HAM-LET CLEAN GAS REGULATOR

HRG

HAM-LET REGULATORS

HAM-LET Group

INDEX

QUICK SELECTION GUIDE

Gases Pressure Reducing Line - HRG

Application	Pressure Stage	inlet pressure	outlet pressure	Cv	series	See Page
Line regulating	Single	175-600 psi (12-40 bar)	0,3 - 44 psi (20-3000 mbar)	0.091	HRG3SL	29
		175-4350 psi (12-300 bar)	3-725 psi (0.2 bar- 50 bar)	0.08	HRG5SL	13
	Dual	3300-4350 psi (230-300 bar)	7.25-150 psi (0.2-10.5 bar)	0.06	HRG5DL	45
Cylinder regulating	Single	175-4350 psi (12-300 bar)	3-2900 psi (0.5-200 bar)	0.091	HRG5SC	17
	Dual	3300-4350 psi (230-300 bar)	3-145 psi (0.2-10.5 bar)	0.06	HRG5DC	49
Point of use regulating	Single	175-600 psi (12-40 bar)	1.45-150 psi (0.1-10.5 bar)	0.0106	HRG4SP	25
Panels	Single	3300-4350 psi (200-300 bar)	7.25-2900 psi (0.5-200 bar)	0.091	HRG5SA	33
	Dual	3300-4350 psi (200-300 bar)	3-150 psi (0.2-10.5 bar)	0.06	HRG5DA	55

PRESSURE REGULATOR FUNDAMENTALS

TYPE OF REGULATORS

SINGLE-STAGE REGULATORS

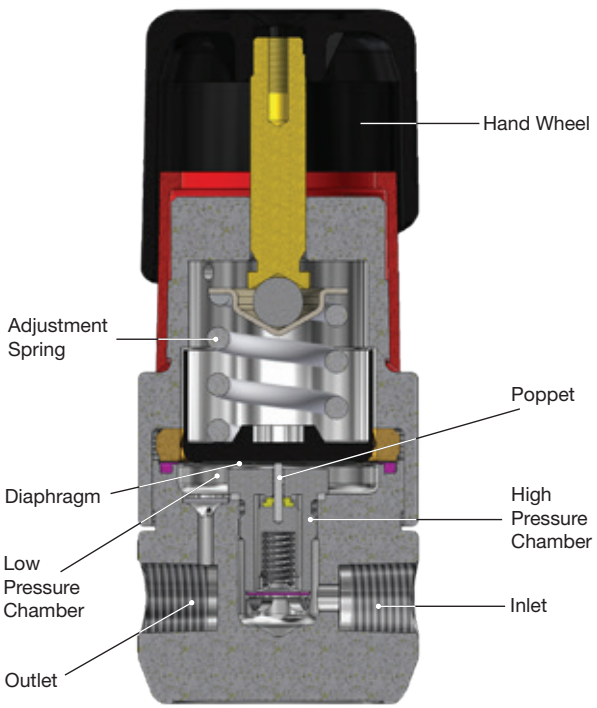
High-pressure gases enter through the inlet of the regulator to the high-pressure chamber. When the hand wheel is turned clockwise, it compresses the spring and creates a force on the diaphragm, which pushes the regulator's poppet open. This releases the gas into the low-pressure chamber, exerting an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

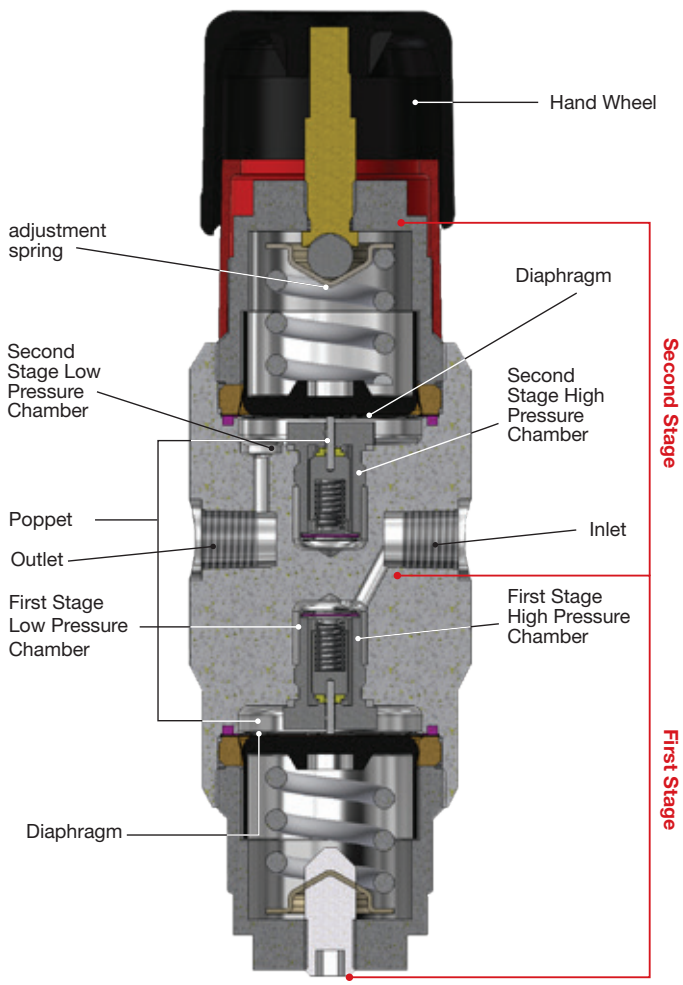
Equilibrium is reached, when the spring force on the diaphragm is equal to the opposing force of the gas in the low-pressure chamber. In a single-stage regulator, delivery pressure increases as cylinder pressure falls, because there is less gas pressure exerted on the diaphragm. Thus, frequent adjustment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

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 desired pressure.
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.





Gas Purity Values

Gas Type	Purity lavel (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
	6.0	99.9999%	1
Ultra Pure Gas	7.0	99.99999%	0.1

REGULATOR SELECTING CONSIDERATIONS:

1. Signal/Dual stage:

Single-stage pressure regulators reduce the cylinder pressure to the delivery or outlet pressure in one step. Two-stage pressure regulators reduce the cylinder pressure to a working level in two steps. The best recommended action is to determine for time span is required to reach the regulated pressure consistency in the designated application. Generally, a single-stage regulator is good for short duration applications; a two-stage regulator is good for long duration applications, such as gas chromatography.

2. Inlet/Outlet pressure range:

There are many options of inlet pressures:

- Cylinder pressure: 2900-4350 psi (230 or 300 bar)
- Line pressure: 175- 2900 psi (12-230 bar)

Pick the correct inlet pressure according to your gas cylinder pressure.

Regulator type (defined by outlet and purging)

- Outlet option (tube fitting, shut-off valve and more)
- Panel option
- Purging option
- Panel with switch-over

3. Body material:

- SS - Stainless Steel
- Brass chrome plated

4. Purge system:

- Process gas purge system.
- External gas purge system.

5. Cv (Kv/.0.85) and Kv factor*

- HRGC5S – Cv = 0.091, Kv=0.077
- HRGC5D – Cv= 0.06, Kv= 0.051
- HRGL5S – Cv= 0.106, Kv= 0.09

***Cv**

The flow coefficient of a regulator/ valve is a relative measure of its efficiency at allowing fluid flow. It describes the relationship between the pressure drop across an orifice, valve or other assembly and the corresponding flow rate.

GENERAL

HRG-HAM-LET REGULATOR FOR GASES PURITY UP TO GRADE 6.0

The Ham-Let Regulators line of products for high purity Gas applications (HRG) are designed and manufactured to meet the highest quality expectation of the market. The HRG line of product designs and manufacturing are proved for many years to meet the markets standards and regulations and with service by a range of prestigious customers. The HRG line offers a complete product range for:

- **Cylinder pressure regulators**
- **Line pressure regulators**
- **Point of use regulators**
- **Gas panels**

HAM-LET regulators assemblies made with the top-quality materials and components are very accurate in the outlet pressure. The regulators are made to meet the standard of gas purity 6.0, and tested to ensure the certified leak rate and safety.
The quality control is very strict, in order to make problem free and safe gas supply in the production and ongoing efficiency of HAM-LET gas systems. HAM-LET regulator is suitable for variable industries from food and drug sector to semi-conductor sector.
Where there is an accuracy problem, you can trust HAM-LET regulators.

HRG Regulators are suitable to be used by divers industrial segments:

- Analytical systems
- Gas chromatography
- Atomic-Adsorption-Spectrometry
- Exhaust-gas measurement for environmental control
- Chemical process technology
- Laser technology
- Pharmaceutical industry
- Petrochemical industry
- Food / pharm industries
- Semiconductor technology
- Fiber optical industry

Quality/ Testing

HAM-LET clean gas systems proves its quality by performance and reliability. The manufacturing process of the approved regulators per ISO9001 at regular intervals. This certification is considered by HAM-LET to be just one step on the long road towards not only achieving and maintaining the security of our customers in our products but also to strengthen it. Uncontrolled inspections by internal and external monitors ensures a continuous high-quality level. Therefore, our customers can have confidence on these certificates, not only as a basis to relax but as a stepping stone to new heights regarding quality and performance. Our goal is to be a reliable partner to our customers in all areas about pure gas technology with economical solutions to their individual problems using outstanding engineered technology.

HRG5S

SINGLE STAGE PRESSURE REGULATOR 5 SERIES

HAM-LET Group

HRG5S SINGLE STAGE PRESSURE REGULATOR 5 SERIES

GENERAL

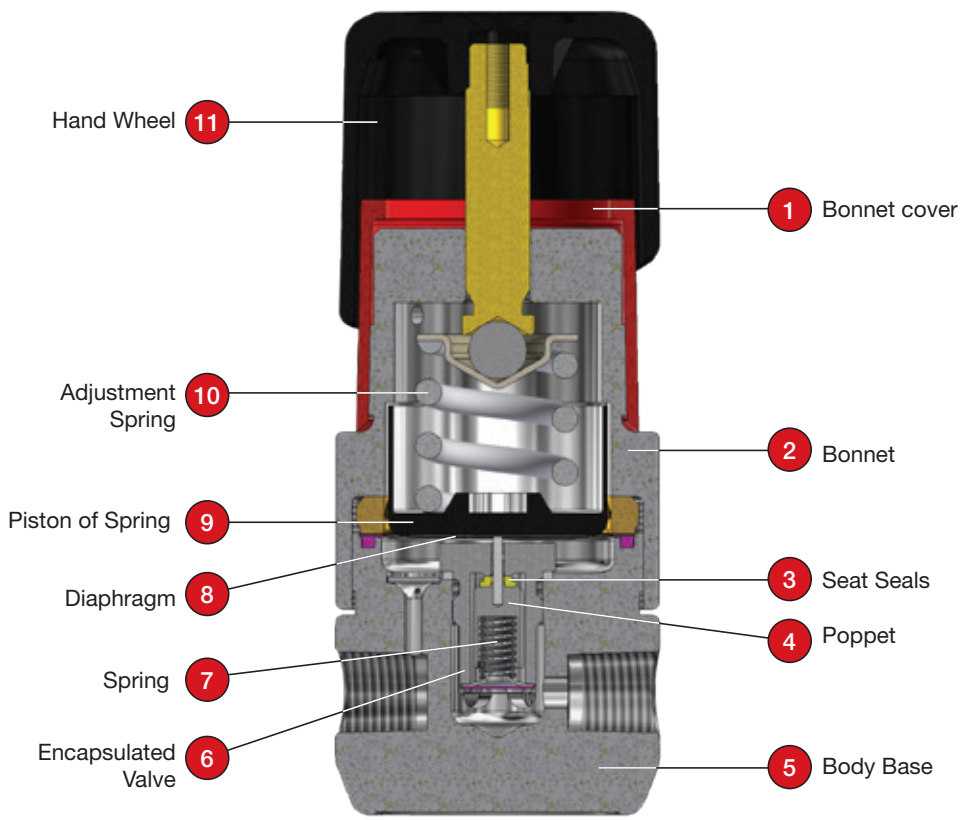
The **HRG5S** products meet the specific requirements of high quality pure-gas distribution systems in terms of purity, pressure stability and operational safety. The supervision and control of the material quality is decisive for quality and safety of the products. Components which undergo electro -polishing and multi stage cleaning processes achieve highest quality surface, are generally ECD-suitable and in combination with 316L, Hastelloy inner parts, 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.

FEATURES

- **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** and more.
- **INNER PARTS** Pressure regulator unit with integrated mesh filter from 10 µm mesh opening at inlet and 100 µm at outlet.
- **DIAPHRAGM** Good material protection against burst and corrosion due to diaphragm material Hastelloy.
- **GUARANTEED LEAKAGE RATES** $< 1\times10^{-9}$ mbar l/s Helium (body). $< 5\times10^{-6}$ mbar l/s Helium (seat).
- **WORKING TEMPERATURES** -13 °F to 158 ° (-25 °C to +70 °C)
- **PURITY** ≤ 6.0
- **INLET** pressure min-max psi (bar)
- **OUTLET** pressure min-max psi (bar)

MATERIAL OF CONSTRUCTION

#	Description	Material	#	Description	Material
1	Bonnet cover	ABS	5	Body base	Stainless steel 316L (1.4404) specially cleaned and electro-polished
					Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated.
2	bonnet	316L (1.4404) specially cleaned and electro-polished	6	Encapsulated valve	Same material ad the body
		Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated.			
3	Seat seal	PCTFE/ FKM, EPDM. dependent on gas specification and purity requirements.	7	Spring	Stainless Steel
4	Poppet	Stainless steel (1.4404)	8	Diaphragm	Hastelloy
			9	Piston of Spring	Aluminum
		Brass (CuZn38Pb1,5F)	10	Adjustment spring	CuBe2 F930
			11	Hand Wheel	PA6+30%GF



PRESSURE OPTIONS:

INLET

HTO CODE	Inlet Pressure option psi (bar)
K	175 (12)
L	600 (40)
P	700 (50)
D	3300 (230)
E	4350 (300)

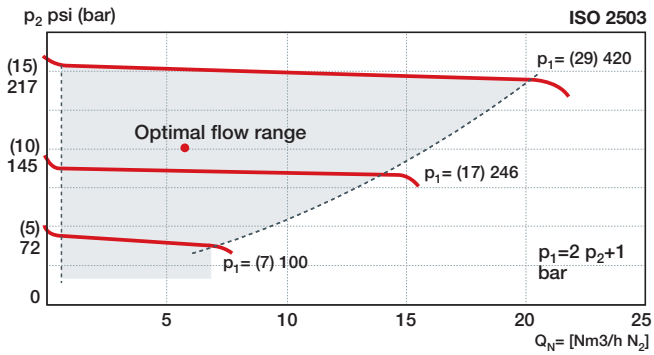
OUTLET

HTO CODE	Outlet Pressure option psi (bar)
1C	3-45 (0.2-2 abs)
1G	3-45 (0.2-3 abs)
1E	3-30 (0.2-2)
1F	3-45 (0.2-3)
1Z	3-87 (0.2-6.0)
1X	3-150 (0.2-10.5)
1L	15-200 (1-14)
2A	3-725 (0.2-50)
1Y	3-2900 (0.5-200)

FLOW CHART HRG5S

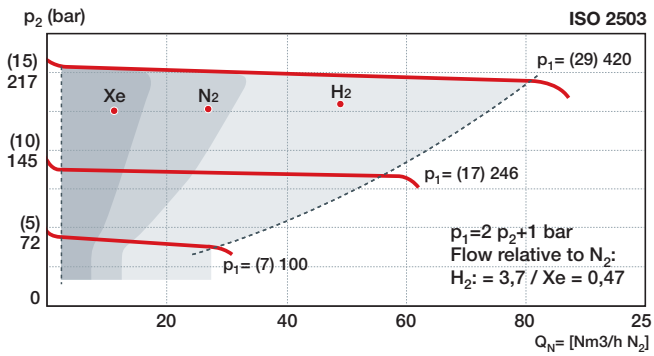
Regulator Performance Characteristic - Flow Range

How to determine the optimal flow range of a pressure regulator for example of G5S?



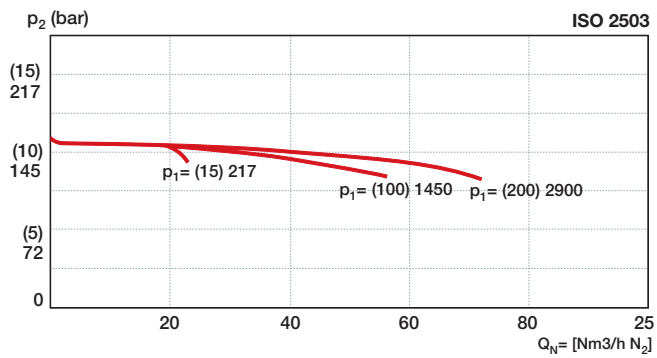
Regulator Performance Characteristic - Flow Range

Same pressure regulator G5S, same pressure p1 & p2, same flow. Variable is gas type



Regulator Performance Characteristic - Influence of P_1

Same pressure regulator G5S, same outlet pressure p_2 = 10 bar, same flow. Variable is inlet pressure: p_1= 200 bar, p_1 = 100 bar, p_1= 15 bar



HRG5SL

SINGLE STAGE LINE REGULATOR 5 SERIES

HAM-LET Group

HRG5SL SINGLE STAGE LINE REGULATOR 5 SERIES

GENERAL

The **HRG5SL** is a Single stage inline regulators of the 5 series. This series reduces line pressure to give a lower supply of pressure. Through its compact design this regulator is especially well suited for use in analytical or chemical apparatuses or processes. A broad application spectrum through the 4-port configuration or 6-port-configuration.
SPECIFIC FEATURES

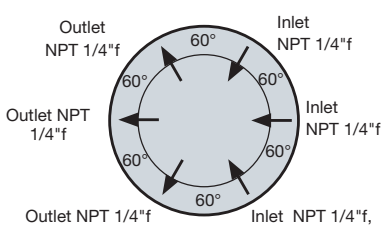
- Sub atmospheric-pressure regulation
- Compact design

FEATURES

- **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** and more depending on gas type.
- **INNER PARTS** Pressure regulator unit with integrated mesh filter from 10 µm mesh opening at inlet and 100 µm at outlet.
- **DIAPHRAGM** Good material protection against burst and corrosion due to diaphragm material Hastelloy.
- **GUARANTEED LEAKAGE RATES** < 1×10^{-9} mbar l/s Helium (external). < 1×10^{-6} mbar l/s Helium (across the seat).
- **WORKING TEMPERATURES** -13 °F to 158 ° (-25 °C to +70 °C)
- **PURITY** ≤ 6.0
- **INLET** pressure up to 300 bar
- **OUTLET** pressure up to 200 bar

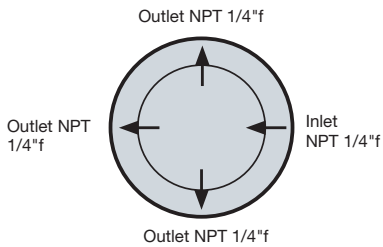
CONNECTIONS 6-PORT-VERSION

(Frontal View)



CONNECTIONS 4-PORT-VERSION

(Frontal View)



HRG5SL – SINGLE STAGE LINE REGULATOR SERIES CONFIGURATION

With 1 Gauge
G1 Model

With 1 Gauge + Relief Valve
GF Model

With 2 Gauges
G2 Model

With 2 Gauges + Relief Valve
GV Model

(1) Gauge for delivery pressure side
(2) Relief Valve for delivery pressure
(3) Gauge for high pressure side

HRG5SL SINGLE STAGE LINE REGULATOR 5 SERIES

HOW TO ORDER:

HRG5SL - D 1C G1 S H - M M C

Series

HRG5SL

Inlet pressure psi (bar)

		Outlet pressure psi (bar)	
K	175 (12)	1C	3-30 abc (0.2-2 abs)
		1G	3-45 abs (0.2-3 abs)
		1E	3-30 (0.2-2)
		1F	3-45 (0.2-3)
P	700 (50)	1F	3-45 (0.2-3)
		1I	7-85 (0.5-6)
		1L	15-200 (1-14)
D	3300 (230)	1F	3-45 (0.2-3)
		1I	7-85 (0.5-6)
		1L	15-200 (1-14)
		1N	35-720 (2.5-50)
E	4350 (300)	1I	7-85 (0.5-6)
		1L	15-200 (1-14)
		1N	35-720 (2.5-50)
		2O	145-2900 (10-200)

Body Material

S	SS 316 / SS 316L
C	Chrome plated-Brass

Diaphragm

H	Hastelloy C-22

Configuration (Assembly)

G1	With 1 gauge in low pressure chamber
GF	With 1 gauge in low pressure chamber + relief valve
G2	1 gauge in low pressure chamber 1 gauge in high pressure chamber
GV	1 gauge in low pressure chamber 1 gauge in high pressure chamber + relief valve

Inlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

Outlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

LK = LET-LOK Tube Fittings
* For more fittings option please contact.

Gas Type*

C	CO2
A	Argon
O	Oxygen

*For other gases please specify

Warning!

The system designer and user have the sole responsibility for selecting products suitable for their special application requirements, ensuring their safe and trouble-free installation, operation, and maintenance. Application details, material compatibility and product ratings should all be considered for each selected product. Improper selection, installation or use of products can cause property damage or personal injury.

HRG5SC

SINGLE STAGE CYLINDER REGULATOR 5 SERIES

HAM-LET Group

HRG5SC SINGLE STAGE CYLINDER REGULATOR

GENERAL

The outstanding cylinder pressure regulator series **HRG5SC** offers a wide range of uses and impressive performance, with inert, flammable and oxidizing gases and gas mixtures.

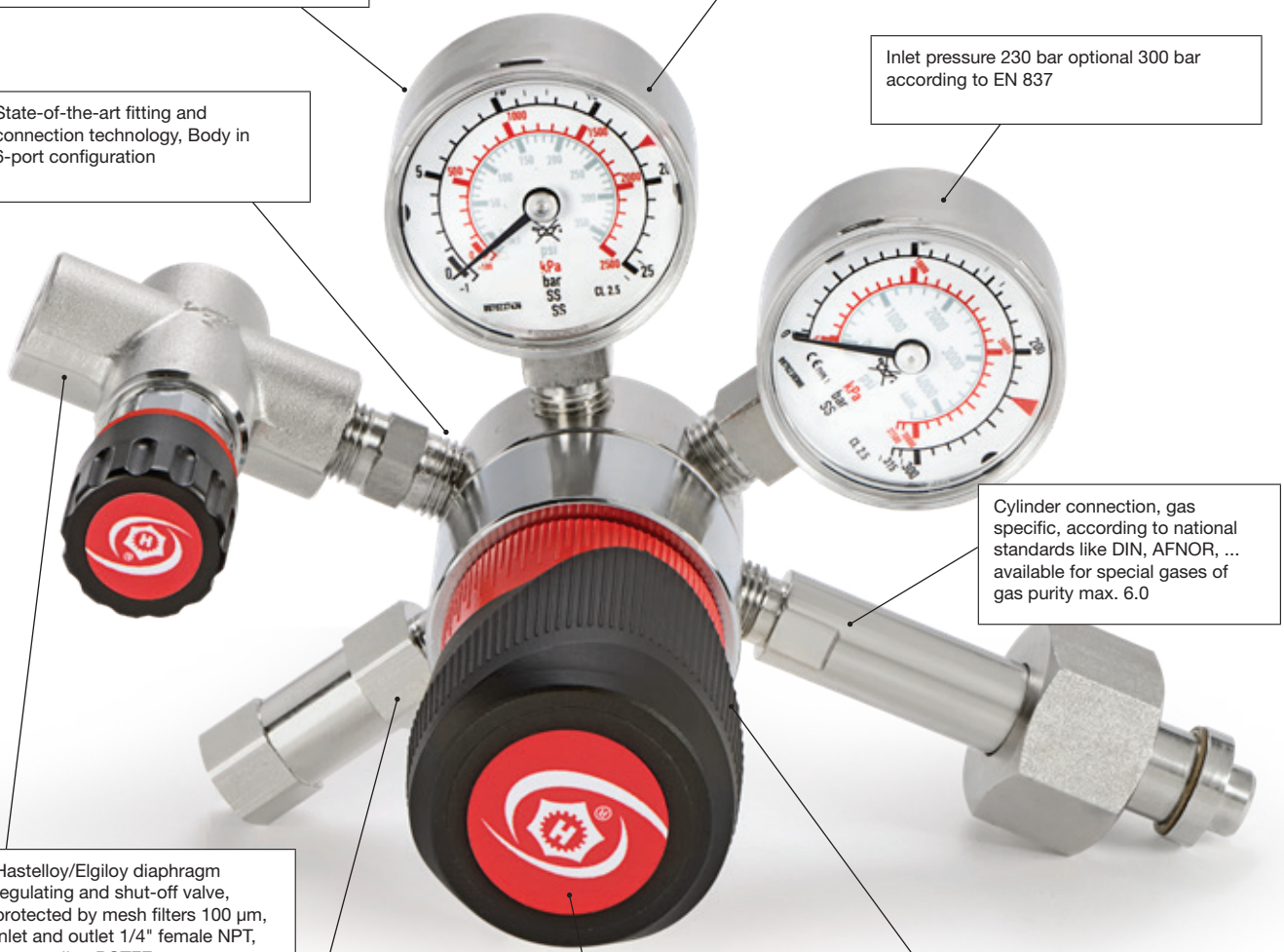
The 5SC-OF is the basic model. The 5SC-OS allows shut-off of the gas flow while maintaining the pressure regulator's adjustment.

The regulating valve of the 5SC-OM allows a finer apportioning of gas flow.

FEATURES

- **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** and more depending on gas type.
- **INNER PARTS** Pressure regulator unit with integrated mesh filter from 10 µm mesh opening at inlet and 100 µm at outlet.
- **DIAPHRAGM** Good material protection against burst and corrosion due to diaphragm material Hastelloy.
- **GUARANTEED LEAKAGE RATES** < 1×10 -9 mbar l/s Helium (body). < 1×10 -6 mbar l/s Helium (seat).
- **WORKING TEMPERATURES** -13 °F to 158 ° (-25 °C to +70 °C)
- **PURITY** ≤ 6.0
- **INLET** pressure up to 300 bar
- **OUTLET** pressure up to 200 bar
- CYLINDER / INLET CONNECTIONS Compliant with national standards: DIN 477 and other connections as US-Norm CGA, British Standard BS etc. are available upon request.

HRG5SC-SINGLE STAGE CYLINDER REGULATOR SERIES



Adjustable outlet pressure range between 0.2 bar and 200 bar optional 0.2 bar abs.

Pressure Gauge in safety model according to EN 837

State-of-the-art fitting and connection technology, Body in 6-port configuration

Inlet pressure 230 bar optional 300 bar according to EN 837

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

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

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

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

Ergonomic, clean, long lasting and ATEX compliant adjusting knob

CYLINDER REGULATOR CONFIGURATION OPTION

Tube Fittings
OF Model

Shut-off valve
OS Model

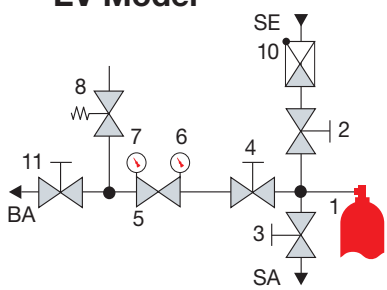
Regulating valve
OM Model

With External purging with/without shut-off valve in delivery pressure side.
EV/EP Model

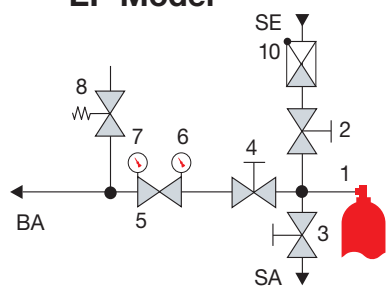
Flow Schematic

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

EV Model



EP Model



HRG5SC SINGLE STAGE CYLINDER PRESSURE REGULATOR

HOW TO ORDER:

HRG5SC - D 1B OF S H D M C

Series

Inlet pressure psi (bar) / Outlet pressure psi (bar)

Inlet pressure psi (bar)		Outlet pressure psi (bar)	
K	175 (12)	1C	3-30 abc (0.2-2 abs)
		1G	3-45 abs (0.2-3 abs)
		1E	3-30 (0.2-2)
		1F	3-45 (0.2-3)
P	700 (50)	1F	3-45 (0.2-3)
		1I	7-85 (0.5-6)
		1L	15-200 (1-14)
D	3300 (230)	1F	3-45 (0.2-3)
		1I	7-85 (0.5-6)
		1L	15-200 (1-14)
		1N	35-720 (2.5-50)
E	4350 (300)	1I	7-85 (0.5-6)
		1L	15-200 (1-14)
		1N	35-720 (2.5-50)
		2O	145-2900 (10-200)

Configuration (Assembly)

OF	With outlet tube fitting
OS	Outlet shut-off valve
OM	Outlet metering valve
EP	External gas purging
EV	External gas purging + Shutoff valve

Body Material

S	SS 316 / SS 316L
C	Chrome plated-Brass

Diaphragm

H	Hastelloy C-22

*Only for purity≤ 5

Connection Types

D	DIN 477
A	ASNI
R	AFNOR
B	NBN
S	BS
CXX	CGA**
E	NEN
O	other upon request

** Must specify code 2 digits from table

Outlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

LK = LET-LOK Tube Fittings
* For more fittings option please contact.

Gas Type*

C	CO2
A	Argon
O	Oxygen

*For other gases please specify

**CGA

AA	590	Air industrial
AB	660	Ammonia ,anhydrous
AC	580	Argon
AD	320	Carbon dioxide
AE	350	Carbon monoxide
AF	660	Chlorine
AG	350	Ethane
AH	350	Ethylene
AI	580	Helium
AJ	350	Hydrogen
AK	330	Hydrogen chloride
AL	330	Hydrogen sulfide
AN	580	Krypton
AM	350	Methane, natural gas
AO	660	methyl chloride
AP	330	methyl mercaptan
AU	50	neon
AV	660	nitric oxide
AW	580	nitrogen
AX	660	nitrogen dioxide
AY	540	oxygen
AZ	660	phosgene
BA	580	refrigerant-14
BB	660	refrigerant-22
BC	660	sulfur dioxide
BD	590	sulfur hexafluoride
BE	580	Xenon

Warning!

The system designer and user have the sole responsibility for selecting products suitable for their special application requirements, ensuring their safe and trouble-free installation, operation, and maintenance. Application details, material compatibility and product ratings should all be considered for each selected product. Improper selection, installation or use of products can cause property damage or personal injury.

HRG4S

SINGLE STAGE POINT OF USE REGULATOR 4 SERIES

HAM-LET Group

HRG4S SINGLE STAGE POINT OF USE REGULATOR SERIES

GENERAL

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

- ECD-suitable
- Great variety of assembly possibilities in laboratory furniture due to the modular design of the Lab System
- Gas type specific color indication labels according to EN 13792
- Analysis version available Assembly configuration for wall, plate, suspended and bench mounting, with great variety of combinations, covering any laboratory gas supply requirement.

FEATURES

- **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** and more depending on gas type.
- **INNER PARTS** Pressure regulator unit with integrated mesh filter from 10 µm mesh opening at inlet and 100 µm at outlet.
- **DIAPHRAGM** Good material protection against burst and corrosion due to diaphragm material Hastelloy.
- **GUARANTEED LEAKAGE RATES** < 1×10^{-9} mbar l/s Helium (body). < 5×10^{-6} mbar l/s Helium (seat).
- **WORKING TEMPERATURES** -13 °F to 158 ° (-25 °C to +70 °C)
- **PURITY** ≤ 6.0
- **INLET** pressure up to 40 bar (600 psi)
- **OUTLET** pressure up to 10.5 bar (145 psi)

PRESSURE OPTIONS:

INLET

HTO CODE	Inlet Pressure option psi (bar)
K	175 (12)
L	600 (40)

OUTLET

HTO CODE	Inlet Pressure option psi (bar)
2L	1.45-14.5 (0.1-1)
1H	3-60 (0.2-4)
2K	7-145 (0.5-10.5)
2J	1.45-32 (0.1-2.2)
2M	7.25-58 (0.5-4)

HRG4SP

SINGLE STAGE POINT OF USE REGULATOR 4 SERIES

HAM-LET Group

HRG4SP– SINGLE STAGE POINT OF USE REGULATOR CONFIGURATION

Standard
SG Model

Wall mounted with shut- off valve
WM Model

Plate assembly with shut-off valve
PA Model

Bench version
BV Model

(1) Gauge for delivery pressure side
(2) Shut Off valve
(3) Wall mounted
(4) Plate assembly
(5) Bench version

HRG4SP SINGLE STAGE POINT OF USE PRESSURE REGULATOR

HRG4SP - L 2L G1 S H - M M C

Series

Inlet pressure psi (bar)		Outlet pressure psi (bar)	
K	175 (12)	2J	1-30 (0.1-2.2)
		2M	7-60 (0.5-4)
L	600 (40)	2L	1-14 (0.1-1)
		1H	3-60 (0.2-4)
		2K	7-145 (0.5-10.5)

Configuration (Assembly)	
SG	One gauge
PA	Plate Assembly + shut-off valve
WM	Wall mounted + shut-off valve
BV	Bench version + shut-off valve
	Plate assembly + shut-off valve + regulating valve
	Wall mounted + shut-off valve + regulating valve
	Bench version + shut-off valve + regulating valve

Diaphragm	
H	Hastelloy C-22

Body Material	
S	SS 316 L
C	Chrome plated-Brass

Inlet connection	
X	LK 4 mm
L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
N	LK 1/8"
O	LK 1/4"
D	LK 1/2"
P	1/4" female NPT**
U	NO 6 mm
Y	NO 1/4"
W	1/4" FBSPP****
V	3/8" FBSPP***

Outlet connection	
X	LK 4 mm
L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
N	LK 1/8"
O	LK 1/4"
D	LK 1/2"
P	1/4" female NPT**
U	NO 6 mm
Y	NO 1/4"
W	1/4" FBSPP****
V	3/8" FBSPP***

Gas Type*	
C	CO2
A	Argon
O	Oxygen

*For other gases please specify

LK = LET-LOK Tube Fittings
NO = Hose connector for ...mm hose inside diameter
W* For more fittings option pls contact.
** For plate assembly versions.
*** For standard type.
**** For wall mounted and bench versions.

Warning!

The system designer and user have the sole responsibility for selecting products suitable for their special application requirements, ensuring their safe and trouble-free installation, operation, and maintenance. Application details, material compatibility and product ratings should all be considered for each selected product. Improper selection, installation or use of products can cause property damage or personal injury.

HRG3SL

SINGLE STAGE LINE REGULATOR 3 SERIES

HAM-LET Group

HRG3S SINGLE STAGE LINE REGULATOR SERIES LOW DOWNSTREAM MODEL

GENERAL

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 or 6-Port versions.

FEATURES

- 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, depending on gas type.
- 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 HAM-LET.
- GUARANTEED LEAKAGE RATES < 1×10^{-9} mbar l/s Helium (body). <5×10^{-6} mbar l/s Helium (seat).
- WORKING TEMPERATURES -25 °C to +70 °C / -13 °F to 158 °
- PURITY ≤ 6.0

PRESSURE OPTIONS:

INLET		OUTLET	
HTO CODE	Inlet Pressure option bar (psi)	HTO CODE	Inlet Pressure option psi (mbar)
K	12 (175)	**2W**	0.3-3.6 (20-250)
L	40 (600)	**2X**	1.45-19 (100-1300)
		2Y	2.2-7.25 (150-500)
		2Z	2.2-44 (150-3000)

HRG3SL – SINGLE STAGE LINE REGULATOR SERIES CONFIGURATION

1 Gauge
G1 Model

2 Gauge
G2 Model

(1) Gauge high pressure side
(2) Gauge delivery pressure side

HOW TO ORDER:

HRG3SL - L 2W G1 S H M M C

Series

Configuration (Assembly)

G1	1 gauge
G2	2 gauge

Body Material

S	SS 316L
C	Chrome plated-Brass

Diaphragm

H	Hastelloy C-22

Inlet pressure psi (bar) / Outlet pressure psi (mbar)

K	175 (12)	2W	0.3-3.6 (20-250)
		2Y	2.2-7.25 (150-500)
L	600 (40)	2X	1.45-19 (100-1300)
		2Z	2.2-44 (150-3000)

Inlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

Outlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

Gas Type*

C	CO2
A	Argon
O	Oxygen

*For other gases please specify

LK = LET-LOK Tube Fittings
* For more fittings option please contact.

Warning!

The system designer and user have the sole responsibility for selecting products suitable for their special application requirements, ensuring their safe and trouble-free installation, operation, and maintenance. Application details, material compatibility and product ratings should all be considered for each selected product. Improper selection, installation or use of products can cause property damage or personal injury.

HRG5SA

SINGLE STAGE GAS SUPPLY PANELS

HAM-LET Group

HRG5SA SINGLE STAGE GAS SUPPLY PANELS

GENERAL

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. These gas supply panels are mounted onto a stainless-steel panel and consist of a pressure regulator, inlet and outlet pressure gauges and relief valve.
A connection of a coil or a high-pressure flexible hose is an option.

FEATURES

- 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., dependent 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. Option for Hastelloy inner parts
- DIAPHRAGM Good protection against burst and corrosion due to diaphragm material Hastelloy.
- 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

Warning!

The system designer and user have the sole responsibility for selecting products suitable for their special application requirements, ensuring their safe and trouble-free installation, operation, and maintenance. Application details, material compatibility and product ratings should all be considered for each selected product. Improper selection, installation or use of products can cause property damage or personal injury.

GENERAL

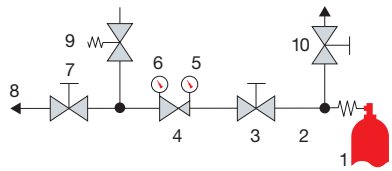
These gas supply panels are mounted onto a stainless-steel panel and consist of a pressure regulator, inlet and outlet pressure gauges, a relief valve (by downstream pressure>50bar RV on request) and shut-off valves (model - PA) at the outlet, (model-PP) at the inlet, (model -PS) at inlet and outlet) for the process gas. A choice of stainless steel coils or flexible high-pressure hoses is available for the connection to the gas cylinder.

PRESSURE OPTIONS:

INLET		OUTLET	
HTO CODE	Inlet Pressure option bar (psi)	HTO CODE	Outlet Pressure option psi (bar)
D	230 (3300)	**1N**	35-720 (2.5-50)
E	300 (4350)	**2O**	145-2900 (10-200)
		1L	15-200 (1-14)
		1M	35-400 (2,5-28)

FLOW SCHEMATIC

1. Cylinder connection
2. Coil/Hose
3. Inlet shut off valve)
4. Pressure regulator - Single-stage
5. Upstream pressure gauge
6. Downstream pressure gauge
7. Process gas outlet shut-off valve
8. Process gas outlet
9. Relief valve
10. Purge outlet valve



CONFIGURATION OPTIONS:

Model SA:
regular

Model PP:
Panel gas supply with process gas purging

Model PS:
Panel gas supply with process gas purging + shutoff valve

HRG5SA SINGLE STAGE / ONE SOURCE SUPPLY PANEL WITH EXTERNAL GAS PURGING SYSTEM

GENERAL

The supply panel type EP is mounted on a stainless-steel panel and consists of a purge valve block with check valve, a purge inlet and purge outlet valves, pressure regulator, inlet and outlet pressure gauges, a relief valve and inlet and outlet shut-off valves for inlet and outlet of the process gas. Stainless steel coils for connection to the gas cylinders are available.
Gas panels are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower line pressure. Through the subsequent piping system, the gas is taken to the point of use. The positioning of the purge block on the inlet side reduces the purge volume to a minimum (only with cylinder connection) and allows for a separate discharge for the purge gases. Type guarantees optimum purge conditions even when using toxic gases and so offers maximum safety for the user and the application. This design with external gas purging offers the following advantages:

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

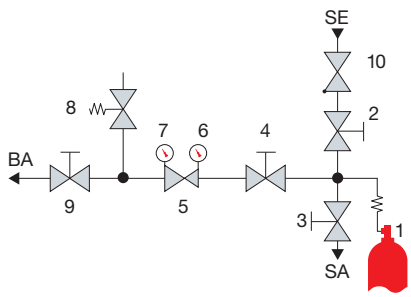
PRESSURE OPTIONS:

INLET		OUTLET	
HTO CODE	Inlet Pressure option bar (psi)	HTO CODE	Outlet Pressure option psi (bar)
D	230 (3300)	**1N**	35-720 (2.5-50)
E	300 (4350)	**2O**	145-2900 (10-200)
		1L	1-14 (15-200)
		1M	2.5-28 (35-400)

FLOW SCHEMATIC

1. Cylinder connection / Coil
2. Purge inlet valve
3. Purge outlet valve
4. Upstream shut-off valve
5. Pressure regulator
6. Upstream pressure gauge
7. Downstream pressure gauge
8. Relief valve
9. Downstream shut-off valve
10. Check valve

SE. Purge inlet
SA. Purge outlet
BA. Process gas outlet



CONFIGURATION OPTIONS:

Model EP: With external gas purging + shutoff valve

HRG5SA- SINGLE STAGE/TWO SOURCES SUPPLY PANEL WITH MANUAL CHANGE OVER SYSTEM

GENERAL

The manifold enables a continuous gas supply. The manifolds main advantage 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.

- Continuous gas supply even during cylinder change
- Fast manual switch-over to the reserve side
- Optional contact pressure gauges to monitor for gas supply failure
- Process gas purging (model MG)
- Connection for 2×1 cylinders, upgradable for 2×4 cylinders,

PRESSURE OPTIONS:

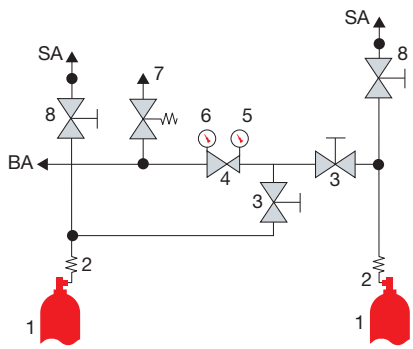
INLET		OUTLET	
HTO CODE	Inlet Pressure option bar (psi)	HTO CODE	Outlet Pressure option psi (bar)
D	230 (3300)	**1N**	35-720 (2.5-50)
E	300 (4350)	**2O**	145-2900 (10-200)
		1L	15-200 (1-14)
		1M	35-400 (2.5-28)

FLOW SCHEMATIC

1. Cylinder
2. Coil/Hose
3. Process gas inlet shut-off valve
4. Regulator single-stage
5. Upstream pressure gauge
6. Downstream pressure gauge
7. Relief valve
8. Purge outlet valve

SA. Purge outlet

BA. Process gas outlet



CONFIGURATION OPTIONS:

Model EG: Panel gas supply with external gas purging

Model ES: Panel gas supply with external gas purging+ inlet and outlet shut-off valve

HRG5SA SINGLE STAGE/TWO SOURCES SUPPLY PANEL WITH SEMIAUTOMATIC CHANGE OVER SYSTEM

GENERAL

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.

- Uninterrupted gas supply with semi-automatic Indicator for active cylinder
- Low gas alarm signal with contact gauges (optional)
- Upgradable to max. 2×4 cylinders

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

H. Lever
BA. Process gas outlet
SA. Purge gas outlet
SE. Purge gas inlet

PRESSURE OPTIONS:

INLET		OUTLET	
HTO CODE	Inlet Pressure option bar (psi)	HTO CODE	Inlet Pressure option bar (psi)
D	230 bar (3300 psi)	**2D**	14 bar (200psi)
E	300 bar (4350 psi)	**2E**	50 bar(720 psi)

CONFIGURATION OPTIONS:

Model SE

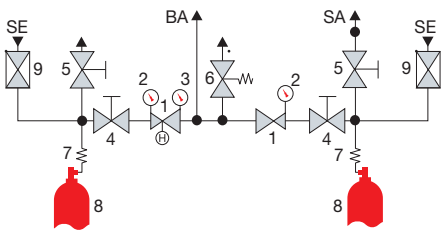
Panel gas supply semi-automatic switch-over, with inert gas purging

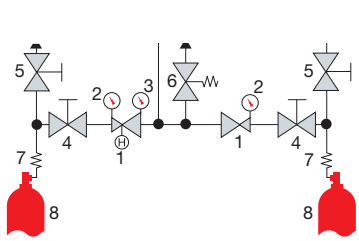
Model SP

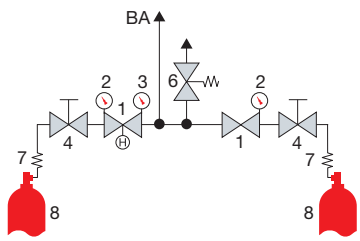
Panel gas supply with semi-automatic switch-over, with process gas purge

Model SW

Panel gas supply with semi-automatic switch-over, without purge







HRG5SA HOW TO ORDER **MANIFOLD SEMI AUTOMATIC CHANGEOVER**

HOW TO ORDER

HRG5SA - D 1M SA S - P L C KI1 HC

Series

HRG5SA

Inlet pressure psi (bar)

D	3300 (230)
E	3450 (300)

Outlet pressure psi (bar)

1L	15-200 (1-14)
1M	35-400 (2.5-28)
1N	35-720 (2.5-50)
2O	145-2900 (10-200)
1I	7-85 (0.5-6)
2D	MCP 200 (14)*
2E	MCP 720 (50)*

* For semiautomatic changeover systems.

Configuration (Assembly)

SA	Panel, one source, single stage, no purging system, outlet shut off valve
PP	Panel, one source, single stage, process gas purging system
PS	Panel, one source, single stage, process gas purging system, outlet shut off valve
EP	Panel, one source, single stage, external gas purging system, outlet shut off valve
ES	Panel, two sources, single stage, manual changeover system, process gas purging system
EG	Panel, two sources, single stage, manual changeover system, no purging system
SE	Panel, two sources, single stage, semiautomatic change-over system, external gas purging system
SP	Panel, two sources, single stage, semiautomatic change-over system, process gas purging system
SW	Panel, two sources, single stage, semiautomatic change-over system, no purging system

Body Material

S	SS 316L
B	BRASS Chrome Plated

Inlet connection

P	1/4" female NPT

Outlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
O	LK 1/4"
d	LK 1/2"
P	1/4" female NPT

Gas Type*

C	CO2
A	Argon
O	Oxygen

*For other gases please specify

Gauge

KI (1)	Inductive contact gauge

Encapsulation

HC	Hastelloy encapsulated valve

HRG5D

DUAL STAGE PRESSURE REGULATOR 5 SERIES

HAM-LET Group

HRG5D DUAL STAGE PRESSURE REGULATOR

GENERAL

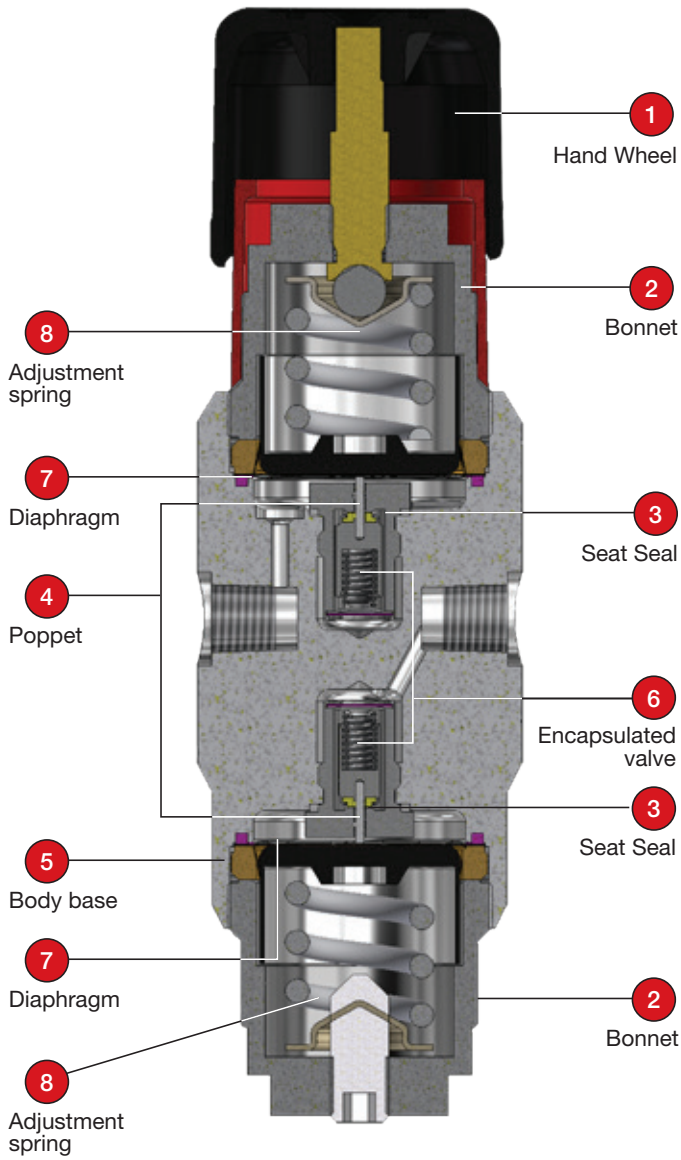
This pressure regulator reduces the upstream pressure to a lower downstream pressure. The dual-stage design ensures the uniformity of the downstream pressure irrespectively of the upstream pressure. HRG5D stands out for its precise pressure allocation, minimum space requirement and uniformity of downstream 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.

FEATURES

- **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 depending on gas type.**
- **INNER PARTS** Pressure regulator unit with integrated mesh filter from 10 µm mesh opening at inlet and 100 µm at outlet.
- **DIAPHRAGM** Good material protection against burst and corrosion due to diaphragm material Hastelloy.
- **GUARANTEED LEAKAGE RATES** $< 1\times10^{-9}$ mbar l/s Helium (body). $< 5\times10^{-6}$ mbar l/s Helium (seat).
- **WORKING TEMPERATURES** -13 °F to 158 ° (-25 °C to +70 °C)
- **PURITY** ≤ 6.0
- **INLET** pressure min-max psi (bar)
- **OUTLET** pressure min-max psi (bar)

DUAL STAGE SECTION COMPONENT DESCRIPTION

	Description	Material
1	Hand Wheel	PA6+30%GF
2	Bonnet	316L (1.4404) specially cleaned and electro-polished / brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated.
3	Seat seal	PCTFE/ FKM, EPDM, etc., dependent on gas specification and purity requirements.
4	Poppet	Brass / Stainless Steel
5	Body base	Stainless steel 316L (1.4404) specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated.
6	Encapsulated valve	SS (SS) , Brass (Brass)
7	Diaphragm	Hastelloy
8	Adjustment spring	CuBe2F930



GENERAL

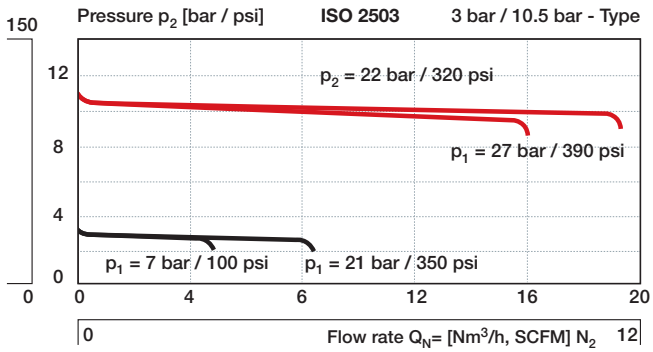
Body:	Stainless steel 316L (1.4404) specially cleaned and electro- polished
	Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Seat seals 2 nd stage:	Stainless steel: FFKM (EPDM)*, Brass: EPDM, (FKM)* (depending on gas type)
Body seals:	PCTFE (SS), PVDF (Brass).
Inlet-/Outlet:	NPT 1/4"f, optional tube fitting.
Purity	6.0

Inlet/Outlet pressure options:

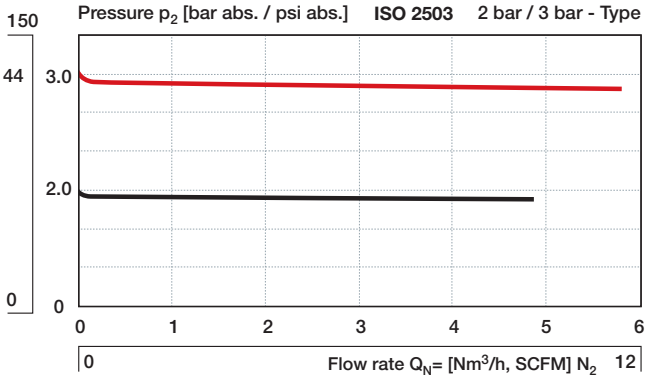
HTO CODE	Inlet Pressure option (bar)(psi)	HTO CODE	Outlet Pressure option (bar)(psi)
D	3300 (230)	**1B**	0.3-15 (0.2-1)
E	4350 (300)	**1F**	3-45 (0.2-3)
		1I	7-85 (0.5-6)
		1K	15-150 (1-10.5)
		1C	3-30 abs (0.2-2 abs)
		1G	3-45 abs (0.2-3 abs)

FLOW CHART HRG5D

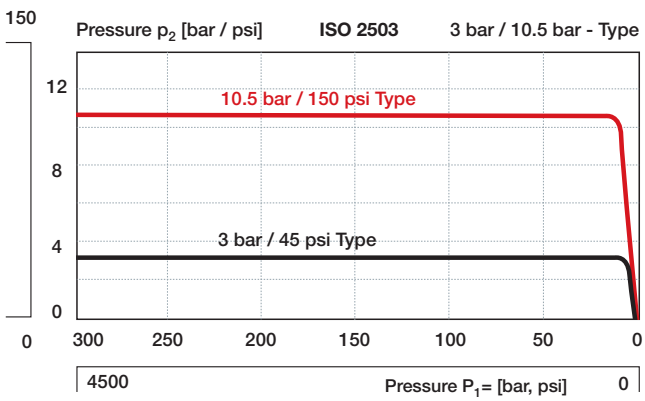
Outlet: 0.2-10.5 bar (3-150 psi)



Outlet: 0.2-10.5 bar (3-150 psi)



Outlet: 0.2-10.5 bar (3-150 psi)



HRG5DL

DUAL STAGE LINE PRESSURE REGULATOR 5 SERIES

HAM-LET Group

HRG5DL DUAL-STAGE LINE PRESSURE REGULATOR

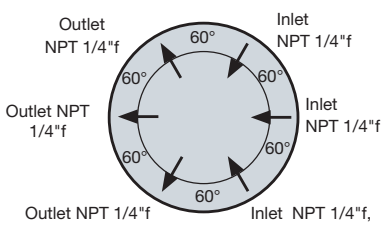
GENERAL

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 multiple inlet/outlet connections.

The HRG5DL 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 6-PORT-VERSION

(Frontal View)



FEATURES

- **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** and more depending on gas type.
- **INNER PARTS** Pressure regulator unit with integrated mesh filter from 10 µm mesh opening at inlet and 100 µm at outlet.
- **DIAPHRAGM** Good material protection against burst and corrosion due to diaphragm material Hastelloy.
- **GUARANTEED LEAKAGE RATES** $< 1\times10^{-9}$ mbar l/s Helium (body). $< 1\times10^{-6}$ mbar l/s Helium (seat).
- **WORKING TEMPERATURES** -13 °F to 158 ° (-25 °C to +70 °C)
- **PURITY** ≤ 6.0
- **INLET** pressure up to 300 bar
- **OUTLET** pressure up to 10,5 bar

CONFIGURATION OPTION

With 2 gauges
G2 Model

With 2 gauges + Relief valve
GV Model

(1) Gauge for delivery pressure side
(2) Gauge for high pressure side
(3) Relief Valve for delivery pressure

HRG5DL DUAL STAGE LINE PRESSURE REGULATOR

HOW TO ORDER:

HRG5DL - D 1B G2 S H M M C

Series

Inlet pressure psi (bar) / Outlet pressure psi (bar)

Inlet pressure psi (bar)		Outlet pressure psi (bar)	
D	3300 (230)	1B	0.3-15 (0.2-1)
		1F	3-45 (0.2-3)
E	4350 (300)	1I	7-85 (0.5-6)
		1K	15-150 (1-10.5)
D	3300 (230)	1C	3-30 abs (0.2-2 abs)
		1G	3-45 abs (0.2-3 abs)
		1E	3-30 (0.2-2)
		1F	3-45 (0.2-3)

Body Material

S	316L
C	Chrome plated-Brass

Diaphragm

H	Hastelloy C-22

Configuration (Assembly)

G2	2 Gauge
GV	With 2 gauge + relief valve

Inlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

Outlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

LK = LET-LOK Tube Fittings
* For more fittings option please contact.

Gas Type*

C	CO2
A	Argon
O	Oxygen

*For other gases please specify

Warning!

The system designer and user have the sole responsibility for selecting products suitable for their special application requirements, ensuring their safe and trouble-free installation, operation, and maintenance. Application details, material compatibility and product ratings should all be considered for each selected product. Improper selection, installation or use of products can cause property damage or personal injury.

HRG5DC

DUAL STAGE CYLINDER PRESSURE REGULATOR 5 SERIES

HAM-LET Group

HRG5DC DUAL-STAGE CYLINDER PRESSURE REGULATOR

GENERAL

The-Dual stage cylinder pressure regulator series HRG5DC offers a wide range of uses and impressive performance. The dual stage allows to control a low downstream pressure and can be used for inert, flammable and oxidizing gases and gas mixtures. The GRG5DC-OF is the basic model.

The HRG5DC-OS allows shut-off of the gas flow while maintaining the pressure regulator's adjustment. The regulating valve of the HRG5DC-OM allows a finer apportioning of gas flow.

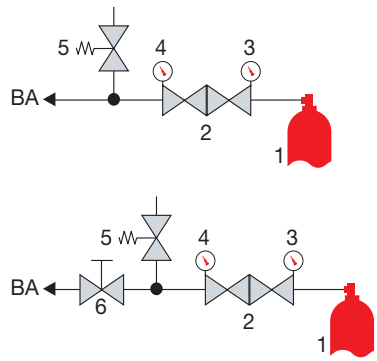
PRESSURE OPTIONS:

INLET		OUTLET	
HTO CODE	Inlet Pressure option psi (bar)	HTO CODE	Inlet Pressure option psi (bar)
E	3300 (230)	**1C**	3-30 abs (0.2-2 abs)
D	4350 (300)	**1G**	3-45 abs (0.2-3 abs)
K	175 (12)	**1B**	3-15 (0.2-1)
		1E	3-30 (0.2-2)
		1F	3-45 (0.2-3)
		1I	7-85 (0.5-6)
		1K	15-150 (1-10.5)

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 18)

BA. Process gas outlet



CYLINDER REGULATOR CONFIGURATION OPTION

Tube Fittings
OF Model

Shut-off valves
OS Model

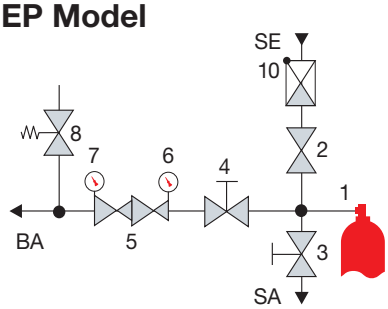
Regulating valve
OM Model

With External purging with/without shut-off valve in delivery pressure side.
EP / EV Model

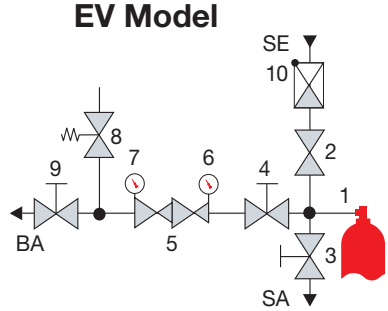
Flow Schematic

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

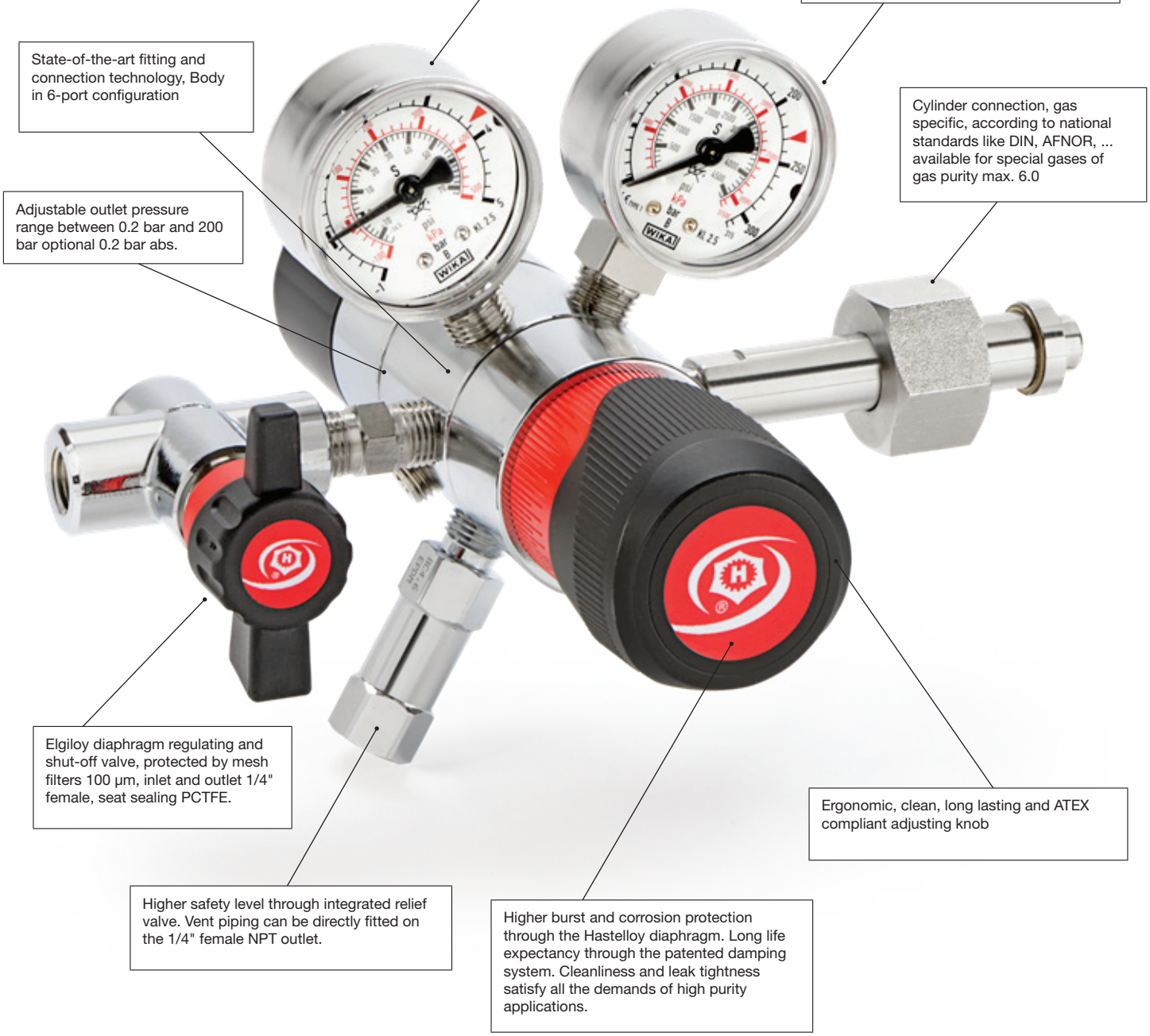
EP Model



EV Model



HRG5DC DUAL-STAGE CYLINDER PRESSURE REGULATOR



HRG5DC DUAL-STAGE CYLINDER REGULATOR SERIES

HOW TO ORDER:

Series	Inlet pressure psi (bar)	Outlet pressure psi (bar)	
K	175 (12)	1C	3-30 abs (0.2-2 abs)
		1G	3-45 abs (0.2-3 abs)
		1B	3-15 (0.2-1)
		1E	3-30 (0.2-2)
D	2900 (230)	1F	3-45 (0.2-3)
		1I	7-85 (0.5-6)
		1K	15-150 (1-10.5)
E	4350 (300)	1F	3-45 (0.2-3)
		1I	7-85 (0.5-6)
		1K	15-150 (1-10.5)

Body Material	
S	SS 316L
C	Chrome plated-Brass*

* Not for EP and EV version.

Diaphragm	
H	Hastelloy C-22
S	SS316*

*Only for purity≤ 5

Configuration (Assembly)	
OF	With outlet tube fitting
OS	Outlet shut-off valve
OM	Outlet metering valve
EP	External gas purging
EV	External gas purging + Shutoff valve

H

Connection Types	
D	DIN 477
A	ASNI
R	AFNOR
B	NBN
S	BS
CXX	CGA*
E	NEN
O	other upon request

D

* (must specify code ,2 digits from table)

Outlet Fitting	
L	LK 6 MM
M	LK 8 MM
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

M

LK = LET-LOK Tube Fittings
* For more fittings option please contact.

Gas Type*	
N	Ammonia
L	Chlorine
HL	Hydrogen Chlorine
A	Argon
O	Oxygen

N

*For other gases please specify

**CGA		
AA	590	Air industrial
AB	660	Ammonia ,anhydrous
AC	580	Argon
AD	320	Carbon dioxide
AE	350	Carbon monoxide
AF	660	Chlorine
AG	350	Ethane
AH	350	Ethylene
AI	580	Helium
AJ	350	Hydrogen
AK	330	Hydrogen chloride
AL	330	Hydrogen sulfide
AN	580	Krypton
AM	350	Methane, natural gas
AO	660	methyl chloride
AP	330	methyl mercaptan
AU	50	neon
AV	660	nitric oxide
AW	580	nitrogen
AX	660	nitrogen dioxide
AY	540	oxygen
AZ	660	phosgene
BA	580	refrigerant-14
BB	660	refrigerant-22
BC	660	sulfur dioxide
BD	590	sulfur hexafluoride
BE	580	Xenon

Warning!

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HRG5DA

DUAL STAGE GAS SUPPLY PANEL

HAM-LET Group

HRG5DA DUAL-STAGE GAS SUPPLY PANELS

GENERAL

Dual-stage Regulator 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. These gas supply panels are mounted onto a stainless-steel panel and consist of a pressure regulator, inlet and outlet pressure gauges and relief valve.
A connection of a coil or a high-pressure flexible hose is an option.

FEATURES

- **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** and more.
- **INNER PARTS** Pressure regulator unit with integrated mesh filter from 10 µm mesh opening at inlet and 100 µm at outlet.
- **DIAPHRAGM** Good material protection against burst and corrosion due to diaphragm material Hastelloy.
- **GUARANTEED LEAKAGE RATES** $< 1\times10^{-9}$ mbar l/s Helium (body). $< 5\times10^{-6}$ mbar l/s Helium (seat).
- **WORKING TEMPERATURES** -13 °F to 158 ° (-25 °C to +70 °C)
- **PURITY** ≤ 6.0
- **INLET** pressure min-max psi (bar)
- **OUTLET** pressure min-max psi (bar)

DUAL-STAGE / ONE SOURCE SUPPLY PANEL

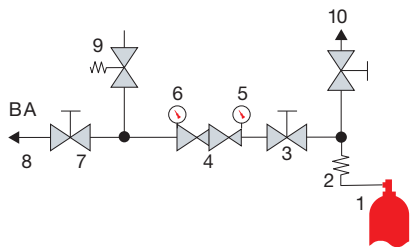
GENERAL

Dual station pressure regulators are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower, constant inlet pressure for the user. The model -PP allows for process gas purging to be carried out while cylinders are being changed. The model-PS design allows shutting-off of gas flow during cylinder change from the panel itself. Standard application for these panels: Centralized or decentralized gas supply for highly sensitive analysis devices. 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 (model SA at the outlet, model PP at the inlet, model PS at inlet and outlet) for the process gas. A choice of stainless steel pigtails or flexible high-pressure hoses is available for the connection to the gas cylinder. The use of contact gauge (accessories) in conjunction with alarm box (accessories) facilitates the monitoring of gas reserves. Vent gas piping for attachment to the relief valve can be ordered as an optional extra.
Downstream pressure is independent of the upstream pressure due to the dual-stage design

- Gas supply panel for standard applications (model SA)
- Process gas purging (model PP)
- Process gas purging and process gas outlet shut-off valve (model PS)

FLOW SCHEMATIC

1. Cylinder
2. Coil/Hose
3. Upstream shut-off valve
4. Pressure regulator - dual-stage
5. Upstream pressure gauge
6. Downstream pressure gauge
7. Process gas outlet shut-off valve
   8Process gas outlet
8. Relief valve
9. Purge gas outlet valve
   Purge outlet
10. Process gas outlet



PRESSURE OPTIONS:

INLET		OUTLET	
HTO CODE	Inlet Pressure option bar (psi)	HTO CODE	Inlet Pressure option psi (bar)
D	3300 (230)	**1F**	3-45 (0.2-3)
E	4350 (300)	**1I**	7-85 (0.5-6)
		2K	7-145 (0.5-10)

CONFIGURATION OPTIONS:

Model SA:
regular

Model PP:
Panel gas supply with process gas purging

Model PS:
Panel gas supply with process gas purging + shut-off valve

HRG5DA DUAL-STAGE/ONE SOURCE SUPPLY PANEL WITH EXTERNAL GAS PURGING SYSTEM

GENERAL

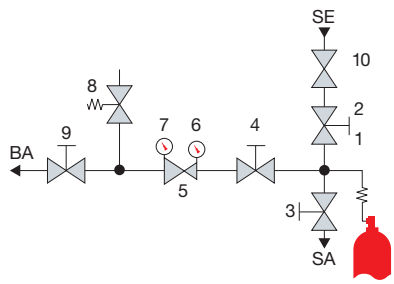
Dual station pressure regulators are permanently installed in the cylinder stock room or cabinet near the point of use and reduce the cylinder pressure to a lower pressure for the user. Through the subsequent piping system, the gas is taken to the point of use. The positioning of the purge block on the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

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

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

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

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



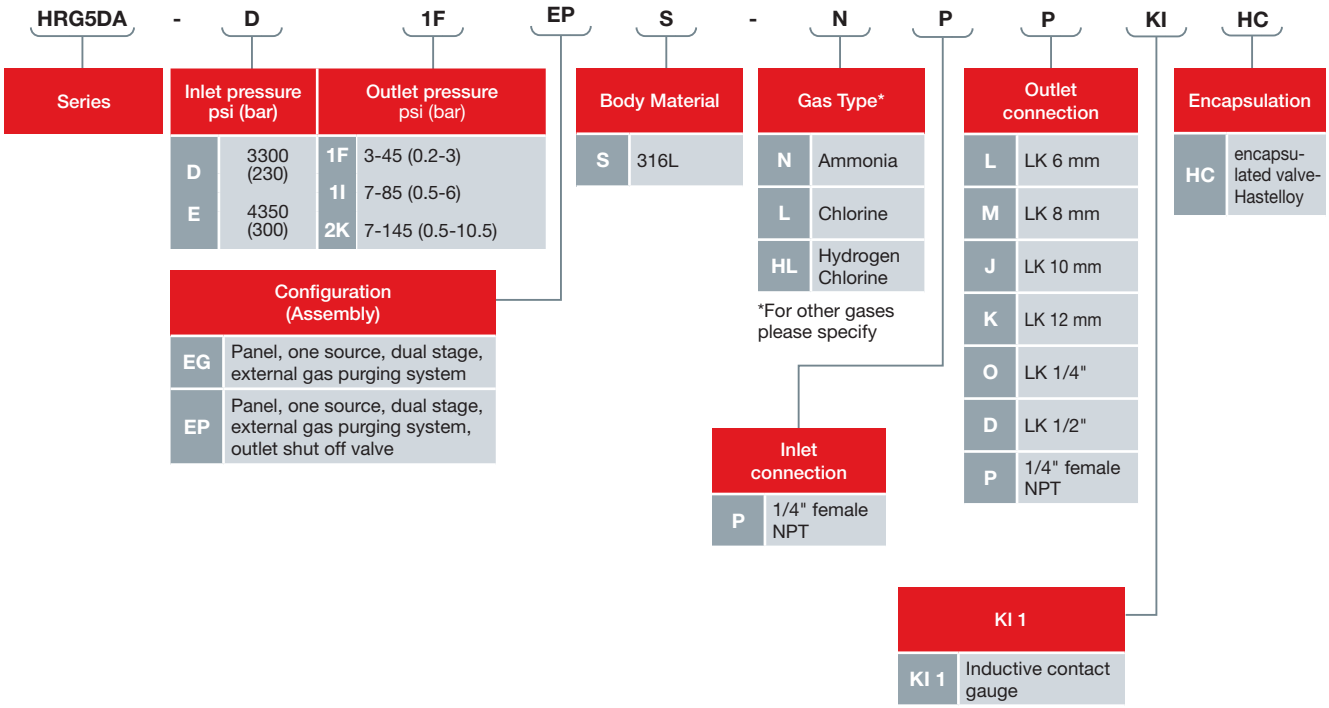
CONFIGURATION OPTIONS:

PRESSURE OPTIONS:

INLET		OUTLET	
HTO CODE	Inlet Pressure option bar (psi)	HTO CODE	Inlet Pressure option psi (bar)
D	230 bar (3300 psi)	**1F**	3-45 (0.2-3)
E	300 bar (4350 psi)	**1I**	7-85 (0.5-6)
		2K	7-145 (0.5-10.5)

DUAL-STAGE/ONE SOURCE SUPPLY PANEL WITH EXTERNAL GAS PURGING SYSTEM

HOW TO ORDER:



Warning!

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HRG5DA-DUAL STAGE/TWO SOURCES SUPPLY PANEL WITH SEMIAUTOMATIC CHANGEOVER SYSTEM

GENERAL

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.
Thus 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 changeover is needed.

- 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

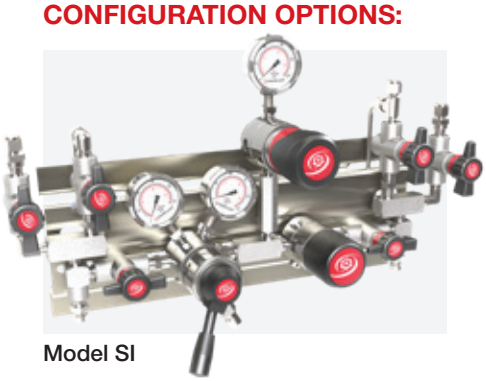
PRESSURE OPTIONS:

INLET		OUTLET	
HTO CODE	Inlet Pressure option psi (bar)	HTO CODE	Inlet Pressure option psi (bar)
D	3300 (230)	**1F**	0.2-3 bar (3-45)
E	4350 (300)	**1I**	0.5-6 bar (7-85)
		2K	0.5-10.5 bar(7-14)

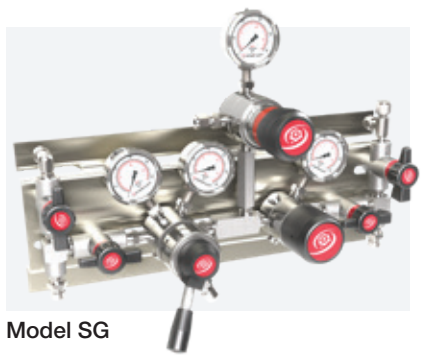
FLOW SCHEMATIC

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

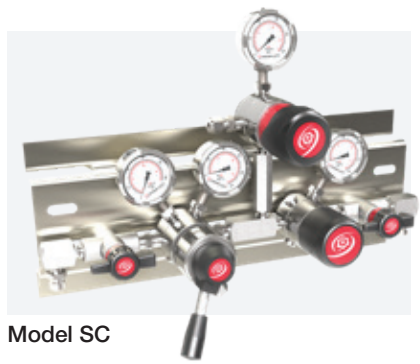
CONFIGURATION OPTIONS:



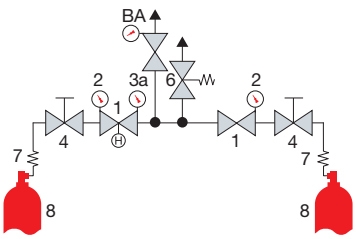
Model SI

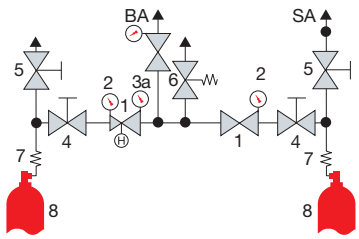


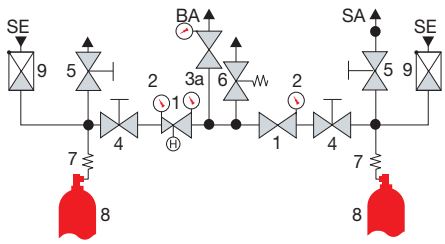
Model SG



Model SC







HRG5DA DUAL-STAGE / TWO SOURCES SUPPLY PANEL WITH SEMIAUTOMATIC CHANGEOVER SYSTEM

HOW TO ORDER:

HRG5DA - D 1M SC S P - M - N

Series

HRG5DA

Inlet pressure psi (bar)

D	3300 (230)
E	4350 (300)

Outlet pressure psi (bar)

1F	3-45 (0.2-3)
1I	7-85 (0.5-6)
2K	7-145 (0.5-10.5)

Configuration (Assembly)

SC	Panel, two sources, two stages, semiautomatic changeover system, no purging system
SG	Panel, two sources, two stages, semiautomatic changeover system, process gas purging system
SI	Panel, two sources, two stages, semiautomatic changeover system, external gas purging system

Body Material

S	316L
B	BRASS Chrome Plated

Inlet connection

P	1/4" female NPT

*Please specifiy gas

Outlet connection

L	LK 6 MM
M	LK 8 MM
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

LK = LET-LOK Tube Fittings
* For more fittings option please contact.

Gas Type*

N	Ammonia
L	Chlorine
HL	Hydrogen Chlorine
A	Argon
O	Oxygen

*For other gases please specify

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ACCESSORIES

HAM-LET Group

GENERAL

The 2-Port-purge block consists of a cylinder connection, check valve, purge gas inlet and purge gas outlet shut-off valves. The 3-Port-configuration also includes a process gas shut-off valve. The regular routine surface cleansing and ensuing quality control minimizes the potential of contamination. The triple valve block is used for external gas purging of high purity or corrosive gases and ensures continued gas purity during the cylinder switch over. This purge unit guarantees the necessary safety when toxic gases are used. The benefit of these purge blocks with its wide range of applications lies in the optimum safety for the application and for the operator.

TECHNICAL DATA

Body:	Stainless steel 1.4404 specially cleaned and electro-polished or Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Elgiloy
Body seals:	PCTFE
Nominal width:	DN 5
KV-value:	0.15
Weight:	approx. 1.0 kg (2-port), 1.4 kg (3-port)
Dimensions:	PE2: approx. 80×90×150 mm
	PE3: approx. 120×90×150 mm
Inlet- and outlet filters:	100 µm mesh
Purge gas inlet:	check valve, tube fitting 6 mm
Purge gas outlet:	NPT 1/4"f, optional tube fitting
Inlet:	Cylinder connection DIN 477 longer cylinder connections optional
Outlet:	NPT 1/4"f, optional tube fitting

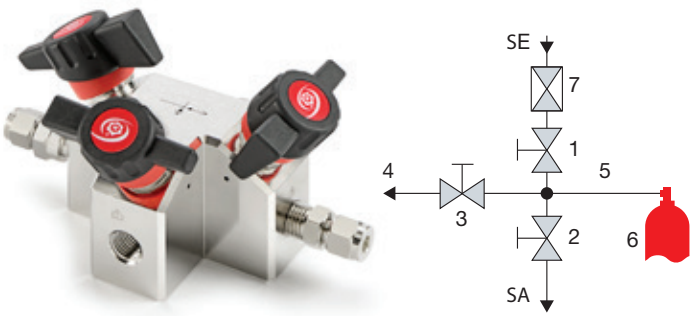
GENERAL

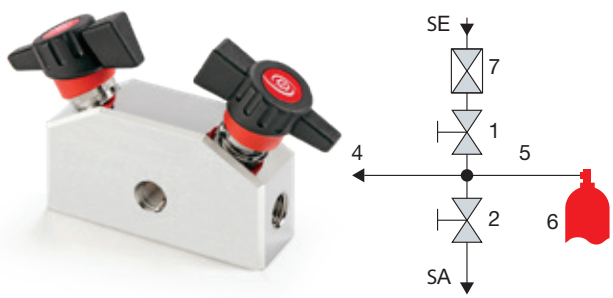
- For pure gases and gas mixtures, no oxygen
- Purity max. 6.0
- 2- or 3-port version
- Manual purging
- Nominal pressure 230 bar / 3300 psi
- Maintaining gas purity near to the gas source
- No contact between the process gas and the ambient air
- Quick operation of shut-off valve with only quarter turn
- Clearly visible open/closed position
- Optimum purge conditions
- Wide range of applications
- Inlet- and outlet filters

FLOW SCHEMATIC

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

SE. Purge intlet
SA. Purge outlet





HOW TO ORDER

HRGA - PE2 - D S D - M

Series
HRGA

model	
PE2	Two valve version
PE3	Three valve version

The inlet is for the external purge gas

pressure psi (bar)	
D	3300 (230)

material	
S	Stainless steel
C	Brass chrome-plated*

*PE2 only

Connection Types	
D	DIN 477
A	ASNI
R	AFNOR
B	NBN
S	BS
CXX	CGA*
E	NEN
O	other upon request

* (must specify code ,2 digits from table)

Process gas and purg gas	
L	LK 6 MM
M	LK 8 MM
N	LK 1/8"
O	LK 1/4"
P	1/4" female NPT

LK = LET-LOK Tube Fittings
* For more fittings option please contact.

**CGA		
AA	590	Air industrial
AB	660	Ammonia ,anhydrous
AC	580	Argon
AD	320	Carbon dioxide
AE	350	Carbon monoxide
AF	660	Chlorine
AG	350	Ethane
AH	350	Ethylene
AI	580	Helium
AJ	350	Hydrogen
AK	330	Hydrogen chloride
AL	330	Hydrogen sulfide
AN	580	Krypton
AM	350	Methane, natural gas
AO	660	methyl chloride
AP	330	methyl mercaptan
AU	50	neon
AV	660	nitric oxide
AW	580	nitrogen
AX	660	nitrogen dioxide
AY	540	oxygen
AZ	660	phosgene
BA	580	refrigerant-14
BB	660	refrigerant-22
BC	660	sulfur dioxide
BD	590	sulfur hexafluoride
BE	580	Xenon

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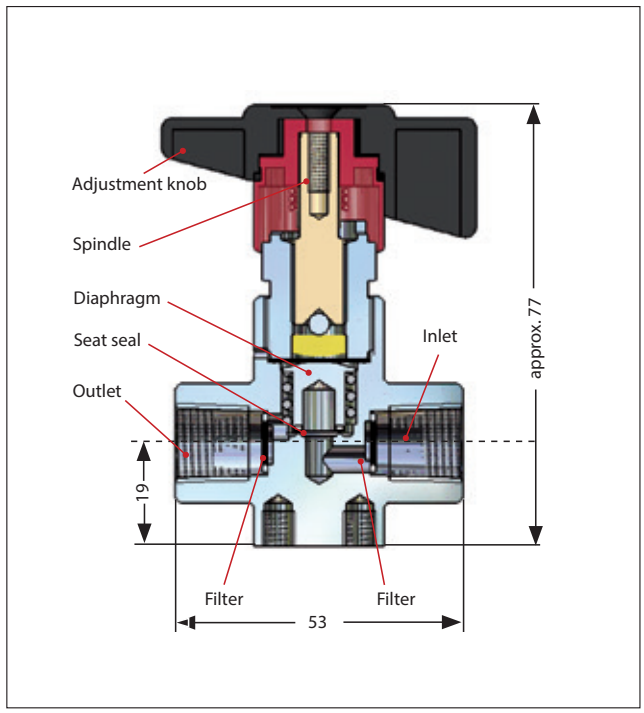
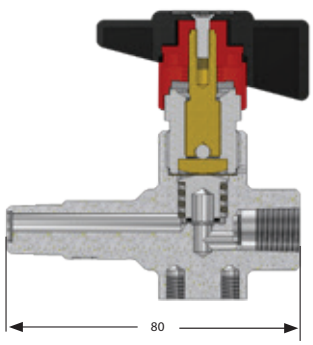
GENERAL

The diaphragm valve HRADSV is characterized through its outstanding functional safety and high leak tightness. The open/closed position on the valve is achieved through a 90°-turn of the handle (with a click into the end position).
A line shut-off in a centralized high purity gas supply. A system component in high and low-pressure areas.

- For inert, reactive, flammable and oxidizing gases and gas mixtures,
- Purity max. 6.0,
- Inlet pressure: HRGADSV-D: 230 bar/ 3300 psi
  HRGADSV-E: 300 bar /4350 psi
  HRGADSVL-E: 300 bar /4350 psi*

Body:	Stainless steel 1.4404 specially cleaned and electro-polished or Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Elgiloy
Body seals:	PCTFE
Nominal width:	DN 5
KV-value:	0.15
Weight:	approx. 1.0 kg (2-port), 1.4 kg (3-port)
Dimensions:	PE2: approx. 80×90×150 mm
	PE3: approx. 120×90×150 mm
Inlet- and outlet filters:	100 µm mesh
Inlet:	NPT 1/4"
Outlet:	NPT 1/4"female, optional tube fitting





* HRGADSVL-E: diaphragm shut-off valve long extantion

DSVL Type

DSV Type

ACCESSORIES HRGA**DSV** DIAPHRAGM SHUT-OFF VALVE

HOW TO ORDER

HRGA - PE2 - D - S - D - A

Series		model		pressure psi (bar)		material		Inlet connection		Outlet connection	
		DSV	Diaphragm Shut-Off Valves	D	3300 (230)	S	stainless steel	L	LK 6 mm	L	LK 6 mm
		DSVL	Diaphragm Shut-Off Valves Long Extantion	E	4350 (300)	C	brass chrome-plated	M	LK 8 mm	M	LK 8 mm
								J	LK 10 mm	J	LK 10 mm
								K	LK 12 mm	K	LK 12 mm
								O	LK 1/4"	O	LK 1/4"
								d	LK 1/2"	d	LK 1/2"
								P	1/4" female NPT	P	1/4" female NPT

Warning!

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ACCESSORIES HRGA**DRV** DIAPHRAGM REGULATING VALVE

GENERAL

The regulating valve HRADRV has a very good regulating characteristic and is very finely adjustable both by greater as also by lesser flow rate values. As a system component in low pressure areas. As an accessory for cylinder and point-of-use regulators for fine adjustment of the gas flow. As system element in apparatus and analytical equipment.

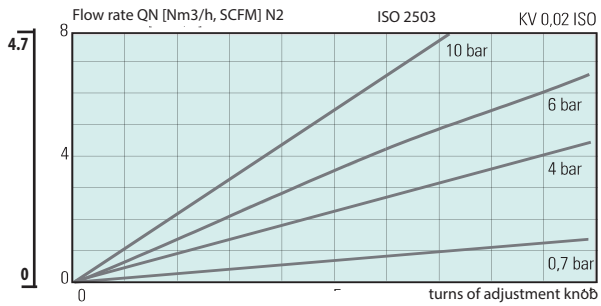
TECHNICAL DATA

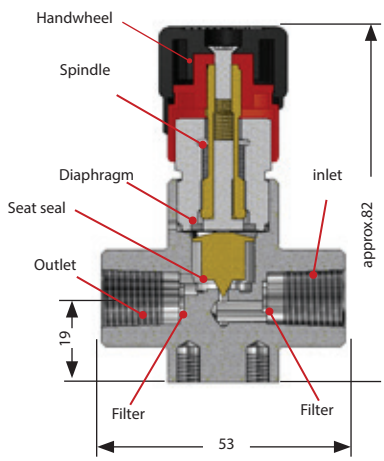
Body:	Stainless steel 1.4404 specially cleaned and electro-polished or Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Elgiloy
Body seals:	hardened stainless steel cone
Leakage rate:	< 1×10^{-4} mbar l/s Helium (seats), < 1×10^{-9} mbar l/s Helium (outboard)
Dimensions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

FEATURES

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

PERFORMANCE DATA





ACCESSORIES HRGA**DRV** DIAPHRAGM REGULATING VALVE

HOW TO ORDER

HRGA - DRV - C - S - D - A

Series
HRGA

model	
DRV	Diaphragm Regulating Valves

pressure psi (bar)	
C	720 (50)
F	600 (40)

*For Oxygen only

material	
S	stainless steel
C	brass chrome-plated

Inlet connection	
L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
O	LK 1/4"
d	LK 1/2"
P	1/4" female NPT

Outlet connection	
L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
O	LK 1/4"
d	LK 1/2"
P	1/4" female NPT

Warning!

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ACCESSORIES HRGA**DRV** DIAPHRAGM REGULATING VALVE WITH SHUT-OFF FUNCTION

GENERAL

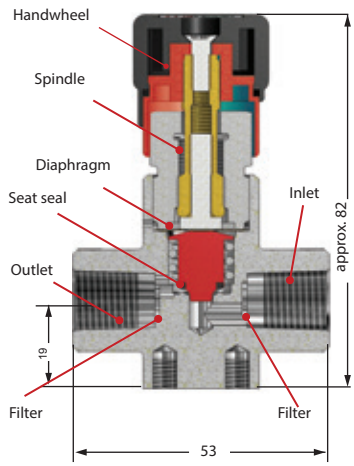
The regulating valve HRADRV has a very good regulating characteristic and is very finely adjustable both by greater and lesser flow rate values. As a system component in low pressure areas. As accessory for cylinder and point-of-use regulators for fine adjustment of the gas flow. As system element in apparatus and analytical equipment.

TECHNICAL DATA

Body:	Stainless steel 1.4404 specially cleaned and electro-polished or brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy C
Body seals:	PCTFE
Leakage rate:	< 1×10-6 mbar l/s Helium (seats), < 1×10-9 mbar l/s Helium (outboard)
Dimensions (w×h×d):	approx. 53×100×42 mm
Nominal width:	DN 8 NPT 3/8 DN5 NPT 1/4
Working temperature:	-25° to 70°C / -13 °F to 158 °F
Kv-value:	0.5
Inlet/outlet filter:	100 µm mesh SS
Weight:	approx. 280 g
Inlet Filter:	100 µm mesh on inlet and outlet, SS
Vacuum capable:	yes
Weight:	approx. 380 g
inlet/Outlet:	NPT 1/4" female (SS, BC) or G3/8"f (SS, B)

FEATURES

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



ACCESSORIES HRGA**DRV** DIAPHRAGM REGULATING VALVE WITH SHUT-OFF FUNCTION

HOW TO ORDER

HRGA - DRS - C - S - D - A

Series
HRGA

model	
DRS	Diaphragm Regulating ValveWith Shut-Off Function

pressure psi (bar)	
C	720 (50)
F	600 (40)

*For Oxygen only

material	
S	stainless steel
C	brass chrome-plated

Inlet connection	
L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
O	LK 1/4"
D	LK 1/2"
P	1/4" female NPT

Outlet connection	
L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
O	LK 1/4"
D	LK 1/2"
P	1/4" female NPT

*Please specifiy gas

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HRGA ACCESSORIES HRGA**DSL** DIAPHRAGM SHUT-OFF VALVE LOW PRESSURE

GENERAL

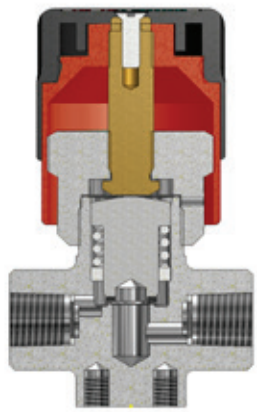
The diaphragm valve HRGADSL with shut-off function enables the easy shut-off of the gas flow with the turn of an adjustment knob. The valve is particularly suitable as system component for applications in low pressure areas for high gas flow.

FEATURES

- Higher flow rates
- Leakage rate less than 1×10-8 mbar l/sec
- Gas wetted surfaces are specially cleaned and diffusion tight

TECHNICAL DATA

Body:	Stainless steel 1.4404 specially cleaned and electro-polished or Brass CW614 (CuZn39Pb3) specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy C
Body seals:	PCTFE
Leakage rate:	< 1×10-6 mbar l/s Helium (seats), < 1×10-9 mbar l/s Helium (outboard)
Dimensions (w×h×d):	approx. 53×100×42 mm
Nominal width:	DN 8 NPT 3/8 DN5 NPT 1/4
Working temperature:	-25° to 70°C / -13 °F to 158 °F
Kv-value:	0.5
Inlet/outlet filter:	100 µm mesh SS
Weight:	approx. 280 g
Inlet Filter:	100 µm mesh on inlet and outlet, SS
Vacuum capable:	yes
Weight:	approx. 380 g
inlet/Outlet:	1/4" female NPT (SS, BC) or 3/8" FBSPP (SS, B)



HOW TO ORDER

HRGA - DSL - F S D - A C

Series

HRGA

model

DSL	Diaphragm Shut-Off Valve Low Pressure

pressure psi (bar)

F	600 (40)

material

S	stainless steel
C	brass chrome-plated
B	Brass

Inlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
O	LK 1/4"
D	LK 1/2"
P	1/4" female NPT

Outlet connection

L	LK 6 mm
M	LK 8 mm
J	LK 10 mm
K	LK 12 mm
O	LK 1/4"
D	LK 1/2"
P	1/4" female NPT

Gas type

C	Carbon Dioxide
A	Argon
O	Oxygen

*For other gases please specify

* Each inlet and outlet connection comes as a stainless steel or brass chrome plated version. Please add either the abbreviation SS or B to your order.

ACCESSORIES HRGA**PSV** (HRG4SP) SHUT-OFF VALVES

GENERAL

These valves can be combined in many ways with the numerous components of the lab system in particular with the pressure regulator G4SP, These regulating valves are characterized by their outstanding operational reliability and extreme leak-tightness.

FEATURES

- Very fine flow rate adjustment
- Gas type specific identification according to EN 13792
- Very easily purged

TECHNICAL DATA

Body	Stainless steel 1,4404 specially cleaned and electro-polished or brass 2.0401.26 specially cleaned, nickel-plated and chrome-plated
Diaphragm:	Hastelloy
Seat seals:	PCTFE
Leakage rate:	< 1×10-6 mbar l/s Helium (seat)
	< 1×10-9 mbar l/s Helium (outboard)
Vacuum capable:	yes
Nominal width:	DN 5
Kv-value:	< 0.2
Working temperature:	-25 °C to 70 °C / -13 °F to 158 °F
Weight:	approx. 500 g
Inlet - Outlet:	1: G1/4"f - G3/8"m
	2: G3/8"f - G3/8"m

1: Side Inlet

2: Back Inlet

HOW TO ORDER

HRGA	PSV	-	F	S	B	L	-	V
Series	model		pressure psi (bar)	material	Inlet Location	Inlet connection		Outlet connection
	PSV (Hrg4sp) Shut-Off Valves		F 600 (40)	S Stainless steel	B Back	L KL6		V 3/8 FBSPP
				C Brass chrome-plated	S Side	M KL8		*Please specifiy gas
						V 3/8 FBSPP		
						W 1/4 FBSPP		

Warning!

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ACCESSORIES HRGA**COG** CONTACT GAUGE

GENERAL

Contact gauge with inductive contact (KI), for visual and acoustic warning of low gas supply pressure and to monitor the cylinder pressures; for inert, combustible, oxidizing and corrosive gases and gas mixtures, nominal pressure maximum 300 bar, These pressure measuring instruments have a robust chrome nickel steel/cooper-zinc-alloy housing in accordance with DIN 16063. It indicates when the gas cylinder is empty and by sinking cylinder pressure an inductive contact switch is activated.

The switch point, i.e. the pressure level at which the signal should be triggered is freely adjustable within a sector of 45° (at 315 bar types e.g. 38 bar). To set the switch point, the pressure level marking is simply adjusted to the desired switch point. Panel and manifolds can be fitted out with contact gauges as an option. Contact gauges combine the advantages of a local display with the demand for an electric signal transmission. This allows for - in conjunction with special signal boxes - the optical and acoustic warning signal by low gas supply pressure or the monitoring of the line pressure with freely adjustable threshold.

FEATURES

Measuring element:	Bourbon tube
Diameter:	50 mm
Design:	Chemical-safety version DIN 16063
Housing:	CrNi-steel/copper-zinc-alloy
Measuring element:	CrNi-steel 1.4571, circular form/copper-zink-alloy
Inspection glass:	Polycarbonate
Accuracy:	Class 2.5 (DIN 16005)
Wrench size:	14 mm
Nominal pressure:	230 bar/ 300 bar
Display range:	see gauge scale
Threshold:	Freely adjustable in marked range (45° of the display range from p = 0 originating)
Gas suitability:	All gases
inlet/Outlet:	NPT 1/4"f (SS, BC) or G3/8"f (SS, B)
Contact:	inductive slit sensor (in accordance with NAMUR)
Working temperature:	ambient: -25°C to +70°C measuring medium maximum +100°C
Protection class:	II 2 G EEx ia IIC T6, PTB 99 ATEX 2219 X
Switching hysteresis:	+/- 5 % (SEW)
Control behavior:	Contact type 1 (I1), contact of low impedance with increasing pressure
Dimensions (Ø×d×h):	50×35×70 mm
Connection:	NPT 1/4"m outside thread

HOW TO ORDER

STAINLESS STEEL:	**BRASS:**	**MAXIMAL WORKING PRESSURE:**
1. DMPS50-LN1/4N-EP315D-LC6	1. DMPB50-LN1/4N-EP315D-LC6	230 bar
1. DMPS50-LN1/4N-EP400D-LC6	1. DMPB50-LN1/4N-EP400D-LC6	300 bar

MAXIMAL SCALE VALUE:	**INLET CONNECTION:**
315 bar	NPT 1/4" m
400 bar	NPT 1/4" m

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ACCESSORIES HRGA**SBD** SIGNAL BOX

GENERAL

The gas management signal box HRASBD 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 office, a control unit or an external signaling device. Any equipment is possible for use as a signal transmitter if it has either a mechanical contact or an inductive contact in accordance with DIN 19234 NAMUR.

The HRASBD is used for all kinds of alarm signaling, predominantly for monitoring gas supply or metered flow in gas applications. Monitoring of gas supply can be done by controlling the upstream or downstream pressure (using contact gauges), the weight of the bottle or through monitoring rupture disks, dependent upon model for as many as 10 cylinders simultaneously. Flow switches, floaters or mass flow controllers are suitable as signal transmitters for the monitoring of metered flow.

TECHNICAL DATA

CONNECTION LOAD	
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
INLETS	
Signal transmitter:	zero potential, mechanical contacts, initiators comply with DIN 19234 (NAMUR)
Effective direction:	NC (normally closed)
Connection system:	2 wires
Signal transmitter supply:	10 V max. throughout the instrument, 10 mA max. (short circuit proof)
Max. load/circiut:	330 mH/ 4.0 µF (EEx ib IIC); 1000 mH/30.0 µF (EEx ib IIB)
Cable monitoring:	Short circuit I> 6 mA, cable break I<80 µA
(optional):	
Connection cross section:	2.5 mm² max.
OUTLET (COLLECTIVE ALARM)	
Alarm output:	2* relay output (1 change over contact)
Contact load:	max. 230 V ~, 50 Hz, 100 VA max. 48 V , 1A
INTERNAL ALARM EQUIPMENT	
Signal lamp:	LED green 5 mm
Acoustic alarm:	Piezo buzzer, f = 3.3 kHz
Collective alarm:	via zero potential break contact
AMBIENT CONDITIONS	
Ambient temperature:	max. 40 °C
Humidity:	0 – 95 % rel. humidity, not condensing
DESIGN	
Housing:	Polystyrene color similar to RAL 7035 (light grey)
Protection category:	IP 54
Dimensions (w×h×d):	200×160×60 mm
Installation position:	upright

HOW TO ORDER:

HRGA	SBD	-	O2N	EX	230
Series	model		Singnals	Ec Protaction	Power Supply
	SBD Signal box		02N 2 Channels	0 With out	230 220-250 V/AC, 50-60 Hz
			04N 4 Channels	EX With	110 110 V/AC, 60Hz
			06N 6 Channels		
			10N 10 Channels		