

# Rotary actuator for butterfly valves

- Torque motor 3500 Nm
- Nominal voltage AC 230 V
- Control Open/close, 3-point
- With 2 integrated auxiliary switches
- with torque limit protection and alarm



Peternical data   Peternical data   Nominal voltage   AC 230 V			
Nominal voltage frequency Nominal voltage range AC 207253 V Power consumption in operation 424 W Power consumption in operation incl. heater Power consumption for wire sizing 460 VA Current consumption 2 A Auxiliary switch Switching capacity auxiliary switch Connection supply / control Terminals 2.5 mm² (Wire 2x 1.5 mm² or 1x 2.5 mm²) Parallel operation No  Functional data Torque motor Angle of rotation Angle of rotation Angle of rotation Angle of rotation note Running time motor To dB(A) Duty cycle value Position indication Protection class IEC/EN Protection class IEC/EN I, protective earth (PE) Protection class suikliary switch IEC/EN EMC CE according to 2014/30/EU Low voltage directive CE according to 2014/35/EU Type of action Pollution degree Ambient temperature 3065°C [-22149°F] Storage temperature 3080°C [-22176°F] Servicing Maintenance-free	Technical data		
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Auxiliary switch  Switching capacity auxiliary switch  Connection supply / control  Terminals 2.5 mm² (Wire 2x 1.5 mm² or 1x 2.5 mm²)  Parallel operation  No  Functional data  Torque motor  Angle of rotation  Angle of rotation  Angle of rotation  Running time motor  Sound power level, motor  Outy cycle value  Position indication  Safety data  Protection class IEC/EN  Protection class auxiliary switch IEC/EN  Degree of protection IEC/EN  Low voltage directive  Type of action  Type 1  Pollution degree  4  Ambient humidity  Ambient temperature  Servicing  Terminals 2.5 mm²  1 mA5 A (3 A inductive), DC 5 VAC 250 V  Terminals 2.5 mm²  1 mA5 A (3 A inductive), DC 5 VAC 250 V  Terminals 2.5 mm²  1 mA5 A (3 A inductive), DC 5 VAC 250 V  Terminals 2.5 mm²  Okima 2x 1.5 mm²  1 memora or 1x 2.5 mm²  1 memorary with handwheel (non-rotating)  Angle of rotation  90°  Angle of rotation  1 nternal limit switch, not adjustable  Internal limit switch, not adjustable  Running time motor  70 dB(A)  20°  Angle of rotation  70 dB(A)  20% (= active time 76 s / operating time 25  Position indication  Mechanical, integrated  1 protective earth (PE)  Protection class auxiliary switch IEC/EN  I, protective earth (PE)  Protection earth (PE)  Protection legree  CE according to 2014/30/EU  Low voltage directive  CE according to 2014/35/EU  Type of action  Type 1  Pollution degree  4  Ambient humidity  Max. 95% RH, non-condensing  Ambient temperature  -3065°C [-22149°F]  Storage temperature  -3080°C [-22176°F]  Servicing			2 A
Switching capacity auxiliary switch  Connection supply / control  Terminals 2.5 mm² (Wire 2x 1.5 mm² or 1x 2.5 mm²)  Parallel operation  No  Functional data  Torque motor  Manual override  Angle of rotation  Angle of rotation note  Running time motor  Sound power level, motor  Position indication  Safety data  Protection class IEC/EN  Protection class auxiliary switch IEC/EN  EMC  Low voltage directive  Type of action  Type 1  Pollution degree  Ambient humidity  Ambient temperature  Sound power level, motor  Type 1  Storage temperature  -3080°C [-22149°F]  Servicing  Terminals 2.5 mm²  Terminals 2.5 mm²  (Wire 2x 1.5 mm² or 1x 2.5 mm²  Terminals 2.5 mm²  (Wire 2x 1.5 mm² or 1x 2.5 mm²  Terminals 2.5 mm²  (Wire 2x 1.5 mm² or 1x 2.5 mm²  Terminals 2.5 mm²  (Wire 2x 1.5 mm² or 1x 2.5 mm²  Terminals 2.5 mm²  Terminals 2.5 mm²  (Wire 2x 1.5 mm² or 1x 2.5 mm²  Terminals 2.5		<u>-</u>	2x SPDT, 1x 3° / 1x 87°
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Parallel operation   No			
Functional data  Torque motor Manual override Angle of rotation Angle of rotation Angle of rotation po° Angle of rotation note Running time motor Sound power level, motor Duty cycle value Position indication Mechanical, integrated  Frotection class IEC/EN Protection class auxiliary switch IEC/EN Degree of protection IEC/EN EMC CE according to 2014/30/EU Low voltage directive Type of action Pollution degree 4 Ambient humidity Anbient temperature Storage temperature Servicing Manual override temporary with handwheel (non-rotating) 90° Angle of rotation 1 Internal limit switch, not adjustable Running time 25. 70 dB(A) 7		11.7	
Manual override temporary with handwheel (non-rotating)  Angle of rotation 90°  Angle of rotation note Internal limit switch, not adjustable  Running time motor 76 s / 90°  Sound power level, motor 70 dB(A)  Duty cycle value 30% (= active time 76 s / operating time 25)  Position indication Mechanical, integrated  Frotection class IEC/EN I, protective earth (PE)  Protection class auxiliary switch IEC/EN IP67  EMC CE according to 2014/30/EU  Low voltage directive CE according to 2014/35/EU  Type of action Type 1  Pollution degree 4  Ambient humidity Max. 95% RH, non-condensing  Ambient temporary with handwheel (non-rotating)  100°  200°  Angle of rotation Type 1  Pollution degree 4  Ambient humidity Max. 95% RH, non-condensing  Ambient temperature -3085°C [-22149°F]  Storage temperature -3080°C [-22176°F]  Servicing maintenance-free		Parallel operation	No
Angle of rotation 90°  Angle of rotation note Internal limit switch, not adjustable Running time motor 76 s / 90°  Sound power level, motor 70 dB(A)  Duty cycle value 30% (= active time 76 s / operating time 25: Position indication Mechanical, integrated  Protection class IEC/EN I, protective earth (PE)  Protection class auxiliary switch IEC/EN I, protective earth (PE)  Degree of protection IEC/EN IP67  EMC CE according to 2014/30/EU  Low voltage directive CE according to 2014/35/EU  Type of action Type 1  Pollution degree 4  Ambient humidity Max. 95% RH, non-condensing  Ambient temperature -3065°C [-22149°F]  Storage temperature -3080°C [-22176°F]  Servicing maintenance-free	Functional data	Torque motor	3500 Nm
Angle of rotation note Running time motor Sound power level, motor Duty cycle value Position indication  Safety data Protection class IEC/EN Protection IEC/EN I, protective earth (PE) Degree of protection IEC/EN I, protective earth (PE) Degree of protection IEC/EN IP67 EMC CE according to 2014/30/EU Low voltage directive CE according to 2014/35/EU Type of action Type 1 Pollution degree 4 Ambient humidity Amax. 95% RH, non-condensing Ambient temperature -3065°C [-22149°F] Storage temperature -3080°C [-22176°F] Servicing maintenance-free		Manual override	temporary with handwheel (non-rotating)
Running time motor  Sound power level, motor  Duty cycle value  Position indication  Protection class IEC/EN Protection class auxiliary switch IEC/EN  I, protective earth (PE)  Degree of protection IEC/EN  EMC  CE according to 2014/30/EU  Low voltage directive  CE according to 2014/35/EU  Type of action  Pollution degree  Ambient humidity  Max. 95% RH, non-condensing  Ambient temperature  -3065°C [-22149°F]  Storage temperature  -3080°C [-22176°F]  Servicing  maintenance-free		Angle of rotation	90°
Sound power level, motor  Duty cycle value  Position indication  Safety data  Protection class IEC/EN Protection class auxiliary switch IEC/EN I, protective earth (PE) Degree of protection IEC/EN IP67  EMC CE according to 2014/30/EU Low voltage directive CE according to 2014/35/EU Type of action Pollution degree Ambient humidity Amx. 95% RH, non-condensing Ambient temperature Storage temperature -3065°C [-22149°F] Storage temperature -3080°C [-22176°F] Servicing  maintenance-free		Angle of rotation note	Internal limit switch, not adjustable
Duty cycle value Position indication  Mechanical, integrated  Protection class IEC/EN Protection class auxiliary switch IEC/EN Degree of protection IEC/EN IP67 EMC CE according to 2014/30/EU Low voltage directive Type of action Type 1 Pollution degree Ambient humidity Ambient temperature Storage temperature Servicing  Mechanical, integrated I, protective earth (PE) I, protective earth (PE) CE according to 2014/30/EU CE according to 2014/35/EU Type 1 Pollution degree 4 Ambient degree 4 Ambient temperature -3065°C [-22149°F] Storage temperature -3080°C [-22176°F] Servicing maintenance-free		Running time motor	76 s / 90°
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Protection class IEC/EN Protection class auxiliary switch IEC/EN Degree of protection IEC/EN IP67 EMC CE according to 2014/30/EU Low voltage directive Type of action Pollution degree 4 Ambient humidity Ambient temperature Storage temperature Servicing  Protection class IEC/EN I, protective earth (PE) I, protective earth (PE)  I, protective earth (PE)  I, protective earth (PE) I, protective earth (PE) I, protective earth (PE) I, protective earth (PE) I, protective earth (PE) I, protective earth (PE) I, protective earth (PE) I, protective earth (PE) I, protective earth (PE) I, protective earth (PE) I, protective earth (PE) In protective ear		Duty cycle value	30% (= active time 76 s / operating time 253 s)
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EMC  Low voltage directive  CE according to 2014/30/EU  Type of action  Type 1  Pollution degree  4  Ambient humidity  Max. 95% RH, non-condensing  Ambient temperature  -3065°C [-22149°F]  Storage temperature  -3080°C [-22176°F]  Servicing  maintenance-free		· <del></del>	·
Low voltage directive  CE according to 2014/35/EU  Type of action  Type 1  Pollution degree  4  Ambient humidity  Max. 95% RH, non-condensing  Ambient temperature  -3065°C [-22149°F]  Storage temperature  -3080°C [-22176°F]  Servicing  maintenance-free		_ <del></del>	CE according to 2014/30/EU
Type of action  Pollution degree  4  Ambient humidity  Ambient temperature  Storage temperature  Servicing  Type 1  4  Amax. 95% RH, non-condensing  -3065°C [-22149°F]  -3080°C [-22176°F]  maintenance-free			
Pollution degree 4  Ambient humidity Max. 95% RH, non-condensing  Ambient temperature -3065°C [-22149°F]  Storage temperature -3080°C [-22176°F]  Servicing maintenance-free			
Ambient humidity  Ambient temperature  Ambient temperature  -3065°C [-22149°F]  Storage temperature  -3080°C [-22176°F]  Servicing  maintenance-free			
Ambient temperature -3065°C [-22149°F]  Storage temperature -3080°C [-22176°F]  Servicing maintenance-free			Max. 95% RH. non-condensing
Storage temperature -3080°C [-22176°F]  Servicing maintenance-free			
Servicing maintenance-free		_ <del></del>	
Mechanical data Connection flange F16			
	Mechanical data	Connection flange	F16
Weight Weight 70 kg	Weight	Weight	70 kg

Die cast aluminium

Materials

Housing material



### **Technical data**

## Safety notes



- This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea) water, snow, ice, insolation or
  aggressive gases interfere directly with the device and that it is ensured that the ambient
  conditions remain within the thresholds according to the data sheet at any time.
- Caution: Mains voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.
- The device does not contain any parts that can be replaced or repaired by the user.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

### **Product features**

Internal heating

An internal heater prevents condensation buildup.

Mounting on Belimo valves

Refer to the valve documentation for suitable valves, their permitted fluid temperatures and close-off pressures.

Manual override

The butterfly valve can be closed (turn clockwise) and opened (turn counterclockwise) with the handwheel. The handwheel does not move while the motor is running. The butterfly valve remains in its position as long as no voltage is applied.

High functional reliability

Mechanical end stops limit the actuator to  $-2^{\circ}$  and 92°. The internal limit switches interrupt the voltage supply to the motor. In addition, a motor thermostat provides overload protection and interrupts the voltage supply if the actuator is used outside of the specified temperatures.

Signalling

The integrated auxiliary switches are equipped with a gold/silver coating that permits integration both in circuits with low currents (mA range) and in ones with larger-sized currents (A range) in accordance with the specifications in the data sheet. It should be noted with this application however that the contacts can no longer be used in the milliampere range after larger currents have been applied to them, even if this has taken place only once.

Torque not constant

A torque limit switch is equipped to protect the system from structural overloads. The torque limit is carefully adjusted at the factory and it is not adjustable. If the valve is outside the recommended operating condition or when the valve is stuck, the torque limit switch interrupts the voltage supply to protect the system. An alarm switch will be triggered when the torque limit switch is activated.

### **Electrical installation**

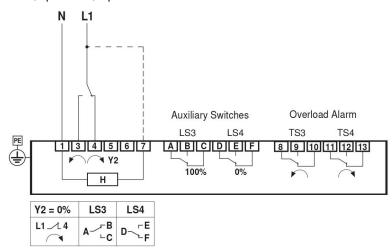


Caution: Mains voltage!



### **Electrical installation**

AC 230 V, open/close, 3-point



H: Internal heating (no need to connect internal heating for indoor applications with constant temperature conditions) LS3: Auxiliary switch 100% (butterfly valve open) LS4: Auxiliary switch 0% (butterfly valve closed) Overload alarm: TS3: Valve opening: Terminal #8 will loop to terminal #9 if torque value overloads TS4: Valve closing: Terminal #11 will loop to terminal #12 if torque value overloads

## Settings



Limit switches TC1/TC2 and angle of rotation limitation are provided with sealing varnish and may not be adjusted.

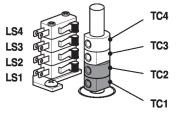
#### Setting cam

The setting cams for limit and auxiliary switches can be accessed by removing the housing cover.

Optionally, auxiliary switches LS4 / LS3 can be connected for signalling.

Limit switches LS2 / LS1 interrupt the voltage to the motor and are controlled by setting cams TC...

The setting cams turn with the spindle. The butterfly valve closes when the spindle is turning clockwise (cw) and opens when the spindle is turning counterclockwise (ccw).



TC1/TC2 with sealing varnish: limit switches are secured against adjustment

## Settings of setting cams TC..

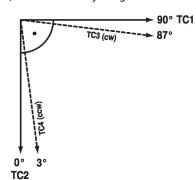
- $\bullet$  TC4 for auxiliary switch position closed (factory setting 3°).
- TC3 for auxiliary switch position open (factory setting 87°).
- TC2 for limit switch closed (0°).
- TC1 for limit switch open (90°).



## **Settings**

## Adjusting setting cams

- 1) Use a 2.5 mm Allen key to unscrew the corresponding setting cams TC..
- 2) Turn the setting cam using the Allen key
- 3) Set as shown in the illustration below
- 4) Use the Allen key to tighten the corresponding setting cams



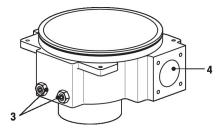
TC1: OPEN
TC2: CLOSED
TC3: Present position

TC3: Present position TC4: Desired position

# Mechanical angle-of-rotation limitation

The mechanical angle of rotation (3) is set at the factory to -2° and 92° and cannot be changed.

The handwheel is rotated by means of a worm gear in a planetary gear unit. The gearing is stopped mechanically by means of two setscrews (3).

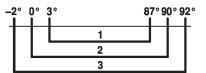


3: Angle of rotation limitation with sealing varnish:

Must not be adjusted
4: Connection handwheel

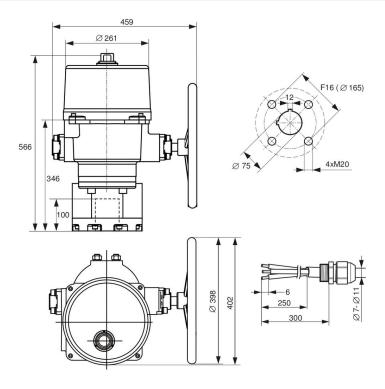
Relationship between mechanical angle of rotation limitation, limit and auxiliary switches

1: Auxiliary switch adjustable TC3 / TC4 2: Limit switch fix adjusted TC1 / TC2 3: Mechanical angle of rotation fix adjusted





# **Dimensions**



# **Further documentation**

- Data sheets for butterfly valves
- Installation instructions for actuators and/or butterfly valves
- Notes for project planning for butterfly valves