Gas Equipment

druva

CENTRAL GAS SySTEMS

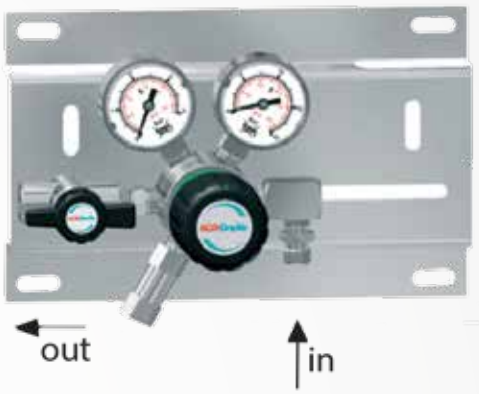
AdvanceLab

Content

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? Which outlet pressure range is required? Which flow rate is required? Do you have a 200 or a 300 bar gas supply level? Which type of inlet connection (cylinder connection) do you need, DIN BS norm? Which kind of outlet connections do you need: tube fittings, hose nozzles etc.?



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 lowpressure 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 lowpressure 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.

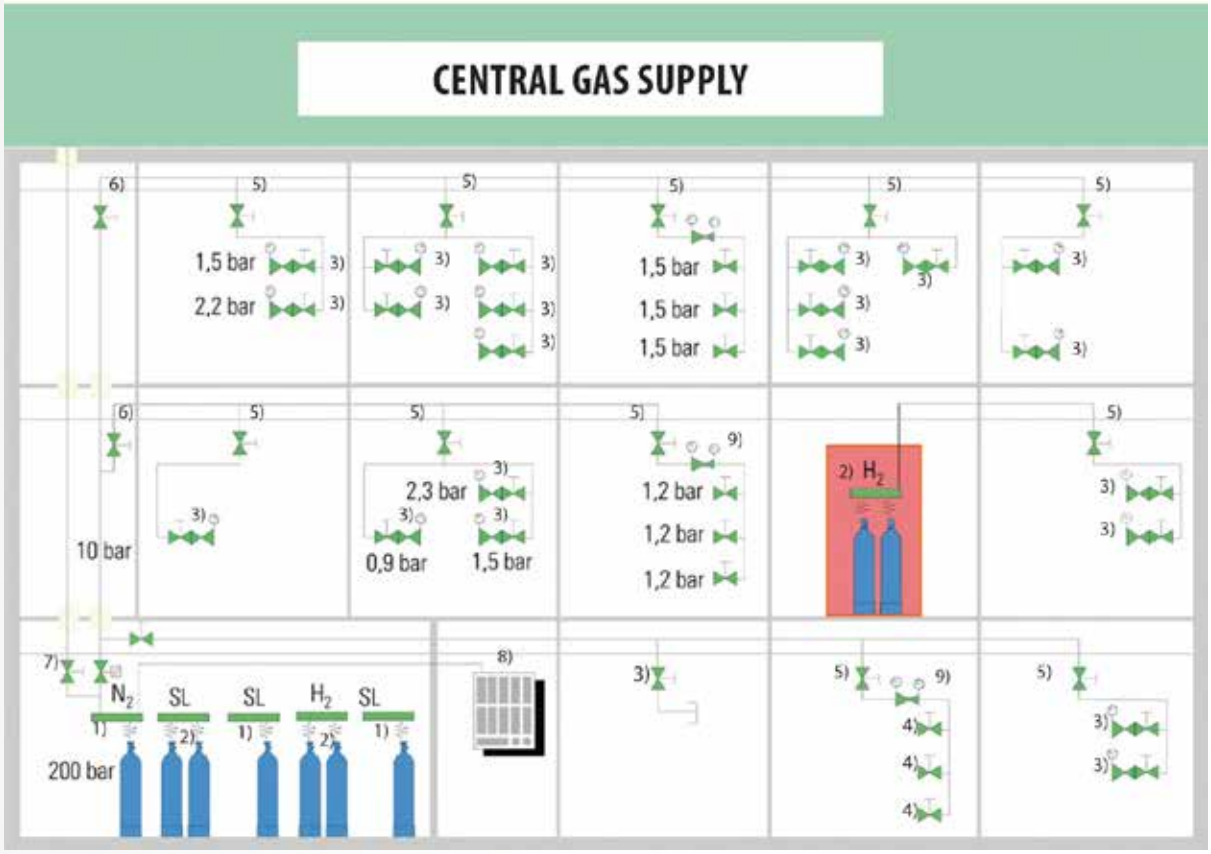
With the two stage regulator the point of use pressure stays practically constant, irrespectively of the cylinder pressure which sinks progressively as the cylinder empties.

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

Gas Purity Values

Gas Type	Purity [degress]	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

Gas Type	Purity [degress]	Purity	Max. Contamination (ppm)
High purity gas	5.0	99.999 %	10
	5.5	99.9995 %	5
	6.0	99.9999 %	1.0
Ultra pure gas	7.0	99.99999 %	0.1

Order Code For Your Pressure Regulators

Series	500	3100	320	100
Purity	<6.0	<6.0	<5.0	for techn. Gases & Laser gases
Application	Standard	Laboratory	diverse	diverse

FMD	50	0	-16	B	F	200	DIN	CL6	BC	O	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 regulators
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_2H_2)
-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

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	4500

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

CYLINDER CONNECTION

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

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

MATERIAL OF OUTLET FITTING

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

OPTIONAL

O = without
KI = contact gauge

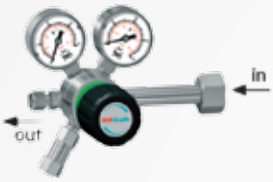
GAS TYPE

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	G = 300bar	3 = 0.2-3bar	DIN	CL6 (standard)	0 = without	0 = without	Please specify
	-16	chrome-plated		6 = 0.5-6bar	ANSI	CL 1/8"	Ki = with	A= with	
	-18	SS = Stainless		10 = 1-10.5bar	AFNOR	CL 1/4"		(Only in	
		steel			NBN	BC=brass-		conjunction	
						chrome pl.		with RV)	
						SS=stainless			
						steel			

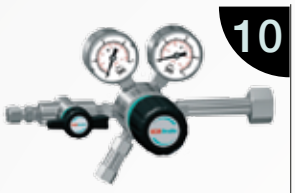
Regulators & Panel Overview

Cylinder Pressure Regulators



Single-stage - 200 Bar

FMD 500-14
Brass chrome
Inlet pressure:
230 bar / 3300psi
Outlet pressure:
6, 14, 28, 50, 200 bar
85, 200, 400, 720, 2900 psi



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Single-stage - 200 Bar

FMD 500-16
Brass chrome
Inlet pressure:
230 bar / 3300 psi
Outlet pressure:
6, 14, 28, 50, 200 bar
85, 200, 400, 720, 2900 psi

Dual-stage - 200 Bar

FMD 502-14
Brass chrome
Inlet pressure:
230 bar / 3300 psi
Outlet pressure:
3, 6, 10.5 bar
45, 85, 150 psi

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Dual-stage - 200 Bar

FMD 502-16
Brass chrome
Inlet pressure:
230 bar / 3300 psi
Outlet pressure:
3, 6, 10.5 bar
45, 85, 150 psi

Gas Supply Panels Series

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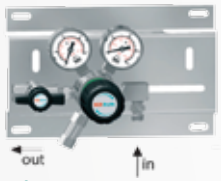
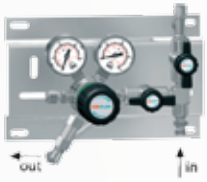


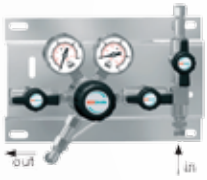
Single-stage

SMD 500-16
Brass chrome
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
14, 28, 50, 200 bar /
200, 400, 720, 2900 psi



Single-stage

SMD 500-24
Brass chrome
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
14, 28, 50, 200 bar /
200, 400, 720, 2900 psi



Single-stage

SMD 500-25
Brass chrome
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
14, 28, 50, 200 bar /
200, 400, 720, 2900 psi

Dual-stage

SMD 502-16
Brass chrome
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
3, 6, 10.5 bar /
45, 85, 150 psi

Dual-stage

SMD 502-24
Brass chrome
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
3, 6, 10.5 bar /
45, 85, 150 psi

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Dual-stage

SMD 502-25
Brass chrome
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
3, 6, 10.5 bar /
45, 85, 150 psi

Acetylene Panels

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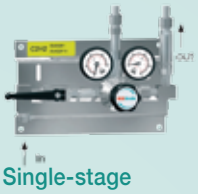
Single-stage, manual change over system

BMD 200-29
Brass chrome
For Acetylene
Outlet pressure:
1.5 bar / 22 psi



Single-stage

SMD 200-29
Brass chrome
For Acetylene
Outlet pressure:
1.5 bar / 22 psi

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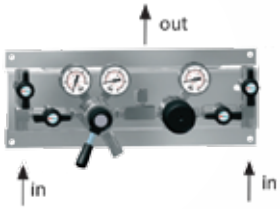
Single-stage, manual change over system

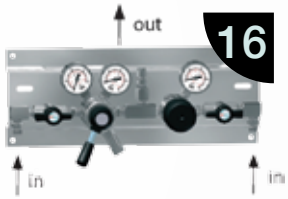
BMD 500-30
Brass chrome
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
14, 28, 50, 200 bar /
200, 400, 720, 2900 psi

16



Single-stage, semi-automatic change over system

BMD 500-35
Brass chrome
With process gas purging
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
14, 50 bar /
200, 720 psi



Single-stage, semi-automatic change over system

BMD 500-39
Brass chrome
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
14, 50 bar /
200, 720 psi

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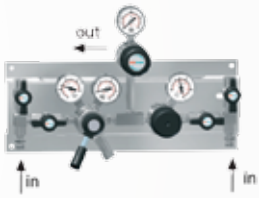
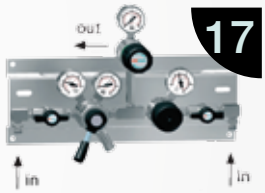


Dual-stage, semi-automatic change over system

BMD 502-35
Brass chrome
With process gas purging
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
3, 6, 10 bar /
45, 85, 145 psi



Dual-stage, semi-automatic change over system

BMD 502-39
Brass chrome
Without purging
Inlet pressure:
230 / 300 bar
3300 / 4350 psi
Outlet pressure:
3, 6, 10 bar /
45, 85, 145 psi

Line Pressure Regulators

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Single-stage (Line Regulator)

LMD 500-01
Brass chrome
Inlet pressure:
230 bar / 3300psi
Outlet pressure:
0.2-3 / 0.5-6 / 1-14 /2.5-50 bar
3-15 / 3-45 / 7.5-85 / 14-150 psi

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Dual-stage (Line Regulator)

LMD 502-03
Brass chrome
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

Point-Of-Use-Regulators

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Single-stage

EMD 400
Brass chrome
Inlet pressure:
40 bar
600 psi
Outlet pressure:
0.1-10.5 bar
1-150 psi

EMD400-01

EMD400-06
wall mounted

EMD400-42
plate assembly

EMD400-41
bench version

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Single-stage

EMD 500-06
Brass chrome
Inlet pressure:
40 bar
600 psi
Outlet pressure:
0.2-1 / 0.2-6 / 0.5-10.5 bar
200, 400, 720, 2900 psi

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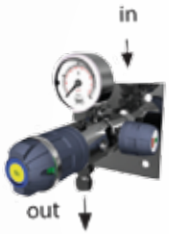
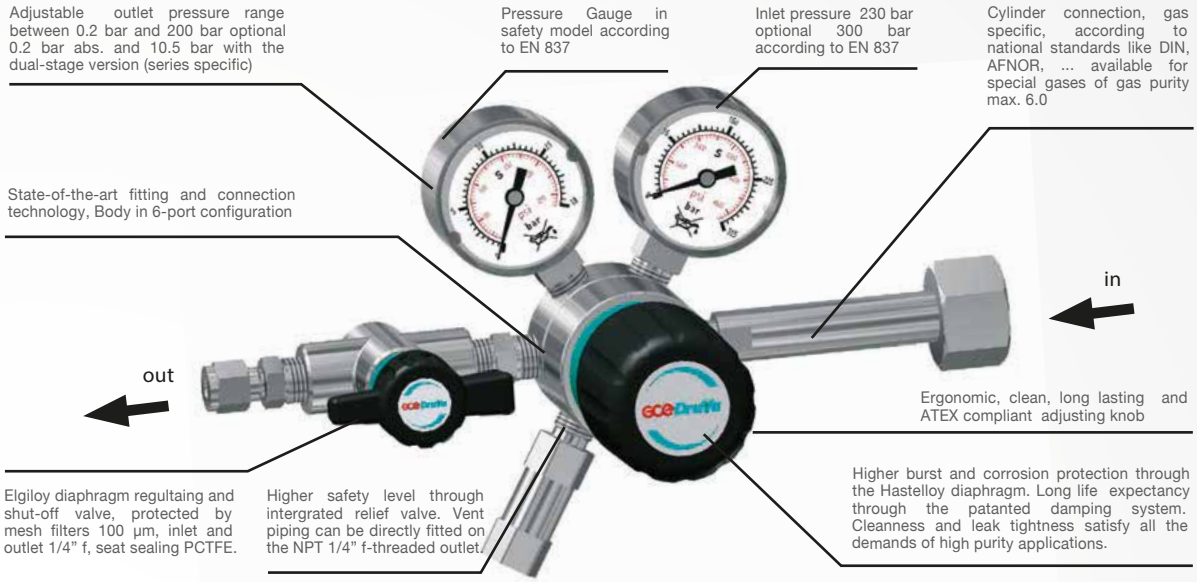
Single-stage

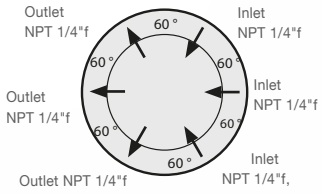
EMD 3100
Brass chrome
Inlet pressure:
40 bar / 600 psi
Outlet pressure:
0.2-1.5 / 0.2-4 / 0.5-6 / 0.5-10.5 bar
3-22 / 3-60 / 7-87 / 7-150 psi
Analysis Version:
Inlet Pressure: 10 bar / 145 psi
Outlet pressure: 2.2/44.4 bar - 33/66 psi

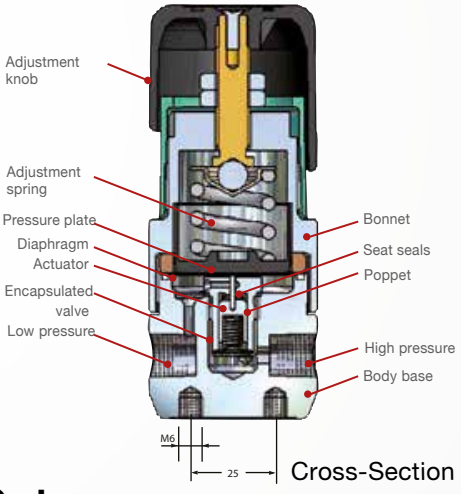


High Purity Regulators Series 500



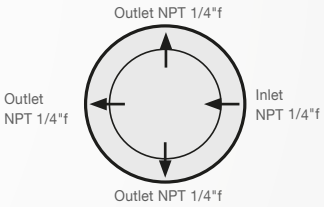
Connections 6-Port-Version (Frontal View)





Cross-Section MD

Connections 4-Port-Version (Frontal View)



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 Advancelab.

Guaranteed Leakage Rates

$< 1 \times 10^{-9}$ mbar l/s Helium (body).
$< 1 \times 10^{-6}$ mbar l/s Helium (seat).

Working Temperatures

-25 °C to +70 °C / -13 °F to 158 °F

Purity

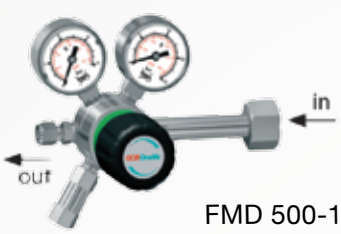
≤ 6.0

Cylinder / Inlet Connections

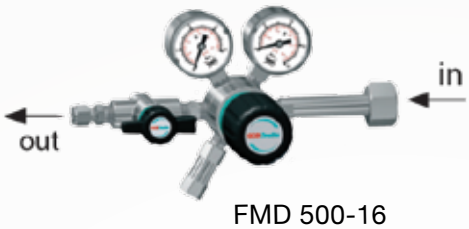
Compliant with national standards: DIN 477 and other connections as US-Norm CGA, British Standard BS etc. are available upon request.

Cylinder Pressure Regulators

FMD 500-14/-16



FMD 500-14



FMD 500-16

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)
- Diaphragm pressure regulator
- ATEX compliant adjustment knobs

Description

These pressure regulators consists of a cylinder connection, pressure regulator body, upstream and downstream pressure gauges.

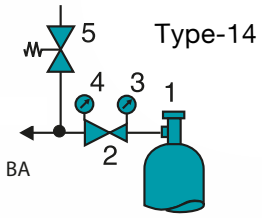
Application

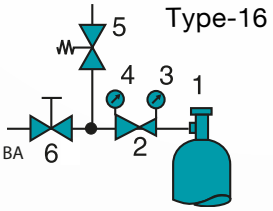
The cylinder pressure regulator series FMD 500 offers a wide range of uses and great performance.

The FMD 500-14 is the basic model.

Technical Data

Body :	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)
Weight :	Approx. 1.5 kg (type -14), 1.8 kg (type -16)
Dimentions (W x H x D) :	Approx. 225×140×125mm
Outlet :	NPT 1/4"f, optional tube fitting





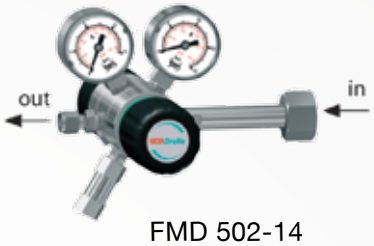
1 Cylinder connection
2 Pressure regulator
3 Upstream pressure gauge
4 Downstream pressure gauge
5 Relief valve
6 Downstream shut-off valve (Type -16)
BA Process gas outlet

Order Code

Type	Material	Upstream pressure	Downstream pressure	Inlet	Outlet	Contact gauge	Gas type
FMD 500-14	**BC**	**F**	**6**	**DIN**	**CL6**	**Ki**	**GAS**
FMD 500-14	BC = brass	F = 230bar/3300psi	6 = 0.5-6bar/3-85psi	DIN	N14F = NPT 1/4"f	0 = without	Please specify
FMD 500-16	chrome-plated		14 = 1-14bar/15-200psi	ANSI	CL6	Ki = with	
			28 = 2.5-28bar/35-365psi	AFNOR	CL8		
			50 = 2.5-50bar/35-720psi	NBN	CL 1/8”		
			200 = 10-200bar/145-2900psi	BS 341	CL 1/4”		
				CGA	NO6		
				NEN, UNI			

Cylinder Pressure Regulators

FMD 502-14/-16



FMD 502-14

FMD 502-16

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)
- 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) and outlet tube fittings. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves.

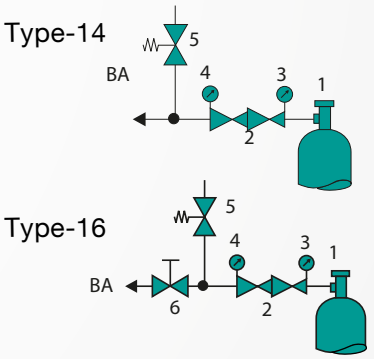
Application

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.

Technical Data

Body :	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)*
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)
Dimentions (W x H x D) :	Approx. 225×140×210 mm
Cylinder connections:	In compliance with DIN 477
Outlet :	NPT 1/4"f, optional tube fi tting



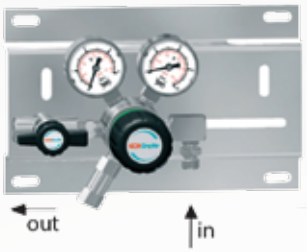
1 Cylinder connection
2 Pressure regulator
3 Upstream pressure gauge
4 Downstream pressure gauge
5 Relief valve
6 Downstream shut-off valve (type -16)
BA Process gas outlet

Order Code

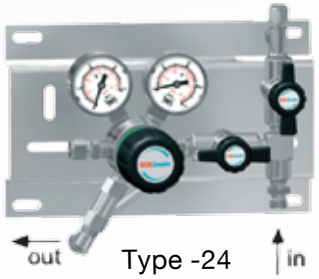
Type	Material	Upstream pressure	Downstream pressure	Inlet	Outlet	Contact gauge	Gas type
FMD 502-14	**BC**	**F**	**3**	**DIN**	**CL6**	**Ki**	**GAS**
FMD 502-14	BC = brass	F = 230bar/3300psi	1 = 0.2-1 bar/3-15 psi	DIN	N14F= NPT 1/4"f	0 = without	Please specify
FMD 502-16	chrome-plated		3 = 0.2-3 bar/3-45 psi	ANSI	CL6	Ki = with	
			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			

Gas Supply Panels

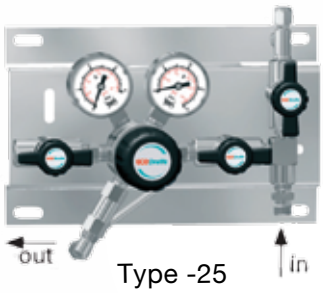
SMD 500-16/-24/-25 - Single-Stage



Type -16



Type -24



Type -25

Single-stage
For inert, flammable and oxidizing gases and gas mixtures
Purity max. 6.0
Inlet pressure 230/300bar / 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

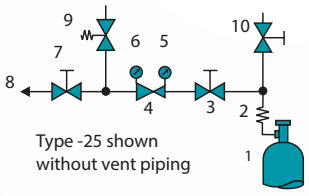
These gas supply panels are mounted onto a stainless steel panel and consist of a pressure regulator, inlet and outlet pressure gauges, a relief valve (by downstream pressure > 50 bar RV on request) and shut-off valves (type -16 at the outlet, type -24 at the inlet, type -25 at inlet and outlet) for the process gas.

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. Standard application for these panels: centralized or decentralized gas supply for highly sensitive analysis devices.

Technical Data

Body :	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 :	Stainless steel: FKM, (EPDM, FFKM)* Brass: 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) 0 - 400 bar (0 - 5800 psi)
Weight :	Approx. 2.5 kg (type -16)/ 2.74 kg (type -24)/ 3 kg (type -25)
Dimentions (W x H x D) :	Approx. 250×155×185 mm
Purge outlet :	NPT 1/4"f or tube fitting
Intlet :	NPT 1/4"f , M 14×1.5 (optional)



Type -25 shown without vent piping

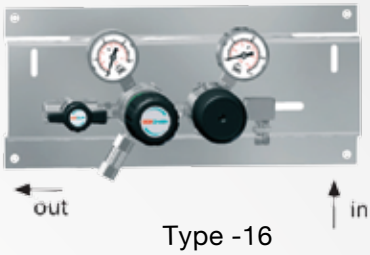
1 Cylinder connection
2 Coil/Hose
3 Inlet shut off valve
4 Pressure regulator - Single-stage
5 Upstream pressure gauge
6 Downstream pressure gauge
7 Process gas outlet shut-off valve (Type -25 only)
8 Process gas outlet
9 Relief valve
10 Purge outlet valve (not Type -16)

Order Code

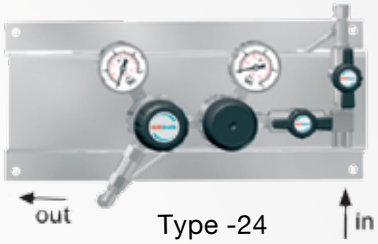
Type	Material	Upstream pressure	Downstream pressure	Inlet	Outlet	Contact gauge	Vent Piping	Gas type
SMD 500-16	**BC**	**F**	**14**	**N14**	**CL6 BC**	**Ki**	**A**	**GAS**
SMD 500-16	BC = brass	F = 230bar/3300psi	14 = 1-14bar/15-200psi	N14 =	N14 = NPT 1/4"f	0 = without	0 = without	Please
SMD 500-24	chrome-plated	G = 300bar/4350psi	28 = 2.5-28bar/35-400psi	NPT 1/4"f	CL6, CL8**	Ki = with	A = with	specify
SMD 500-25			50 = 2.5-50bar/35-720psi	M14×1.5	CL10, CL12		(Only in	
			200 = 10-200bar/145-2900psi	(optional)	BC = brass		conjunction	
					chrome-plated		with RV not	
							available for	
							Type-16)	

Gas Supply Panels

SMD 502-16/-24/-25 - Dual-Stage



Type -16



Type -24

Type -25

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

Special Features

- Downstram 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. Vent gas piping for attachment to the relief valve can be ordered as an optional extra.

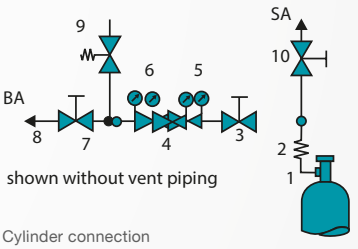
Application

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.

Standard application for these panels: centralized or decentralized gas supply for highly sensitive analysis devices.

Technical Data

Body :	Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Relief valve :	Outlet NPT 1/4"f
Seat seals 1st stage :	PCTFE
Seat seals 2ndstage :	PTFE
Body seals :	PCTFE (SS), PTFE (Brass)
Relief valve seat seals :	Stainless steel: FKM, (EPDM, FFKM)*
	Brass: EPDM, (FKM)*
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)
	0 - 400 bar (0 - 5800 psi)
Weight :	Approx. 3.5 kg (Type -16)/ 4.1 kg (Type -24) / 4.4
Dimentions (W x H x D) :	kg (Type -25)
Intlet :	Approx. 400×155×160 mm
Outlet :	NPT 1/4"f , M 14×1.5 (optional)
	NPT 1/4"f, optional tube fitting



shown without vent piping

1 Cylinder connection
2 Coil/Hose
3 Upstream shut-off valve (Type -24+Type -25)
4 Pressure regulator - dual-stage
5 Upstream pressure gauge
6 Downstream pressure gauge
7 Process gas outlet shut-off valve (Type -16 + Type -25)
8 Process gas outlet
9 Relief valve
10 Purge gas outlet valve (Type -24 + Type -25)
SA Purge outlet
BA Process gas outlet

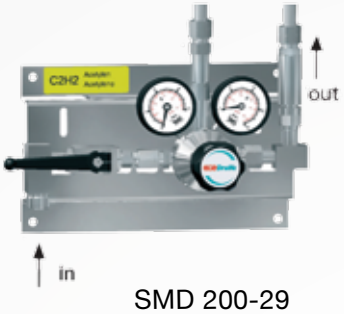
Order Code

Type	Material	Upstream pressure	Downstream pressure	Inlet	Outlet	Contact gauge	Vent Piping	Gas type
SMD 502-16	**BC**	**F**	**3**	**N14**	**CL6 BC**	**Ki**	**A**	**GAS**
SMD 502-16	BC = brass	F = 230bar/3300psi	3 = 0.2-3bar/3-45psi	N14 =	N14 = NPT 1/4"f	0 = without	0 = without	Please
SMD 502-24	chrome-plated	G = 300bar/4350psi	6 = 0.5-6bar/7-85psi	NPT 1/4"f	CL6, CL8**	Ki = with	A = with	specify
SMD 502-25			10.5 = 0.5-10.5bar/7-145psi	M14×1.5m	CL10, CL12		(Only in	
				(optional)	BC = brass		conjunction	
					chrome-plated		with RV not	
							available for	
							Type-16)	

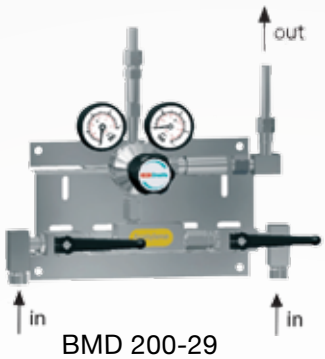
Acetylene Panels

BMD/SMD 200-29

Single-stage
For acetylene
Inlet pressure 25bar
Outlet pressure < 1.5 bar



SMD 200-29



BMD 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 2×1 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).

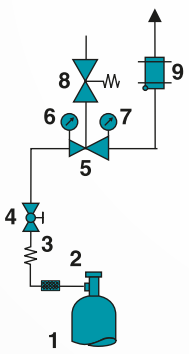
Application

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.

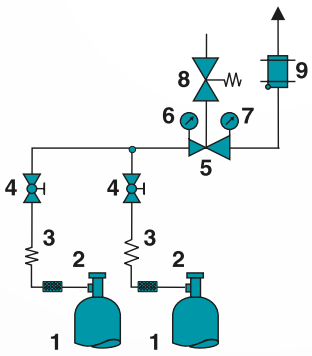
Technical Data

Upstream pressure :	25 bar
Downstream pressure :	<1.5 bar
Body :	Brass 2.0401.26
Diaphragm :	Rubber
Flow rate :	To 11 m³/h (pa = 1.26 bar)
Working temperature :	-20 to +60 °C / -4 to 140 °F
Dimentions (W x H x 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“ lh
Intlet :	W21,8×1/14"
Outlet :	Tube Ø 12 mm×7 mm

SMD 200-29



BMD 200-29



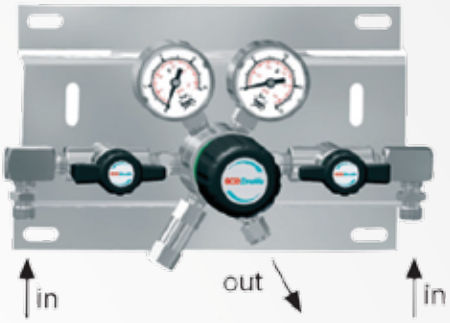
1 Cylinder
2 Cylinder valve
3 Connecting hose
4 Ball valve
5 Pressure regulator
6 Upstream pressure gauge
7 Downstream pressure gauge
8 Relief valve
9 GVA

Order Code

Type	Material	Downstream pressure	Inlet	Outlet	Contact gauge	Gas type
SMD 200-29	**BC**	**6**	**W21.8x1/14”**	**12**	**Ki**	**GAS**
SMD 200-29	BC = brass	1.5 = 1.5bar/22psi	W21.8x1/14”	12 = Tube with 12 mm	0 = without	C2H2
BMD 200-29				outside diameter,	Ki = with	
				inside diameter 7 mm		
				Brass - version		

Gas Supply Manifolds

BMD 500-30 - Manual Changeover



Single-stage
For inert, flammable and oxidizing gases and gas mixtures
Purity max. 6.0
Inlet pressure 230/300bar / 3300/4350 psi
Downstream pressure range 1-200 bar / 14-2900 (3300) psi

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
- Connection for 2×1 cylinders, upgradable for 2×4 cylinders

Description

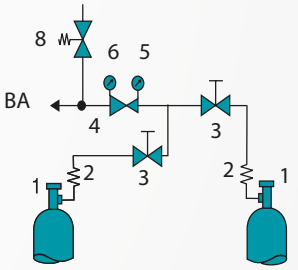
These gas supply panels reduce the upstream pressure from 230/300 bar to downstream pressures of 1 to 200 bar. The BMD 500 is mounted onto a stainless steel console and consist of a pressure regulator and inlet and outlet gauges. The upstream shut-off valve enables the uninterrupted gas supply even while 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.

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.

Technical Data

Body :	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)*
Pressure gauge range :	-1 - 18 bar (-15 - 260 psi) 0 - 80 bar (0 - 1150 psi) 0 - 315 bar (0 - 4500 psi) 0 - 400 bar (0 - 5800 psi)
Weight :	Approx. 2.9 /3.8 kg
Dimentions (W x H x D) :	Approx. 400×200×185 mm
Intlet :	NPT 1/4"f , M14×1.5 (optional)
Outlet :	NPT 1/4"f, optional tube fitting



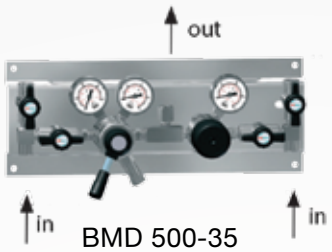
1 Inlet connection
2 Coil/Hose
3 Process gas inlet shut-off valve
4 Regulator single-stage
5 Upstream pressure gauge
6 Downstream pressure gauge
8 Relief valve
9 Purge outlet valve
SA Purge outlet
BA Process gas outlet

Order Code

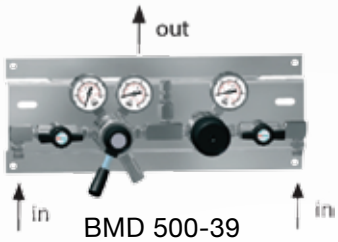
Type	Material	Upstream pressure	Downstream pressure	Inlet	Outlet	Contact gauge	Vent Piping	Upgrade	Gas type
BMD 500-30	**BC**	**F**	**14**	**N14**	**CL6 BC**	**Ki**	**A**	**M**	**GAS**
BMD 500-30	BC = brass chrome-plated	F = 230bar/3300psi G = 300bar/4350psi	14 = 1-14bar /15-200psi 50 = 2.5-50bar /35-720psi 200 = 10-200bar /145-2900psi	N14 = NPT 1/4"f CL6, CL8 M14×1.5 (optional)	N14 = NPT 1/4"f CL6, CL8 CL10, CL12 BC = brass chrome-plated	0 = without Ki = with	0 = without A = with (On type-32 only in combination with RV)	0 = without M2 = 2x2 Cylinder M3 = 2x3 Cylinder M4 = 2x4 Cylinder	Please specify

Gas Supply Manifolds

BMD 500-35/39 - Automatic Changeover



BMD 500-35



BMD 500-39

Single-stage
For inert, flammable and oxidizing gases and gas mixtures
Purity max. 6.0
Inlet pressure 230/300bar / 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. 2×4 cylinders

Description

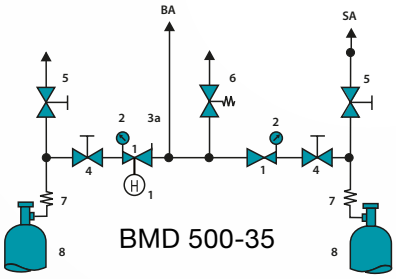
Pressure decreases in the active cylinder (or bundle) below a preset level which causes a semi-automatic switch to switch over to the full cylinder. This is achieved by two integrated pressure regulators (preset to slightly different delivery pressure levels), connected at their outlet ports. Moving 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 500-35 an internal gas purge. Vent piping can be ordered optionally.

Application

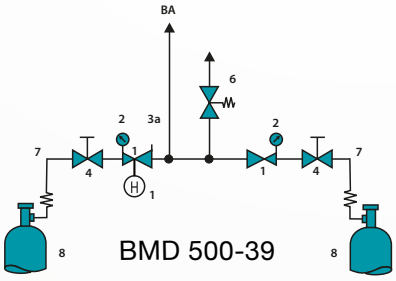
These gas supply panels, with semi-automatic switch over, are optimally used when uninterupted gas supply is required.

Technical Data

Body :	Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Relief valve :	Outlet NPT 1/4"f
Seat seals :	PCTFE
Body seals :	PCTFE (SS), PVDF (Brass)
Relief valve seat seals:	SS-FKM, (EPDM, FFKM)*, Brass-EPDM, (FKM)*
Pressure gauge range :	-1 - 18 bar (-15 - 260 psi)/0-315 bar (0-4500 psi) 0 – 400 bar (0 – 5800 psi)
Weight :	Approx. 5.5 kg (BMD 500-35)
Dimentions (W x H x D) :	Approx. 400×155×200 mm
Preset downstream pressure:	14 bar +/-2 bar ; 200 +/- 30 psi
Flow rate:	25 Nm³/h N² (14 bar - type at 29 bar inlet pressure.)
Intlet :	NPT 1/4"f , M 14×1.5 (optional)
Outlet :	NPT 1/4"f, optional tube fitting



BMD 500-35



BMD 500-39

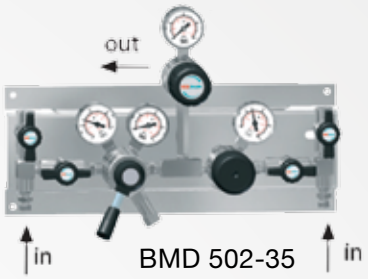
1 Pressure regulator
2 Upstream pressure gauge
3 Downstream pressure gauge
4 Process gas valve
5 Purge gas outlet valve
5a Purge gas inlet valve
6 Relief valve
7 Coil/hose
8 Gas cylinder
9 Check valve
3a Middle pressure gauge
H Lever
BA Process gas outlet
SA Purge gas outlet
SE Purge gas inlet

Order Code

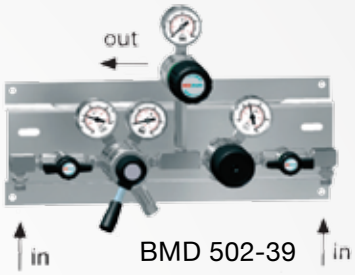
Type	Material	Inlet pressure	Outlet pressure	Inlet	Outlet	Contact gauge	Vent Piping	Extention bar	Gas type
BMD 500-35	**BC**	**F**	**MSD14**	**N14**	**CL6 BC**	**Ki**	**A**	**M**	**GAS**
BMD 500-35	BC = brass	F = 230bar/3300psi	MSD14 = 14bar	N14 F=	N14 = NPT 1/4"f	0 = without	0 = without	0 = without	Please
BMD 500-39	chrome-plated	G = 300bar/4350psi	/200psi	NPT 1/4"f	CL6, CL8*	Ki = with	A = with	M2 = 2x2	specify
			MSD50 = 50bar	M14×1.5m	CL10, CL12		(On type-35	Cylinder	
			/720psi	(optional)	BC = brass		only in	M3 = 2x3	
					chrome-plated		combination	Cylinder	
							with RV)	M4 = 2x4	
								Cylinder	

Gas Supply Manifolds

BMD 502-35/-39 - Semi Automatic



BMD 502-35



BMD 502-39

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

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. 2×4 Cylinder

Description

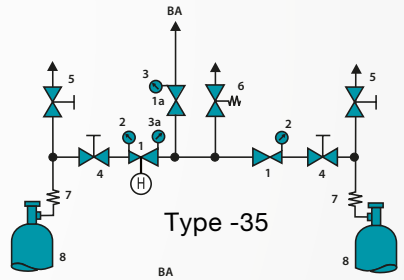
Pressure decrease in the active cylinder (or bundle) below a preset level causes a semi-automatic switch over to the full cylinder. Moving the lever towards the full bank allows for the disconnection and replacement of empty cylinders without interruption of gas supply. The use of contact gauge (accessories)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

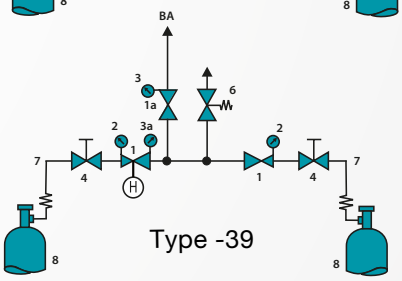
Application

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 :	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)*
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)
	0–400 bar (0–5800 psi)
Weight :	Approx. 6.7 kg (BMD 502-35)
Dimentions (W x H x D) :	Approx. 400×280×200 mm
Purge inlet and outlet :	Tube fitting 6 mm
Intlet :	NPT 1/4"f, M 14×1.5 (optional)
Outlet :	NPT 1/4"f, optional tube fitting





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

Order Code

Type	Material	Inlet pressure	Downstream pressure	Inlet	Outlet	Contact gauge	Vent Piping	Upgrade	Gas type
BMD 502-35	**BC**	**F**	**3**	**N14**	**CL6 BC**	**Ki**	**A**	**M**	**GAS**
BMD 502-35	BC = brass	F = 230bar/3300psi	3 = 0.2-3bar	N14 =	N14 = NPT 1/4"f	0 = without	0 = without	0 = without	Please
BMD 502-39	chrome-plated	G = 300bar/4350psi	/3-45psi	NPT 1/4"f	CL6, CL8	Ki = with	A = with	M2 = 2x2	specify
			6 = 0.5-6bar	M14×1.5	CL10, CL12		(On type-35	Cylinder	
			/7-85psi	(optional)	BC = brass		only in	M3 = 2x3	
			10 = 1-10.5bar		chrome-plated		combination	Cylinder	
			/15-150psi				with AV)	M4 = 2x4	
								Cylinder	

Line Pressure Regulators

LMD 500-01

Single-stage
For inert, reactive, flammable and oxidizing gases and gas mixtures
Purity max. 6.0
Inlet Presure 40 bar/600 psi, 230 bar / 3300 psi
Outlet pressure range 0.2-50 bar / 3-725 psi

Special Features

- Excelent pressure adjustment
- Compact design
- 4 or 6 port configuration

Description

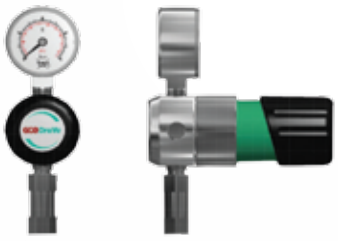
A broad application spectrum through the 4-port configuration, with (type-01AV) or whitout (type-01) relief valve. Use the contact gauge (accessories) in conjuction with alarm box (accessories) facilitates the monitoring of gas reserves.

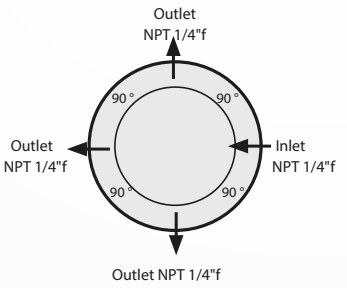
Application

The LMD 500 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 appara-tuses or processes.

Technical Data

Body :	Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm :	Hastelloy
Seat seals :	PCTFE
Body seals :	PCTFE (SS), PVDF (Brass)
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
Dimentions (W x H x D) :	Approx. 55×120×130 mm
Inlet/Outlet :	NPT 1/4"f, optional tube fitting



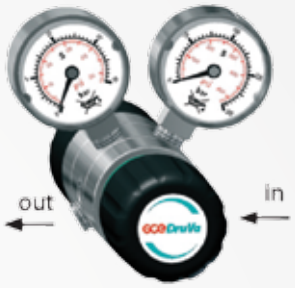


Order Code

Type	Material	Upstream pressure	Downstream pressure	Inlet	Outlet	Relief valve	Contact gauge	Gas type
LMD 500-01	**BC**	**E**	**14**	**CL6 BC**	**CL6 BC**	**AV**	**Ki**	**GAS**
LMD 500-01	BC = brass	E = 50bar/720psi	3 = 0.2-3 bar/3-45 psi	N14=NPT 1/4"f	N14=NPT 1/4"f	0 = without	0 = without	Please
	crome-plated	F = 230bar/3300psi	6 = 0.5-6 bar/7-85 psi	CL6	CL6	AV = with	Ki = with	specify
			14 = 1-14 bar/15-200 psi	CL8	CL8			
			50 = 2.5-50 bar/35-720 psi	CL10	CL10			
				CL12	CL12			
				BC = brass	BC = brass			
				chrome-plated	chrome-plated			

Line Pressure Regulators

LMD 502-03



Dual-stage
For inert, reactive, flammable and oxidizing gases and gas mixtures
Purity max. 6.0
Inlet Presure 230 bar/ 3300 psi
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

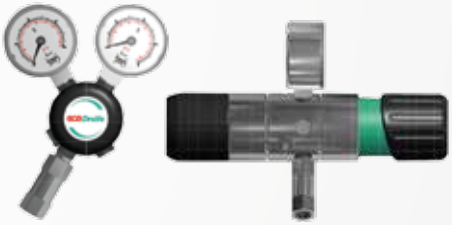
This pressure regulator reduces the upstream pressure to a lower downstream pressure. The dual-stage design ensures the uniformity of the downstream pressure irrespectively of the upstream pressure. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring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

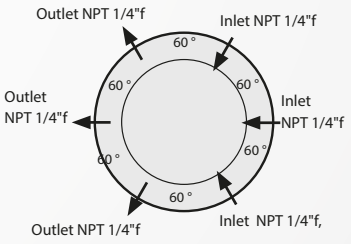
Application

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.

Technical Data

Body :	Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Seat seals 1st stage :	PCTFE
Seat seals 2nd stage :	PTFE
Body seals :	PCTFE(SS), PTFE (Brass)
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. 1.8 kg
Dimentions (W x H x D) :	Approx. 112×148×206 mm
Inlet/Outlet :	NPT 1/4"f, optional tube fitting





Order Code

Type	Material	Upstream pressure	Downstream 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	F = 230bar/3300psi	1 = 0.2-1 bar/3-15 psi	N14=NPT 1/4"f	N14=NPT 1/4"f	0 = without	0 = without	Please
	crome-plated		3 = 0.2-3 bar/3-45 psi	CL6**	CL6	Ki = with	AV = with	specify
			6 = 0.5-6 bar/7-85 psi	CL8	CL8			
			10 = 1-10.5 bar/15-150 psi	CL10	CL10			
				CL12	CL12			
				BC = brass	BC = brass			
				chrome-plated	chrome-plated			

Point-of-Use Regulators

EMD 400-41

Single-stage
For inert, reactive, flammable and oxidizing gases and gas mixtures
Purity max. 6.0
Inlet Presure 40bar / 600psi
Outlet pressure range 0.1-10.5 bar / 1-105 psi

EMD400-41 bench version

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.

Application

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

EMD400-01

EMD400-06 wall mounted

EMD400-42
plate assembly

Technical Data

Body material :	Brass CW614 (CuZn39Pb3) specially cleaned, chrome-plated
Pressure gauge range :	0 - 2.5/6/16 bar (0 - 35/85/235 psi)
Weight :	Approx. 0.8 kg
Inlet/Outlet :	G 3/8" f - G 1/4" f

Order Code

Type	Variation	Material	Inlet pressure	Outlet pressure	Inlet	Outlet	Gas type
EMD 400	**-41**	**BC**	**E**	**1**	**CL6 BC**	**CL6**	**GAS**
EMD 400	-01 = standard	BC = brass	**EMD 400**	**EMD 400**	G3/8=C3/8"f	G1/4=G1/4"f	Please
	-06 = plate	crome-plated	E = 40bar/600psi	1 = 0.1-1 bar/1-15 psi	G1/4=G1/4"f	CL4, CL6, CL8	specify
	mounted			4 = 0.2-4 bar/3-60 psi	NPT1/4=NPT 1/4"f	CL1/4", CL1/8"	
	-41 = bench			10 = 0.5-10.5 bar/7-150 psi	CL4, CL6, CL8	NO 1/4"	
	version				CL1/4", CL1/8"	NO 1/8"	
	-42 = wall				NO 1/4", NO1/8"	BC=brass chrome-plated	
	assembly				BC=brass chrome-plated		

Point-of-Use Regulators

EMD 500-06

Single-stage
For inert, reactive, flammable and oxidizing gases and gas mixtures
Purity max. 6.0
Inlet Presure : 40bar / 600psi / EMD 500
EMD 500 : 0.2-10.5 bar / 3-85 psi

Special Features

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

Description

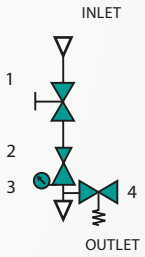
The EMD 500-06 consists of an upstream shut-off valve, pressure regulator, downstream gauges and Aluminium panel for wall mounting. A relief valve can be ordered as an optional extra.

Application

The EMD 500-06 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 up to 0.2 bar absolute can be regulated downward.

Technical Data

Body :	Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Seat seals :	PTFE
Body seals :	PCTFE (SS), PVDF (Brass)
Pressure gauge range :	0 – 2.5 bar (0 – 40 psi) -1 – 1.5 bar (-15 – 22 psi) -1 – 3 bar (-15 – 45 psi) 0 – 5 bar (0 – 75 psi) 0 – 10 bar (0 – 145 psi) 0 – 18 bar (0 – 260 psi)
Weight :	Approx. 1.95 kg
Dimentions (W x H x D) :	Approx. 90×260×135 mm
Inlet/Outlet :	NPT 1/4"f, optional tube fitting



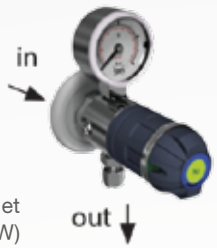
1 Upstream shut-off valve
2 Pressure regulator
3 Downstream gauge
4 Relief valve (Optional)

Order Code

Type	Material	Upstream pressure	Downstream pressure	Inlet	Outlet	Relief Valve	Gas type
EMD 500-06	**BC**	**E**	**1**	**CL6 BC**	**CL6 BC**	**AV**	**GAS**
EMD 500-06	BC = brass	E = 40bar/600psi	1 = 0.2-1 bar/3-15 psi	N14=NPT 1/4"f	N14 = NPT 1/4"f	0 = without	Please
	crome-plated		6 = 0.5-6 bar/7-85 psi	CL6, CL8	CL6, CL8*	A = with	specify
			10 = 1-10.5 bar/15-145 psi	CL10, CL12	CL10, CL12		
				BC = brass	BC = brass		
				chrome-plated	chrome-plated		

Point-of-Use Regulators

EMD 3100 - Surface Mounted



Wall mounted rear inlet straight (Version W)

Single-stage
For inert, reactive, flammable and oxidizing gases and gas mixtures
Purity max. 6.0
Inlet Presure 40bar
Outlet pressure 0.1-10 bar

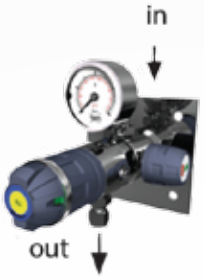


Plate mounted inlet, from top (Version P)

Special Features

- Pressure regulator with integrated shut-off function
- Coloured identifi cation 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 identifi cation according to DIN EN 13792
- Analytic version optionally available

Description

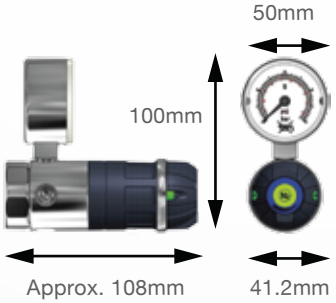
The basic version of this pressure regulator with gauge includes an integrated quick-closing function. The gas type is indicated on the front side of the pressure regulator with the appropriate decal. The wall mounting use a wall adapter or a wall mounting plate; the gas supply is brought in through the wall.

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 confi guration options cover all the customary lab applications and fi t to all laboratory furnishings.

Technical Data

Body :	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
Weight :	Approx. 0.64 kg
Dimentions (W x H x D) :	Approx. 50×100×108 mm
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

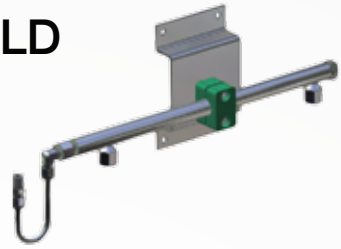


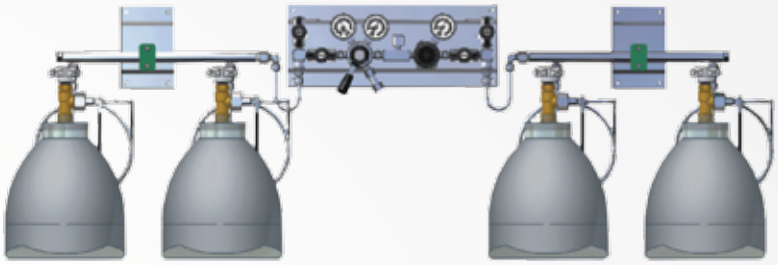
Order Code

Type	Variation	Material	Inlet pressure	Outlet pressure	Surface mounted versions	Inlet	Outlet	Gas type
EMD 3100	**-01**	**BC**	**E**	**4**	**O**	**CL6 BC**	**CL6**	**GAS**
EMD 3100	-01 = Pressure Regulator (MD)	BC = brass crome-plated	E = 40bar/ 600psi	1 = 0.2-1.5 bar/ 3-22 psi	O = Basic module	G38F=C3/8"f	G14F=G1/4"f	Please specify
	-06 = MD + Pre-shut-off valve			4 = 0.2-4 bar/ 3-60 psi	P = Plate Mounting	G14F=G1/4"f	CL4, CL6, CL8	
	-07 = MD + LP-flame arrestor			10 = 0.5-10.5 bar/ 7-150 psi	W = Wall Mounting	NPT14F=NPT 1/4"f	CL1/4", CL1/8"	
	-08 = MD + LP-MVAR				T = Bench Mount	CL4, CL6, CL8	NO 1/4"	
	-10 = MD + Pre-shut-off valve + LP-MVAR				Standard	CL1/4", CL1/8"	NO 1/8"	
						NO 1/4", NO1/8"	BC=brass chrome-plated	
						BC=brass chrome-plated		

Extension Header Kits

MFOLD





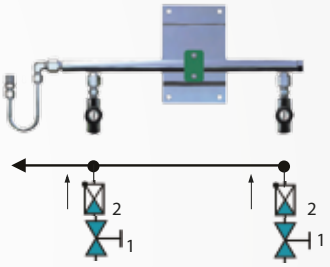
Extension header kit
For inert, corrosive, flammable and oxidizing gases and gas mixtures
Purity max. 6.0
Inlet pressure 315 bar / 4350 psi

Highlighs

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

Description

Extension kit consist of a NPT inlets, 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.



1 Shut off valve
2 Non return valve

Technical Data

Body material :	Stainless steel 316L (1.4404) specially cleaned and electropolished
Weight :	Approx. 1.2 kg
Dimentions (W x H x D) :	470×70×200 mm (with 2 inlets) 770×70×200 mm (with 3 inlets) 1070×70×200 mm (with 4 inlets)
Intlet :	NPT 1/4"f
Outlet :	NPT 1/4"m

Order Code

Type	Material	Inlet Ports	Shut off Valve	Check Valve	Outlet Port	Type of tube	Gas type
MFOLD	**BC**	**2 N14F**	**MVA**	**CV**	**N14M**	**R**	**GAS**
	SS=stainless steel	2 N14F = 2 x NPT 1/4”f	0 = no valve	0 = no CV	N14M=NPT 1/4M	R = right	
	BC=brass crome-plated	3 N14F = 3 x NPT 1/4”f	MVA = with valve	CV = CV on each inlet		L = left	
		4 N14F = 4 x NPT 1/4”f					

Signal Boxes

DGM-SK 2N/4N/6N/10N

Signal box
For optical and acoustic signaling of fault reporting
2 or 4-channel version

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

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, fl oaters 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.

Available Accessories

Solenoid valve control and regulator DGM-MV, relay box DGM-IT, contact gauges and operation terminal DGMAX for gas management system, mass fl ow controller, cylinder scales, rupture disks, floater , fl ow 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.

Description

The gas management signal box DGM-SK it 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 offi ce, 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.

Technical Data

Power supply :	230V AC, 50Hz, 5VA; 110V AC, 60Hz
Fuse :	3,15 mA slow-blow
Note :	Defective fuses may only be replaced by the manufacturer
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/circiut :	330 mH/ 4.0 µF (EEx ib IIC); 1000 mH/ 30.0 µF (EEx ib IIB)
Cabel monitoring (optional) :	Short circuit I> 6 mA, cable break I<80 µA
Connection cross section :	2.5 mm² max.
Alarm output :	2* relay output (1 change over contact)
Contact load :	Max. 230 V ~, 50 Hz, 100 VA max. 48 V , 1A
Signal lamp :	LED green 5 mm
Acoustic alarm :	Piezo buzzer, f = 3.3 kHz
Collective alarm :	Via zero potential break contact
Ambient temperature :	Max. 40 °C
Humidity :	0 - 95 % rel. humidity, not condensing
Housing :	Polystyrene colour similar to RAL 7035 (light grey)
Protection category :	IP 54
Dimentions (W x H x 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

Order Code

Type	Signals	Ex-protection	Power Supply
DGM-SK	**02N**	**0**	**230AC50HZ**
DGM-SK	02N = 2 channels	0 = without	230 = 230V 50Hz
	04N = 4 channels	EX = with	110 = 110V 60Hz
	06N = 6 channels		
	010N = 10 channels		

Gas Monitoring Software Gascom

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

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 GCEDruVa 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 pressurerange
- 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

System Requirements

- Standard PC, 2 GHz, 512 MB memory, Windows XP

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 specifi c functions

Fault And Cost Reduction

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

Archive Fuction And Statistical Analysis

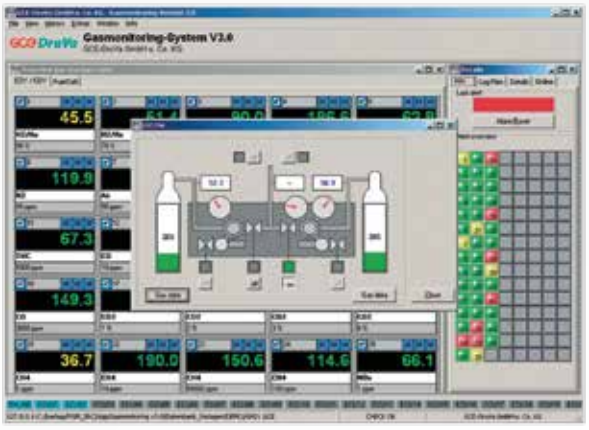
- Where was each gas cylinder connected and at what time?
- Logging of events and measured data
- Variable logging intervals
- Automatic recording of pressure in the log data
- Automatic recording of all triggered actions in the log data
- Automatic saving of fault and system-warnings in the log data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

Expandability According To System Requirments

- Langauge choices German / English

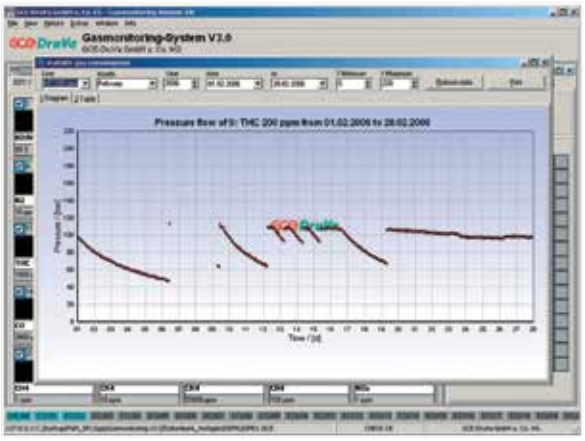
**Please contact Advancelab for further information*

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



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

Safety Cylinder Cabinets

Security cabinets
In accordance with norm DIN EN 14470 -2,
For 1 to 4 50-liter-cylinders

Special Features

- Installation in workrooms
- Highest possible fi re-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-thoughs 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 fl exible 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 TRG 280. Integrated inlet and extraction openings close automatically in the case of fire. The identifi cation/labelling comply with ISO 3864. During installation of the cabinets there are construction requirements to be observed: 10-times air exchange is necessary for fl ammable 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.

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. TRG) for lack of space, but continuous gas supply is essential, and/or short pipework is necessary

Order Code

Type	Ex-protection
SC 600	600×617×2050 mm
SC 900	900×617×2050 mm
SC 1200	1200×617×2050 mm
SC 1400	1400×617×2050 mm

Gas Cylinder Cabinet

G-Ultimate-90 G90.205.060.2F

Safe and approved storage of flammable or toxic gases in working areas – for up to 2 x 50-litre gas cylinders

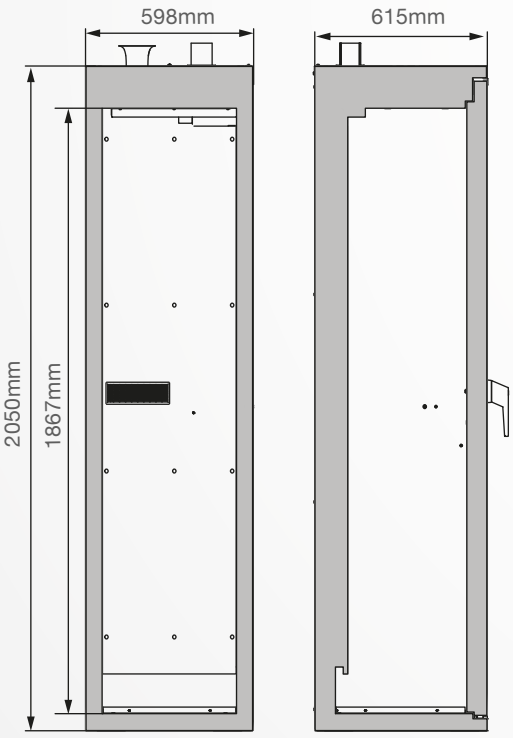
No unauthorised use: door lockable with profile cylinder (integration in an existing locking system possible)

Easy alignment: adjusting aids to compensate for uneven floor

Easy mounting of connecting pipes and gas fittings: large interior height (1890 mm), many lead-through possibilities on the top of the cabinet

Ventilation: integrated air ducts ready for connection (DN 75) to a technical exhaust, even ventilation inside the cabinet

Tested and certified: according to the stricter GS principles



Available equipment:

standard interior equipment – complete with mounting rails, rolling ramp, cylinder retainer and matching tension belts

Dimension

External:

598mm(W) x 615mm(D) x 2050mm(H)

Internal:

477mm(W) x 425mm(D) x 1858mm(H)

Ventilation

Extraction air: 75 DN

Min. exhaust air quantity 10 times: 4 m³/h

Min. exhaust air quantity 120 times: 45 m³/h

Lead-through possiblilities: 24

General Information

Weight: 365 kg

Maximum load: 600 kg

x 50-litre gas cylinders: 2 piece

Door opening angle: 180°

Depth with open doors: 1135 mm

Gas Cylinder Cabinet

G-Ultimate-90 G90.205.120

Safe and approved storage of flammable or toxic gases in working areas – for up to 4 x 50-litre gas cylinders

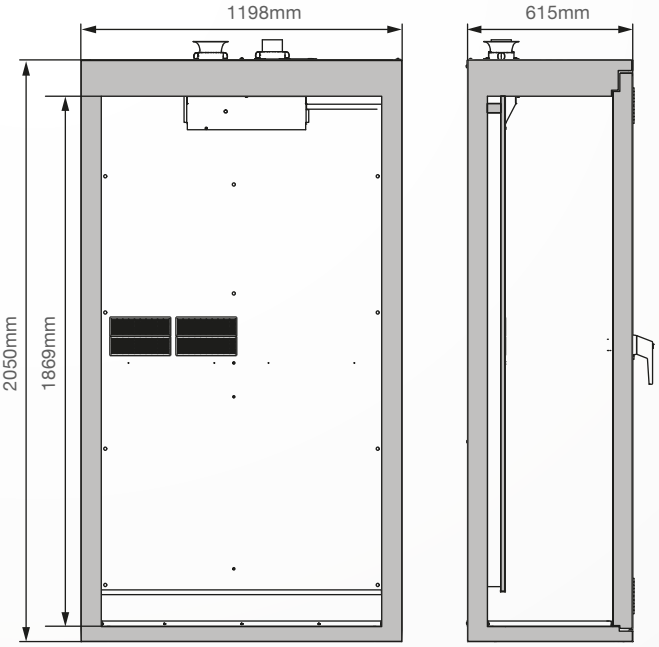
No unauthorised use: doors lockable with profile cylinder (integration in an existing locking system possible)

Easy alignment: adjusting aids to compensate for uneven floor

Easy mounting of connecting pipes and gas fittings: large interior height (1890 mm), many lead-through possibilities on the top of the cabinet

Ventilation: integrated air ducts ready for connection (DN 75) to a technical exhaust, even ventilation inside the cabinet

Tested and certified: according to the stricter GS principles



Available equipment:

Comfort interior equipment – complete with mounting rails, rolling ramp (L = 350 mm) with pneumatic damper, cylinder retainer and matching tension belts

Standard interior equipment – complete with mounting rails, rolling ramp, cylinder retainer and matching tension belts

Cylinder retainer – variable installation in the cabinet, flexibly adjustable in depth, across the entire width of the cabinet

Sateral cylinder retainer – for two 10-litre cylinders, alternatively in height adjustable version (no tools required)

Dimension

External: 1198mm(W) x 615mm(D) x 2050mm(H)

Internal: 1045mm(W) x 400mm(D) x 1858mm(H)

Ventilation

Extraction air: 75 DN

Min. exhaust air quantity 10 times: 8 m³/h

Min. exhaust air quantity 120 times: 93 m³/h

Lead-through possiblilities: 60

General Information

Weight: 610 kg

Maximum load: 600 kg

x 50-litre gas cylinders: 4 piece

Door opening angle: 180°

Depth with open doors: 1238 mm

Accessories

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 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 diff erent contact types. To set the switch point the pressure level marking is adjusted by turning the beyonetring 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

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

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 interupted by decreasing pressure Contact type 2 (R2), Contact is interupted by increasing pressure
Dimensions (Ø×d×h):	63×50×90 mm

Accessories

Contact Gauges KI 63, KR 63 - NPT 1/4”

Order Code

Art.-Nr.	Type	Material	Displya range	
			bar	psi
H28941101	KI 63- 250 / i1	SS	0 – 250	0 – 3600
H28974101	KR 63- 250 / r1	SS	0 – 250	0 – 3600

Safety Gauges RM 50, NPT 1/4”

Technical Data

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)

Order Code

Art.-Nr.	Type	RM	Material	Displya range	
				bar	psi
H28160403	RM 50-10 NPT	7.5	Brass / NI-CR	-1 – 10	-14.5 – 145
H28160401	RM 50-10 NPT	7.5	SS	-1 – 10	-14.5 – 145

Flash Back Arrestors

Order Code

Art.-Nr.	Type	Inlet x Outlet	RM	Material	Gas/max. pressure (bar)				
					A*	H	M	O	P
B000643	FS500	NPT1/4”f x NPT1/4”f	7.5	SS	1.5	4	5	-	-
B000892	FS500	NPT1/4”f x NPT1/4”f	7.5	Brass	1.5	10	12	-	12

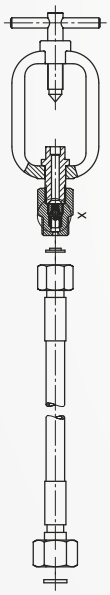
**Acetylene C2H2 (A), Hydrogen H2 (H), Methane CH4 (M), Oxygen O2 (O), Propane C3H8 (P)*

Accessories

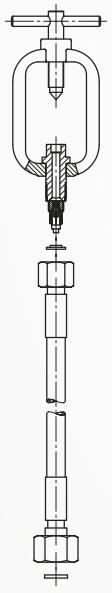
Cylinder Connection BS 341

Order Code

Art.-Nr.	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

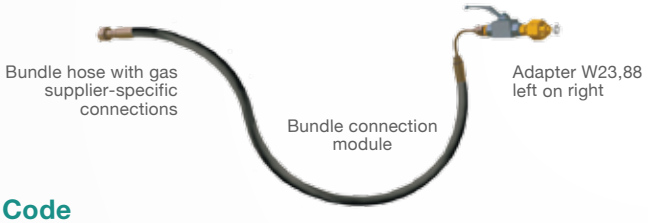


Cylinder hoses with back pressure protection 14037493



Cylinder hoses without back pressure protection 14037334

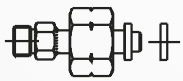
Acetylene High Pressure Connection Hoses



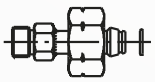
Order Code

Application	Version		Length
14037493	Cylinder with back pressure safety		800 mm
14037249	Bundle	RHÖNA	1500 mm
14037841	Bundle	LINDE	1500 mm
14037842	Bundle	MG	1500 mm
14037843	Bundle	Basi	1500 mm

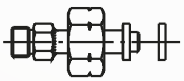
***Attention:** there is a 5-yearly obligatory testing for acetylene high pressure hoses in accordance with TRAC 204, 5.3.7. These hoses fulfil the requirements according to EN ISO 14113. Further connections upon request.*



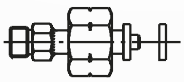
Bundle connection Rhöna standard 14.037.190 for AGA



14.037.115 for Linde bundle



14.037.190 for MG bundle



14.037.190 for BASI bundle

Accessories

Cylinder Holder

Order Code

Art.-Nr.	Type	Description
H03110301	FH	Profiled stainless steel sheet with belt
H03050220	Belt	Replacement belt for cylinder holder

Adjustment Knobs for Pressure Regulators and Valve

Order Code

Application	Version
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

Stainless Steel Tubing

Recommendations

Maximum Allowable Working Pressure (PSI) For Inch Sizes Stainless Steel Tube

	Tube wall thickness (inch)										
Tube- Outside-Ø [inch]	0,028	0,035	0,049	0,065	0,083	0,095	0,0109	0,0120	0,0134	0,0156	0,0188
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 wall thickness (mm)													
Tube- Outside-Ø [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.

Unit Conversion

Volumes

	cm³	Litri	m³	(inch)³	(foot)³	gal
cm³	1	10^{-3}	10^{-6}	0.061	$3.53x10^{-5}$	$2.642x10^{-4}$
Liter	1000	1	10^{-3}	61.02	0.0353	0.2642
m³	10^{6}	1000	1	$6.1x10^{4}$	35.31	$2.642x10^{2}$
in³ (inch)	16.39	$1.64x10^{-2}$	$1.64x10^{-5}$	1	$5.79x10^{-4}$	$4.33x10^{-2}$
ft³ (foot)	$2.83x10^{4}$	28.32	0.0283	$1.728x10^{3}$	1	7.481
gal	$3.785x10^{3}$	3.785	$2.83x10^{3}$	$2.31x10^{-2}$	0.1337	1

Volumes Flow

	m³/h	l/h	ml/h	(foot)³/min SFPM	gal/min	(foot)³/s SFPS	l/s	cm³/s
cm³	1	10^{3}	10^{-6}	0.589	4.403	$9.808×10^{-3}$	0.2778	277.78
l/h	10^{-3}	1	10^{-3}	$5.887×10^{-4}$	$4.403×10^{-3}$	$9.808×10^{-6}$	$2.778×10^{-4}$	0.2778
ml/h	10^{-6}	10^{-3}	1	$5.887×10^{-7}$	$4.403×10^{-6}$	$9.808×10^{-9}$	$2.778x10^{-7}$	$2.778×10^{-4}$
ft³/min	1.699	$1.699x10^{3}$	$1.699x10^{6}$	1	7.481	$1.667x10^{-2}$	0.4719	$4.720×10^{2}$
gal/min	0.227	$2.271x10^{2}$	$2.271x10^{5}$	0.133 67	1	$2.288×10^{-3}$	$6.309×10^{-2}$	63.09
ft³/s	$1.019x10^{2}$	$1.019x10^{5}$	$1.019x10^{8}$	60	$4.4877×10^{2}$	1	28.32	$2.832×10^{4}$
l/s	3.6	$3.6x10^{3}$	$3.6x10^{6}$	2.119	15.85	0.0353	1	10^{3}
cm³/s	$3.6x10^{-3}$	3.6	$3.6x10^{3}$	$2.119×10^{-3}$	$1.585×10^{-2}$	$3.531×10^{-5}$	10^{-3}	1

Pressure Units

	bar	mbar	µbar	Pa	kPA	MPa	kp/mm²	kp/cm²	atm [1]	mm Hg [2]	m Ws	mm Ws	psi
bar	1	10^{3}	10^{6}	10^{5}	100	0.1	$1.019×10^{-2}$	1.019	0.986	$7.500×10^{2}$	10.197	$1.020×10^{4}$	14.514
mbar	10^{-3}	1	10^{3}	100	0.1	10^{-4}	$1.020×10^{-5}$	$1.020×10^{-3}$	$9.869×10^{-4}$	0.750	$1.020×10^{-2}$	10.200	$1.4514×10^{-2}$
µbar	10^{-6}	10^{-3}	1	0.1	10^{-4}	10-7	$1.020×10^{-8}$	$1.020×10^{-6}$	9.869×10-7	$7.5×10^{-4}$	$1.2×10^{-5}$	5 1.2 10^{-2}	$1.4514×10^{-5}$
Pa	10^{-5}	10^{-2}	10	1	10^{-3}	10^{-6}	1.02×10-7	$1.02×10^{-5}$	$9.869×10^{-6}$	$7.501×10^{-3}$	$1.02×10^{-4}$	0.10^{2}	1.4514 10^{4}
kPA	10^{-2}	10	10^{4}	10^{3}	1	10^{-3}	$1.02×10^{-4}$	$1.02×10^{-2}$	$9.869×10^{-3}$	7.501	0.10^{5}	$1.02×102^{2}$	0.1451
MPa	10	10^{4}	107	10^{6}	10^{3}	1	0.10^{5}	10.197	9.869	$7.501×10^{3}$	$1.02×10^{2}$	$1.02×10^{5}$	$1.451×10^{2}$
kp/mm²	980.7	$9.807×10^{4}$	$9.807×10^{7}$	$9.807×10^{6}$	9807	9.807	1	10^{5}	96.784	$7.356×10^{4}$	1000	10^{6}	$1.423×10^{3}$
kp/cm²	0.9807	980.7	$9.807×10^{5}$	$9.807×10^{-4}$	98.07	$9.807×10^{-2}$	0.01	1	0.968	$7.356×10^{2}$	10	10^{4}	14.23
atm [1]	1.013	1013	$1.013×10^{6}$	$1.013×10^{5}$	$1.013×10^{2}$	0.101	$1.033×10^{-2}$	1.033	1	$7.6x10^{2}$	10.332	$1.033×10^{4}$	14.7
mm Hg [1]	$1.333×10^{-3}$	1.333	1333	$1.333×10^{2}$	0.133	$1.333×10^{-4}$	$1.36×10^{-5}$	$1.36×10^{-3}$	$1.36×10^{-3}$	1	$1.36×10^{-2}$	13.6	$1.934×10^{-2}$
m Ws	$9.807×10^{-2}$	98.07	$9.807×10^{4}$	$9.807×10^{3}$	9.807	$9.807×10^{-3}$	10^{-3}	0.1	$9.678×10^{-2}$	7.356×101	1	10^{3}	1.423
mm Ws	$9.807×10^{-5}$	$9.807×10^{-2}$	98.07	9.807	$9.807×10^{-3}$	$9.807×10^{-6}$	10^{-6}	10^{-4}	$9.678×10^{-5}$	$7.356×10^{-2}$	10^{-3}	1	$1.423×10^{-3}$
psi	0.0689	68.9	$6.89×10^{4}$	$6.89×10^{6}$	6.89	$6.89×10^{-3}$	$7.028×10^{-4}$	$7.028×10^{-2}$	$6.803×10^{-2}$	51.703	0.703	$7.032×10^{2}$	1

Gases and Their Properties

Gas	Formula	Flow rate rel. to N2	Cylinder Pressure (20 °F) bar	Cylinder Pressure (68 °F) psi	Cylinder Connection Accord. DIN477	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	SF2	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*

Ordering Details for Specialty Gas Equipment

***Gas** _____

Chem. Formula _____ Purity _____

upstrem pressure [bar] _____

***Downstream Pressure Range** [bar] _____

Flow rate [Nm³/h N2] _____

Application:

_____

_____

_____

***Company / Name / Tel / E-mail**

***Select Equipment 1.-5.**

1. Cylinder pressure regulator (first tage) ☐

(Cylinder connection accord. DIN 477)

other Norm: _____

manual connection: ☐

without cylinder connection: ☐

Purge unit: without ☐ inert gas ☐

2. Stations pressure regulator (first stage)

(connection standard pigtail SS)

Flex hose stainless steel, length [m]: _____

Purge unit: without ☐ process ☐

gas ☐ inert gas ☐

3. Batterie pressure regulator (first stage)

(connection standard pigtail SS)

2 Flex hose stainless steel, length [m]: _____

Extension bar to 1 x ..... Cylinder ☐

manual switch over ☐ automatic ☐

Purge device: without ☐

inert gas ☐ process gas ☐

4. Line pressure rehulator (secod stage)

4-Port-Version ☐ 6-Port-Version ☐

5. Point-of-use regulator (second stage) ☐

***Pressure Regulator Model**

Single-stage ☐

Dual-stage for constet downstream pressure ☐

Material (mostly gas type dependent)

Pressure regulator:

Stainless steel instead of Brass ☐

Guage:

Stainless steel instead of Brass ☐

Gauge Version (Standard bourdon tube version)

Upstream pressure: without ☐

inductive contact gauge ☐

Special display range: _____

Downstream pressure: without ☐

inductive contact gauge ☐

Special display range: _____

***Outlet**

(Standard tube fitting for outside diameter 6 mm tube)

without tube fitting ☐

Tube fitting for tube outside diameter [mm] ☐

Hose nozzle for outside diameter [mm] ☐

Material: Brass ☐ Stainless steel ☐

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