Instruction manual J4C 20 - 300



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Read these instructions carefully before putting the appliance into operation.
Damage caused by non-compliance with these instructions is not covered by the warranty/guarantee.

When operating electrical devices, certain parts of these devices inevitably carry dangerous voltages. Failure to observe the general electrical safety rules and VDE regulations can therefore result in serious personal injury or damage to property. Only suitably qualified personnel may work on or near these appliances. The personnel must be familiar with all safety instructions and maintenance measures in accordance with these operating instructions.

INTRODUCTION

These electric quarter-turn actuators were designed to control and regulate industrial valves.
The actuator operates within its configured working angle, which can be freely adjusted.
The position indicator shows the current position of the valve and the operation status is indicated by the status LED. In the event of blocking, the internal torque protection circuit protects against damage.

ENVIRONMENT

If the outside temperature fluctuates, the internal heater protects against condensation in the interior. To do this, the actuator must be permanently supplied with power.

When used outdoors, adequate protection (roofing) against climatic influences such as UV radiation, heat development and icing of the manual override should also be provided.

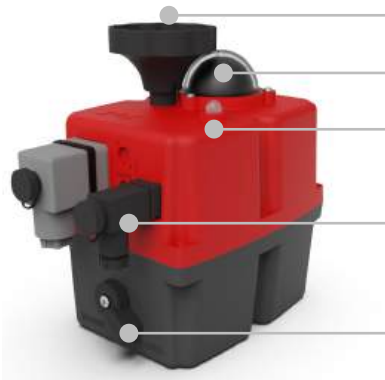
Vibrations in the piping must be absorbed by appropriate line compensators.

MAINTENANCE

No maintenance is required on these quarter-turn actuators. Regular functional checks are recommended in accordance with the safety requirements of the system, especially for actuators that are rarely used.

OVERVIEW

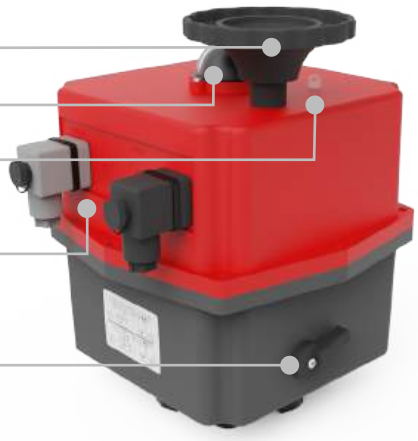
Model 20 to 85



Handwheel
Position indicator
Status LED
Plugs
Override switch
Automatic - Manual



Model 140 to 300



ELECTRIC CONNECTION

VOLTAGE

The actuator automatically recognises the connected operating voltage. Available voltage ranges:

- Models **S20** to **S300** can be operated in the range **24V-240V DC/AC (50/60Hz) -0%/+5%**
- Models **B20** to **B300** can be operated in the range **12V DC/AC (50/60Hz) -0%/+5%**

POWER CONSUMTION

The actuator protects itself against increased current consumption, so that fusing is only necessary as line protection. As it is to be regarded as a capacitive load due to the internal power supply unit, an external fuse with appropriate tripping characteristics for increased inrush currents (e.g. type C or D circuit breaker) must be provided.
Switching contacts should have a suitable contact material (e.g. silver-tin oxide AgSnO) or a zero-voltage switch. Interference caused by coupling parallel loads must be avoided.

Model	Current consumption / Power with maximum torque					
	J4C B20 - B300		J4C S20 - S300			
	12V DC	12V AC	24V DC	24V AC	110V AC	230V AC
20	2,0A / 23,4W	2,3A / 27,3W	1,0A / 23,4W	1,3A / 30,7W	0,3A / 32,7W	0,2A / 46W
35	2,6A / 31,5W	2,3A / 27,3W	1,4A / 32,8W	1,7A / 40,2W	0,4A / 41,9W	0,2A / 46W
55	3,4A / 41,1W	3,8A / 45,4W	1,6A / 39,0W	2,0A / 47,5W	0,4A / 47,0W	0,2A / 46W
85	2,3A / 27,3W	2,7A / 31,8W	1,2A / 29,3W	1,5A / 36,0W	0,3A / 36,5W	0,2A / 46W
140	5,4A / 64,7W	8,5A / 101,6W	2,5A / 60,7W	3,3A / 79,2W	0,7A / 78,7W	0,4A / 105,6W
300	5,5A / 65,3W	8,6A / 103,6W	2,7A / 64,7W	3,3A / 79,2W	0,8A / 84,7W	0,5A / 113,5W

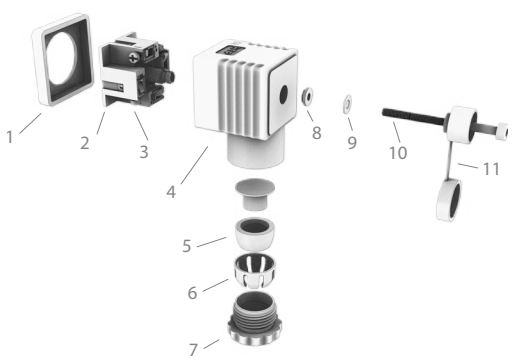
CONNECTION PLUGS

Caution: Before connecting, make sure that the voltage to be applied to the actuator is within the range specified on the type label. DIN plugs are supplied for connection to the actuator.
The diameter of the cable to be used must meet the minimum and maximum requirements.

Plugs	Small, Black		Big, Grey or Black	
	EN175301-803 Form CI		EN175301-803 Form A	
Cable diameter	min. Ø 5mm	max. Ø 6mm	min. Ø 8mm	max. Ø 10,5mm

Caution: Make sure that the rubber seal (1) is in place when you attach the plug to the actuator. When installing the cable, also ensure that the seals (5 & 9) are correctly installed. Water ingress and damage caused by this installation error will invalidate any warranty. The DIN plugs are attached to their respective sockets on the drive housing with a screw. Do not overtighten the screw (10) during assembly (max. 0.5 Nm).

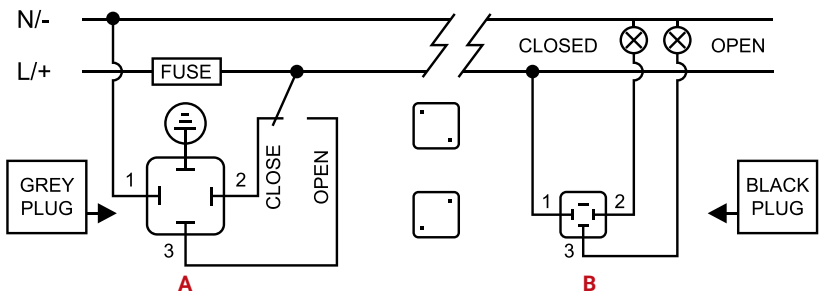
1. **Sealing**
2. **Terminal block**
3. **Klamp**
4. **Housing**
5. **Sealing ring**
6. **Clamp ring**
7. **Screw-in socket**
8. **Sealing ring**
9. **Washer**
10. **Screw**
11. **EMC Cap**



Wiring diagram Open/Close

In the standard version, all of these three listed wiring variants can be used without further configuration.

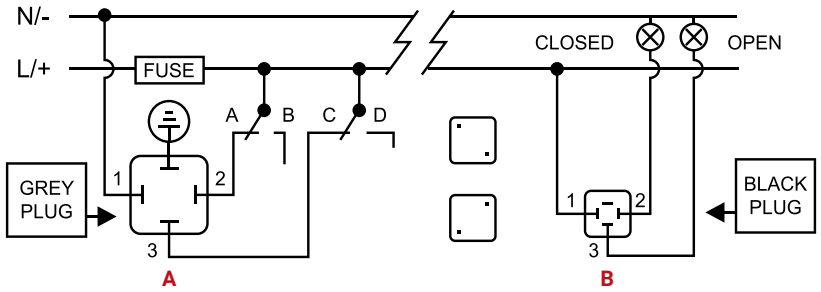
OPEN-CLOSE AC/DC



A = Supply plug (Grey)
Neutral / - PIN 1 & Phase / + PIN 2 = CLOSE
Neutral / - PIN 1 & Phase / + PIN 3 = OPEN
Earth/Protective wire - Flat PIN ⏚

B = End position plug (Black)
Com PIN 1 & PIN 2 = Feedback CLOSE
Com PIN 1 & PIN 3 = Feedback OPEN

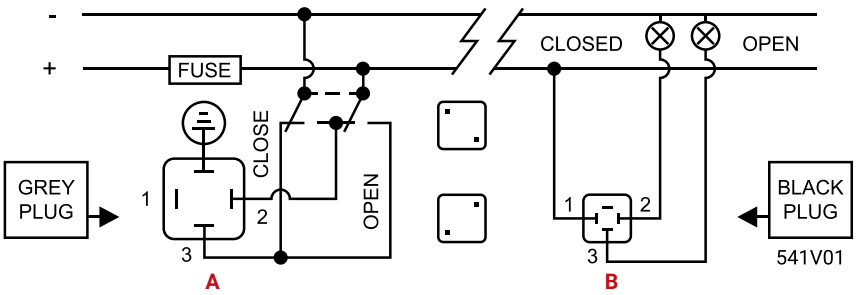
OPEN - CLOSE - STOP AC/DC



A = Supply plug (Grey)
Neutral / - PIN 1 & Phase / + PIN 2 = CLOSE
Neutral / - PIN 1 & Phase / + PIN 3 = OPEN
Neutral / - PIN 1 & Phase / + PIN 2 & PIN 3 = STOP
Earth/Protective wire - Flat PIN ⏚

B = End position plug (Black)
Com PIN 1 & PIN 2 = Feedback CLOSE
Com PIN 1 & PIN 3 = Feedback OPEN

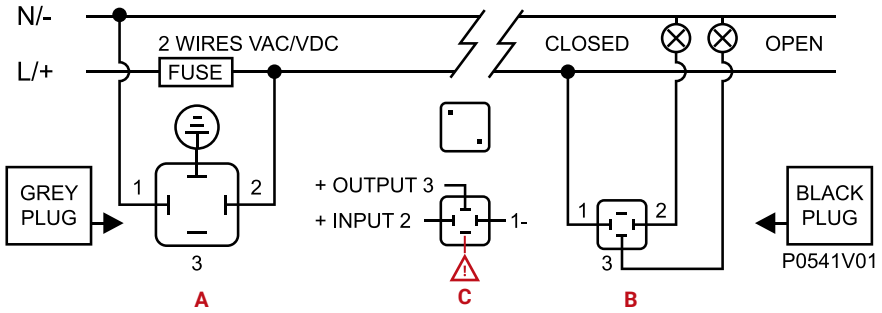
OPEN - CLOSE 2 WIRE DC



A = Supply plug (Grey)
Negative PIN 3 & Positive PIN 2= CLOSE
Negative PIN 2 & Positive PIN 3= OPEN
Earth/Protective wire - Flat PIN ⏚

B = End position plug (Black)
Com PIN 1 & PIN 2 = Feedback CLOSE
Com PIN 1 & PIN 3 = Feedback OPEN

Wiring diagram Option DPS Positioner



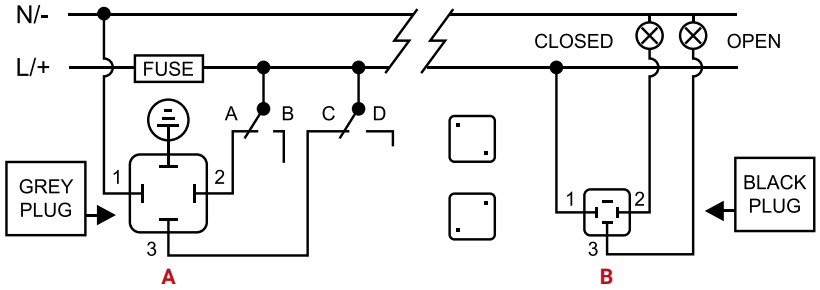
Caution! Earth pin must not be connected to DPS connector (C), as this could trigger a self adjustment.

A = Supply plug (Grey)
Neutral / - PIN 1 & Phase / + PIN 2 = Power supply
Earth/Protective wire - Flat PIN ⏚

C = DPS plug (black)
PIN 1 Ground
PIN 2 Input signal
PIN 3 Output signal

B = End position plug (Black)
Com PIN 1 & PIN 2 = Feedback CLOSE
Com PIN 1 & PIN 3 = Feedback OPEN

Wiring diagram Option 3 Positions

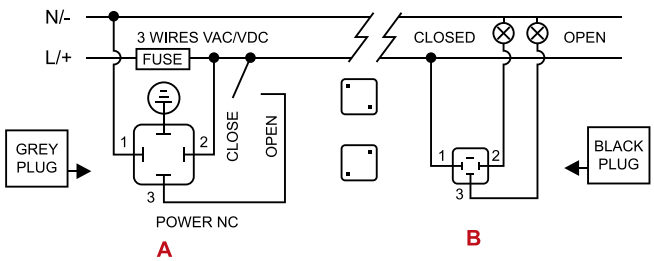


A = Supply plug (Grey)
Neutral / - PIN 1 & Phase / + PIN 2 = CLOSE
Neutral / - PIN 1 & Phase / + PIN 3 = OPEN
Neutral / - PIN 1 & Phase / + PIN 2 & PIN 3 = MIDDLE
Earth/Protective wire - Flat PIN ⏚

B = End position plug (Black)
Com PIN 1 & PIN 2 = Feedback CLOSE
Com PIN 1 & PIN 3 = Feedback OPEN

Wiring diagram Option Permanent phase

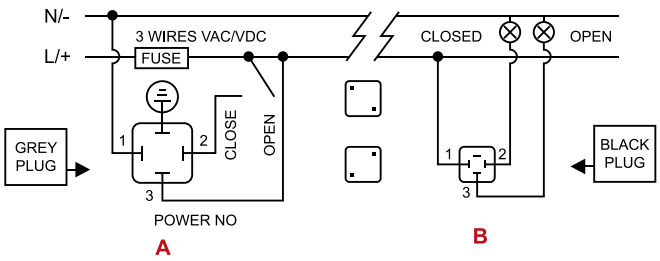
Permanent phase NC (2PH-NC)



A = Supply plug (Grey)
Neutral / - PIN 1 & Phase / + PIN 2 = CLOSE
Neutral / - PIN 1 & Phase / + PIN 2 & PIN 3 = OPEN
Earth/Protective wire - Flat PIN ⏚

B = End position plug (Black)
Com PIN 1 & PIN 2 = Feedback CLOSE
Com PIN 1 & PIN 3 = Feedback OPEN

Permanent phase NO (2PH-NO)



A = Supply plug (Grey)
Neutral / - PIN 1 & Phase / + PIN 3 = OPEN
Neutral / - PIN 1 & Phase / + PIN 2 & PIN 3 = CLOSE
Earth/Protective wire - Flat PIN ⏚

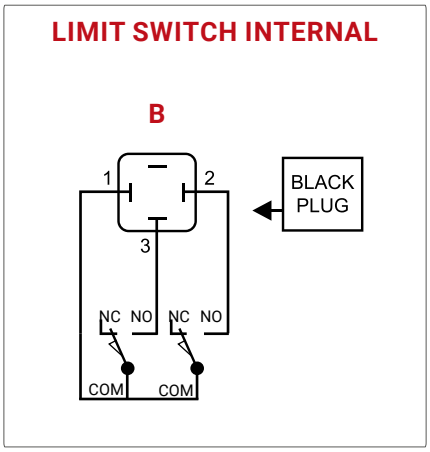
B = End position plug (Black)
Com PIN 1 & PIN 2 = Feedback CLOSE
Com PIN 1 & PIN 3 = Feedback OPEN

End position feedback

In the standard version, two potential-free SPDT microswitches with silver plated contacts are installed in the actuator. The NO contacts of these switches are routed to the end position plug (B).

Technical data:
SPST NO max. 5A 125V AC / 3A 250V AC

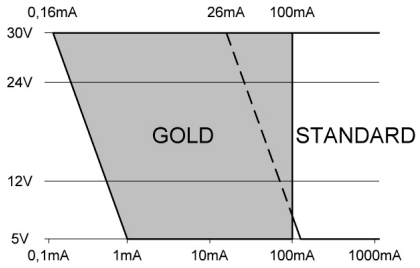
Notice:
For load-free monitoring of the end position feedback (<100mA) switches with gold plated contacts should be used.



Gold plated microswitches

Alternatively, two potential-free SPDT microswitches with gold-plated contacts can be installed. These should be used for load-free monitoring of the end positions, for example via PLC inputs, as gold contacts do not tend to form soot inside the microswitch. The formation of soot in a standard silver contact switch is reliably burnt off by currents >100mA. At lower currents, this can lead to sporadic or complete failure of the end position feedback.

Technical data:
SPST NO max. 0,1A 30V DC



Differen wiring optins

The installed SPDT microswitches can be available in different versions, including the following variants:
4 potential-free end positions, 2x NC contact or 2x changeover contact.
Please refer to the circuit diagram on the respective device.

Position indicator

All J4C quarter-turn actuators are equipped with an optical position indicator consisting of a black base with a yellow insert. It indicates the actual position and working direction.

The end positions are labelled with a molding in the cover.

Working direction when viewing the position indicator:

Anti-clockwise rotation to the left = OPEN

Clockwise rotation to the right = CLOSE


0 = CLOSE


90 = OPEN

Optional position indicator

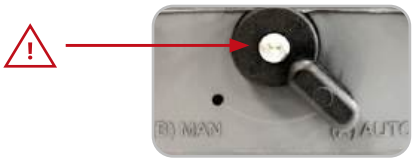
A freely configurable position indicator can be installed as an option.
This can display different configurations or “L” or “T” bore.



Manual override

All J4C actuators have a manual override to move the valve to the desired position in case of an emergency.
The operating mode can be set via the manual override switch:

AUTO = Automatic operation via motor
MAN = Manual operation via handwheel



Caution: The manual switch must not be turned over its predetermined switch positions.
The screw on the switch must not be loosened.

If “AUTO” position is selected:

The actuator moves automatically according to the control. On models 20, 35, 55 and 85, the handwheel also rotates, so it is important not to block it.

If “MAN” position is selected:

The motor is mechanically decoupled and the position can be adjusted using the handwheel.
After a running time of approx. 360°, the motor is automatically stopped, which is indicated by the status LED.
To restore the automatic function, the manual switch is returned to the “AUTO” position.
To reactivate the motor, the opposite direction must be controlled or the supply voltage must be shortly interrupted (e.g. by disconnecting the supply plug).

Heater

The internal heater is controlled by a thermostat and keeps the interior at approx. 20°C. If the outside temperature fluctuates, it protects against condensation in the interior. The heating is active as soon as voltage is applied to the supply plug. The supply voltage must therefore never be switched off.

Torque limiter

The torque limiter monitors the current torque electrically and triggers when the break torque is exceeded in order to protect the motor and the gearbox if the valve is blocked or has a higher torque. When triggered, the motor is stopped and moved approx. 2° in the opposite direction to release the built-up tension between the actuator and valve. Tripping is indicated by the status LED. In this case, it is essential to check the valve.

To reactivate the motor, the opposite direction can be activated or the supply voltage can be shortly interrupted (for example by disconnecting the supply plug).

Status LED

The status LED always indicates the current operating status in order to communicate it to the user. It lights up in different colours or flashes.



OPERATING STATUS OPEN/CLOSE ACTUATOR	LED STATUS
Actuator without power supply	
Actuator is in opened position	
Actuator is in closed position	
Actuator in stop position (Open + Close simultaneously controlled. Only for standard wiring)	
Actuator is turning in open direction	
Actuator is turning in close direction	
Torque limiter active in open direction	
Torque limiter active in close direction	
Motor stopped, manual override active	
Option 3 Positions: Actuator is in middle position	
Option BSR: Safety function NO active, actuator opens automatically. Max. 3 min.	
Option BSR: Safety function NC active, actuator opens automatically. Max. 3 min.	
Option BSR: Battery protection. Needs to be recharged	

OPTION DPS: OPERATION STATUS POSITIONER	LED STATUS
Actuator without power supply	
Actuator is in correct position	
Actuator is turning in open direction	
Actuator is turning in close direction	
Self adjustment mode active	
Torque limiter active in open direction	
Torque limiter active in close direction	
Motor stopped, manual override active	
Input signal too high. Actuator needs reset	
Actuator has no input signal (only for 4-20mA or 1-10V)	
Option BSR: Safety function NO active, actuator opens automatically. Max. 3 min.	
Option BSR: Safety function NC active, actuator opens automatically. Max. 3 min.	
Option BSR: Battery protection. Needs to be recharged	

Mounting on valve

The torque of the valve should never exceed the working torque of the actuator, taking into account the specific application and after multiplying by a sufficient safety factor. Before installation, components that could block the valve (e.g. end stops) must be removed. Assembly is carried out using the threaded holes in the flange in accordance with ISO5211 and can be carried out using grub screws or headed screws, which must be sufficiently screwed into the actuator. The stem intake is designed in accordance with DIN3337.

The shaft of the valve must never be longer than the insertion depth of the stem intake in the actuator!

It must be ensured that the valve shaft is centred in relation to the mounting holes. If the flange pattern and the shaft of the valve are not aligned with the actuator, the manual override can be used for this purpose.

Open housing

The housing must be opened to adjust the working angle or configure the DPS / BSR. Before opening, the power must be switched off and all actuator plugs need to be removed.

1



Remove handwheel (Torx 20 or 3mm Allen key)

2



Remove housing screws (Torx 20)

3



Carefully pull the cover upwards

Close housing

When fitting the housing cover, check that the circumferential housing seal and the handwheel shaft seal are seated correctly. All screws, individual parts and the cable routing must be placed in their original position.

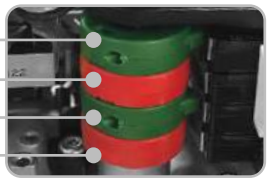


Shaft sealing handwheel

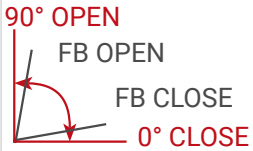
Adjustment cam system

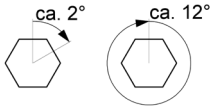
The working angle and the end position feedback are set via the cam system. The actuator is pre-adjusted at the factory and may need to be adjusted. An adjustment tool is attached to the motor for this purpose.

1. Feedback OPEN
2. Feedback CLOSE
3. Motor stop OPEN
4. Motor stop CLOSE



To ensure that the end position feedback functions reliably, the corresponding cam is set so that it activates approx. 3° before reaching the end position.





Adjustment tool inserted



Green cam 1 & 3

Turn the adjustment tool anti-clockwise to the left to move further in the open direction.

Turn the adjustment tool clockwise to the right to move less in the open direction.



Red cam 2 & 4

Turn the adjustment tool clockwise to the right to move further in the close direction.

Turn the adjustment tool anti-clockwise to the left to move less in the close direction.



Option BSR battery safety pack

With the BSR, the actuator moves to its specified safety position (NC or NO) in the event of a power failure. The safety function is realised via an internal rechargeable battery, therefore the actuator must be permanently supplied with power! The battery is supplied pre-charged; to ensure proper function, the actuator must be charged for the specified "Charging time for 100% battery charge" before use. After the BSR is activated, the actuator indicates for approx. 3 minutes via the status LED that it has moved to its safety position due to a lack of supply voltage. As soon as the actuator is supplied with voltage again, it is immediately ready for use.

Function test

A regular functional test must be carried out in accordance with the safety requirements. This should be carried out at least once a year. To prevent unintentional opening or closing, it may be necessary to remove the actuator from the valve during the test!

It is carried out as follows:

1. Operate the actuator to the opposite position of the safety position using the controls or manual override (BSR NO: Operate the actuator to the closed position / BSR NC: Operate the actuator to the open position)
2. Switch off the supply and thus simulate a power failure (if necessary, set the override switch back to AUTO)
3. Actuator moves to its safety position via BSR, the LED flashes to indicate that BSR is activated
4. Test completed, actuator can be put back into operation

Maintenance

J+J electric part-turn actuators are generally maintenance-free, but the internal battery of the BSR should be replaced before it reaches the end of its service life.

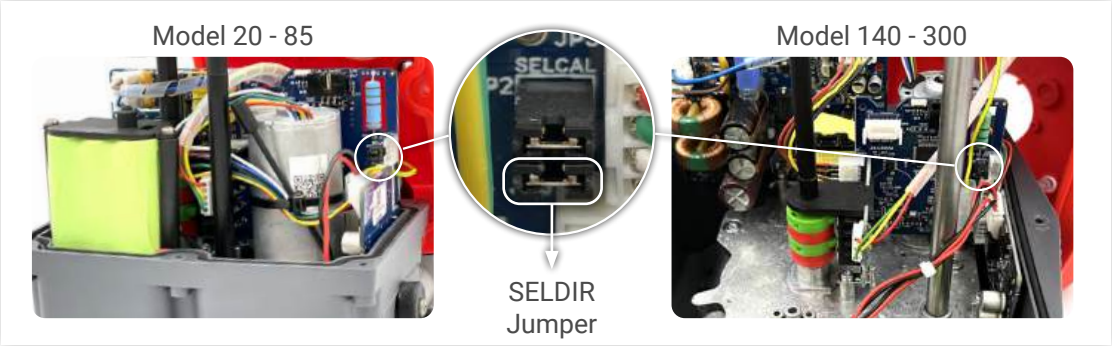
According to this a replacement should be planned after a maximum of 300 BSR activations or 5 years.

Configuration NC / NO

The desired safety function is selected via the „SELDIR" jumper on the controller board.

Jumper plugged on: Safety position NC - Actuator moves to the close position in the event of a power failure

Jumper removed: Safety position NO - Actuator moves to the open position in the event of a power failure



Technical data

Model size	20	35	55	85	140	300
Charging time for 100% charge	28 h				54 h	
Max. operations with full charge	5				4	
Reload time per BSR operation	15 min	21 min	48 min	58 min	30 min	50 min
Battery load	2200 mAh				4400 mAh	
Weight	0,27 kg				0,38 kg	

Option DPS Positioner

With the DPS, the part-turn actuator can be freely positioned in its working range via the input signal.
In addition, it permanently provides its actual position as an output signal.
The input and output signal can be configured as required: 4-20mA, 0-10V, 1-10V
In addition, the position at the lowest signal or when there is no input signal (0mA, 0V) can be set:
NC (closed), NO (open)

The following options are also available from factory:

- 0-20mA input and output signal
- Fail Freeze (4-20mA / 1-10V), whereby the actuator remains in its position whenever there is no signal
- Open/Close control with DPS output signal

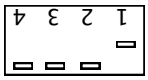
Adjusting the working angle

The self adjustment is carried out to set the working angle. This causes the actuator to move to both end positions via the cams and store them.
The working angle must therefore always be adjusted via the cam system first.

Self adjustment with opened cover

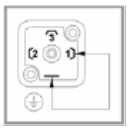
1. Turn off the power supply
2. Put Dipswitch 1 ON
3. Turn on the power supply
4. Put Dipswitch 1 OFF
5. Actuator will do the self adjustment

Dipswitch:



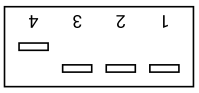
Self adjustment from outside

1. Turn off the power supply
2. Connect Pin1 and Earth on DPS Plug
3. Turn on the power supply
4. Disconnect Pin1 and Earth
5. Actuator will do the self adjustment

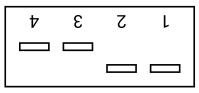


Signal configuration

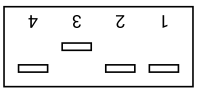
The signal type can be set using the dip switches on the DPS board.



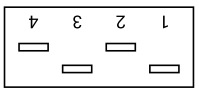
4-20 mA NC



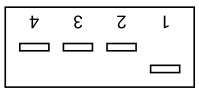
0-10 V NC



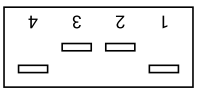
1-10 V NC



4-20 mA NO



0-10 V NO



1-10 V NO



Technical data

Precision	3%
Linearity	2%
Hysteresis	3%
Impedance Input mA	100 Ω
Impedance Input V	25 kΩ
Class	B+C to DIN EN15714 Inching + Modulation

Steps for 90°	
4-20 mA	min. 150 steps / 90°
0-10 V	min. 98 steps / 90°
1-10 V	min. 87 steps / 90°
0-20 mA	min. 150 steps / 90°

Technical data

Model size	20	35	55	85	140	300
Working torque	20 Nm	35 Nm	55 Nm	85 Nm	140 Nm	300 Nm
Break torque	25 Nm	38 Nm	60 Nm	90 Nm	170 Nm	350 Nm
Working time without load s/90° ±10%	9 s (5 s, 140 s)	9 s (140 s)	13 s	29 s	34 s	58 s
Weight	1,7 kg	1,9 kg	2,4 kg	3,0 kg	5,2 kg	5,2kg
Temperature range	-20°C to +70°C					
Protection IEC60529	IP67					
Duty cycle (Motor)	75%					
Motor	Operating type S4 / insulation class B					

If the WEEE (Waste Electrical and Electronic Equipment) contains batteries, they must be removed and deposited separately for proper management before being deposited at the collection facilities. Batteries may contain hazardous substances that can harm the environment and human health if mishandled or disposed of improperly. Therefore, it is important to deposit them in specific containers for recycling and proper treatment. In some countries, there are selective collection programs for used batteries in supermarkets, electronic stores, or other establishments.



Num: RII-AEE: 8760

Date: 29.09.2025

If you have any questions, please contact our technical support team:

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