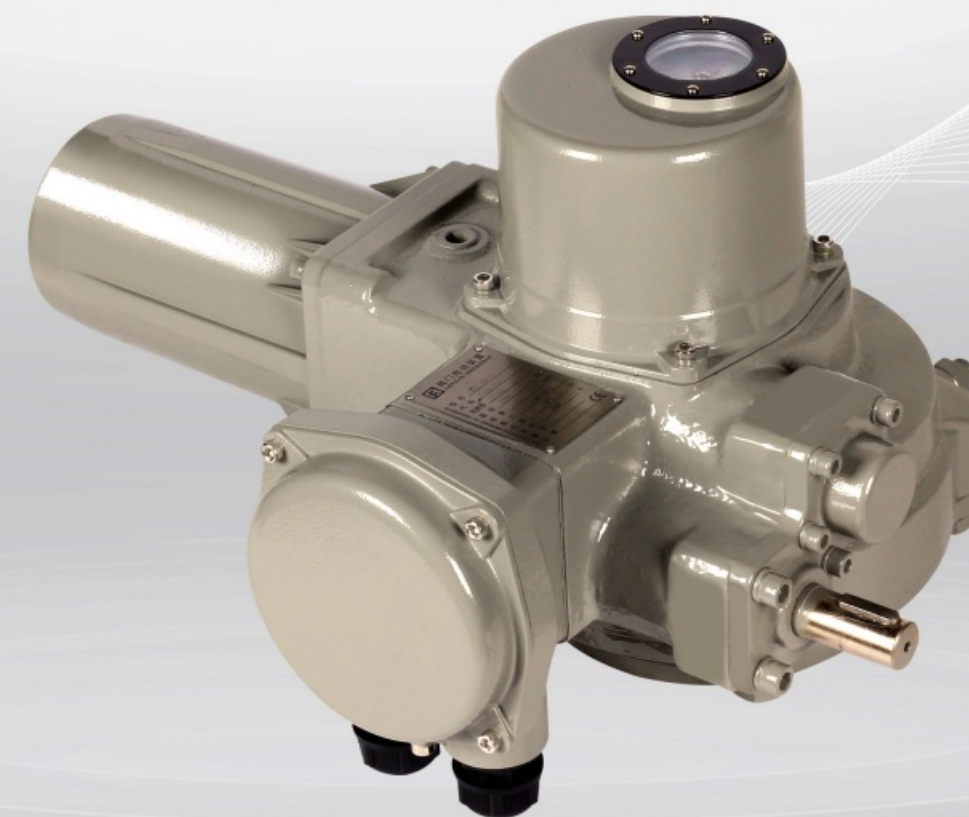




802 Series Electric Actuators

► For Part-turn Application



Summary

- **Applicability** They provide a reliable position control of butterfly, ball valves, as well as similar ones.
- **Torque** 100 ~ 12000 Nm

Features

- 1 The transmission structure design of combination of worm gear and planetary gear drive has become a classic in the industry. The reduction mechanism is placed in the watertight house even the output torque reaches 5000Nm. So the compact profiles provide the 802 series higher reliability and watertightness.
- 2 The shift from manual to motor operation is fully automatic and no hand/auto lever is provided. The handwheel could be operated without danger even in motor mode.
- 3 802 series have a separate terminal box, which is more convenient for wiring and can be easily extended. Installing different control packages make 802 series be feature-rich integrated products.
- 4 The 802 series can have explosion-proof enclosure to reach Ex d IIB T4 Gb (GB3836.1-2010, GB3836.2-2010) .
- 5 802 series (include ex-proof units) with IP65 (GB4208-2008) enclosure can ensure complete protection from dust and moisture. IP67 or IP68 enclosure can be provided if need.



About us

Tianjin Beifang Valve Actuator Co., Ltd. (BF for short) always focus on the design and manufacture of excellent valve actuator and control equipment.

BF attaches great importance to product design, and the design team has strong product design and innovation ability. BF has complete intellectual property rights and a number of technical patents. Over the years, our products have been annual exported in batches and were widely and successfully used in water treatment, oil, electricity, chemical and other industries.

BF acquired the authentication of quality management system standards ISO9000 of DNV in 1998. Strict quality control in all stages and constantly improving the product quality control standards is the consensus of the staff.

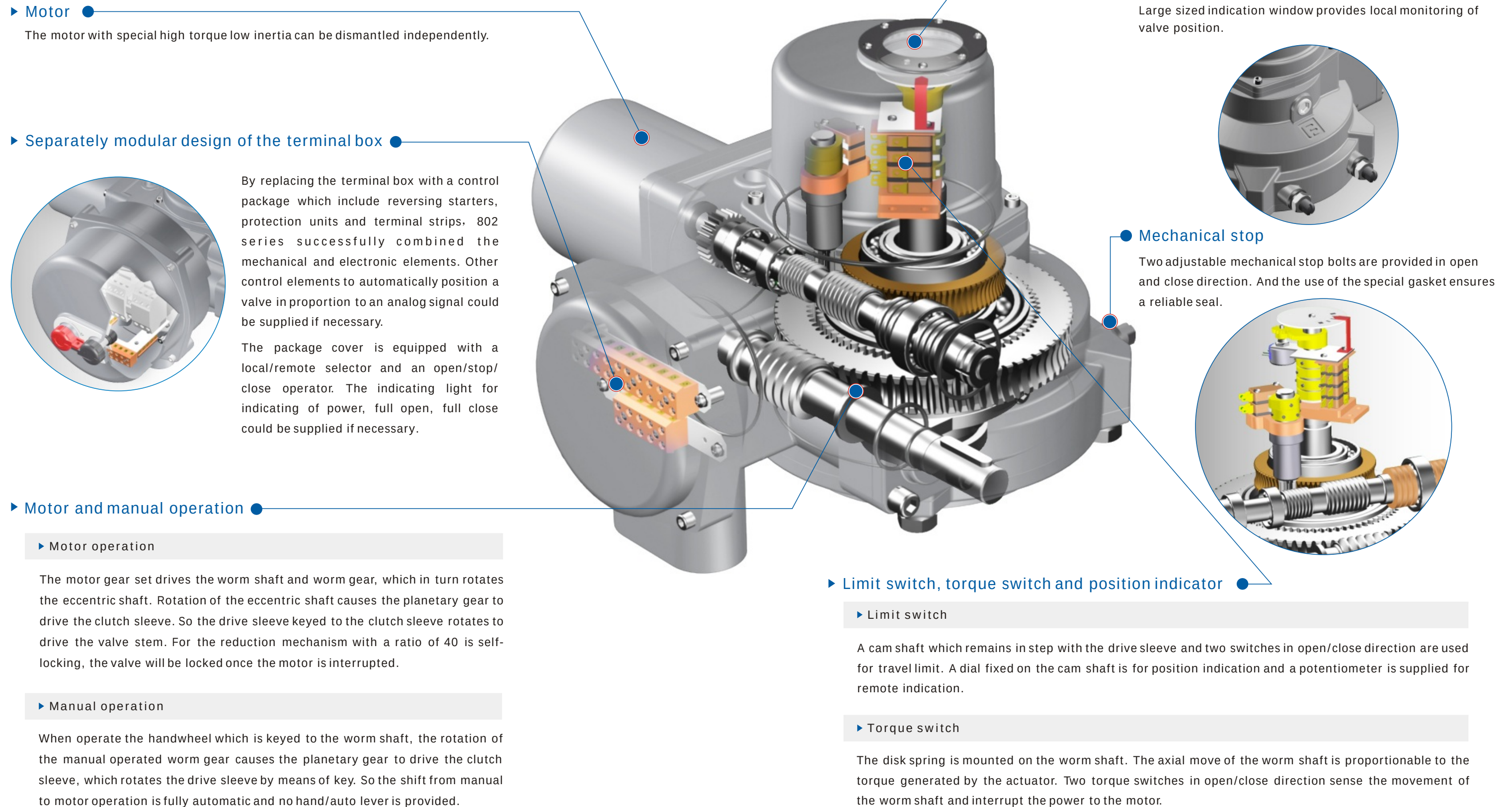
BF believes that only solid the software and hardware foundation to achieve long-term stable development. We have set up some advanced computer-aided system, such as product design, resource management, production management, and soon. And we have set up the platform of precision machining mainly based on CNC machining center. We also continue to establish and improve a documented management system.

BF will design and manufacture products solidly and continue our efforts to create more value for customers.

Where to find information

Features	01/	Main parameters	10/
Structure	02/	Connection parameters	12/
Configuration and function	04/	Overall dimension	13/
Model and specification	08/	Wiring diagram	16/

Structure



Configuration and function

► 802 series include the basic type and the integrated type.

Basic type
Include motor, reduction mechanism, limit and torque switch. The consumer could fulfil local/remote operation by equipping with the BF series controllers made in our company or other similar equipment.

Integrated type
It integrates reversing starters, protection elements, logic elements, in/output unit in a watertight box, which can fulfil local/remote operation. This kind of actuator include: Open-close type (fulfil the fully open/close operation) and modulating type(fulfil the proportional control of the opening degree of valves).
A full range of options could be provided, if necessary, please tell us when order.

► Standard
Ordinary products comply with GB/T24923 《Technical specifications of basic version electric valve actuators》. Explosion-proof products comply with GB/T24922 《Technical specifications of explosion-proof version electric valve actuators》.

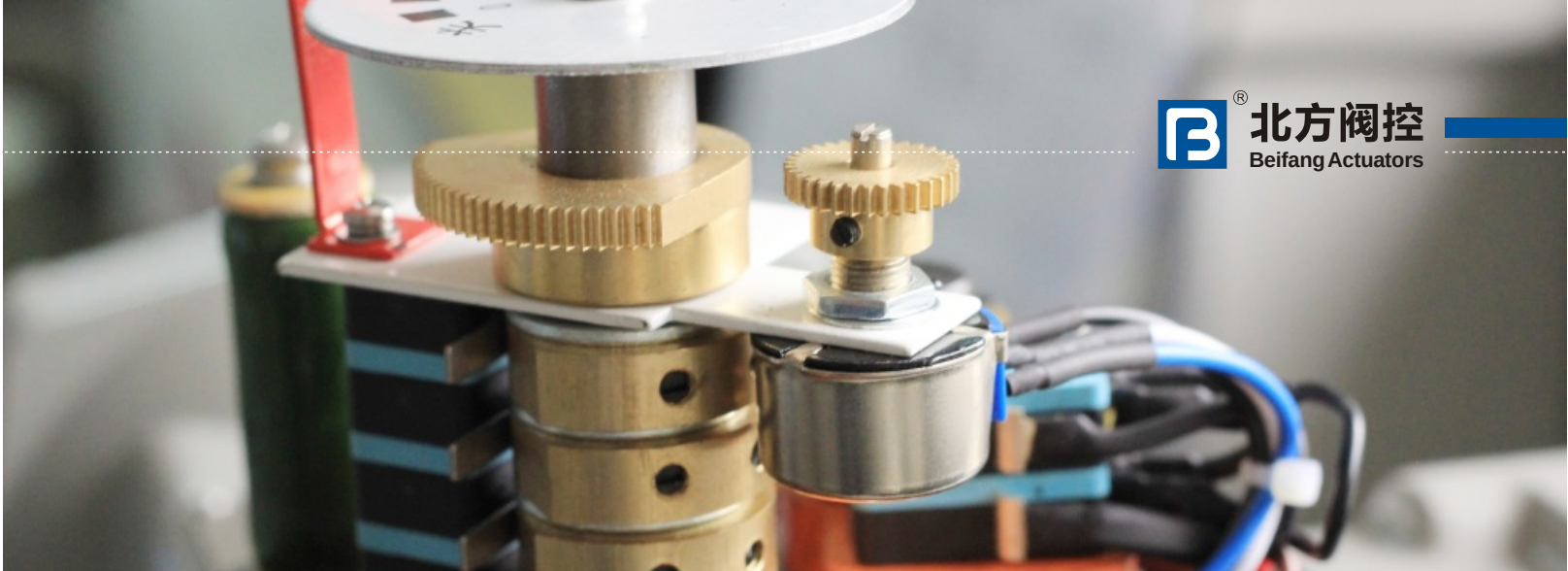
► Ambient temperature

	Basic and integrated type	Ex-proof type and ex-proof integrated type
Standard	-20~+70 °C	-20~+40 °C
Low temperature	-40~+60 °C	
Ultralow temperature	-60~+60 °C	

► Degree of protection
Standard IP65 (GB4208) : Protection from dust and sprinkling.
Options IP67 (GB4208) : Protection from dust and submersion in water to a depth of 1m for 30 minutes.
IP68 (GB4208) : Protection from dust and submersion in water to a depth of 3m for 48 hrs.

► Ex degree
The Ex degree of ex-proof and ex-proof integrated products is Ex d IIB T4 Gb (GB3836.1, GB3836.2)

► Lubrication
Extreme pressure lithium grease is used in the products. And it is not need to refresh the lubricating grease periodically.



► Coating
The grey (RAL 7030) acrylic polyurethane spraying surface has excellent corrosion resistance. If other color required, please contact us.

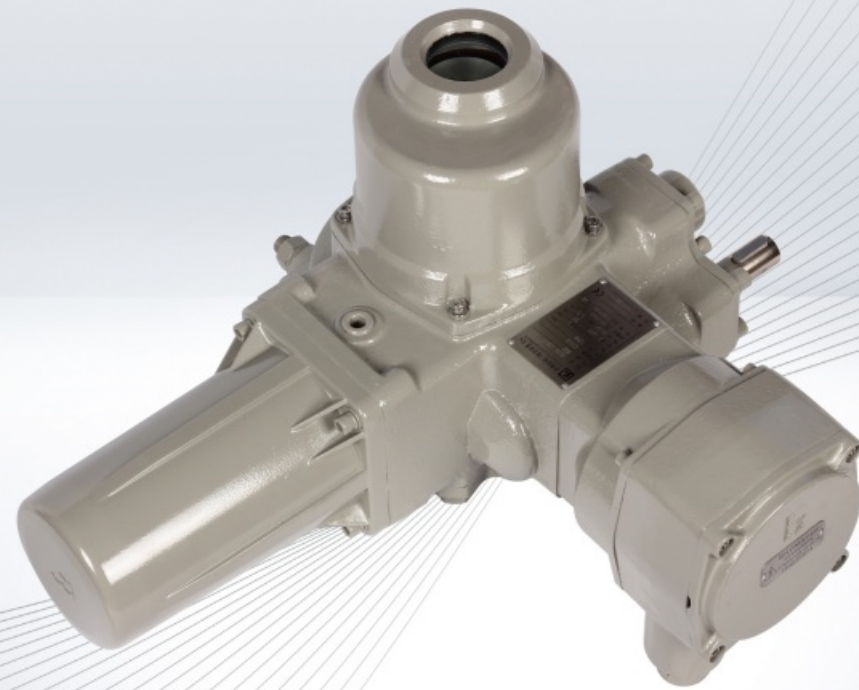
► Power supply
Standard Three phase four wire system 380V/50Hz AC power supply. The product can work normally in the condition of ±10% voltage vibration or ±5% frequency vibration.
Options Three phase three wire system 380V/50Hz AC power supply.
220VAC/50Hz/1ph power supply (Apply to part models).
24VDC power supply (Apply to part models).

► Cable gland

	Basic and integrated type	Ex-proof type and ex-proof integrated type
Standard	2 x G1"	2 x G1 1/4"
Options	2 x 1" NPT	2 x 1 1/4" NPT

► Motor
802 series adopt special motor for valve with high torque low inertia. A temperature protection switch embedded in the windings of the motor will trip the actuator control circuit if the motor windings overheat. Duty of motor as follows:
●S2-10: The continuous running time of the motor is less than 10 minutes, and it will not start again until the motor surface cooled to ambient temperature. This kind of motor is used for operating the valve full open or full close.
●S4-25%: The proportion of each working time and working cycle (the interval between two starts) is not more than 25%. This kind of motor is the standard configuration for the modulating type.

► Manual operation
802 series actuators have a handwheel for manual operation in the event of adjusting or a power supply failure.
The shift from manual to motor operation is fully automatic and no hand/auto lever is provided. The consumer may operate the handwheel at anytime.



► Limit switch

The mechanical limit switch ensures the cam and the drive sleeve coaxially and synchronously. 802 series supplied two SPDT switches of 250VAC 16A in open/close direction respectively. The adjustable range is 0~300°.

Options Two accessorial switches in open/close direction can be provided for transmitting signals if cancel the potentiometer.

► Torque switch

Torque switch mechanism is used to limit the maximum output torque of the actuator. When the valve is blocked or jammed, it can protect the valve and actuator from damage. 802 series adopted mechanical torque switch and supplied a SPDT switch of 250VAC 16A in open/close direction respectively.

Options Two accessorial switches in open/close direction can be provided for transmitting signals.

► Position indication

The mechanical position indicator keeps in step with the drive sleeve.

► Position transmitter

802 series actuators provide a potentiometer of 560Ω. If require special potentiometer, please contact us. Two optional module can output 4~20mADC analog signal proportional to valve position. Generally, 4mA corresponds to fully close position, 20mA corresponds to fully open position.

VPT2 Two-wire system. Input 24VDC signal by two wire and feedback 4~20mADC signal at the same time.

VPT4 Four-wire system. Input 220VAC signal by two wire, feedback 4~20mADC signal by other two wire.

► Heat and dehumidify

802 series provide a space heater of 220VAC to prevent from humidity and condensation.

► Integrated type

The control package integrates the reversing startup of motor, input and output signal processing and all protection functions.

Local/Remote operation

802 series provide a local/remote selector and a local open/stop/close operator; When the selector is in "local" position, it can be operated in site; When the selector is in "remote" position, actuators can communicate with upper computer, receive the on-off signals of opening/closing valve and feedback the passive contact signals of valve position and over torque, and the selector can be locked to prevent from mistaken operation in "remote" position.

Protection

Mechanical interlock	The open and close contactors are supplied with mechanical interlock component, which can effectively prevent short circuits when reversing or contact ignition.
Overcurrent protection	The thermal overload relays are supplied for overcurrent protection.
Phase discrimination and phase-failure protection	(options) The phase protector real-time monitor the three phase current, which can prevent the valve running to the wrong direction or running short of phase due to phase sequence error.

► Proportional modulating

802 series can proportional modulate the valve according to the received 4 ~ 20mA DC control signal.

- 1) It can achieve the best control precision by the adaptive algorithm. Usually the steady state control precision is higher than 2%.
- 2) Isolated output 4 ~ 20mADC valve position signal (percentage) .
- 3) Setting of open mode: In general, 4mA corresponds to full close position, 20mA corresponds to full open position. If need, this parameter can be set with 4mA corresponding to full open position, 20mA corresponding to full close position.
- 4) Setting of signal loss action (action of 802 series when control signal loss) : keep in place, full open or full close.
- 5) The sensitivity can be set. When the valve inertia is larger or the load changes dramatically, for tracking control signal, the electric mechanism may start repeatedly, which is shock phenomenon. Reduce sensitivity can effectively eliminate the shock.

The integrated type may be equipped with proportional regulating module to achieve proportional modulating function for 802 series. For the proportional modulating mode, S4-25% motor is the standard configuration to adapt to more frequent startup operation.

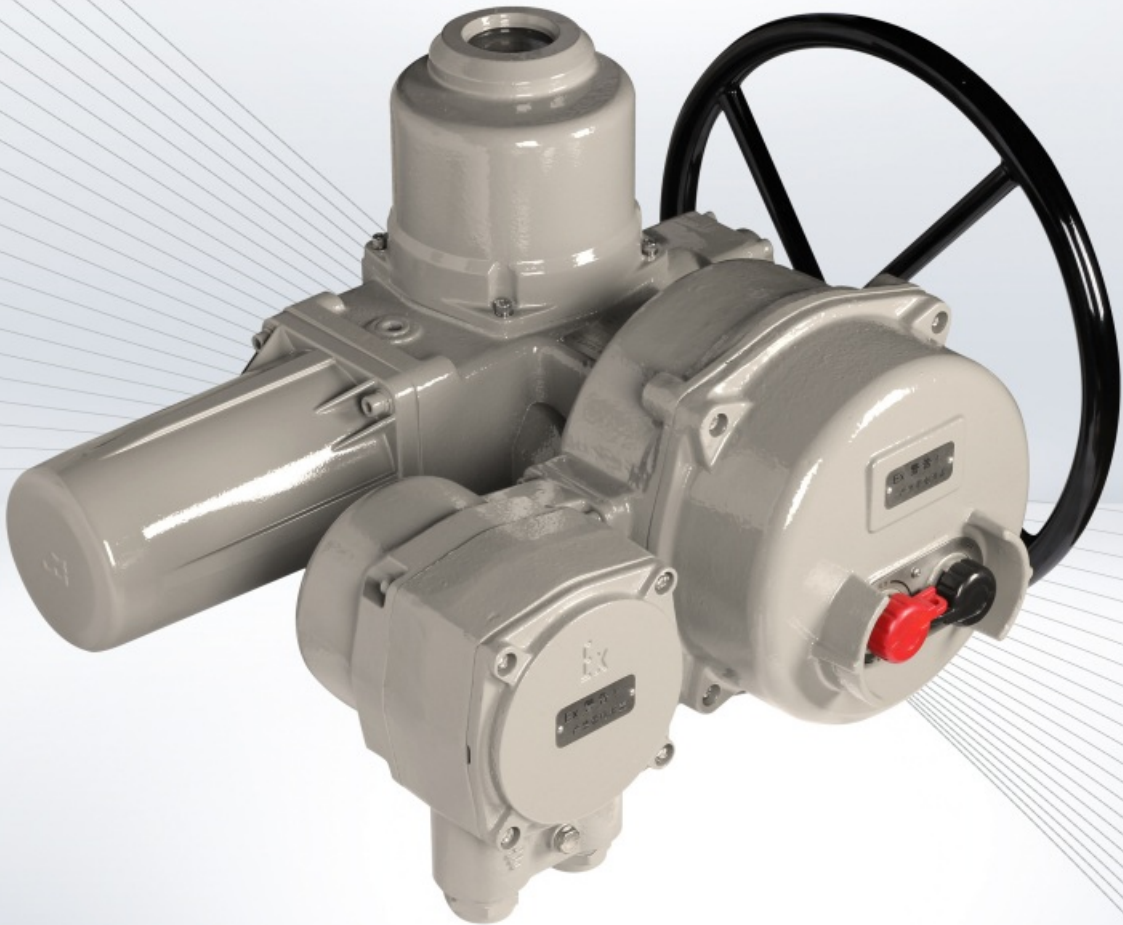
The modulating precision and starting frequency of actuators relate to their rotational inertia, so actuators with a rotate speed not more than 0.5r/min are suggested to choose in order to lower the running inertia and improve control precision.



Model and specification

Model

8022	CP	Null	Basic type
		B	Ex-proof type (or Ex-proof basic type)
		CP	Integrated type
		BCP	Ex-proof integrated type
		Base No.	



Specification

8023BCP	•	250	-	0.5	/	60	T	7	S	G	-	L	:	C131	:	J09-05	Connection ways and code for valve	
																	Wiring diagram	
																	Work environment:	
																	Null	Standard
																	L	Low temperature
																	U	Ultralow temperature
																	Manual operation:	
																	Null	With handwheel
																	G	Additional spur gear reducer (apply to 8023)
																	Power supply:	
																	Null	Three-phase AC power supply
																	S	Single-phase AC power supply
																	D	DC power supply
																	Degree of protection: (if the former one is a letter, omit "P")	
																	Null	IP65
																	P7	IP67
																	P8	IP68
																	Working mode and functions	
																	Null	Open-close type
																	T	Modulating type
																	Special stroke angle	
																	Output Speed, unit: r/min. 15 divided by this value may obtain operating time: s/90°	
																	Output torque, unit:x10Nm	
																	Model	

Note1: If the options are required, please tell us when order.
Note2: Electrical wiring is closely related to the function of products. There are three wiring diagrams on page 16&17 corresponding to the basic type, integrated open-close type and modulating type respectively. If the different wiring required, please contact us.

Main parameters

Output and motor parameters

Base No.	Output torque ¹	Output speed ²		380VAC/3ph/50Hz S2-10min			380VAC/3ph/50Hz S4-25%			220VAC/1ph/50Hz S2-10min		
				Motor power	Rated current	Stall current	Motor power	Rated current	Stall current	Motor power	Rated current	Stall current
	Nm	r/min	sec /90°	W	A	A	W	A	A	W	A	A
8021	100	1	15	30	0.22	1	30	0.25	0.9	60	1.5	4
	200	0.5	30									
	300	1	15	60	0.4	1.8	60	0.5	1.6	90	1.8	4.5
		0.5	30									
8022	600	1	15	180	1.3	5.3	180	0.9	4.8	370	5.8	14
		0.5	30									
	1200	1	15	370	2.5	8.9	370	1.3	9	-	-	-
		0.5	30									
	1500	0.5	30	180	1.3	5.3	180	0.9	4.8	370	5.8	14
		1	15									
8023	2500	0.5	30	550	2.4	12.8	550	1.8	13	-	-	-
		1	15									
	5000	0.5	30	750	2.8	16.5	750	2.4	17.5	-	-	-
8023/3011 ³	10000	0.2	75	1100	4.6	25	1100	3.2	24.5	-	-	-
	12000	0.2	75									

Note 1: The output torque is the setting torque at the factory. Stall torque will be 1.3~1.8 times this value.
Note 2: The running time is motor operating time of the 380VAC/3ph/50Hz motor.
Note 3: Base No. 8023/3011 are comprised of 8023 and gear-box 3011.

Mechanical parameters

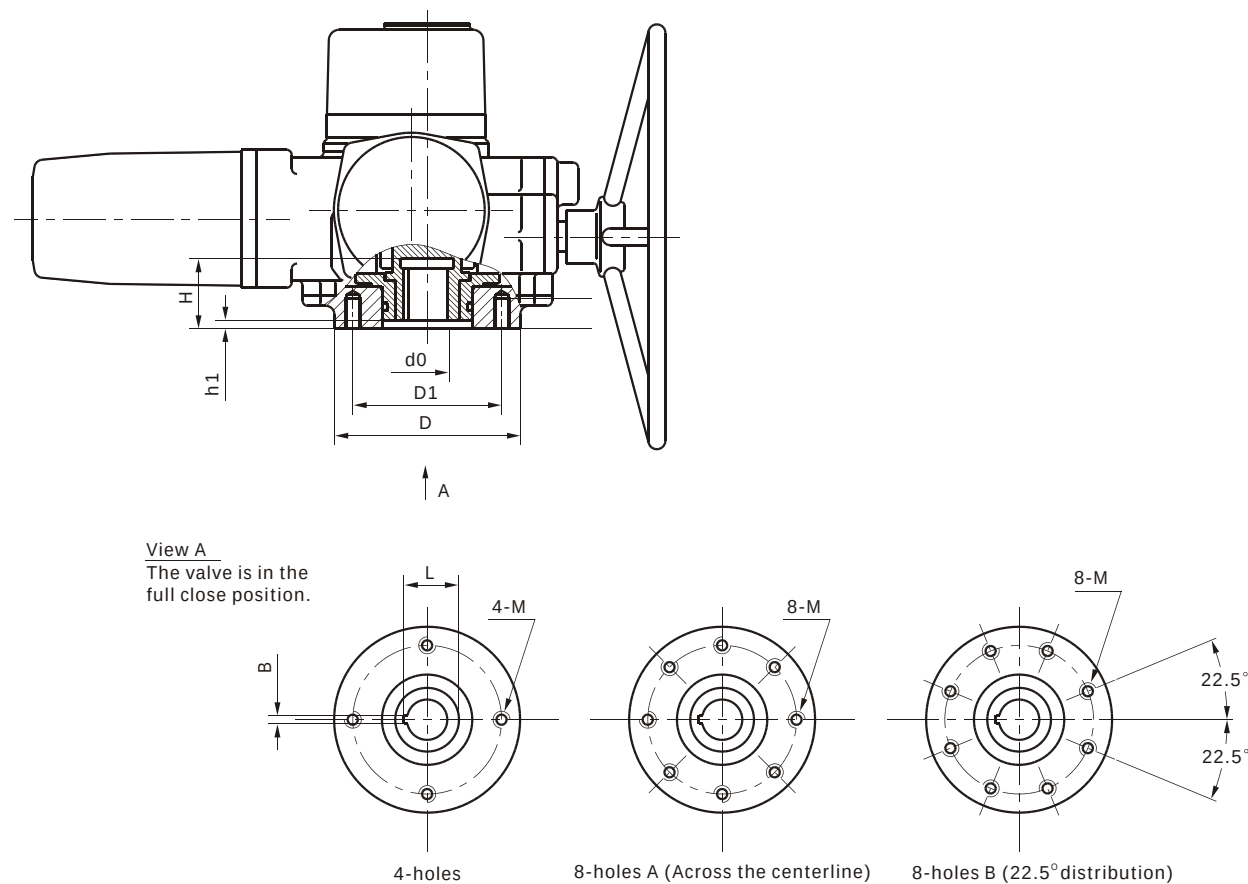
Base No.		8021			8022			8023				8023/3011			
								Direct connection		Additional gear-box		Direct connection		Additional gear-box	
Manual gear ratio		88			74			67		424		194		1228	
Handwheel turns		22			19			17		106		49		307	
Handwheel dia.	mm	Φ220			Φ400			Φ500		Φ400		Φ500		Φ400	
Output torque	Nm	100	200	300	600	1200	1500	2500	5000	2500	5000	10000	12000	10000	12000
Unilateral operation force	N	37	74	111	145	290	362	533	1067	118	235	921	1105	203	243
Max-dia. of stem	mm	Φ24			Φ43			Φ55				Φ85			

Weight

Model	8021	8021B	8021CP	8021BCP	8022	8022B	8022CP	8022BCP
Weight kg	31	45	34	51	58	71	62	79
Model	8023	8023B	8023CP	8023BCP	3011			
Weight kg	93	111	100	129	116			



Connection parameters



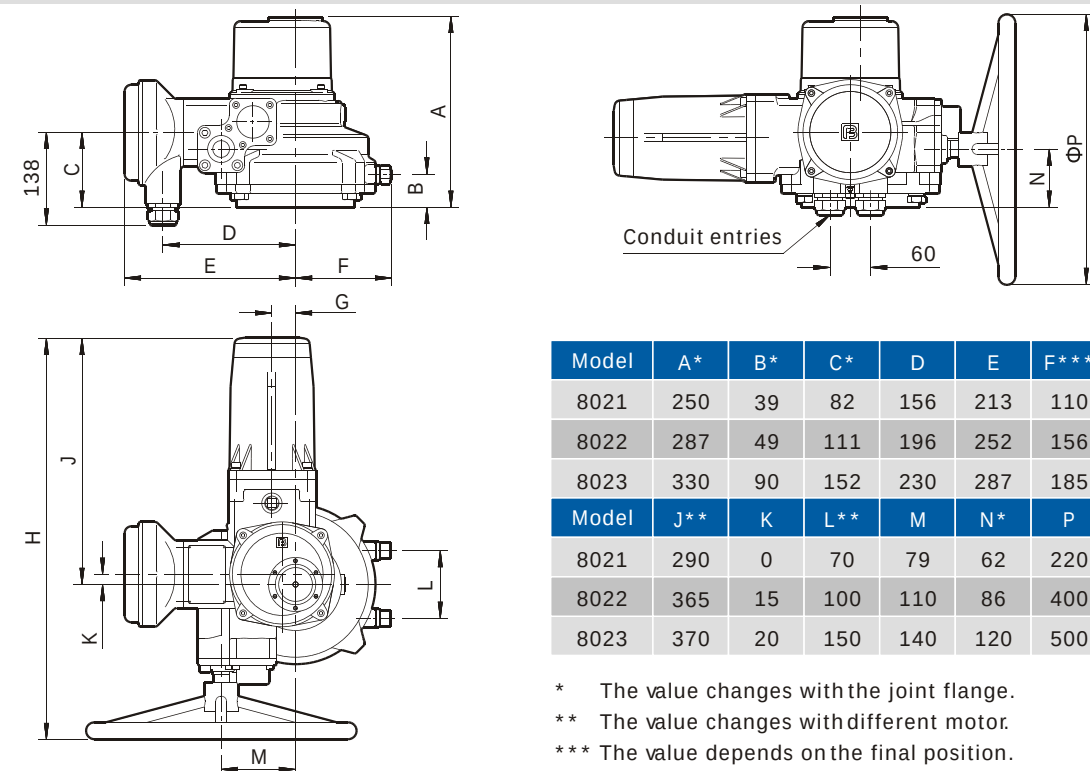
Base No .	Output torque Nm	D	D1	n-M	Hole location	d0(F9) ¹	B ²	L	H	h	Connection code
8021	100	77	57	4- M6		12.7	3	14.1	55	1	J06-02g
		92	70	4- M10		15.9	5	18.2	55	1	F07a-03c
	200	92	70	4- M10		19	5	21.3	55	1	F07a-03e
	300	115	89	4- M12		22.2	5	24.5	55	1	J09-04f
8022	600	115	89	4- M12		28.6	8	31.9	70	1	J09-05k
	1200	140	108	4- M12		31.7	8	35	70	1	J10a-06k
	1500	140	108	4- M12		31.7	8	35	70	1	J10a-06k
		197	159	4- M20		33.4	10	36.7	70	1	J16C-06g
	38				10	41.3	70	1	J16c-07h		
8023	2500	200	159	4- M20		38	10	41.3	102	2	J16c-07h
						41.2	10	44.5	102	2	J16c-08s
	5000	276	216	4- M20		50.7	16	55	102	2	J22a-10u
8023/3011	10000	300	254	8- M16	A	55	2-16	63.6	150	3	F25c-11
					B	55	2-16	63.6	150	3	F25d-11
	12000	300	254	8- M16	B	55	2-16	63.6	150	3	F25d-11

Note 1: If require special size, please contact us. The max-dia. of stem may refer to "Mechanical Data" (page 10).

Note 2: 8021~8023 provide a same keyway shifted 90 degrees with graphical position for later use. The two keyways of 8023/3011 are 180° distribution.

Overall dimension

Basic type



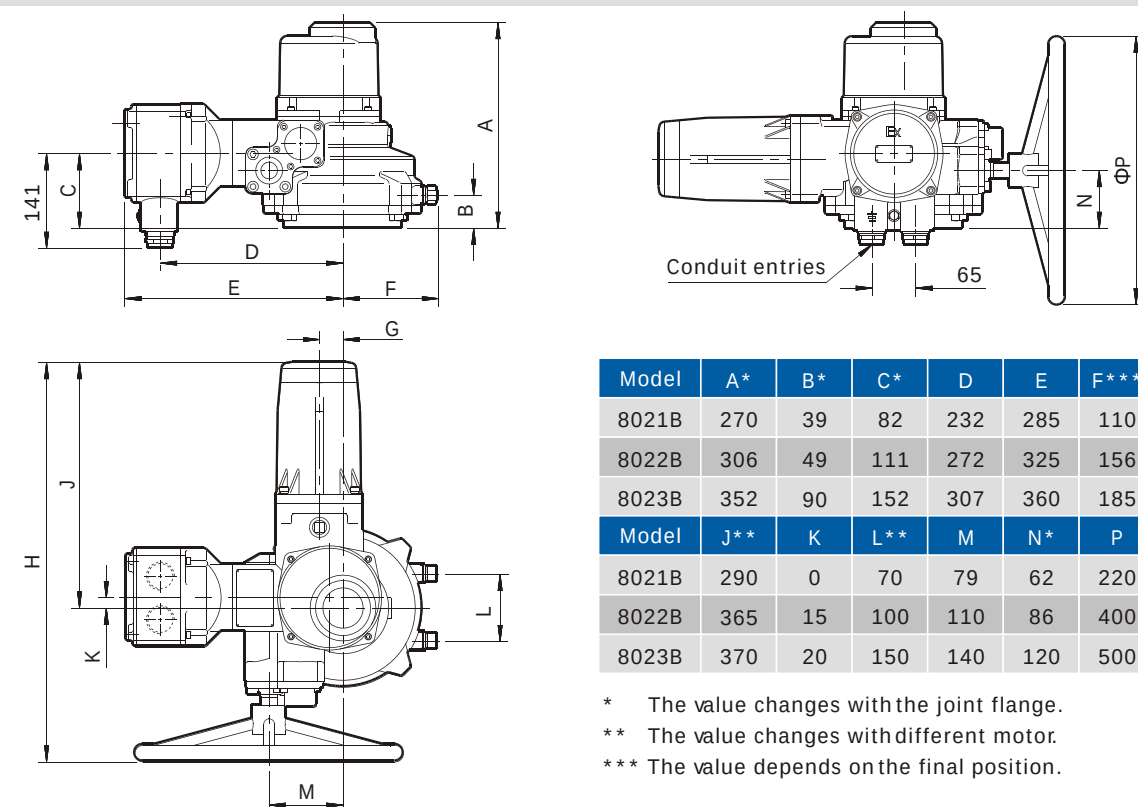
Model	A*	B*	C*	D	E	F***	G	H**
8021	250	39	82	156	213	110	22	497
8022	287	49	111	196	252	156	35	594
8023	330	90	152	230	287	185	45	650
Model	J**	K	L**	M	N*	P		
8021	290	0	70	79	62	220		
8022	365	15	100	110	86	400		
8023	370	20	150	140	120	500		

* The value changes with the joint flange.

** The value changes with different motor.

*** The value depends on the final position.

Ex-proof type



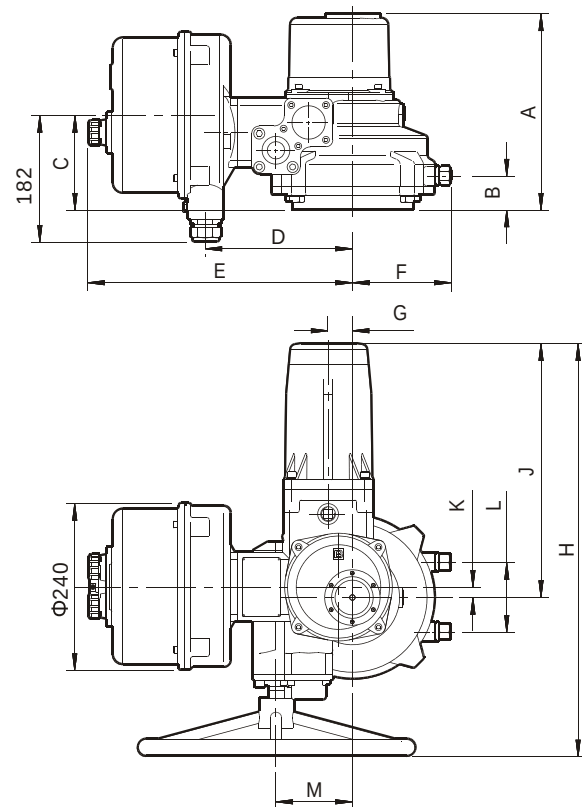
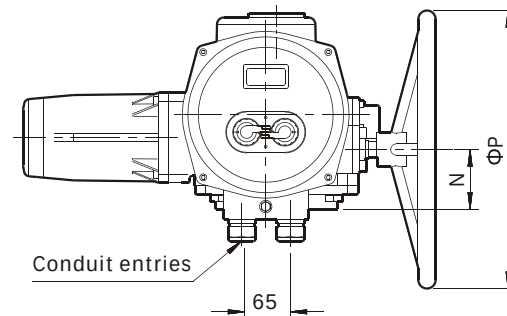
Model	A*	B*	C*	D	E	F***	G	H**
8021B	270	39	82	232	285	110	22	497
8022B	306	49	111	272	325	156	35	594
8023B	352	90	152	307	360	185	45	650
Model	J**	K	L**	M	N*	P		
8021B	290	0	70	79	62	220		
8022B	365	15	100	110	86	400		
8023B	370	20	150	140	120	500		

* The value changes with the joint flange.

** The value changes with different motor.

*** The value depends on the final position.

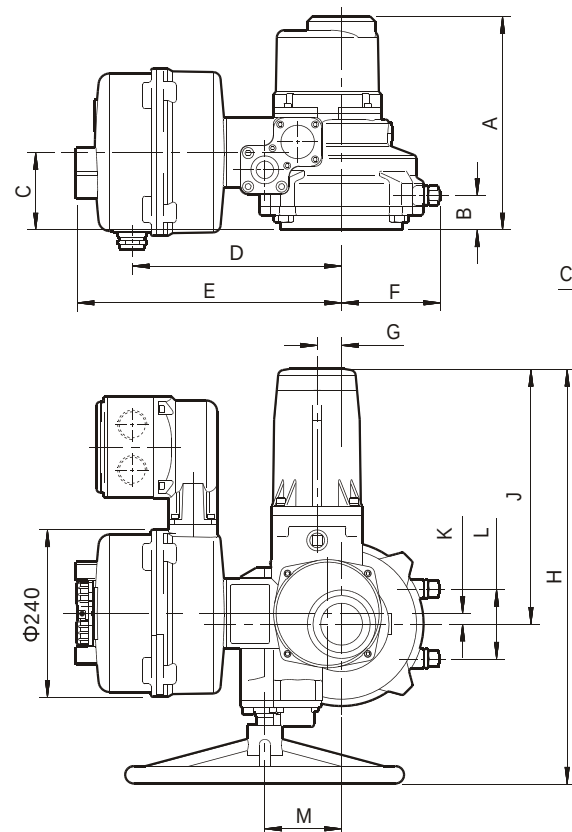
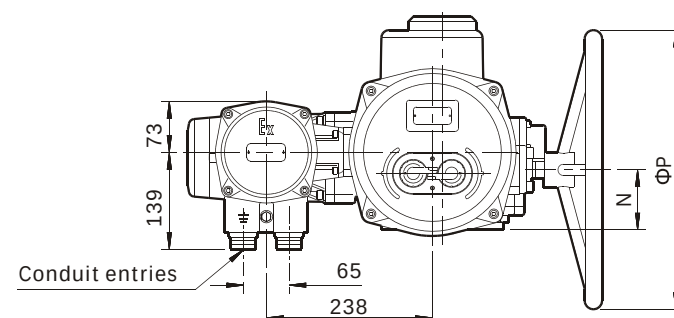
Integrated type



Model	A*	B*	C*	D	E	F***	G	H**
8021CP	250	39	107	172	341	110	22	497
8022CP	287	49	136	212	385	156	35	594
8023CP	330	90	177	246	416	185	45	650
Model	J**	K	L**	M	N*	P		
8021CP	290	0	70	79	62	220		
8022CP	365	15	100	110	86	400		
8023CP	370	20	150	140	120	500		

* The value changes with the joint flange.
 ** The value changes with different motor.
 *** The value depends on the final position.

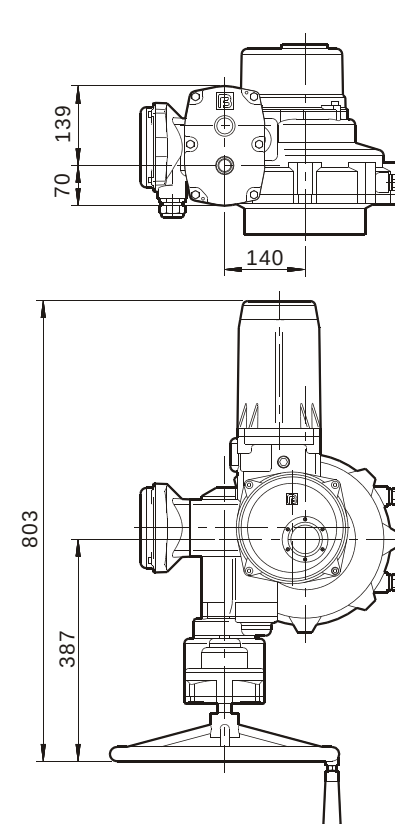
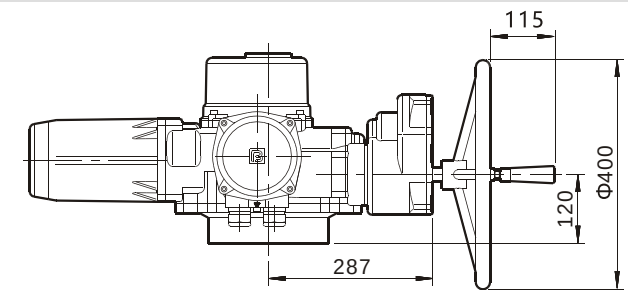
Ex-proof integrated type



Model	A*	B*	C*	D	E	F***	G	H**
8021BCP	270	39	82	255	339	110	22	497
8022BCP	306	49	111	300	379	156	35	594
8023BCP	352	90	152	335	414	185	45	650
Model	J**	K	L**	M	N*	P		
8021BCP	290	0	70	79	62	220		
8022BCP	365	15	100	110	86	400		
8023BCP	370	20	150	140	120	500		

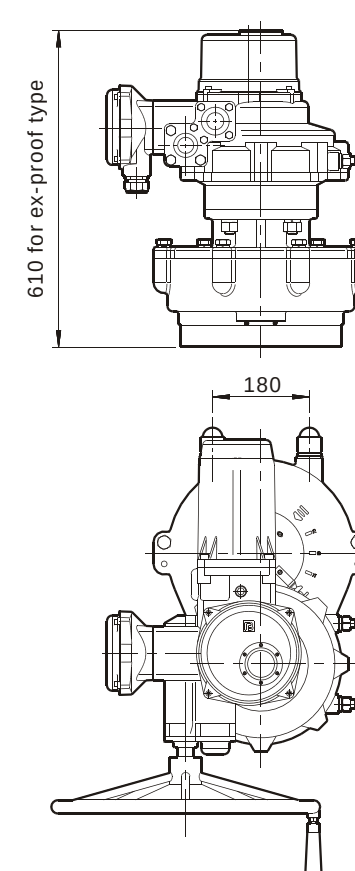
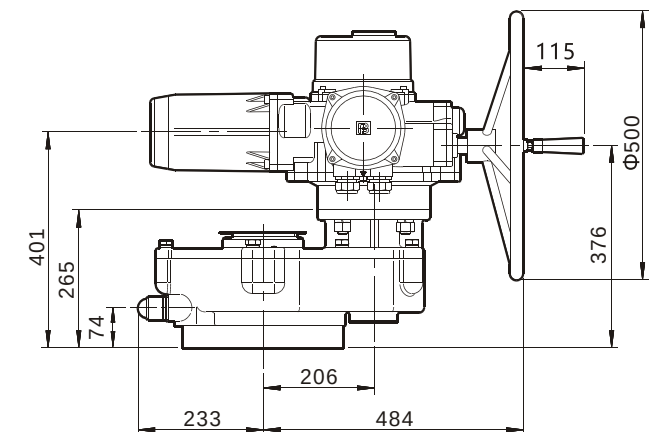
* The value changes with the joint flange.
 ** The value changes with different motor.
 *** The value depends on the final position.

8023 with additional gear-box



Note: In the figure only indicate the changed dimensions with adding the additional gear-box. Please refer to the preceding outline drawing for other dimensions.

Combination of 8023 and 3011



Note: The dimensions of 8023 are not indicated in detail in the figure. Please refer to the preceding outline drawing for other dimensions.

Wiring diagram

Electrical wiring is closely related to the function of products.

802 series are designed with rich wiring diagrams. You can visit our website or contact us for them.

This book describes some typical wiring principle (The actual wiring is subject to the wiring diagrams provided with the products) .

Introduction

1. The internal wiring showed on the right side of the dashed line or inside the dashed line.
2. Limit switches in the diagram show that the valve is in the intermediate position. Torque switches show that the valve is not over torque.

Symbol description

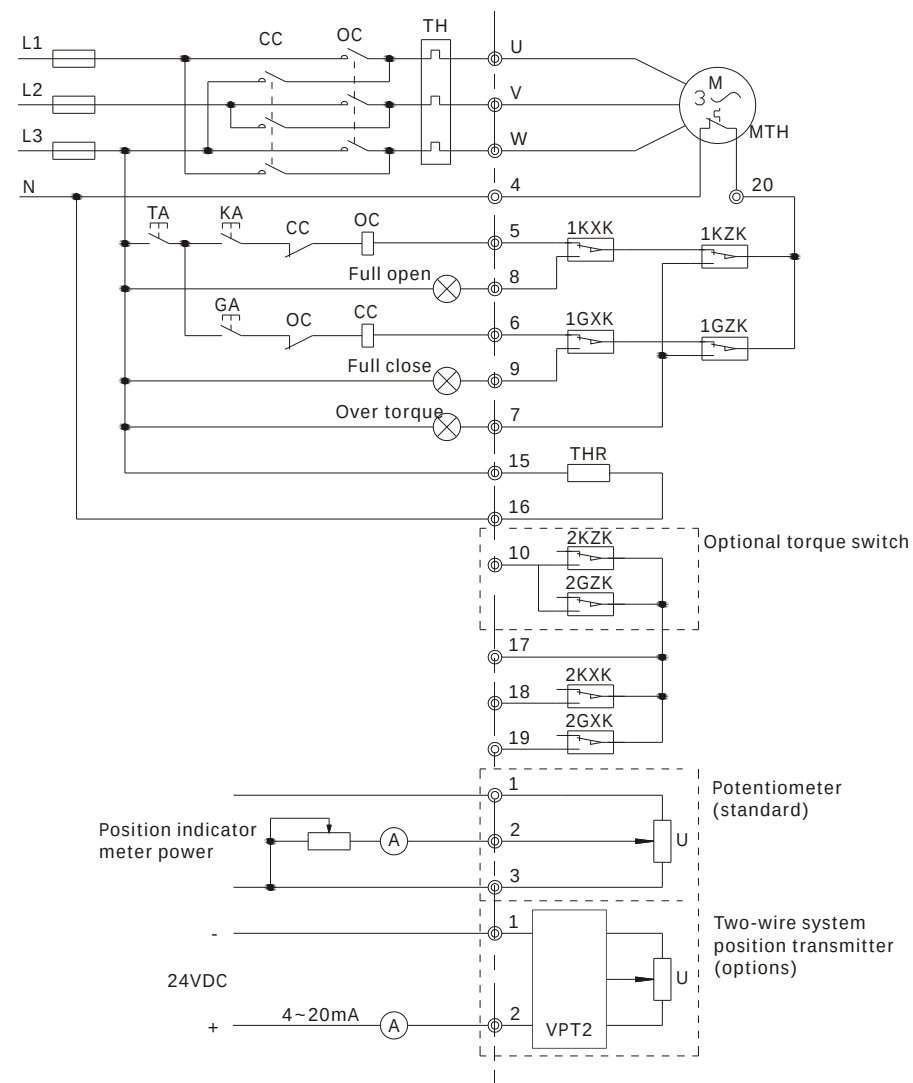
KXK	Open limit switch
GXK	Close limit switch
KZK	Open torque switch
GZK	Close torque switch
M	Motor
MTH	Temperature protection switch in motor winding
THR	Space heater
U	Potentiometer

Limit switch contact development

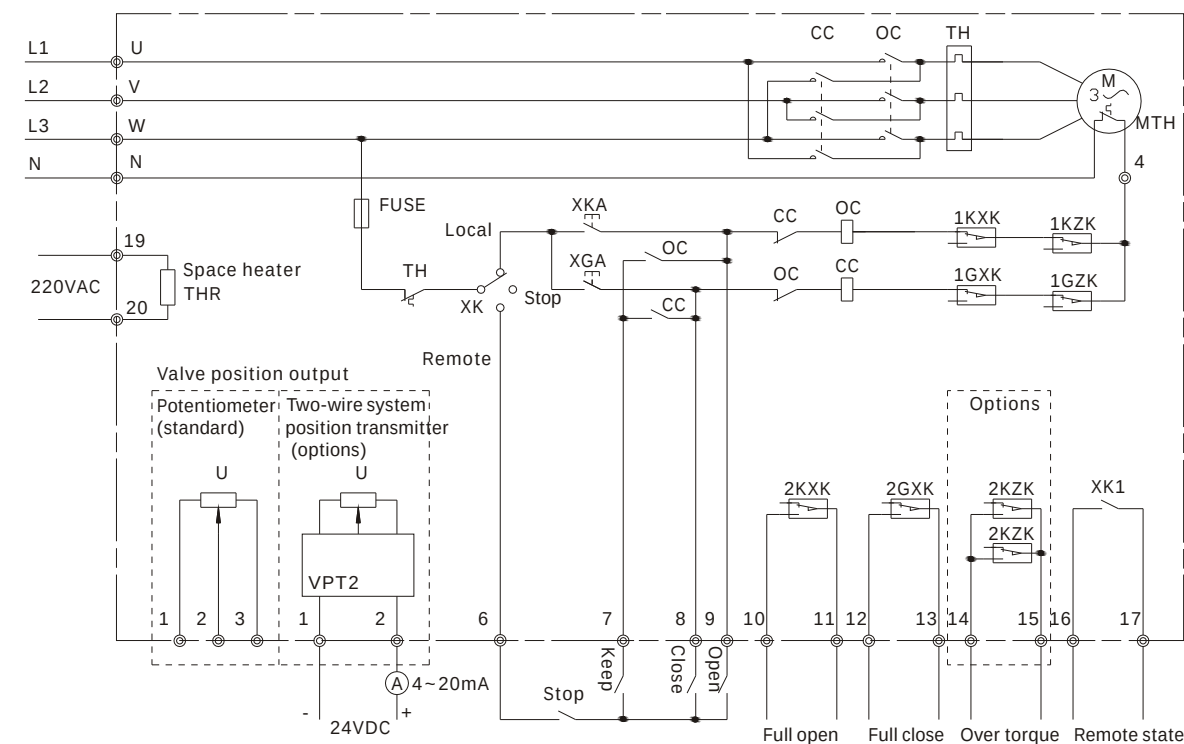
Limit switch	Valve position	
	Full close	Full open
1KXK	ON	OFF
2KXK	OFF	ON
1GXK	OFF	ON
2GXK	ON	OFF

— ON - - - OFF

Basic type (Three-phase AC power supply)



Integrated (open-close) type



Integrated (modulating) type

