

浙江中德自控科技股份有限公司

Zhejiang Zhongde Automatic Control Science And Technology Joint Stock Co., Ltd.

高性能O型球阀

High Performance O Ball Valve

通过了ISO9001质量体系认证

通过API6D/609产品认证

通过API6FA/607防火认证

通过国家特种设备制造许可“压力管道元件”TS认证

通过CE安全认证

通过HSE认证

通过SIL 产品功能安全认证

通过ISO 15848逸散性认证

中国著名品牌



ZHONGDE TECHNOLOGY

浙江中德自控科技股份有限公司

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企业概述

浙江中德自控科技股份有限公司(原中德机械集团有限公司)是集研发、生产、销售、服务于一体的专业控制阀制造商。自1992年创立以来,中德致力于发展切断阀专业领域技术,使我们始终处于国内切断阀领域的技术领先地位。在我们二十多年的发展历程中,中德人专业、聚焦、坚持不懈来打造切断阀品牌,其中气\电\液动高性能蝶阀、高性能球阀、高温耐磨球阀、高温蝶阀、快速切断闸阀等产品广泛应用于石油、化工、天然气、煤化工等高端领域,并获得了众多用户朋友的高度信任。

中德集团现已拥有专业阀门研究中心和一流的生产平台,并通过了ISO9001:质量体系认证,美国石油学会API6D/609产品认证、API6FA/607防火认证,特种设备压力管道制造许可“TS认证”。是中国石化、中石油、中海油、中化、神华、煤化工等领域的一级供应商。先后被评为“中国著名品牌”,“省级星火示范企业”,“国家高新技术企业”,“省明星企业”,连续五年被工行评为“AAA信用企业”。

“客户的满意我们视之为生命”为此中德在国内建立了十二个直销和服务网络,在服务市场的广度和深度上都具有独创性。我们能满足您的需求,我们给您提供“安全、可靠、省心”产品的同时,我们的产品价值永远大于产品价格。无论您在那里,我们具有丰富经验和专业知识的团队,都能给您提供“认真、负责、快速”的优质服务。我们坚守“一个电话,一天内到达,一次性成功”的服务承诺。

“以人为本,以德兴业”是中德企业文化的核心,是中德人做事的标准,中德人将以“以诚会友,以德待友”来衬托我们过硬的产品质量和一流的服务。中德人厚积薄发,再立潮头,全力打造国家高端切断阀先进制造企业,致力于加快我国切断阀的国产化应用进程,以更好地实现顾客满意度的最大化,中德愿与您精诚合作,共创美好的明天!



BRIEF INTRODUCTION

Zhejiang Zhongde Automatic Control Technology Co., Ltd. (formerly known as Zhongde Machinery Group Co., Ltd.) is a professional control valve manufacturer integrating research, development, production, sale and service. Since its establishment in 1992, Zhongde has been devoted to developing specialized technologies of shut-off valves, keeping us always at the leading position in Chinese shut-off valve industry. During more than twenty years of development, Zhongde personnel are building the brand of shut-off valves with specialization, concentration and perseverance. The products such as high performance butterfly valves, high performance ball valves, high temperature anti-wear ball valves, high temperature butterfly valves and quick shut-off gate valves with pneumatic, electric and electro-hydraulic driving are widely applied in petroleum, chemical industry, natural gas, coal chemical industry and other high-end fields, receiving deep trust from users.

Now Zhongde Group has set up the professional valve research and development center and first-class production platforms. It has successively obtained the ISO9001: quality system certification, API6D/609 product certification, API6FA/607 fire safety certification and special equipment (pressure pipes) manufacturing license TS certification. It is a first-tier supplier of SINOPEC, CNPC, CNOOC, CHEMCHINA, Shenhua Group, coal chemical industry and other fields. It has been successively awarded such honors as "China Famous Brand", "Spark Model Enterprise in Zhejiang Province", "National High-tech Enterprise", "Star Enterprise in Zhejiang Province", and has been approved as a "Class AAA Creditable Enterprise" by the Industrial and Commercial Bank of China for five years in succession.

"Customer satisfaction is regarded as our life". For this, Zhongde has established 12 sales and service networks, which are creative both in breadth and depth of serving the markets. We can meet your demands. We will provide you with safe, reliable and trustworthy products and the value of our products is much higher than their price. Wherever you are, our team will offer serious, responsible, fast and high quality services to you with their rich experience and professional knowledge. We always keep our service promise of "one telephone, arrival within one day and success in one step".

"Human oriented, booming business by morals" is the core idea of Zhongde Enterprise, and the standard followed by Zhongde personnel in conducting themselves and handling affairs. Zhongde personnel will offer high product quality and top-ranking services with the attitude of "meeting friends with sincerity, treating friends with morals". Accumulating profoundly and working ceaselessly and unremittingly, Zhongde personnel are making all efforts to create an advanced manufacturing enterprise of high-end shut-off valves in China, accelerate the process of localization of shut-off valves and realize maximized customer satisfaction. Zhongde hopes to cooperate with you faithfully and create a brilliant future together!

概要

R_{Y/R}系列高性能直通型O型切断球阀，是一种旋转型自动控制球阀，接受开关信号，只需旋转1/4周就能实现阀门开启或关闭作用。可与工业计算机或程序控制器配套使用，广泛应用于石油、化工、冶金、电力、轻工等工业部门的过程自动化控制系统中对管道中输送介质气体、液体、具有良好的切断性能，当全开时其流通能力和管道内径基本相同，流体压力损失极小，因此最适合各种液体、气体、料浆粉末类介质流体等切断控制。

本产品具有密封性能优良，使用寿命长、流阻系数小、流通能力大，结构简单合理，易于维修、保养等特点。

执行机构采用横推式气动执行机构与阀门组合为标准产品，也可与电动或液动执行机构组合。（见图1和图2）

特点

- 流路畅通：流阻小、流量大
- 耐磨性强：密封面喷涂或堆硬质合金，球体、阀座表面硬度可达到HRC64~68
- 密封性能好：泄漏量小、硬密封为class VI、软密封为零泄漏
- 安装流向不限：双向密封，安装方便
- 防火防静电：满足API607/6FA要求，设有防静电装置
- 阀杆防飞出：阀杆设有防飞出台阶，防喷出
- 结构紧凑：体积小，重量轻、便于维护



图1 气动高性能球阀
Figure 1 pneumatic high performance ball valve

Summary

The RY/R series high performance straight-through O shut-off ball valve is a kind of rotary automatic control ball valve. After receiving the switching signal, it only needs to turn 1/4 circle, and the valve opening or closing function can be realized. It can be used with industrial computer or programmed controller. It is widely used for playing the shut-off function in conveying media such as gas and liquid in the pipes in petroleum, chemical industry, metallurgy, electric power, light industry, etc. When it is fully opened, its flow capacity is basically same as the pipe inside diameter. The fluid pressure loss is very low. Therefore, it is very suitable for shut-off control of various liquids, gases, slurries, powders and other fluids.

The product has such features as good sealing performance, long service life, low flow resistance coefficient, high flow capacity, simple and reasonable structure, easy maintenance and servicing, etc.

The product combined with the horizontal push type pneumatic actuator is the standard product. The product can also be combined with electric or hydraulic actuator (see figure 1 and figure 2).

Features

- Smooth flow channel: low flow resistance and high flow
- Good anti-wear performance: The sealing face is subjected to hard alloy spray coating or overlaying welding. The ball and seat surface hardness can reach HRC64~68.
- Good sealing performance: low leakage, class VI for hard seal, zero leakage for soft seal
- Installation flow direction is not limited: two-way sealing, convenient installation
- Fireproof and antistatic: meeting API607/6FA requirements. Provided with the antistatic device
- Blow-out proof stem: The stem is provided with blow-out proof steps to prevent blow-out.
- Compact structure: small volume, light weight, easy maintenance



图2 电动高性能球阀
Figure 2 electric high performance ball valve

主要技术参数

阀体
型式：二体式、三体式
公称通径：1/2" ~ 40"
公称压力：ANSI 150LB ~ 2500LB
连接方式：法兰连接
材质：A216 WCB、A217 WC5、A217 WC9、A351 CF8、A351 CF8M (或按用户要求)
结构长度：见表5-1~8-2(P13~18)
阀盖：标准型-29~+250℃
加长型+251~+350℃ -46 ~ -30℃
散热片型 ≥ +351℃
各种材料的使用温度、压力范围。见表1(P5)
填料：PTFE，柔性石墨，镍基丝增强柔性石墨
阀体涂层：银灰色(环氧树脂)。当本体为不锈钢时，不加涂层

阀内组件

阀芯型式：O型直通式
阀芯材料：A105、A182-F6a、A182-F304、A182-F316(或按用户要求)
阀座材质：软密封(R)：PTFE、RTFE、PPL、DEVILON、PEEK
硬密封(Y)：A105、A182-F6a、A182-F304、A182-F316
阀体、阀芯、阀座、阀杆等材质组合、表面处理
请参见表2-1 ~ 2-3(P6~7)
流量特性：快开特性
额定Kv值：请参见表3(P8)
额定行程：0 ~ 90°
阀座泄露率：软密封为零泄漏，硬密封为ANSI Class IV~VI
最大关闭压力：请参见表4-1 ~ 4-3(P11~12)
外型尺寸：请参见表5-1~8-2(P13~18)
产品重量：请参见表5-1~8-2(P13~18)

Main technical parameters

Body
Type: two-piece type, three-piece type
Nominal diameter: 1/2" ~ 40"
Nominal pressure: ANSI 150LB ~ 2500LB
Type of connection: flange connection
Materials: A216 WCB、A217 WC5、A217 WC9、A351 CF8、A351 CF8M (or according to user requirements)
Face-to-face dimensions: See the table 5-1~8-2(P13~18).
Bonnet: Standard type -29~+250℃
Extended type +251~+350℃ -46 ~ -30℃
Radiation fin type ≥ +351℃
The range of working temperature and pressure for different materials. See table 1(P5).
Packing: PTFE, flexible graphite, nickel-based wire reinforced flexible graphite.
Body coating: silver grey (epoxy resin). No coating shall be added if the body material is stainless steel.

Trim

Plug type: O straight-through type
Plug materials: A105、A182-F6a、A182-F304、A182-F316(or according to user requirements)
Seat materials: soft seal (R): PTFE、RTFE、PPL、DEVILON、PEEK
Hard seal (Y): A105、A182-F6a、A182-F304、A182-F316 Body, valve core, valve seat, stem and other material combination, surface treatment, For details, see Table 2-1 to 2-3(P6~7).
Flow characteristics: quick open characteristics
Rated Kv value: Please refer to the table 3(P8).
Rated travel: 0 ~ 90°
Seat leakage: zero leakage for soft seal, ANSI Class IV~VI for hard seal
Maximum closing pressure: Please refer to the table 4-1 ~ 4-3(P11~12).
Outline dimensions: Please refer to the table 5-1~8-2(P13~18).
Product weight: Please refer to the table 5-1~8-2(P13~18)

高性能O型球阀
High Performance O Ball Valve



执行机构 Actuator

规格 Specification	型号 Model	气缸式 Cylinder type		电动式 Electric type	电液联动式 Electro-hydraulic type
		ZSS/ZSH	ZST	ZDJ	ZYDZ
		双作用 Double acting	单作用 Single acting	双作用 Double acting	单作用 Single acting
用途 Purpose		通断 On-off		通断 On-off	
操作源 Operating source		气压 Air pressure 0.35 ~ 0.7Mpa(G)		电源 Power supply 220VAC 50Hz, 380VAC 50Hz	
输入范围 Input range		通断; 电磁阀通电 On - off: Solenoid valve is energized		通断 On-off 24VDC, 48VDC, 220VAC	
动作 Action		阀开或阀闭 Valve open or closed		通断: 通电阀开或阀闭 On-off: The valve is opened or closed when powered on	
允许环境温度 Allowable ambient temperature		-40℃ ~ +80℃		-40℃ ~ +80℃	
执行器涂层色 Actuator coating color		橘红色 (环氧树脂) 或用户要求 Orange (epoxy resin) or user requirements		随外购执行器 Actuator	
选购设备 Optional equipment		手动操作机构、限位开关、气控阀 空气过滤减压阀、电磁阀、储气罐、锁止阀及其他 Manual operation mechanism, limit switch, gas control valve Air filter pressure reducing valve, solenoid valve, air storage tank, lock valve and other		手动操作机构、限位开关、输入/输出模拟信号 浪涌保护器、阀位变送器、扭矩开关及其他 Manual operating mechanism, limit switch, input/output analogue signal, surge protector, valve position transducer, torque switch and others	

表1 阀体材料的使用温度、压力范围

Table 1 Range of working temperature and pressure for body materials

单位 Unit: bar(G)

温度℃ Temperature	150#				300#				600#				900#				1500#				2500#			
	WCB	WC5	CF8	CF8M	WCB	WC5	CF8	CF8M	WCB	WC5	CF8	CF8M	WCB	WC5	CF8	CF8M	WCB	WC5	CF8	CF8M	WCB	WC5	CF8	CF8M
-29~+38	19.6	19.8	19.2	19.2	51.1	51.7	49.6	49.6	102.1	103.4	99.2	99.3	153.2	155.1	149.9	148.9	255.3	258.6	248.2	248.2	425.5	430.9	413.7	413.7
+50	19.2	19.5	18.4	18.4	50.1	51.7	47.8	48.1	100.2	103.4	95.7	96.3	150.4	155.1	143.5	144.3	250.6	258.6	239.1	240.6	417.7	430.9	398.5	400.9
+100	17.7	17.7	15.8	15.8	46.4	51.5	40.9	42.2	92.8	103.1	81.8	84.4	139.8	154.6	122.6	126.6	233.0	257.6	204.3	211.0	388.3	429.4	340.4	351.6
+150	15.8	15.8	14.0	14.0	46.1	50.3	36.3	38.6	90.5	100.3	72.7	77.0	135.2	150.6	111.0	115.5	225.4	250.8	185.0	192.5	375.6	418.2	308.4	320.8
+200	14.0	13.8	12.6	12.6	44.7	48.6	32.8	35.7	87.6	97.2	65.5	71.3	131.4	145.8	103.4	107.0	219.0	243.4	172.4	178.3	365.0	405.4	287.3	297.2
+250	12.1	12.1	11.7	11.7	41.8	46.3	30.5	33.5	83.4	92.7	61.1	66.8	125.8	139.0	97.5	100.1	209.7	231.8	162.4	166.9	349.5	386.2	270.7	278.1
+300	10.2	10.2	10.2	10.2	38.7	42.9	29.1	31.6	77.5	85.7	58.1	63.3	119.5	128.6	92.7	94.9	199.1	214.4	154.6	158.1	331.8	357.1	257.6	263.5
+350	8.4	8.4	8.4	8.4	36.5	40.3	28.2	30.4	73.9	80.4	56.1	60.8	112.7	120.7	88.9	91.0	187.8	201.1	148.1	151.6	313.0	335.3	246.9	252.7
+375	7.4	7.4	7.4	7.4	34.5	38.9	27.8	29.7	72.9	77.6	55.5	59.4	109.1	116.5	87.1	89.6	181.8	194.1	145.2	149.4	303.1	323.2	241.9	249.0
+400	6.5	6.5	6.5	6.5	34.5	36.5	27.5	29.2	69.0	73.2	54.9	58.2	104.2	109.8	85.3	88.3	173.6	183.1	142.2	147.2	289.3	304.9	237.0	245.3
+425	5.5	5.5	4.5	5.6	28.8	35.2	27.2	28.7	57.5	70.0	54.3	57.3	86.3	105.1	84.0	87.4	143.8	175.1	140.0	145.7	239.7	291.6	233.3	242.9
+450	-	4.7	4.7	4.7	-	33.7	26.9	28.2	-	67.7	53.7	56.2	-	101.4	82.2	86.5	-	169.0	137.0	144.2	-	281.8	228.4	240.4
+475	-	3.7	3.7	3.7	-	26.7	26.6	27.4	-	63.4	53.1	54.7	-	95.1	80.8	86.0	-	158.2	134.7	143.4	-	263.9	224.5	238.9
+500	-	2.8	2.8	2.8	-	13.9	26.1	26.8	-	53.4	52.1	53.7	-	80.1	79.5	84.7	-	133.4	132.4	140.9	-	222.4	220.7	235.0
+538	-	1.4	1.4	1.4	-	12.6	24.4	25.2	-	27.9	48.9	50.0	-	41.8	73.3	75.2	-	69.7	122.1	125.5	-	116.2	203.6	208.9
+575	-	1.4	1.4	1.4	-	7.2	20.8	24.0	-	25.2	41.7	47.9	-	21.5	62.5	71.8	-	35.9	104.2	119.7	-	59.8	173.7	199.5

注：CF8和CF8M用于温度超过538℃时，碳含量需大于或等于0.04%。

Note: CF8 and CF8M must have a carbon content greater than or equal to 0.04% when the temperature exceeds 538℃.

表2 阀体、阀内件材质组合及使用温度范围、阀门检验与试验

Table 2 Body and trim material combination and working temperature range, valve inspection and testing

密封形式 Seal form		软密封 Soft seal	金属硬密封 Metal hard seal	防火型密封 Fireproof seal	金属硬密封 Metal hard seal
阀体材质 Valve body material		A216 WCB			A217 WC5
阀芯 Valve core	材质 Material	A105 / A182-F6a	A182 F304 / A182 F316	A182 F304 / A182 F316	A182 F304 / A182 F316
	处理 Treatment	表面硬化处理 Surface hardening treatment	表面喷涂STL Surface STL spray coating	表面喷涂STL Surface STL spray coating	表面喷涂STL Surface STL spray coating
阀座 Seat	材质 Material	PTFE / RTFE / PPL/DEVLON/PEEK	A182 F304 / A182 F316	A182 F304 / A182 F316 +弹性密封	A182 F304 / A182 F316
	处理 Treatment		密封面堆焊/喷涂STL STL overlaying welding/spray coating on the sealing face	密封面堆焊/喷涂STL STL overlaying welding/spray coating on the sealing face	密封面堆焊/喷涂STL STL overlaying welding/spray coating on the sealing face
压板 Pressing plate	材质 Material	A216 WCB	A216 WCB	A216 WCB	A217 WC5
阀杆 Stem	材质 Material	A276 420/ A564 T630	A276 420/ A564 T630	A564 T630/ XM-19	A564 T630/ XM-19
	处理 Treatment	调质/固溶+时效处理 Quenching and tempering/solid solution + ageing treatment			
导向轴套 Guiding shaft sleeve	材质 Material	A182 F304	A182 F304	A182 F304	高温合金 High temperature alloy
	处理 Treatment	渗氮/ 喷涂 Nitriding/spray coating			渗氮/ 喷涂 Nitriding/spray coating
使用温度范围℃ Working temperature range °C		-29~300	-29~425	-29~300	-29~525
填料 Packing		PTFE, 柔性石墨, 镍基丝增强柔性石墨 Flexible graphite, nickel-based wire reinforced flexible graphite			
阀门检验与试验 Valve inspection and testing		ANSI/FCI 70-2/API 598			

表2-2 阀体材质：低温碳钢(A352 LCB)

Table 2-2 Body material: cryogenic carbon steel (A352 LCB)

密封形式 Seal form		软密封 Soft seal	金属硬密封 Metal hard seal	防火型密封 Fireproof seal
阀体材质 Valve body material		A352 LCB	A352 LCB	A352 LCB
阀芯 Valve core	材质 Material	A182 F304 / A182 F316	A182 F304 / A182 F316	A182 F304 / A182 F316
	处理 Treatment	表面硬化处理 Surface hardening treatment	表面喷涂STL Surface STL spray coating	表面喷涂STL Surface STL spray coating
阀座 Seat	材质 Material	PTFE / RTFE / PPL/DEVLON/PEEK	A182 F304 / A182 F316	A182 F304 / A182 F316+弹性密封
	处理 Treatment		密封面堆焊/喷涂STL STL overlaying welding/spray coating on the sealing face	密封面堆焊/喷涂STL STL overlaying welding/spray coating on the sealing face
压板 Pressing plate	材质 Material	A352 LCB	A352 LCB	A352 LCB
阀杆 Stem	材质 Material	A564 T630 / XM-19	A564 T630 / XM-19	A564 T630 / XM-19
	处理 Treatment	调质/固溶+时效处理 Quenching and tempering/solid solution + ageing treatment		
导向轴套 Guiding shaft sleeve	材质 Material	A182 F304	A182 F304	A182 F304
	处理 Treatment	渗氮/ 喷涂 Nitriding/spray coating		
使用温度范围℃ Working temperature range °C		-46~300	-46~345	-46~300
填料 Packing		PTFE, 柔性石墨, 镍基丝增强柔性石墨 PTFE, Flexible graphite, nickel-based wire reinforced flexible graphite		
阀门检验与试验 Valve inspection and testing		ANSI/FCI 70-2/API 598		

表2-3 阀体材质：不锈钢（A351 CF8、A351 CF8M）
Table2-3 Body material: Stainless steel(A351 CF8、A351 CF8M)

密封形式 Seal form		软密封	金属硬密封	防火型密封
阀体材质 Valve body material		A351 CF8 / CF8M	A351 CF8 / CF8M	A351 CF8 / CF8M
阀芯 Valve core	材质 Material	A182 F304 / A182 F316	A182 F304 / A182 F316	A182 F304 / A182 F316
	处理 Treatment	表面硬化处理 Surface hardening treatment	表面喷涂STL Surface STL spray coating	表面喷涂STL Surface STL spray coating
阀座 Seat	材质 Material	PTFE / RTFE / PPL/DEVLON/PEEK	A182 F304 / A182 F316	A182 F304 / A182 F316 +弹性密封
	处理 Treatment		密封面堆焊/喷涂STL STL overlaying welding/spray coating on the sealing face	密封面堆焊/喷涂STL STL overlaying welding/spray coating on the sealing face
压板 Pressing plate	材质 Material	A351 CF8 / CF8M	A351 CF8 / CF8M	A351 CF8 / CF8M
阀杆 Stem	材质 Material	A564 T630 / XM-19	A564 T630 / XM-19	A564 T630 / XM-19
	处理 Treatment	调质/固溶+时效处理 Quenching and tempering/solid solution + ageing treatment		
导向轴套 Guiding shaft sleeve	材质 Material	A182 F304	高温合金 High temperature alloy	A182 F304
	处理 Treatment	渗氮/喷涂 Nitriding/spray coating		渗氮/喷涂 Nitriding/spray coating
使用温度范围℃ Working temperature range °C		-46~300	-46~550	-46~300
填料 Packing		PTFE, 柔性石墨, 镍基丝增强柔性石墨 Flexible graphite, nickel-based wire reinforced flexible graphite		
阀门检验与试验 Valve inspection and testing		ANSI/FCI 70-2/API 598		

注：当A351-CF8/CF8M用于超低温流体时，耐压部的含镍量必须在9.5%以上。
Note: When A351-CF8 is used for ultra-low temperature fluid, the nickel content of pressure withstanding part must be more than 9.5%.

填料使用温度、压力范围
Packing Working temperature and pressure range

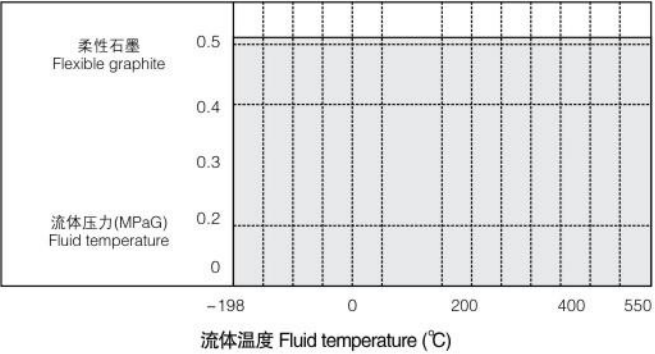
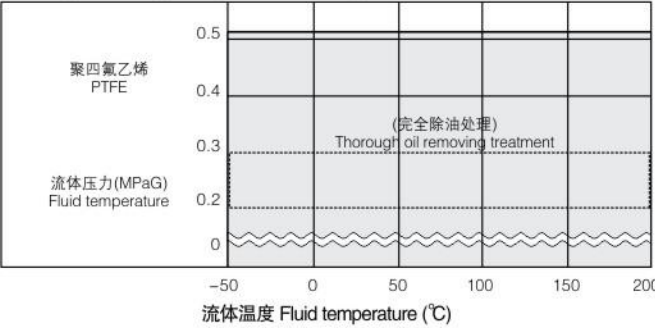


图3 球阀流量特性曲线
Fig. 3 Ball valve flow characteristic curve

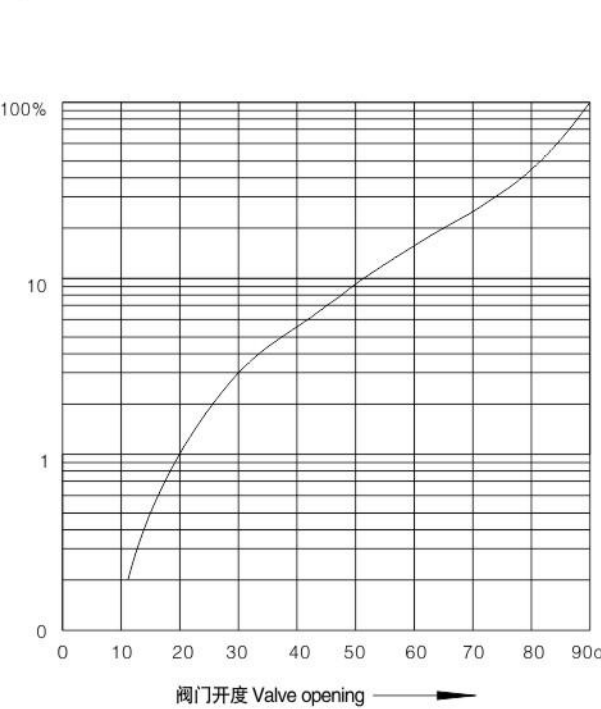


表3 O型球阀额定流量系数KV值
Table 3 Rated flow coefficient KV value of O-type ball valve

公称口径DN(mm) Nominal diameter	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
流量系数KV Discharge coefficient	17	28	72	106	170	240	337	510	940	1450	2230	3610	5000	7400	10500	14700	21300	32500	44850	61890	85410	106500	133400

图4 O型直通球阀阀体构造、主要零部件分解图
Figure 4 O straight-through ball valve body construction and exploded view of main parts

O型高性能球阀球体分两种结构：浮动式和固定式
The body of O high performance ball valve includes two kinds of structures: floating type and fixing type

图4-1 浮动式结构
Figure 4-1 Floating type construction

密封原理：浮动式球阀的球体是浮动的，在介质压力作用球体球面时，产生一定的位移并紧压在出口端阀座的密封面上，保证出口端密封。一般用于中低压球阀。
Sealing principle: The ball of the floating type ball valve is floating. When the medium pressure acts on ball face, certain displacement will be produced and the ball will be pressed tightly on the sealing face of valve seat at the outlet end, ensuring sealing at the outlet end. It is generally used for low and medium pressure ball valves.

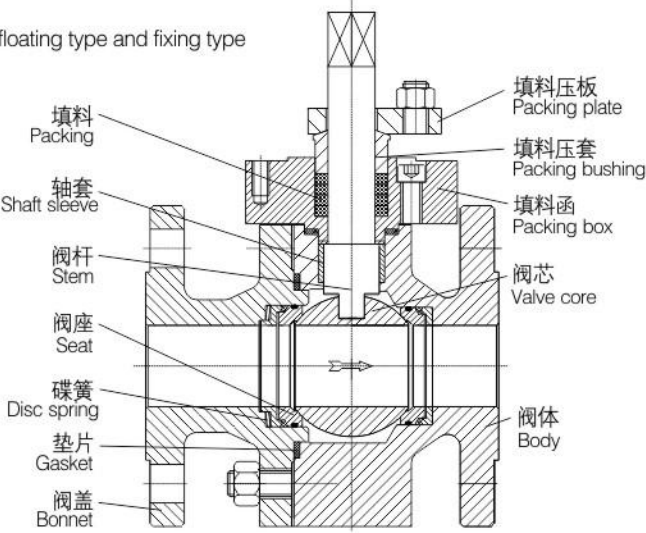


图4-1 浮动式球阀结构图
Figure 4-1 structural figure of floating type ball valve

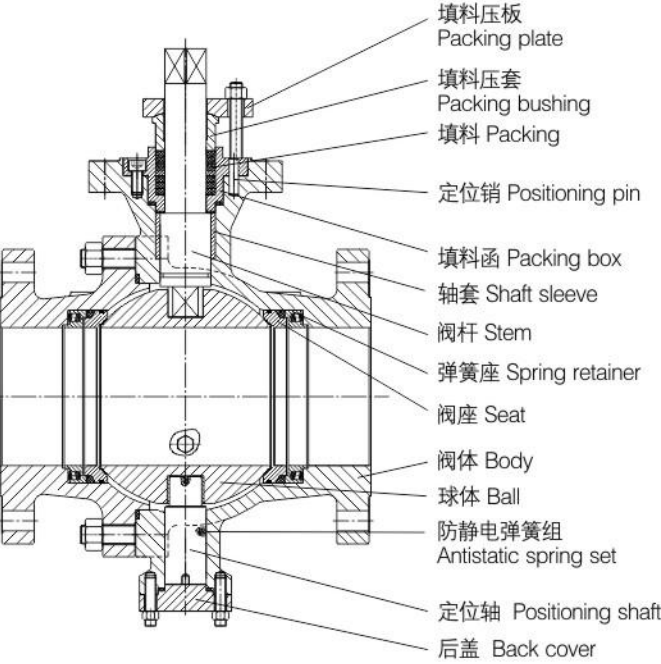
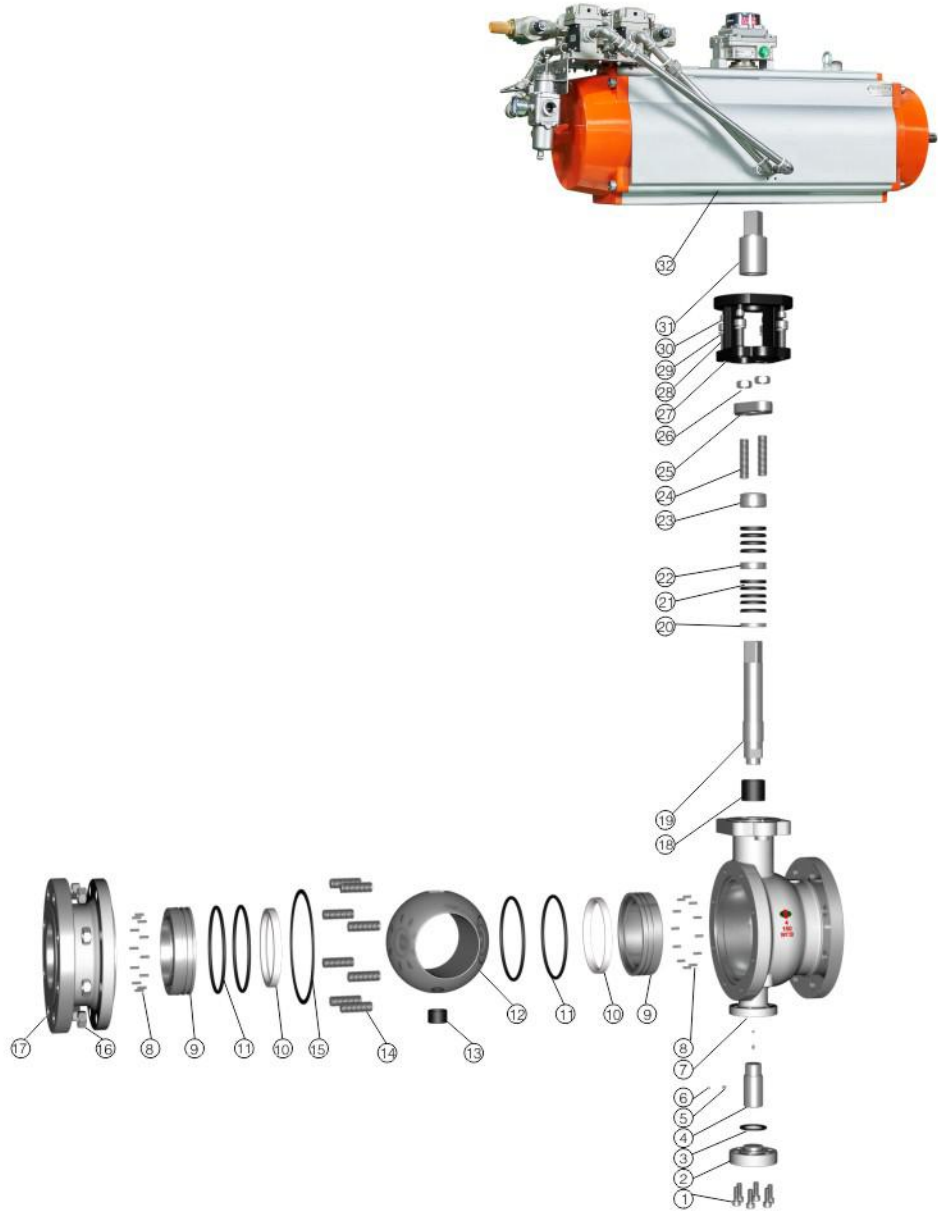


图4-2 固定球阀结构图
Figure 4-2 structural figure of fixing type ball valve

图4-2 固定式结构
Figure 4-2 fixing type structure

密封原理：固定式球阀的球体是通过阀体上部阀杆与底部的定位轴固定，采用弹簧(或碟簧)预紧阀座组件，使阀座密封面贴合球体表面。同时利用介质压力作用在阀座有限截面积上，推动阀座更紧密的贴合球体，实现很好密封。阀门设有两个阀座，每个方向都能密封，因而安装没有流向限制，为双向密封。
Sealing principle: The ball of the fixing type ball valve is fixed through the stem at the top of the body and the positioning shaft at the bottom. The spring (or disc spring) is adopted for pre-tightening the seat assembly so as to make the seat sealing face closely contact the ball face. Meanwhile, the medium pressure acts on the limit sectional area of valve seat to push the seat to contact the ball more closely, realizing good sealing. The valve is provided with two seats, which can realize sealing at each direction. Therefore, the installation is not limited by flow direction. It can realize two-way sealing.

图4-3 球阀主要零部件分解图
Figure 4-3 Ball valve exploded view of main parts



1	内六角螺钉 Inner hexagon screw	7	阀体 Body	13	阀芯衬套 Plug sleeve	19	阀杆 Stem	25	填料压板 Packing plate	31	连接轴 Connection shaft
2	后盖 Back cover	8	阀座弹簧 Valve seat spring	14	双头螺栓 Stud	20	填料垫片 Packing gasket	26	六角螺母 Hexagon nut	32	ZSH执行器 ZSH Actuator
3	密封垫片 Sealing gasket	9	基座 Base	15	金属缠绕垫片 Metal wound gasket	21	填料 Packing	27	支架 Yoke		
4	定位轴 Positioning shaft	10	阀座 Seat	16	六角螺母 Hexagon nut	22	填料隔环 Packing spacer ring	28	阀体连接螺栓 Body connection bolt		
5	防静电弹簧组(弹簧) Antistatic spring set (spring)	11	密封圈 Seal ring	17	阀盖 Bonnet	23	填料压套 Packing bushing	29	弹垫 Spring washer		
6	防静电弹簧组(钢珠) Antistatic spring set (steel ball)	12	球体 Ball	18	轴套 Shaft sleeve	24	全螺纹螺杆 Full thread screw	30	执行器连接螺母 Actuator connecting nut		

图5 球阀密封原理 Figure 5 sealing principle of ball valve

图5-1 软密封结构 Figure 5-1 soft seal structure

采用PTFE、RTFE、PPL做为密封阀座，球体研磨抛光，弹簧（或碟簧）预紧。密封达零泄露。使用温度为-40~300℃。
PTFE, RTFE and PPL are adopted for sealing seat. The ball is grinded and polished. Spring (or disc spring) pre-tightening is adopted. The sealing can reach zero leakage. The working temperature is -40~300℃.

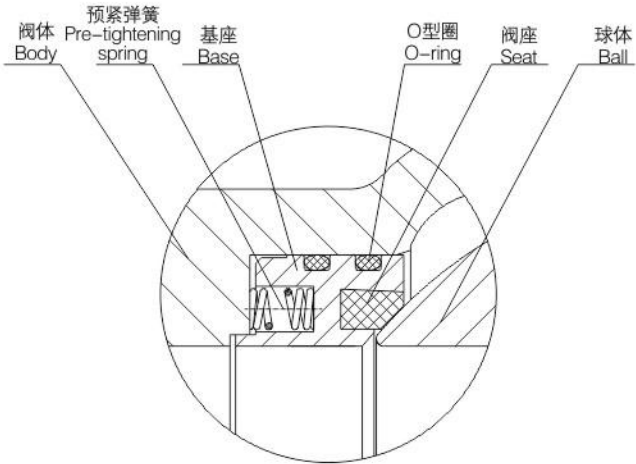


图5-1 软密封结构示意图
Figure 5-1 schematic figure of soft seal structure

图5-2 硬密封结构 Figure 5-2 hard seal structure

采用金属材料做阀座，密封面堆焊或喷涂司太莱合金，球体整体喷涂司太莱合金，磨球面，再精研磨密封副。弹簧（或碟簧）预紧。密封达VI级。使用温度为-46~550℃。
The seat is made of metal materials, and the sealing face is subjected to Stellite overlaying welding or spray coating. The ball is totally subjected to Stellite spray coating. The ball face is grinded, and the sealing pair is subjected to fine grinding. Spring (or disc spring) pre-tightening is adopted. The sealing can reach Class VI. The working temperature is -46~550℃.

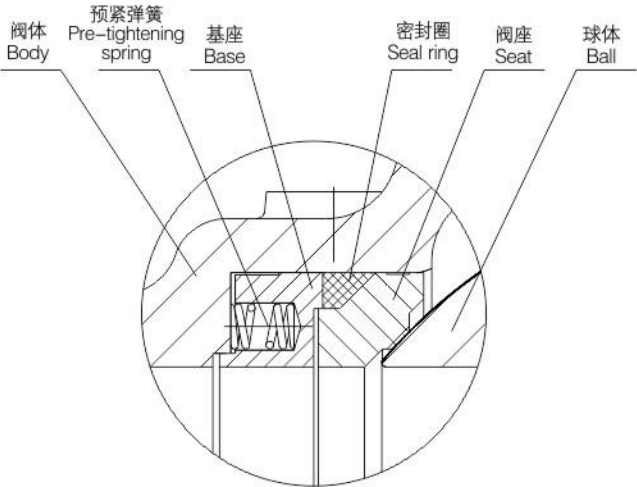


图5-2 硬密封结构示意图
Figure 5-2 schematic figure of hard seal structure

图5-3 防火型密封结构 Figure 5-3 fireproof sealing structure

采用金属和弹性工程塑料材料做组合阀座，形成复合密封，金属密封面堆焊或喷涂司太莱合金，当发生火灾而使弹性密封圈烧损时，球阀的各个密封部位均能形成金属对金属的硬密封结构。球体整体喷涂司太莱合金，球体表面进行磨削后再与阀座金属密封面进行精研磨密封副。弹簧（或碟簧）预紧。具有自动补偿及自洁功能。初始密封为零泄露，当着火烧掉弹性密封圈后，通过弹簧（或碟簧）推动阀座组件贴合球体形成二次密封，密封达V级。使用温度为-46~300℃。

The metal and elastic engineering plastic materials are used to make the compound seat and form compound sealing. The metal sealing face is subjected to Stellite overlaying welding or spray coating. When the elastic seal ring is burnt in case of fire, the sealing parts of the ball valve can form metal to metal hard sealing structure. The ball is totally subjected to Stellite spray coating. After the ball face is grinded, the seat metal sealing face is subjected to fine grinding. Spring (or disc spring) pre-tightening is adopted. It has automatic compensation and self-cleaning function. The initial sealing is zero leakage. When the elastic seal ring is burnt in case of fire, the spring (or disc spring) pushes the seat assembly to contact closely the ball to form the secondary sealing. The sealing can reach Class V. The working temperature is -46~300℃.

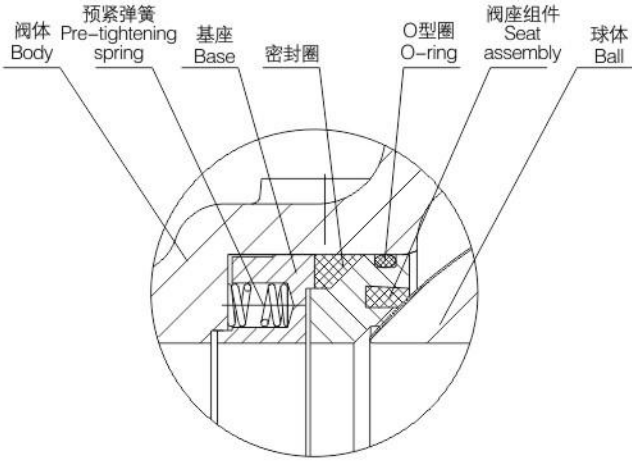


图5-3 防火型密封结构示意图
Figure 5-3 schematic figure of fireproof sealing structure

最大关闭压差(bar) Maximum closing differential pressure(bar)

表4-1 执行机构：双动作型立推式执行器(ZSC/ZSH-D) Table4-1 Actuator: Double acting vertical push type actuator(ZSS)

执行机构型号 Actuator model		ZSC 075D	ZSC 083D	ZSC 092D	ZSC 105D	ZSC 125D	ZSC 140D	ZSC 160D	ZSC 190D	ZSC210D /ZSH0 ~200D	ZSC240D /ZSH1 ~250D	ZSC270D /ZSH1 ~300D	ZSC300D /ZSH2 ~300D	ZSH3 = 400D	ZSH4 = 450D	ZSH4 = 500D	ZSH5 = 550D	ZSH5 = 600D	ZSH7 = 700D	ZSH8 = 800D	ZSH9 = 900D	ZSH9 = 1000D
阀门口径 Valve size	气源压力Bar G Air supply pressure																					
1/2"	4	13.5	22.3	37.6																		
1"	4	5.23	16.5	26.5	40.2	51.6	72.7	96.5														
1-1/2"	4		4.61	14.6	29.3	38.6	52.6	67.3	92.4													
2"	4			5.65	18.9	26.3	45.2	54.1	71.2	98.5												
3"	4				8.22	14.5	29.5	42.5	59.3	80.6	102.3											
4"	4					7.51	17.3	30.1	38.7	48.5	68.4	113.1										
5"	4						7.33	15.3	23.3	32.7	45.0	75.6										
6"	4							5.66	9.55	20.8	29.6	43.8	52.3	85.3								
8"	4								3.20	8.51	16.5	28.5	39.5	50.5	77.2	104.5						
10"	4										4.52	19.2	26.8	34.4	52.1	64.5						
12"	4											6.52	12.5	22.6	38.1	48.3	72.9					
14"	4												5.68	14.3	24.9	32.6	49.6	73.7				
16"	4														6.26	13.1	33.3	51.9				
18"	4															4.63	15.3	20.4	55.1			
20"	4																9.82	13.5	22.9	40.3		
24"	4																2.54	6.81	12.3	26.6	38.5	
28"	4																		5.75	15.8	23.3	
32"	4																			9.63	14.5	24.8
36"	4																			4.25	7.42	18.5
40"	4																				4.56	9.32

表4-2 执行机构：双动作型立推式执行器(ZSS-D) Table4-2 Actuator: Double acting vertical push type actuator(ZSS)

执行机构型号 Actuator model	阀门口径 Valve size	气源压力 Bar G Air supply pressure	ZSS4	ZSS5	ZSS6	ZSS7	ZSS8	ZSS9	ZSS10	ZSS11	ZSS12
6"	4	10.3	16.7	22.5	35.8						
8"	4	5.20	8.93	15.9	27.5	33.6					
10"	4		2.05	8.99	16.8	22.3	40.5				
12"	4			3.25	9.20	14.0	26.3	32.4			
14"	4					7.25	12.4	19.6	29.9		
16"	4						5.33	10.1	17.8	30.7	
18"	4							3.02	9.56	19.8	
20"	4								3.24	12.5	

表4-3 执行机构：单动作型横推式执行器(ZSC/ZSH-S) Table4-3 Actuator: Single acting horizontal push type actuator(ZSC/ZSH-S)

执行机构型号 Actuator model	阀门口径 Valve size	气源压力 Bar G Air supply pressure	ZSC083S	ZSC105S	ZSC125S	ZSC140S	ZSC160S	ZSC190S	ZSC210S/ ZSH0-200S	ZSC240S/ ZSH1-250S	ZSC270S/ ZSH1-300S	ZSC300S/ ZSH2-350S	ZSH3-400S	ZSH4-500S
1/2"	4	11.2	24.5	38.4										
1"	4	5.30	10.3	22.5	30.6									
1-1/2"	4		4.78	9.40	17.4	26.3								
2"	4			3.38	8.34	18.3	38.4	55.3						
3"	4				4.23	9.92	20.1	36.2	45.3					
4"	4					5.87	12.2	19.5	28.7	46.5				
5"	4						5.30	10.3	20.5	30.4	47.6			
6"	4							5.03	13.4	15.7	30.8	52.7		
8"	4								7.66	9.75	17.6	24.9	32.5	
10"	4									2.30	10.4	16.5	20.3	
12"	4										2.56	6.30	14.4	
14"	4											2.43	8.99	

图6 外型尺寸 Figure 6 External dimensions

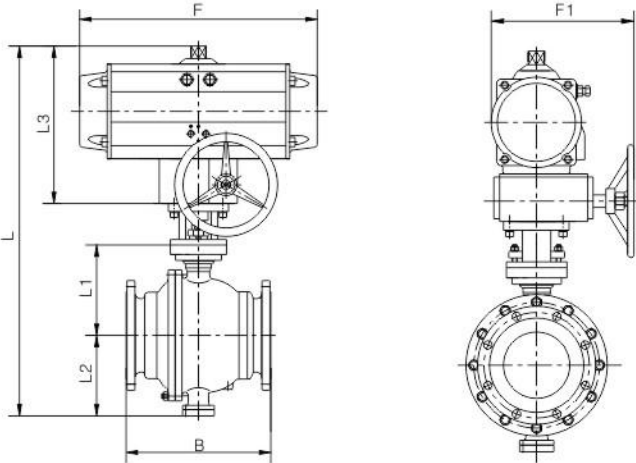


表5-1 ZSH/HTR气动球阀外型尺寸—横推式
Table 5-1 ZSH/HTR pneumatic ball valve outline dimensions—horizontal push type

阀门口径 Valve size	150LB									300LB								
	B		L	L1	L2	L3	F	F1	重量(kg) Weight	B		L	L1	L2	L3	F	F1	重量(kg) Weight
	RF	RJ								RF	RJ							
1/2"	108	—	397	75	48	204	211	235	15	140	151	407	80	53	204	211	235	17
1"	127	140	430	85	58	217	248	242	20	165	178	470	88	68	244	268	248	28
1-1/2"	165	178	515	98	73	244	268	248	28	190	203	543	98	83	262	315	256	42
2"	178	191	572	115	95	262	315	256	37	216	232	599	120	105	274	345	262	50
3"	203	216	674	150	130	274	345	262	55	283	298	744	165	165	294	409	305	92
4"	229	241	754	180	160	294	409	305	86	305	321	808	190	180	313	438	313	133
5"	356	369	843	200	190	313	438	313	141	381	398	898	200	200	358	487	324	184
6"	394	406	963	235	230	358	487	324	175	403	419	1027	255	235	397	543	343	248
8"	457	470	1082	280	265	397	543	343	273	502	518	1186	290	280	476	633	407	406
10"	533	546	1296	330	310	476	633	407	417	568	584	1363	335	340	508	728	487	688
12"	610	622	1463	405	370	508	728	487	860	648	664	1557	410	395	592	876	551	1160

表5-2 ZSH/HTR气动球阀外型尺寸—横推式
Table 5-2 ZSH/HTR pneumatic ball valve outline dimensions—horizontal push type

阀门口径 Valve size	600LB									900LB								
	B		L	L1	L2	L3	F	F1	重量(kg) Weight	B		L	L1	L2	L3	F	F1	重量(kg) Weight
	RF	RJ								RF	RJ							
1/2"	165	163.5	442	90	60	217	248	242	20	—	—	—	—	—	—	—	—	—
1"	216	216	525	105	70	262	315	256	35	254	254	574	115	85	274	345	262	52
1-1/2"	241	241	564	115	85	274	345	262	50	305	305	619	125	95	294	409	305	84
2"	292	295	639	130	115	294	409	305	71	368	371	691	140	120	313	438	313	129
3"	356	359	783	180	170	313	438	313	112	381	384	878	200	190	358	487	324	157
4"	432	435	863	200	185	358	487	324	211	457	460	957	220	210	397	543	343	260
5"	508	511	997	230	220	397	543	343	341	559	562	1141	250	240	476	633	407	451
6"	559	562	1156	265	235	476	633	407	540	610	613	1253	285	260	508	728	487	792
8"	660	664	1258	310	300	508	728	487	768	737	740	1422	340	330	592	876	551	1256
10"	787	791	1482	360	350	592	876	551	1492	—	—	—	—	—	—	—	—	—

表5-3 ZSH/HTR气动球阀外型尺寸—横推式
Table 5-3 ZSH/HTR pneumatic ball valve outline dimensions—horizontal push type

阀门口径 Valve size	1500LB									2500LB								
	B		L	L1	L2	L3	F	F1	重量(kg) Weight	B		L	L1	L2	L3	F	F1	重量(kg) Weight
	RF	RJ								RF	RJ							
1"	254	254	670	120	100	350	438	313	82	308	308	720	130	110	380	487	324	125
1-1/2"	305	305	800	135	125	420	487	324	128	384	387	835	140	130	445	543	343	286
2"	368	371	860	155	140	445	543	343	165	451	454	926	170	160	476	633	407	325
3"	470	473	991	205	190	476	633	407	263	578	584	1038	210	200	508	728	487	410
4"	546	549	1118	240	230	508	728	487	460	673	683	1354	265	250	699	876	667	753

图6-2 ZSH/ZSHTR气动横推式球阀 Figure 6-2 ZSH/ZSHTR pneumatic horizontal push type ball valve

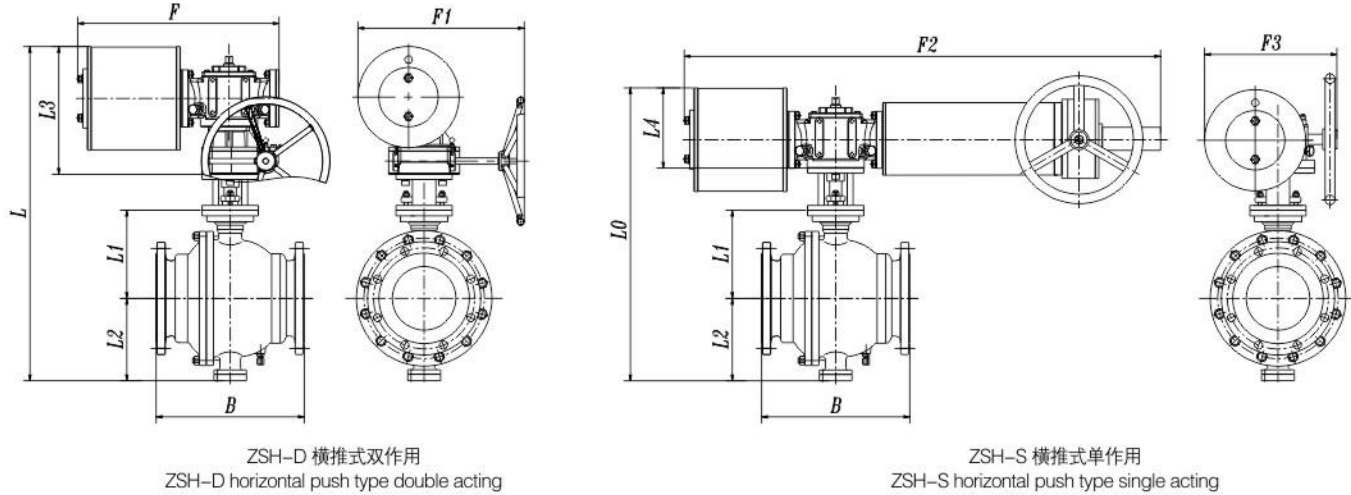


表6-1 ZSH/HTR气动球阀外型尺寸—横推式
Table 6-1 ZSH/HTR pneumatic ball valve outline dimensions—horizontal push type

阀门口径 Valve size	150LB													300LB												
	B		L	L0	L1	L2	L3	L4	F	F1	F2	F3	重量(kg) Weight	B		L	L0	L1	L2	L3	L4	F	F1	F2	F3	重量(kg) Weight
	RF	RJ												RF	RJ											
4"	229	241	810	670	180	160	330	275	627	300	1120	270	124	305	321	845	730	190	185	330	275	627	300	1120	270	167
5"	356	369	860	735	200	190	330	275	627	300	1120	270	174	381	398	870	836	200	200	330	326	627	300	1495	350	210
6"	394	406	935	846	235	230	330	326	627	300	1495	350	198	403	419	1032	916	255	235	402	326	850	362	1495	350	306
8"	457	470	1087	941	280	265	402	326	850	362	1495	350	330	502	518	1112	1016	290	280	402	326	850	362	1630	375	430
10"	533	546	1274	1061	330	310	454	326	860	440	1630	375	539	568	584	1328	1166	335	340	473	396	880	453	1955	460	751
12"	610	622	1428	1176	405	370	473	396	880	453	1955	460	822	648	664	1447	1370	410	395	482	440	910	477	2520	545	1021
14"	686	699	1472	1285	415	395	482	440	910	477	2520	545	993	762	778	1572	—	425	410	557	—	1097	745	—	—	1690
16"	762	775	1657	—	470	450	557	—	1105	745	—	—	1597	838	854	1727	—	475	455	617	—	1150	880	—	—	2257
18"	864	876	1807	—	500	490	617	—	1150	880	—	—	2063	914	930	1853	—	510	500	643	—	1220	950	—	—	2895
20"	914	927	1923	—	540	540	643	—	1220	950	—	—	2645	991	1010	1977	—	550	545	682	—	1285	980	—	—	3428
24"	1067	1080	2102	—	620	600	682	—	1285	980	—	—	3520	1143	1165	1980	—	635	635	510	—	1740	980	—	—	4911
28"	1245	1285	2090	—	700	680	510	—	1820	1165	—	—	5050	1346	1372	2125	—	710	680	535	—	1820	1165	—	—	5600
32"	1372	1385	2230	—	750	725	535	—	1820	1165	—	—	6950	1524	1553	2430	—	800	770	640	—	1820	1165	—	—	7820
36"	1524	1537	2660	—	920	880	640	—	1820	1165	—	—	9850	1727	1756	2785	—	960	910	705	—	1990	1235	—	—	12000
40"	1753	—	2855	—	1020	960	655	—	1990	1235	—	—	13250	1956	1985	3062	—	1100	980	762	—	1990	1235	—	—	15000

表6-2 ZSH/HTR气动球阀外型尺寸—横推式
Table 6-2 ZSH/HTR pneumatic ball valve outline dimensions—horizontal push type

阀门 口径 Valve size	600LB													900LB												
	B		L	L0	L1	L2	L3	L4	F	F1	F2	F3	重量(kg) Weight	B		L	L0	L1	L2	L3	L4	F	F1	F2	F3	重量(kg) Weight
	RF	RJ												RF	RJ											
3"	356	359	820	715	180	170	330	275	627	300	1120	270	146	381	384	932	848	200	190	402	326	850	362	1495	350	228
4"	432	435	855	816	200	185	330	326	627	300	1495	350	237	457	460	1043	926	220	210	473	326	880	453	1495	350	415
5"	508	511	992	886	230	220	402	326	850	362	1495	350	399	559	562	1112	1026	250	240	482	326	910	477	1630	375	573
6"	559	562	1162	996	265	235	482	326	910	477	1630	375	562	610	613	1287	1186	285	260	557	396	1097	745	1955	460	760
8"	660	664	1307	1176	310	300	557	396	1105	745	1955	460	831	737	740	1427	1350	340	330	617	440	1150	880	2520	545	1121
10"	787	791	1507	1315	360	350	617	440	1150	880	2520	545	1257	838	841	1612	—	380	370	682	—	1285	980	—	—	1768
12"	838	841	1643	—	420	400	643	—	1220	950	—	—	1723	965	968	1550	—	440	420	510	—	1740	980	—	—	2268
14"	889	892	1727	—	440	425	682	—	1285	980	—	—	2026	1029	1038	1675	—	490	470	535	—	1820	1165	—	—	2710
16"	991	994	1645	—	490	465	510	—	1740	980	—	—	2577	1130	1140	1855	—	525	510	640	—	1820	1165	—	—	3553
18"	1092	1095	1790	—	520	510	560	—	1740	980	—	—	3358	1219	1232	1965	—	540	520	705	—	1990	1235	—	—	3880
20"	1194	1200	1860	—	575	550	535	—	1820	1165	—	—	4599	1321	1334	2102	—	580	560	762	—	1990	1235	—	—	5390
24"	1397	1407	2130	—	650	640	640	—	1820	1165	—	—	6560	1549	1568	2337	—	680	660	797	—	2430	1350	—	—	7515
28"	1549	1562	2335	—	725	705	705	—	1990	1235	—	—	7200	—	—	—	—	—	—	—	—	—	—	—	—	—
32"	1778	1794	2607	—	830	795	762	—	1990	1235	—	—	9890	—	—	—	—	—	—	—	—	—	—	—	—	—
36"	2083	2099	2947	—	990	940	797	—	2430	1350	—	—	16170	—	—	—	—	—	—	—	—	—	—	—	—	—

表6-3 ZSH/HTR气动球阀外型尺寸—横推式
Table 6-3 ZSH/HTR pneumatic ball valve outline dimensions—horizontal push type

阀门 口径 Valve size	1500LB													2500LB												
	B		L	L0	L1	L2	L3	L4	F	F1	F2	F3	重量(kg) Weight	B		L	L0	L1	L2	L3	L4	F	F1	F2	F3	重量(kg) Weight
	RF	RJ												RF	RJ											
3"	470	473	865	880	205	190	330	326	850	362	1630	375	245	578	584	952	1096	210	200	402	396	1158	440	1955	460	330
4"	546	549	1032	1116	240	230	402	396	1158	440	1955	460	460	673	683	1124	1186	260	250	454	454	1158	440	1955	460	552
6"	705	711	1219	1320	310	295	454	440	1158	440	2520	545	890	914	927	1462	1485	320	300	682	617	1285	980	2520	545	1070
8"	832	841	1542	—	360	340	682	—	1285	980	—	—	1170	1022	1038	1545	—	380	365	640	—	1820	1165	—	—	1557
10"	991	1000	1475	—	400	385	510	—	1740	980	—	—	1500	1270	1292	1710	—	425	400	705	—	1990	1235	—	—	2100
12"	1130	1146	1595	—	450	430	535	—	1820	1165	—	—	2550	1422	1445	1910	—	478	455	797	—	2430	1350	—	—	3200
14"	1257	1276	1895	—	505	485	705	—	1990	1235	—	—	3260	—	—	—	—	—	—	—	—	—	—	—	—	—
16"	1384	1407	2067	—	540	530	797	—	2430	1350	—	—	4070	—	—	—	—	—	—	—	—	—	—	—	—	—

图6-3 ZSSR气动立推式球阀
Figure 6-3 ZSSR pneumatic vertical push type ball valve

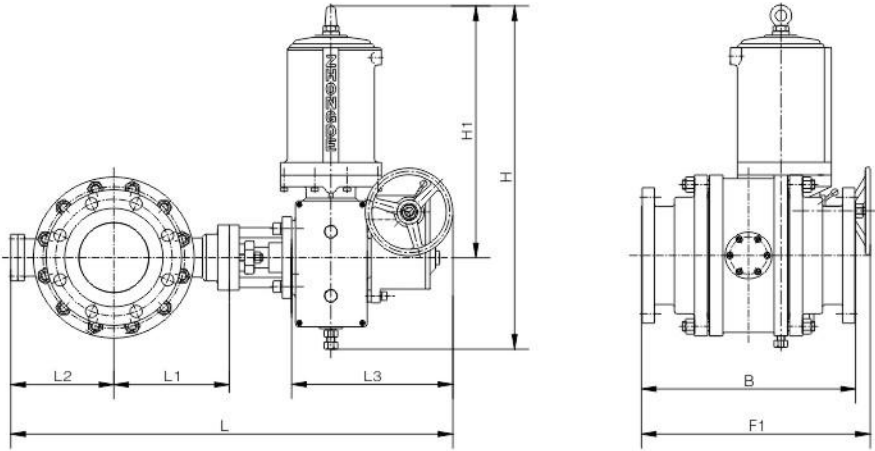


表7-1 ZSSR气动球阀外型尺寸—立推式双作用
Table 7-1 ZSSR pneumatic ball valve outline dimensions—vertical push type double acting

阀门 口径 Valve size	150LB										300LB									
	B		L	L1	L2	L3	F1	H	H1	重量(kg) Weight	B		L	L1	L2	L3	F1	H	H1	重量(kg) Weight
	RF	RJ									RF	RJ								
6"	394	406	935	235	230	330	410	970	720	315	403	419	1150	255	235	520	565	960	720	377
8"	457	470	1205	280	265	520	565	960	720	401	502	518	1230	290	280	520	565	995	750	521
10"	533	546	1340	330	310	520	565	995	750	531	568	584	1465	335	340	610	660	1335	990	950
12"	610	622	1565	405	370	610	660	1335	990	917	648	664	1575	410	395	610	660	1335	990	1296
14"	686	699	1600	415	395	610	660	1335	990	1268	762	778	1995	425	410	980	800	1500	1050	1976
16"	762	775	2080	470	450	980	800	1500	1050	1884	838	854	2210	475	455	1100	1000	1900	1380	2550
18"	864	876	2170	500	490	980	800	1510	1060	2512	914	930	2310	510	500	1100	1000	1900	1380	3188
20"	914	927	2380	540	540	1100	1000	1900	1380	3643	—	—	—	—	—	—	—	—	—	—

表7-2 ZSSR气动球阀外型尺寸—立推式双作用
Table 7-2 ZSSR pneumatic ball valve outline dimensions—vertical push type double acting

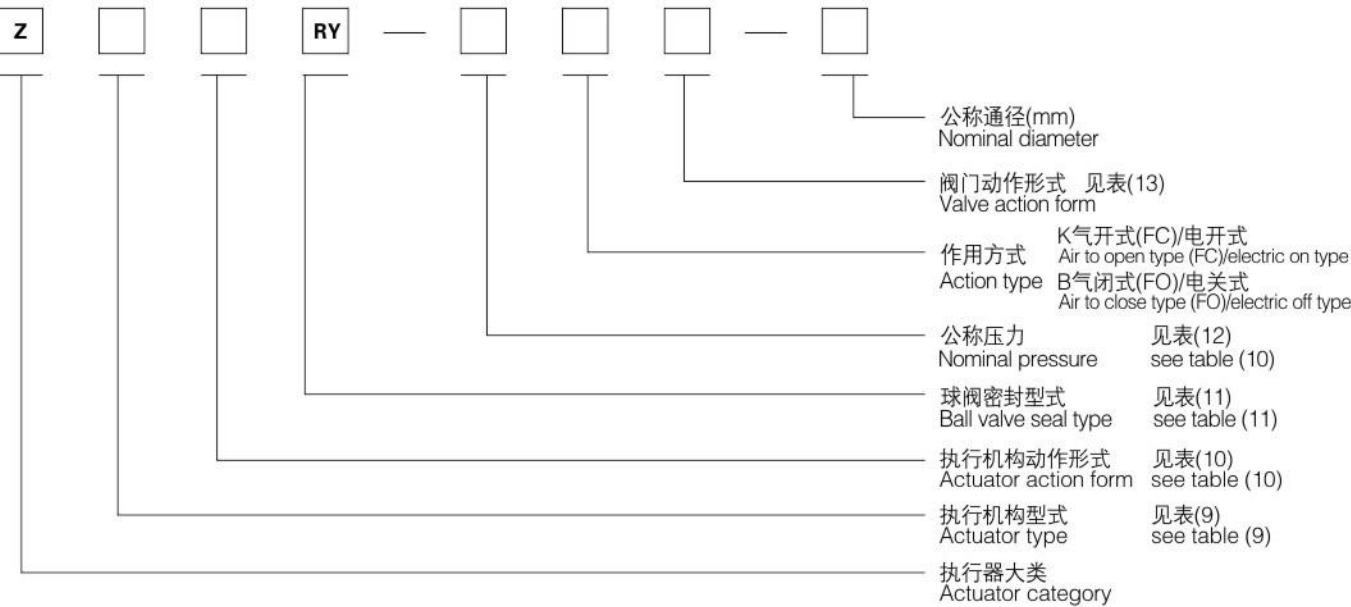
阀门 口径 Valve size	600LB										900LB									
	B		L	L1	L2	L3	F1	H	H1	重量(kg) Weight	B		L	L1	L2	L3	F1	H	H1	重量(kg) Weight
	RF	RJ									RF	RJ								
6"	559	562	1180	265	235	520	565	995	750	555	610	613	1300	285	260	610	660	1335	990	935
8"	660	664	1360	310	300	610	660	1335	990	1031	737	740	1790	340	330	980	800	1500	1050	1667
10"	787	791	1870	360	350	980	800	1500	1050	1803	838	841	2030	380	370	1100	1000	1900	1380	2304
12"	838	841	2100	420	400	1100	1000	1900	1380	2450	965	968	2140	440	420	1100	1000	1900	1380	3068
14"	889	892	2145	440	425	1100	1000	1900	1380	3062	—	—	—	—	—	—	—	—	—	—

注：以上阀门重量为标准配置双作用执行器带手操的重量，具体配置时需重新核算。
Note: The weight of the above valve is the weight with standard configuration of double acting actuator and manual operating mechanism. The weight shall be recalculated when detailed configuration is made.

阀门口径 Valve size	150LB													300LB												
	B		L	L0	L1	L2	L3	L4	F	F1	F2	H	重量(kg) Weight	B		L	L0	L1	L2	L3	L4	F	F1	F2	H	重量(kg) Weight
	RF	RJ												RF	RJ											
1"	127	140	520	-	85	58	277	-	440	338	-	-	38	165	178	535	-	88	68	277	-	440	338	-	-	44
1-1/2"	165	170	548	-	98	73	277	-	440	338	-	-	47	190	203	548	-	98	83	277	-	440	338	-	-	58
2"	178	191	575	-	115	95	277	-	440	338	-	-	54	216	232	560	-	120	105	277	-	440	338	-	-	65
3"	203	216	647	-	150	130	277	-	440	338	-	-	69	283	298	707	-	165	165	277	-	440	338	-	-	117
4"	229	241	692	-	180	160	277	-	440	338	-	-	112	305	321	732	-	190	180	277	-	440	338	-	-	155
5"	356	369	757	-	200	190	277	-	440	338	-	-	162	381	398	849	-	200	200	339	-	440	368	-	-	221
6"	394	406	889	-	235	230	339	-	440	368	-	-	210	403	419	959	-	255	235	339	-	440	368	-	-	357
8"	457	470	984	-	280	265	339	-	440	368	-	-	315	502	518	1029	-	290	280	339	-	440	368	-	-	485
10"	533	546	1074	1065	330	310	339	330	440	368	626	619	495	568	584	-	1130	335	340	-	330	-	-	626	619	691
12"	610	622	-	1110	405	370	-	330	-	-	626	619	762	648	664	-	1265	410	395	-	335	-	-	626	648	1261
14"	686	699	-	1180	415	395	-	335	-	-	626	648	1188	762	778	-	1387	425	410	-	382	-	-	733	669	1675
16"	762	775	-	1322	470	450	-	382	-	-	733	669	1585	838	854	-	1515	475	455	-	395	-	-	733	721	2128
18"	864	876	-	1395	500	490	-	395	-	-	733	721	1962	914	930	-	1587	510	500	-	402	-	-	733	755	2568
20"	914	927	-	1517	540	540	-	402	-	-	733	755	2373	991	1010	-	1697	550	545	-	417	-	-	770	755	2982
24"	1067	1080	-	1752	620	600	-	417	-	-	770	755	3008	1143	1165	-	1852	635	635	-	417	-	-	770	803	4360
28"	1245	1285	-	-	700	680	-	453	-	-	770	755	4832	1346	1372	-	2063	710	680	-	453	-	-	770	755	5330
32"	1372	1385	-	-	750	725	-	453	-	-	770	755	6500	1524	1553	-	2275	800	770	-	485	-	-	824	972	7240
36"	1524	1537	-	-	920	880	-	485	-	-	824	972	9320	1727	1756	-	2595	960	910	-	505	-	-	824	1050	11523
40"	1753	-	-	-	1020	960	-	605	-	-	831	1132	11255	1956	1985	-	2905	1100	980	-	605	-	-	831	1132	13460

[illegible][illegible]

型号编制 Model establishment



表(9) Table9

执行机构型式 Actuator type	气动活塞式 Pneumatic piston type	电动式 Electric type	电液联动式 Electro-hydraulic type
代号 Code	S	D	Y

表(10) Table10

执行机构动作形式 Actuator action form	气动双作用横推式 Pneumatic double acting horizontal push type	气动双作用立推式 Pneumatic double acting vertical push type	气动单作用弹簧复位式 Pneumatic single acting spring return type	电动/电液动转角式 Electric/electro-hydraulic rotary angle type
代号 Code	H	S	T	J

表(11) Table11

密封型式 Seal type	软密封型 Soft seal type	硬密封型 Hard seal type	防火型密封 Fireproof type seal
代号 Code	RR	RY	RYH

注：阀门为软密封时，密封型式可直接表示为R。
Note: When the valve adopts soft seal, the seal type can be directly expressed by R.

表(12) Table12

公称压力PN Nominal pressure	CL150LB	CL300LB	CL600LB	CL900LB	CL1500	CL2500
代号 Code (bar)	20	50	110	150	260	420

表13 Table13

阀门动作形式 Valve action form	调节型 Control type	二位切断型 Two-position shut-off type	快速切断调节型 Fast shut-off control type
代号 Code	I	II	III

示例

ZSHRY-20KII-100 气动金属硬密封球阀，公称压力150LB，气开式切断型，双作用横推式执行器，公称通径为4"(100mm)。
ZSTRR-50BII-80 气动软密封球阀，公称压力300LB，气关式切断型，单作用执行器，公称通径为3"(80mm)。

配管安装位置

- 球阀可在水平或垂直管道上安装，但气动立推式执行机构一般正立安装(除特殊说明外)。使用前应对管道及压缩空气管路进行吹扫，彻底清洗管路和阀内腔污物、焊渣、润滑油脂等异物。
- 对于公称通径 $DN \geq 250$ 的阀门，执行机构建议增加弹性支撑或悬吊装置，以免执行机构过重，影响阀门正常操作。
- 由于选配执行机构的关系，请在订货时一定要注明安装位置。

正确操作

- 阀门在出厂时已经过必要性的性能测试，且按订单要求进行了整定，用户一般可直接安装使用。
- 使用手轮操作时，先将气缸内的残余气体通过电磁阀(或控制元件)排空(在气缸内有残余气体的情况下)。
- 双作用气缸先将执行器的平衡阀打开，然后将转换手柄置于“手动”位置，使蜗杆与蜗轮处于完全吻合状态。用手轮操作时请勿用力过大(不可借用其他的外力工具)。
- 操作时，请参照执行器上铭牌指示。
- 对于单作用执行机构，在拆卸弹簧时，一定要使用专用工具。

特别提示：带手动操作机构的阀门在弹簧复位(关闭阀门)或是气动开启(关闭)阀门过程中，任何一个开度都不能使用“自动—手动”切换。

For example

Examples: ZSHRY-20KII-100 pneumatic metal hard seal ball valve, nominal pressure 150LB, air to open shut-off type, double acting horizontal push type actuator, nominal diameter 4"(100mm)
ZSTRR-50BII-80 pneumatic soft seal ball valve, nominal pressure 300LB, air to close shut-off type, single acting actuator, nominal diameter 3"(80mm)

Pipe installation position

- The ball valve can be installed on horizontal or vertical pipe, but the pneumatic vertical push type actuator shall be generally installed vertically (except those specially noted). See figure 10. Before the use, please scavenge the pipe and compressed air pipe to thoroughly clean away dirty things, welding slag, lubricating grease and other foreign matters in the pipes and valve cavity.
- For valves with nominal diameter $DN \geq 250$, it is recommended that the actuator should be additionally provided with elastic supporting or hoisting device. Otherwise, too heavy actuator may influence normal operation of the valve.
- Due to different actuators selected, please make sure to specify the installation position when placing orders.

Proper operation

- The valve has undergone necessary performance tests before leaving the factory, and setting has been made according to order requirements, so users can install and use it directly.
- When using the handwheel for operation, first empty the residual gas in the cylinder through the solenoid valve (or control element) (in case there is residual gas in the cylinder).
- For the double acting cylinder, first open the balancing valve of the actuator, turn the change-over handle to the "manual" position to make the worm and worm gear fully fit with each other. Do not use excessive force when operating the handwheel (other tools shall not be used).
- During operation, please refer to the indication on the nameplate of the actuator.
- For single acting actuator, please use special tools when removing the spring.

Special hint: For the valve with manual operating mechanism, during spring reset (closing the valve) or pneumatic valve opening (closing), any opening cannot be switched through using "automatic-manual".

Maintenance and servicing

1. Normal check: Carry out normal check once every year to check if there is any gas leakage at the connecting parts, and replace the O rings or relevant bolts if there is any. Check the air cleanliness. Eliminate condensate in the filter. Check if the connecting parts of all threads are loose.
2. The bearings on the output shaft and the bearings on the change-over shaft of the manual operating mechanism and other moving parts shall be added with sufficient lubricating grease once every three or six months.
3. During maintenance, please check and clean the cylinder cover and piston. If it is found that the O rings are damaged or age, please replace them in time. During assembly, please spread lubricating grease on the cylinder wall and inside the groove of seal rings. Notice that the piston shall be slowly pushed into the cylinder. otherwise, the O rings may be damaged.
4. The air supply pressure shall be within the range of 0.35~0.7MPa(G). The air supply shall be subjected to dust removing and dehydrating treatment.

Ordering notes

When placing orders, please specify the following items:

1. Valve size and valve bore
2. Body specification and type of connection
3. Body material and trim material
4. Valve characteristic and valve plug form
5. Bonnet form
6. Actuator model and shall it be provided with manual operating mechanism and air supply pressure
7. Valve action (air supply failure requirement)
8. Shall it be provided with positioner, solenoid valve, Air set, etc.
9. Are products of special specifications such as oil removing, water removing and copper-free needed
10. Tube size, tube wall thickness (inlet side, outlet side)
11. Fluid name and status (liquid, gas, steam, etc.)
12. Common flow and maximum and minimum flow
13. Fluid pressure and differential pressure (during full opening and full closing)
14. Fluid temperature, specific gravity or density
15. Fluid viscosity, containing slurry or not, flash evaporation
16. Is it used for high pressure and high temperature applications
17. Other special requirements