ZZYP TYPE
AUTOMATIC PRESSURE REGULATING CONTROL VALVE

OPERATION INSTRUCTION
Catalogue

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1. Application and feature

ZZYP type pressure regulating valve is a self-regulating actuator product that reply on the medium's energy to realize regulation function without any extra energy. The most important feature of the product is that it can work without electricity and gas power which is very saving energy. And we can adjust the pressure value when it is working. This valve is widely used in oil, chemical, electricity, metallurgy, food, light textile, machinery and residents buildings and etc industries to control the gas, liquid and steam to reduce pressure, inlet pressure regulation, or relief pressure, outlet pressure regulation. This valve is performing fast and with very good seal.

2. Structure and working principle

The control valve is consisted of detecting actuator, regulating control valve, condenser and outlet pipe. (the structure as drawing 1).

Drawing-1a is pressure regulating valve used for controlling outlet pressure. Mode of action is pressure closed. The working principle is: medium flow into the valve body, then into valve core, and then throttling by valve seat then flow out. The other way is used when the medium is steam, the medium go through condenser and goes into the actuator and act on the diaphragm, at the same time the valve core's place is also changed, in this case the valves realize to reduce pressure and steady pressure. If outlet pressure is increased, the power acting on diaphragm is increasing accordingly, then the spring is compressed and drive valve core, than the opening channel is becoming smaller and smaller until the outlet pressure reduced the set value. The same principle, if outlet pressure is decreased, the power that act on diaphragm is decreasing, because of compress spring's Reacting force it can drive the valve core, than the opening channel is becoming bigger and bigger until the outlet pressure increased the set value.

![Drawing-1a ZZYP-16B pressure regulating valve](image-url)

1. inlet ferrule
2. Exhaust plug
3. detection actuator
4. inlet pipe
5. Blind screw
6. condenser
7. spring
8. valve rod
9. valve core
10. bellows
11. regulate pressure plate
12. screws
13. take pressure pipe
14. outlet pipe
15. valve seat
16. valve body
Drawing-b. is pressure regulating valve used for controlling inlet pressure. Mode of action is pressure open type. The working principle is: medium flow into the valve body as the direction of arrow. The other way is used when the medium is steam, the medium goes through condenser and goes into the actuator and act on the diaphragm, at the same time the valve core's place is also changed, in this case the valves realize to reduce pressure and steady pressure. If inlet pressure is increased, the power acting on diaphragm is increasing accordingly, then the spring is compressed and drive valve core, than the opening channel is becoming bigger and bigger until the inlet pressure reduced the set value. The same principle, if inlet pressure is decreased, the power that act on diaphragm is decreasing, because of compress spring's Reacting force it can drive the valve core, than the opening channel is becoming smaller and smaller until the outlet pressure increased the set value.

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**Drawing-1b  ZZYP-16B pressure regulating valve**

7. spring  8. valve rod  9. valve core  10. bellows  11. regulate pressure plate  12. screws
13. take pressure pipe  14. outlet pipe  15. valve seat  16. valve body

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2) Pressure regulating range

Pressure regulating range has several stages, details please see the form of Main technical parameters and property index. It is better to choose the middle value of the pressure range. (refer form1).

3) Outlet pressure regulating valve and relation between inlet pressure and outlet pressure.

Automatic regulating valve is a regulating system and there is some requirements for reducing pressure. For B type outlet pressure regulating valve, in order to guarantee the outlet pressure in a proper range, the inlet pressure must achieve a proper number. Requirement please see Form 2.
4) Sharp dimension and weight  

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<th>25</th>
<th>32</th>
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<th>150</th>
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<td>Adapter’s screw</td>
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5) Main parts' material (Form 4)

<table>
<thead>
<tr>
<th>Parts' name</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve body</td>
<td>ZG230–450, ZG1Cr18Ni9Ti, ZG1Cr18Ni12Mo2Ti</td>
</tr>
<tr>
<td>Valve core</td>
<td>ICr18Ni9Ti, Cr18Ni12Mo2Ti</td>
</tr>
<tr>
<td>Valve seat</td>
<td>ICr18Ni9Ti, Cr18Ni12Mo2Ti</td>
</tr>
<tr>
<td>Valve rod</td>
<td>ICr18Ni9Ti, Cr18Ni12Mo2Ti</td>
</tr>
<tr>
<td>Rubber diaphragm</td>
<td>Chemigum, EPR, FKM, Oil resistant rubber</td>
</tr>
<tr>
<td>Diaphragm cap</td>
<td>A3, A4, Steel coated TFE</td>
</tr>
<tr>
<td>Filter</td>
<td>PTFE, soft graphite</td>
</tr>
</tbody>
</table>

Valve core structure types

![Single-seat regulating valve](image1)
![Double-seat regulating valve](image2)
![Sleeve regulating valve](image3)

Valve body working temperature and allowed pressure

![Valve body working temperature and allowed pressure](image4)
4. Installation, use and maintenance

1) Installation

When the valve is working in gas or other low viscous liquid medium (normal temperature \( \leq 80^\circ C \)), the valve is installed on horizontal direction in upright direction like pneumatic diaphragm regulating valve. Details as drawing 3.

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Drawing 3

Installation: The medium is gas or other low viscous liquid
If the medium is steam, the regulating valve must be installed on horizontal pipe in inverted direction. As drawing 4.

Drawing 4  Installation: the medium is steam

A. ZZYF-16B type regulate valve

B. ZZYF-16F type regulate valve

1. globe valve  2. pressure gauge  3. filter  4. condenser  5. regulating valve

Drawing 4  Installation: the medium is steam
When you install the valve please note these points:

A) Condenser must be higher than valve’s actuator but lower than outlet’s connecting pipe (for outlet regulating valve) or inlet’s connecting pipe (for inlet regulating valve), to guarantee the condenser is filled with condenser liquid.

B) Pressure measuring point should take a suitable place, inlet pressure valve should be further than 2 times of the pipe diameter, outlet regulating valve should be further than 6 times of pipe diameter.

C) In order to convenient for maintenance and operation, there is be leaving some space for the regulating valve. Before and after the valve, there should be installing globe valve and bypass manual valve. Details as drawing 5

![Drawing 5: installation plans](image)

Note: The dotted line meaning: another proper direction for inlet and outlet.

D) If the regulating valve size is too large (DN ≥ 100), should install bracket.

E) Medium flow’s direction should be the same as the arrow on the valve body. Inlet and outlet pipe center, regulating valve’s flanges center must be in line to avoid valve body bearing too heavy stress.

F) Before the regulating valve, we should set a filter to avoid blocked by impurities in the medium.

G) Regulating valve should be installed in proper environment that the temperature is -25℃~55℃.

2. Usage

**Operational program for gas or low viscosity at normal temperature.** See drawing 3.

A).
B) Loosen exhaust plug until the gas or liquid flow out from actuator.
C) Then tightened exhaust plug, the regulating valve can working now. The pressure can be adjusted by pressure regulate plate. Pay attention to the pressure value, action should be slow, don’t let valve rod moving with.

**Operational program for steam.** See drawing 4.

A) remove the entrance screws from condenser.
B) Loosen exhaust plug
C) Use drain head to add water through entrance mouth until water flow out from vent.
D) Tighten exhaust plug, continue adding water until it flow out entrance.
E) Tighten screws of entrance.
F) Open the globe valve before and after the regulating valve slowly
G) Adjusted pressure regulate plate, and pay attention to the pressure number until achieve the requirement.

3. Maintenance

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After the regulating valve is running normally, generally maintain workload is very small, only need to observe the pressure value is whether at the proper rang that suit for your application. And observe whether the stuffing box and actuator is leaking. If it is leaking, please tighten or replace padding and diaphragm.

<table>
<thead>
<tr>
<th>Fault phenomenon</th>
<th>Reason</th>
<th>Method</th>
</tr>
</thead>
</table>
| Outlet pressure is changing when inlet pressure changes | 1. Valve core get stuck  
2. Valve rod, plush rod get stuck  
3. Entrance pipe locked. | 1. Disassemble and reassemble again  
2. Adjusted again  
3. Dredge |
| Outlet pressure can't decrease, staying higher than requirement value | 1. Set spring stiffness too large  
2. Valve dia. too big  
3. Inlet pressure too high, pressure reducing ratio too large | 1. Replace spring  
2. Use less size diam. valve  
3. Inlet pressure: if outlet pressure > 10:1, should be decrease two stage's pressure |
| Outlet pressure can't increase, staying lower than requirement value | 1. Set spring stiffness too light  
2. Valve dia too small  
3. Pressure reducing ratio too small | 1. Replace spring  
2. Use large size diam.  
3. Inlet pressure: if outlet pressure < 1:25, should be increase inlet pressure |
| Inlet pressure can't increase, staying lower than requirement value | 1. Spring stiffness too light  
2. Valve core locked  
3. Valve rod, plush rod locked  
4. Valve cord, valve seat is damaged, leaked too heavy  
5. Valve's dia too large | 1. Replace spring  
2. Dismounting again  
3. Adjust again  
4. Grinding again or replace  
6. Lessen diam |
| inlet pressure can't decrease, staying higher than requirement value | 1. Stiffness too big  
2. Valve dia too small  
3. Valve core, valve rod, plush rod are locked | 1. Replace spring  
2. Use large size diam  
3. Solve locked and adjust again |
| Outlet pressure or inlet pressure changes too often | 1. Valve dia too large  
2. Actuator's capacity is too less | 1. Choose proper size diam  
2. Add damper at entrance pipe |

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### How to order

When ordering please offer these information:

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Size</td>
<td>Nominal pressure</td>
</tr>
<tr>
<td>Signal Range</td>
<td>Action mode</td>
</tr>
<tr>
<td>Medium data</td>
<td>Working temp.</td>
</tr>
<tr>
<td>Rated flow rate</td>
<td>Set flow feature</td>
</tr>
<tr>
<td>Max inlet pressure</td>
<td>Max outlet pressure</td>
</tr>
<tr>
<td>Min inlet pressure</td>
<td>Min outlet pressure</td>
</tr>
<tr>
<td>Normal inlet pressure</td>
<td>Normal outlet pressure</td>
</tr>
<tr>
<td>Max flow</td>
<td>Liquid viscosity</td>
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<tr>
<td>Min flow</td>
<td>Liquid severe</td>
</tr>
<tr>
<td>Normal flow</td>
<td>Gas severe</td>
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<tr>
<td>Material: valve core</td>
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<tr>
<td>Valve body</td>
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<td>Parts inside</td>
<td>Remarks</td>
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<td>Padding</td>
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<td>pipe size</td>
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<tr>
<td>Regulating pressure range</td>
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<td>Regulating temperature range</td>
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<tr>
<td>Pressure difference range</td>
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<tr>
<td>Micro pressure difference range</td>
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</tbody>
</table>

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I. ZZYP regulating valve model

Example
050ZZYP10B12S0280-350P means the valve diameter is 50mm, valve seat pressure is 1.0MPA, the valve is outlet pressure regulating valve, the flanges is standard type, without condenser, pressure regulating range is 280-350KPA, the valve material is stainless steel.