

General specifications of smart actuator





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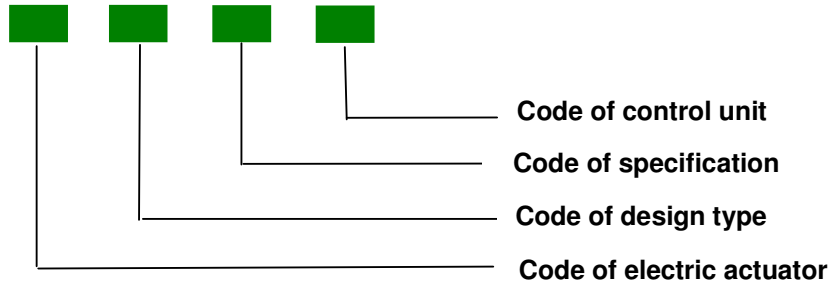


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Establishment method of electric actuators model

The actuator model is composed of four units and is established according to the following sequence



Code of electric actuator: H Code of design type: Q

Code specification	(N·m) Torsion moment	Code specification	(N·m) Torsion moment
008	80	080	800
015	150	100	1000
020	200	120	1200
040	400	200	2000
060	600	3000	3000

Code of control unit

control unit	Code
aptitude numeral module	A
HART	H
HART+Infrared remote control	HIR
MODBUS	M
MODBUS+Infrared remote control	MIR
FF	F
FF+Infrared remote control	FIR
PROFIBUS	P
PROFIBUS+Infrared remote control	PIR
Ethernet	E
Ethernet+Infrared remote control	EIR
Infrared remote control	IR

Notes: Any special requirements, please specify when order, to make ensure that we manufacture the right product for you, Please spare space for maintenance while installing

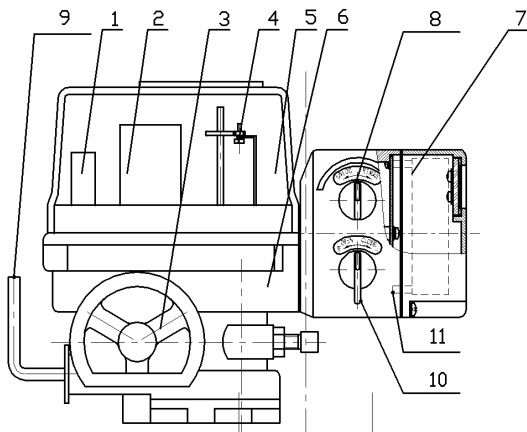
HQ Angular travel electric actuator



Technical specification

Design reference	GB/T 8219-1999 LVD/EMC
Test & inspection	GB/T 8219-1999 CE LVD/EMC

Materials of major parts



Nº	Accessory name	Material
1	Capacitance	Discreteness
2	Motor	Discreteness
3	hand wheel	Discreteness
4	Potentiometer	Discreteness
5	Main body	ZL104
6	Cover	ZL104
7	Control module	Discreteness
8	Local/remote switch	Discreteness
9	Handle	Q235-A
10	Manual/auto switch	Discreteness
11	Junction box	ZL104

Control precision: 0.1% ~ 5%

Display: valve opening, input signal, malfunction

Parameter setting: field bus, Infrared remote control, keystroke

Acknowledgement signal: field bus DS , 4~20mA, 1~5VDC

Feedback signal: field bus DS , 4~20mA, 1~5VDC

Telecommunication modes: HART , PROFIBUS , FF , ETHERNET , MODBUS

Working temperature: -20°C~70°C

Power supply: 220±10%VAC 50(60)Hz

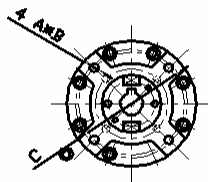
Model	Turning angle (°)	Output torque (N·m)	Speed (s/90°)	Motor protection	Wire connection	Manual operation	Protection Class	Weight (Kg)
HQ008	0~90	80	13/16	Thermo switch	M20×1.5	hand wheel	IP67	7.4
HQ015	0~90	150	21/25	Thermo switch	M20×1.5	hand wheel	IP67	16.6
HQ020	0~90	200	21/25	Thermo switch	M20×1.5	hand wheel	IP67	16.6
HQ030	0~90	300	26/31	Thermo switch	M20×1.5	hand wheel	IP67	22
HQ050	0~90	500	26/31	Thermo switch	M20×1.5	hand wheel	IP67	23
HQ060	0~90	600	23/31	Thermo switch	M20×1.5	hand wheel	IP67	23
HQ080	0~90	800	31/37	Thermo switch	M20×1.5	hand wheel	IP67	29
HQ120	0~90	1200	31/37	Thermo switch	M20×1.5	hand wheel	IP67	29
HQ200	0~90	2000	93/112	Thermo switch	M20×1.5	hand wheel	IP67	75
HQ300	0~90	3000	93/112	Thermo switch	M20×1.5	hand wheel	IP67	75

Model selection (HQ015)

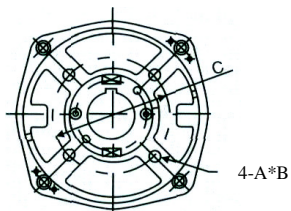
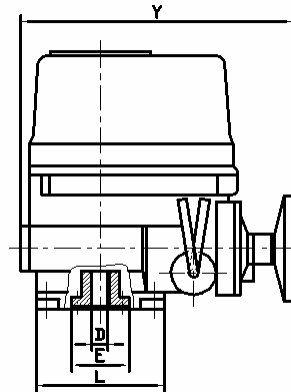
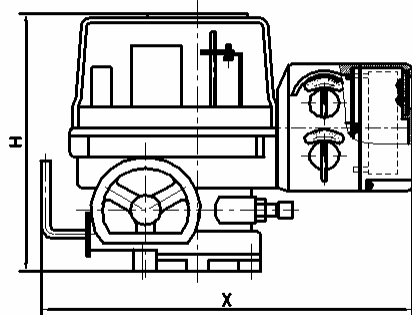
Classification	Model
Switch	HQ015
Aptitude numeral module	HQ015A
HART	HQ015H
HART+Infrared remote control	HQ015HIR
MODBUS	HQ015M
MODBUS+Infrared remote control	HQ015MIR
FF	HQ015F
FF+Infrared remote control	HQ015 FIR
PROFIBUS	HQ015P
PROFIBUS+Infrared remote control	HQ015PIR
Ethernet	HQ015E
Ethernet+Infrared remote control	HQ015EIR
Infrared remote control	HQ015IR

Note: All the actuators are equipped with local/remote control switch, please specify if it is not required.

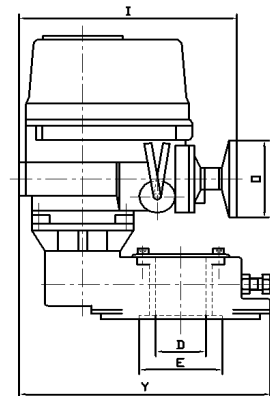
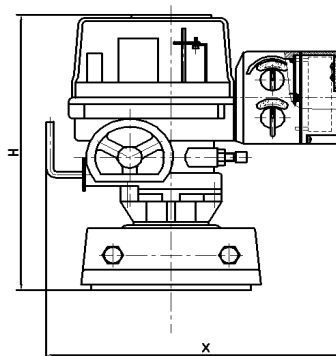
External dimensions



Base ISO 5211



Base ISO 5211



<i>Model</i>	<i>Base ISO 5211 øC</i>	<i>A*B</i>	<i>D</i>	<i>E</i>	<i>H</i>	<i>I</i>	<i>L</i>	<i>O</i>	<i>X</i>	<i>Y</i>
<i>HQ008</i>	<i>ø70 F07/F10</i>	<i>M8</i>	<i>20</i>	<i>-</i>	<i>220</i>	<i>207</i>	<i>88</i>	<i>120</i>	<i>388</i>	<i>170</i>
<i>HQ015</i>	<i>ø70/ø102 F07/F10</i>	<i>12/15 M8/M10</i>	<i>22</i>	<i>-</i>	<i>260</i>	<i>273</i>	<i>125</i>	<i>156</i>	<i>468</i>	<i>229</i>
<i>HQ020</i>	<i>ø70/ø102 F10/F12</i>	<i>12/15 M8/M10</i>	<i>22</i>	<i>-</i>	<i>260</i>	<i>273</i>	<i>125</i>	<i>156</i>	<i>468</i>	<i>229</i>
<i>HQ030</i>	<i>ø102/ø125 F10/F12</i>	<i>12/15 M10/M12</i>	<i>35</i>	<i>-</i>	<i>290</i>	<i>303</i>	<i>148</i>	<i>156</i>	<i>468</i>	<i>259</i>
<i>HQ050</i>	<i>ø102/ø125 F10/F12</i>	<i>15/18 M10/M12</i>	<i>35</i>	<i>-</i>	<i>290</i>	<i>303</i>	<i>148</i>	<i>156</i>	<i>498</i>	<i>259</i>
<i>HQ060</i>	<i>ø102/ø125 F12/F14</i>	<i>15/18 M10/M12</i>	<i>35</i>	<i>-</i>	<i>290</i>	<i>324</i>	<i>148</i>	<i>156</i>	<i>498</i>	<i>259</i>
<i>HQ080</i>	<i>ø125/ø140 F14/F16</i>	<i>15/18 M12/M16</i>	<i>45</i>	<i>-</i>	<i>315</i>	<i>345</i>	<i>178</i>	<i>220</i>	<i>540</i>	<i>297</i>
<i>HQ120</i>	<i>ø140/ø165 F14/F16</i>	<i>18/24 M12/M16</i>	<i>45</i>	<i>-</i>	<i>315</i>	<i>345</i>	<i>178</i>	<i>220</i>	<i>540</i>	<i>297</i>
<i>HQ200</i>	<i>ø140/ø165 F14/F16</i>	<i>18/24 M16/M20</i>	<i>65</i>	<i>245</i>	<i>548</i>	<i>345</i>	<i>-</i>	<i>220</i>	<i>540</i>	<i>319</i>
<i>HQ300</i>	<i>ø140/ø165 F14/F16</i>	<i>24/30 M16/M20</i>	<i>65</i>	<i>245</i>	<i>548</i>	<i>345</i>	<i>-</i>	<i>220</i>	<i>540</i>	<i>319</i>

Commitment on quality service

We hereby confirm that the design, manufacture, and inspection of our products are strictly in accordance with the relevant state and international standards, and meet the relative quality requirement.

The guarantee period of our products is valid for 12 months. If any doubt to the quality of our products, we hereby promise to deal with it within 24 hours upon receiving the quality objection.

Quality Control Department

Appendix

1. Product debug

① Connection of electric device and valve

1. Turn the valve by hand, to confirm it's in normal operation, and then turn it to full close position
2. Fix the bracket onto the valve
3. Put the electric device on the bracket and fix it with bolts and nuts
4. Turn the electric device to full close position and combine valve stem and electric device output axle with coupler;
5. Tighten the screws between the electric device and the bracket;
6. Rotate the electric device with handle, make sure it goes smooth, no eccentric or slanting, and pay attention not to exceed.

② Cable layout

Please use the cable with outer diameter $\Phi 9 \sim \Phi 11$ (refer to the figure on the right). When using the wire pipe, its outer diameter must also be $\Phi 9 \sim \Phi 11$;

If the cable diameter and wire pipe diameter fall short of the requirement, it will cause the water enter into the machine and damage it.

③ Layout wire pipe

When using the wire pipe, please adopt the waterproof countermeasure fully (refer to the figure on the right) as the figure shows: The machine should be higher than the wire pipe, so, the bead inside the wire pipe will not flow into the electric device, to ensure the machine's safety

④ Stroke adjustment and commissioning

1. Stroke switch and opening meter adjustment

Loose the block screw (or nut), and rotate the block to adjust the full open and full close angle. (see figure)

2. Adjustment of Mechanical Block

Rotate the nut with handle, make the adjustment screw and block contact, then rotate it for half circle backwards and tighten the nut.

Carry out the full close position adjustment with the same method.

3. Manual operation

Cut off the power source when carrying out manual operation;

Remove the rubber cap of the deceleration cover and insert the handle into hexagon holes;

Rotate the manual handle clockwise to reduce the opening degree

Note: The limit switch will meet the mechanical block half a circle after the position indicator shows full open or full close position, and excessive or overpower turning will cause damage on other components, thus, avoid excessive forces.



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4. Electro motion operation

Before electro motion operation, first, use hand operation to check whether the position indicator and valve opening degree are consistent (full open and full close);

Check whether the wiring is correct, meanwhile use the external wiring switch to determine open and close action;

Begin the electro motion operation after confirming above stated.

Refer to the wiring diagram to connect designated signal source, positioner, electrical actuator, output signal measuring meter and power supply.

Electrifying. The actual opening value of valve position will be displayed at this time. And the positioner is in auto monitor status. If you rotate the actuator with handle after disconnecting the input signal, the actual opening value of valve position will increase as the opening value of actuator increases. If not so, please check if the feedback signal of positioner potentiometer is correctly connected.

Press A/M key to switch to Manual status. Respectively press▲ and▼ keys, the operations of actuator shall be "OPEN" and "SHUT" respectively. Or check if COM, OPEN and SHUT terminals of the positioner and actuator are connected correspondingly.

In Auto status, press ▲ key to see the opening value of valve position. At this time, you can see the change trend and stability of input signal.

In Auto status, press▼ key to see the temperature inside the housing of positioner. When the temperature is over 70°C, the positioner will stop control on actuator OPEN and SHUT.

Parameters list:

Parameter	Displayed value	Description	Factory setting
U0	00x.0	X=1: Allow electronic brake; x=0: Do not allow electronic brake	1
	000.x	①x =0: Do not allow changing positioning precision, but allow to change readjusting time. ②x=1 , 2 , 3: Do not allow to change readjusting time, but allow to change positioning precision.	0
U1	00x.0	Set positive and negative actions. x=0: Positive; x=1: Negative	1
	000.x	Break signal mode. x=0(omit)x=1(OPEN)x=2(STOP)x=3(SHUT)	2
U2	xxx.x	Control output lower limit, manually set zero point. Will not be limited by the parameter in full position.	0.0
U3	xxx.x	Control output upper limit, manually set zero point. Will not be limited by the parameter in full position.	100.0
U4	00x.x	Adjustable precision: x.x/100	0.4
U5	xxx.x	Operation password (U5=003.1: Enter to set opening value of actuator)	
U6	xxx.x	Confirm zero position of actuator. Press ▲▼ key. When the zero position is reached, press A/M key to confirm and then enter U7.	
U7	xxx.x	Confirm full position of actuator. Press ▲▼ key. When the full position is reached, press A/M key to confirm.	
Note: For other parameters, the factory will reserve using. Please refer to Annex if necessary.			

Set zero and full positions of actuator (⚠if the positioner is used with actuator for the first time, the rotating angle of actuator must be set. Or the positioner cannot work normally. This setting will not affect the input and output signals of positioner.)

Solution 1: Simple automatic setting (*this solution requires electric or mechanical position limitation)

Press A/M and ▼ simultaneously and release them simultaneously will active automatic setting when on auto status. Actuator will confirm zero position, when the actuator reaches minimum position it will judge zero position(valve position 0.0); then the actuator will turn to maximum position, when the actuator reaches maximum position it will judge full position(valve position 100.0), Setting result will be recorded automatically after setting is done and return to auto status.

Solution 2: Free setting :(*Ensure the idle time between pressing button is less than 8 seconds during this setting method)

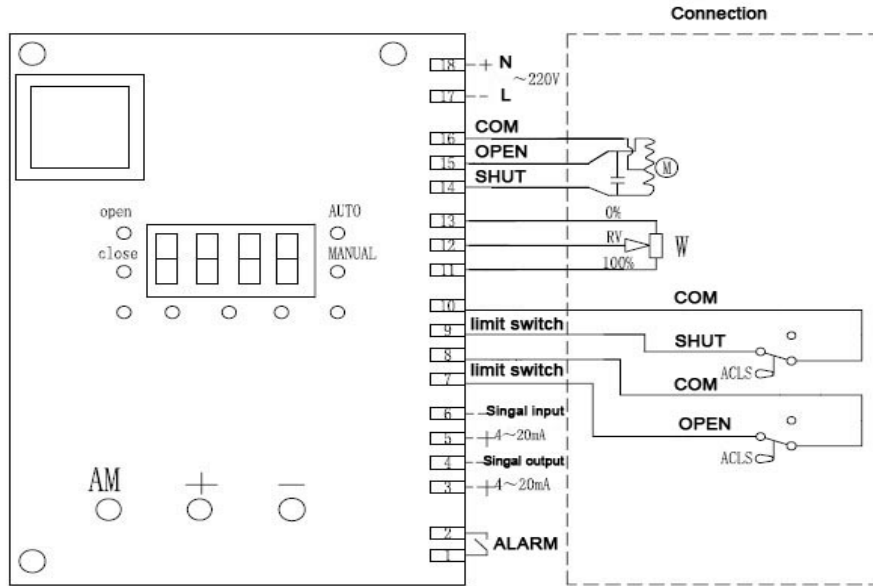
Press A/M for 4 seconds turns into U0 parameter, skip U1, U2, U3, U4 into U5 parameter, modify U5=003.1 then press A/M button.

(1) Enter U6 parameter, Press ▲ or ▼ , actuator will turn to “open” or “close” accordingly, valve positioner will increase or decrease too. When reach target zero position(eye confirming valve position if valve is installed, normally set to full close position), press A/M button, zero position confirms, enter U7 parameter;

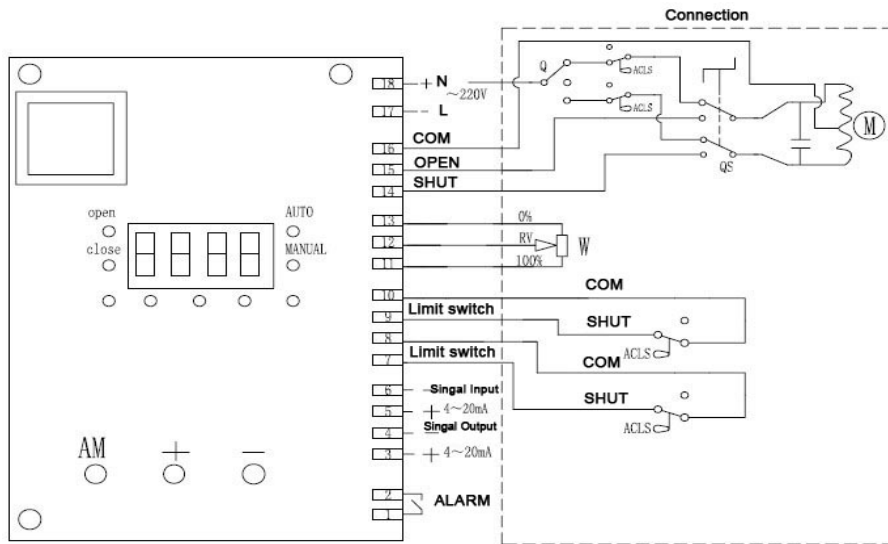
(2)In U7 parameter, press ▲ or ▼ to adjust valve position(eye confirming valve position if valve is installed, normally set to full open position), press A/M button, return to U5.

(3)Modify U5=000.5, return to auto status.

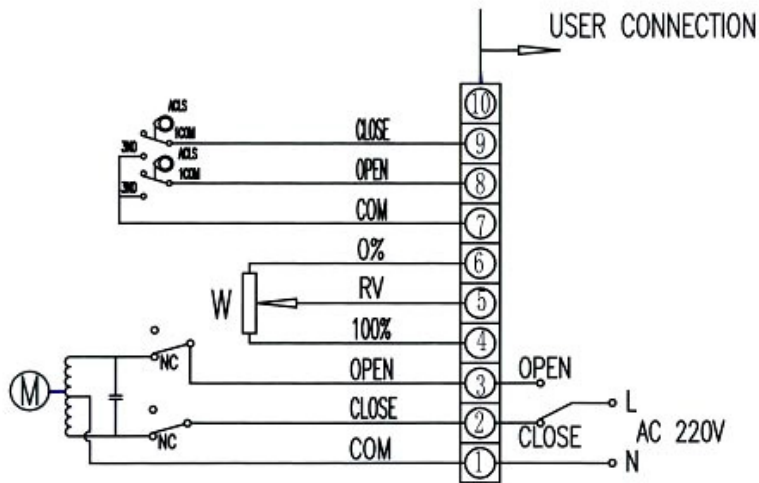
11. Circuit connection



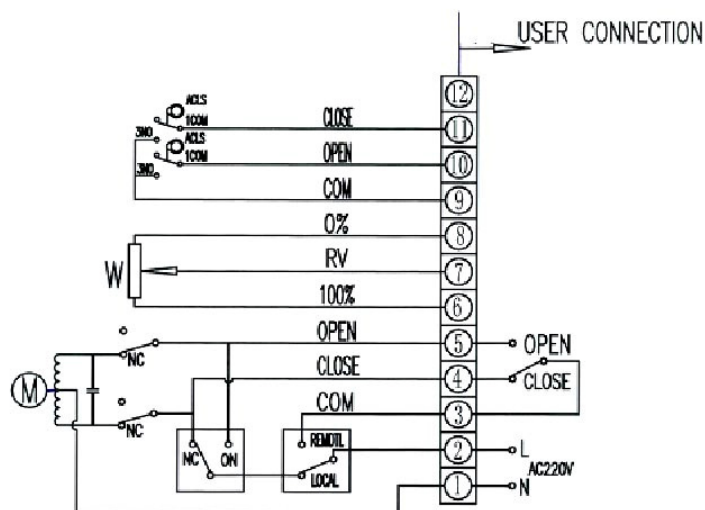
Common Adjust Type



Local/Remote Adjusting Type



Common Switch Type



Local/Remote Switch Type

III、 Maintenance

Oiling: It's unnecessary to add oil because of the long service life and good pressure resistant molybdenum base lubricant;

Regular running: When the valve is infrequently used, please drive the machine regularly and check if it is normal or not.

IV、 Common faults and countermeasure

Faults	Reason	Countermeasure
<i>Motor cannot start</i>	<i>Power is off</i>	<i>Switch on the power</i>
	<i>Wire broken, connector and terminal table are separated</i>	<i>Repair the broken wire, correctly connect and tighten the terminal</i>
	<i>The power voltage is incorrect or too low</i>	<i>Check the voltage and make it normal</i>
	<i>Overheat protector actions</i>	<i>Drop down the temperature</i>
	<i>Ambient temperature is too high, valve is blocked</i>	<i>open and close by hand to check it's normally</i>
	<i>Abnormal action of Limit switch</i>	<i>Replace the switch</i>
	<i>Improper adjustment of Stroke block</i>	<i>Readjust the stroke block</i>
<i>No response from the open/close indicating lamp</i>	<i>Indicating lamp is damaged</i>	<i>Replace the indicating lamp</i>
	<i>Limit switch acts bad</i>	<i>Replace the switch</i>
	<i>improper adjustment of Stroke block</i>	<i>Readjust the stroke block</i>