



ZZVP/N 型自力式差压调节阀

Self-operated Pressure Difference Regulator

ZZVP/N 型自力式差压调节阀，是一种依靠被调介质自身的压力变化进行自动调节的一种节能型调节阀。

ZZVP/N self-operated pressure difference regulator is one kind of energy-saving control valve which it can adjust according to medium pressure.

它可应用于燃烧系统，发电机、空压机轴封系统，阀前 $P \leq 0.1\text{Mpa}$ 、阀后 $< 10\text{kpa}$ ，连续控制。其特点是设备运行中可进行设定值调整；无填料，动作灵敏；能检测出微小的压力变化。广泛应用于工业生产微压压力的自动控制中。减压比大于 100 要用两级降压。

It is applicable for continuously controlling to burning system, generator and shaft seal system of air compressor ($P_1 \leq 0.1\text{Mpa}$, $P_2 < 10\text{kpa}$). It can set the value in running and feature no packing and adaptable. Inspect the slight variation. It is widely used in automatic control of micropressure in industry producing. Use the secondary pressure reduction when the reduction ratio is more than 100.

该系列分为 ZZVP/N-16B 常开（控制压力高于设定值时阀闭合）和 ZZVP/N-16K 常闭（控制压力高于设定值时阀开启）两种。

This series has ZZVP/N-16B normally open type (valve close for control pressure more than set value) and ZZVP/N-16K normally close type (valve open for control pressure more than set value).

标准规格 STANDARD SPECIFICATION

阀体 BODY

| | |
|----------------------|---|
| 形式 Type | 流体压力平衡型阀芯 Fluid pressure balanced type |
| 公称通径 Nominal size | 20、25、40、50、65、80、100 |
| 公称压力 Pressure rating | ANSI 150; PN16; JIS10K |
| 连接型式 End connection | 法兰式 Flange type (JIS B2201-1984 、 JB/T79.1-94 、 ANSI B16.5-2009;HG20592-2009、HG20615-2009) |
| 阀内件材质 Trim materials | 各种材质组合及适用温度·压力范围，请参见表 1 |
| 阀内件处理 Trim treatment | As to the operating pressure-temperature limitation for each material, see Table 1 |
| 阀体及上阀盖 Body & Bonnet | SCPH2/WCB, SCS13A/CF8, SCS14A/CF8M 各种材质的使用温度·压力范围，请参照表 1 As to the operating pressure-temperature limitation for each material, see Table 1 |
| 填料 Packing | 无 Non |
| 垫圈 Gasket | 无石棉橡胶板 Non-asbestos rubber sheet |

执行机构 ACTUATOR

| | |
|------------------|---|
| 类型 Type | 薄膜式 Diaphragm type |
| | 膜片材质 Diaphragm material |
| 规格 Specification | 丁腈橡胶 NBR |
| 用途 Purpose | 调节 Adjust |
| 压力调节范围 kPa | 0.5~5.5, 5~10, 9~14, 13~19, 18~24, 22~28, 26~33, 31~38, 36~44, 42~51, |

| | |
|--------------------------|------------------------------------|
| Pressure adjusting range | 49~58, 56~66, 64~78, 76~90, 88~100 |
| 使用温度 Operating temp. | -5~80℃ |
| 标准涂层色 Painting color | 灰色 |

性能 PERFORMANCE

| | |
|-------------------------------------|---|
| 额定 Cv 值 Rated Cv value | 见表 2 See Table 2 |
| 流量特性 Flow characteristics | 快开 Quick opening |
| 压力调节范围 Pressure adjusting range | 见表 3 See Table 3 |
| 压力调节精度 Pressure adjusting precision | ±10% |
| 允许泄漏量 Allowable leakage | 小于额定容量的 0.01% Less than 0.01% of rated capacity |

表 1 阀体、阀内件材质组合及使用温度

Table1 BODY/TRIM STANDARD MATERIAL COMBINATION AND OPERATING TEMPERATURE

表 1-1 阀体材质：碳钢

Table 1-1 BODY MATERIAL: CARBON STEEL

| | | |
|----------------------|-------------|----------------------------------|
| 阀体材质 | | SCPH2/A216-WCB |
| 阀 芯 Plug | 材质 Material | SUS304 |
| 阀 座 Seat ring | 材质 Material | SUS304 |
| 波纹管 Bellows | 材质 Material | SUS304 |
| 膜 片 Diaphragm | 材质 Material | 丁腈橡胶 NBR |
| 垫 圈 Gasket | 材质 Material | 无石棉橡胶板 Non-asbestos rubber sheet |
| 使用温度 Operating temp. | 材质 Material | -5~80℃ |

表 1-2 阀体材质：不锈钢

Table 1-2 BODY MATERIAL: STAINLESS STEEL

| | | |
|----------------------|-------------|----------------------------------|
| 阀体材质 Body material | | SCS13A/CF8,SCS14A/CF8M |
| 阀 芯 Plug | 材质 Material | SUS316 |
| 阀 座 Seat ring | 材质 Material | SUS316 |
| 波纹管 Bellows | 材质 Material | SUS316 |
| 膜 片 Diaphragm | 材质 Material | 丁腈橡胶 NBR |
| 垫 圈 Gasket | 材质 Material | 无石棉橡胶板 Non-asbestos rubber sheet |
| 使用温度 Operating temp. | 材质 Material | -5~80℃ |

表 2 额定 Kv 值

Table 2 Rated Kv value

| | | | | | | | |
|---|--|----|----|----|----|-----|-----|
| 公称口径 DN(mm) Nominal size | 20 | 25 | 40 | 50 | 65 | 80 | 100 |
| 额定流量系数 (Kv) Rated flow coefficient | 7 | 11 | 30 | 48 | 75 | 120 | 190 |
| 额定行程 (mm) Rated travel | 6 | 8 | 10 | | 15 | | 20 |
| 压力分段范围 (kPa) Pressure subsection range | 0.5~5.5, 5~10, 9~14, 13~19, 18~24, 22~28, 26~33, 31~38, 36~44, 42~51, 49~58, 56~66, 64~78, 76~90, 88~100 | | | | | | |

表 3 压力调节范围

Table 3 PRESSURE ADJUSTING RANGE

| 压力调节范围(kPa) Pressure adjusting range | 执行机构膜室有效面积 (cm ²) Effective area of diaphragm room | 使用阀门口径 (mm) Using valve size |
|--|---|---------------------------------|
| 0.5~5.5, 5~10, 9~14, 13~19, 18~24, 22~28, 26~33, 31~38, 36~44, 42~51, 49~58, 56~66, 64~78, 76~90, 88~100 | 100 | 20~50 |
| | 280 | 65~100 |

阀体结构及原理

STRUCTURE AND PRINCIPLE

控制压力小于或等于 100Kpa 的调节阀称为自力式微压力调节阀(P3 通大气)， 差压调节阀是微压调节阀的另一种控制方式。由执行机构、调节机构、导压管等组成。差压调节阀工作原理：见原理图 1

原理图 PRINCIPLE DIAGRAM

ZZVP-16K 作用方式为压开式，即差压增大阀开启型。流体 P1 节流后成 P2，经导压管与差压调节阀执行机构上模室联通，P2 作用在波纹膜片有效面积上产生一个向下的作用力，加上弹簧的初始压力（向下）作用力； 讯号源压力 P3（恒定值）引入执行机构下模室，作用在波纹膜片有效面积上产生一个向上的作用力。与上模室 P2 和弹簧的合力（向下）的作用力平衡。P3 与 P2 之间有一个差压值，这个差压值就是设定值。若差压变化，增大或减小，则平衡被破坏，阀门开大或关小，保住差压值恒定。若差压达不到设定值：如，小于设定值，调整方法如下：打开防尘盖 1； 反时针旋转调节螺钉 2，减小弹簧的预压力，使设定值达到理想要求。反之，则调节螺钉的旋转方向相反。

The action of **ZZVP-16K** is pressure -to-open. After P1 throttling, P2 connects the diaphragm case (top) by pressure pipe. It brings the down force at the effective area of bellows diaphragm, adding the spring first force (down). P3 guided into diaphragm case (bottom) brings the up force that is equal to that resultant force at the effective area of bellows diaphragm. There is a differential pressure between P3 and P2 that is set value. If differential pressure changes, increasing or reducing, this balance is destroyed and valve open wider or close smaller in the following to keep it as a constant. If the differential pressure is less than set value, adjusting method: open the dustproof cover 1, turn bolt 2

counterclockwise to reduce spring pressure and make the setting value meeting the requirement. Otherwise, turn bolt 2 clockwise.

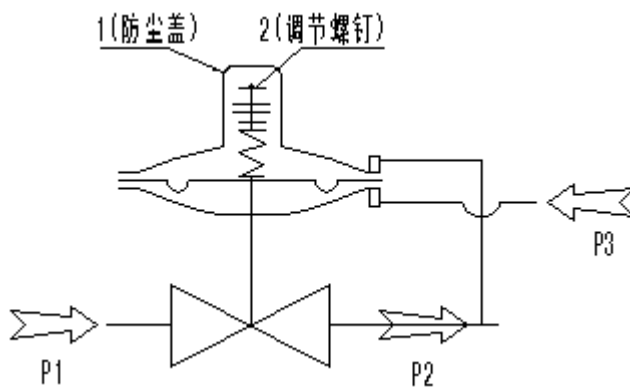


图1 差压调节阀原理

Fig.1 Principle diagram

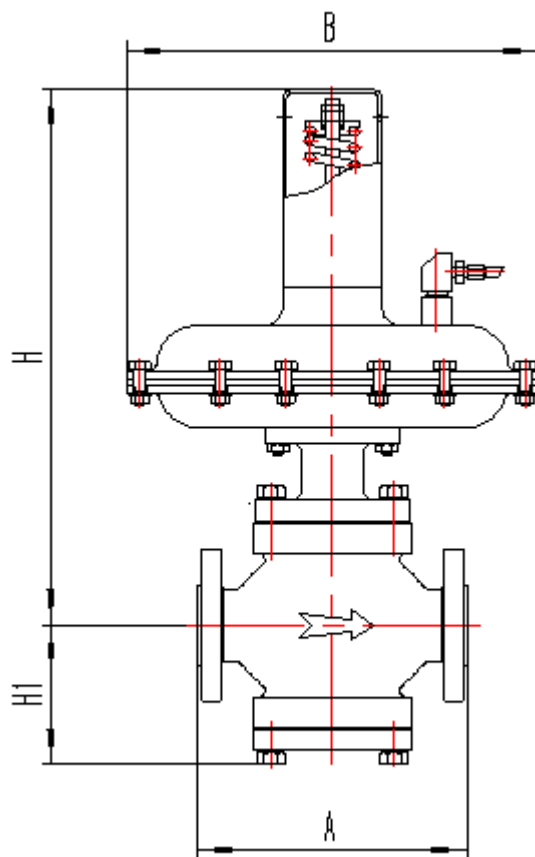


图 2 外形尺寸图

Fig.2 External dimensions

表 4 外形尺寸及重量

单位: mm

Table 4 EXTERNAL DIMENSIONS AND WEIGHT

UNIT:mm

| | | | | | | | |
|----------------------|-----|-----|-----|-----|-----|-----|-----|
| 公称通径 Nominal size | 20 | 25 | 40 | 50 | 65 | 80 | 100 |
| ΦB | 195 | | | | 280 | | |
| A | 184 | 184 | 222 | 254 | 276 | 298 | 352 |
| H1 | 88 | 102 | 114 | 114 | 156 | 166 | 176 |
| H | 285 | 337 | 344 | 344 | 386 | 396 | 406 |
| 重量 (Kg) Weight | 12 | 13 | 17 | 20 | 28 | 38 | 43 |