

HFS 高压单座调节阀（锻制）
HFC 高压笼式调节阀（锻制）
HFAS 高压单座角型调节阀（锻制）
HFAC 高压笼式角型调节阀（锻制）

适用场合

产品特点

应用标准

选择阀体部件

阀体规格

主要性能指标

阀体结构、材质与温度极限

工作原理

执行机构的选择

气动薄膜执行机构

选择附件

SIPART PS2 型智能定位器 SIEMENS

其它附件

参考信息

允许压差

电/气安装配管线

阀门安装空间位置图

阀门、手轮与管道相对安装示意图

安装尺寸

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选型规则

本产品简介只包括一些比较常用的规格、材质、温度、选项、以及附件。

特殊的工况可根据要求定制提供。

需要这些产品的选型方面的协助，可联系本公司销售办事处、营销中心及全球各地代理商。

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注：SIEMENS 系德国 SIEMENS 集团的商标，本公司智能定位器战略合作商

HFS (Forging)

High Pressure Single Seat Control Valve

HFC(Forging)

High Pressure Balanced Cage Control Valve

HFAS (Forging)

High Pressure Single Seat Angle Control Valve

HFAC(Forging)

High Pressure Balanced Cage Angle Control Valve

Application condition

Products characteristics

Application standard

Body selection

Specification

Performance

Body structure, materials and temperature limits

Working principles

Actuator

Pneumatic diaphragm actuator

Accessories

SIPART PS2 intelligent positioner SIEMENS^①

Other accessories

Reference information

Allowable DP

Tube @ Wire for Power/ Air Supply Connection

Valve installation diagram

Valve, hand wheel and pipe relative installation diagram

Installation size

Product weight

Model selection

This literature only includes some common specification, materials, temperature, option and accessories.

Special work condition could be customized.

Please contact with our sales office、marketing center and worldwide agents for assistance in model selection

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Note:

①SIEMENS is the trademark of Germany SIEMENS group, the company's strategic partner of intelligent positioner

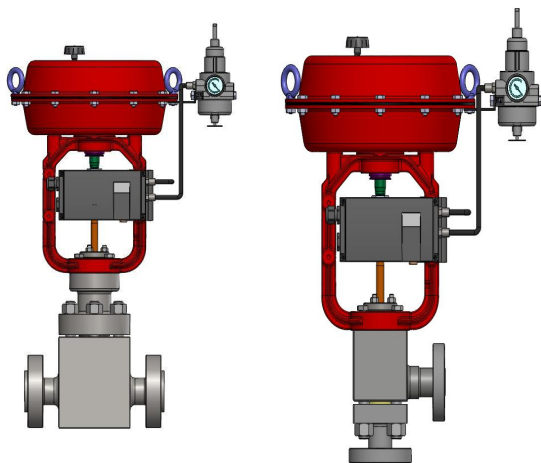
■适用场合

适用于化工、石油、等行业,尤其适用于合成氨、尿素工业上高压和高压差调节场合。

Applicable to chemical, petroleum, metallurgy, light industry and other industries which under automated control occasions of regulating liquid and gas.

■产品特点 Product Characteristics

压降损失小 small pressure drop	-阀体流道呈 S 型 S-shaped body flow
可调范围大、流量特性精度高 wide adjustment range and high accuracy of flow	-符合 IEC534-2-1976 标准 in accordance with IEC534-2-1976 standard
泄漏量小 small leakage	-符合 ANSI B16.104 标准 in accordance with ANSI B16.104 standard
阀座易于更换, 密封性好 Easy to change the seat, good packing seal	-采用下阀体和透镜式阀座结构; lower valve body and lens seat structure
结构紧凑、体积小 Small and with compact structure	-配用多弹簧薄膜执行机构 equipped multi-spring diaphragm actuator



HFS/HFC

HFAS/HFAC

■应用标准 Applicable Standard

	中国标准 Chinese Standard	美国标准 American Standard
质量保证 Quality assurance	IS09001、TS2710J59	IS09001
设计制造 Design and manufacture	GB12224-2005	ASME B16. 34

法兰标准 Flange standard	HG20592-2009	ASME B16. 5
结构长度 Length of structure	GB12221-2005	ASME B16. 10
检验和试验标准 Inspection and test standard	GB/T4213-2008	API598

■选择阀体部件

阀体规格

公称口径 DN	mm	25	40	50	65	80
	inch	1	1.5	2	2.5	3
产品型号 Model	HFS/HFAS	△	△	△	△	△
	HFC/HFAS	/	△	△	△	△
公称口径 DN	mm	100	125	150		
	inch	4	5	6		
产品型号 Model	HFS/HFAS	/	/	/		
	HFC/HFAS	△	△	△		
公称压力 PN	PN	220、320				
	ANSI	CL900、CL1500、CL2500				
连接形式 Connection	法兰式 Flanged					
阀体形式 Body type	直通单座铸造球阀 Straight single seat casting ball valve					
压盖形式 Gland type	螺栓压紧式 Bolt clamp					
阀芯形式 Plug type	HFS/HFAC	单座柱塞型阀芯 single-seat plunger valve plug				
	HFC/HFAC	压力平衡结构 pressure balanced structure				
③上阀盖 Bonnet temp	常温型 (P) Normal	-17~ +230℃				
温度范围	伸长 I 型 (E I)	-45~ -17℃, +230~ +566℃				
	伸长 II 型 (E II)	-100~ -45℃				
	伸长 III 型 (E III)	-196~ -100℃				

注: 1、△表示各种阀的规格范围;

2、③上阀盖使用温度范围不能超过各种材料允许使用的温度范围。

Note:

1. '△' means the scope of the various valve specifications

2. '③' the bonnet working temperature cannot over the allowed working temperature of various materials

主要性能指标 Performance

表 1 性能参数 Performance parameter

流量特性 flow characteristics	HFS/HFAS HFC/HFAC	等百分比特性（%CF）和线性特性（LCF）参考图 1 和图 2 equal percentage character（%CF） and linear character（LCF） refer to chart 1 and chart 2	
泄漏等级 leakage	HFS/HFAS	硬密封(hard seal): 标准(standard)Class IV	小于阀额定容量的 0.01% less than 0.01% of the rated capacity
	HFC/HFAC	硬密封(hard seal): 标准(standard)Class III	小于阀额定容量的 0.1% less than 0.01% of the rated capacity
可调范围 Adjustable range	HFS/HFAS HFC/HFAC	50: 1	

3

表 2 HFS/HFAS CV 值和额定行程 Cv Value and rated stroke

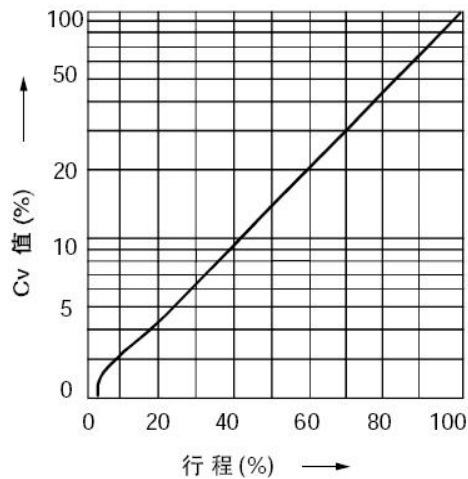
公称通径 DN			25									40			50			80		
阀座直径 Seat diameter												25	32	40	32	40	50	50	65	80
额定 Cv 值 Rated Cv	等百分 比 EQ%	Class 900	0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	12	12	17	25	17	25	47	47	75	110
	线性 Linear	Class 2500										--	12	17	12	17	31	31	47	75
额定行程 rated stroke			14.3			25									38					

表 3 HFC/HFAC CV 值和额定行程 Cv Value and rated stroke

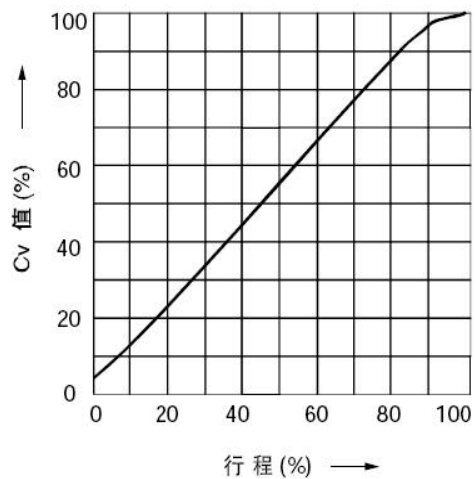
公称通径 DN			40			50			80			100			125			150		
阀座直径 Seat diameter			25	32	40	32	40	50	50	65	80	65	80	100	80	100	125	100	125	150
额定 Cv 值 Rated Cv	等百分 比 EQ%	Class 900	12	17	25	17	25	52	52	78	110	78	110	180	110	180	270	180	270	375
	Class 1500	--																		
线性 Linear	Class 900	Class 1500	12	20	30	20	30	62	62	90	135	90	135	210	135	210	330	210	330	485
额定行程 Rated stroke			25			38			50											

流量特性 Flow Characteristics

典型流量特性曲线图 typical flow characteristic diagram,

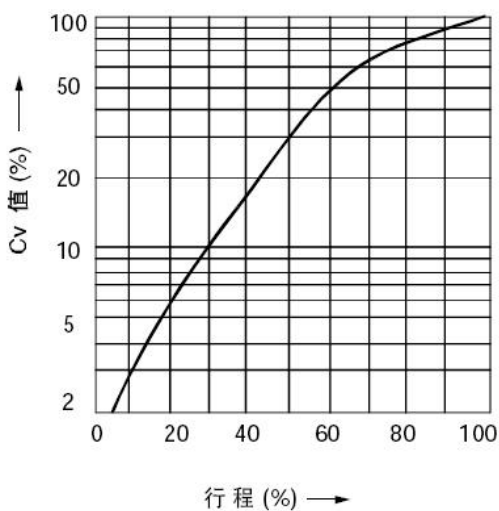


等百分比特性 EQ% (%C)

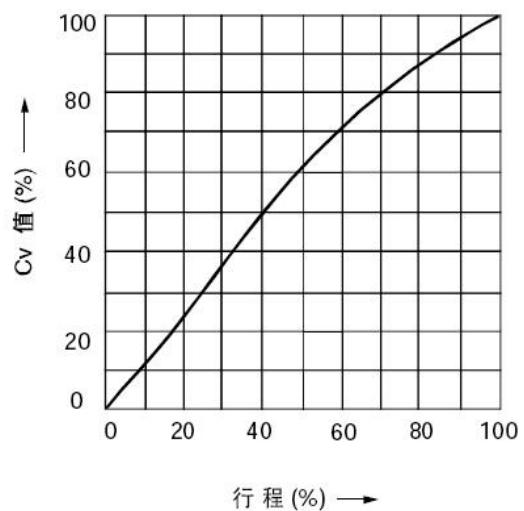


线性特性 Linear (LC)

图1 HFS/HFAS 流量特性曲线图 HFS/HFAS flow characteristic diagram,



等百分比特性 EQ% (%C)



线性特性 Linear (LC)

图2 HFC/HFAC 流量特性曲线图

阀体结构、材质与温度极限 **Body Structure, materials and temperatures limits**

表 4 材质的使用温度-压力范围(参考 GB/T 12224-2005) range of temperature and pressure of materials

度 Temp °C	公称压力 PN											
	CL900				CL1500				CL2500			
	A105	304	316	316L	A105	304	316	316L	A105	304	316	316L
	分级表示的工作压力 MPa classified working pressure											
-29~38	15.8	15.8	15.8	14.1	26.3	26.3	26.3	23.5	43.9	43.9	43.9	39.1
93	15.8	14.1	14.5	11.9	26.3	23.5	24.2	19.8	43.9	39.1	40.4	33.1
149	15.8	12.6	13.1	10.7	26.3	21.1	21.9	17.8	43.9	35.1	36.5	29.6
204	15.8	11.7	12.0	9.7	26.3	19.4	20.0	16.2	43.9	32.4	33.3	27.0
260	15.8	10.9	11.2	9.0	26.3	18.2	18.6	15.0	43.9	30.4	31.1	25.0
315	15	10.3	10.6	8.5	25	17.1	17.7	14.1	42	28.6	29.5	23.5
343	14.7	10.1	10.4	8.2	24.6	16.8	17.3	13.7	41	28.0	28.9	22.8
371	14.6	9.9	10.2	8.0	24.4	16.5	17.0	13.4	40.6	27.6	28.3	22.3
399	13.3	9.8	10.0	7.8	22.1	16.3	16.7	13.1	36.9	27.1	27.8	21.8
427	10.9	9.5	9.9	7.7	18.1	15.8	16.5	12.9	30.1	26.3	27.6	21.5
454	-	9.3	9.9	-	-	15.5	16.4	-	-	25.8	27.3	-
482	-	9.1	9.8	-	-	15.2	16.3	-	-	25.3	27.1	-
510	-	9.0	9.7	-	-	14.9	16.1	-	-	24.8	26.8	-
538	-	8.6	8.8	-	-	14.3	14.8	-	-	23.8	24.6	-

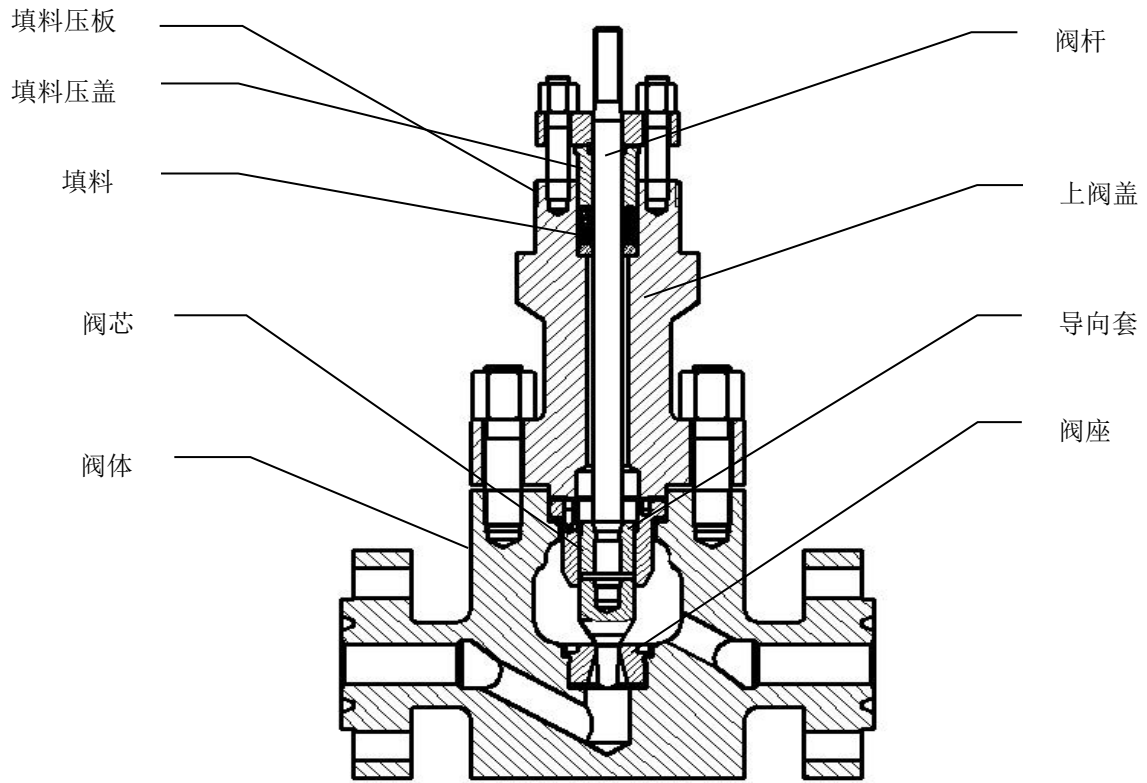


图3 HFS 高压单座调节阀构造图 (锻制) HPS high pressure control valve structure

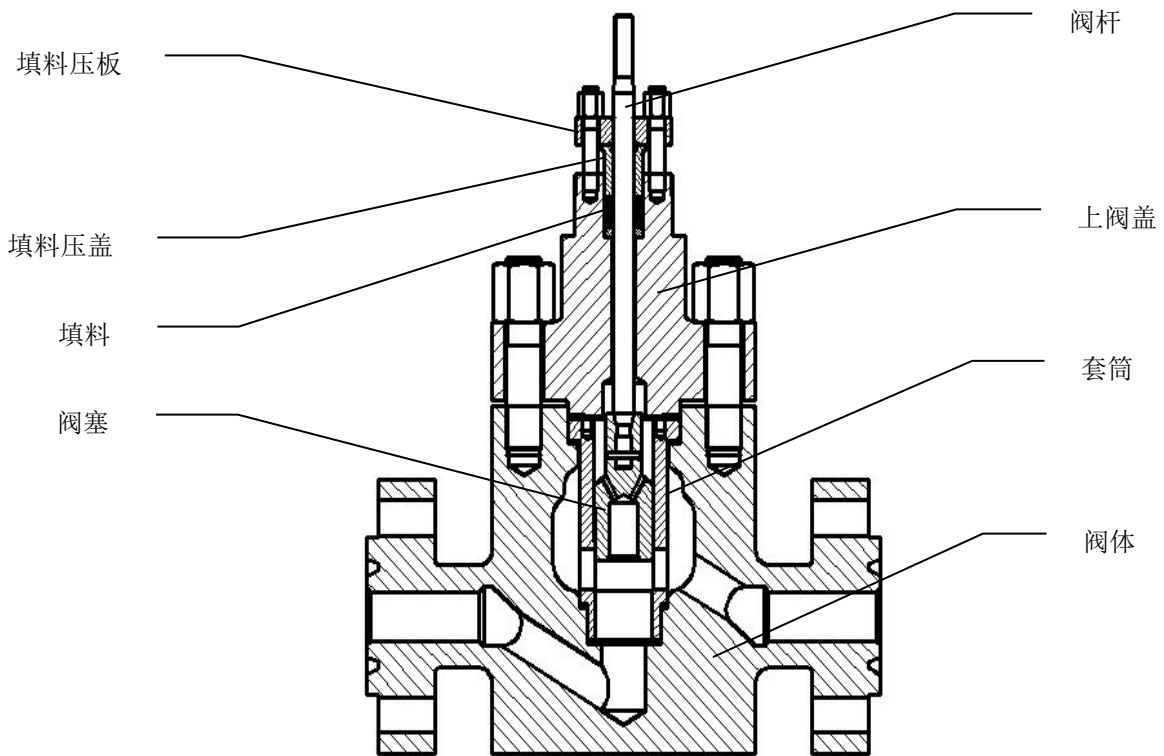


图4 HFC 高压笼式调节阀构造图 (锻制)

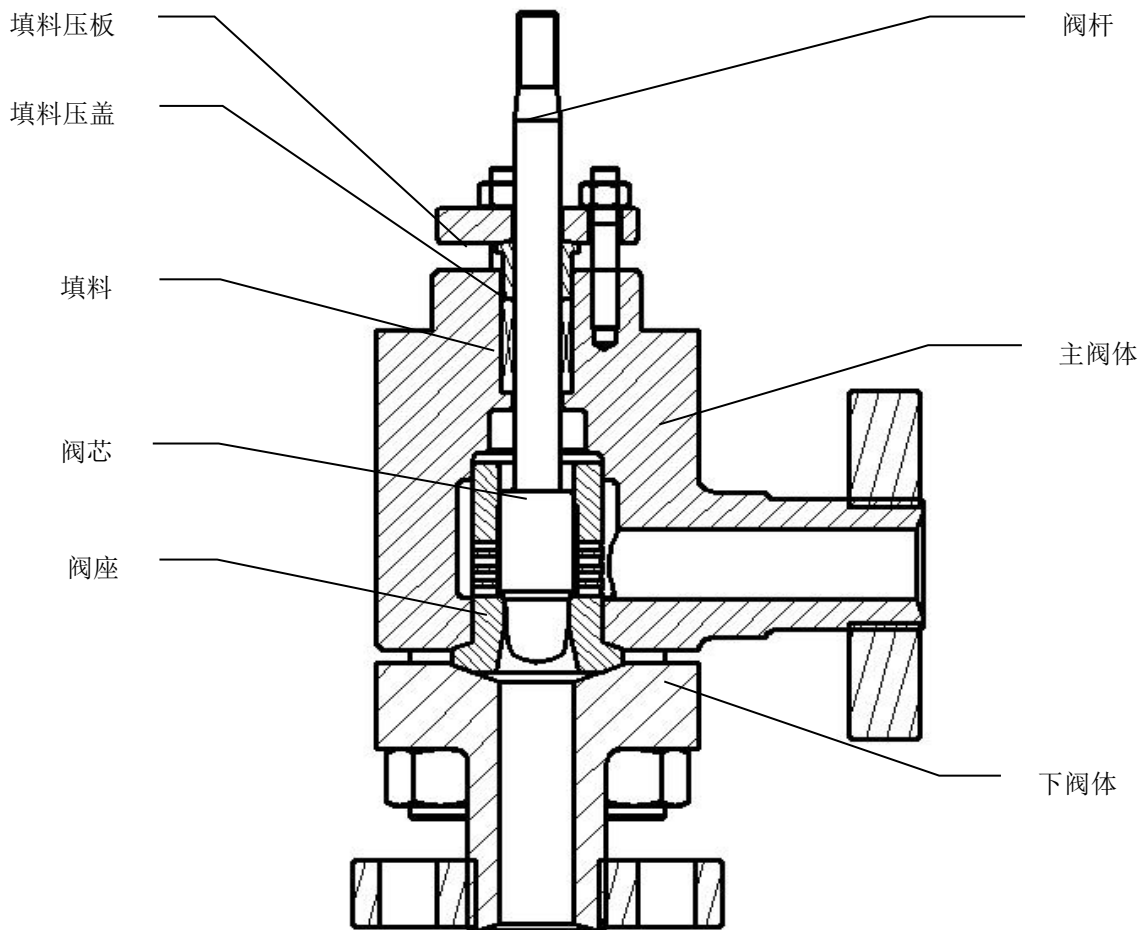


图5 HFAS 高压单座角型调节阀构造图（锻制）

填料压板 restrainer 填料 packing 阀芯 Plug 阀杆 stem 上阀盖 bonnet 导向套 guide sleeve 阀座 seat
 阀塞 plug 套筒 cage 阀体 body 填料压盖 packing gland 主阀体 main body 下阀体 lower body

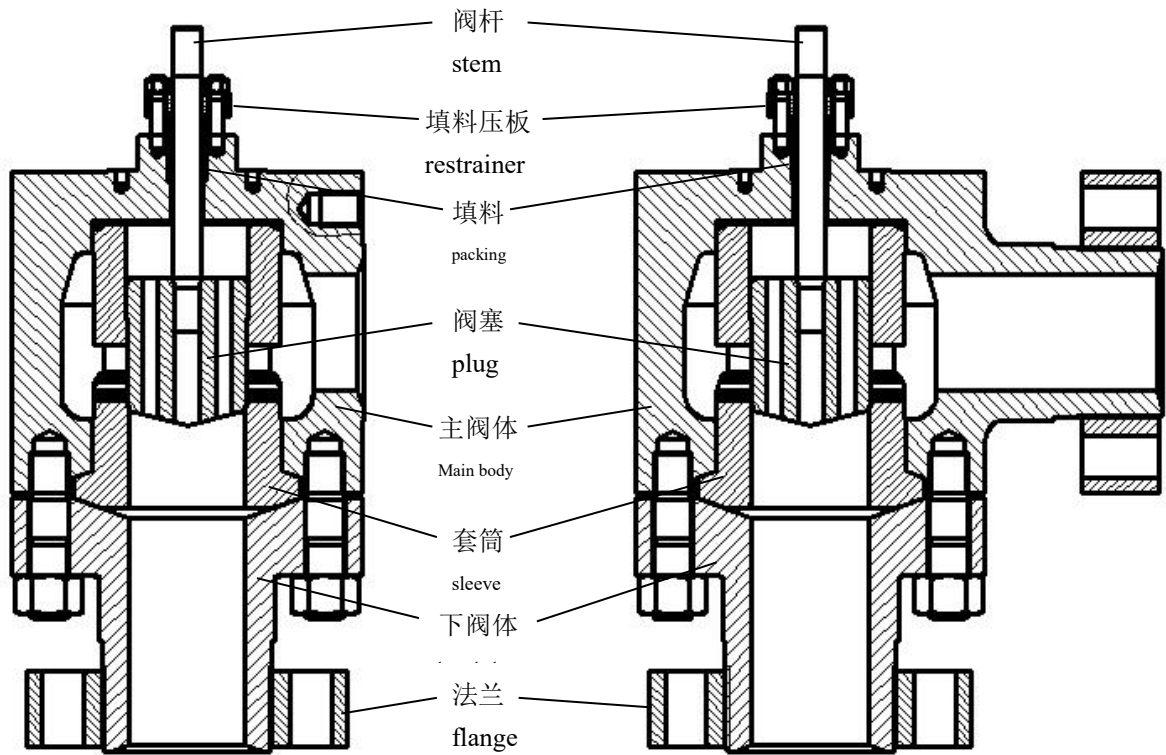


图6 HFAC 高压笼式角型调节阀构造图（锻制）

工作原理 working principles

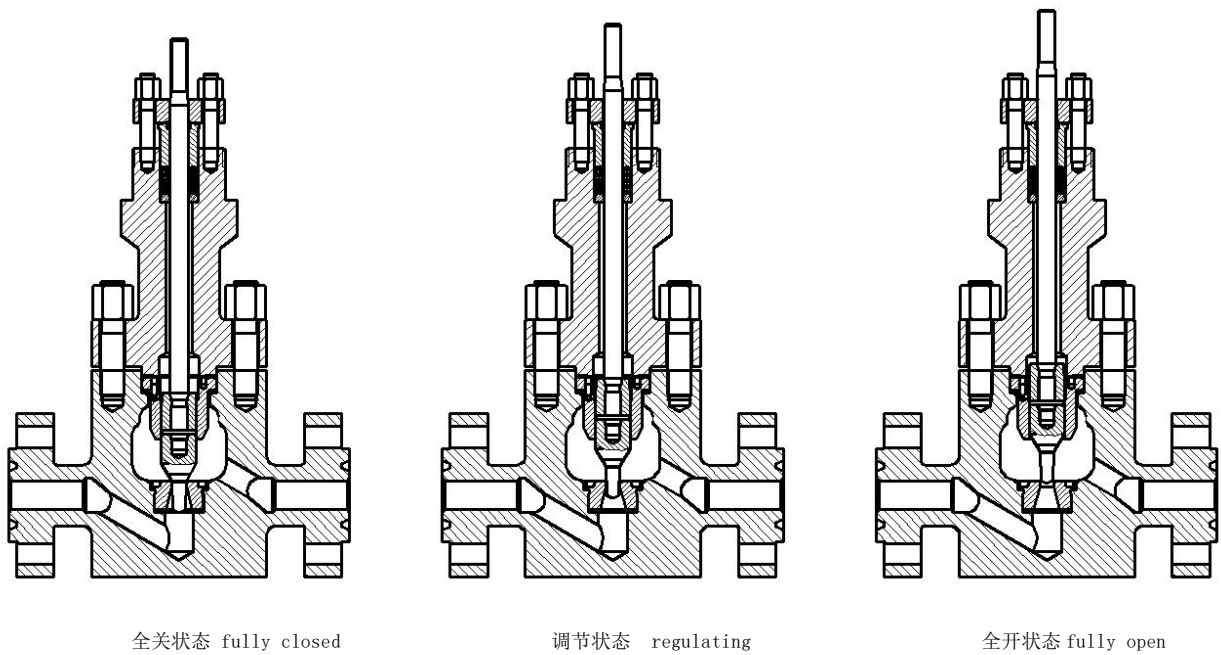
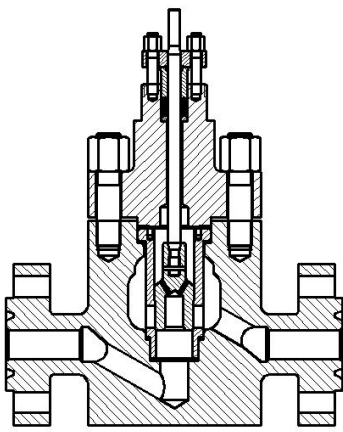
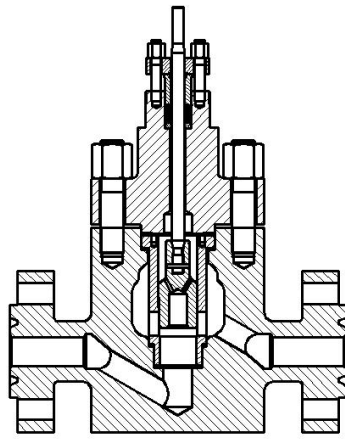


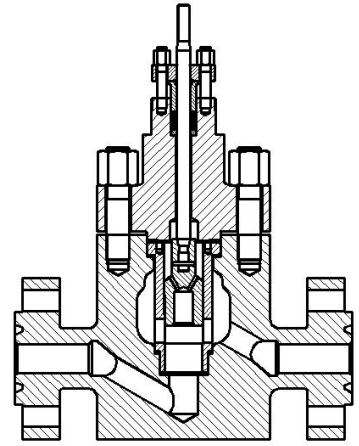
图7 HFS 高压单座调节阀（锻制）工作原理 working principles of HFS



全关状态 fully closed

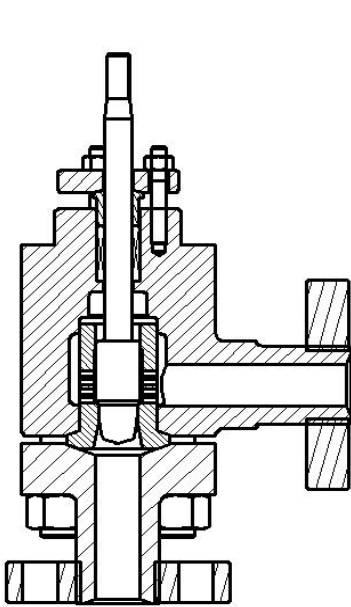


调节状态 regulating

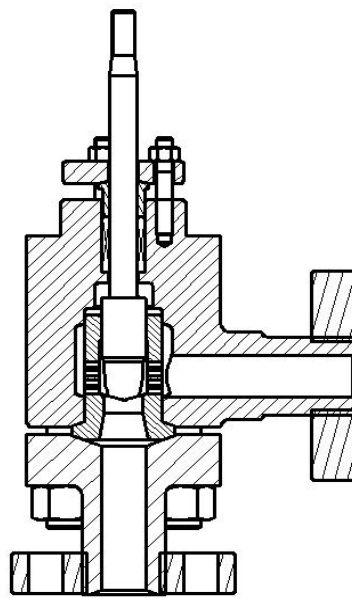


全开状态 fully open

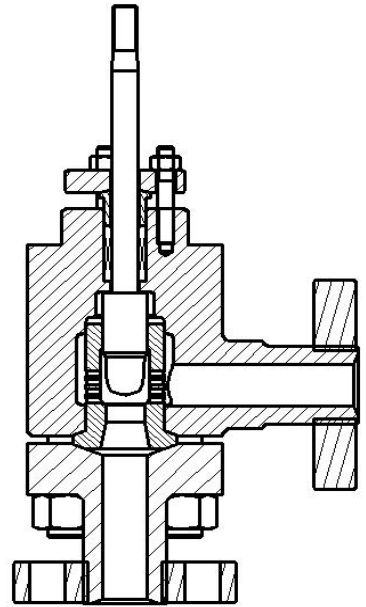
图8 HFC 高压笼式调节阀 (锻制) 工作原理 working principles of HFC



全关状态 fully closed

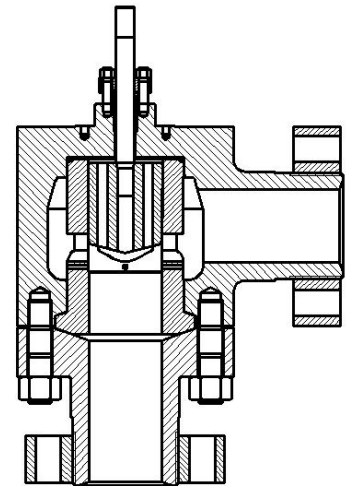
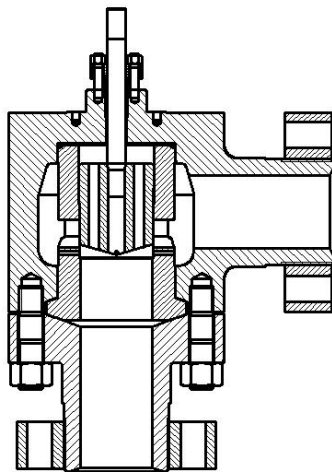
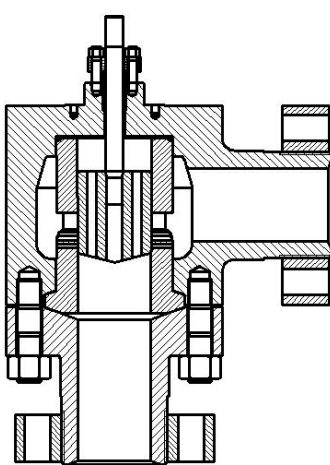


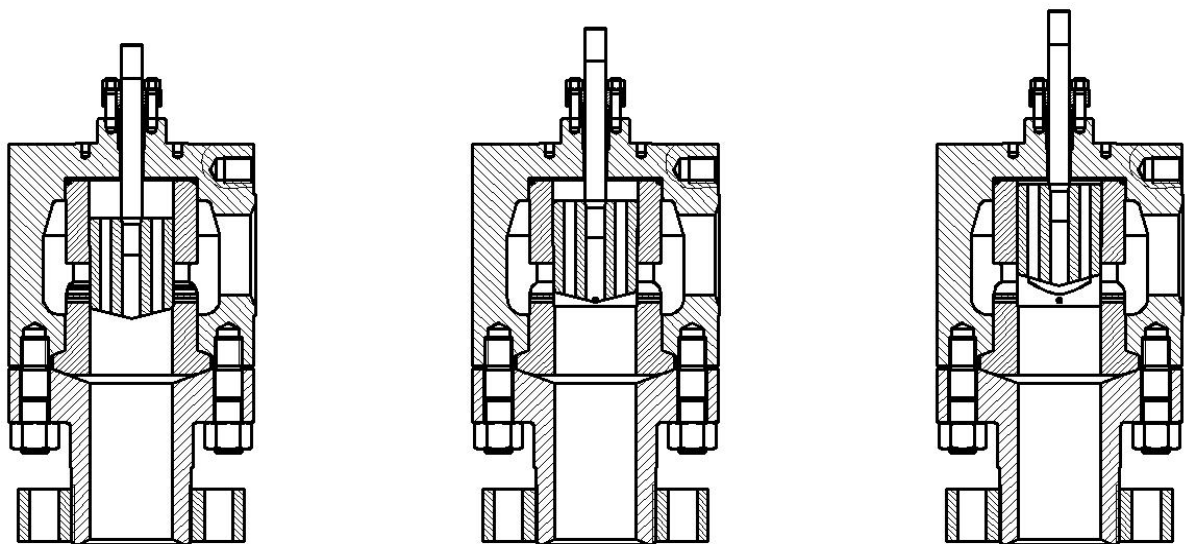
调节状态 regulating



全开状态 fully open

图9 HFAS 高压单座角型调节阀 (锻制) 工作原理 working principles of HFAS





全关状态 fully closed

调节状态 regulating

全开状态 fully open

图 10 HFAC 高压笼式角型调节阀（锻制）工作原理 working principles of HFAC

■选择附件

型号 Model	S-500 型智能定位器 (Hopeway) s-500 intelligent positioned(Hopeway)	SIPART PS2 型智能定位器(SIEMENS) SIPART PS2 intelligent positioner (SIEMENS)
用途 Application	<p>1、实现系统信号分程控制，扩大调节范围 To realize system signal split control, expand adjustable range.</p> <p>2、实现控制系统过程的电-气转换 To realize electrical-pneumatic transform for control system process.</p> <p>3、消除调节阀不平衡力对阀位的影响，实现精确控制 To eliminate affect of the control valve unbalanced force on valve position, to realize precise control.</p>	
输入信号 input signal	2 线制 4-20mA 2 wiring system	2 线制 4-20mA 2 wiring system
转动角度 turning angle	20-150mm	3-130mm(直行程 linear motion)
供气压力 Air supply pressure	280 KPa	280 KPa
气源接头 Air supply pressure	1/4 NPT 或 G1/4	1/4 NPT 或 G1/4
电气接头 Electrical connection	PF1/2 或 G1/2	1/2 NPT 或 M20×1.5
防护等级 Protection class	防护等级 Protection class IP 66	IP68/NEMA 4x
使用环境温度 Work ambient temperature	-40~+85℃	-30~+80℃
性能 特性偏差 characteristic deviation	≤0.5%	≤0.2%

指标	滞后性 hysteresis	20ms	10ms
performance	耗气量 air consumption	0.025 Nm ³ /h	0.036 Nm ³ /h
可选项 optional	本体、本体带反馈、本体带 HART 、本体带 HART 带反馈 valve, valve with feedback, valve with HART, valve with HART and Feedback		
其它定位器 other positioner	SVP 系列山武智能定位器 SVP positioner YT-1000R 型机械电气阀门定位器 YT-1000R mechanical-electrical positioner BF-5000 (Bastar Fisher) 智能定位器(CANADA) BF-5000 (Bastar Fisher) intelligent positioned (CANADA)		
其它附件 Other accessories	空气过滤减压阀 Air filter valve	T-50 (HOPEWAY)、AW (SMC)	
	电磁阀 solenoid valve	气源接头 1/4、3/8、1/2 可选; 隔爆, 本安防爆, 浇封防爆可选 Air supply connection 1/4、3/8、1/2 optional; flame explosion-proof, the security explosion-proof, encapsulated explosion-proof,	
	限位开关 limit switch	把阀的开关位置信号传送到控制室, 以便了解现场阀的开关位置情况 Transmit the signal of valve's open/close position to the control room	
	手轮机构 Handwheel	当自动调节出现问题或需要现场手动操作阀门时用来转动阀 Driving the valve in case the automatic adjusting device goes wrong or handwheel operation is required on site.	

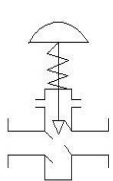
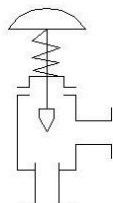
■参考信息 Reference

允许压差 Allowable DP

阀门配用 HA 执行机构 Equipped with HA actuator

表 5 HFS/HFAS 允许压差表 Allowable DP of HFS/HFAS

100Kpa

A 气-关式阀 air to close valve	公称压力 PN	执行机构 Actuator or	供气压力 Air supply	弹簧范围 Spring range	定位器 positioner	允许压差 allowable DP							
						阀座直径或 Cv 值 seat diameter or Cv value							
						Cv≤4.0	Cv=6.3	Cv=12	32	40	50	65	80
	Class 900	HA3D	4.0	0.8~2.4	有 yes	264	264	264	135	91	53	32	22
					有 yes	264	264	260	128	85	48	28	19
	Class 1500	HA4D	4.0	0.8-2.4	有 yes				239	161	95	58	41
					有 yes				232	155	90	54	38
	Class 2500	HA3D	4.0	0.8-2.4	有 yes	425	423	270	270	135	72	53	32
					有 yes	414	410	260	260	128	67	48	28
	Class 2500	HA4D	4.0	0.8-2.4	有 yes	—	—	440	440	239	128	95	58
					有 yes	—	—	440	440	232	123	90	54

注: 1、粗线框内数字表示调节阀配用标准规格执行机构。

2、最大允许压差表不准超过 ANSI B16.34-1981 或 JIS B2201-1984 标准规定的最大工作压力。

3、进口压力 P1 不准超过阀关闭时的最大允许压差。

4、最大允许压差随阀泄漏量不同而变化，用一格内上方数字表示阀泄漏量 $\leq 0.01\%$ ，下方数字表示阀泄漏量 $\leq 0.001\%$ 。

Note:

1. The number in black line indicates that the valve is equipped with standard actuator.

2. The maximum allowable DP shall not exceed the maximum operation pressure specified in ANSI 816.34-1981 or JIS B2201-1984;

3. Inlet pressure P1 shall not exceed the maximum allowable pressure drop when valve closed;

4. The maximum allowable DP is changing as different leakage. In the same column, the upper number stands for leakage $\leq 0.01\%$, the lower number stands for leakage $\leq 0.001\%$.

100Kpa

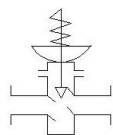
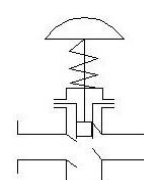
B 气-开式阀 Air to open valve 	公称压力 PN	执行机构 Actuator	供气压力 Air supply	弹簧范围 Spring range	定位器 positioner	允许压差 allowable DP						
						阀座直径或 Cv 值 seat diameter or Cv value						
						Cv ≤ 4.0	Cv=6.3	Cv=12	32	40	50	65
Class 900 Class 1500	HA3R	4.0	0.8~2.4	有	163	161	102	50	32	18	10	7
					152	149	92	42	27	14	7	4
	HA4R	4.0	0.8-2.4	有	187	185	183	91	61	35	21	14
					180	177	173	84	55	30	17	11
Class 2500	HA3R	4.0	0.8-2.4	有	163	161	102	102	50	25	18	10
					152	149	92	92	42	20	14	7
	HA4R	4.0	0.8-2.4	有	187	185	183	183	91	48	35	21
					180	177	173	173	84	43	30	17

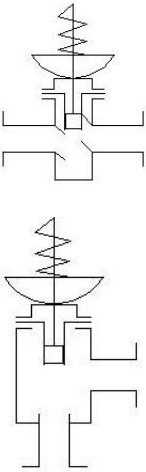
表 6 HFC/HFAC 允许压差表 Allowable DP of HFS/HFAS

100Kpa

A 气-关式阀 Air to close valve 	公称压力 PN	执行机构 Actuator	供气压力 Air supply	弹簧范围 Spring range	允许压差 Allowable DP					
					公称通径 DN					
					40	50	80	100	150	200
Class 900 Class 11500 JIS63K	HA3D	3.5	0.8~2.4	261	233	156	117	64	--	
				264	264	172	118	64	--	
				264	233	156	117	78	--	
				264	264	264	191	117	--	
	HA4D	3.5	0.8-2.4	--	264	264	202	135	95	
				--	264	264	235	142	95	
				--	--	--	202	135	101	
				--	--	--	264	226	158	
Class 2500	HA3D	3.5	0.8-2.4	261	233	212	142	78		

			4.0	0.8-2.4	377	277	249	153	78		
					306	233	212	142	88		
					44	423	381	142	134		
			HA4D		3.5	289	289	289	246	153	135
						440	440	440	195	167	142
					4.0	420	403	367	246	153	135
						440	440	440	440	263	226

100Kpa

B 气-开式阀 Air to open valve	公称 压力 PN	执行 机构 Actuator	供气压力 Air supply	弹簧 范围 Spring range	允许压差 Allowable DP						
					公称口径 DN						
					40	50	80	100	150	200	
	Class 900 Class 1500 JIS63K	HA3R	2.8	0.8~2.4	153	116	78	58	--	--	
			3.0		264	190	113	74	--	--	
			3.5		190	175	113	74	--	--	
		HA4R	2.8		264	190	113	74	--	--	
			3.0		--	189	--	--	--	--	
			3.5		--	190	--	--	--	--	
	Class 2500	HA3R	2.8	0.8-2.4	211	201	135	101	67	50	
			3.0		264	264	227	159	91	57	
			3.5		--	210	203	152	91	57	
			HA4R		2.8	--	264	227	159	91	57
					3.0	--	--	210	159	--	--
					3.5	--	--	227	159	--	--
HA3R		2.8	0.8-2.4	153	116	106	71	44	--		
		3.0		164	190	169	99	45	--		
		3.5		190	175	159	99	45	--		
		HA4R		2.8	264	190	169	99	45	--	
				3.0	--	189	169	--	--	--	
				3.5	--	190	169	--	--	--	
HA4R	2.8	0.8-2.4	211	201	183	123	76	67			
	3.0		440	359	324	203	110	91			
	3.5		--	210	210	184	110	91			
	HA4R		2.8	--	359	324	203	110	91		
			3.0	--	--	--	203	--	--		
			3.5	--	--	--	203	--	--		

- 注：1、粗线框内数字表示调节阀用标准规格执行机构。
 2、最大允许压差不准超过 ANSI B16.34-1981 或 JIS B2201-1984 标准规定的最大值。
 3、进口压力 P1 不准超过阀关闭时的最大允许压差。
 4、同一格内上方数字表示阀常开允许压差，下方数字表示阀全关允许压差。
 5、表上关闭时的允许压差的条件是 $\Delta P = P1(P2=0)$ ，全关时的压差随出口压力 P2 不同稍有变化。

Note:

1. The number in black line indicates that the valve is equipped with standard actuator.

2. The maximum allowable DP shall not exceed the maximum operation pressure specified in ANSI 816.34-1981 or JIS B2201-1984;
3. Inlet pressure P1 shall not exceed the maximum allowable pressure drop when valve closed;
4. In the same column, the upper number stands for allowable DP when normally open, the lower number stands for allowable DP when valve fully closed;
5. The condition of allowable DP when closed is $\Delta P=P1(P2=0)$, closed DP will change slightly as outlet pressure P2 changes.

电/气安装配管线 Tube & Wire for Power/Air Supply Connection

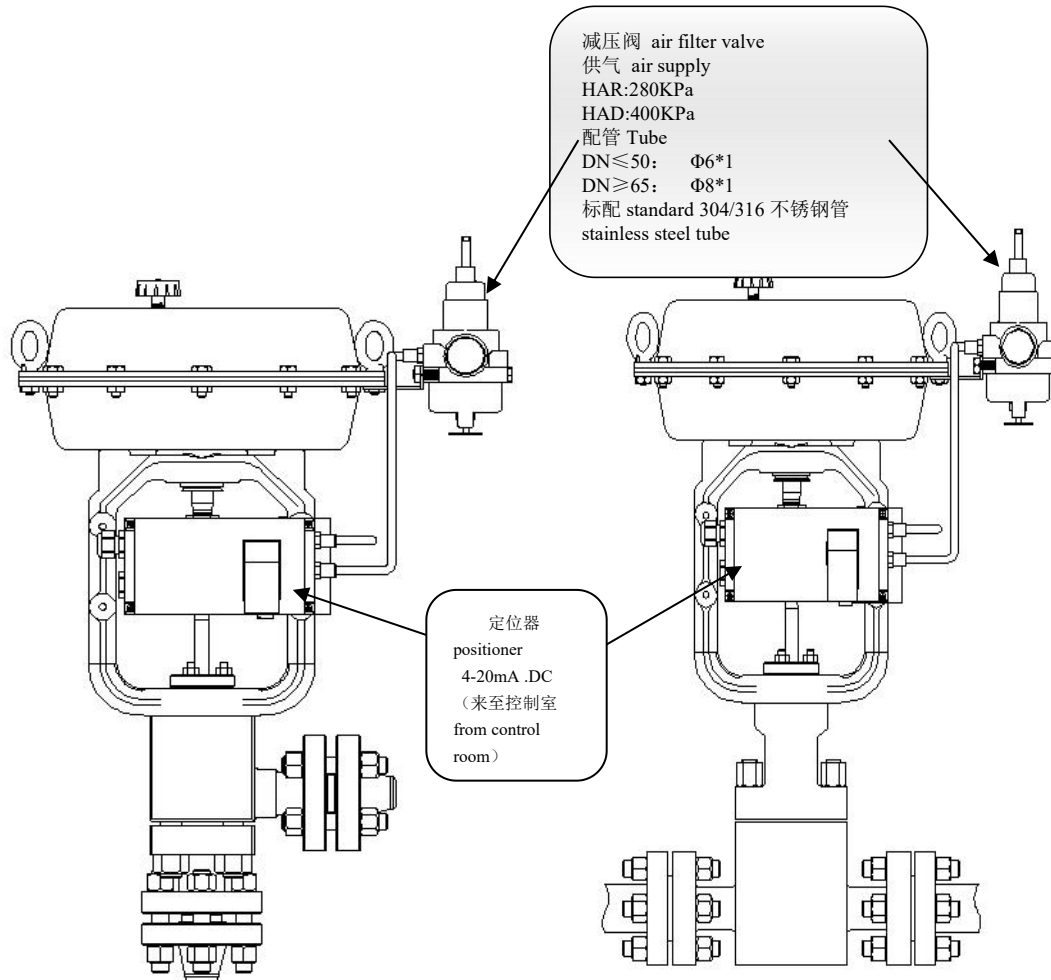


图 11 电气安装配管线

阀门、手轮与管道相对安装示意图 Valve, hand wheel and pipe installation diagram

调节阀不可倾斜安装，水平安装，只能竖直安装，常见的安装方式有以下两种：

Control valve can't be tilted or horizontal installed, it can be vertically installed and the following are two common installation ways.

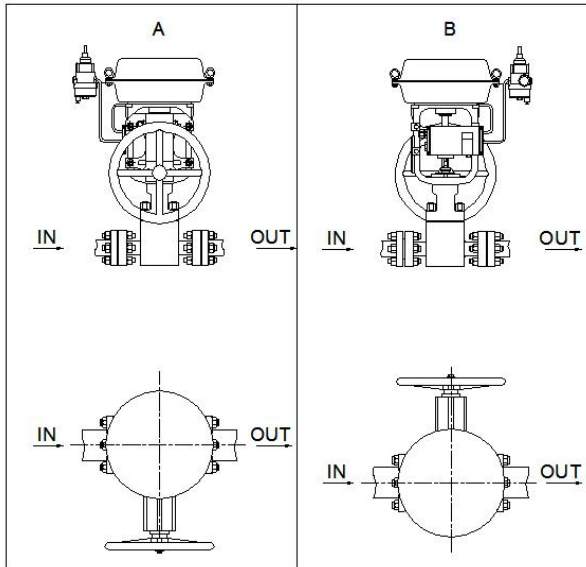


图 12 HFS/HFC 阀门、手轮与管道相对安装示意图

Installation diagram of HFS/HFC

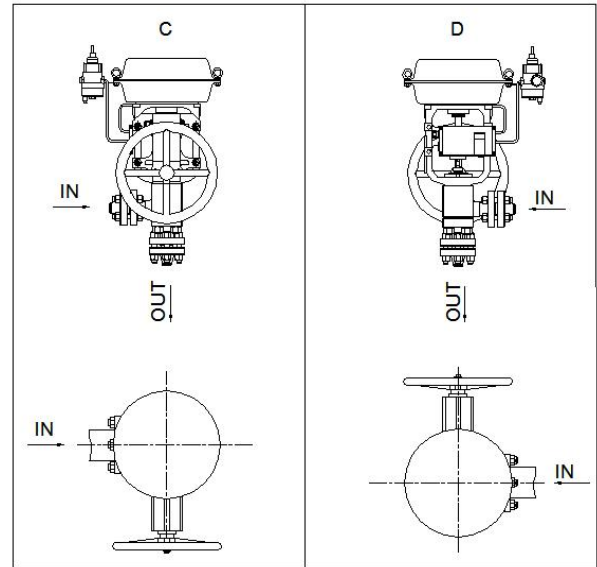


图 13 HFAS/HFAC 阀门、手轮与管道相对安装示意图

Installation diagram of HFAS/HFAC

安装尺寸 Installation dimension

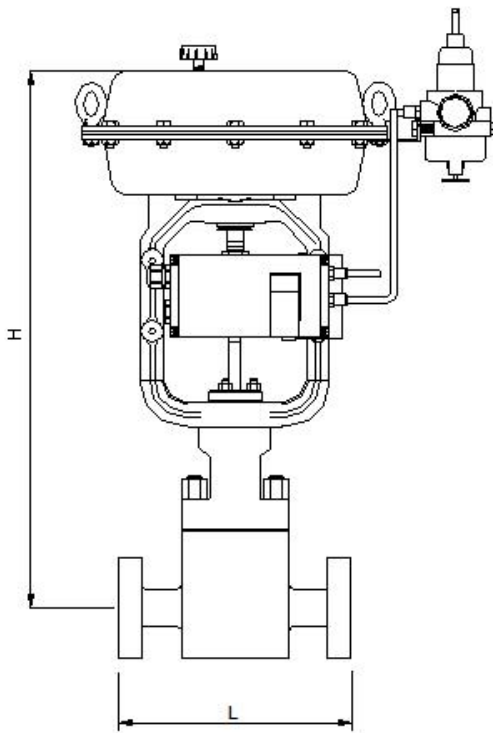


图 14 HFS/HFC 不带手轮安装尺寸图(without handwheel)

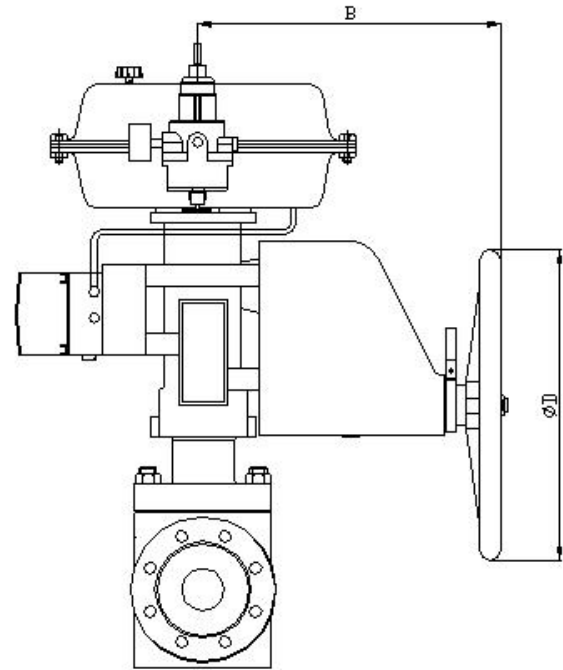


图 15 HFS/HFC 带手轮尺寸图(with handwheel)

表 7: HFS 法兰距尺寸 (参考图 12) Face to face dimension (refer to chart 12)

mm

公称通径 DN	L					
	Class 900		Class 1500		Class 2500	
	RF	RJ	RF	RJ	RF	RJ
25	292	292	292	292	318	318

40	333	333	333	333	358	361
50	375	378	375	378	400	403
80	440	443	460	463	498	504

表 8: HFC 法兰距尺寸 (参考图 12) Face to face dimension (refer to chart 12)

mm

公称通径 DN	L					
	Class 900		Class 1500		Class 2500	
	RF	RJ	RF	RJ	RF	RJ
40	333	333	333	333	358	361
50	375	378	375	378	400	403
80	440	443	460	463	498	504
100	510	513	530	533	575	585
125	715	718	770	776	820	833
150	715	718	770	776	820	833

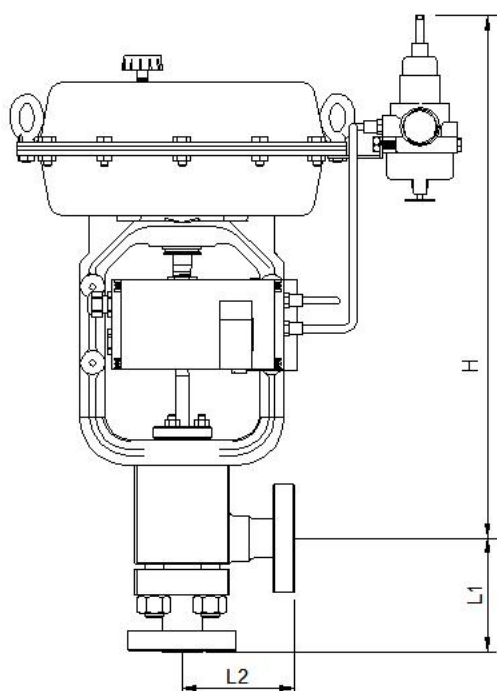


图 16HFAS/HFAC 不带手轮安装尺寸图(Without handwheel)

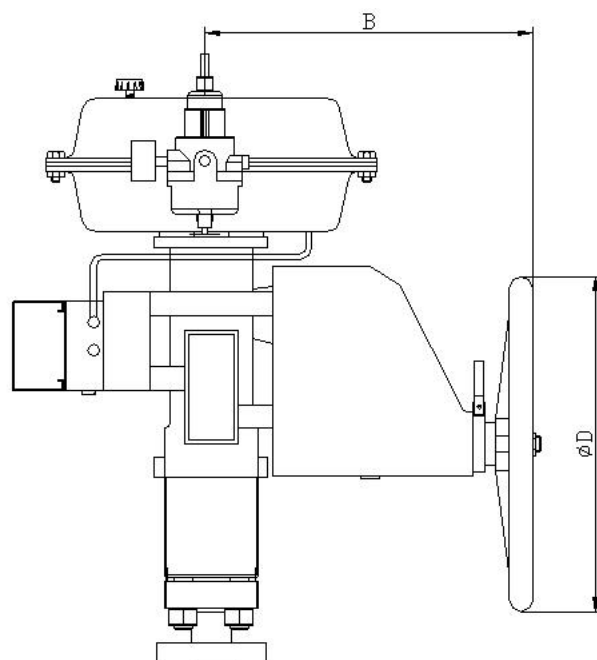


图 17HFAS/HFAC 带手轮尺寸图(with handwheel)

表 9: 整机外形尺寸 Valve external dimension

HFAS/HFAC 角型高压调节阀 HFAS/HFAC High Pressure Angle Control Valve

mm

公称通径 DN	PN220		PN320		H				B	D
	L1	L2	L1	L2	常温型	伸长 I 型	伸长 II 型	伸长 III 型		
					Normal	EXI	EXII	EXIII		
25	120	120	120	120	450	600	760	900	267	202

40	190	165	190	165	500	665	780	1020	267	202
50	225	190	225	190	500	670	785	1025	267	202
80	315	130	335	150	635	820	955	1190	350	355
100	335	150	391	170	660	870	1020	1205	350	355
125	391	170	429	181	766	965	1250	1385	350	355
150	429	181	494	199	785	1045	1255	1390	350	355

选型规则 Rule for Model Selection

选型举例 examples	基本型号 Basic model	-	口径 DN	-	公称压力 PN	-	阀体材质 Body material	/	阀内件材质 Trim material	-	泄漏等级 leakage	-	阀作用方式 Action type
例 1 example 1	HFS	-	25	-	PN220	-	A105	/	304	-	4	-	D
例 2 example 2	HFAS	-	80	-	CL1500	-	304	/ 3	304	-	4	-	R
例 3 example 3	HFC	-	40	-	PN320	-	316	/	316+STL	-	3	-	R
例 4 example 4	HFAC	-	150	-	CL2500	-	316L	/	316L+STL	-	4	-	D
公称 通 径 DN			25 40 50 80 100 125 150										
公称 压力 PN					PN220 PN320 CL900 CL1500 CL2500 其他(注明) others								
阀							A105						

		304			
		316			
		316L			
		其他（注明） others			
内件 材质 Trim material			304		
			316		
			316L		
			其它（注明） others		
泄漏 等级 leakage				III (3)	
				IV (4)	
作用 方式 Action type					气开 R Air to open
					气关 D Air to close

代理商：
Agent:

制造商 Manufacturer:
重庆海王仪器仪表有限公司 Chongqing Hopeway Instrument Co., Ltd.
网址 website: www.cqhw.com