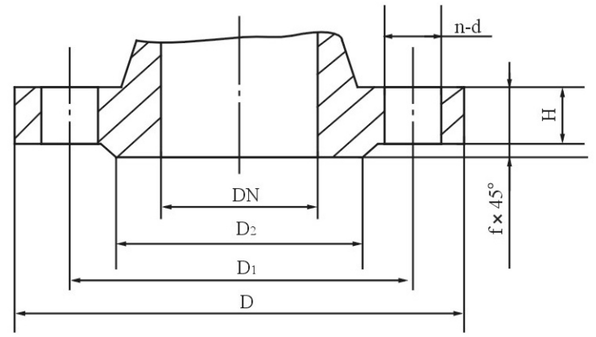


Self-operated Pressure (Differential Pressure) Regulating Valve

K23001/K23101 Series
K23003/K23103 Series

K23002/K23102 Series
K23004/K23104 Series

OPERATION MANUAL



PN1.6~PN4.0（MPa）

German DIN standard flange size

mm

DN	D		D_1		D_2		f		H		n-d		Bolt diameter	
	PN16	PN40	PN16	PN40	PN16	PN40	PN16	PN40	PN16	PN40	PN16	PN40	PN16	PN40
15	95		65		45		2		14		4-ϕ14		M12	
20	105		75		58		2		16		4-ϕ14		M12	
25	115		85		68		2		16		4-ϕ14		M12	
32	140		100		78		2		18		4-ϕ18		M16	
40	150		110		88		2		18		4-ϕ18		M16	
50	165		125		102		3		20		4-ϕ18		M16	
65	185		145		122		3		20		4-ϕ18	8-ϕ18	M16	
80	200		160		138		3		22		8-ϕ18		M16	
100	220	235	180	190	158	162	3		24		8-ϕ18	8-ϕ22	M16	M20
125	250	270	210	220	188	188	3		26		8-ϕ18	8-ϕ26	M16	M24
150	285	300	240	250	212	218	3		16	28	8-ϕ22	8-ϕ26	M20	M24
200	340	375	295	320	268	285	3		30	34	12-ϕ22	12-ϕ30	M20	M27
250	405	450	355	385	320	345	3		32	38	12-ϕ26	12-ϕ33	M24	M30

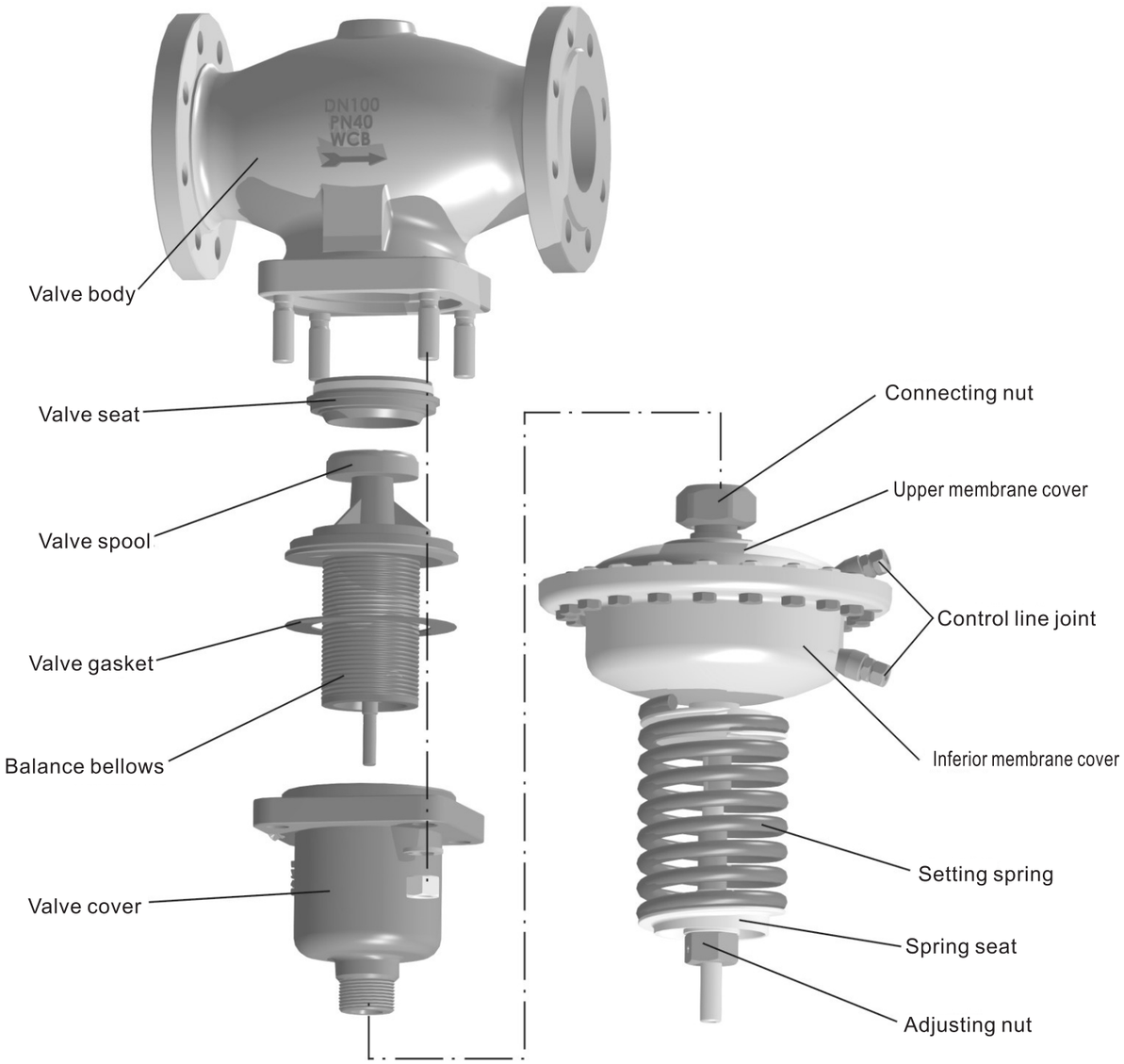


Figure 10. Pressure Valve Disassembly and Disassembly Steps

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1.Product Introduction

1.1 Product Functions and Applications

The self-operated pressure (differential pressure) regulating valve is an energy-saving product that automatically adjusts the pressure (differential pressure) without external energy (signal) but only relies on the pressure (differential pressure) change of the regulated medium itself. It integrates measurement, execution, control and many other functions into one, forming an independent instrument control system. It can be widely applied to the automatic control systems without (or unavailable of) driving energy in industrial sectors such as petrochemical, electric power, metallurgy, light industry and urban construction, where the controlled mediums are non-corrosive gas, liquid and steam. It is especially suitable for the automatic control systems of natural gas production, transportation and coal gas transmission. Confirmed by authoritative overseas departments, when applied to urban heat supply and heating systems, it can improve the thermal efficiency by 30%–40%. It is economical, environmentally friendly and features remarkable energy-saving effects.

1.2 Model (Abbreviation)

Category	Pressure control regulating valve						Differential pressure control regulating valve					
	Pressure adjustment behind the valve (pressure behind the valve increases and valve closes)			Pre-valve pressure adjustment (post-valve pressure increase valve opening)			Differential pressure rise valve closed			Differential pressure rise valve open		
	Hard seal	Soft seal	Hard seal	Soft seal	Hard seal	Soft seal	Hard seal	Soft seal	Hard seal	Soft seal	Hard seal	Soft seal
Model	23001	23101	23201	23002	23102	32202	23003	23103	23203	23004	23104	23204
Operating temperature	≤150℃		≤350℃	≤150℃		≤200℃	≤150℃		≤200℃	≤150℃		≤200℃

Note: If PTFE diaphragm is used, F should be added before the model number. Example: KF23101.

1.3 Working Principle of Product Structure

A. Product structure

1. Valve body
2. Valve seat
3. Valve core
4. Valve cover
5. Membrane cover
6. Diaphragm
7. Spring
8. Adjustment nut

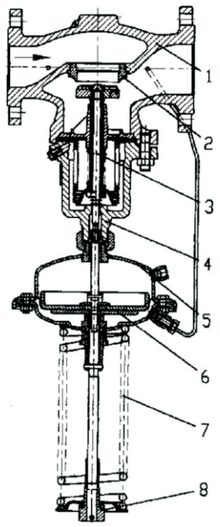


Figure 1a.
K23001
K23101 DN15–125

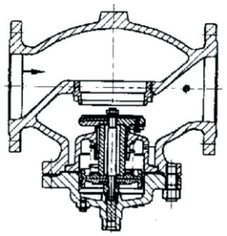


Figure 1b. DN150–250

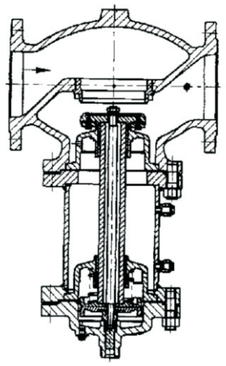


Figure 1c. DN150–250 with extension (above 150 ℃)

When the system is not running, the valve is fully open. The pressure behind the valve is transmitted to the lower side of the diaphragm through the pipeline, and the other side of the diaphragm is connected to the atmospheric pressure.

When the controlled pressure exceeds the set value, the valve begins to close until the force between the diaphragm and the spring reaches a new equilibrium.

4. Repair and Troubleshooting

4.1 Repair

Under normal operating conditions, the pressure valve does not need maintenance. When maintenance is required under special circumstances, professionals should do it.

4.2 Troubleshooting

If there is a fault, find the cause according to Table 7

Table 7

Faults	Causes	Solutions
Automatic control failure	Clogged control line or impurities in valve	Clean control lines and valves
	Diaphragm rupture	Diaphragm replacement
	Spring breaks	Replacement Spring
	The actual pressure difference before and after the valve is less than the minimum working pressure difference of the valve	Replace Pressure Valve
Controlled parameters are unstable	Select the valve bore too large or too small	Replace the appropriate valve
	Corrugated pipe damage	Replace bellows components
	Spool, valve seat wear	Replace the spool and seat

4.3 Disassembly and Assembly of Pressure Valve

Refer to Figure 10 for the disassembly and assembly procedures of the pressure valve.

First, release the pressure of the control valve, disassemble the control pipeline, loosen the connecting nut connecting the actuator, and remove the actuator. Then remove the valve bonnet and balancer. Check the spool, valve seat and bellows (DN15 ~ 125) or balance diaphragm (DN150 ~ 250) for damage. If the spool, valve seat, bellows or balancing diaphragm is damaged, the entire balancer needs to be replaced. When reassembling, in reverse order, but the gasket should be replaced.

5. Transportation and Storage

1. Before storage and transportation, check whether all signs are complete, complete, correct and clear. The packing box should be neat and firm without damage. Finally, check the reliability and safety of nail box bandaging.

2. During transportation, it should be loaded and unloaded lightly. Throwing and collision are strictly prohibited. All kinds of signs must not be lost, damp or damaged.

3. Store it at an air temperature of 5 ~ 40 ° C and a relative humidity of no more than 90%. The warehouse air does not contain harmful impurities that corrode various valves.

4. Place it according to the marks on the surface of the packing box, and do not turn it upside down.

5. The rust-prone parts of the product should be coated with anti-rust grease or wrapped with anti-rust paper. Petroleum asphalt paper or plastic film should be used as a rain-proof measure in the packaging box.

6. Order Instructions

A. The following conditions should be indicated when ordering:

① Product model, ② nominal pressure, ③ nominal diameter, ④ flange standard, ⑤ pressure setting range and pressure regulation method, ⑥ valve body material, ⑦ medium type and process conditions and working temperature, ⑧ valve seat sealing type (hard, soft seals and materials), ⑨ whether there are special requirements

b. If the technical parameters are changed due to improvement without prior notice.

c. Please refer to "Selection Guide for Self-operated Regulating Valve" for model compilation.

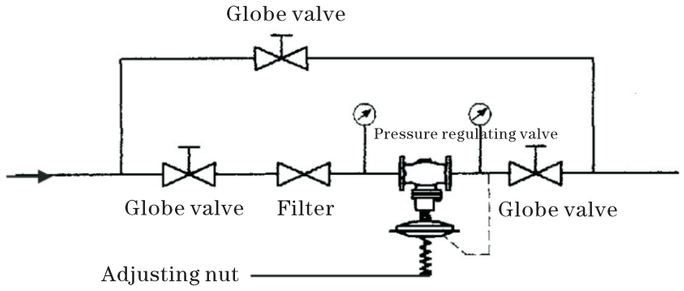


Figure 9. Installation diagram

2.2 Field Installation

① Installers should first realize that the pressure valve is a kind of precise instrument equipment, and it is not allowed to collide or fall to avoid damage and affect product performance.
② Before starting construction and after shutdown for maintenance, the piping system should be flushed first, and then the pressure valve should be installed, and the pressure in the pipeline should be ensured to do not exceed the limit value of the pressure valve.
③ Be sure to install the pressure valve according to the medium flow direction shown by the pressure valve (arrow on the valve body).
④ The pressure valve should be installed vertically on the pipeline. The actuator is at the bottom and the control valve is at the top, as shown in Figure 9, so that the temperature of the medium can be reduced to the actuator. When the medium temperature is lower than 80 ° C, the pressure valve can be installed upright. When the medium temperature is higher than 80 ° C, the pressure valve must be installed vertically upside down, that is, the actuator is installed downward. A support frame should be added when the valve weighs heavily or there is vibration.
⑤ A pressure gauge should be installed before and after the pressure valve so as to check it when setting and adjusting.

3. Product Debugging and Use

Tip: When the pressure valve leaves the factory, the pressure (differential pressure) is not set according to the field conditions. It must be set according to the following steps before use.

3.1 Operation Steps

After the pressure valve is completely installed, first slowly open the stop valve downstream of the pressure valve, then slowly open the stop valve upstream of the pressure valve. Observe the pressure gauges on both sides of the pressure valve, and adjust the adjustment nut of the pressure valve (the adjustment nut is located at the end of the actuator spring, as shown in the structural diagram on Page 1 or Page 2 of this manual. For the ZA3–type actuator, turning the nut clockwise increases the set pressure, while turning it counterclockwise decreases the set pressure. For the ZA4–type actuator, turning the nut clockwise decreases the set pressure, while turning it counterclockwise increases the set pressure) until the required upstream or downstream pressure of the pressure valve is achieved. Maintain this state for a period of time to obtain the optimal upstream or downstream pressure value of the pressure valve. (For liquid pressure control, slightly loosen the control pipeline connector to bleed the air inside the actuator, then retighten the connector.)
SPECIAL NOTE: !!! ① When separating the actuator from the control valve, all pressure in the valve must be released.
② If the temperature of the controlled medium exceeds 140 ° C, DN15 ~ 125 needs to be equipped with a cooling tank. The liquid medium with low temperature and the same kind as the controlled medium should be injected into the film chamber and cooling tank through the mouth of the cooling tank, and must be filled.
③ If the temperature of the controlled medium exceeds 140 ° C, DN150 ~ 250 needs to be equipped with an extension and a cooling tank. At this time, in addition to injecting refrigerant into the cooling tank, the extension should also be filled with refrigerant.

3.2 Adjustment Steps

If it is found that the pressure of the pressure valve is not ideal, you can fine–tune the adjustment nut of the pressure valve to obtain the ideal value.

1. Valve body
2. Valve seat
3. Valve core
4. Valve cover
5. Membrane cover
6. Diaphragm
7. Spring
8. Adjustment nut

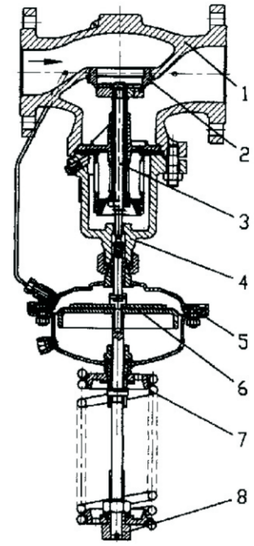


Figure 2a.
K23002
K23102 DN15–125

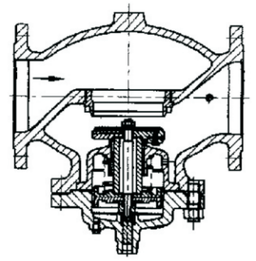


Figure 2b. DN150–250

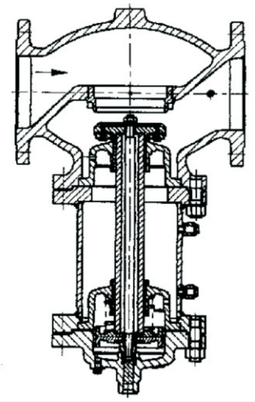


Figure 2c. DN150–250 with extension (200℃)

When the system is not running, the valve is fully closed. The system pressure behind the pump (before the valve) is transmitted through the pipeline to the upper side of the diaphragm, and the other side of the diaphragm is connected to the atmospheric pressure.

When the controlled pressure rises above the set value, the valve opens until the force between the diaphragm and the spring reaches a new equilibrium.

1. Valve body
2. Valve seat
3. Valve core
4. Valve cover
5. Membrane cover
6. Diaphragm
7. Safety valve
8. Spring
9. Adjusting nut

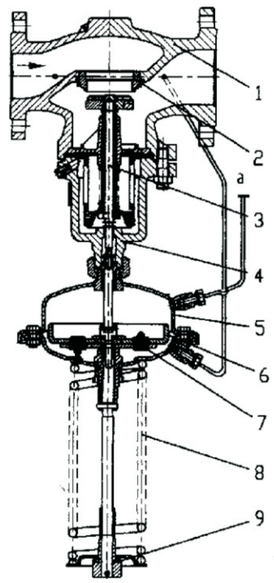


Figure 3a.
K23003
K23103 DN15–125

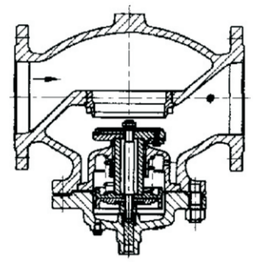


Figure 3b. DN150–250

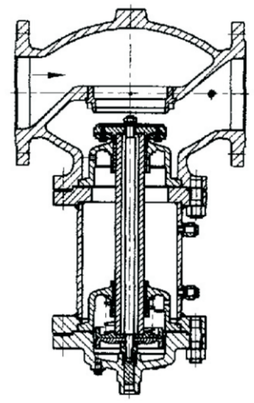


Figure 3c. DN150-250 with extension (200 °C)

Note: Pipeline A is connected to the pressure taking point of differential pressure equipment

The control differential pressure is led to the upper side of the diaphragm through the pipeline. When the differential pressure rises, the control valve closes; When the differential pressure decreases, the control valve opens to maintain a constant differential pressure.

The capsule is equipped with an overpressure limiting device (safety valve) to protect the diaphragm and control valve from high differential pressure (for effective area 250, 630 cm2).

1. Valve body
2. Valve seat
3. Valve core
4. Valve cover
5. Membrane cover
6. Diaphragm
7. Spring
8. Adjustment nut

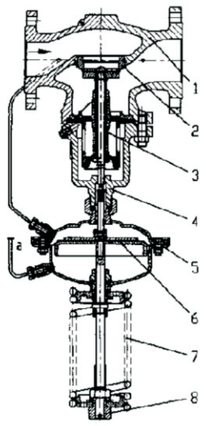


Figure 4a.
K23004
K23104 DN15–125

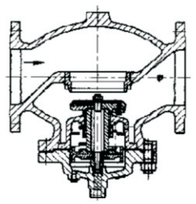


Figure 4b. DN150–250

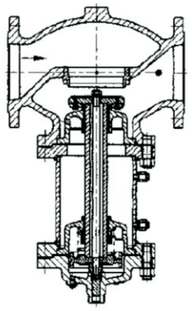


Figure 4c. DN150–250 with extension (200℃)

Note: Pipeline A is connected to the pressure taking point of differential pressure equipment

The differential pressure is transmitted to the upper side of the capsule through the pipeline. When the differential pressure increases beyond the set differential pressure, the valve opens until the force between the diaphragm and the spring reaches a new equilibrium.

B. Working Principle

A. When adjusting the pressure behind the valve (K23001/23101/23201), see Figure 1a.

Self–operated post–valve pressure regulating valve (also known as pressure reducing valve) is mainly used for post–valve pressure control of process equipment. When the post–valve pressure rises, the control valve closes.

After the pre–valve pressure P_1 of the process medium is throttled by the valve core and valve seat, it is converted into the post–valve pressure P_2.P_2 is transmitted through the control pipeline to the lower diaphragm chamber of the actuator and acts on the top disk. The generated acting force balances the reaction force of the spring, which determines the relative position of the valve core and valve seat and controls the post–valve pressure. When the post–valve pressure P_2 increases, the acting force of P_2 on the top disk increases accordingly. At this moment, the acting force of the top disk exceeds the reaction force of the spring, causing the valve core to move toward the valve seat until the acting force of the top disk balances the reaction force of the spring again.At this point, the flow area between the valve core and valve seat decreases, and the flow resistance increases, thereby reducing P_2 to the set value. Meanwhile, when the post–valve pressure P_2 decreases, the action direction is opposite to the above–mentioned process.This is the working principle of post–valve pressure regulation.

When it is necessary to change the setting value of the post–valve pressure P2, the adjustment nut can be adjusted.

B. When adjusting the pressure in front of the valve (K23002/23102/23202), see Figure 2a.

Self–operated front valve pressure regulating valve (also known as pressure bypass valve) is mainly used for front valve pressure control of process equipment. When the front valve pressure increases, the control valve opens.

After the pre–valve pressure P_1 of the process medium is throttled by the valve core and valve seat, it is converted into the post–valve pressure P_2. Meanwhile, P_1 is transmitted through the control pipeline to the upper diaphragm chamber of the actuator and acts on the top disk. The generated acting force balances the reaction force of the spring, which determines the relative position of the valve core and valve seat and controls the pre–valve pressure. When the pre–valve pressure P_1 increases, the acting force exerted by P_1 on the top disk increases accordingly. At this moment, the acting force on the top disk exceeds the reaction force of the spring, causing the valve core to move away from the valve seat until the acting force on the top disk balances the spring's reaction force again. At this point, the flow area between the valve core and valve seat increases, and the flow resistance decreases, thereby reducing P_1 to the set value. Meanwhile, when the pre–valve pressure P_1 decreases, the direction of action is opposite to the above process. This is the working principle of pre–valve pressure regulation.

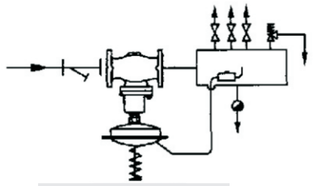
The adjustment nut can be adjusted when it is necessary to change the setpoint of the pre–valve pressure P1

c. See Figure 3a and Figure 4a for differential pressure control (K23003/K23004).

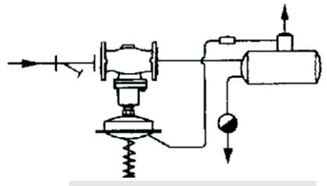
After being throttled by the valve, the process medium enters the controlled equipment. The differential pressure of the controlled equipment is introduced into the upper and lower diaphragm chambers of the valve respectively, generating thrust in the upper and lower diaphragm chambers that balances the spring reaction force. This determines the relative position of the valve core and valve seat, which in turn defines the value of the differential pressure ΔP. When the controlled differential pressure changes, the force balance is disrupted, which drives the movement of the valve core. The movement of the valve core changes the flow resistance coefficient of the valve, thus regulating the controlled differential pressure to the set value. This is the working principle of differential pressure control.

The adjustment nut can be adjusted when the differential pressure setting value needs to be changed.

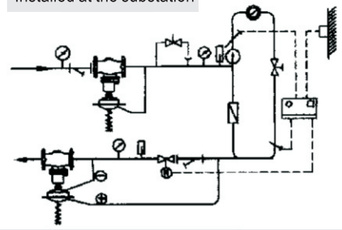
1.8 Brief Application Examples



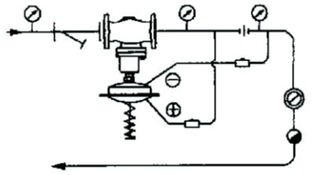
Installed at the substation



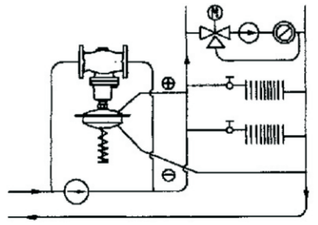
Mounted on a steam generator



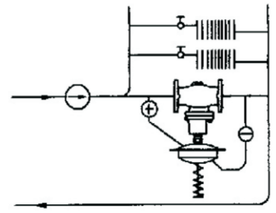
Installed in differential pressure flow control situations



Installed in flow control occasions



Installed in pump pressure control occasions



Installed in differential pressure maintenance occasions

2. Installation

2.1 Field Installation Tips

① Field safety: There should be no pressure in the pipeline where the pressure valve is installed in advance, and the shut–off valves before and after the pressure valve should be closed. Appropriate fire protection measures should be taken prior to welding.

② Control performance: The pressure loss of the piping system should be consistent with the loss considered when calculating the size of the pressure valve. The inlet and outlet should ensure a certain straight pipe section (generally 5D ~ 10D) as far as possible to ensure the required control performance.

③ Installation location: There should be enough space to facilitate the operator to install and adjust the pressure valve, and to ensure the possibility of field disassembly, assembly and maintenance of the pressure valve and accessories.

④ Filter: In order to ensure the normal use of the pressure valve, the filter should be installed in front of the pressure valve during installation and cleaned regularly. There should be adequate drainage and ventilation systems in plants with steam.

⑤ Pressure valve group: Generally, a shut–off valve and a bypass valve should be installed in the process piping to form a valve group to meet the needs of continuous operation of the equipment. When servicing and unexpected situations occur, isolate with shut–off valve and regulate with bypass valve. It is recommended to use the arrangement of FIG. 9.

⑥ It is used for pressure regulation of coal gas and natural gas. When installed and used indoors, if there is no air leakage alarm device, a drainage pipe should be connected to the actuator to lead to the outdoor without blocking to ensure safety. (Pressure adjustment behind the valve, connected to the upper membrane cover joint, pressure adjustment before the valve, connected to the lower membrane cover joint)

⑦ The pressure valve used for pressure reduction or pressure relief must not block the joint without nozzle on the membrane cover when using it, otherwise the pressure valve will not work.

1.7 Product Accessories

Self-operated regulating valves can be equipped with the following accessories according to different working temperature needs and uses:

a.FGL type cooling tank (isolation tank)-used when the medium temperature is 150 ~ 200 °C. It is installed on the control pipeline. Refrigerant is injected into the tank to prevent the aging of the diaphragm. There are two specifications. FGL-I type has a volume of 1 liter, FGL-III type has a volume of 3 liters (for an effective area of 630 cm²). (See FIGS. 5a, 5b.)

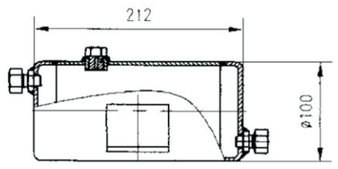


Figure 5a. FGL-type I

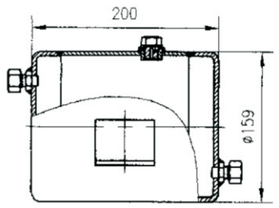


Figure 5b. FGL-type III

B. FSQ type heat sink 1 is used when the medium temperature is greater than 200 °C, and is generally used at the same time with the cooling tank (except the temperature control valve). There are 2 types of structures. Type I is used for general control working conditions, and Type II is mainly used for self-operated pressure regulating valves in thermal power plants. The inner seal of the heat sink is a stainless steel bellows. (See FIGS. 6a, 6b)

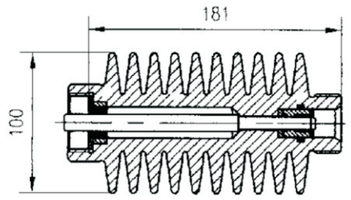


Figure 6a. Type FSQ-I

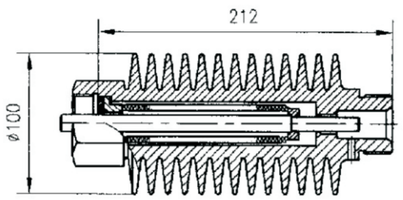


Figure 6b. FSQ-Type II

C. Stroke display (FHC type)-used for stroke display, and used to eliminate unbalanced forces when the pressure is greater than 1.4 MPa and when the temperature reaches 200 °c (this piece is not required when using the assembly). (See Figure 7)

D. FZQ type assembly-a combined self-operated regulating valve for multi-parameter control, such as a pressure-differential pressure combination; Pressure-temperature combination; Flow-temperature combination, etc. Working according to the principle of preferential action, two parameters cannot be controlled at the same time. (see Figure 8)

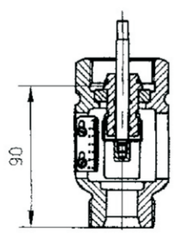


Figure 7. FHC Travel Display

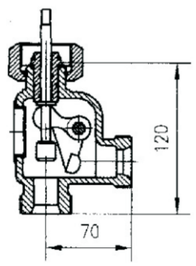


Figure 8. FZQ Type Assembly

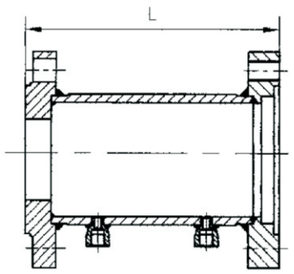


Figure 9. FJC Type Extension

DN150 L=304
DN200 L=504
DN250 L=804

e.FHC type valve body extension 1 is used for DN150 ~ 250 When the medium temperature is greater than 140C, refrigerant is injected into the cavity to prevent the diaphragm in the valve body from aging. (See Figure 9)

1.4 Standard Technical Parameters

Valve body

Type: Straight–through cast ball valve body
Nominal diameter DN: 15 ~ 250mm
Nominal pressure PN: 1.6, 4.0 MPa DIN16, 40 ANSI 150, 300 JIS10K, 20K
Connection form: flange connection RF type (convex surface)
Material: PN1.6 (HT200 WCB CF8 CF8M) PN4.0 (WCB CF8 CF8M)

Valve cover

Material: PN1.6 (HT200 WCB CF8 CF8M) PN4.0 (WCB CF8 CF8M)
Pressure balance original: bellows (DN15 ~ 125) rolling diaphragm (DN150 ~ 250) plus spring
Balancing original material: bellows 316, spring 0Cr17Ni12Mo2
Rolling diaphragm FKM (fluorine rubber) is suitable for oil, water, steam and gas media

Valve components

Valve core: hard seal (230) 304316, soft seal (231) 304316, embedded FKM (fluorine rubber)
Valve Seat: CF8 CF8M
Stem: 304 316

Executor

Type: Spring–type membrane actuator
Model: ZA3 Za4
Diaphragm material: FKM (fluororubber) PTFE (tetrafluoro diaphragm)
Membrane cover material: A3 steel plate pressed forming lined with PTFE (four–building type
Adjustment spring: 60Si2Mn
Control pipeline and joint: copper pipe or steel pipe ϕ 10 χ 1 mm, ferrule type pipe joint R1/4 "

Note: Special materials can also be provided according to customer ordering requirements.

1.5 Main Technical Performance Parameters

A. Main technical parameters of actuator

Table 1

Model		ZA3				ZA4			
Effective Area (cm²)		32※	80※	250	630	32※	80※	250	630
Pressure setting range Xc(MPa)	Red	0.3~1.2	0.1~0.6	0.015~0.15		0.3~1.1	0.1~0.5	0.015~0.12	
	Yellow		0.05~0.3	0.01~0.07	0.005~0.035		0.05~0.25	0.01~0.06	0.005~0.035
	Black	0.8~1.6				1.0~1.6			
Minimum differential pressure to ensure normal operation of pressure valve △Pmin (MPa)		⩾0.05	⩾0.04	⩾0.01	⩾0.005	⩾0.05	⩾0.04	⩾0.01	⩾0.005
Maximum pressure differential between upper and lower membrane chambers allowed (MPa)		2.0	1.25	0.4	0.15	2.0	1.25	0.4	0.15
Setpoint deviation		8%							
Control lines, joints		Copper or steel pipe 10 × 1; ferrule joint R1/4 "							

Note: ① ※ The pressure setting range corresponding to this effective area is not applicable to DN150 ~ 250. A commander–operated pressure regulating valve is available.
② The differential pressure valve has no effective area of 32.

B.K230/231/232 Pressure Control Valve Technical Parameter

Table 2

Nominal diameter (DN)		15	20	25	32	40	50	65	80	100	125	150	200	250
Kvs value (m^3/h)		4	6.3	8	16	20	32	50	80	125	160	280	320	400
K 'vs value (m^3/h)		2.5	4.0	6.3	10	16	25	40	63	100	125	-	-	-
Z value according to VDMA24422 standard		0.6	0.6	0.6	0.55	0.55	0.5	0.5	0.45	0.4	0.35	0.3	0.2	0.2
Maximum differential pressure △ Pmax.PN16 (Mpa)		1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.2	1.0	1.0
Maximum differential pressure △ Pmax.PN40 (MPa)		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5	1.5	1.2	1.0	1.0
Nominal pressure		Pn16 or 40, flange to DIN250I												
Maximum temperature	K230/232	Metal sealed valve core, temperature resistant to 150 ℃ (temperature resistant to 200 ℃ using cooling tank)										140 ℃ (200 ℃ (2))		
	K231	Soft seal spool, 150 ℃										140 ℃		
	K232	Use cooling tank, metal sealed valve core, temperature resistance to 200 ℃										300 ℃ (2)		
		Use cooling tank and heat sink, metal sealed valve core, temperature resistance to 350 ℃ (3)												
Working medium		Non-corrosive gases, liquids and vapors (K23201 only)										Compressed diaphragm		
Allowable leakage (Under Specified Test Conditions)	Hard seal	4 x 10-4 x valve rated capacity (/h)												
	Soft seal	10 bubbles/min						20 bubbles/min				40 bubbles/min		
Control lines, joints		Copper or steel pipe ϕ10 x 1 x (mm) ferrule type pipe joint R1/4 "												

Note: (1) K'vs value with silencer as shown in the table; (2) with valve body extension and cooling tank;
(3) limited to PN40, PN16 with Tmax = 300℃.
B. The Z value is the noise measurement factor, and when it is greater than this value, obvious noise will be generated. Please refer to page 5 of "Self-actuated Regulating Valve Selection Guide" for detailed calculation.
C. The maximum operating temperature of the differential pressure control valve is + 200 ° c.

C. Product assembly and working temperature

Table 3

Product category		Control valve model		Actuator model	Fitting accessories	Operating Temperature ℃	Specification range DN
Name	Model	Hard seal	Soft seal				
Post-valve pressure regulation	K23001	K230		ZA3	None	≤150	15~250
	K23101		K231		None	≤150	15~250
	K23201	K232			Cooling tank	≤200	15~125
					Cold + heat sink	≤350	15~125
					Cooling tank	≤200	150~250
					Cold + Extension	≤300	150~250
Pre-valve pressure regulation	K23002	K230		ZA4	None	≤150	15~250
	K23102		K231		None	≤150	15~250
	K23202	K232			Cooling tank	≤200	15~125
					Cold + Extension	≤200	150~250
Differential pressure adjustment behind the valve (differential pressure rise valve closed)	K23003	K230		ZA3	None	≤150	15~250
	K23103		K231		None	≤150	15~250
	K23203	K232			Cooling tank	≤200	15~250
Differential pressure adjustment in front of valve (differential pressure rise valve open)	K23004	K230		ZA4	None	≤150	15~250
	K23104		K231		None	≤150	15~250
	K23204	K232			Cooling tank	≤200	15~250

Note: Equipped with FHC travel display, the operating temperature can also reach ≤ 200 ℃ (specification within ≤ 125).

1.6 Main Dimensions and Weight

A. Control valve overall dimensional drawing

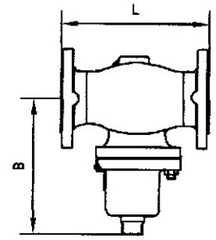


Figure 5. DN15~125

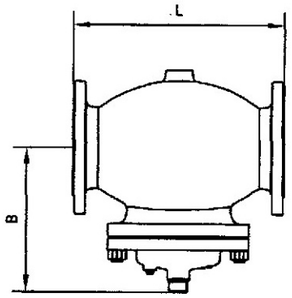


Figure 6. DN150~250

B. Control valve dimensions and weight

Table 4

Nominal diameter DN	15	20	25	32	40	50	65	80	100	125	150	200	250
L(mm)	130	150	160	180	200	230	290	310	350	400	480	600	730
B(mm)	212	212	238	238	240	240	275	275	380	380	295	325	372
Approximate weight (kg)	6.2	6.7	9.7	13	14	17	29	33	60	70	80	140	220

C. Actuator overall dimensions and weight

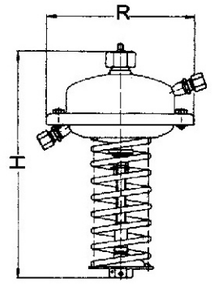


Figure 7a.ZA3

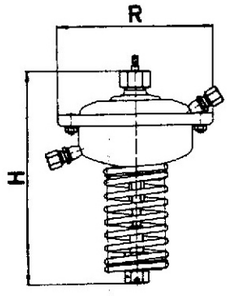


Figure 7b.ZA4

ZA3 actuator dimensions and weight (Figure 7a)

Table 5

Effective Area (cm^2)	32	80	250	630
ϕ R(mm)	172	172	263	380
H(mm)	435	430	470	520
Approximate weight (kg)	7.5	7.5	13	28

ZA4 actuator dimensions and weight (Figure 7b)

Table 6

Effective Area (cm^2)	32	80	250	630
ϕ R(mm)	172	172	263	380
H(mm)	440	435	440	520
Approximate weight (kg)	7.5	7.5	13	28

Note: ① The total height and total weight of the pressure valve are the sum of the height and weight of the control valve and actuator respectively.
② Nominal pressure: PN16, Pn40
③ Flange standard: Normally it is DIN standard (Germany). We can also provide users with the following flange standard products, but they should be specifically indicated when ordering.
1) JB (China); 2) ANSI (USA) can only provide ANSI150 and 300; 3) JPI (Japan); JIS (Japan)