

## 气动/电动衬氟波纹管单座调节阀 ZJHMPF-1.6K/BW

Pneumatic/electric fluorine lined corrugated pipe single seat regulating valve

### 一. 用途与特点

#### Uses And Features

气动薄膜衬氟波纹管调节阀是自动化仪表系统中的执行单元，安装在介质输送管道上，同其它仪表配套使用，控制流量等参数。与流体接触的阀体内壁和阀内组件都衬有 F46 或 F4 氟塑料，阀杆密封采用波纹管和填料双重密封结构，使安全可靠性能更好。除具有可靠的密封性能外，几乎能抗所有的化学介质（包括浓硫酸和王水）的腐蚀，适宜控制剧毒、贵重、易挥发和易渗透的介质，广泛用于化工、石油、冶金、医药、轻纺工业部门的自动化装置上。

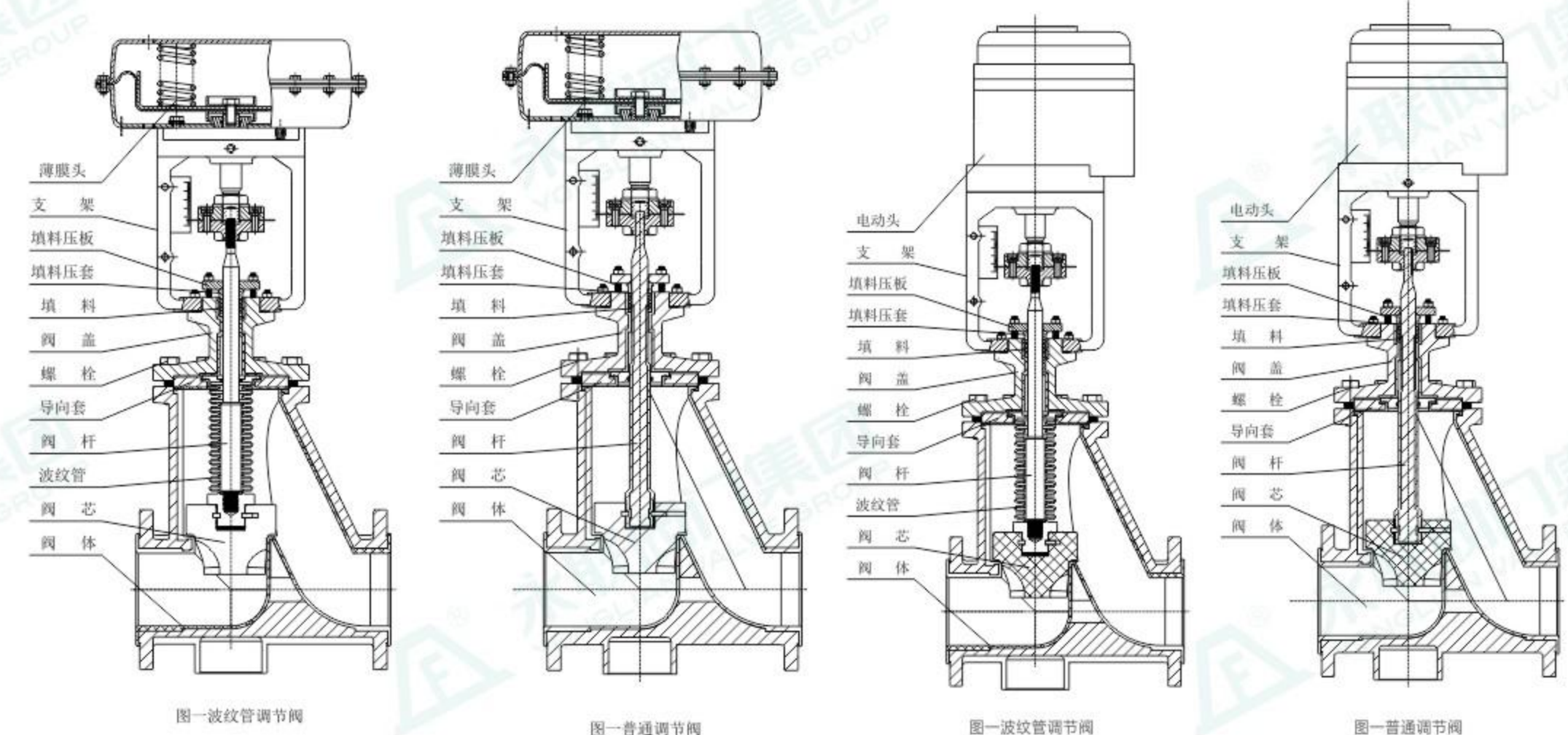
Pneumatic membrane lining plastic corrugated pipe regulating valve is the execution units in the automation instrument system, installed on the medium pipeline, with other instrument, control parameters such as flow. Contact with liquid in the valve body wall and components are lining F46 or F4 fluorine plastic stem seal adopts double sealing structure, corrugated pipe and packing to make better safety and reliability. Besides has a reliable sealing performance, resistant to almost all chemical medium (including concentrated sulfuric acid and aqua regia) corrosion, appropriate control of virulent and precious, volatile and permeability of media, widely used in chemical, petroleum, metallurgy, medicine, light textile industry automation device.

### 二. 结构与工作原理

#### The structure and working principle

气动薄膜衬氟波纹管调节阀是一种防腐的直通单座调节阀，它由 ZJH 气动精小型薄膜执行机构和调节阀体两部分组成，如图 1 所示。执行机构接受 DCS 控制组件的输出信号后，供气压力作用在膜片上，使弹簧压缩，推动或拉动执行机构推杆和阀芯上下移动，从而改变阀芯与阀座的环形间隙面积，调节流量，达到对工艺进行调节的目的。调节阀体组件的阀盖内装有波纹管组件，阀芯顶端与聚四氟乙烯的波纹管下端密封连接，波纹管上端与阀体、上阀盖、螺栓、螺母密封连接。这样，波纹管把介质与外界隔绝，保证了密封，且阀芯上下动作灵活，因此显示了波纹管密封的特点。

Pneumatic membrane lining fluoride bellows valve is a kind of anti-corrosion through single-seat regulating valve, it is composed of ZJH pneumatic precision small film actuators and two major part is regulating valve components, as shown in figure 1. Actuators and DCS control component of the output signal, gas supply pressure on the diaphragm, the spring compression, push or pull actuators push rod and the valve core to move up and down, and transform the annular clearance of the valve core and valve seat area, regulate traffic, to achieve the purpose of to adjust the process. Components inside the bonnet of the valve body is equipped with bellows components, the lower the top of the valve core and pte bellows seal connections, corrugated pipe on the upper valve body, valve cover, bolt, nut sealing connection. In this way, the bellows dielectric isolation with the outside world, to ensure the seal, and valve disc up and down movement is flexible, thus shows the characteristics of bellows seal.



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#### 三. 主要零件材料

##### The major parts material

阀体、管接：为铸钢件，内衬氟塑料 (WCB+F46;ZG25B+F4) 等；  
阀杆、阀芯：2Cr13, 阀芯包有氟塑料 PTFE 衬层；  
波纹管、填料：聚四氟乙烯 PTFE。

Valve, pipe joint: for steel, lined with fluoroplastic (WCB + F46; ZG25B + F4), etc.;  
The valve stem, valve core: 2 cr13, of PTFE valve core with fluorine plastic lining;  
PTFE bellows, packing: PTFE.

#### 四. 技术参数与性能

##### The major parts material

##### 1. 执行机构型号和基本参数 Model and basic parameters of the actuator

型号 Model	HA2D/R	HA3D/R	HA4D/R
作用形式 Action form	正作用或反作用 Positive or negative effects		
供气压力 (MPa) Air supply pressure (Mpa)	0.14, 0.25, 0.40		
弹簧范围 (MPa) Spring range (Mpa)	0.02~0.10、0.04~0.20、0.08~0.24		
薄膜有效面积 (mm <sup>2</sup> ) Effective area of thin film(mm <sup>2</sup> )	400	630	1000
气源接头 Air source connector	Rc1/4		

##### 2. 阀体组件基本参数 Basic parameters of valve body components

公称通径 (mm) Nominal Diameter	25	32	40	50	65	80	100	125	150	200										
阀体直径 (mm) Valve body diameter	12	25	25	32	32	40	40	50	50	65	65	80	80	100	100	125	125	150	150	200
额定 Cv 值 Rated Cv value	2.4	10	10	17	17	25	25	40	40	60	60	110	110	175	175	220	220	260	260	450
行程 (mm) Stroke (mm)	16		25			40			50											
执行机构 Actuator	HA2D/R				HA3D/R				HA4D/R											
工作温度 (°C) Operation temperature	-30~+200																			
工作压力 (MPa) Working pressure	PN1.0																			
公称压力 (MPa) Nominal pressure	PN1.6																			
流量特征 Flow characteristics	直线、等百分比 Straight line, equal percentage																			
泄漏量 leakage rate	不超过额定 Cv 值的 10 <sup>-1</sup> Straight line, equal percentage 10 <sup>-1</sup>																			

##### 3. 调节阀流量特征如图2所示 The flow characteristics of the regulating valve are shown in Figure 2

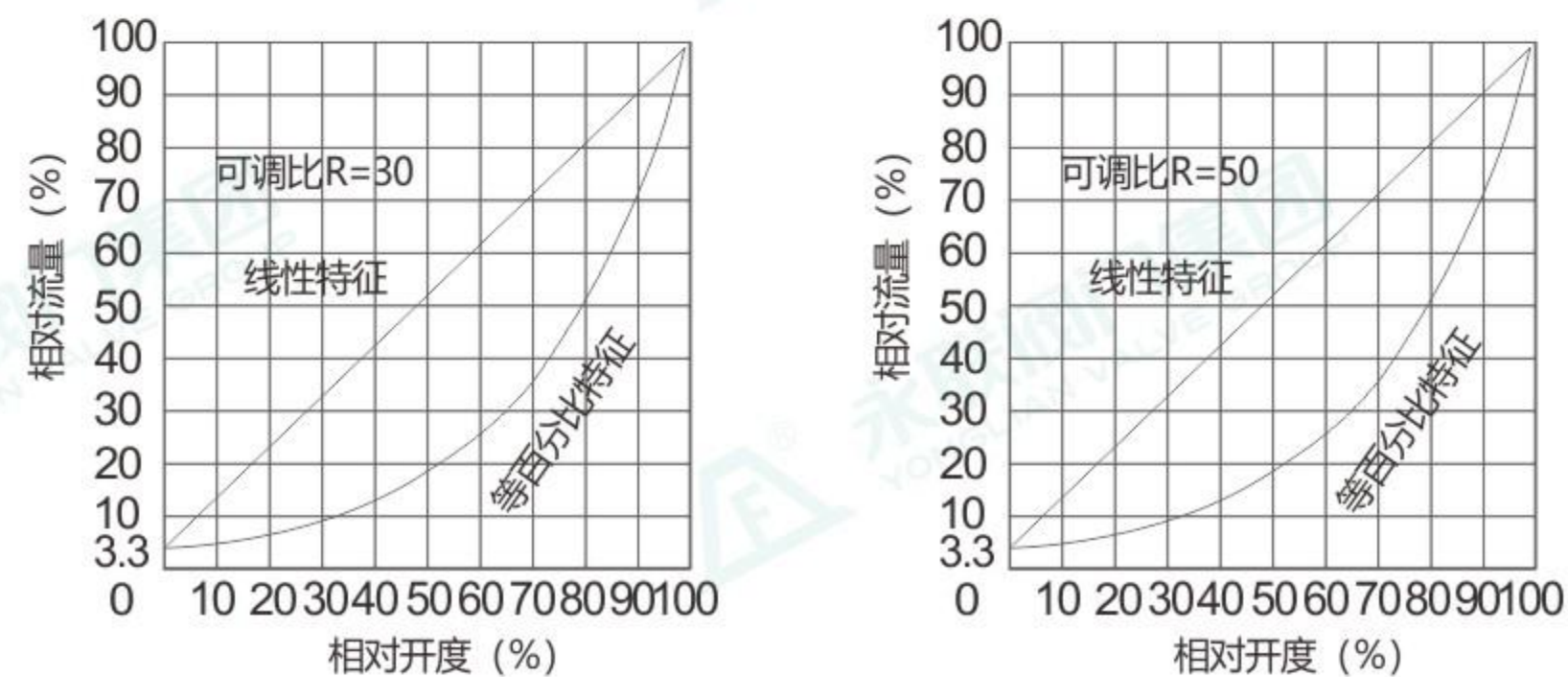


图2 流量特征曲线

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#### 五. 主要技术参数

##### Technical Parameters

##### 4. 电动执行机构型号和基本参数 Model and basic parameters of electric actuator

型号规格 Model specifications	出力 (N) Output force (N)	工作速度 (mm/s) Working speed (mm/s)	最大行程 (mm) Maximum stroke (mm)
381LSA-08 381LXA-08	80	4.2	30
381LSA-20 381LXA-20	2000	2.1	
381LSA-30 381LXA-30	3000	3.5	60
381LSA-50 381LXA-50	5000	1.7	
381LSC-65 381LXC-65	6500	2.8	100
381LSC-99 381LXC-99	10000	2.0	
381LSC-160 381LXC-160	16000	1.0	

##### 5. 气动执行机构型号和基本参数 Pneumatic actuator model and basic parameters

作用形式 Action Form	执行机构 Actuator	薄膜面积 (cm <sup>2</sup> ) Film Area	供气压力 (MPa) Air supply pressure	弹簧范围 (MPa) Spring range	允许压差 (100KPa) Allowable pressure difference											
					阀座直径 (mm) Valve seat diameter											
					20	25	32	40	50	65	80	100	125	150	200	
气 关 式 Gas Shut Type	HA2D	310	0.14	0.02~0.10	3.6	3.1	1.9	1.4	0.8	0.5	0.35	0.25	-	-	-	
					26	20	20	20	11	7.5	5.5	3.0	-	-	-	
	HA3D	550	0.14	0.02~0.10	6.4	5.6	3.4	2.4	1.4	0.8	0.6	0.35	0.2	0.15	-	
					24	20	20	20	20	13.2	9.8	5.2	3.3	2.05	-	
	HA4D	950	0.14	0.02~0.10	-	-	-	4.1	2.4	1.5	1.1	0.6	0.35	0.25	0.15	
					-	-	-	20	20	20	16.1	9.1	5.8	3.5	2.25	
气 开 式 Gas Open Type	HA2R	310	0.14	0.02~0.10	3.6	3.1	1.9	1.3	0.8	0.5	0.35	0.25	-	-	-	
					24	20	13.5	7.0	5.5	3.5	2.4	1.4	-	-	-	
	HA3R	550	0.14	0.02~0.10	8.4	5.6	3.4	2.4	1.4	0.8	0.6	0.35	0.2	0.15	-	
					26	20	20	17	9.8	6.1	4.4	2.4	1.5	0.95	-	
	HA4R	950	0.14	0.02~0.10	-	-	-	4.2	2.4	1.5	1.1	0.6	0.35	0.25	-	
					-	-	-	20	16.5	10.7	7.5	4.2	2.7	1.6	1.1	

注：1、表中同一格内的上方数字表示阀常用允许压差，下方数字表示阀全关时的最大工作压差。

2、允许压差超过本表规格时，克按特殊品订货。

Note: 1. The upper numbers in the same cell in the table represent the commonly used allowable pressure difference of the valve, while the lower numbers represent the maximum working pressure difference when the valve is fully closed.

2. When the allowable pressure difference exceeds the specifications in this table, special products can be ordered.

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## 气动单座调节阀

Single-seat pneumatic control valve

### PN16 国标调节阀

DN	NPS	L	D	D1	D2	z-Φd	b	f	H	A	重量 (KG)
25	1"	185	Φ115	Φ85	Φ65	4-Φ14	16	4	481	290	21.5
32	1 1/4"	200	Φ140	Φ100	Φ75	4-Φ18	16	4	466.5	290	23.9
40	1 1/2"	220	Φ150	Φ110	Φ85	4-Φ18	16	4	558	290	28.8
50	2"	250	Φ165	Φ125	Φ96	4-Φ18	16	4	565	290	31
65	2 1/2"	275	Φ185	Φ145	Φ120	8-Φ18	16	5	744	365	55
80	3"	300	Φ200	Φ160	Φ135	8-Φ18	18	5	754	365	60
100	4"	350	Φ220	Φ180	Φ155	8-Φ18	18	5	764	365	71
125	5"	400	Φ250	Φ210	Φ185	8-Φ18	20	5	1017	475	110
150	6"	480	Φ285	Φ240	Φ210	8-Φ22	20	5	1229	475	125
200	8"	600	Φ340	Φ295	Φ265	12-Φ22	22	6	1337	475	143

注: 重量包括阀本身重量和执行机构的重量 Note: Weight includes the weight of the valve itself and the weight of the actuator

### Class150LB 美标调节阀

DN	NPS	L	D	D1	D2	z-Φd	b	f	H	A	重量 (KG)
25	1"	185	Φ110	Φ79.4	Φ65	4-Φ16	9.6	4	481	290	21.5
32	1 1/4"	200	Φ115	Φ88.9	Φ75	4-Φ16	11.2	4	466.5	290	23.9
40	1 1/2"	220	Φ125	Φ98.4	Φ85	4-Φ16	12.7	4	558	290	28.8
50	2"	250	Φ150	Φ120.7	Φ96	4-Φ19	14.3	4	565	290	31
65	2 1/2"	275	Φ180	Φ139.7	Φ120	4-Φ19	15.9	5	744	365	55
80	3"	300	Φ190	Φ152.4	Φ135	4-Φ19	17.5	5	754	365	60
100	4"	350	Φ230	Φ190.5	Φ155	8-Φ19	22.3	4	764	365	71
125	5"	400	Φ255	Φ215.9	Φ185	8-Φ22.5	22.3	5	1017	475	110
150	6"	480	Φ280	Φ241.3	Φ210	8-Φ22.5	23.9	5	1229	475	125
200	8"	600	Φ345	Φ298.5	Φ265	8-Φ22.5	27	6	1337	475	143

注: 重量包括阀本身重量和执行机构的重量 Note: Weight includes the weight of the valve itself and the weight of the actuator

## 六、安装与维修

- 产品使用的环境温度为 -30~+70°C。气动薄膜机构中的橡胶零件在过低温度下易硬化变脆，高温时会加速老化。
- 产品最好正立安装。如安装位置不允许，也可与垂直线成一角度。倾斜安装时，应考虑加设支架。
- 调节阀一般都设置旁通管路，以便检修或发生故障时，可以手动操作，使工艺流程照常运行。
- 调节阀安装在管道上之前，应彻底清洗管道系统的杂质和污物，以免调节阀运行部件卡死，或损坏阀座、阀芯密封面及波纹管等重要零件。
- 调节阀安装时，介质流向应与调节阀箭头方向一致。
- 调节阀填料密封是保护性的第二次密封。一旦波纹管损坏，不准调节阀继续使用。应立即采取措施检修更换波纹管。更换波纹管后的阀芯组件，必须进行气密性检验，检验合格后才准使用。

## 七、订货须知

- 产品型号
- 公称口径DN，阀座直径dn或额定流量系数
- 固有流量特性
- 介质工作压力和工作温度范围
- 阀的作用方式（气关式或气开式）
- 附件（定位器、手轮机构等）
- 其他特殊要求

## Installation and maintenance

- Products using the environment temperature is 30 ~ +70 °C. Pneumatic film mechanism of rubber parts easy to hardening of the brittle at low temperatures, high temperature accelerated ageing.
- The product is best installed. Such as the installation position does not allow, also can with vertical lines into a point of view. When installation, should consider adding support.
- The regulator is usually set by pass line, so that maintenance or failure occurs, you can manually operation, make the process run as usual.
- Regulating valve installed on the pipeline before, should be thoroughly clean impurities and dirt of the pipeline system, in order to avoid the regulator stuck running parts, or damage to the valve seat, valve core sealing surface and corrugated pipe, and other important components.
- When regulator is installed, the medium flow direction should be consistent with the regulator direction arrow.
- The regulator packing seal is the second time the protective seal. Once the corrugated pipe is damaged, no regulator continues to use. Immediate measures should be taken to repair replacement bellows. After the replacement of bellows valve core components, must be air tightness inspection, inspection before use.

## Ordering instructions

- The product model
- Nominal diameter DN, seat diameter DN or rated flow coefficient
- The intrinsic flow feature
- Working pressure and working temperature range
- The role of valve (closed type or gas open)
- The attachment (the locator, the handwheel institutions, etc.)
- Other special requirements

## 调节阀的泄漏量标准 (GB4213-92)

泄漏等级 Leakage level	试验介质 Test medium	试验程序 Test procedure	最大阀座泄漏量 Maximum valve seat leakage
I			由用户与制造厂商定 Agreed between user and manufacturer
II	L或G	1	5×10×阀额定容量, 1/h five × ten × Rated capacity of valve, 1/h
III	L或G	2	10×阀额定容量, 1/h ten × Rated capacity of valve, 1/h
IV	L	1或2	10×阀额定容量, 1/h ten × Rated capacity of valve, 1/h
	G	1	
IV-S1	L	1或2	5×10×阀额定容量, 1/h five × ten × Rated capacity of valve, 1/h
	G	1	
IV-S2	G	1	2×10×ΔP×D, 1/h
V	L	2	1.8×10×Δp×D, 1/H
VI	G	1	3×10×ΔP×(表5规定的泄漏量) Leakage amount specified in Table 5

注: 1.表中 "L"为水,G为空气或氮气。2.ΔP以KPa为单位。3.D为阀直径,以mm为单位。4.对于可压缩流体体积流量,绝对压力为101.325KPa和绝对温度为273K的标准状态下的测定值。5.试验程序1为试验压力0.35MPa。若ΔP<0.35MPa时用阀的设计规定压差。6.试验程序2为试验压力等于阀的工作压差。7.试验信号压力:试验程序1对气开阀信号为零,气关阀为输入信号上限加启动信号。对切断阀则为信号的上限值。8.上表中阀的额定容量值按表三的公式计算  
Note: 1. In the table, "L" For water, G is air or nitrogen. 2. ΔP is in KPa. 3. D is the valve diameter in mm. 4. For compressible fluid volume flow rate, the measured value is at an absolute pressure of 101.325KPa and an absolute temperature of 273K under standard conditions. 5. Test Procedure 1 is the test pressure of 0.35MPa. If ΔP<0.35MPa, the specified pressure difference of the valve design is used. 6. Test Procedure 2 is the test pressure equal to the working pressure difference of the valve. 7. Test Signal Pressure: Test Procedure 1 is for the air valve opening signal Zero, the pneumatic valve is the upper limit of the input signal plus the starting signal. For the shut-off valve, it is the upper limit value of the signal. 8. The rated capacity value of the valve in the above table is calculated according to the formula in Table 3

阀座直径mm Valve seat diameter mm	泄漏量 leakage rate	
	mL/min	每分钟气泡数 Number of bubbles per minute
25	0.15	1
40	0.30	2
50	0.45	3
65	0.60	4
80	0.90	5
100	1.70	6
150	4.00	11
200	6.75	27
250	11.1	45
300	16.0	-
350	21.6	-
400	28.4	-

注: 1. 每分钟气泡数是用外径6mm、壁厚1mm的管子垂直浸入水下5~10mm深度的条件下测得的,管端表面应光滑,无倒角和毛刺。  
2. 如果阀座直径与表列值之一相差2mm以上,则泄漏系数可假设与阀座直径的平方成正比的情况下通过内推法取得。

Note: 1. The number of bubbles per minute is measured using a tube with an outer diameter of 6mm and a wall thickness of 1mm when immersed in water at a depth of 5-10mm. The surface of the tube end should be smooth and free of chamfers and burrs. If the diameter of the valve seat differs by more than 2mm from one of the listed values, the leakage coefficient can be obtained by extrapolation assuming that the leakage amount is proportional to the square of the valve seat diameter.

介质 Medium	条件 Condition	
	ΔP < 0.5P1	ΔP < 0.5P1
液体 liquid	$Q1D = 0.1Kv \sqrt{\frac{\Delta P}{p/po}}$	
气体 Gas	$Qg = 4.73Kv \sqrt{\frac{\Delta Ppm}{G(237+T)}}$	$Qg = 4.73Kv \sqrt{\frac{2.9P1.KV}{G(237+T)}}$

表中: Q1-液体流量, m/h;  
In the table Q1- Liquid flow rate, m/h;  
Qg-标准状态下的气体流量, m/h;  
Qg-gas flow rate under standard state, m/h;  
Kv-额定流量系数;  
Kv-rated flow coefficient;  
Pm=(P1+P2)/2, KPa;  
P1-阀前绝对压力, KPa;  
P1-absolute pressure before the valve, KPa;  
P2-阀后绝对压力, KPa;  
P2-Absolute pressure after valve, KPa;  
ΔP-阀前后压差, KPa;  
ΔP-Differential pressure before and after the valve, KPa;  
t-试验介质温度, 取20°C;  
t-test medium temperature, taken as 20 °C;  
G-气体比重, 空气=1;  
G-specific gravity of gas, air=1;  
p/po相对密度(规定温度范围内的水p/po=1)。  
P/po relative density (p/po=1 for water within the specified temperature range).

## 气动薄膜单座调节阀111型

Pneumatic diaphragm single seat regulating valve

### 产品概述

Product description

111型新系列气动薄膜精小型单座调节阀采用顶导向结构, 配用多弹簧薄膜执行机构。具有结构紧凑、重量轻、动作灵敏、流体通道呈~流线型、压降损失少、阀容量大、流量特性精确、拆装方便等优点。广泛应用于精确控制气体、液体、蒸汽等介质, 工艺参数如压力、流量、温度、液位保持在给定值。特别适用于允许泄漏量小阀前后压差不大的工作场合。

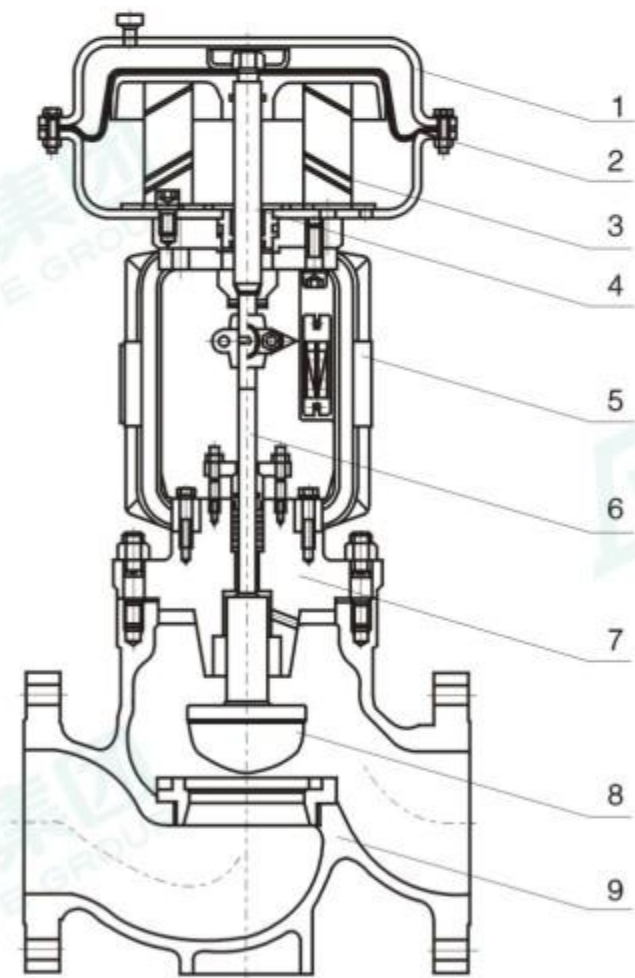
本系列产品有标准型、调节切断型、波纹管密封型、夹套保温型、低温型、高温散热等多个品种。产品公称压力等级有PN16、25、40、64(63);20(CLASS150)、50(CLASS300)、110(CLASS600)口径范围DN15~250。适用流体温度由-250°C~+550°C范围内多种档次。泄漏量标准有IV级或VI级。流量特性有线性或等百分比。设计单位及用户可根据具体工况进行选择。

Model 111 is a new series of pneumatic diaphragm fine and small single-seat control valves with top guide structure and multi-spring diaphragm actuators. It has the advantages of compact structure, light weight, sensitive action, streamlined flow passage, less pressure drop loss, large valve capacity, accurate flow characteristics, and convenient disassembly and assembly. It is widely used in precise control of gas, liquid, steam and other media, and process parameters such as pressure, flow, temperature and liquid level are kept at a given value. It is especially suitable for working occasions where the pressure difference between the front and rear of the valve with small leakage is small.

This series of products includes standard type, adjustable cut-off type, bellows sealing type, jacket insulation type, low temperature type, high temperature heat dissipation and other varieties. Product nominal pressure grades are PN16, 25, 40, 64 (63); 20 (CLASS150), 50 (CLASS300), 110 (CLASS600) caliber range DN15~250. The applicable fluid temperature ranges from -250°C to +550°C in various grades. Leakage standards are either Class IV or Class VI. The flow characteristics are linear or equal percentage. Design units and users can choose according to specific working conditions.



111型气动薄膜单座调节阀基本结构



- 1、膜盖
- 2、膜片
- 3、弹簧
- 4、推杆
- 5、支架
- 6、阀杆
- 7、阀盖(标准型)
- 8、阀芯(常温型)
- 9、阀体

### 主要技术参数 Main technical parameters

公称直径 DN(mm) Nominal Diameter	20				25				32	40		50					
	10	12	15	20	10	12	15	20	25	32	32	40	32	40	50		
阀座直径 dn(mm) Valve seat diameter	10	12	15	20	10	12	15	20	25	32	32	40	32	40	50		
额定流量系数(KV) Rated flow coefficient (KV)	直线 Straight line		1.8	2.8	4.4	6.9	1.8	2.8	4.4	6.9	11	17.8	17.6	27.5	17.6	27.5	44
	等百分比 Equal percentage		1.6	2.5	4.0	6.3	1.6	2.5	4.0	6.3	10	16	16	25	16	25	40
额定行程L Rated stroke L	16									25							
膜片有效面积Ae(cm <sup>2</sup> ) Effective area Ae of membrane	280									400							
公称直径 DN(mm) Valve seat diameter	65		80		100			125		150		200		250			
	65	65	80	65	80	100	125	125	150	150	200	250					
额定流量系数(KV) Rated flow coefficient (KV)	直线 Straight line		69	69	110	69	110	176	275	275	440	440	690	1100			
	等百分比 Equal percentage		63	63	100	63	100	160	250	250	400	400	630	900			
额定行程L Rated stroke L	40									60			100				
膜片有效面积Ae(cm <sup>2</sup> ) Effective area Ae of membrane	600									1000			1600				
公称压力 PN Nominal pressure	Mpa	1.6、2.5、4.0、6.4(6.3)/2.0、5.0、11.0															
	Bar	16、25、40、64(64)/20、50、110															
	Lb	ANSI: Class150、Class300、Class600															
固有流量特性 Inherent flow characteristics	直线、等百分比																
固有可调比(R) Inherently adjustable ratio	50:1																
弹簧(信号)范围Pr(KPa) Spring (signal) range Pr (Kpa)	20~100、40~200、80~240、(20~60、60~100)																
起源压力Ps(MPa) Origin pressure Ps (Mpa)	0.14/0.25/0.3																
允许泄露量 Permissible leakage amount	硬阀芯: IV级 (10 <sup>-4</sup> x Kv) 软阀芯: VI级见GB/T4213-2008 Hard valve core: Class IV (10 <sup>-4</sup> x Kv) Soft valve core: Class VI, see GB/T4213-2008																
工作温度t(°C) work temperature	常温型 Normal temperature type	-20~200、-40~250、-60~250															
	散热型 Heat dissipation type	代号Code: S	-40~350、-60~350														
	高温型 High temperature type	代号Code: G	350~550 (选用高温材料Select high-temperature materials)														
	低温型 Low temperature type	代号Code: D	-100~-60; -196~-100; -253~-196														
	调节切断阀 Adjusting the shut-off valve	代号Code: Q	-40~150(阀芯夹增强PTFE)														

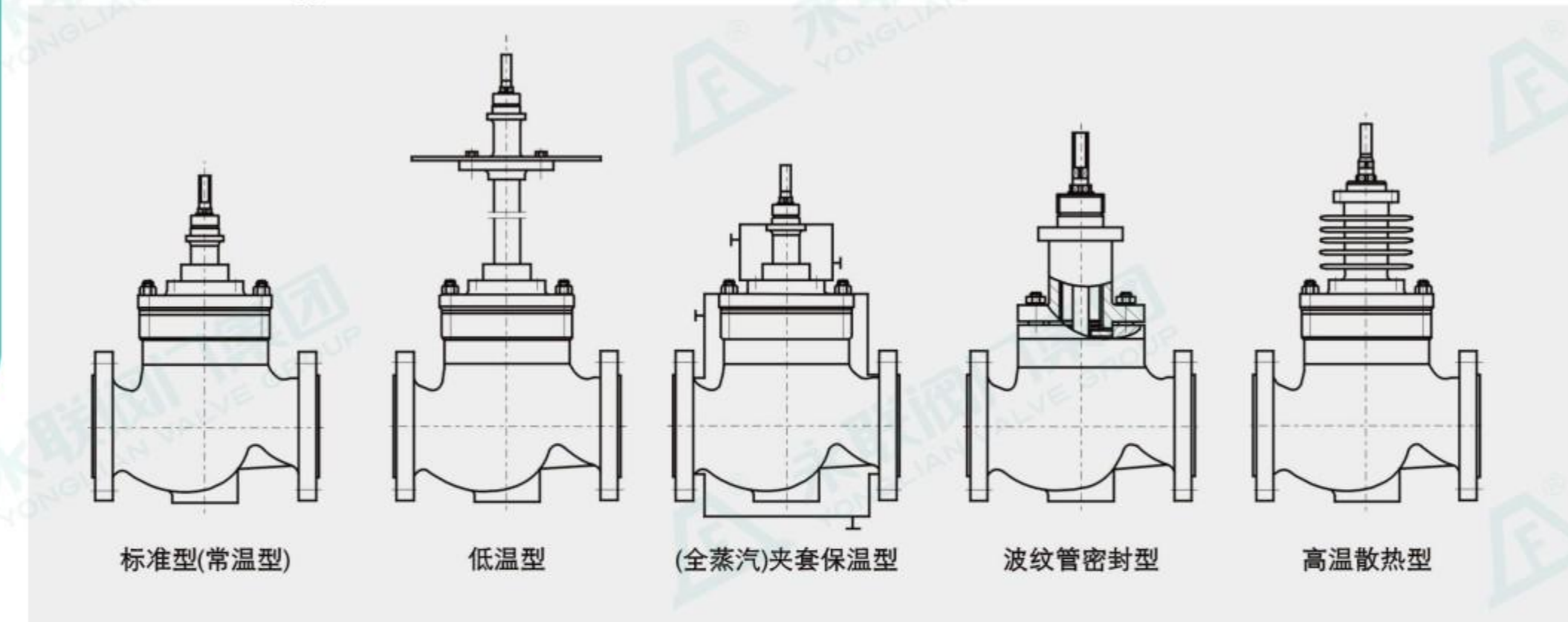
- 弹簧范围: 气开式优先选用40-200KPa及80-240KPa; 气闭式优先选用20-100KPa及40-200KPa, 可选用其他弹簧范围。
  - 工作温度划分是根据阀体材料的压力-温度等级(GB/T12224-2015)、使用工况、阀门的密封件材料等综合因素来划分的, 各国划分是有细微区别的, 甚至每个厂家因使用的材料不一也会导致温度划分不一样。
1. Spring range: For air open type, 40-200KPa and 80-240KPa are preferred; 20-100KPa and 40-200KPa are preferred for the air closed type, and other spring ranges can be selected.  
2. The classification of working temperature is based on comprehensive factors such as the pressure temperature grade of the valve body material (GB/T12224-2015), operating conditions, and the sealing material of the valve. There are slight differences in classification among countries, and even each The use of different materials by manufacturers can also result in different temperature divisions.

**连接尺寸及标准 Connection dimensions and standards**

- 法兰按GB/T9124.1-2019(默认标准)也可按JB/T79-2015或HG20592~HG20635-2009
- 法兰密封面型式: PN16为凸面法兰; PN25为凸面法兰; PN40、PN64(63)为凹凸面法兰, 阀体为凹面法兰
- 法兰端面距按GB/T12221-2005(其他标准须指明)
- 焊接连接坡口按: GB/T12224-2015
- 执行机构气信号接口: Rc1/4, Rc3/8(DN≥250)
- 阀体法兰及法兰端面距离可以按用户指定的标准制造, 如ANSI, JIS, DIN等。

The flange can be according to GB/T9124.1-2019 (default standard) or JB/T79-2015 or HG20592~HG20635-2009  
Flange sealing surface type: PN16 is a raised face flange; PN25 is a raised face flange; PN40, PN64 (63) are concave convex flange, and the valve body is concave flange  
The distance between flange end faces shall be in accordance with GB/T12221-2005 (other standards must be specified)  
Welding connection groove according to GB/T12224-2015  
Pneumatic signal interface of actuator: Rc1/4, Rc3/8 (DN ≥ 250)  
The distance between the valve body flange and the flange end face can be manufactured according to user specified standards, such as ANSI, JIS, DIN, etc.

**阀盖型式 Valve cover type**



**主要零件尺寸 Main component dimensions**

零件名称 Part Name	材料 Material
阀体、阀盖 Valve body, valve cover	WCB(ZG230-450)WCC(ZG270-500)WC6(ZG15CrMo) CF8(304) CF8M(316) CF3(304L)CF3M(316L)
阀芯、阀座 Valve core and valve seat	304(0Cr18Ni9)316(0Cr17Ni12Mo2)316L(00Cr17Ni14Mo2)并 堆焊司太莱合金17-4PH(沉淀硬化型不锈钢) And overlay welding of Stellite alloy 17-4PH (precipitation hardening stainless steel)
填料 Filler	PTFE(聚四氟乙烯)PTFE(增强聚四氟乙烯)Grafoil(柔性石墨) PTFE (polytetrafluoroethylene) PTFE (reinforced polytetrafluoroethylene) Grafoil (flexible graphite)
密封垫片 Sealing gasket	PTFE、不锈钢夹石墨 PTFE, stainless steel with graphite clip
膜盖 Membrane cover	A3(Q235镀锌或喷塑)304(特殊情况下采用) A3 (Q235 painted or sprayed) 304 (used in special cases)
波纹管膜片 Corrugated diaphragm	丁腈橡胶夹尼龙 Nitrile rubber clip nylon
弹簧 Spring	60Si2Mn 50CrVA
阀杆 Valve stem	304 316 316L 17-4PH

**调节阀重量表 Weight table of regulating valve**

单位: Kg

公称通径 Nominal Diameter	20	25	32	40	50	65	80	100	125	150	200
标准型 Standard Type	PN16	17	18	23	26	29	52	62	95	115	235
	PN40	18	19	25	27	32	56	68	115	140	295
	PN64	25	27	35	41	45	69	78	155	190	355
散热高温型 Heat dissipation high-temperature type	18	19	25	27	32	56	68	75	120	148	325
波纹管密封型 Bellows sealed type	18	19	25	27	32	56	68	75	120	148	325
低温型 Low temperature type	25	27	30	33	39	59	68	85	150	210	335

注:1、重量不包括附件 2、波纹管密封型、散热高温型、低温型以PN16为例

Note: 1. Weight does not include attachment 2. For bellows sealed type, heat dissipation high temperature type, and low temperature type, take PN16 as an example

**允许压差(气开式) Allowable pressure difference (air open)**

单位: mm

膜片有效面积Ae(cm <sup>2</sup> ) Effective area Ae of membrane (cm <sup>2</sup> )	280	400	600	1000	
信号范围Pr(KPa) Signal range Pr (KPa)	20-100	40-200	20-100	40-200	
起源压力Ps(MPa) Origin pressure Ps (MPa)	0.14	0.25	0.14	0.25	
需配附件 Accessories required	-	P	-	P	
公称通径 DN (mm) 及阀座直径 dn (mm) Nominal diameter DN (mm) and valve seat diameter dn (mm)	10	5.35	6.40		
	20	12	3.72	6.40	
		15	2.38	5.55	
		20	1.34	3.12	
	25	25	0.86	2.00	
		32	32		0.75 1.74
	40	25		1.22	2.85
		32		0.75	1.74
		40		0.48	1.11
	50	32		0.75	1.74
		40		0.48	1.11
		50		0.31	0.71
	65	65		0.27	0.63
		50		0.46	1.07
		80		0.27	0.63
	80	65		0.18	0.42
80			0.27	0.63	
100			0.18	0.42	
100	80		0.11	0.23	
	100				
	125			0.12 0.28	
150	100			0.19 0.44	
	125			0.12 0.24	
	150			0.09 0.20	
200	125			0.12 0.28	
	150			0.09 0.20	
	200			0.05 0.11	

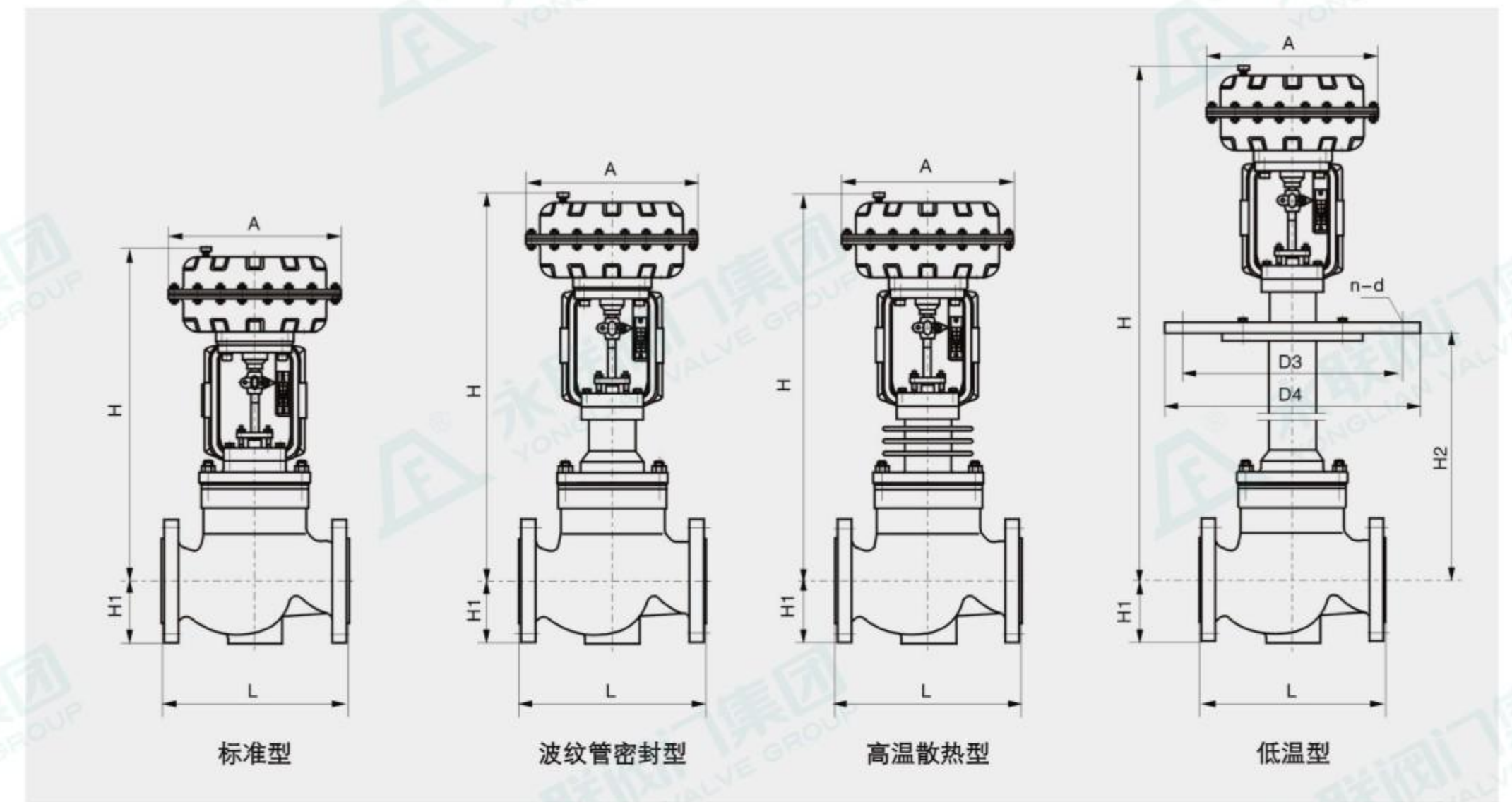
1. P: 阀门定位器(气开式不带定位器是不影响允许压差的)。
2. 对于111型单座波纹管密封调节阀, 最大允许压差为1.0MPa, 表中数据若数值小于1.0MPa则不变, 若数值大于1.0MPa, 则取值1.0MPa。
3. 允许压差仅指按标准执行机构配置的数值, 可根据具体工况条件另配执行机构来满足使用要求。
4. 由于国内外各个厂家使用的执行机构输出力是有差别的, 因此同一口径的阀门每个供应商出具的允许压差数据是不一样的。
5. 同一阀门选用40-200KPa弹簧其允许压差是20-10KPa弹簧允许压差的2倍, 由以上数据可知, 气开式单座调节阀尽量使用40-200KPa弹簧或80-240KPa弹簧。
6. 以上数据是根据阀门关闭时, 阀后压力P2=0时的计算值, 在调节时允许压差更大。

允许压差(气关式) Allowable pressure difference (air closed) 单位: mm

膜片有效面积Ae(cm <sup>2</sup> ) Effective area Ae of membrane (cm <sup>2</sup> )		280			400			600			1000			
信号范围Pr(KPa) Signal range Pr (KPa)		20-100	20-100	40-200	20-100	20-100	40-200	20-100	20-100	40-200	20-100	20-100	40-200	
起源压力Ps(MPa) Origin pressure Ps (MPa)		0.14	0.14	0.25	0.14	0.14	0.25	0.14	0.14	0.25	0.14	0.14	0.25	
需配附件 Accessories required		-	P	P	-	P	P	-	P	P	-	P	P	
公称 通径 DN (mm) 及 阀座 直 径 dn (mm)	20	10	5.35	6.40	6.40									
		12	3.72	6.40	6.40									
		15	2.33	5.55	6.40									
	25	20	1.34	3.12	4.01									
		25	0.86	2.00	2.57									
	40	32				0.75	1.74	2.24						
		25				1.22	2.85	3.67						
		32				0.75	1.74	2.24						
	50	40				0.48	1.11	1.48						
		32				0.75	1.74	2.24						
		50				0.31	0.71	0.91						
	65	65							0.27	0.63	0.81			
		50							0.46	1.07	1.38			
		80							0.27	0.63	0.81			
	80	80							0.18	0.42	0.52			
		65							0.27	0.63	0.81			
100								0.18	0.42	0.52				
100	100							0.11	0.26	0.34				
	125										0.12	0.29	0.37	
	150										0.19	0.44	0.57	
150	125										0.12	0.29	0.37	
	150										0.09	0.20	0.25	
	200										0.12	0.29	0.37	
200	150										0.09	0.20	0.25	
	200										0.05	0.11	0.14	

1. P: 阀门定位器
2. 对于111型单座波纹管密封调节阀, 最大允许压差为1.0MPa, 表中数据若数值小于1.0MPa则不变, 若数值大于1.0MPa, 则取值1.0MPa。
3. 允许压差仅仅指按标准执行机构配置的数值, 可根据具体工况条件另配执行机构来满足使用要求。
4. 气源压力相同时, 选用80-240Kpa弹簧其允许压差与40-200Kpa弹簧允许压差是一样的(不带定位器时), 由以上数据可知, 气闭式单座调节阀尽量使用40-200Kpa弹簧范围或20-100Kpa弹簧范围。
5. 以上数据是根据阀门关闭时, 阀后压力P2=0时的计算值, 在调节时允许压差更大。

外形尺寸 Overall dimensions



标准型、波纹管密封型、高温散热型外形尺寸表

Outline dimension table for standard type, bellows sealed type, and high-temperature heat dissipation type

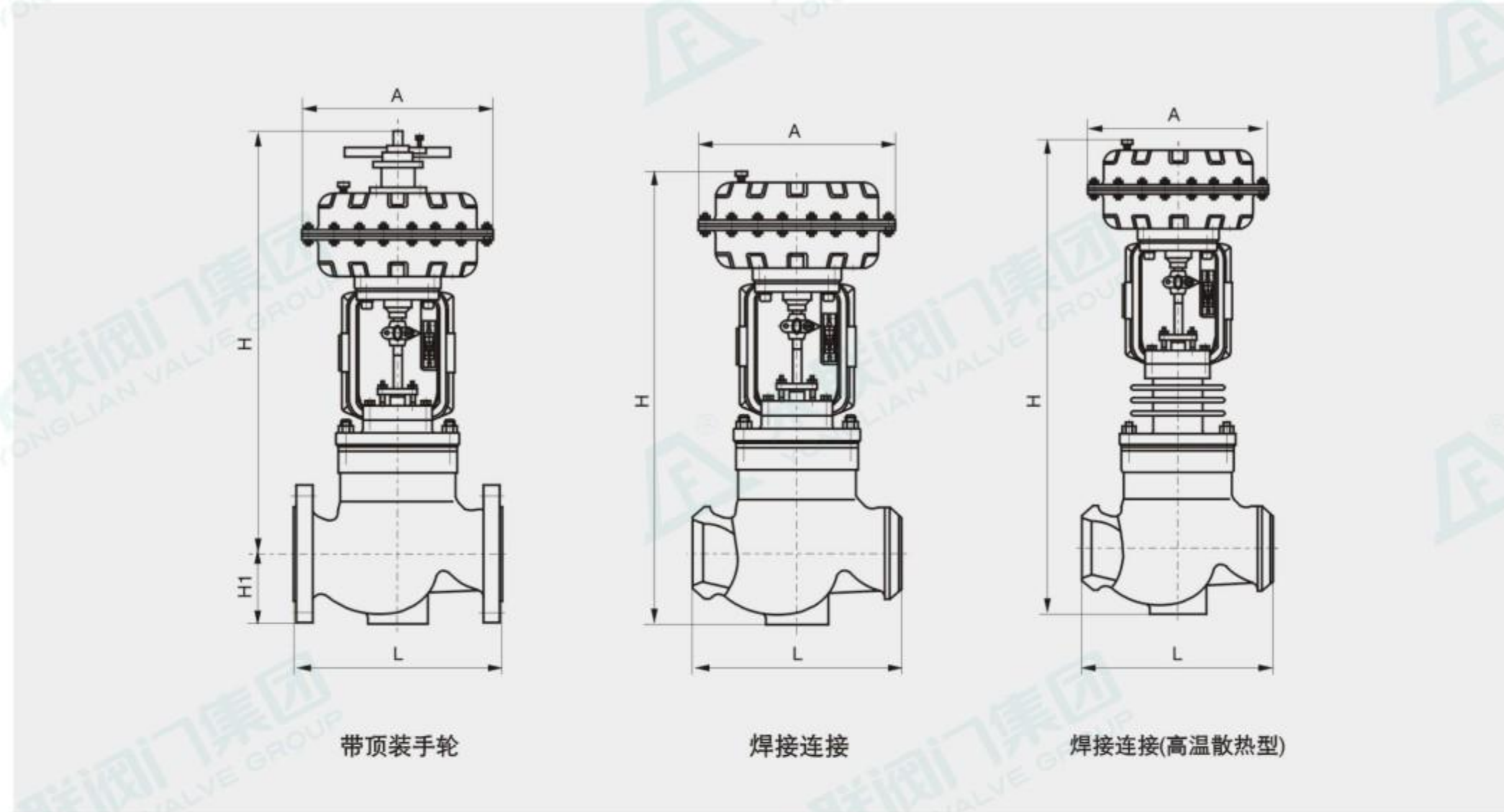
单位: mm

公称通径 Nominal Diameter		20	25	32	40	50	65	80	100	125	150	200	250	
ΦA		282			308			395			498			620
L	PN16, 20, 25, 40 ANSI150lb	150	160	180	200	230	290	310	350	400	480	600	730	
	PN64, 100(110) ANSI300lb, 600lb	230	230	260	260	300	340	380	430	500	550	650	775	
H1	PN16	52.5	57.5	70	75	82.5	92.5	100	110	125	142.5	170	202.5	
	PN25	52.5	57.5	70	75	82.5	92.5	100	115	135	150	180	212.5	
	PN40	52.5	57.5	70	75	82.5	92.5	100	117.5	135	150	187.5	225	
	PN64(63)	65	70	78	85	90	102.5	107.5	125	147.5	172.5	202.5	235	
	ANSI 150lb(PN20)	50	55	60	85	75	80	95	115	127.5	140	172.5	202.5	
	ANSI 300lb(PN50)	60	62.5	67.5	77.5	82.5	95	105	127.5	140	160	190	222.5	
H	标准型 Standard Type	PN16/25/40	400	400	440	450	460	570	570	570	670	700	740	970
	ANSI 150lb(PN20)	400	400	440	450	460	570	570	570	670	700	740	970	
	PN64, 300lb(PN50)	400	400	450	450	460	570	570	570	720	750	750	980	
散热、高温型波纹管密封型 Heat dissipation, high-temperature corrugated pipe sealing type		480	480	530	530	530	640	640	640	800	810	840	1050	

1. 带顶装手轮机构阀高度H增加152(DN20-50)、182(DN65-100)253(DN125-200)、352(DN250)

1. The height of the valve with top mounted handwheel mechanism should be increased by 152 (DN20-50), 182 (DN65-100), 253 (DN125-200), and 352 (DN250)

外形尺寸 Overall dimensions



低温型外形尺寸表(美标)

Low temperature type external dimension table (American standard)

单位: mm

公称通径 Nominal Diameter		20	25	32	40	50	65	80	100	125	150	200	
ΦA		282			308			395			498		
L	PN16,20 (150lb)25,40	150	160	180	200	230	290	310	350	400	480	600	
	PN50(300Lb) 64(63)	230	230	260	260	300	340	380	430	500	550	650	
H1	-60~-100°C	500	500	500	500	500	600	600	600	700	700	700	
	-100~-200°C	700	700	700	700	700	800	800	800	900	900	900	
	-200~-250°C	900	900	900	900	900	1000	1000	1000	1100	1100	1100	

1、带顶装手轮机构阀高度应H增加152(DN20-50)、182(DN65-100)、253(DN125-200)

2、尺寸H2(保温长度)是以一般空分行业设计尺寸推荐的,设计院及使用单位可以根据需求指定,如不指定我公司按以上尺寸出厂。

1. The height of the valve with top mounted handwheel mechanism should be increased by 152 (DN20-50), 182 (DN65-100), and 253 (DN125-200)

2. The size H2 (insulation length) is recommended based on the design size of the general air separation industry. The design institute and user unit can specify it according to their needs. If not specified, our company will produce according to the above dimensions.

低温型外形尺寸表(国标) Low temperature type external dimension table (national standard)

单位: mm

公称通径 Nominal Diameter		20	25	32	40	50	65	80	100	125	150	200	
H	-60~-100°C	PN16、20、25、40	810	810	832	832	832	1026	1026	1026	1200	1198	1198
		PN50、64	810	810	832	832	832	1026	1026	1026	1200	1198	1198
	-100~-200°C	PN16、20、25、40	1010	1010	1032	1032	1032	1226	1226	1226	1400	1398	1398
		PN50、64	1010	1010	1032	1032	1032	1226	1226	1226	1400	1398	1398
-200~-250°C	PN16、20、25、40	1210	1210	1232	1232	1232	1426	1426	1426	1600	1598	1598	
	PN50、64	1210	1210	1232	1232	1232	1426	1426	1426	1600	1598	1598	
ΦD3		260	260	285	305	340	370	405	460	525	590	700	
ΦD4		290	290	315	335	370	400	435	490	555	630	740	
螺栓孔n(个)d(直径)		8-14	8-14	8-14	8-16	8-16	10-16	10-16	12-18	14-18	16-18	18-18	

1、带顶装手轮机构阀高度应H增加152(DN20-50)、182(DN65-100)、253(DN125-200)

2、尺寸H2(保温长度)是以一般空分行业设计尺寸推荐的,设计院及使用单位可以根据需求指定,如不指定我公司按以上尺寸出厂。

1. The height of the valve with top mounted handwheel mechanism should be increased by 152 (DN20-50), 182 (DN65-100), and 253 (DN125-200)

2. The size H2 (insulation length) is recommended based on the design size of the general air separation industry. The design institute and user unit can specify it according to their needs. If not specified, our company will produce according to the above dimensions.

订货须知

订货时请用户提供一下材料

- 调节阀名称、型号、用途。
- 公称通径(mm)、公称压力(MPa)、工作温度及范围。
- 阀前压力, 阀后压力。
- 介质名称及状态, 介质流量。
- 阀盖型式。
- 整机作用方式(气开还是气关), 仪表风(气源压力)。
- 阀体、阀内件材质要求

• 附件要求:

- 电-气阀门定位器、空气过滤减压器、电磁阀、保位阀、阀位变送器、(顶装)手轮等。
- 阀体法兰标准。
- 阀体结构长度(法兰面距L)。
- 其他特殊要求(如耐蚀要求, 防爆等级要求, 泄漏等级限制要求, 等等)。
- 技术参数更改, 恕不另行通知!

Ordering Instructions

Please provide the following materials when placing an order

- Name, model, and purpose of the regulating valve.
- Nominal diameter (mm), nominal pressure (MPa), operating temperature and range.
- Pre valve pressure, post valve pressure.
- Media name and status, media flow rate.
- Valve cover type.

The operation mode of the entire machine (air on or air off), instrument air (air source pressure).

Attachment requirements:

- Electric pneumatic valve positioner, air filter pressure reducer, solenoid valve, holding valve, valve position transmitter, (top mounted) handwheel, etc.
- Standard for valve body flanges.
- The length of the valve body structure (flange face distance L).
- Other special requirements (such as corrosion resistance requirements, explosion-proof level requirements, leakage level limit requirements, etc.).

Technical parameters are subject to change without prior notice!

## 气动薄膜角形套筒调节阀 137型

Pneumatic diaphragm angle sleeve control valve

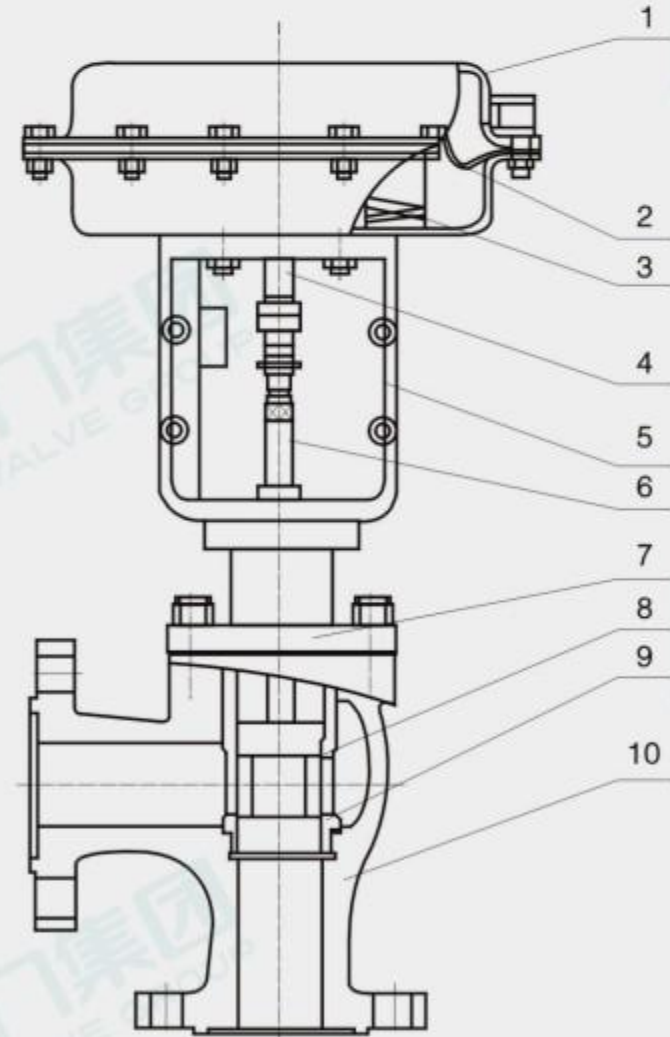
### 产品概述

Product description

137型新系列气动薄膜角形套筒调节阀, 相对于1151型气动薄膜角形单座阀来说只是阀内件不一样, 相对于气动薄膜套筒调节阀来说, 只是阀体不一样。137型用在管道90°弯道处, 用于代替117型不能胜任高压差的场合。

Compared with the 1151 type pneumatic diaphragm angle single-seat valve, the new series of 137 type pneumatic film angle sleeve control valve is only different in the valve trim, and compared with the pneumatic film sleeve control valve, only the valve body is different. Type 137 is used at 90° bends in pipelines to replace the occasions where Type 117 cannot handle high pressure differences.

137型气动薄膜角形套筒调节阀基本结构  
Basic Structure of 137 Pneumatic Diaphragm Angle Sleeve Regulating Valve



- 1、膜盖
- 2、膜片
- 3、弹簧
- 4、推杆
- 5、支架
- 6、阀杆
- 7、阀盖
- 8、阀芯
- 9、套筒
- 10、阀体



### 型号编制说明 Model preparation instructions

137-□□K(B) 1: 新系列 1: 气动薄膜执行机构 5: 角型阀 2: 笼式结构  
1: New series 1: Pneumatic diaphragm actuator 5: Angle valve 2: Cage structure

-□□: 压力级别: 如16: 1.6MPa K(B)气开(关)式  
Pressure range: such as 16: 1.6MPa K (B) gas on (off) type

137-□□K(B)	Q: 调节切断型	Adjusting the cut-off type
137-□□K(B)G	G: 高温型	High temperature type
137-□□K(B)V	V: 波纹管密封型	Sealing performance of corrugated pipes
137-□□K(B)J	J: 夹套保温型	Jacket insulation type
137-□□K(B)D	D: 低温型	Low temperature type
137-□□K(B)S	S: 散热型	Heat dissipation type

### 允许压差

同112型气动薄膜套筒调节阀篇

### Allowable differential pressure

Same as Type 112 Pneumatic Film Sleeve Control Valve

### 外形尺寸

同112型气动薄膜角形单座阀篇

### External dimensions

Same as Type 112 Pneumatic Film Angle Single Seat Valve

### 连接尺寸及标准

同112型气动薄膜角形单座阀篇

### Connection size and standard

Same as Type 112 Pneumatic Film Angle Single Seat Valve

### 订货须知

同112型气动薄膜角形单座阀篇

### Ordering notice

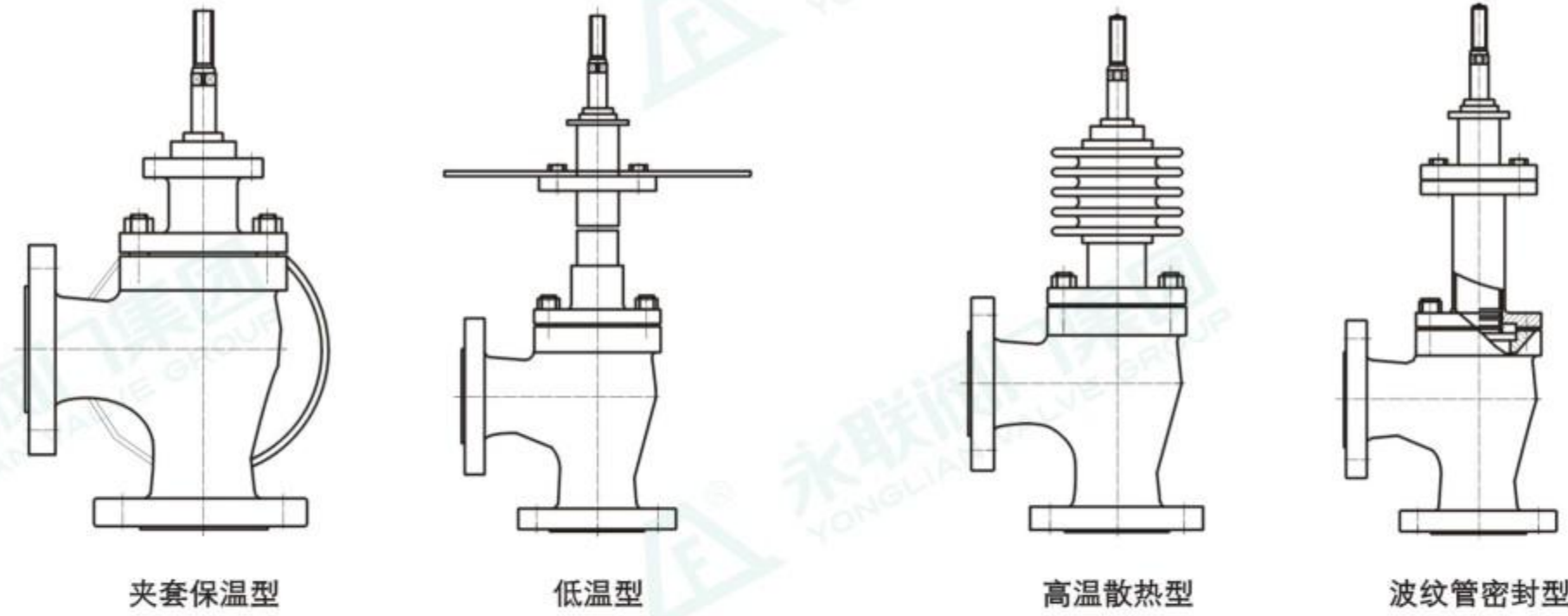
Same as Type 112 Pneumatic Film Angle Single Seat Valve

### 主要零件尺寸 Main component dimensions

零件名称 Part Name	材料 Material
阀体、阀盖 Valve body, valve cover	WCB(ZG230-450)WCC(ZG270-500)WC6(ZG15CrMo) CF8(304) CF8M(316) CF3(304L)CF3M(316L)
阀芯、套筒 Valve core and sleeve	304(0Cr18Ni9)316(0Cr17Ni12Mo2)316L(00Cr17Ni14Mo2) 并堆焊司太莱合金17-4PH(沉淀硬化型不锈钢) And overlay welding of Stellite alloy 17-4PH (precipitation hardening stainless steel)
填料 Filler	PTFE(聚四氟乙烯)PTFE(增强聚四氟乙烯)Grafoil(柔性石墨) PTFE (polytetrafluoroethylene) PTFE (reinforced polytetrafluoroethylene) Grafoil (flexible graphite)
密封垫片 Sealing gasket	PTFE、不锈钢夹石墨 PTFE, stainless steel with graphite clip
膜盖 Membrane cover	A3(Q235镀锌或喷塑)304(特殊情况下采用)
波纹管片 Corrugated diaphragm	丁腈橡胶夹尼龙 Nitrile rubber clip nylon
阀杆 Valve stem	304 316 316L 17-4PH

可根据工况需用其他材料技术参数更改, 恕不另行通知!  
Other material technical parameters can be changed according to the working conditions without prior notice!

阀盖型式 Valve cover type



自力式调节阀 211型  
Self-operated regulator

产品概述  
Product description

211系列自力式调节阀的英文名为Self-Operated Regulator, 直译为“自动调节器”, 它是集检测、变送、控制、执行为一体的阀门装置, 与控制阀(control valve)有很大的区别。自力式调节阀显著特点是: 无须外加能源(电源、气源), 直接利用被控介质自身能量进行自动控制与操作。只要利用了辅助能源的阀门就不能称作“自力式”, 这个概念必须要澄清, 否则会被供应商制造造成误解! 自力式阀门共有四大类: 自力式压力调节阀、自力式温度调节阀、自力式流量调节阀、自力式液位调节阀其中自力式压力调节阀种类最多, 共有以下种类: 211型压力调节阀, 212型微压阀, 213型差压阀, 214-16 II型指挥器操作式压力调节阀(氮封装置), 216型全天候阻火呼吸阀。

The English name of the 211 series self-operated regulating valve is Self-Operated Regulator, which is literally translated as "automatic regulator". It is a valve device integrating detection, transmission, control and execution. difference. The remarkable feature of the self-operated control valve is that it does not need external energy (power supply, gas source), and directly utilizes the energy of the controlled medium for automatic control and operation. As long as the valve using auxiliary energy cannot be called "self-operated", this concept must be clarified, otherwise it will cause misunderstandings to suppliers and manufacturers! There are four categories of self-operated valves: self-operated pressure regulating valves, self-operated temperature regulators Valves, self-operated flow control valves, and self-operated liquid level control valves. Among them, there are the most types of self-operated pressure control valves. There are the following types: 211 type pressure regulating valve, 212 type micro-pressure valve, 213 type differential pressure valve, 214-16 II type commander 216 type all-weather fire-resisting breathing valve.

我公司是自力式阀门专业厂家, 其生产的自力式阀门无论是质量、数量、品种规格等均在国内处于前列!

Our company is a professional manufacturer of self-operated valves, and the self-operated valves produced by it are in the forefront of the country in terms of quality, quantity, variety and specifications!

主要技术参数 Main technical parameters

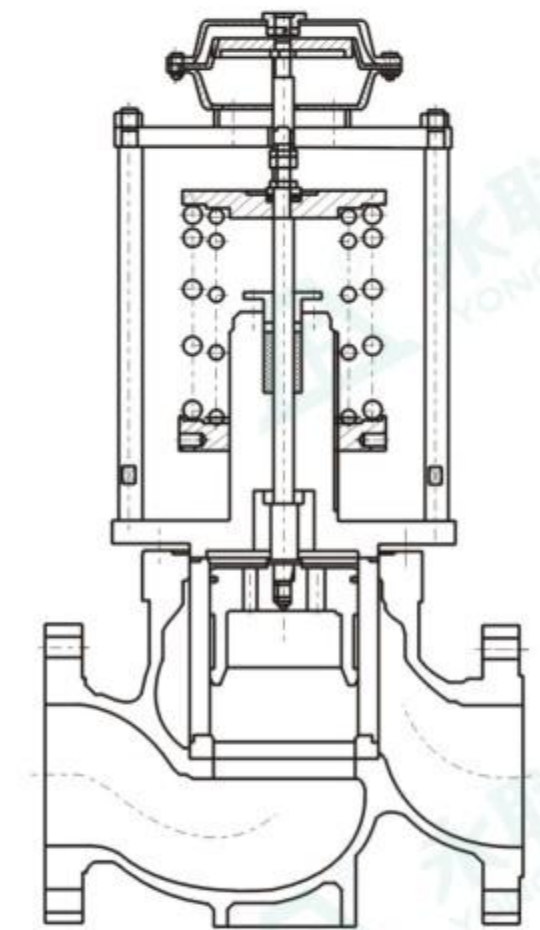
公称通径DN(mm) Nominal Diameter	20	25	32	40	50	65	80	100	125	150	200	
额定流量系数Kv Rated flow coefficient Kv	直线 Straight line	6.9	11	17.6	27.5	44	69	110	176	275	440	690
	等百分比 Equal percentage	6.3	10	16	25	40	63	100	160	250	400	630
额定行程L(mm) Rated stroke L (mm)	16		25		40		60					
膜片有效面积Ae(cm <sup>2</sup> ) Effective area Ae of membrane (cm <sup>2</sup> )	280		400		600		1000					
公称通径DN(mm) Nominal diameter DN (mm)	250		300		350							
额定流量系数Kv Rated flow coefficient Kv	直线 Straight line	1000		1650		2160						
	等百分比 Equal percentage	900		1500		200						
额定行程L(mm) Rated stroke L (mm)	100											
膜片有效面积Ae(cm <sup>2</sup> ) Effective area Ae of membrane (cm <sup>2</sup> )	1600											
信号范围Pr(KPa) Signal range Pr (KPa)	20~100、40~200、80~240											
气源压力PS(MPa) Air source pressure PS (Mpa)	0.14、0.25、0.30											
固有流量特征 Inherent flow characteristics	直线、等百分比 Straight line, equal percentage											
固有可调比R Inherently adjustable ratio R	50:1											
允许泄露量 Permissible leakage amount	硬阀芯平衡型: III级、IV级软密封: VI级 Hard valve core balance type: Class III, Class IV soft seal: Class VI											
公称压力 PN Nominal pressure	MPa	1.6, 2.5, 4.0, 6.4(6.3)/2.0, 5.0, 11.0, 15.0										
	Bar	16, 25, 40, 64(63), 100, 160/20, 50, 110, 150										
	Lb	ANSI: Class150、Class300、Class600/Class900										
工作温度 (°C) working temperature (°C)	常温型 Normal temperature type	-20~200、-40~250、-60~250										
	散热型 Heat dissipation type	-40~450、-60~450										
	高温型 High temperature type	450-560(使用高温材料) 450-560 (using high-temperature materials)										
	低温型 Low temperature type	-60~-100、-100~-200、-200~-250										
	调节切断阀 Adjusting the shut-off valve	-40~150(阀芯夹PTFE)、-60~200(阀芯夹增强PTFE) -40-150 (valve core clamp PTFE), -60-200 (valve core clamp reinforced PTFE)										

- 1、弹簧范围: 气开式优先选用40-200KPa及80-240KPa; 气闭式优先选用20-100KPa及40-200KPa
- 2、工作温度划分是根据阀体材料的压力-温度等级(GB9131-94)、使用工况、阀门的密封件材料等综合因素来划分的, 各国划分是有细微区别的

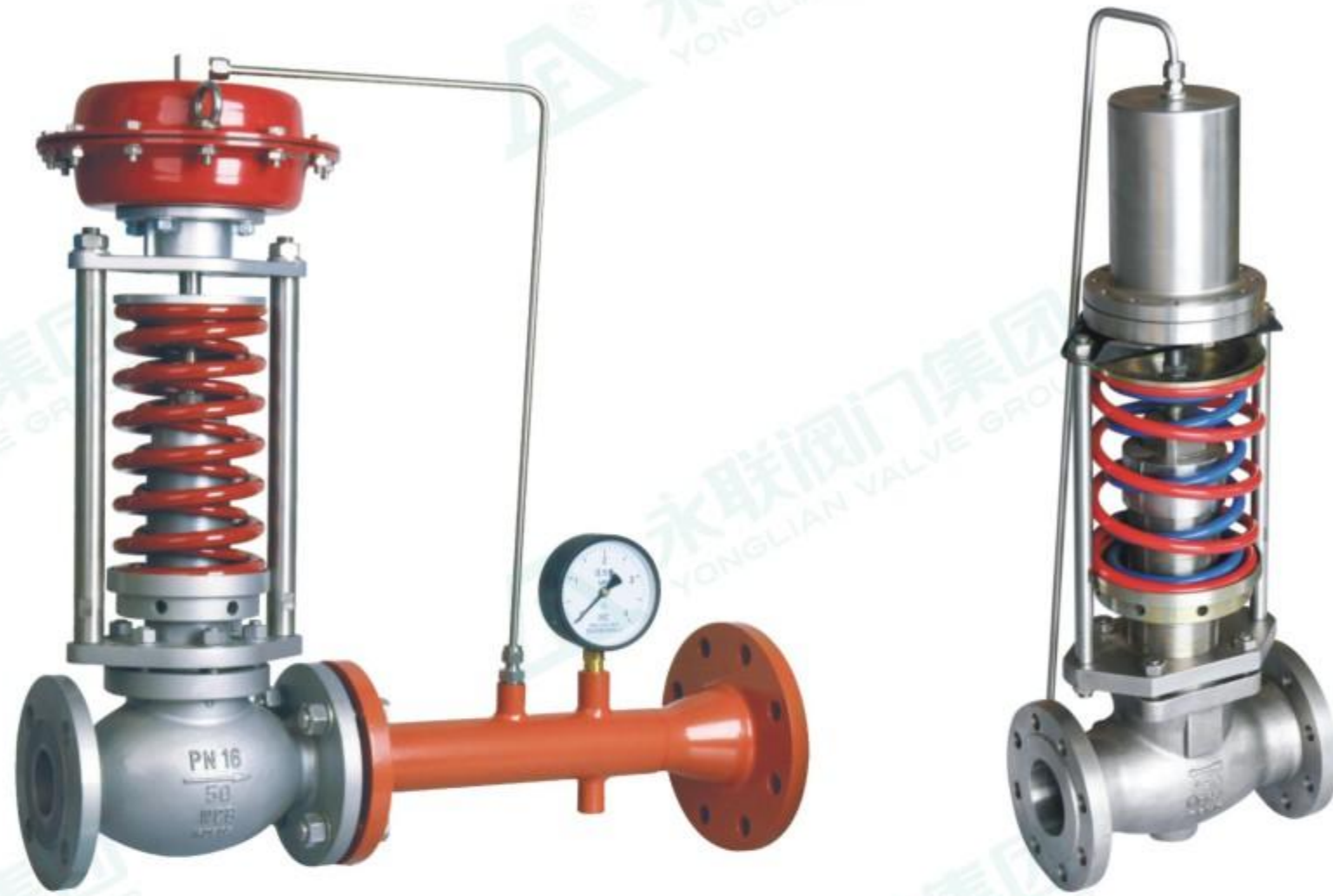
1. Spring range: For air open type, 40-200KPa and 80-240KPa are preferred; 20-100KPa and 40-200KPa are preferred for air closed systems
2. The classification of working temperature is based on comprehensive factors such as the pressure temperature grade (GB9131-94) of the valve body material, operating conditions, and the sealing material of the valve, There are subtle differences in the division of countries



211系列自力式阀门系列产品  
211 series self operated valve series products



套筒自力式2112



自力式阀门系列产品 Self operated valve series products

211型自力式压力调节阀是不需要任何外加能源，利用被调介质自身能量而自动调节的执行产品。该产品的最大特点就是能在无电、无气的场所使用，同时又节约了能源。压力没定期在一定范围内随意可调。211型自力式压力调节阀根据各种工艺场合的需要有三种阀内件行程：2111型(单座自力式压力调节阀)；2112型(套筒自力式压力调节阀)；2114型(双座自力式压力调节阀)。用户可根据况(压差、温度、介质状态)和泄漏量要求来选择。211型自力式压力调节阀根据各种工艺场合的需要有三种阀盖型式：普通(一般场合)、长颈(压力调节范围大)、散热(温度350~550℃)。

211型自力式压力调节阀根据各种工艺场合的需要有三种执行机构型式：膜片(普通膜片和增强膜片)、活塞、金属膜片(OCr18Ni9)。211型自力式压力调节阀采用快开流量特性，动作灵敏，调节精度高(误差≤10%)；该阀占据空间小(相对于重锤式减压阀)，调节简易，因而它广泛用于石油、化工、电力、冶金、食品、轻纺、机械制造、民用建筑等各种设备的气体、液体及蒸汽的减压、稳压(用于阀后调节)或泄压、稳压(用于阀前调节)。

Self operated valve series products

The 211 type self operated pressure regulating valve is an executive product that does not require any external energy and utilizes the energy of the regulated medium to automatically regulate. The biggest feature of this product is that it can be used in places without electricity or gas, while also saving energy. The pressure is not regularly adjustable within a certain range. The 211 type self operated pressure regulating valve has three types of valve trim strokes according to the needs of various process occasions: the 2111 type (single seat self operated pressure regulating valve); 2112 type (sleeve self operated pressure regulating valve); 2114 type (double seat self operated pressure regulating valve). Users can choose based on the conditions (pressure difference, temperature, medium status) and leakage requirements. The 211 type self operated pressure regulating valve has three types of valve cover according to the needs of various process occasions: ordinary (general occasions), long neck (large pressure regulating range), and heat dissipation (temperature 350~550 °C).

The 211 type self operated pressure regulating valve has three types of actuator according to the needs of various process occasions: diaphragm (ordinary diaphragm and reinforced diaphragm), piston, and metal diaphragm (OCr18Ni9). The 211 type self operated pressure regulating valve adopts a fast opening flow characteristic, with sensitive action and high adjustment accuracy (error ≤ 10%); The valve occupies a small space (compared with the weight type pressure reducing valve) and is easy to adjust, so it is widely used in petroleum, chemical industry, power, metallurgy, food, textile, machinery manufacturing, civil buildings and other unprepared gas, liquid and steam pressure reduction and stabilization (for post valve regulation) or pressure relief and stabilization (for pre valve regulation).

结构与原理 Structure and Principle

- 211型自力式压力调节阀有检测执行机构、阀本体、取压管阀前(后)接管组成。
- 其结构见右图一(下页)

Structure and Principle

The 211 type self operated pressure regulating valve consists of a detection actuator, valve body, and front (rear) connecting pipe of the pressure pipe valve.

The structure is shown in Figure 1 on the right (next page)

图一a、用于控制阀后压力的调节阀，阀作用方式为压闭型。其用原理如下：

介质由箭头方向流入阀体，经阀座、阀芯节流后输出，另一路径取压管(介质为蒸汽时加冷凝水)被引入执行机构作用与膜片上，使阀芯随之发生相应位移，达到减压、稳压的目的。如阀后压力增加，作用于膜片上的力增加，压缩弹簧，带动阀芯，使阀门开度减少，直至阀后压力下降至设定值为止。同理，如阀后压力降低，作用在膜片上的力减小，由于弹簧的反作用力，带动阀芯，使阀门的开度加大，直至阀后压力上升至设定值为止。

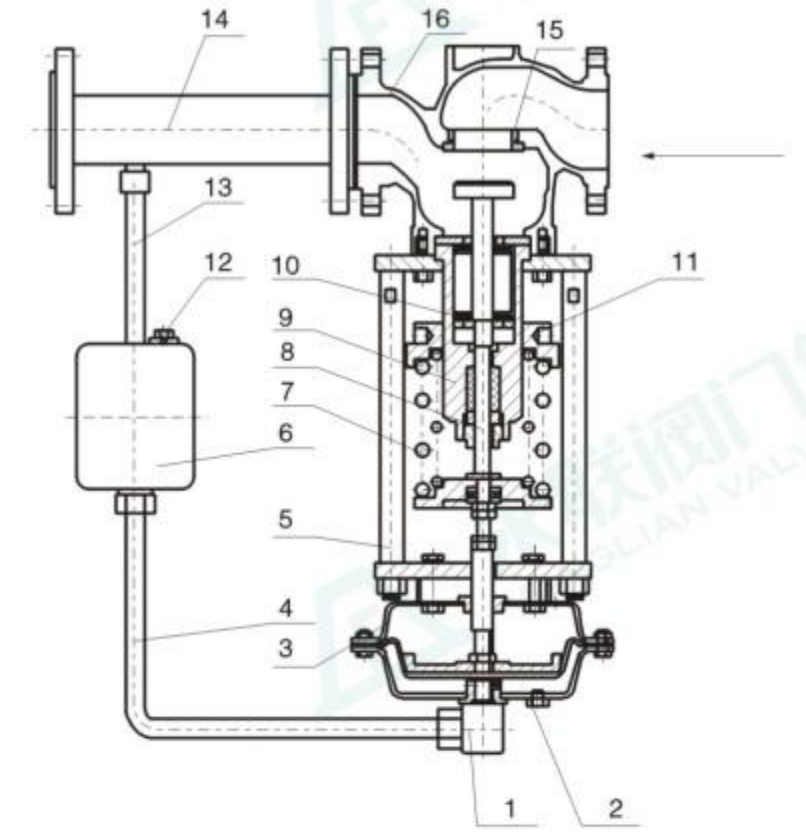
图一b、用于控制阀前压力的调节阀，阀作用方式为压开型，其作用原理如下：介质由箭头方式流入阀体，经阀座、阀芯节流后输出。另一路径取压管(介质蒸汽时加冷凝器)被引执行机构作用于膜片上，使阀芯随之发生相应的位移，达到泄压、稳压的目的。如阀前压力增加，作用于膜片上的力增加，压缩弹簧，带动阀芯，式阀门开度增大，直至阀前压力下降至设定值为止。同理，如阀前压力降低，作用在膜片上的力减小，由于弹簧的反作用力，带动阀芯，使阀门的开度减小，直至阀前压力上升至设定值为止，若阀前压力小于设定值则该阀一直是关闭的。

Figure 1a. The regulating valve used to control the pressure behind the valve, with a pressure closed valve action mode.

The principle of its use is as follows:

The medium flows into the valve body in the direction of the arrow, and is throttled by the valve seat and valve core before being output. Another path of the pressure pipe (adding condensate when the medium is steam) is introduced into the actuator and diaphragm, causing the valve core to move accordingly, achieving the purpose of reducing pressure and stabilizing pressure. If the pressure behind the valve increases, the force acting on the diaphragm increases, compressing the spring and driving the valve core to reduce the valve opening until the pressure behind the valve drops to the set value. Similarly, if the pressure behind the valve decreases, the force acting on the diaphragm decreases. Due to the reaction force of the spring, it drives the valve core and increases the opening of the valve until the pressure behind the valve rises to the set value.

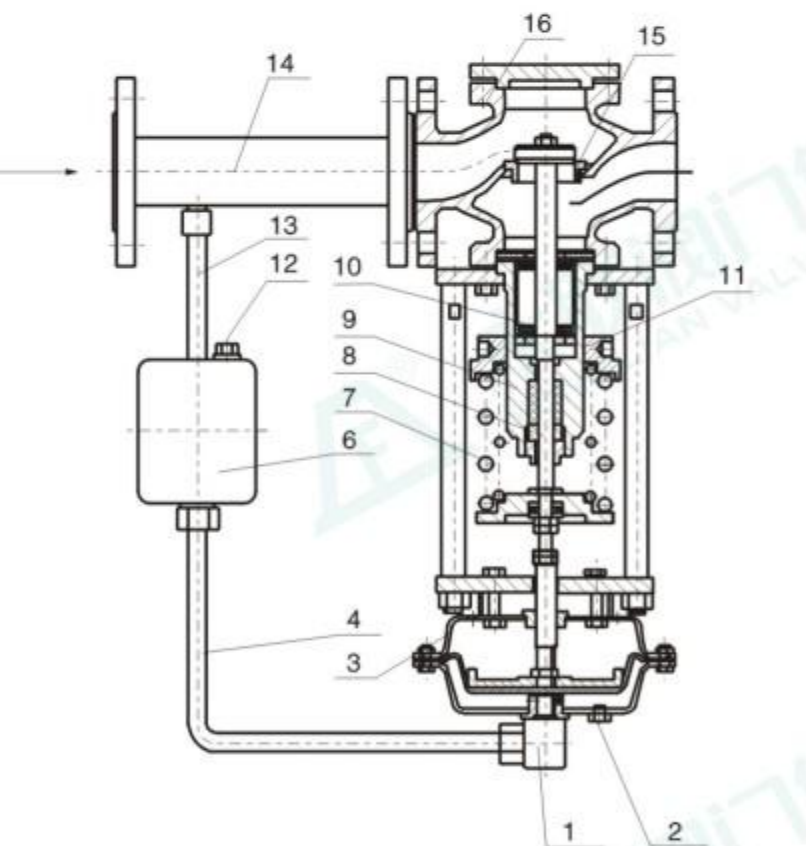
Figure 1b: A regulating valve used to control the pressure in front of the valve. The valve operates in a pressure open type, and its working principle is as follows: the medium flows into the valve body in an arrow pattern, and is output after being throttled by the valve seat and core. The other path of the pressure pipe (adding a condenser when the medium is steam) is guided by the actuator to act on the diaphragm, causing the valve core to undergo corresponding displacement, achieving the purpose of pressure relief and stabilization. If the pressure in front of the valve increases, the force acting on the diaphragm increases, compressing the spring, driving the valve core, and increasing the opening of the valve until the pressure in front of the valve drops to the set value. Similarly, if the pressure in front of the valve decreases, the force acting on the diaphragm decreases. Due to the reaction force of the spring, it drives the valve core, causing the opening of the valve to decrease until the pressure in front of the valve rises to the set value. If the pressure in front of the valve is less than the set value, the valve remains closed.



图一a、2111型-16B型

单座自力式压力调节发(控制阀后)

- 1、排放塞 2、排气塞 3、执行机构 4、进液管
- 5、压盖螺钉 6、冷凝器 7、弹簧 8、阀杆
- 9、阀芯 10、波纹管 11、压力调节盘
- 12、注液口螺钉 13、进汽口
- 14、阀后接管 15、阀座 16、阀体

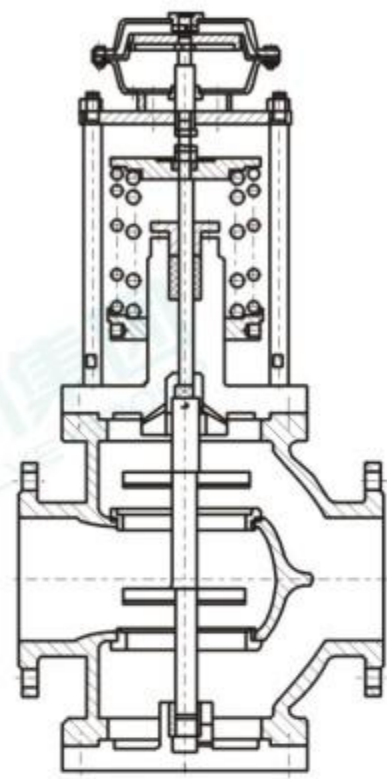


图一b、2111型-16K型

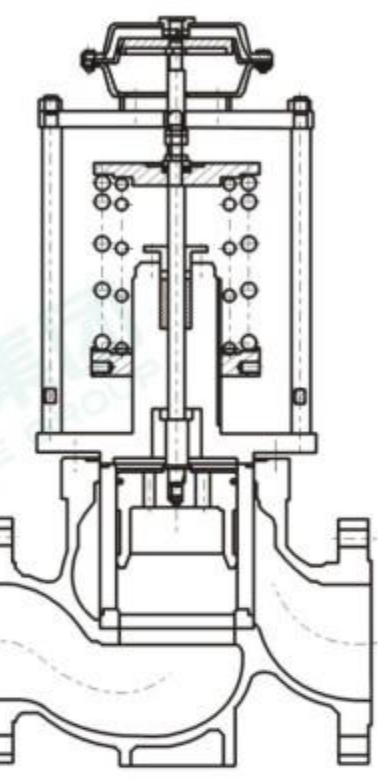
- 1、排放塞 2、排气塞 3、执行机构 4、进液管
- 5、压盖螺钉 6、冷凝器 7、弹簧 8、阀杆
- 9、阀芯 10、波纹管 11、压力调节盘 12、注液口螺钉
- 13、进汽口 14、阀后接管 15、阀座 16、阀体

主要零件材料 Material for main parts

零件名称 Part Name	材料 Material
阀体 Valve body	ZG230-450、ZGOCr18Ni9Ti、 ZGOCr18Ni12Mo2Ti
阀芯 Valve core	1Cr18Ni9、OCr18Ni12Mo2Ti (堆焊Stellite)PTFE
阀座 Valve seat	1Cr18Ni9、 OCr18Ni12Mo2Ti(堆焊Stellite)
阀杆 Valve stem	1Cr18Ni9、OCr18Ni12Mo2Ti
橡胶膜片 Rubber diaphragm	丁腈、乙丙、氟、耐油橡胶 或OCr18Ni9Ti Nitrile, ethylene propylene, fluorine, oil resistant rubber Or OCr18Ni9Ti
膜盖 Membrane cover	Q235、Q235涂PTFE
填料 Filler	聚四氟乙烯、柔性石墨 PTFE, flexible graphite



2114型双座自力式



2114型套筒自力式

## 自力式压力调节阀 211型

Self operated pressure regulating valve Type 211

- 1、压力调节范围：  
压力调节范围的确定见上表，控制压力精良选在中间期附近，压力范围设定越小，精度越高，因此不要人为瓜达压力设定范围。
  - 2、对控制阀后的自力式而言，若阀前后压差比超过10这个范围，建议用多级减压阀或二个自力式串联（阀前压力小于0.8MPa除外。例如指挥器操作式）。
  - 3、公称压力若超过6.4MPa，须特殊处理。
  - 4、1kgf/cm<sup>2</sup>=100KPa。
- 安装时，应注意以下几点：

- (1) 冷凝器应高于调压阀的执行机构而低于阀后接管。使用前冷凝器应灌满冷水，以后约3个月灌水一次。
- (2) 取压点应取在调压阀适当位置，阀前调压应大于2倍管道直径，阀后调压应大于6倍管道直径。
- (3) 便于现场维修及操作，调节阀四周应留有适当空间，阀前后应设置截止阀与旁通手动阀。
- (4) 调压阀通径过大 (DN≥100时)，应有固定支架。
- (5) 当确定介质很纯洁时，件3可不安装。
- (6) 自力式阀可以比管道通径小，但过滤器和截止阀不能。

### 型号编制说明 Model preparation instructions

2111--16 (25、40、64、110) B 3001P-16K

2:自力式产品系列;

1:薄膜执行机构; 1:直接作用型; 1:单座结构; 2:套筒笼式结构; 4:双座结构; 16:PN1.6MPa、40:4.0MPa

B:控制阀后，压力增加阀关闭; K:控制阀前，压力增加阀开启

### 连接尺寸及标准 Connection dimensions and standards

法兰按GB/T9124.1-2019(默认标准)，也可按JB/T79-2015或HG20592~HG20635-2009

法兰密封面形式: PN16为凸面法兰; PN25为凸面法兰; PN40、PN64(63)为凹凸面法兰，阀体为凹面法兰

法兰端面距按GB/T12221-2005(其他标准须指明)

焊接连接坡口按: GB/T12224-2015

执行机构气信号接口: Rc1/4,Rc3/8(DN≥250)

)阀体法兰及法兰端面距离可以按用户指定的标准制造，如ANSI,JIS,DIN等。

### 压力调整方法 Pressure adjustment method

见图 - (a,b,c)中

自力式压力调节阀在出厂前已按设定值调整好，但用户希望改变设定值，或由于某种原因实际指示针便利设定值时，可以用调节棒转动7(调节盘)，顺时针方向为压力降低，反顺时针方向为压力升高。

### 外形尺寸及重量 Overall dimensions and weight

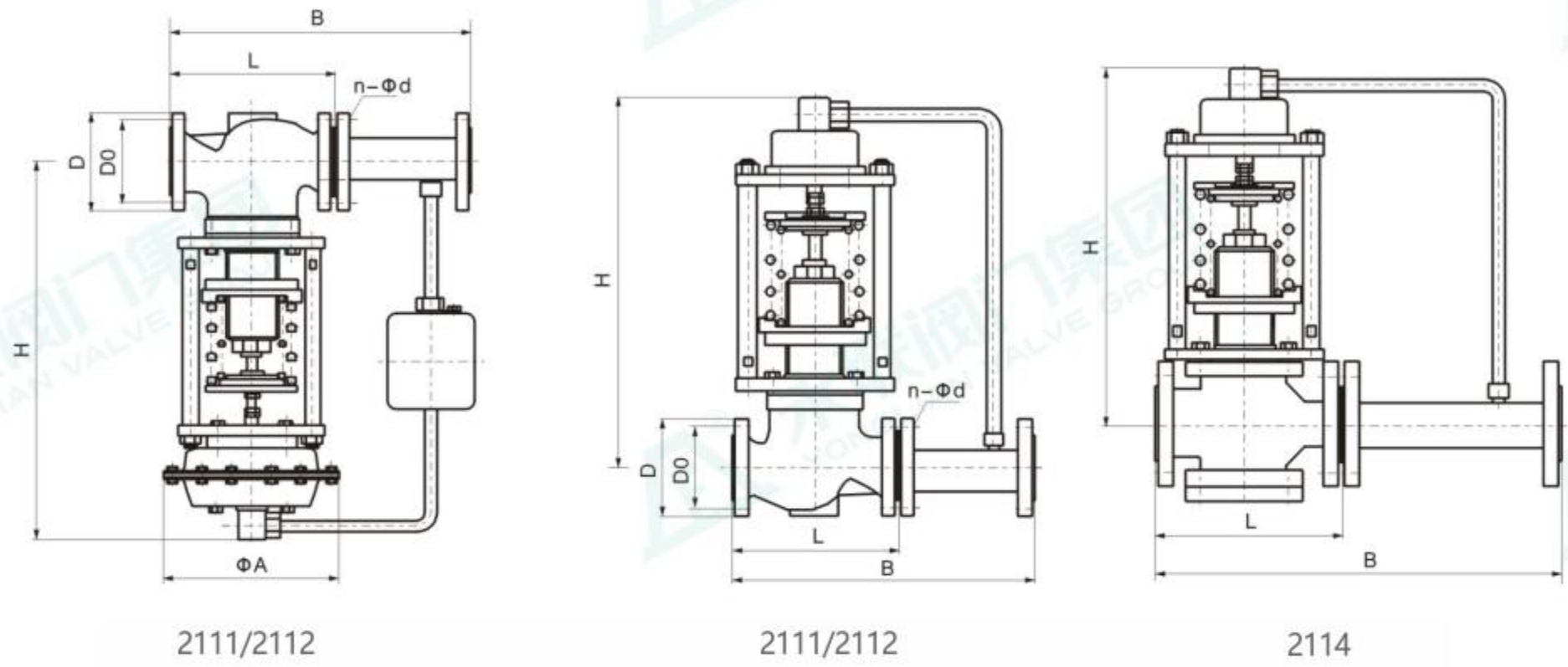
公称通径 Nominal diameter DN	20	25	32	40	50	65	80	100	125	150	200	250	300							
接管长度 (B) Connecting pipe length (B)	383		512		603	862		1023	1380		1800	2000	2200							
法兰面距L (PN16、25、40) Flange face distance L	150	160	180	200	230	290	310	350	400	480	600	730	850							
法兰面距L (PN64) Flange face distance L	230		260		300	340	380	430	500	550	650	775	900							
压力调节范围 Kpa Pressure adjustment range	15~140	H	475		520		540		710		780		840		880		940		950	
		A	280		308		308		308		308		308		308		308		308	
	120~300	H	455		500		520		690		760		800		870		900		950	
		A	230		230		230		230		230		230		230		230		230	
280~500	H	450		490		510		590		750		790		860		890		940		
	A	176		176		176		194		280		280		280		280		280		
480~1000	H	445		480		670		740		780		780		850		880		930		
	A	176		176		194		194		280		280		280		280		280		
重量 (Kg) 以PN16为例 Weight (kg) Taking PN16 as an example	26		37		42	72		90	112		130	169	285	495	675					

### 主要技术参数及性能指标 Main technical parameters and performance indicators

公称通径 Nominal Diameter DN(mm)	20	25	32	40	50	65	80	100	125	150	200	250	300
额定流量系数KV Rated flow coefficient KV	5	8	12.5	20	32	50	80	125	160	320	450	630	900
额定行程 (mm) Rated travel	8		10		12	15	18	20	30	40	45	60	65
公称通径 Nominal Diameter DN(mm)	20(或G3/4)												
阀座直径 Valve seat diameter	2	3	4	5	6	7	8	9	10	12	15	20	
额定流量系数KV Rated flow coefficient KV	0.02	0.08	0.12	0.20	0.32	0.5	0.80	1.20	1.80	2.80	4.0	5	
公称压力 Nominal pressure PN	Mpa: 1.6,2.5,4.0,6.4(6.3)/2.0,5.0,11.0 Bar: 16,25,40,64(63)20,50,100 Lb: ANSI:Class150、Class300、Class600												
压力分段范围 Kpa Pressure segmentation range	15~50、40~80、60~100、80~140、120~180、160~220 200~260、240~300、280~350、330~400、380~450、430~500 480~560、540~620、600~700、680~800、780~900、880~1000 900~1200、1000~1500、1200~1600、1300~1800、1500~2100 (其它范围特殊设计) Special designs for other ranges												
流量特性 Flow characteristics	快开 Quick open												
调节精度 Adjusting accuracy	±5-10 (%)												
使用温度 Operating temperature	-60~350(°C) (低于-60特殊设计) 350~550(°C) Special design below -60												
允许泄露量 Permissible leakage amount	IV级 (硬密封) VI级 (软密封) (GB/T4213-92) Level IV (hard sealed) Grade VI (Soft Seal)												
减压比 (阀前压力/阀后压力) Pressure reduction ratio (pre valve pressure/post valve pressure)	1.25~10(超过此范围特殊设计) 1.25~10 (special design beyond this range)												

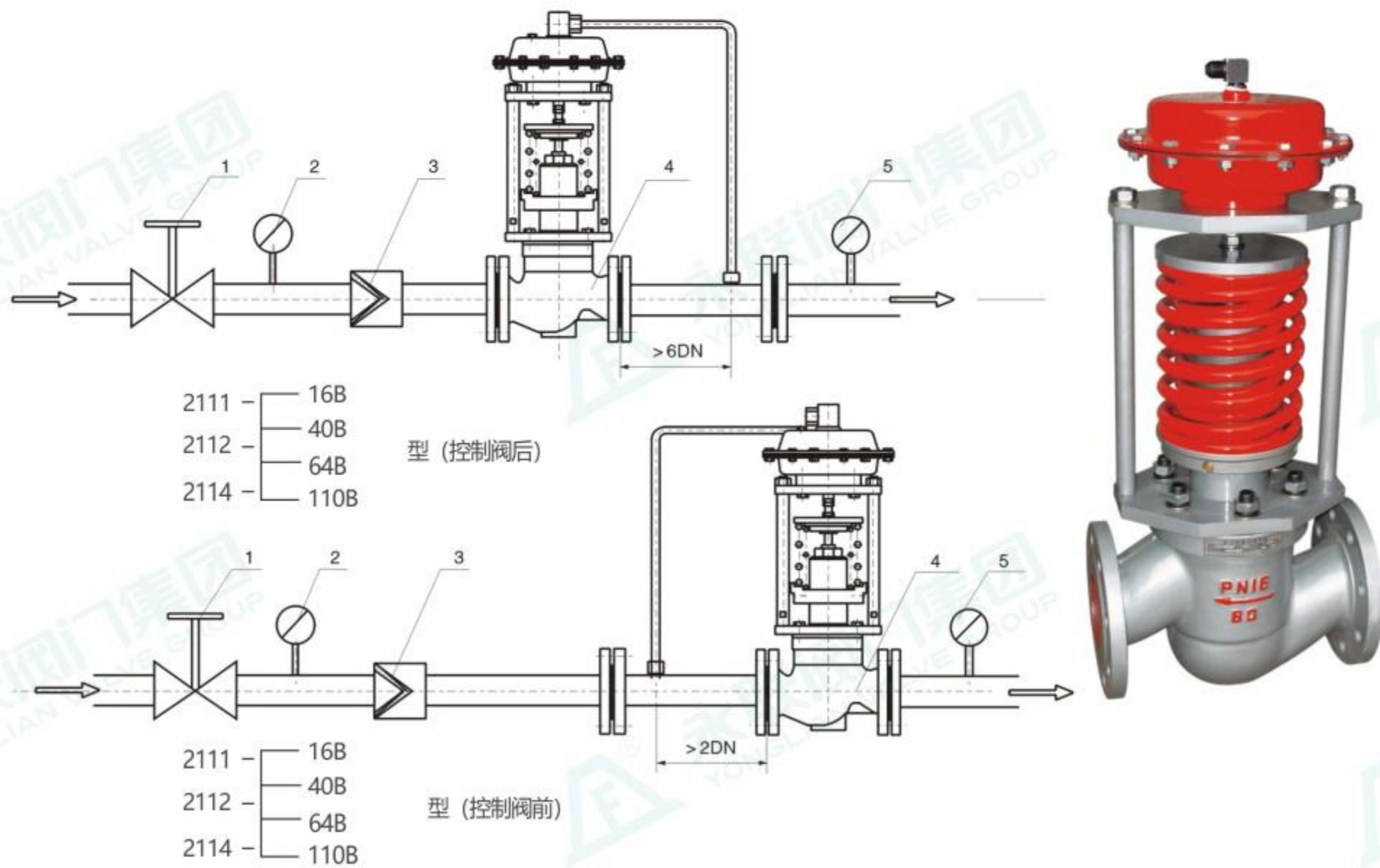
**H** 自力式压力调节阀 211型  
Self operated pressure regulating valve Type 211

调节阀系列  
Regulating Valve Series



**安装方式 Installation method**

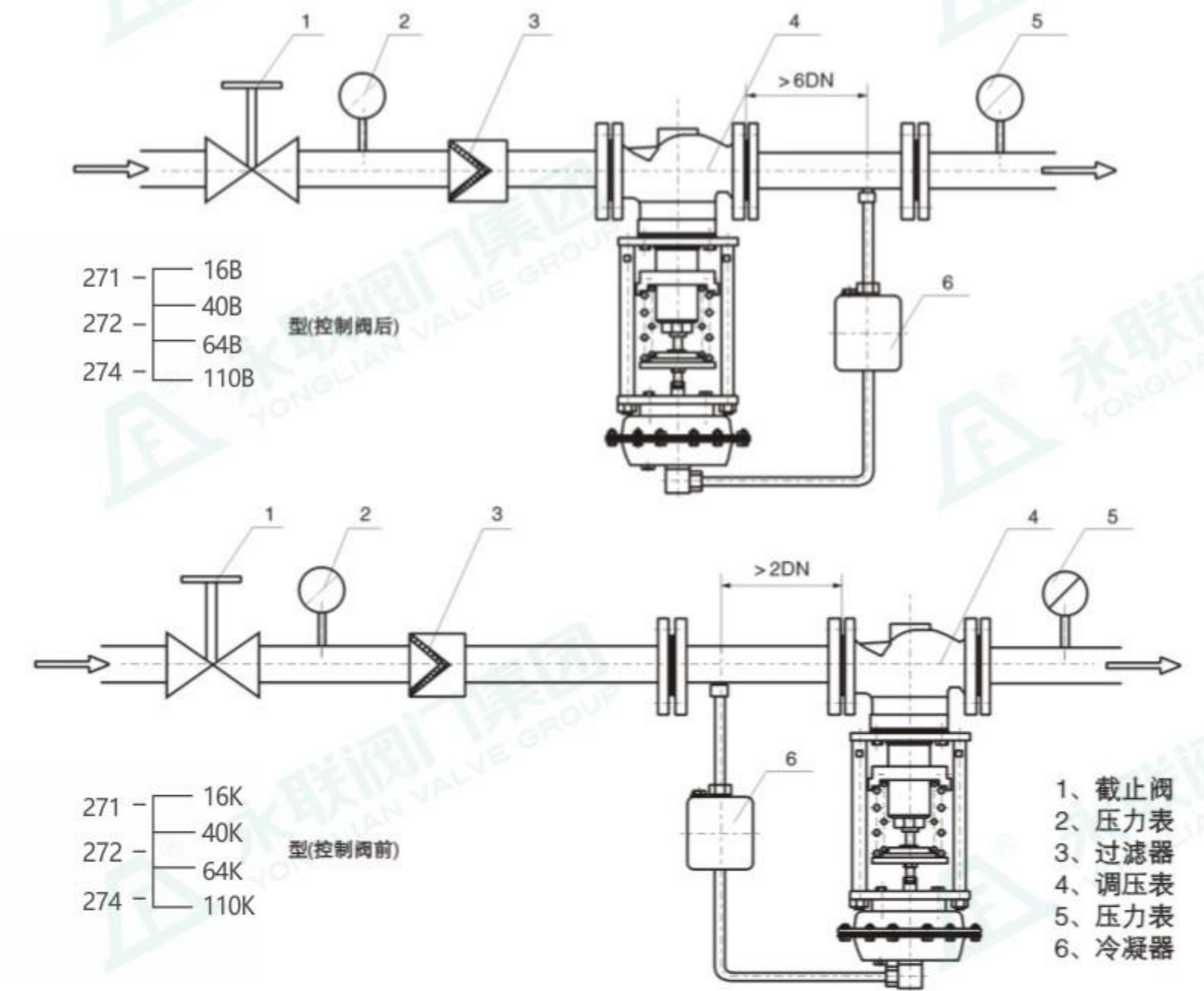
1. 阀在气体或低粘度介质中使用时，通常211型自力式压力调节阀为直立安装在水品质管上，当位置空间不允许时才倒置或斜装。  
(When it is determined that the medium is very clean, component 3 may not be installed)
  2. 阀在蒸汽或高粘度液体介质中使用时，通常211型自力式压力调节阀为倒立安装在水平管上
1. When the valve is used in gas or low viscosity medium, the 211 type self operated pressure regulating valve is usually installed vertically on the water quality pipe. It is only inverted or inclined when the position space is not allowed.
  2. When valves are used in steam or high viscosity liquid media, the Type 211 self operated pressure regulating valve is usually installed upside down on a horizontal pipe



1、截止阀 2、压力表 3、过滤器 4、调压阀 5、压力表  
1. Globe valve 2, Pressure gauge 3, Filter 4, Pressure regulating valve 5, Pressure gauge

**H** 自力式压力调节阀 211型  
Self operated pressure regulating valve Type 211

调节阀系列  
Regulating Valve Series



1、截止阀  
2、压力表  
3、过滤器  
4、调压表  
5、压力表  
6、冷凝器

**订货须知 Ordering Instructions**

阀门型号 Valve model	阀门名称 Valve name
公称直径 (mm) Nominal diameter (mm)	公称压力 (MPa) Nominal pressure (MPa)
压力调节范围 (MPa) Pressure regulation range (MPa)	控制阀前还是阀后 Before or after the control valve
压力设定值 (MPa) Pressure setting value (MPa)	介质名称 Media Name
执行结构型式 Execution structure type	介质工作温度 Medium operating temperature
额定流量系数 Rated flow coefficient	
阀前最大压力 Maximum pressure in front of the valve	阀前最大压力 Maximum pressure in front of the valve
阀前最小压力 Minimum pressure before valve	阀前最小压力 Minimum pressure before valve
阀前正常压力 Normal pressure in front of the valve	阀前正常压力 Normal pressure in front of the valve
最大流量 Maximum flow rate	液体粘度 Liquid viscosity
最小流量 Minimum flow rate	液体密度 Liquid density
正常流量 Normal flow rate	气体密度 Gas density
材质: 阀体 Material: Valve body	泄漏量等级要求 (GB/T4213-92) Leakage level requirements
工艺管道尺寸 Process pipeline size	耐蚀要求 Corrosion resistance requirements
法兰面距 (mm)L Flange face distance (mm) L	法兰执行标准 Flange execution standard
所带附件 Accessories provided	冷凝器、接管、配法兰、紧固件、调压棒、取压管、取压接头 Condenser, connecting pipe, flange, fastener, pressure regulating rod, pressure tapping pipe, pressure tapping joint

注: 带“√”的必须填!  
Note: Those with "√" must be filled in!

## 自力式减压阀组 212型

Self operated pressure reducing valve group Type 212

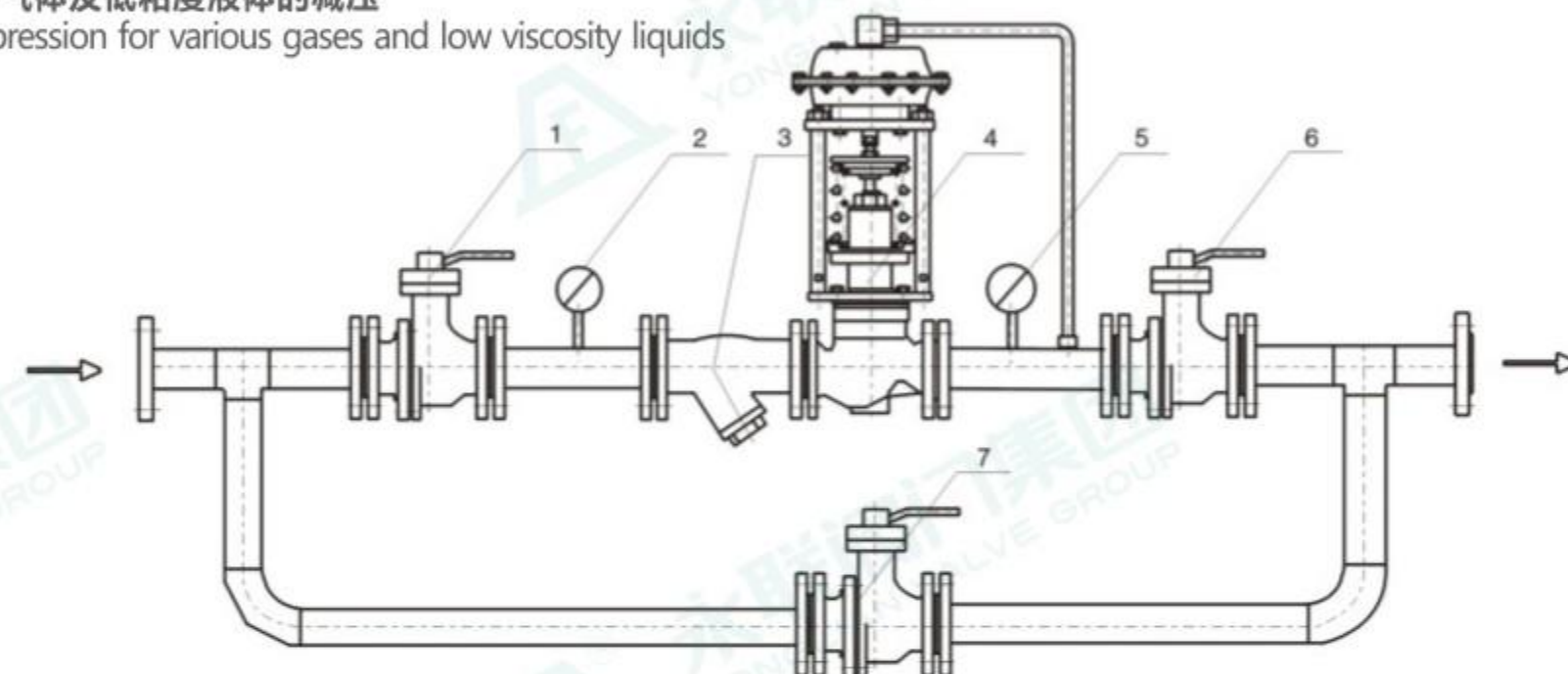
27型自力式压力调节阀不是孤零安装在管道上,而是配合其他阀门或管道联和安装在系统中,通常有单座减压阀和双路减压两种,用户可以根据需要订购

The Type 27 self operated pressure regulating valve is not installed alone on the pipeline, but in conjunction with other valves or pipelines and installed in the system. There are usually two types of pressure reducing valves: single seat pressure reducing valve and double way pressure reducing valve. Users can order according to their needs

### 27D型

#### 一、单路减压用于各种气体及低粘度液体的减压

1、Single path decompression for various gases and low viscosity liquids

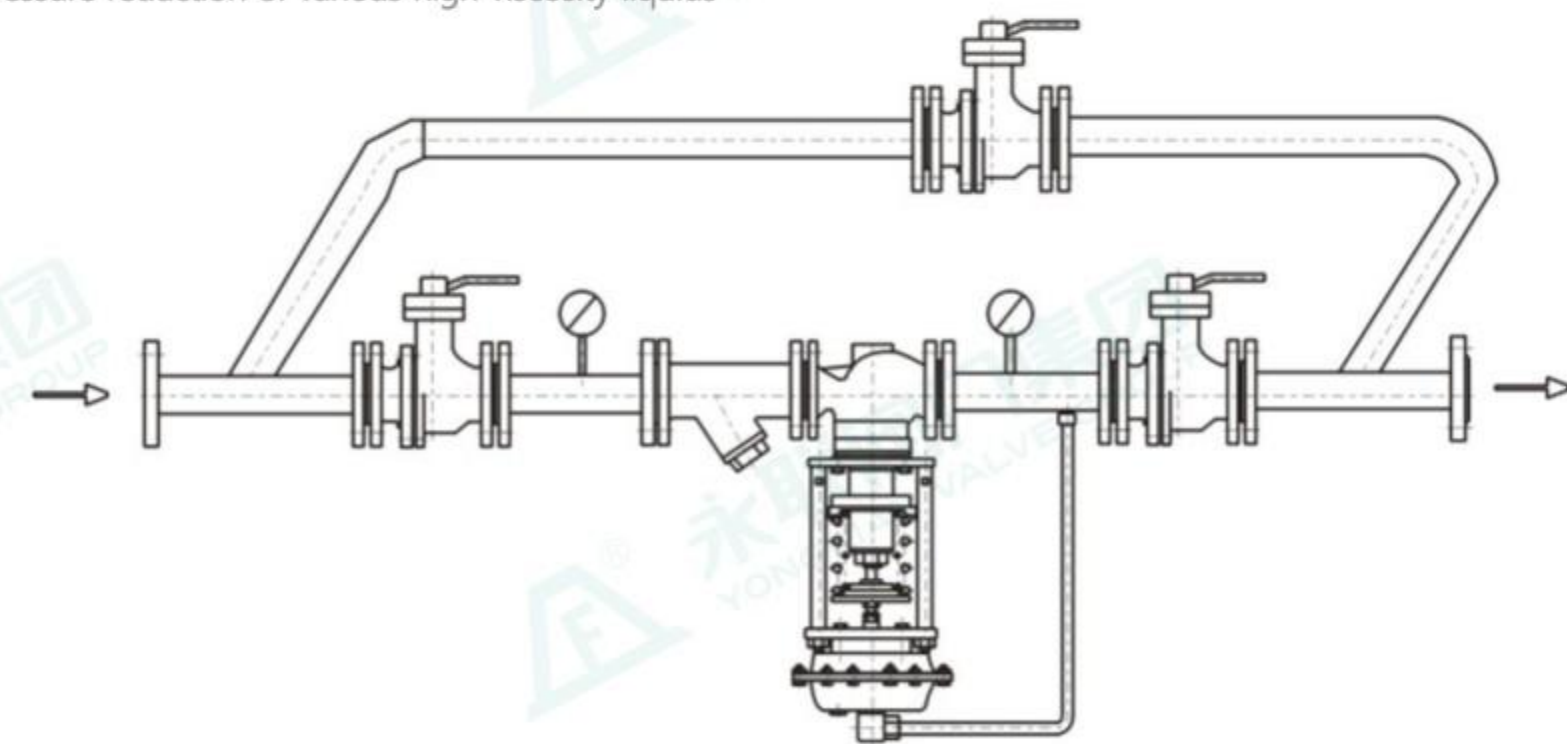


- 1、阀前手动球阀
- 2、阀前压力表
- 3、过滤器 (介质确认无颗粒可省略)
- 4、自动式减压阀
- 5、阀前压力表
- 6、阀后手动球阀
- 7、旁通球阀

备注: 1、根据需要, 阀组后还可以安装、安全阀 (是否允许而定)  
2、旁通关可根据现场空间布置在于自力式阀同一水平面上或同一垂直面上。

#### 二、用于各种高粘度液体的介质减压

2、Used for medium pressure reduction of various high viscosity liquids

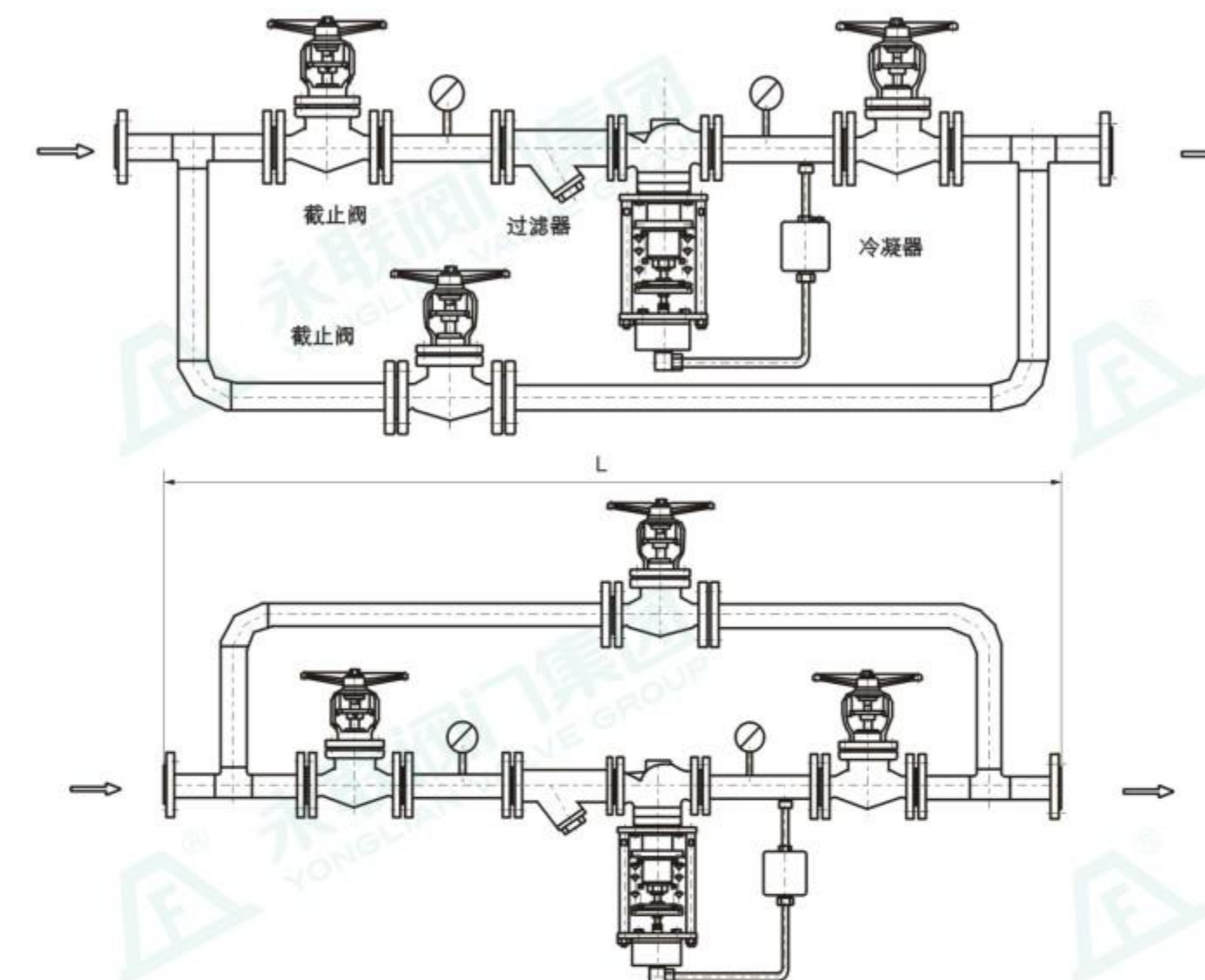


相对于气体减压而言, 只是自力式倒装而已  
Compared to gas decompression, it's just a self operated flip flop

## 自力式减压阀组 212型

Self operated pressure reducing valve group Type 212

用于蒸汽减压的自力式  
Self operated type for steam pressure reduction



冷凝水使用前请灌满冷水  
Please fill the condensate with cold water before use

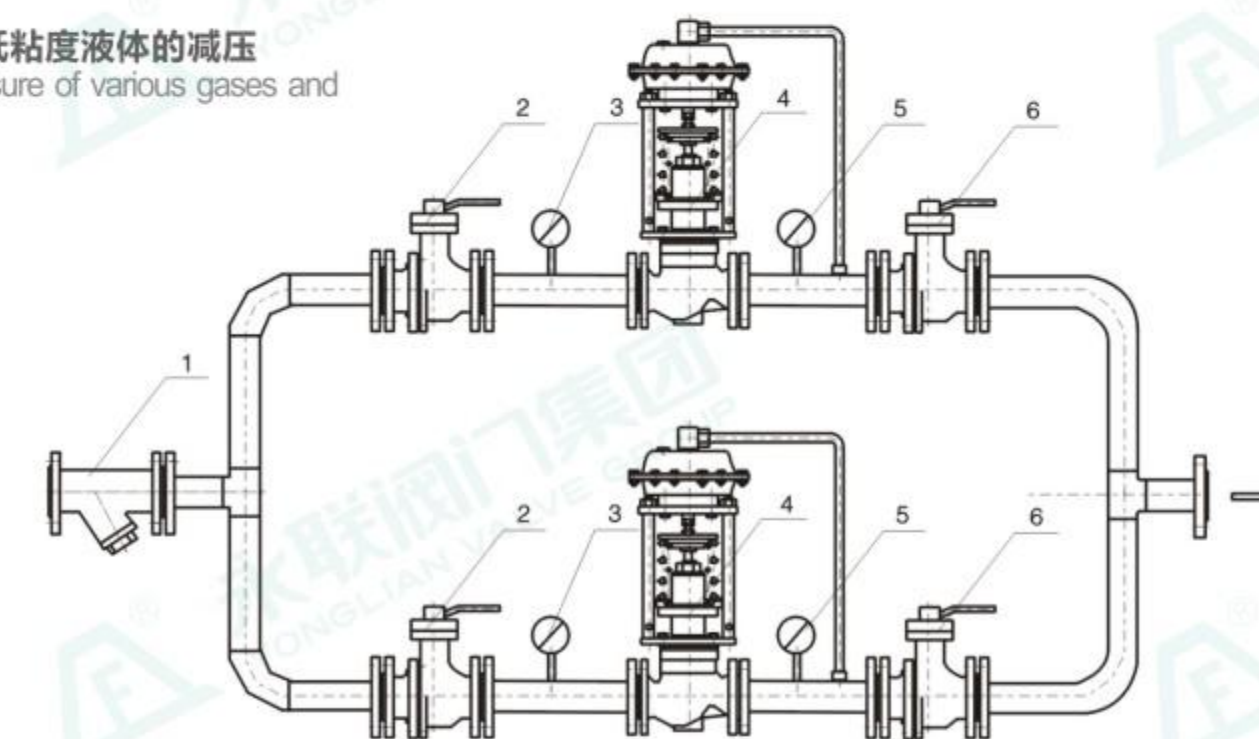
### 27S型

双路减压只用在工况特别重要, 系统不允许出故障的系统中, 平常一路工作, 一路关闭备用, 只要流量足够, 不需要同时开启两路减压, 以免出现阀开度过小产生的震荡和噪声, 影响阀使用寿命。

Dual pressure relief is only used in systems where the working condition is particularly important and the system does not allow malfunctions. Normally, one circuit works and the other circuit is closed for backup. As long as the flow rate is sufficient, it is not necessary to simultaneously open both circuits of pressure relief to avoid vibration and noise caused by excessively small valve opening, which may affect the service life of the valve.

#### 一、用于各种气体及低粘度液体的减压

1、Used for reducing pressure of various gases and low viscosity liquids



- 1、过滤器 2、手动球阀 3、压力表 4、自力式压力调节阀 5、压力表 6、手动球阀安装时件1前用户自配手动球阀

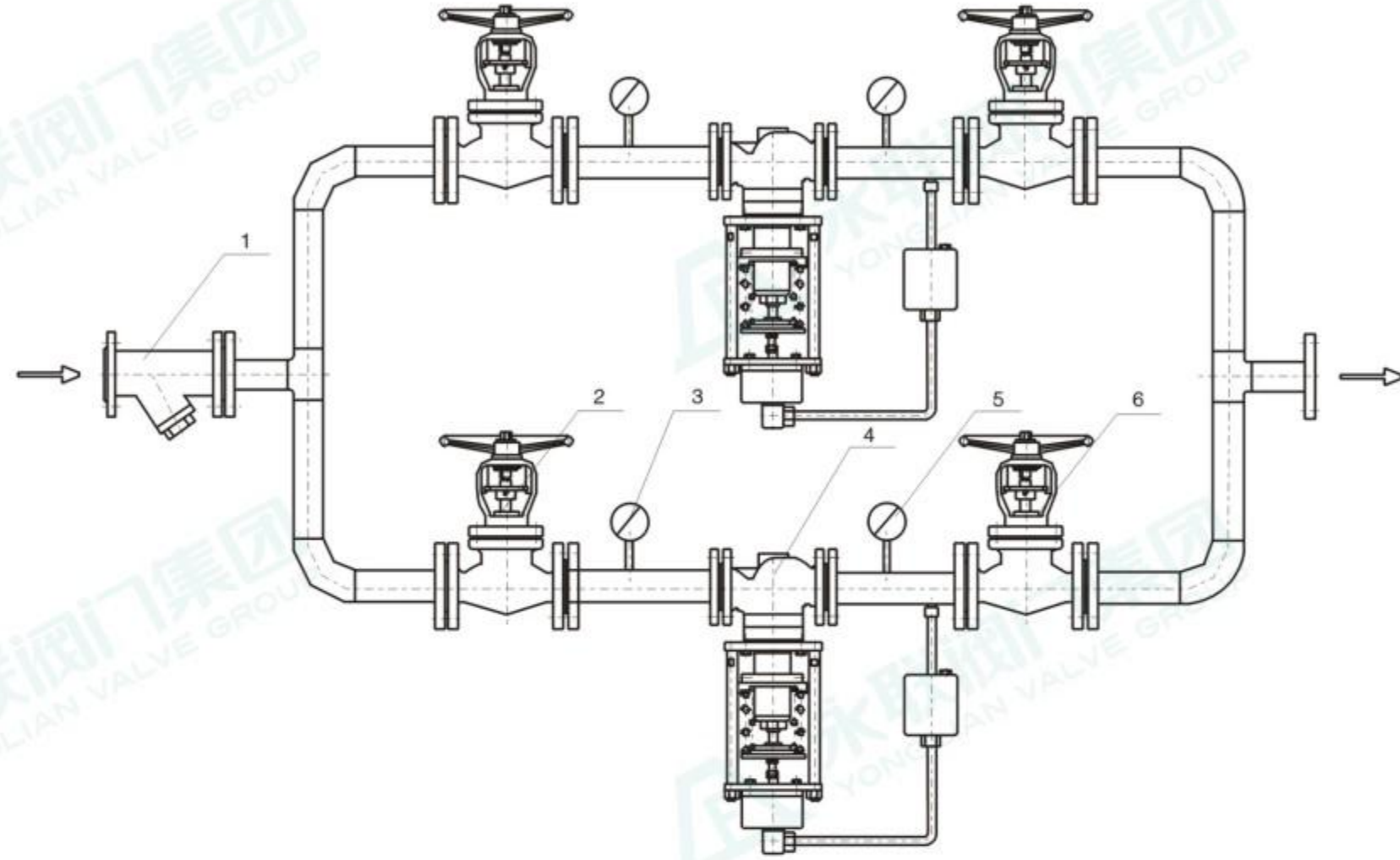
1, user provided manual ball valve before installation

## 自力式减压阀组 212型

Self operated pressure reducing valve group Type 212

- 二、同于各种高粘度液体介质的减压同气体减压，只是自力式阀门倒装便可  
三、用于蒸汽减压的自力式双路阀座

2. Similar to the pressure reduction of various high viscosity liquid media and gas, it is only possible to flip the self operated valve upside down  
3. Self operated dual valve seat for steam pressure reduction



安装时件1前用户自配手动截止阀  
User equipped manual globe valve before installation of component 1

### 设计、安装减压阀组注意事项

Precautions for designing and installing pressure reducing valve groups

安装时，应注意以下几点：

- (1) 阀在气体或低粘度液体介质中使用，通常3001型自力式压力调节阀为直立式安装在水品质管上，当位置空间不允许时才倒装或斜装。
- (2) 阀在蒸汽或高粘度液体介质中使用，通常3001型自力式压力调节阀为倒立安装在水平管上，冷凝器（蒸汽用自力式）应高于调压阀的执行机构而低于阀前后接管。使用前冷凝器应灌满冷水，以后约3个月灌水一次。
- (3) 取压点应取在调压阀适当位置，阀前调压应大于2倍管道直径，阀后调压应大于6倍管道直径。
- (4) 为便于现场维修及操作，调压阀四周留有适当空间。
- (5) 当介质为洁净气体或液体时，阀前过滤器可不安装。
- (6) 调压阀通径过大（DN≥100时），应有固定支架。
- (7) 当确定介质很洁净时，件3可不安装。
- (8) 位置实在不允许时，旁通阀（手动）可以省略（我们不推荐）。
- (9) 阀组根据需要用户可自选配止回阀，安全阀等。
- (10) 自力式阀根据计算通径可以小于管道直径，而截止阀、切断球阀、旁通阀、过滤器则不能小于管道直径。

When installing, the following points should be noted:

- (1) When the valve is used in gas or low viscosity liquid media, the 3001 self operated pressure regulating valve is usually installed vertically on the water quality pipe. It is only installed upside down or diagonally when the position space does not allow.
- (2) When valves are used in steam or high viscosity liquid media, the Type 3001 self operated pressure regulating valve is usually installed upside down on a horizontal pipe, and the condenser (self operated for steam) should be higher than the actuator of the pressure regulating valve. Connect the mechanism below the front and rear of the valve. The condenser should be filled with cold water before use, and then filled with water approximately once every 3 months.
- (3) The pressure tapping point shall be taken at the appropriate position of the pressure regulating valve. The top note valve shall be greater than 2 times the pipe diameter, and the base note valve shall be greater than 6 times the pipe diameter.
- (4) To facilitate on-site maintenance and operation, appropriate space should be left around the pressure regulating valve.
- (5) When the medium is clean gas or liquid, the filter in front of the valve may not be installed.
- (6) If the diameter of the pressure regulating valve is too large (DN ≥ 100), there should be a fixed bracket.
- (7) When it is determined that the medium is very clean, component 3 may not be installed.
- (8) When the position is really not allowed, the bypass valve (manual) can be omitted (we do not recommend it).
- (9) The valve group can be equipped with check valves, safety valves, etc. according to user needs.
- (10) Self operated valves can have a diameter smaller than the pipeline diameter according to calculations, while globe valves, shut-off ball valves, bypass valves, and filters cannot have a diameter smaller than the pipeline diameter.

## 自力式减压阀组 212型

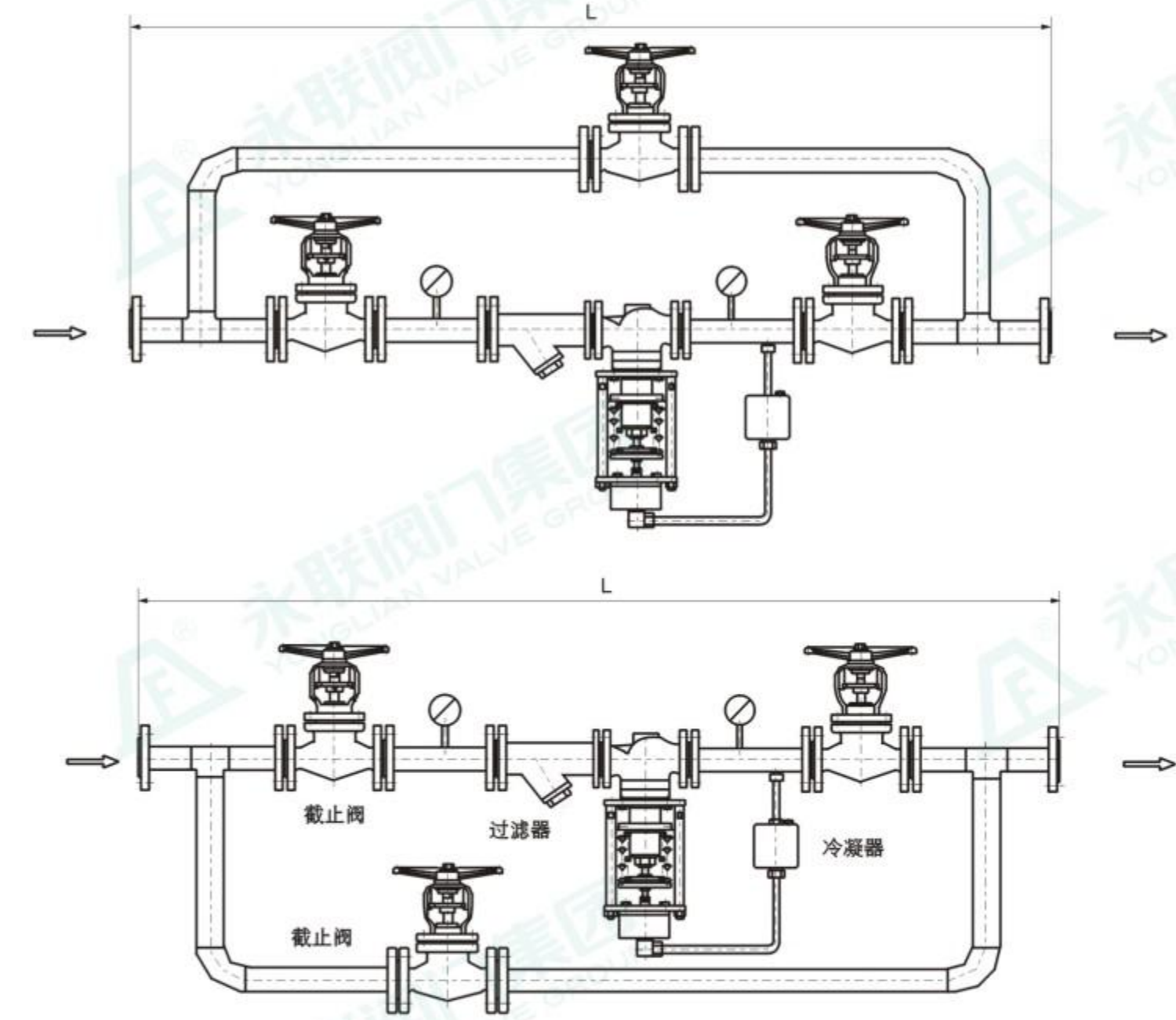
Self operated pressure reducing valve group Type 212

### 外形尺寸

Self operated type for steam pressure reduction

减压阀组关键是总长L的确定，至于自力式阀门的尺寸件2111和2114篇，以控制蒸汽为例，控制其它介质总长类同，当然，尺寸L用户也可根据需要定

The key to determining the total length L of the pressure reducing valve group is the determination of the total length L. As for the size components 2111 and 2114 of the self operated valve, taking steam control as an example, controlling the total length of other media is similar. Of course, the size L can also be determined by users according to their needs



DN	L	
	PN16/25/20/40	PN50/60/100/110
20/H/4"	1433	1673
25	1463	1673
32	1652	1812
40	1862	2042
50	2043	2253
65	2582	2732
80	2642	2852
100	3073	3313
125	3580	3880
150	3970	4180
200	4750	4900
250	5640	5775
300	6450	6600

## 指挥器操作式自力式压力调节阀214型

Pilot operated self-operated pressure regulating valve type 214

214型带指挥器操作式自力式压力调节阀(简称压力阀)无需外加能源,利用被调介质自身能量为动力源,引入压力阀的指挥器以控制压力阀的阀芯位置,改变流经阀门的介质流量,使阀门后端压力(B型)或前端压力(K)型保持恒定,214型主要用在阀前压力较高(0.2-0.8MPa)而阀后力很低(0.5-100KPa),例如50mmH<sub>2</sub>O(水柱)的场合,214型只用在泄氮装置上,并且与供氮装置配套使用。单独使用时请用ZZVP阀代替。

- 1. 气压减压**  
如阀前0.2-0.8MPa(高于0.8MPa阀前面应加减压阀), 阀后0.5~100KPa
- 2. 氮封装置**  
供氮和泄氮装置上

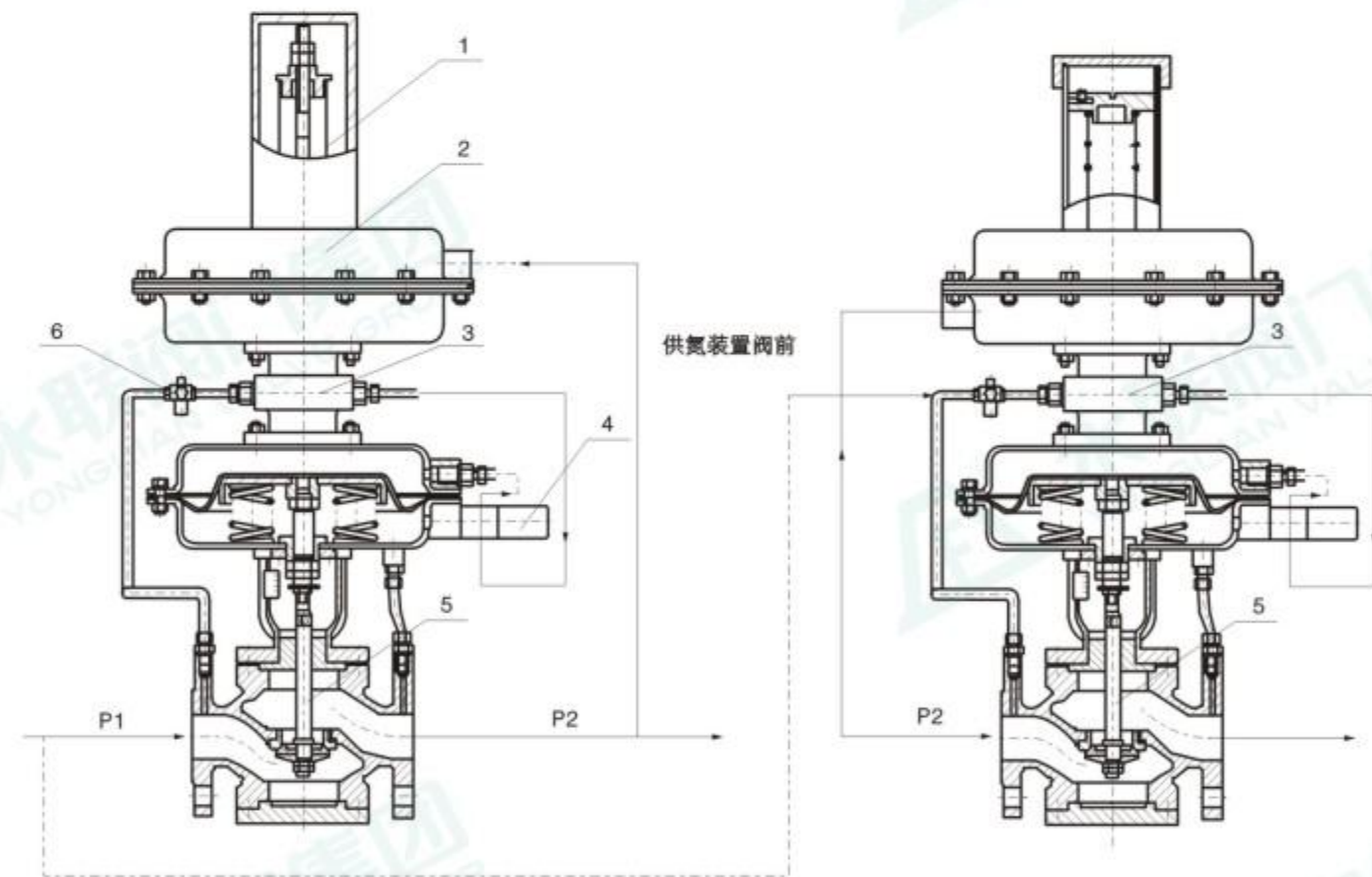
The 214 type self operated pressure regulating valve with a controller (referred to as the pressure valve) does not require external energy and uses the energy of the regulated medium as the power source. The controller of the pressure valve is introduced to control the position of the valve core, change the flow rate of the medium flowing through the valve, and keep the rear pressure (B type) or front pressure (K) of the valve constant. The 214 type is mainly used for high front pressure (0.2-0.8MPa) and low rear pressure (0.5-100KPa). For example, in the case of 50mmH<sub>2</sub>O (water column), the 214 model is only used on the nitrogen relief device and is used in conjunction with the nitrogen supply device. Please use ZZVP valve instead when used alone.

1. Atmospheric pressure reduction  
If the front of the valve is 0.2-0.8MPa (above 0.8MPa, a pressure reducing valve should be added in front of the valve), and the back of the valve is 0.5-100KPa
2. Nitrogen sealing device  
On nitrogen supply and discharge devices

### 特点 Feature

1. 压力设定在指挥器上实现,因而方便、便捷、省力省时且可在运行状态下连续设定。
2. 控制精度比211型自力式高1倍左右,故适合在控制精度高的场合使用。
3. 对同一台阀而言,调节范围比211型自力式广。
4. 反应特别灵敏,极小的压力(如50mm水柱的压力)或极小的压力变化都可以感染出来。
5. 减压比特别大,例如阀前0.8MPa, 阀后50mmH<sub>2</sub>O, 压差比达1600。

1. The pressure setting is achieved on the controller, making it convenient, convenient, labor-saving, and time-saving, and can be continuously set during operation.
2. The control accuracy is about twice that of the 211 type self operated type, making it suitable for use in situations with high control accuracy.
3. For the same valve, the adjustment range is wider than the 211 self operated type.
4. The reaction is particularly sensitive, and even extremely small pressures (such as a pressure of 50mm water column) or small pressure changes can be infected.
5. The pressure reduction ratio is particularly large, such as 0.8MPa in front of the valve and 50mmH<sub>2</sub>O behind the valve, with a pressure difference ratio of 1600.



控制阀后 (214-16B)  
(供氮装置)  
Behind control valve (214-16B)  
(Nitrogen supply device)

控制阀前 (214-16K)  
(泄氮装置)  
Control valve front (214-16K)  
(Nitrogen relief device)



1. 压力设定弹簧 2. 指挥器执行机构 3. 指挥阀 4. 针阀 5. 主阀 6. 空气过滤减压器
1. Pressure setting spring 2. Command actuator 3. Command valve 4. Needle valve 5. Main valve 6. Air filter pressure reducer
- 其中214-16B型阀可以用1台2111自力式阀+1台212型微压阀代替。  
其中214-16K型阀可以用1台212型微压阀代替。

The 214-16B valve can be replaced by one 2111 self operated valve and one 212 micro pressure valve.  
The 214-16K type valve can be replaced by one 212 type micro pressure valve.

## 指挥器操作式自力式压力调节阀214型

Pilot operated self-operated pressure regulating valve type 214

### 连接尺寸及标准

法兰标准: GB/T9124.1-2019;  
法兰密封面型式:凸面;  
信号接口: 内螺纹M16×1.5;  
阀体法兰及法兰端面距离可以按用户指定的标准制造,如ANSI、JIS、JPI等标准

### Connection dimensions and standards

Flange standard: GB/T9124.1-2019;  
Flange sealing surface type: convex surface;  
Signal interface: internal thread M16 × 1.5;  
The distance between the valve body flange and the flange end face can be manufactured according to user specified standards, such as ANSI, JIS, JPI, etc

### 型号编制说明

- 2:自力式产品系列
- 1:薄膜执行机构
- 4:指挥器操作型

### Model preparation instructions

- 2: Self operated product series
- 1: Thin film actuator
- 4: Command operation type

### 订货须知

订货时请用户提供以下资料:  
调压阀名称、型号  
公称通径(mm)  
公称压力(MPa)  
额定流量系数(Kv)  
固有流量特性  
介质名称  
工作压力及范围  
阀体、阀内件及填料材质 其它特殊要求

### Ordering Instructions

Please provide the following information when placing an order:  
Name and model of pressure regulating valve  
Nominal diameter (mm)  
Nominal pressure (Mpa)  
Rated flow coefficient (Kv)  
Inherent flow characteristics  
Media Name  
Working pressure and range  
Other special requirements for valve body, trim, and packing materials

### 主要零件材料 Material for main parts

零件名称 Part Name	材料 Material
阀体 Valve body	ZG230-450、ZG0Cr18Ni9、ZG0Cr18Ni12Mo2
阀芯 Spool	1Cr18Ni9、0Cr18Ni12Mo2(堆焊Stellite) PTFE
阀座 Valve seat	1Cr018Ni9、0Cr18Ni12Mo2(堆焊Stellite)
阀杆 Valve stem	1Cr18Ni9、0Cr18Ni12Mo2
橡胶膜片 Rubber diaphragm	丁腈橡胶夹增强涤纶织物 Nitrile rubber clip adds strong polyester fabric
膜盖 Membrane cover	Q235、Q235涂PTFE
O形圈 O-ring	耐油橡胶、聚四氟乙烯 Oil resistant rubber, polytetrafluoroethylene

### 主要技术参数和性能指标 Main technical parameters and performance indicators

公称通径DN(mm) Nominal diameter DN (mm)	20	25	32	40	50	65	80	100	125	150		
阀座直径D(mm) Valve seat diameter D (mm)	6	15	20	25	32	40	50	65	80	100	125	150
额定流量系数Kv Rated flow coefficient Kv	0.32	4	5	8	12.5	20	32	50	80	125	160	320
压力调节范围KPa Pressure regulation range KPa	0.5-100范围内选取 Select within the scope											
公称压力PN(MPa) Nominal pressure PN (MPa)	1.0 1.6											
被调介质温度(°C) Temperature of the adjusted medium (°C)	-40~80											
流量特性 Flow characteristics	快开 Quick open											
调节误差(%) Adjustment error (%)	≤5											
允许压降(MPa) Allowable pressure drop (MPa)	1.6			1.6		1.1		0.4		0.6		
执行机构薄膜有效面积(cm <sup>2</sup> ) Effective area of actuator film (cm <sup>2</sup> )	200			280				400				
允许泄漏量 Permissible leakage	硬阀芯Hard valve core: IV级(10 <sup>-4</sup> xKv) 软阀芯Soft valve core: VI级(GB/T4213-2008)											

## 指挥器操作式自力式压力调节阀214型

Pilot operated self-operated pressure regulating valve type 214

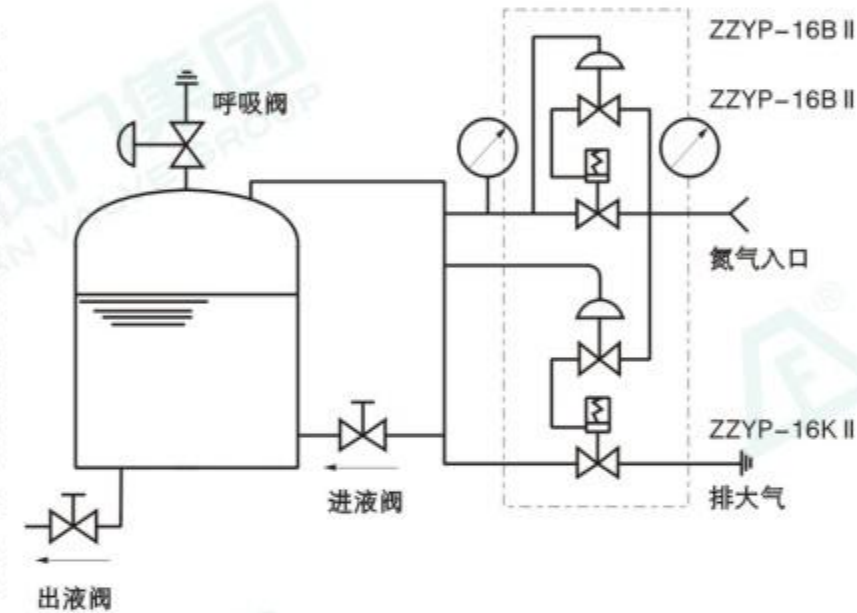
### 应用举例 Application examples

- 代替212型微压阀  
212型微压阀阀前一般要求介质压力 $\leq 0.1\text{MPa}$ ，而214B型带指挥器操作式自力式压力调节阀则不受此限制。
- 用于氮封装置

氮封装置的出罐内成品油上端覆盖氮气，其压力一般在 $100\text{mmH}_2$ 左右，通过氮封保护装置加以控制。出液阀开启放油时，出罐内液位下降，此时，214B型供氮调节阀开度增加，向出罐内补充氮气使压力增加到设定值为止。进液阀开启进油时，液位上升，气相部分容积减小，氮气压力上升，此时214B型供氮调节阀关闭，而214B型泄漏调节阀在压力控制器作用下开启，排出氮气使压力降至设定值。为确保储罐安全，应在罐顶设置呼吸阀。供氮压力调整：在214B型压力调节阀选定-设定值如 $1\text{KPa}$  ( $100\text{mm.W.C}$ )，通过调整主弹簧2的预压缩(拉伸)量来达到；泄氮压力调整：在214K型泄放阀中的压力控制器部分，通过调整主弹簧预压缩量达到，一般为避免氮封装置启闭频繁，泄氮设定值应远离供氮压力设定值，如 $2\text{KPa}$  ( $200\text{mm.W.C}$ )。呼吸阀设定值调整：在上述两设定值调整后，为避免呼吸阀启闭频繁，呼吸阀设定值应大于泄压设定值。两者设定值亦不能靠得太近。呼吸阀型号为：216型。214B型压力设定值为 $P_c$ ，214K型压力设定值为 $P_1$ ， $P_c$ 与 $P_1$ 两值不能靠得太近，以免阀门工作太频繁，呼吸阀的排放压力 $P_2$ 的设定值应大于 $P_1$ ， $P_2$ 与 $F_1$ 两值也不能靠得太近，三者关系 $P_c < P_1 < P_2$ 。

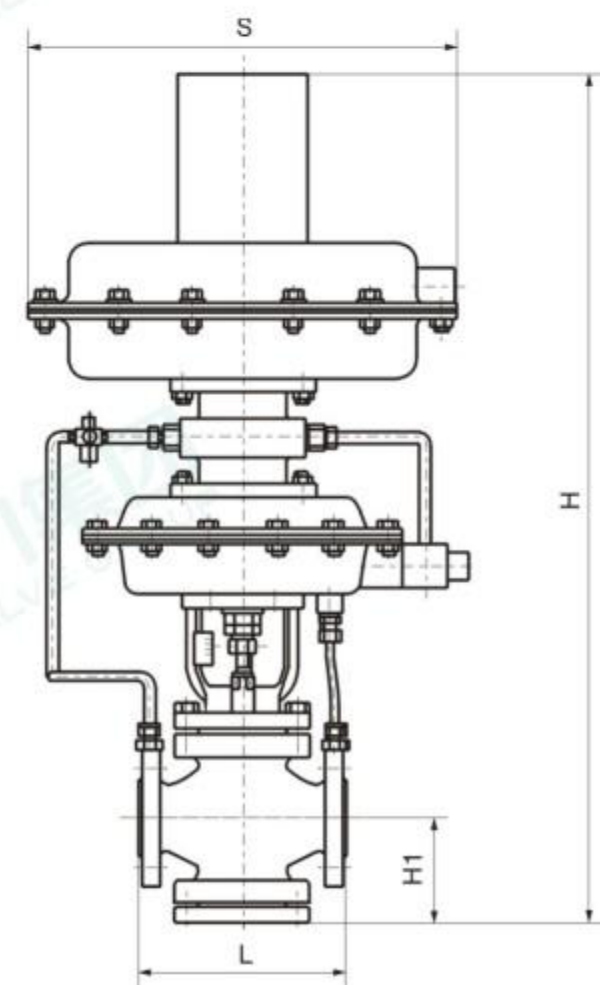
1. Replacing the 212 type micro pressure valve  
The 212 type micro pressure valve generally requires a medium pressure of  $\leq 0.1\text{MPa}$  in front of the valve, while the 214B type self operated pressure regulating valve with a command is not subject to this restriction.

2. For nitrogen sealing device  
The upper end of the finished oil in the nitrogen sealing device is covered with nitrogen gas, and its pressure is generally around  $100\text{mmH}_2$ , which is controlled by the nitrogen sealing protection device. When the outlet valve is opened to drain oil, the liquid level in the outlet tank decreases. At this time, the opening of the 214B nitrogen supply regulating valve increases, and nitrogen is added to the outlet tank to increase the pressure to the set value. When the oil inlet valve is opened, the liquid level increases, the volume of the gas phase decreases, and the nitrogen pressure increases. At this time, the 214B nitrogen supply regulating valve is closed, while the 214B leakage regulating valve is opened under the action of a pressure controller, and nitrogen is discharged to reduce the pressure to the set value. To ensure the safety of the storage tank, a breathing valve should be installed on the top of the tank. Nitrogen supply pressure adjustment: When selecting the 214B pressure regulating valve with a set value of  $1\text{KPa}$  ( $100\text{mm.W.C}$ ), adjust the pre-compression (stretching) amount of the main spring 2 to achieve this; Nitrogen relief pressure adjustment: In the pressure controller part of the 214K relief valve, the main spring pre-compression shrinkage is adjusted to achieve. Generally, to avoid frequent opening and closing of the nitrogen sealing device, the nitrogen relief setting value should be far away from the nitrogen supply pressure setting value, such as  $2\text{KPa}$  ( $200\text{mm.W.C}$ ). Adjustment of the setting value of the breathing valve: After adjusting the above two settings, in order to avoid frequent opening and closing of the breathing valve, the setting value of the breathing valve should be greater than the pressure relief setting value. The two settings should not be too close together. The breathing valve model is: 216 type. The pressure setting value for the 214B type is  $P_c$ , and the pressure setting value for the 214K type is  $P_1$ . The values of  $P_c$  and  $P_1$  should not be too close together to prevent the valve from working too frequently. The setting value for the discharge pressure  $P_2$  of the breathing valve should be greater than  $P_1$ , and the values of  $P_2$  and  $F_1$  should not be too close together. The relationship between the three values is  $P_c < P_1 < P_2$ .



### 外形尺寸与重量 Overall dimensions and weight

DN	L	S	H1	H
20	150	308	390	715
25	160	308	390	715
32	180	308	390	735
40	200	394	435	755
50	230	394	435	755
65	290	394	435	795
80	310	394	435	795
100	350	394	435	825
150	480	498	565	1105



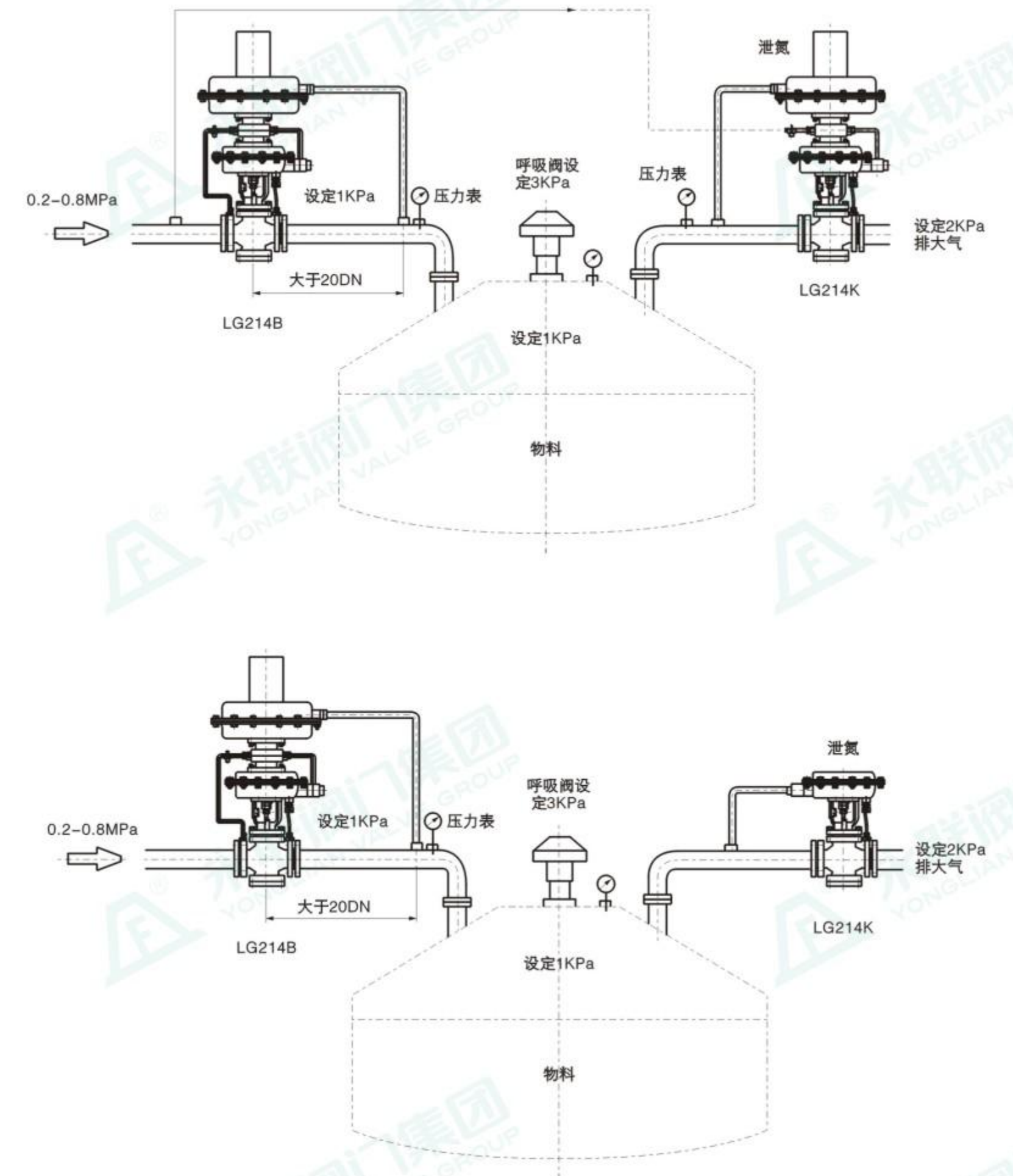
## 指挥器操作式自力式压力调节阀214型

Pilot operated self-operated pressure regulating valve type 214

### 应用设计案例

Application Design Cases

氮封装置原理图



上例以储罐1KPa为例

- 214B型阀门的取压位置应离储罐(或缓冲罐)较近。
- 压力表应至于取压点不远处，以免引起不必要的争议。
- 214B型阀后管道不宜太小(一般大于阀前管道)。

The above example takes the storage tank 1KPa as an example

- The pressure tapping position of the 214B valve should be close to the storage tank (or buffer tank).
- The pressure gauge should be located not far from the pressure measuring point to avoid unnecessary disputes.
- The pipeline behind the 214B valve should not be too small (generally larger than the pipeline before the valve).

## 自力式微压调节阀/自力式差压调节阀 215V型

Self-operated micro pressure regulating valve  
/self-operated differential pressure regulating valve 215V type

215V型自力式差压阀是一种不需要外加能源而能自动调节一种或两种介质压差,使压差维持在恒定值,如在工业炉气体燃烧系统中,用于控制甲、乙两种燃料混合比流量调节,达到理想的燃烧条件,节省燃料及投资,也可以作为煤气、天然气、液化石油气、氨气、氮气、氧气等各种工业气体的减压、微压、差压的调节系统中。还可用于氢冷发电机组密封油系统,控制密封油与氢气间的压力差,以确保可靠密封。

微压阀控制阀前时可替代214K型带指挥器操作式自力式压力调节阀。

当差压阀的低压端通大气即成为微压阀(见图二)213型自力式压差调节阀和212型自力式微压调节阀主要特点为:

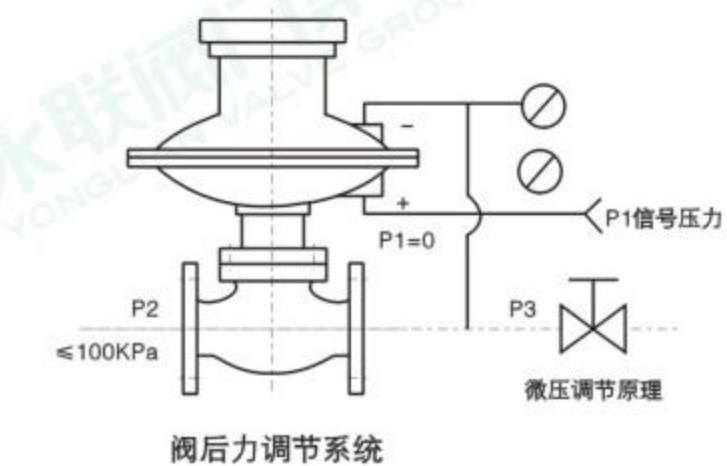
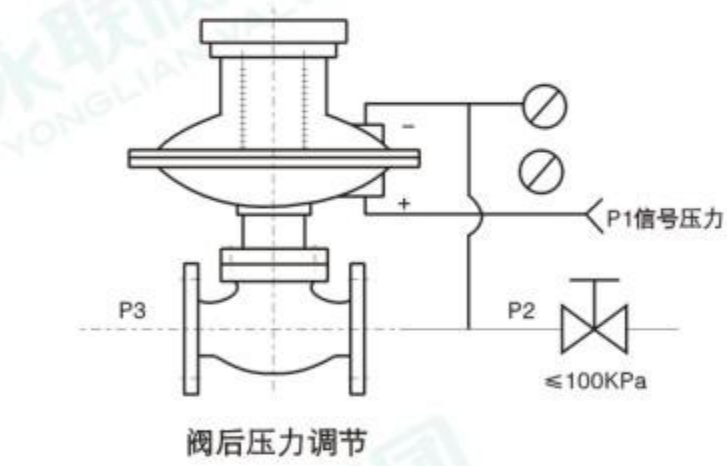
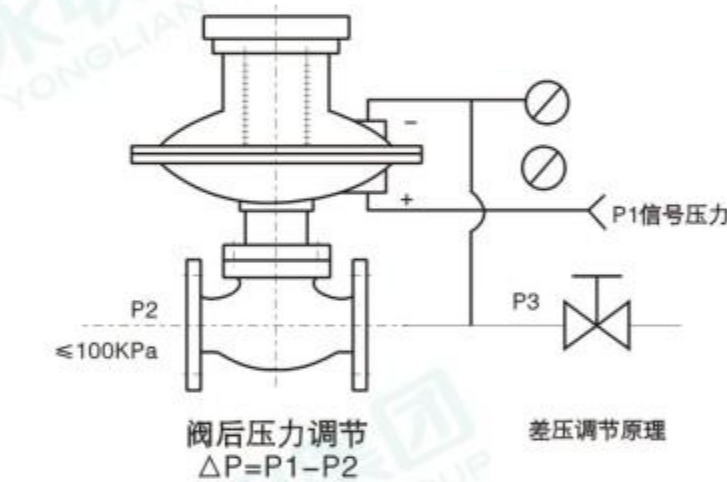
- 1、对单座微(差)压阀而言,若阀前压力 $\geq 100\text{KPa}$ 则安装3001P型自力式进行减压至 $\leq 100\text{KPa}$ ,因此可用于压力特别小的场合(例如 $0.5\text{KPa}$ )
- 2、执行机构元件极为灵敏,极微小的压力变化会感测出来。
- 3、压力调节极为方便,无需停止生产即可进行设定值调整。

The 215V type self operated differential pressure valve is a type of valve that can automatically adjust the pressure difference of one or two media without the need for external energy, so as to maintain a constant pressure difference. For example, in the gas combustion system of industrial furnaces, it is used to control the mixing ratio and flow rate of A and B fuels, achieve ideal combustion conditions, save fuel and investment, and can also be used as a pressure reducer, micro pressure regulator for various industrial gases such as gas, natural gas, liquefied petroleum gas, ammonia, nitrogen, oxygen, etc in the differential pressure regulation system. It can also be used in the sealing oil system of hydrogen cooled generator units to control the pressure difference between the sealing oil and hydrogen gas to ensure reliable sealing.

The micro pressure valve can replace the 214K type self operated pressure regulating valve with a command when controlling the front of the valve.

When the low-pressure end of the differential pressure valve is opened to the atmosphere, it becomes a micro pressure valve (see Figure 2). The main characteristics of the 213 type self operated differential pressure regulating valve and the 212 type self operated micro pressure regulating valve are:

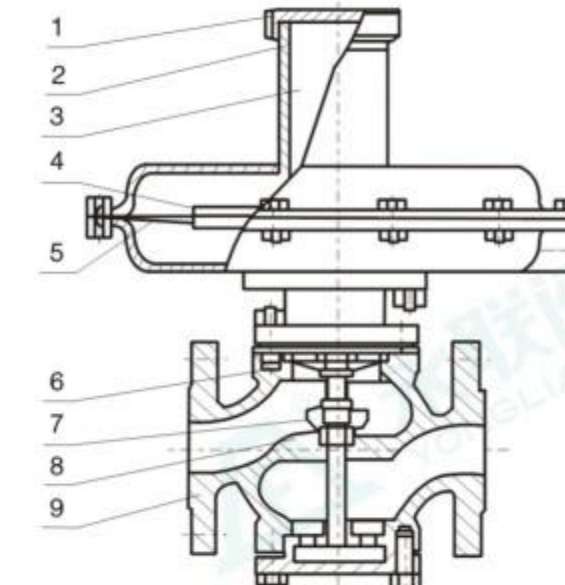
1. For single seat micro (differential) pressure valves, if the pressure in front of the valve is  $\geq 100\text{KPa}$ , install the 3001P self operated type to reduce the pressure to  $\leq 100\text{KPa}$ , so it can be used in particularly low pressure situations (such as  $0.5\text{KPa}$ )
2. The actuator components are extremely sensitive, and extremely small pressure changes can be sensed.
3. The pressure adjustment is extremely convenient, and the set value can be adjusted without stopping production.



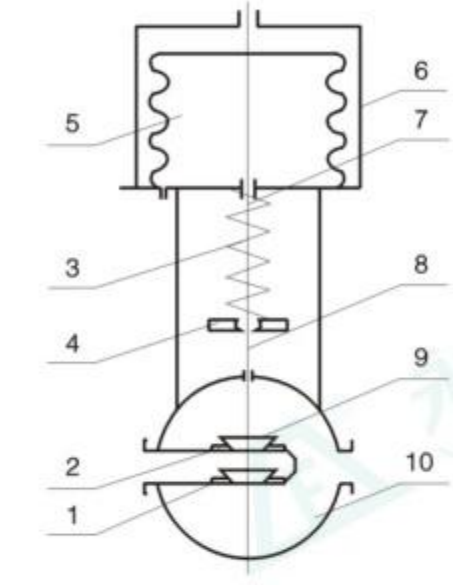
图一 差(微)压调节阀外形图



(图二)



对图三而言



对图四而言

序号 No.	名称 Name	材质 Material quality
1	封盖 Cover	2Cr13
2	弹簧座 Spring seat	45
3	弹簧 Spring	60Si2Mn
4	托盘 Tray	16Cr18Ni9Ti
5	膜片 Diaphragm	丁腈橡胶
6	小膜片 Small diaphragm	耐油橡胶
7	阀芯 Spool	PTFE
8	阀座 Valve seat	1Cr18Ni9Ti
9	阀体 Valve body	ZG230-450 ZG1Cr18Ni9Ti

序号 No.	名称 Name	材质 Material quality
1	上阀座 Upper valve seat	1Cr18Ni9Ti
2	下阀座 Lower valve seat	1Cr18Ni9Ti
3	调节盘 Adjusting disc	2Cr13
4	弹簧座 Spring seat	45
5	波纹管 corrugated pipe	1Cr18Ni9Ti
6	执行机构外腔 Outer chamber of actuator	Q235
7	推杆 Push rod	2Cr13
8	阀杆 Valve stem	1Cr18Ni9Ti
9	阀芯 spool	1Cr18Ni9Ti
10	阀体 valve body	ZG230-450

主要技术参数和性能指标(表一) Main technical parameters and performance indicators (Table 1)

公称通径DN(mm) Nominal Diameter	20	25	32	40	50	65	80	100		
额定流量系数Kv Rated flow coefficient Kv	ZZCP/ZZVP		5	8	12.5	20	32	50	80	125
	ZZCN		-	-	-	-	53	83	-	-
额定行程(mm) Rated stroke (mm)	5	6	10	15	20					
公称压力PN(MPa) Nominal pressure PN (Mpa)	0.10		1.0							
差压调节范围 (KPa) 一般设计范围 Differential pressure adjustment range (KPa) General design scope	0.5~5.5		5~10	9~14	13~19					
	18~24		22~28	26~33	31~38					
	36~44		42~51	49~59	56~66	64~78	76~90	88~100		
介质温度(°C) Medium temperature (°C)	≤80									
调节精度(%) Adjustment accuracy (%)	≤10									
允许泄漏量 (l/h) Permissible leakage (l/h)	ZZCP/ZZVP		硬密封 $10^{-4}$ x 阀额定容量(IV级)(GB/T4213-2008) Hard seal $10^{-4}$ x valve Nameplate capacity (Class IV) (GB/T4213-2008)							
	ZZCN		软密封:VI级 Soft sealing: Class VI							
			5x10 <sup>-4</sup> x 阀额定容量(III级)(GB/T 4213-2008) 5x10 <sup>-4</sup> x valve Nameplate capacity (Class III) (GB/T 4213-2008)							

注:1、215V型公称压力为1.0MPa, 2152型为1.6MPa

2、215V型差压调节范围为36~44, 42~51, 49~58, 56~66, 64~78, 76~90, 88~100KPa。

Note: 1. The nominal pressure of the 215V type is 1.0MPa, while the 2152 type is 1.6MPa

2. The 215V type differential pressure regulation range is 36-44, 42-51, 49-58, 56-66, 64-78, 76-90, 88-100KPa.

## 自力式微压调节阀/自力式差压调节阀 215V型

Self-operated micro pressure regulating valve  
/self-operated differential pressure regulating valve 215V type

### 差(微)压阀调节范围的确定

差(微)压调节范围的分段见表一。  
控制房范围(控制点)应选取在中间期附件。

### Determination of the adjustment range of differential (micro) pressure valve

The segmentation of differential (micro) pressure adjustment range is shown in Table 1.  
The scope of the control room (control points) should be selected in the interim attachment.

### 整机作用方式的确定

差(微)压调节阀有B型K型两种。B型阀阀芯初始位置常开,差(微)压增大时开度减少甚至闭合K型阀阀芯初始位置常闭,差(微)压增大时开度增大。

### Determination of the operation mode of the entire machine

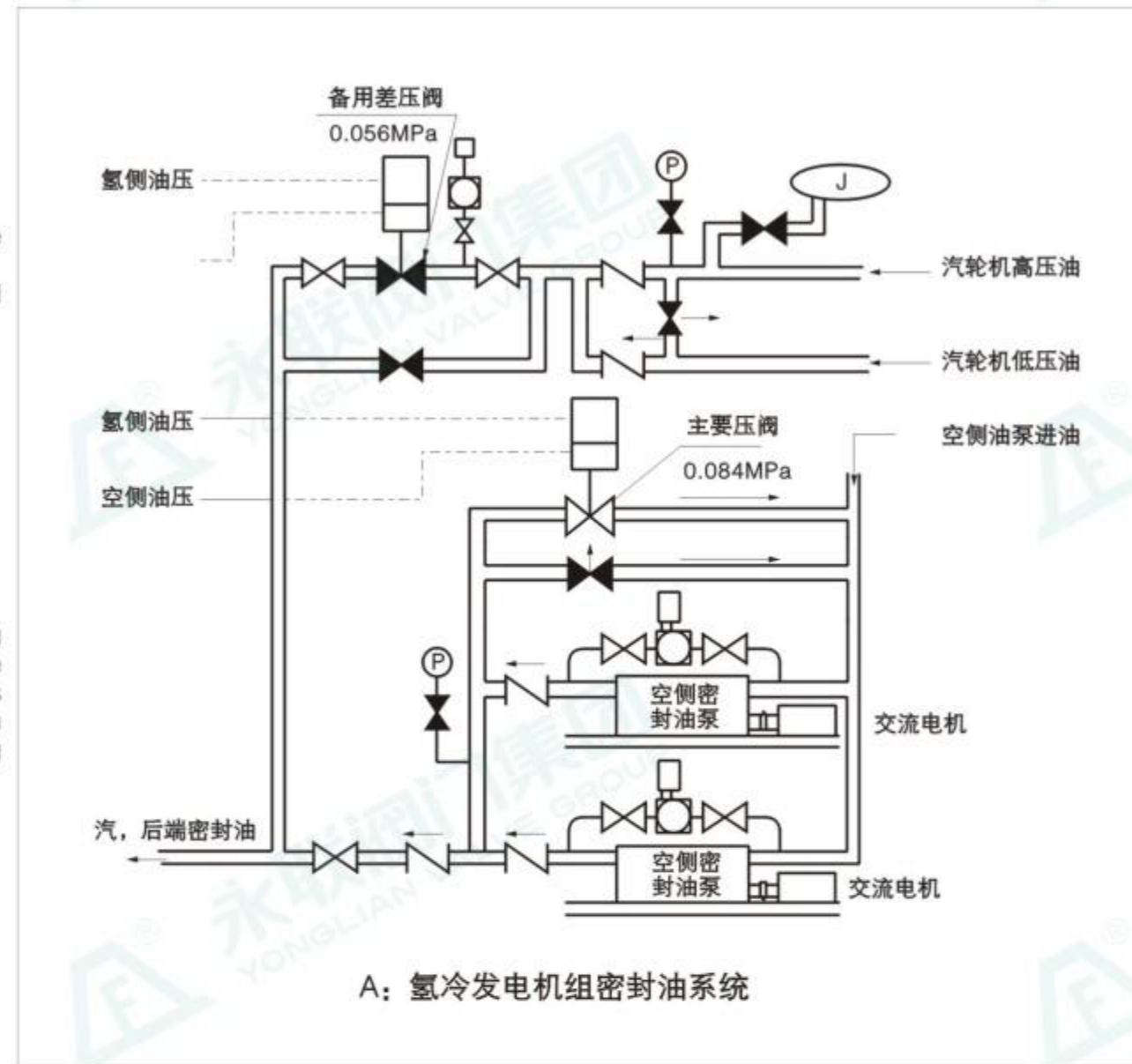
There are two types of differential (micro) pressure regulating valves: B-type and K-type. The initial position of the B-type valve core is usually open, and the opening decreases or even closes when the differential (micro) pressure increases. The initial position of the K-type valve core is usually closed, and the valve opening increases when the differential (micro) pressure increases.

### 应用举例

- A. 氢冷发电机组密封油系统
- B. 风机加热系统循环风量控制机
- C. 两种气体流量的配比控制
- D. 泵旁路调节

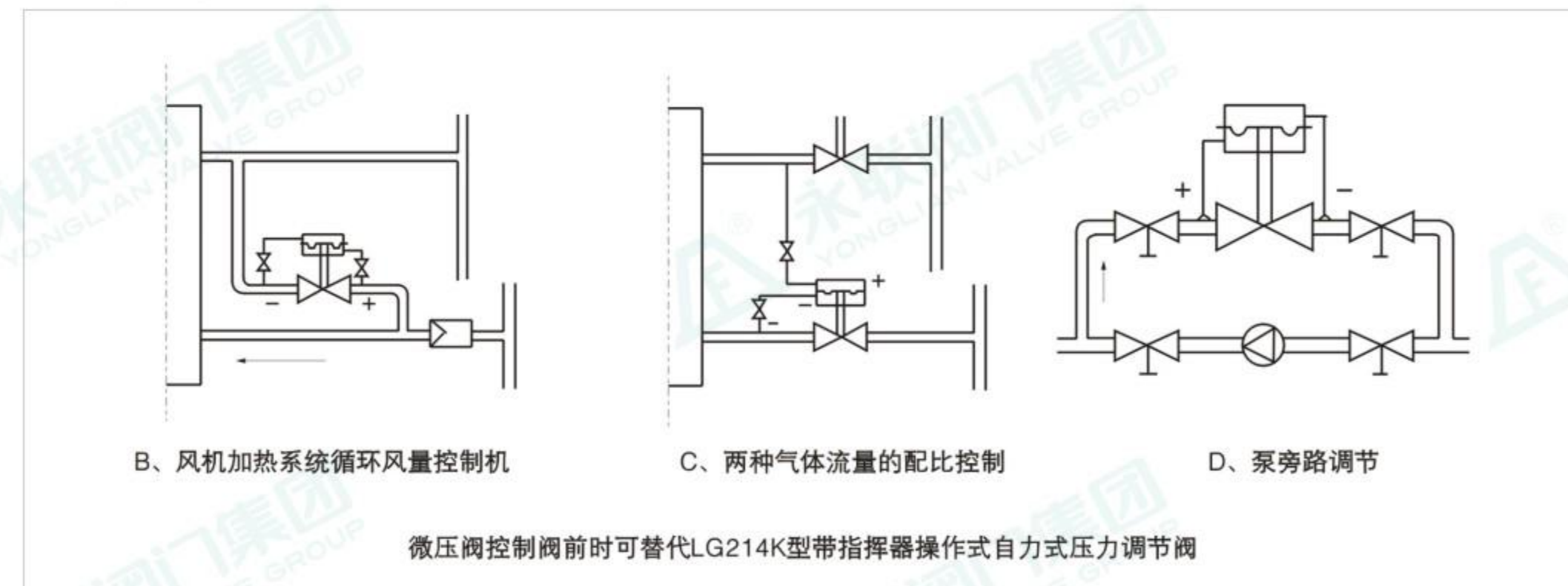
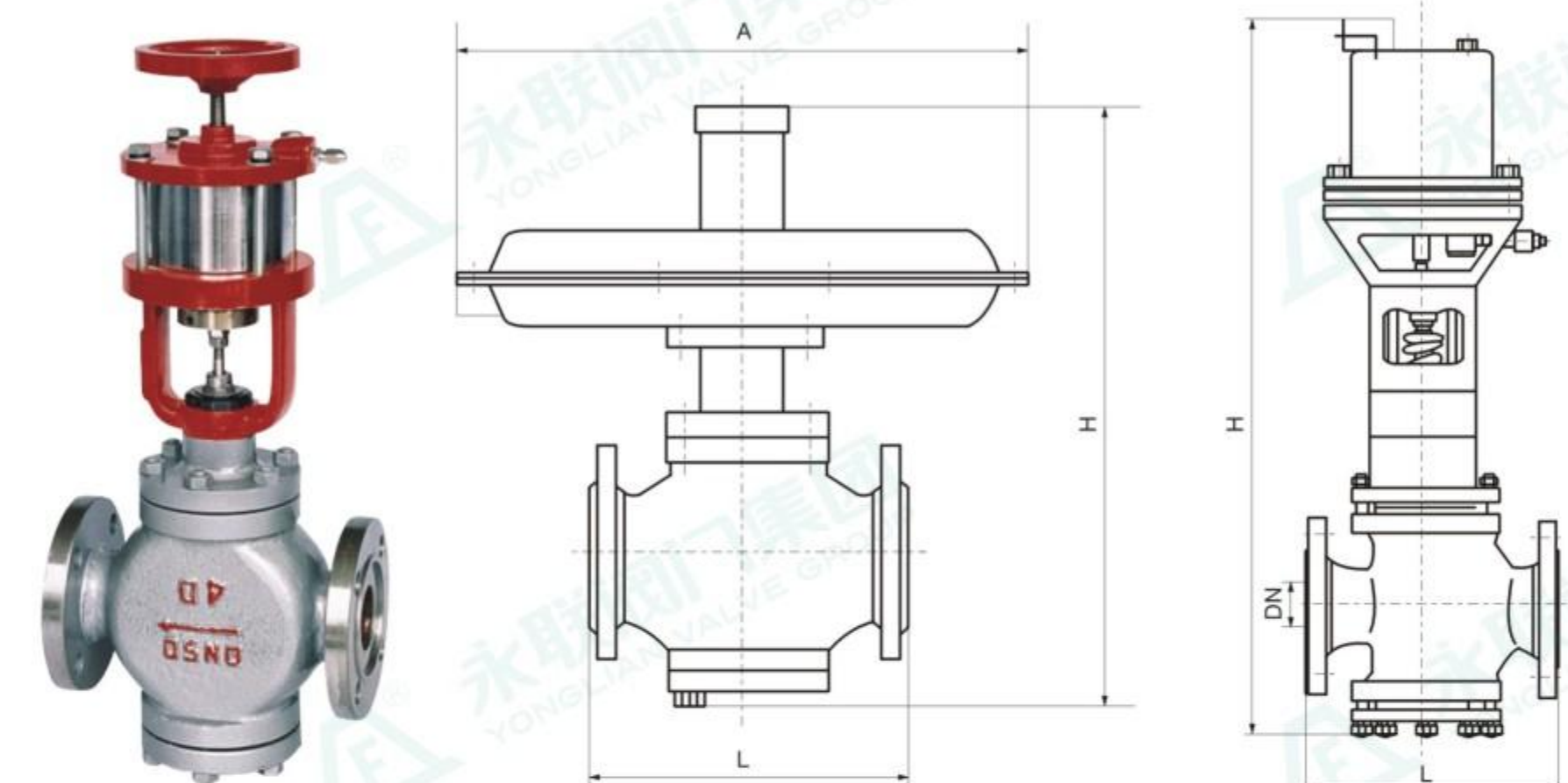
### Application examples

- A. Sealing oil system of hydrogen cooled generator unit
- B. Fan heating system circulating air volume control machine
- C. Proportional control of two gas flow rates
- D. Pump bypass regulation



## 自力式微压调节阀/自力式差压调节阀 215V型

Self-operated micro pressure regulating valve  
/self-operated differential pressure regulating valve 215V type



### 型号编制说明

215V-10B 215V-10K

2: 自力式产品系列

1: 薄膜执行机构

2: 微压产品

1: 单座结构

2: 笼式结构

4: 双座结构

### Application examples

215V-10B 215V-10K

2: Self operated product series

1: Thin film actuator

2: Micro pressure products

1: Single seat structure

2: Cage structure

4: Double seat structure

10: PN1.0MPa

B: 压力(差压)增加阀关闭

K: 压力(差压)增加阀开启

10: PN1.0MPa

B: Pressure (differential pressure) increase valve closed

K: Pressure (differential pressure) increase valve opens

DN	20	25	32	40	50	65	80	100
A	308	394	308	394	308	394	394	394
H	ZZCP/ZZVP	376	465	365	445	448	490	490
	ZZCN	-	-	-	-	536	536	-
L	ZZCP/ZZVP	150	160	180	200	230	290	310
	ZZVN	-	-	-	-	220	222	-
重量G (Kg) Weight	12	18	25	32	45	58	68	76
导压管螺纹接头 Pressure pipe threaded joint	M16x1.5							

### 订货须知 Ordering Instructions

请提供详细介质参数(阀前后压力、温度、状态)、介质名称、阀公称压力、公称口径、调节系统详图(系统控制较复杂时)。

Please provide detailed medium parameters (pressure, temperature, status before and after the valve), medium name, valve nominal pressure, nominal diameter, and detailed diagram of the regulating system (when the system control is complex).