Gas Pressure Regulator

F-P Serie DN25 - DN150

Main Features

Direct-acting F-P Serie Gas Pressure Regulators According to 2014/68/EU Directive, EN334 and EN 14382

- **Balanced valve**
- **Rugged construction for durability**
- **Wide pressure regulation range**
- **Full seal at zero flow**
- **Easy maintenance**
- **Optional minimum and/or maximum pressure slam-shut device**
- **Optional silencer internal and/or external**
- **With or Without SSV**
- **With electric position indicator SSV closed by an inductive proximity switch**
- **Combined monitoring system**
- **Bypass system for to activate ssv easily**

Technical Features

H2 Ready

Maximum allowable pressure –PS	25 bar
Inlet pressure range –bPu	0.2 – 25 bar
Outlet pressure range –Wd	15 – 16.000 mbar
Allowable temperature –TS[1]	-20 °C to +60 °C
Inlet gas temperature	-20 °C to +60 °C
Accuracy class –AC	up to AC 2.5
Lock-up pressure class –SG	up to SG 5
Nominal size –DN	DN25 1'' | DN40 11/2'' | DN50 2'' | DN65 21/2'' DN80 3'' | DN100 4'' | DN150 6''
Connections[3]	PN16, PN25 according to ISO 7005 Class 150 RF according to ASME B16.5 and

[1] Low temperature version -40°C: available on request
[3] On request for other connection class

Metarials

Body[1]	EN-GJS 500-7
Main Actuator[2]	Ø280 mm Aluminium cast alloys Ø380 mm Cast steel Ø520 mm Carbon Steel
Seat[2]	DN up to 2'' Brass DN up to 21/2'' to 6'' Stainless Steel
Internal Parts[2]	Stainless steel and brass
Seals	NBR+canvas (powered by hot operation process)
Diaphragm	Synthetic rubber with fabric reinforcement

[1] A 216 WCB: available on request
[2] Other materials available on request

Standards and certificates

Applied directives:

Pressure Equipment Directive –PED (EU) EU/2014/68

Compliance with the regulations of the applied directives is verified by the adherence to the following standards / regulations:

- Gas pressure regulators for inlet pressure up to 100 bar EN 334:2019
- Gas safety shut-off devices for inlet pressures 100 bar EN 14382:2019
- EU Desing Examination Certificate 2195-PED-20081-T
- UkrSepro Tecnical Regulations for Pressure Equipment UA.TR.012C.0368

The relevant valid edition of the standards can be found in the declaration of conformity!

Use

General Gases :

Natural gas, town gas, propane, butane, air, nitrogen or all non-corrosive gases

Suitable for use with previously filtered gaseous fluids, it is mainly used for medium and low pressure natural gas distribution networks. Biogas resistant up to 0.1% H2S dry for standard version.

Hydrogen Ready :

Suitability of natural gas-hydrogen mixtures or pure hydrogen.
When using the F-P Serie, a manufacturer's declaration and nofied body reports can be provided on request.

Biogas or Biomethane Version :

Suitable for biogases and recycling gases
– up to maximum 1% by volume H2S, dry
– up to maximum 1% by volume NH3,
dry No non-ferrous metals (except in very small quantities found in the plastic components)

Biogas version of F-P Serie are also designed for slightly aggressive, dry gases.

Gases according such as biogases, landfill gases, sewage gases, other recycled gases, process gases, and air. The chemical composition and aggressiveness of each biogas or recycled gas is different, not constant, and dependent on several factors.

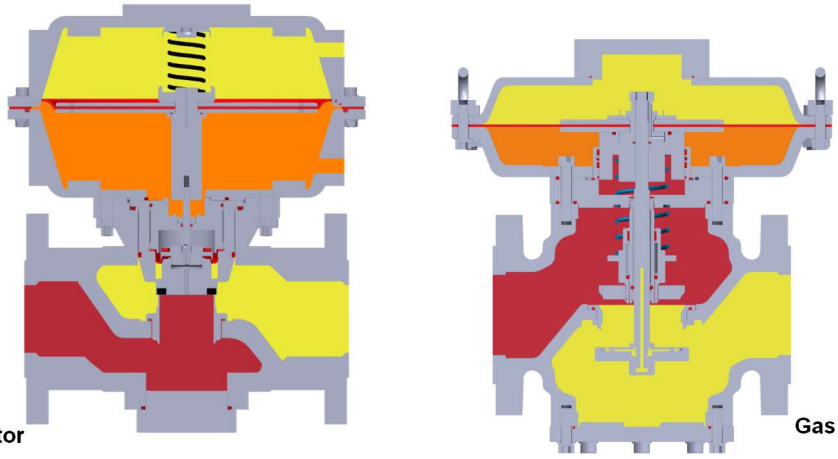
The aggressiveness of the gas notably increases:
- as the hydrogen sulfide content H2S increases
- with the moisture content of the gas, condensation is not permitted inside the regulator

In consultation with Gastech, users must decide whether the materials used for the F-P Serie are suitable for the intended types of recycling gas. These gases can vary in terms of both their composition and the respective concentration of the components.

As a result, it is not possible to make any warranties or definitive statements regarding service life. An assessment should be carried out to determine the suitability of the gas used.

⚠ For safety reasons, we strongly recommend
- the installation of a safety relief Valve and SSV device
- a visual inspection of the F-P Serie regulator at intervals of 3 to 6 months
- Function and leakage tests

Desing,
Operational Diagram

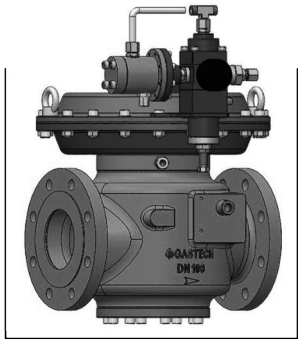


Gas Pressure Regulator
DN25 – 1''
DN40 – 11/2''
DN50 – 2''

Inlet Pressure Outlet Pressure Motorized Pressure

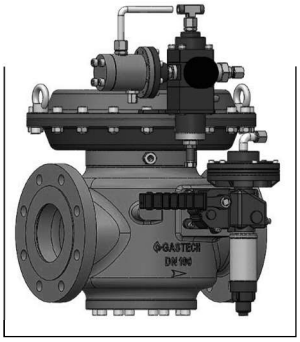
Gas Pressure Regulator
DN65 –2$_{1/2}$''
DN80 – 3''
DN100 – 4''
DN150 – 6''

Configurations

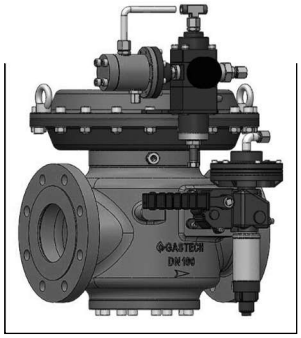


Gas Pressure Regulator

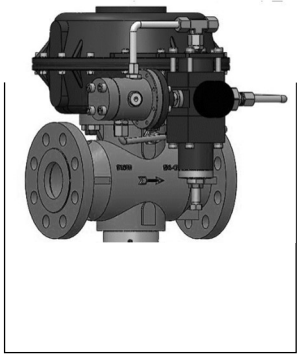
F65-150



Gas Pressure Regulator with Slum Shut Valve F65-150/S Serie

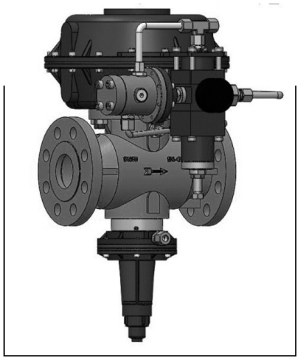


Gas Pressure Regulator with Slum Shut Valve + Monitor F65-150M/S Serie

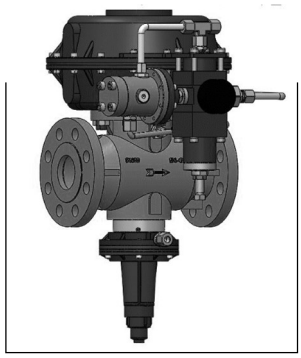


Gas Pressure Regulator

F25-50

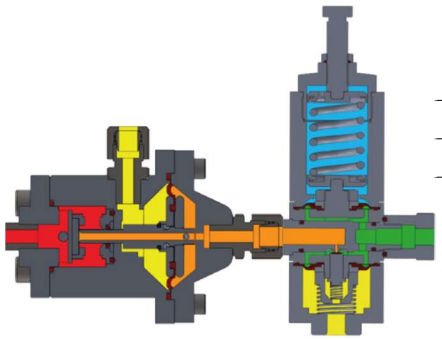


Gas Pressure Regulator with Slum Shut Valve F25-50/S Serie



Gas Pressure Regulator with Slum Shut Valve + Monitor F25-50M/S Serie

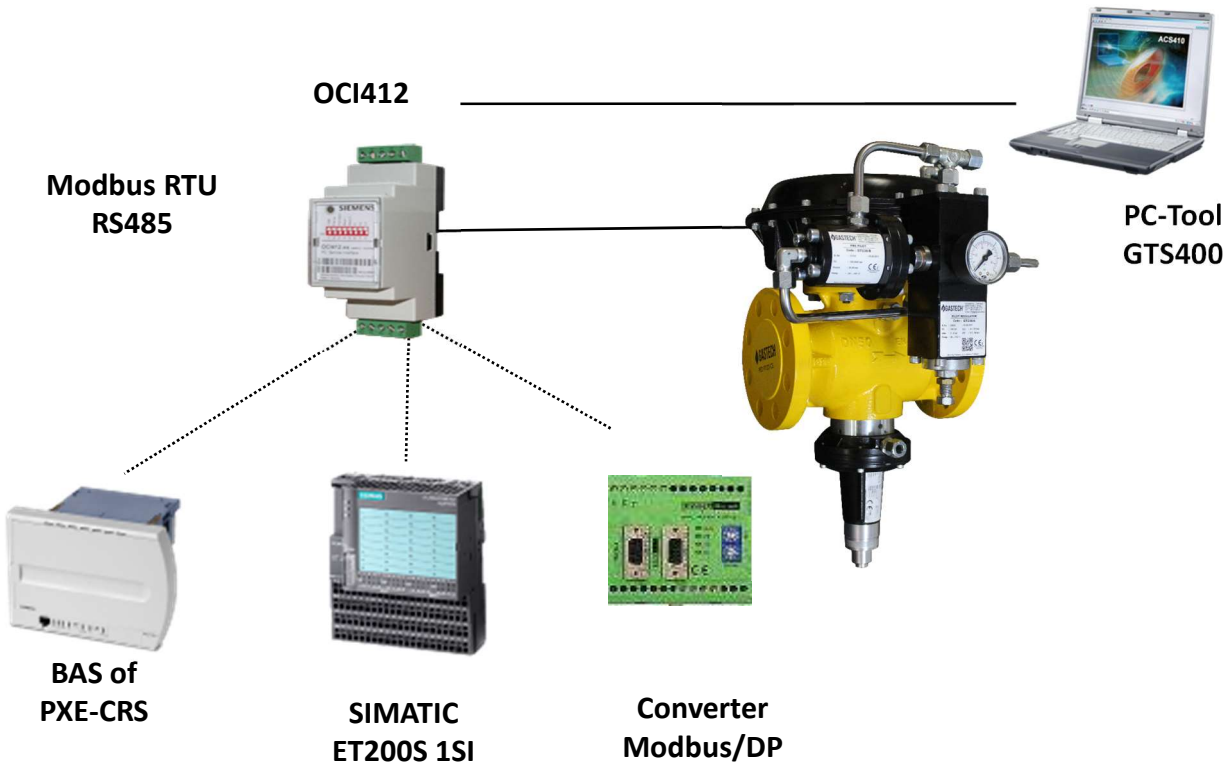
Pre Pilot - Pilot



Type	GT Serie
Allowable temperature –TS	-20 °C to +60 °C
Set Range	GT239A 10 -500 mbar | GT238A 0.3 – 16 bar

Pilot Control System

GTxxxA	Manual Setting
GTxxxB	Cannot be adjusted, only factory settings
GTxxxC	Analog Signal Control, 4-20mA or 0-10V
GTxxxD	Pneumatic Control
GTxxxE	Flow Control with Orifice Plate



Slum Shut Valve

The F-P Serie of regulators can be fitted with safety shut-off valve for overpressure (OPSO) or combined under-and-over pressure (UPSO/OPSO) protection. Shutoff gas flow when the outlet pressure of the regulator increases or/and decreases. The Slum shut valve trip pressure can easily be adjusted independently of the regulator set point. Built internal bypass, for balancing pressure before relatching the safety shut-off valve, is operated by pulling the valve stem. Possibility of application of devices for remote signal and remote control.

Technical Features

Type	IS
Operation class	A
Response time	< 2 s
Allowable temperature –TS[1]	-20 °C to +60 °C
Accuracy –AG[2]	50 mbar AG 30 50 – 150 mbar AG 10 150 – 5.500 mbar AG 5 1.0 – 16 bar AG 5
Set Range OPSO[3]	BP 20 -300mbar | MP 50 - 500mbar | AP 0.3 – 5.5bar | HP 1 – 16 bar
Set Range OPSO[3]	BP 10 -280mbar | MP 20 - 350mbar | AP 0.2 – 3.2bar | HP 0.8 – 14 bar

[1] Low temperature version -40°C: available on request
[2] Depending on working conditions
[3] change differant springs Refer to page

Slum Shut Unit for F-P Serie

Article No	Type	DN Size
2.80.0311	S-BP	DN25-40
2.80.0312	S-MP	DN25-40
2.80.0313	S-AP	DN25-40
2.80.0330	S-HP	DN50
2.80.0314	S-BP	DN50
2.80.0315	S-MP	DN50
2.80.0316	S-AP	DN50
2.80.0331	S-HP	DN50
2.80.0317	S-BP	DN65-80
2.80.0318	S-MP	DN65-80
2.80.0319	S-AP	DN65-80
2.80.0332	S-HP	DN65-80
2.80.0320	S-BP	DN100
2.80.0321	S-MP	DN100
2.80.0322	S-AP	DN100
2.80.0333	S-HP	DN100
2.80.0323	S-BP	DN150
2.80.0324	S-MP	DN150
2.80.0325	S-AP	DN150
2.80.0334	S-HP	DN150

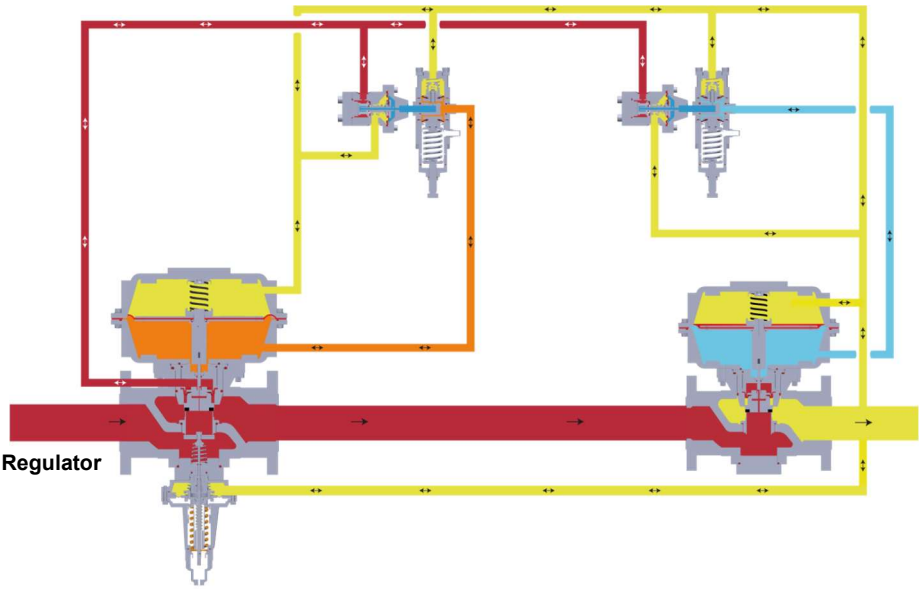
⚠ Please, select the springs (OPSO and UPSO Range), Refer to Page 22 and 23

Monitor Unit

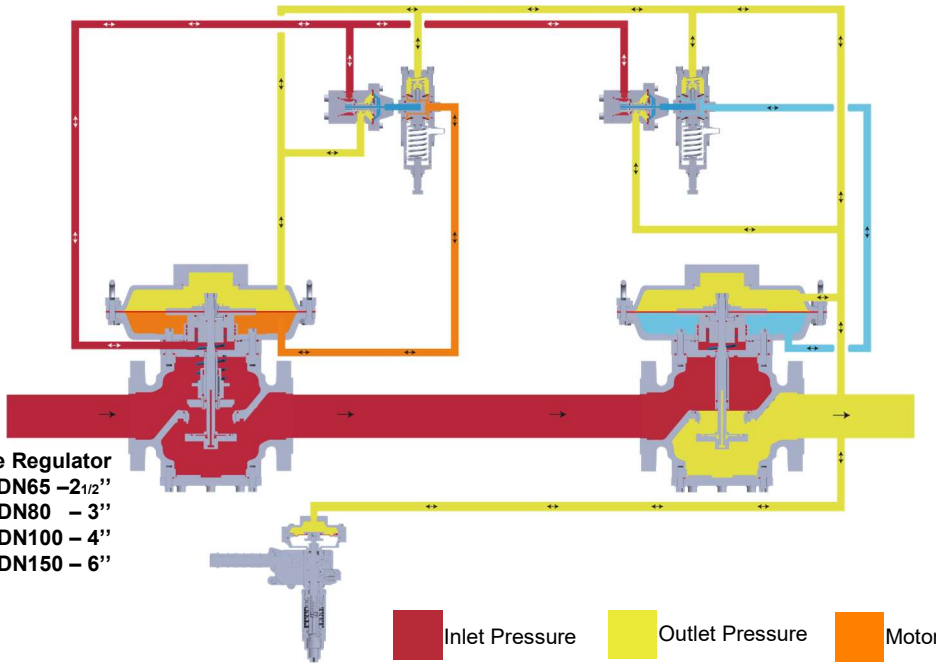
The Monitor or emergency regulator is used as a safety device in gas pressure reduction systems. The purpose of this device is to protect the system against possible overpressure, while keeping the reduction line in service. To perform a periodic test on a monitoring regulator, increase the outlet set pressure of the working regulator and watch the outlet pressure to determine if the monitoring regulator takes over at the appropriate outlet pressure.

Monitor regulator is generally installed upstream of the active regulator. Although the function of the monitor regulator is different, the two regulator s are virtually identical from the point of view of the ir mechanical components. Flow coefficients of the regulator puls line monitor system are about 15% lower than those of the active regulator alone.

In order for the standard regulator to be a monitor regulator, it is necessary to add a few mechanical parts. This attachment is directly integrated into the body of the monitor regulator. Figure below is focused on the monitor unit



Gas Pressure Regulator
DN25 – 1''
DN40 – 11/2''
DN50 – 2''



Gas Pressure Regulator
DN65 –2$_{1/2}$''
DN80 – 3''
DN100 – 4''
DN150 – 6''

Silencer –INT

This silencer is fitted on the regulator orifice and is highly efficient up to a theoretical speed of 80 m/s calculated at the outlet flange.

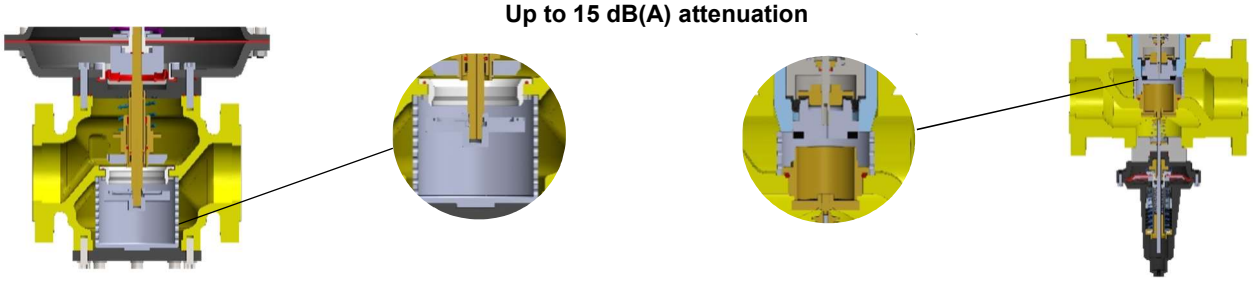
Type int silincer multi-path noise abatement device is incorporated into the regulator on the seat area. It consists of plated Stainless steel metals containing no sound deadening materials.

Depending on flows and pressure drop, the silencer can reduce noise levels as much as 15 dB (A) with an approximate 3% capacity reduction.

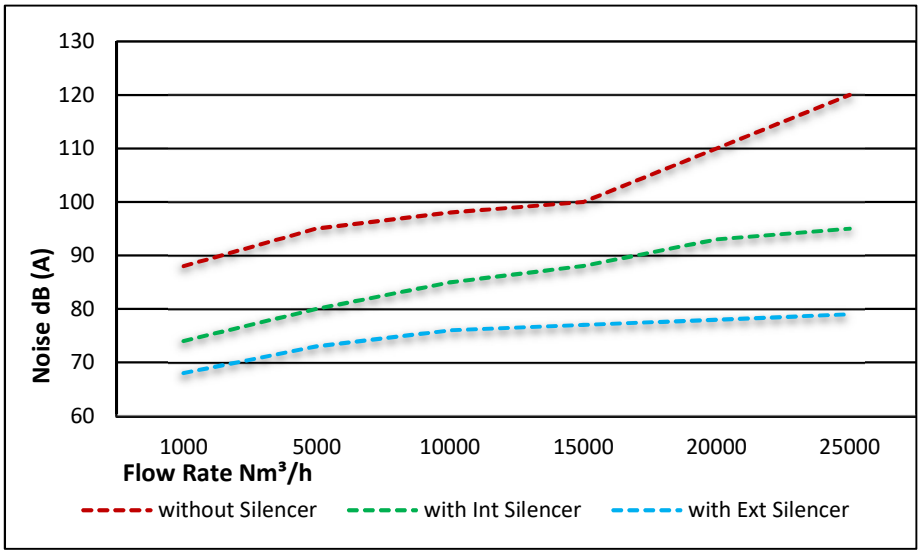
Silencer Unit for F-P Serie

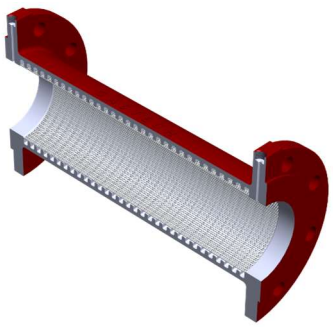
Article No	Type	DN Size
2.80.0580	M-BP/MP/AP	DN25-40
2.80.0581	M-BP/MP/AP	DN50
2.80.0582	M-BP/MP/AP	DN65-80
2.80.0583	M-BP/MP/AP	DN100
2.80.0584	M-BP/MP/AP	DN150

multi-path
Up to 15 dB(A) attenuation



Performance of Silencer





Ext Silencer

Pilot Heater - Electric

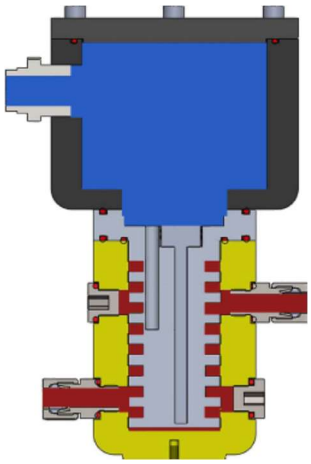
The electric pilot heater Type PEH is used for reheating gas supplying pressure reducing regulator pilots to avoid the inconveniences caused by freezing which occurs during large pressure drops and/or low ambient temperatur

Pilot heater for F-P Serie

Article No	Type	DN Size
2.80.0680	PEH27	230Vac 50-60 Hz
2.80.0681	PEH17	110Vac 50-60 Hz
2.80.0682	PEH10	12Vdc

Technical Features

Heater tube	102 bar
Thermometer pocket	102 bar
Group according to directive 2014/34/UE	Group II
Category according to directive 2014/34/UE	Category 2
Protection	Ex db IIC T2 Gb
Power supply	230 V 50-60 Hz
Power consumption	280W Max.
Recommended operating temperature	0 to 30 °C
Max. allowable admitted temperature	60 °C
Selector for temperature A range	0/30
Thermostat	+ 30 to + 90 °C
Differential selector C	2
Interchangeable thermic probe	10 kΩ



Accessories
(to be ordered separately)

Switch for SSV of F-P Serie - EExd II CT6 - IP65

Article No	Type	DN Size
2.80.0622	M-BP/MP/AP	DN25-40-50
2.80.0623	M-BP/MP/AP	DN65-80-100-150

Switch for SSV of F-P Serie - **EN 50041 - IP66**

Article No	Type	DN Size
2.80.0624	M-BP/MP/AP	DN25-40-50
2.80.0625	M-BP/MP/AP	DN65-80-100-150

3 way solenoid valve for SSV of F-P Serie -EExd II CT6 - IP65

Article No	Type	DN Size
2.80.0699	M-BP/MP/AP	DN25-40-50-65-80-100-150

Pnömatic Actuator for F-P Serie –Air supplay pressure 2-6bar

Article No	Type	DN Size
2.80.1143	N.O or NC	DN25 – 40
2.80.1144	N.O or NC	DN50
2.80.1145	N.O or NC	DN65 – 80
2.80.1146	N.O or NC	DN100
2.80.1147	N.O or NC	DN150

Sensing Line Kit for F-P Serie

Article No	Type	DN Size
2.80.2122	All Type	All size

⚠ Consisting of: 3pcs x 1mt dia.10mm steel pipe – 3pcs x pipe connection for 10 mm dia. ¼''

Flow Calculations

For a 0.6 specific gravity gas, sizing of regulators is usually made on the basis of Cg valve and KG flow rate coeffcients . Flow rates at the fully open position and the various operating conditions are related by the following formula

Sub-critical flow behaviour (Pu -Pd) ≤ 0.5 Pu

$$Q = 0{,}52 \; x \; Cg \; x \; Pu \; x \; sen\left(K1 \; x \sqrt{\frac{Pu-Pd}{Pd}}\right) \qquad Q = KG \times \sqrt{Pd \; x \; (Pu - Pd)}$$

Critical flow behaviour (Pu -Pd) > 0.5 Pu

$$Q = 0{,}52 \; x \; Cg \; x \; Pu \qquad Q = \frac{KG}{2} x \; Pu$$

Acronyms

Q	volumetric flow rate in (m3 /h)
Pu	absolute inlet pressure in (bar)
Pd	absolute outlet pressure in (bar)

Flow rate coefficient

Size	25 | 1"	40 | 1 1/2"	50 | 2"	50H | 2"H	65 | 2 1/2"	80 | 3"	100 | 4"	150 | 6"
Cg	540	984	1525	2200	3320	4153	7990	16700
K_G	567	1034	1602	2288	3452	4320	8395	17368

Select the diameter of the regulator with Cg higher than calculated value .
After finding the DN of the regulator, check that gas speed on the seat does not exceed 100 m/sec, using the following formula:

$$V = 345.92 \; x \; \frac{Q}{DN^2} x \; \frac{1-0.002 \; x \; Pd}{1+Pd}$$

V	Velocity (m/s)
345.92	Numerical constant
Q	Flow rate under standard conditions (Stm3/h)
DN	Regulator nominal diameter (mm)
Pd	absolute outlet pressure in (bar)

Correction factor for non-natural gas applications

The flow rates are indicated for a 0.6 specific gravity gas. To determine the volumetric flow rate for gases other than natural gas, multiply or calculate the values in the capacity tables using the sizing equations with a correction factor. The table below lists correction factors for some common gases:

Gas Type	Density ratio to air	Conversion factor
Air	1.00	0.77
Butane	2.00	0.55
Propane	1.52	0,63
Propane+Air Mix	1.2	0,71
Hydrogen	0.07	2.94
Nitrogen	0.97	0.79
Carbondioxide	1.52	0.63

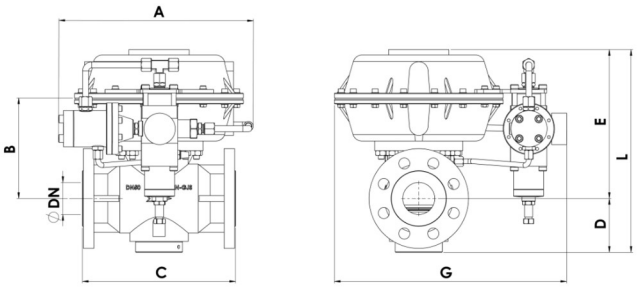
Use the following formula to calculate the correction factor for gases not listed above. In the formula, d is the specific gravity of the gas.

Conversion factor = $\sqrt{\frac{0.6}{d}}$

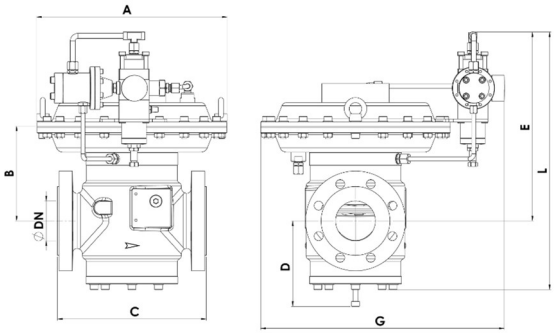
	Stm3 /h /hreference conditions 15 °C, 1 barg
Stm3 /h x 0.94795 = Nm3 /h	Nm3 /h reference conditions 0 °C, 1 barg

Dimensions and Weights

F-P Serie -without SSV



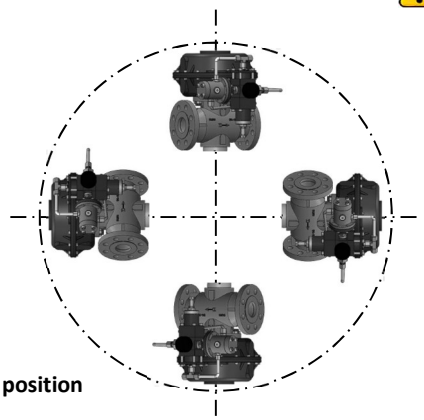
DN 25 – 40 – 50



DN 65 – 80 – 100 - 150

DN[(1)]	A	B	C	D	E	G	L	**Wgt** kg
25 | 1''	320	160	222	80	240	385	320	26
40 | 11/2''	320	160	222	80	240	385	320	27
50 | 2''	320	170	254	90	246	385	340	32
50 | 2''	385	190	254	90	246	490	340	41
65 | 21/2''	385	190	298	175	380	490	520	82
80 | 3''	385	190	298	175	380	490	520	83
100 | 4''	385	190	352	175	380	490	520	103
150 | 6''	385	280	451	360	780	490	700	165

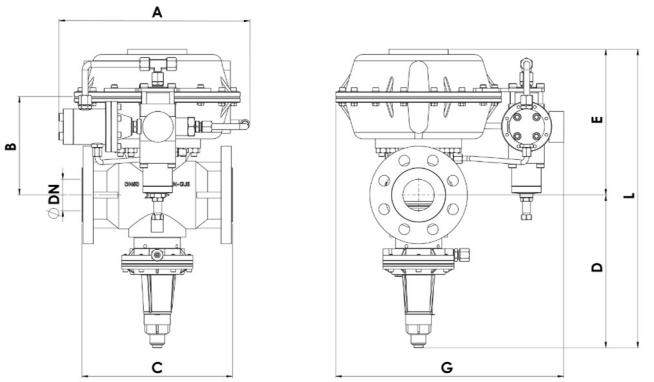
Int silencer does not affect dimensions
Flange holes on DN25 size are threaded M12x1,75
Flange holes on DN65 size are threaded M16x2,0



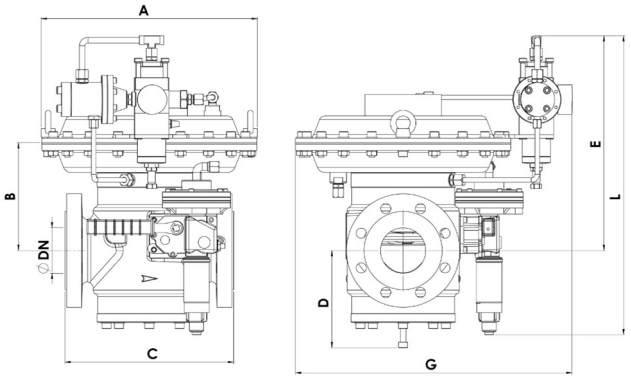
Mounting position

Dimensions and Weights

F-P Serie -with SSV



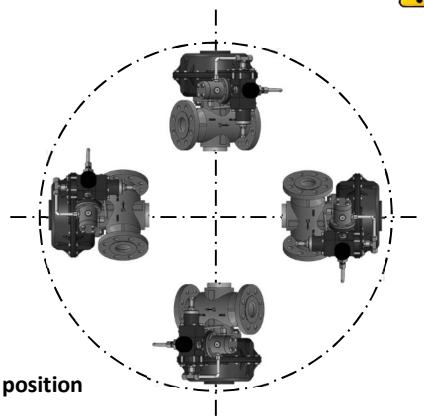
DN 25 – 40 – 50



DN 65 – 80 – 100 - 150

DN[1]	A	B	C	D	E	G	L	**Wgt** kg
25 | 1''	320	160	222	250	240	385	490	
40 | 11/2''	320	160	222	250	240	385	490	
50 | 2''	320	170	254	260	246	385	510	
50 | 2''	385	190	254	260	246	490	510	
65 | 21/2''	385	190	298	175	380	490	530	
80 | 3''	385	190	298	175	380	490	530	
100 | 4''	385	190	352	175	380	490	530	
150 | 6''	385	280	451	350	780	490	610	

Int silencer does not affect dimensions
Flange holes on DN25 size are threaded M12x1,75
Flange holes on DN65 size are threaded M16x2,0



Mounting position

Outlet Pressure Range and Setting Springs

The spring setting ranges for all diameter regulator are shown in the tables below

Pressure Range (mbar)	Actuator (ø)	Color	Diameter (mm)	Order Code
15 – 30	GT239A	Green	1.8	2.13.0415
25 – 100	GT239A	Pink	2.0	2.13.0416
90 – 250	GT239A	Red	2.5	2.13.0417
230 – 330	GT238A	Purple	3.0	2.13.0418
300 – 1100	GT238A	Orange	3.5	2.13.0419
1000 – 2500	GT238A	Grey	4.0	2.13.0420
1500 – 6000	GT238A	Yellow	5.0	2.13.0421
4000 – 6000	GT238A	Blue	6.0	2.13.0422
6000 – 16000	GT238A	Black	7.0	2.13.0423

Shut Off Range and Setting Springs

Over- Shut off setting ranges for the all diameters are shown in the tables below

Pressure Range (mbar)	Actuator (ø)	Color	Diameter (mm)	Order Code
30 – 125	120 BP-MP	Red	2.2	2.13.0713
65 – 280	120 BP-MP	Blue	2.5	2.13.0280
80 – 370	120 BP-MP	Yellow	2.7	2.13.0714
280 – 490	120 BP-MP	Black	3.2	2.13.0066
480 – 1000	120 AP	Purple	3.5	2.13.0682
750 – 1250	120 AP	Silver	3.7	2.13.0683
1000 – 1750	120 AP	Pink	4.0	2.13.0744
1500 – 2500	120 AAP	White	4.5	2.13.0319
2000 – 5500	120 AAP	Orange	5.0	2.13.0324

Over- Shut off setting ranges for the all diameters are shown in the tables below

Pressure Range (mbar)	Actuator (ø)	Color	Diameter (mm)	Order Code
15 – 35	120 BP-MP	Red	1.2	2.13.0715
25 – 40	120 BP-MP	Blue	1.5	2.13.0283
30 – 100	120 BP-MP	Yellow	2.0	2.13.0716
60 – 240	120 BP-MP	Black	2.3	2.13.0069
70 – 450	120 BP-MP	Purple	2.5	2.13.0746
350 – 900	120 AP-AAP	Silver	2.8	2.13.0320
700 – 3200	120 AP-AAP	Pink	3.5	2.13.0745

⚠ Minimum difference between regulator and SSV settings (ΔPw):
BP-MP Model: 15% with a minimum difference of 10 mbar for UPSO, 20 mbar for OPSO
AP-AAP Model : 20% with a minimum difference of 40 mbar for UPSO, 40 mbar for OPSO

Color of Products

Standard Colors

The colors of the regulator parts are painted as follows.

Part	RAL Code	Color
Body PN16-20 according to ISO 7005	1021	
Body Class 150 RF according to ASME B16.5	3000	
Main Actuator All Versions	9005	
Slum Shut Covers All Versions	9005	

Optional Colors

You can choose one or more of the following colors.

Part	RAL Code	Color
All Parts	1021	
All Parts	3000	
All Parts	9005	
All Parts	6011	
All Parts	5010	

delivery times and price may vary in optional color options.

NOTES

For more information, contact your local sales representative or agency.

info@gastech.com.tr
www.gastech.com.tr
+90 286 501 55 11
gastech_naturalgas
www.linkedin.com/in/gastech-naturalgas-577b931a8/

GASTECH SANAYI VE TICARET ANONIM SIRKETI
Çanakkale Organize Sanayi Bölgesi, 1. Cadde No:28 17100
Merkez-Çanakkale-TURKEY
Chamber of Commerce Çanakkale, 9492
www.gastech.com.tr info@gastech.com.tr