STLMIN



Minimal version



- 1-Pressure measure element (gauge, contact gauge, pressure transmitter)
- 2-Safety device with multiple functions for flammable gases or Oxygene
- 3-Safety relief valve
- 4-Shut off valve type VTMF000

## DRUVATEC LOW- FLOW RANGE- MINIMAL - VERSION

for industrial, inert, flammable, oxidizing gases and gas mixtures.  
Not usable for corrosive or toxic gases and gas mixtures.



### SPECIAL FEATURES:

On a Safety and Maintenance Panel, both safety-related components and maintenance-related systems of a central, industrial gas supply are combined.

#### SAFETY RELATED COMPONENTS:

- > **safety device with multiple functions** for flammable, oxidizing gases
- > **safety relief valve** designed and adjusted based on worst case scenario measurements of DruvaTEC Low Flow manifold regulators
- > **pressure indication port** for monitoring of pipeline pressure, gauges are exchangeable without disassembly of the panel

#### PANEL CONSISTS OF TWO PLATES

- Easy installation of ground plate without weight of complete safety and maintenance panel
- Simple hang front plate including safety and maintenance panel
- Fixing front plate by only one bolt

TECHNICAL DATA	
Nominal working pressure rates:	10; 20; 40 bar
Maximal allowable working pressure:	11,5; 22; 53 bar
Nominal flow rate:	20 m <sup>3</sup> /h (at 20 bar)
Test after production	100% functionality
	100% seat leakage test
	100% pressure test

TECHNICAL DATA - VALVES VTMF		
Working temperature:	-20°C to + 60°C	
Inlet/Outlet ports:	NPT 3/8" female	
Max. working pressure:	40 bar	
Kv-value:	0,35	
Seat diameter:	7 mm	
Leakage rate seat:	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut)	Compressed Air
Leakage rate outside:	less than 6 cm <sup>3</sup> /h (20°C; 1,013 bar absolut)	Compressed Air
Filter inlet:	100 µm mesh	
Filter outlet ports:	100 µm mesh	
Mounting holes:	M6	
Weight:	0,62 kg	
Valve body:	BRASS (2.0401.26)	
Valve diaphragm:	1 x Hastelloy (2.4819), 1 x Elgiloy (2.4711)	
Valve seat:	PCTFE	
Valve popet:	BRASS (2.0401.26)	
Tests in production:	Pressure test with dry air (ISO 8573 [1:2:2]) of each item	
	Seat leakage test with dry air (ISO 8573 [1:2:2]) of each item	
	Test of functionality of each item	
Approvals during development:	Type test accordance with relevant sections of EN ISO 10297	
	O2 ignition test regarding EN ISO 10297 for main shut off valve	
	Electrostatic chargeability test	
	- fulfill requirements according DIN EN ISO 80070-36; IEC TS 60079-32-1 and German TRGS 727	
	- usable in EX- areas zones 1 and 2 for gases with explosion risk group I; IIA; IIB; IIC	

**TECHNICAL DATA - SAFETY RELIEF VALVE**

P.E.D. 2014/68/EU and AD2000 (A2) approved

<b>Cracking pressure:</b>	13 bar; 24 bar; 57 bar (based on pressure version)
<b>Seat diameter:</b>	9,5 mm
<b>Inlet thread:</b>	NPT ½" male
<b>Outlet thread:</b>	NPT ¾" female
<b>Working temperature rate:</b>	-20°C up to 60°C
<b>Material gas wetted parts:</b>	
<b>Valve body:</b>	Brass (C83600)
<b>Seat:</b>	CW614N
<b>Seal:</b>	Viton
<b>Inner plunger:</b>	CW614N

**TECHNICAL DATA - SAFETY DEVICE WITH MULTIPLE FUNCTIONS****FLAMMABLE GASES**

according Standards EN 730-1 and ISO 5175:

Included safety elements inside are flame arrestor, temperature sensitive cut- off valve and dust filter

<b>Maximum working pressure:</b>	10 bar
<b>Cracking pressure:</b>	10 mbar
<b>Working temperature range:</b>	-20 °C up to 70 °C
<b>Maximum flow rate:</b>	more than 20 m³/h
<b>Material body:</b>	brass (2.0401)
<b>Material Internal spring:</b>	stainless steel 1.4301

**OXYGENE**

according Standards EN 730-1 and ISO 5175:

Included safety elements inside are flame arrestor, temperature sensitive cut- off valve and dust filter

<b>Maximum working pressure:</b>	10 bar
<b>Cracking pressure:</b>	10 mbar
<b>Working temperature range:</b>	-20 °C up to 70 °C
<b>Maximum flow rate:</b>	more than 20 m³/h
<b>Material body:</b>	brass (2.0401)
<b>Material Internal spring:</b>	stainless steel 1.4310

**TECHNICAL DATA - PRESSURE INDICATION PORT - GAUGE**

based on requirement of EN 837 (safety gauge without baffle wall)

Suitable for max. steady working pressure 75% of max. scale value

<b>Nominal size:</b>	50 mm
<b>Inlet connection:</b>	NPT ¼" male
<b>Cleaned for:</b>	
<b>Scale range (bar):</b>	16 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar)
<b>Accuracy class:</b>	2,5
<b>Temperature range:</b>	-20°C up to 60 °C
<b>Material</b>	
<b>Pressure element:</b>	brass
<b>Pressure inlet connection:</b>	brass nickel plated
<b>Dial:</b>	Aluminum
<b>Pointer:</b>	Aluminum
<b>Case:</b>	stainless steel polished
<b>Window:</b>	plastic crystal clear



**TECHNICAL DATA - PRESSURE INDICATION PORT - OPTION REEED CONTACT GAUGE**

based on requirement of EN 837 (safety gauge with baffle wall and blow out back- S3)

Suitable for max. steady working pressure 75% of max. scale value

<b>Nominal size:</b>	50 mm
<b>Inlet connection:</b>	NPT ¼" male
<b>Cleaned for:</b>	Oxygene
<b>Scale range (bar; psi):</b>	16 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar)
<b>Accuracy class:</b>	2,5
<b>Temperature range:</b>	-20°C up to 60 °C
<b>Material</b>	
<b>Pressure element:</b>	stainless steel
<b>Pressure inlet connection:</b>	stainless steel
<b>Dial:</b>	Aluminum
<b>Pointer:</b>	Aluminum
<b>Case:</b>	stainless steel blank
<b>Window:</b>	plastic crystal clear
<b>Electrical data contacts:</b>	operating voltage U max. = 24 V DC/AC
	Current input: I <sub>max.</sub> = 0,4 A
	Breaking capacity: P max. = 8W/8 VA
<b>Contact type:</b>	RK 1.1, normally open, contact opens by decreasing value
	RK 1.2, normally open, contact closed by decreasing value

**TECHNICAL DATA - PRESSURE INDICATION PORT - OPTION INDUCTIVE CONTACT GAUGE**

based on requirement of EN 837 (safety gauge with baffle wall and blow out back- S3)

Suitable for max. steady working pressure 75% of max. scale value

<b>Nominal size:</b>	50 mm
<b>Inlet connection:</b>	NPT ¼" male
<b>Cleaned for:</b>	Oxygene
<b>Scale range (bar):</b>	16 bar (10 bar); 40 bar (20 bar); 65 bar (40 bar)
<b>Accuracy class:</b>	2,5
<b>Temperature range:</b>	-20°C up to 60 °C
<b>Material</b>	
<b>Pressure element:</b>	stainless steel
<b>Pressure inlet connection:</b>	stainless steel
<b>Dial:</b>	Aluminum
<b>Pointer:</b>	Aluminum
<b>Case:</b>	stainless steel blank
<b>Window:</b>	plastic crystal clear
<b>Electrical data contacts:</b>	operating voltage U nominal = 8,2 V DC
	Current input contact closed: > = 3 mA
	Current input contact open: <= 1 mA
<b>Contact type:</b>	IK 1.1, inductive contact, contact opens by decreasing value
	IK 1.2, inductive contact, contact closes by decreasing value

**TECHNICAL DATA - PRESSURE INDICATION PORT - OPTION PRESSURE TRANSMITTER****FOR INERT, NON-CORROSIVE GASES AND GAS MIXTURES, OXYGEN** (Not for flammable gases, not useable in EX-Areas)

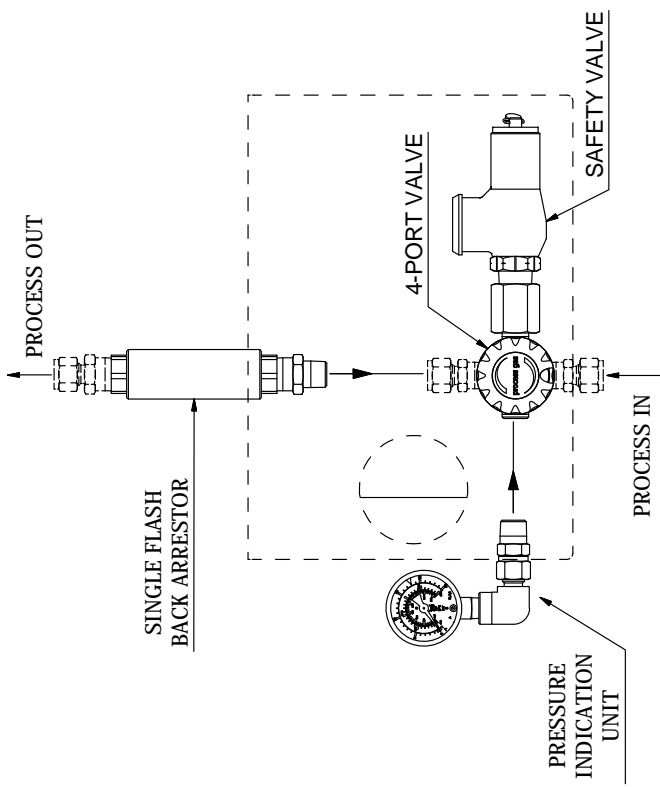
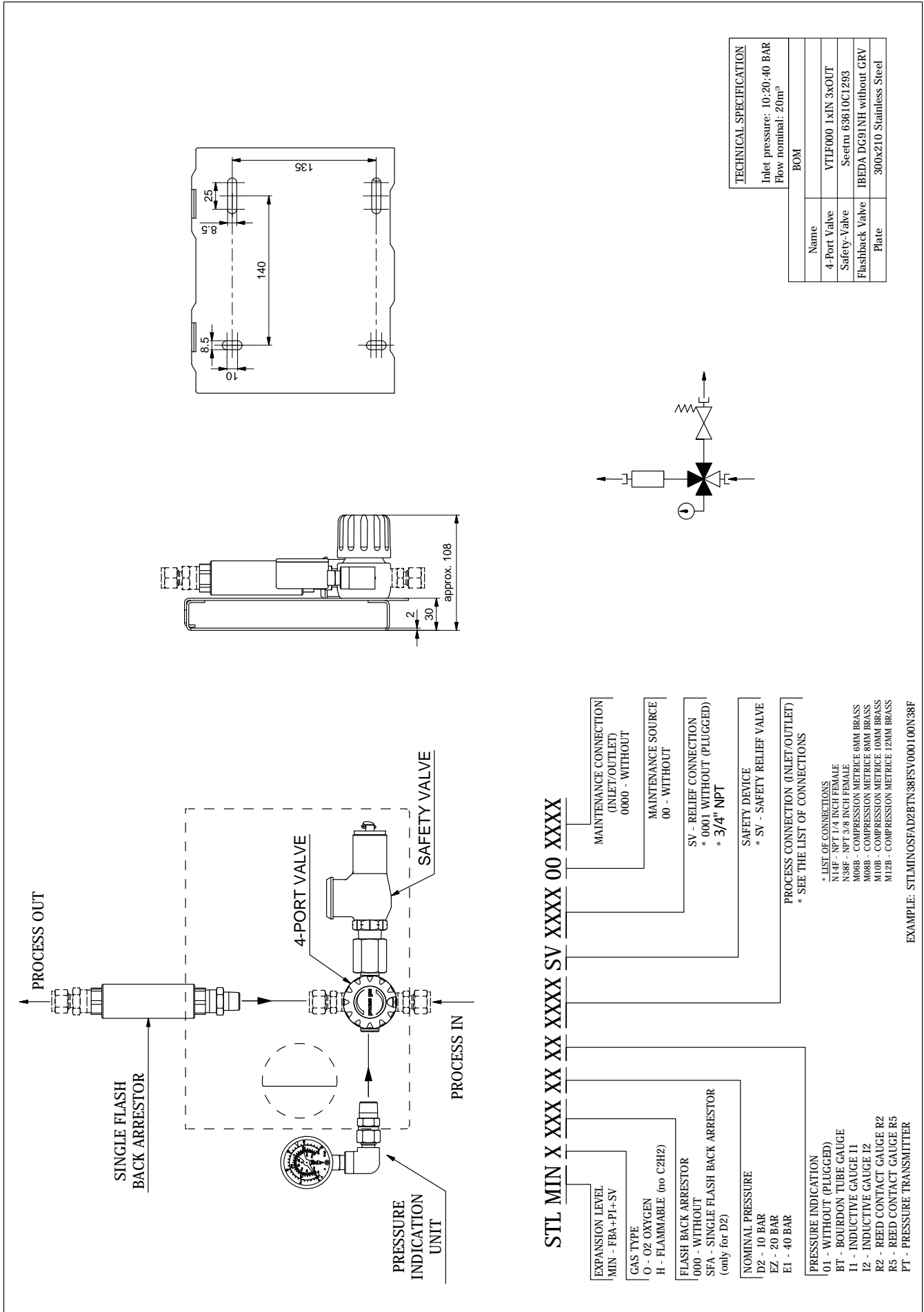
<b>Long Term Drift:</b>	0,2% Full Scale/YR (non-cumulative)
<b>Accuracy:</b>	0,25% Full Scale
<b>Thermal Error:</b>	0,83% Full Scale/100°F (1,5% Full Scale/100°C)
<b>Compensated Temperatures:</b>	-40°C to +125°C
<b>Operating Temperatures:</b>	-40°C to +125°C
<b>Zero Tolerance:</b>	0,5% of span
<b>Span Tolerance:</b>	0,5% of span
<b>Fatigue Life:</b>	Designed for more than 100 M cycles
<b>Mechanical Configuration:</b>	stainless steel
<b>Pressure Port:</b>	¼" NPT Male
<b>Electrical Connection:</b>	M12x1 – 4 pin
<b>Parts in Contact with Gas:</b>	Stainless Steel
<b>Enclosure:</b>	IP67 (IP65 for electrical code G)
<b>Supply Voltage:</b>	2 Volts above full scale to 30 Vdc max @ 4.5mA (6.5mA at output version)
<b>Vibration:</b>	40G peak to peak sinusoidal (Random Vibration: 20 to 100 Hz @ approx.. 40G) Peak per MIL-STD-810E
<b>Shock:</b>	Withstands free fall to IEC 68-2-32 procedure 1
<b>Approvals:</b>	CE, conform to European Pressure Directive, Fully RoHS compliant UL recognized files # E219842 & E174228
<b>Weight:</b>	35 grams
<b>Output signal:</b>	4...20mA

**FOR FLAMMABLE GASES, USEABLE IN EX-AREAS**

<b>Material gas wetted parts:</b>	Stainless steel, fully welded.
<b>Accuracy:</b>	<= +/- 0,50% of span
<b>Output signal:</b>	4...20mA
<b>Operating temperature medium:</b>	-15°C to +70°C
<b>Operating temperature ambient:</b>	-15°C to +70°C
<b>Manufacture's information:</b>	SIL 2, Functional safety, MTTF:>100 years and certificates China RoHS directive
<b>Long term stability:</b>	<= +/- 0,2% of span/year
<b>Mechanical Configuration:</b>	
<b>Pressure Port:</b>	¼" NPT Male
<b>Electrical Connection:</b>	M12x1 – 4 pin
<b>Parts in Contact with Gas:</b>	Stainless Steel
<b>Enclosure:</b>	IP65 (IP 68 also available)
<b>Power Supply:</b>	24 V DC
<b>Vibration resistance:</b>	20 g
<b>Shock resistance:</b>	1,000 g
<b>Approvals:</b>	ATEX, IECEx, FM, CSA, SIL rating per IEC61508/ IEC 61511



Link to product configurator



**STL MIN X XXX XX XX XXXX SV XXXX 00 XXXX**

- EXPANSION LEVEL  
MIN - FBA+PI+SV
- GAS TYPE  
O - O<sub>2</sub> OXYGEN  
H - FLAMMABLE (no C<sub>2</sub>H<sub>2</sub>)
- FLASH BACK ARRESTOR  
000 - WITHOUT  
SFA - SINGLE FLASH BACK ARRESTOR (only for D2)
- NOMINAL PRESSURE  
D2 - 10 BAR  
EZ - 20 BAR  
E1 - 40 BAR
- PRESSURE INDICATION  
01 - WITHOUT (PLUGGED)  
BT - BOURDON TUBE GAUGE  
I1 - INDUCTIVE GAUGE I1  
I2 - INDUCTIVE GAUGE I2  
R2 - REED CONTACT GAUGE R2  
R5 - REED CONTACT GAUGE R5  
PT - PRESSURE TRANSMITTER
- MAINTENANCE CONNECTION (INLET/OUTLET)  
0000 - WITHOUT  
00 - WITHOUT
- MAINTENANCE SOURCE  
00 - WITHOUT
- SV - RELIEF CONNECTION  
\* 0001 WITHOUT (PLUGGED)  
\* 3/4" NPT
- SAFETY DEVICE  
\* SV - SAFETY RELIEF VALVE
- PROCESS CONNECTION (INLET/OUTLET)  
\* SEE THE LIST OF CONNECTIONS
- \* LIST OF CONNECTIONS  
N14F - NPT 1/4 INCH FEMALE  
N38F - NPT 3/8 INCH FEMALE  
M06B - COMPRESSION METRICE 6MM BRASS  
M10B - COMPRESSION METRICE 10MM BRASS  
M12B - COMPRESSION METRICE 12MM BRASS

EXAMPLE: STLMINOSFAD2BTN:38FSV000100N38F

# MU LINE

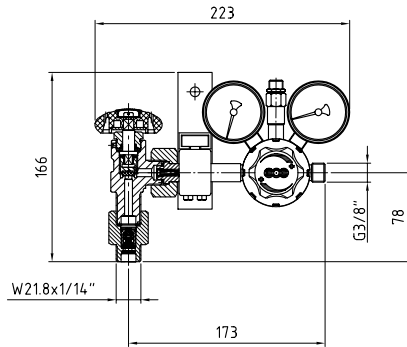


## MU70

Basic unit with one inlet and one outlet, shut-off valve and pressure regulator, with inlet filter and non return valve. Designed for small or middle gas consumptions for one cylinder or cylinder bundle.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768091	MU70	O, D, N, CO <sub>2</sub> , 300/20 bar	W21,8x1/14"	G3/8"
0768092	MU70	Hydrogen/methan, 300/20 bar	W21,8x1/14"LH	G3/8"LH

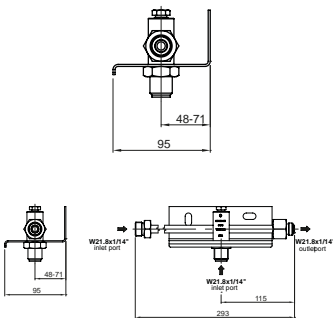
TECHNICAL DATA	
Regulator type:	UC500
Body, bonnet material:	Brass
Connectors & fittings material:	Brass
Diaphragm material:	EPDM, NBR
Seat sealing material:	PA
Wall bracket:	Painted steel
Maximal inlet pressure:	300 bar
Maximal flow rate:	30 Nm <sup>3</sup> /h
Temperature range:	From -20 °C to 60 °C



## SE LINE

High pressure manifold extension unit. SE-Line manifolds contain collecting tubes in adjustable positions. The axial distance between tube and wall bracket is changeable. The tube as well as wall bracket are made of stainless steel. Connection blocks are made of brass. One block includes always port for pressure gauge or contact gauge optional mounting. SE Line can be used up to 300 bar.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
9625640	SE-1	O, D, N, CO <sub>2</sub> , 300/20 bar	W21,8x1/14"	W21,8x1/14"
9625690	SE-1	Hydrogen/methan, 300/20 bar	W21,8x1/14"LH	W21,8x1/14"LH
9625650	SE-2	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14"	W21,8x1/14"
9625700	SE-2	All fuel gases; 300 bar	W21,8x1/14"LH	W21,8x1/14"LH
9625660	SE-4	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14"	W21,8x1/14"
9625710	SE-4	All fuel gases; 300 bar	W21,8x1/14"LH	W21,8x1/14"LH
215191005	Tube 90° SS	All fuel gases; 300 bar	W21,8x1/14"LH female	W21,8x1/14"LH male
215191010	Tube 90° SS	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14" female	W21,8x1/14" male
215191081	Plug with nut	All fuel gases; 300 bar	W21,8x1/14"LH	
215191080	Plug with nut	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14"	



## MU70-M

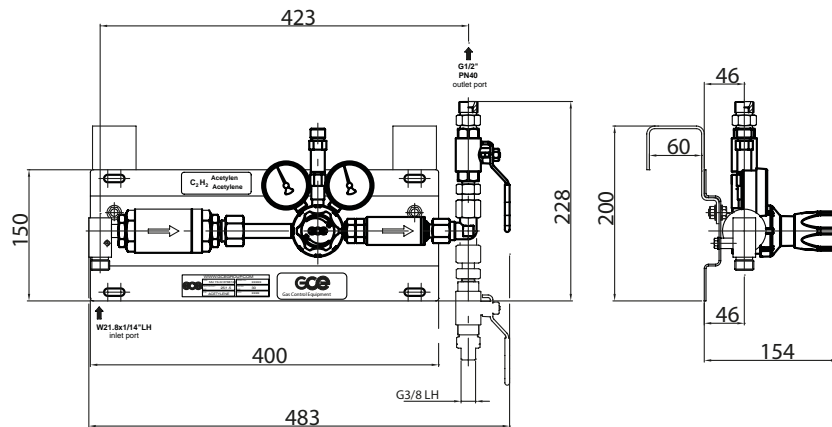
New concept of acetylene manifold either for stabile installation or for mobile usage with bundles or cylinders. Panel can be mounted directly at the wall with configuration as shown at the picture. When hanging kit in mounted on, panel can be hanged directly at the bundle or cylinders pallet frame. This configuration fulfills requests of outdoor on-side applications. It is designed in accordance with ISO 14 114 with automatic quick - acting shut-off valve and regulator, both tested in accordance with ISO 15 615. There is also flashback arrestor GVA 90 downstream regulator. GVA 90 (EN 730-1, ISO 5175) contains filter, flame arrestor, thermal arrestor and non-return valve.



Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768120	MU70-M	Acetylene, 25/1,5 bar	W21,8x1/14"LH	DN15
9443320	Hanging kit for MU70-M and MU400-M			

Hanging kit contains two stainless steel hangers, screws with nuts and washers and also two outlet adaptors with threads G1/4" and G3/8" for direct hose installation. This kit can be used in combination with MU70-M or MU400-M manifolds.

TECHNICAL DATA	
<b>Regulator type:</b>	UC500
<b>Body, bonnet material:</b>	Brass (Cu < 65%)
<b>Connectors &amp; fittings material:</b>	Brass (Cu < 65%)
<b>Diaphragm material:</b>	EPDM
<b>Seat sealing material:</b>	Chloroprene
<b>Wall bracket:</b>	Stainless steel
<b>Maximal inlet pressure:</b>	25 bar
<b>Maximal flow rate:</b>	14 Nm <sup>3</sup> /h
<b>Temperature range:</b>	From -20 °C to 60 °C

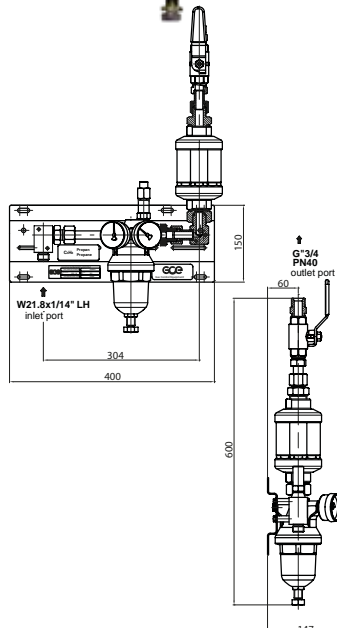
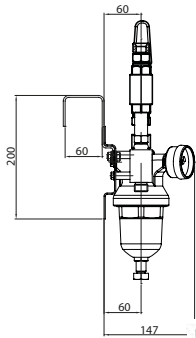
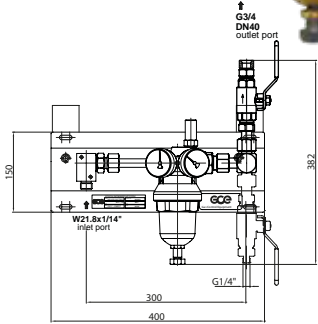


MU70-M with mounted hangers and with outlet adapted for direct low-pressure hose connection. This picture shows optimal product configuration how to place MU70-M directly at the cylinders bundle or cylinders pallet cage, e.g. for on-site applications.



## MU400-M

New concept of gas manifold with similar features as MU70-M. O, D, N, CO<sub>2</sub> variant is equipped by high-flow regulator MR400. Manifold unit with mounted hanging kit is shown at the picture. Hanging kit contains two stainless steel hangers, screws with nuts and washers and also two outlet adaptors with threads G1/4" and G3/8" for direct hose installation. This kit can be used in combination with MU70-M or MU400-M manifolds.



Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768121	MU70-M	O, D, N, CO <sub>2</sub> , 300/20 bar	W21,8x1/14"	DN15
9443320	Hanging kit for MU70-M and MU400-M			

TECHNICAL DATA	
Regulator type:	MR400
Body, bonnet material:	Brass
Connectors & fittings material:	Brass, stainless steel
Diaphragm material:	EPDM
Seat sealing material:	PA
Wall bracket:	Stainless steel
Maximal inlet pressure:	300 bar
Maximal flow rate:	400 Nm <sup>3</sup> /h
Nominal flow rate:	250 Nm <sup>3</sup> /h
Temperature range:	from -20 °C to 60 °C

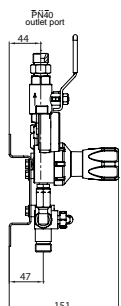
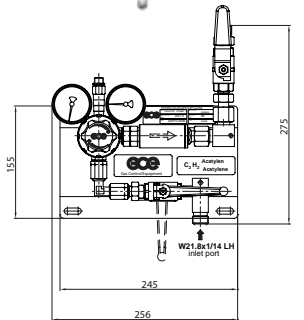
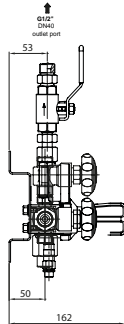
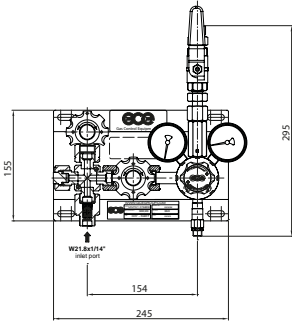
## MU400-M PROPANE

Propane variant is with high-flow regulator and contains also high-flow flashback arrester Simax 3 at the outlet. Simax 3 is high flow flashback arrester in accordance with EN 730-1 and ISO 5175 with filter, flame arrester, thermal arrester and non-return valve. There is also possibility to use hanging kit for mobile on-site installation.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768138	MU400-M	Propane, 25/4 bar	W21,8x1/14" LH	DN20
9443320	Hanging kit for MU70-M and MU400-M			

TECHNICAL DATA	
Regulator type:	MR60
Body, bonnet material:	Brass
Connectors & fittings material:	Brass, stainless steel
Diaphragm material:	NBR
Seat sealing material:	PTFE
Wall bracket:	Stainless steel
Maximal inlet pressure:	100 bar
Maximal flow rate:	100 Nm <sup>3</sup> /h
Nominal flow rate:	50 Nm <sup>3</sup> /h
Temperature range:	from -20 °C to 60 °C

# MM70 LINE



## MM70-1

Gas manifold panel for different gases with inlet pressure up to 300bar. Manifold contains inlet x-block with non return valve and filter, purge valve and second inlet from site to install potentially extension unit. Purge valve can be used for pressure release when cylinder/bundle hose is dismantled. There is also high pressure shut-off valve, regulator with pressure relieve valve and outlet ball valve mounted at the stainless steel panel.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768093	MM70-1	O, D, N, CO <sub>2</sub> , 300/20 bar	W21,8x1/14"	DN15, G1/2"
0768142	MM70-1	O, D, N, CO <sub>2</sub> , 300/40 bar	W21,8x1/14"	DN15, G1/2"
0768168	MM70-1	O, D, N, CO <sub>2</sub> , 300/100 bar, JC600	W21,8x1/14"	DN4, W21,8x1/14"
0768094	MM70-1	Hydrogen/methane, 300/20 bar	W21,8x1/14"LH	DN15, G1/2"
0768096	MM70-1	Propane, 25/4 bar	W21,8x1/14"LH	DN15, G1/2"

TECHNICAL DATA	
Regulator type:	UC 500
Body, bonnet material:	Brass
Connectors & fittings material:	Brass, stainless steel
Diaphragm material:	EPDM, NBR
Seat sealing material:	PA
Wall bracket:	Stainless steel
Maximal inlet pressure:	300 bar
Nominal flow rate:	50 Nm <sup>3</sup> /h
Temperature range:	from -20 °C to 60 °C

## MM70-1 ACETYLENE

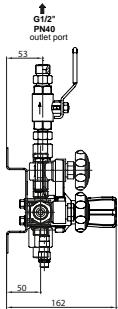
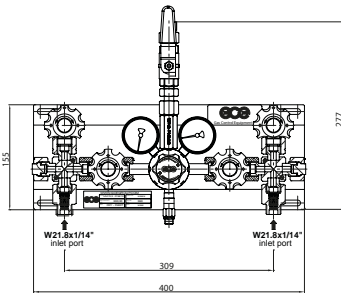
Acetylene variant of MM70-1 manifold for cylinder service. It is designed and produced in accordance with **ISO 14 114:2014**. There is used manual quick acting shut-off valve upstream regulator. There is flashback arrestor GVA 90 (EN 730-1, ISO 5175) mounted downstream regulator and also outlet ball valve.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768111	MM70-1	Acetylene, 25/1,5 bar	W21,8x1/14"LH	DN15, G1/2"

TECHNICAL DATA	
Regulator type:	UC 500
Body, bonnet material:	Brass (Cu < 65%)
Connectors & fittings material:	Brass (Cu < 65%)
Diaphragm material:	EPDM
Seat sealing material:	Chloroprene
Wall bracket:	Stainless steel
Maximal inlet pressure:	25 bar
Maximal flow rate:	5 Nm <sup>3</sup> /h
Temperature range:	from -20 °C to 60 °C

## MM70-2

Manual changeover manifold for different gases with inlet pressure up to 300bar. At both inlet sides is placed x-block with non return valves and filters, purge valves and second inlets from sites for extension units. Shut-off valves, regulator with pressure relieve valve and outlet ball valve as well as other components are mounted at the stainless steel panel.

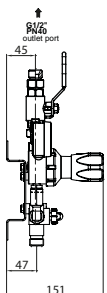
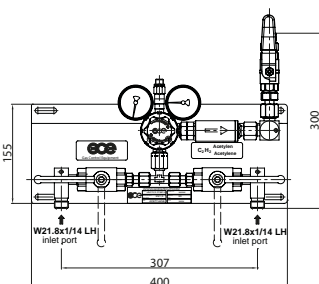


Art.-Nr.	Description	Gas,Pressure	Inlet	Outlet
0768122	MM70-2	O, D, N, CO2, 300/20 bar	W21,8x1/14"	DN15, G1/2"
0768143	MM70-2	O, D, N, CO2, 300/40 bar	W21,8x1/14"	DN15, G1/2"
0768124	MM70-2	Hydrogen/methane, 300/20 bar	W21,8x1/14"LH	DN15, G1/2"
0768125	MM70-2	Propane, 25/4 bar	W21,8x1/14"LH	DN15, G1/2"

TECHNICAL DATA	
<b>Regulator type:</b>	UC500
<b>Body, bonnet material:</b>	Brass
<b>Connectors &amp; fittings material:</b>	Brass
<b>Diaphragm material:</b>	EPDM, NBR
<b>Seat sealing material:</b>	PA
<b>Wall bracket:</b>	Stainless steel
<b>Maximal inlet pressure:</b>	300 bar
<b>Maximal flow rate:</b>	50 Nm <sup>3</sup> /h
<b>Temperature range:</b>	from -20 °C to 60 °C

## MM70-2 ACETYLENE

Acetylene variant of MM70-2 manual changeover manifold for cylinder service. It is designed and produced in accordance with **ISO 14 114:2014**. There are used manual quick acting shut-off valves at each inlet side upstream regulator. These devices are tested according to ISO 15 615. There is flashback arrestor GVA 90 (EN 730-1, ISO 5175) mounted downstream regulator and also outlet ball valve.



Art.-Nr.	Description	Gas,Pressure	Inlet	Outlet
0768140	MM70-2	Acetylene, 25/1,5 bar	W21,8x1/14"LH	DN15, G1/2"

TECHNICAL DATA	
<b>Regulator type:</b>	UC500
<b>Body, bonnet material:</b>	Brass
<b>Connectors &amp; fittings material:</b>	Brass
<b>Diaphragm material:</b>	EPDM, NBR
<b>Seat sealing material:</b>	Chloroprene
<b>Wall bracket:</b>	Stainless steel
<b>Maximal inlet pressure:</b>	300 bar
<b>Maximal flow rate:</b>	5 Nm <sup>3</sup> /h
<b>Temperature range:</b>	from -20 °C to 60 °C





### MA70

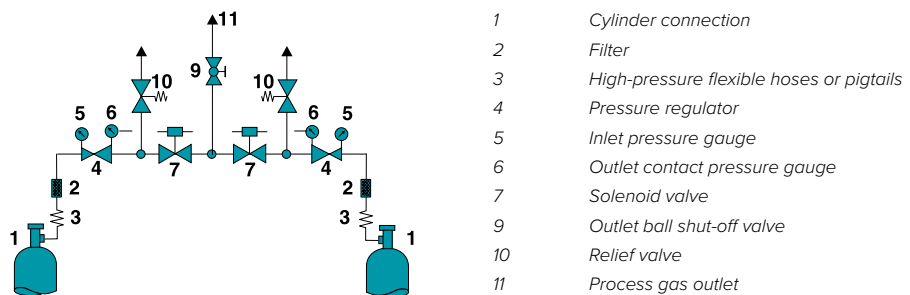
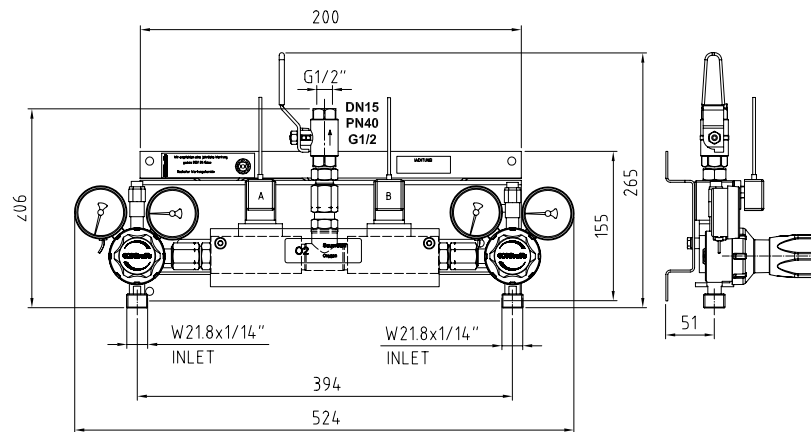
Automatic change over manifold mounted onto a stainless steel panel and consists of two pressure regulators with inlet and outlet pressure gauge, a switch unit with two magnetic valves including control unit and signal monitoring. Automatic change over for uninterrupted gas flow. Solenoid valves guarantee a maximum of exhaustion of the gas sources (cylinders or bundles). Acoustic and optical gas leakage monitoring via contact pressure gauges and signal device. In each case, after falling below boundary values (at the pressure gauges preset delay period) gas supply will be changed over to the full cylinder. Check valves on both sides prevent the reflux of gas back into the empty side. The user will be protected against operating errors by clear display and operator control functions. Control unit is the part of standard delivery package.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
EXM0025	BMD100-39	O, D, N, CO <sub>2</sub> , 300/16 bar	W21,8x1/14"LH	DN15
EXM0028	BMD100-39	Nitrogen, 300/40 bar	W21,8x1/14"LH	DN15

TECHNICAL DATA	
Regulator type:	UC500
Body, bonnet material:	Brass
Regulator bonnet:	Zinc alloy
Diaphragm material:	EPDM
Seat sealing:	PA
Piston sealing (for N <sub>2</sub> ):	Silicon
Ball valve sealing:	PTFE
Maximal inlet pressure:	300 bar
Temperature range:	From -20 °C to 60 °C
Wall bracket:	Stainless steel

TECHNICAL DATA - CONTROL UNIT	
Power supply:	220 V, 50 Hz
Working temperature:	From 0 °C to 55 °C



# M400 LINE

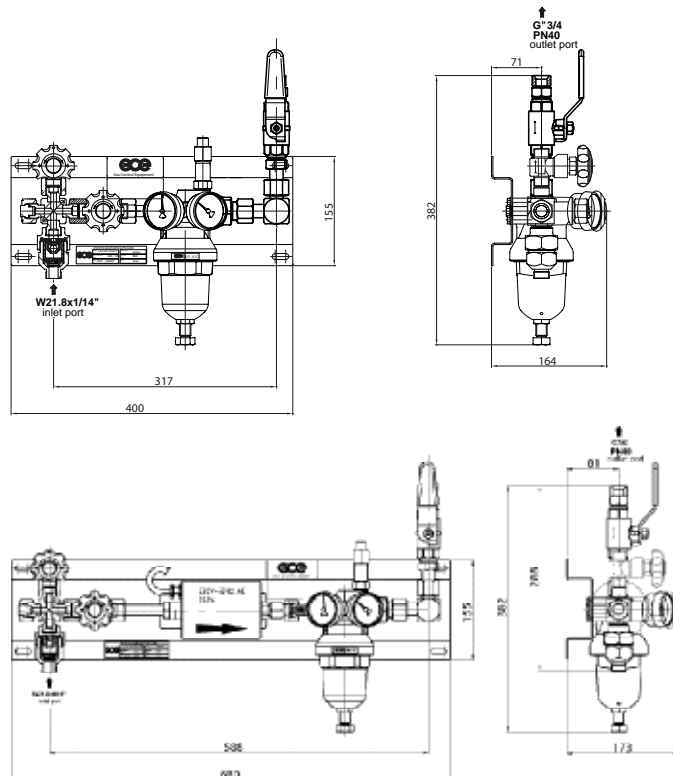


## MM400-1

Gas manifold panel with regulators MR60 or MR400 for high-flow applications for different gases with inlet pressure up to 300bar. Manifold contains inlet x-block with non return valve and filter, purge valve and second inlet from site to install potentially extension unit. Purge valve can be used for pressure release when cylinder/bundle hose is dismounted. There is also high pressure shut-off valve, regulator with pressure relieve valve and outlet ball valve mounted at the stainless steel panel.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768127	MM400-1	O, D, N, CO <sub>2</sub> , 300/20 bar	W21,8x1/14"	G3/4", DN20
0768144	MM400-1	O, D, N, CO <sub>2</sub> , 300/40 bar	W21,8x1/14"	G3/4", DN20
0768194	MM400-1 PH	O, D, N, CO <sub>2</sub> , 300/12 bar, with preheater	W21,8x1/14"	G3/4", DN20
0768189	MM400-1 PH	O, D, N, CO <sub>2</sub> , 300/20 bar, with preheater	W21,8x1/14"	G3/4", DN20
0768128	MM400-1	Hydrogen/methan, 300/20 bar	W21,8x1/14"LH	G3/4", DN20
0768130	MM400-1	Propane, 25/4 bar	W21,8x1/14"LH	G3/4", DN20
0768165	MM 400-1 CG	O, D, N, CO <sub>2</sub> , 300/20 bar, with contact gauge	W21,8x1/14"	G3/4", DN20

TECHNICAL DATA	
Regulator type:	MR400/MR60
Body, bonnet material:	Brass
Connectors & fittings material:	Brass, stainless steel
Diaphragm material:	Butyl, NBR
Seat sealing material:	PA, PTFE
Wall bracket:	Stainless steel
Maximal inlet pressure:	300 bar
Maximal flow rate:	400 Nm <sup>3</sup> /h
Nominal flow rate:	250 Nm <sup>3</sup> /h
Temperature range:	from -20 °C to 60 °C



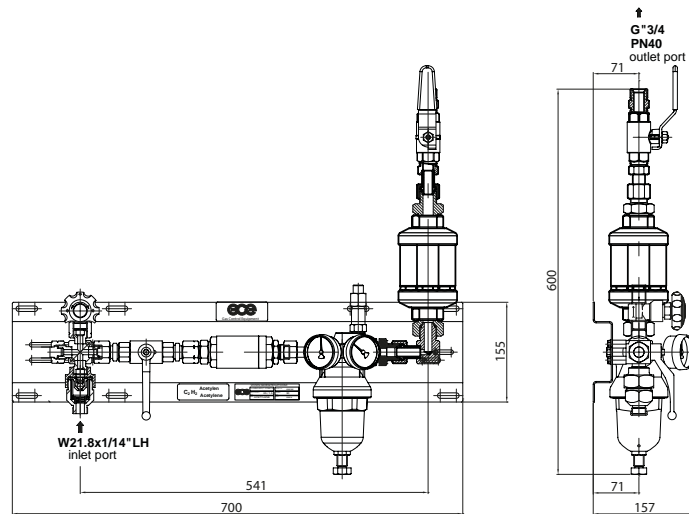


## MM400-1 ACETYLENE

Gas manifold panel with regulator MR60 for high-flow acetylene applications. Acetylene variant of MM400-1 is designed and produced in accordance with **ISO 14 114:2018**. Inlet x-block with mounted purge valve, non-return valve and filter enable safety operation with high pressure acetylene. There are used manual and also automatic quick acting shut-off valves upstream regulator. These devices are tested according to ISO 15 615. There is flashback arrestor Simax 3 (EN 730-1, ISO 5175) mounted downstream regulator and also outlet ball valve.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768131	MM400-1	Acetylene, 25/1,5 bar	W21,8x1/14"LH	G3/4", DN20

TECHNICAL DATA	
Regulator type:	MR60
Body, bonnet material:	Brass (Cu< 65%)
Connectors & fittings material:	Brass (Cu< 65%), stainless steel
Diaphragm material:	Chloroprene
Seat sealing material:	PTFE
Wall bracket:	Stainless steel
Maximal inlet pressure:	25 bar
Maximal flow rate:	25 Nm <sup>3</sup> /h
Temperature range:	From -20 °C to 60 °C



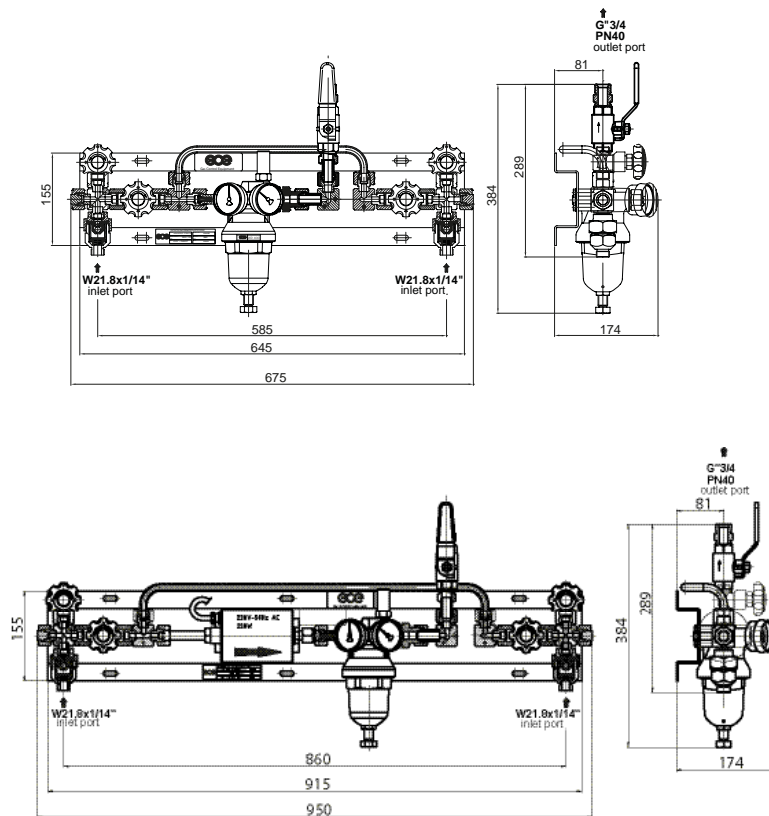


### MM400-2

Manual changeover manifold with regulators MR60 or MR400 for high-flow applications for different gases with inlet pressure up to 300 bar. At both inlet sides is placed x-block with non return valves and filters, purge valves and second inlets from sites for extension units. Shut-off valves, regulator with pressure relieve valve and outlet ball valve as well as other components are mounted at the stainless steel panel.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768132	MM400-2	O, D, N, CO <sub>2</sub> , 300/20 bar	W21,8x1/14"	G3/4", DN20
0768146	MM400-2	O, D, N, CO <sub>2</sub> , 300/40 bar	W21,8x1/14"	G3/4", DN20
0768145	MM400-2 PH	O, D, N, CO <sub>2</sub> , 300/20 bar, with preheater	W21,8x1/14"	G3/4", DN20
0768133	MM400-2	Hydrogen/methan, 300/20 bar	W21,8x1/14"LH	G3/4", DN20
0768135	MM400-2	Propane, 25/4 bar	W21,8x1/14"LH	G3/4", DN20

TECHNICAL DATA	
Regulator type:	MR400/MR60
Body, bonnet material:	Brass
Connectors & fittings material:	Brass, stainless steel
Diaphragm material:	Butyl, NBR
Seat sealing material:	PA, PTFE
Wall bracket:	Stainless steel
Maximal inlet pressure:	300 bar
Maximal flow rate:	400 Nm <sup>3</sup> /h
Nominal flow rate:	250 Nm <sup>3</sup> /h
Temperature range:	From -20 °C to 60 °C



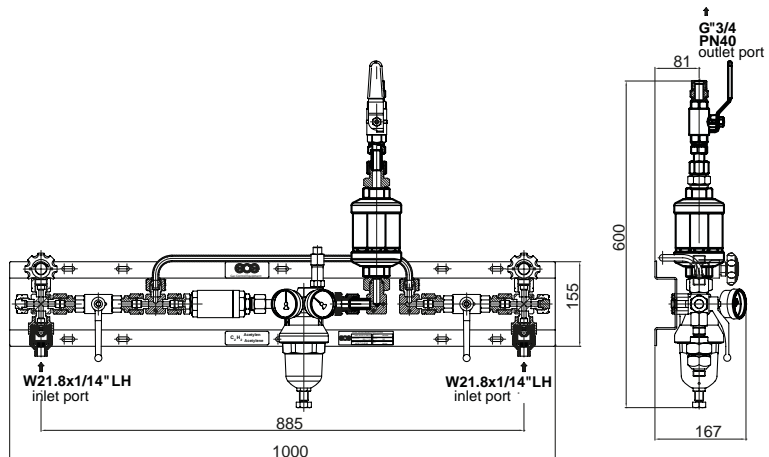


### M400-2 ACETYLENE

Manual changeover manifold with regulator MR60 for high-flow acetylene applications. Acetylene variant of MM400-2 is designed and produced in accordance with **ISO 14 114:2018**. Inlet x-blocks with mounted purge valves, non-return valves and filters enable safety operation with high pressure acetylene. There are used manual and also automatic quick acting shut-off valves upstream regulator. These devices are tested according to ISO 15 615. There is flashback arrestor Simax 3 (EN 730-1, ISO 5175) mounted downstream regulator and also outlet ball valve.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768136	MM400-2	Acetylene, 25/1,5 bar	W21,8x1/14"LH	G3/4", DN20

TECHNICAL DATA	
Regulator type:	MR60
Body, bonnet material:	Brass (Cu < 65%)
Connectors & fittings material:	Brass (Cu < 65%), stainless steel
Diaphragm material:	Chloroprene
Seat sealing material:	PTFE
Wall bracket:	Stainless steel
Maximal inlet pressure:	25 bar
Maximal flow rate:	25 Nm <sup>3</sup> /h
Temperature range:	From -20 °C to 60 °C



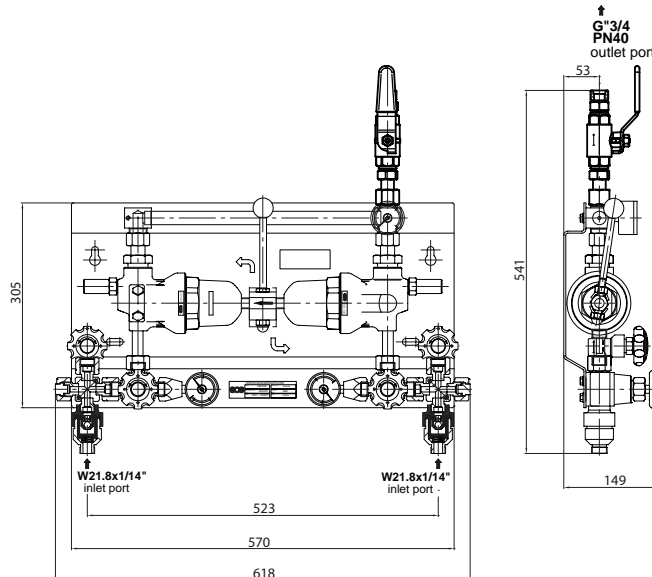
## MS400



The MS400 Semiautomatic manifold reduces compressed gases of max. 300 bar to a continuous gas supply of 17-20 bar or 35-40 bar. It is designed for the use with 2 gas sources (cylinders or cylinder bundles). However, one side at a time is the operating one and the other is then the reserve side. The MS400 will ensure continuity of gas flow by automatically changing from a nearly empty side to a full (reserve) side. MS400 is a complete valve unit with high pressure filters, isolating valves, purge valves, regulators, autochange unit and low pressure pipe with line shut-off valve. Components are assembled and mounted at stable stainless steel plate. Inlet x-block contain free port for extension to more gas sources. MS400 can be used for oxygen and inert gases as nitrogen, argon, CO2 and their mixtures. The variant for fuel gas can be used for hydrogen, methane and their mixtures. It is optimal solution for continuous gas supply for industrial applications as e.g. welding & cutting, assist gas supply for laser cutting, different inertization and many other applications. There are also variants with contact gauges giving alarm information about switching over to reserve side.

Art.-Nr.	Description	Gas, pressure	Inlet	Outlet
0768114	MS400	O, D, N, CO <sub>2</sub> ; 300 bar/20 bar	W21,8x1/14"	G3/4", DN20
0768164	MS400 CG	O, D, N, CO <sub>2</sub> ; 300 bar/20 bar, with contact gauge	W21,8x1/14"	G3/4", DN20
0768191	MS400 CG	O, D, N, CO <sub>2</sub> ; 300 bar/40 bar, with contact gauge	W21,8x1/14"	G3/4", DN20
0768192	MS400	O, D, N, CO <sub>2</sub> ; 300 bar/40 bar	W21,8x1/14"	G3/4", DN20
0768193	MS400	Hydrogen/methan; 300 bar/20 bar	W21,8x1/14" LH	G3/4", DN20
0768212	MS400 CG	Hydrogen/methan; 300 bar/20 bar, with contact gauge	W21,8x1/14" LH	G3/4", DN20

TECHNICAL DATA	
Regulator type:	MR400/MR60
Body, bonnet material:	Brass
Connectors & fittings material:	Brass, stainless steel
Diaphragm material:	Butyl, NBR
Seat sealing material:	PA, PTFE
Wall bracket:	Stainless steel
Maximal inlet pressure:	300 bar
Maximal flow rate:	400 Nm <sup>3</sup> /h
Nominal flow rate:	250 Nm <sup>3</sup> /h
Temperature range:	From -20 °C to 60 °C

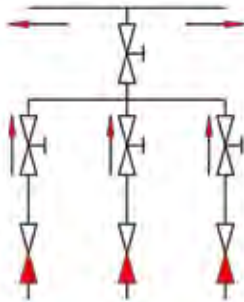


## MS400, SPARE PARTS, REGULATORS



Art.-Nr.	Description	Gas, pressure
0762913	MR60	O, D, N, CO <sub>2</sub> ; 300 bar/40 bar
0762910	MR400	O, D, N, CO <sub>2</sub> ; 300 bar/20 bar

# MB LINE



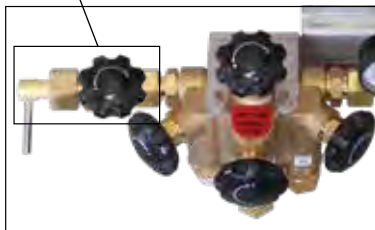
## MANYFLOW

MANYFLOW block with its modular design establishes a complete range of gas control units either for cylinders or for bundle gas supply with Acetylene or high compressed gases up to 300 bar. Different gas flow level may be selected. This pressure device is used as a component in below mentioned high-pressure manifolds. It is also delivered as a basic unit without connection hoses. Hoses have to be ordered related to gas type and kind of supply (bundles or cylinders). Stainless steel tubes with different lengths are provided to prepare this modular concept for connection of more gas packages and therethrough to extend particular gas supply system for requested operating conditions.

Art.-Nr.	Description	Gas	Inlet	Outlet
14037312	Manyflow block	Acetylene	W21,8x1/14"	W21,8x1/14"
0764954	Manyflow block	Acetylene	W21,8x1/14"LH	G3/4"
14037514	Manyflow block	O, D, N, CO <sub>2</sub> , H up to 300 bar	W21,8x1/14"	W21,8x1/14"
0768221	Manyflow block	O, D, N, CO <sub>2</sub> , H up to 300 bar	W21,8x1/14"LH	W21,8x1/14"
14037804	Connecting tube 450 mm	All gases	G3/4"	G3/4"
14037797	Connecting tube 750 mm	All gases	G3/4"	G3/4"
14037423	Connecting tube 1500 mm	All gases	G3/4"	G3/4"
SPP27990016	Manyflow outlet adaptor		G3/4" F	W21,8x1/14" M

- > Compact block design for cylinder pressure up to 300 bar
- > GCE high pressure shut-off valves
- > Acetylene variant in accordance with ISO 15615
- > Space saving installations
- > In- and outlet connections W21,8x1/14" according to DIN 477 (other connection on request)
- > Sinter metal filter and non return valve included.
- > Continuous gas flow of all the cylinders is guaranteed.
- > Very easy to extend. The modular design constitutes numerous variants.
- > For bundle and cylinder gas supply.

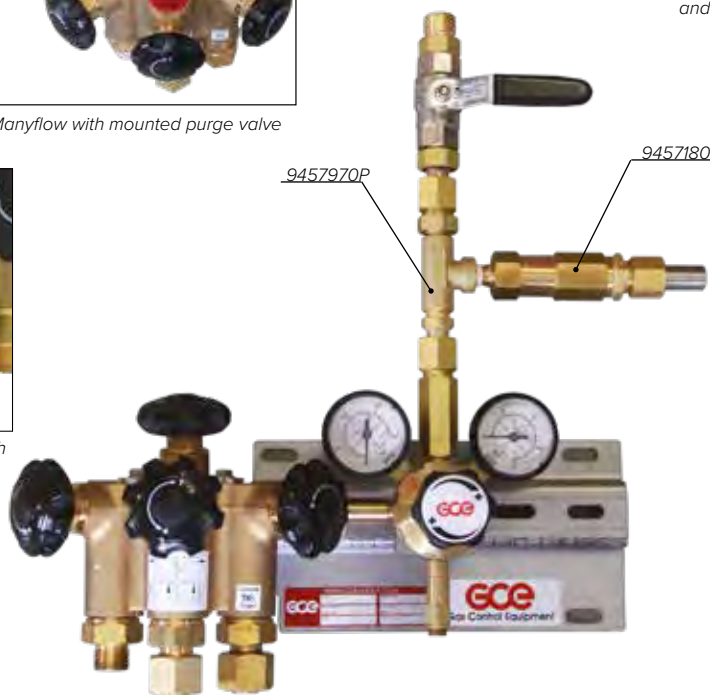
purge valve for manyflow block  
item number SPK27990171



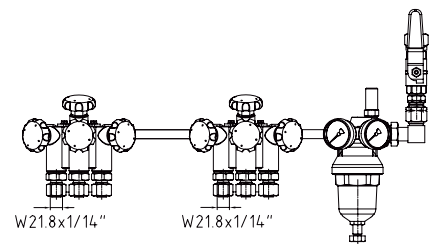
Manyflow with mounted purge valve



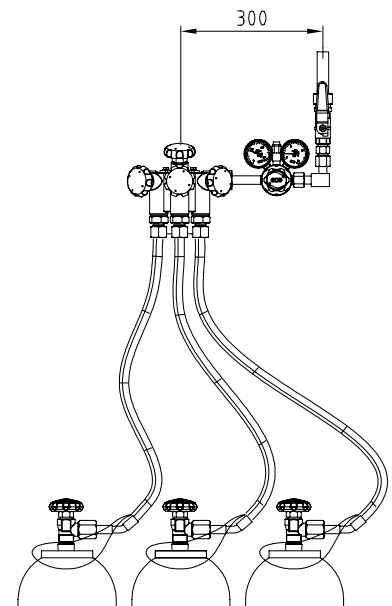
Cross section of the inlet with non-return valve and filter



Manyflow application in MB70 with safety valve



High pressure manifold with Manyflow and extension unit for 6 cylinders or bundles



High pressure manifold MB70 for 3 cylinders connected by high pressure flexible hoses

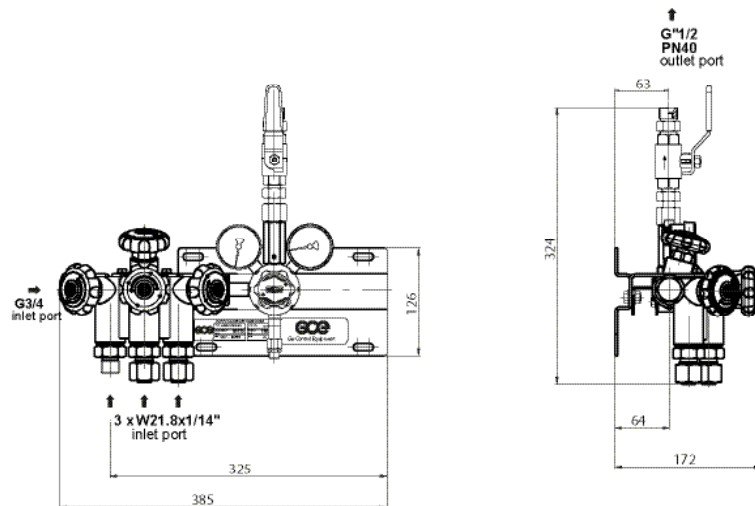


### MB70

High pressure manifold based on Manyflow unit for middle and low flow rates. It can be used for oxygen and inert gases. It is designed for cylinder or cylinder bundles service. There are non-return valves at the Manyflow inlets, separated isolating valves and one central inlet shut-off valve. UC 500 regulator contains high pressure and low pressure gauges and pressure relief valve. There is outlet low pressure ball valve downstream regulator. Gas wetted components are made of brass. All components are fixed to the stabilizing stainless steel wall bracket.

Art.-Nr.	Description	Gas, pressure	Inlet	Outlet
0768099	MB70	O, D, N, CO <sub>2</sub> ; 300 bar/20 bar	W21,8x1/14"	G1/2", DN15
14037552	MB70 CG	O, D, N, CO <sub>2</sub> ; 300 bar/20 bar, with contact gauge	W21,8x1/14"	G1/2", DN15
0768148	MB70	Hydrogen, 300/20 bar	W21,8x1/14" LH	G1/2", DN15
0768219	MB70	O, D, N, CO <sub>2</sub> ; 300 bar/40 bar	W21,8x1/14"	G1/2", DN15
ARS0157	MB70 PH	O, D, N, CO <sub>2</sub> , 300/20 bar, with preheater	W21,8x1/14"	G1/2", DN15

TECHNICAL DATA	
Regulator type:	UC500
Body, bonnet material:	Brass
Connectors & fittings material:	Brass
Diaphragm material:	EPDM
Seat sealing material:	PA
Wall bracket:	Stainless steel
Maximal inlet pressure:	300 bar
Maximal flow rate:	50 Nm <sup>3</sup> /h
Temperature range:	From -20 °C to 60 °C





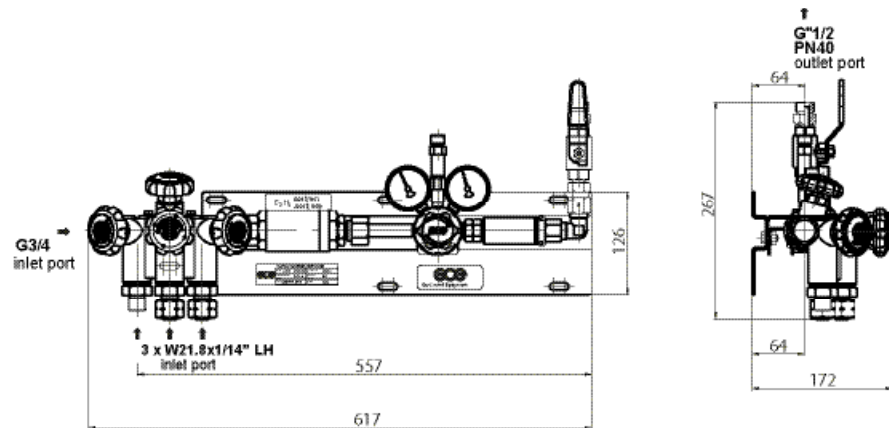


## MB70 ACETYLENE

MB 70 for acetylene is design and produced in accordance with **ISO 14 114:2018**. Manyflow is tested and approved in accordance with ISO 15 615 as well as high pressure automatic quick acting shut-off valve and pressure regulator UC 500. There are also pressure relief valve, high pressure and low pressure gauges. Low pressure flashback arrestor GVA 90 (EN 730-1, ISO 5175) consists of filter, flame arrestor, thermal arrestor and non-return valve. Outlet ball valve is mounted downstream FBA.

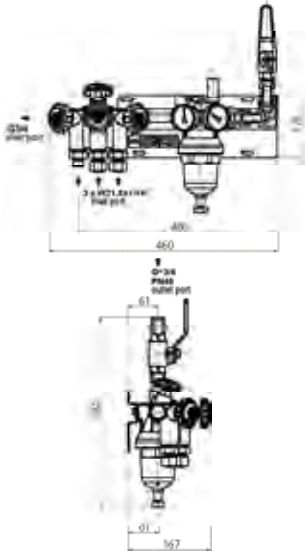
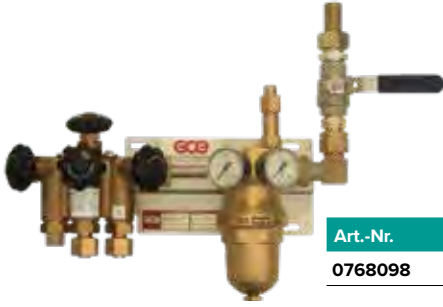
Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768100	MB70	Acetylene, 25/1,5 bar	W21,8x1/14"LH	G1/2", DN15
14037556	MB70 CG	Acetylene, 25/1,5 bar, with contact gauge	W21,8x1/14"LH	G1/2", DN15

TECHNICAL DATA	
Regulator type:	UC500
Body, bonnet material:	Brass (Cu < 65%)
Connectors & fittings material:	Brass (Cu < 65%)
Diaphragm material:	EPDM
Seat sealing material:	Chloroprene
Wall bracket:	Stainless steel
Maximal inlet pressure:	25 bar
Maximal flow rate:	10 Nm <sup>3</sup> /h
Temperature range:	From -20 °C to 60 °C



### MB400

High pressure manifold based on Manyflow unit for high flow applications. It can be used for oxygen and inert gases. It is designed mainly for cylinder bundles service. There are non-return valves at the Manyflow inlets, separated isolating valves and one central inlet shut-off valve. MR400 regulator contains high pressure and low pressure gauges and pressure relief valve. There is outlet low pressure all valve downstream regulator. All components are fixed to the stabilizing stainless steel wall bracket.

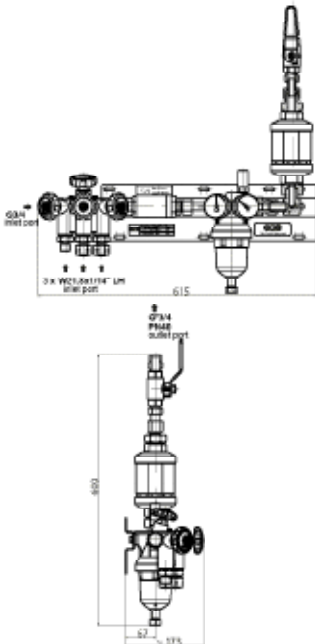


Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768098	MB400	O, D, N, CO <sub>2</sub> , 300/20 bar	W21,8x1/14"	G3/4", DN15

TECHNICAL DATA	
Regulator type:	MR400
Body, bonnet material:	Brass
Connectors & fittings material:	Brass, stainless steel
Diaphragm material:	Butyl
Seat sealing material:	PA
Wall bracket:	Stainless steel
Maximal inlet pressure:	300 bar
Maximal flow rate:	400 Nm <sup>3</sup> /h
Nominal flow rate:	250 Nm <sup>3</sup> /h
Temperature range:	From -20 °C to 60 °C

### MB400 ACETYLENE

MB400 for acetylene is design and produced in accordance with **ISO 14114:2018**. Manyflow is tested and approved in accordance with ISO 15615 as well as high pressure automatic quick acting shut-off valve and pressure regulator MR60. There are also pressure relief valve, high pressure and low pressure gauges. Low pressure flashback arrestor Simax 3 (EN 730-1, ISO 5175) consists of filter, flame arrestor, thermal arrestor and non-return valve. Outlet ball valve is mounted downstream FBA.



Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768097	MB400	Acetylene, 25/1,5 bar	W21,8x1/14"LH	G3/4", DN15

TECHNICAL DATA	
Regulator type:	MR60
Body, bonnet material:	Brass (Cu< 65%)
Connectors & fittings material:	Brass (Cu< 65%), stainless steel
Diaphragm material:	Chloroprene
Seat sealing material:	PTFE
Wall bracket:	Stainless steel
Maximal inlet pressure:	25 bar
Maximal flow rate:	25 Nm <sup>3</sup> /h
Temperature range:	From -20 °C to 60 °C

# MF LINE

An unique compact solution for high pressure gas supply. This manifold integrates many different high pressure components into the one massive brass block. Due to this specific design- aspect potential leakages are minimized. This ensures high- safety standard and eliminates not controlled gas consumption what creates additional profits for user.

**MAXIFLOW BRASS BLOCK CONTAINS FOLLOWING COMPONENTS:**

- > 2 inlet connections with sintered filters
- > two regulators for semiautomatic operation
- > inlet shut-off valves at both sides
- > purge valves for high pressure part purging and for pressure release
- > two HP gauges (contact gauges optionally)
- > pressure relieve valve
- > outlet connection with ball valve

**MAXIFLOW DESIGN VARIANTS:**

- > Maxiflow 2/2 with second regulation step for precise outlet pressure adjustment
- > Maxiflow 2/2 for acetylene with safety components in accordance with ISO 14114 and ISO 15615

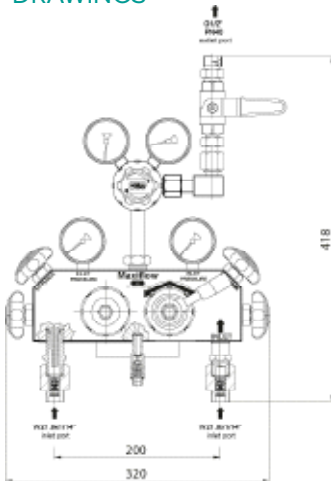


## MAXIFLOW 2/2

Semiautomatic autochange gas manifold for compressed gases with inlet pressure up to 300 bar. This product can ensure continuous gas supply without any application process interruption. Manifold can be equipped as an option by contact gauges to give information about gas source emptying. It is double-stage regulation unit giving stabile value of outlet pressure parameter. Product consists of massive brass block which is the stabile base for other components installation. There are almost eliminated internal connections what means minimal risk of leakages.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0768183	Maxiflow 2/2	O, D, N, CO <sub>2</sub> , 300/10 bar	W21,8x1/14"	G1/2", DN15
0768222	Maxiflow 2/2 CG	O, D, N, CO <sub>2</sub> , 300/10 bar, contact gauges	W21,8x1/14"	G1/2", DN15
0768184	Maxiflow 2/2	Hydrogen/methan, 300/10 bar	W21,8x1/14"LH	G1/2", DN15
0768223	Maxiflow 2/2 CG	Hydrogen, methan, 300/10 bar, contact gauges	W21,8x1/14"LH	G1/2", DN15
0768119	Maxiflow 2/2	Propane, 12/2,5 bar	W21,8x1/14"LH	G1/2", DN15
0768196	Maxiflow 2/2 CG	Propane, 12/2,5 bar, contact gauges	W21,8x1/14"LH	G1/2", DN15

## DRAWINGS



TECHNICAL DATA	
<b>Panel and regulator body:</b>	Brass
<b>Regulator bonnet:</b>	Zn-Al alloy
<b>Regulator type ODNCO<sub>2</sub>HM:</b>	Piston
<b>Regulator type P:</b>	Diaphragm NBR
<b>Regulator type HM:</b>	Diaphragm NBR (2nd stage)
<b>Regulating valve sealing:</b>	Encapsulated, PA, ODNCO <sub>2</sub>
<b>Regulating valve sealing P:</b>	Encapsulated, Chloroprene
<b>Regulating valve sealing HM:</b>	Encapsulated, PA
<b>Connectors &amp; fittings:</b>	Brass
<b>Wall bracket:</b>	Stainless steel
<b>Maximal inlet pressure:</b>	300 bar
<b>Nominal flow rate:</b>	20 Nm <sup>3</sup> /h (at 10 bar)
<b>Temperature range:</b>	From -20 °C to 60 °C



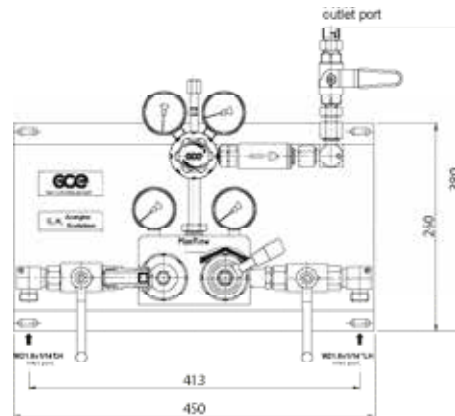
## MAXIFLOW 2/2 ACETYLENE

Semiautomatic autochange gas manifold for acetylene. This product can ensure continuous gas supply without any application process interruption. There is variant equipped by contact gauges to give information about gas source emptying. It is double -stage regulation unit giving stable value of outlet pressure parameter. Product is designed and produced in accordance with ISO 14114. There are used inlet manual quick acting shut-off valves, regulators tested according to requirements of ISO 15615. There is also mounted outlet flashback arrestor GVA90 (EN 730-1, ISO 5175) and isolating ball valve.

Art.-Nr.	Description	Gas,Pressure	Inlet	Outlet
0768166	Maxiflow 2/2	Acetylene, 25/1,5 bar	W21,8x1/14"LH	G1/2", DN15
0768167	Maxiflow 2/2CG	Acetylene, 25/1,5 bar, contact gauges	W21,8x1/14"LH	G1/2", DN15

TECHNICAL DATA	
Panel and regulator body:	Brass
Regulator bonnet:	Zn/Al alloy
Regulator type:	Diaphragm EPDM
Regulating valve sealing:	Encapsulated, Chloroprene
Connectors & fittings:	Brass
Wall bracket:	Stainless steel
Flashback arrestor:	Brass
Manual quick acting valve:	Steel
Maximal inlet pressure:	30 bar
Nominal flow rate:	5 Nm <sup>3</sup> /h (at 1,2 bar)
Temperature range:	From -20 °C to 60 °C

## DRAWINGS





### SHUTOFF VALVES DN4 AND DN8 FOR EXTENSION UNITS

SOV DN4 should be used for extension modules of MM70 Line manifolds. BV 300 DN8 are designed for M400 Line manifolds.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0777111	SOV DN4	O, D, N, CO <sub>2</sub> , 300 bar	W21,8x1/14"	W21,8x1/14"LH
0777112	SOV DN4	Fuel gas, 300 bar	W21,8x1/14"LH	W21,8x1/14"
0777208	SOV DN4	Acetylene, 25 bar	W21,8x1/14"LH	W21,8x1/14"
BV777105	BV 300 DN8	O, D, N, CO <sub>2</sub> , 300 bar	W21,8x1/14"	W21,8x1/14"LH
BV777106	BV 300 DN8	Inert, 300 bar	W21,8x1/14"	W21,8x1/14"LH
BV777107	BV 300 DN8	Fuel gas, 300 bar	W21,8x1/14"LH	W21,8x1/14"
BV777209	BV 300 DN8	Acetylene, 25 bar	W21,8x1/14"LH	W21,8x1/14"

### HIGH PRESSURE ACETYLENE BALL VALVE



High pressure acetylene isolating valve and manual quick acting shut-off valve according to ISO 14114 and ISO 15615.

Art.-Nr.	Connection
SPP27990018	3/8"
SPP27990019	1/2"

### NON RETURN VALVES



Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
0764935	Non return valve	O, D, N, CO <sub>2</sub> , 300 bar	W21,8x1/14"	W21,8x1/14"
0764936	Non return valve	Fuel gas, 300 bar	W21,8x1/14"LH	W21,8x1/14"LH
0764937	Non return valve	Acetylene, 25 bar	W21,8x1/14"LH	W21,8x1/14"LH
0764976	Non return valve	Propane, 20 bar	W21,8x1/14"LH	W21,8x1/14"LH



### CYLINDER WALL BRACKET



Art.-Nr.	Description
14037116	for 1 cylinder
14037117	for 2 cylinders
14037118	for 3 cylinders

# HIGH PRESSURE MANIFOLD EXTENSION UNITS

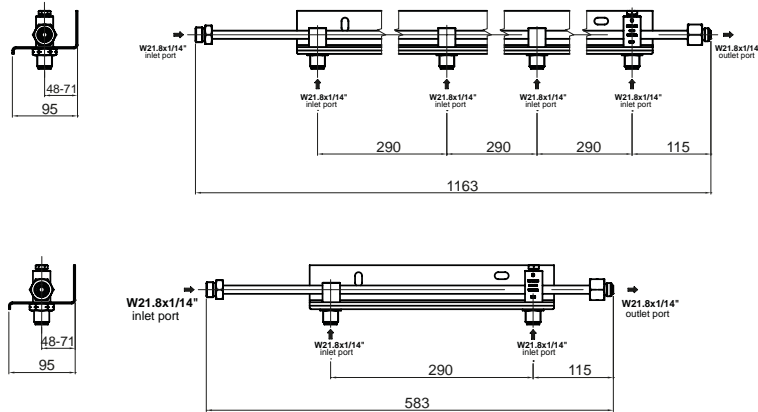
## SE LINE

High pressure manifold extension unit. SE-Line manifolds contain collecting tubes in adjustable positions. The axial distance between tube and wall bracket is changeable. This enables SE Line application for both, M70 Line and M400 Line manifolds. The tube as well as wall bracket are made of stainless steel. Connection blocks are made of brass. One block includes always outlet for pressure gauge or contact gauge optional mounting. SE Line can be used up to 300 bar.



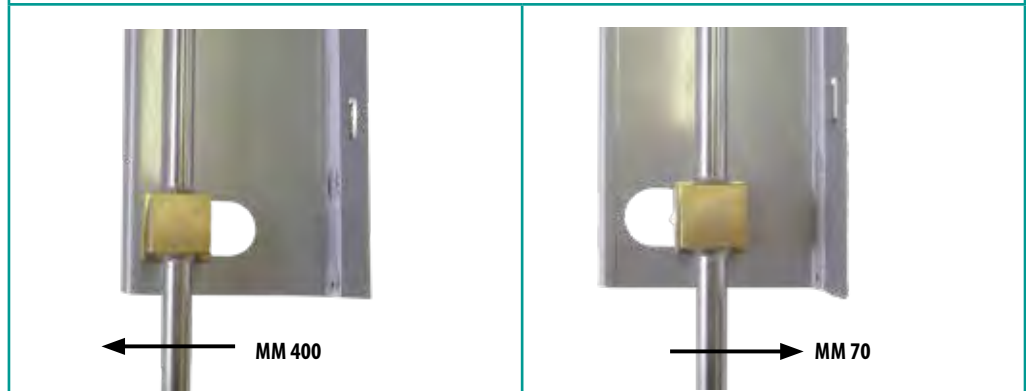
9625660

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet
9625640	SE-1	O, D, N, CO <sub>2</sub> , 300 bar	W21,8x1/14"	W21,8x1/14"
9625690	SE-1	All fuel gases, 300 bar	W21,8x1/14"LH	W21,8x1/14"LH
9625650	SE-2	O, D, N, CO <sub>2</sub> , 300 bar	W21,8x1/14"	W21,8x1/14"
9625700	SE-2	C <sub>2</sub> H <sub>2</sub>	W21,8x1/14"LH	W21,8x1/14"LH
9625660	SE-4	O, D, N, CO <sub>2</sub> , 300 bar	W21,8x1/14"	W21,8x1/14"
9625710	SE-4	C <sub>2</sub> H <sub>2</sub>	W21,8x1/14"LH	W21,8x1/14"LH



## SE LINE SET-UP

Two axial positions of collecting tube in the bracket. See SE Line prepared for extension of M70 Line in the right picture and position prepared for M400 Line in the left picture.

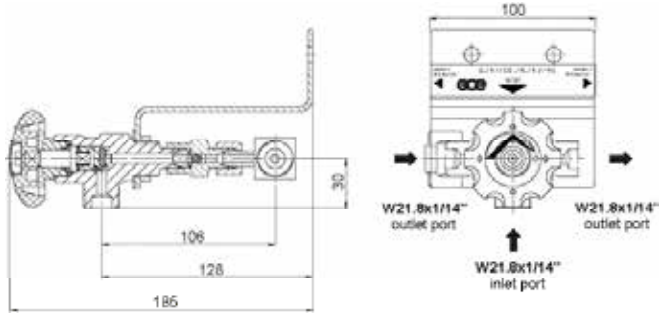




### ME-1

ME-1 contains inlet connection with shut-off valve, non return valve, collecting pipe and two outlets. Bodies of components are made of brass. Stable wall bracket made of 3 mm stainless steel is used as a base for components mounting. ME-1 is prepared for 300 bar service.

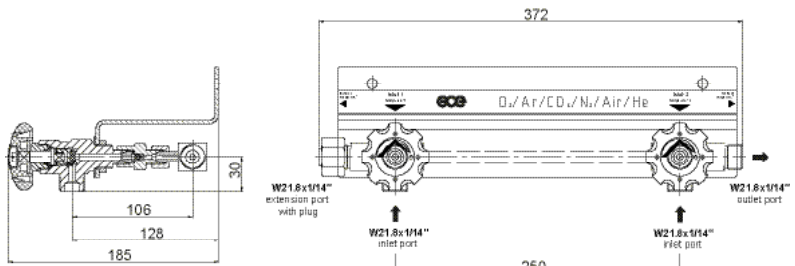
Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet	Standard
0768169	ME-1	O, D, N, CO <sub>2</sub> , 300 bar	W21,8x1/14"	W21,8x1/14"	DIN 477-1/6
0768179	ME-1	Fuel gas, 300 bar	W21,8x1/14"LH	W21,8x1/14"LH	DIN 477-1/1
CE10001M	ME-1	O, D, N, CO <sub>2</sub> , 300 bar	W21,7x1/14"	W21,7x1/14"	UNI4406
CE10006M	ME-1	Acetylene, 25 bar	G5/8" LH	G5/8" LH	UNI4411/2
CE10008M	ME-1	Fuel gas, 300 bar	W20x1/14"LH	W20x1/14"LH	UNI4405



### ME-2

ME-2 contains inlet connections with shut-off valves, non return valves, collecting pipe and two outlets. Bodies of components are made of brass. Stable wall bracket made of 3 mm stainless steel is used as a base for components mounting. ME-2 can be used up to 300 bar.

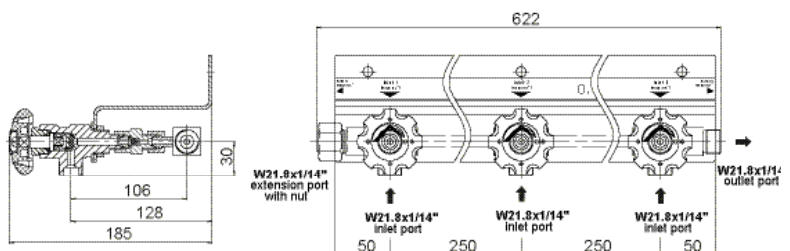
Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet	Standard
0768177	ME-2	O, D, N, CO <sub>2</sub> , 300 bar	W21,8x1/14"	W21,8x1/14"	DIN 477-1/6
0768181	ME-2	Fuel gas, 300 bar	W21,8x1/14"LH	W21,8x1/14"LH	DIN 477-1/1
CE10026M	ME-2	O, D, N, CO <sub>2</sub> , 300 bar	W21,7x1/14"	W21,7x1/14"	UNI4406
CE10031M	ME-2	Acetylene, 25 bar	G5/8" LH	G5/8" LH	UNI4411/2
CE10034M	ME-2	Fuel gas, 300 bar	W20x1/14"LH	W20x1/14"LH	UNI4405



### ME-3

ME-3 contains inlet connections with shut-off valves, non return valves, collecting pipe and two outlets. Bodies of components are made of brass. Stable wall bracket made of 3 mm stainless steel is used as a base for components mounting. ME-3 can be used up to 300 bar.

Art.-Nr.	Description	Gas, Pressure	Inlet	Outlet	Standard
0768178	ME-3	O, D, N, CO <sub>2</sub> , 300 bar	W21,8x1/14"	W21,8x1/14"	DIN 477-1/6
0768182	ME-3	Fuel gas, 300 bar	W21,8x1/14"LH	W21,8x1/14"LH	DIN 477-1/1
CE10051M	ME-3	O, D, N, CO <sub>2</sub> , 300 bar	W21,7x1/14"	W21,7x1/14"	UNI4406
CE10056M	ME-3	Acetylene, 25 bar	G5/8"LH	G5/8"LH	UNI4411/2
CE10074M	ME-3	Fuel gas, 300 bar	W20x1/14"LH	W20x1/14"LH	UNI4405

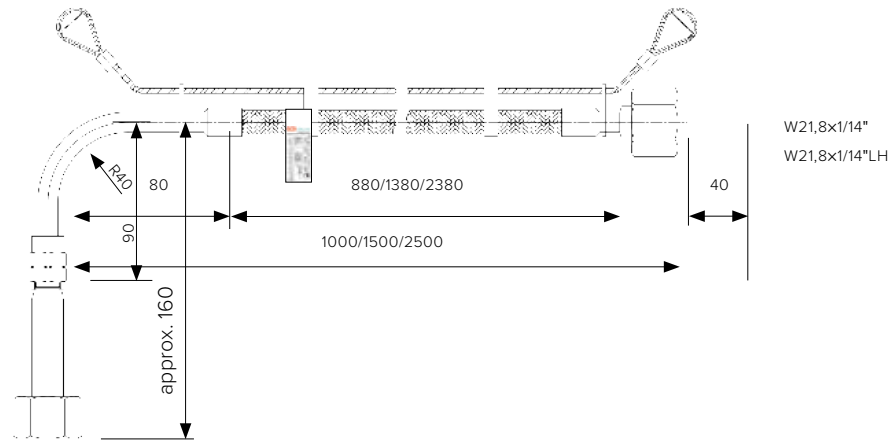


## HIGH PRESSURE HOSES

Stainless steel-hoses for high pressure applications.



Art.-Nr.	Gas	Pressure (bar)	Lenght (mm)	Input	Output
F2771006	Argon/CO <sub>2</sub>	200	1000	W21,8x1/14"	W21,8x1/14"
F2771007	Argon/CO <sub>2</sub>	200	2500	W21,8x1/14"	W21,8x1/14"
F2771009	Argon/CO <sub>2</sub>	300	1000	W30x2	W21,8x1/14"
F2771010	Argon/CO <sub>2</sub>	300	2500	W30x2	W21,8x1/14"
F2771004	O <sub>2</sub>	200	1000	G3/4"	W21,8x1/14"
F2771005	O <sub>2</sub>	200	2500	G3/4"	W21,8x1/14"
F2771003	O <sub>2</sub>	300	1000	W30x2	W21,8x1/14"
F2771008	O <sub>2</sub>	300	2500	W30x2	W21,8x1/14"
F2771008	Nitrogen	200	1000	W24,32x1/14"	W21,8x1/14"
F2771009	Nitrogen	200	2500	W24,32x1/14"	W21,8x1/14"
F2771009	Nitrogen	300	1000	W30x2	W21,8x1/14"
F2771010	Nitrogen	300	2500	W30x2	W21,8x1/14"
F2771012	Compressed air	200	1000	G5/8"	W21,8x1/14"
F2771013	Compressed air	200	2500	G5/8"	W21,8x1/14"
F2771013	Compressed air	300	1000	W30x2	W21,8x1/14"
F2771014	Compressed air	300	2500	W30x2	W21,8x1/14"
F2771010	H <sub>2</sub> / Forming gas	200	1000	W21,8x1/14" LH	W21,8x1/14" LH
F2771011	H <sub>2</sub> / Forming gas	200	2500	W21,8x1/14" LH	W21,8x1/14" LH
F2771011	H <sub>2</sub> / Forming gas	300	1000	W30x2 LH	W21,8x1/14" LH
F2771012	H <sub>2</sub> / Forming gas	300	2500	W30x2 LH	W21,8x1/14" LH

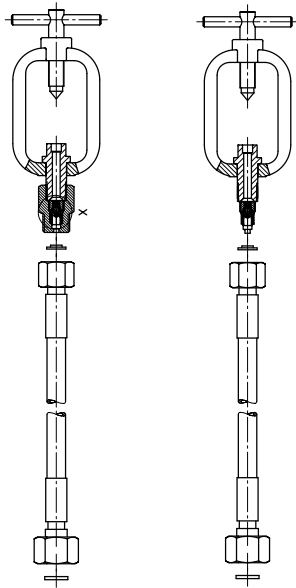


Connection according to national standard

## HIGH PRESSURE HOSES, 200 BAR, BENELUX

Art.-Nr.	Gas	Pressure (bar)	Lenght (mm)	Input	Output	Land
19037021001	Argon/CO <sub>2</sub> / N <sub>2</sub>	200	800	W21,8x1/14" NEN3268 RU1	W21,8x1/14"	B
19037020001	Argon/CO <sub>2</sub> /N <sub>2</sub>	200	1500	W21,8x1/14" NEN3268 RU1	W21,8x1/14"	B
19037021002	Argon/N <sub>2</sub>	200	800	W24,32x1/14" NEN3268 RU3	W21,8x1/14"	NL
19037020002	Argon/N <sub>2</sub>	200	1500	W24,32x1/14" NEN3268 RU3	W21,8x1/14"	NL
19037021006	Compressed air	200	800	G3/4"	W21,8x1/14"	B
19037020006	Compressed air	200	1500	G3/4"	W21,8x1/14"	B
19037021007	Compressed air	200	800	W28,8x1/14" NEN3268 RU6	W21,8x1/14"	NL
19037020007	Compressed air	200	1500	W28,8x1/14" NEN3268 RU6	W21,8x1/14"	NL
19037021003	O <sub>2</sub>	200	800	G5/8" NEN3268 RI2	W21,8x1/14"	B/NL
19037020003	O <sub>2</sub>	200	1500	G5/8" NEN3268 RI2	W21,8x1/14"	B/NL
19037021004	H <sub>2</sub> / Forming gas	200	800	G1/2"LH	W21,8x1/14"	B
19037020004	H <sub>2</sub> / Forming gas	200	1500	G1/2"LH	W21,8x1/14"	B
19037021004	H <sub>2</sub> / Forming gas	200	800	W21,8x1/14"LH NEN3268 RU1	W21,8x1/14"	NL
19037020005	H <sub>2</sub> / Forming gas	200	1500	W21,8x1/14"LH NEN3268 RU1	W21,8x1/14"	NL



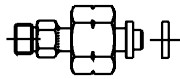


## ACETYLENE HIGH PRESSURE CONNECTION HOSES

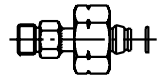
Art.-Nr.	Application	Inlet	Outlet	Length	Remark
14037493	connection for one cylinder	DIN 3	W21,8x1/14"	800 mm	
14037249	connection for one bundle	M28 x 1,5LH	W21,8x1/14"	1500 mm	GCE bundle connector
14037841	connection for one bundle	M28 x 1,5LH	W21,8x1/14"	1500 mm	LINDE bundle connector
14037842	connection for one bundle	M28 x 1,5LH	W21,8x1/14"	1500 mm	MG bundle connector
14037843	connection for one bundle	M28 x 1,5LH	W21,8x1/14"	1500 mm	BASI bundle connector
14038015	connection for one cylinder	DIN3	W21,8x1/14" LH	800 mm	
0764938	connection for one cylinder	LI2 (Large Yoke)	W21,8x1/14" LH	800 mm	Netherlands
0764939	connection for one cylinder	LI2 (Small Yoke)	W21,8x1/14" LH	800 mm	Belgium
14038011	connection for one bundle	M28 x 1,5LH	W21,8x1/14" LH	1500 mm	LINDE bundle connector
14038012	connection for one bundle	M28 x 1,5LH	W21,8x1/14" LH	1500 mm	MG bundle connector
14038013	connection for one bundle	M28 x 1,5LH	W21,8x1/14" LH	1500 mm	BASI bundle connector
14038014	connection for one bundle	M28 x 1,5LH	W21,8x1/14" LH	1500 mm	GCE bundle connector

Attention: there is a 5-yearly obligatory testing for acetylene high pressure hoses in accordance with TRAC 204, 5.3.7. These hoses fulfil the requirements according to EN ISO 14113. Further connections upon request.

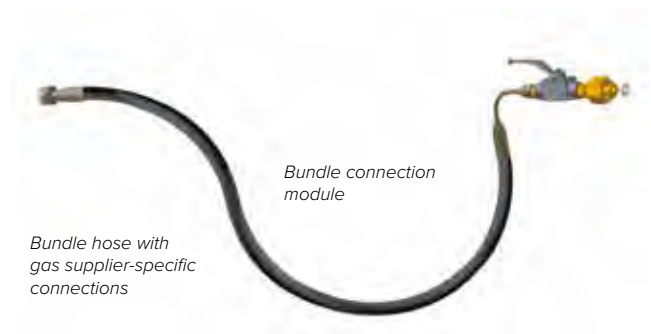
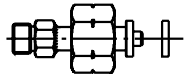
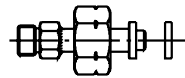
Bundle connection Rhöna standard 14.037190 for AGA



14.037115 for Linde bundle



14.037190 for MG bundle



Bundle hose with gas supplier-specific connections

Bundle connection module



## HIGH PRESSURE FLEXIBLE HOSES

The high pressure flexible hoses are produced in accordance to ISO 14113. The PTFE inner liner is covered by stainless steel braided mantle. Cylinder and manifold connectors are made of brass. The hose for oxygen service contains heat sink at the manifold end.

Art.-Nr.	Gas	Pressure (bar)	Length (mm)	Input	Output	Specification
MM2598	O <sub>2</sub>	300	1000	G5/8"	G3/8"f	Incl. heat sink
MM2532	Argon/N <sub>2</sub>	300	1000	G5/8"	G3/8"f	
MM3364	CO <sub>2</sub>	300	1000	W 0,860"	G3/8"f	
MM2537	Hydrogen/Propane	300	1000	G5/8"LH	G3/8"f	
MM3513	Acetylene	30	600	G5/8"LH	G3/8"f	Incl. non-return valve
MM2599	O <sub>2</sub>	300	2000	G5/8"	G3/8"f	Incl. heat sink
MM2534	Argon/N <sub>2</sub>	300	2000	G5/8"	G3/8"f	
MM2535	Argon/N <sub>2</sub>	300	3000	G5/8"	G3/8"f	
MM3365	CO <sub>2</sub>	300	2000	W 0,860"	G3/8"f	
MM2539	Hydrogen/Propane	300	2000	G5/8"LH	G3/8"f	
MM2540	Hydrogen/Propane	300	3000	G5/8"LH	G3/8"f	
MM3514	Acetylene	30	2000	G5/8"LH	G3/8"f	Incl. non-return valve



## LINE FILTER

Nominal flow rate: 800 Nm<sup>3</sup>/h at 40 bar, pressure drop: max 15 bar.

Art.-Nr.	Description	Gas, Pressure	Inlet / Outlet	Filter ability
<b>0760582</b>	FZ 11	O, D, N, CO <sub>2</sub> , Max 200 bar	M42x1,5	50 µm
<b>SPP27990007</b>	Spare filter insert 5 µm			
<b>SPP27990008</b>	Spare filter insert 50 µm			
<b>SPP27990031</b>	Pressure gauge, 400/300 bar			
<b>SPP27990032</b>	Pressure gauge, 40/20 bar			

## HIGH PRESSURE ACCESSORIES

Art.-Nr.	Description	Gas, Max. pressure	Inlet	Outlet	Pos.
<b>215191005</b>	Tube 90° SS	A, P, H, M; 300 bar	W21,8x1/14"LH female	W21,8x1/14"LH male	1
<b>215191010</b>	Tube 90° SS	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14" female	W21,8x1/14" male	1
<b>0768159</b>	Tube 90° Cu	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14" female	W21,8x1/14" female	1
<b>0768160</b>	Tube 90° SS	A, P, H, M; 300 bar	W21,8x1/14"LH female	W21,8x1/14"LH female	1
<b>9451080P</b>	Tube straight	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14"	W21,8x1/14"	7
<b>9451090P</b>	Tube straight	A, P, H, M; 300 bar	W21,8x1/14"LH	W21,8x1/14"LH	7
<b>215191076</b>	Plug	A, P, H, M; 300 bar	W21,8x1/14"LH		2
<b>215191077</b>	Plug	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14"		2
<b>215191069</b>	Nipple	A, P, H, M; 300 bar	W21,8x1/14"LH female	W21,8x1/14 male	3
<b>215191068</b>	Nipple	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14" female	W21,8x1/14"LH male	3
<b>200059835P</b>	Double nut	All gases; 300 bar	W21,8x1/14"	W21,8x1/14"LH	4
<b>215191081</b>	Plug with nut	A, P, H, M; 300 bar	W21,8x1/14"LH		5
<b>215191080</b>	Plug with nut	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14"		5
<b>215191084</b>	T-piece	A, P, H, M; 300 bar	W21,8x1/14"LH female		6
<b>215191085</b>	T-piece	O, D, N, CO <sub>2</sub> ; 300 bar	W21,8x1/14" female		6
<b>311837121815P</b>	Alu sealing gasket (package of 5 pcs), 18x12,0x1,5				
<b>311325111032P</b>	Cu sealing gasket (package of 10 pcs), 18x12,7x1,5				



# MANIFOLD LOW PRESSURE OUTLETS



## WELDING AND BRAZING SOCKETS G1/2"

Accessories for 70-line manifolds according to EN 560.

Art.-Nr.	Material	Out diam.	In diam.
9459830	Stainless steel	14 mm	9,2 mm
9459840	Brass	15 mm	9,8 mm
4A38550P	Carbon steel	14 mm	9,5 mm

## WELDING AND BRAZING SOCKETS G3/4"

Accessories for 400-line manifolds according to EN 560.

Art.-Nr.	Material
0764986	Stainless steel
0764977	Brass
0764978	Carbon steel

## SLEEVE NUTS

Accessories according to EN 560.

Art.-Nr.	Material	Connection
9459850	Brass	G1/2"
14099732P	Brass	G3/4"

## BALL VALVES WITH CONNECTIONS

Accessories according to EN 560.



Art.-Nr.	Connection	Nominal pressure
9457980P	G1/2"	PN40
94597890P	G1/2"	PN64
9460140P	G3/4"	PN40
9460280P	G3/4"	PN64

## ACCESSORIES

Accessories according to EN 560.



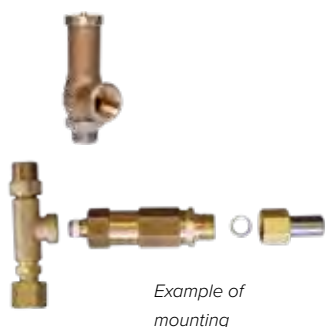
Art.-Nr.	Connection	Gas, Max. pressure	Inlet	Outlet	Pos.
SPP27990022	Elbow	All gases; 64 bar	G1/2"	G1/2"	1
SPP27990023	Elbow	All gases; 64 bar	G3/4"	G3/4"	1
SPP27990024	T-piece	All gases; 64 bar	G1/2"	G1/2"	2
SPP27990025	T-piece	All gases; 64 bar	G3/4"	G3/4"	2
SPP27990026	T-piece	All gases; 64 bar	G1"	G1"	2

## SAFETY VALVE SETS

Accessories according to EN 560.



Art.-Nr.	Gas type	Connection
0764984	All	G1/2"
9457970P	All	G1/2"m; G1/2"f; NPT 1/4"f



Art.-Nr.	Gas type	Opening pressure (bar)	Inlet	Outlet
MM1968P	O, D, N, CO <sub>2</sub> , H	28 bar	G1/2"M	G3/4"F
MM3401P	N (Argon, Nitrogen)	52 bar	G1/2"M	G3/4"F
MM3382P	P (Propane)	6 bar	G1/2"M	G3/4"F
MM3306ACP	A (Acetylene)	1,9 bar	G1/2"M	G3/4"F
9443240	Acetylene	1,55 bar	1/4NPT	G1/2"
9444210	Propane	6 bar	1/4NPT	G1/2"
9443250	O,D,N,CO <sub>2</sub>	18 bar	1/4NPT	G1/2"
9457180	O,D,N,CO <sub>2</sub>	28 bar	1/4NPT	G1/2"
9457190	O,D,N,CO <sub>2</sub>	45 bar	1/4NPT	G1/2"

# GAUGES



## CONTACT GAUGES KI 50 - NPT 1/4"

Contact gauge with inductive contact (KI),  
for visual and acoustic warning of low gas supply pressure and  
to monitor the cylinder pressures;  
for inert, combustible, oxidizing and corrosive gases and gas mixtures,  
nominal pressure maximum 300 bar

### SPECIAL FEATURES

- > Construction conforms to safety regulations EN 837-01
- > Switching point is freely adjustable in marked area (45°)
- > Pressure display at location and signal transmission for recording measured data
- > Ex-protection is possible in conjunction with corresponding signal box

### DESCRIPTION

These pressure measuring instruments have a robust chrome nickel steel/cooper-zinc-alloy housing in accordance with DIN 16063. When the gas cylinder is empty and by sinking cylinder pressure an inductive contact switch is activated. The switch point, i.e. the pressure level at which the signal should be triggered is freely adjustable within a sector of 45° (at 315 bar type e.g. 38 bar).

To set the switch point the pressure level marking is simply adjusted to the desired switch point.

### APPLICATION

Panel and manifolds can be fitted out with contact gauges as an optional. Contact gauges combine the advantages of a local display with the demand for an electric signal transmission. This allows for - in conjunction with special signal boxes - the optical and acoustic warning signal by low gas supply pressure or the monitoring of the line pressure with freely adjustable threshold.

### NOTICE ABOUT ELECTRICAL CONNECTIONS

The polarity must be taken into consideration when connecting as the inductive contact is an active electronic component. The KI 50 can only be operated with a special amplifier.

Suitable for operation are: Signal boxes DGM-SK and if needed switch amplifier DGM-TR.

TECHNICAL DATA	
<b>Measuring element:</b>	Bourbon tube
<b>Diameter:</b>	50 mm
<b>Design:</b>	Chemical-safety version DIN 16063
<b>Housing:</b>	CrNi-steel/copper-zinc-alloy
<b>Measuring element:</b>	CrNi-steel 1.4571, circular form/copper-zinc-alloy
<b>Inspection glass:</b>	Polycarbonate
<b>Accuracy:</b>	Class 2.5 (DIN 16005)
<b>Wrench size:</b>	14 mm
<b>Nominal pressure:</b>	230 bar/ 300 bar
<b>Display range:</b>	see gauge scale
<b>Threshold:</b>	Freely adjustable in marked range (45° of the display range from p = 0 originating)
<b>Gas suitability:</b>	All gases
<b>Contact:</b>	inductive slit sensor (in accordance with NAMUR)
<b>Working temperature:</b>	ambient: -25°C to +70°C measuring medium maximum +100°C
<b>Protection class:</b>	II 2 G EEx ia IIC T6, PTB 99 ATEX 2219 X
<b>Switching hysteresis:</b>	+/- 5 % (SEW)
<b>Control behavior:</b>	Contact type 1 (I1), contact of low impedance with increasing pressure
<b>Dimensions (Ø×d×h):</b>	50×35×70 mm
<b>Connection:</b>	NPT 1/4"m outside thread

Art.-Nr.	Type/ Contact-Type	Material	Display range	
			bar	psi
<b>H28191203</b>	KI 50-400/I1	BC	0-400	0-5800
<b>24037010</b>	KI 63-40/I1	BC	0-40	0-600

## CONTACT GAUGES WITH MAGNETIC REED CONTACT

### Contact gauge

#### with reed contact

for visual and acoustic warning of low gas supply pressure,  
to monitor the line pressure,  
nominal pressure maximum 300 bar

### SPECIAL FEATURES

- > Construction conforms to safety regulations of the BG-chemical industry
- > One switching point model
- > Pressure display and signal transmission for recording measured data
- > Ex-protection is possible in conjunction with corresponding signal box

### DESCRIPTION

These pressure measuring instruments have a robust stainless steel housing in safety version. When the gas cylinder nears empty and by sinking cylinder pressure and reed contact is activated.

TECHNICAL DATA	
<b>Measuring element:</b>	Bourbon tube
<b>Diameter:</b>	50 mm
<b>Design:</b>	Chemical-safety version
<b>Material:</b>	Housing: SS 1.4301, parts in contact with the measuring medium: 316 Window: Polycarbonat
<b>Accuracy:</b>	Class 2.5
<b>Working temperature:</b>	-25°C to +60°C/ -13°F to +135°F
<b>Display range:</b>	0/40 (0/580 psi), 0/400 bar (0/5800 psi)
<b>Threshold:</b>	400 bar gauge: 10-60 bar, 40 bar gauge: 1-6 bar
<b>Gas suitability:</b>	All industrial gases
<b>Connection:</b>	G1/4"m
<b>Contact:</b>	reed contact
<b>Maximum voltage:</b>	24 V DC/AC
<b>Current input:</b>	0.4 A
<b>Breaking capacity:</b>	8 W/ 8 VA
<b>Material of contact points:</b>	316L
<b>Contact types:</b>	contact open by decreasing value

Art.-Nr.	Material	Display range		Inlet connection
		bar	psi	
COM006695	SS	0-40	0-580	G 1/4"male, radial 6 o'clock position
COM006696	SS	0-400	0-5800	G 1/4"male, radial 6 o'clock position
COM006697	SS	0-400	0-5800	G 1/4"male, center back
COM005382	SS	0-40	0-580	G 1/4"male, center back

# SIGNAL BOXES DGM-SK 2N/4N /6N /10N

## SPECIAL FEATURES

- > Optional Fax-/SMS alarm
- > Low supply pressure monitoring with contact gauges
- > Collective alarm for control room
- > Fast system overview
- > Installation outside the Ex-Zone



Signal box



Intrinsically safe barriers

## AVAILABLE ACCESSORIES

Solenoid valve control and regulator DGM-MV, relay box DGM-IT, contact gauges and operation terminal DGM-AX for gas management system, mass flow controller, cylinder scales, rupture disks, floater, flow switch and cable monitoring.

## INSTALLATION

The housing is designed for wall mounting outside of a ex-area. Four mounting holes are provided in the back of the housing for this purpose. These can be accessed by unscrewing the cover.

## ORDER CODE

Type	Signals	Ex-protection	Power supply
<b>DGM-SK</b>	<b>O2N</b>	<b>E</b>	<b>230</b>
DGM-SK	O2N = 2 channels	0 = without	230 = 220- 250 V, 50- 60 Hz
DGM-SK	O4N = 4 channels	EX = with	110 = 110V 60 Hz
DGM-SK	O6N = 6 channels		
	10N = 10 channels		

## Signal box,

for optical and acoustic signaling of fault reporting, 2, 4, 6 and 10-channel versions

## DESCRIPTION

The gas management signal box DGM-SK is a fault indicating unit and can monitor up to ten electrical circuits for deviation from the norm. An integrated lamp and signal horn allow for testing the correct operation of the instrument. If one or more alarm signals are triggered (e.g. gas failure) an acoustic (buzzing noise) and an optical signal (red LED) are emitted for each channel. The acoustic signal is acknowledged by pressing a button, the optical signal does not switch off until all malfunctions have been remedied. The instrument is equipped with a collective alarm to notify a main central office, a control unit or an external signalling device. Any equipment is possible for use as a signal transmitter as long as it has either a mechanical contact or an inductive-contact in accordance with DIN 19234 NAMUR.

## APPLICATION

The DGM-SK is used for all kinds of alarm signalling, predominantly for monitoring gas supply or metered flow in gas applications. Monitoring of gas supply can be done by controlling the upstream or downstream pressure (using contact gauges), the weight of the bottle or through monitoring rupture disks, dependent upon model for as many as 10 cylinders simultaneously. Flow-switches, floaters or mass flow controllers are suitable as signal transmitters for the monitoring of metered flow. In connection with these new IT relay stations individual faults can be passed on by SMS or fax. For every individual alarm you can program an individual text or an SMS and also a separate target number.

### TECHNICAL DATA - CONNECTION LOAD

Power supply:	220- 250 V AC; 50-60 Hz; 110 V AC, 60 Hz
Fuse:	3.15 mA slow-blow
Note:	defective fuses may only be replaced by the manufacturer

### TECHNICAL DATA - INLETS

Signal transmitter:	zero potential, mechanical contacts, initiators comply with DIN 19234 (NAMUR)
Effective direction:	NC (normally closed)
Connection system:	2 wires
Signal transmitter supply:	10 V max. throughout the instrument, 10 mA max. (short circuit proof)
Max. load/circuit:	330 mH/ 4.0 µF (EEx ib IIC); 1000 mH/ 30.0 µF (EEx ib IIB)
Cable monitoring (optional):	Short circuit I > 6 mA, cable break I < 80 µA
Connection cross section:	2.5 mm <sup>2</sup> max.

### TECHNICAL DATA - OUTLETS (COLLECTIVE ALARM)

Alarm output:	2* relay output ( 1 change over contact)
Contact load:	max. 220- 250 AC, 50- 60 Hz; 100 VA max. 48 V, 1A

### TECHNICAL DATA - INTERNAL ALARM EQUIPMENT

Signal lamp:	LED green 5 mm
Acoustic alarm:	Piezo buzzer, f = 3.3 kHz
Collective alarm:	via zero potential break contact

### TECHNICAL DATA - AMBIENT CONDITIONS

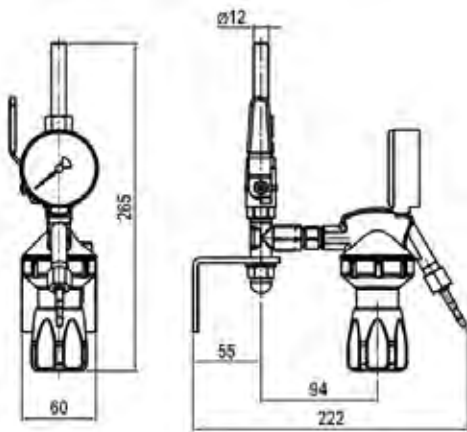
Ambient temperature:	0 – 40 °C
Humidity:	0 – 95 % rel. humidity, not condensing

### TECHNICAL DATA - DESIGN

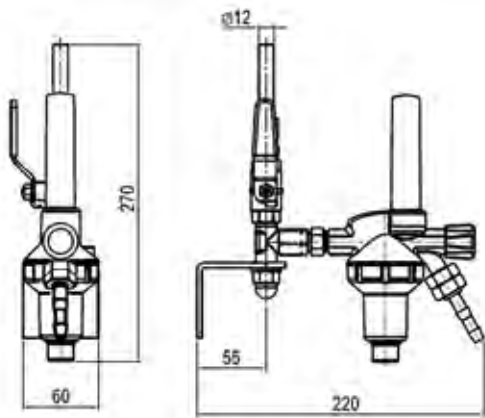
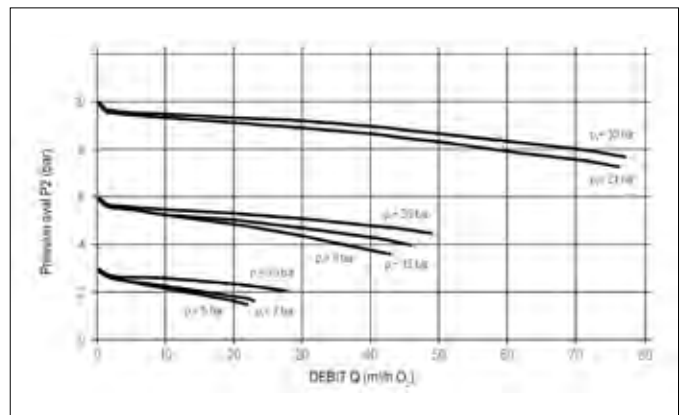
Housing:	Polystyrene colour similar to RAL 7035 (light grey)
Protection category:	IP 54
Dimensions (w×h×d):	200×160×60 mm
Installation position:	upright
Cable glands:	blue: 1 each of PG 9 and PG 11; grey: 1 each of PG 11 and PG 13.5

# DINSET

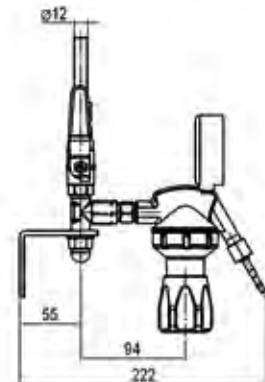
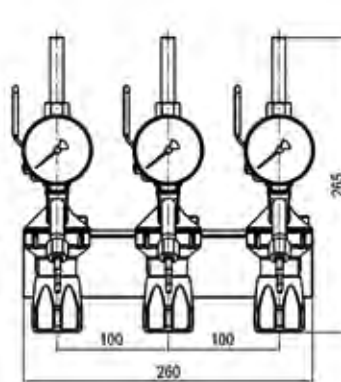
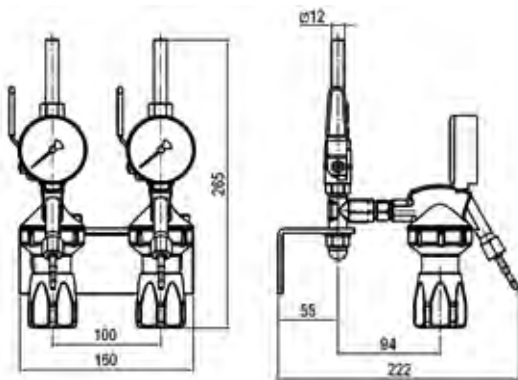
Dinset is classical GCE concept of products for industrial gases service based on premium Dincontrol regulator. They were created with using of huge professional experience in GCE group. They are continuously developed and optimized in accordance with current engineering knowledge. Dinset consists of inlet welding or brazing socket (acc. to gas type), inlet ball valve PN40, DIN-line regulator with pressure gauge, flow-gauge or flow-meter and hose nipple. Variants for shielding gases with flow-meter with dosing valve are supplying and indicating exact flow-rate. Components are mounted on V-profile steel wall bracket for safety installation. Functionality and quality of all components can be easy checked due to open design. Oxygen variant as well as acetylene and propane variants are prepared for optional installation of GCE flashback arrestors FR50 or SG5 due to identical outlet/inlet angle. But it can be used also other flashback arrestors from the market according to customer choice.



FLOW CAPACITY: OXYGEN



TECHNICAL DATA	
Regulator body and bonnet:	Brass
Diaphragm:	EPDM, NBR
Seat sealing:	PA, Chloroprene
Connectors & fittings:	Brass
Wall bracket:	Steel Zn-coated
Maximal inlet pressure:	30 bar Oxygen
Maximal inlet pressure:	40 bar Other gases
Temperature range:	from -20 °C to 60 °C



## DINSET SINGLE UNITS

Single units are prepared for all technical gases and can be used for all industrial processes.



Art.-Nr.	Type	Gas	Outlet range	Inlet	Outlet
14096150	Dinset Single	Acetylene	1,5 bar	G3/8"LH	G3/8"LH
14096151	Dinset Single	Oxygen	10 bar	G3/8"	G1/4"
14096152	Dinset Single	Ar/Mix	32 l/min Gauge	G3/8"	G1/4"
14096165	Dinset Single	Propane	2,5 bar	G3/8"LH	G3/8"LH
14096166	Dinset Single	Nitrogen	10 bar	G3/8"	G1/4"
14096167	Dinset Single	Compressed air	10 bar	G3/8"	G1/4"
14096168	Dinset Single	Ar/Mix	10 bar	G3/8"	G1/4"
14096169	Dinset Single	Hydrogen/methan	10 bar	G3/8"LH	G3/8"LH
14096172	Dinset Single	N <sub>2</sub> /H <sub>2</sub>	10 bar	G3/8"LH	G3/8"LH
14096170	Dinset Single	Ar/H <sub>2</sub>	32 l/min Gauge	G3/8"	G3/8"LH
14096171	Dinset Single	N <sub>2</sub> /H <sub>2</sub>	50 l/min Gauge	G3/8"LH	G3/8"LH
0785016	Dinset Single	O, D, N, CO <sub>2</sub>	10 bar	G3/8"	G3/8"

## DINSET FLOW

Single units for shielding gases with flow-meter and dosing valve are giving and showing exact flow-rate.



Art.-Nr.	Type	Gas	Outlet range	Inlet	Outlet
14096173	Dinset Flow	N <sub>2</sub> /H <sub>2</sub>	50 l/min Flow	G3/8"LH	G3/8"LH
14096163	Dinset Flow	Ar/Mix	30 l/min Flow	G3/8"	G1/4"
14096164	Dinset Flow	Ar/Mix	15 l/min Flow	G3/8"	G1/4"
0785017	Dinset Flow	Ar/Mix	30 l/min Flow	G3/8"	G3/8"

## DINSET DOUBLE UNITS

Double units are useful for oxy-fuel applications as well as for arc welding and plasma applications including root shielding. For other variants please ask your GCE partner.



Art.-Nr.	Type	Gas	Outlet range	Inlet	Outlet
14096153	Dinset Double	Oxy-Ace	see single units	G3/8"	G1/4", G3/8"LH
14096154	Dinset Double	Oxy-Prop	see single units	G3/8"	G1/4", G3/8"LH
14096155	Dinset Double	Oxy-Ar	see single units	G3/8"	2×G1/4"
14096156	Dinset Double	Ar-Ar	see single units	G3/8"	2×G1/4"
0785015	Dinset Double	Oxy-Ace	see single units	G3/8"	G1/4", G3/8"LH

## DINSET TRIPLE UNITS

Triple units designed mainly for oxygen cutting, flame applications and other welding and cutting technologies. But chosen combination of outlet points can be used for gas supply in all industrial processes. For other variants please ask your GCE partner.



Art.-Nr.	Type	Gas	Outlet range	Inlet	Outlet
14096157	Dinset Triple	Ar-Oxy-Ace	see single units	G3/8"	G1/4", G1/4", G3/8"LH
14096158	Dinset Triple	Oxy-Oxy-Ace	see single units	G3/8"	G1/4", G1/4", G3/8"LH
14096159	Dinset Triple	Oxy-Oxy-Prop	see single units	G3/8"	G1/4", G1/4", G3/8"LH
14096160	Dinset Triple	Oxy-Oxy-Ar	see single units	G3/8"	3× G1/4"
14096161	Dinset Triple	Oxy-Ar-Ar	see single units	G3/8"	3× G1/4"
14096162	Dinset Triple	Ar-Ar-Ar	see single units	G3/8"	3× G1/4"



# SPARE PARTS FOR DINSET OUTLET POINTS

## DINLINE AND DINFLOW REGULATORS



Art.-Nr.	Description	Gas	Outlet range	Inlet	Outlet
0783071	Dinline	Ar, N <sub>2</sub> , Compr. Air	10 bar	G3/8"	G1/4"
0783070	Dinline	Oxygen	10 bar	G3/8"	G1/4"
0783073	Dinline	Acetylene	1,5 bar	G3/8"LH	G3/8"LH
0783080	Dinline	Hydrogen/methan	10 bar	G3/8"LH	G3/8"LH
0783077	Dinline	Propane	2,5 bar	G3/8"LH	G3/8"LH
0783072	Dinline	Ar/Mix	32 l/min gauge	G3/8"	G1/4"
0783076	Dinline	N <sub>2</sub> /H <sub>2</sub>	50 l/min gauge	G3/8"LH	G3/8"LH
0783081	Dinline	Ar/H <sub>2</sub>	32 l/min gauge	G3/8"LH	G3/8"LH
0783078	Dinflow	N <sub>2</sub> /H <sub>2</sub>	50 l/min flow-meter	G3/8"LH	G3/8"LH
0783074	Dinflow	Ar/Mix	30 l/min flow-meter	G3/8"	G1/4"
0783075	Dinflow	Ar/Mix	15 l/min flow-meter	G3/8"	G1/4"



## BALL VALVES

Carbon steel Zn-coated, V-profile, PN40, DN10

Art.-Nr.	Description	Gas
14016153	with elbow	Oxygen
14016154	with elbow	All fuel gases
14016154	with elbow	Other gases



## WALL BRACKETS

Art.-Nr.	Description
14016145P	for single unit
14016146P	for double unit
14016147P	or triple unit



## BRAZING AND WELDING NIPPLES, NUTS

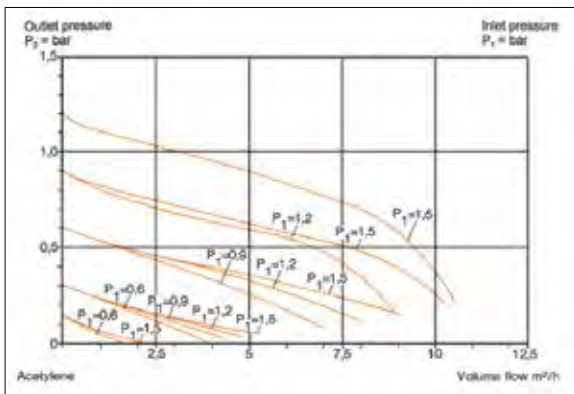
Art.-Nr.	Description	Material
14018004P	Welding nipple G3/8"	Carbon steel
4A19020P	Welding nipple G3/8"	Stainless steel
14018024P	Brazing nipple G3/8"	Brass
548200018932P	Swivel nut G3/8"LH	Brass
548200018934P	Swivel nut G3/8"	Brass

# UNISET

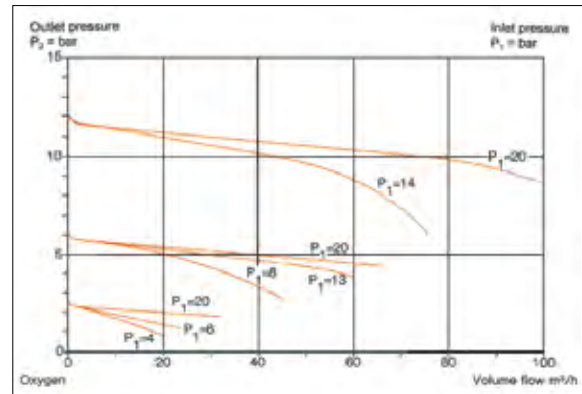
UNISET are new outlet points in GCE proposal for industrial gases service. They were created with using of long term experience with production of central gas supply systems. Variants for oxygen and fuel gases are equipped with three function flashback arrestors (FBA). There are two design types for shielding gases. First of them consists of flow-gauge showing flow-rate adjusted by pressure regulator. The second one is based on flow-meter with dosing valve supplying and indicating exact flow-rate. Components of entire range are mounted on stabile steel wall bracket ensuring fast and safety installation. Gas supply can be easy connected to application with outlet hose nipples.

Oxy/Inert variant is ready for oxygen service and can be used also for argon, nitrogen, helium carbon dioxide, compressed air and their mixtures. Special oxygen variant as well as acetylene and propane variants contain FBA. Fuel gas variant is designed for hydrogen, methane and natural gas. Unisets for shielding gases (Ar and Ar-mixtures) show adjusted flow-rate using either pressure gauge with flow-scale or flow-meter. Special twin-variant enable connection of two welding generators at one outlet pipe. This can be used also for combination of welding and root shielding with identical gas. Flow variant for N<sub>2</sub>/H<sub>2</sub> and Ar/H<sub>2</sub> with outlet capacity of 50 l/min is optimal for root shielding application.

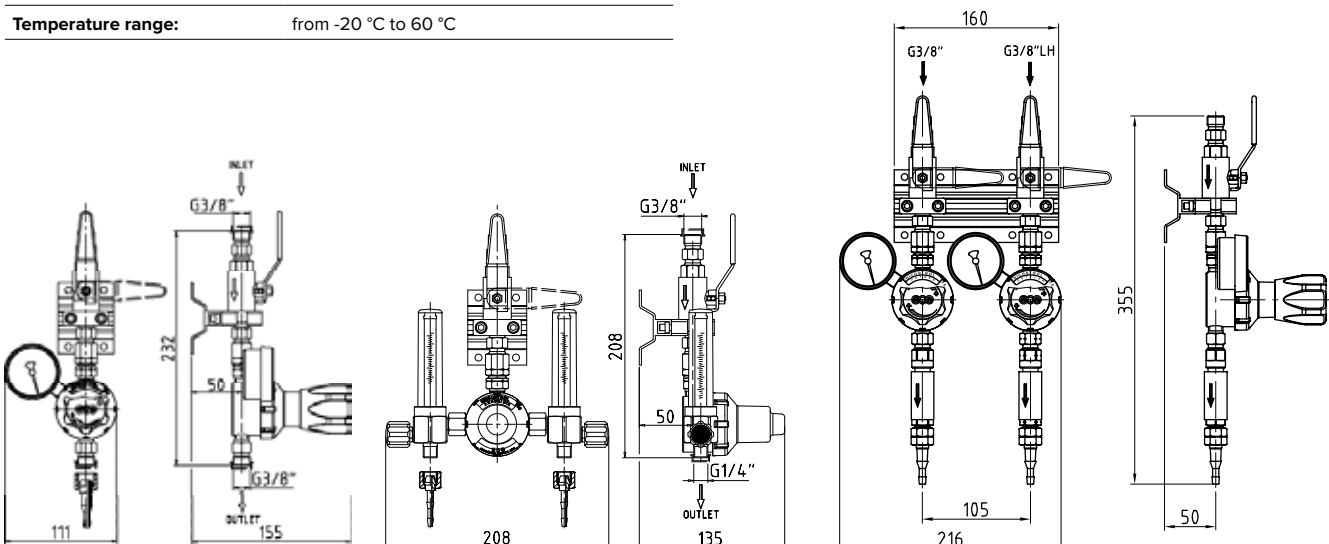
## FLOW CAPACITY: ACETYLENE



## FLOW CAPACITY: OXYGEN



TECHNICAL DATA	
Regulator body and bonnet:	Brass
Diaphragm:	EPDM, NBR
Seat sealing:	PA, Chloroprene
Connectors & fittings:	Brass
Wall bracket:	Steel Zn-coated
Maximal inlet pressure:	30 bar Oxygen
Maximal inlet pressure:	40 bar Other gases
Temperature range:	from -20 °C to 60 °C





## UNISSET SINGLE UNITS

Single units are prepared for all technical gases and can be used for all industrial processes.

Art.-Nr.	Type	Gas	Outlet range	Inlet	Outlet
0768156	Uniset Single	Oxy/Inert	2,5 bar	G3/8"	G3/8" + hose nipple 6,3-8 mm
0768157	Uniset Single	Oxy/Inert	5 bar	G3/8"	G3/8" + hose nipple 6,3-8 mm
0768158	Uniset Single	Oxy/Inert	10 bar	G3/8"	G3/8" + hose nipple 6,3-8 mm
0768109	Uniset Single	Oxy/Inert	16 bar	G3/8"	G3/8" + hose nipple 6,3-8 mm
0768210	Uniset Single	Inert/Inert	40 bar	G1/2"	G3/8" + hose nipple 6,3-8 mm
0768108	Uniset Single	Oxygen	10 bar FBA	G3/8"	G3/8" + hose nipple 6,3-8 mm
0768106	Uniset Single	Acetylene	1,5 bar FBA	G3/8"LH	G3/8"LH + hose nipple 6,3-8 mm
0768107	Uniset Single	Propane	2,5 bar FBA	G3/8"LH	G3/8"LH + hose nipple 6,3-8 mm
0768190	Uniset Single	Hydrogen/Methan	16 bar	G3/8"LH	G3/8"LH + hose nipple 6,3-8 mm
0768200	Uniset Single	Hydrogen	16 bar	G3/8"LH	G3/8"LH + hose nipple 6,3-8 mm
0768103	Uniset Single	Ar/Mix	30 l/min Gauge	G3/8"	G1/4" + hose nipple 4-6,3 mm
24037055	EMD 100-06	Nitrogen	35 bar	G1/2"	G3/8"
24037057	EMD 100-06	Oxy	16 bar	G1/2"	G3/8"



## UNISSET FLOW

Single units for shielding gases with flow-meter and dosing valve are giving and showing exact flow-rate.

Art.-Nr.	Type	Gas	Outlet range	Inlet	Outlet
0768104	Uniset Flow	Ar/Mix	15 l/min Flow	G3/8"	G1/4"+ hose nipple 4-6,3 mm
0768155	Uniset Flow	Ar/Mix	30 l/min Flow	G3/8"	G3/8"+ hose nipple 4-6,3 mm
0768260	Uniset Flow	N <sub>2</sub> /H <sub>2</sub> , Ar/H <sub>2</sub>	32 l/min Flow	G3/8"LH	G3/8"LH + hose nipple 6,3-8 mm
0768105	Uniset Twinflow	Ar/Mix-Ar/Mix	30 l/min Flow	G3/8"	2x G1/4"+ 2x hose nipple 4-6,3 mm



## UNISSET DOUBLE UNITS

Double units are useful for oxy-fuel applications as well as for arc welding and plasma applications including root shielding. Other gas combination are on request.

Art.-Nr.	Type	Gas	Outlet range	Inlet, Outlet
0768250	Uniset Double	Oxy - Ace	10 bar - 1,5 bar FBA	see single units
0768240	Uniset Double	Oxy - Prop	10 bar - 2,5 bar FBA	see single units



## UNISSET SPARE PARTS, FLOW-METERS

Flow-meters as a spare parts but can be used also for other applications.

Art.-Nr.	Type	Gas	Outlet range	Inlet	Outlet
0768170	Flowmeter	Ar/Mix	30 l/min	G3/8"	hose nipple 6,3 mm
0768180	Flowmeter	Ar/Mix	15 l/min	G3/8"	hose nipple 6,3 mm



## BRAZING AND WELDING NIPPLES, NUTS

Connecting nipples, outer diameter 12 mm.

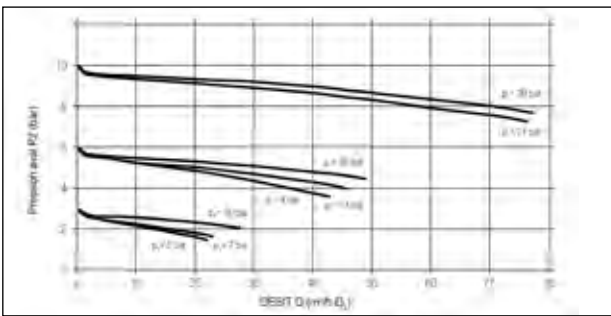
Art.-Nr.	Type	Material
14018004P	Welding nipple G3/8"	Carbon steel
4A19020P	Welding nipple G3/8"	Stainless steel
14018024P	Brazing nipple G3/8"	Brass
548200018932P	Swivel nut G3/8"LH	Brass
548200018934P	Swivel nut G3/8"	Brass

# UNISET+

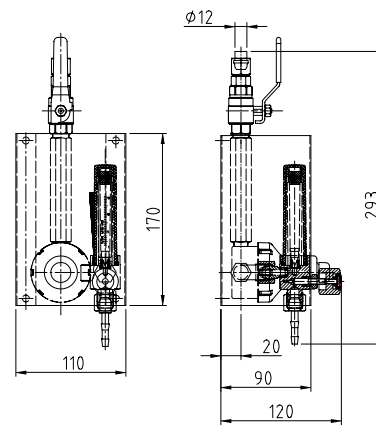
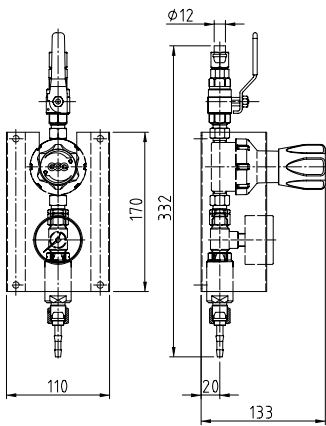
UNISET+ outlet points are an innovation in the field of central gas supply in deed. Excellent protection, given by the external steel cover, is combined with excellent look and easy assembly. Their high precision gives the possibility to use them with any industrial application. UNISET+ outlet points are based on inlet ball valve and line pressure regulator. All variants include inlet brazing socket for 8 mm tube and outlet hose nipple. Oxygen, acetylene and fuel gas version contain also pressure gauge and outlet safety device MV93. MV93 is flashback arrestor protecting pipe works and gas source against flame coming from application in case of safety issue. There are two types for shielding gases (Ar, Ar/CO2 and Ar/O2 mixtures).

First of them consists of flow-gauge showing flow-rate adjusted by pressure regulator. The second one is based on flow-meter with dosing valve giving and showing exact flow-rate.

UNISET+ outlet points are also called „Easy Work“ because of fast installation and easy handling. They can be mounted in less than 15 minutes, using appropriate tools. Maintenance operation thus makes very simply to be executed by just removing the metal cover, fully independent from the internal parts.



TECHNICAL DATA	
<b>Regulator body and bonnet:</b>	Brass, Zn alloy
<b>Diaphragm:</b>	EPDM, NBR
<b>Seat sealing:</b>	PA, Chloroprene
<b>Connectors &amp; fittings:</b>	Brass
<b>Wall bracket:</b>	Stainless steel
<b>Flashback arrestor:</b>	Brass Ni-coated
<b>Maximal inlet pressure:</b>	30 bar Oxygen
<b>Maximal inlet pressure:</b>	40 bar Inert gases
<b>Temperature range:</b>	from -20 °C to 60 °C



## UNISET+

### TYPICAL APPLICATION:

welding, cutting and allied processes

Art.-Nr.	Type	Outlet range	Inlet	Outlet
CE14000	Oxygen	Carbon steel		
CE14100	Acetylene	Stainless steel		
CE14105	Hydrogen/methan/LPG	Brass		
CE14200	Shielding gas	Brass		
CE14250	Shielding gas	Brass		
CE14300	Inert gases			

# HF-SET

HF-set are outlet points for high flow applications. There are originally prepared for installation of oxygen cutting machines but because of their high flow capacity they can be used for all industrial processes. Outlet points are based on two regulators. S100 regulator is prepared for oxygen, acetylene and propane (this can be also used for natural gas). Maximal flow capacity of S100 regulator is 100 Nm<sup>3</sup>/h for oxygen and 20 Nm<sup>3</sup>/h for fuel gases. Optionally can be added flashback arrestor GVA 90 eventually GVO 90. S200 regulator is designed for oxygen and has maximal flow capacity 200 Nm<sup>3</sup>/h. Maximal inlet pressure of HF-set outlet points is 30 bar for Oxygen and 40 bar for other industrial gases.



Type S200

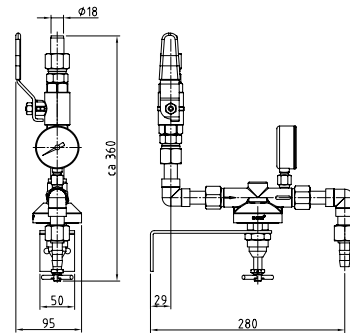


Type S100

## HF S100/S200

Individual high-capacity outlet points for various industrial oxy-fuel applications. There are versions for oxygen with S100 or S200 regulators, version for acetylene and for propane, both with S100 (BG20) regulator. Products can be equipped with flashback arrestor (FBA) GVO90 or GVA90.

Art.-Nr.	Description	Flow capacity	Outlet pressure	Inlet	Outlet
14016242	Oxygen S100	100 m <sup>3</sup> /h	10 bar	G3/4"	G3/4", ø12,5
0768195	Oxygen S100	100 m <sup>3</sup> /h	16 bar	G3/4"	G3/4", ø12,5
0768086	Oxygen S200	200 m <sup>3</sup> /h	15 bar	G3/4"	G3/4", ø12,5
0768087	Oxygen S100 + FBA	100 m <sup>3</sup> /h	10 bar	G3/4"	G1/2", ø11
14016243	Acetylene S100 (BG20)	20 m <sup>3</sup> /h	1,5 bar	G1/2"LH	G1/2" LH, ø11
14016244	Propane S100 (BG20)	20 m <sup>3</sup> /h	4 bar	G1/2"LH	G1/2" LH, ø11
0768088	Propane S100 (BG20) + FBA	20 m <sup>3</sup> /h	4 bar	G1/2"LH	G1/2" LH, ø11



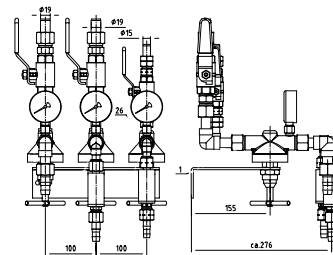
## HF TRIPLE S100

Three outlet points with S100 regulators mounted at the stable wall bracket. Outlets for heating oxygen as well as for fuel gas contain three function flashback arrestor GVO90 and GVA90.

Art.-Nr.	Description
14016180	S 100 triple unit oxy/acetylene
14016181	S 100 triple unit oxy/propane

### TECHNICAL DATA - MAX FLOW CAPACITY

Cutting oxygen	100 m <sup>3</sup> /h
Heating oxygen	100 m <sup>3</sup> /h
Fuel gas	20 m <sup>3</sup> /h



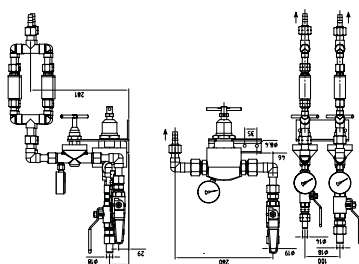
## HF TRIPLE S200

This triple outlet points are based on S200 regulator for cutting oxygen. Heating oxygen and fuel gas are supplied by S100 regulators, both with twin-connected three function flashback arrestor GVO90 and GVA90.

Art.-Nr.	Description
14016182	S 200 triple unit oxy/acetylene
14016183	S 200 triple unit oxy/propane

### TECHNICAL DATA - MAX FLOW CAPACITY

Cutting oxygen	200 m <sup>3</sup> /h
Heating oxygen	100 m <sup>3</sup> /h
Fuel gas	20 m <sup>3</sup> /h



These Point-of-use systems are designed for high performing applications, i.e. machine cutting and automatized heating and similar applications, where standard point-of-use stations do not provide sufficient capacity and flow and where it is not necessary to regulate gas pressure at the outlet of the pipeworks.



### HF BV, BALL VALVE UNIT

For compressed gases. Inlet: G 3/4" swivel nut with brazing nipple, diameter 19 mm. Outlet: G 3/4" swivel nut with hose nipples, 12,5 and 16 mm.

Art.-Nr.	Type	Gas, pressure	Inlet	Outlet
14016175	DN20 Ball valve unit	Oxy/Inert,	G3/4" + brazing	G3/4" + hose nipples
		40 bar	nipple 19 mm	12,5 mm and 16 mm



### HF BV WITH FBA, BALL VALVE UNIT WITH FLASHBACK ARRESTOR

Consists of high performance multi functional safety device GVO 90/GVA 90 and ball valve DN 20, without regulator.

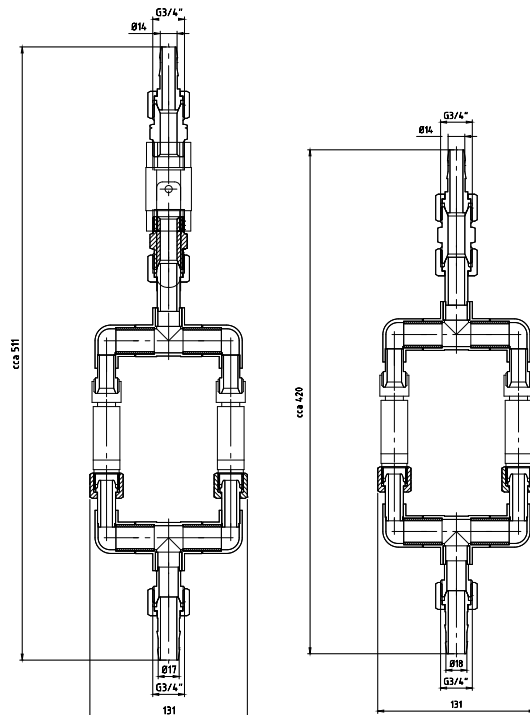
Art.-Nr.	Type	Gas, pressure	Inlet	Outlet
14016176	DN20 Ball valve unit with GVO90	Oxygen,	G3/4" + brazing	G1/2" + hose nipple 11 mm
		20 bar	nipple 19 mm	
14016176	DN20 Ball valve unit with GVA90	All fuel gases,	G1/2" + brazing	G1/2" + hose nipple 11 mm
		5 bar, 1,5 bar	nipple 19 mm	



### HF TWIN

Consists of 2 high performance multi functional safety devices GVO 90/GVA 90 and ball valve DN 20, without regulator.

Art.-Nr.	Type	Gas, pressure	Inlet	Outlet
14016177	DN20 Ball valve unit with twin GVO90	Oxygen,	G3/4" + hose	G3/4" + hose nipple 16 mm
		20 bar	nipple 12,5 mm	
14016179	DN20 Ball valve unit with twin GVA90	All fuel gases,	G3/4" + hose	G3/4"LH + hose nipple 16 mm
		5 bar, 1,5 bar	nipple 12,5 mm	
0764926	Twin GVO90 unit	Oxygen, 20 bar	G3/4" + hose	G3/4" + hose nipple 16 mm
			nipple 12,5 mm	
0764927	Twin GVA90 unit	All fuel gases,	G3/4"LH + hose	G3/4"LH + hose nipple 16 mm
		5 bar, 1,5 bar	nipple 12,5 mm	



# ACCESSORIES

## GAS PREHEATER FOR USING IN INDUSTRIAL GAS SUPPLY SYSTEMS

Gas preheater helps to prevent icing of parts of gas supply system by heating during expansion of highly compressed gases.

### SPECIAL FEATURES

- > Usable in supply systems for oxidizing, non- corrosive, inert gases.
- > Cleaned for O2 service
- > Safety against Oxygen burnout is ensured as there are no non- metallic materials coming into direct contact with medium.
- > CE- marked according to Directive 2014/35/EU
- > Correspond to requirements of Regulation (EC) No. 1935/2004 and (EC) No. 2023/2006 and fulfill the requirements on good manufacturing practice for materials coming into direct contact with food.



GGP250 B M16X1,5F M16X1,5F TYPE C



H28746619

Art.-Nr.	Type		Material Inlet connection	Outlet connection	Type of plug
COM008364	GGP250	B	M16 x 1,5 mm female	M16 x 1,5 mm female	Type C, „CEE 7/16“
19008004	GGP250	B	W21,8x1/14” female	W21,8x1/14” male	Type C, „CEE 7/16“
H28054801	GGP250	B	W21,8x1/14” male	W21,8x1/14” female	Type C, „CEE 7/16“
H28746719	GGP250	B	NPT ¼” female	NPT ¼” male	Type C, „CEE 7/16“
30024951	GGP250	B	NPT ¼” female	NPT ¼” female	Type C, „CEE 7/16“
H28746619	GGP250	B	G3/8” female	G 3/8” male	Type C, „CEE 7/16“

### TECHNICAL DATA

**Working temperature (environment)** -30 °C up to + 50 °C

**Inlet and outlet port** see order information

**Max. working pressure:** 300 bar

**Gas wetted materials** bronze, copper, brass

**Dimensions (width x height)** 86 mm x 61 mm

**Dimensions (length)** based on version- see following drawing

**Weight** app. 2,3 kg

**Voltage/Power:** 230V/ 50Hz/ 250 W

**Electrical connection** plug with 2m connection cable

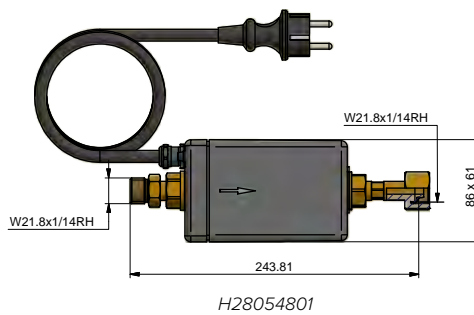
**Protection class plug** IP44

**Protection class cage** IP65

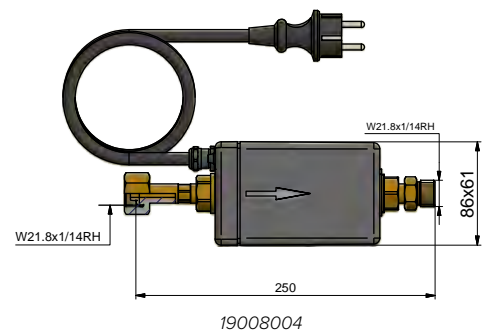
**Temperature switch** 70 +/- 5°C

**Temperature limiter with manual reset**

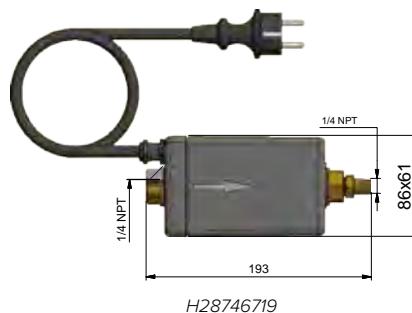
**Green LED for signal “Heating system ON”**



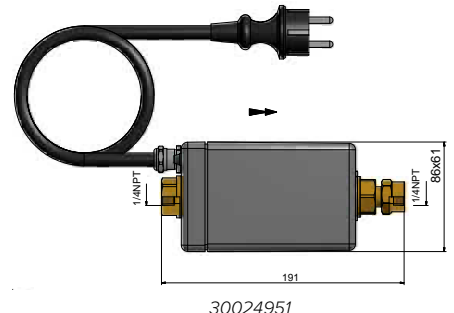
H28054801



19008004



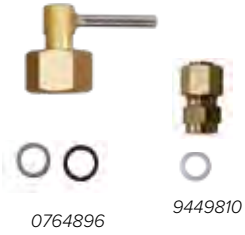
H28746719



30024951

## OUTLET CONNECTIONS

Purge valve blow-out tube for M70line and M400line manifolds. Inlet connection with sleeve nut, W21,8×1/14". UC500 Pressure relieve valve outlet should be mounted at MM70 Line manifolds to be connected with evacuating pipe.



Art.-Nr.	Description
0764896	Purge valve outlet W21,8×1/14"
9449810	UC500 pressure relieve valve outlet



Purge valve with outlet connection mounted on X-block

## HIGH PERFORMANCE MULTI FUNCTIONAL FLASHBACK ARRESTOR FOR MANIFOLD CONNECTION OR FOR HIGH FLOW OUTLET POINTS



Art.-Nr.	Type	Gas	Inlet/Outlet	Max. pressure	Max. flow rate
14008440	GVO 90	Oxygen	G3/8"	25 bar	6.6 Nm <sup>3</sup> /h at 2.5 bar
					19.0 Nm <sup>3</sup> /h at 4.0 bar
					67.0 Nm <sup>3</sup> /h at 8.0 bar
14008131	GVO 90	Oxygen	G1/2"	25 bar	6.6 Nm <sup>3</sup> /h at 2.5 bar
					19.0 Nm <sup>3</sup> /h at 4.0 bar
					67.0 Nm <sup>3</sup> /h at 8.0 bar
14008121	GVA 90	Acetylene	G3/8"LH	1.5 bar	6.0 Nm <sup>3</sup> /h at 0.2 bar
					7.2 Nm <sup>3</sup> /h at 0.5 bar
					8.4 Nm <sup>3</sup> /h at 1.5 bar
		Hydrogene		4 bar	22.0 Nm <sup>3</sup> /h at 0.5 bar
					27.0 Nm <sup>3</sup> /h at 1.5 bar
		Methane		5 bar	8.4 Nm <sup>3</sup> /h at 0.5 bar
					9.8 Nm <sup>3</sup> /h at 1.5 bar
		Propane		5 bar	5.4 Nm <sup>3</sup> /h at 0.5 bar
6.3 Nm <sup>3</sup> /h at 1.5 bar					
14008130	GVA 90	Acetylene	G1/2"LH	1.5 bar	6.0 Nm <sup>3</sup> /h at 0.2 bar
					7.2 Nm <sup>3</sup> /h at 0.5 bar
					8.4 Nm <sup>3</sup> /h at 1.5 bar
		Hydrogene		4 bar	22.0 Nm <sup>3</sup> /h at 0.5 bar
					27.0 Nm <sup>3</sup> /h at 1.5 bar
		Methane		5 bar	8.4 Nm <sup>3</sup> /h at 0.5 bar
					9.8 Nm <sup>3</sup> /h at 1.5 bar
		Propane		5 bar	5.4 Nm <sup>3</sup> /h at 0.5 bar
6.3 Nm <sup>3</sup> /h at 1.5 bar					
0764975	GVA 90	Acetylene	G1/2"	1.5 bar	6.0 Nm <sup>3</sup> /h at 0.2 bar
					7.2 Nm <sup>3</sup> /h at 0.5 bar
					8.4 Nm <sup>3</sup> /h at 1.5 bar
		Hydrogene		4 bar	22.0 Nm <sup>3</sup> /h at 0.5 bar
					27.0 Nm <sup>3</sup> /h at 1.5 bar
		Methane		5 bar	8.4 Nm <sup>3</sup> /h at 0.5 bar
					9.8 Nm <sup>3</sup> /h at 1.5 bar
		Propane		5 bar	5.4 Nm <sup>3</sup> /h at 0.5 bar
6.3 Nm <sup>3</sup> /h at 1.5 bar					

Attention: Please obtain the regular inspection for safety devices. Note the national laws.



## FLASHBACK ARRESTORS FOR CYLINDER REGULATORS OR FOR OUTLET POINTS

Safety device (flashback arrester) for regulators.



Art.-Nr.	Type	Gas	Inlet/Outlet	Max. pressure	Max. flow rate based on inlet pressure
14008400	GVO 10	Oxygen	G1/4"	25 bar	6.7 Nm <sup>3</sup> /h at 2.5 bar
					10.0 Nm <sup>3</sup> /h at 4.0 bar
					38.0 Nm <sup>3</sup> /h at 9.0 bar
14008401	GVO 10	Oxygen	G3/8"	25 bar	6.7 Nm <sup>3</sup> /h at 2.5 bar
					10.0 Nm <sup>3</sup> /h at 4.0 bar
					38.0 Nm <sup>3</sup> /h at 9.0 bar
14008402	GVA 10	Acetylene	G3/8"LH	1.5 bar	3.0 Nm <sup>3</sup> /h at 0.2 bar
					4.2 Nm <sup>3</sup> /h at 0.5 bar
					5.0 Nm <sup>3</sup> /h at 1.5 bar
	GVA 10	Hydrogene	G3/8"LH	3.5 bar	12.0 Nm <sup>3</sup> /h at 0.5 bar
					17.0 Nm <sup>3</sup> /h at 1.5 bar
	GVA 10	Methane	G3/8"LH	5 bar	4.9 Nm <sup>3</sup> /h at 0.5 bar
					6.3 Nm <sup>3</sup> /h at 1.5 bar
	GVA 10	Propane	G3/8"LH	5 bar	3.1 Nm <sup>3</sup> /h at 0.5 bar
4.0 Nm <sup>3</sup> /h at 1.5 bar					

Attention: Please obtain the regular inspection for safety devices. Note the national laws.

## DEMAX/SIMAX - 3 FUNCTION MANIFOLD FLASHBACK ARRESTORS



The manifold (line) flashback arrestors of the SIMAX and DEMAX family are products specially designed to provide maximal flow rate with minimal pressure drop necessary for central gas manifolds or cylinder bundle supply systems. Enormous flow capacity without any compromising of safety is achieved by the splitting of massive gas flow into several sections protected by individual flame arresting units. Sintered stainless steel filters in every unit provide flame arresting function, each of them is fitted by reliable non-returning valves and integrated thermal (melting) fuses. Individual units are arranged into compact clusters fitted by connection flanges allowing easy integration in to manifold pipelines.

Many other higher capacity variants (SIMAX 5/8...) are available on request. To reach optimal performance and before choosing and purchasing GCE recommend consulting our experts who can give advice on your individual application.

Complies with EN730, German BAM institute tested.

SIMAX / DEMAX offers following safety functions:

- > FA Sintered flame arresting element
- > NV Non return valve to prevent reverse flow of gases
- > TV Thermal trip device, activated by heat to permanently cut off the gas supply.

Art.-Nr.	Gas	Description	Function	Pressure	Thread	Weight
0764433	OXY	FBA DEMAX-5 Oxy G1/2" RH	NV, FA, TV	15 bar	G1/2"RH	1,45 kg
0764432	FUEL	FBA DEMAX-5 Fuel G1/2" LH	NV, FA, TV	5 bar	G1/2"LH	1,45 kg
0764435	OXY	FBA SIMAX-3 Oxy G1" RH	NV, FA, TV	15 bar	G1"RH	3,55 kg
0764434	FUEL	FBA SIMAX-3 Fuel G1" LH	NV, FA, TV	5 bar	G1"RH	3,55 kg

## GCE SAFE-GUARD-5

The latest innovation from GCE the SAFE-GUARD-5 offers the maximum level of protection required by EN730-1 to prevent dangerous flashbacks from reaching the regulator and cylinder supply sources.

### FUNCTIONS

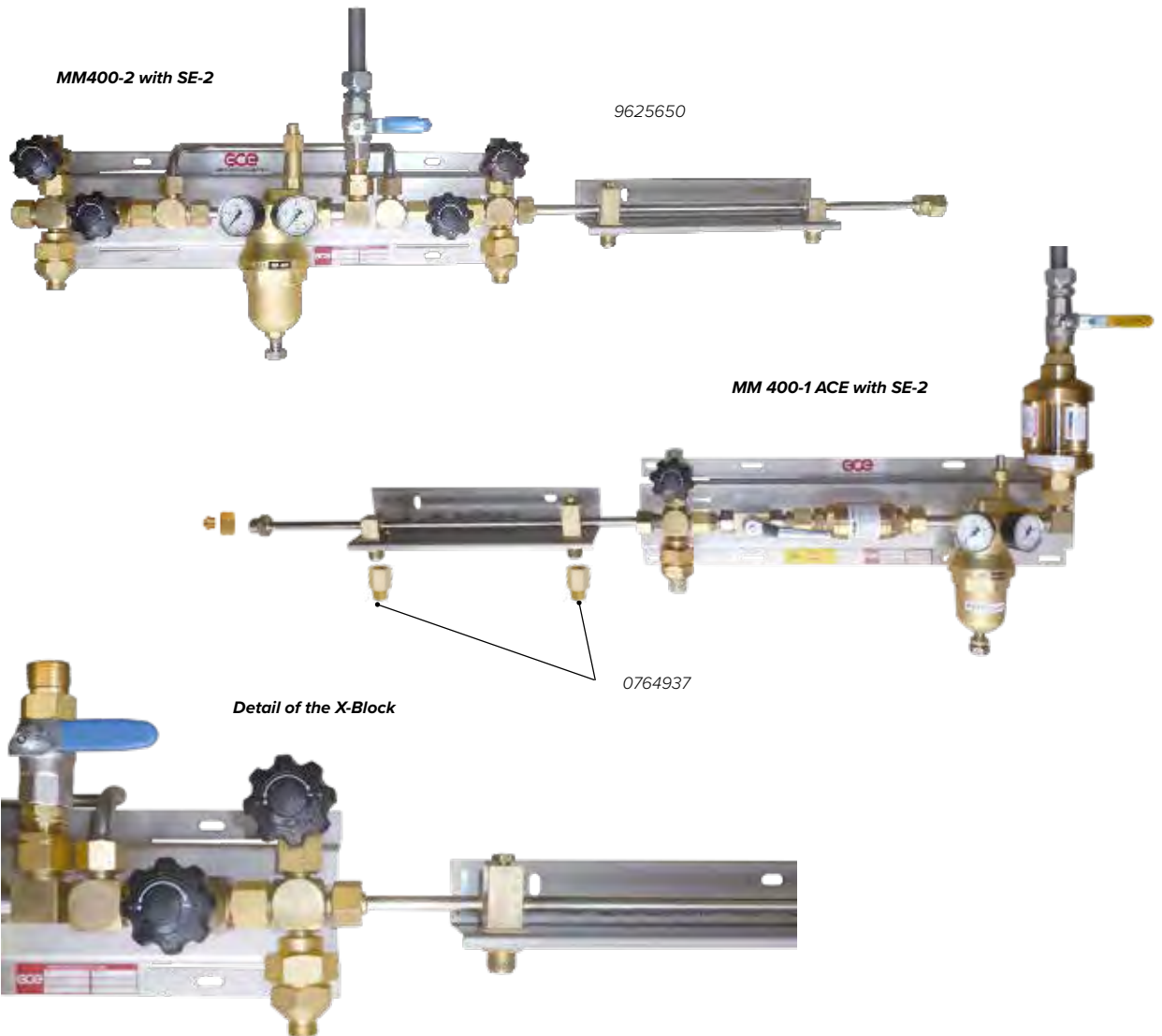
- > Flame arresting element (FA)
- > Non return valve (NV)
- > Pressure sensitive cut off valve (PV)
- > Temperature sensitive cut off valve (TV)
- > Reset mechanism to clearly advise unit activation (RM)

Art.-Nr.	Gas	Inlet connection	Max. pressure	Outlet connection
0764456	Fuel	G3/8" LH Female	A:1,5 bar; HPMYF:5 bar	G3/8" LH Male
0764457	Oxygen	G3/8" Female	10 bar	G3/8" Male
0764458	Oxygen	G1/4" Female	10 bar	G1/4" Male



# APPLICATIONS AND VARIANTS

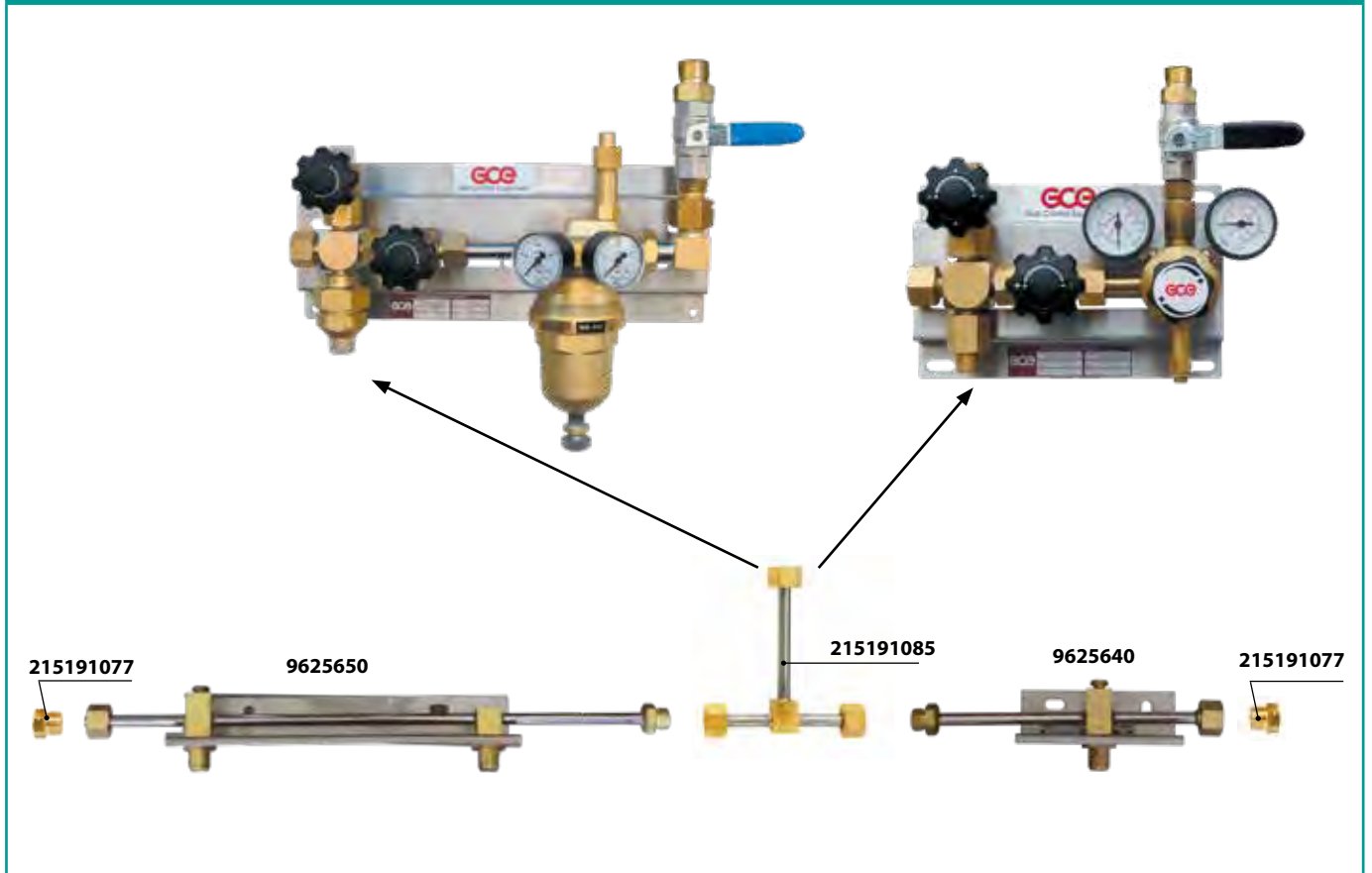
## SE LINE APPLICATION EXAMPLES



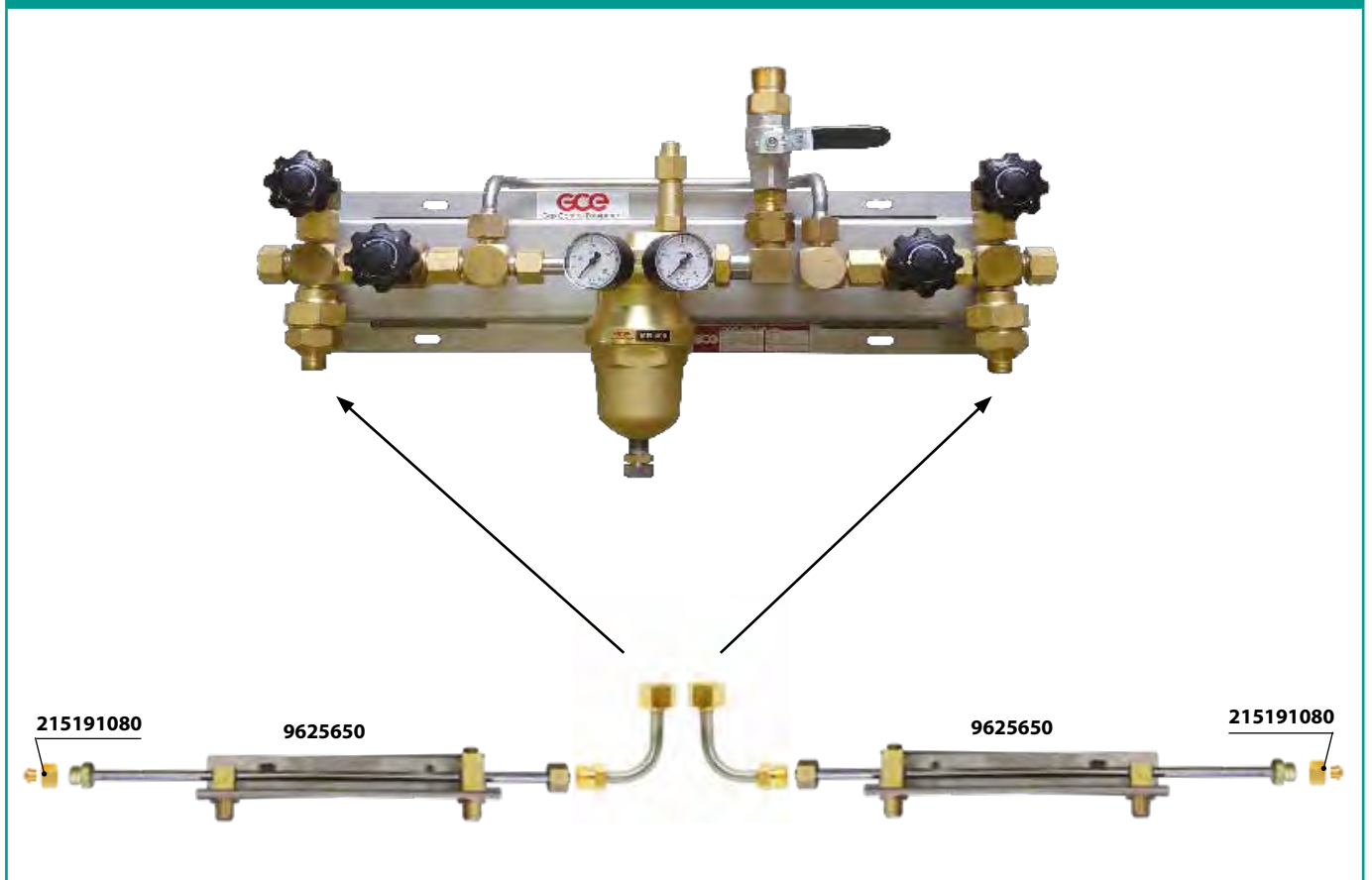
## HIGH PRESSURE COMPONENTS OF MM400 MANIFOLD



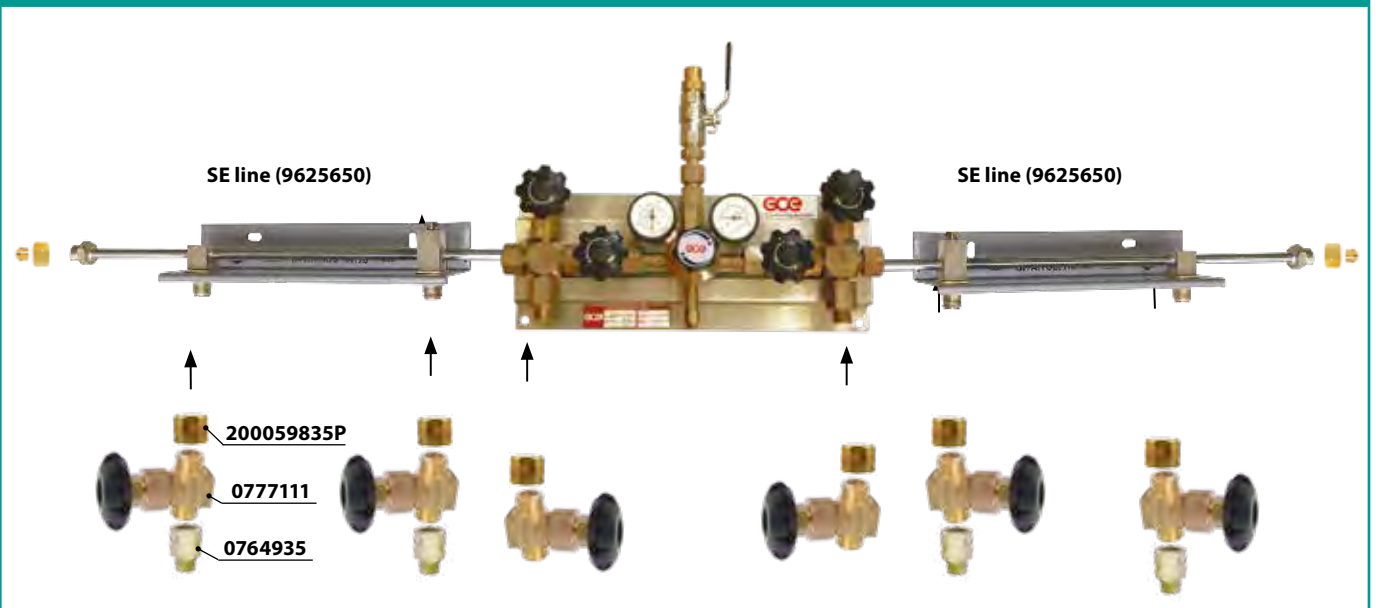
### SE LINE MOUNTING EXAMPLES WITH T-PIECE



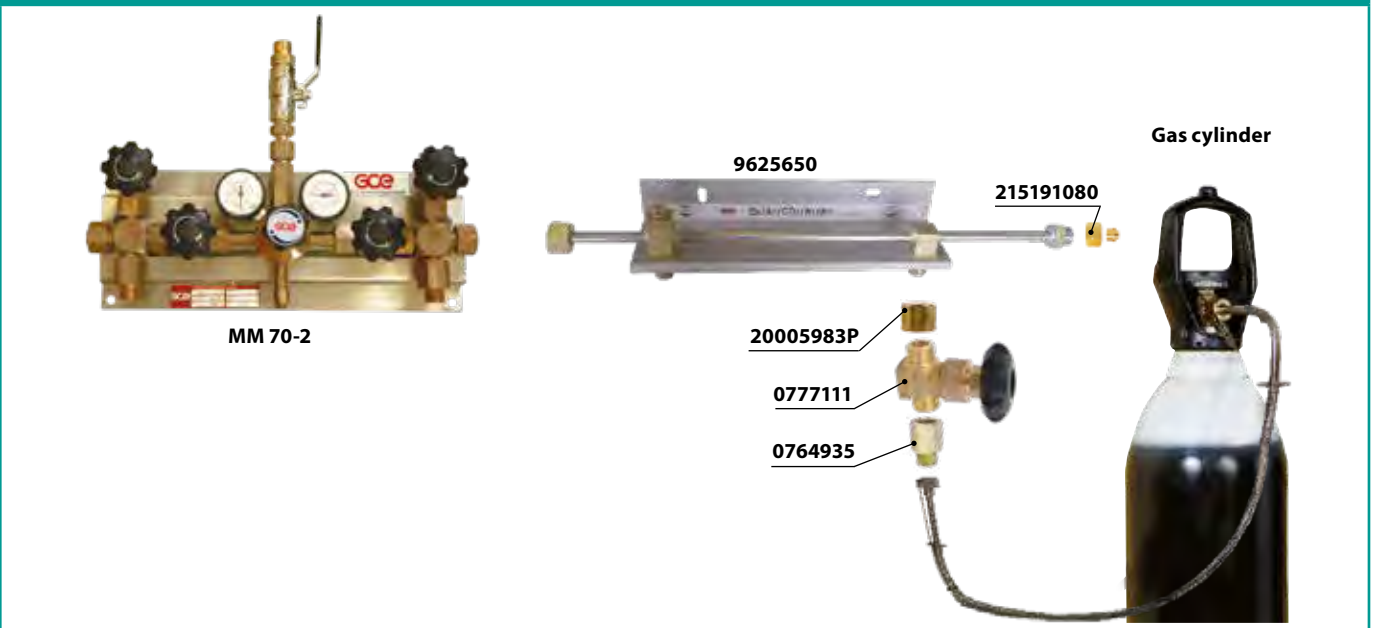
### SE-LINE MOUNTING EXAMPLE WITH ELBOW



MM70-2 WITH SE-2



SE LINE MOUNTING

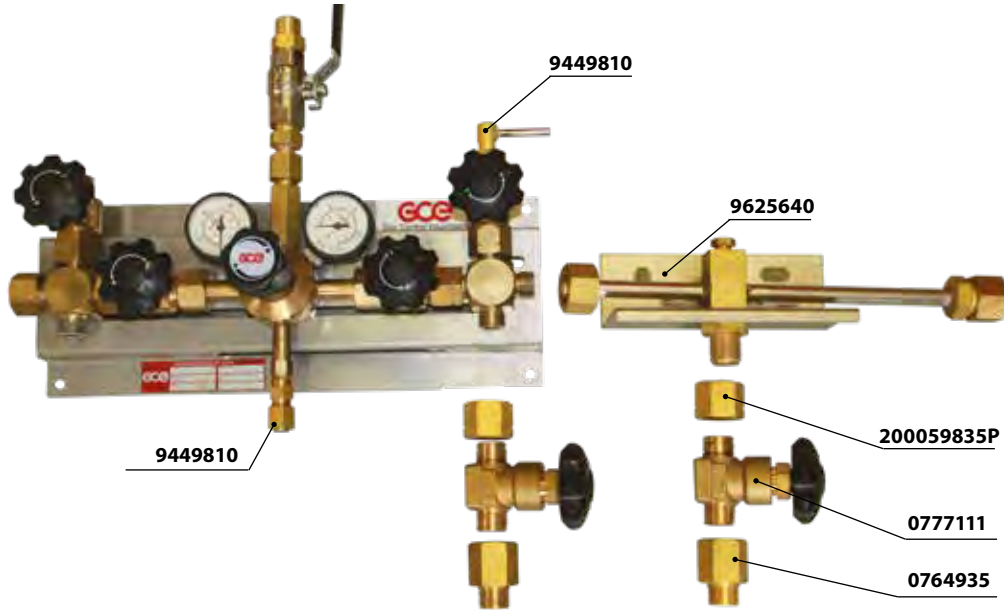


HIGH PRESSURE ACETYLENE SAFETY DEVICES OF MM400 MANIFOLD



### MM70-2 MANIFOLD APPLICATION

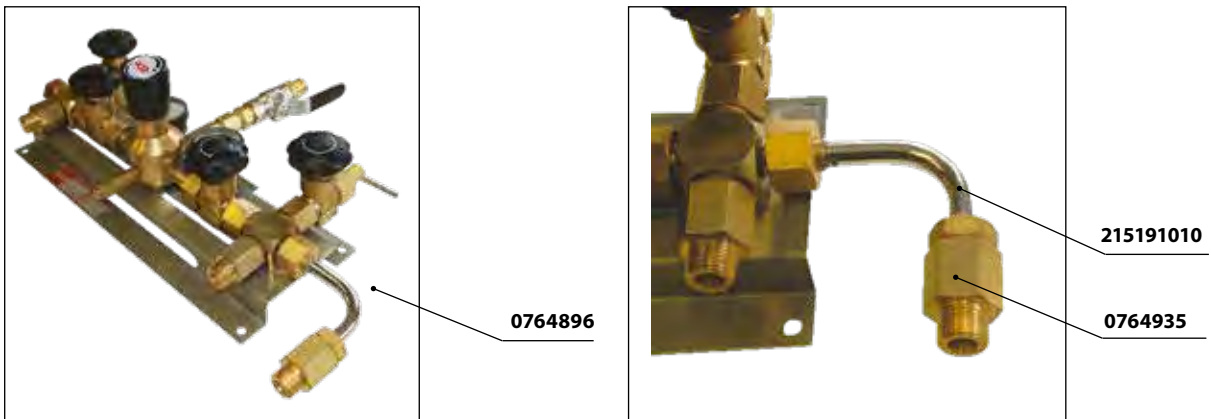
MM70-2 extended with pressure relief valve outlet, purge valve outlet. Right bank is extended for 2 cylinders with SE-1 and shut-off valve and non-return valve.



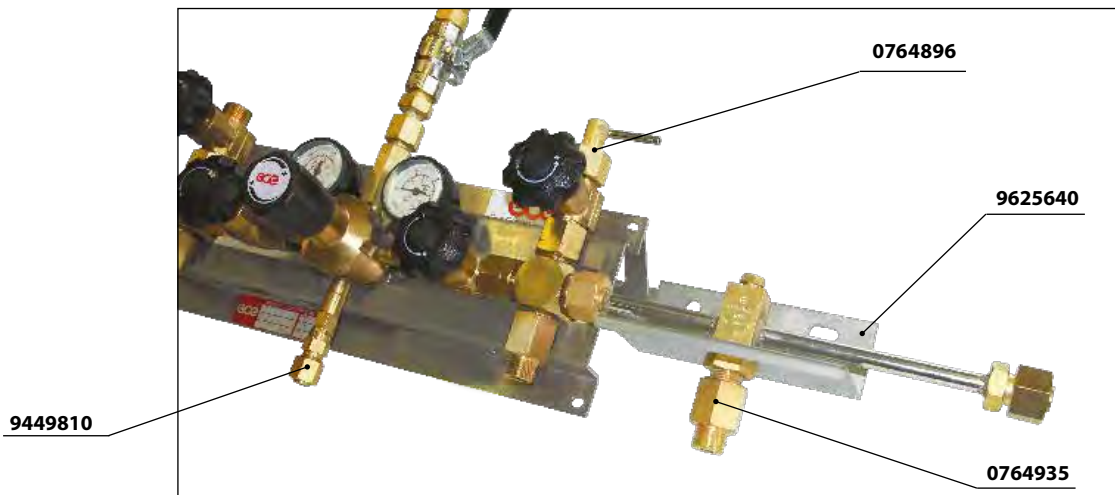
### RELIEF VALVE OUTLET WITH BRAZING NIPPLE



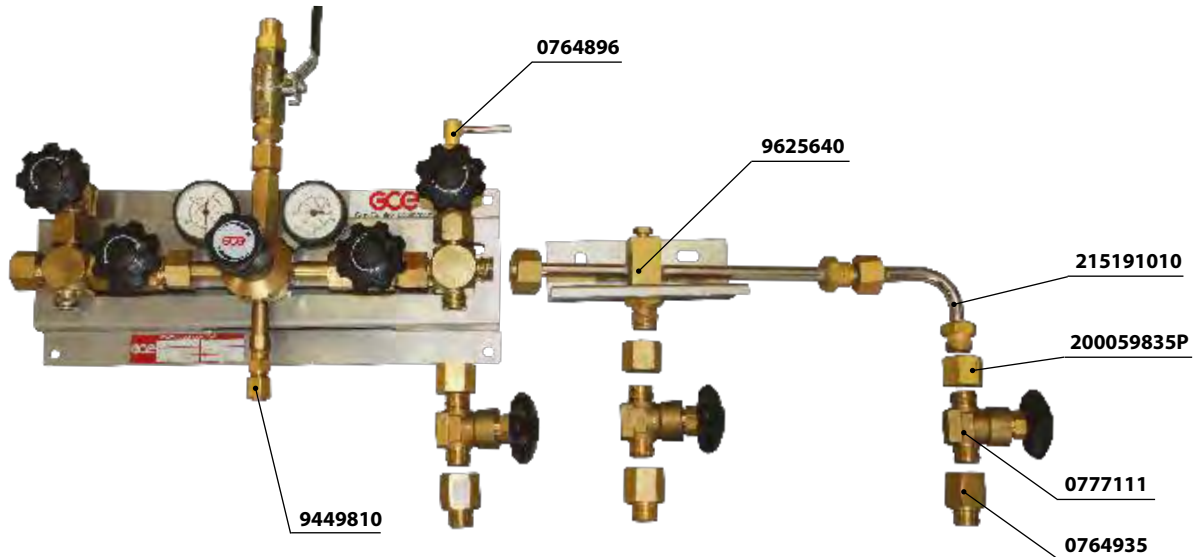
### RELIEF VALVE OUTLET WITH BRAZING NIPPLE



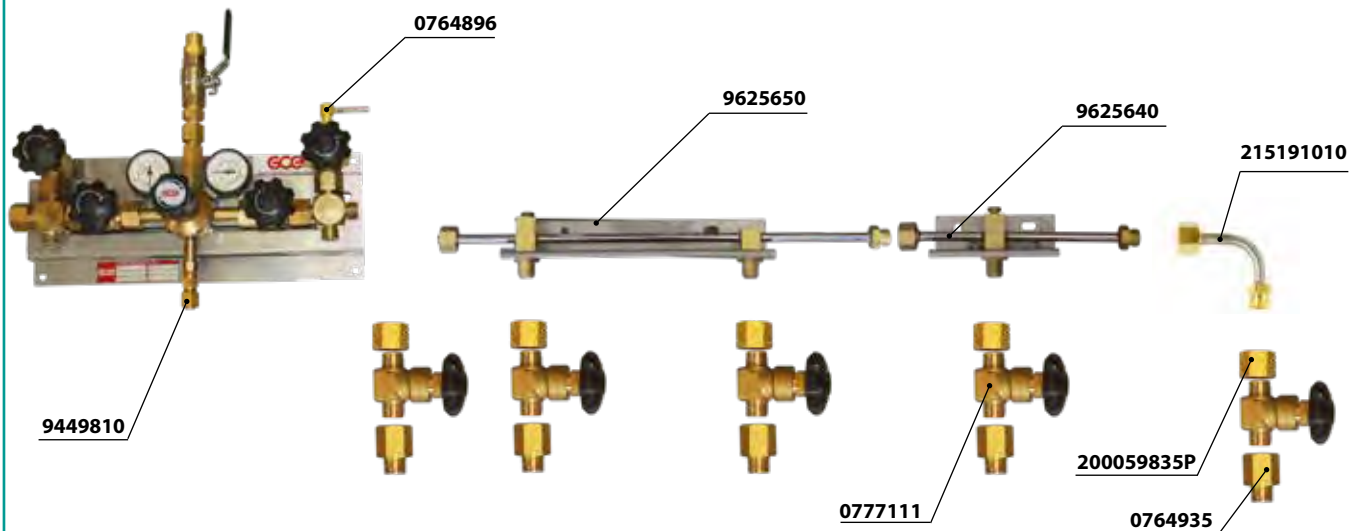
MM70-2 WITH SE-2



SE LINE MOUNTING



HIGH PRESSURE ACETYLENE SAFETY DEVICES OF MM400 MANIFOLD



## FUEL GASES



Methane (Natural Gas) -  $CH_4$



Ethane -  $C_2H_6$



Ethene (ethylene) -  $C_2H_4$



Ethine (acetylene) -  $C_2H_2$



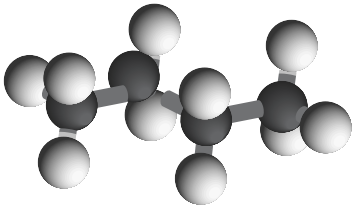
Propane -  $C_3H_8$



Propene (propylene) -  $C_3H_6$



Propyne (methylacetylene) -  $C_3H_4$



n - Butane -  $C_4H_{10}$

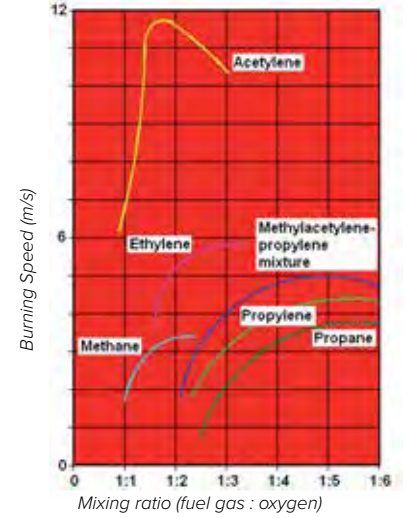
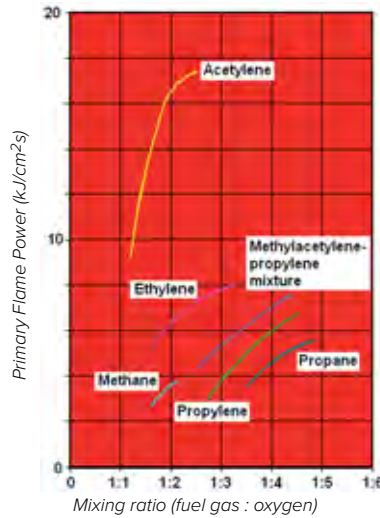
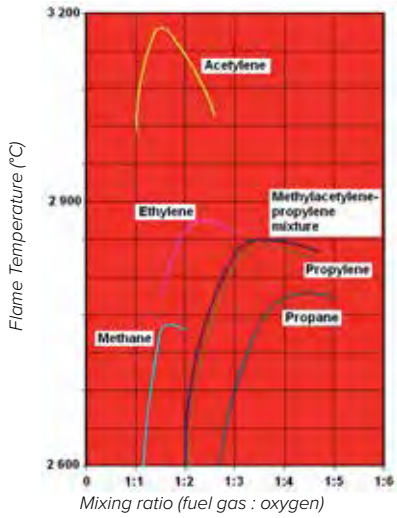


1 - Butene -  $C_4H_8$



Butadiene -  $C_4H_6$

## FUEL GASES PROPERTIES:



## FUEL GASES PROPERTIES

Fuel gas type			Heating power		Mixing ratio		Flame temperature (°C)		Density		Relative density to air
					V oxygen / V fuel gas				A bar, 15°C	liquid form	
			MJ/m <sup>3</sup>	MJ/kg	N	M	N	M	Kg/m <sup>3</sup>	kg/l	
Hydrogen	H <sub>2</sub>	H	10,758	119,533	0,36	0,42	2 835	2 856	0,09	0,07	0,007
Methane	CH <sub>4</sub>	M	31,814	44,186	1,6	1,8	2 770	2 786	0,72	0,42	0,566
Acetylene	C <sub>2</sub> H <sub>2</sub>	A	56,93	48,678	1,1	1,5	3 106	3 160	1,11	0,62	0,923
Ethylene	C <sub>2</sub> H <sub>4</sub>	F	55,674	47,6	1,8	2,4	2 902	2 924	1,17	0,57	0,98
Propylene	C <sub>3</sub> H <sub>6</sub>	Y	89,999	46,153	2,8	3,5	2 872	2 896	1,95	0,58	1,506
Propane	C <sub>3</sub> H <sub>8</sub>	P	93,557	46,315	3,75	4,3	2810	2820	2,02	0,53	1,589

Glossary: V - volume, N - mixing ratio with neutral flame, M - mixing ratio with maximal flame temperature

## CYLINDER CONNECTION FOR WORKING PRESSURES UP TO 200 BAR

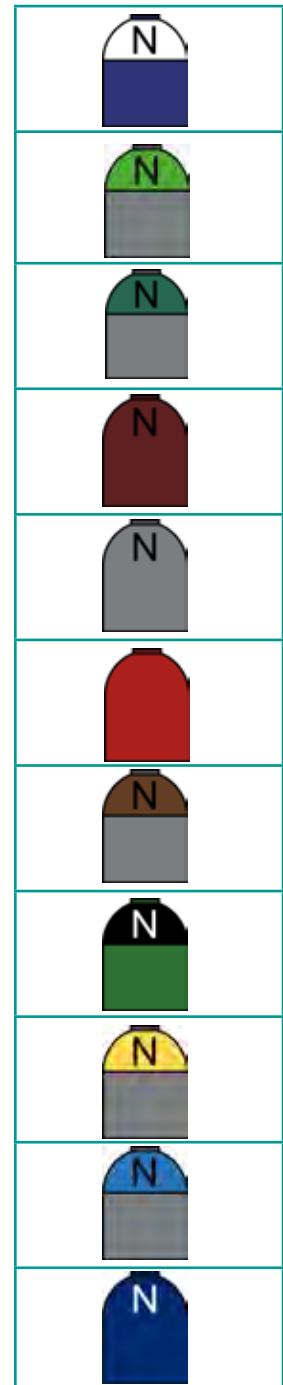
Gas/Country Standard	Sweden SS 2238	Czech Republic ČSN 078600	Germany DIN 477	France NF E 29-650	UK BS 341	Spain MIE-AP7	Italy UNI 11144
Oxygen	W21,8	W21,8	G3/4	SI22,91	G5/8	W22,91	W21,7
Acetylene	G3/4	Yoke	Yoke or M24×2LH	Yoke or W22,91LH	G5/8 LH	Yoke or W22,91LH	Yoke or G5/8LH
Argon	W24,32	W21,8	W21,8	SI21,7	G5/8	W21,7	W24,5
Nitrogen	W24,32	W24,32	W24,32	SI21,7	G5/8	W21,7	W21,7
Air	G5/8	G5/8	G5/8	SI30×1,75	G5/8	M30×1,75	W30
Hydrogen	W21,8LH	W21,8 LH	W21,8 LH	SI21,7LH	G5/8 LH	W21,7LH	W20 LH
Carbon dioxide	W21,8	G3/4	W21,8	SI21,7	W0,860	W21,7	W21,7

## EXPLOSIBILITY

Fuel gas		Explosibility limit (%)		
			% of fuel gas in Oxygen	% of fuel gas in Air
Acetylene	C <sub>2</sub> H <sub>2</sub>	High	93	80
		Low	2,5	2,5
Propane	C <sub>3</sub> H <sub>8</sub>	High	45	9,5
		Low	2,2	2,2
Natural gas (Methan)	CH <sub>4</sub>	High	60	15
		Low	5	5
Hydrogen	H <sub>2</sub>	High	94	74,5
		Low	4	4

## GAS CYLINDER IDENTIFICATION

COLOUR CODING ACCORDING TO EN 1089-3 FOR INDUSTRIAL GASES



## MAXIMAL FLOW RATE ACETYLENE PER 40L OR 50L CYLINDER AT 15°C

Short-term consumption (max.10 min.)	max. 1 m <sup>3</sup> /hour	
For a 1 shift (approx. 8 hours)	max. 0,5 m <sup>3</sup> /hour	
Continuous consumption	max. 0,35 m <sup>3</sup> /hour	

## CONVERSION OF PRESSURE UNITS

	bar	mbar	kPa	MPa	atm	psi
bar	1	1x10 <sup>3</sup>	100	0,1	0,986	14,504
mbar	1x10 <sup>-3</sup>	1	0,1	1x10 <sup>-4</sup>	9,869x10 <sup>-4</sup>	0,0145
kPa	1x10 <sup>-2</sup>	10	1	1x10 <sup>-3</sup>	9,869x10 <sup>-3</sup>	0,145
MPa	10	1x10 <sup>4</sup>	1x10 <sup>3</sup>	1	9,869	145,038
atm	1,013	1013	1,013x10 <sup>2</sup>	0,101	1	14,696
psi	0,0689	68,948	6,895	6,89x10 <sup>-3</sup>	6,895x10 <sup>-2</sup>	1

## FLOW RATES CONVERSION COEFFICIENT

Test gas	Gas conversion coefficient (ISO 7291)								
	Air	Oxygen	Nitrogen	Argon	Hydrogen	Helium	Acetylene	LPG	CO <sub>2</sub>
Air	1	0,95	1,02	0,851	3,81	2,695	1,05	0,800	0,808
Nitrogen	0,983	0,93	1	0,837	3,75	2,65	1,03	0,784	0,792

Standard atmosphere at 23 °C and 1,013 bar (0,1013 MPa), ISO 554





# TECHLINE COMPLETE RANGE



# GCE DRUVA TECHLINE

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The GCE druva TECH LINE is the industrial gas and hydraulic pressure regulator line. It is a broad line of pressure reducing regulators and back pressure regulators, which can be operated by hand, by use of a dome or air-actuated. The gas purity is maximum 5.0. Regulators are diaphragm and piston sensed. To best cover customer needs, there is ample choice of Cv values, seat materials, O-rings and seals. Besides standard solutions, customer specific requests can be fulfilled as well. Quality wise, the range fulfills many industry specific standards and its heated regulator range is ATEX-approved.

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## TYPICAL HYDRAULIC APPLICATIONS ARE:

- > Hydraulic Power Unit (HPU)
- > Wellhead Control Panel
- > SC-SSV – Surface Controlled Subsurface Safety Valve
- > Blowout Preventer
- > Accumulators
- > Umbilical Reels
- > IWOCS – Intervention Work Over Control System
- > Hydraulic Seals / Seal protection – Injection & Production Lines (FPSO)
- > Valve Automation Systems, Choke Control, ESD Systems, and Actuators
- > Test & Calibration Systems
- > ROV Control
- > Fuel & Lubrication Systems



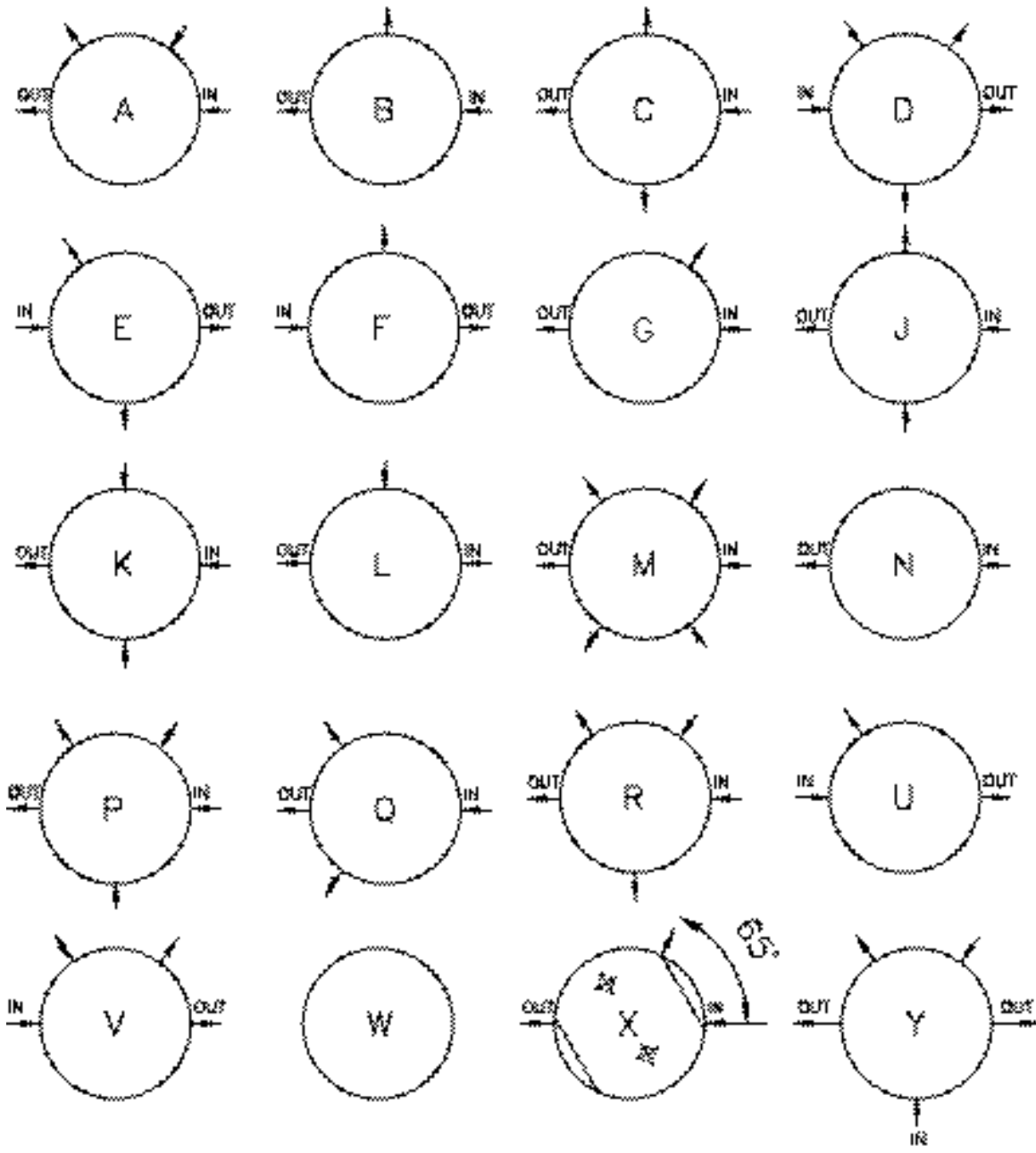
GCE druva is a synonym for quality, user-friendliness, and customer service. The company now exists for 50 years and has gained its place as a market leader in the gas supply systems industry. GCE druva has global coverage and a team of in depth experts. Besides selling regulators & valves, we advise customers on applications and product use. Our regulators are used in complete systems and as single units for gas changeover or in line.

## A FEW EXAMPLES OF GAS APPLICATIONS ARE:

- > Laboratories & research centers
- > Analytical & pilot plants
- > Heated regulator for gas sample systems
- > Diving & Life Support
- > Pneumatic / hydraulic seals & tank control
- > Valve / Emergency Shutdown system control
- > Testing & Calibration
- > Gas Bottle Racks – central gas supply
- > Hydrogen – up to 1380bar

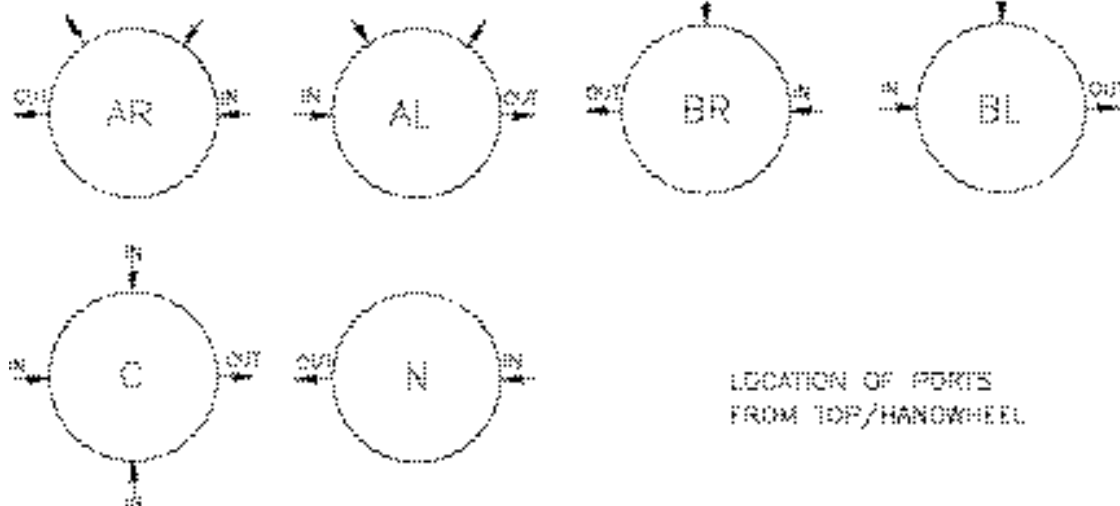


### FORWARD REDUCING REGULATORS, GAUGE PORT LOCATIONS



Location of ports from TOP/HANDWHEEL

### BACK PRESSURE REGULATORS, GAUGE PORT LOCATIONS



LOCATION OF PORTS FROM TOP/HANDWHEEL

## QUICK REFERENCE OVERVIEW

Article no.	Description / Features	Sensing element D-Diaphragm P-Piston	Body material B-Brass S-316SS Hastelloy R – 17-4PH SS	Max inlet Bar (Psi)	Max outlet Bar (Psi)	Fluid	Cv	Port-size	Self-venting / Non-venting
<b>MINI-300</b>	Compact low flow, dome loaded option	P	B - S	300 (4350)	100 (1450)	Gas	0,03 - 0,06 – 0,15	1/8" NPT	NV
<b>LF-230</b>	Low flow with sensitive elastomeric diaphragm	D	S	230 (3340)	10 (145)	Gas	0,06	1/4" NPT	NV
<b>LF-300</b>	Inconel diaphragm & cone seat	D	B - S	300 (4350)	35 (507)	Gas	0,06	1/4" NPT	NV
<b>LF-310</b>	Inconel diaphragm & solid disk seat	D	S	414 (6000)	35 (507)	Gas	0,06	1/4" NPT	NV
<b>TS-300</b>	Two-stage regulator with Inconel diaphragm & cone seat	D	B - S	300 (4350)	25 (360)	Gas	0,06	1/4" NPT	NV

## PRESSURE REGULATORS CV 0,06 – 0,2

<b>LF-301</b>	Low flow piston sensed	P	B - S	300 (4350)	180 (2600)	Gas	0,06	1/4" NPT	NV
<b>LF-540</b>	pilot regulator option	P	B - S	550 (8000)	414 (6000)	Gas	0,1 & 0,2	1/4" & 3/8" NPT	SV & NV
<b>LF-692</b>	20.000psi option, low pressure hydraulic options, air actuated option	P	S	1380 (20.000)	1380 (20.000)	Gas	0,1	1/4" NPT to 9/16" MP	SV & NV

## PRESSURE REGULATORS CV 0,5 – 2,0

<b>MF-101</b>	Unbalanced & Balanced option	P	B - S	Unbalanced - 100 (1450) Balanced 414 (6000)	Unbalanced - 35 (507) Balanced - 50 (725)	Gas	0,5	1/4" NPT	SV & NV
<b>MF-230</b>	Elastomeric diaphragm	D	S	210 (3045)	10 (145)	Gas	1,0	1/2" NPT	NV
<b>MF-231</b>	Piston sensed option	P	S	210 (3045)	50 (725)	Gas	1,0	1/2" NPT	NV
<b>MF-301</b>	sensitive piston with balanced main valve, air actuated option	P	B - S	300 (4350)	200 (2900)	Gas	2,0	1/2" or 3/4" NPT	SV & NV
<b>MF-400G - Diaphragm</b>	sensitive diaphragm sensed	D	S	400 (5800)	10 (145)	Gas	2,0	1/2" / 3/4" NPT & BSP	NV
<b>MF-400H Diaphragm</b>	sensitive diaphragm, PEEK	D	S	400 (5800)	10 (145)	Hydraulic	2,0	1/2" / 3/4" NPT & BSP	NV
<b>MF-401G - Piston</b>	PCTFE	P	S	50 (725) or 400 (5800)	300 (4350)	Gas	2,0	1/2" / 3/4" NPT & BSP	NV
<b>MF-401H - Piston</b>	PEEK	P	S	50 (725) or 400 (5800)	300 (4350)	Hydraulic	2,0	1/2" / 3/4" NPT & BSP	NV
<b>MF-414G</b>	sensitive piston sensed	D	S	414 (6000)	414 (6000)	Gas	2,0	1/2" 3/4" 1" NPT & 1/2" BSP	SV - NV

## PRESSURE REGULATORS CV 4,0 – 12,0

<b>HF-300G</b>		D	S	300 (4350)	10 (145)	Gas	4,0	3/4" 1" NPT & BSP	NV
<b>HF-300H</b>		D	S	300 (4350)	10 (145)	Hydraulic	4,0	3/4" 1" NPT & BSP	NV
<b>HF-301G</b>		P	S	50 (725) or 300 (4350)	250 (3600)	Gas	4,0	3/4" 1" NPT & BSP	NV
<b>HF-301H</b>		P	S	50 (725) or 300 (4350)	250 (3600)	Hydraulic	4,0	3/4" 1" NPT & BSP	NV
<b>HF-250G</b>	Dome loaded option		S	250 (3600)	10 (145)	Gas	7,0	1" NPT & BSP, DN25	NV

Article No.	Description	Sensing element D-Diaphragm B-Bellow P-Piston	Body material B-Brass S-316SS	Max Inlet bar/psi	Max Outlet bar/psi	Fluid	Cv	Port-size	Self-venting / Non-venting
HF-250H	Dome loaded option	D	S	250 (3600)	10 (145)	Hydraulic	7,0 & 12,0	1" NPT & BSP, DN25	NV
HF-251G	Dome loaded option	P	S	50 (725) or 300 (4350)	250 (3600)	Gas	7,0 & 12,0	1" NPT & BSP, DN25	NV
HF-251H	Dome loaded option	P	S	50 (725) or 300 (4350)	250 (3600)	Hydraulic	7,0 & 12,0	1" NPT & BSP, DN25	NV

## HYDRAULIC REGULATORS CV 0,05 – 2,0

HYD-691	Economical alternative to LF690/691 incl ceramic seat	P	S	690 (10.000)	690 (10.000)	Hydraulic	0,06	¼" 3/8" ½" NPT, 3/8" MP	SV - NV
LGC-690	Logic control	P	S	414 (6000)	15 (218)	Hydraulic	0,3	¼" 3/8" ½" NPT	SV
LF-690	Air actuated option	P	S	690 (10.000)	690 (10.000)	Hydraulic	0,05 – 0,1 – 0,3	¼" 3/8" ½" 9/16" NPT, MP & ½" SAE- ORB	SV - NV
LF-691	Max outlet 1080 (15.600), air actuated option	P	S	1034 (15.000) or 1380 (20.000)	1034 (15.000) or 1080 (15.600)	Hydraulic	0,05 – 0,1 – 0,3	¼" 3/8" ½" 9/16" NPT, MP & ½" SAE- ORB	SV - NV
MF-414H	Air actuated option	P	S	414 (6000)	414 (6000)	Hydraulic	2,0	½" ¾" 1" NPT, ½" BSP, 9/16" AE MP	SV - NV

## BACK PRESSURE REGULATORS

Article No.	Description	Sensing element D-Diaphragm P- Piston	Body material B-Brass S-316SS	Pressure control range	Max Rated pressure	Fluid	Cv	Port-size
BP-300		D	S	20 (290)	50(725)	Gas	0,1	¼" NPT
BP-301		P	S	CV 0,1-150 (2175) CV 0,5 – 35 (507)	225(3263)	Gas	0,1 & 0,2	¼" & 3/8" NPT
BP-MF400G		D	S	400 (5800)	400 (5800)	Gas	2,0	½" ¾" 1" NPT & BSP
BP-MF400H		D	S	400 (5800)	400 (5800)	Hydraulic	2,0	½" ¾" 1" NPT & BSP
BP-MF401G		P	S	400 (5800)	400 (5800)	Gas	2,0	½" ¾" 1" NPT & BSP
BP-MF401H		P	S	400 (5800)	400 (5800)	hydraulic	2,0	½" ¾" 1" NPT & BSP
BP-LF690	Liquid limited at 10lpm, air-actuated option	P	S	690 (10.000), air-actuated up to 600 (8700)	690 (10.000)	Gas & hydraulic	0,02 – 0,1	¼" 3/8" ½" NPT
BP-MF690G-05	Air-actuated option	P	S	690 (10.000), air-actuated up to 600 (8700)	690 (10.000)	Gas	0,5	3/8" ½" NPT & MP
BP-MF690H-05	Limited to 50lpm, air- actuated option	P	S	690 (10.000), air-actuated up to 600 (8700)	690 (10.000)	Hydraulic	0,5	3/8" ½" NPT & MP
BP-MF690G-15		P	S	up to 320 (4640), air- actuated up to 300(4350)	690 (10.000)	Gas	1,5	½" ¾" NPT & BSP, 1" NPT
BP-MF690H-15	Limited to 125lpm	P	S	690/10000	690/10000	Hydraulic	1,5	½" ¾" NPT & BSP, 1" NPT

### HEATED PRESSURE REDUCING REGULATORS

Article No.	Description	Sensing element D-Diaphragm P- -Piston	Body material B-Brass S-316SS	Max Inlet bar/psi	Max Outlet bar(psi)	Fluid	Heating element type
XHS-300	Side and inline entry options	D	S	300 (4350)	35 (507)	G	Single 100W heater
XHR-300	300bar option	D	S	300 (4350)	35 (507)	G	2x 100W heating element, steam or electric
XHR-310	414bar option	D	S	414 (6000)	35 (507)	G	2x 100W heating element, steam or electric
XHR-301	300bar option	P	S	300 (4350)	35 (507)	G	2x 100W heating element, steam or electric
XHR-311	414bar option	P	S	414 (6000)	35 (507)	G	2x 100W heating element, steam or electric

### ACCESSORIES AND ANCILLARY EQUIPMENT

Article No.	Description	Size	Material	Regulator line
PT-C-024	Hex Panel mounting ring	M33 x 1mm	316SS	300 series
PT-C-024-001	Hex Panel mounting ring	M34 x 2mm	316SS	MINI-300
PT-C-061-005	Panel mounting ring	55mm bodies		HYD-691, LF-540, MF-301
PT-C-061-003	Panel mounting ring	65mm bodies		LF-690, MF-414, LF-550, MF-300
GAU1100	Pressure gauges	¼" NPT	316SS	Up to 1000bar (14.500psi)

### CUSTOM SOLUTIONS

Article No.	Description
SUBSEA	
XHM300	Heated manifold block

### APPROVALS, CERTIFICATES, STATEMENTS

Article No.	Description
CERTCONF	Certificate of Conformity
TESTCERT	Test Certificate
Certificate of Origin	Certificate of Origin (Chamber of Commerce)
ASTM G93 Level C Cert	Oxygen Cleaning Certificate
MATCERT	3.1 Material Certification (Body material only)
MATCERT - GAUGES	3.1 Material Certification for Gauges
MATCERT - SPECIFIC	3.1 Material Certification (Order specific)
MATCERT - WETTED	3.1 Material Certification for all Wetted Components
SMDRL	Supplier Master Requirement Document List
	ATEX Statement
	Conflict Minerals
	Customer specific statements
	PED Statement
	Product Statements
	REACH Compliance
	RoHS Statement

### BAR-PSI OVERVIEW

Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi
1	14,5	20	290	180	2600	414	6000
2	30	25	360	200	2900	550	8000
4	60	35	507	210	3045	600	8700
5	73	50	725	225	3263	690	10 000
6	90	70	1000	230	3300	862	12 500
8	116	100	1450	250	3600	1000	14 500
10	145	140	2000	300	4350	1034	15 000
15	218	150	2175	320	4640	1080	15 600
16	232	160	2320	400	5800	1380	20 000

# MINI-300 SERIES – COMPACT ‘LOW FLOW’ REGULATOR



## DESCRIPTION

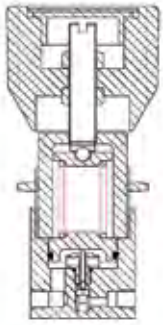
The MINI-300 provides an economical, lightweight, and versatile regulator range, designed for customers who want accurate control from a compact unit.

## APPLICATION

- > Analyser Systems
- > Point Of Use
- > Instrumentation Control
- > Gas Sticks
- > Lecture Bottle Assembly

## SPECIAL FEATURES

- > 38mm diameter body provides small foot space
- > Fully supported ‘sensitive’ pistons with low pressure and high pressure outlet options
- > Low internal volume
- > All 316SS wetted parts including bonnet with panel mounting as standard
- > ‘Soft’ seating area perpendicular to flow stream to minimise particle damage



## PRODUCT DATA

<b>Fluid Type:</b>	Gas (& low pressure hydraulics)
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	210bar (3000psi) (PCTFE), 300bar (4350psi) (PEEK)
<b>Max Outlet ranges:</b>	up to 100bar (1450psi)
<b>CV options:</b>	0,03 – 0,06 – 0,15 (max 50 bar inlet)
<b>Port size / Connections:</b>	1/8" NPT
<b>Loading Options:</b>	Hand-wheel or Dome-loaded
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	0,5kg
<b>Body material options:</b>	Brass – 316SS
<b>Wetted parts:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	PCTFE
<b>Seat diameter:</b>	2,3mm
<b>O-ring seals:</b>	Viton

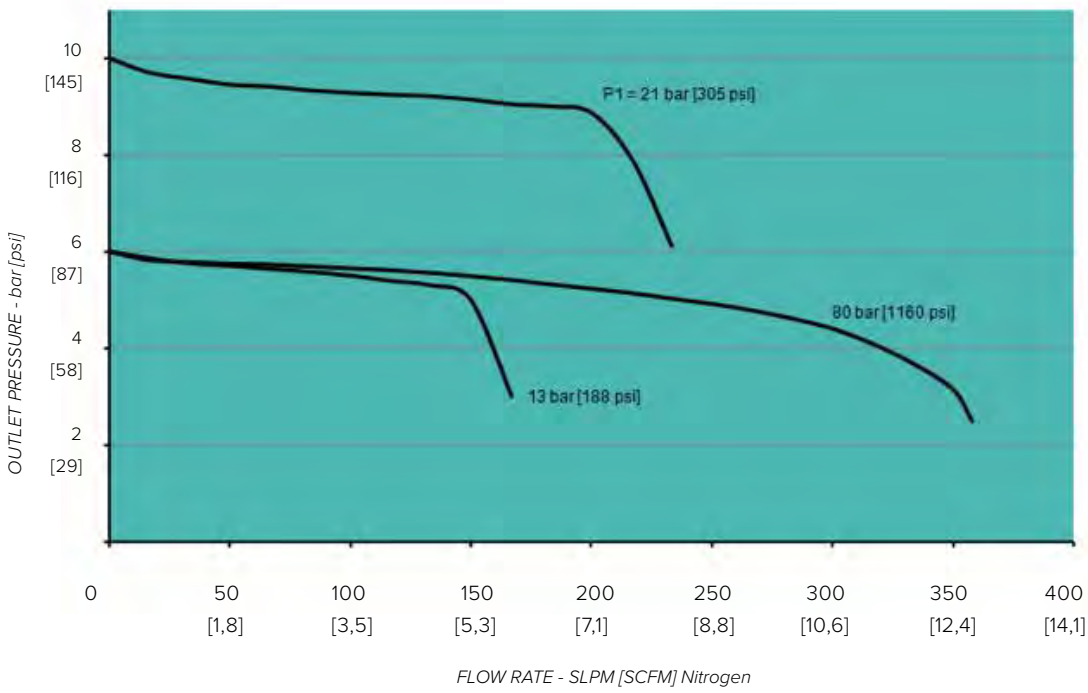
## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	Seat	Porting configuration
<b>MINI300</b>	<b>06</b>	<b>S</b>	<b>10</b>	<b>P</b>	<b>N</b>
MINI300	03 – 0,03 06 – 0,06 15 – 0,15	S – 316SS B – Brass	01 – 0 - 1 bar (0 - 14,5psi) 02 – 0 - 2bar (0 - 30psi) 04 – 0 - 4bar (0 - 60psi) 10 – 0 - 10bar (0 - 145psi) 35 – 0 - 35bar (0 - 507psi) 50 – 0 - 50bar (0 - 725psi) 100 – 0 - 100bar (0 - 1450psi)	P – PEEK (Max Inlet 300bar) K – PCTFE (Max Inlet 210bar)	Please select your configuration in the quick reference overview

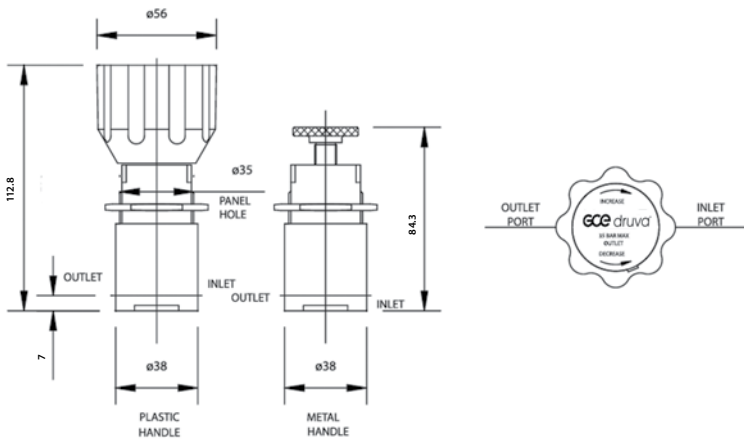
NOTE: Please contact us for any non-standard requests and for the dome-loaded option.



PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# LF-230 SERIES – LOW FLOW PRESSURE REGULATOR WITH SENSITIVE ELASTOMETRIC DIAPHRAGM



## DESCRIPTION

The LF-230 is a low pressure gas regulator with excellent low pressure regulation. It has a specially designed elastometric diaphragm for very sensitive gas regulation.

## APPLICATION

- > Gas feed to burners
- > Gas analyzer systems
- > Laboratories and research labs

## SPECIAL FEATURES

- > 316L SS Machined Wetted Parts
- > Large sensitive elastomeric diaphragm
- > 0,1bar to 10bar / 1,5psi to 150psi control range
- > Minimal decaying inlet pressure effect
- > For flow rates to 30Nm<sup>3</sup>/hr (@ max P2)

## PRODUCT DATA

<b>Fluid Type:</b>	Gas (& low pressure hydraulics)
<b>Sensing element:</b>	Diaphragm
<b>Max Inlet Pressure:</b>	230bar (3300psi)
<b>Max Outlet ranges:</b>	10bar (145psi)
<b>CV options:</b>	0,06
<b>Port size / Connections:</b>	1/4" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight to ANSIFCI 70-3-2004

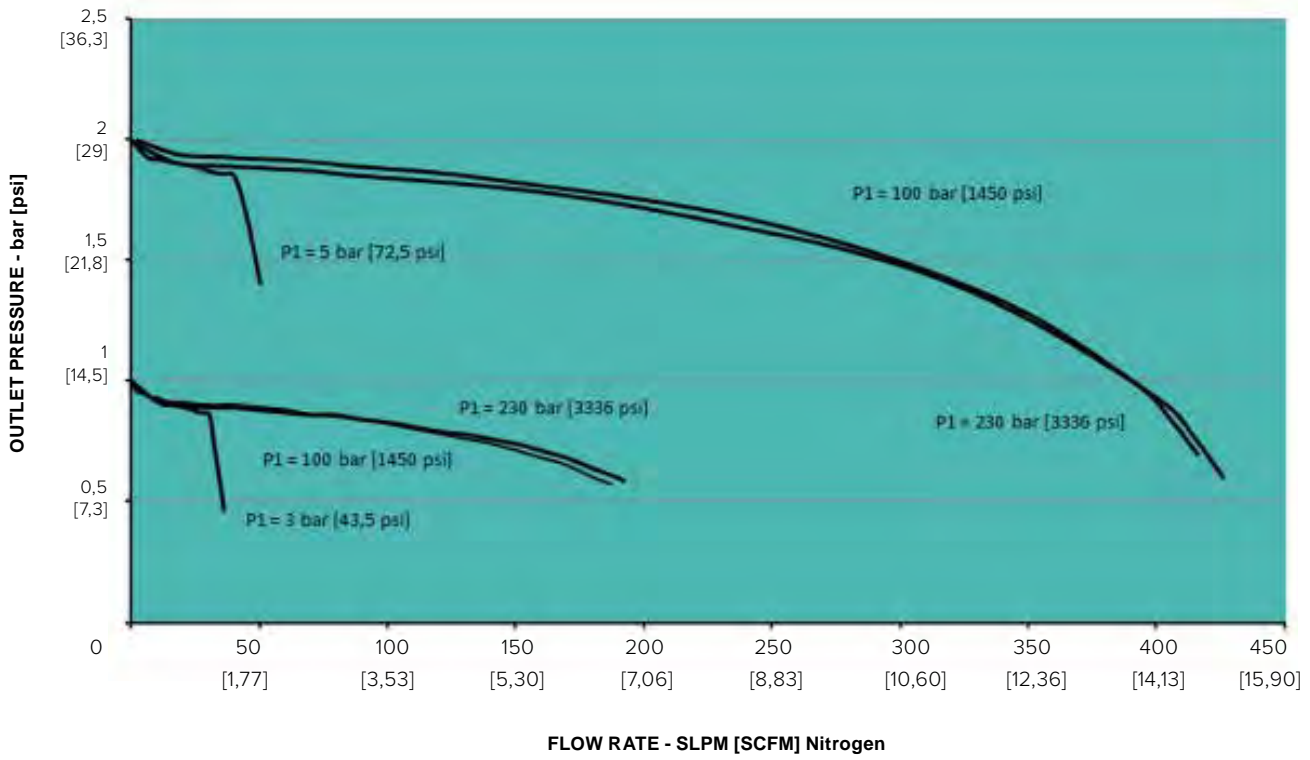
## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	Approx. 1kg
<b>Body material options:</b>	316SS
<b>Body &amp; Wetted parts:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	PCTFE, FEP, TEFLON
<b>Seat diameter:</b>	2,5mm
<b>O-ring seals:</b>	FKM

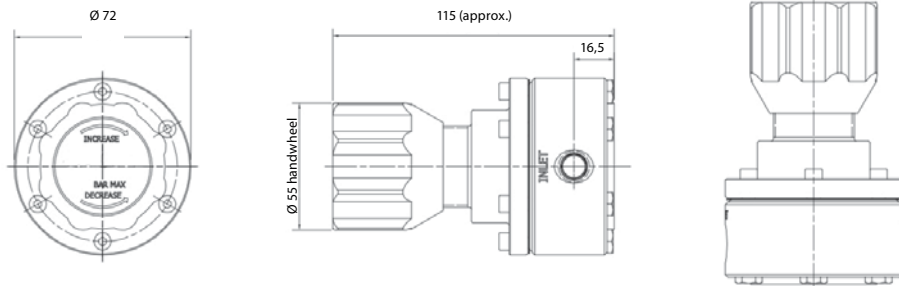
## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	Seat	Porting configuration
<b>LF230</b>	<b>06</b>	<b>S</b>	<b>10</b>	<b>P</b>	<b>N</b>
LF230	06 – 0,06	S – 316SS	01 – 0 - 1bar (0 - 14,5psi) 02 – 0 - 2bar (0 - 30psi) 05 – 0 - 5bar (0 - 73psi) 10 – 0 - 10bar (0 - 145psi)	F – FEP (Max Inlet 50bar) K – PCTFE (Max Inlet 230bar) T – Teflon (Max Inlet 10bar)	Please select your configuration in the quick reference overview

PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# LF-300 “LOW FLOW” PRESSURE REDUCING REGULATOR DIAPHRAGM SENSED FOR OUTLET CONTROL TO 35BAR (500PSI)



## DESCRIPTION

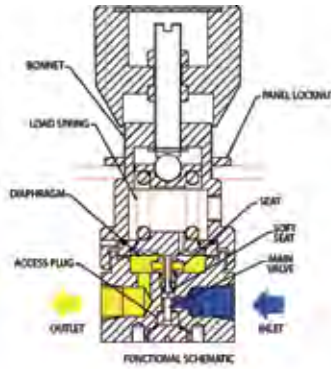
The LF-300 has been designed with quality and reliability in mind, with genuinely unique features designed into this single stage regulator. Finite Element Analysis, combined with physical cycle tests, created an Inconel X750 diaphragm that lasts 50% longer than a typical stainless steel designs. The metal diaphragm means that leak integrity is maintained, and that no sample media is absorbed by the sensing element – reducing purge times between sample analysis. A Brass machined Washer also ensures no torsional load is applied to the diaphragm during assembly.

## APPLICATION

- > Gas and Liquid Analyzer Systems
- > Gas Cylinder Regulator Assemblies
- > Portable Calibration Kits
- > Laboratories & Research Labs
- > Low Pressure Hydraulic Systems

## SPECIAL FEATURES

- > Metal to metal diaphragm sealing
- > Coned seating design
- > Sealing area protected and centralized on the body of the regulator
- > Lightweight compact design
- > Strong and sensitive diaphragm element
- > High Accuracy



Assembly drawing for reference only. Refer to office for specific detail.

## PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Diaphragm
<b>Max Inlet Pressure:</b>	300bar (4350psi) with PEEK seat
<b>Max Outlet ranges:</b>	Up to 35bar (507psi)
<b>CV options:</b>	0,03 – 0,06
<b>Port size / Connections:</b>	¼" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)

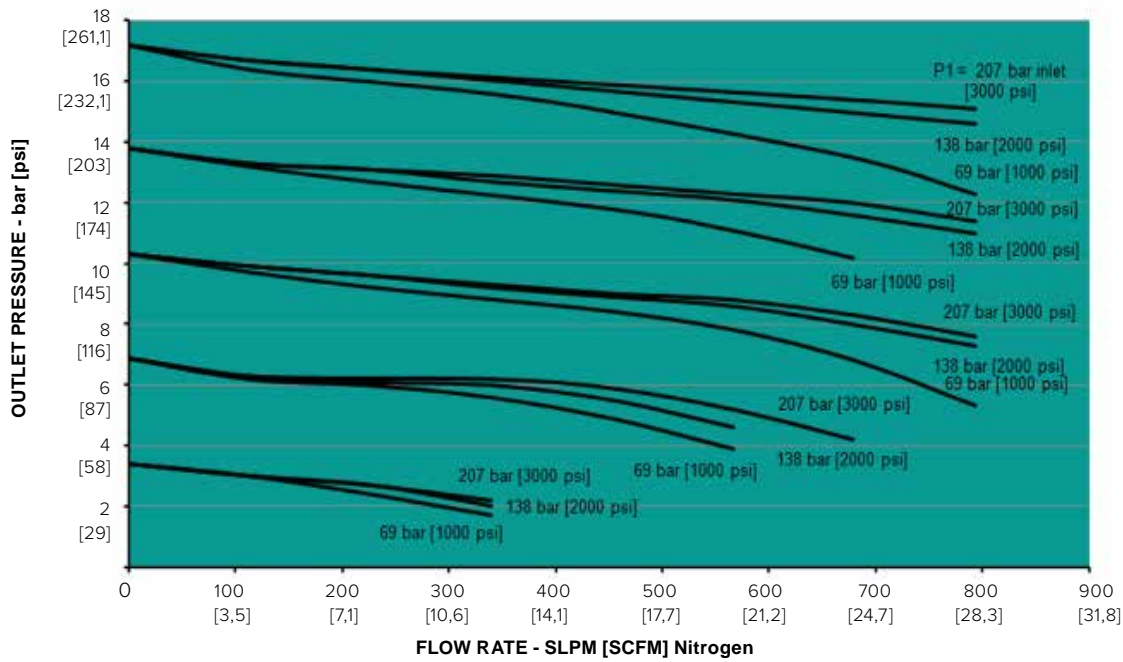
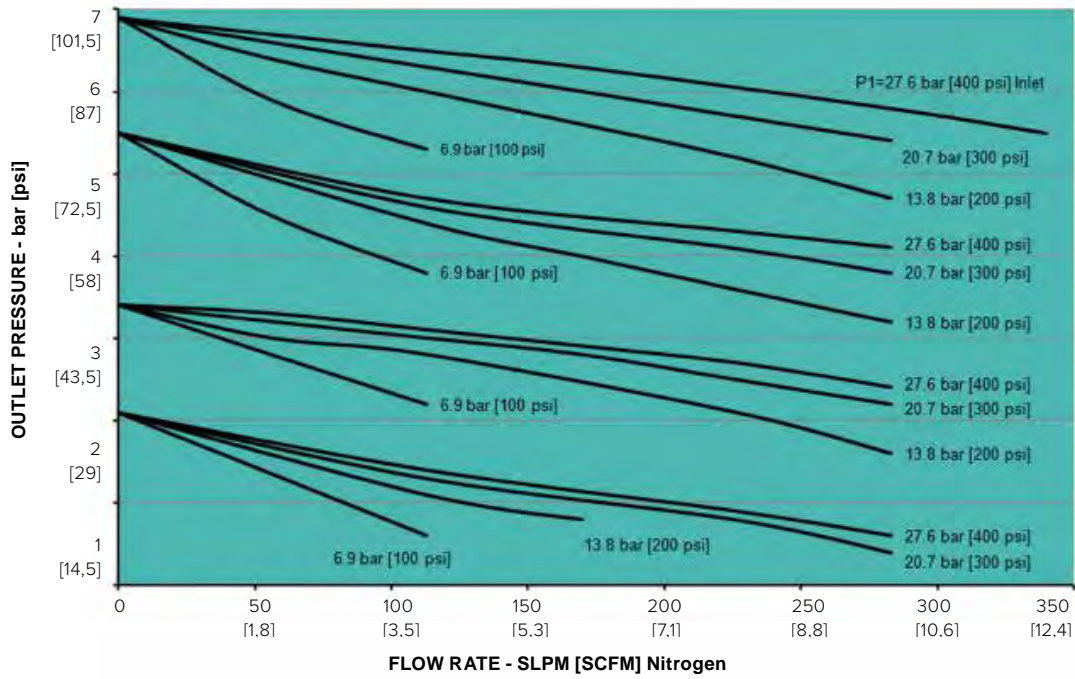
### TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	0,9kg
<b>Body material options:</b>	316SS
<b>Body &amp; wetted parts:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	PEEK, PCTFE, FEP, TEFLON
<b>O-ring seals:</b>	Viton

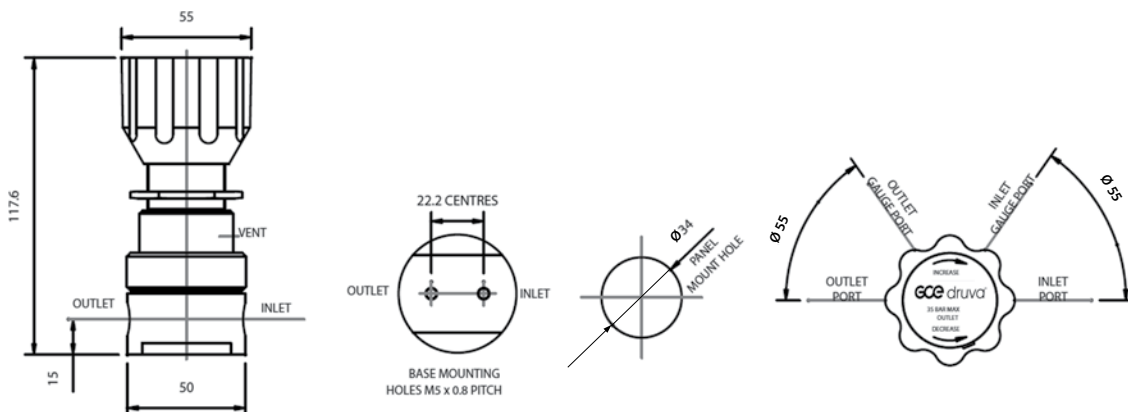
## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	Seat	Porting configuration
<b>LF300</b>	<b>03</b>	<b>S</b>	<b>10</b>	<b>P</b>	<b>N</b>
LF300	03 – 0,03 06 – 0,06	S – 316SS	01 – 0 - 1bar (0 - 14,5psi) 02 – 0 - 2bar (0 - 30psi) 04 – 0 - 4bar (0 - 60psi) 10 – 0 - 10bar (0 - 145psi) 20 – 0 - 20bar (0 - 290psi) 35 – 0 - 35bar (0 - 507psi)	P – PEEK (Max Inlet 300bar) K – PCTFE (Max Inlet 210bar) F – FEP (Max Inlet 50bar) T – Teflon (Max Inlet 20bar)	Please select your configuration in the quick reference overview

PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# LF-310 DIAPHRAGM SENSED SINGLE STAGE REGULATOR WITH SOLID DISK SEAT



## DESCRIPTION

The LF-310 offers the same features as the LF-300 single-stage diaphragm-sensed regulator but with a 'solid disk' seat design.

The LF-310 offers more options with various seating materials available such as Tecasin® or ceramic for aggressive or high temperature applications. In addition, the strong Inconel X750 diaphragm provides 150% longevity over stainless steel designs, whilst flexible seating options ensure more choices can be provided to meet arduous process applications.

## APPLICATION

- > Gas analyser systems
- > Gas cylinder regulators
- > Calibration systems

## SPECIAL FEATURES

- > 414bar (6000psi) with solid disk seat
- > Fully supported convoluted X750 diaphragm
- > All 316SS machined wetted parts and bonnet
- > Non-venting
- > Unbalanced main valve
- > Port size: ¼" NPT
- > 40 micron inlet filter

## PRODUCT DATA

<b>Fluid Type:</b>	Gas
<b>Sensing element:</b>	Diaphragm
<b>Max Inlet Pressure:</b>	414bar (6000psi) with PEEK seat
<b>Max Outlet ranges:</b>	Up to 35bar (507psi)
<b>CV options:</b>	0,06
<b>Port size / Connections:</b>	¼" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	In accordance to ANSI/FCI 70-3

### TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	0,9kg
<b>Body material options:</b>	316SS, Brass, Hastelloy
<b>Wetted parts:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	PCTFE, PEEK, PTFE, FEP
<b>Seat diameter:</b>	2,3mm
<b>O-ring seals:</b>	Viton

## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	Seat	Porting configuration
<b>LF310</b>	<b>06</b>	<b>S</b>	<b>10</b>	<b>P</b>	<b>N</b>
LF310	06 – 0,06	S – 316SS B – Brass H – Hastelloy	01 – 0 - 1bar (0 - 14,5psi) 02 – 0 - 2bar (0 - 30psi) 05 – 0 - 5bar (0 - 73psi) 10 – 0 - 10bar (0 - 145psi) 20 – 0 - 20bar (0 - 290psi) 35 – 0 - 35bar (0 - 507psi)	P – PEEK (Max Inlet 300bar) K – PCTFE (Max Inlet 210bar) F – FEP (Max Inlet 50bar)	Please select your configuration in the quick reference overview

NOTE: Please contact us for any non-standard requests.



# TS-300 TWO STAGE PRESSURE REDUCING REGULATOR DIAPHRAGM SENSED FOR OUTLET CONTROL TO 25BAR (360PSI)



## DESCRIPTION

The TS-300 provides stable pressure control under decaying cylinder pressures. The first stage of the regulator is set to 35bar to allow maximum flow capability through the regulator.

## APPLICATION

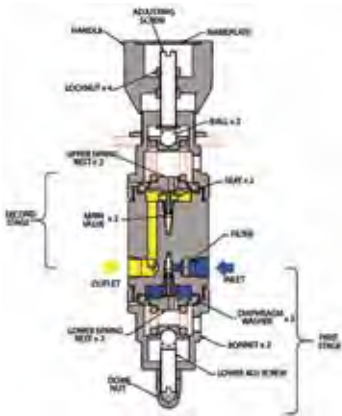
- > Gas and Liquid Analyzer Systems
- > Gas Cylinder Regulator Assemblies
- > Carrier gases
- > Laboratories & Research Labs

## SPECIAL FEATURES

- > Metal to metal sealing diaphragm
- > Sealing area protected and centralized within the body of the regulator 0.04% decaying pressure effect 'Interstage' relief valve option

## PRODUCT DATA

<b>Fluid Type:</b>	Gas
<b>Sensing element:</b>	Diaphragm
<b>Max Inlet Pressure:</b>	300bar (4350psi) with PEEK seat
<b>Max Outlet ranges:</b>	Up to 25bar (360psi)
<b>CV options:</b>	0,06
<b>Port size / Connections:</b>	¼" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)



Assembly drawing for reference only.

Refer to office for specific detail.

### TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	1,4kg
<b>Body material options:</b>	Brass or 316SS
<b>Wetted parts:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	PEEK or PCTFE
<b>O-ring seals:</b>	Viton

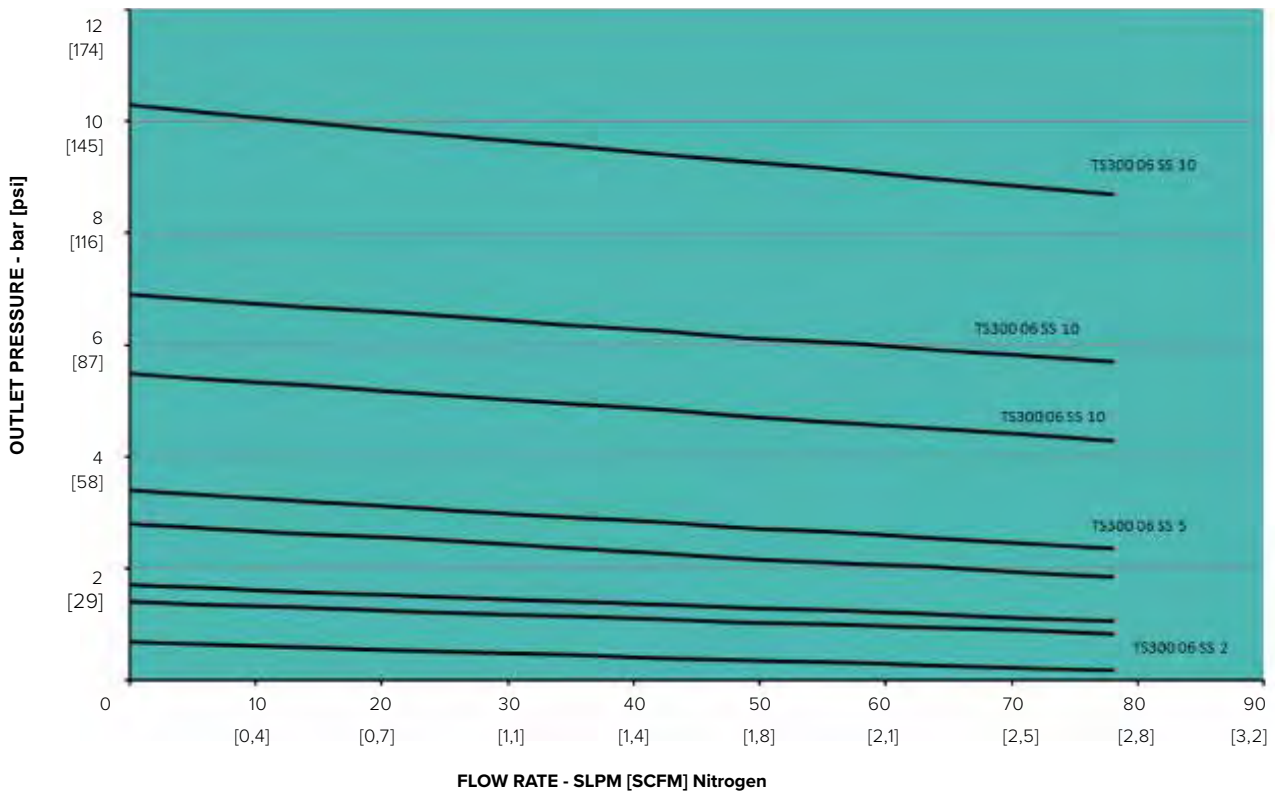
## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	Seat	Porting configuration
<b>TS300</b>	<b>06</b>	<b>S</b>	<b>10</b>	<b>P</b>	<b>N</b>
TS300	06 – 0,06	S – 316SS B – Brass	01 – 0 - 1bar (0 - 14,5psi) 02 – 0 - 2bar (0 - 30psi) 04 – 0 - 4bar (0 - 60psi) 10 – 0 - 10bar (0 - 145psi) 25 – 0 - 25bar (0 - 360psi)	P – PEEK (Max Inlet 300bar) K – PCTFE (Max Inlet 210bar)	Please select your configuration in the quick reference overview

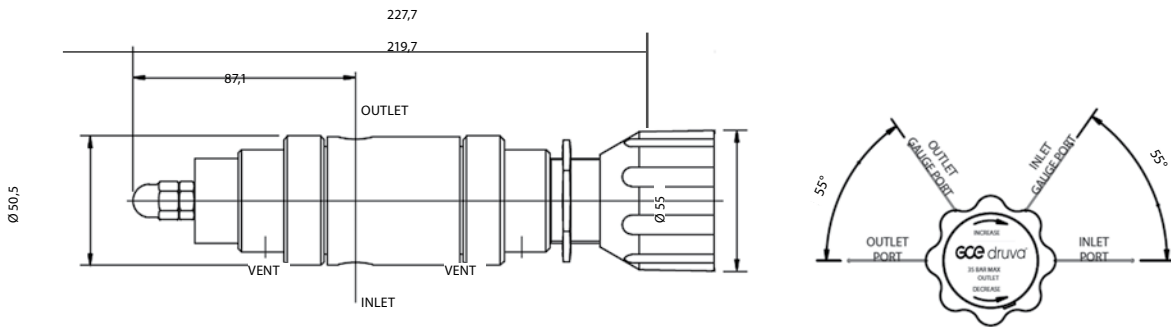
NOTE: Please contact us for any non-standard requests.



PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# LF-301 “LOW FLOW” PRESSURE REGULATOR PISTON SENSED FOR OUTLET CONTROL TO 180BAR (2600PSI) (360PSI)



## DESCRIPTION

The LF-301 provides a compact and economical solution for controlling pressures up to 180bar on low flow applications.

Ideal for first stage pressure let down where basic pressure control is required. A small piston sensing element allows low torque adjustment with a range of springs with fine pressure adjustment.

## APPLICATION

- > Gas Cylinder regulator assemblies
- > Pressure test rigs
- > Instrument Air Lines
- > Aircraft service carts

## SPECIAL FEATURES

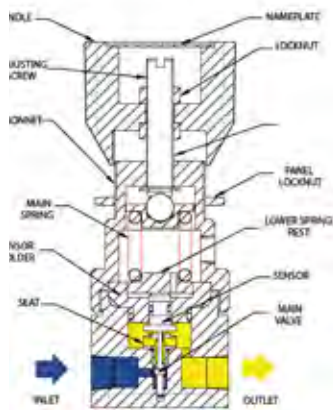
- > Compact design
- > Economical
- > 316SS Bonnet
- > Max 300bar inlet

## PRODUCT DATA

<b>Fluid Type:</b>	Gas
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	300bar (4350psi) with PEEK seat

### TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	0.06
<b>Body material options:</b>	Brass or 316SS
<b>Port size / connections:</b>	1/4" BSP
<b>Winding ports:</b>	Hand wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Sealage:</b>	O-ring PEEK max WP (tested on Nitrogen)
<b>O-ring seals:</b>	Viton



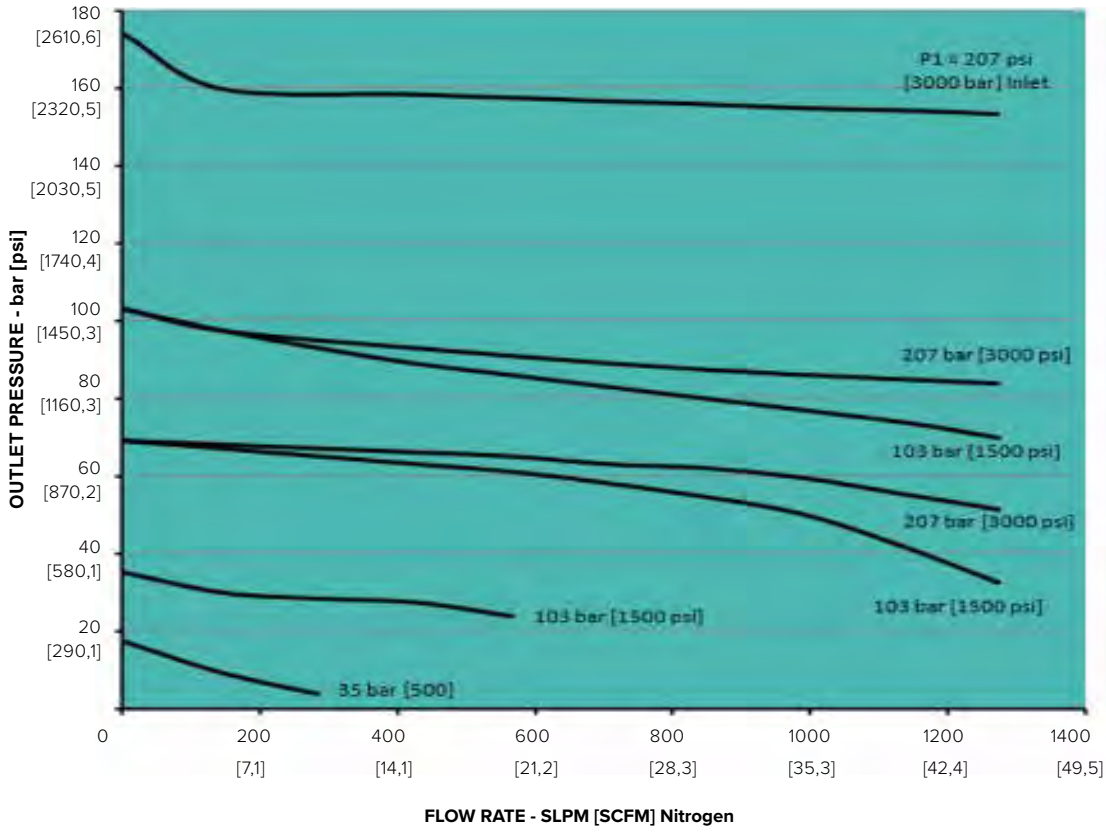
Assembly drawing for reference only. Refer to office for specific detail.

## ORDER CODE

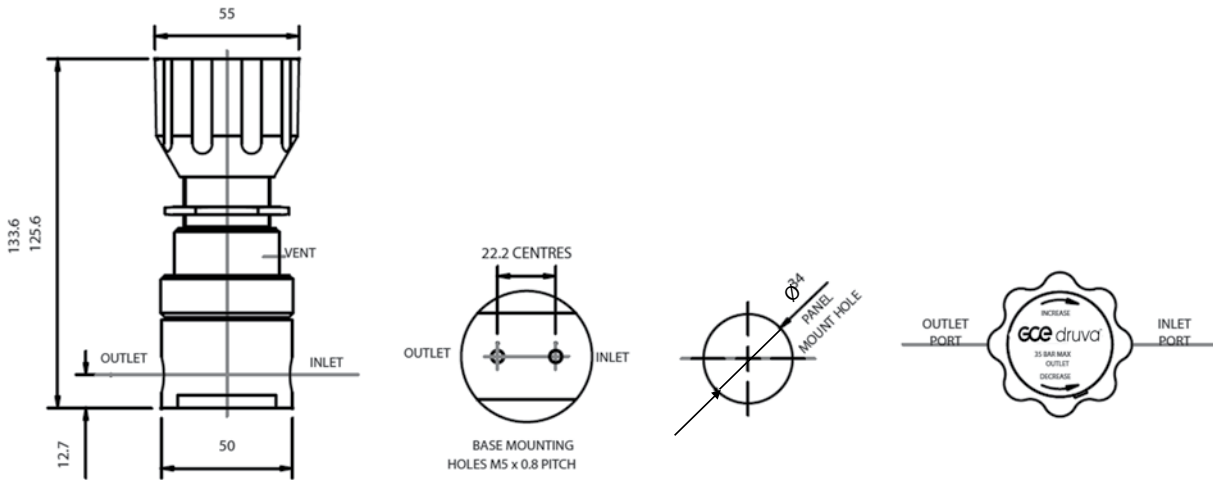
Basic Model	Cv Value	Body material	Outlet ranges	Body material	Seat	Porting configuration
<b>LF301</b>	<b>06</b>	<b>S</b>	<b>50</b>	<b>FKM/FPM</b>	<b>P</b>	<b>N</b>
LF301	06 – 0,06	S – 316SS B – Brass	50 – 0 - 50bar (0 - 725psi) 70 – 0 - 70bar (0 - 1000psi) 100 – 0 - 100bar (0 - 1450psi) 180 – 0 - 180bar (0 - 2600psi)	V – FKM/FPM N – NBR E – EPDM K – FFKM	P – PEEK (Max Inlet 300bar) K – PCTFE (Max Inlet 210bar)	Please select your configuration in the quick reference overview

NOTE: Please contact us for any non-standard requests.

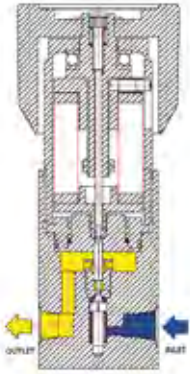
PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# LF-540 'LOW FLOW' PRESSURE REDUCING REGULATOR PISTON SENSED FOR OUTLET CONTROL TO 414BAR (6000PSI)



Assembly drawing for reference only. Refer to office for specific detail.

## DESCRIPTION

A compact and economical high pressure regulator with precision machined sensing elements to allow fine pressure control on pressures up to 414bar, which can be supplied as none venting or self-venting (non-adjustable).

## APPLICATION

- > Test and calibration systems
- > Aircraft charging carts
- > Valve Actuator Systems
- > Gas Cylinder Regulator Assemblies

## SPECIAL FEATURES

- > 550bar (8000psi) inlet pressure
- > Economical Design
- > Precision machined sensing elements
- > Load bearings and large handwheel for low torque adjustment
- > Excellent sensitivity
- > Self venting and non venting options

## PRODUCT DATA

<b>Fluid Type:</b>	Gas (& low pressure hydraulics)
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	550bar (8000psi)
<b>Max Outlet ranges:</b>	Up to 414bar (6000psi)
<b>CV options:</b>	0,1 or 0,2
<b>Port size / Connections:</b>	¼" NPT or 3/8" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Self-venting (non-adjustable) or Non-venting
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)

### TECHNICAL DATA / MATERIALS OF CONSTRUCTION

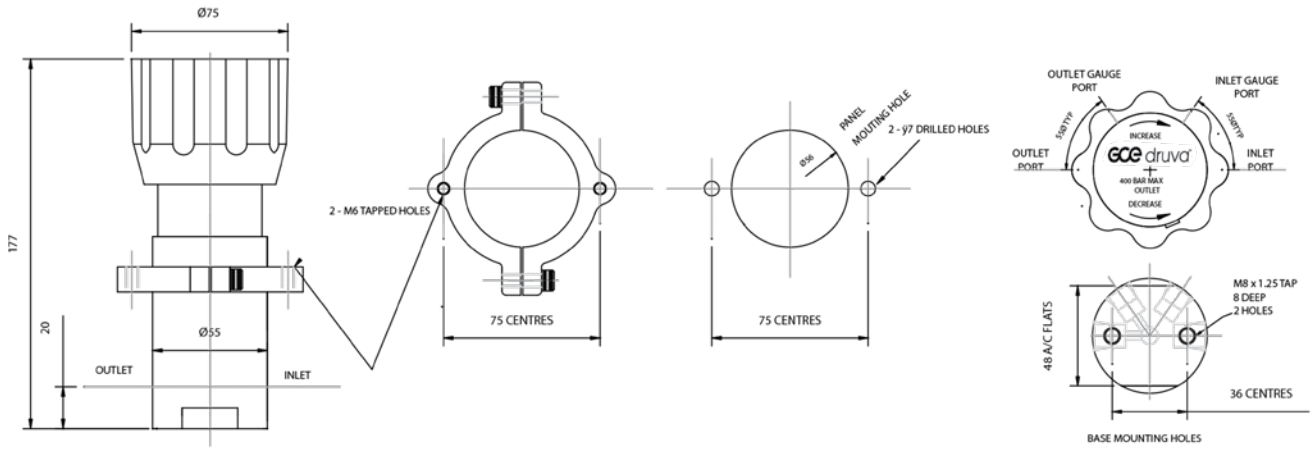
<b>Weight:</b>	2,1kg
<b>Body material options:</b>	Brass or 316SS
<b>Wetted parts:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	PEEK GF30
<b>O-ring seals:</b>	NBR, Viton, EPDM

## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	Body material	Seat	Porting configuration
<b>LF540</b>	<b>01</b>	<b>S</b>	<b>100</b>	<b>FKM/FPM</b>	<b>P</b>	<b>N</b>
LF540	01 – 0,1 02 – 0,2	S – 316SS B – Brass	50 – 0 - 50bar (0 - 725psi) 70 – 0 - 70bar (0 - 1000psi) 100 – 0 - 100bar (0 - 1450psi) 180 – 0 - 180bar (0 - 2600psi)	V – FKM/FPM N – NBR E – EPDM K – FFKM	P – PEEK (Max Inlet 300bar) K – PCTFE (Max Inlet 210bar)	Please select your configuration in the quick reference overview

NOTE: Please contact us for any non-standard requests.

INSTALLATION DIMENSIONS:



# LF-692 – ‘LOW FLOW’ GAS REDUCING REGULATOR PISTON SENSED FOR OUTLET CONTROL TO 1380BAR (20.000PSI)



## DESCRIPTION

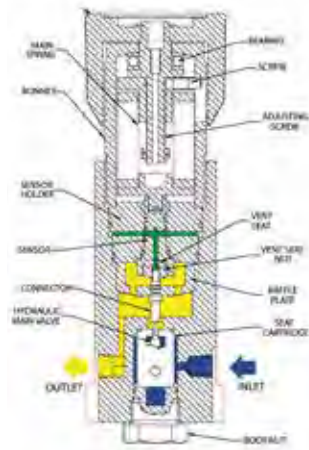
The LF-692 uses high engineered plastics to provide positive shut off on high pressure gases. The unique seating cartridge provides a dampening action on this critical component to prevent ‘chattering’ or ‘unstable frequency resonance’. The regulator is self relieving with segregated captured vent to pipe gases away to a safe area or recycle within the process. The seating area can easily be accessed from the base of the regulator for speedy servicing in situ.

## APPLICATION

- > Hydrogen fuel cells
- > Valve actuator systems
- > Valve test rigs
- > Gas sample lines

## SPECIAL FEATURES

- > 690bar (10.000psi) inlet pressure as standard
- > PEEK or TECASINT POLYIMIDE seating options
- > Precision machined sensing elements
- > 5 Sensor ranges for combination of low torque and high sensitivity
- > Segregated captured vent 316SS Panel mounting rings
- > Optional materials for 1350bar/20,000psi control



## PRODUCT DATA

<b>Fluid Type:</b>	Gas (& low pressure hydraulics)
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	1380bar (20.000psi)
<b>Max Outlet ranges:</b>	up to 1380bar (Hand-wheel) up to 1034 bar (air actuated)
<b>CV options:</b>	0,05 or 0,1
<b>Port size / Connections:</b>	¼" NPT, ¼" MP, 3/8" NPT, 3/8" MP, ½" NPT, 9/16" MP
<b>Loading Options:</b>	Hand-wheel & Air-actuated
<b>Venting / non-venting:</b>	Self-venting & Non-venting
<b>Leakage:</b>	Bubble tight seal at max inlet pressure

Assembly drawing for reference only. Refer to office for specific detail.

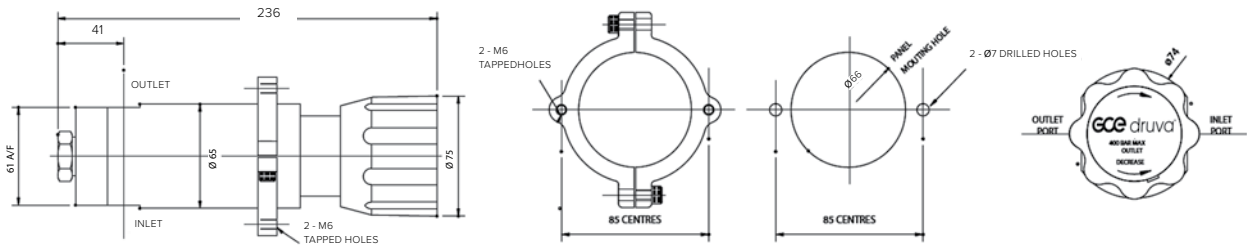
TECHNICAL DATA / MATERIALS OF CONSTRUCTION	
<b>Weight:</b>	Approx. 4kg
<b>Body material options:</b>	316SS or 17-4PH SS
<b>Wetted parts:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	PEEK or TECASINT
<b>O-ring seals:</b>	NBR, Viton, EPDM

## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connections	Porting configuration	Venting Options	MOD (Options)
<b>LF692</b>	<b>01</b>	<b>S</b>	<b>862S</b>	<b>N</b>	<b>03A</b>	<b>N</b>	<b>SV</b>	<b>MOD</b>
LF692	01 – 0,1 05 – 0,05	S – 316SS (690bar inlet) R – 17-4PH SS (1380bar inlet)	50S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi) 200S – 0 - 200bar (0 - 2900psi) 414S – 0 - 414bar (0 - 6000psi) 690S – 0 - 690bar (0 - 10.000psi) 862S – 0 - 862bar (0 - 12.500psi) 1034S – 0 - 1034bar (0 - 15.000psi) 1380S – 0 - 1380bar (0 - 20.000psi) 140A – 0 - 140bar (0 - 2000psi) (Air Actuated) 600A – 0 - 600bar (0 - 8700psi) (Air Actuated) 1034A – 0 - 1034bar (0 - 15.000psi)	N – NBR V – FKM/FPM E – EPDM H – HNBR K – FFKM	02N – ¼" NPT (max 690bar) 03N – 3/8" NPT (max 690bar) 04N – ½" NPT (max 690bar) 03A – 3/8" MP 04A – 9/16" MP	Please select your porting configuration in the quick reference overview	SV – Self Venting NV – Non Venting	Upon request, special options are available

NOTE: Please contact us for any non-standard requests.

INSTALLATION DIMENSIONS:



# MF-101 SERIES – ‘MEDIUM FLOW’ PRESSURE REGULATOR, PISTON SENSED FOR MEDIUM PRESSURE APPLICATIONS



## DESCRIPTION

The MF-101 incorporates a large precision machined sensing element to control outlet pressures up to 35bar from a maximum 100bar inlet. The main valve is an unbalanced design to create positive shut-off on gas or liquid applications against the PEEK seat.

There is also a balanced main valve design available. Please contact us for further details & ordering options.

## APPLICATION

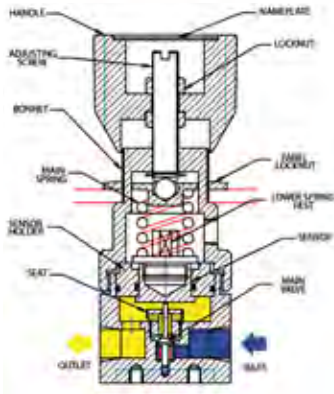
- > Gas and Liquid Analyzer Systems
- > Low Pressure Hydraulic Systems
- > Research labs
- > Instrument Air Lines

## SPECIAL FEATURES

- > Lightweight compact design
- > Piston sensing element
- > High accuracy

## PRODUCT DATA

<b>Fluid Type:</b>	Gas & Hydraulics
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	Unbalanced – 100bar (1450psi)
<b>Balanced:</b>	PEEK – 414bar (6000psi) PCTFE – 300bar (4350psi)
<b>Max Outlet ranges:</b>	up to 35bar (507psi)
<b>CV options:</b>	0,5
<b>Port size / Connections:</b>	¼" NPT or 3/8" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight at max WP



Assembly drawing for reference only. Refer to office for specific detail.

TECHNICAL DATA / MATERIALS OF CONSTRUCTION	
<b>Weight:</b>	0,9kg
<b>Body material options:</b>	Brass or 316SS
<b>Wetted parts:</b>	316SS
<b>Bonnet:</b>	Brass or 316SS
<b>Seat:</b>	PEEK or PCTFE
<b>O-ring seals:</b>	Viton

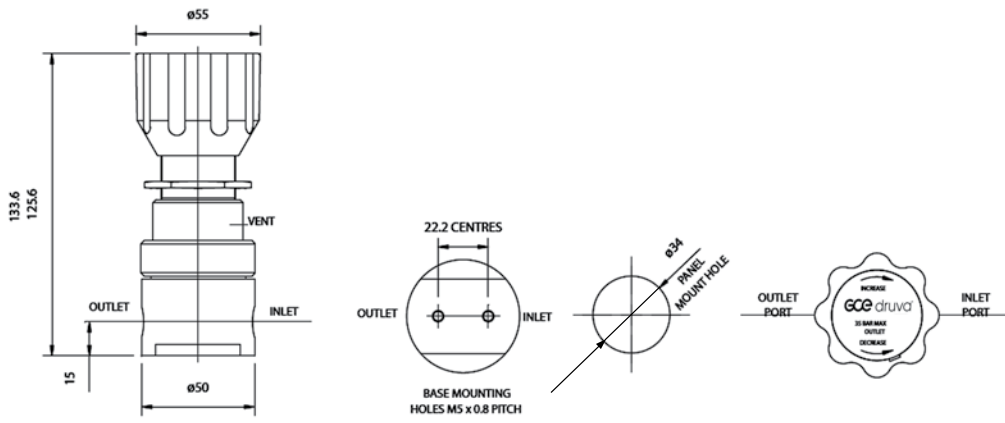
## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	Seat	Port connections	Porting configuration
<b>MF101</b>	<b>5</b>	<b>S</b>	<b>10</b>	<b>P</b>	<b>02N</b>	<b>N</b>
MF101	5 – 0,5	S – 316SS B – HT Brass	10 – 0 - 10bar (0 - 145psi) 20 – 0 - 20bar (0 - 290psi) 35 – 0 - 35bar (0 - 507psi)	P – PEEK – Hydraulic service (Max 100bar inlet) K – PCTFE – Gas service (Max 100bar inlet)	02N – ¼" NPT 03N – 3/8" NPT	Please select your configuration in the quick reference overview

NOTE: Please contact us for any non-standard requests.



INSTALLATION DIMENSIONS:



# MF-230/231 – ‘MEDIUM FLOW’ PRESSURE REGULATOR WITH DIAPHRAGM (MF-230) & AS PISTON OPTION (MF-231)



## DESCRIPTION

Versatile and economical regulator for gas applications. An elastomeric diaphragm provides excellent sensitive control to 10bar (145psi) pressure and piston sensed options for higher outlets. A balanced main valve minimises the load on the seat and provides stable control under decaying inlet pressure. Easy to access seat cartridge from base of regulator reduces downtime during servicing.

## APPLICATION

- > CNG
- > Commercial Diving
- > Pneumatic Logic Systems
- > Pressure Test Rigs

## SPECIAL FEATURES

- > Excellent sensitive control
- > Finely balanced main valve
- > Stable outlet pressure under decaying inlet
- > Easy to service design
- > All machined parts in 316SS

## PRODUCT DATA

<b>Fluid Type:</b>	Gas
<b>Sensing element:</b>	Diaphragm or Piston
<b>Max Inlet Pressure:</b>	230bar (3300psi)
<b>Max Outlet ranges:</b>	0 – 10bar (diaphragm) or 0 – 50bar (piston)
<b>CV options:</b>	1,0
<b>Port size / Connections:</b>	½" NPT, ½" BSP, ¾" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight at max WP

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

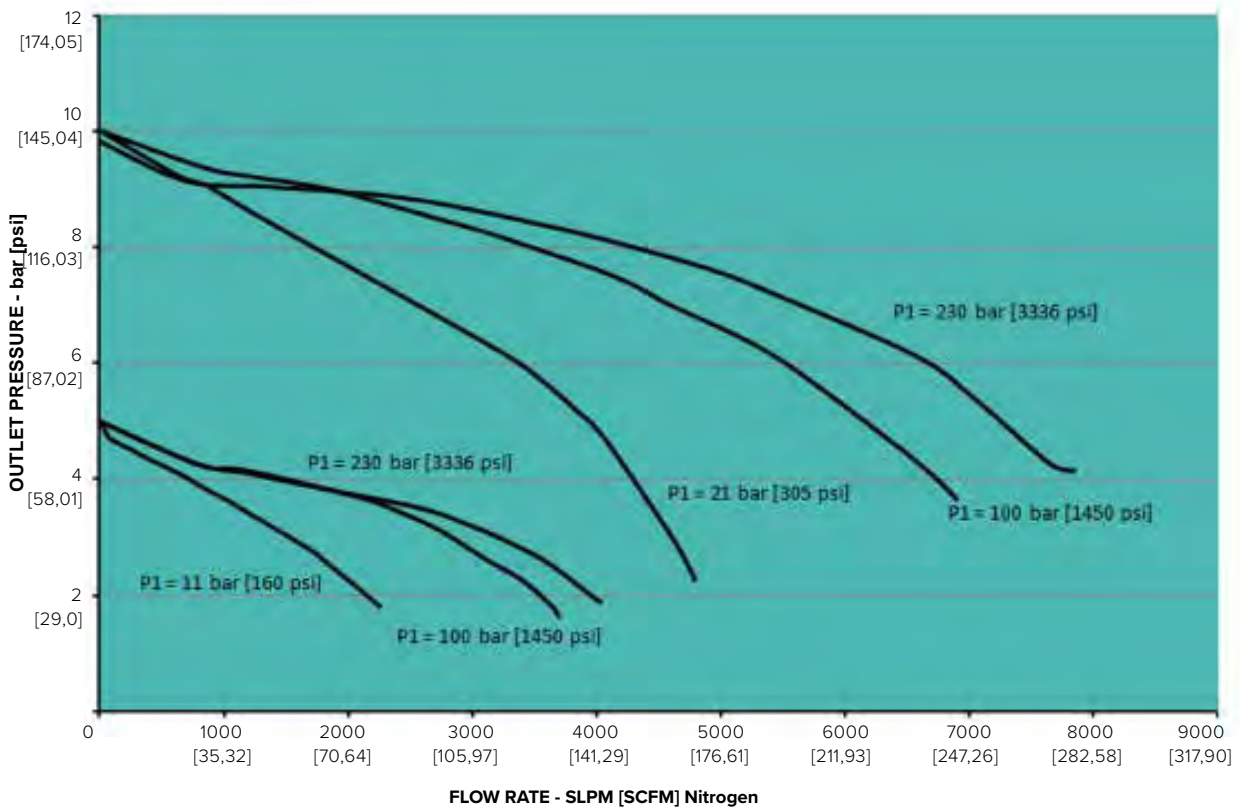
<b>Weight:</b>	Approx. 1,7kg
<b>Body material options:</b>	316SS
<b>Wetted parts:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	PCTFE, PTFE, FEP
<b>Seat diameter:</b>	7,2mm
<b>O-ring seals:</b>	FKM

## ORDER CODE

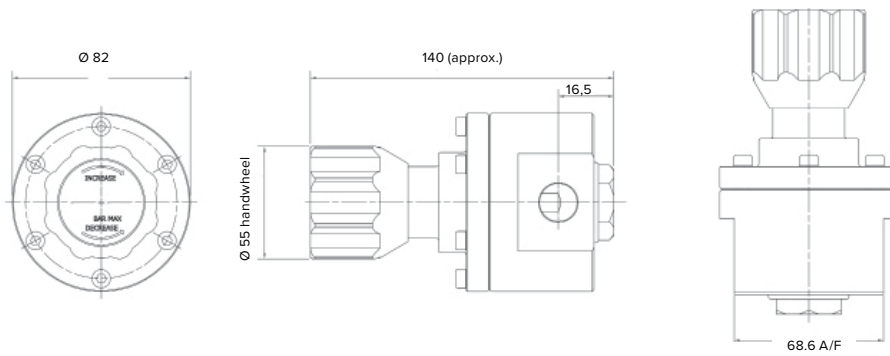
Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Seat	Inlet/outlet connesctions	Porting configuration
<b>MF230</b>	<b>1</b>	<b>S</b>	<b>10</b>	<b>V</b>	<b>T</b>	<b>04N</b>	<b>N</b>
MF230 (diaphragm)	1 – 1,0	S – 316SS	01 – 0 - 1bar (0 – 14,5psi) 02 – 0 - 2bar (0 – 29psi)	V – FKP/FPM N – NBR	T – PTFE (Max Inlet 10bar) K – PCTFE (Max Inlet 230bar) F – FEP (max inlet 50bar)	04N – ½" NPT 04B – ½" BSP 06N – ¾" NPT	Please select your configuration in the quick reference overview
MF231 (piston)			05 – 0 - 5bar (0 – 72psi) 10 – 0 - 10bar (0 - 145psi) 50 – 0 - 50bar (0 - 725psi) – piston option only				

NOTE: Please contact us for any non-standard requests.

PERFORMANCE CHARTS MF-230



INSTALLATION DIMENSIONS:



# MF-301 – ‘MEDIUM FLOW’ PRESSURE REGULATOR PISTON SENSED FOR OUTLET CONTROL TO 200BAR (2900PSI)



## DESCRIPTION

The MF-301 is a medium flow piston sensed pressure reducing regulator, which incorporates a balanced main valve to provide stable control under varying inlet pressures. The regulator has a PCTFE seat for excellent shut off and control on gas service. A combination of sensors and spring ranges provide a range of pressure control options with minimal torque adjustment and accurate control.

## APPLICATION

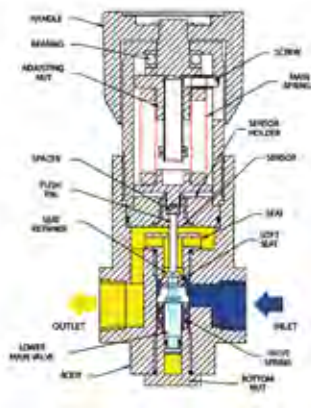
- > Compressed air systems
- > Gas quads
- > Commercial diving & life support applications
- > Pressure Test Rigs
- > Air starter engine

## SPECIAL FEATURES

- > Precision machined sensing elements
- > Low torque adjustment
- > Lower entry access to main valve and plastic cone
- > Finely balanced main valve
- > Stable and accurate pressure control
- > Self-venting or non-venting options

## PRODUCT DATA

<b>Fluid Type:</b>	Gas
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	300bar (4350psi)
<b>Max Outlet ranges:</b>	200bar (hand-wheel) or 140bar (Air-actuated)
<b>CV options:</b>	0,8 or 2,0
<b>Port size / Connections:</b>	½" NPT or ¾" NPT
<b>Loading Options:</b>	Hand-wheel or air-actuated
<b>Venting / non-venting:</b>	Self-venting or Non-venting
<b>Leakage:</b>	Bubble tight at max WP



Assembly drawing for reference only. Refer to office for specific detail.

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	3,9kg
<b>Body &amp; Bonnet material options:</b>	316SS or Brass
<b>Wetted parts:</b>	316SS
<b>Seat:</b>	PCTFE
<b>Seat diameter:</b>	7,2mm
<b>O-ring seals:</b>	NBR, Viton, EPDM

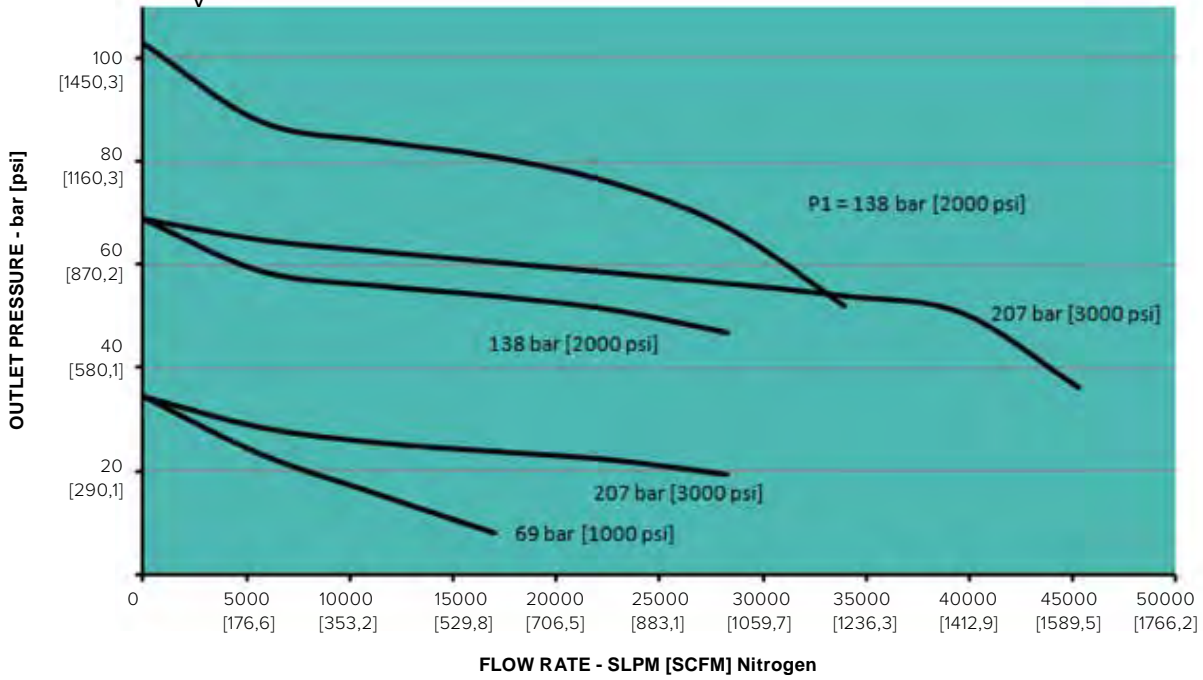
## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connesctions	Porting configuration	Venting options
<b>MF301</b>	<b>2</b>	<b>S</b>	<b>20S</b>	<b>V</b>	<b>04N</b>	<b>N</b>	<b>SV</b>
MF301	2 – 2,0 8 – 0,8	S – 316SS B – Brass	20S – 0 - 20bar (0 - 290psi) 50S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi) 200S – 0 - 200bar (0 - 2900psi) 140A – 0 - 140bar (0 - 2000psi) (Air-actuated)	V – FKP/FPM N – NBR	04N – ½" NPT 04B – ½" BSP 06N – ¾" NPT	Please select your configuration in the quick reference overview	NV – Non-venting SV – Self-venting

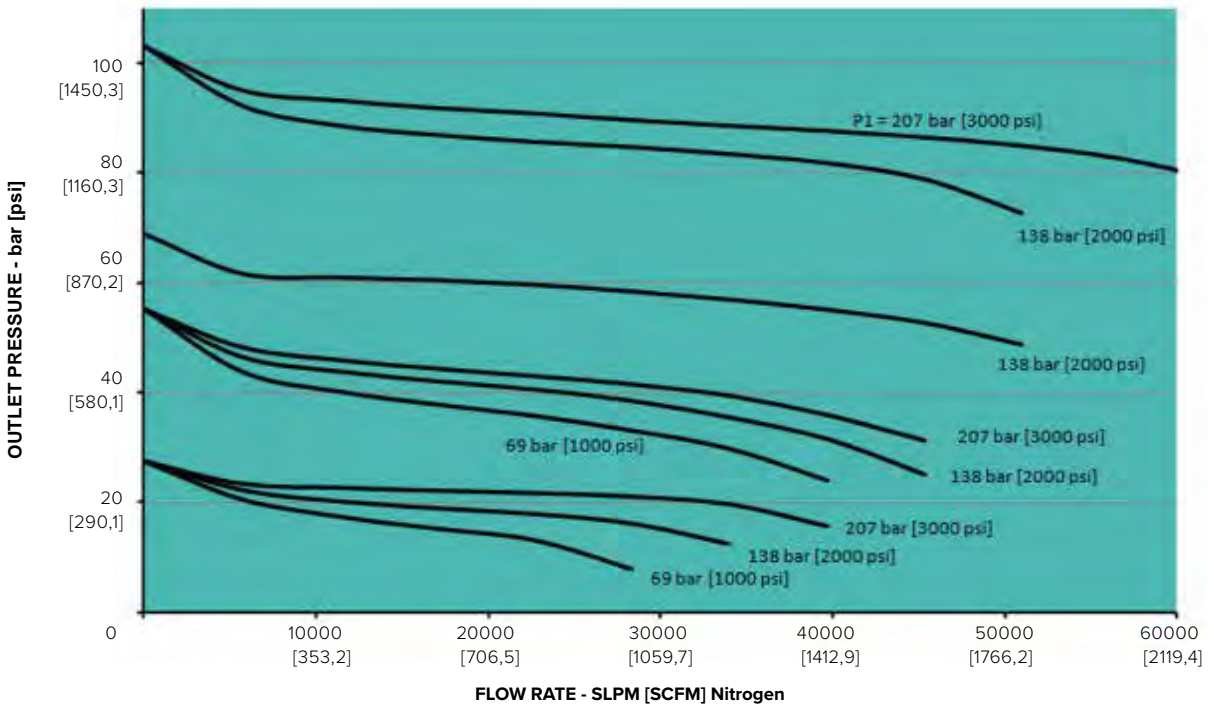
NOTE: Please contact us for any non-standard requests.

PERFORMANCE CHARTS

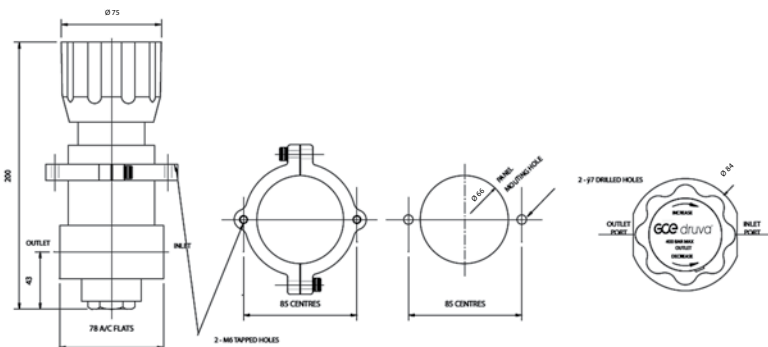
MF-301 SERIES  $C_v = 0.8$



MF-301 SERIES  $C_v = 2.0$



INSTALLATION DIMENSIONS:



# MF-400/401G – ‘MEDIUM FLOW’ PRESSURE REGULATOR FOR LIQUID OR GAS APPLICATIONS DIAPHRAGM AND PISTON SENSED OPTIONS



DIAPHRAGM SENSED DESIGN:



PISTON SENSED DESIGN:



## DESCRIPTION

The MF-400 is the diaphragm sensed option and the MF401 is the piston sensed option. Both the diaphragm sensed and piston sensed options also have gas and hydraulic options. This makes the model a versatile and widely used model.

## APPLICATION

> Versatile set of gas & hydraulic applications

## SPECIAL FEATURES

- > 316L SS Wetted Parts
- > Balanced Main Valve
- > Cv 2,0
- > Diaphragm or Piston Sensed
- > Range of O Rings
- > None rising stem
- > Low torque adjustment
- > Threaded or Flanged Options

## PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Diaphragm or Piston
<b>Max Inlet Pressure:</b>	50bar (725psi) or 400bar (5800psi)
<b>Max Outlet ranges:</b>	Diaphragm – 10bar (145psi), Piston – 300bar (4350psi)
<b>CV options:</b>	2,0
<b>Port size / Connections:</b>	½" NPT, ½" BSP, ¾" NPT, ¾" BSP
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Self-venting or Non-venting
<b>Leakage:</b>	Bubble tight at max WP

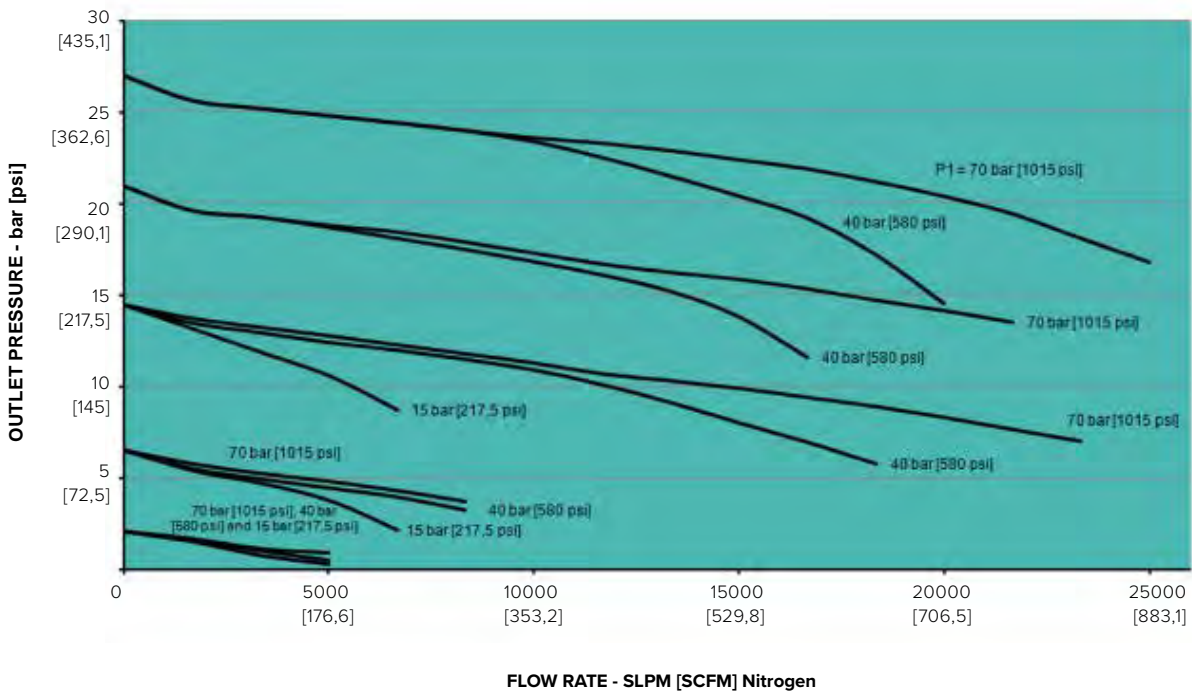
TECHNICAL DATA / MATERIALS OF CONSTRUCTION	
<b>Weight:</b>	5kg
<b>Body &amp; Bonnet material options:</b>	316SS
<b>Wetted parts:</b>	316SS
<b>Seat:</b>	Gas applications – PCTFE
<b>Hydraulic applications:</b>	PEEK
<b>Seat diameter:</b>	10mm
<b>O-ring seals:</b>	NBR, Viton, EPDM

## ORDER CODE

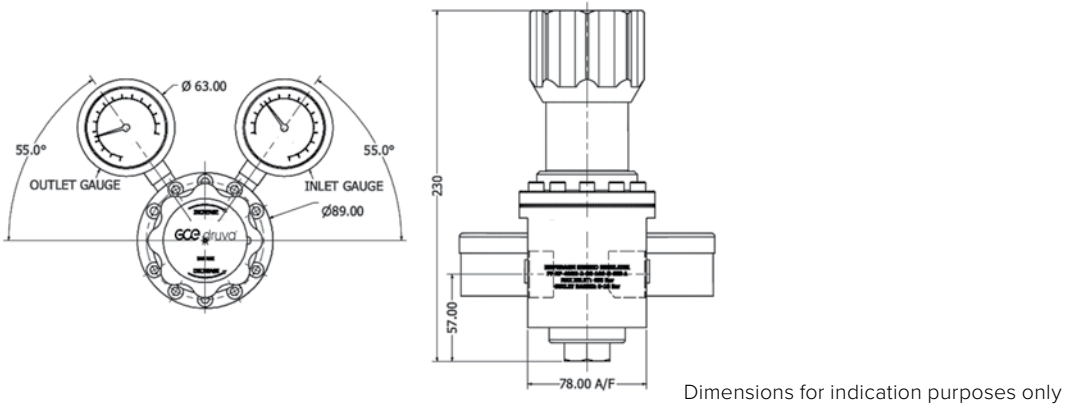
Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connesions	Porting configuration	Venting options
<b>MF400G</b>	<b>2</b>	<b>S</b>	<b>20S</b>	<b>V</b>	<b>04N</b>	<b>N</b>	<b>NV</b>
MF400G – Diaphragm sensed, gas service	2 – 2,0	S – 316SS	05S – 0 - 5bar (0 - 73psi) 10S – 0 - 10bar (0 - 145psi)	V – FKP/FPM N – NBR	04N – ½" NPT 04B – ½" BSP	Please select your configuration in the quick reference overview	NV – Non-venting
MF400H – Diaphragm sensed, hydraulic service			50S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi) 200S – 0 - 200bar (0 - 2900psi)		06N – ¾" NPT 06B – ¾" BSP		
MF401G – Piston sensed, gas service			400S – 0 - 400bar (0 - 5800psi)				
MF401H – Piston sensed, hydraulic service							

NOTE: Please contact us for any non-standard requests.

PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# MF-414G – ‘MEDIUM FLOW’ PRESSURE REGULATOR FOR GAS APPLICATIONS PISTON SENSED FOR OUTLET CONTROL TO 414BAR (6000PSI)



## DESCRIPTION

The MF-414 is a medium flow piston sensed pressure reducing regulator, which incorporates a balanced main valve to provide stable control under varying inlet pressures. The regulator has a PEEK seat for ultimate protection on gas service. A segregated captured vent allows pressure reduction of the outlet pressure through a 1/4 NPT port on the side of the regulator body.

## APPLICATION

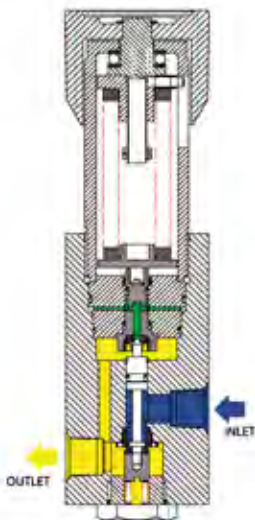
- > Valve Actuator Control
- > Large diameter pipe testing
- > Gas compression systems
- > Automated pressure cycling
- > Aircraft charging carts

## SPECIAL FEATURES

- > 414bar (6000psi) inlet pressure
- > Precision machined sensing elements
- > Load bearings and large hand-wheel for low torque adjustment
- > Excellent sensitivity
- > Self-venting and non-venting options

## PRODUCT DATA

<b>Fluid Type:</b>	Gas
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	414bar (6000psi)
<b>Max Outlet ranges:</b>	Up to 414bar (6000psi)
<b>CV options:</b>	2,0
<b>Port size / Connections:</b>	½" NPT, ¾" NPT, 1" NPT, ½" BSP
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Self-venting or Non-venting
<b>Leakage:</b>	Bubble tight at max WP



## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	6kg
<b>Body &amp; Bonnet material options:</b>	316SS
<b>Wetted parts:</b>	316SS
<b>Seat:</b>	17-4PH SS or PEEK
<b>O-ring seals:</b>	NBR, Viton, EPDM

## ORDER CODE

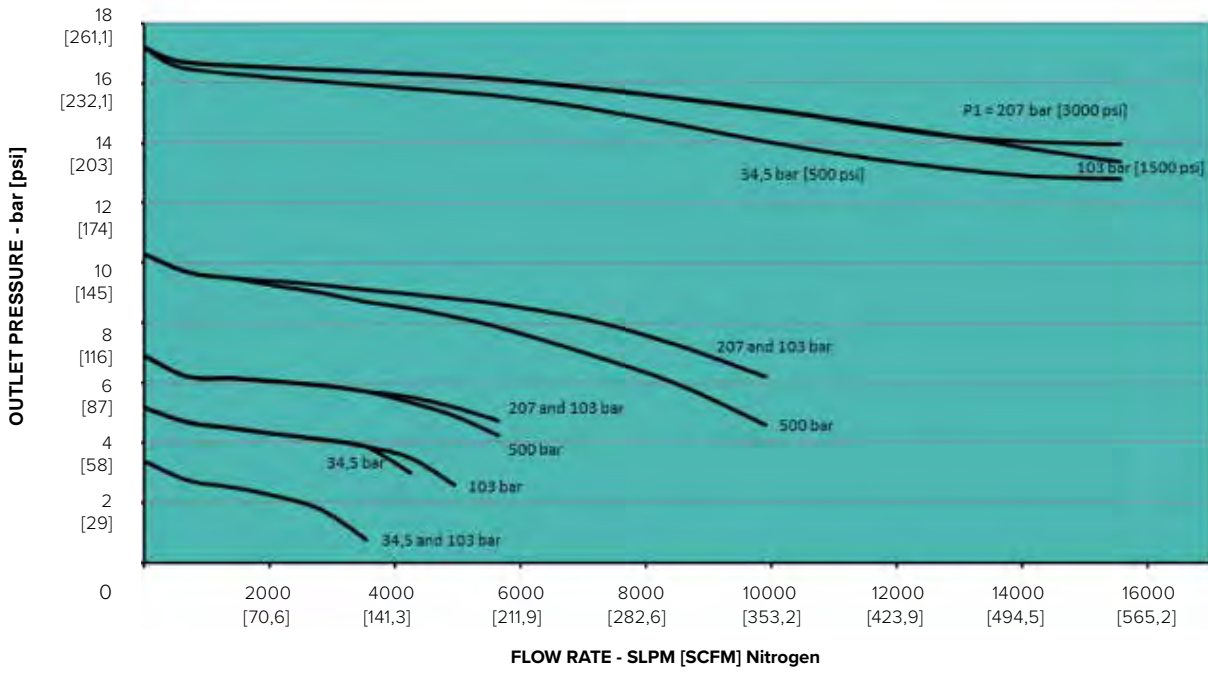
Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connections	Porting configuration	Venting options
<b>MF414G</b>	<b>2</b>	<b>S</b>	<b>20S</b>	<b>V</b>	<b>04N</b>	<b>N</b>	<b>NV</b>
MF414G	2 – 2,0	S – 316SS	50S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi) 200S – 0 - 200bar (0 - 2900psi) 414S – 0 - 414bar (0 - 6000psi)	V – FKP/FPM N – NBR	04N – ½" NPT 04B – ½" BSP 06N – ¾" NPT 08N – 1" NPT	Please select your configuration in the quick reference overview	NV – Non-venting SV – Self-venting

NOTE: Please contact us for any non-standard requests.

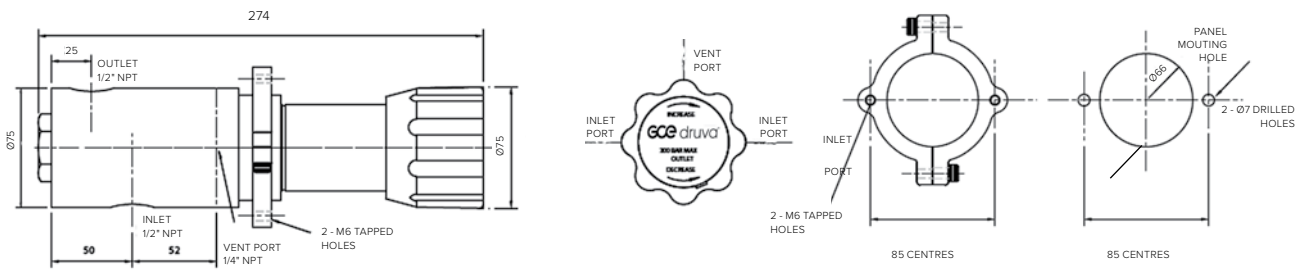


PERFORMANCE CHARTS

MF-414 SERIES C - 3.0



INSTALLATION DIMENSIONS:



# HF300-301 – ‘HIGH FLOW’ PRESSURE REGULATOR FOR LIQUID OR GAS APPLICATIONS DIAPHRAGM AND PISTON SENSED OPTIONS



### DESCRIPTION

The HF-300 is the diaphragm sensed option and the HF-301 is the piston sensed option. Both the diaphragm sensed and piston sensed options also have gas and hydraulic options. This makes the model a versatile and widely used model.

### APPLICATION

> Versatile set of gas & hydraulic applications.

### SPECIAL FEATURES

- > 316L SS Wetted Parts
- > Balanced Main Valve
- > Cv 4,0
- > Diaphragm or Piston Sensed
- > Range of O Rings
- > Non-rising stem
- > Low torque adjustment
- > Threaded or Flanged Options

DIAPHRAGM SENSED DESIGN:



### PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Diaphragm or Piston
<b>Max Inlet Pressure:</b>	50bar (725psi) or 300bar (4350psi)
<b>Max Outlet ranges:</b>	Diaphragm - 10bar (145psi), Piston – 250bar (3000psi)
<b>CV options:</b>	4,0
<b>Port size / Connections:</b>	¾" NPT, ¾" BSP, 1" NPT, 1" BSP
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight at max WP

PISTON SENSED DESIGN:



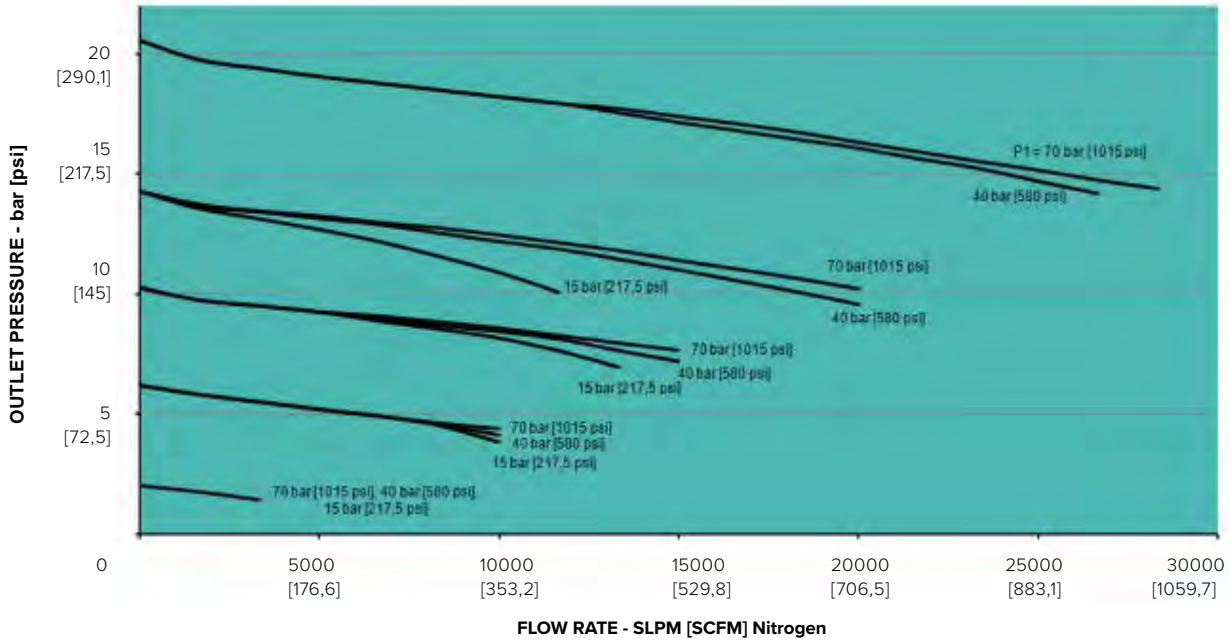
TECHNICAL DATA / MATERIALS OF CONSTRUCTION	
<b>Weight:</b>	8kg
<b>Body &amp; Bonnet material options:</b>	316SS
<b>Wetted parts:</b>	316SS
<b>Seat:</b>	Gas applications – PEEK Hydraulic applications – Vespel
<b>O-ring seals:</b>	NBR, Viton, FKM/FPM, EPDM, FFKM/FFPM

### ORDER CODE

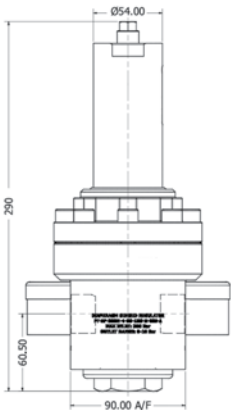
Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connesctions	Porting configuration	Venting options
<b>HF300G</b>	<b>4</b>	<b>S</b>	<b>20S</b>	<b>V</b>	<b>06N</b>	<b>N</b>	<b>NV</b>
HF300G – Diaphragm sensed, gas service	4 - 4,0	S – 316SS	05S – 0 - 5bar (0 - 73psi) 10S – 0 - 10bar (0 - 145psi)	V – FKP/FPM N – NBR	06N – ¾" NPT 06B – ¾" BSP	Please select your configuration in the quick reference overview	NV – Non-venting
HF300H – Diaphragm sensed, hydraulic service			50S – 0 - 50bar (0 - 725psi)	E – EPDM	08N – 1" NPT		
HF301G – Piston sensed, gas service			100S – 0 - 100bar (0 - 1450psi) 250S – 0 - 250bar (0 - 3600psi)	K – FFKM/FFPM	08B – 1" BSP		
HF301H – Piston sensed, hydraulic service							

NOTE: Please contact us for any non-standard requests.

PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# HF250/251 – 7 SERIES - ‘HIGH FLOW’ PRESSURE REGULATOR FOR LIQUID OR GAS APPLICATIONS DIAPHRAGM AND PISTON SENSED OPTIONS

## DESCRIPTION

The HF-250 is the diaphragm sensed option and the HF-251 is the piston sensed option. Both the diaphragm sensed and piston sensed options also have gas and hydraulic options. This makes the model a versatile and widely used model. This is the 7-Series, with Cv 7,0. There is also the option for this regulator with a Cv 12,0.

Pilot regulator option is the LF-540 or LF692 and needs to be ordered separately.

## APPLICATION

> Versatile set of gas & hydraulic applications.

## SPECIAL FEATURES

- > 316L SS Wetted Parts
- > Balanced Main Valve
- > Cv 7,0 (12,0 is optional)
- > Diaphragm or Piston Sensed
- > Range of O Rings
- > Non-rising stem
- > Low torque adjustment
- > Threaded or Flanged Options

## PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Diaphragm or Piston
<b>Max Inlet Pressure:</b>	50bar (725psi) or 300bar (4350psi)
<b>Max Outlet ranges:</b>	Diaphragm - 10bar (145psi), Piston – 300bar (3600psi)
<b>CV options:</b>	7,0 or 12,0
<b>Port size / Connections:</b>	¾" NPT, ¾" BSP, 1" NPT, 1" BSP
<b>Loading Options:</b>	Hand-wheel, dome-loaded
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight at max WP



DIAPHRAGM SENSED DESIGN:



PISTON SENSED DESIGN:



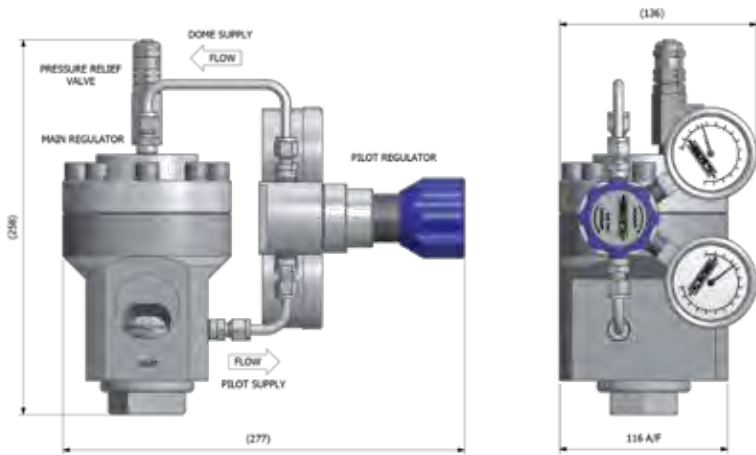
TECHNICAL DATA / MATERIALS OF CONSTRUCTION	
<b>Weight:</b>	4,8kg
<b>Body &amp; Bonnet material options:</b>	316SS
<b>Wetted parts:</b>	316SS
<b>Seat:</b>	Gas applications – PCTFE Hydraulic applications - PEEK
<b>Seat diameter:</b>	14mm
<b>O-ring seals:</b>	NBR, FKM/FPM

## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connesctions	Porting configuration	Venting options
<b>HF250G</b>	<b>7</b>	<b>S</b>	<b>20S</b>	<b>V</b>	<b>06N</b>	<b>N</b>	<b>NV</b>
HF250G – Diaphragm sensed, gas service	7 – 7,0 12 – 12,0	S – 316SS	05S – 0 - 5bar (0 - 73psi) 10S – 0 - 10bar (0 - 145psi) 50S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi) 250S – 0 - 250bar (0 - 3600psi)	V – FKP/FPM N – NBR	08N – 1" NPT 08B – 1" BSP 12N – 1 1/2 " NPT	Please select your configuration in the quick reference overview	NV – Non-venting
HF250H – Diaphragm sensed, hydraulic service							
HF251G – Piston sensed, gas service			10D – 0 - 10bar (0 - 145psi) (dome loaded option)				
HF251H – Piston sensed, hydraulic service			50D – 0 - 50bar (0 - 725psi) (dome loaded option)				

NOTE: Please contact us for any non-standard requests.

INSTALLATION DIMENSIONS:



# HYD-691 – ‘LOW FLOW’ HYDRAULIC PRESSURE REDUCING REGULATOR PISTON SENSED FOR OUTLET CONTROL TO 690BAR (10.000PSI)



## DESCRIPTION

The HYD-691 is the compact version of the highly successful LF-690/691. It has been designed as the economical alternative, yet still incorporates all the key features of the larger regulator, including ceramic seats. The ceramic ball has a ‘glass like’ finish to provide a positive shut-off and is also fully supported to ensure fixed travel in the Y-axis. The ceramic seat is incorporated into a unique cartridge assembly which is supplied as one piece.

## APPLICATION

- > Wellhead logic and control systems
- > Subsea valve actuator control
- > Valve test rigs
- > Liquid sampling
- > Hydraulic power packs

## SPECIAL FEATURES

- > Compact economical design
- > 690bar (10.000psi) inlet pressure
- > Precision machined sensing elements
- > Load bearings and large handwheel for low torque adjustment SS Panel Mounting Ring

## PRODUCT DATA

<b>Fluid Type:</b>	Hydraulic
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	690bar (10.000psi)
<b>Max Outlet ranges:</b>	Up to 690bar
<b>CV options:</b>	0,06
<b>Port size / Connections:</b>	¼" NPT, 3/8" NPT, 3/8" MP, ½" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Self-venting or non-venting
<b>Leakage:</b>	Bubble tight seal at max inlet pressure

### TECHNICAL DATA / MATERIALS OF CONSTRUCTION

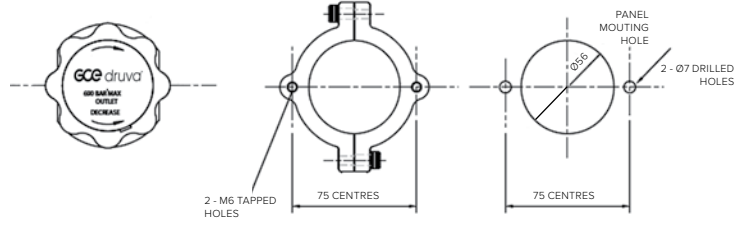
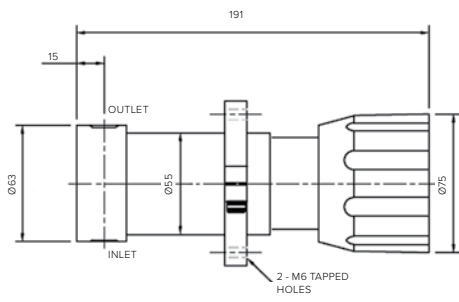
<b>Weight:</b>	2,5kg
<b>Body &amp; wetted parts material options:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	Ceramic TX3000
<b>O-ring seals:</b>	NBR, Viton, EPDM

## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connestions	Porting configuration	Venting options
<b>HYD691</b>	<b>06</b>	<b>S</b>	<b>100S</b>	<b>N</b>	<b>03N</b>	<b>N</b>	<b>SV</b>
HYD691	06 – 0,06	S – 316SS (690bar inlet)	050S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi) 200S – 0 - 200bar (0 - 2900psi) 414S – 0 - 414bar (0 - 6000psi) 690S – 0 - 690bar (0 - 10.000psi)	N – NBR V – FKM/FPM E – EPDM	02N – ¼" NPT 03N – 3/8" NPT 04N – ½" NPT 03A – 3/8" MP	Please select your configuration in the quick reference overview	SV – Self-venting NV – Non-venting

NOTE: Please contact us for any non-standard requests.

INSTALLATION DIMENSIONS:



# LGC-690 – ‘LOGIC’ LOW PRESSURE HYDRAULIC REDUCING REGULATOR FOR OUTLET CONTROL TO 414BAR (8000PSI)



## DESCRIPTION

The LGC-690 provides accurate low pressure control on Logic Control Systems used on Wellhead control Panels where low dead-band and repeatable pressure control is critical.

## APPLICATION

> Wellhead logic control systems

## SPECIAL FEATURES

- > Large precision machined piston sensed element
- > Setpoint dead-band +/- 0,25bar per 100bar inlet pressure
- > Easy-to-service main valve cartridge assembly
- > Balanced main valve
- > 30 micron filter element
- > Self-venting with captured port

## PRODUCT DATA

<b>Fluid Type:</b>	Hydraulic
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	414bar (8000psi)
<b>Max Outlet ranges:</b>	Up to 10bar
<b>CV options:</b>	0,3
<b>Port size / Connections:</b>	¼" NPT, 3/8" NPT, ½" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Self-venting
<b>Leakage:</b>	Bubble tight seal at max inlet pressure

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	3,5kg
<b>Body &amp; wetted parts material options:</b>	316SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	PEEK
<b>O-ring seals:</b>	NBR, Viton

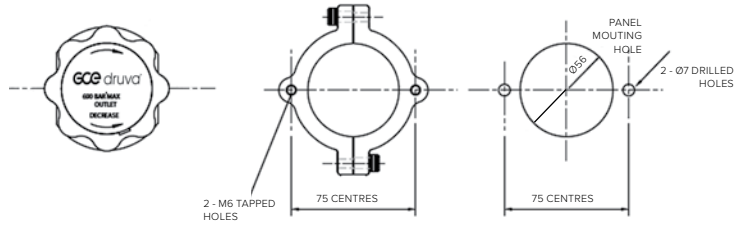
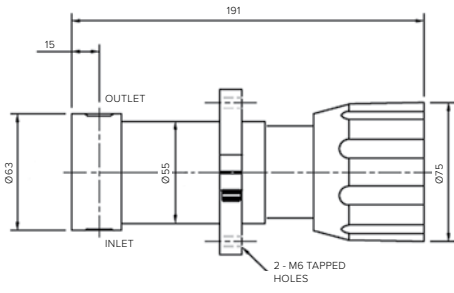
## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connesctions	Porting configuration	Venting options
<b>LGC690</b>	<b>03</b>	<b>S</b>	<b>10S</b>	<b>N</b>	<b>03N</b>	<b>N</b>	<b>SV</b>
LGC690	03 – 0,3	S – 316SS (690bar inlet)	10S – 0 - 10bar 15S – 0 - 115bar	N – NBR	02N – ¼" NPT 03N – 3/8" NPT 04N – ½" NPT	Please select your configuration in the quick reference overview	SV – Self-venting

NOTE: Please contact us for any non-standard requests.



INSTALLATION DIMENSIONS:



# LF-690/691 – 'LOW FLOW' HYDRAULIC PRESSURE REDUCING REGULATOR

FOR WATER GLYCOL APPLICATIONS PISTON SENSED FOR OUTLET CONTROL TO 1380BAR (20.000PSI)



## DESCRIPTION

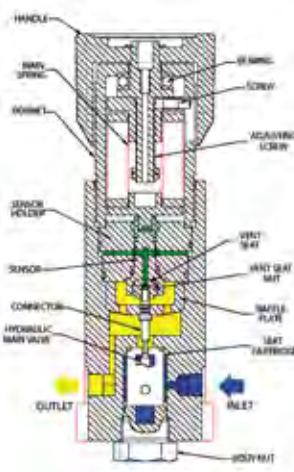
The LF-690/691 uses Ceramic Seating to provide ultimate protection against the harsh service encountered on hydraulic water glycol services. The unique seating cartridge provides a dampening action on this critical component to prevent 'chattering' or 'unstable frequency resonance'. The regulator is self relieving with segregated captured vent to prevent deterioration to the loading mechanism and making the regulator cleaner to service. The seating area can easily be accessed from the base of the regulator for speedy servicing in suit.

## APPLICATION

- > Wellhead logic and control systems
- > Subsea valve actuator control
- > Valve test rigs
- > Liquid sampling
- > Hydraulic Power Packs

## SPECIAL FEATURES

- > 5 sensor ranges for combination of low torque and high sensitivity
- > Segregated captured vent
- > 316SS panel mounting ring
- > Optional Cv 0,3 for quick fill umbilical systems



## PRODUCT DATA

<b>Fluid Type:</b>	Hydraulic, Water Glycol
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	1380bar (20.000psi), 1034bar (20.000psi) (Air-Actuated)
<b>Max Outlet ranges:</b>	Up to 1380bar (20.000psi), 1034bar (20.000psi) (Air-Actuated)
<b>CV options:</b>	0,05 – 0,1 – 0,3 (Max 1034bar)
<b>Port size / Connections:</b>	¼" NPT, 3/8" NPT, 3/8" MP, ½" NPT, 9/16" MP
<b>Loading Options:</b>	Hand-wheel or Air-actuated
<b>Venting / non-venting:</b>	Self-venting & Non-venting
<b>Leakage:</b>	Bubble tight seal at max inlet pressure

Assembly drawing for reference only. Refer to office for specific detail.

### TECHNICAL DATA / MATERIALS OF CONSTRUCTION

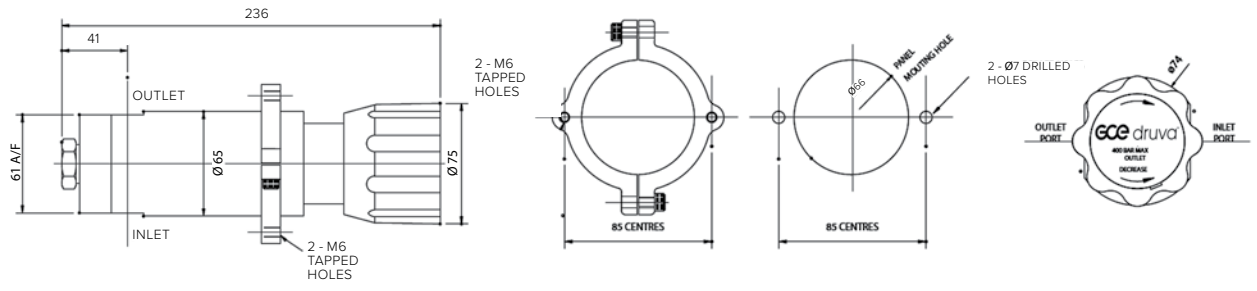
<b>Weight:</b>	Approx. 4kg (without flanges)
<b>Body &amp; wetted parts material options:</b>	316SS or 17-4PH SS
<b>Bonnet:</b>	316SS
<b>Seat:</b>	Ceramic, TX3000
<b>O-ring seals:</b>	NBR, Viton, EPDM

## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connestions	Porting configuration	Venting options
<b>LF691</b>	<b>01</b>	<b>S</b>	<b>100S</b>	<b>N</b>	<b>03A</b>	<b>N</b>	<b>SV</b>
LF690 (max 690bar)	01 – 0,1 05 – 0,05	S – 316SS (690bar inlet)	150S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi)	N – NBR V – FKM/FPM E – EPDM H – HNBR	02N – ¼" NPT 03N – 3/8" NPT 04N – ½" NPT 03A – 3/8" MP 04A – 9/16" MP	Please select your configuration in the quick reference overview	SV – Self-venting NV – Non-venting
LF691 (max 1380bar)	03 – 0,3	R – 17-4PH (1380bar inlet)	200S – 0 - 200bar (0 - 2900psi) 414S – 0 - 414bar (0 - 6000psi) 690S – 0 - 690bar (0 - 10.000psi) 862S – 0 - 862bar (0 - 12.500psi) 1034S – 0 - 1034bar (0 - 15.000psi) 1380S – 0 - 0 1380bar (0 - 20.000psi) 140A – 0 - 140bar (0 - 2000psi) (Air-actuated) 600A – 0 - 600bar (0 - 8700psi) (Air-actuated) 1034A – 0 - 1034bar (0 - 15.000psi) (Air-actuated)				

NOTE: Please contact us for any non-standard requests.

INSTALLATION DIMENSIONS:



# MF-414H – ‘MEDIUM FLOW’ PRESSURE REDUCING REGULATOR FOR HYDRAULIC APPLICATIONS PISTON SENSED FOR OUTLET CONTROL TO 414BAR (6000PSI)



## DESCRIPTION

The MF-414 is a medium flow piston sensed pressure reducing regulator, which incorporates a balanced main valve to provide stable control under varying inlet pressures.

## SPECIAL FEATURES

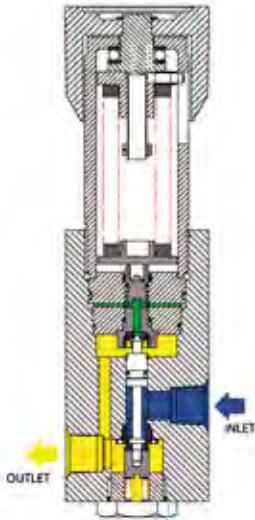
- > 414bar (6000psi) inlet pressure
- > Precision machined sensing elements
- > Load bearings and large hand-wheel for low torque adjustment
- > Excellent sensitivity
- > Self-venting and non-venting options

## APPLICATION

- > Medium flow hydraulic control systems like for umbilical reels, IWOCs, or BOP.
- > Valve Actuator Control
- > Large diameter pipe testing
- > Automated pressure cycling

## PRODUCT DATA

<b>Fluid Type:</b>	Hydraulic
<b>Sensing element:</b>	Piston
<b>Max Inlet Pressure:</b>	414bar (6000psi)
<b>Max Outlet ranges:</b>	Up to 414bar (6000psi)
<b>CV options:</b>	2,0
<b>Port size / Connections:</b>	½" NPT, ½" BSP, ¾" NPT, 1" NPT, 9/16" AE MP
<b>Loading Options:</b>	Hand-wheel or air-actuated
<b>Venting / non-venting:</b>	Self-venting or Non-venting
<b>Leakage:</b>	Bubble tight at max WP



## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Weight:</b>	6kg
<b>Body &amp; Bonnet material options:</b>	316SS
<b>Wetted parts:</b>	316SS
<b>Seat:</b>	7-4PH SS or PEEK
<b>O-ring seals:</b>	NBR, Viton, EPDM

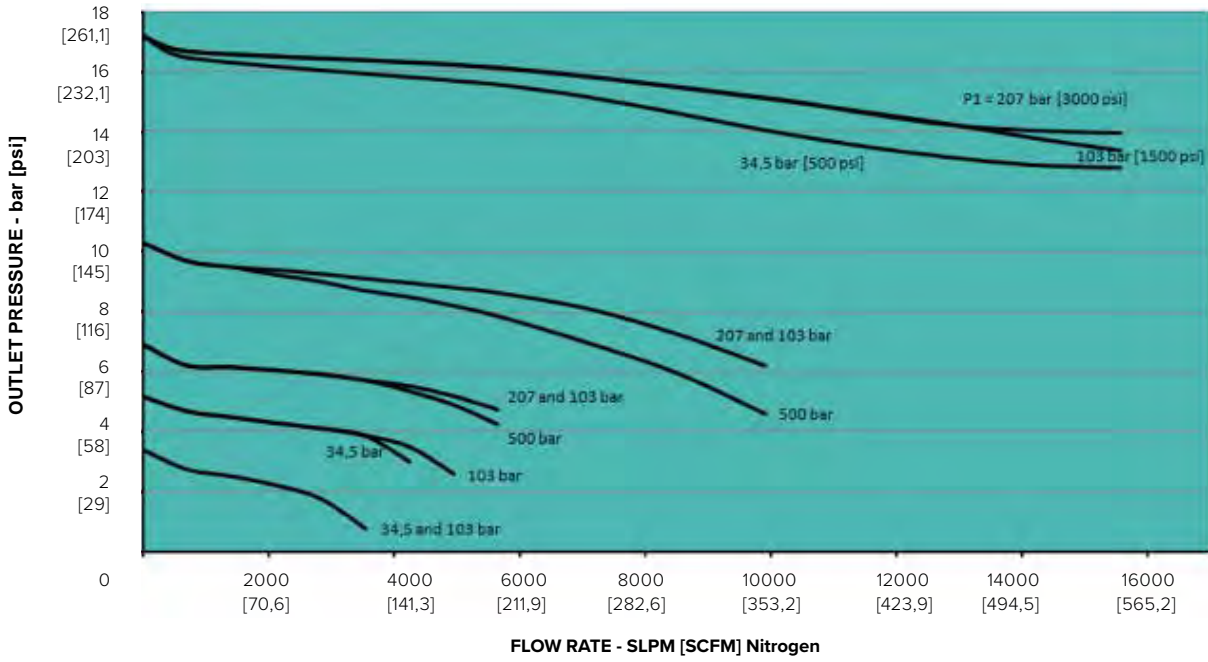
## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connections	Porting configuration	Venting options
<b>MF414H</b>	<b>2</b>	<b>S</b>	<b>20S</b>	<b>V</b>	<b>04N</b>	<b>N</b>	<b>NV</b>
MF414H	2 – 2,0	S – 316SS	50S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi) 200S – 0 - 200bar (0 - 2900psi) 414S – 0 - 414bar (0 - 6000psi) 140A – 0 - 140bar (0 - 2000psi) (Air-actuated) 400A – 0 - 400bar (0 - 5800psi) (Air-actuated)	V – FKP/FPM N – NBR E – EPDM	04N – ½" NPT 04B – ½" BSP 06N – ¾" NPT 08N – 1" NPT 08A – 9/16" AE MP	Please select your configuration in the quick reference overview	SV – Self Venting NV – Non Venting

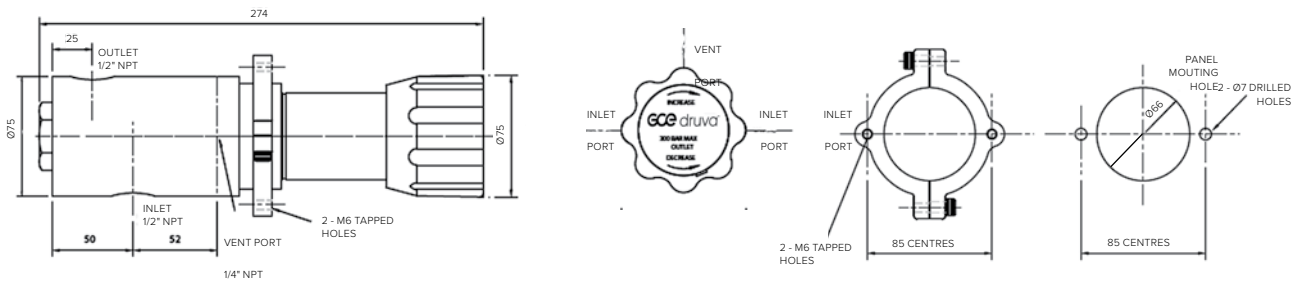
NOTE: Please contact us for any non-standard requests.

PERFORMANCE CHARTS

MF-414 SERIES  $C_v = 2.0$



INSTALLATION DIMENSIONS:



# BP-300 SERIES - 'LOW FLOW' BACK PRESSURE REGULATOR DIAPHRAGM SENSED FOR INLET CONTROL TO 20BAR (290PSI)



## DESCRIPTION

The BP-300 has been designed with a convoluted Inconel X750 diaphragm that lasts 50% longer than a typical stainless steel designs. Its compact simple design makes it ideal for general purpose applications, where accurate control of upstream pressure is required.

## APPLICATION

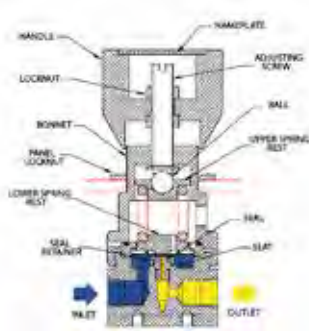
- > Gas and Liquid Analyzer Systems
- > Blanketing applications
- > Laboratories & Research Labs

## SPECIAL FEATURES

- > Metal to metal diaphragm sealing
- > Positive sealing against Viton seat
- > Lightweight compact design
- > Strong and sensitive diaphragm element
- > High Accuracy

## PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Diaphragm
<b>Max rated pressure:</b>	50bar (725psi)
<b>Pressure Control ranges:</b>	Up to 20bar (290psi)
<b>CV options:</b>	0,1
<b>Port size / Connections:</b>	¼" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)
<b>Weight:</b>	0,9kg



Assembly drawing for reference only. Refer to office for specific detail.

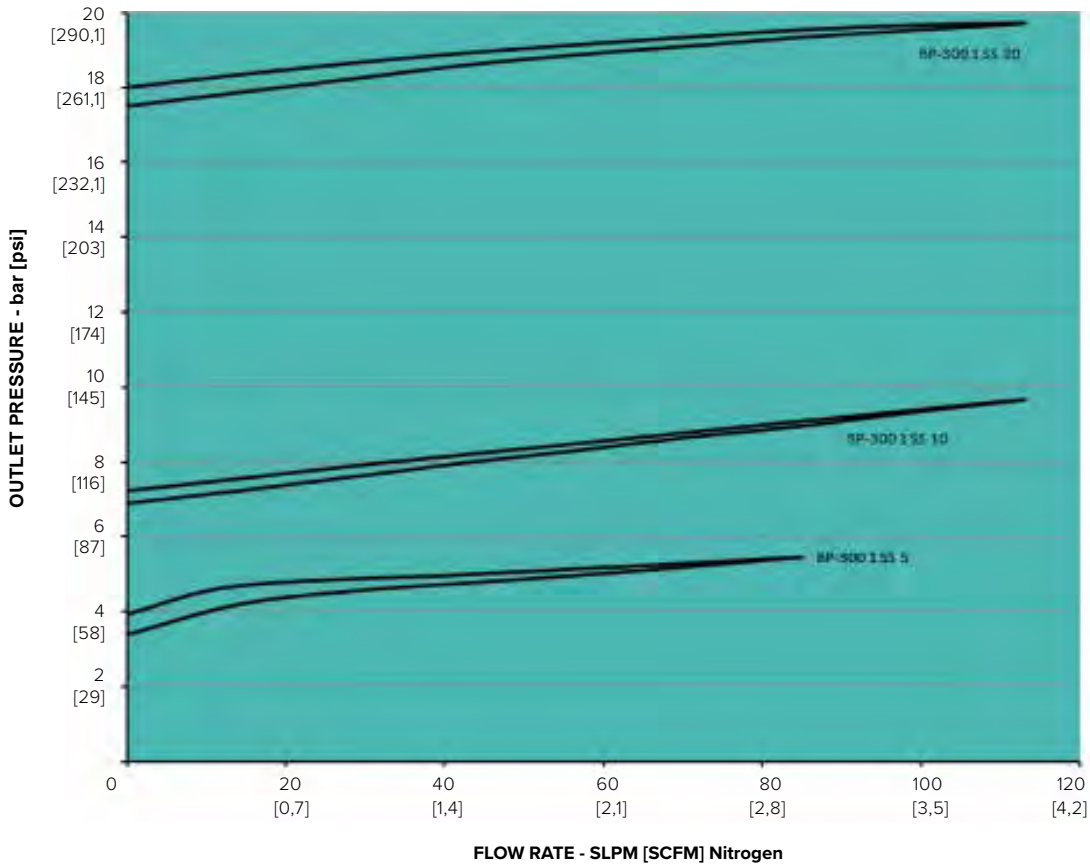
TECHNICAL DATA / MATERIALS OF CONSTRUCTION	
<b>Regulator Part:</b>	Material
<b>Body &amp; Bonnet:</b>	316SS
<b>Seat retainer:</b>	316SS
<b>Soft seat:</b>	Viton
<b>Valve spring:</b>	Inconel X750
<b>Diaphragm:</b>	Inconel X750
<b>Hand-wheel:</b>	Nylon
<b>Diaphragm washer:</b>	Brass
<b>Spring rests:</b>	316SS
<b>O-ring seals:</b>	Viton
<b>Adjusting screw:</b>	AlI Bronze
<b>Loading spring:</b>	302SS

## ORDER CODE

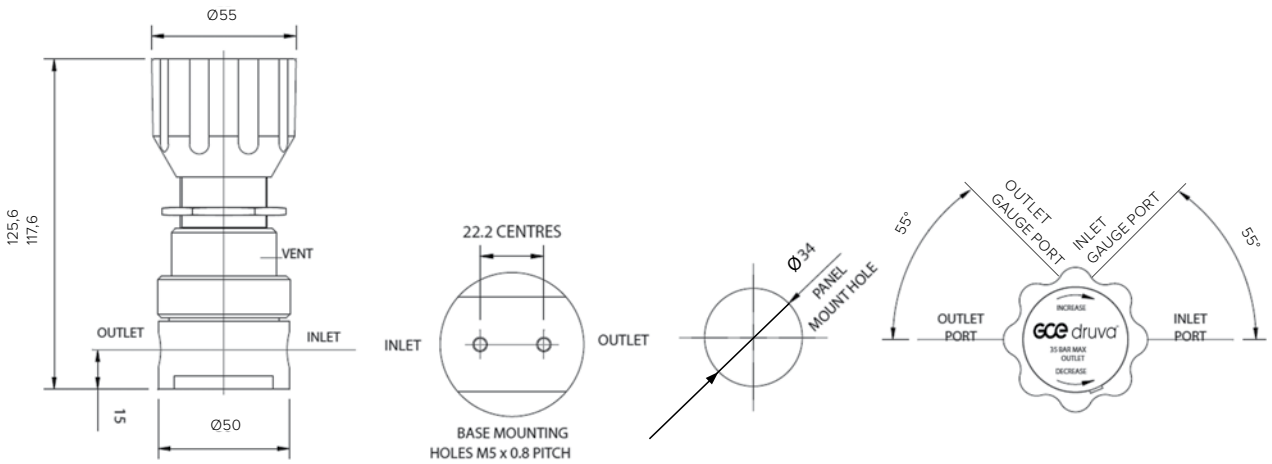
Basic Model	Cv Value	Body material	Pressure control ranges	Seat	Porting configuration
<b>BP300</b>	<b>1</b>	<b>S</b>	<b>10S</b>	<b>V</b>	<b>N</b>
BP300	01 - 0,1	S - 316SS	01S - 0 - 1bar (0 - 14,5psi) 02S - 0 - 2bar (0 - 30psi) 04S - 0 - 4bar (0 - 60psi) 10S - 0 - 10bar (0 - 145) 20S - 0 - 20bar (0 - 290psi)	V - Viton	Please select your configuration in the quick reference overview

NOTE: Please contact us for any non-standard requests.

PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# BP-301 BACK PRESSURE REGULATOR PISTON SENSED FOR MEDIUM PRESSURE APPLICATIONS



## DESCRIPTION

The BP-301 incorporates a highly sensitive piston to control pressures up to 150 bar with the lower Cv value of 0,1 and up to 35 bar with a higher Cv of 0,5. Both designs provide accurate back pressure control on liquid or gas applications. Unlike relief valves, the set load from the spring is not directly applied to the seating area, and the piston sensor provides accurate control throughout the control range.

## APPLICATION

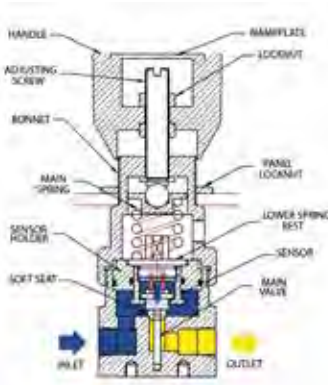
- > Fuel Analyzer Systems
- > Portable Calibration Kits
- > Medium Pressure Reactor Vessels
- > Instrument Air Lines

## SPECIAL FEATURES

- > Lightweight compact design
- > Piston sensing element
- > High accuracy

## PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Piston
<b>Max rated pressure:</b>	225bar (3263psi)
<b>Pressure Control ranges:</b>	Cv 0,1 – Up to 150bar (2175psi), Cv 0,5 – Up to 35bar (507psi)
<b>CV options:</b>	0,1 – 0,5
<b>Port size / Connections:</b>	¼” NPT, 3/8” NPT, ½” NPT
<b>Loading Options:</b>	Hand-wheel
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)
<b>Weight:</b>	0,9kg



Assembly drawing for reference only. Refer to office for specific detail.

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

<b>Regulator Part:</b>	Material
<b>Body &amp; Bonnet:</b>	316SS
<b>Main valve pin:</b>	316SS
<b>Soft seat cone:</b>	Liquid application – PEEK, Gas application - PCTFE
<b>Valve spring:</b>	Inconel X750
<b>Sensor &amp; holder:</b>	316SS
<b>Hand-wheel:</b>	Nylon
<b>Spring rests:</b>	316SS
<b>O-ring seals:</b>	Viton
<b>Adjusting screw:</b>	Ali Bronze
<b>Loading spring:</b>	302SS

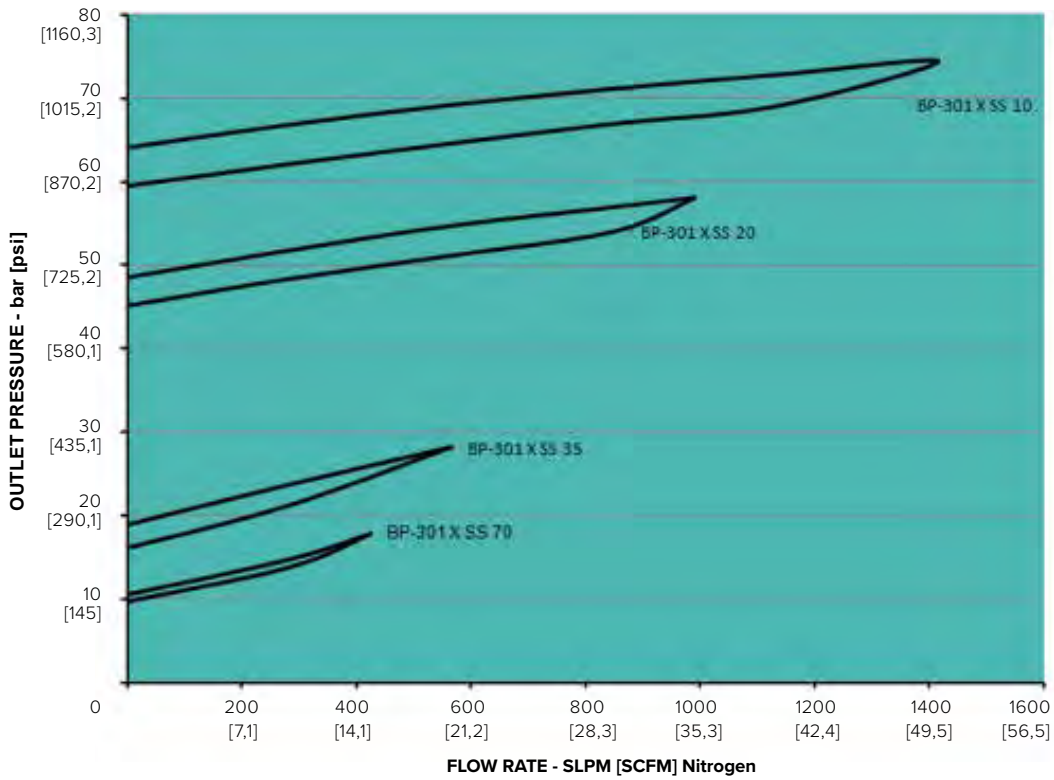
## ORDER CODE

Basic Model	Cv Value	Body material	Pressure control ranges	Seat	Port connections	Porting configuration
<b>BP301</b>	<b>01</b>	<b>S</b>	<b>10S</b>	<b>V</b>	<b>02N</b>	<b>N</b>
BP301	01 – 0,1 05 – 0,5	S – 316SS	10S – 0 - 10bar (0 - 145psi) 20S – 0 - 20bar (0 - 290psi) 35S – 0 - 35bar (0 - 507psi) 70S – 0 - 70bar (0 - 1000psi) (Cv 0,1) 150S – 0 - 150bar (0 - 2175psi) (Cv 0,1)	V – Viton N – NBR	02N – ¼” NPT 02B – ¼” BSP 03N – 3/8” NPT 04N – ½” NPT	Please select your configuration in the quick reference overview

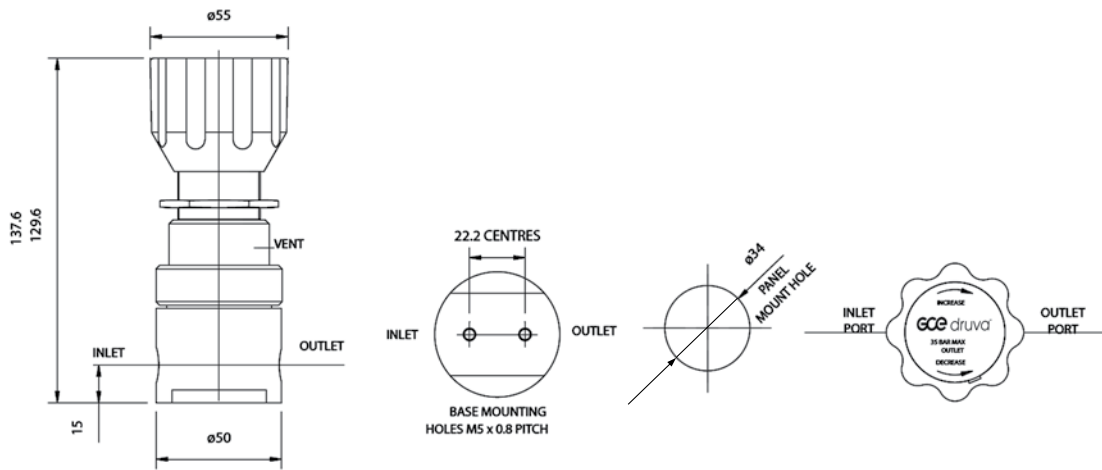
NOTE: Please contact us for any non-standard requests.



PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# BP-MF400/401 BACK PRESSURE REGULATOR DIAPHRAGM & PISTON SENSED FOR MEDIUM PRESSURE LIQUID AND GAS APPLICATIONS



DIAPHRAGM SENSED DESIGN:



PISTON SENSED DESIGN:



## DESCRIPTION

The BP-MF400/401 series is the Back Pressure Regulator version of the MF 400/401. The BP-MF400 is the diaphragm sensed option. The BP-MF401 is the piston sensed option. Both options can be used for gas and liquids. This makes it a versatile and widely used model.

## APPLICATION

- > Hydraulic test stands
- > Process control
- > Pump discharge control

## SPECIAL FEATURES

- > Diaphragm & piston sensed
- > Range of O-rings available
- > Low torque adjustment
- > Cv 2,0

## PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Diaphragm, Piston
<b>Max rated inlet pressure:</b>	690bar (10.000psi)
<b>Pressure control ranges:</b>	414bar (6000psi)
<b>CV options:</b>	2,0
<b>Port size / Connections:</b>	½" NPT, ½" BSP, ¾" NPT, ¾" BSP, 1" NPT, 1" BSP
<b>Loading Options:</b>	Hand-wheel
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)
<b>Weight:</b>	5kg

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

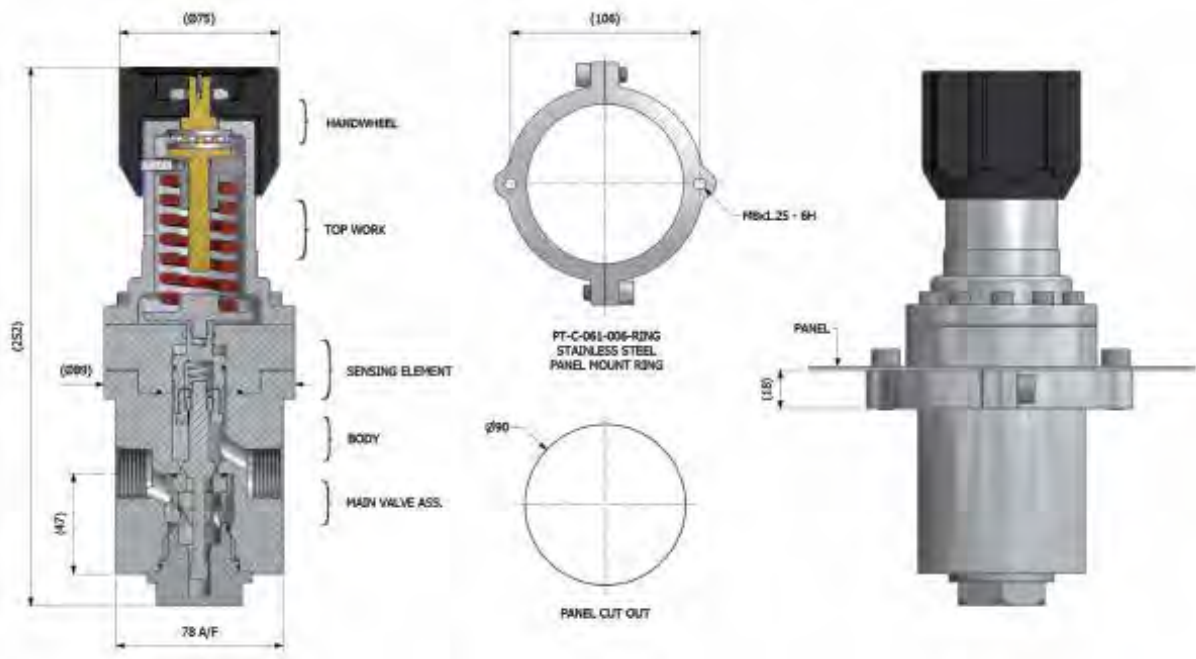
<b>Regulator Part:</b>	Material
<b>Body &amp; Bonnet:</b>	316SS
<b>Main valve pin:</b>	316SS
<b>Soft seat cone:</b>	Liquid application – PEEK, Gas application – PCTFE
<b>Valve spring:</b>	302SS
<b>Sensor &amp; holder:</b>	316SS
<b>Hand-wheel:</b>	Nylon
<b>Spring rests:</b>	316SS
<b>O-ring seals:</b>	Viton
<b>Adjusting screw:</b>	Ali Bronze
<b>Loading spring:</b>	316SS

## ORDER CODE

Basic Model	Cv Value	Body material	Pressure control ranges	Seat	Inlet/outlet connections	Porting configuration
<b>BPMF400G</b>	<b>2</b>	<b>S</b>	<b>20S</b>	<b>V</b>	<b>04N</b>	<b>N</b>
BPMF400G – Diaphragm sensed, gas service	2 – 2,0	S – 316SS	05S – 0 - 5bar (0 - 73psi) 10S – 0 - 10bar (0 - 145psi) 50S – 0 - 50bar (0 - 725psi)	V – FKP/FPM N – NBR	04N – ½" NPT 04B – ½" BSP 06N – ¾" NPT 06B – ¾" BSP	Please select your configuration in the quick reference overview
BPMF400H – Diaphragm sensed, hydraulic service			100S – 0 - 100bar (0 - 1450psi)		08N – 1" NPT	
BPMF401G – Piston sensed, gas service			200S – 0 - 200bar (0 - 2900psi) 414S – 0 - 414bar (0 - 6000psi)		08B – 1" BSP	
BPMF401H – Piston sensed, hydraulic service						

NOTE: Please contact us for any non-standard requests.

INSTALLATION DIMENSIONS BPMF401G:



# BP-LF690 'LOW FLOW' BACK PRESSURE REGULATOR PISTON SENSED FOR LIQUID OR GAS APPLICATIONS



## DESCRIPTION

The BP-LF690 is a back pressure regulator for gas or liquid applications suited for typical low flow applications up to 10lpm (liquid). This accurate regulator controls pressure and vents excess pressure back via the threaded ¼" NPT outlet port.

## APPLICATION

- > Chemical injection systems
- > Valve test rigs
- > Liquid sampling
- > Supercritical liquid

## SPECIAL FEATURES

- > Metal to metal seating for liquid and PEEK seating for Gas
- > Precision machined sensing elements
- > 3 Sensor ranges for combination of low torque and high sensitivity
- > Captured outlet port
- > Optional 316SS Panel mounting ring

## PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Piston
<b>Max rated inlet pressure:</b>	690bar (10.000psi)
<b>Pressure control ranges:</b>	Hand-wheel – Up to 690bar (10.000psi) Air actuated – Up to 600bar (8700psi)
<b>CV options:</b>	0,02 – 0,1
<b>Port size / Connections:</b>	¼" NPT, 3/8" NPT, ½" NPT
<b>Loading Options:</b>	Hand-wheel or Air-actuated
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)
<b>Weight:</b>	0,9kg

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

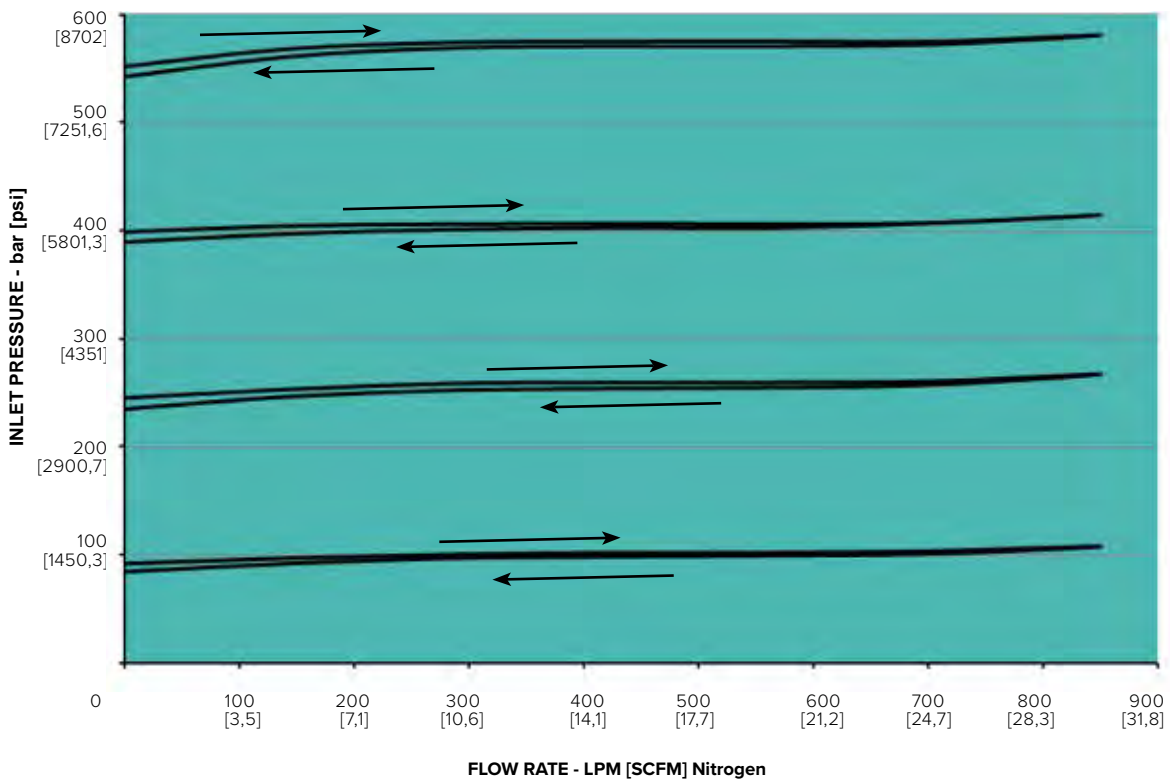
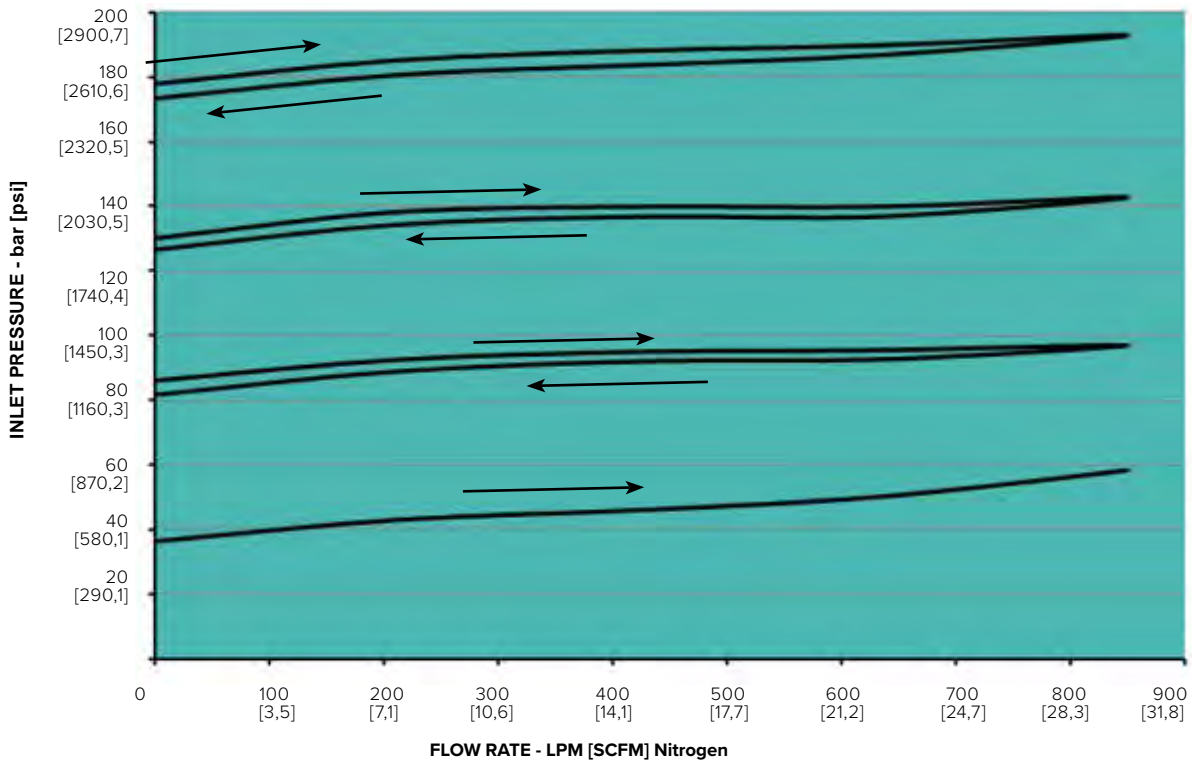
<b>Regulator Part:</b>	Material
<b>Body &amp; Bonnet:</b>	316SS
<b>Main valve:</b>	Alloy 718
<b>Seat:</b>	Liquid application – 17-4PH SS, Gas application – PEEK
<b>Valve spring:</b>	302SS
<b>Baffle plate:</b>	316SS
<b>Sensor &amp; holder:</b>	316SS
<b>Hand-wheel:</b>	Nylon
<b>Spring rests:</b>	316SS
<b>O-ring seals:</b>	NBR, Viton, EPDM
<b>Adjusting screw:</b>	Ali Bronze
<b>Loading spring:</b>	302SS
<b>Lubricant:</b>	Krytox GPL 205

## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges (Examples*)	Seat	Inlet/outlet connections	Porting configuration
<b>BPLF690H</b>	<b>1</b>	<b>S</b>	<b>414S</b>	<b>V</b>	<b>03N</b>	<b>N</b>
BPLF690G – Gas service	01 – 0,1	S – 316SS	50S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi) 200S – 0 - 200bar (0 - 2900psi) 414S – 0 - 414bar (0 - 6000psi) 690S – 0 - 690bar (0 - 10.000psi) 140A – 0 - 140bar (0 - 2000psi) (Air-actuated) 600A – 0 - 600bar (0 - 8700psi) (Air-actuated)	V – Viton N – NBR E – EPDM K – FFKM / FFPM	02N – ¼" NPT 03N – 3/8" NPT 04N – ½" NPT	Please select your configuration in the quick reference overview
BPLF690H – Hydraulic service	02 – 0,02					

NOTE: Please contact us for any non-standard requests.

PERFORMANCE CHARTS



# BP-MF690-05 SERIES 'MEDIUM FLOW' BACK PRESSURE REGULATOR PISTON SENSED FOR LIQUID OR GAS APPLICATIONS WITH CV 0,5



## DESCRIPTION

The BP-MF690 is a back pressure regulator for gas or liquid applications suited for typical low flow applications up to 50 lpm (liquid). This accurate regulator controls inlet pressure and vents excess pressure back via the threaded 1/2" NPT outlet port.

## APPLICATION

- > Chemical injection systems
- > Valve test rigs
- > Liquid sampling
- > Supercritical liquid

## SPECIAL FEATURES

- > Metal to metal seating for liquid and PEEK seating for Gas
- > Precision machined sensing elements
- > 3 Sensor ranges for combination of low torque and high sensitivity
- > Captured outlet port
- > Optional 316SS Panel mounting ring

## PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Piston
<b>Max rated inlet pressure:</b>	690bar
<b>Pressure control ranges:</b>	Hand-wheel – Up to 690bar (10.000psi) Air actuated – Up to 600bar (8.700psi)
<b>CV options:</b>	0,5
<b>Port size / Connections:</b>	3/8" NPT, 3/8" MP, 1/2" NPT, 1/2" MP
<b>Loading Options:</b>	Hand-wheel or Air-actuated
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)
<b>Weight:</b>	3,4kg

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

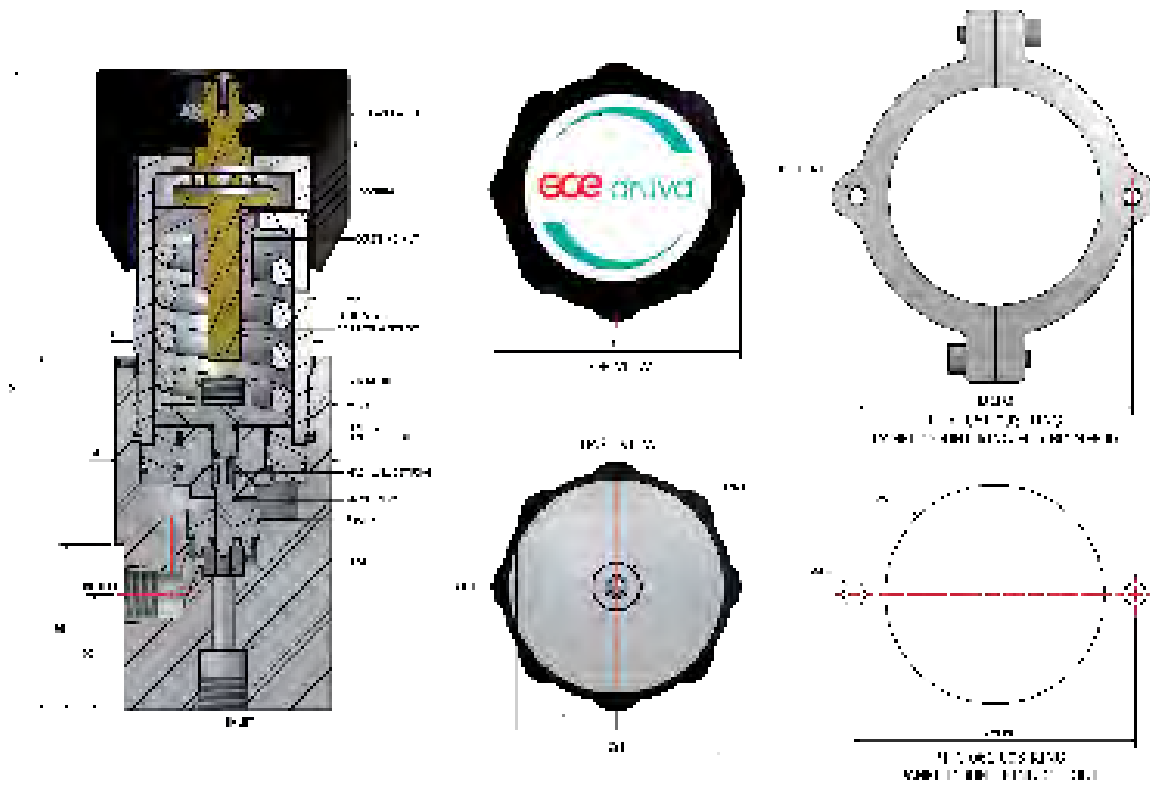
<b>Regulator Part:</b>	Material
<b>Body &amp; Bonnet:</b>	316SS
<b>Main valve:</b>	Alloy 718
<b>Seat:</b>	Liquid application – 17-4PH SS, Gas application – PEEK
<b>Valve spring:</b>	302SS
<b>Baffle plate:</b>	316SS
<b>Sensor &amp; holder:</b>	316SS
<b>Hand-wheel:</b>	Nylon
<b>Spring rests:</b>	316SS
<b>O-ring seals:</b>	NBR, Viton, EPDM
<b>Adjusting screw:</b>	Ali Bronze
<b>Loading spring:</b>	302SS
<b>Lubricant:</b>	Krytox GPL 205

## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges (Examples*)	Seat	Inlet/outlet connections	Porting configuration
<b>BPMF690H</b>	<b>05</b>	<b>S</b>	<b>414S</b>	<b>V</b>	<b>03N</b>	<b>N</b>
BPMF690G – Gas service	05 – 0,5	S – 316SS	50S – 0 - 50bar (0 - 725psi) 100S – 0 - 100bar (0 - 1450psi) 200S – 0 - 200bar (0 - 2900psi) 414S – 0 - 414bar (0 - 6000psi) 690S – 0 - 690bar (0 - 10.000psi) 140A – 0 - 140bar (0 - 2000psi) (Air-actuated) 600A – 0 - 600bar (0 - 8700psi) (Air-actuated)	V – Viton N – NBR E – EPDM K – FFKM / FFPM	03N – 3/8" NPT 03A – 3/8" MP 04N – 1/2" NPT 04A – 1/2" MP	Please select your configuration in the quick reference overview

NOTE: Please contact us for any non-standard requests.

INSTALLATION DIMENSIONS:



# BP-MF690-15 SERIES 'MEDIUM FLOW' BACK PRESSURE REGULATOR PISTON SENSED

FOR LIQUID OR GAS APPLICATIONS WITH CV 1,5



## DESCRIPTION

The BP-MF690 is a back pressure regulator for gas or liquid applications. The liquid version includes ceramic seating for ultimate protection against cavitation and erosion on aggressive application media such as water glycol and methanol. This accurate regulator controls the pressure and vents excess pressure back via the threaded 3/4" NPT outlet port.

## APPLICATION

- > Chemical injection systems
- > Valve test rigs
- > Methanol Injections systems
- > Supercritical liquid

## SPECIAL FEATURES

- > NEW ceramic seating for liquid & PEEK seating for Gas
- > Precision machined sensing element
- > Captured outlet port
- > Optional flanged connections
- > Optional 316SS Panel mounting ring



## PRODUCT DATA

<b>Fluid Type:</b>	Gas or Hydraulic
<b>Sensing element:</b>	Piston
<b>Max rated inlet pressure:</b>	690bar (10.000psi)
<b>Pressure control ranges:</b>	Hand-wheel – Up to 320bar (4640psi), Air actuated – Up to 300bar (4350psi)
<b>CV options:</b>	1,5
<b>Port size / Connections:</b>	1/2" NPT, 1/2" BSP, 3/4" NPT, 3/4" BSP, 1" NPT, 3/4" weld flange, 1" weld flange
<b>Loading Options:</b>	Hand-wheel or Air-actuated
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

Regulator Part:	Material
<b>Body &amp; Bonnet:</b>	316SS
<b>Main valve:</b>	Liquid application – Ceramic
<b>Gas application:</b>	316SS
<b>Seat:</b>	Liquid application – Ceramic
<b>Gas application:</b>	PEEK
<b>Valve spring:</b>	302SS
<b>Sensor &amp; holder:</b>	316SS
<b>Hand-wheel:</b>	Nylon
<b>Spring rests:</b>	316SS
<b>O-ring seals:</b>	NBR, Viton, EPDM
<b>Adjusting screw:</b>	Ali Bronze
<b>Loading spring:</b>	302SS
<b>Lubricant:</b>	Krytox GPL 205

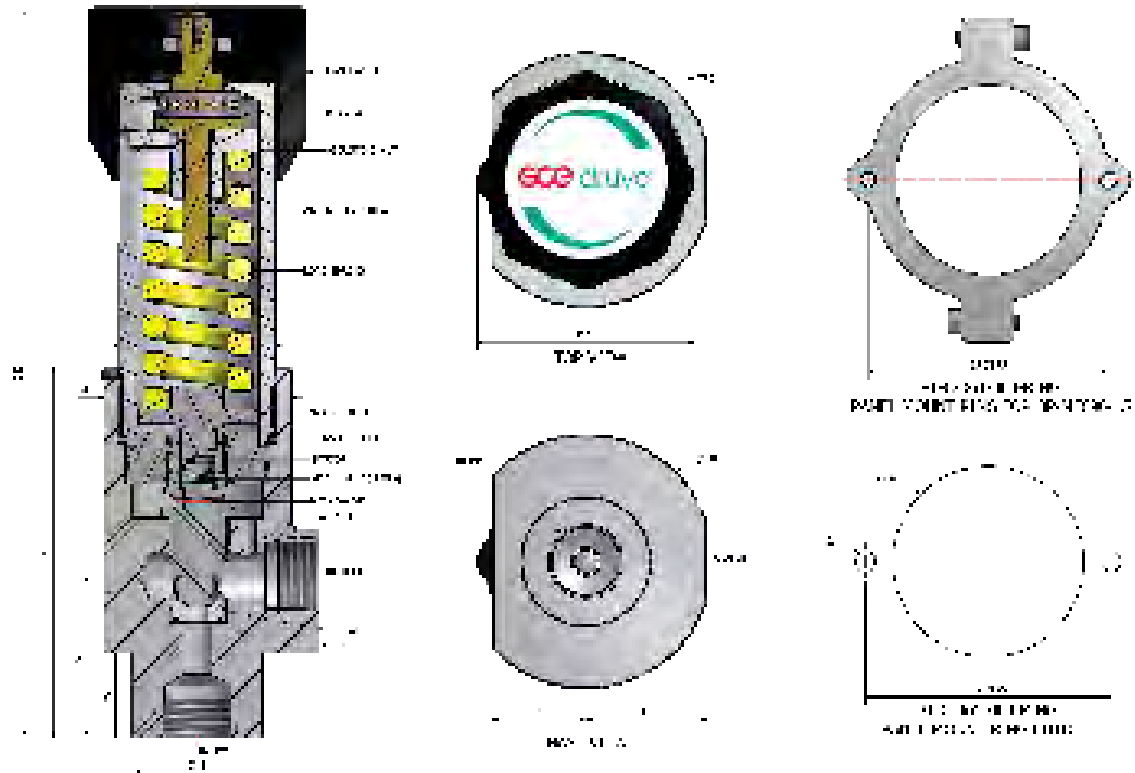
## ORDER CODE

Basic Model	Cv Value	Body material	Outlet ranges	O Ring	Inlet/outlet connections	Porting configuration
<b>BPMF690H</b>	<b>15</b>	<b>S</b>	<b>200S</b>	<b>V</b>	<b>04N</b>	<b>N</b>
BPMF690G – Gas service	15 – 1,5	S – 316SS	50S – 0 - 50bar (0 - 725psi)	V – Viton	04N – 1/2" NPT	Please select your configuration in the quick reference overview
BPMF690H – Hydraulic service			100S – 0 - 100bar (0 - 1450psi)	N – NBR	04B – 1/2" BSP	
			200S – 0 - 200bar (0 - 2900psi)		06N – 3/4" NPT	
			320S – 0 - 320bar (0 - 4640psi)		06B – 3/4" BSP	
			300A – 0 - 300bar(0 - 4350psi) (Air-actuated)		08N – 1" NPT	

NOTE: Please contact us for any non-standard and any welded flange connection requests.



INSTALLATION DIMENSIONS:



# XHS-300 DIAPHRAGM SENSED PRESSURE REGULATOR WITH SINGLE 100W HEATER



## DESCRIPTION

An economical heated regulator available in 'side entry' or 'in-line' heat transfer options to maintain sample gases in their vapour state. The 'in-line' design maximizes the heat transfer area via a unique spiral machined heater sheath, which mixes the gas and ensures efficient heat transfer. The 'side entry' design can be used in applications where heat transfer is less critical, and where installations have height restrictions. Both options incorporate an efficient 100W heater cartridge, and are fully serviceable to remove carbon deposits and maintain maximum heat transfer.

## APPLICATION

- > Natural Gas sample systems
- > Oxygen sample systems
- > Moisture sample systems

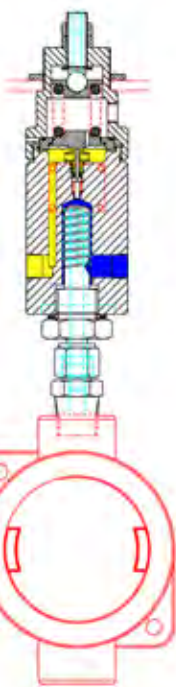


## SPECIAL FEATURES

- > IECEx, ATEX certified to EEx d IIC T3
- > 100 W Heater cartridge
- > Strong Inconel X750 Convoluted diaphragm
- > Easy to wire potted board with 115 V or 230 V supply
- > Fully serviceable design
- > Optional entry points for cable supply

## PRODUCT DATA

<b>Fluid Type:</b>	Gas
<b>Sensing element:</b>	Diaphragm
<b>Max rated inlet pressure:</b>	PEEK seat – 300bar (4350psi) PCTFE seat – 210bar (3045psi)
<b>Inlet ranges:</b>	Up to 35bar (507psi)
<b>Loading Options:</b>	None
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)
<b>Weight:</b>	3,2kg



### TECHNICAL DATA / MATERIALS OF CONSTRUCTION

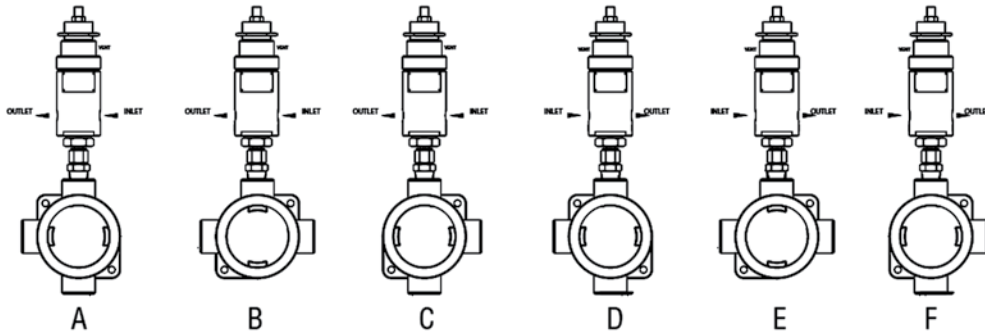
Regulator Part:	Material
<b>Body &amp; Bonnet:</b>	316SS
<b>Main valve pin:</b>	316SS
<b>Soft seat cone:</b>	PEEK seat – 300bar (4350psi), PCTFE seat – 210bar (3045psi)
<b>Valve spring:</b>	Inconel X750
<b>Diaphragm:</b>	Inconel X750
<b>Diaphragm washer:</b>	Brass
<b>Cartridge holder:</b>	316SS
<b>O-ring seals:</b>	Viton
<b>Adjusting screw:</b>	Ali Bronze
<b>Electric enclosure:</b>	Coated aluminum
<b>Compression fitting</b>	316SS

## ORDER CODE

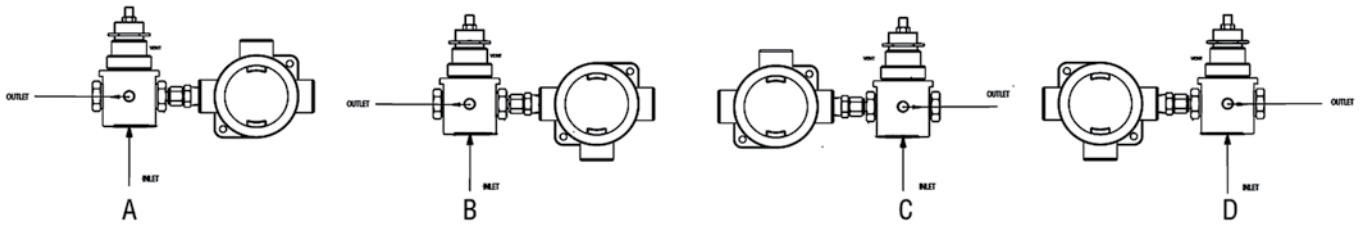
Basic Model	Configuration	Body material	Outlet pressure ranges	Seat	Port connections	Orientation	Porting configuration
<b>XHS300</b>	<b>IL</b>	<b>S</b>	<b>10</b>	<b>K</b>	<b>1</b>	<b>B</b>	<b>N</b>
XHS300	IL – In-line SE – side	S – 316SS	02 – 0 - 2bar (0 - 29psi) 04 – 0 - 4bar (0 - 60psi) 08 – 0 - 8bar (0 - 116psi) 10 – 0 - 10bar (0 - 145psi) 20 – 0 - 20bar (0 - 290psi) 35 – 0 - 35bar (0 - 507psi)	V – Viton N – NBR	02N – ¼" NPT 02B – ¼" BSP 03N – 3/8" NPT 04N – ½" NPT	Refer to the next page	Refer to office.

NOTE: Please contact us for any non-standard requests.

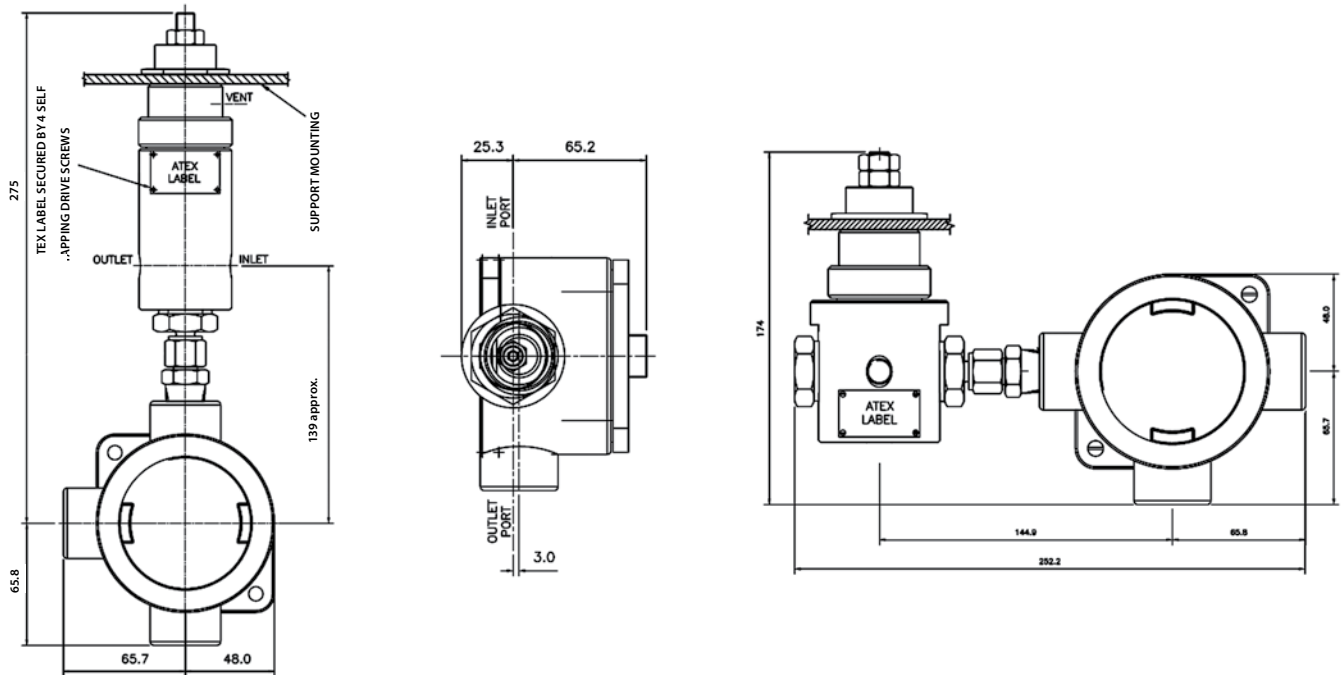
CONFIGURATION:  
IL OPTION



SE OPTION



INSTALLATION DIMENSIONS:



# XHR-300/310 ‘LOW FLOW’ ELECTRIC AND STEAM HEATED REGULATOR DIAPHRAGM SENSED

## DESCRIPTION

The XHR-300 is the standard seat option. The XHR-310 is the disk seat option. Certified to ATEX directive 94/9/EC, the XHR-300 helps to maintain saturated gases in their vapourised state due to its unique DUAL heating design. Two 100 W heater cartridges, or steam tubes, are inserted in spiral machined sheaths, which agitate the media to help with the heat transfer and analysis process. The propriety PCB is easy to wire and incorporates an adjustable potentiometer to adjust the temperature setting to the heaters.

## APPLICATION

- > Natural Gas sample systems
- > Oxygen sample systems
- > Moisture sample systems

## SPECIAL FEATURES

- > ATEX certified to EEx d IIC T3
- > Dual, independent, 100 W heaters for pre heat and re-heat of sample gas. Oxygen sample – Inconel X750 Diaphragm for extra strength
- > Large surface area for heat transfer
- > Easy to wire circuit board with 115 V or 230 V supply
- > Stylish Junction Box with 7 mm mounting supports.
- > Fully serviceable design
- > Optional entry points for cable supply

## PRODUCT DATA

<b>Fluid Type:</b>	Gas
<b>Sensing element:</b>	Diaphragm
<b>Max rated inlet pressure:</b>	Up to 414bar (6000psi)
<b>Inlet ranges:</b>	XHR300 – PCTFE seat – 210bar (3045psi), XHR300 – PEEK seat – 300bar (4350psi) XHR310 – PCTFE seat – 300bar (4350psi), XHR310 – PEEK seat – 414bar (6000psi)
<b>CV options:</b>	0,06
<b>Porting connections:</b>	¼" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)
<b>Weight:</b>	4,1kg

### TECHNICAL DATA / MATERIALS OF CONSTRUCTION

Regulator Part:	Material
<b>Body &amp; Bonnet:</b>	316SS
<b>Main valve pin:</b>	316SS
<b>Soft seat cone:</b>	PEEK, PCTFE
<b>Valve spring:</b>	Inconel X750
<b>Diaphragm:</b>	Inconel X750
<b>Hand-wheel:</b>	Nylon
<b>Diaphragm washer:</b>	Brass
<b>Cartridge holder:</b>	316SS
<b>O-ring seals:</b>	Viton
<b>Adjusting screw:</b>	Ali Bronze
<b>Electric enclosure:</b>	Coated aluminum
<b>Compression fitting</b>	316SS



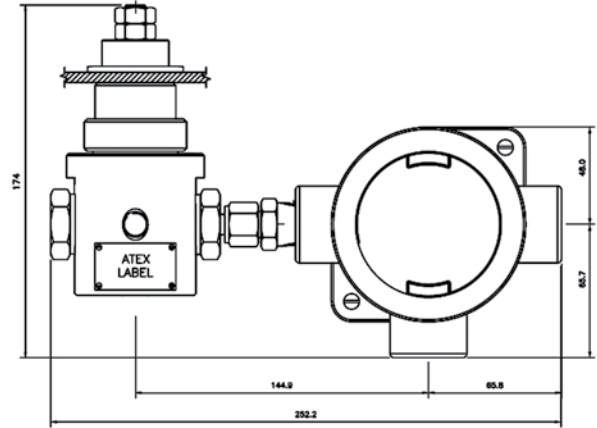
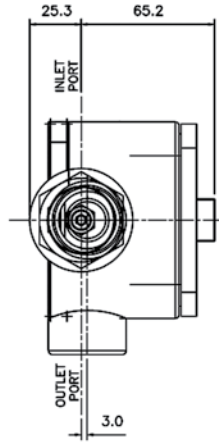
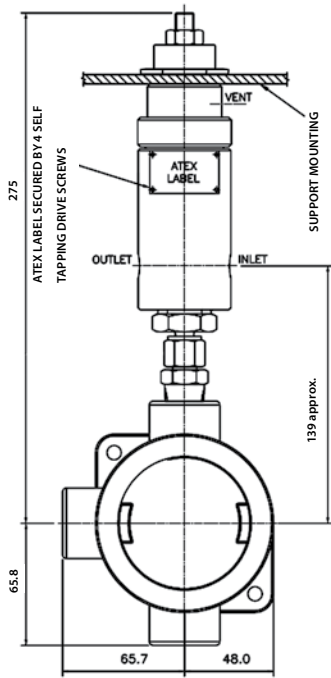
Assembly drawing for reference only. Refer to office for specific detail.

## ORDER CODE

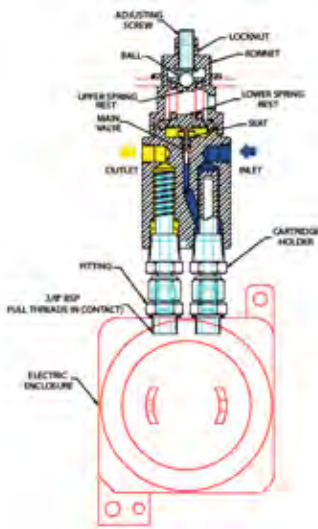
Basic Model	Configuration	Body material	Outlet pressure ranges	Seat	Heat supply	Power cable supply	Porting configuration
<b>XHR300 (300bar inlet)</b>		<b>S</b>	<b>10</b>	<b>K</b>	<b>1</b>	<b>L</b>	<b>N</b>
XHR310 (414bar inlet)		S – 316SS	02 – 0 - 2bar (0 - 29psi) 04 – 0 - 4bar (0 - 60psi) 08 – 0 - 8bar (0 - 116psi) 10 – 0 - 10bar (0 - 145psi) 20 – 0 - 20bar (0 - 290psi) 35 – 0 - 35bar (0 - 507psi)	K – PCTFE P – PEEK	1 – 115V 2 – 230V S – Steam	L – Left side of box R – Right side of box B – Base of box N – N/A /steam heated)	Please select your configuration in the quick reference overview.

NOTE: Please contact us for any non-standard requests.

INSTALLATION DIMENSIONS:



# XHR-301/311 'LOW FLOW' ELECTRIC AND STEAM HEATED REGULATOR PISTON SENSED



Assembly drawing for reference only. Refer to office for specific detail.

## DESCRIPTION

The XHR-301 is the standard seat option. The XHR-311 is the disk seat option. Certified to ATEX directive 94/9/EC, the XHR-300 helps to maintain saturated gases in their vapourised state due to its unique DUAL heating design. Two 100 W heater cartridges, or steam tubes, are inserted in spiral machined sheaths, which agitate the media to help with the heat transfer and analysis process. The propriety PCB is easy to wire and incorporates an adjustable potentiometer to adjust the temperature setting to the heaters.

## APPLICATION

- > Natural Gas sample systems
- > Oxygen sample systems
- > Moisture sample systems

## SPECIAL FEATURES

- > ATEX certified to EEx d IIC T3
- > Dual, independent, 100 W heaters for pre heat and re-heat of sample gas. Oxygen sample – Inconel X750 Diaphragm for extra strength
- > Large surface area for heat transfer
- > Easy to wire circuit board with 115 V or 230 V supply
- > Stylish Junction Box with 7 mm mounting supports.
- > Fully serviceable design
- > Optional entry points for cable supply

## PRODUCT DATA

<b>Fluid Type:</b>	Gas
<b>Sensing element:</b>	Piston
<b>Max rated inlet pressure:</b>	300bar or 414bar
<b>Inlet ranges:</b>	XHR301 – PCTFE seat – 210bar (3045psi), XHR301 – PEEK seat – 300bar (4350psi) XHR311 – PCTFE seat – 300bar (4350psi), XHR311 – PEEK seat – 414bar (6000psi)
<b>CV options:</b>	0,06
<b>Porting connections:</b>	¼" NPT
<b>Loading Options:</b>	Hand-wheel
<b>Venting / non-venting:</b>	Non-venting
<b>Leakage:</b>	Bubble tight at max WP (tested on Nitrogen)
<b>Weight:</b>	4,1kg

## TECHNICAL DATA / MATERIALS OF CONSTRUCTION

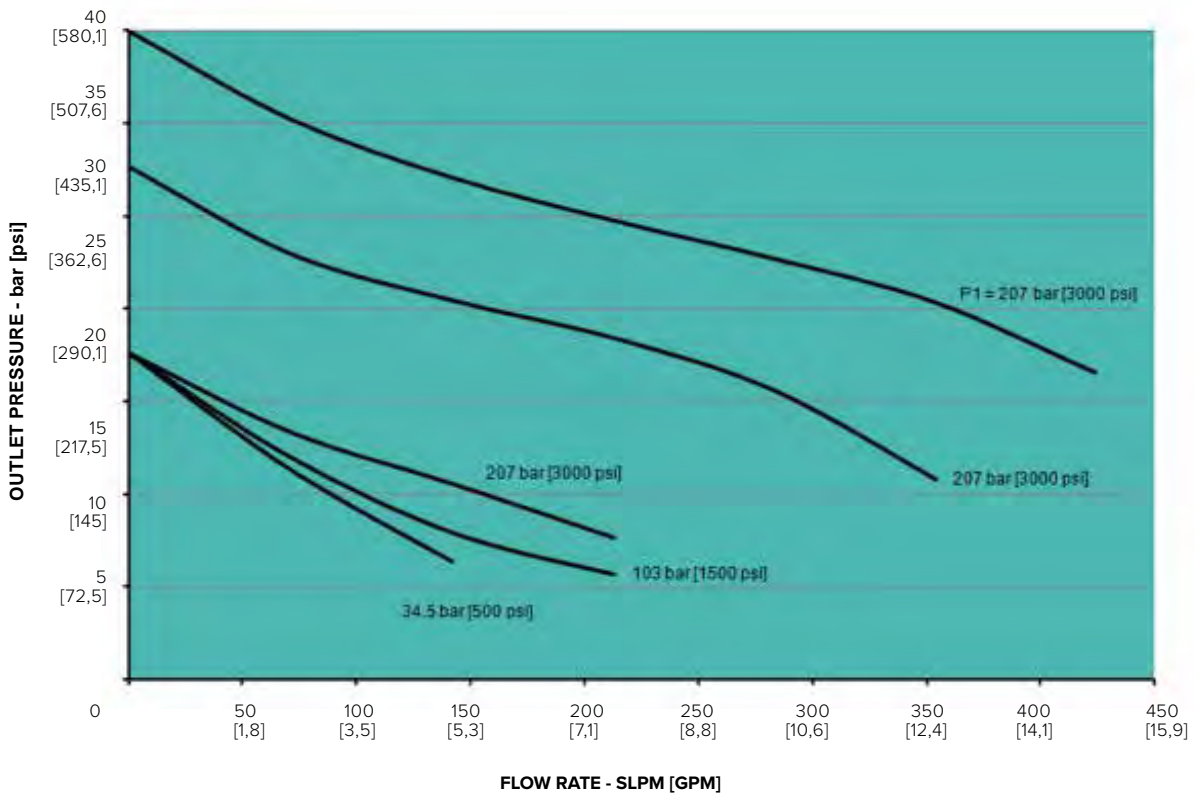
<b>Regulator Part:</b>	Material
<b>Body &amp; Bonnet:</b>	316SS
<b>Main valve pin:</b>	316SS
<b>Seat:</b>	PEEK, PCTFE
<b>Valve spring:</b>	Inconel X750
<b>Sensor &amp; Holder:</b>	316SS
<b>Hand-wheel:</b>	Nylon
<b>Spring rests:</b>	316SS
<b>O-ring seals:</b>	Viton, NBR, EPDM
<b>Adjusting screw:</b>	Ali Bronze
<b>Loading spring:</b>	316SS
<b>Lubricante:</b>	Krytox GPL 205
<b>Electric enclosure:</b>	Coated aluminum
<b>Compression fitting</b>	316SS

## ORDER CODE

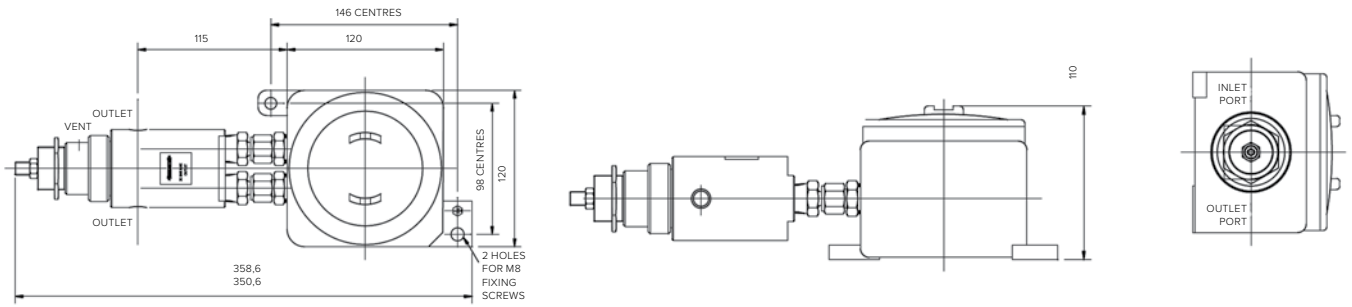
Basic Model	Configuration	Body material	Outlet pressue ranges	Seat	Heat supply	Power cable supply	Porting configuration
<b>XHR301 (300bar inlet)</b>		<b>S</b>	<b>10</b>	<b>K</b>	<b>1</b>	<b>L</b>	<b>N</b>
XHR311 (414bar inlet)		S – 316SS	02 – 0 - 2bar (0 – 29psi) 04 – 0 - 4bar (0 – 60psi) 08 – 0 - 8bar (0 – 116psi) 10 – 0 - 10bar (0 – 145psi) 20 – 0 - 20bar (0 – 290psi) 35 – 0 - 35bar (0 – 507psi)	K – PCTFE P – PEEK	1 – 115V 2 – 230V S – Steam	L – Left side of box R – Right side of box B – Base of box N – N/A /steam heated)	Please select your configuration in the quick reference overview.

NOTE: Please contact us for any non-standard requests.

PERFORMANCE CHARTS



INSTALLATION DIMENSIONS:



# PANEL MOUNTING RING PT-C-024



### PT-C-024

Panel Mounting Ring in 316SS  
Suitable for '300 series' instrumentation regulator  
M33 x 1mm

### PT-C-024-001

Panel Mounting Ring in 316SS  
Suitable for MINI-300 series  
M34 x 2mm



### PT-C-061-005

Panel Mounting Ring  
Suitable for bodies with 55mm Diameter  
Used on HYD-691, LF-540, MF-301

### PT-C-061-003

Panel Mounting Ring  
Suitable for bodies with 65mm Diameter  
Used on LF-690, MF-414, LF-550, MF-300

# GAU1100-STAINLESS STEEL PRESSURE GAUGES



### DESCRIPTION

The diameter of the pressure gauges Pressure tech supply is 63mm, they feature dual scale (bar / psi) dials, are full safety pattern with blowout back. The connection is on the base of the gauge and is available as standard in 1/4"NPT(M). Please contact the office for other types of connection.

The pressure ranges cover the requirements of our standard range of pressure regulators, should you need specific pressure ranges or have a special requirement, please contact us directly.

### SPECIAL FEATURES

- > 63mm Dual Scale Gauge (bar/psi)
- > Stainless Steel
- > 1/4"NPTM Lower entry
- > Full Safety Pattern
- > Blowout back

### ORDER CODE

Basic Model	Body material	Inlet/outlet connections	Outlet ranges	Modifications
<b>GAU1100</b>	<b>63</b>	<b>02N</b>	<b>10</b>	<b>B</b>
GAU1100	63 – 316SS	02N – 1/4" NPT	1BAR/PSI – 1bar (14,5psi) 2BAR/PSI – 2bar (30psi) 4BAR/PSI – 4bar (60psi) 6BAR/PSI – 6bar (90psi) 10BAR/PSI – 10bar (145psi) 16BAR/PSI – 16bar (232psi) 20BAR/PSI – 20bar (290psi) 25BAR/PSI – 25bar (360psi) 100BAR/PSI – 100bar (1450psi) 160BAR/PSI – 160bar (2320psi) 200BAR/PSI – 200bar (2900psi) 250BAR/PSI – 250bar (3600psi) 400BAR/PSI – 400bar (5800psi) 600BAR/PSI – 600bar (8700psi) 1000BAR/PSI – 1000bar (14.500psi)	02 – 02 Cleaned NACE – NACE

NOTE: Please contact us for any non-standard requests.



## APPROVALS & CERTIFICATES

These are the standard approvals and certificates which are available.

For NACE-certified products, special prices apply for the regulator. Please contact us directly for further details.

CERTCONF	Certificate of Conformity
TESTCERT	Test Certificate
Certificate of Origin	Certificate of Origin (Chamber of Commerce)
ASTM G93 Level C Cert	Oxygen Cleaning Certificate
MATCERT	3.1 Material Certification (Body material only)
MATCERT - GAUGES	3.1 Material Certification for Gauges
MATCERT - SPECIFIC	3.1 Material Certification (Order specific)
MATCERT - WETTED	3.1 Material Certification for all Wetted Components
SMDRL	Supplier Master Requirement Document List
	ATEX Statement
	Conflict Minerals
	Customer specific statements
	PED Statement
	Product Statements
	REACH Compliance
	RoHS Statement

If there are specific wishes you have, please contact us directly.

# THE DRINKS DISPENSE INDUSTRY EQUIPMENT FOR GAS SUPPLIER SYSTEMS



# PRIMARY REGULATORS



## PRIMARY REGULATOR - CO<sub>2</sub>

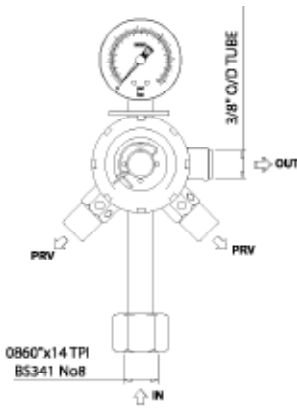
This regulator connects a single CO<sub>2</sub> cylinder to a single ring main for soft drinks systems. The regulator comes complete with inlet stem or HP hose with a BS 8 cylinder fitting for CO<sub>2</sub>.

### APPLICATION

This regulator is a high outlet pressure regulator to be used for soft drinks only unless used to supply gas to a blender enhancer or nitrogen generation system. The higher outlet pressure allows the regulator to be used directly for the carbonation of the water as well as supply of CO<sub>2</sub> gas to the secondary regulators, typically used in conjunction with the twin secondary regulator for the syrup gas pumps.

Art.-Nr.	Description	Gas
MM4057	Single stage regulator	CO <sub>2</sub>

### BASIC DIMENSIONS



TECHNICAL DATA	
Max inlet pressure:	138 bar
Working pressure:	56 bar
Outlet pressure:	6,9 bar
Inlet connection:	BS341 No. 8
Outlet connection:	3/8" O/D John Guest
Relief valve settings:	9 bar
Flow:	50 L/min

## PRIMARY REGULATOR - MIXED GAS

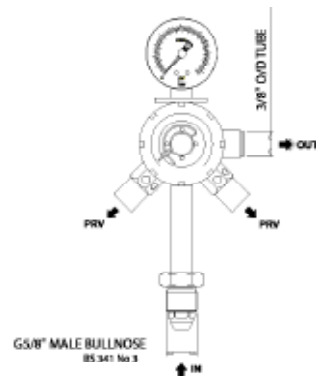


Art.-Nr.	Description	Gas
MM4050	Single stage wall regulator	Mixed gas

TECHNICAL DATA	
Max inlet pressure:	276 bar
Working pressure:	230 bar
Outlet pressure:	2,6 bar
Inlet connection:	BS341 No. 3
Outlet connection:	3/8" O/D John Guest
Relief valve settings:	3,8 bar
Flow:	50 L/min

\* 1 bar = 14,5 psi

### BASIC DIMENSIONS





## PRIMARY REGULATOR WITH WALL BRACKET - CO<sub>2</sub>

This wall-mounted twin regulator for CO<sub>2</sub> is fitted in the higher pressure of a soft drinks single ring main.  
 To used in conjunction with single wall mounted CO<sub>2</sub> primary regulator or bulk supply from other source.  
 Standard outlet fittings are 3/8" John Guest.  
 Please specify system application to ensure correct safety valves are employed.

### APPLICATION

This twin regulator is to be used for soft drinks syrup/postmix gas pumps. The twin regulator setup is used to supply 2 different pressures for the gas pumps on sugared and non sugared soft drinks. Typically used in conjunction with MM4059 single stage wall mounted regulator.

Note: Additional inline relief valves may be required.

Art.-Nr.	Description	Gas
MM4059	Single stage wall regulator	CO <sub>2</sub>

*\*basic version without electric sensors*

TECHNICAL DATA	
Max inlet pressure:	138 bar
Working pressure:	56 bar
Outlet pressure:	7,6 bar
Inlet connection:	BS341 No. 8
Outlet connection:	3/8" O/D John Guest
Relief valve settings:	9 bar
Flow:	50 L/min

*\*basic version without electric sensors*

## PRIMARY REGULATOR WITH WALL BRACKET - MIXED GAS

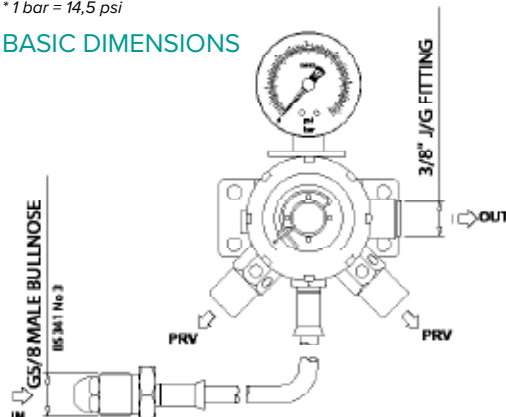
Art.-Nr.	Description	Gas
MM4052	Single stage wall regulator	Mixed gas

*\*basic version without electric sensors*

TECHNICAL DATA	
Max inlet pressure:	276 bar
Working pressure:	230 bar
Outlet pressure:	2,6 bar
Inlet connection:	BS341 No. 3
Outlet connection:	3/8" O/D John Guest
Relief valve settings:	3,8 bar
Flow:	50 L/min

*\* 1 bar = 14,5 psi*

### BASIC DIMENSIONS



# TWIN REGULATOR



## TWIN REGULATOR & LP CHANGEOVER VALVE - CO<sub>2</sub>

This wall-mounted panel connects two or more CO<sub>2</sub> cylinders to a single ring main, kegs, or soft drinks systems, depending on the delivery pressure/relief valve selection. Two single stage regulators and a low pressure changeover valve are mounted on a panel, with standard outlet fitting 3/8" John Guest. Please specify system application to ensure correct safety valves are employed.

### APPLICATION

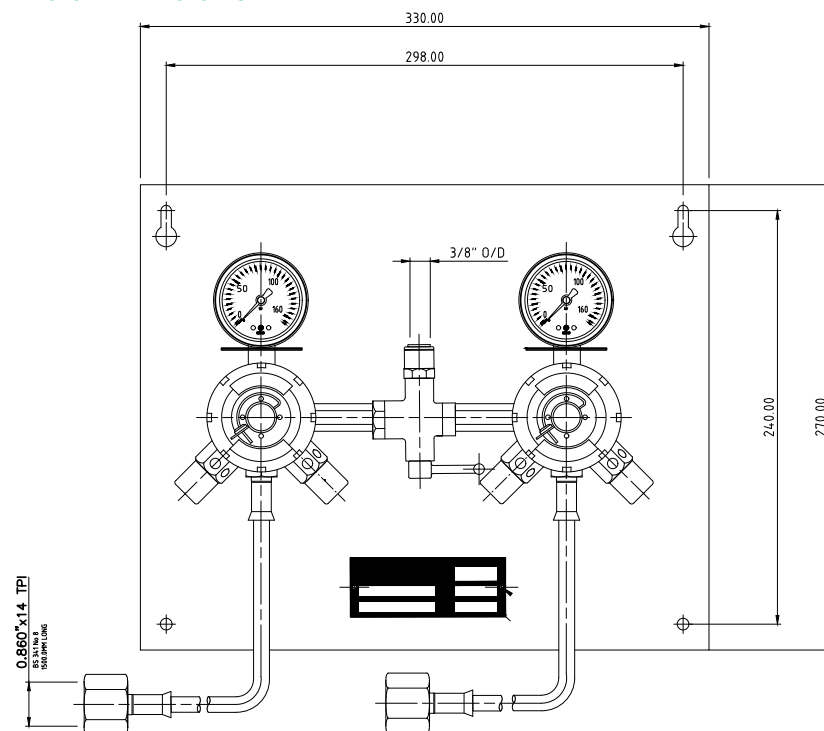
This panel allows two or more CO<sub>2</sub> cylinders to be connected into a single ring main feeding blender units, kegs or soft drinks systems, where high volumes of gas are used and a backup cylinder is required. This allows continuous gas supply during busy periods by the simple operation of switching the low-pressure valve from the empty cylinder to a full cylinder.

Art.-Nr.	Description	Gas
MM4063	Twin regulator & LP Changeover Valve	CO <sub>2</sub>
MM4064	Twin regulator & LP Changeover Valve	CO <sub>2</sub>

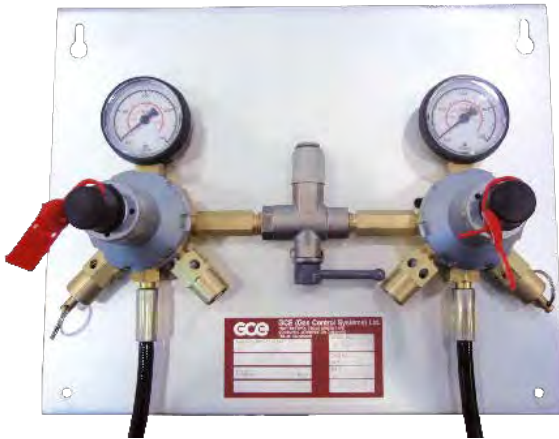
TECHNICAL DATA	
Max inlet pressure:	276 bar
Working pressure:	230 bar
Outlet pressure:	MM4063 2,6 bar
	MM4064 7,6 bar
Inlet connection:	BS341 No. 3
Outlet connection:	3/8" O/D John Guest
Relief valve settings:	MM4063 3,0 bar
	MM4064 9,0 bar
Flow:	50 L/min

\* 1 bar = 14,5 psi

### BASIC DIMENSIONS



## TWIN REGULATOR & LP CHANGEOVER VALVE - MIXED GAS



This wall-mounted panel connects two or more Mixed Gas cylinders to a single ring main, kegs, or soft drinks systems, depending on the delivery pressure/relief valve selection. Two single stage regulators and a low pressure changeover valve are mounted on a panel, with standard outlet fitting 3/8" John Guest.

Please specify system application to ensure correct safety valves are employed.

### APPLICATION

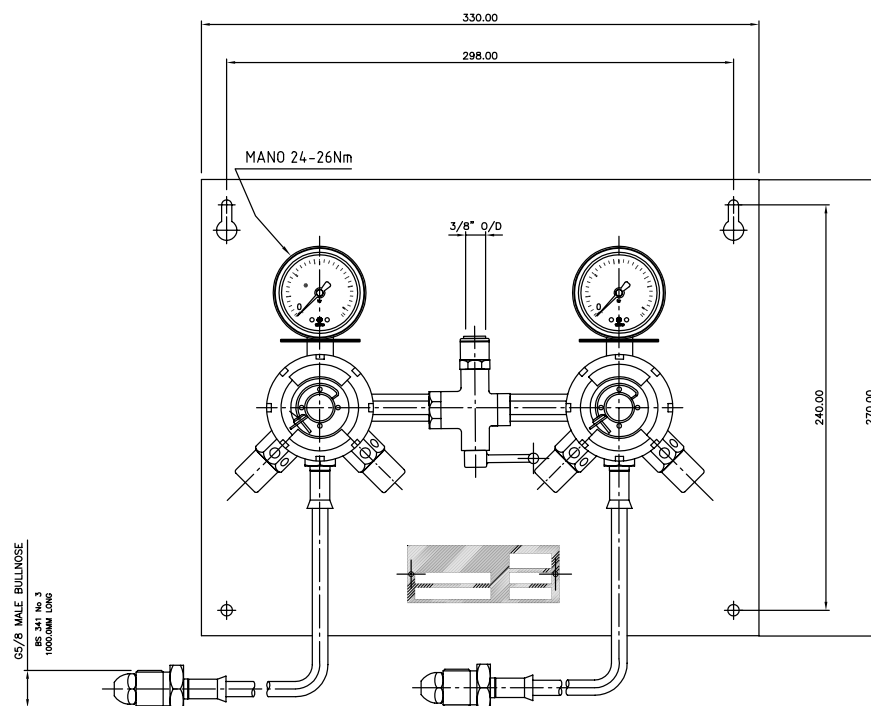
This panel allows two or more Mixed Gas cylinders to be connected into a single ring main feeding blender units, kegs, where high volumes of gas are used and a backup cylinder is required. This allows continuous gas supply during busy periods by the simple operation of switching the low-pressure valve from the empty cylinder to a full cylinder.

Art.-Nr.	Description	Gas
MM4061	Twin regulator & LP Changeover Valve	Mixed gas
MM4062	Twin regulator & LP Changeover Valve	Mixed gas

TECHNICAL DATA	
Max inlet pressure:	276 bar
Working pressure:	230 bar
Outlet pressure:	MM4061 2,6 bar MM4062 7,6 bar
Inlet connection:	BS341 No. 3
Outlet connection:	3/8" O/D John Guest
Relief valve settings:	MM4061 3,8 bar MM4062 9,0 bar
Flow:	50 L/min

\* 1 bar = 14,5 psi

### BASIC DIMENSIONS





## MIXED GAS REGULATOR WITH CO<sub>2</sub> REGULATOR PANEL

Basic one cylinder panel for both CO<sub>2</sub> and mixed gas, suitable for connection into a blender system, (can be connected to kegs only if additional secondary regulators are used downstream).

Comprises of single stage CO<sub>2</sub> and mixed gas regulators, two high-pressure

connecting hoses, and cylinder contents gauges. Outlet pressures are pre-set and locked, with a tamper proof seal. Outlet pressure must be specified at the time of ordering. Downstream equipment is protected by two pressure relief valves fitted to the low-pressure side of each regulator.

The standard outlet fitting are 3/8" John Guest.

### APPLICATION

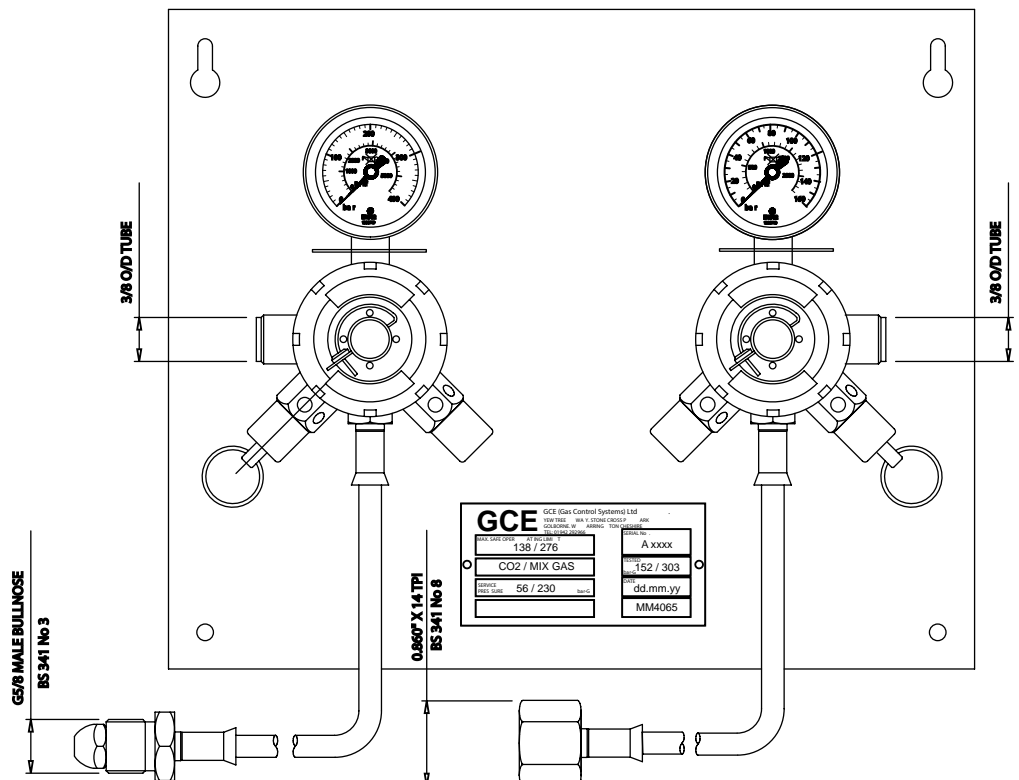
Simple supply system for blender panels. Note this panel is unsuitable for direct connection to kegs or syrup pumps etc. unless additional secondary pressure regulator(s) are fitted downstream of the panel.

Art.-Nr.	Description	Gas
MM4066	Mixed Gas regulator with CO <sub>2</sub> regulator panel	Mixed gas

TECHNICAL DATA	Mixed gas	CO <sub>2</sub>
	<b>Max inlet pressure:</b>	276 bar
<b>Working pressure:</b>	230 bar	56 bar
<b>Outlet pressure:</b>	7,6 bar	7,6 bar
<b>Inlet connection:</b>	BS341 No. 3	BS341 No. 8
<b>Outlet connection:</b>	3/8" O/D John Guest	3/8" O/D John Guest
<b>Relief valve settings:</b>	9 bar	9 bar

\* 1 bar = 14,5 psi

### BASIC DIMENSIONS





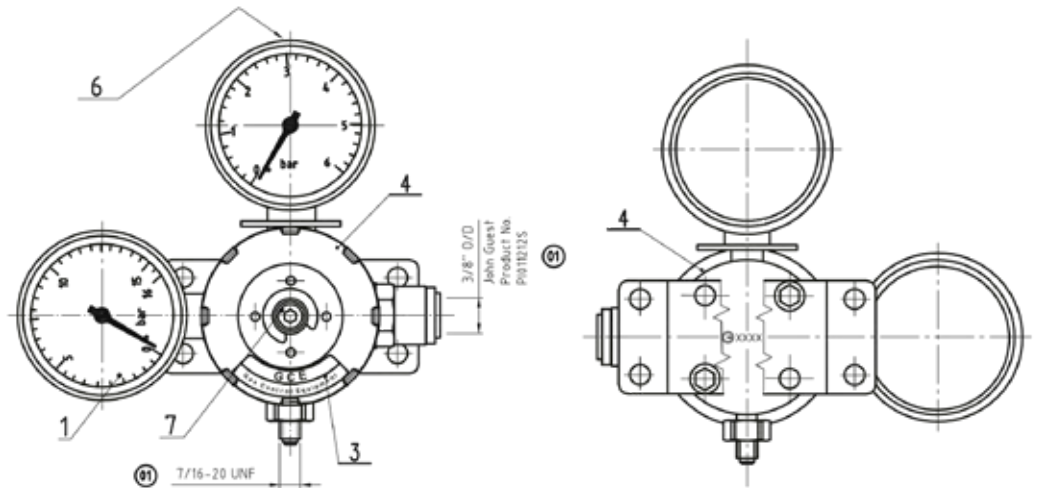
## LINE REGULATOR MIXED GAS

Art.-Nr.	Description	Gas
F20410013	Single stage line regulator	Mixed gas

TECHNICAL DATA	
Max inlet pressure:	10 bar
Outlet pressure:	4,14 bar preset
Inlet connection:	7/16-20 UNF
Outlet connection:	3/8" O/D John Guest
Inlet pressure gauge:	ISO5171; 16 bar scale
Delivery pressure gauge:	ISO5171; 6 bar scale

\* 1 bar = 14,5 psi

### BASIC DIMENSIONS





## SPARE PARTS

Art.-Nr.	Description
<b>1280803P</b>	Flexi G1/4LH-BS341 No. 8 KS50 (10 pcs)
<b>1280389P</b>	Flexi G1/4LH-BS341 No. 3 KS50 (10 pcs)
<b>9384050P</b>	PRV 130 psi G1/4" ring (100 pcs)
<b>388413351402P</b>	Gauge 50 400 bar 5800 psi (5 pcs)
<b>548904710370P</b>	Conical washer (10 pcs)
<b>9430290</b>	PRV 130PSI G1/4 (10 pcs)
<b>9430710</b>	Gauge D.50 160 bar neutral

# INDUSTRIAL REGULATORS

## LPG, NATURAL GAS, INDUSTRIAL GAS



# FIRST STAGE REGULATOR

## CELTIC JUNIOR 74 - DIRECT REGULATORS

The CELTIC range can be used for all common non-corrosive industrial gas. As for regulation, these products are very accurate.



Celtic Junior 74



Celtic Junior 74 Duo

### APPLICATION

- > Outlet pressure regulation at the outlet of an air gas vaporizer (JUNIOR 74 ES)
- > First stage regulation for propane at the outlet of a cistern
- > Pressure limiting device (JUNIOR 74 DUO)

### PRODUCT ADVANTAGES

- > Watertightness in case of bad weather
- > All components comfortably accessible
- > Easy and fast dismantling
- > Simple and heavy-duty
- > Low pressure closing
- > Stainless steel adjustment screw

### CELTIC JUNIOR 74-A

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I130301	G3/4"F*	N,M,P	20 (300)	0,8-6 (12-90)	30-170	80-260
I130331	G3/4"F*	O,N	20 (300)	0,8-6 (12-90)	30-170	NA
I130341	G3/4"F*	P-liquid	20 (300)	0,8-6 (12-90)	30-170	NA

### CELTIC JUNIOR 74-A DUO

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I130360	G3/4"M*	N,M,P	20 (300)	0,8-6 (12-90)	30-170	45-260

### CELTIC JUNIOR 74-ES

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I130325	G3/4"F*	N,M,P,O	20 (300)	0,8-10 (12-145)	30-250	45-260

### CELTIC JUNIOR 74-B

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I130302	G3/4"F*	N,M,P	8 (120)	0,3-1,5 (4-20)	35-70	54-109
I130332	G3/4"F*	O,N	8 (120)	0,3-1,5 (4-20)	35-70	NA
I130342	G3/4"F*	P-liquid	8 (120)	0,3-1,5 (4-20)	35-70	NA

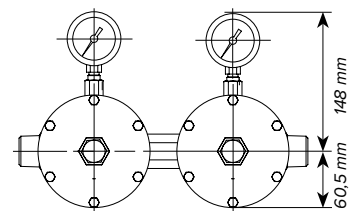
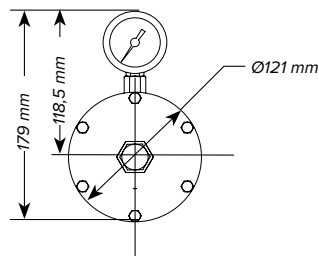
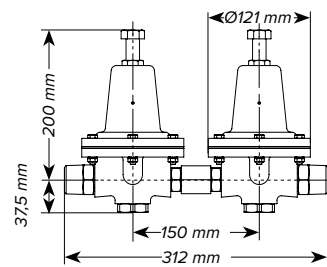
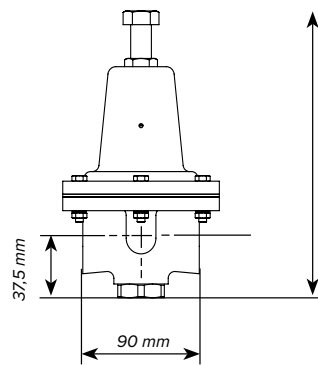
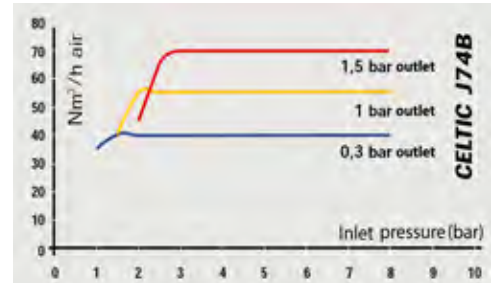
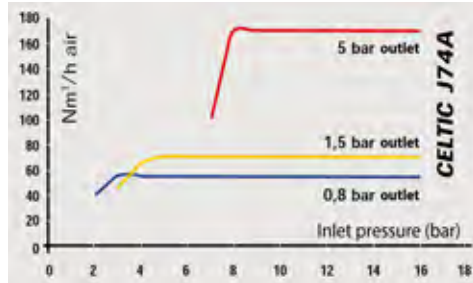
### CELTIC JUNIOR 74-C

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I130303	G3/4"F*	N,M,P	4 (60)	0,1-0,5 (2-7)	5-45	30-60
I130333	G3/4"F*	O,N	4 (60)	0,1-0,5 (2-7)	5-45	NA

\* Versions with gauge

TECHNICAL DATA	
<b>Max. inlet pressure:</b>	20 bar (A, ES, A DUO); 8 bar (B); 4 bar (C)
<b>Material:</b>	Aluminium alloy body
<b>Connection:</b>	G3/4" Female (A, B, C, ES) G3/4" Male (A DUO)
<b>Operating temperature range:</b>	from -20 to + 60°C

**FLOW RATES PERFORMANCE CURVES**



## CELTIC AML1, RGCL - DIRECT REGULATORS

The CELTIC range can be used with all common non-corrosive industrial gas. As for regulation, these products are very accurate.



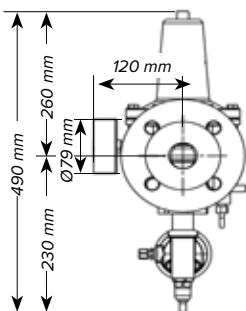
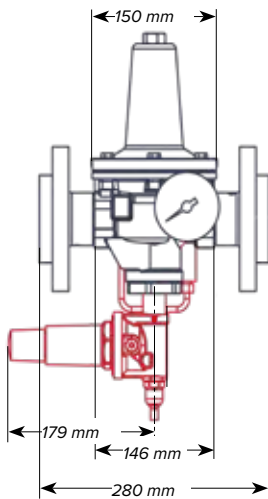
Celtic RGCL-N



Celtic AML1-N



Celtic AML1-S



### APPLICATION

- > First stage regulation for propane at the outlet of a cistern (RGCL-N)
- > Pressure limiting device (AML1 with RD05)

### PRODUCT ADVANTAGES

- > Watertightness in case of bad weather
- > All components comfortably accessible
- > Easy and fast dismantling
- > Simple and heavy-duty
- > Low pressure closing
- > Stainless steel adjustment screw
- > Flange with turning end-plate (for DN 50)

### CELTIC RGCL-N

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I130420SL	Flanged DN 50*	N,M,P	20 (300)	0,8-5 (12-70)	190-680	295-1050

### CELTIC AML1-N

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I130551SL	G1 1/2"F	N,M,P	20 (300)	0,8-5 (12-70)	190-680	295-1050
I130552SL	Flanged DN 50*	N,M,P	20 (300)	0,8-5 (12-70)	190-680	295-1050
I130553SL	G1 1/2"F	O	20 (300)	0,8-5 (12-70)	190-680	NA

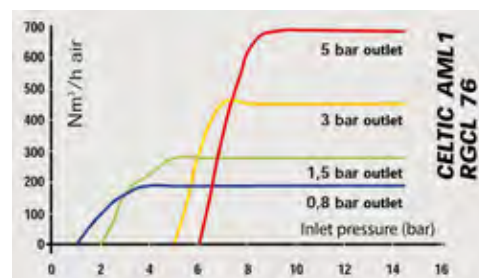
### CELTIC AML1-S (AML1 WITH RD05)

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I130561SL	G1 1/2"F	N,M,P	20 (300)	0,8-2 (12-30)	190-350	295-540
I130562SL	G1 1/2"F	N,M,P	20 (300)	1,3-5 (20-70)	250-680	390-1050
I130563SL	Flanged DN 50*	N,M,P	20 (300)	0,8-2 (12-30)	190-350	295-540
I130564SL	Flanged DN 50*	N,M,P	20 (300)	1,3-5 (20-70)	250-680	390-1050
I130565SL	G1 1/2"F	O	20 (300)	0,8-2 (12-30)	190-350	NA
I130566SL	G1 1/2"F	O	20 (300)	1,3-5 (20-70)	250-680	NA

\* Versions with gauge

TECHNICAL DATA	
Max. inlet pressure:	20 bar
Material:	Aluminium alloy body
Connection:	CELTIC AML 1 - RGCL-N : inlet and outlet with fl ange DN50 PN 40 or thread G1 1/2" (40x49)
Operating temperature range:	from -20 to + 60°C

### FLOW RATES PERFORMANCE CURVES



## PROTÉE 431 - REGULATOR WITH BALANCED VALVE

This regulator is designed for medium and low pressure. Thanks to their balanced valve, the PROTÉE are insensitive to the variations of the outlet pressure. They enable the distribution of all non-corrosive compressed gas (except oxygen: contact GCE).



PROTÉE 431 - N



PROTÉE 431 - S

### APPLICATION

- > First stage regulation for a propane cistern
- > Gas distribution of medium pressure
- > Supply gas for burners in medium pressure
- > Oven inert
- > Gas supply for safety devices
- > Pressure limiting device (PROTÉE 431 with RD05)

### PRODUCT ADVANTAGES

- > Watertightness in case of bad weather
- > All components comfortably accessible
- > Easy and fast dismantling
- > Simple and heavy-duty
- > Low closing pressure
- > Removable encapsulated valve

### PROTÉE 431-N

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I101349	Flanged DN 50*	N,M,P	20 (300)	0,8-2 (12-30)	400-1150	620-1750
I101350	Flanged DN 50*	N,M,P	20 (300)	2,1-3 (30-40)	400-1450	620-2250
I101351	Flanged DN 50*	N,M,P	20 (300)	3-6,5 (40-90)	400-2305	620-3570

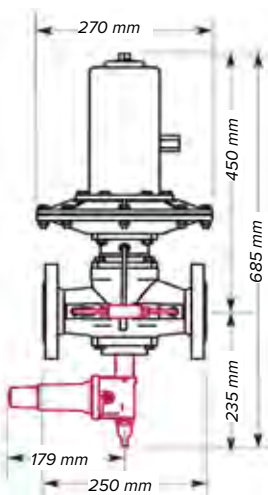
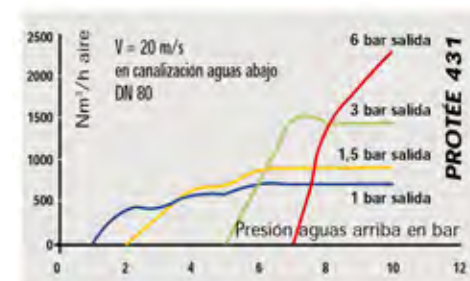
### PROTÉE 431-S (AML1 WITH RD05)

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I101352	Flanged DN 50*	N,M,P	20 (300)	0,8-2 (12-30)	400-1150	620-1750
I101353	Flanged DN 50*	N,M,P	20 (300)	2,1-3 (30-40)	400-1450	620-2250
I101354	Flanged DN 50*	N,M,P	20 (300)	3-6,5 (40-90)	400-2305	620-3570

\* Versions with gauge

TECHNICAL DATA	
Max. inlet pressure:	20 bar
Material:	Cast iron body
Connection:	Flanged DN50 PN 40 inlet and outlet
Operating temperature range:	from -20 to + 60°C

### FLOW RATES PERFORMANCE CURVES



PROTÉE 431-S

# SECOND STAGE REGULATOR

## CELTIC AML2 - DIRECT REGULATORS

The CELTIC range can be used for all common non-corrosive industrial gas. As for regulation, these products are very accurate.



Celtic AML2-N



Celtic AML2-S

### APPLICATION

- > Second stage regulation to supply furnaces
- > Inertness (cisterns, pipes)
- > Pressure limiting device (AML2 with RD05 = „S“)

### PRODUCT ADVANTAGES

- > Watertightness in case of bad weather
- > All components comfortably accessible
- > Easy and fast dismantling
- > Simple and heavy-duty
- > Low closing pressure

### CELTIC AML2-N

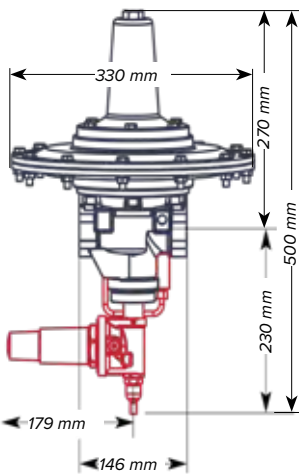
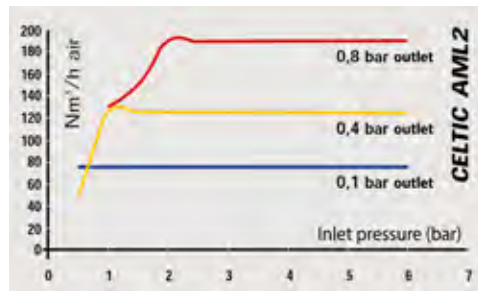
Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
1130621	G1 1/2" F	N,M,P	8 (120)	0,1-0,8 (2-12)	70-190	100-290

### CELTIC AML2-S (AML1 WITH RD05)

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
1130623	G1 1/2" F	N,M,P	8 (120)	0,3-0,8 (4-12)	70-190	100-290

TECHNICAL DATA	
Max. inlet pressure:	8 bar
Material:	Aluminium alloy body
Connection:	Threaded inlet and outlet G 1 1/2" F (40x49)
Operating temperature range:	from -20 to + 60°C

### FLOW RATES PERFORMANCE CURVES



## PROTÉE 432 - REGULATOR WITH BALANCED VALVE

Regulator for medium and low pressure. Thanks to their balance valve the PROTÉE are insensitive to the variations of the outlet pressure. They enable the distribution of all non corrosive gas (except oxygen: contact GCE).



PROTÉE 432-N

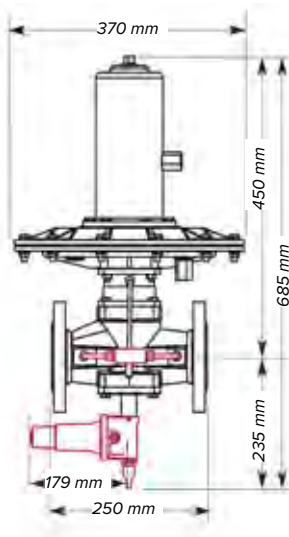
### APPLICATION

- > Second stage regulation for a propane cistern
- > Medium pressure network supply
- > Medium pressure burner supply
- > Oven inert
- > Security network

### PRODUCT ADVANTAGES

- > Watertightness in case of bad weather
- > All components comfortably accessible
- > Easy and fast dismantling
- > Simple and heavy-duty
- > Low closing pressure
- > Low pressure balanced valve
- > Removable encapsulated valve

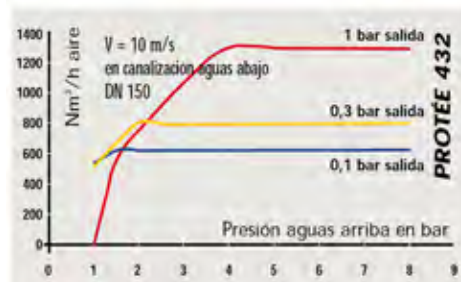
### PROTÉE 432-N



Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
I101303	Flanged DN 50	N,M,P	8 (120)	0,25-0,35 (4-5)	750-820	1160-1270
I101324	Flanged DN 50	N,M,P	8 (120)	0,1-0,3 (2-4)	600-800	930-1240
I101325	Flanged DN 50	N,M,P	8 (120)	0,3-0,5 (4-7)	800-950	1240-1470
I101326	Flanged DN 50	N,M,P	8 (120)	0,5-1 (7-15)	950-1300	1470-2015

TECHNICAL DATA	
<b>Max. inlet pressure:</b>	8 bar
<b>Material:</b>	Cast iron body
<b>Connection:</b>	Inlet and outlet with flange DN 50 PN 40
<b>Operating temperature range:</b>	from -20 to + 60°C

### FLOW RATES PERFORMANCE CURVES





## OMT - LOW PRESSURE REGULATOR

The OMT range comprises of very accurate low pressure regulators developed for burning gas (LPG, natural gas) and commonly for non-corrosive gas as well.



OMT B242



OMT A102 AP

### APPLICATION

- > To inert network and tanks
- > Last regulation before burners
- > Second stage regulation for propane
- > To compress space
- > Low pressure and big flow.
- >

### PRODUCT ADVANTAGES

- > Watertightness in case of bad weather
- > All components comfortably accessible
- > Easy and fast dismantling
- > Simple and heavy-duty
- > Low closing pressure
- > Low pressure balanced valve

### OMT B242

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
<b>I120121</b>	G1 1/2 "F	N,M,P	5 (75)	13-22 (0,195-0,33)	10-200	15-300
<b>I120122</b>	G1 1/2 "F	N,M,P	5 (75)	20-29 (0,3-0,435)	10-200	15-300
<b>I120123</b>	G1 1/2 "F	N,M,P	5 (75)	29-42 (0,435-0,63)	10-200	15-300
<b>I120124</b>	G1 1/2 "F	N,M,P	5 (75)	40-58 (0,6-0,87)	10-200	15-300
<b>I120125</b>	G1 1/2 "F	N,M,P	5 (75)	56-80 (0,84-1,2)	10-200	15-300

### OMT B242 AP (DELIVERED WITH 2 REGULATING SPRINGS)

Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
<b>I120221</b>	G1 1/2 "F	N,M,P	5 (75)	78-200 (1,17-3)	20-240	30-350
<b>I120225</b>	G1 1/2 "F	N,M,P	5 (75)	140-320 (2,1-4,8)	20-240	30-350

### OMT A102

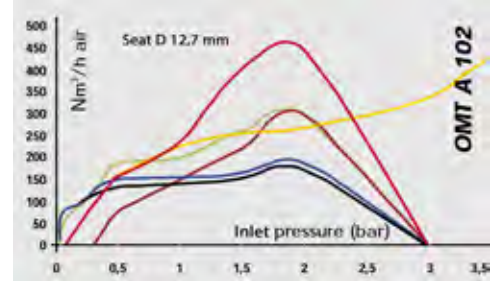
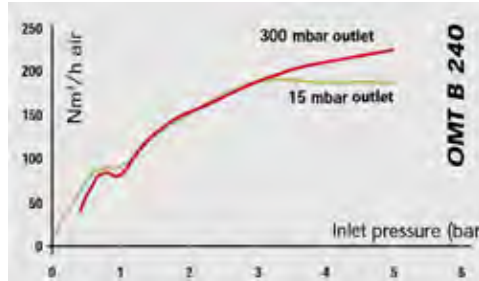
Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
<b>I120625</b>	G2" F	N,M,P	4 (60)	20-45 (0,3-0,675)	20-120	30-180
<b>I120632P</b>	G2" F	N,M,P	4 (60)	5,5-12,5 (0,082-0,188)	20-120	30-180
<b>I120633</b>	G2" F	N,M,P	4 (60)	9-18 (0,135-0,27)	20-120	30-180
<b>I120635</b>	G2" F	N,M,P	4 (60)	36-75 (0,54-1,125)	20-120	30-180

### OMT A102 AP

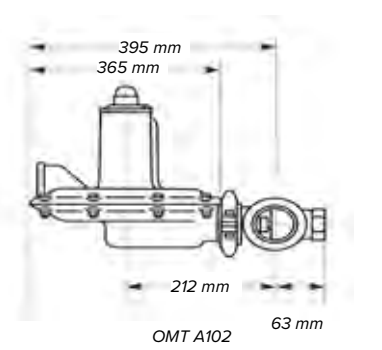
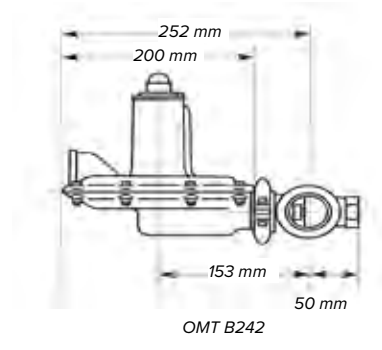
Art.-Nr.	Connection	Gas	Max. inlet pressure bar (psi)	Outlet pressure bar (psi)	Flow air Nm <sup>3</sup> /h	Flow propane kg/h
<b>I120221</b>	G1 1/2 "F	N,M,P	5 (75)	78-200 (1,17-3)	20-240	30-350
<b>I120225</b>	G1 1/2 "F	N,M,P	5 (75)	140-320 (2,1-4,8)	20-240	30-350

TECHNICAL DATA	
Max. inlet pressure:	4 bar (A102), 5 bar (B242)
Material:	Cast iron body
Connection:	G1 1/2" F (A102), G2" F (B242)
Operating temperature range:	from -20 to + 60°C

FLOW RATES PERFORMANCE CURVES



- 38 to 115 mbar   ■ 12 to 26,5 mbar   ■ 20 to 45 mbar
- 38 to 115 mbar   ■ 75 to 220 mbar   ■ 210 to 300 mbar



# SECURITY DEVICE

## RD 05 - RELEASE SECURITY SYSTEM

Because some fluid in a network can be dangerous, GCE has developed an efficient security device that will act on the flow when the outlet pressure will be very high or very low.

The GCE security device is used only with selected regulators of the range. The security valve cut the inlet gas flow, if the outlet pressure is out of the pressure slot that has been previously adjusted.



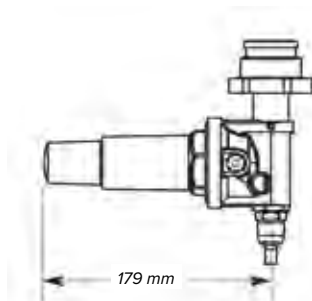
RD 05



AML1-S

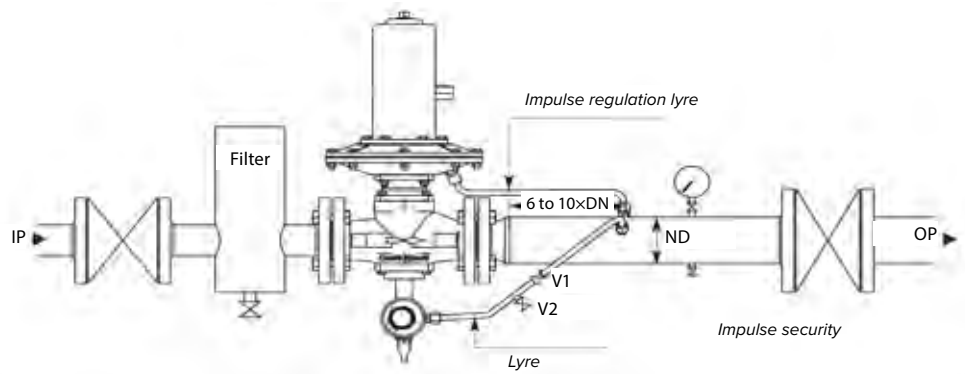


PROTÉE 431-S



179 mm

TECHNICAL DATA	
<b>Spring pressure slot:</b>	4 bar (A102), 5 bar (B242)
	<b>RD05 C:</b> 0,3-0,8 bar <b>I290813</b>
	Mini adjustment 0,2 to 0,4 bar
	Maxi adjustment 0,3 to 1,2 bar
	<b>RD05 B1:</b> 0,5 to 2 bar <b>I290814</b>
	Mini adjustment 0,3 to 1,3 bar
	Maxi adjustment 0,7 to 3 bar
	<b>RD05 B2:</b> 0,5 to 2 bar <b>I290816</b>
	Mini adjustment 0,3 to 1,3 bar
	Maxi adjustment 0,7 to 3 bar
	<b>RD05 A:</b> 1,3 to 5 bar <b>I290815</b>
	Mini adjustment 0,6 to 3 bar
	Maxi adjustment 1,6 to 6,7 bar
<b>Valve reaction time:</b>	< 1 second (norm < 2 seconds)
<b>Release precision:</b>	<b>Class AG 5</b> for pressure < 0,5 bar
	<b>Class AG 2,5</b> for pressure between 0,5 and 6 bar
<b>Definition:</b>	
<b>Class of precision:</b>	AG 2,5 means that as soon as the security is adjusted at 1 bar, it is released between 0,975-1,025 bar. (± 2,5%). It is the same for AG 5 class (± 5%)
<b>Operating temperature range:</b>	from -20 to + 60°C



- V1:** Regulation valve
- V2:** Bleeding valve
- IP:** Inlet pressure
- OP:** Outlet pressure
- ND:** Nominal Diameter

### VARIABLE WITH

- > CELTIC AML1-S
- > PROTÉE 431-S
- > CELTIC AML2-S

# PNEUMATIC LOADED REGULATOR

## DE 232

High pressure, high flow regulator for inert gas application. Regulator provides constant and stable flow.

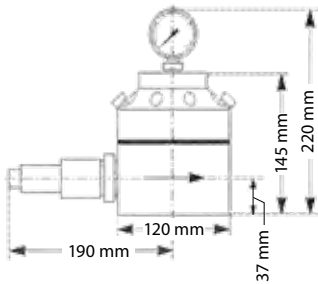


### APPLICATION

- > Inertisation in various processes
- > Chemical industries
- > Vessel pressurising

### PRODUCT ADVANTAGES

- > Adjustable with or without pilot regulator (pilot regulator on request)
- > Inlet pressure up to 250 bar
- > Outlet pressure adjustable up to 200 bar
- > Flow capacity up to 3000 Nm<sup>3</sup>/h



Art.-Nr.	Gas	Max. inlet pressure (bar)	Inlet connection	Max. outlet pressure (bar)	Outlet connection	Note
I110408	N (Inert)	250	W21,8×1/14″M	200	G1″	without gauge
I110410	N (Inert)	250	W21,8×1/14″M	200	G1″	with gauge

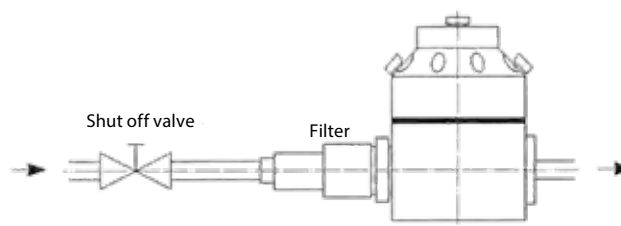
TECHNICAL DATA	
<b>Body and bonnet material:</b>	Machined brass
<b>Surface screws material:</b>	Stainless steel
<b>Diaphragm material:</b>	NBR
<b>Seat sealing material:</b>	PA
<b>Inlet filter material:</b>	Bronze
<b>Inlet outlet connections material:</b>	Brass
<b>Maximal inlet pressure:</b>	250 bar
<b>Maximal outlet pressure:</b>	200 bar
<b>Maximal flow capacity:</b>	3000 Nm <sup>3</sup> /h
<b>Weight:</b>	11 kg
<b>Ambient temperature range:</b>	from -20 to + 60°C

### FLOW RATES PERFORMANCE CURVES

		Inlet pressure (bar)					
		10	30	50	150	200	250
Working pressure (bar)	5	165	165	165	165	165	165
	15	-	465	465	465	465	465
	30	-	-	745	745	745	745
	60	-	-	1480	1480	1480	1480
	100	-	-	-	2130	2130	2130
	150	-	-	-	-	2605	2605
	200	-	-	-	-	-	3000

Performance in Nm<sup>3</sup>/h Air with an outlet gas speed of 30 m/s.

### INSTALLATION EXAMPLE



# SPARE PARTS

Maintenance kit for models with spring used with non-corrosive gas

## CELTIC

Art.-Nr.	Model	Contents
<b>I291261</b>	CELTIC JUNIOR 74-A	1 diaphragm, 2 O-rings (plug), 1 complete regulating valve, 1 valve stem
<b>I291262</b>	CELTIC JUNIOR 74-B	1 diaphragm, 2 O-rings (plug), 1 complete regulating valve, 1 valve stem
<b>I291281</b>	CELTIC AML1, RGCL-N	1 diaphragm, 1 diaphragm washer (for AML2), 1 complete regulating valve, 3 washers (plug, valve), 1 blind nut
<b>I291281</b>	CELTIC AML2-N	1 diaphragm, 1 diaphragm washer (for AML2), 1 complete regulating valve, 3 washers (plug, valve), 1 blind nut
<b>I291288</b>	CELTIC AML1, RGCL-N	Flanges (2x) + Neck (2x)
<b>I303348P</b>	CELTIC AML1, RGCL-N	Pressure gauge 6 bar
<b>I291205</b>	CELTIC AML1, RGCL-N	Counter flange (1x) + DN 50 + Bolts (4x) + Washer

## PREVIOUS MODEL

Art.-Nr.	Model	Contents
<b>I291263</b>	CELTIC AML1, RGCL-N	1 diaphragm, 1 diaphragm washer (for AML2), 1 complete regulating valve, 3 washers (plug and valve), 1 blind nut
<b>I291264</b>	CELTIC AML1, RGCL-N	1 diaphragm, 1 diaphragm washer (for AML2), 1 complete regulating valve, 3 washers (plug and valve), 1 blind nut

## PROTÉE

Art.-Nr.	Model	Contents
<b>I291283</b>	PROTÉE 431-N	1 diaphragm, 1 diaphragm washer (for AML2), 1 complete regulating valve, 3 washers (plug and valve), 1 blind nut
<b>I291286</b>	PROTÉE 432-N	O-rings, 1 main diaphragm, 1 encapsulated valve, 2 diaphragms and clip rings for event hole

## PREVIOUS MODEL

Art.-Nr.	Model	Contents
<b>I291270</b>	CELTIC AML1, RGCL-N	washers, 1 diaphragm, 1 complete regulating valve, 1 valve axis
<b>I291270</b>	CELTIC AML1, RGCL-N	complete regulating valves, 1 main diaphragm, 2 diaphragms and clip rings for event hole, 1 encapsulated valve

## OMT

Art.-Nr.	Model	Contents
<b>I291265</b>	B242	1 diaphragm, 5 O-rings, 1 gasket
<b>2200077P</b>	A102	1 diaphragm, 5 O-rings, 1 gasket

## DE 232

Art.-Nr.	Model	Contents
<b>I291271</b>	DE 232	valve, seat, filter, diaphragm, and O-rings

# ACCESSORIES

Outlet security kit for N-models not having outlet security device, GCE propose a security kit

## CELTIC

Art.-Nr.	Model	Outlet pressure	Name
<b>I291300</b>	CELTIC AML1	0,3 to 0,8 bar	Kit RD05 - C AML
<b>I291302</b>	CELTIC AML1	0,5 to 2 bar	Kit RD05 - B AML
<b>I291301</b>	CELTIC AML1	1,3 to 5 bar	Kit RD05 - A AML
<b>I291303</b>	CELTIC AML2-N	0,3 to 0,8 bar	Kit RD05 - C AML

*The installation of the security device has to be done in our workshop.*

## PROTÉE

Art.-Nr.	Model	Outlet pressure	Name
<b>I291308</b>	PROTÉE 431-N	0,8 to 2,1 bar	Kit RD05 - B PROTÉE 431
<b>I291307</b>	PROTÉE 431-N	2,1 to 3 bar; 3 - 5 bar	Kit RD05 - A PROTÉE 431

*The installation of the security device has to be done in our workshop.*

# TECHNICAL SPECIFICATION

## GAS DESIGNATION

TYPE OF GAS	CODE LETTER
Acetylene	A
Oxygen	O
Hydrogen	H
Compressed air	D
LPG	P
MPS	Y
Natural gas	M
CO <sub>2</sub> , nitrogen, inert gas	N

## PRODUCT DESIGNATION

### - S REGULATOR WITH SAFETY DEVICE

CELTIC AML1-S (AML1 WITH RD05)	
Art.-Nr.	Connection
<b>I130561SL</b>	G1 1/2" F
<b>I130562SL</b>	G1 1/2" F

- > CELTIC AML1-S
- > PROTÉE 431-S
- > CELTIC AML2-S

### - N REGULATOR WITHOUT SAFETY DEVICE

CELTIC AML1-N	
Art.-Nr.	Connection
<b>I130551SL</b>	G1 1/2" F
<b>I130552SL</b>	Flanged DN 50*
<b>I130553SL</b>	G1 1/2" F

- > CELTIC RGCL-N
- > CELTIC AML1-N
- > PROTÉE 431-N
- > CELTIC AML2-N
- > PROTÉE 432-N

# LNG CATALOGUE

## LIQUIFIED NATURAL GAS





## LNG

With the increasing adoption of LNG (Liquefied Natural Gas) as a vehicle fuel to replace diesel and reduce pollution GCE Druva have utilised our detailed understanding of gas equipment to design a range of LNG specific products to address this demand. The components are designed to meet customer requirements across a range of applications and environmental conditions as well as national and international standards of safety and reliability.

The product range includes pressure regulation, flow control, safety and check valves, fill and vent adaptors and isolation valves. These are available in a range of sizes and flow rates to suit most applications.



The safety and reliability demanded by the automotive industry combined with the low temperature and flammable nature of LNG has resulted in a significant development effort at GCE Druva to design and produce an entirely new range of dedicated products for this rapidly expanding industry. All products have to meet demanding requirements for rugged durability, leak-tightness and overall safety often at very low temperatures and in harsh environments. Uniquely qualified in this area, GCE Druva stands at the forefront of product development in this field, all products are tested to ISO standards and a number of approvals are expected shortly for the entire product range.

# ECONOMIZERS AND REGULATORS

## ECONOMIZER (ECO)

Set pressure 140 psi,  
range 10 - 150 psi, design pressure 550 psi

The LNG economizer is designed to make use of the evaporated gas in an LNG cylinder that would otherwise be lost to the atmosphere through the pressure relief valve by redirecting this gas to the vehicle engine inlet or the point of use. The economiser may also be used in LNG lines and LNG vaporizer and converter applications and is especially useful in installations where space and cost limitations are important.

TECHNICAL DATA	
<b>Seal:</b>	PA66
<b>Body:</b>	Brass
<b>Set pressure:</b>	140 psi
<b>Range:</b>	10 - 150 psi
<b>Design pressure:</b>	550 psi
<b>Possible inlet/outlet:</b>	NPT1/4" - NPT1/4"
<b>Dimensions:</b>	115×68 mm

## OUTLET PRESSURE REGULATOR (OPR)

Design pressure 400 psi

The Outlet Pressure Regulator provides reliable and precise pressure control of evaporated natural gas to the vehicle engine or point of use in the most demanding applications. Optimized venturi and spring design assures high flow with extremely low droop characteristics.

TECHNICAL DATA	
<b>Seal:</b>	PTFE
<b>Body:</b>	Brass
<b>Available inlet/outlet:</b>	NPT1/2" - NPT1/2" NPT3/8" - NPT3/8"
<b>Dimensions:</b>	146×70 mm

## BUILD-UP REGULATOR (BUR)

Range 25 - 250 psi, design pressure 550 psi

The Build-Up Regulator controls the pressure of evaporated gas in the LNG cylinder and may also be used in LNG lines, and LNG vaporizer and converter applications. They are especially useful in installations where space and cost limitations are important.

TECHNICAL DATA	
<b>Seal:</b>	PA66
<b>Body:</b>	Brass
<b>Available inlet/outlet:</b>	NPT1/4" - NPT1/4"
<b>Dimensions:</b>	115×68 mm



# ISOLATION VALVES

## SHUT-OFF VALVES (SV)

Design pressure 600 psi

LNG shutt-off valve.



TECHNICAL DATA	
<b>Seal:</b>	PCTFE
<b>Body:</b>	Brass
<b>Possible inlet/outlet:</b>	NPT1/4" - NPT1/4"
	NPT3/8" - NPT3/8"
	NPT1/2" - NPT1/2"
<b>Dimensions:</b>	78×68 mm

# SAFETY VALVES / BLOWOUT PREVENTORS

## FILL NOZZLE CHECK VALVE (LCV)



Design pressure 1,000 psi, Opening pressure 1 psi

The large check valve is a safety device fitted between the fill adaptor and the cylinder to allow LNG to flow into the cylinder during refilling while preventing loss of fuel gas when the fill nozzle is disconnected.

TECHNICAL DATA	
<b>Seal:</b>	PCTFE
<b>Body:</b>	Brass
<b>Possible inlet/outlet:</b>	M30×1,5 - NPT1/2"
	NPT1/2" - NPT1/2"
	M30×1,5 - NPT3/8"
	NPT1/2" - NPT3/8"
<b>Dimensions:</b>	78×68 mm

## EXCESS FLOW VALVE (EFV)



Design pressure 435 psi

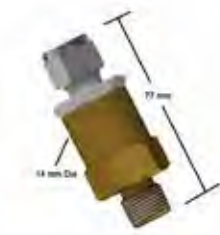
The Excess flow valve is a safety device to shut off the fuel line if it is ruptured and contain the LNG within the cylinder until it can be safely removed.

TECHNICAL DATA	
<b>Seal:</b>	Stainless steel 1.4301
<b>Available inlet/outlet:</b>	NPT3/8" - for tube OD 10mm or larger
	NPT1/4" - for tube OD 10mm or larger
	NPT1/2" - for tube OD 10mm or larger
<b>Dimensions:</b>	78×68 mm

## EXCESS FLOW VALVE (EFV)

Design pressure 400 psi, Opening pressure 1 psi

The Excess flow valve is a safety device to shut off the fuel line if it is ruptured and contain the LNG within the cylinder until it can be safely removed.



TECHNICAL DATA	
<b>Body:</b>	Brass
<b>Available inlet/outlet:</b>	NPT1/4" - for tube OD 10mm or larger
	NPT3/8" - for tube OD 10mm or larger
	NPT1/8" - for tube OD 10mm or larger
	NPT1/2" - for tube OD 10mm or larger
<b>Dimensions:</b>	77×14 mm

## FUEL LINE CHECK VALVE (SCV)



Design pressure 435 psi

Small gas line check valve for the fuel line to the vehicle.

TECHNICAL DATA	
<b>Body:</b>	Brass
<b>Available inlet/outlet:</b>	NPT1/8"
<b>Dimensions:</b>	30×10.5 mm

## LNG FUEL LINE RELIEF VALVE (RV)



Set Pressure 350 psi, Design pressure 550 psi

The LNG fuel line relief valve is a safety device to prevent over pressurisation of the LNG cylinder by venting excess gas safely to atmosphere above the vehicle.

TECHNICAL DATA	
<b>Body:</b>	PTFE
<b>Available inlet/outlet:</b>	NPT1/4"
	NPT1/8"
	NPT3/8"
<b>Dimensions:</b>	67×22 mm

## LNG CYLINDER RELIEF VALVE (RV)



Set Pressure 250 psi, Design pressure 550 psi

The LNG cylinder relief valve is a safety device to prevent over pressurisation of the LNG cylinder by venting excess gas safely to atmosphere above the vehicle.

TECHNICAL DATA	
<b>Seal:</b>	PTFE
<b>Body:</b>	Brass
<b>Available inlet/outlet:</b>	NPT1/4"
	NPT1/8"
	NPT3/8"
<b>Dimensions:</b>	67×22 mm

# FILLING NOZZLES/ QDV ADAPTORS



## FILLING NOZZLE (FLN)

Design pressure 550 psi

The LNG filling nozzle is designed to accept the filling hose connector for refilling the LNG cylinder at a fuel station, it is a simple quick connect coupling to allow safe efficient refilling of the LNG cylinder.

TECHNICAL DATA	
<b>Seal:</b>	PCTFE
<b>Body:</b>	Stainless steel 1.4301
<b>Available inlet/outlet:</b>	INLET ACC. TO NORM - M30×1,5
	INLET ACC. TO NORM - M36×2
	INLET ACC. TO NORM - NPT3/4"
<b>Dimensions:</b>	135×100 mm



## QDV ADAPTORS

Design pressure 550 psi

The quick disconnecting valve is designed to allow safe efficient connection of a recovery hose to the LNG cylinder, allowing the cylinder to be emptied of LNG for inspection, maintenance or storage.

TECHNICAL DATA	
<b>Seal:</b>	PCTFE
<b>Body:</b>	Stainless steel 1.4301
<b>Available inlet/outlet:</b>	INLET ACC. TO NORM - M30×1,5
	INLET ACC. TO NORM - M36×2
	INLET ACC. TO NORM - NPT3/4"
<b>Dimensions:</b>	110×44 mm

# GENERAL BUSINESS TERMS AND CONDITIONS

## PREAMBLE

1. These General Conditions shall apply when the parties agree in writing or otherwise thereto. Deviations from the Conditions shall not apply unless agreed in writing. When used in these conditions the term "written" or "in writing" refers to a document signed by both parties or a letter, fax, electronic mail or other means agreed by the parties.

## PRODUCT INFORMATION

2. Data in product information and price lists are binding only to the extent that they are expressly referred to in the contract.

## TECHNICAL DOCUMENTS AND TECHNICAL INFORMATION

3. All drawings and other technical documents regarding the goods or their manufacture submitted by one party to the other, prior or subsequent to the formation of the contract, shall remain the property of the submitting party.

Drawings, technical documents or other technical information received by one party shall not, without the consent of the other party, be used for any other purpose than that for which they were submitted. They may not without the consent of the other party be copied, reproduced, transmitted or otherwise communicated to a third party.

4. The Seller shall, not later than by delivery of the goods, free of charge provide the Buyer with one copy, or the larger number of copies that may have been agreed, of drawings and other technical documents, which are sufficiently detailed to permit the Buyer to carry out installation, commissioning, operation and maintenance (including running repairs) of all parts of the goods. The Seller shall not, however, be obliged to supply manufacturing drawings of the goods or spare parts.

## DELIVERY TEST

5. Where a delivery test has been agreed, it shall, unless otherwise agreed, be carried out where the goods are manufactured.

If technical requirements for the test have not been agreed, the test shall be carried out in accordance with general practice in the industry concerned in the country where the goods are manufactured.

6. The Seller shall notify the Buyer in writing of the delivery test in sufficient time to permit the Buyer to be present at the test.

If the Buyer has received such notice, the test may be carried out even if the Buyer is not represented at the test.

The Seller shall record the test. The test report shall be sent to the Buyer. The report shall, unless otherwise shown by the Buyer, be considered to correctly describe the execution of the test and its results.

7. If at the delivery test the goods are found not to be in accordance with the contract, the Seller shall as soon as possible ensure that the goods comply with the contract. If so required by the Buyer a new test shall thereafter be carried out. The Buyer may not, however, require a new test if the defect was insignificant.

8. If no other division of the costs has been agreed, the Seller shall bear all costs for delivery tests carried out where the goods are manufactured. The Buyer shall, however, at such delivery tests bear all costs for his representatives, including costs for travel and subsistence.

## DELIVERY

9. Where a trade term has been agreed, it shall be interpreted in accordance with the INCOTERMS in force at the formation of the contract. If no trade term is specifically agreed, the delivery shall be Ex Works.

## TIME FOR DELIVERY. DELAY

10. If, instead of a fixed date for delivery, the parties have agreed on a period of time within which delivery shall take place, such period shall start to run at the formation of the contract.

11. If the Seller finds that he will not be able to deliver the goods at the agreed time or if delay on his part seems likely, he shall without undue delay notify the Buyer thereof in writing, stating the reason for the delay and if possible the time when delivery can be expected. If the Seller fails to give such notice, he shall, regardless of the provisions of Clauses 13 and 14, reimburse the Buyer for any additional expenses, which the latter incurs and which he would have avoided, had he received notice in time.

12. If delay in delivery is caused by a circumstance which under Clause 36 constitutes ground for relief or by an act or omission on the part of the Buyer, including suspension by the Seller under Clause 18, the time for delivery shall be extended by a period, which is reasonable having regard to the circumstances in the case. The time for delivery shall be extended even if the reason for delay occurs after the originally agreed time for delivery.

13. If the Seller fails to deliver the goods on time, the Buyer is entitled to liquidated damages from the date on which delivery should have taken place.

The liquidated damages shall be payable at a rate of 0.5 per cent of the agreed price for each complete week of delay. If the delay concerns only a part of the goods, the liquidated damages shall be calculated on the part of the price which is properly attributable to the part of the goods which cannot be taken in use due to the delay.

The liquidated damages shall not exceed 7.5 per cent of that part of the price on which it is calculated. The liquidated damages become due at the Buyer's written demand but not before all of the goods have been delivered or the contract is terminated under Clause 14.

The Buyer loses his right to liquidated damages if he has not lodged a written claim for such damages within six months after the time when delivery should have taken place.

14. If the Buyer is entitled to maximum liquidated damages under Clause 13, and the goods are still not delivered, the Buyer may in writing demand delivery within a final reasonable period which shall not be less than one week.

If the Seller fails to deliver within such final period and this is not due to any circumstance for which the Buyer is responsible, the Buyer may, by written notice to the Seller, terminate the contract in respect of that part of the goods which cannot be taken in use due to the delay.

In case of such termination the Buyer shall also be entitled to compensation for the loss he suffers because of the Seller's delay to the extent that the loss exceeds the maximum of liquidated damages which the Buyer may claim under Clause 13. This compensation shall not exceed 7.5 per cent of that part of the price which is properly attributable to the part of the goods in respect of which the contract is terminated.

The Buyer shall also have the right to terminate the contract by written notice to the Seller if it is clear that there will be a delay, which under Clause 13 would entitle the Buyer to maximum liquidated damages. In case of termination on this ground the Buyer shall be entitled to both maximum liquidated damages and compensation under the third paragraph of this Clause.

Except for liquidated damages under Clause 13 and termination of the contract with limited compensation under this Clause 14, all other claims in respect of the Seller's delay shall be excluded.

This limitation of the Seller's liability shall not apply, however, where the Seller has been guilty of gross negligence.

15. If the Buyer finds that he will be unable to accept delivery of the goods on the agreed date, or if delay on his part seems likely, he shall without undue delay notify the Seller thereof in writing stating the reason for the delay and, if possible, the time when he will be able to accept delivery.

If the Buyer fails to accept delivery on the agreed date, he shall nevertheless make any payment which is dependent on delivery as if the goods in question had been delivered. The Seller shall arrange storage of the goods at the Buyer's risk and expense. If the Buyer so requires, the Seller shall insure the goods at the Buyer's expense.

16. Unless the Buyer's failure to accept delivery as referred to in Clause 15 is due to any such circumstance as described in Clause 36, the Seller may by written notice require the Buyer to accept delivery within a reasonable period.

If, for any reason for which the Seller is not responsible, the Buyer fails to accept delivery within such period, the Seller may, by written notice to the Buyer, terminate the contract in respect of that part of the goods which is ready for delivery but has not been delivered due to the Buyer's default. The Seller shall then be entitled to compensation for the loss he has suffered by reason of the Buyer's default. The compensation shall not exceed that part of the price which is properly attributable to the part of the goods in respect of which the contract is terminated.

## PAYMENT

17. Unless otherwise agreed, the agreed purchase price, together with value added tax, if any, shall be invoiced with one third at the formation of the contract, one third when the Seller gives written notice that the bulk of the goods are ready for delivery. Final payment shall be invoiced at delivery of the goods. The invoiced amount becomes due 30 days after the date of the invoice.

18. If the Buyer fails to pay, the Seller shall be entitled to interest from the due date at the rate of interest determined by the law on late payments in the Seller's country.

If the Buyer fails to pay by the due date, the Seller shall also, after having notified the Buyer in writing thereof, suspend performance of his contractual obligations until payment is made.

19. If the Buyer has failed to pay the amount due within three months after the due date, the Seller may terminate the contract by written notice to the Buyer and, in addition to interest on late payment, claim compensation for the loss he has suffered. The compensation shall not exceed the agreed purchase price.

## RETENTION OF TITLE

20. The goods shall remain the property of the Seller until paid for in full, to the extent that such retention of title is valid.

## LIABILITY FOR DEFECTS

21. The Seller shall, in accordance with the provisions of Clauses 23–33 below, remedy any defect in the goods resulting from faulty design, materials or workmanship.

The Seller is not liable for defects arising out of material provided by the Buyer or a design stipulated or specified by him.

22. The Seller's liability does not cover defects caused by circumstances, which arise after the risk has passed to the Buyer.

The liability does not, for example, cover defects due to conditions of operation deviating from those anticipated in the contract or to improper use of the goods. Nor does it cover defects due to faulty maintenance or incorrect installation from the Buyer's side, alterations undertaken without the Seller's written consent or faulty repairs by the Buyer. Finally the liability does not cover normal wear and tear or deterioration.

23. The Seller's liability is limited to defects which appear within a period of one year from the date of delivery of the goods. If the goods are used more intensely than agreed, this period shall be reduced proportionately.

24. For parts, which have been repaired or replaced under Clause 21, the Seller shall have the same liability for defects as for the original goods for a period of one year. For other parts of the goods the liability period referred to in Clause 23 shall be extended only by the period during which the goods could not be used due to a defect for which the Seller is liable.

25. The Buyer shall notify the Seller in writing of a defect without undue delay after the defect has appeared and in no case later than two weeks after the expiry of the liability period defined in Clause 23 as supplemented by Clause 24. The notice shall contain a description of how the defect manifests itself. If the Buyer fails to notify the Seller in writing within the above time limits, he loses his right to make any claim in respect of the defect. If there is reason to believe that the defect may cause damage, notice shall be given forthwith. If notice is not given forthwith, the Buyer loses the right to make any claim based on damage which occurs and which could have been avoided if such notice had been given.

26. After receipt of a written notice under Clause 25, the Seller shall remedy the defect without undue delay. Within this limit the time for remedial work shall be chosen in order not to interfere unnecessarily with the Buyer's activities. The Seller shall bear the costs as specified in Clauses 21–32.

Remedial work shall be carried out at the Buyer's premises unless the Seller finds it appropriate to have the defective part or the goods sent to him for repair or replacement at his own premises.

The Seller shall carry out dismantling and re-installation of the part if this requires special knowledge. If such special knowledge is not required, the Seller has fulfilled his obligations in respect of the defect when he delivers a duly repaired or replaced part to the Buyer.

27. If the Buyer gives such notice as referred to in Clause 25, and no defect is found for which the Seller is liable, the Seller shall be entitled to compensation for the work and costs which he has incurred as a result of the notice.

28. If remedy of the defect requires intervention in other equipment than the goods, the Buyer shall be responsible for any work or costs caused thereby.

29. All transports in connection with repair or replacement shall be at the Seller's risk and expense.

The Buyer shall follow the Seller's instructions regarding how the transport shall be carried out.

30. The Buyer shall bear the increase in costs for remedying a defect which the Seller incurs when the goods are located elsewhere than at the destination stated in the contract or – if no destination has been stated – the place of delivery.

31. Defective parts, which have been replaced under Clause 21, shall be placed at the Seller's disposal and shall become his property.

32. If the Seller fails to fulfil his obligations under Clause 26 within a reasonable time, the Buyer may by written notice require him to do so within a final time. If the Seller fails to fulfil his obligations within that time limit, the Buyer may at his option:

a) have the necessary remedial work carried out and/or have new parts manufactured at the Seller's risk and expense, provided that the Buyer proceeds in a reasonable manner, or

b) demand a reduction of the agreed purchase price not exceeding 15 per cent thereof.

If the defect is substantial, the Buyer may instead terminate the contract by written notice to the Seller.

The Buyer shall also be entitled to such termination where the defect remains substantial after measures referred to in a). In case of termination, the Buyer shall be entitled to compensation for the loss he has suffered. The compensation shall not, however, exceed 15 per cent of the agreed purchase price.

33. Regardless of the provisions of Clauses 21–32, the Seller shall have no liability for defects in any part of the goods for more than two years from the start of the liability period referred to in Clause 23.

34. The Seller shall have no liability for defects save as stipulated in Clauses 21–33. This applies to any loss the defect may cause, such as loss of production, loss of profit and other consequential economic loss. This limitation of the Seller's liability shall not apply, however, if he has been guilty of gross negligence.

## LIABILITY FOR DAMAGE TO PROPERTY CAUSED BY THE GOODS

35. The Buyer shall indemnify and hold the Seller harmless to the extent that the Seller incurs liability towards any third party in respect of loss or damage for which the Seller is not liable towards the Buyer according to the second and third paragraphs of this Clause.

The Seller shall have no liability for damage caused by the goods:

a) to any (movable or immovable) property, or consequential loss due to such damage, occurring while the goods are in the Buyer's possession, or

b) to products manufactured by the Buyer or to products of which the Buyer's products form a part.

The above limitations of the Seller's liability shall not apply if he has been guilty of gross negligence.

If a third party lodges a claim for compensation against Seller or Buyer for loss or damage referred to in this Clause, the other party to the contract shall forthwith be notified thereof in writing.

The Seller and the Buyer shall be mutually obliged to let themselves be summoned to the court or arbitral tribunal which examines claims against either of them based on damage or loss alleged to have been caused by the goods. The liability as between the Seller and the Buyer shall, however, always be settled by arbitration in accordance with Clause 39.

## GROUND FOR RELIEF (FORCE MAJEURE)

36. The following circumstances shall constitute grounds for relief if they impede the performance of the contract or makes performance unreasonably onerous: industrial disputes and any other circumstance beyond the control of the parties, such as fire, war, mobilization or military call up of a comparable scope, requisition, seizure, trade and currency restrictions, insurrection and civil commotion, shortage of transport, general shortage of materials, restrictions in the supply of power and defects or delays in deliveries by sub-contractors caused by any such circumstance as referred to in this Clause. The above described circumstances shall constitute grounds for relief only if their effect on the performance of the contract could not be foreseen at the time of formation of the contract.

37. The party wishing to claim relief under Clause 36 shall without delay notify the other party in writing on the intervention and on the cessation of such circumstance.

If grounds for relief prevent the Buyer from fulfilling his obligations, he shall reimburse the expenses incurred by the seller in securing and protecting the goods.

38. Notwithstanding other provisions of these General Conditions, either party shall be entitled to terminate the contract by notice in writing to the other party, if performance of the contract is delayed more than six months by reason of any grounds for relief as described in Clause 36.

## DISPUTES, APPLICABLE LAW

39. Disputes arising out of or in connection with the contract shall not be brought before the court, but shall be finally settled by arbitration in accordance with the law on arbitration applicable in the Seller's country.

40. All disputes arising out of the contract shall be judged according to the law of the Seller's country.

## REGIONAL OFFICES

### EUROPE

CZECH REPUBLIC  
FRANCE  
GERMANY  
HUNGARY  
ITALY  
POLAND  
PORTUGAL  
ROMANIA  
SPAIN  
SWEDEN  
UNITED KINGDOM & IRELAND

### AMERICA

LATIN AMERICA  
MEXICO  
USA

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