Technical User Manual

Gas Pressure Regulator

R Serie 1'' – 2''

Main Features

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

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

Technical Features

Maximum allowable pressure –PS	20 bar
Inlet pressure range –bPu	BP 0.1 – 16 bar MP – AP 0.1 – 20 bar
Outlet pressure range –Wd[4]	15 - 4400 mbar
Allowable temperature –TS[1]	-20 °C to +60 °C
Inlet gas temperature	-20 °C to +60 °C
Accuracy class –AC[2]	up to AC 5
Lock-up pressure class –SG[2]	up to SG 10
Nominal size –DN	1'' x 1'' | 1'' x 11/2'' | 11/2'' x 11/2 '' | 2'' x 2''
Connections[3]	Threaded Rp EN or NPT ASME

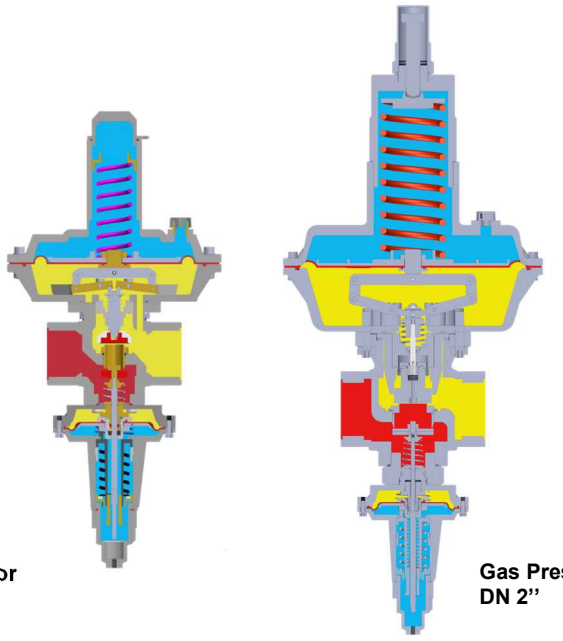
[1] Low temperature version -40°C: available on request
[2] Depending on working conditions
[3] On request for other connection class
[4] with differant versions

Metarials

Body[1]	EN-GJS 500-7
Main Actuator[2]	Ø 185 mm Aluminium cast alloys (for service box) Ø 210 mm Aluminium cast alloys Ø 280 mm Aluminium cast alloys
Seat[2]	Brass
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

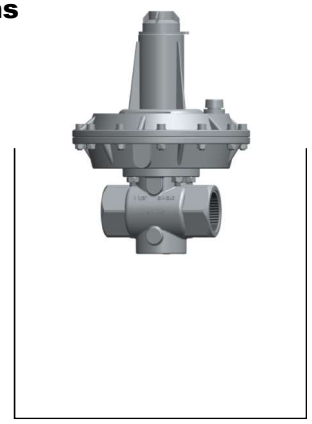
Desing,
Operational Diagram



Gas Pressure Regulator
DN 1''

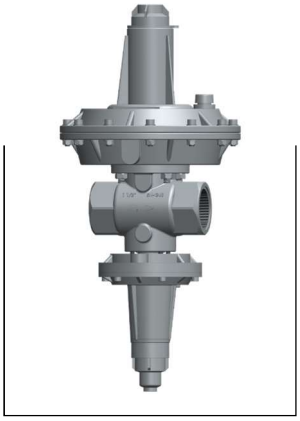
Gas Pressure Regulator
DN 2''

Configurations

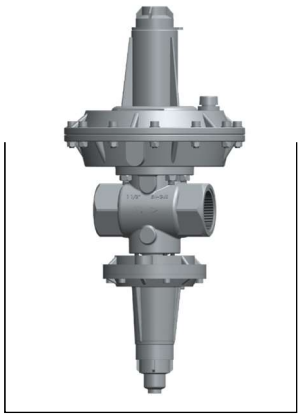


Gas Pressure Regulator

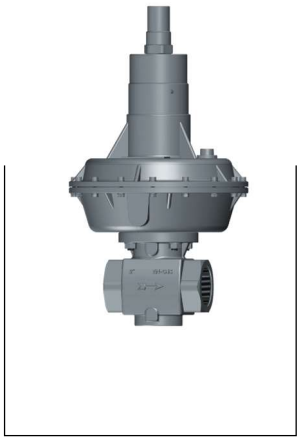
R25-40-40H



Gas Pressure Regulator
with Slum Shut Valve
R25-40-40H/S Serie

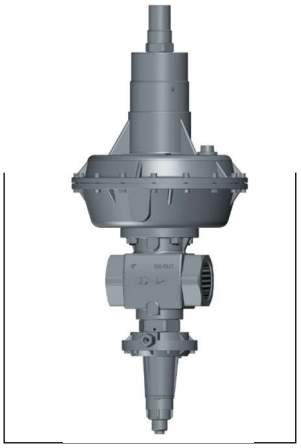


Gas Pressure Regulator
with Slum Shut Valve + Monitor
R25-40-40H-M/S Serie

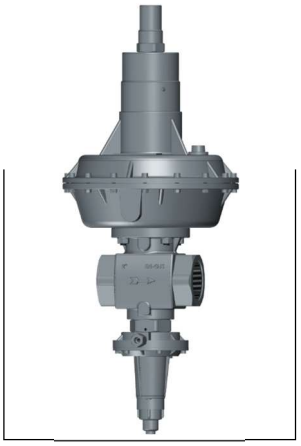


Gas Pressure Regulator

R 50



Gas Pressure Regulator
with Slum Shut Valve
R 50/S Serie



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

Change & revision history

Date	Page	Reason	Statement

INDEX

Safety and Safe Use

Warning Notes!

To safely use the equipment, observe the environmental conditions allowed and the data provided on the nameplate of the regulator and any accessories.

To avoid injury to persons, damage to property or the environment, the following warning notes must be observed!

Any opening of the valve, replacement of parts or modifications to the original product is the user's responsibility and is done at his own risk.

Caution!

- **All activities (mounting, installation and service work, etc.) must be carried out by qualified staff.**
- **Ensure that the relevant national safety regulations are complied with.**
- **Any gas pressure regulator that experience a fall or shock must not be put into operation, as this can adversely affect the safety functions even if they do not exhibit any external signs of damage.**
- **Unsuitable gases or gas components lead to a loss of the safety shutoff function.**
- **It must not be possible for foreign bodies/particles to enter the gas pressure regulator, as this could have an adverse effect on the safety shutoff function.**
- **Gases with concentrations of >0.1% for H2S and NH3 are only permissible in connection with biogas version.**
- **Condensation is not permitted in the gas pressure regulator. If not observed, the safety functions are no longer ensured.**
- **In connection without slum shut valve, the gas pressure regulator must not be used as a safety device. Closing does not take place.**
- **The R serie gas pressure regulators are designed to withstand gas pressures up to 20 bar (BP model is 16bar) in standby mode or working. At a pressure of 20 bar (BP model is 16bar), the R serie gas pressure regulator remains safely closed or will safely work. If the maximum permissible operating pressure is exceeded, a valve shutdown must be initiated.**
- **The gas pressure regulator cannot be mounted or replaced while the gas valve is under pressure.**
- **The impulse pipe (pressure feedback) must be connected to the main outlet gas pipe, downstream from the gas pressure regulator observing a distance of at least 4 x the diameter of the main outlet pipe.**
- **The upstream and downstream pipes must be cleaned after being laid. Before commissioning, it is essential to ensure that no dirt particles have remained that could enter the gas pressure regulator.**
- **The slum shut valves supplied by Gastech may only be repaired by Gastech Repair Centers.**

Summary of symbols, terms and units

The following table summarizes the symbols and relevant descriptions and unit considered in this chapter and/or used in this document. The symbols are listed in alphabetic order.

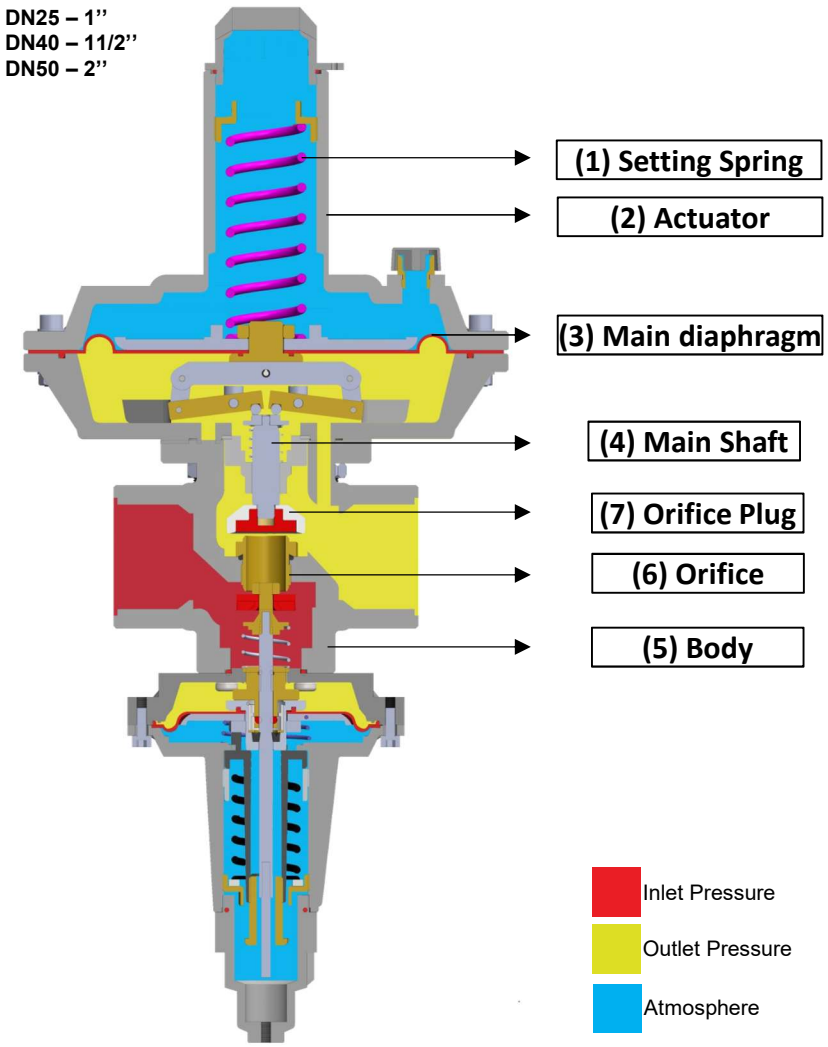
Symbol	Terms	Unit
AC	Accuracy class	%
AG	Accuracy group	%
bpu	Inlet pressure range	bar
d	Relative density of natural gas at actual conditions	/
DN	Nominal size	/
DS	Differential strength	/
Δp	Differential pressure	bar
Δpmin	Minimum operating differential pressure	bar
IS	Integral strength	/
KG	Flow coefficient	See definition
LpA	Sound pressure level	EN 61672-1
MIPd	Downstream maximum incidental pressure	Bar
p	Component operating pressure	Bar
pb	Atmospheric pressure (absolute pressure)	bar abs
pd	Outlet pressure	Bar
pdmax	Maximum outlet pressure	Bar
pds	Set point	Bar
pf	Lock-up pressure	Bar
pmax	Maximum component operating pressure	Bar
pn	Reference absolute pressure for normal conditions	bar abs
PS	Maximum allowable pressure	Bar
PSD	Specific maximum allowable pressure	Bar
pu	Inlet pressure	Bar
pumax	Maximum inlet pressure	Bar
pumin	Minimum inlet pressure	Bar
SG	Lock-up pressure class	%
SZ	Class of lock-up pressure zone	Lock-up time
TS	Maximum/minimum allowable temperature	°C
V	Gas velocity	m/s
Wd	Set range	Bar
Wds	Specific set range	Bar

General Description and Operation

The main diaphragm (3) inside the actuator (2)is connected to the orifice plug (7) with the main shaft (4).

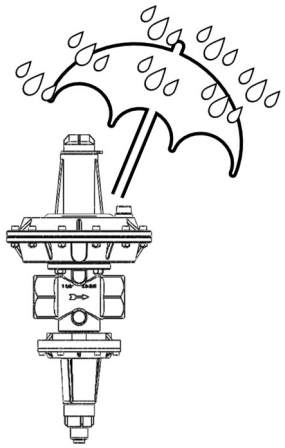
if outlet pressure exceeds the force of the set spring;
the main diaphragm (3) moves up, moves with the main shaft (4) orifice plug (7) attached to the main diaphragm (3) and closes the orifice (6), stopping the flow.

if the outlet pressure decreases further than the compression force of the regulating spring;
the main diaphragm (3) moves down, moves with the main shaft (4) orifice plug (7) attached to the main diaphragm (3) and opens the orifice (6), starting the flow.



Environmental conditions

Gastech guarantees the product under the following storage and transportation conditions. All functions of products that are stored unused for more than 3 years should be checked.



Storage IEC 60721-3-1

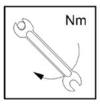
Climatic conditions	Class 1K3
Mechanical conditions	Class 1M2
Temperature range	-20...60 °C
Humidity	< 95 % r.h.

Transport IEC 60721-3-2

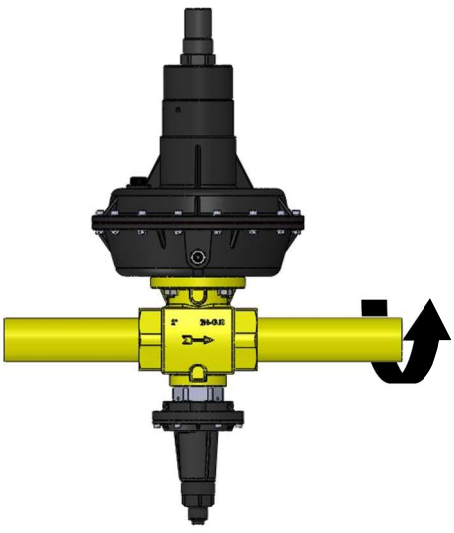
Climatic conditions	Class 2K2
Mechanical conditions	Class 2M2
Temperature range	-15...60 °C
Humidity	< 95 % r.h.

Pipe installation

Maximum tightening torque of pipe



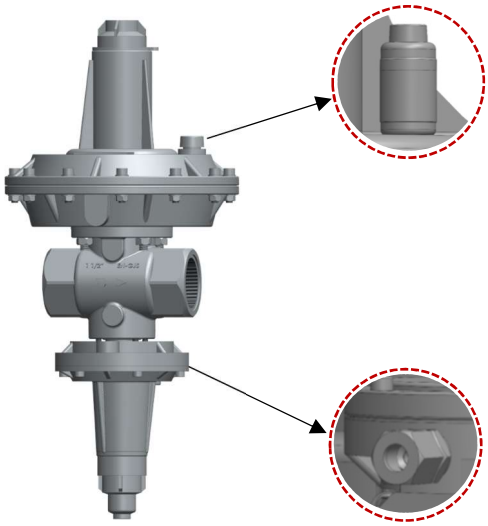
Diameter	**25| 1''**	**40|1 1/2''**	**50| 2''**
BSP	125Nm	200Nm	260Nm
NPT	125Nm	200Nm	260Nm

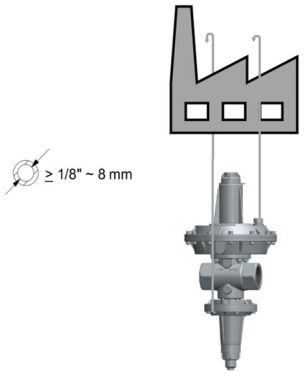


check the tightness at the pipe connection points

Vent Lines for Safety

The discharge outlets on the regulator must be transported to the outside with a pipe. In indoor use, if the vent lines are not carried outside, gas may leak into the environment when the regulator fails. Creates a risk of fire and explosion.





Make sure the gas is conveyed to a non-hazardous area with the vent line. Natural gas will rise due to lower density than air, GPL will go down due to greater density than air. The density of the gas used should be analyzed and accumulations should be prevented.

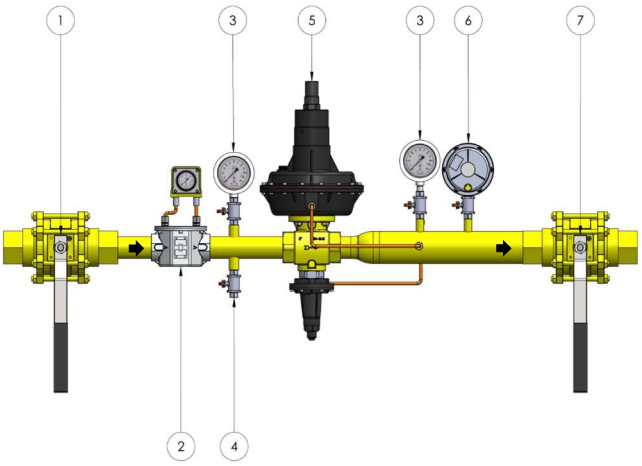
General Information for Connection

The bodies of the regulators have an arrow sign indicating the flow direction. The gas must flow in the same direction as the arrow on the body of regulator. Make sure that the flow direction is correct while the regulator is mounted to the installation. The gas must be filtered and must not contain particles larger than 5 microns.

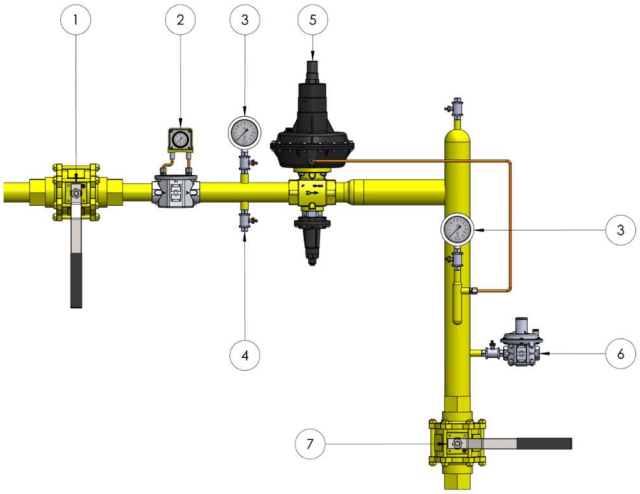
The simplest installation should include the following equipment;

Pos	Equipment
1	Upstream Main Shut off Valve
2	Gas Filter with DP gauge
3	Pressure Gauge –for upstream and downstream
4	Manual Relief Valve –for upstream and downstream
5	Gas Pressure Regulator with SSV
6	Safety Relief Valve
7	Downstream Main Shut off Valve

Standard Position



Angle Position



Connection of the sensing Lines

For a perfect pressure stabilization, follow the guidelines below;

- The impulse pipe (pressure feedback) must be connected to the main outlet gas pipe, downstream from the gas pressure regulator observing a distance of at least 4 x the diameter of the main outlet pipe.

- Do not install equipment (main ball valve, solenoid valve, gas meter, etc…) on the main pipe at the regulator outlet before the 6x distance after the regulator.

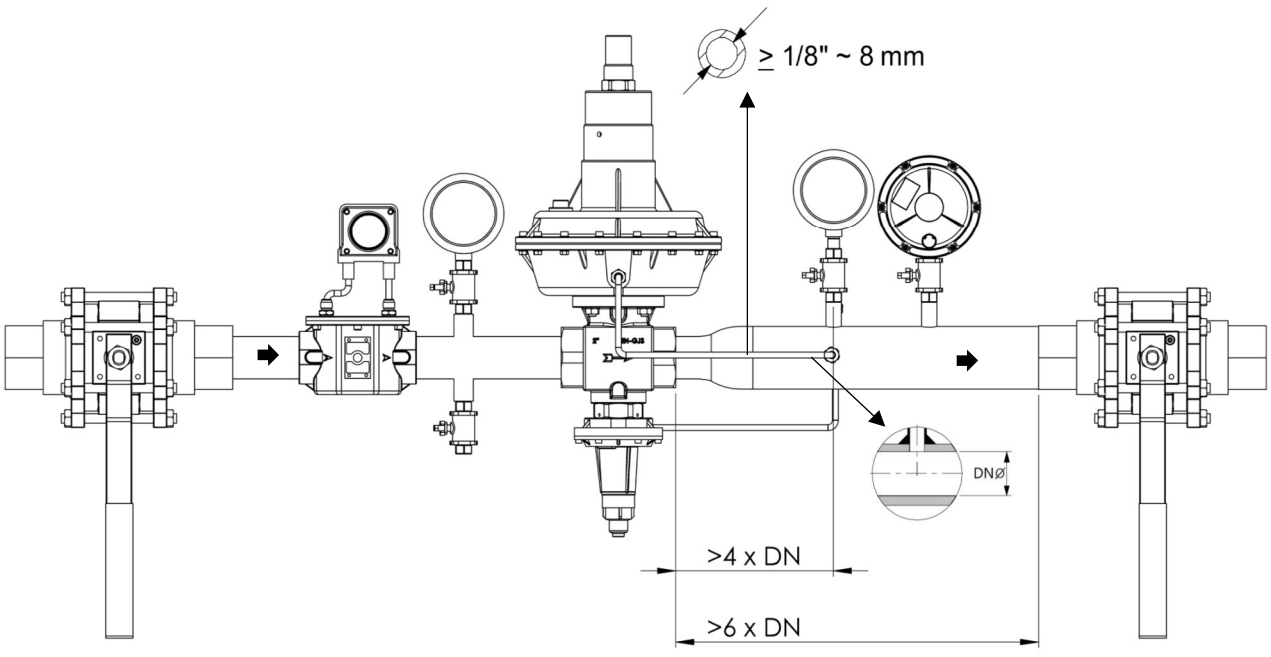
- Gas velocity can never exceed 40m/s in the main outlet pipe, recommended gas velocities are as follows;

  Vmax = 30 m/s for 1,5 < Pd < 4 bar
  Vmax = 25 m/s for 0,15 < Pd ≤ 1,5 bar
  Vmax = 15 m/s for Pd ≤ 0,15 bar

To prevent the impulse connections of the sensing lines from collecting dirt and condensation, the following is required:

- Impulse pipe fittings are always connected to the top or horizontal axis of the pipe.

- The slope of the impulse pipe is always 5-10% towards the main pipe connection.

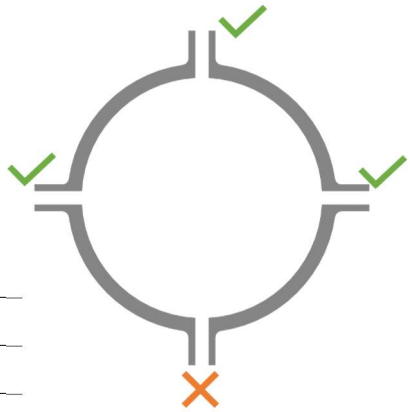


All pipe of sensing line must have pipes with a minimum inside diameter of 8 mm, recommend not to put valve on the impulse line.

Connection of the sensing Lines

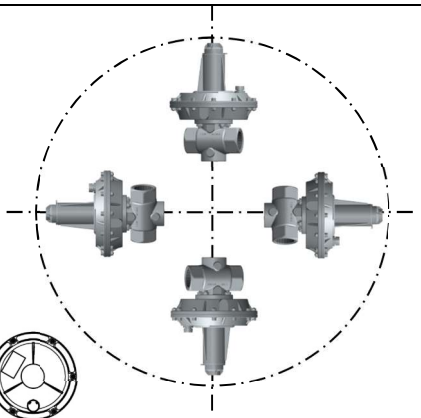
Calculate the gas velocity with the following formula;

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

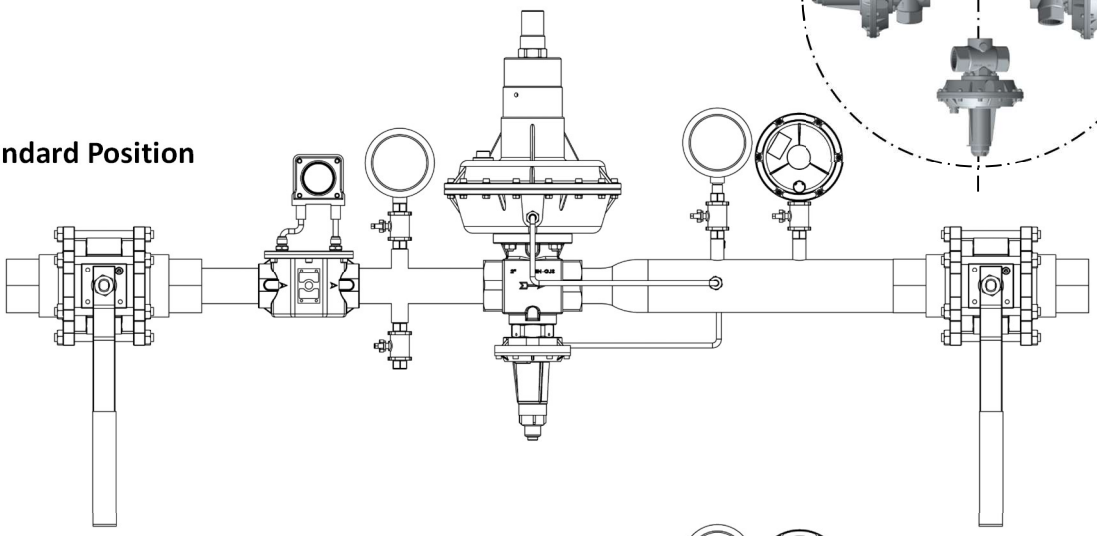


V	Velocity (m/s)
345.92	Numerical constant
Q	Flow rate under standard conditions (Stm3/h)
DN	Regulator nominal diameter (mm)
Pd	absolute outlet pressure in (bar)

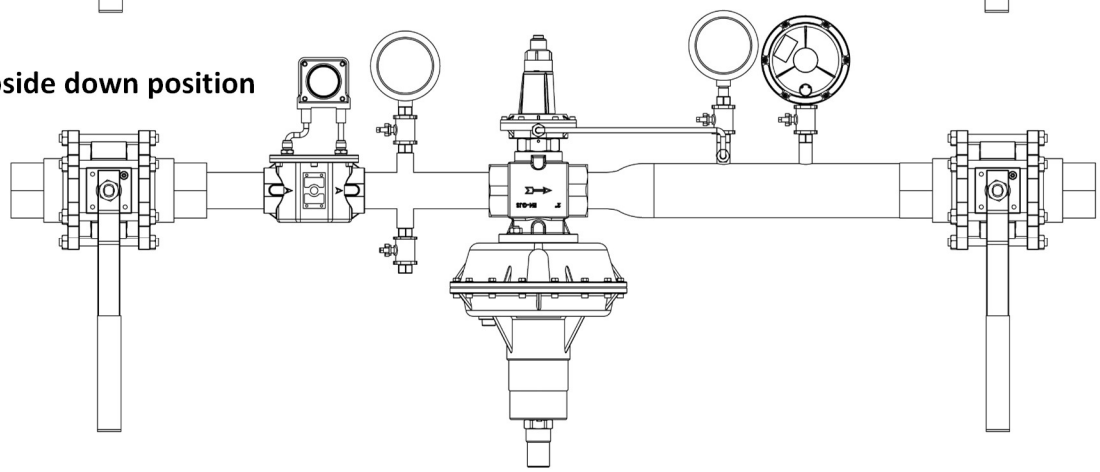
Mounting Position



Standard Position

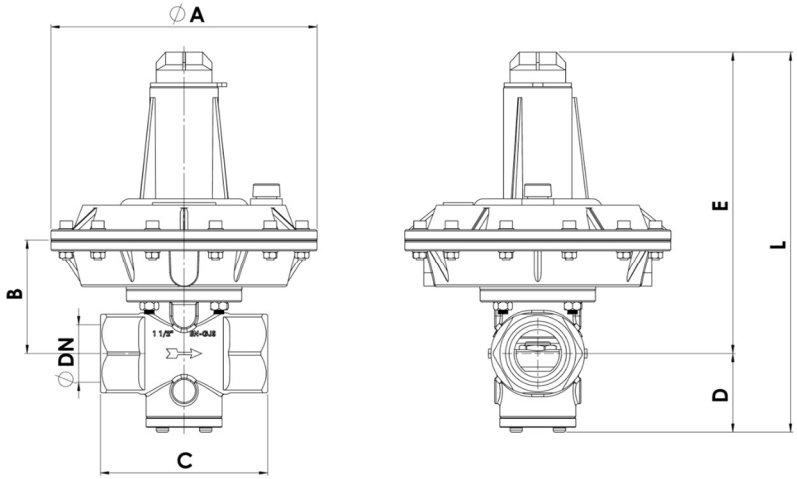


Upside down position

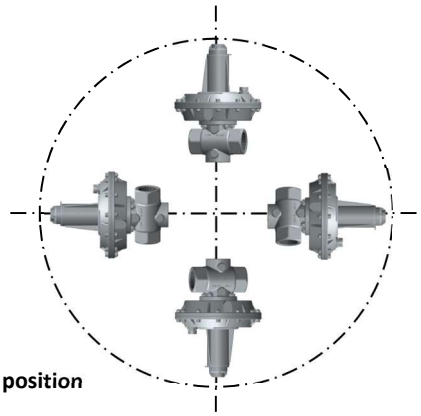


Dimensions and Weights

R Serie -without SSV



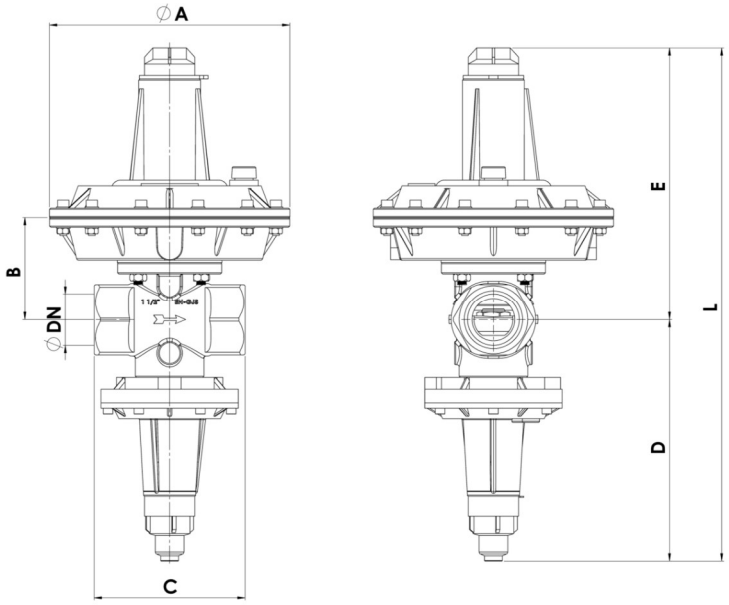
DN	A	B	C	D	E	L	**Wgt** kg
1'' x 1''	185	90	102	63	240	303	
1'' x 1'' BP-MP	210	90	102	63	240	303	
1'' x 1'' AP	210	100	102	63	250	313	
11/2'' x 11/2''	185	90	132	63	240	303	
11/2'' x 11/2'' BP-MP	210	90	132	63	240	303	
11/2'' x 11/2'' AP	210	100	132	63	250	313	
1'' x 11/2''	185	100	132	63	250	313	
1'' x 11/2'' BP-MP	210	100	132	63	250	313	
1'' x 11/2'' AP	210	100	132	63	250	313	
2'' x 2'' BP-MP	280	155	156	80	440	510	
2'' x 2'' AP	210	145	156	80	400	480	



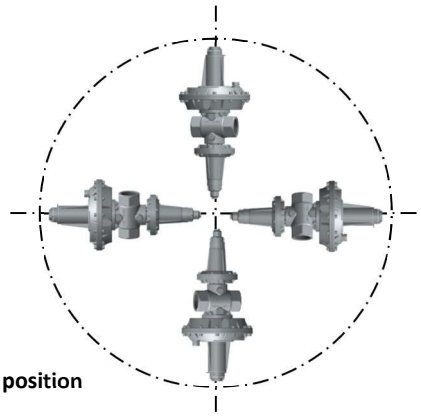
Mounting position

Dimensions and Weights

R Serie -with SSV



DN	A	B	C	D	E	L	**Wgt** kg
1'' x 1''	185	90	102	215	240	455	
1'' x 1'' BP-MP	210	90	102	215	240	455	
1'' x 1'' AP	210	100	102	215	250	465	
11/2'' x 11/2''	185	90	132	215	240	455	
11/2'' x 11/2'' BP-MP	210	90	132	215	240	455	
11/2'' x 11/2'' AP	210	100	132	215	250	465	
1'' x 11/2''	185	100	132	215	250	465	
1'' x 11/2'' BP-MP	210	100	132	215	250	465	
1'' x 11/2'' AP	210	100	132	215	250	465	
2'' x 2'' BP-MP	280	155	156	245	440	685	
2'' x 2'' AP	210	145	156	255	400	655	



Mounting position

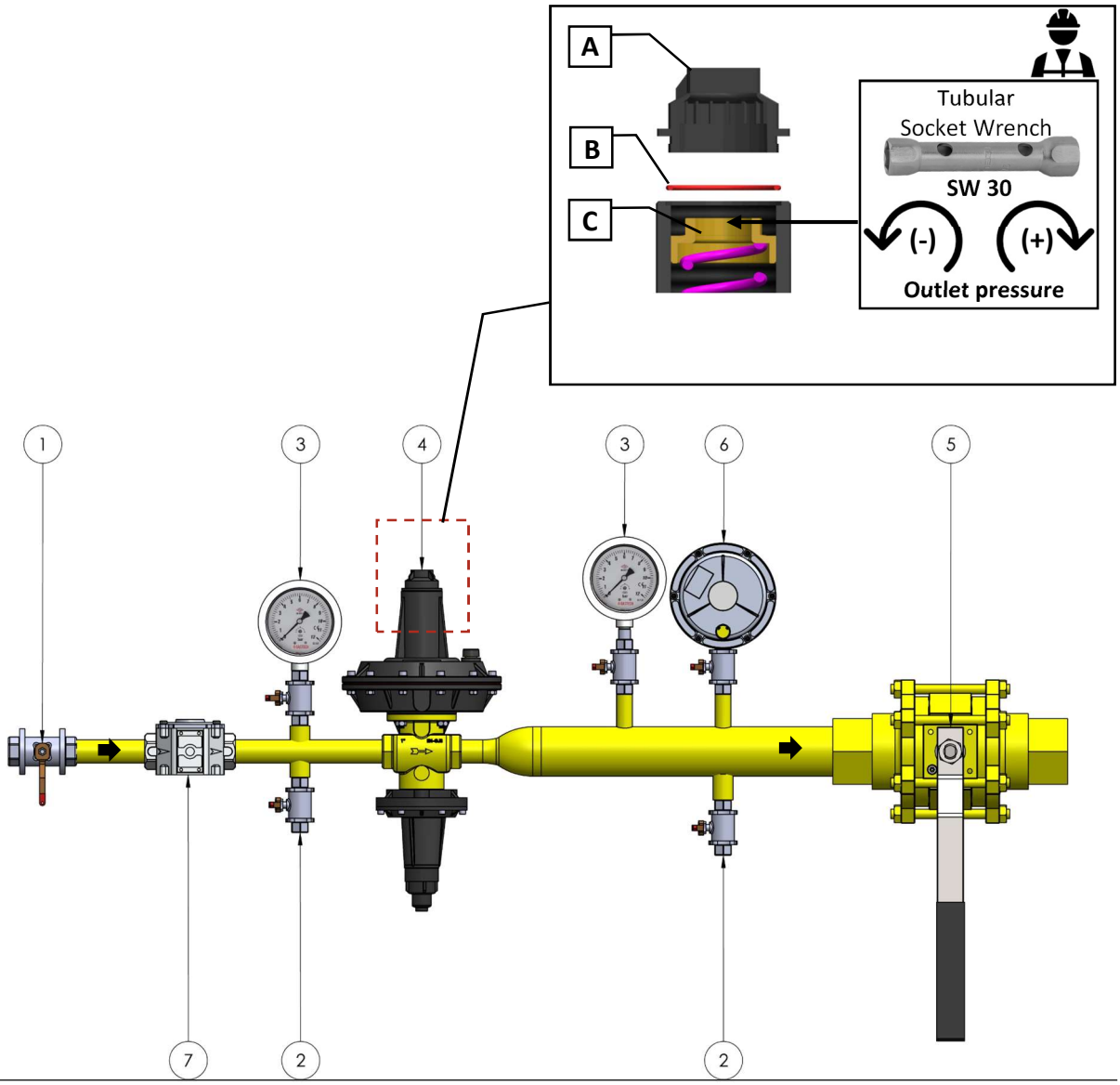
SETTING

Setting of the outlet pressure R25 – R40 – R40H

⚠ Make sure that all safety precautions (staff, environment, system) are taken before following the instructions below.

Operation

Pos	Practice
1	Remove the protective cap A.
2	Turn the adjusting screw C using a Tubular Socket wrench SW 30 mm.
3	Turning clockwise: the preload of the setpoint spring is increased and the outlet pressure is increased (+).
4	Turning counter-clockwise: the setpoint spring is released and the outlet pressure reduced (–).
5	After the setting: screw on the protective cap A again.



Setting of the outlet pressure R25 – R40 – R40H

⚠ Make sure that all safety precautions (staff, environment, system) are taken before following the instructions below.

With All Details

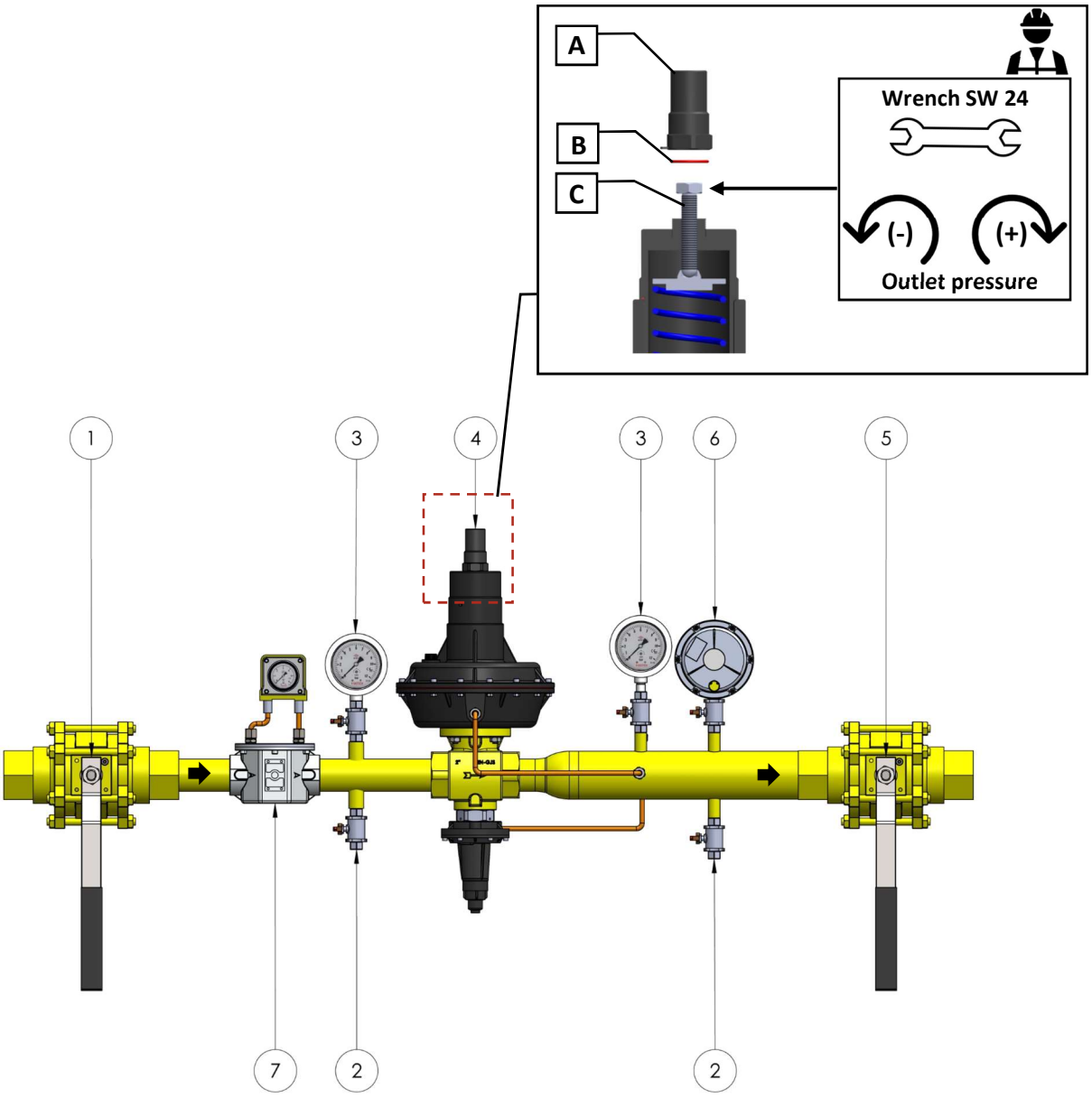
Pos	Practice
1	Open the manual vent valve on the outlet side to 30% (2).
👉	Remember the gas will discharge, check the safety requirements again
2	Make sure the main outlet valve is closed (5)
3	Open the main inlet valve (1) slowly and observe the outlet pressure gauge (3)
👉	Check the inlet pressure on the inlet manometer. Check that the inlet pressure is at the system design value. If the inlet pressure is lower or higher than the design pressure, contact your gas supplier.
👉	In the first pressurization, the outlet pressure may increase by 30-60%, since the outlet vent valve is open, the high pressure will be discharged and the regulator reflex will recover after a while.
👉	Check the pressure gauge (3) on the outlet pressure side, if the outlet pressure rises unreasonably, close the inlet main valve (1).
4	Close the manual vent valve on the outlet side (2).
👉	Check the outlet pressure gauge (3), the outlet pressure should not rise more than 10% from the outlet pressure (on the label Pd Value).
	If the outlet pressure is not at the required value;
5	Open the manual vent valve on the outlet side to 30% (2).
6	Remove the protective cap A.
7	Turn the adjusting screw C using a Tubular Socket wrench SW 30 mm.
7a	Turning clockwise: the preload of the setpoint spring is increased and the outlet pressure is increased (+).
7b	Turning counter-clockwise: the setpoint spring is released and the outlet pressure reduced (–).
8	After the setting: screw on the protective cap A again.
9	Close the manual vent valve on the outlet side (2).
👉	Check the outlet pressure gauge (3), the outlet pressure should not rise more than 10% from the calibrated outlet pressure
9	Close all valves (1)(2)(5), check leakage control with inlet and outlet manometers (3) and foaming liquid
10	If there is a leak, fix it and repeat step 9.
11	Return to step 1
12	Open the main outlet valve slowly and ensure gas supply to the system

Setting of the outlet pressure R50

⚠ Make sure that all safety precautions (staff, environment, system) are taken before following the instructions below.

Operation

Pos	Practice
1	Remove the protective cap A.
2	Turn the adjusting screw C using an open-ended wrench SW 24 mm.
3	Turning clockwise: the preload of the setpoint spring is increased and the outlet pressure is increased (+).
4	Turning counter-clockwise: the setpoint spring is released and the outlet pressure reduced (–).
5	After the setting: screw on the protective cap A again.



Setting of the outlet pressure R50

⚠ Make sure that all safety precautions (staff, environment, system) are taken before following the instructions below.

With All Details

Pos	Practice
1	Open the manual vent valve on the outlet side to 30% (2).
☛	Remember the gas will discharge, check the safety requirements again
2	Make sure the main outlet valve is closed (5)
3	Open the main inlet valve (1) slowly and observe the outlet pressure gauge (3)
☛	Check the inlet pressure on the inlet manometer. Check that the inlet pressure is at the system design value. If the inlet pressure is lower or higher than the design pressure, contact your gas supplier.
☛	In the first pressurization, the outlet pressure may increase by 30-60%, since the outlet vent valve is open, the high pressure will be discharged and the regulator reflex will recover after a while.
☛	Check the pressure gauge (3) on the outlet pressure side, if the outlet pressure rises unreasonably, close the inlet main valve (1).
4	Close the manual vent valve on the outlet side (2).
☛	Check the outlet pressure gauge (3), the outlet pressure should not rise more than 10% from the outlet pressure (on the label Pd Value).
	If the outlet pressure is not at the required value;
5	Open the manual vent valve on the outlet side to 30% (2).
6	Remove the protective cap A.
7	Turn the adjusting screw C using an open-ended wrench SW 24 mm.
7a	Turning clockwise: the preload of the setpoint spring is increased and the outlet pressure is increased (+).
7b	Turning counter-clockwise: the setpoint spring is released and the outlet pressure reduced (–).
8	After the setting: screw on the protective cap A again.
9	Close the manual vent valve on the outlet side (2).
☛	Check the outlet pressure gauge (3), the outlet pressure should not rise more than 10% from the calibrated outlet pressure
9	Close all valves (1)(2)(5), check leakage control with inlet and outlet manometers (3) and foaming liquid
10	If there is a leak, fix it and repeat step 9.
11	Return to step 1
12	Open the main outlet valve slowly and ensure gas supply to the system

Outlet Pressure Range and Setting Springs

The spring setting ranges for R25 – R40 – R40H regulator are shown in the tables below

Pressure Range (mbar)	Actuator (ø)	Color	Diameter (mm)	Order Code
20 – 35	185 or 210 BP	Grey	2.5	2.13.0277
30 – 50	185 or 210 BP	Yellow	2.8	2.13.0668
40 – 70	185 or 210 BP	Blue	3.0	2.13.0701
50 – 130	185 or 210 BP	Black	3.2	2.13.0702
110 – 200	185 or 210 MP	Orange	3.5	2.13.0703
140 – 250	185 or 210 MP	Purple	3.7	2.13.0704
200 – 360	185 or 210 MP	Pink	4.0	2.13.0004
250 – 450	185 or 210 AP	Red	4.5	2.13.0667
400 – 600	185 or 210 AP	Green	5.0	2.13.0666
500 – 900	185 or 210 AP	Silver	5.5	2.13.0705
700 – 1200	185 or 210 AP	Black+White	6.0	2.13.0416
1000 – 1600	185 or 210 AP	Purple+White	6.5	2.13.0657
1400 – 2500	185 or 210 AP	Grey+White	7.5	2.13.0658
2200 – 3600	210 AAP	White	12.0	2.13.0700
3400 – 5000	210 AAP	Orange	13.0	2.13.0414

The spring setting ranges for R50 regulator are shown in the tables below

Pressure Range (mbar)	Actuator (ø)	Color	Diameter (mm)	Order Code
16 – 20	280 BP	Grey	3.5	2.13.0696
20 – 35	280 BP	Yellow	4.0	2.13.0670
30 – 50	280 BP	Blue	4.5	2.13.0281
50 – 80	280 BP	Black	5.0	2.13.0697
80 – 120	280 MP	Orange	5.5	2.13.0671
110 – 170	280 MP	Purple	6.0	2.13.0669
130 – 220	280 MP	Pink	6.5	2.13.0698
180 – 330	280 MP	Red	7.0	2.13.0594
200 – 350	280 MP	Green	7.5	2.13.0089
350 – 600	210 AP	Black	8.0	2.13.0695
600 – 1000	210 AP	Purple	9.0	2.13.0699
800 – 1600	210 AP	Grey	10.0	2.13.0412
1400 – 2400	210 AP	Pink	11.0	2.13.0662
2200 – 3600	210 AP	White	12.0	2.13.0700
3400 – 5000	210 AP	Orange	13.0	2.13.0414

Slum Shut Valve

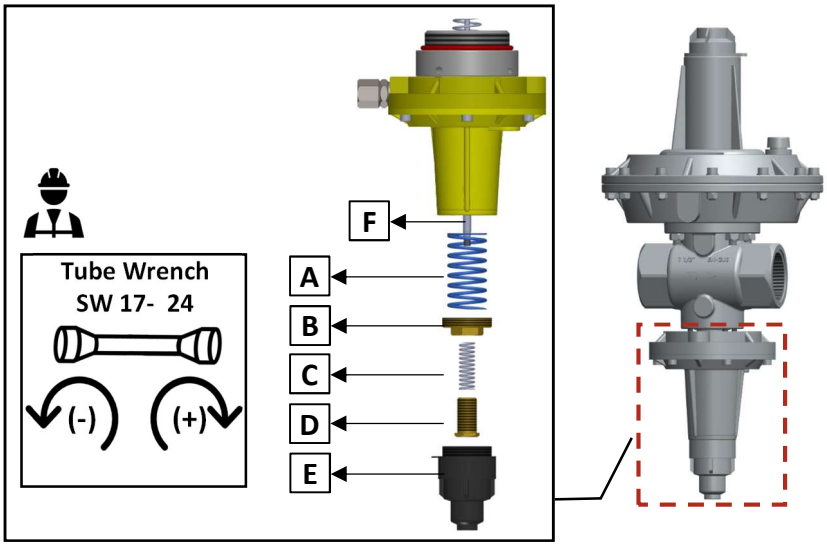
The R series of regulators can be fitted with safety shut-off valve for overpressure (OPSO) or combined under-and-over pressure (UPSO/OPSO) protection. Shutoff gas flow when the outlet pressure of the regulator increases or/and decreases. The Slum shut valve trip pressure can easily be adjusted independently 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

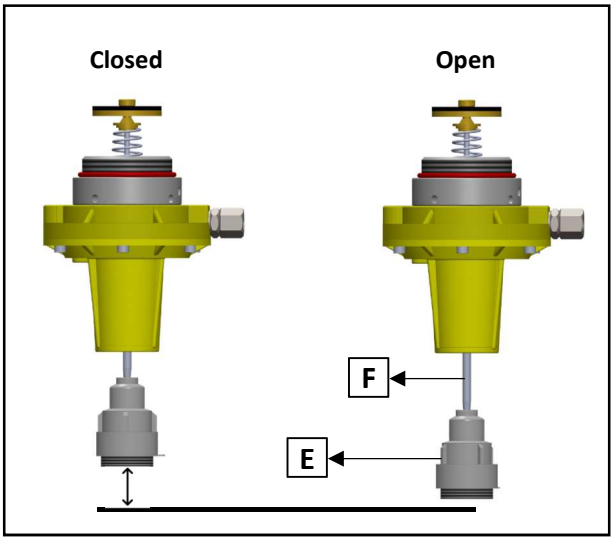
Type	IS
Operation class	A
Response time	< 2 s
Allowable temperature –TS[1]	-20 °C to +60 °C
Accuracy –AG[2]	up to 0.05 bar AG 30 0.05 – 0.15 bar AG 10 0.15 – 5.5 bar AG 5
Set Range OPSO[3]	BP 20 -300mbar | MP 50 - 500mbar | AP 0.3 – 5.5bar
Set Range OPSO[3]	BP 10 -280mbar | MP 20 - 350mbar | AP 0.2 – 3.2bar

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

Setting Procedure of the Slum Shut Valve



SSV Unit for R25-40-40H-50



⚠ SSV units have a built-in bypass system for safety and easy installation. When you pull the cover, the bypass system is activated and the outlet is slowly pressurized. If the outlet main valve is not closed; It takes too long to fill out the exit and you cannot activate SSV.

Setting Procedure of the Slum Shut Valve (Maximum and Minimum)

Pos	Practice
1	Use ring nut (B) to completely load maximum pressure spring (A). Loosen adjusting screw (D) to completely relieve minimum pressure spring (C).
2	Use a small pump or other appropriate means to raise pressure to normal operating level on the downstream vent valve (2).
3	Relatch controller and allow pressure to drop to minimum pressure triggering level.
4	Using adjusting screw (D), slowly load minimum pressure spring (C) until actuator triggers.
5	Repeat steps 2 and 3 above, making any necessary adjustments in setting. Least three times
6	Bring pressure back to normal values.
7	Relatch controller and raise pressure until it reaches maximum pressure triggering level.
8	Using ring nut (B), slowly unload spring (A) until actuator triggers.
9	Repeat steps 6 and 7 above, making any necessary adjustments in setting. Least three times
10	Close the downstream vent valve (2) and disconnect the external pressure source.

⚠ **It is recommended that slam-shut controller efficiency be checked periodically.**

Cut-off Test

Pos	Practice
1	Close inlet and outlet main valves (1) (5). The controller should trigger at minimum pressure (only if so set).
2	Using a small pump or other appropriate means on the downstream vent valve (2) , raise pressure in the line to normal operating level. Relatch controller in case it has triggered following on step 1 above.
3	Simulate pressure increase until maximum triggering pressure is reached.
4	Bring the line back to full operating conditions as described in Startup procedure.

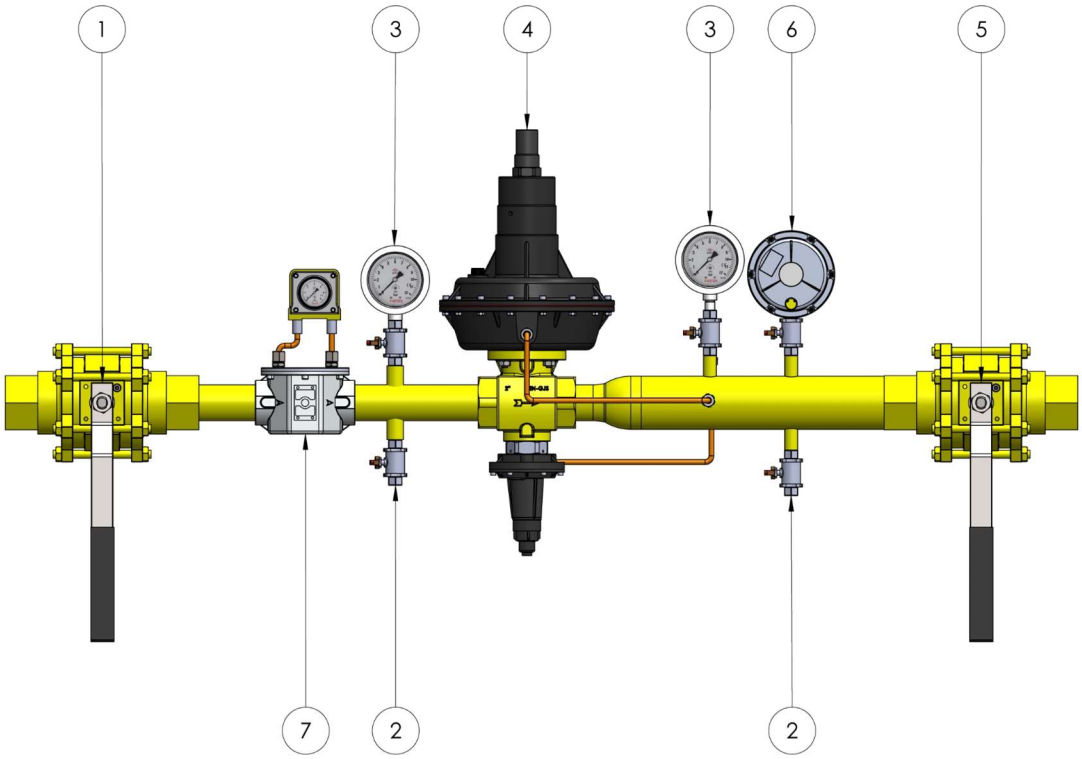
Controller-seal Check

Pos	Practice
1	Slowly close the main outlet valve (5) located downstream.
2	Disable the ssv unit and close the stream
3	Loosen one fitting in the line downstream of the slam-shut valve and apply soapy water in order to make sure that there are no leaks. In case of any leak being detected, proceed with the necessary maintenance of the controller.

R Serie Regulator Startup of the Slum Shut Valve

Previously calibrated

Pos	Practice
1	Make sure that the main inlet and outlet valves are closed.
2	Open the main inlet valve (1) slowly
3	Remove cap (E) reverse and screw it onto stem (F).
4	Pull cap (E) and keep It pulled several seconds until outlet pressure stabilizes, and SSV is easily activated.
☛	SSV units have a built-in bypass system for safety and easy installation. When you pull the cover, the bypass system is activated and the outlet is slowly pressurized. If the outlet main valve is not closed; It takes too long to fill out the exit and you cannot activate SSV.
5	Open the main outlet valve slowly and ensure gas supply to the system
6	Repeat the above procedure, making sure that controller remains properly latched, then mount cap back in its original position



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

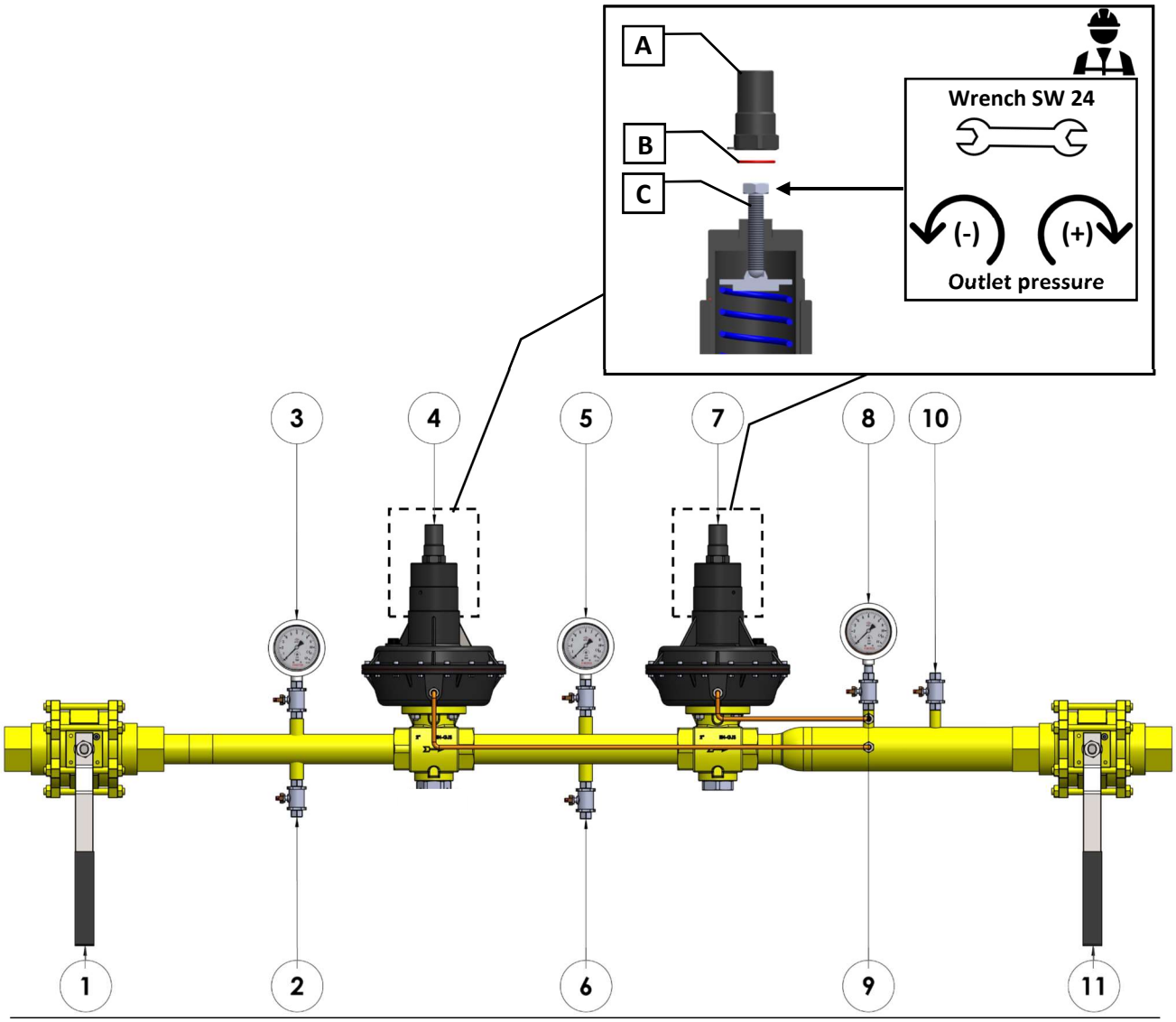
Monitor Unit

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.

Setting of the outlet pressure for monitor system

⚠ Make sure that all safety precautions (staff, environment, system) are taken before following the instructions below.



Setting of the outlet pressure for monitor system

⚠ Make sure that all safety precautions (staff, environment, system) are taken before following the instructions below.

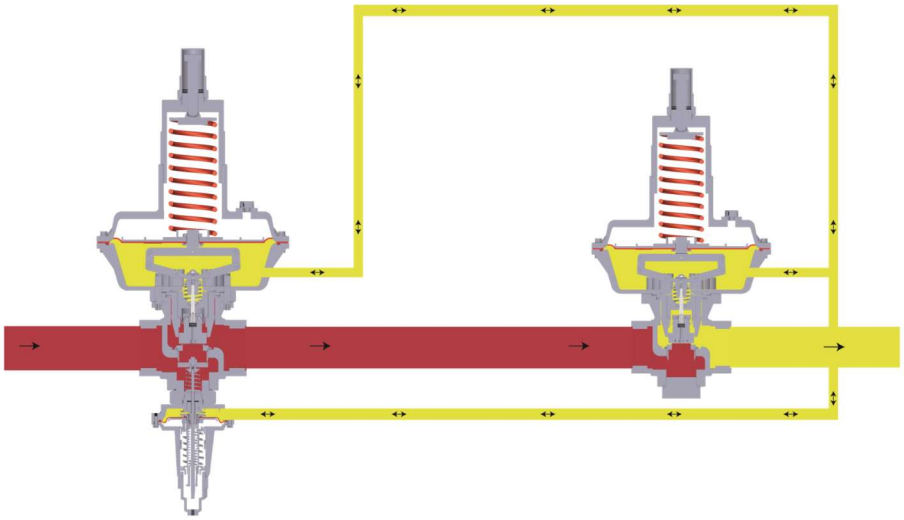
With All Details

Pos	Practice
1	Open the manual vent valve on the outlet side to 30% (10).
	Remember the gas will discharge, check the safety requirements again
2	Make sure the main outlet valve is closed (11)
3	Remove the protective cap A of active regulator (7).
4	Turn the adjusting screw C using an open-ended wrench SW 24 mm.
5	Turning the part with symbol (C) clockwise, set the output pressure of the active regulator(7) to the highest level.
6	Remove the protective cap A of monitor regulator (4).
7	Turn the adjusting screw C using an open-ended wrench SW 24 mm.
8	Set the monitor regulator(4) 10% above the required outlet pressure of the system
9a	Turning clockwise: the preload of the setpoint spring is increased and the outlet pressure is increased (+).
9b	Turning counter-clockwise: the setpoint spring is released and the outlet pressure reduced (–).
	Check pressure gauge (8), verify pressure is 10% higher than required outlet pressure
10	Adjust the monitor regulator to the required outlet pressure of the system
11a	Turning clockwise: the preload of the setpoint spring is increased and the outlet pressure is increased (+).
11b	Turning counter-clockwise: the setpoint spring is released and the outlet pressure reduced (–).
12	Check pressure gauge (8), verify pressure is outlet pressure of the system
☛	Check pressure gauge (5), the inlet and outlet pressure of the monitor regulator must be equal.
13	Close the manual vent valve on the outlet side (11).
14	Check the outlet pressure gauge (8), the outlet pressure should not rise more than 10% from the calibrated outlet pressure of Monitor regulator.
15	Close all valves (1) (2) (6) (10) (12), check leakage control with inlet and outlet manometers (3) (5) (8) and foaming liquid
16	If there is a leak, fix it and repeat step 9.
17	Open the main inlet and outlet valve (1) (12) slowly and ensure gas supply to the system

If active regulator working

The monitor controls downstream pressure at the same point as the main regulator and is set a little higher than the latter. Under normal duty, the monitor is fully open as it detects a pressure value lower than its set value.

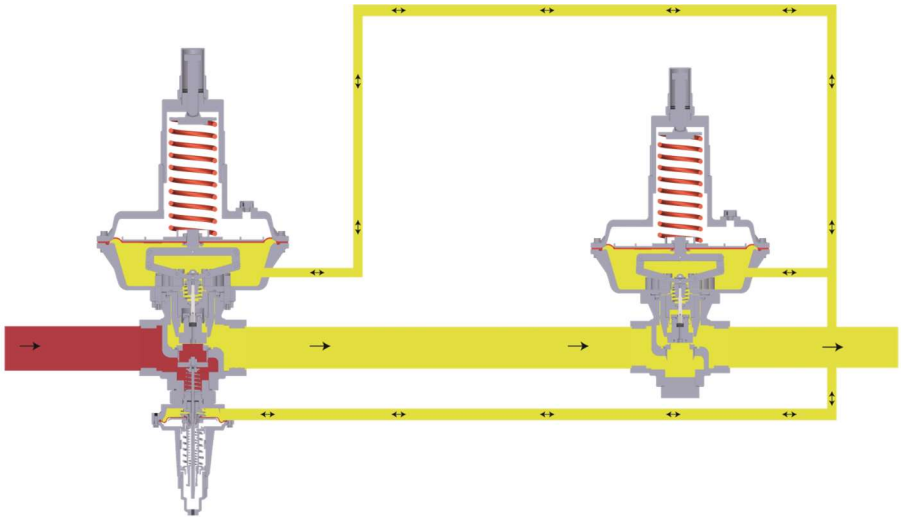
In normal operation of a wide-open configuration, the working regulator controls the system's outlet pressure. With a higher outlet pressure setting, the monitor regulator senses a pressure lower than its setpoint and tries to increase outlet pressure by going wide open. If the working regulator fails, the monitoring regulator assumes control and holds the outlet pressure at its outlet pressure setting.



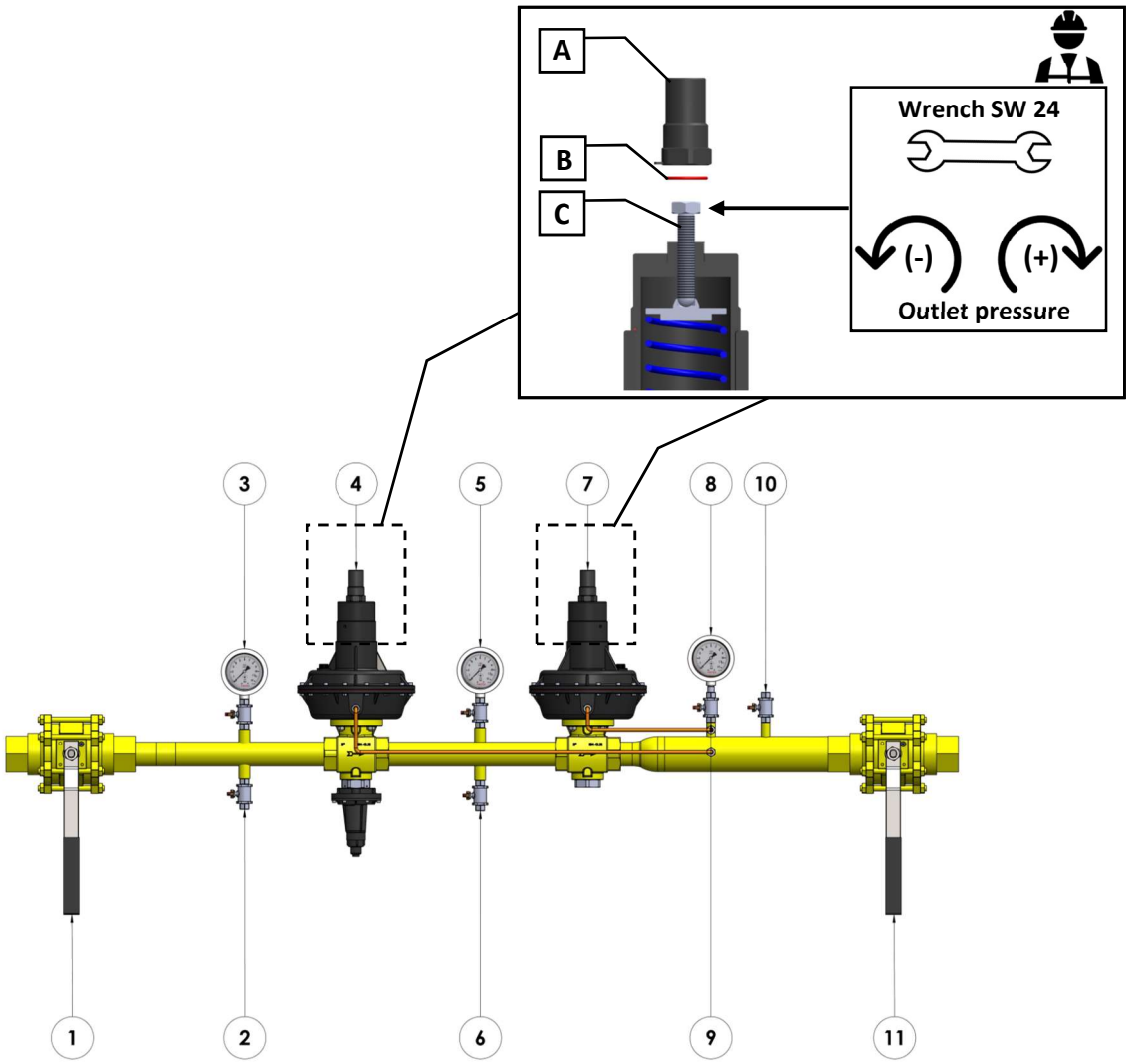
When the active regulator fails

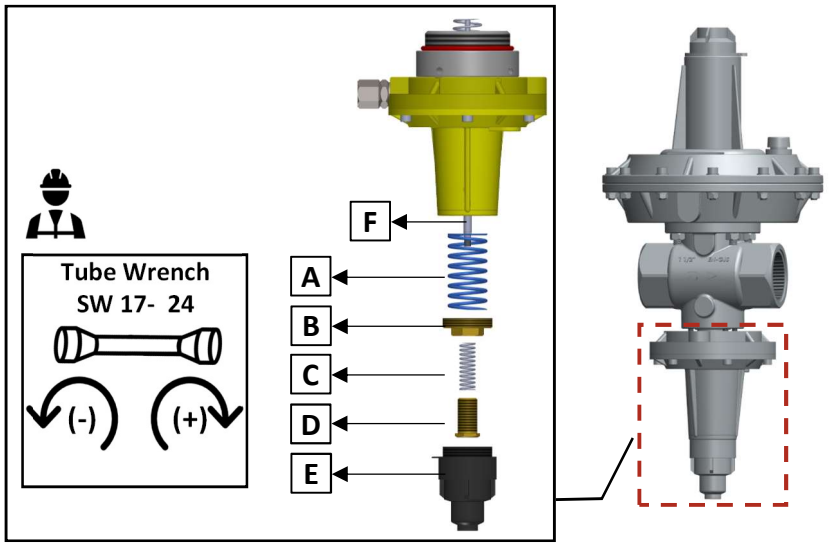
In normal operation, the working regulator controls the outlet pressure of the system. The monitoring regulator's working actuator controls the intermediate pressure and the monitoring regulator senses the system's outlet pressure. If the working regulator fails, the monitoring pilot will sense the increase in outlet pressure and take control.

If, due to any regulator fault, downstream pressure increases, when it exceeds the tolerated level, the monitor comes into operation and adjusts pressure to its own set value.



Setting of the outlet pressure for monitor system with SSV





SSV Unit for R25-40-40H-50

Setting of the outlet pressure for monitor system with SSV

With All Details

Pos	Practice
1	Use ring nut (B) to completely load maximum pressure spring (A). Loosen adjusting screw (D) to completely relieve minimum pressure spring (C).
2	Use a small pump or other appropriate means to raise pressure to normal operating level on the downstream vent valve (11).
3	Relatch controller and allow pressure to drop to minimum pressure triggering level.
4	Using adjusting screw (D), slowly load minimum pressure spring (C) until actuator triggers.
5	Repeat steps 2 and 3 above, making any necessary adjustments in setting. Least three times
6	Bring pressure back to normal values.
7	Relatch controller and raise pressure until it reaches maximum pressure triggering level.
8	Using ring nut (B), slowly unload spring (A) until actuator triggers.
9	Repeat steps 6 and 7 above, making any necessary adjustments in setting. Least three times
10	Close the downstream vent valve (11) and disconnect the external pressure source.
11	Open the manual vent valve on the outlet side to 30% (11).
	Remember the gas will discharge, check the safety requirements again
☛	Make sure the main outlet valve is closed (12)
12	Remove the protective cap A of active regulator (7).
13	Turn the adjusting screw C using an open-ended wrench SW 24 mm.
14	Turning the part with symbol (C) clockwise, set the output pressure of the active regulator(7) to the highest level.
15	Remove the protective cap A of monitor regulator (4).
16	Turn the adjusting screw C using an open-ended wrench SW 24 mm.
17	Set the monitor regulator(4) 10% above the required outlet pressure of the system
18a	Turning clockwise: the preload of the setpoint spring is increased and the outlet pressure is increased (+).
18b	Turning counter-clockwise: the setpoint spring is released and the outlet pressure reduced (–).
	Check pressure gauge (8), verify pressure is 10% higher than required outlet pressure
19	Adjust the monitor regulator to the required outlet pressure of the system

Setting of the outlet pressure for monitor system with SSV

With All Details

Pos	Practice
19a	Turning clockwise: the preload of the setpoint spring is increased and the outlet pressure is increased (+).
19b	Turning counter-clockwise: the setpoint spring is released and the outlet pressure reduced (–).
20	Check pressure gauge (8), verify pressure is outlet pressure of the system
☛	Check pressure gauge (5), the inlet and outlet pressure of the monitor regulator must be equal.
21	Close the manual vent valve on the outlet side (11).
22	Check the outlet pressure gauge (8), the outlet pressure should not rise more than 10% from the calibrated outlet pressure of Monitor regulator.
23	Close all valves (1) (2) (6) (10) (12), check leakage control with inlet and outlet manometers (3) (5) (8) and foaming liquid
24	If there is a leak, fix it and repeat step 9.
25	Open the main inlet and outlet valve (1) (12) slowly and ensure gas supply to the system

MAINTENANCE and REPAIR

REGULATOR

Equipment List for Maintenance and Repair

You must have the following hand tools for maintenance and repair. Check that the hand tools you use comply with the standards in your country.

Equipment	R25|R40	R40H	R50	Images
Combination Wrench	13	13	10, 13, 17, 19, 24, 28, 42	
Hex Key Wrench T-Handle	5	4,5	5, 8	
Screwdriver Sloted	8x150		8x150	
Hook Wrench			58/62, 80/90	
Double Ended Tubular Socket Wrench	30,22,26	30,22	17, 22, 27	
Circlip Pliers, External				
Adjustable Wrench	40	34	34	
O-ring Tool				

the unit of all dimensions is mm

Abbreviations will be used in maintenance and repair instructions

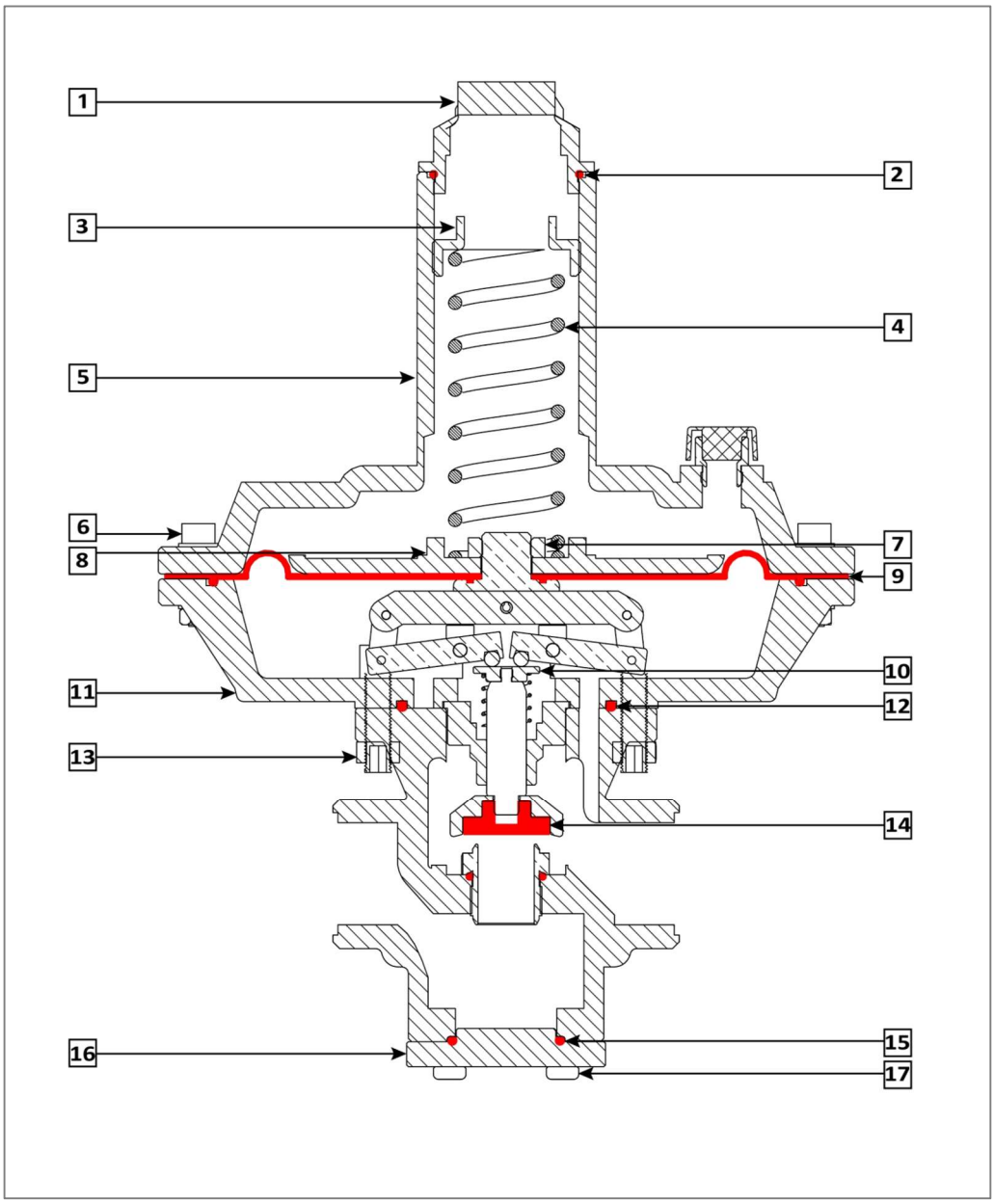
Equipment	Abbreviations
Combination **W**rench	CW
Hex **K**ey Wrench T-Handle	HK
Screwdriver **S**loted	SS
Hook **W**rench	HW
Double Ended Tubular **S**ocket **W**rench	SW
Circlip **P**liers, External	CP
Adjustable **W**rench	AW
O-ring **T**ool	OT

Personal Protective Equipmen List

All certified technical personnel must wear personal protective equipment. You must comply with the occupational safety rules of the local authorities you are in. You should use personal protective equipment that complies with the standards of the country you are in. Personal protective equipment must meet at least the following standards

Equipment	Standard	Images
Industrial safety helmet	EN 397:2012+A1:2012	
Safety goggles	EN 166:2001	
Ear muffs	EN 352-1:2002	
Protective coverall	EN 14605+A1	
Visibility vest	EN 20471 : 2013	
Safety shoes	EN 20345: 2004	
Protective mask	EN149:2001	
Safety glove	EN 1082-1:1996	

R Serie Regulator R25 – R40 Ø210 Actuator BP-MP



Before carrying out any work, it is important to ensure that the line on which the regulator is installed has been shut off upstream and downstream, and discharged.

Tighten all threaded parts with the correct torque.

R Serie Regulator R25 – R40 Ø210 Actuator BP-MP

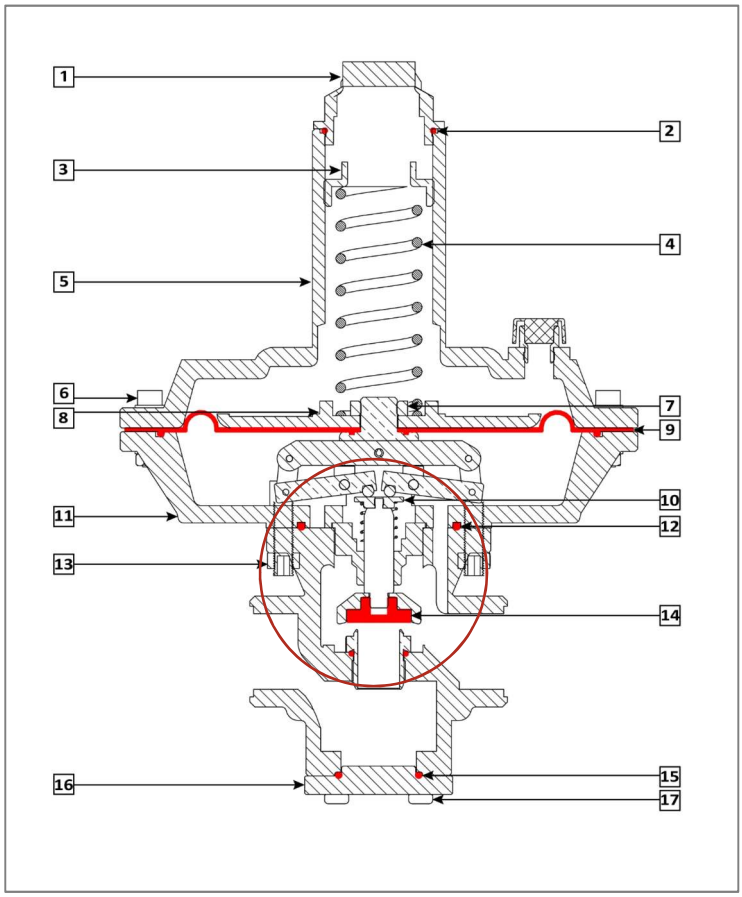
Reach the actuator part / change the main diaphragm

Step	Practice	Equipment and size
1	Unscrew and remove the locking protection cover (1)	
2	Turn counterclockwise and remove the adjustment screw (3)	HW30
3	Remove the o-ring (2) from the spring cover (5). Clean the surface where the o-ring (2) is attached. Lubricate and replace new o-ring (2) with synthetic grease	
4	Undo and remove the nut and the screw (6)	HK5
5	Remove the main cover (5)	
6	Unscrew and remove the locking nut (7)	HW22
7	Remove the disc of the diaphragm (8) and remove the main diaphragm (9). Clean the surface where the main diaphragm (9) is attached.	
8	Fit the new main diaphragm (9).	
9	Fit the disc of the diaphragm (8).	
10	Insert the nut (7). Tork 30Nm	HW22
11	Fit the main cover (5). Please check; direction of the vent piece (8.1)	
12	Insert the nuts into the screws (6). Do not damage the main diaphragm (9) when installing the screws (6), check that the holes are in the center	HK5
13	Insert the the main spring (4)	
14	Turn clockwise and screws the adjustment screw (3).	HW30
15	Turn clockwise and locking protection cover (1)	

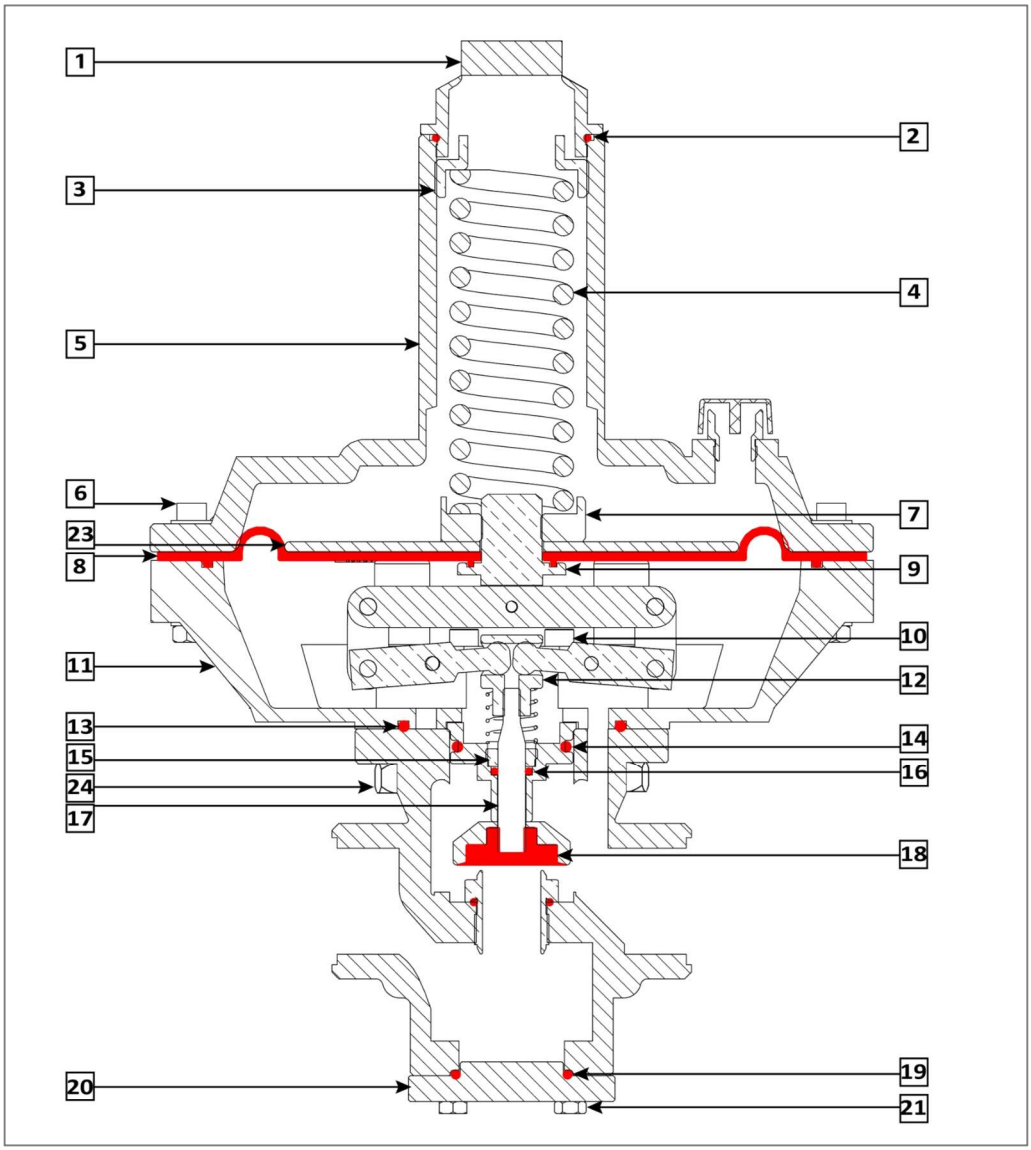
R Serie Regulator R25 – R40 Ø210 Actuator BP-MP

Reach the body part / replace the compensation membrane and the closing plug

Step	Practice	Equipment and size
16	Unscrew and remove the nut (13).	CW13
17	Pulling up, separate the main actuator (11) from the regulator's.	
18	Remove the o-ring (12) from the main actuator (11). Clean the surface where the o-ring (12) is attached. Lubricate and replace new o-ring (12) with synthetic grease	OT
19	Pull and remove main block (10)	
20	Unscrew the old plug and install the new one (14)	
21	Replace main block (10)	
22	Put the main actuator (11) back into the body of the regulator. Make sure origin is under the main actuator	
23	Screw and remove the nut (13).	CW13



R Serie Regulator R25 – R40 Ø210 Actuator AP



Before carrying out any work, it is important to ensure that the line on which the regulator is installed has been shut off upstream and downstream, and discharged.

Tighten all threaded parts with the correct torque.

R Serie Regulator R25 – R40 Ø210 Actuator AP

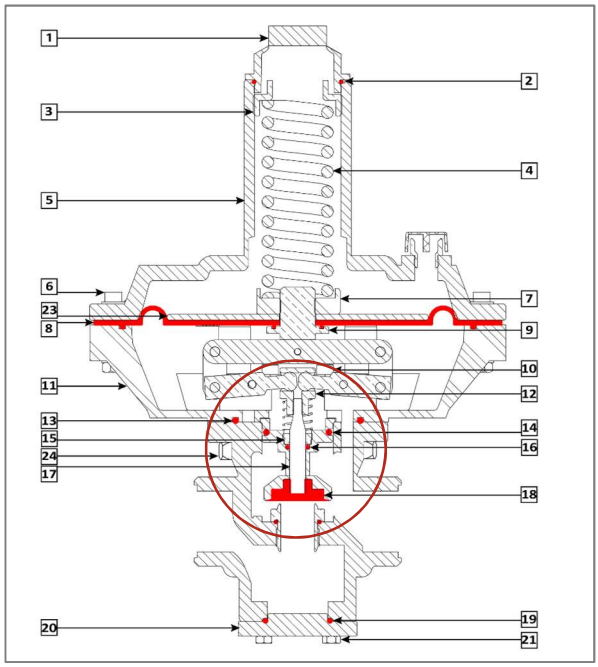
Reach the actuator part / change the main diaphragm

Step	Practice	Equipment and size
1	Unscrew and remove the locking protection cover (1)	
2	Turn counterclockwise and remove the adjustment screw (3)	HW30
3	Remove the o-ring (2) from the spring cover (5). Clean the surface where the o-ring (2) is attached. Lubricate and replace new o-ring (2) with synthetic grease	OT
4	Undo and remove the nut and the screw (6)	HK5
5	Remove the main cover (5)	
6	Unscrew and remove the locking nut (7)	
7	Remove the disc of the diaphragm (22) and remove the main diaphragm (8). Clean the surface where the main diaphragm (8) is attached.	OT
8	Fit the new main diaphragm (8).	
9	Fit the disc of the diaphragm (22)	
10	Insert the nut (7). Tork 40Nm	
11	Fit the main cover (5). Please check; direction of the vent piece (8.1)	
12	Insert the nuts into the screws (6). Do not damage the main diaphragm (8) when installing the screws (6), check that the holes are in the center	HK5
13	Insert the the main spring (4)	
14	Turn clockwise and screws the adjustment screw (3).	HW30
15	Turn clockwise and locking protection cover (1)	

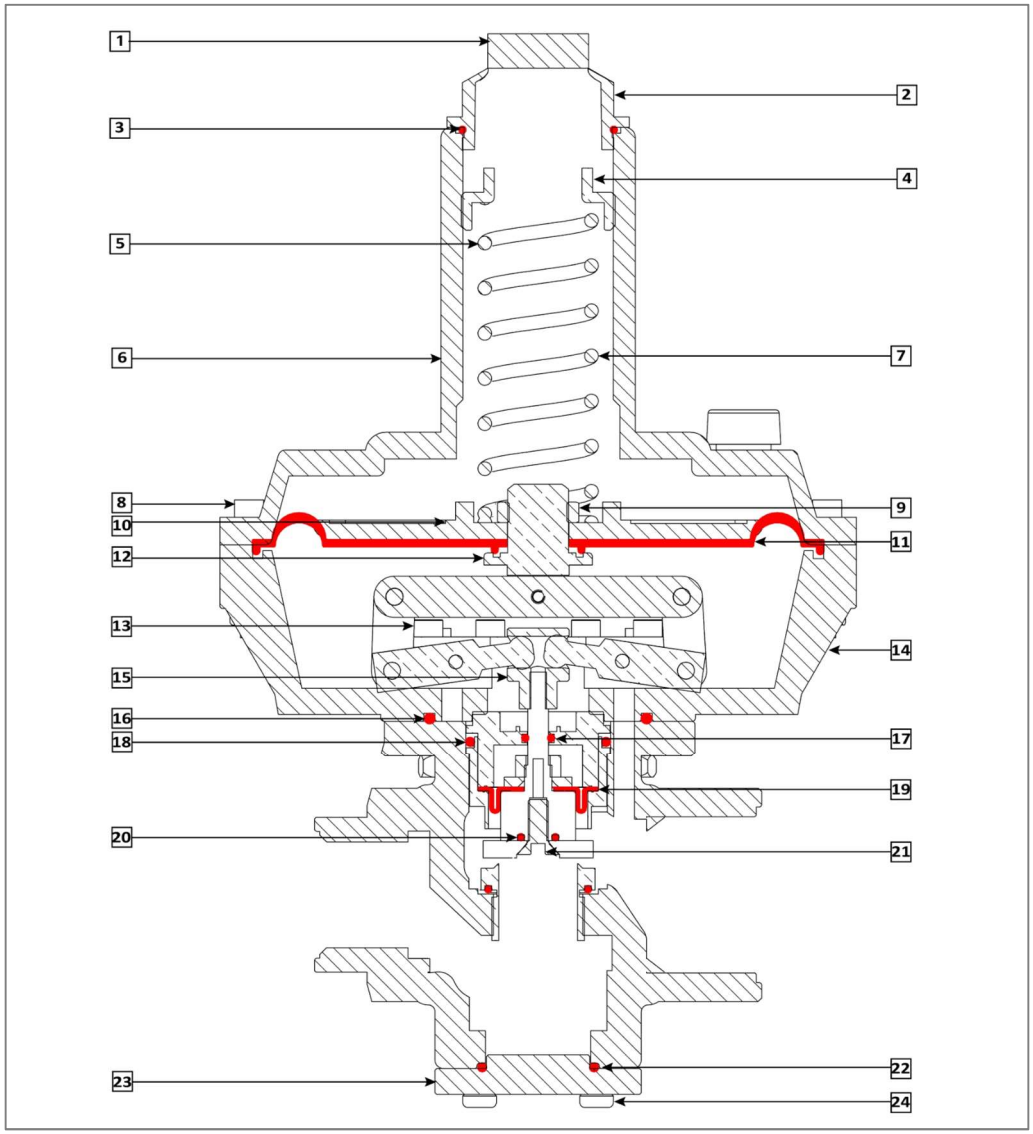
R Serie Regulator R25 – R40 Ø210 Actuator BP-MP

Reach the body part / replace the compensation membrane and the closing plug

Step	Practice	Equipment and size
16	Unscrew and remove the nut (23).	CW13
17	Pulling up, separate the main actuator (11) from the regulator's.	
18	Remove the o-ring (13) from the main actuator (11). Clean the surface where the o-ring (13) is attached. Lubricate and replace new o-ring (13) with synthetic grease	OT
19	Pull and remove main block (12)	
20	Remove the o-ring (14) from the main blok. Clean the surface where the o-ring (14) is attached. Lubricate and replace new o-ring (14) with synthetic grease	OT
21	Unscrew and remove the nut (15).	SS
22	Remove the o-ring (16) from the main shaft. Clean the surface where the o-ring (16) is attached. Lubricate and replace new o-ring (16) with synthetic grease	OT
23	Unscrew the old plug and install the new one (18)	
24	Replace main block (12)	
25	Put the main actuator (11) back into the body of the regulator. Make sure origin is under the main actuator	
26	Screw and remove the nut (13).	CW13



R Serie Regulator R40H Ø185 or 210 Actuator BP-MP-AP



Before carrying out any work, it is important to ensure that the line on which the regulator is installed has been shut off upstream and downstream, and discharged.

Tighten all threaded parts with the correct torque.

R Serie Regulator R40H Ø185 or 210 Actuator BP-MP-AP

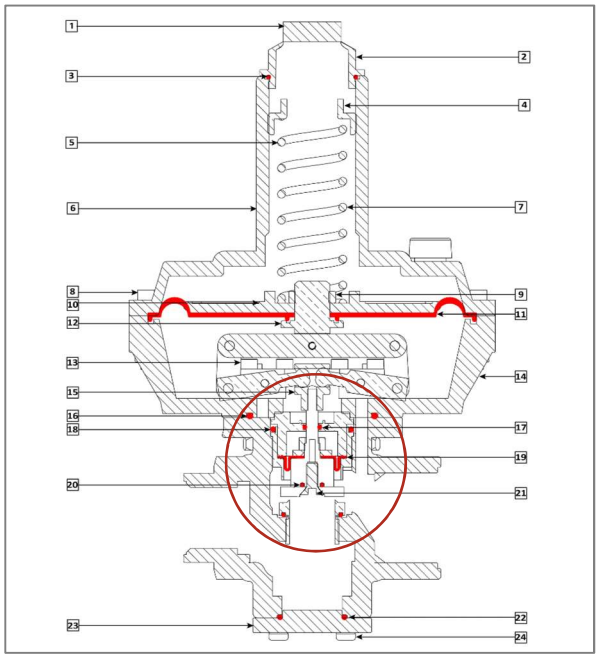
Reach the actuator part / change the main diaphragm

Step	Practice	Equipment and size
1	Unscrew and remove the locking protection cover (1)	
2	Turn counterclockwise and remove the adjustment screw (4)	HW30
3	Remove the o-ring (3) from the main cover (6). Clean the surface where the o-ring (3) is attached. Lubricate and replace new o-ring (3) with synthetic grease	OT
4	Undo and remove the nut and the screw (8)	HK5
5	Remove the main cover (6)	
6	Unscrew and remove the locking nut (9)	SW22
7	Remove the disc of the diaphragm (10) and remove the main diaphragm (11). Clean the surface where the main diaphragm (11) is attached.	OT
8	Fit the new main diaphragm (11).	
9	Fit the disc of the diaphragm (10)	
10	Insert the nut (9). Tork 30Nm	SW22
11	Fit the main cover (6). Please check; direction of the vent piece (8.1)	
12	Insert the nuts into the screws (8). Do not damage the main diaphragm (11) when installing the screws (8), check that the holes are in the center	HK5
13	Insert the the main spring (7)	
14	Turn clockwise and screws the adjustment screw (4).	HW30
15	Turn clockwise and locking protection cover (1)	

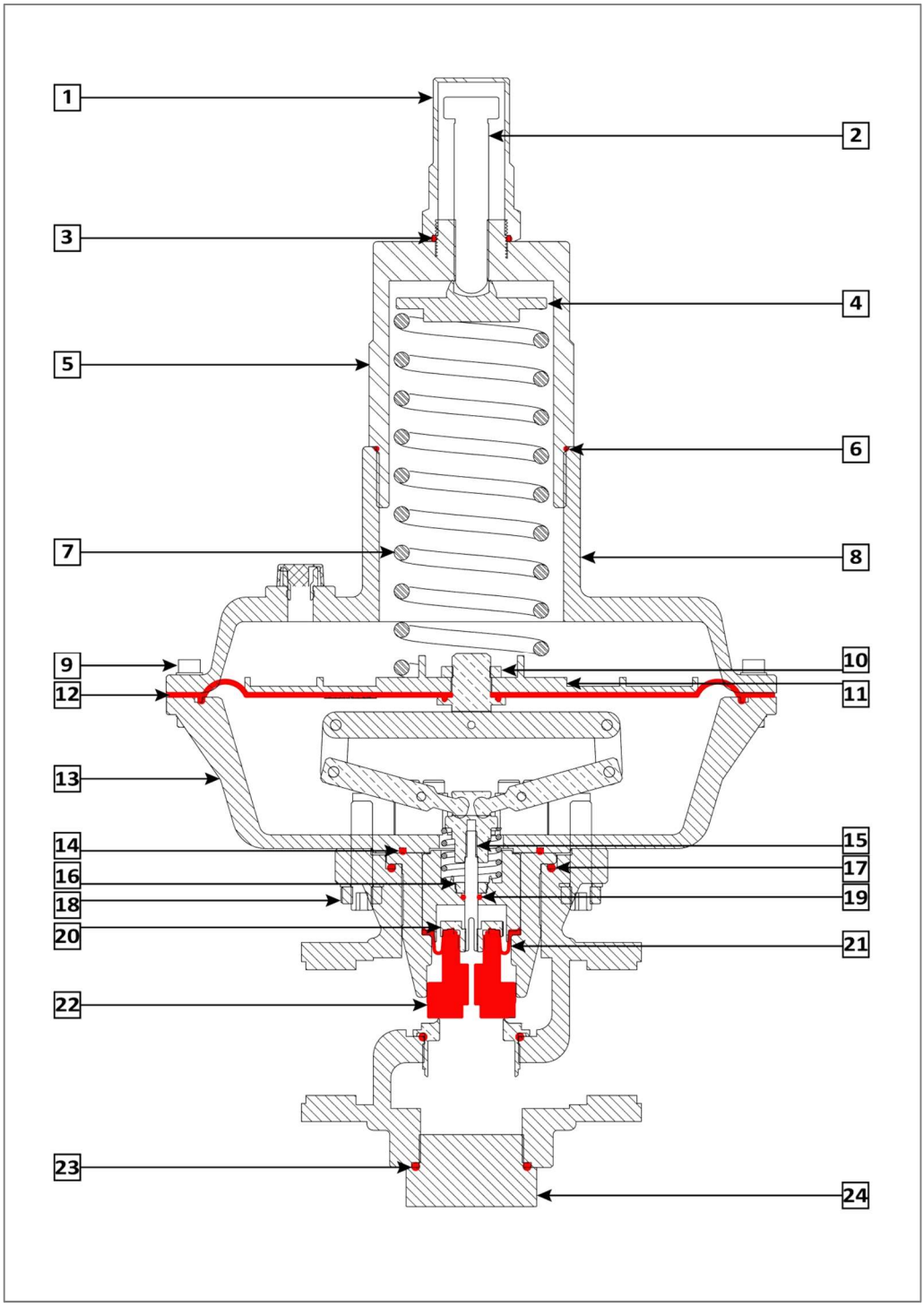
R Serie Regulator R40H Ø185 or 210 Actuator BP-MP-AP

Reach the body part / replace the compensation membrane and the closing plug

Step	Practice	Equipment and size
16	Unscrew and remove the nut (25).	CW13
17	Pulling up, separate the main actuator (14) from the regulator's.	
18	Remove the o-ring (16) from the main actuator (14). Clean the surface where the o-ring (16) is attached. Lubricate and replace new o-ring (16) with synthetic grease	OT
19	Pull and remove main block (16)	
20	Remove the o-ring (18) from the main blok. Clean the surface where the o-ring (18) is attached. Lubricate and replace new o-ring (18) with synthetic grease	OT
21	Unscrew and remove the nut (21).	HW4
22	Remove the o-rings (20) (17) from the main shaft. Clean the surface where the o-rings (20) (17) is attached. Lubricate and replace new o-rings (20) (17) with synthetic grease	OT
23	Unscrew the old plug and compensation diapghram (19) install the new one (18)	
24	Replace main block	
25	Put the main actuator (14) back into the body of the regulator. Make sure origin is under the main actuator	
26	Screw and remove the nut (25).	CW13



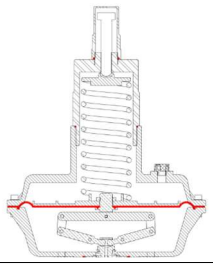
R Serie Regulator R50 Ø280 Actuator BP-MP



Before carrying out any work, it is important to ensure that the line on which the regulator is installed has been shut off upstream and downstream, and discharged.

Tighten all threaded parts with the correct torque.

R Serie Regulator R50 Ø280 Actuator BP-MP



Reach the actuator part / change the main diaphragm

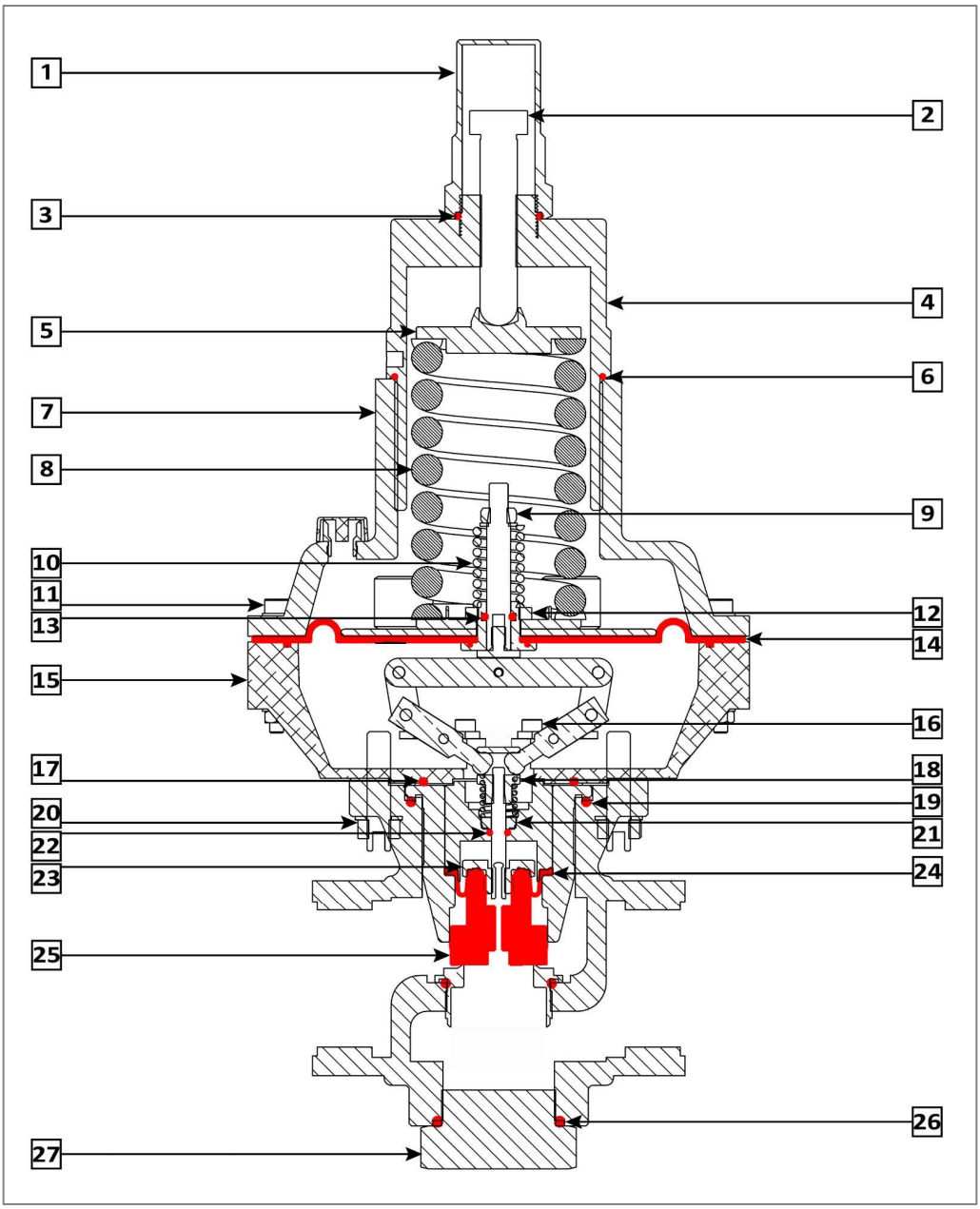
Step	Practice	Equipment and size
1	Unscrew and remove the locking protection cover (1)	CW42
2	Turn counterclockwise and remove the adjustment screw (2)	CW24
3	Remove the o-ring (3) from the spring cover (5). Clean the surface where the o-ring (3) is attached. Lubricate and replace new o-ring (3) with synthetic grease	OT
4	Turn counterclockwise and remove the spring cover (5)	HW80/90
5	Remove the o-ring (6) from the spring cover (5). Clean the surface where the o-ring (6) is attached. Lubricate and replace new o-ring (6) with synthetic grease	OT
6	Remove the spring disc (4) and remove the main spring (7)	
7	Undo and remove the nut and the screw (9)	HK5
8	Remove the main cover (8)	
9	Unscrew and remove the locking nut (10)	SW27
10	Remove the disc of the diaphragm (11) and remove the main diaphragm (12). Clean the surface where the main diaphragm (12) is attached.	
11	Fit the new main diaphragm (12).	
12	Fit the disc of the diaphragm (11).	
13	Insert the nut (9). Tork 40Nm	SW27
14	Fit the main cover (8). Please check; direction of the vent piece (8.1)	
15	Insert the nuts into the screws (9). Do not damage the main diaphragm (12) when installing the screws (9), check that the holes are in the center	HK5
16	Secure the screws (9) Tork 25Nm	HK5
17	Turn clockwise and screws the spring cover (5), check that the oring (6) is in place	HW80/90
18	Insert the the main spring (7) and spring disc (4)	
19	Insert the o-ring (3) on the spring cover (5).	
20	Turn clockwise and screws the adjustment screw (2).	CW24
21	Turn clockwise and locking protection cover (1)	CW42

R Serie Regulator R50 Ø280 Actuator BP-MP

Reach the body part / replace the compensation membrane and the closing plug

Step	Practice	Equipment and size
22	Unscrew and remove the nut (18).	CW17
23	Pulling up, separate the main actuator (13) from the regulator's.	
24	Disconnect the shaft (15) from the main actuator (13) by turning the block (28) counterclockwise	
25	Remove the o-ring (14) from the main actuator (13). Clean the surface where the o-ring (14) is attached. Lubricate and replace new o-ring (14) with synthetic grease	OT
26	Remove the o-ring (17) from the body (29). Clean the surface where the o-ring (17) is attached. Lubricate and replace new o-ring (17) with synthetic grease	OT
27	Detach it from the block (28) by pressing the closing plug (22) in reverse	
28	Unscrew the nut (16) to access the oring (19)	SS
29	Remove the o-ring (19). Clean the surface where the o-ring (19) is attached. Lubricate and replace new o-ring (19) with synthetic grease	OT
30	Unscrew and remove the special nut (20). Dont forget; hold the close plug (22) with hex key. Compensation diaphragm and closing plug will be separated	CW22, HK8
31	Reassemble the new compensation diaphragm and the new closing plug with the special nut	CW22, HK8
32	Put the closing plug (22) group back into the block (28)	
33	Turn clockwise the block (28) and screw on main actuator (13). Dont forget; check that new origin (14) main actuator is installed	
34	Insert the new o-ring (17) into its slot on the body.	
35	Mount the main actuator (13) with the block (28) on the body.	
36	Screw the nut (18).	CW17

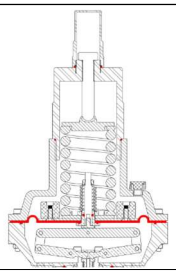
R Serie Regulator R50 Ø210 Actuator AP - AAP



Before carrying out any work, it is important to ensure that the line on which the regulator is installed has been shut off upstream and downstream, and discharged.

Tighten all threaded parts with the correct torque.

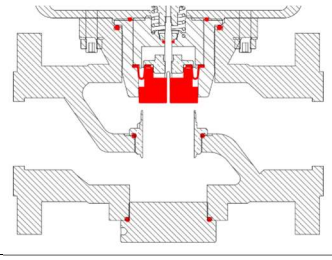
R Serie Regulator R50 Ø210 Actuator AP - AAP



Reach the actuator part / change the main diaphragm

Step	Practice	Equipment and size
1	Unscrew and remove the locking protection cover (1)	CW42
2	Turn counterclockwise and remove the adjustment screw (2)	CW24
3	Remove the o-ring (3) from the spring cover (5). Clean the surface where the o-ring (3) is attached. Lubricate and replace new o-ring (3) with synthetic grease	OT
4	Turn counterclockwise and remove the spring cover (5)	HW80/90
5	Remove the o-ring (6) from the spring cover (5). Clean the surface where the o-ring (6) is attached. Lubricate and replace new o-ring (6) with synthetic grease	OT
6	Remove the spring disc (4) and remove the main spring (7)	
7	Undo and remove the nut and the screw (9)	HK5
8	Remove the main cover (8)	
9	Unscrew and remove the locking nut (10)	SW27
10	Remove the disc of the diaphragm (11) and remove the main diaphragm (12). Clean the surface where the main diaphragm (12) is attached.	
11	Fit the new main diaphragm (12).	
12	Fit the disc of the diaphragm (11).	
13	Insert the nut (10). Tork 40Nm	SW27
14	Fit the main cover (8). Please check; direction of the vent piece (8.1)	
15	Insert the nuts into the screws (9). Do not damage the main diaphragm (12) when installing the screws (9), check that the holes are in the center	HK5
16	Secure the screws (9) Tork 25Nm	HK5
17	Turn clockwise and screws the spring cover (5), check that the oring (6) is in place	HW80/90
18	Insert the the main spring (7) and spring disc (4)	
19	Insert the o-ring (3) on the spring cover (5).	
20	Turn clockwise and screws the adjustment screw (2).	CW24
21	Turn clockwise and locking protection cover (1)	CW42

R Serie Regulator R50 Ø210 Actuator AP - AAP



Reach the body part / replace the compensation membrane and the closing plug

Step	Practice	Equipment and size
22	Unscrew and remove the nut (18).	CW17
23	Pulling up, separate the main actuator (13) from the regulator's.	
24	Disconnect the shaft (15) from the main actuator (13) by turning the block (28) counterclockwise	
25	Remove the o-ring (14) from the main actuator (13). Clean the surface where the o-ring (14) is attached. Lubricate and replace new o-ring (14) with synthetic grease	OT
26	Remove the o-ring (17) from the body (29). Clean the surface where the o-ring (17) is attached. Lubricate and replace new o-ring (17) with synthetic grease	OT
27	Detach it from the block (28) by pressing the closing plug (22) in reverse	
28	Unscrew the nut (16) to access the oring (19)	SS
29	Remove the o-ring (19). Clean the surface where the o-ring (19) is attached. Lubricate and replace new o-ring (19) with synthetic grease	OT
30	Unscrew and remove the special nut (20). Dont forget; hold the close plug (22) with hex key. Compensation diaphragm and closing plug will be separated	CW22, HK8
31	Reassemble the new compensation diaphragm and the new closing plug with the special nut	CW22, HK8
32	Put the closing plug (22) group back into the block (28)	
33	Turn clockwise the block (28) and screw on main actuator (13). Dont forget; check that new oring (14) main actuator is installed	
34	Insert the new o-ring (17) into its slot on the body.	
35	Mount the main actuator (13) with the block (28) on the body.	
36	Screw the nut (18).	CW17

MAINTENANCE and REPAIR

SLUM SHUT

Equipment List for Maintenance and Repair

You must have the following hand tools for maintenance and repair. Check that the hand tools you use comply with the standards in your country.

Equipment	DN25 – 50 BP-MP	DN25 – 50 AP-AAP	DN65 – 150 BP-MP	DN65 – 150 AP-AAP	Images
Combination Wrench	30,10,17	42,10,17			
Hex Key Wrench T-Handle	4	5	5,6	5,6	
Screwdriver Sloted	8x150	8x150			
Hook Wrench	58/62, 80/90	58/62, 80/90			
Circlip Pliers, External	5-15mm	5-15mm	5-15mm		
Adjustable Wrench	34	34	34		
O-ring Tool					

the unit of all dimensions is mm

Abbreviations will be used in maintenance and repair instructions

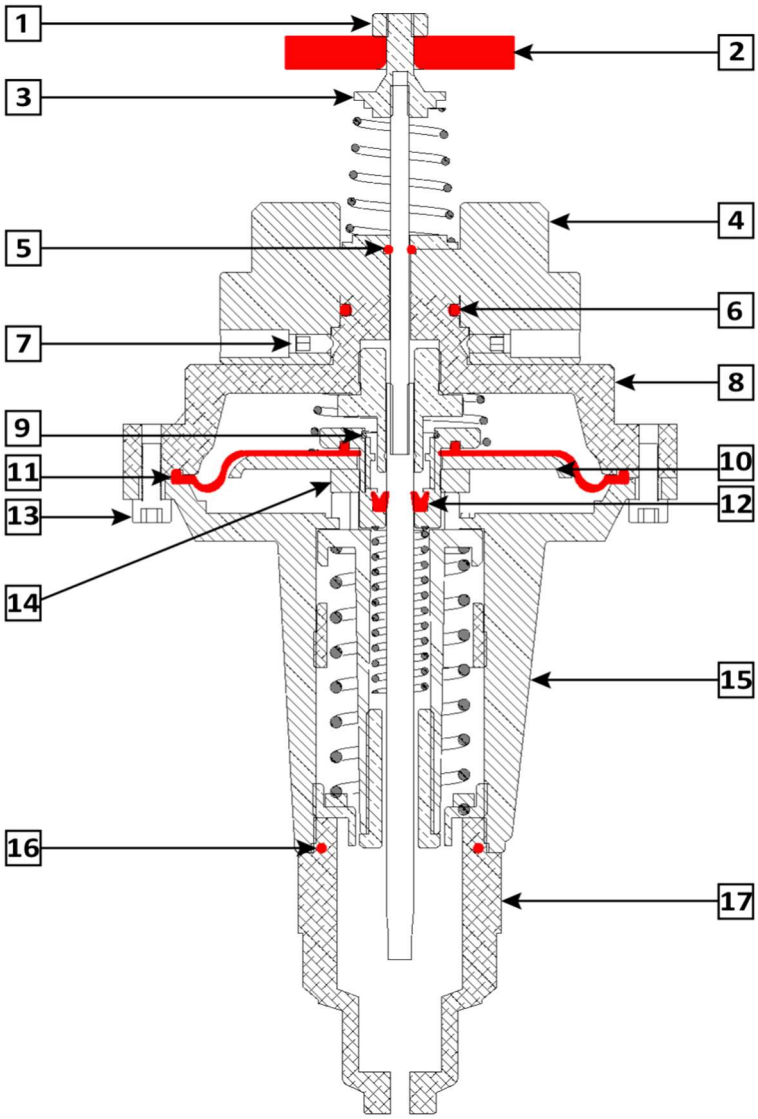
Equipment	Abbreviations
Combination **W**rench	CW
Hex **K**ey Wrench T-Handle	HK
Screwdriver **S**loted	SS
Hook **W**rench	HW
Double Ended Tubular **S**ocket **W**rench	SW
Circlip **P**liers, External	CP
Adjustable **W**rench	AW
O-ring **T**ool	OT

Personal Protective Equipmen List

All certified technical personnel must wear personal protective equipment. You must comply with the occupational safety rules of the local authorities you are in. You should use personal protective equipment that complies with the standards of the country you are in. Personal protective equipment must meet at least the following standards

Equipment	Standard	Images
Industrial safety helmet	EN 397:2012+A1:2012	
Safety goggles	EN 166:2001	
Ear muffs	EN 352-1:2002	
Protective coverall	EN 14605+A1	
Visibility vest	EN 20471 : 2013	
Safety shoes	EN 20345: 2004	
Protective mask	EN149:2001	
Safety glove	EN 1082-1:1996	

Slum Shut DN 1” – 2” **BP-MP** Actuator



Before carrying out any work, it is important to ensure that the line on which the regulator is installed has been shut off upstream and downstream, and discharged.

Tighten all threaded parts with the correct torque.

Slum Shut DN 1” – 2” BP-MP Actuator

Step	Practice	Equipment and size
1	Undo and remove the screw (13)	CW42
2	pull off main cover (15)	CW24
3	pull out the diaphragm group (11)	OT
4	unscrew the nut (14)	HW80/90
5	remove the old diaphragm and replace it with a new one (11)	OT
6	replace and tighten the nut (14)	
7	replace the diaphragm assembly (11)	HK8
8	remove the circlip (9)	
11	Lubricate and replace new felt (12) with synthetic grease	CW19
12	Fix part (13) with the wrench and loosen part (1) and remove it	CW7 and 24
13	replace the shutdown disk with a new one	CW32
14	Fix part (13) with the wrench and tighten part (1) replace and fix the main cover (15)	
15	tighten the screws (13)	HK8

It is recommended that slam-shut controller efficiency be checked periodically.

Cut-off Test

Pos	Practice
1	Close inlet and outlet main valves (1) (5). The controller should trigger at minimum pressure (only if so set).
2	Using a small pump or other appropriate means on the downstream vent valve (2) , raise pressure in the line to normal operating level. Relatch controller in case it has triggered following on step 1 above.
3	Simulate pressure increase until maximum triggering pressure is reached.
4	Bring the line back to full operating conditions as described in Startup procedure.

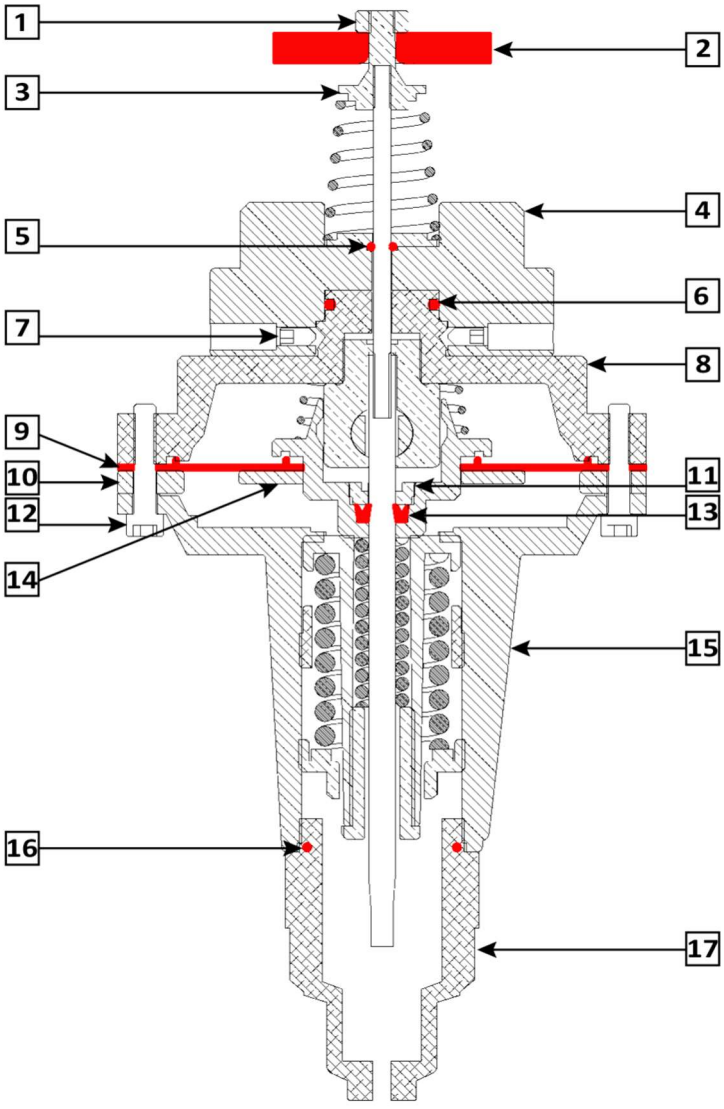
Referance Page 24

Controller-seal Check

Pos	Practice
1	Slowly close the main outlet valve (5) located downstream.
2	Disable the ssv unit and close the stream
3	Loosen one fitting in the line downstream of the slam-shut valve and apply soapy water in order to make sure that there are no leaks. In case of any leak being detected, proceed with the necessary maintenance of the controller.

Referance Page 24

Slum Shut DN 1” – 2” AP or AAP Actuator



Before carrying out any work, it is important to ensure that the line on which the regulator is installed has been shut off upstream and downstream, and discharged.

Tighten all threaded parts with the correct torque.

Slum Shut DN 1” – 2” AP or AAP Actuator

Step	Practice	Equipment and size
1	Undo and remove the screw (12)	CW42
2	pull off main cover (15)	CW24
3	pull out the diaphragm group (9)	OT
4	unscrew the nut (14)	HW80/90
5	remove the old diaphragm and replace it with a new one replace (9)	OT
6	and tighten the nut (14)	
7	replace the diaphragm assembly (14)	HK8
8	remove the circlip (11)	
11	Lubricate and replace new felt (13) with synthetic grease	CW19
12	Fix part (3) with the wrench and loosen part (1) and remove it	CW7 and 24
13	replace the shutdown disk (2) with a new one	CW32
14	Fix part (3) with the wrench and tighten part (1) replace and fix the main cover (15)	
15	tighten the screws (12)	HK8

It is recommended that slam-shut controller efficiency be checked periodically.

Cut-off Test

Pos	Practice
1	Close inlet and outlet main valves (1) (5). The controller should trigger at minimum pressure (only if so set).
2	Using a small pump or other appropriate means on the downstream vent valve (2) , raise pressure in the line to normal operating level. Relatch controller in case it has triggered following on step 1 above.
3	Simulate pressure increase until maximum triggering pressure is reached.
4	Bring the line back to full operating conditions as described in Startup procedure.

Referance Page 24

Controller-seal Check

Pos	Practice
1	Slowly close the main outlet valve (5) located downstream.
2	Disable the ssv unit and close the stream
3	Loosen one fitting in the line downstream of the slam-shut valve and apply soapy water in order to make sure that there are no leaks. In case of any leak being detected, proceed with the necessary maintenance of the controller.

Referance Page 24

NOTES

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