



Gas Regulator For High Purity Gases

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STANDARD EQUIPMENT

High purity regulators series 500	1
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PRODUCT RANGE

STANDARD EQUIPMENT

1. 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

2. 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

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

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

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.



The FDA - Food and Drug Administration - is an agency inside the "US Department of Health and Human Services". FDA is responsible for protection of the public health through verifying the safety of medicines, vaccines, biological products from medical production, food supply, cosmetics, dietary supplements and production, radiation emission.

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“.

Handling of compressed gases presupposes intensive knowledge of regulations and technical rules which form the basis for a safe layout of any gas-supply system.

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.



Point-of-use pressure regulator EMD

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 downtime.

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.

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 utmost 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 decisive 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 GCEDRUA 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,
- 12-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 3×10^{-9} mbar l/sec He equivalent. This is equal to a leak of just 1 cm³ 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. : p1 = 101 bar and p2 = 50 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)

Lineregulators 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 to be specified as it depends on gas type. GCEdruva will automatically



taylor it's proposal to makes 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.

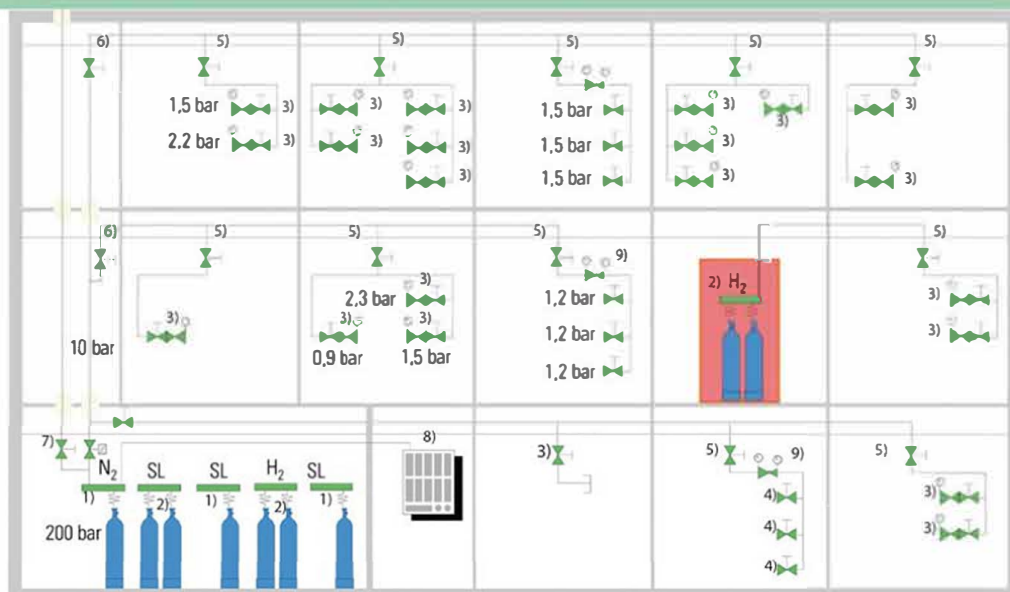
With the two stage regulator the point of use pressure stays practically constant, irrespectively of the cylinder pressure which sinks progressively as the cylinder empties.

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

SERIES
 Purity: 500 (< 6.0), 3100 (< 6.0), 320 (< 5.0), 100 (for techn. Gases and Laser gases)
 Application: Standard, Laboratory, diverse, diverse

FMD **50** **0** **-16** **B** **F** **200** **DIN** **CL6** **BC** **0** **Gas**

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 (C₂H₂)
- 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

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
 A = ANSI
 F = AFNOR
 B = NBN
 UK = BS
 US = CGA
 NL = NEN
 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 – 30abs
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
FMD 532	-14*	BC	G	10	DIN	CL6 BC	Ki	A	GAS
	-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"	without	A = with	
	-18	SS = stainless steel		10 = 1 – 10.5 bar	AFNOR	CL 1/4"	Ki = with	(only in conjunction with RV)	
					NBN	BC = brass-chrome pl. SS = stainless steel			

* recommended Standard model = printed in BOLD

PRESSURE REGULATORS OVERVIEW

CYLINDER PRESSURE REGULATORS 500 OVERVIEW

Outlet: tube fitting



Outlet: shut-off valve



Outlet: regulating 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 pressure: 6, 14, 28, 50, 200 bar
85, 200, 400, 720, 2900 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 530-18

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

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 532-16

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

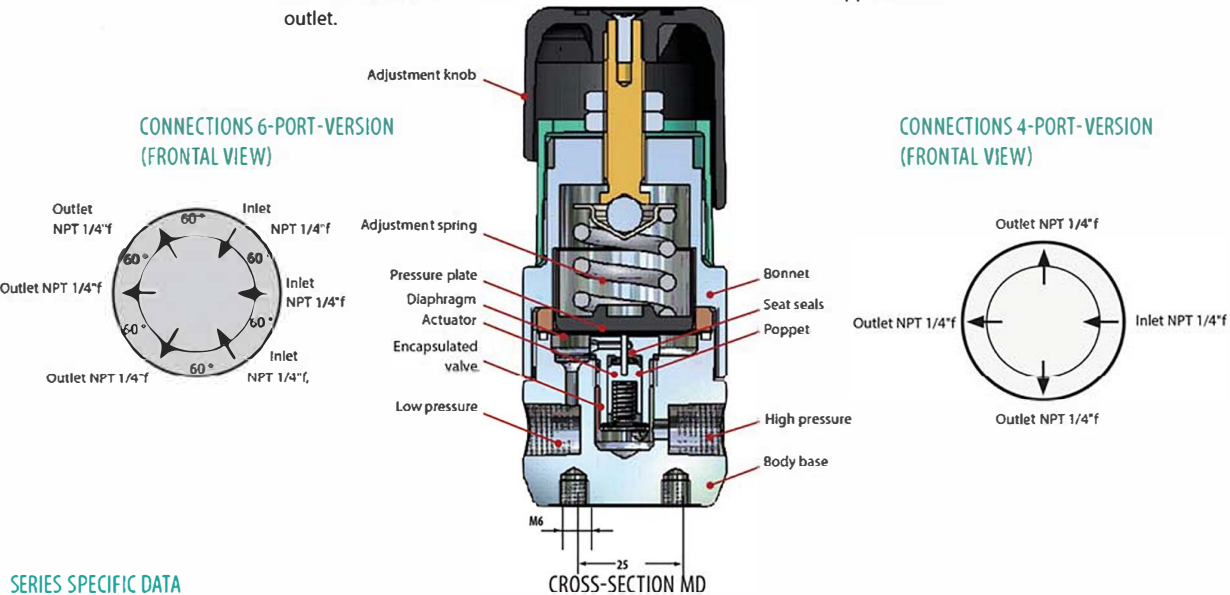
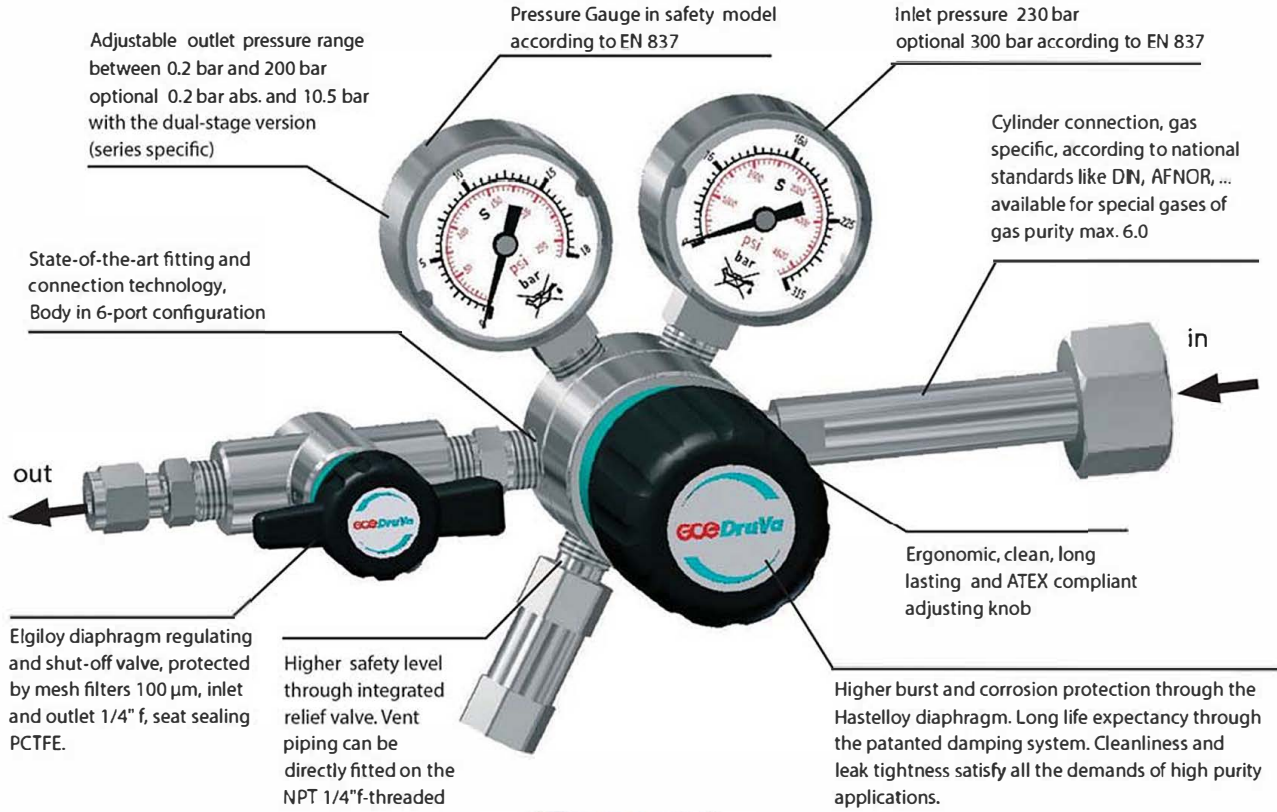
FMD 532-18

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

FMD 532-26/-27

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

HIGH PURITY REGULATORS SERIES 500



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 catalog, for different performance data please contact GCE Druva.

GUARANTEED LEAKAGE RATES

< 1×10⁻⁹ mbar l/s Helium (body).
< 1×10⁻⁶ mbar l/s Helium (seat).

WORKING TEMPERATURES

-25 °C to +70 °C / -13 °F to 158 °

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



Type -14



Type -16



Type -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 0.5 – 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

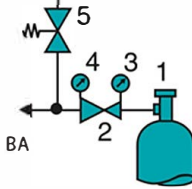
DESCRIPTION

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.

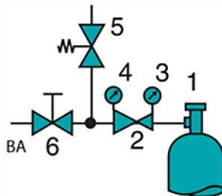
APPLICATION

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



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

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Seat seals:	PCTFE
Seal material:	PCTFE (SS), PVDF (brass)
Relief valve:	outlet NPT1/4"f, by downstream pressure >50bar RV*
Relief valve seat seal:	SS: FKM, (EPDM, FFKM)*, MS: EPDM, (FKM)*
Pressure gauge range:	-1 – 10 bar (-15 – 145 psi) 0 – 25 bar (0 – 365 psi) 0 – 40 bar (0 – 600 psi) 0 – 80 bar (0 – 1150 psi) 0 – 315 bar (0 – 4500 psi)
Basic design aspects:	see page 19
Weight:	approx. 1.5 kg (type -14), 1.8 kg (type -16/18)
Dimensions (wxhxd):	approx. 225x 140x 125mm
Cylinder connections:	according to gas type, see page 91-92
Outlet:	NPT 1/4"f, optional tube fitting

* on request

ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Contact gauge	Gas type
FMD 500-14	BC	F	6	DIN	CL6	Ki	GAS
FMD 500-14	BC = brass	F = 230 bar/3300 psi	6 = 0.5 – 6 bar/ 3 – 85 psi	DIN	N14F = NPT 1/4"f	0 = without	Please specify
FMD 500-16	chrome-plated		14 = 1 – 14 bar/15 – 200psi	ANSI	CL6	Ki = with	
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	BS 341	CL 1/4"		
			(200 bar not with FMD 500-18)	CGA	NO6		
				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

**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



Type -16

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.



Type -18

APPLICATION

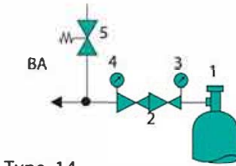
The cylinder pressure regulator series FMD 502 offers a wide range of uses and great performance. The FMD 502-16 allows shut-off/opening of the gas flow while maintaining the pressure regulator's adjustment. The FMD 502-18 allows for pressure setting as well as a finer apportioning of gas flow. The dual-stage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

TECHNICAL DATA

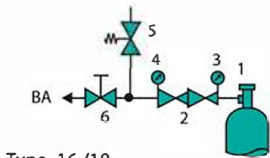
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass
	CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Seat seals 1st stage:	PCTFE
Seat seals 2nd stage:	PTFE
Seal material:	PCTFE (SS), PTFE (brass)
Relief valve seat seals:	Stainless steel: FKM, (EPDM, FFKM)*
	Brass: EPDM, (FKM)*
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 5 bar (-15 – 75 psi)
	-1 – 10 bar (-15 – 145 psi)
	-1 – 18 bar (-15 – 260 psi)
	0 – 315 bar (0 – 4500 psi)
Weight:	approx. 2.1 kg (type -14), 2.4 kg (type -16/18)
Dimensions (wxhxd):	approx. 225x140x210 mm
Cylinder connections:	in compliance with DIN 477
Cylinder connections:	according to gas type, see page 91-92
Outlet:	NPT 1/4" f, optional tube fitting

*on request

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

ORDER CODE

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

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

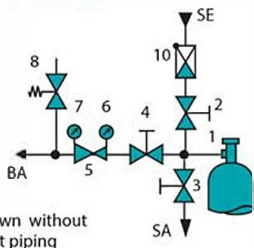
CYLINDER PRESSURE REGULATORS FMD 500-26/-27



Type -26

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

FLOW SCHEMATIC



shown without vent piping



Type -27

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

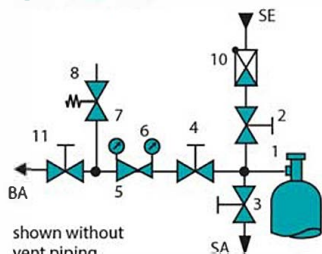
DESCRIPTION

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.

FLOW SCHEMATIC



shown without vent piping

TECHNICAL DATA

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished
Seals:	PCTFE
Relief valve seat seals:	FKM, (EPDM, FFKM) *
Pressure gauge range:	-1 – 10 bar / 0 – 25 bar / 0 – 40 bar / 0 – 80 bar / 0 – 315 bar
Weight:	approx. 2.9 kg (type -26), 3.3 kg (type -27)
Dimensions (wxhxd):	approx. 310x180x125 mm
Basic design aspects:	see page 19
Purge inlet:	check valve, compressed fitting
Purge outlet:	NPT 1/4" f, optional compressed fitting
Cylinder connections:	according to gas type, see page 91-92
Outlet:	NPT 1/4" f, optional compressed fitting

*on request

- 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

ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet *	Option contact gauge inlet	Option contact gauge outlet	Gas type
FMD 500-26	SS	F	6	DIN	CL6	Ki1	Ki2	GAS
FMD 500-26	SS = stainless steel	F = 230 bar	6 = 0.5 – 6 bar	DIN	N14F = NPT 1/4" f	0 = without	0 = without	Please specify
FMD 500-27			14 = 1 – 14 bar	ANSI	CL3	Ki1 = with	Ki1 = with	(no O ₂)
			28 = 2.5 – 28 bar	AFNOR	CL6(Standard)		Ki2 = with	
			50 = 2.5 – 50 bar	NBN	CL8		Ki5 = with	
			200 = 10 – 200 bar	BS 341	CL 1/8"			
				CGA	CL 1/4"			
				NEN, UNI				

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

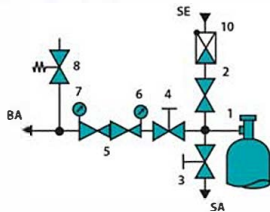
CYLINDER PRESSURE REGULATORS FMD 502-26/-27



Type -26

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.

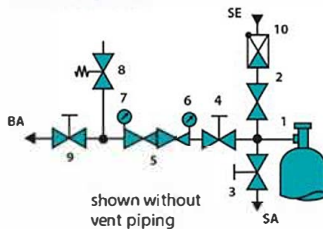


Type -27

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



TECHNICAL DATA

Body:	stainless steel 3 16L (1.4404) specially cleaned and electro-polished
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 19
Pressure gauge range:	-1 – 5 bar (-15 – 75 psi)
	-1 – 10 bar (-15 – 145 psi)
	0 – 315 bar (0 – 4500 psi)
Weight:	approx. 3.5 kg (type -26), 3.9 kg (type -27)
Dimensions (w×h×d):	approx. 310×180×230 mm
Purge inlet:	check valve, tube tting 6 mm
Purge outlet:	NPT 1/4" f, optional tube fitting
Cylinder connections:	according to gas type, see page 91-92
Outlet:	NPT 1/4" f, optional tube fitting

* on request

- 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-o valve (only type -27)
- 10 Check valve
- BA Process gas outlet
- SE Purge inlet
- SA Purge outlet

ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Option contact gauge inlet	Option contact gauge outlet	Gas type
FMD 502-26	SS	F	3	DIN	CL6	Ki1	Ki2	GAS
FMD 502-26	SS = stainless steel	F = 230 bar	3 = 0.2 – 3 bar	DIN	N14F = NPT 1/4" f	0 = without	0 = without	Please
FMD 502-27		/3300 psi	/ 3 – 45 psi	ANSI	CL3	Ki1 = with	Ki1 = with	specify
			6 = 0.5 – 6 bar	AFNOR	CL6 (standard)		Ki2 = with	(no O ₂)
			/ 3 – 85 psi	NBN	CL8		Ki5 = with	
				BS 341	CL 1/8"			
				CGA				
				NEN, UNI				

*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



Type -14



Type -16



Type -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

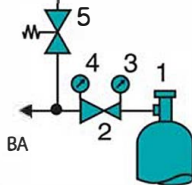
DESCRIPTION

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.

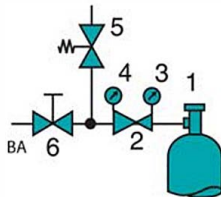
APPLICATION

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



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

Body:	Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass
	2.0401.26 specially cleaned, nickel-plated and chrome-plated
Seat seals:	Stainless steel: FFKM, (EPDM)*
Brass:	EPDM, (FKM)*
Seal material:	PCTFE (stainless steel), PVDF (brass)
Relief valve seat seals:	Stainless steel: FKM, (EPDM, FFKM)*
	Brass: EPDM, (FKM)*
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 1.5 bar (-15 – 40 psi)
	-1 – 5 bar (-15 – 75 psi)
	-1 – 18 bar (-15 – 260 psi)
Weight:	approx. 1.5 kg (type -14), 1.8 kg (type -16/18)
Dimensions (wxhxd):	approx. 139x126x175 (-14), 223 (-16 and -18) mm
Cylinder connections:	according to gas type, see page 91-92
Outlet:	NPT 1/4" f, optional tube fitting

* on request

ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Contact gauge	Gas type
FMD 510-14	BC	D	2	DIN	CL6	Ki	GAS
FMD 510-14	BC = brass	D = 12 bar	FMD 510:	DIN	N14F = NPT 1/4" f	0 = without	Please
FMD 510-16	chrome-plated	/175 psi	2a = 0.2 – 2 bar abs. /3 – 30 psi abs.	ANSI	CL6	Ki = with	specify
FMD 510-18	SS = stainless steel		3a = 0.2 – 3 bar abs. /3 – 45 psi abs.	AFNOR	CL8		
FMD 540-14			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.

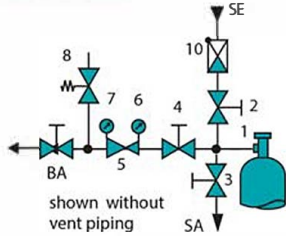
CYLINDER PRESSURE REGULATORS FMD 510/540-26-/27



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

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

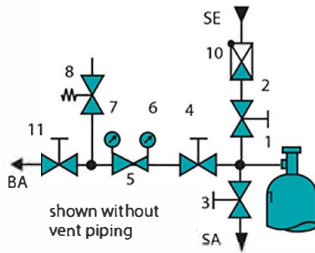
DESCRIPTION

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.

FLOW SCHEMATIC



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

TECHNICAL DATA

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished
Seat seals:	FFKM, (EPDM *)
Seals:	PCTFE
Relief valve seat seals:	FKM, (EPDM, FFKM) *
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 1,5 bar (-15 – 40 psi) -1 – 5 bar (-15 – 75 psi) / -1 – 18 bar (-15 – 260 psi)
Weight:	approx. 3.3kg (type-26), 3.7kg (type-27)
Dimensions (wxhxd):	approx. 310x180x230 mm
Purge inlet:	check valve, tube fitting 6 mm
Purge outlet:	NPT 1/4" f, optional tube fitting
Cylinder connections:	according to gas type, see page 91-92
Outlet:	NPT 1/4" f, optional tube fitting

* on request

ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Contact gauge	Vent piping	Gas type
FMD 510-26	SS	D	2	DIN	CL6	Ki	A	GAS
FMD 510-26	SS = stainless steel	D = 12 bar /175 psi	FMD 510: 2 a = 0.2 – 2 bar abs. /3 – 30 psi abs.	DIN	N14F = NPT 1/4" f 0 = without CL3, CL8	0 = without Ki = with	0 = without A = with (Only in conjunction with RV)	Please specify
FMD 510-27			3a = 0.2 – 3 bar abs. /3 – 45 psi abs.	ANSI AFNOR	CL 1/8"			
FMD 540-26				NBN	CL 6			
FMD 540-27				BS 341				
			FMD 540: 1 = 0.2 – 1 bar / 3 – 15 psi NEN 2 = 0.2 – 2 bar / 3 – 30 psi UNI	CGA				

*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



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



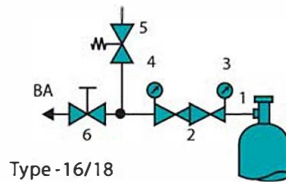
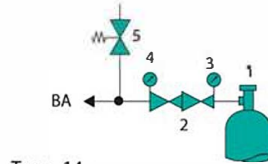
DESCRIPTION

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.

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.

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

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass
	CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Seat seals 1st stage:	PCTFE
Seat seals 2nd stage:	Stainless steel: FFKM, (EPDM)*, Brass: EPDM, (FKM)*
Body seals:	PCTFE (Stainless steel), PVDF (Brass)
Relief valve seat seals:	SS: FKM, (EPDM, FFKM)* Brass: EPDM, (FKM)*
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 1.5 bar (-15 – 40 psi) -1 – 5 bar (-15 – 75 psi) 0 – 315 bar (0 – 4500 psi)
Weight:	approx. 2.1 kg (type -14), 2.4kg (type -16/18)
Dimensions (wxhxd):	approx. 225x140x210 mm
Cylinder connections:	according to gas type, see page 91-92
Outlet:	NPT 1/4" f, optional tube fitting

* on request

ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Contact gauge	Gas type
FMD 522-14	BC	F	2	DIN	CL6	Ki	GAS
FMD 522-14	BC = brass	F = 230 bar/3300 psi	FMD 522	DIN	N14F = NPT 1/4" f	0 = without	Please specify
FMD 522-16	chrome-plated		2 a= 0.2 – 2 bar abs.	ANSI	CL6	Ki = with	
FMD 522-18	SS = stainless steel		/3 – 30 psi abs.	AFNOR	CL8		
FMD 562-14			3a = 0.2 – 3 bar abs.	NBN	CL 1/8"		
FMD 562-16			/3 – 45 psi abs.	BS 341	CL 1/4"		
FMD 562-18			FMD 562	CGA	NO6		
			1 = 0.2 – 1 bar /3 – 15 psi	NEN			
			2 = 0.2 – 2 bar /3– 30 psi	UNI			

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

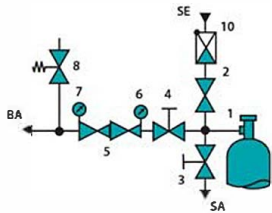
CYLINDER PRESSURE REGULATORS FMD 522/562-26/-27



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.

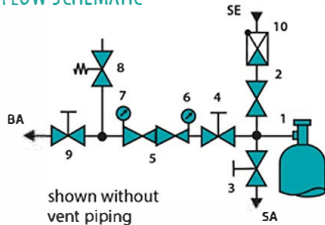
APPLICATION

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.



Type -27

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 shutoff valve (only type -27)
- BA Process gas outlet
SE Purge inlet
SA Purge outlet

TECHNICAL DATA

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished
Seat seals 1st stage:	PCTFE
Seat seals 2nd stage:	FFKM, (EPDM *)
Body seals:	PCTFE
Relief valve seat seals:	FKM, (EPDM, FFKM *)
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 1.5 bar (-15 – 40 psi) -1 – 5 bar (-15 – 75 psi) 0 – 315 bar (0 – 4500 psi)
Weight:	approx. 3.5 (type -26) / 3.9 kg (type -27)
Dimensions (wxhxd):	approx. 310x180x230 mm
Purge inlet:	check valve, tube fitting 6 mm
Purge outlet:	NPT 1/4" f, optional tube connection
Outlet:	NPT 1/4" f, optional tube fitting
Cylinder connections:	according to gas type, see page 91-92

*on request

ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet	Option contact gauge inlet	Option contact gauge outlet	Gas type
FMD 522-27	SS	F	2	DIN	CL6	Ki1	Ki2	GA8
FMD 522-26	SS = stainless steel	F = 230 bar	FMD 522	DIN	N14F = NPT 1/4" f	0 = without	0 = without	Please specify
FMD 522-27		/3300 psi	2a = 0.2 – 2 bar abs.	ANSI	CL3**	Ki1 = with	Ki1 = with	(no O ₂)
FMD 562-26			/1 – 30 psi abs.	AFNOR	CL6 (standard)		Ki2 = with	
FMD 562-27			3a = 0.2 – 3 bar abs.	NBN	CL8		Ki5 = with	
			/1 – 45 psi abs.	B5 341	CL 1/8"			
			FMD 562	CGA				
			1 = 0.2 – 1 bar / 1 – 15 psi	NEN				
			2 = 0.2 – 2 bar / 1 – 30 psi	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



Type -14

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



Type -16

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.

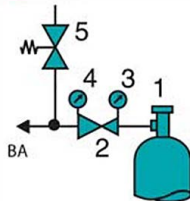
Type-14 is the basic model for independent gas supply with 300 bar cylinder.

The 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.

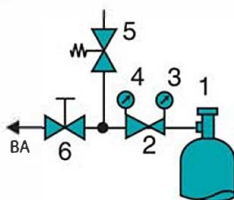


Type -18

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

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or Brass
	2.0401.26 specially cleaned, nickel-plated and chrome-plated
Seat seals:	PCTFE
Body seals:	PCTFE (Stainless steel), PVDF (Brass)
Relief valve:	Outlet NPT1/4" f, for downstream pressure >50bar AV*
Relief valve seat seals:	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*,
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 10bar (-15 – 145 psi)
	0 – 25 bar (0 – 365 psi)
	0 – 40 bar (0 – 600 psi)
	0 – 80 bar (0 – 1150 psi)
	0 – 315 bar (0 – 4500 psi)
	0 – 400 bar (0 – 5800 psi)
Weight:	approx. 1.5 kg (type -14), 1.8 kg (type -16/18)
Dimensions (wxhxd):	approx. 225x140x125 mm
Outlet:	NPT 1/4" f. optional tube fitting
Cylinder connections:	according to gas type, see page 91-92

*on request

ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Contact gauge	Gas type
FMD 530-14	BC	G	14	DIN	CL6 BC	Ki	GAS
FMD 530-14	BC = brass	G = 300bar	6 = 0.5 – 6 bar / 7 – 85 psi	DIN	N14 = NPT 1/4" f	0 = without	Please
FMD 530-16	chrome-plated	/4350 psi	14 = 1 – 14 bar/15 – 150 psi	ANSI	CL3	Ki = with	specify
FMD 530-18	SS = stainless steel		28 = 2.5 – 28 bar / 35 – 400 psi	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	NO6		
				NEN			
				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



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

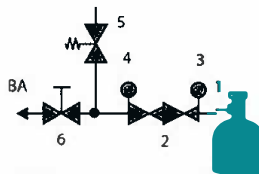
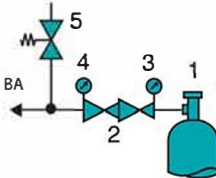
The cylinder pressure regulator series FMD 532 has a broad range of uses and excellent performance. The FMD 532-14 is the basic model for location-independent gas supply with 300 bar cylinder. The FMD 532-16 allows shut-off/opening of the gas flow while maintaining the pressure regulator's adjustment.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

TECHNICAL DATA

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass
	2.0401.26 specially cleaned, nickel-plated and chrome-plated
Dimensions (wxhxd):	approx. 175x139x206 mm
Seat seals:	PCTFE
Body seals:	PCTFE (Stainless steel), PVDF (Brass)
Relief valve seat seals:	SS: FKM, (EPDM, FFKM)*, Brass: EPDM, (FKM)*,
Basic design aspects:	see page 19
Pressure gauge range:	0 – 400 bar (0 – 5800 psi)
	-1 – 5bar (-15 – 73 psi)
	-1 – 10 bar (-15 – 145 psi)
	-1 – 18 bar (-15 – 260 psi)
Weight:	approx. 2.1 kg (type-14), 2.4kg (type-16/18)
Dimensions (wxhxd):	approx. 139x206 mm, 175 mm (-14), 223 mm (-16 and -18)
Cylinder connections:	according to gas type, see page 91-92
Outlet:	NPT 1/4" f, optional tube fitting

*on request

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

ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Contact gauge	Gas type
FMD 532-14	BC	G	10	DIN	CL6	Ki	GAS
FMD 532-14	BC = brass	G = 300 bar	3 = 0.2 – 3 bar / 3 – 45 psi	DIN	N14 = NPT 1/4" f	0 = without	Please
FMD 532-16	chrome-plated	/4350 psi	6 = 0.5 – 6 bar / 7 – 85 psi	ANSI	CL6 (standard)	Ki = with	specify
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

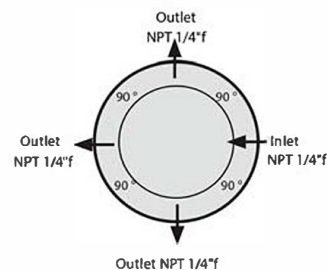
The LMD 500/530 reduces line pressure to give a lower supply pressure. Through its compact design this regulator is especially well suited for use in analytical or chemical apparatuses or processes.

TECHNICAL DATA

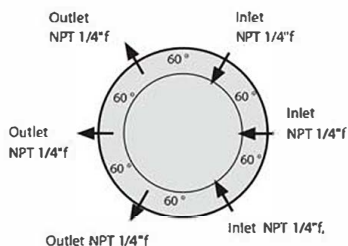
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Seat seals:	PCTFE
Body seals:	PCTFE (SS), PVDF (Brass)
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 5 bar (-15 – 73 psi) / -1 – 10 bar (-15 – 145 psi), 0 – 25 bar (0 – 365 psi) / 0 – 40 bar (0 – 600 psi), 0 – 80 bar (0 – 1150 psi) / 0 – 315 bar (0 – 4500 psi) 0 – 400 bar (0 – 5800 psi)
Weight:	approx. 1.1 kg (type -01), 1.2 kg (type -03)
Dimensions (w×h×d):	approx. 55/115×120×130
Inlet/Outlet:	NPT 1/4" f, optional tube fitting
*on request	

CONNECTIONS (FRONT VIEW)

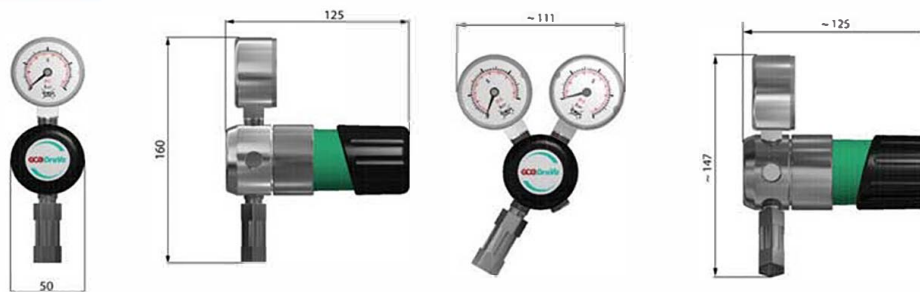
Type -01



Type-03



DIMENSIONS



ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet*	Relief valve	Contact gauge	Gas type
LMD 500-01 BC		E	3	CL6 BC	CL6 BC	AV	Ki	GAS
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	6 = 0.5 – 6 bar/7 – 85 psi	CL6		AV = with	Ki = with	
LMD 530-01	SS = stainless steel	/ 720 psi	14 = 1 – 14 bar/15 – 200 psi	CL8				
LMD 530-03		F = 230 bar / 3300 psi	50 = 2.5 – 50 bar/35 – 720 psi	CL10				
		LMD 530:	LMD 530:	CL12				
		G = 300 bar/ 4350 psi	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



LMD 502-03



LMD 502-03 AV

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

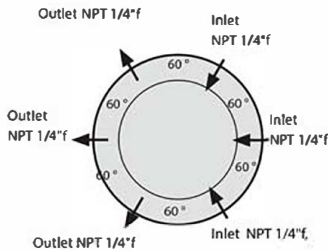
DESCRIPTION

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)

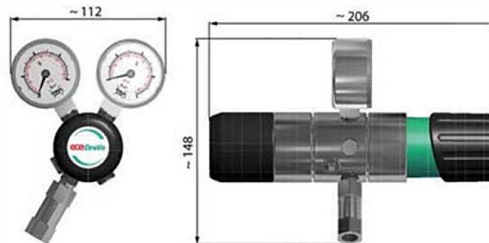


TECHNICAL DATA

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated cleaned
Diaphragm:	Hastelloy
Seat seals 1st stage:	PCTFE
Seat seals 2nd stage:	PTFE
Body seals:	PCTFE (Stainless steel), PTFE (Brass)
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 5 bar (-15 – 75 psi) -1 – 10 bar (-15 – 145 psi) -1 – 18 bar (-15 – 260 psi) 0 – 315 bar (0 – 4500 psi)
Weight:	approx. 1.8kg (type-03)
Dimensions (w×h×d):	approx. 112×148×206 mm
Inlet-/Outlet:	NPT 1/4" f, optional tube fitting

* on request

DIMENSIONS



ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Contact gauge	Relief valve	Gas type
LMD 502-03	BC	F	3	CL6 BC	CL6 BC	Ki	AV	GAS
LMD 502-03	BC = brass chrome-plated SS = stainless steel	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 / 7 – 85 psi 10 = 1 – 10.5 bar / 15 – 150 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	0 = without Ki = with	0 = without AV = with	Please specify

*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



LMD 510-01

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.



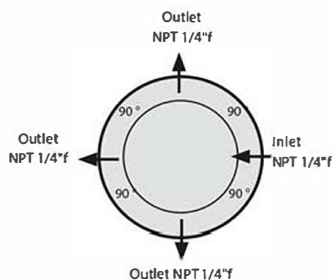
LMD 510-03

APPLICATION

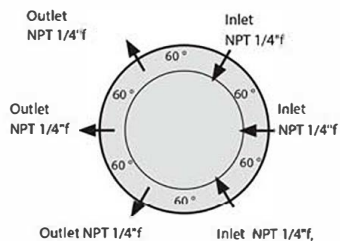
The pressure regulator series LMD 510 reduces low upstream pressure to a very low downstream pressure down to 0.2 bar absolut and is suitable for subatmospheric-pressure regulation.

CONNECTIONS (FRONT VIEW)

Type -01



Type -03

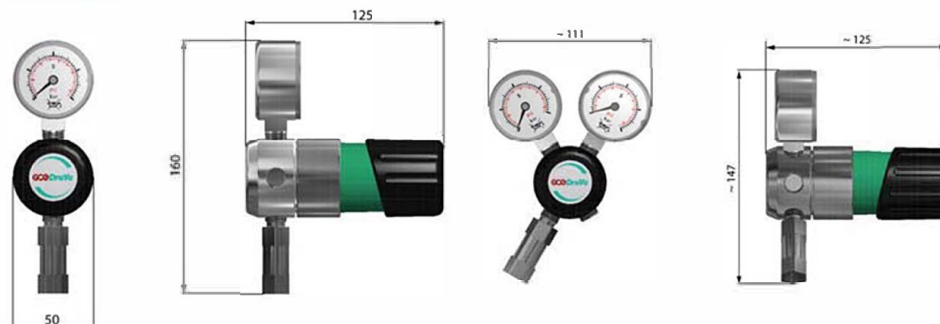


TECHNICAL DATA

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Seat seals:	SS: FFKM, (EPDM)*, Brass EPDM, (FKM)*
Body seals:	PCTFE (SS), PVDF (Brass)
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 1.5 bar (-15 – 40 psi) -1 – 5 bar (-15 – 75 psi) -1 – 18 bar (-15 – 260 psi)
Weight:	approx. 1.1 kg (type -01), 1.2kg (type -03)
Dimensions (wxhxd):	approx. 55/115x140x120x130 mm
Inlet/Outlet:	NPT 1/4" f, optional tube fitting

*on request

DIMENSIONS



ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet*	Relief valve	Contact gauge	Gas type
LMD 510-03	BC	D	2	CL6 BC	CL6 BC	AV	Ki	GAS
LMD 510-01	BC = brass	D = 12 bar /175 psi	2 = 0.2 – 2 bar abs./ 3 – 30 psi abs.	N14 = NPT 1/4" f	N14 = NPT 1/4" f	0 = without AV = with	0 = without Ki = with	Please specify
LMD 510-03	chrome-plated SS = stainless steel		3 = 0.2 – 3 bar abs./ 3 – 45 psi abs.	CL6 CL8 CL10 CL12 BC = brass chrome-plated SS = stainless steel	CL6 CL8 CL10 CL12 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 522-03



LMD 522-03

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

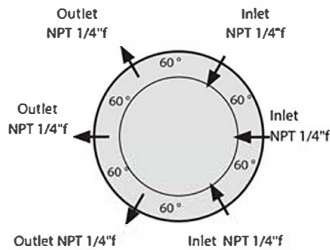
The pressure regulator series LMD 522 reduces inlet pressure to diverse very low outlet pressures down to 0.2 bar. The dual-stage design ensures that the inlet pressure remains independent of the outlet pressure. Subatmospheric-pressure regulation possible.

TECHNICAL DATA

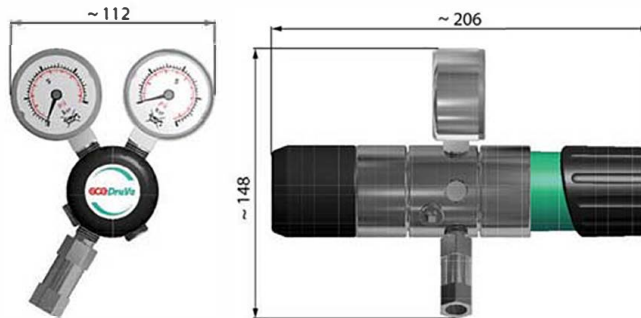
Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Seat seals 1st stage:	PCTFE
Seat seals 2nd stage:	Stainless steel: FFKM, (EPDM)*, Brass: EPDM, (FKM)*
Body seals:	PCTFE (SS), PVDF (Brass)
Basic design aspects:	see page 19
Pressure gauge range:	-1 – 1.5 bar (-15 – 40 psi) -1 – 5 bar (-15 – 75 psi) 0 – 315 bar (0 – 4500 psi)
Option:	0 – 600 mbar (8.7 psi) with Ø 63 mm
Weight:	approx. 1.8 kg (Type -03)
Dimensions (w×h×d):	approx. 112×148×206 mm
Inlet-/Outlet:	NPT 1/4" f, optional tube fitting

*on request

CONNECTIONS (FRONT VIEW)



DIMENSIONS

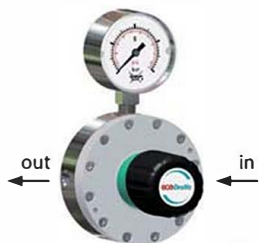


ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet*	Contact gauge	Relief valve	Gas type
LMD 522-03	BC	F	2	CL6 BC	CL6 BC	Ki	AV	GAS
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.	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 Ki = with	0 = without AV = 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



Type -01

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

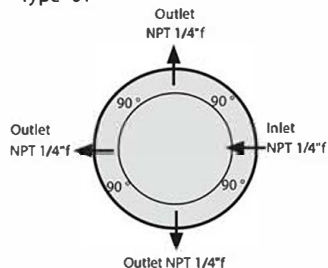
The LMD 545 reduces the line pressure by very small increments to a very low supply pressure.



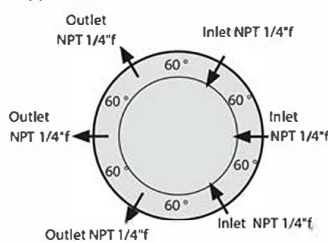
Type -03

CONNECTIONS (FRONT VIEW)

Type -01



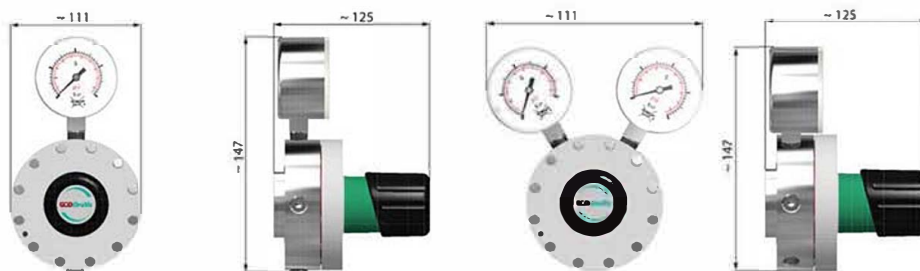
Type -03



TECHNICAL DATA

Body:	stainless steel 316L (1.4404) specially cleaned and electro-polished or Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Upstream pressure:	12 / 40 bar
Configuration:	4-Port-Version (Type -01) or 6 Port-Version (Type -03)
Downstream pressure:	12 bar Version: 20 – 250 mbar/ 100 – 1300 mbar 0.3 – 3,6 psi/ 1,45 – 19 psi 40 bar Version: 150 – 500 mbar / 150 – 3000 mbar 2,2 – 7,25 psi/ 2,2 – 44 psi
Basic design aspects:	see page 19
Seat seals:	EPDM, FKM (Brass)
Body seals:	PCTFE, PVDF (Brass)
Pressure gauge range:	600 mbar / 1.5 bar / 5 bar
Weight:	approx. 2.4 (Type -01) / 2.5 kg (Type -03)
Dimensions (w×h×d):	approx. 150×230×150 mm
Inlet-/Outlet:	NPT 1/4" f, optional tube fitting
	*on request

DIMENSIONS

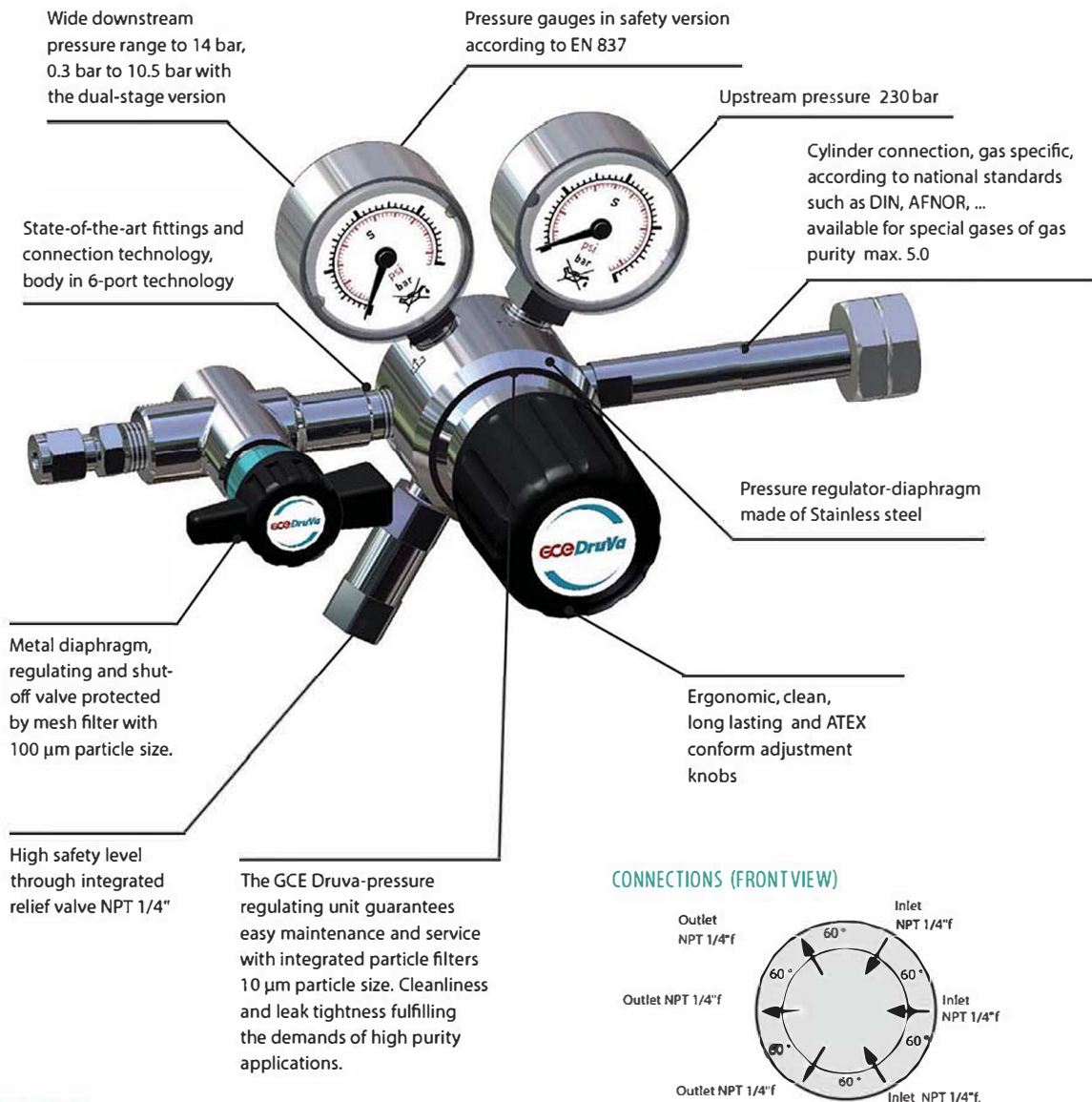


ORDER CODE

Type	Material	Inlet pressure D	Outlet pressure 250	Inlet** CL6 BC	Outlet** CL6 BC	Gas type GAS
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.

PRESSURE REGULATORS SERIES 320



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 on pages 3 and 4, for differing pressure ranges please contact GCE GmbH.

GUARANTEED LEAKAGE RATES

< 1×10⁻⁹ mbar l/s Helium (outboard).
< 1×10⁻⁶ 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

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



Type -16

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.



Type -18

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.

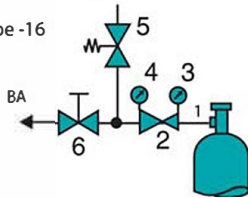
TECHNICAL DATA

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 ⁻⁹ mbar l/s Helium (outboard) < 1×10 ⁻⁶ 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 – 25 bar (0 – 365 psi), 0 – 80 bar (0 – 1150 psi), 0 – 315 bar (0 – 4500 psi)
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)
Basic design aspects:	see page 45
Cylinder connection:	according to gas type
Outlet:	NPT 1/4" f, optional tube fitting

*on request

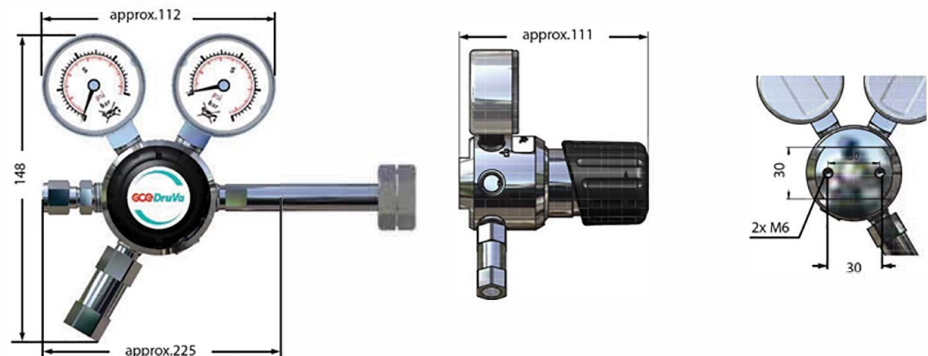
FLOW SCHEMATIC

Type -16



- 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

DIMENSIONS



ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Gas type
FMD 320-14	BC	F	6	DIN	CL6	GAS
FMD 320-14	BC = brass	F = 230 bar	6 = 0.5 – 6 bar / 15 – 200 psi	DIN	0=NPT 1/4" f	Please specify
FMD 320-16	chrome-plated	/3300 psi	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	

*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



Type -14



Type -16



Type -18

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 0.5 – 10.5 bar / 7 – 150 psi

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 DIN EN 837

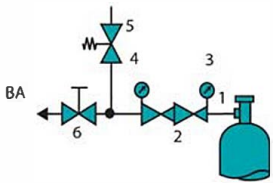
DESCRIPTION

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.

FLOW SCHEMATIC



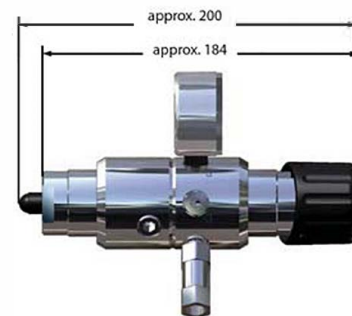
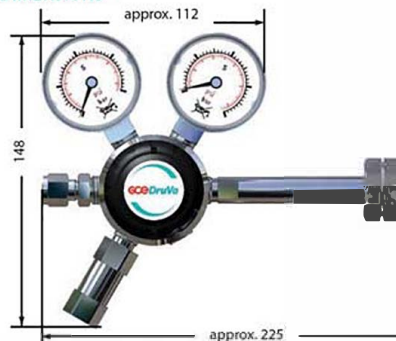
- 1 Cylinder connection
 - 2 Dual-stage pressure regulator
 - 3 Upstream pressure gauge
 - 4 Downstream pressure gauge
 - 5 Relief valve
 - 6 Downstream shut-off valve (only type -16) / downstream regulating valve (only type -18)
- BA Process gas outlet

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 ⁻⁹ mbar l/s Helium (outboard) < 1×10 ⁻⁶ 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 45
Cylinder connection:	according to gas type

*on request

DIMENSIONS



ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet*	Gas type
FMD 322-14	BC	F	6	DIN	CL6	GAS
FMD 322-14	BC = brass	F = 230 bar	3 = 0.2 – 3 bar / 3 – 25 psi	DIN	N14=NPT 1/4" f	Please
FMD 322-16	chrome-plated	/3300 psi	6 = 0.5 – 6 bar / 7 – 85 psi	ANSI/ AFNOR/	CL6/ CL8	specify
FMD 322-18	SS = stainless steel		10 = 1 – 10.5 bar / 15 – 150 psi	NBN/BS 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,

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.

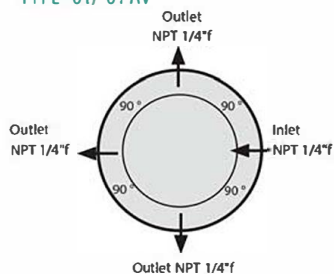
APPLICATION

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.

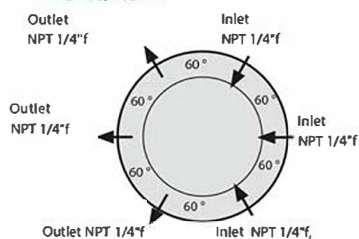
TECHNICAL DATA

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:	55: 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)
Dimensions (wxhxd):	approx. 115x140x120 to 140 mm
Inlet/Outlet:	NPT 1/4" f, optional tube fitting
	*on request

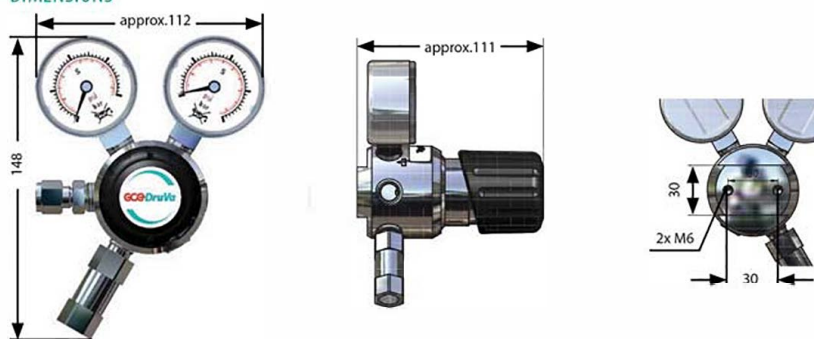
CONNECTIONS (FRONT VIEW) TYPE -01/-01 AV



TYPE -03/-03 AV



DIMENSIONS



ORDER CODE

Type	Material	Inlet pressure	Outlet pressure	Inlet*	Outlet	Relief Valve	Contact gauge	Gas type
LMD 320-01	BC	E	3	CL6 BC	CL6 BC	AV	Ki	GAS
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 A = with	0 = without Ki = with	Please specify
LMD 320-01 AV	chrome-plated	F = 230 bar/ 3300 psi	6 = 0.5 – 6 bar/7 – 85 psi	CL6				
LMD 320-03	55 = stainless steel		14 = 1 – 14 bar/15 – 200 psi	CL8 CL10 CL12			(only for Type-03)	
LMD 320-03 AV				BC = brass chrome-plated 55 = stainless steel				

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

GCE Group is one of the world's leading companies in the field of gas control equipment. The headquarters are in Malmö, Sweden, and the two major supply units are located in Europe and Asia. The company operates 18 subsidiaries around the world and employs more than 900 people. GCE Group includes four business areas – Cutting&Welding technologies, Valves, Healthcare and Druva. Today's product portfolio corresponds to a large variety of applications, from single pressure regulators and blowpipes for cutting and welding to sophisticated gas supply systems for medical and electronics industry applications.



شرکت مهندسی بازرگانی رایtek پویا

تهران ، بزرگراه جلال آل احمد، روبروی دانشگاه تربیت مدرس
خیابان پرنده، نبش کوچه اول ، ساختمان پروانه ، شماره ۷ ، واحد ۸
تلفن: ۰۲۱۸۸۳۵۲۰۲۵
فاکس: ۰۲۱۸۸۶۳۱۹۵۰
وب سایت: www.raitec.ir
ایمیل: info@raitec.ir



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www.gcegroup.com