8280 INSTRUCTION MENU

Quarter Turn Electric Actuator

Basic and integral type

Edition: V3/20240416

1.0 Introduction

Several of models can be selected that including series 8280, 8280M etc., and the product is well designed and suitable for the butterfly valve, ball valve, some part-turn valve and other similar application. With Aluminum alloy structure housing, make it lighter and more durable under pressure resistance. Meanwhile, to ensure the internal circuit free from wetness, both moisture-proof resistor and closed type seal structure design are provided and which according to **IP67 standard**. Therefore, it is widely used in the fields like Petroleum, Chemical industry, water solution, marine and etc.

2.0 Technical specification

- Voltage：Three phases: 230VAC / 380VAC / 400VAC / 460VAC
  Single phase: 24VAC / 110 - 120VAC / 220 - 240VAC
  DC：24VDC
- Frequency：50/60Hz
- Ambient temperature：-25°C to +70°C (Operation: -40°C to +70°C)
- Operation time：On/Off type：S2-15min；
  Modulating type：S4-50%；
- Humidity：≤95%RH；
- Operating condition：Ordinary Location type - not supporting situation include strong corrosive, Inflammable and explosive medium
- Explosion-proof type grade: ExdIIBT4, ExdIICT4/CT6, can be used in other explosive gas environment except coal mine methane gas and explosive dust environment except coal mine
- Control signal：On/Off - digital signal control
  Modulating：4-20mA/0-10V/2-10V analog control
- Feedback signal：on/off • Dry contact position feedback (rated 5A @ 250VAC)
  Modulating • 4-20mA/0-10V/2-10V position analog feedback
- IP grade: **IP67 (default)**, IP68 is optional
- Special Features: Torque protection, phase protection, General fault feedback,4-20mA position feedback。
- Insulation system of motor：**Class F**（Class H is optional）

➢ Technical Data

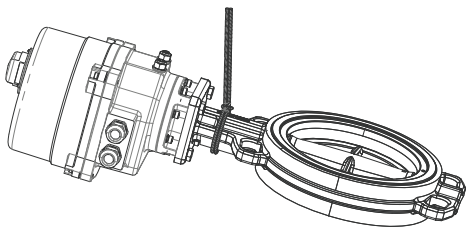
Series		Torque (N·m)	Running time(Sec)			Power(W)	Flange according to ISO5211
			DC	Single phase	3 phases		
				50Hz			
8280 035	-	35	8	11	-	10	F03/F05/F07
8280 050		50	10	15	-	10	
8280 100	EXB(C)2	100	14	19		40	F05/F07/F10/F12
8280 200	EXB(C)3	200	28	39		40	
8280 300		300	28	39		40	
8280 400	EXB(C)4	400	21	29		90	F10/F12/F14
8280 600	EXB(C)5	600	28	39		90	
8280 800	EXB(C)6	800	34	47		90	
8280 1000	EXB(C)7	1000	34	47		120	
8280 1700	EXB(C)8	1700	25	34		200	F12/F14/F16
8280 2300	EXB(C)9	2300	34	47		200	
8280 3500	EXB(C)10	3500	55	76		200	F14/F16
8280 5000	EXB(C)11	5000	76	105		200	
8280 8000	EXB(C)12	8000	103	143		200	F25
8280 13000	-	13000	-	109		400	F25/F30
8280 16000	-	16000	-	129		400	
8280 20000	-	20000	-	155		400	

3.0 Transportation and storage

3.1 Transportation

- ✧ Don't lift the hand wheel for lifting the item during transport and installation. Otherwise the product maybe dropped or damaged.
- ✧ Lifting the electric device by the rope or a hook shall be avoided for any large dimension electric valve need to be raised, or the electric actuator may easy damaged by such operation.

Note: Attachment for reference only



Warning!

The actuator shall be fully and reliable supported until it fully engaging with the valve stem, before fixed onto the suitable mounting pad flange. The flange shall comply with ISO5211.

3.2 Storage

- The suggested temperature is -30℃~+50℃ for both transport and storage, any case surpass 40℃ shall be avoid from shrinking items service life.
- The actuator should be stocked inner door and keep dry, secures it from condensation, when without special package measures.
- Suitable package and the desiccant should be considered, for the humid and corrosive gas environment, and the desiccant should also be checked regularly for effectiveness.

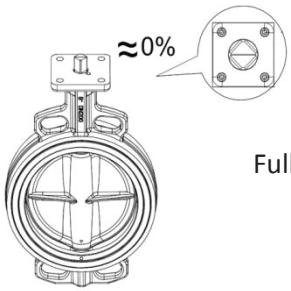
3.3 Unpacking and inspection

Before shipping out, All the actuators have passed strict inspection to ensure the quality. And to check whether the unpacking direction is consistent with the direction indicated on the packaging box before unpacking the actuator is the necessary, and ensure they are consistent before unpacking for the following inspections

- Check whether the actuator is damaged during transportation;
- Check whether the model of the actuator is the same as the indicated label on the packaging box, and whether the actual package is consistent with the packing list.

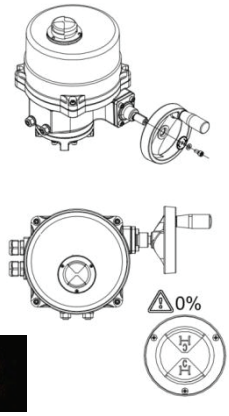
4.0 Installation of actuator.

4.1 The installation procedure



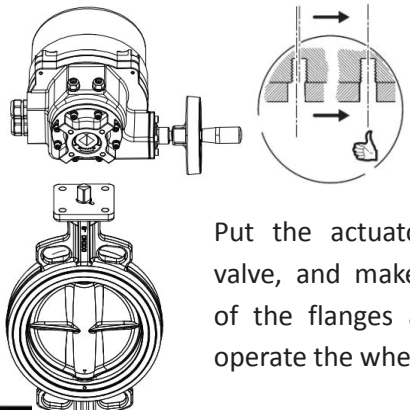
Fully closed the valve

1



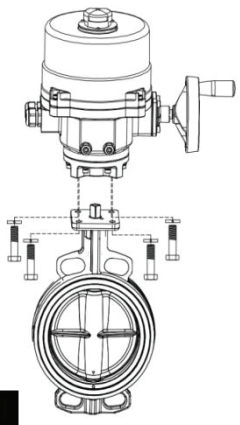
Install the hand wheel and make the actuator fully closed.

2



Put the actuator on the valve, and make the hole of the flanges aligned by operate the wheel.

3



Tighten the screws

4

Attention: Figures only for reference, better to review with actual product.

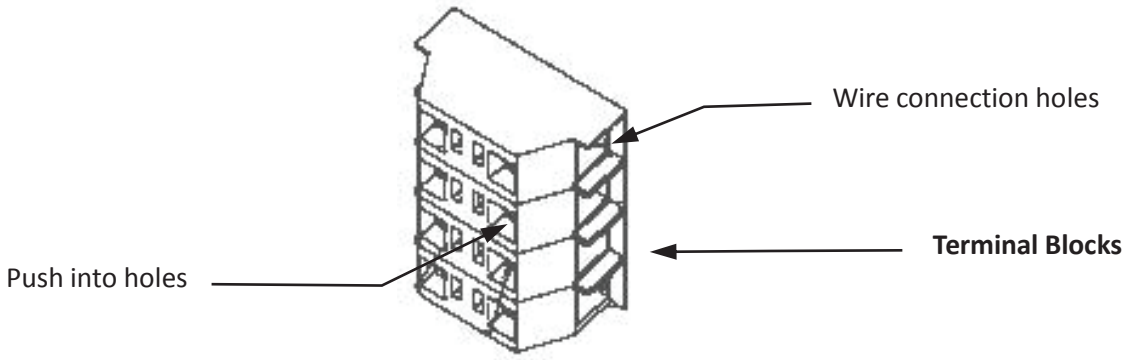
4.2 Wiring

- Loosen the screws and remove the protective cover.
- The wiring work shall according to the wiring diagram attached.
- In the case of wiring, pull out the rubber plug of the waterproof joint, and then insert the cable, through the waterproof joint, into the electric actuator. Once the wiring is finished, rotate the bolt of the waterproof joint clockwise.
- Check and verify that the actuator is energized after proper wiring.
- Carry out trial run for the actuator to check whether the operating direction and limit device are under proper condition.
- After confirming all functions are normal, install the protective cover and tighten the screw.

Note: In order to ensure the waterproof of the electric actuator, when selecting the wiring cable, please observe the following requirements.

For the 8280 035 / 050 series, use the cables of 6 to 12 mm in diameter.

For the 8280 100 to 8280 20000 series, use the cables of 10 to 14mm in diameter.



Note:

1. Don't power on before complete the wiring and inspection; otherwise, short circuit and false wiring will cause permanent damage to the equipment!
2. Please monitor the indicator. Once exceeded the full open or full close position, do not brutally operate the hand wheel / handle or the actuator will be damaged!

5.0 Limit system adjustment

Note:

All the Following settings have been completed before the ship out. Do not readjust the actuator. If necessary, please invite professionals!

5.1 Adjustment of limit cam and limit switch

The stroke limit cam and limit switch is used to sensor the switching position of valve. When valve reach to the limit position, the cam make the limit switch reset. On/Off type actuator is normally equipped with four limit switches (SLO1&SLC1, SLO2&SLC2): SLO1&SLC1 respectively refers to the open/close limit switch, while SLO2&SLC2 are auxiliary limit switches, used for signal feedback. Modulating actuator is normally equipped with two limit switches (SLO1&SLC1): SLO1 is

open limit switch, SLC1 is close limit switch. (It is easy to distinguish them by reference to the figure in below)

Do not regulate the switches when the electric valve can operating normally. If necessary, please follow the instructions in below:

- **Calibration of fully-closed position:**

➢ Shut down the power

➢ Fully close the valve by manual operation

➢ Use a 2.5 mm socket head wrench to release the M5 retaining screw.

➢ Rotate the SLC1 cam in counterclockwise direction till touching the micro switch to make the micro switch act.

➢ Slowly adjust the SLC1 cam in a clockwise direction until the micro switch acts to make “clatter” sound.

➢ Lock the M5 retaining screw on the SLC1 cam and switch on the power supply to confirm that the operating position is correct. If the required positioning is not reached, reset it according to the above steps.

➢ After the setting is completed, reconfirm whether the M5 retaining screw on the SLC1 cam is locked.

- **Calibration of fully-opened position:**

➢ Shut down the power

➢ Fully close the valve by manual operation.

➢ Open the upper cover and loose the M5 retaining screw on the SLO1 cam with a 2.5 mm socket head wrench.

➢ Rotate the SLO1 cam in clockwise direction till touching the micro switch to make the micro switch act.

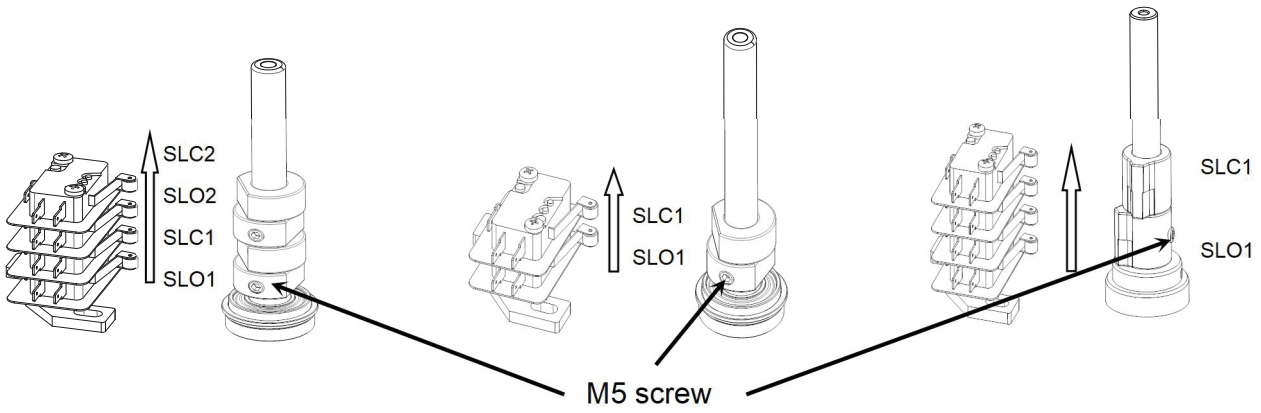
➢ Slowly adjust the SLO1 cam in a counterclockwise direction until the micro switch acts to make “clatter” sound.

➢ Tighten the M5 retaining screw on the SLO1 cam and deliver power to verify that the operating position is correct. If the desired location is not reached, reset it in accordance with the above steps.

➢ After the setting is completed, reconfirm whether the M5 retaining screw on the SLO1 cam is locked.

- **Setting for fully-opened / fully-closed auxiliary limit switch:**

The setting for the full close/ full open auxiliary limit switch (SLO2 & SLC2) is the same as that of SLO1 and SLC1 respectively.

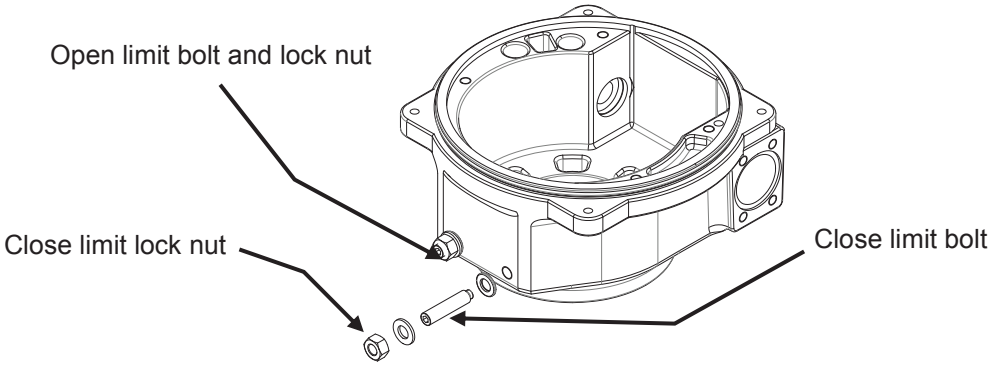


SLC1 cam “close”	CW: reduce the close degree
	CCW: increase the close degree to the full close position
SLO1 cam “open”	CW: increase the open degree to full open position
	CCW: reduce the open degree

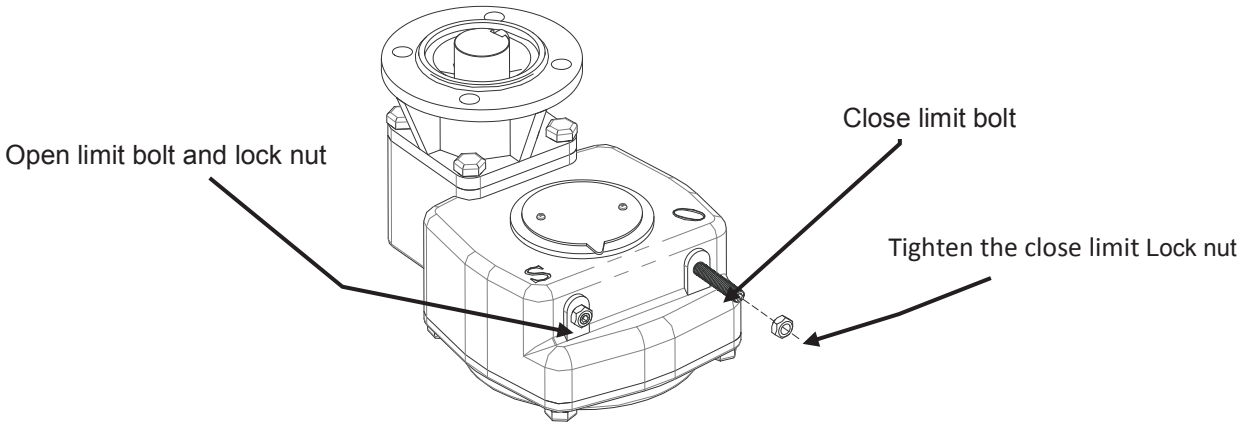
2. Adjustment of mechanical stop screw

The product is provided with mechanical stop bolt. When it is installed to the valve well, the adjustment is not needed. If necessary, please refer to the following instruction:

- Shut down the power.
- Loose the close limit lock nut and screw off few circle with the mechanical stop bolt.
- For modulating actuator, Please loose the retaining screw on sector gear first, on/off is not applicable.
- Turn the actuator manually to the required limiting position.
- Please rotate the sector gear clockwise to the end and then fasten the retaining screw for modulating actuator.
- Rotate the mechanical close limit bolt to the end, and then screw off for one circle.
- Fasten the close limit lock nut.
- Confirm whether the electric operation can reach the full open or full close position. If not, reset the actuator according to the above steps.



Series 8280 100 to 8280 2300



Series 8280 3500 to 8280 20000

Reference Figure of Mechanical stop

Note: Please contact with the manufacturer if there are any questions in previous calibration steps.

6.0 Configuration of the Modulating actuator

6.1 Single-phase series (modulating type)

8280M

Note: Re-set the actuator is not required, as it was well adjustment in the workshop

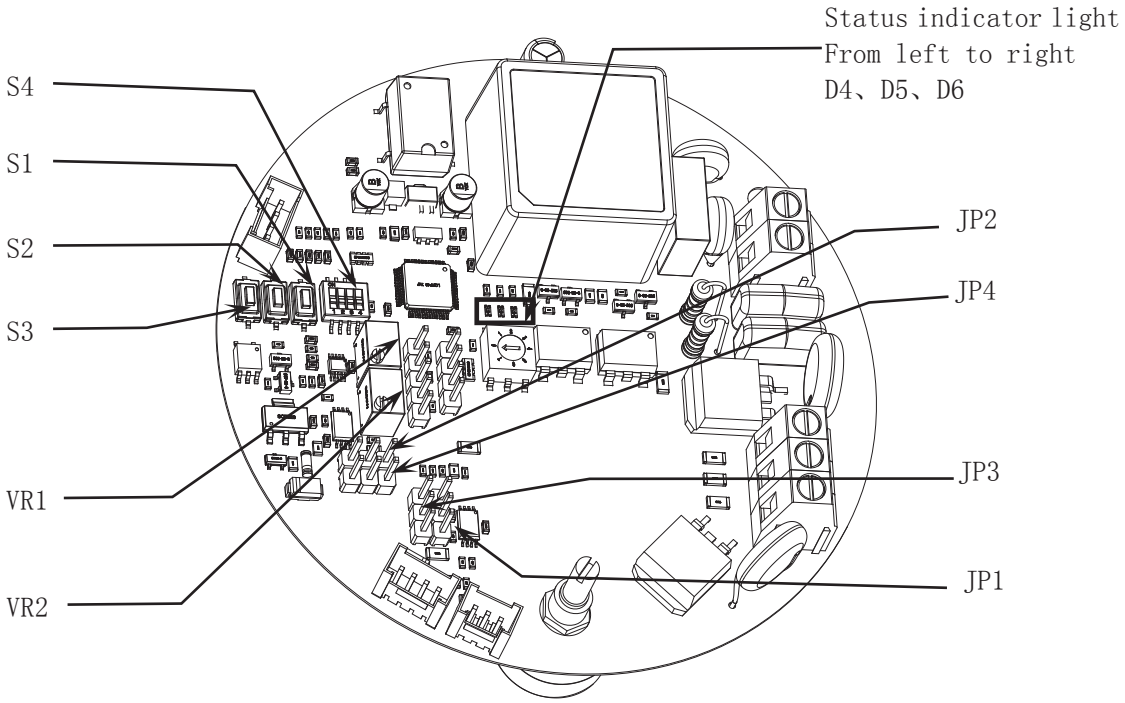


Figure 1 PCB of Electric Actuator

✧ **Signal modulating and change**

The electric actuator has set the input and feedback signal type according to the order requirements at the factory, and the factory default is that the input and output are 4-20mA,. If you need to change the input and feedback signal type, please refer to the jumper shown in the following table.

Signal	Input		Output	
	JP1	JP3	JP2	JP4
4-20mA				
2-10V				
0-10V				

Input and feedback can be set separately, such as setting the dynamic actuator to be the input signal of 0-10V, feedback signal of 4-20mA, can be set at the jumper position shown in the table below, and if also set to other input and feedback type can only be set in this mode.

Signal	Input		Output	
	JP1	JP4	JP2	JP3
Input 0-10V Output 4-20mA				

Note: If you need to change the signal type in use, please adjust the professionals.

✧ **Signal inversion**

The input and feedback signal of the electric actuator can be selected by bits 1 and 2 of the dial switch of S4. The factory default is positive logic (i. e., 4 mA corresponding full off position and 20 mA corresponding full open position). If the logic of input and feedback signal is changed, please refer to the following table:

Status / Bit	OFF	ON
1-Input the signal		
2-Feedback signal		

✧ **Setting of input signal loss mode (applicable to 4-20mA/2-10V)**

After the input signal of the electric actuator is lost, the action mode of the actuator can be selected by bits 3 and 4 of the S4 dialing switch. Factory default is running to 0%. If you need to change the signal loss mode, please refer to the following table:

Status / Bit	Running to 0%	Keep the last position	Keep the last position	Running to 100%
3	OFF	ON	OFF	ON
4	OFF	OFF	ON	ON

✧ **Settings of actuator**

Step 1	Operation	Indicator lamp status
Enter the set state	Power on, press button S1, until the indicator (blue) goes off and the actuator enters the set state	The indicator light (blue) is turned off
Run the actuator to the full-open position	Run the actuator in the full open direction by pressing the S2, release the actuator to stop, press the S3 actuator in the closed direction, release the stop, and run the actuator to the valve full open position in this way.	Run (green) open and (red) in turn off.
Record the position of the valve being fully open	Press the S1, actuator to automatically record the full open position of the valve.	The indicator light (blue) flashes
Run the actuator to the full position	Press the actuator in the full open direction, release the actuator stop, press the S3 actuator in the off direction, release the stop, and run the actuator to the valve full closed position in this way.	Run (green) open and (red) in turn off.
Record the position of the full valve closure	Press the S1, actuator to automatically record the full open position of the valve.	The indicator light (blue) flashes
Set the End	After step 5, the actuator automatically runs to the given position of the signal.	The indicator light (blue) is usually on

Note: When doing the setting procedure, the position of the cam calibration shall be already done (refer to cam adjustment).

6.2 Series 8280 100 to 8280 20000, EXB(C)2-12

Note: Re-set the actuator is not required, as it was well adjustment in the workshop

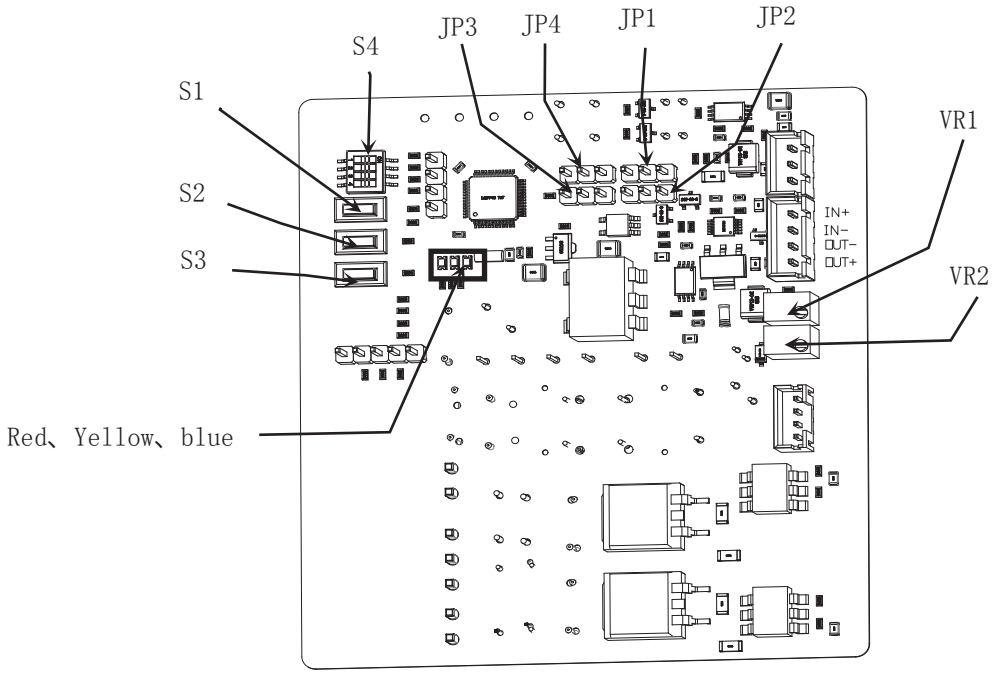


Figure 2 PCB of Electric Actuator

➢ **Signal conditioning and change**

The electric actuator has set the input and feedback signal type according to the order requirements at the factory, and the factory default is that the input and output are 4-20mA,. If you need to change the input and feedback signal type, please refer to the jumper shown in the following table.

Signal	Input		Output	
	JP1	JP4	JP2	JP3
4-20mA	●[●●]	[●●]●	●[●●]	[●●]●
2-10V	[●●]●	[●●]●	[●●]●	[●●]●
0-10V	[●●]●	●[●●]	[●●]●	●[●●]

Input and feedback can be set separately, such as setting the dynamic actuator to be the input signal of 2-10V, feedback signal of 4-20mA, can be set at the jumper position shown in the table below, and if also set to other input and feedback type can only be set in this mode.

Signal	Input		Output	
	JP1	JP4	JP2	JP3
Input 2-10V And Output 4-20mA	[●●]●	[●●]●	●[●●]	[●●]●

Note: If you need to change the signal type in use, please adjust the professionals.

➢ **Signal inversion**

The input and feedback signal of the electric actuator can be selected by bits 1 and 2 of the dial switch of S4. The factory default is positive logic (i. e., 4 mA corresponding full off position and 20 mA corresponding full open position). If the logic of input and feedback signal is changed, please refer to the following table:

Status / Bit	OFF	ON
1-Input the signal		
2-Feedback signal		

➢ **Setting of input signal loss mode (applicable to 4-20mA/2-10V)**

After the input signal of the electric actuator is lost, the action mode of the actuator can be selected by bits 3 and 4 of the S4 dialing switch. Factory default is running to 0%. If you need to change the signal loss mode, please refer to the following table:

Status / Bit	Running to 0%	Keep the last position	Keep the last position	Running to 100%
3	OFF	ON	OFF	ON
4	OFF	OFF	ON	ON

➢ **Settings of actuator**

The actuator has been completed from the factory, and when the terminal position of the actuator and valve is required, the following steps can be followed:

Step 1	Operation	Indicator lamp status
Enter the set state	Power on, press button S1, until the indicator (blue) goes off and the actuator enters the set state	The indicator light (blue) is turned off
Run the actuator to the full-open position	Run the actuator in the full open direction by pressing the S2, release the actuator to stop, press the S3 actuator in the closed direction, release the stop, and run the actuator to the valve full open position in this way.	Run (green) open and (red) in turn off.
Record the position of the valve being fully open	Press the S1, actuator to automatically record the full open position of the valve.	The indicator light (blue) flashes
Run the actuator to the full position	Press the actuator in the full open direction, release the actuator stop, press the S3 actuator in the off direction, release the stop, and run the actuator to the valve full closed position in this way.	Run (green) open and (red) in turn off.
Record the position of the full valve closure	Press the S1, actuator to automatically record the full open position of the valve.	The indicator light (blue) flashes
Set the End	After step 5, the actuator automatically runs to the given position of the signal.	The indicator light (blue) is usually on

Note: When doing the setting procedure, the position of the cam calibration shall be already done (refer to cam adjustment).

6.3 DC-type voltage PCB (modulating type)

Series 8280M 035 to 8280M 050, EXC1 / A / B

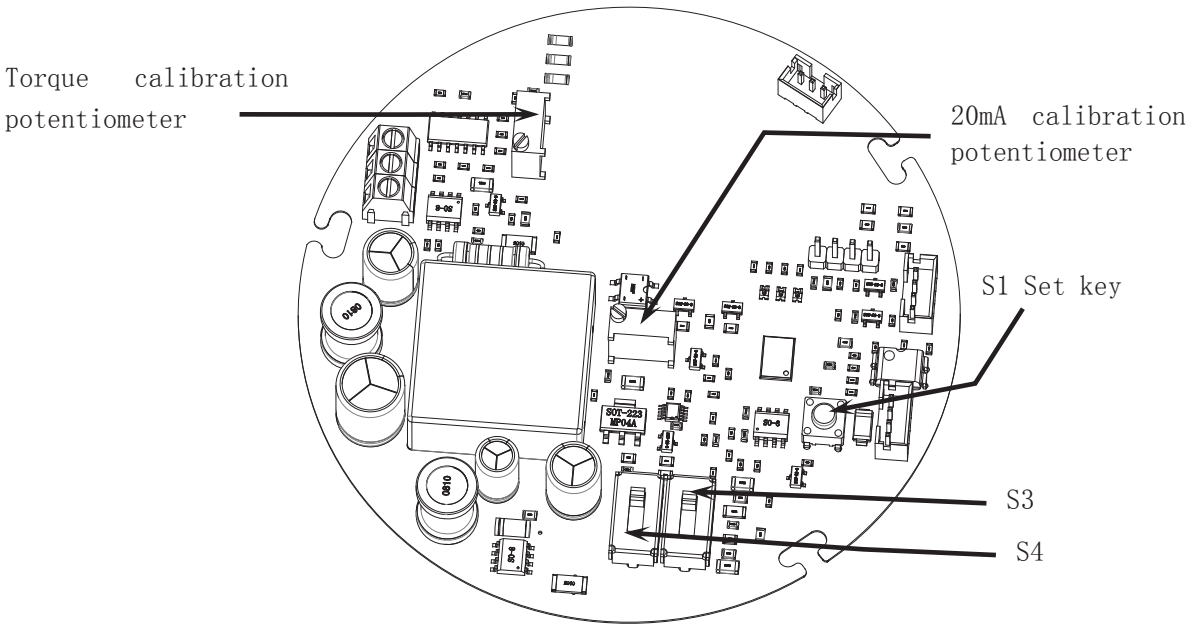
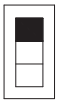
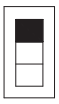
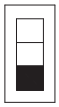
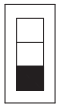


Figure 3 PCB of Electric Actuator

✧ **Signal conditioning and change**

The signal type adjustment and change can be modified and corrected with reference to the Sheet below.

Signal type		Output signal	Input signal
		S4	S3
Current	4-20mA		
Voltage	2-10V		
	0-10V		

✧ **Current calibration**

Press the S1 calibration key for about 3 sec, and then the actuator will automatically adjust and run to the full travel. Give signal to the actuator to make the actuator run to full open position, and adjust the 20 mA potentiometer until the feedback current is exactly 20 mA. The calibration is done.

✧ **Settings of actuator**

Press the S1 calibration key for about 3 sec, and the ”D2” indicator light is changed from flashing to normally constantly on, and the actuator is automatically operated in run to the fully-opened direction.

When the actuator is stopped at the fully-opened position, the”D3” indicator light is turned on and the CPU records the fully- opened closed position and is then automatically run to the fully-closed direction, and the”D3” indicator light is off again.

Once the actuator is stopped at the full close position, the “D4” indicator light will change from OFF to ON, and the CPU will automatically record the full close position. The “D4” indicator light will change from constantly normally on to flashing. At this point, the setting is finished. The electric actuator will run to the position of the current given signal.

Note: When doing the setting procedure, the position of the cam calibration shall be already done (refer to cam adjustment).

6.4 Series 8280M 100 to 8280M 20000, EXB(C)2-12

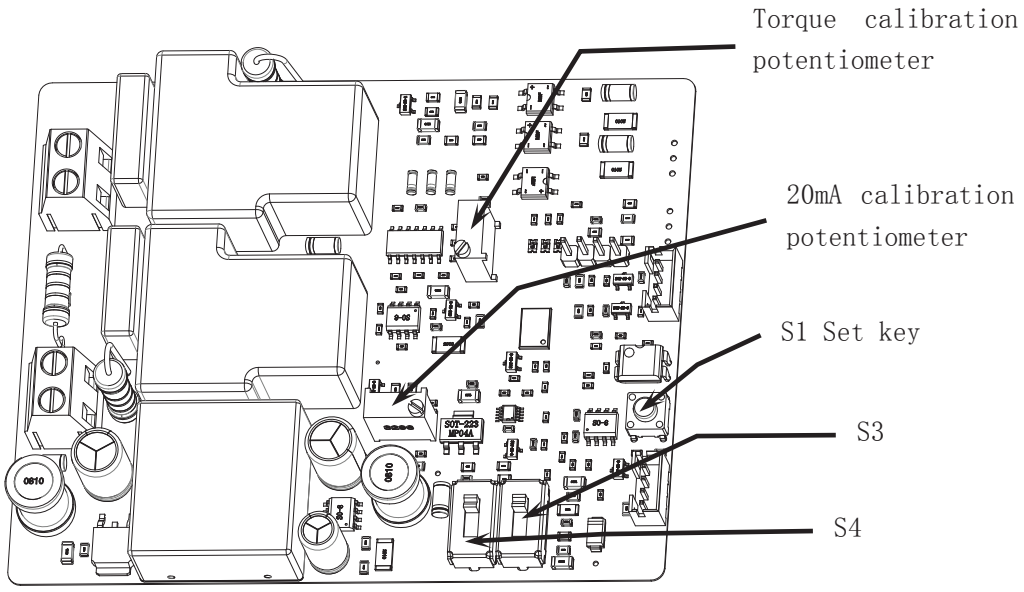
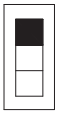
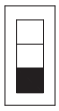
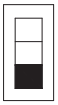


Figure 4 PCB of Electric Actuator

- **Signal conditioning and change**

The signal type adjustment and change can be modified and corrected with reference to the Sheet below.

Signal type		Output signal	Input signal
		S1	S2
Current	4-20mA		
Voltage	2-10V		
	0-10V		

- **Current calibration**

The current calibration can be corrected with reference to the steps of the **EFM DC series**.

- **Settings of actuator**

The actuator can be set with reference to the step of the **EFM DC series**.

Press the S1 calibration key for about 3 sec, and the ”D2” indicator light is changed from flashing to constantly on, and the actuator is automatically operated in the fully-opened direction.

When the actuator is stopped at the fully-opened position, the"D3" indicator light is turned on and the CPU records the fully- opened position and is then automatically operated in the fully- closed direction, and the"D3" indicator light is off again.

Once the actuator is stopped at the full close position, the "D4" indicator light will change from OFF to ON, and the CPU will automatically record the full close position. The "D2" indicator light will change from constantly on to flashing. At this point, the setting is done. The electric actuator will run to the position of the current given signal.

Note: When doing the setting procedure, the position of the cam calibration shall be already done (refer to cam adjustment).

6.5 Three-phase source modulating type (PCB description)

Series 8280M 100 to 8280M 20000, EXB(C)2-12

Note: Re-set the actuator is not required, as it was well adjustment in the workshop

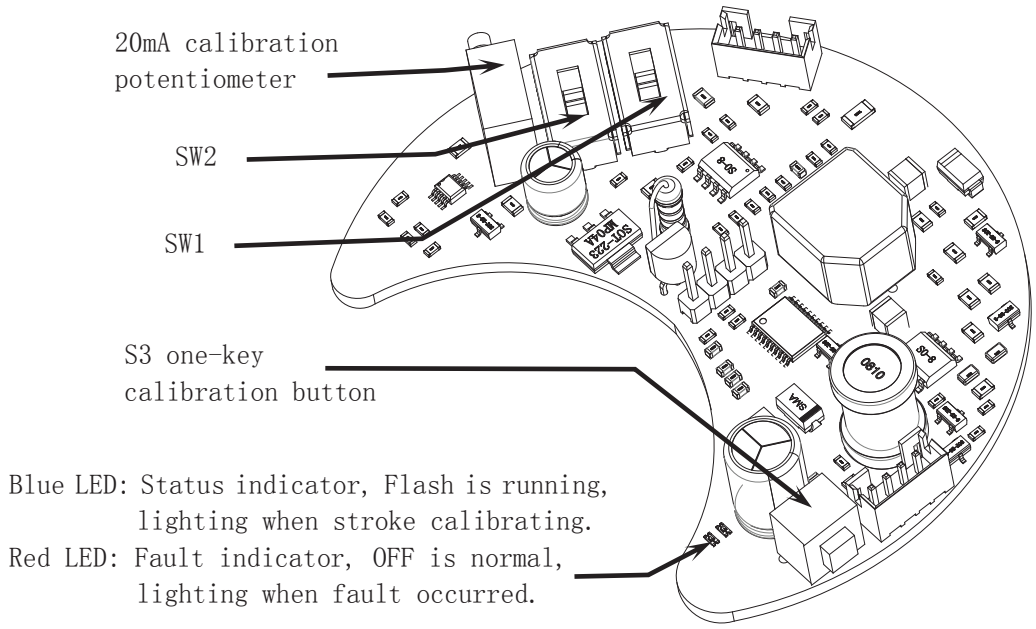


Figure 5 PCB of Electric Actuator

- **Signal conditioning and change**

The signal type adjustment and change can be modified and corrected with reference to the Sheet below.

Signal type		Output signal	Input signal
		SW1	SW2
Current	4-20mA		
Voltage	2-10V		
	0-10V		

- **Current calibration**

  After pressing S3 (see Figure 2) for about 3 seconds, the actuator will be automatically adjusted to run a full travel.

  Give the 20mA to make the actuator to full open position, and adjust the 20 mA potentiometer until the feedback current is exactly 20 mA.

- **Setting of the actuator**

  Press the S3 calibration key for about 3 sec, and the indicator light is changed from flashing to constantly on, and the actuator is automatically operated in the fully-opened direction.

  When the actuator is stopped at the fully-opened position, the indicator light is turned on and the CPU records the fully-opened position and is then automatically operated in the fully-opened direction, and the indicator light is off again

  When the actuator is stopped at the fully-closed position, the indicator light is turn on and the CPU records the fully-close position and flashing light turn on, the modulating completed and the actuator will follow to the control signal.

Note: When doing the setting procedure, the position of the cam calibration shall be already done (refer to cam adjustment).

7.0 Trouble shooting

Fault situation	Questions	Countermeasures
The electric actuator fails to act	1.1. No power	1.1. Check of power supply voltage
	1.2. No input signal or input value error	1.2. Check of input signal
	1.3.Disconnection or separation from terminal board	1.3. Connect the electric wire and replace the terminal block
	1.4. Motor overheat protector acts	1.4. Wait for motor cooling
	1.5. The limit switch acts at the intermediate opening position	1.5. Adjust the cam of travel switch
	1.6. Motor operating capacitor is damaged (except for three phases)	1.6. Replace the capacitor
	1.7. Motor winding is damaged	1.7. Replace the motor
	1.8. Improperly connect the heavy current to signal input terminal (adjustable type)	1.8. Replace the circuit board
The electric actuator acts back and forth, Without stop.	2.1. Signal from signal source is unstable	2.1. Check the input signal
	2.2. Potentiometer is disturbed or damaged (adjustable type)	2.2. Replace the potentiometer
	2.3. The potentiometer gear or sector gear is loose (adjustable type)	2.3. Check the hexagon socket screw of the fastening gear
The input does not match the feedback signal (adjustable type)	3.1. The input signal is not correct	3.1. Check the input signal
	3.2. The value indicated on the calibration potentiometer is changed (operated by professionals)	3.2. Reset based on the setting steps
	3.3. The position of the potentiometer gear is changed	3.3. Re-adjust the potentiometer gear
No feedback signal	The opening signal line is disconnected or poorly contacted.	Check whether the wiring mode conforms to the wiring diagram

* Note: In case of the actuator is not electrified after installation, and the dewing phenomenon is detected inside the actuator, please switch on the power supply to eliminate the water vapor by using the internal heater, before operate the actuator again.

8.0 Maintenance

Daily maintenance

- Visual inspection of appearance shall be performed to check whether there is any component shortage, looseness, and deformation;
- Check whether the actuator is connected to the fixed base firmly, and whether each connector to the main equipment acts flexibly;
- Check whether the operation noise of the actuator is abnormal;
- Check whether the cables of the actuator are properly connected, and whether the terminal (or plug) wiring is fastened.

Overhaul cycle

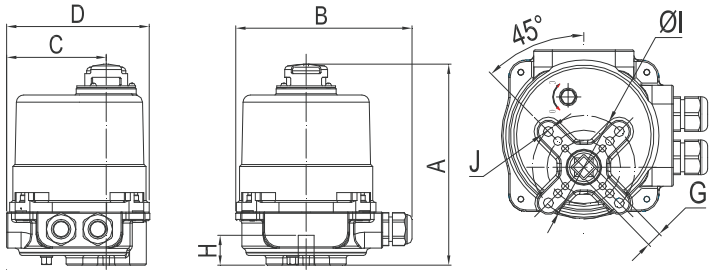
- To ensure the firm operation, please perform the following inspection every 12 months:
- Check whether the full-travel act for the local manual operation is flexible.
- Check whether the control and feedback signals are accurate.

Scraping

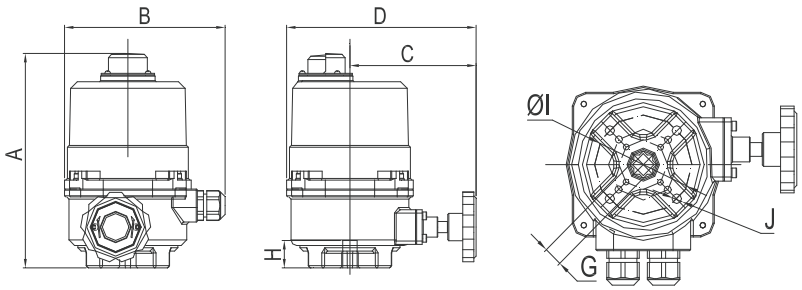
- Once the actuator exceeded the suggested period, or been invalidated due to function failure, do not discard it at will, it is necessary to send them to a professional recycling unit for proper disposal.

9.0 Dimensions

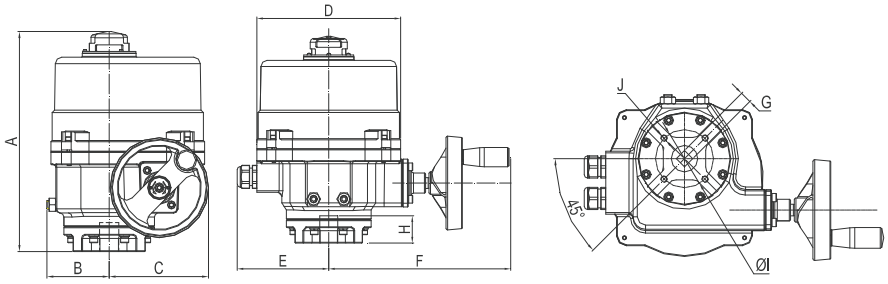
Series 8280 035 to 8280 050, 8280 100 to 8280 20000



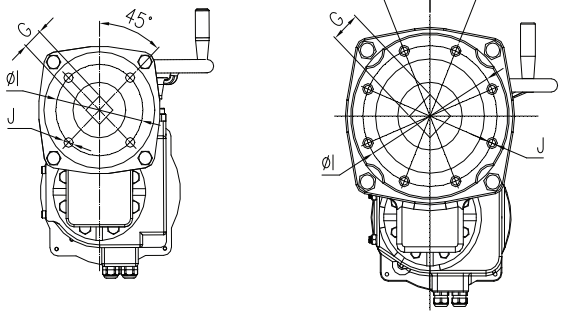
Series 8280 035 / 050



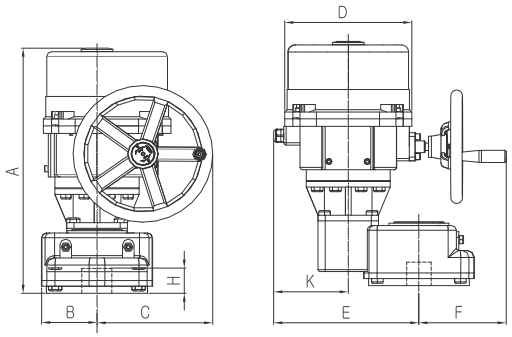
Series 8280 035-H / 050-H



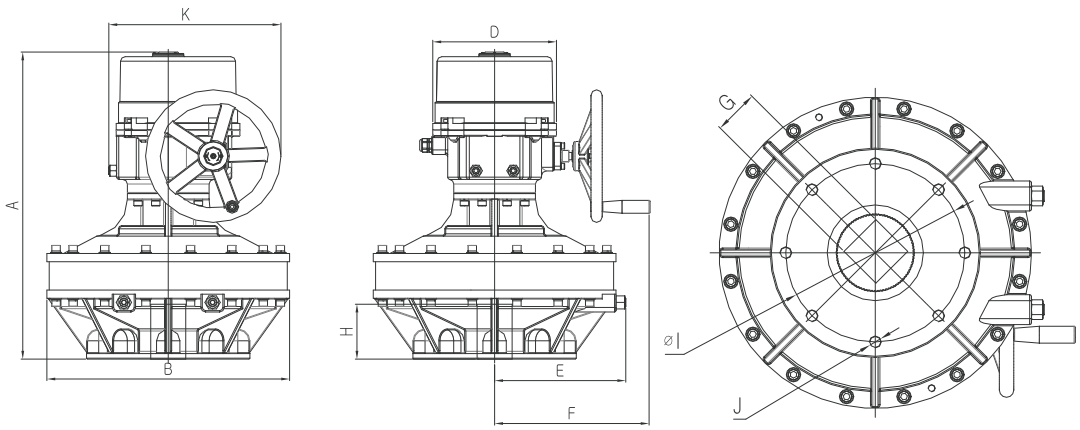
Series 8280 100 / 2300



Series 8280 3500 / 5000 **Series 8280 8000**



Series 8280 3500 / 5000



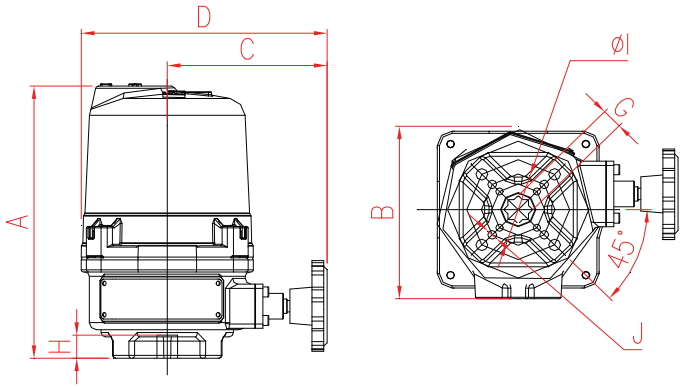
Series 8280 13000 / 20000

Dimension of series 8280 035 to 8280 20000

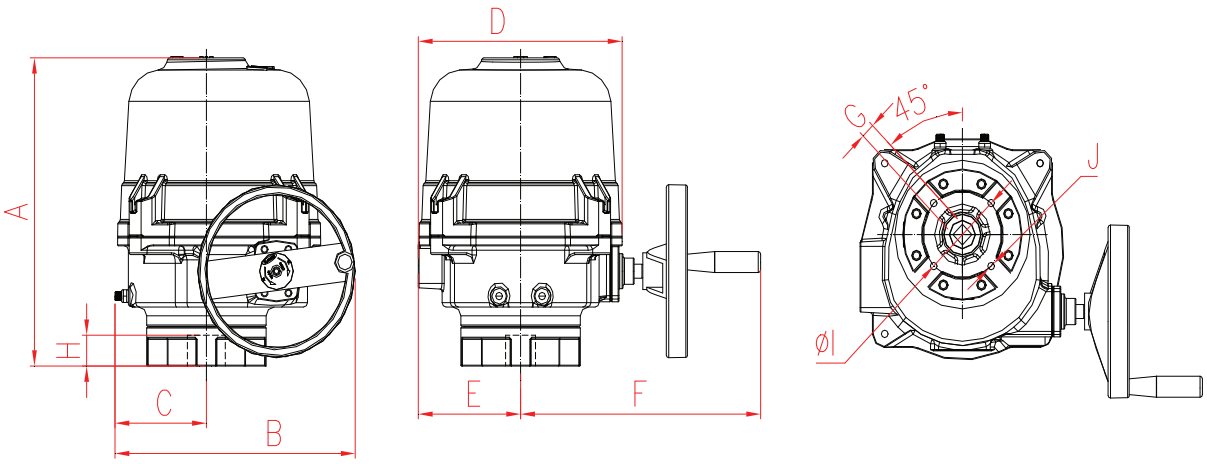
Size(mm) / Model	A	B	C	ΦD	E	F	G	ΦH	ΦI	J	Weight (kg)
8280 035	165	150	82	118	-	-	11*11 14*14	20	36 50 70	4-M5 4-M6 4-M8	3 3.1
8280 050	185										
8280 035-H 8280 050-H 8280 080-H	192	150	135	170	-	-	11*11 14*14 17*17	20			3.6
	212										3.7
8280 100	268	77	123	216	121	240	14*14 17*17	35	70	4-M8	11
8280 200 8280 300											
8280 400	327	103	187	266	150	297	22*22	55	102	4-M10	22
8280 600							22*22 27*27		102 125	4-M10 4-M12	
8280 800											
8280 1000							27*27		125	4-M12	
8280 1700	380	127	242	293	161	333	27*27 36*36	65	125 140	4-M16 4-M20	36
8280 2300											
8280 3500	532	118			308	186	40*40	85	140 165	4-M16 4-M20	76
8280 5000							46*46		165	4-M20	
8280 8000	545	160			343	160	55*55	130	254	8-M16	107
8280 13000	672	520	-	293	281	331	55*55 77*77	120	254	8-M16	218
8280 16000									298	8-M20	
8280 20000											

NOTE: "□G" is a recommended size, it could be customized according to the correspond dimension.

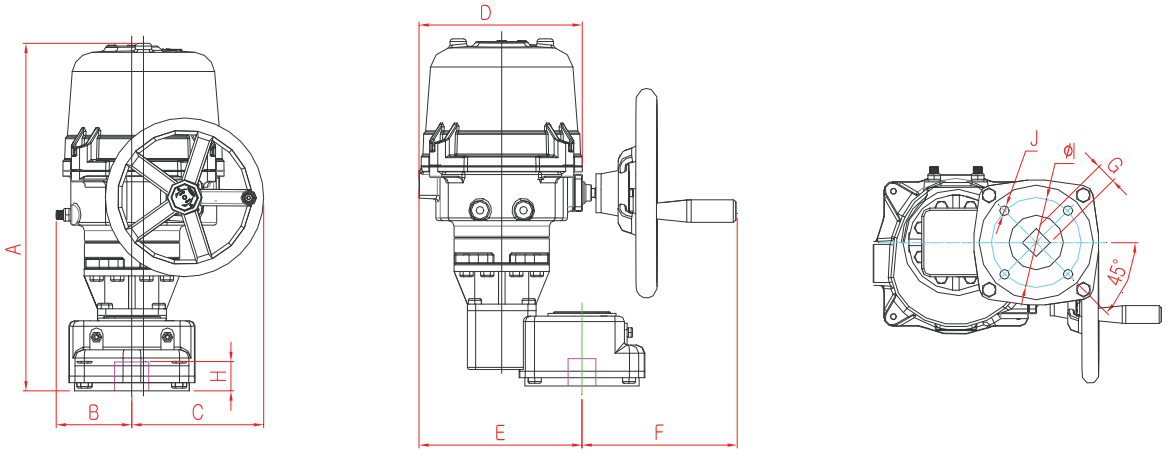
EXB(C)2-12



EXC(G)1/A/B



EXB/C2-9



EXB/C10-12

Dimension of series EXB(C)2-12

Size (mm)

Model	A	B	C	D	E	F	□G	H	ΦI	J	ISO 5211	Weight (kg)
EXC1/A/B	192	121	107	168	-	-	11x11	20	36	4-M5	F03	3.2
							14x14		50	4-M6	F05	
									70	4-M8	F07	
EXC1/A/B	222	121	107	168	-	-	11x11	20	36	4-M5	F03	3.2
							14x14		50	4-M6	F05	
									70	4-M8	F07	
EXB(C)2	286	210	106	208	105	242	14×14	35	70	4-M8	F07	14
EXB(C)3	286	210	106	208	105	242	17×17	35	70	4-M8	F07	14
EXB(C)4	352	302	115	255	130	284	22×22	55	102	4-M10	F10	27
EXB(C)5	352	302	115	255	130	284	22×22	55	102	4-M10	F10	27
							27×27		125	4-M12	F12	
EXB(C)6	352	302	115	255	130	284	27×27	55	125	4-M12	F12	27
EXB(C)7	352	302	115	255	130	297	27×27	55	125	4-M12	F12	27
EXB(C)8	409	382	139	294	150	318	27×27	65	125	4-M12	F12	41
									140	4-M16	F14	
EXB(C)9	409	382	139	294	150	318	36×36	65	125	4-M12	F12	41
									140	4-M16	F14	
EXB(C)10	638	116	215	294	293	182	40×40	85	140	4-M16	F14	88
									165	4-M20	F16	
EXB(C)11	638	116	215	294	293	182	46×46	85	165	4-M20	F16	88
EXB(C)12	638	160	215	294	332	168	55×55	130	254	8-M16	F25	119

NOTE: "□G" is a recommended size, it could be customized according to the correspond dimension.