Product description

The electromechanical J+J quarter-turn actuators are designed to control and regulate industrial valves. For this purpose, the drive has a large number of supporting systems and a freely configurable cam system. In the standard version, the drives are pre-adjusted to 0°-90° (0° = closed / 90° = open). Other working angles are also available. The following manual will guide you through all the necessary steps for installation and operation of the actuator.
Read this manual carefully before installation and commissioning in order to avoid mistakes!
For special models, the enclosed additional instructions and the type label / wiring diagram of the device apply additionally.

Function
The drive automatically detects the connected operating voltage. Depending on the control, it moves in clockwise or counter-clockwise direction into its predefined end position, which is set via the cam system and interrogated by limit switches. The signaling is done before reaching the end position also via the cam system and two other limit switches, which are potential-free interrogated. While the brushless motor drives the main shaft via the gearbox, the DOME position indicator permanently shows the position of the valve. In addition, the operating status is displayed via the multicolored status LED.
To prevent condensation in the housing when the outside temperature fluctuates, the actuator has an automatic heater, which protects the interior. For this, the actuator needs a permanent power supply.
If the valve is blocked or has a high torque, the electronic torque limiter protects against damage to gear and motor.
In the event of a power failure or emergency intervention, the manual override can be switched on via the changeover switch and the actuator can then be manually turned via the handwheel.

Connections
The mechanical connection is made via a standardized interface according to DIN 3337 / ISO 5211.
For this purpose, each drive has a multi-flange plate and is available with various shaft outputs.
The electrical connection is made via industrial connectors (see connection plug).

Options
Optional functions are available for a wide range of applications (for more information see data sheets):
- **BSR** Battery safety return / **DPS** Digital positioning system / Potentiometer / different wiring options
- **Gold plated end switches** for loadless sensing of end position feedback (e.g. PLC) 0.1A 30VDC

Maintenance
Maintenance work is not necessary on J+J actuators. A regular check of the function is recommended according to the safety requirements of the system, especially for rarely used actuators.

Important instructions

For further informations visit our Website
datasheets - drawings - certificates

When operating electrical devices, certain parts of these devices are inevitably under dangerous voltage. Not noticing the general electrical safety regulations may result in serious personal injury or property damage. Only qualified personnel may work on or near these devices. The staff must be familiar with all safety instructions and maintenance according with this operating instruction.

The faultless and safe operation of the devices requires proper transport, professional storage, installation and assembly as well as careful operation and maintenance.

Notes for planning
Before using the electric actuator, all circumstances relating to the connection, fitting and surrounding area must be clarified. Otherwise long-term damage or a functional failure may occur.

Environment and installation position
Do not install J+J actuators overhead (flange upwards).
It is always important to pay attention to the accessibility of the manual override and visibility of position indicator and status LED.
In applications with vibrations in the pipeline, line compensators shall be installed.
If actuators are used outdoor, adequate protection (roofing) against climatic influences must be provided. Strong sunlight can damage the drive due to heat development and UV radiation. Icing of the drive can lead to the unusability of the manual override.
To avoid condensation, the internal heater must always be active (see electrical connection).

J+J Deutschland GmbH
Komponenten für die Armaturenautomatisierung
Brunnenweg 7
31061 Alfeld
Tel.: +49 5181 85590-0
Fax.: +49 5181 85590-29
info@juj-deutschland.de
www.juj-deutschland.de

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Name: AB

Commissioning

Mounting on the valve

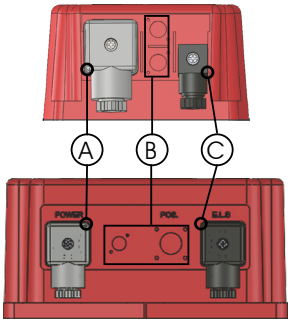
Taking the medium and pressure into account, as well as after multiplication with a sufficient safety factor, the torque of the valve may never exceed the rated torque of the drive. Before mounting, any end stops of the valve must be removed.
If the shaft or flange pattern of the valve can not be directly mounted with the drive, corresponding adaptions are needed.
The shaft of the valve may never be longer than the insertion depth of the actuators output.
The assembly can be done with grub screws, ensuring a sufficient screwing depth in the drive.
In addition, care must be taken during assembly to align the valve and actuator.
In this case, it can be helpful to bring the alignment by using the manual override (see manual override).
Depending on the valve, the working angle may need to be adjusted (see adjustment of cam system).

Electric connection

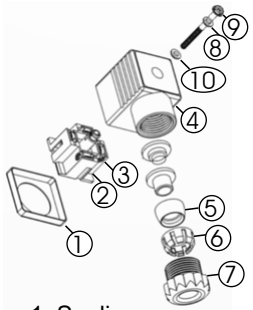
The connection may only be made by electrically trained specialist personnel.
The general electrical safety rules and VDE regulations apply.

The connection is made with the supplied industrial connectors. While wiring always take care of a correct cable diameter, otherwise the degree of protection IP67 is not guaranteed.
Each plug is fastened to the quarter-turn actuator with a screw, it must not be over-tightened.
J+J quarter-turn actuators must be connected with a single phase and controlled via relays or switches.
Depending on requirements, three different wiring methods without reconfiguration are available for the control.
An external fuse with appropriate tripping characteristic for motors (for example circuit breaker type C) shall be provided.
No external consumers should be connected parallel to the actuator.

Connection plugs



A Supply plug
B Option
C End position plug



1 Sealing
2 Terminal block
3 Clamp
4 Housing
5 Sealing ring
6 Clamp ring
7 screw-in pod
8 Washer
9 Screw
10 Sealing washer

	big plug	small plug
Max. cable diameter	8mm -10,5mm	5mm - 6mm
Type	DIN EN175301-803 Form A	Industrial connector type C

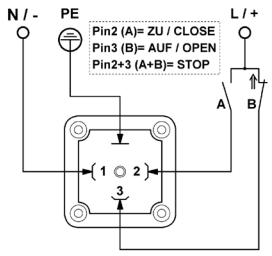
Versorgungsstecker
supply plug

Endlagenstecker
end position plug

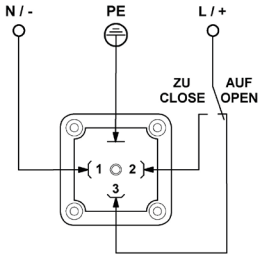
AC/DC

Regelung 3 Punkt regulation 3 point

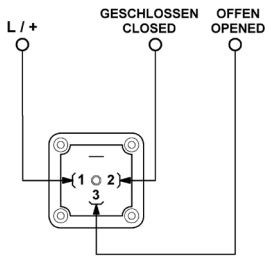
Schaltbild zeigt Ansteuerung in offene Richtung
Wiring diagram shows control to opened direction



Steuerung 2 Punkt control 2 point

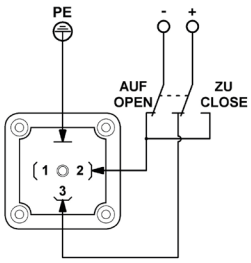


Anschluss connection



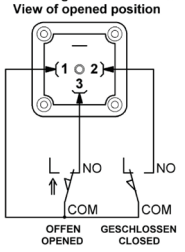
DC

Steuerung 2 Draht control 2 wires



Interne Funktion internal function

Ansicht in geöffneter Position
View of opened position

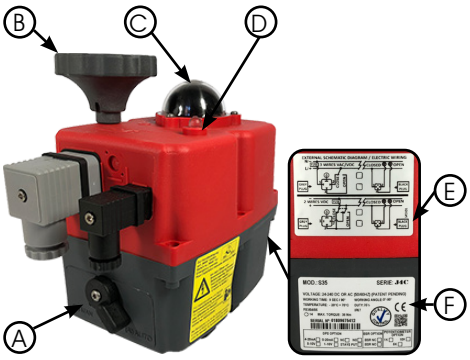


Overview

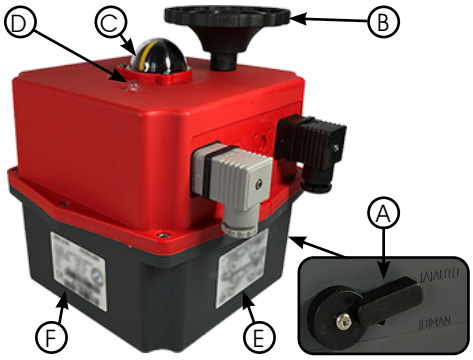
Description

A Switch manual override
B Handwheel
C DOME position indicator
D Status LED
E Wiring diagram
F Type label

20-35-55-85



140-300



All models:

Duty cycle	Temperature range	Heater	Protection IEC60529	2x End position switches
ED= 75%	-20°C - +70°C	3,5 W	IP67	SPST NO 5A 125VAC / 3A 250VAC

Optional 0,1A 30VDC (see page 1)

Model specific:

Model	Current consumption with max. torque 12V AC	Current consumption with max. torque 12V DC	Work- / Break torque	Working time without load s/90° ±10%	Weight
B 20	2,28A / 27,32W	1,95A / 23,36W	20Nm / 25Nm	9s (5s)	1,8kg
B 35	3,19A / 38,28W	2,62A / 31,50W	35Nm / 38Nm	9s	1,9kg
B 55	3,78A / 45,41W	3,42A / 41,05W	55Nm / 60Nm	13s	2,4kg
B 85	2,65A / 31,81W	2,28A / 27,32W	85Nm / 90Nm	29s	3,0kg
B140	8,47A / 101,64W	5,39A / 64,68W	140Nm / 170Nm	34s	5,2kg
B300	8,64A / 103,62W	5,45A / 65,34W	300Nm / 350Nm	58s	5,2kg

Operation

Status LED (D)

Operation status	LED
Without power supply	
Actuator is in opened position	
Actuator is in closed position	
Actuator is in stop position	
Actuator is turning in open direction	
Actuator is turning in close direction	
Torque limiter active in open direction	
Torque limiter active in close direction	
Manual override active, motor was stopped	

Manual override (A/B)

All J4C models have a manual emergency transmission for manual operation in case of a power failure. For manual override turn the switch „AUTO-MAN“ (A) to „MAN“. This decouples the motor from the gear.
Now you can turn the actuator with the handwheel (B).
After about four times of the working time, the motor is automatically stopped by the electronics.

To put the actuator back in automatic mode after manual actuation, turn the switch „AUTO-MAN“ (A) to the „AUTO“ position. Now the motor is coupled again. If the motor has switched off automatically, this can be reversed either by driving to the other direction or by reactivating with a short power interruption (removal of the power plug).

The switch „AUTO-MAN“ must not be turned over its predetermined switch positions.
If the switching is difficult, the gear can be synchronized by using the handwheel.
The screw of the switch must never be loosened!

Adjustment of the cam system

With the cam system, the working angle as well as the end position feedback of the actuator can be adjusted.
The drive is pre-adjusted ex works (see type label). Depending on application, valve, lack of alignment or adapters, it may be necessary that the drive has to be adjusted in its travel.

All work on the opened actuator must be under protective extra-low voltage or without any voltage applied and carried out by appropriately qualified personnel. Not complying with the general Electro safety rules can result in serious injury or property damage.

1. Open the housing

Needed tools: Allen Key 3mm (Models 35-300), Torx key T20
To adjust the cam system, the housing must first be opened. Particular care should be taken to ensure that all sealings and screws are carefully stored. The following steps have to be carried out:

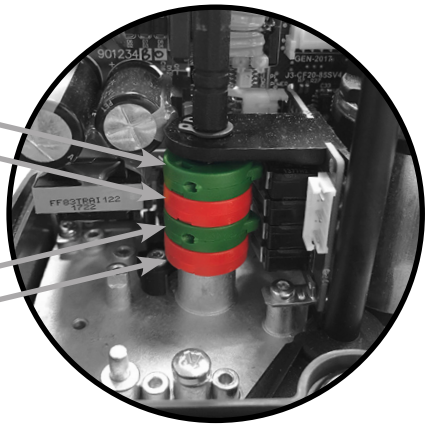
- Unscrew all plugs (watch the plugs sealing)
- Loosen screw in handwheel and pull handwheel upwards
- Loosen and remove the housing screws
- Remove the cover (observe the circumferential housing seal, as well as the shaft seal and snap ring of the handwheel)
- Lay the cover aside (cables can remain connected to the board) and pay attention to the original cable routing
- Put handwheel back on (to turn it while adjusting the cams)

2. Adjusting the cams

For adjustment, first the adjusting tool is needed, which is attached to the motor. To adjust a cam, the tool needs to be plugged in it, as shown in the picture „plugged in tool“. By turning the tool, the cam can now be adjusted.

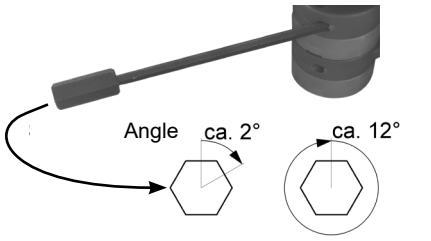
Volt free end position feedback	
Cam 1 (green)	Position „open“
Cam 2 (red)	Position „close“

Motor shutdown	
Cam 3 (green)	Position „open“
Cam 4 (red)	Position „close“



Plugged in tool

Proceeding: The Actuator is first switched from AUTO to MAN.
The position to be set is then approached by handwheel.
Now the adjusting tool is plugged in the respective cam and is twisted until the click sound of the microswitch is heard. The cam must always be turned to the switch from the direction which the main shaft will move in electrical operation to this position.
The end position feedback is set to switch shortly before reaching the end position.
The correct setting of the cam positions must always be checked with an electrical test drive (use safety extra-low voltage). The end positions can be measured with a continuity tester on the plug (see wiring diagram).



3. Close the housing

After completing the adjustment, the actuator can be closed again by reversing the steps described under point 1 in reverse order. Particular care must be taken to ensure that all screws, seals, individual parts and the internal cable routing are returned to their original position.

Troubleshooting

The actuator moves and then stops. The operating LED flashes red or green (see status LED).
» High torque on the valve due to not removed end stops or solids in the valve. Valve must be checked!
» Model size of the actuator is too small.

The actuator is in position „open“ but the valve is closed or half opened.
» Actuator is mounted on the valve with a wrong angle. Dismount, turn the actuator in manual mode to correct angle, mount it.

The limit switches for end position feedback do not work.
» Check the wiring. Check the adjustment of the cams so that they trigger shortly before reaching the end position.
» In load-free interrogation of the limit switch, soot is formed inside. Actuator with gold contact switches are to be used.

The actuator moves, but the valve does not.
» The connection between actuator and valve is damaged or incorrectly dimensioned.

For other malfunctions, please contact our technical service department.

J+J Deutschland GmbH
Komponenten für die Armaturenautomatisierung
Brunnenweg 7
31061 Alfeld
Tel.: +49 5181 85590-0
Fax.: +49 5181 85590-29
info@juj-deutschland.de
www.juj-deutschland.de

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Name: AB