BELIMO

Technical data sheet SY3-230-MF-T

Communicative rotary actuator butterfly valves

- **Nominal torque 150 Nm**
- **Nominal voltage AC 230 V**
- **Control modulating DC 0...10 V or variable**
- **Position feedback DC 0...10 V or variable**
- **with 2 integrated auxiliary switches**
- **State at loss of signal: closed**

Technical data

Mechanical data	Housing material	Aluminium pressure casting
Electrical data	Nominal voltage	AC 230 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 207...253 V
	Power consumption in operation	40 W
	Power consumption in operation note	incl. heating
	Power consumption at rest	5 W
	Power consumption for wire sizing	115 VA
	Current consumption	0.5 A
	Auxiliary switch	2 x SPDT, 1 x 3° / 1 x 87°
	Switching capacity auxiliary switch	5 A, AC 230 V (I protective earth)
	Connection supply	Terminals 2.5 mm² (Wire 2 x 1.5 mm² or 1 x 2.5 mm²)
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	150 Nm
	Control positioning signal Y	DC 0...10 V
	Control positioning signal Y note	Input impedance 100 kΩ
	Control operating range Y	DC 0.5...10 V
	Operating range Y variable	Start point DC 0.5...30 V End point DC 2.5...32 V
	Position feedback (measuring voltage U)	DC 0...10 V
	Position feedback measuring voltage U note	Max. 0.5 mA
	Position feedback U variable	Start point DC 0.5...8 V End point DC 2.5...10 V
	Position accuracy	±5% absolute
	Manual override	Temporary with handwheel (non-rotating)
	Angle of rotation	90°, (internal limit switch)
	Running time motor	26 s
	Running time motor note	can not be changed
	Duty cycle	75 % (= active time 26 s / operating time 35 s)
	Override control	MAX (maximum position) = 100% ZS (intermediate position) = 50% MIN (minimum position) = 0%
	Sound power level motor max.	70 dB(A)
	Position indication	Mechanical (integrated)
Safety	Protection class IEC/EN	I Protective earth
	Degree of protection IEC/EN	IP67
	EMC	CE according to 2004/108/EC
	Low-voltage directive	CE according to 2006/95/EC
	Mode of operation	Type 1
	Control pollution degree	4
	Ambient temperature	-30...65°C
	Non-operating temperature	-30...80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Mechanical data	Connection flange	F07
Weight	Weight approx.	11 kg

Safety notes

- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied 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 is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- Warning: Leakage current possible (<3.5 mA)! When connecting the actuator, connect the earth first and then the supply connections! Do not disconnect the earth until after both supply connections have been disconnected!
- A change of the preset angle of rotation limitation may not take place neither by means of limit switches nor by means of PC-Tool/ZTH-... .

Product features

Mode of operation
The actuator is connected with a standard modulating signal and travels to the position defined by the positioning signal. The measuring voltage U serves for the electrical display of the actuator position 0 ... 100% and as slave control signal for other actuators.

Parameterisable actuators
The factory settings cover the most common applications. Input and output signals and other parameters can be altered with the BELIMO Service Tool, MFT-P.

Direct mounting
Simple direct mounting on the butterfly valve. The mounting orientation in relation to the butterfly valve can be selected in 90° (angle) increments.

Manual override
The butterfly valve can be closed (turn clockwise) and opened (turn anticlockwise) with the handwheel. The handwheel does not move while the motor is running.

Internal heating
An internal heater prevents condensation buildup.

High functional reliability
Mechanical end stops limit the actuator to –2° 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.

Combination valve/actuator
Refer to the butterfly valve documentation for suitable butterfly valves, their permitted medium temperatures and closing pressures.

Accessories

Electrical accessories

Description	Type
Connection cable 5 m, A: RJ11 6/4, B: Free wire end, To ZTH/ZIP-USB-MP	ZK2-GEN
Connecting cable 5 m, A+B: RJ12 6/6, To ZTH/ZIP-USB-MP	ZK6-GEN

Service Tools

Description	Type
Belimo PC-Tool, software for adjustments and diagnostics	MFT-P

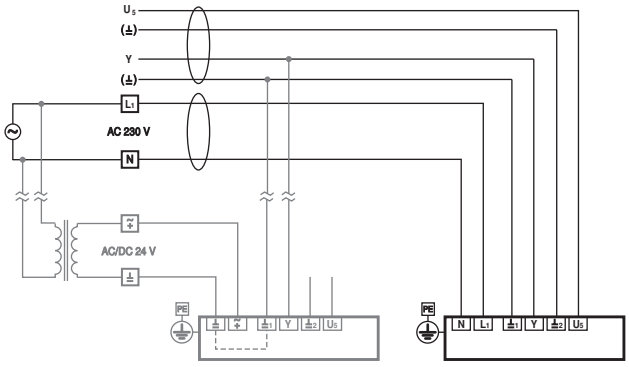
Electrical installation

Notes

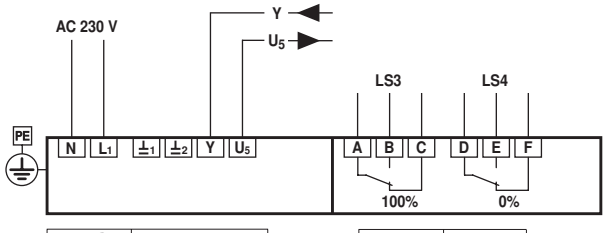
- Caution: Power supply voltage!

4-lead connection

4-lead system connection



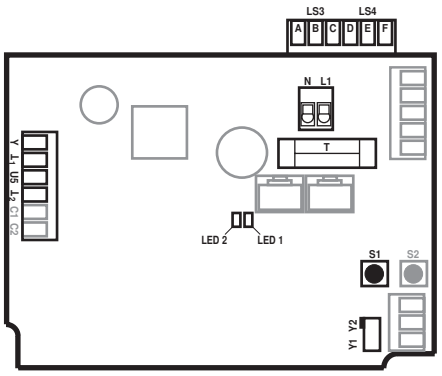
Electrical installation for 4-lead connection



Y1	A – AB = 100%
Y2	A – AB = 0%

LS3	100%
LS4	0%

Connection and function elements



N/L1: Power supply voltage
Y1: Direction of rotation switch (actuator rotates counterclockwise ccw: valve opens)
Y2: Direction of rotation switch (actuator rotates clockwise cw: valve closes)
Y: Positioning signal
U5: Position feedback
T1/T2: Ground 24V-sided
S1: Adaption button (press for 3 s: adaption procedure starts)
Adaption must take place once TC1 and TC2 have been changed
LED1 yellow On: Adaption procedure active
LED1 yellow Off: Standard mode
LED2 green On: In operation
LED2 green Off: No power supply or malfunction
T: Plug fuse (Type T10A250V)
LS3: Auxiliary switch (factory setting 87°)
LS4: Auxiliary switch (factory setting 3°)
C1/C2: not used
S2: not used

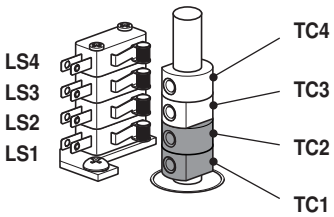
Settings

Notes

- 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 stem. The butterfly valve closes when the stem is turning clockwise (cw) and opens when the stem is turning counterclockwise (ccw).

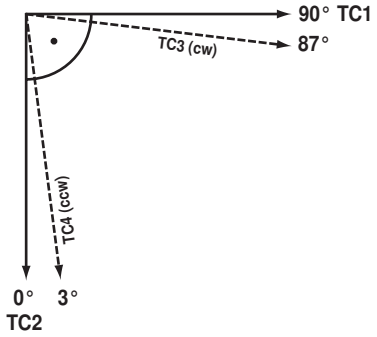


TC1/TC2 with sealing varnish: limit switches are secured against adjustment

Settings

Settings of setting cams TC..

- 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°).

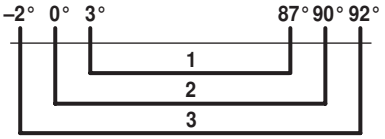


TC1: OPEN
TC2: CLOSED
TC3: Present position
TC4: Desired position

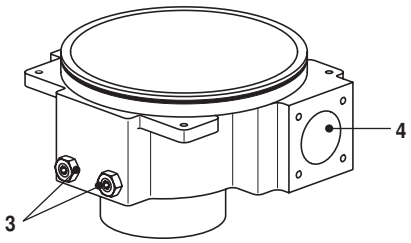
Mechanical angle of rotation limitation

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).

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



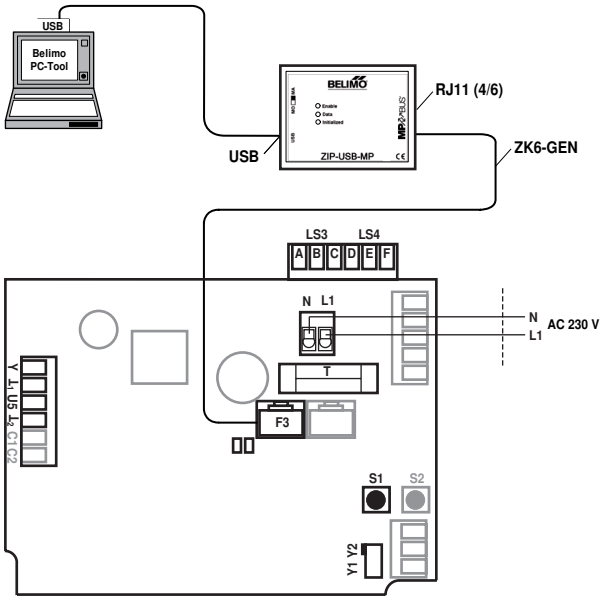
3: Angle of rotation limitation with sealing varnish: Must not be adjusted
4: Connection handwheel

Service

Notes

- Rotary actuators may be parameterised with Belimo PC-Tool MFT-P and ZIP-USB-MP using the service socket of the actuator.

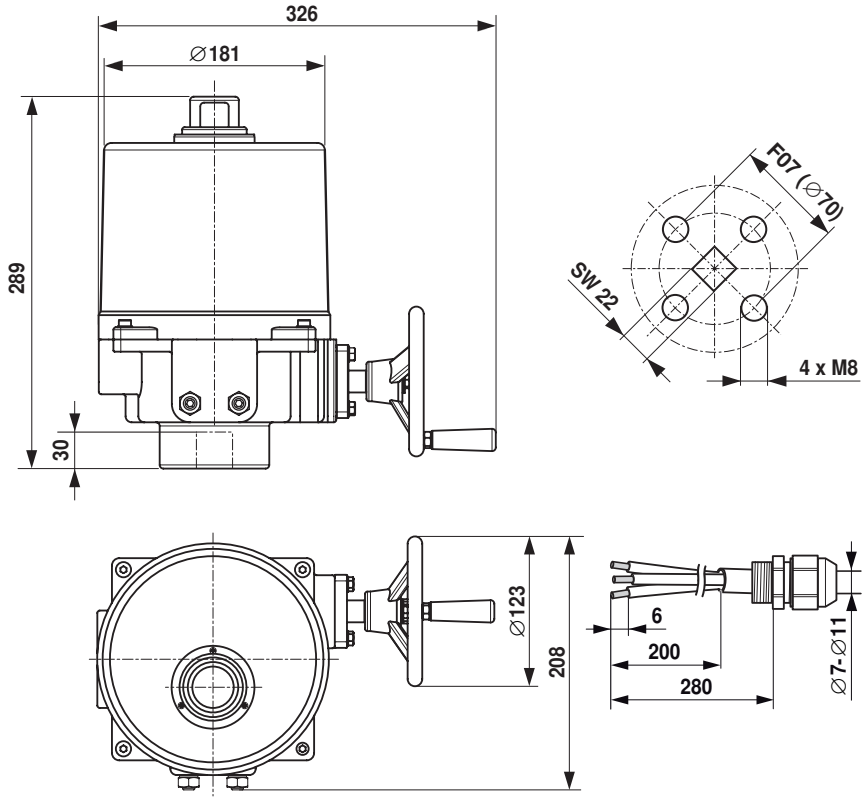
Local connection with ZIP-USB-MP via service socket of the SY actuator.



Note
The housing cover must be opened so that the connections are accessible.
Caution!
In the case of DC 24V supply, it is imperative that the GND signal be placed separately on the print.

Dimensions [mm]

Dimensional drawings



Further documentation

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