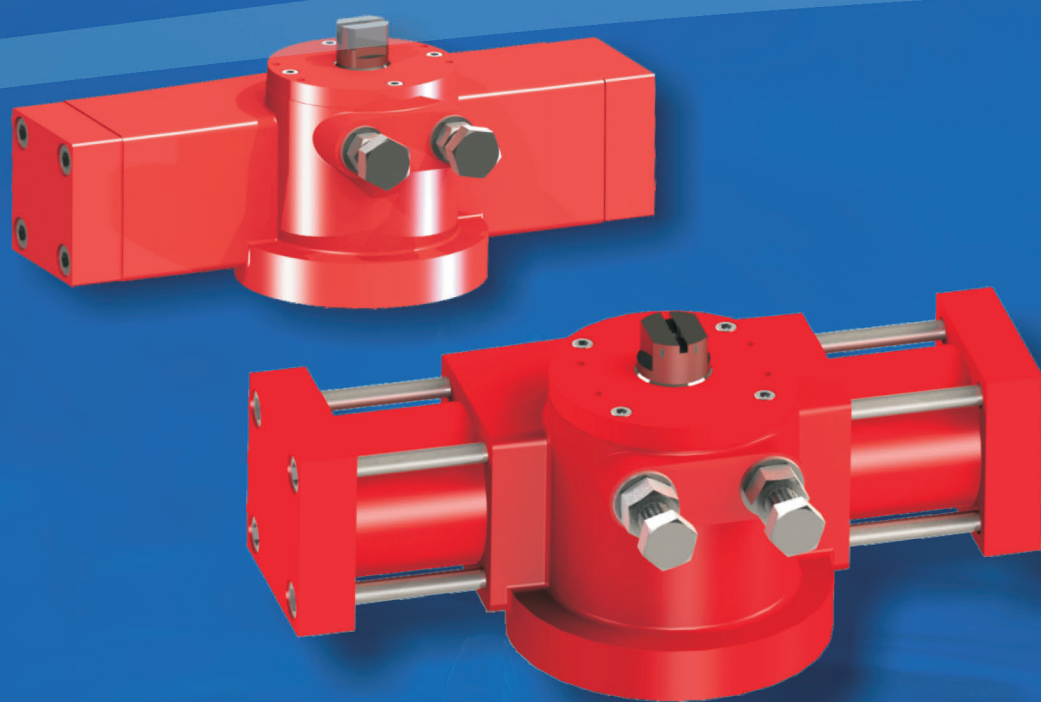


HA系列精巧型液动执行器

HA Series Miniature Hydraulic Actuator



1. 概述

HA系列液动执行器是我司在吸收国内外先进技术基础上，自行研发的一款新型液动执行机构。HA系列执行器通过三维建模软件Solidworks设计与优化。与市面上同类产品相比，具有外形精巧美观、结构紧凑合理、坚固耐用、输出扭矩大、使用寿命长等特点。HA系列执行器可以作为球阀、蝶阀、旋塞阀等阀门或其它1/4回转装置的执行元件。配套液控电磁阀、流量控制阀、限位开关等元件可以实现球阀、蝶阀、旋塞阀等阀门或其它1/4回转装置的就地/远程智能化控制。HA系列液动执行器广泛应用于石油、化工、电力、能源、船舶、冶金、建材、造纸、锅炉设备中。该系列产品已大量出口，深受广大客户好评！

产品特点:

1. 支持单作用和双作用配置。
2. 可选油口居中组件，板式安装更方便。
3. 基于齿轮齿条式设计，结构简单可靠、体积小巧、动作平稳、输出力矩大。
4. 齿轮齿条使用45#钢，可以承受更高的工作压力、输出更大的力矩。
5. 液压缸使用45#无缝钢管，综合力学性能好；内表面平滑，摩擦系数低，确保更长的使用寿命。
6. 执行器背面设计有两个调节螺栓，行程调节更加方便。支持双向行程调节，调节范围 $\pm 5^\circ$ 。
7. 执行器底部连接符合ISO5211标准。使产品更加具有通用性与互换性。
8. 执行器顶部连接符合NAMUR标准。支持标准阀位指示器、限位开关的安装(HA25和HA32需要特殊的安装支架)。

典型应用:

各类球阀、蝶阀、旋塞阀及其它1/4回转装置的自动化工程。

工作条件:

1. 液压油：使用无腐蚀性的抗磨液压油；运动粘度中等。
2. 额定压力：设计压力20MPa；最高使用压力16MPa。
3. 适用温度： $-20\sim+80^\circ\text{C}$
4. 抗振动性：适用于无强烈振动的环境
5. 润滑：使用自润滑轴承，在正常工作条件下，无需添加润滑剂
6. 安装：适合室内外安装使用
7. 选型与标记：根据具体工作条件合理选型；相关参数将标记在产品铭牌上

附件支持:

1. 手动机构：支持离合式手动机构或手动泵
2. 限位开关盒：可装各类限位开关或位置变送器。
3. 单向阀、流量调节阀、液压电磁阀、电液伺服系统、蓄能器等用于操作或控制阀门。

1. General

HA Series Miniature Hydraulic Actuator is a new type actuator developed by our company. It's based on advanced technology at home and abroad, designed and optimized by Solidworks. It has more beautiful appearance, more compact and reasonable construction, more reliable and stable, longer life and bigger output torque than the similar products in the market. HA series can be used to control ball valves, butterfly valves, plug valves and other part turn device. Local / Remote Automation of ball valves, butterfly valves, plug valves and other part turn equipment can be realized by the actuator with other components, such as hydraulic solenoid valves, flow control valves, limit switch box etc. HA series hydraulic actuator is suited for oil and gas, chemical industry, power, energy, shipping, metallurgic, construction materials, paper making, boiler plant, etc.

Features:

- 1) Spring return and double acting configurations are both supported.
- 2) Component for Central Oil Ports are supported, convenience to direct mount all kinds of hydraulic block.
- 3) Rack and Pinion design, simple and reliable, small volume, smooth action, big output torque.
- 4) Rack and Pinion using material ASTM 1045.
- 5) Hydraulic Cylinders adopting ASTM 1045 seamless steel pipe with smooth inner wall, low friction, make sure long life of actuator.
- 6) Two travel stops, supports bi-directional travel adjustment, range of adjustment $\pm 5^\circ$.
- 7) Bottom connection conforms to ISO5211.
- 8) Top connection conforms to NAMUR (except HA25 & HA32).

Typical Application:

Automation of ball valves, butterfly valves, plug valves and other part turn equipment.

Working Condition:

- 1) Hydraulic Oil: wearable non-corrosive hydraulic oil, with medium viscosity.
- 2) Rated Pressure: design pressure is 20MPa, maximum working pressure is 16MPa.
- 3) Working Temperature: $-20\sim+80^\circ\text{C}$
- 4) Anti-vibration: work properly under condition without strong vibration.
- 5) Lubrication: no routine maintenance or lubrication is required. All moving parts are lubricated with heavy duty grease.
- 6) Installation: suited for indoor or outdoor application.
- 7) Selection&Mark: reasonable selection according to specific working condition; technical data noted on the mark.

Accessories:

- 1) Dec clutchable manual override or hydraulic pump for manual emergency control.
- 2) Limit switch boxes available with a wide range of switches and position transmitters.
- 3) Hydraulic circuits with check valve, throttle valve, solenoid valves, electro-hydraulic supply system, accumulator, etc, for valve operation and control.

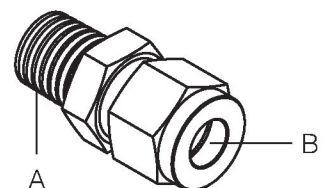
2. 订货信息 How to Order

I	HA	32	-	B14	V01	/	S50	RED	/	RED
1	2	3		4	5		6	7		8

序号 NO.	名称 Name	数据与含义 Value
1	特殊功能 Prefix	I: 浸没式 Immersion Mode
2	系列 Series	HA
3	缸径 Bore Size	25 / 32 / 40 / 50 / 63 / 80 / 100 / 125
4	油口 Oil Ports	B14: BSP1/4" 螺纹 Thread BSP1/4" B38: BSP3/8" 螺纹 Thread BSP3/8" B12: BSP1/2" 螺纹 Thread BSP1/2" M14: M14x1.5 螺纹 Thread M14x1.5 M18: M18x1.5 螺纹 Thread M18x1.5 M20: M20x1.5 螺纹 Thread M20x1.5 M22: M22x1.5 螺纹 Thread M22x1.5 -- > HA25/HA32/HA40/HA50: 标准(Standard): B14 可选(Optional): M14 > HA63/HA80: 标准(Standard): B38 可选(Optional): B14, M14, M18 > HA100/HA125: 标准(Standard): B38 可选(Optional): B14, B12, M14, M18, M20, M22
5	排气口 Air Vent	V01: 带接头BSP1/4转M16x2 with joint BSP1/4 to M16x2 V02: 带接头M14x1.5转M16x2 with joint M14x1.5 to M16x2
6	弹簧设置 Spring Set	S05 / S10, 仅单作用有效 for spring return only.
7	箱体颜色 Body Color	Red as Standard, Optional: Blue, Yellow, Grey, Black 标准: 红色; 可选: 蓝色、黄色、灰色、黑色
8	端盖颜色 End Caps Color	Red as Standard, Optional: Blue, Yellow, Grey, Black 标准: 红色; 可选: 蓝色、黄色、灰色、黑色

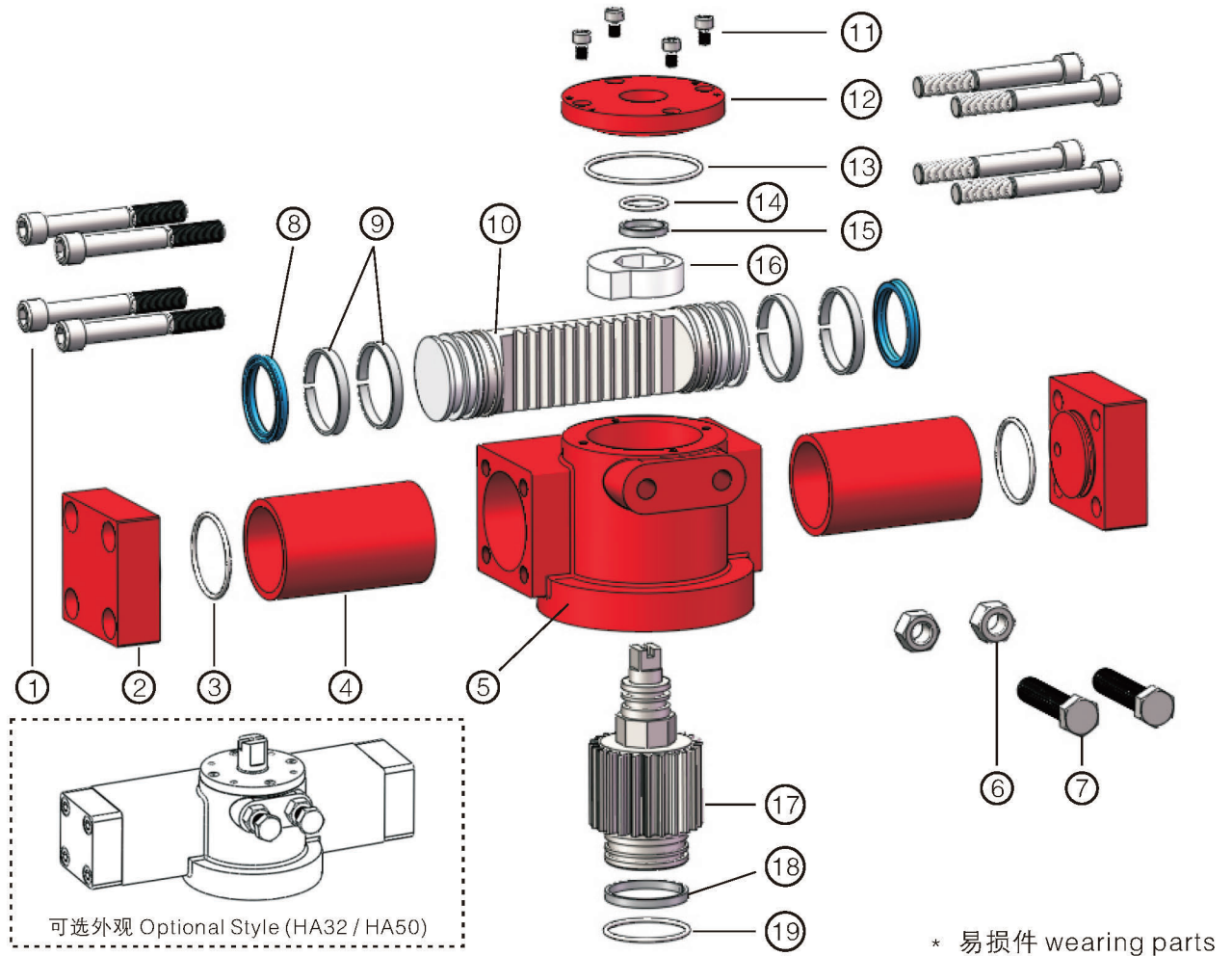
常用接头(Commonly Used Connectors):

订货号 Ordering Code	A	B
TJG1408	G1/4	OD(outer diameter)=8mm pipe 用于液压管外径8mm
TJG1410	G1/4	OD(outer diameter)=10mm pipe 用于液压管外径10mm
TJG3808	G3/8	OD(outer diameter)=8mm pipe 用于液压管外径8mm
TJG3810	G3/8	OD(outer diameter)=10mm pipe 用于液压管外径10mm
TJG3812	G3/8	OD(outer diameter)=12mm pipe 用于液压管外径12mm



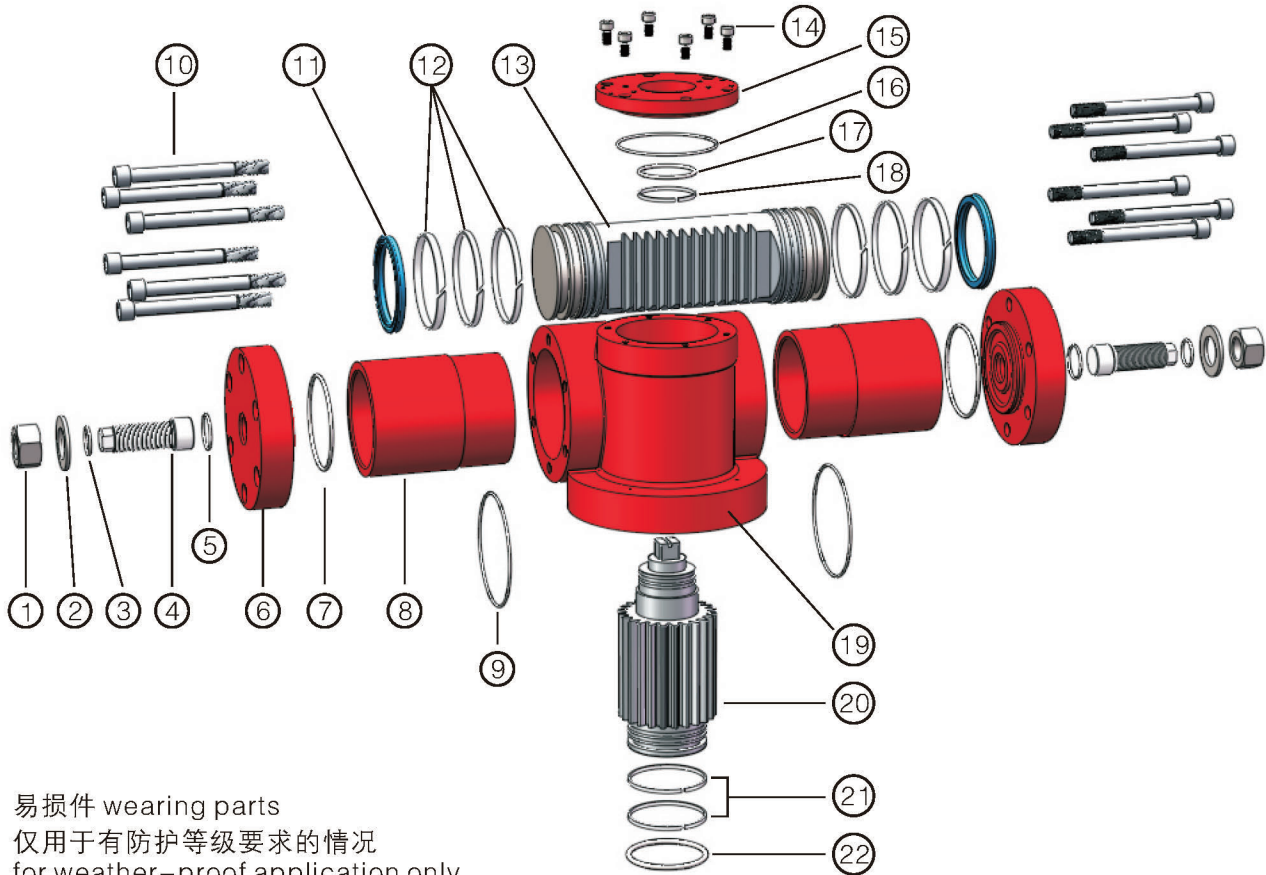
3. 产品零件与材质 Parts and Materials

3.1 产品零件与材质 Parts and Materials (HA25~HA80)



编号 Part No.		名称 Part Name	材质 Materials
1		端盖螺栓 Bolt of end caps	不锈钢或8.8级以上螺栓 stainless steel / grade 8.8 or above
2		端盖 End caps	A3铁板 Q235A
3	*	端盖O型圈 O-ring of end caps	NBR
4		液压缸 Hydraulic cylinder	45#无缝钢管 ASTM 1045 seamless steel pipe
5		箱体 Housing	球墨铸铁 ductile iron
6		调节螺栓螺母 Lock nut of travel stops	不锈钢 stainless steel
7		调节螺栓 Adjusting bolt	不锈钢 stainless steel
8	*	Y-型圈 Y-shaped oil seal ring	P2B
9	*	导向带 Guide ring	POM/PF
10		齿条 Rack	45#钢 ASTM 1045
11		上盖螺栓 Bolts of top cover	不锈钢 stainless steel
12		上盖 Top cover	A3铁板 Q235A
13	*	上盖O型圈 O-ring of top cover	NBR
14	*	轴上O型圈 O-ring of pinion	NBR
15	*	轴上导向环 Guide ring of pinion	POM
16		定位块 Locating piece	Q235A
17		齿轮轴 Pinion	45#钢 ASTM 1045
18	*	轴下导向环 Guide ring of pinion	POM
19	*	轴下O型圈 O-ring	NBR

3.2 产品零件与材质 Parts and Materials (HA100/HA125)



* 易损件 wearing parts

** 仅用于有防护等级要求的情况
for weather-proof application only.

编号 Part No.		名称 Part Name	材质 Materials
1		调节螺栓螺母 Lock nut of travel stops	碳钢 carbon steel
2		调节螺栓垫片 Gasket	不锈钢 stainless steel
3	*	调节螺栓O型圈 O-ring	NBR
4		调节螺栓 Adjusting bolt	45#钢 ASTM 1045
5	*	调节螺栓O型圈 O-ring	NBR
6		端盖 End caps	A3铁板 Q235
7	*	端盖O型圈 O-ring of end caps	NBR
8		液压缸 Hydraulic cylinder	45#无缝钢管 ASTM 1045 seamless steel pipe
9	**	液压缸O型圈 O-ring of cylinder	NBR
10		端盖螺栓 Bolts of end caps	8.8级以上螺栓 grade 8.8 or above
11	*	Y-型圈 Y-shaped oil seal ring	P2B
12	*	导向环 Guide-ring	PF
13		齿条 Rack	45#钢 ASTM 1045
14		上盖螺栓 Bolts of top cover	不锈钢 stainless steel
15		上盖 Top cover	45#钢 / A3铁板 ASTM 1045 / Q235
16	*	上盖O型圈 O-ring of top cover	NBR
17	*	轴上O型圈 O-ring of pinion	NBR
18	*	轴上导向环 Guide ring of pinion	POM
19		箱体 Housing	球墨铸铁 ductile iron
20		齿轮轴 Pinion	45#钢 ASTM 1045
21	*	轴下导向环 Guide ring of pinion	POM
22	*	轴下O型圈 O-ring of pinion	NBR

4. 工作原理 Working Principle

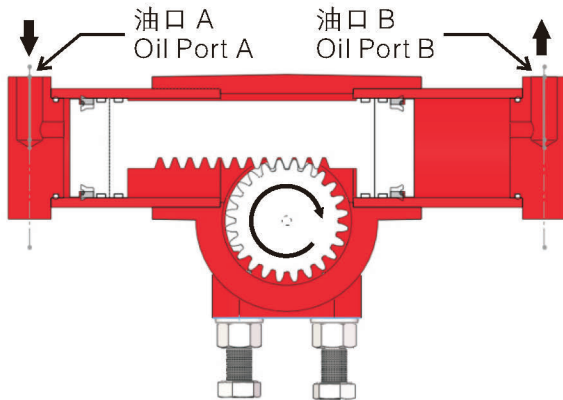


图 Fig 4.1

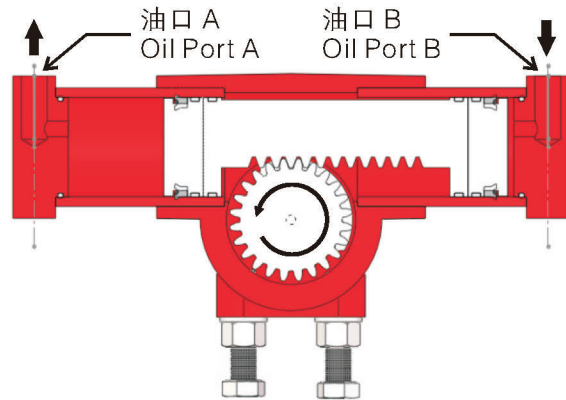


图 Fig 4.2

- 1) 如图4.1所示，当液压油通过油口A进入左侧液压缸内，将推动齿条向右移动，右侧液压缸内的液压油通过油口B排出。同时，与齿条啮合的齿轮轴同步地做顺时针旋转。对应地阀门被关闭。旋入或旋出右侧调节螺栓，可以微调阀门的行程，使之完全被关闭。调节之前需要先将调节螺栓上的锁定螺母松开，调节完成后，再锁紧螺母。
- 2) 如图4.2所示，当液压油通过油口B进入右侧液压缸内，将推动齿条向左移动，左侧液压缸内的液压油通过油口A排出。同时，与齿条啮合的齿轮轴同步地做逆时针旋转。对应地阀门被打开。旋入或旋出左侧调节螺栓，可以微调阀门的行程，使之完全被打开。调节之前需要先将调节螺栓上的锁定螺母松开，调节完成后，再锁紧螺母。
- 1) Hydraulic oil supplied to oil port A, as shown in the Fig 4.1, forces the rack moving towards right, with exhaust oil exiting from oil port B, the pinion meshed to the rack will rotate clockwise synchronously. The valve will be closed accordingly. Turning in or out the right travel stop, it can adjust the valve stroke in $\pm 5^\circ$ to make sure the valve be closed completely. The lock nut should be loosed, before adjusting travel stop and should be fastened after adjustment.
- 2) Hydraulic oil supplied to oil port B, as shown in the Fig 4.2, forces the rack moving towards left, with exhaust oil exiting from oil port A, the pinion meshed to the rack will rotate counter-clockwise synchronously. The valve will be opened accordingly. Turning in or out the left travel stop, it can adjust the valve stroke in $\pm 5^\circ$ to make sure the valve be opened completely. The lock nut should be loosed, before adjusting travel stop and should be fastened after adjustment.



虽然，我们一般地认为顺时针旋转为阀门关闭，逆时针旋转为阀门打开。但是，针对特殊场合下的特殊应用，HA液动执行器可以被定制成相反的操作。详情请与我司联系。

Although, in standard configuration, clockwise rotation is for close, while counter-clockwise rotation is for open. It is also can be changed in special application. More information, please confirm with our technical department.

5. 输出扭矩 Output Torque

单位 UOM: N.m

型号 Model	液源压力 Hydraulic Pressure (MPa)														
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
HA25	13.74	20.61	27.48	34.34	41.21	48.08	54.95	61.82	68.69	76.26	83.16	89.92	96.86	103.8	110.6
HA32	26.5	39.7	52.9	66.1	79.3	92.3	105.8	119	132.2	145.4	158.6	172	185	198	212
HA40	52.75	79.13	105.5	131.9	158.3	184.6	211	237.4	263.8	290.6	317	343.4	369.8	396	422.5
HA50	96.2	144.2	192.3	240	288.5	336.6	384.7	432.7	481	529	577	625	673	721	769
HA63	200.7	301	401	502	602	702	803	903	920	1018	1085	1160	1288	1380	1450
HA80	376	564	752	940	1128	1317	1505	1693	1881	2069	2258	2446	2634	2822	3010
HA100	766	1148	1530	1920	2300	2680	3070	3450	3840	4220	4600	5000	5360	5750	6130
HA125	1600	2400	3200	4000	4800	5580	6400	7180	8000	8780	9570	10365	11162	12000	12800

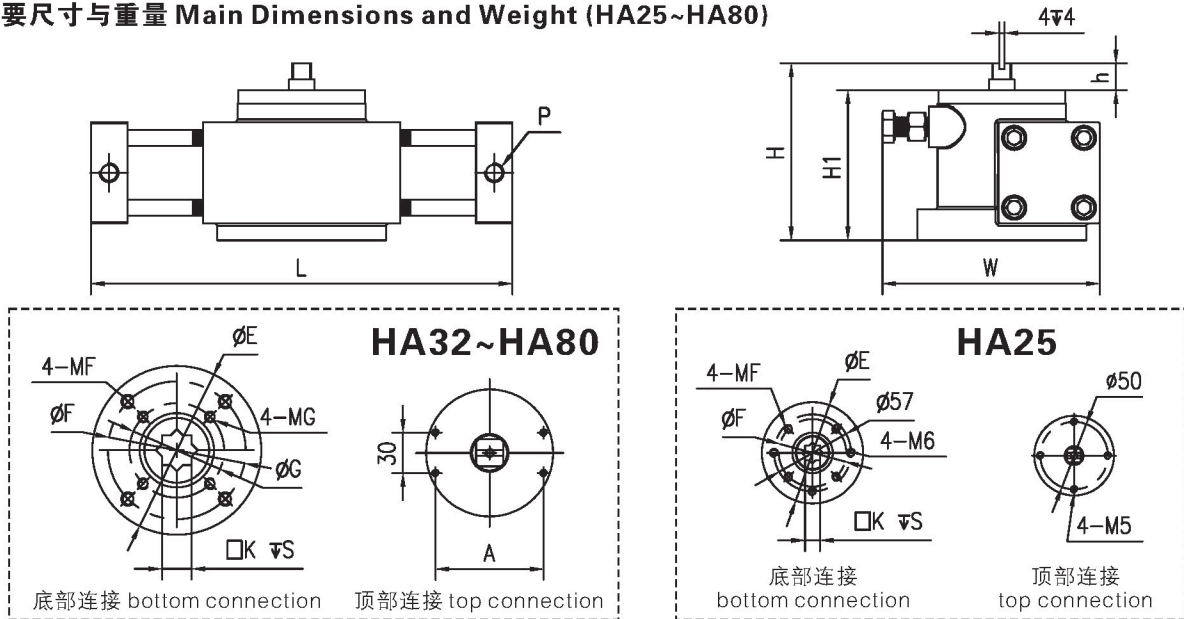
注1: 当液源压力高于10MPa时，请选用10.9或12.9级螺栓连接。

注2: 如果需要更大的输出扭矩，请与我司技术部联系。

Please adopting connecting bolts which quality class is 10.9 or 12.9 for hydraulic pressure above 10MPa. Please contact with our technical department, if bigger output torque is required.

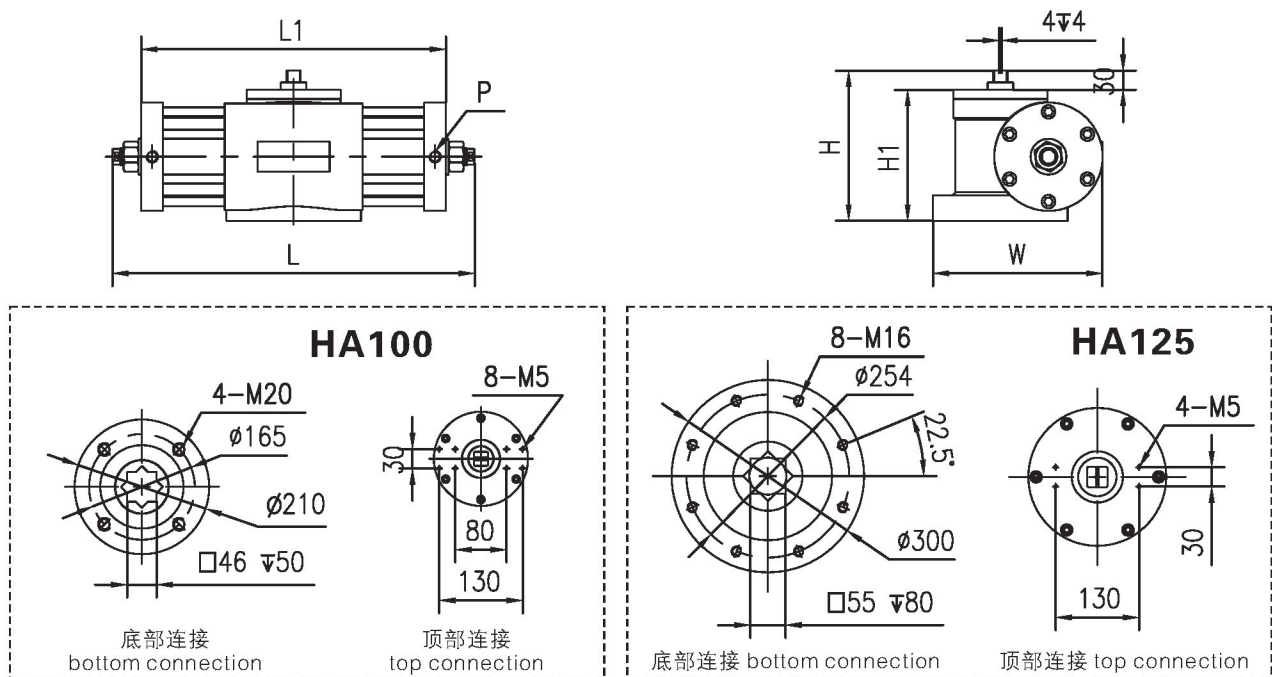
6. 主要尺寸与产品重量

6.1 主要尺寸与重量 Main Dimensions and Weight (HA25~HA80)



型号 Model	L	W	H	H1	E	F	MF	G	MG	K	S	A	h	油口 Oil Port P	重量 Weight
HA25	212	100	89	69	75	50	M6	/	/	11	15	/	20	可定制 on request	2.6 KG
HA32	228	110	94	74	90	70	M8	50	M6	14	20	50	20	可定制 on request	5.5 KG
HA40	286	148	122	102	125	102	M10	70	M8	17	20	80	20	可定制 on request	10.5 KG
HA50	313	161	131	111	125	102	M10	70	M8	22	25	80	20	可定制 on request	15.6 KG
HA63	362	195	162	132	150	125	M12	102	M10	27	30	80	30	可定制 on request	22.9 KG
HA80	406	220	187	157	175	140	M16	/	/	36	40	80	30	可定制 on request	37.5 KG

6.2 主要尺寸与重量 Main Dimensions and Weight of HA100/HA125



型号 Model	L	W	H	L1	H1	油口 Oil Port P	重量 Weight
HA100	575	267	234	475	204	可定制 on request	73 KG
HA125	792	357	266	675	236	可定制 on request	146 KG

液压产品图库 Gallery of Hydraulic Products



HA32, HA50 一体式
Long Body HA32 and HA50



HA25~HA80 三段式
Short Body HA25~HA80



HA100~HA125 液动执行器
HA100~HA125 Hydraulic Actuator



液动执行器带手动泵接头
Hydraulic Actuator
with Hand Pump Ports



浸没式液动蝶阀
Submerged Type
Hydraulic Butterfly Valve



液动蝶阀带手动
Hydraulic Butterfly Valve
with Manual Override



遥控液动蝶阀
Remote Control
Hydraulic Butterfly Valve



浸没式单作用液动蝶阀
Submerged Spring Return
Hydraulic Butterfly Valve



液动浮动式球阀
Hydraulic Floating Ball Valve



液动固定式球阀
Hydraulic Trunnion Ball Valve



防爆遥控液动球阀
Explosion-Proof Remote
Control Hydraulic Ball Valve



液动浮动式球阀
Hydraulic Floating Ball Valve



HC液动执行器(配闸阀截止阀)
Hydraulic Linear Actuator
for Gate Valves / Globe Valves



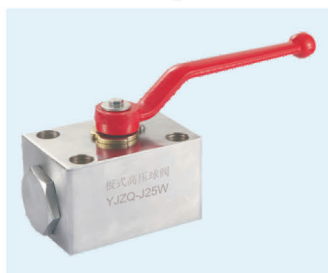
液动截止阀
Hydraulic Globe Valve



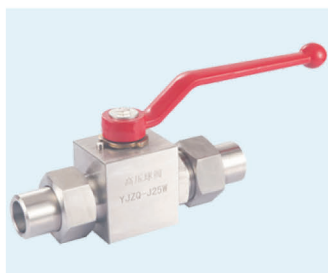
液动闸阀
Hydraulic Gate Valve



多回转液动闸阀
Multi-turn
Hydraulic Gate Valve



液压板式高压球阀
Hydraulic Sub-plate Ball Valve



液压外螺纹球阀
Hydraulic Threaded Ball Valve



液动手动泵
Hydraulic Hand Pump



液压控制阀
Hydraulic Control Valves

液压产品图库 Gallery of Hydraulic Products



液动蝶阀带控制块
Hydraulic Butterfly Valve with Control Block



HSG系列液动执行器输出大扭矩
HSG Series Actuator Output Large Torque



批量生产、价格合格
Volume Production, Reasonable Price



库存充足，交货迅速
Abundant Stock of Parts, Quick Delivery



出口型船用液动蝶阀
Hydraulic Butterfly Valves Special for Shipyard



蓄能式液控蝶阀带PLC控制箱
Accumulation Type Hydraulic Butterfly Valve
with PLC Control Box

其它产品图库 Gallery of Other Products



AT 气动执行器
AT Series Pneumatic Actuator



GT 气动执行器
GT Series Pneumatic Actuator



AW 气动执行器
AW Series Pneumatic Actuator



SG 气动执行器
SG Series Pneumatic Actuator



SC 气动执行器
SC Series Pneumatic Actuator



气动球阀
Pneumatic Ball Valve



全不锈钢气动球阀
All Stainless Steel
Pneumatic Ball Valve



气动蝶阀
Pneumatic Butterfly Valve



气动蝶阀
Pneumatic Butterfly Valve



气动偏心球阀
Pneumatic Eccentric Ball Valve



气动刀闸阀
Pneumatic Knife Gate Valve



气动隔膜阀
Pneumatic Diaphragm Valve



气动调节阀
Pneumatic Control Valve



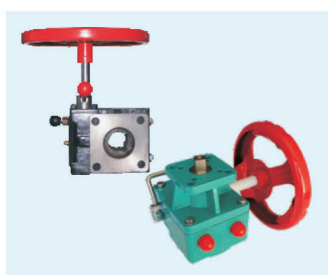
自力式调节阀
Self-operated Control Valve



电动调节阀
Electric Control Valve



手动调节阀
Manual Control Valve



手动机构
Manual Override



限位开关
Limit Switch Box



电磁阀
Solenoid Valve



过滤减压阀
Filter-regulator

其它产品图库 Gallery of Other Products



定位器
Positioner



保位阀
Lock up Valve



气控阀
Air-operated Valve



气源放大器
Booster Relay



阀位变送器
Transmitter



行程开关
End of Switch



Namur 感应开关
Namur Induction Switch



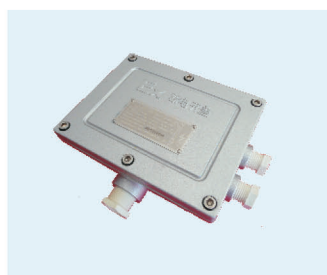
快排阀
Quick Exhaust Valve



控制箱
Control Box



防爆控制箱
Explosion-proof Control Box



防爆接线盒
Explosion-proof Junction Box



转换器
Adapter

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