

FORENSERVTEK Electric Actuator



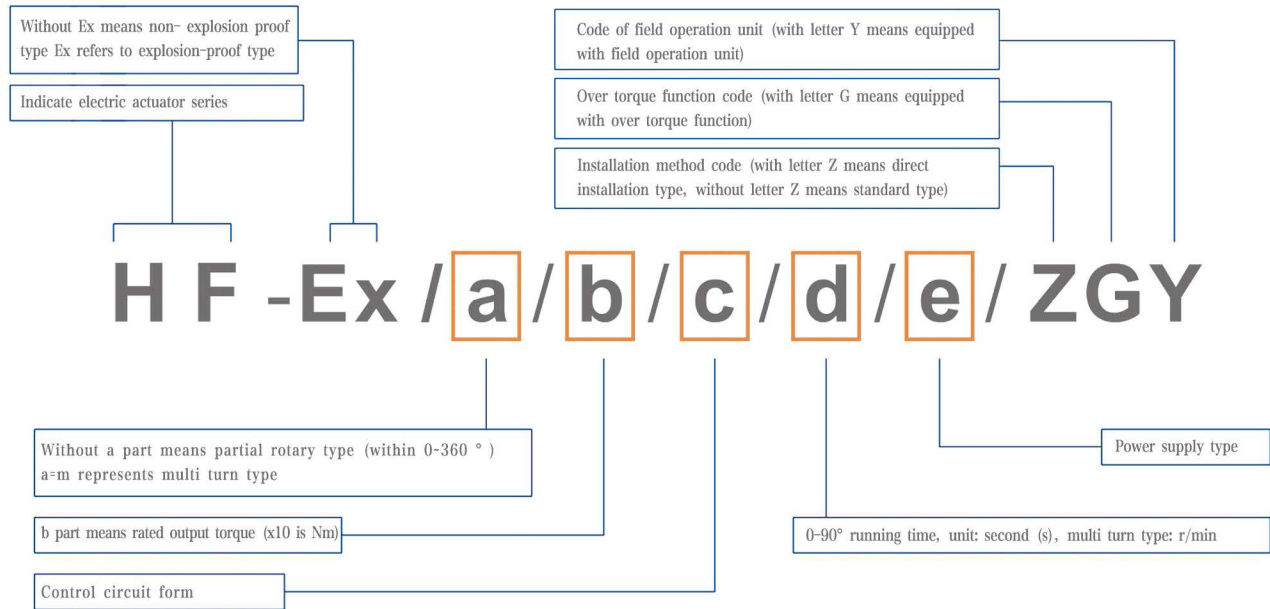
Forenservtek (Shandong) Industrial Equipment Co., Ltd

The Forenservtek team has been focusing on the R&D, production, sales and technical services of valve actuators for many years. HF series electric actuators are the latest generation of refined and improved products in China. Based on absorbing various advantages of similar products at home and abroad and the actual application characteristics, a lot of targeted optimization designs has been made, which have obvious advantages in multi-function, reliability, cost performance, etc. The products are widely used in petrochemical, electric power, steel, paper making, pharmaceutical, water treatment, ships, buildings, food and other fields.

At present, Forenservtek has two categories of products: partial rotation and multi rotation. HF series products are all in line with JB/T8219-1999 standard, and the shell protection reaches IP67. It is the best choice for ball valves, butterfly valves, gate valves, globe valves, diaphragm valves, plug valves and other angle travel and straight travel valves.

Our company is willing to undertake various non-standard customization businesses based on strong product R&D capabilities and rich product development experience, and create the optimal solution tailored to your industrial automation needs.





Example: **HF-060E/45S/AC220V/Z0Y**

It means that the opening and closing time is 45s, and the rated torque is 600Nm. Single phase AC 220V power supply, direct installation, non-explosion-proof integrated adjustable electric actuator.





- Voltage: 24VAC/DC, 110, 220, 380VAC 50/60HZ
- Output torque:
 - Partial rotation: 50Nm to 2500Nm
 - Multi rotation: 50Nm to 200Nm
- Small size and light in weight
- High definition valve status display
- Easy to operate manual handle operating system
- Support switch control or regulation control
- The travel limit cam can be quickly adjusted with a finger or screwdriver
- ISO 5211 can be directly mounted on the valve



1 Housing

The compact waterproof actuator is certified according to IP67 standard. The aluminum die-casting shell is sprayed with electrostatic plastic powder, which has excellent anti-corrosion, abrasion resistance, impact resistance and UV protection functions.

2 High definition valve status display

The traditional on-site indication with simple structure is extended to on-site indication function and operation guidance function.

3 Fastening screw

The upper cover is connected with the base part through stainless steel screws with the fastening function, and is arranged outside the sealing area.

4 O-ring of waterproof housing

The O-ring is located between the housing and the base to provide a waterproof and anti-corrosion sealing function.

5 Wiring inlet and outlet

Two NPT or metric threaded connections for power and control cables.

6 Motor

All motors adopt Class E insulation. When the motor temperature rises to 120 ± 5 °C, the thermal protector in the motor will start and cut off the power supply, so as to protect the motor from damage due to temperature rise.

7 Worm gear

Worm gear are connected by spline, which is suitable for working occasions with long-term heavy load and frequent large torque alternating impact.

8 Mechanical stroke limit screw

When the manual operation system is in operation or the electrical limit fails, the valve and system shall be protected against overtravel in the opening or closing direction by the stop against the forced rotation of the output shaft.

9 Limit switch bracke

The simple and safe design firmly fixes the limit switch to ensure the accuracy and repeatability of valve position feedback.

10 Limit switch cam

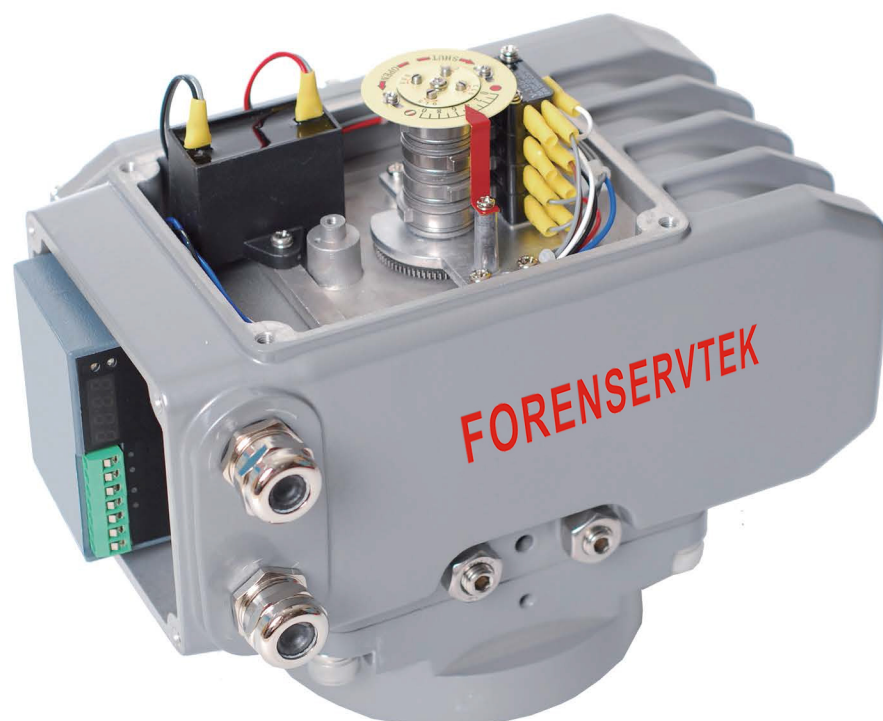
Hartford patented cam can be adjusted directly with fingers or screwdriver without special tools. The standard factory setting is a 90 degree travel between open and closed.

11 Deep groove ball bearing

Provides low friction while safely calibrating the actuator indicator shaft and cam to ensure reliable valve position feedback.

12 Servo controller

The circuit board is designed in an integrated way, which is impregnated with plastic, anti-seismic, heat-insulating, dust-proof, moisture-proof, small temperature drift, and stable and reliable for long-term operation.





The servo controller provides precise adjustment service for adjusting position control.

- Touchable automatic calibration
- User friendly interface
- Proportional regulation and dead time regulation have advanced control
- Automatic pulse mode for precise positioning
- Self diagnosis
- Automatic reset after loss of control signal
- Locating position signal

Servo controller features/specification parameters

Servo is applicable to the actuator with adjustable service and continuous load.

Actuator voltage	24VAC/DC, 110,220,380VAC 50/60 Hz
CPU	high speed CPU components, digital analog hybrid circuit design
Input signal	options 4-20mA, 0-10, 2-10, 0-5 VDC
Transmission signal	options 4-20mA, 0-10, 2-10, 0-5 VDC
Independent isolation	input and output signals, control signals and power supply, and photoelectric isolation
Display	digital display
Menu navigation	up/down allow selection (V) key
Return	less than 0.3%
Calibrate	automatically calibrate in sequence
Dead zone	options 0.4% - 1.5%
The action frequency	up to 1500 times/h
Electronic braking	effectively eliminate the motor's moment of inertia, and the positioning accuracy can reach 0.5%
Fault position (input signal loss)	the options are OFF, ON, and HOLD



1 Potentiometer

The optional gear driven potentiometer provides the customer control system with continuous position feedback.

2 Over torque protection

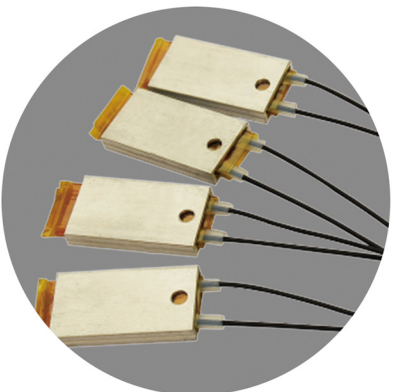
The over torque protection device can achieve this purpose by preset torque protection value. When the output torque of the actuator reaches the set value, power off protection can be realized quickly through mechanical action. It can not only realize qualitative control at the rated value of the actuator, but also conduct quantitative protection at a certain value within the rated torque range.

3 Auxiliary switch

It is equivalent to an additional dry contact single pole double throw mechanical switch to indicate the valve travel position to the client remote control system.

4 Dehumidifying heater

PTC dehumidification heater is optional. Condensation is prevented by heating the air in the instrument cavity. The heater adopts continuous working system, and uses the temperature characteristics of PTC resistance to maintain constant temperature heating. It is safe, reliable and efficient without open fire.



5 Bulgy indicator

Remote visible indication

6 High and low temperature environment

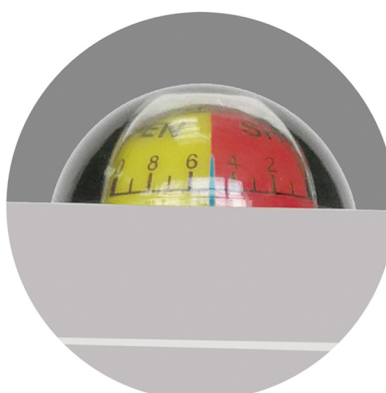
Suitable for occasions with higher and lower temperature

7 Field operation unit

The field operation unit is a unit of modular design, which can be selected by the user according to the needs, and can facilitate the remote local state switching. In the remote state, the actuator receives the command action from the central control room. In the local state, the central control command can be cut off for on-site manual operation. The device adopts non immersion design, and does not need to be opened for debugging. The switch type and adjustment type can be optional.

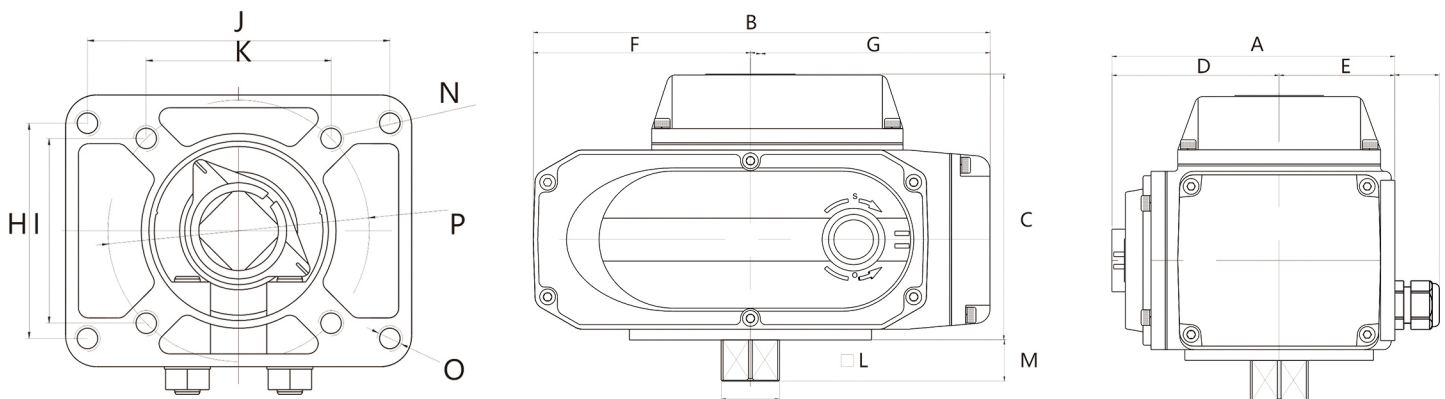
8 Communication

The protocol communication function can also be loaded according to the user's needs, Support Modbus, Profibus, HART.



Item \ Type		HF-005	HF-010	HF-020	HF-040	HF-060	HF-100	HF-160	HF-250
Voltage	V	110V 220V 380V	110V 220V 380V	110V 220V 380V	110V 220V 380V	110V 220V 380V	110V 220V 380V	110V 220V 380V	110V 220V 380V
Power	W	10W 10W 6W	25W 25W 15W	40W 40W 30W	90W 90W 40W	90W 90W 40W	120W 120W 90W	140W 140W 100W	140W 140W 100W
Current	A	0.24A 0.16A 0.07A	0.56A 0.32A 0.10A	0.69A 0.32A 0.15A	1.12A 0.54A 0.29A	1.20A 0.64A 0.29A	1.93A 0.96A 0.45A	1.75A 0.98A 0.46A	1.75A 1.03A 0.48A
Torque	Nm	50	100	200	400	600	1000	1600	2500
Weight	Kg	2.5	3.5	8	8.5	9	20	22	25
Stroke Time	s	20	30	30	30	45	30	48	75

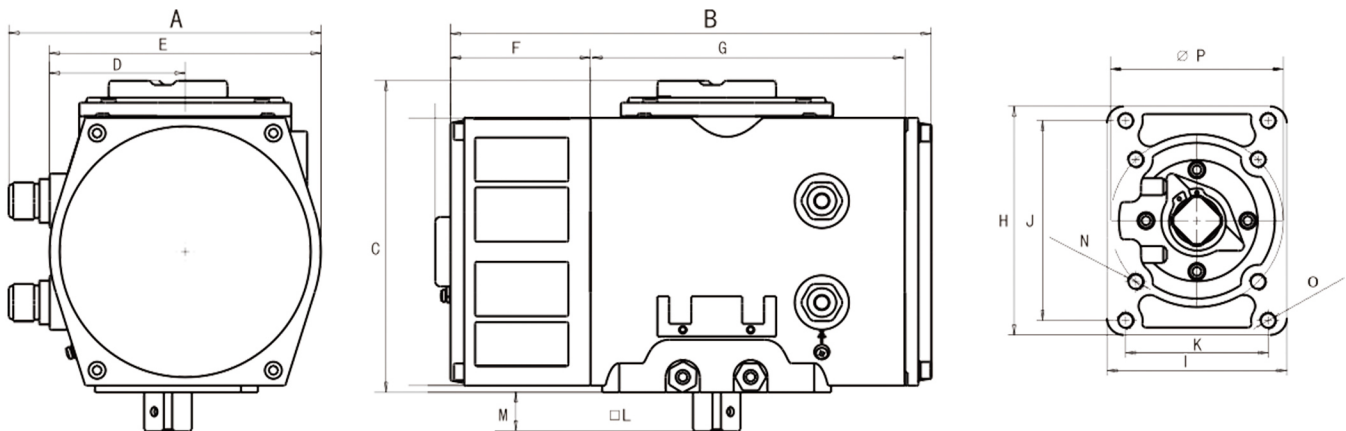
Dimension drawing



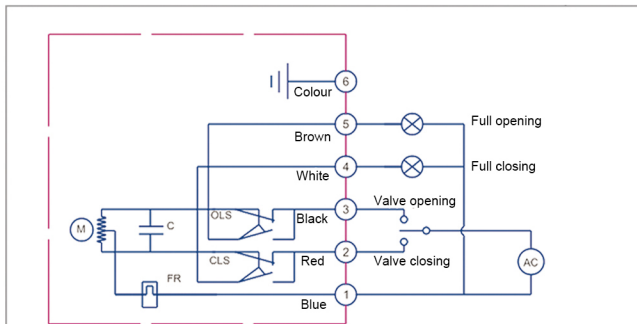
Item Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
HF-005	114	116.5	107	65	49	83	83.5	72	60	80	68	12	12	4-M8	4-M6	70
HF-010	120	195	127.5	72	48	97.5	97.5	86	70	98	82	15	15	4-M8	4-M6	70
HF-020	159	254.5	148.5	94	65	121	133.5	84	72	118	72	23	23	8-M10	8-M10	102
HF-040	159	254.5	148.5	94	65	121	133.5	84	72	118	72	23	23	8-M10	8-M10	102
HF-060	159	254.5	148.5	94	65	121	133.5	84	72	118	72	25	23	8-M10	8-M10	102
HF-100	250.5	353.5	185	151.5	99	155.5	198	116	84	136	118	30	23	4-M10	4-M12	125
HF-160	250.5	353.5	185	151.5	99	155.5	198	116	84	136	118	30	23	4-M10	4-M12	125
HF-250	250.5	353.5	185	151.5	99	155.5	198	116	84	136	118	30	23	4-M10	4-M12	125

Item \ Type		HF-M005	HF-M010	HF-M020
Voltage	V	110V 220V 380V	110V 220V 380V	110V 220V 380V
Power	W	25W 25W 15W	90W 90W 40W	140W 140W 100W
Current	A	0.57A 0.23A 0.10A	1.12A 0.68A 0.29A	1.75A 1.03A 0.48A
Standard output	Nm	50Nm 5r/min	100Nm 5r/min	200Nm 5.6r/min
Alternate Output	Nm	80Nm 5r/min	—	100Nm 11.2r/min
No. of rotation		25	25	25
Weight	kg	8	13	20

Dimension drawing

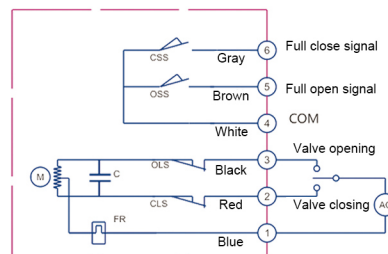


Item Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
HF-M005	162.5	242.5	167.5	92.5	137	70.5	172	98	86	82	70	17	12	4-M8	4-M6	70
HF-M010	184	283.5	184	80	160	82.5	185.5	135	106	118	84	22	23	4-M10	4-M10	102
HF-M020	272.5	353.5	185	99	160.5	155.5	198	165	144	136	116	30	23	4-M10	4-M12	—



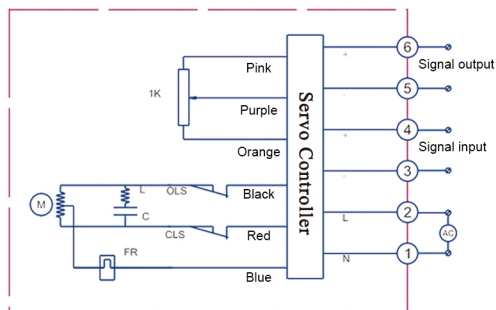
Type A: active contact feedback

Function: open and close operation is realized through AC switching value, and a group of active position signals indicating full open and full close are output.



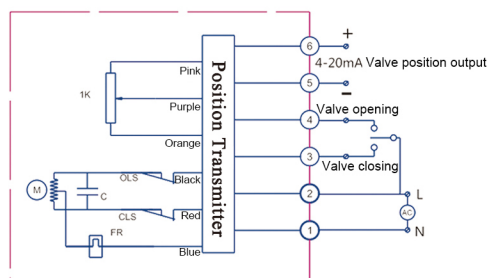
Type B: Passive contact feedback

Function: open and close operation is realized through AC switching value, and a set of contactless signals corresponding to full open and full close are output.



Type E: with servo controller

Function: opening adjustment is realized by external input of 4-20mADC/ 1-5VDC analog signal, and 4-20mADC signal is output continuously.



Type F: Position transmitter

Function: realize opening control through external AC switching value, and continuously output 4-20m ADC position signal.

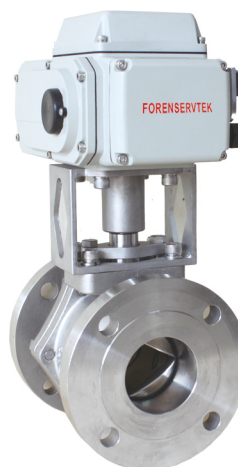
Specification of electric actuator	Rated output Nm	Valve type (partial rotation)		
		Soft seal ball valve (PN ≤ 1.6Mpa)	Soft seal butterfly valve (PN ≤ 1.0Mpa)	Vent butterfly valve (PN ≤ 0.1Mpa)
HF-005	50	≤DN40	≤DN65	≤DN80
HF-010	100	DN50~DN65	DN80~DN100	DN100~DN200
HF-020	200	DN65~DN80	DN125~DN150	DN250~DN300
HF-040	400	DN100~DN125	DN150~DN200	DN350~DN450
HF-060	600	DN125~DN150	DN200~DN250	DN500~DN600
HF-100	1000	DN150~DN200	DN300~DN350	DN700~DN800
HF-160	1600	DN200~DN250	DN350~DN450	DN900~DN1000
HF-250	2500	DN300~DN350	DN500~DN650	DN1100~DN1200

Specification of electric actuator	Rated output Nm	Rated speed r/min	Valve type (multi turn)		
			Stop valve (PN ≤ 1.6Mpa)	Diaphragm valve (PN ≤ 1.0Mpa)	Soft seal valve (PN ≤ 0.1Mpa)
HF-M005	50	5	≤DN65	≤DN65	≤DN80
HF-M010	100	5	DN80~DN125	DN80~DN125	DN100~DN150
HF-M020	200	5.6	DN125~DN150	DN125~DN150	DN200~DN300

Matching of electric actuator with other types of valves

The torque indicators of valves of the same specification and model are different due to different manufacturers' manufacturing processes and quality levels. In actual use, the operating torque of valves varies greatly due to pipeline pressure fluctuation, medium type, ambient temperature, working characteristics and other factors. Therefore, in order to ensure that the actuator can operate the valve normally and work stably and reliably for a long time, a certain margin must be reserved for model selection. For HF series electric actuators, our company suggests to select electric actuators according to the following principles:

$$\text{Safety factor} = \frac{\text{Rated output torque of electric actuator (Nm)}}{\text{Testing opening/closing torque of valve under pressure (PN) (Nm)}} \geq 1.21 \sim 1.3 \text{ times}$$



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