

Globe valves, 3-way, with flange PN16

- For closed cold and hot water systems
- For modulating water-side control of air handling units and heating systems


Type overview

Type	K_{vs} [m ³ /h]	DN [mm]	Stroke [mm]	$\Delta P_s / \Delta P_{max}$ [kPa]
H765S-Q	63	65	20	280
H780S-R	100	80	30	200
H7100S-S	160	100	40	200
H7125S-T	250	125	40	110 / 150
H7150S-T	350	150	40	60 / 100
H7200S-U	520	200	40	80
H7250S-V	700	250	40	50

ΔP_s will be variant depends on actuator selection.

Technical data

Functional data	Flow media	Cold and hot water, water with max. 50% volume of glycol	
	Temperature of medium	0°C ... +150°C	
	Rated pressure P_s	1600kPa (PN16)	
	Flow characteristic	Control path A-AB: equal percentage (to VDI/VDE 2173) $n(gl) = 3$, optimised in the opening range Bypass B-AB: linear (VDI/VDE 2173)	
	Rangeability S_v	100:1	
	Leakage rate	Max. 0.02% of kvs value on all path (DIN EN 1349 and DIN EN 60534-4)	
	Medium velocity	Max. 2 m/s	
	Pipe connection	Flange to ISO 7005-2 (PN16)	
	Stroke	See «Type overview»	
	Valve stem extends	Flow of A decrease, B increase	
	Installation position	Upright to horizontal (in relation to the stem)	
	Maintenance	Maintenance-free	
	Materials	Body	Ductile iron GGG40
		Valve cone	Stainless steel SS304
Valve stem		Stainless steel SS630	
Valve seat		Stainless steel SS304	
Dimensions / Weights	Stem seal	PTFE & FFKM	
	Dimensions and weights	See «Dimensions and weights»	

Safety notes



- This globe valve 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.
- It may only be installed by suitably trained personnel. All applicable legal or institutional installation regulations must be complied with.
- The valve does not contain any parts that can be replaced or repaired by the user.
- The valve is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- The recognised rules should be applied when determining the flow characteristic of final controlling elements.

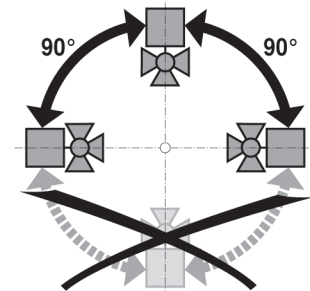
Product features

Mode of operation	The globe valve is operated by an SV, EV or RV series linear actuator. The linear actuators are controlled by a standard modulating or 3-point control system and move the cone of the valve, the throttling device, to the opening position dictated by the control signal.
Flow characteristic	An equal-percentage flow characteristic is produced by profiling the valve cone. The bypass exhibits a linear characteristic curve.
Manual operation	On the SV, EV or RV linear actuator, the valve stem can be actuated manually using a hexagonal key.

Installation notes

Recommended mounting positions

The globe valve may be mounted either **vertically** or **horizontally**. It is not permissible to mount the globe valve with the stem pointing downwards.



Water quality requirements

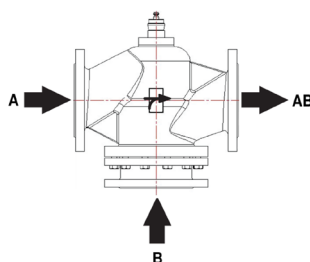
- The water quality requirements specified in VDI 2035 must be adhered to.
- Globe valves are relatively sensitive control devices. In order to ensure a long service life, it is advisable to fit **strainers**.

Maintenance

- The globe valves and linear actuators are maintenance-free.
- Before any kind of service work is carried out on actuator sets of this type, it is essential to isolate the linear actuator from the power supply (by unplugging the power lead). Any pumps in the part of the piping system concerned must also be switched off and the appropriate isolating fittings closed (allow everything to cool down first if necessary and reduce the pressure in the system to atmospheric).
- The system must not be returned to service until the globe valve and the linear actuator have been properly reassembled in accordance with the instructions and the pipework has been refilled in the proper manner.

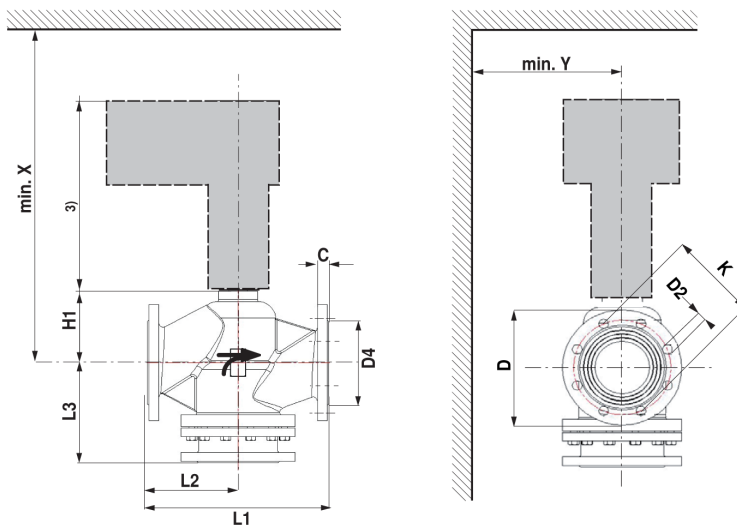
Direction of flow

- The direction of flow, specified by an arrow on the housing, is to be complied with, since otherwise the globe valve can be damaged.



Dimensions and weights

Dimensional drawings



DN [mm]	C [mm]	D [mm]	D2 [mm]	D4 [mm]	K [mm]	L1 [mm]	L2 [mm]	L3 [mm]	H1 [mm]	X [mm]	Y [mm]	Weight [kg]
65	20	185	4-19	118	145	290	145	156	104.5	315	145	24
80	22	200	8-19	132	160	310	155	185	120	445	150	34
100	23	220	8-19	156	180	350	175	202	137	465	160	49
125	24	250	8-19	184	210	400	200	240	157	485	175	63
150	25	285	8-23	211	240	480	240	270	171	500	195	82
200	26	340	12-23	266	295	500	250	318	185	510	220	129
250	31	405	12-28	319	355	600	300	370	205	530	255	195

3) The actuator dimensions can be found on the respective actuator data sheet.

Communicative globe valve actuator for 2-way and 3-way globe valves

- Actuating force 2500 N
- Nominal voltage AC/DC 24 V
- Control modulating, communicative 2...10 V variable
- Stroke 40 mm
- Conversion of sensor signals
- Communication via Belimo MP-Bus


Technical data

Electrical data	Nominal voltage	AC/DC 24 V	
	Nominal voltage frequency	50/60 Hz	
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V	
	Power consumption in operation	4 W	
	Power consumption in rest position	1.5 W	
	Power consumption for wire sizing	6 VA	
	Connection supply / control	Terminals with cable 1 m, 4 x 0.75 mm ² (Terminal 4 mm ²)	
	Parallel operation	Yes (note the performance data)	
	Functional data	Actuating force motor	2500 N
		Communicative control	MP-Bus
Operating range Y		2...10 V	
Input Impedance		100 kΩ	
Options positioning signal		Open/close 3-point (AC only) Modulating (DC 0...32 V)	
Operating range Y variable		Start point 0.5...30 V End point 2.5...32 V	
Position feedback U		2...10 V	
Position feedback U note		Max. 0.5 mA	
Position feedback U variable		Start point 0.5...8 V End point 2.5...10 V	
Position accuracy		±5%	
Manual override		with push-button, can be locked	
Stroke		40 mm	
Running time motor		150 s / 40 mm	
Running time motor variable		90...150 s	
Adaptation setting range		manual (automatic on first power-up)	
Adaptation setting range variable		No action Adaptation when switched on Adaptation after pushing the gear disengagement button	
Override control		MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%	
Override control variable		MAX = (MIN + 33%)...100% MIN = 0%...(MAX - 33%) ZS = MIN...MAX	
Sound power level, motor		56 dB(A)	
Position indication		Mechanically, 5...40 mm stroke	
Safety	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)	
	Protection class UL	UL Class 2 Supply	
	Degree of protection IEC/EN	IP54	
	Degree of protection NEMA/UL	NEMA 2	
	Enclosure	UL Enclosure Type 2	
	EMC	CE according to 2014/30/EU	
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14	
Certification UL	cULus according to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1:02		

Technical data

Safety	Certification UL note	The UL marking on the actuator depends on the production site, the device is UL-compliant in any case
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	0...50°C
	Storage temperature	-40...80°C
	Ambient humidity	Max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	3.6 kg

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 actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of motion and so the closing point may be adjusted only by authorised specialists. The direction of motion is critical, particularly in connection with frost protection circuits.
- The device may only be opened at the manufacturer's site. It 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

Mode of operation	<p>Conventional operation: The actuator is connected with a standard modulating signal of 0...10 V and drives to the position defined by the positioning signal. The measuring voltage U serves for the electrical display of the actuator position 0.5...100% and as slave control signal for other actuators.</p> <p>Operation on Bus: The actuator receives its digital positioning signal from the higher level controller via the MP-Bus and drives to the position defined. Connection U serves as communication interface and does not supply an analogue measuring voltage.</p>
Converter for sensors	Connection option for a sensor (passive or active sensor or switching contact). The MP actuator serves as an analogue/digital converter for the transmission of the sensor signal via MP-Bus to the higher level system.
Parametrisable actuators	The factory settings cover the most common applications. Single parameters can be modified with the Belimo Service Tools MFT-P or ZTH EU.
Simple direct mounting	Simple direct mounting on the globe valve by means of form-fit hollow clamping jaws. The actuator can be rotated by 360° on the valve neck.
Manual override	<p>Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).</p> <p>The stroke can be adjusted by using a hexagon socket screw key (5 mm), which is inserted into the top of the actuator. The stroke shaft extends when the key is rotated clockwise.</p>
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Combination valve/actuator	Refer to the valve documentation for suitable valves, their permitted fluid temperatures and closing pressures.

Product features

Position indication	The stroke is indicated mechanically on the bracket with tabs. The stroke range adjusts itself automatically during operation.
Home position	<p>Factory setting: Actuator spindle is retracted.</p> <p>When valve-actuator combinations are shipped, the direction of motion is set in accordance with the closing point of the valve.</p> <p>The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaption, which is when the operating range and position feedback adjust themselves to the mechanical setting range.</p> <p>The actuator then moves into the position defined by the positioning signal.</p>
Setting direction of stroke	When actuated, the stroke direction switch changes the running direction in normal operation.
Adaption and synchronisation	<p>An adaption can be triggered manually by pressing the "Adaption" button or with the PC-Tool. Both mechanical end stops are detected during the adaption (entire setting range).</p> <p>Automatic synchronisation after pressing the gearbox disengagement button is configured. The synchronisation is in the home position (0%).</p> <p>The actuator then moves into the position defined by the positioning signal.</p> <p>A range of settings can be adapted using the PC-Tool (see MFT-P documentation)</p>

Accessories

	Description	Type
Gateways	Gateway MP zu BACnet MS/TP	UK24BAC
	Gateway MP to Modbus RTU	UK24MOD
	Gateway MP to LonWorks	UK24LON
	Gateway MP to KNX	UK24EIB
Electrical accessories	Description	Type
	Auxiliary switch 2 x SPDT add-on	S2A-H
	Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: 6-pin service socket for Belimo device	ZK1-GEN
	Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: free wire end for connection to MP/PP terminal	ZK2-GEN
	MP-Bus power supply for MP actuators	ZN230-24MP
Connecting board MP-Bus for wiring boxes EXT-WR-FP...-MP	ZFP2-MP	
Service Tools	Description	Type
	Service Tool, with ZIP-USB function	ZTH EU
	Belimo PC-Tool, Software for adjustments and diagnostics	MFT-P
	Adapter for Service-Tool ZTH	MFT-C

Electrical installation

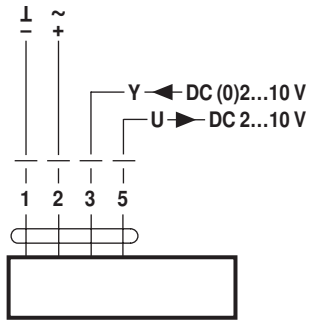
Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of stroke switch factory setting: Actuator spindle retracted (▲).

Electrical installation

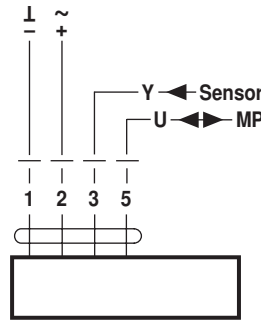
Wiring diagrams

AC/DC 24 V, modulating



Cable colours:
 1 = black
 2 = red
 3 = white
 5 = orange

Operation on the MP-Bus

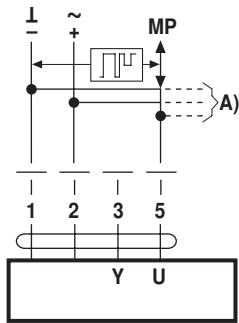


Cable colours:
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Functions

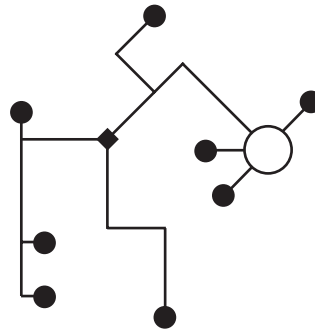
Functions when operated on MP-Bus

Connection on the MP-Bus



A) more actuators and sensors (max.8)

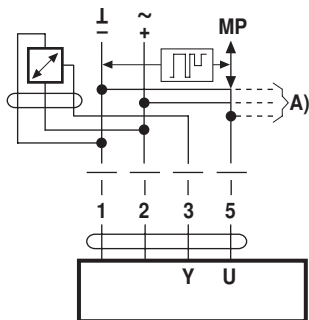
MP-Bus Network topology



There are no restrictions for the network topology (star, ring, tree or mixed forms are permitted). Supply and communication in one and the same 3-wire cable

- no shielding or twisting necessary
- no terminating resistors required

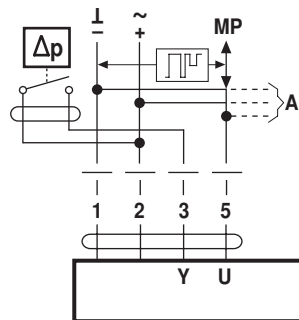
Connection of active sensors



A) more actuators and sensors (max.8)

- Supply AC/DC 24 V
- Output signal DC 0...10 V (max. DC 0...32 V)
- Resolution 30 mV

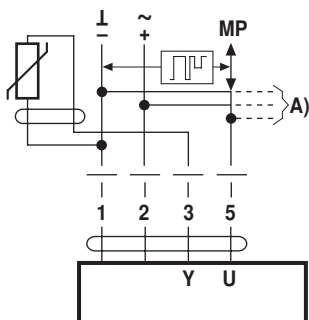
Connection of external switching contact



A) more actuators and sensors (max.8)

- Switching current 16 mA @ 24 V
- Start point of the operating range must be parameterised on the MP actuator as ≥ 0.5 V

Connection of passive sensors



Ni1000	-28...+98°C	850...1600 Ω^2)
PT1000	-35...+155°C	850...1600 Ω^2)
NTC	-10...+160°C 1)	200 Ω ...60 k Ω^2)

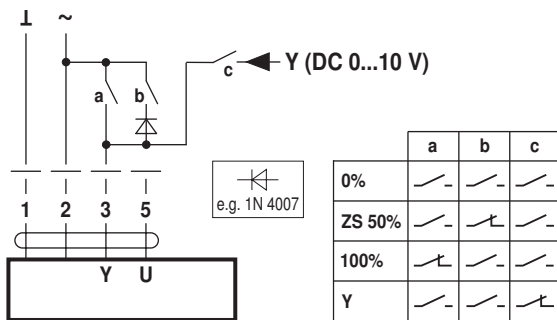
A) more actuators and sensors (max.8)

- 1) Depending on the type
- 2) Resolution 1 Ohm

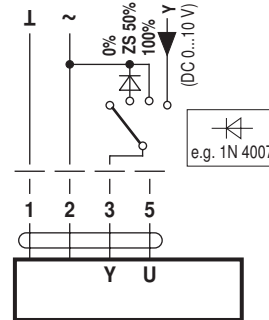
Functions

Functions with basic values (conventional mode)

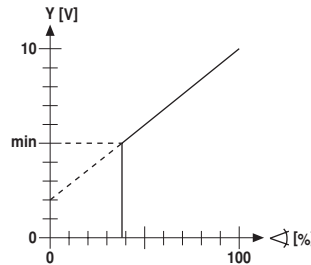
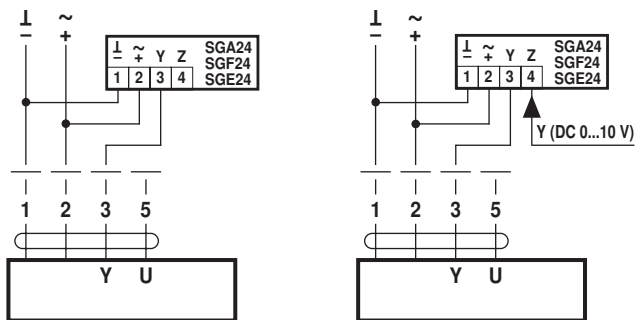
Override control with AC 24 V with relay contacts



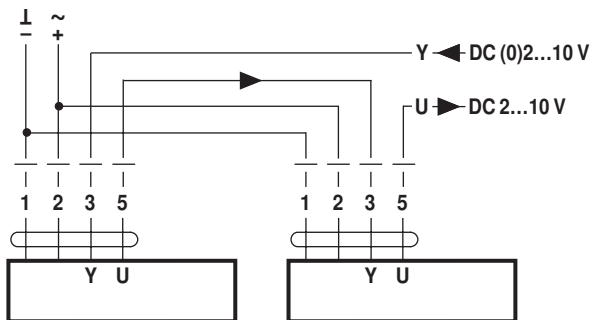
Override control with AC 24 V with rotary switch



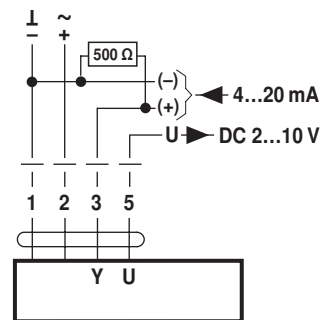
Control remotely 0...100% with positioner SG..
positioner SG..



Follow-up control (position-dependent)

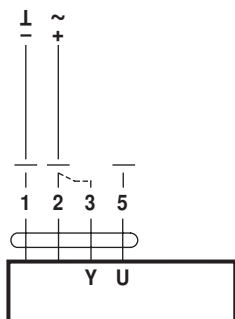


Control with 4...20 mA via external resistor



Caution:
The operating range must be set to DC 2...10 V.
The 500 Ω resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V

Functional check



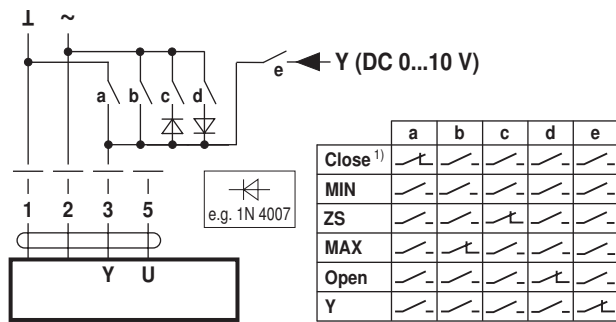
Procedure

1. Apply 24 V to connection 1 and 2
2. Disconnect connection 3:
 - with upwards direction of motion: closing point at top
 - with downwards direction of motion: closing point at bottom
3. Short circuit connections 2 and 3:
 - Actuator runs in the opposite direction

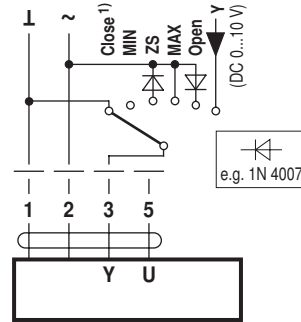
Functions

Functions for devices with specific parameters (Parametrisation necessary)

Override control and limiting with AC 24 V with relay contacts

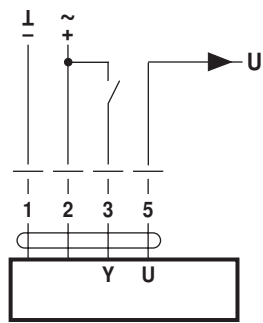


Override control and limiting with AC 24 V with rotary switch

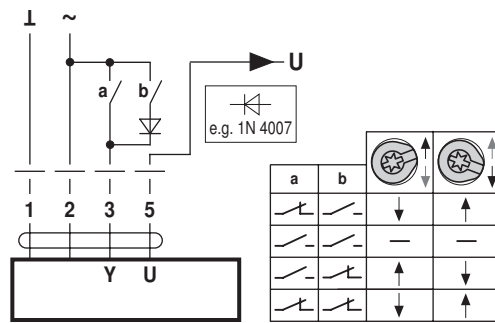


1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

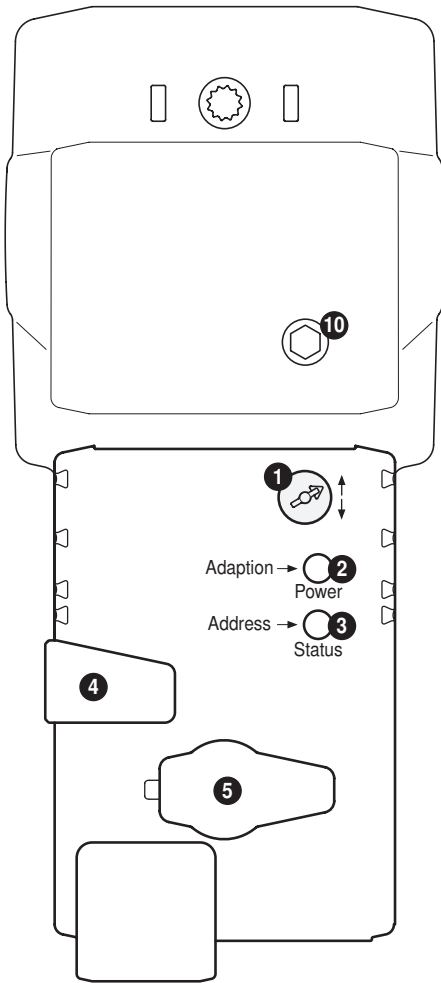
Control open/close



Control 3-point



Operating controls and indicators



- 1 Direction of stroke switch**
Switch over: Direction of stroke changes
- 2 Push-button and LED display green**
Off: No power supply or malfunction
On: In operation
Press button: Triggers stroke adaptation, followed by standard mode
- 3 Push-button and LED display yellow**
Off: Standard mode
Flickering: MP communication active
On: Adaptation process active
Flashing: Request for addressing from MP master
Press button: Confirmation of the addressing
- 4 Gear disengagement button**
Press button: Gear disengages, motor stops, manual override possible
Release button: Gear engages, standard mode
- 5 Service plug**
For connecting parameterisation and service tools
- 10 Manual override**
Clockwise: Actuator spindle extends
Counterclockwise: Actuator spindle retracts

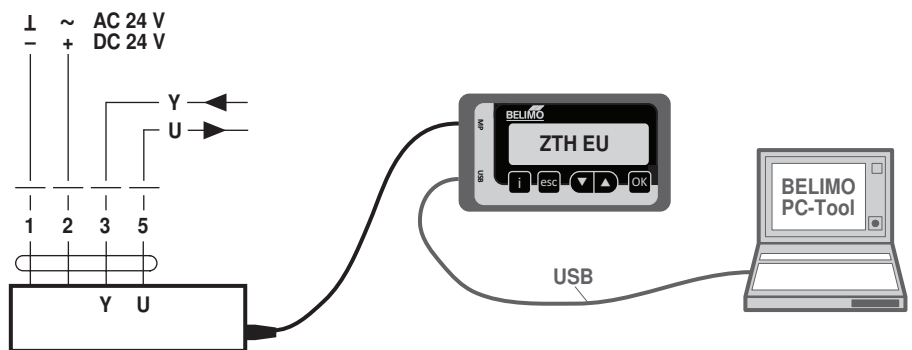
Check power supply connection

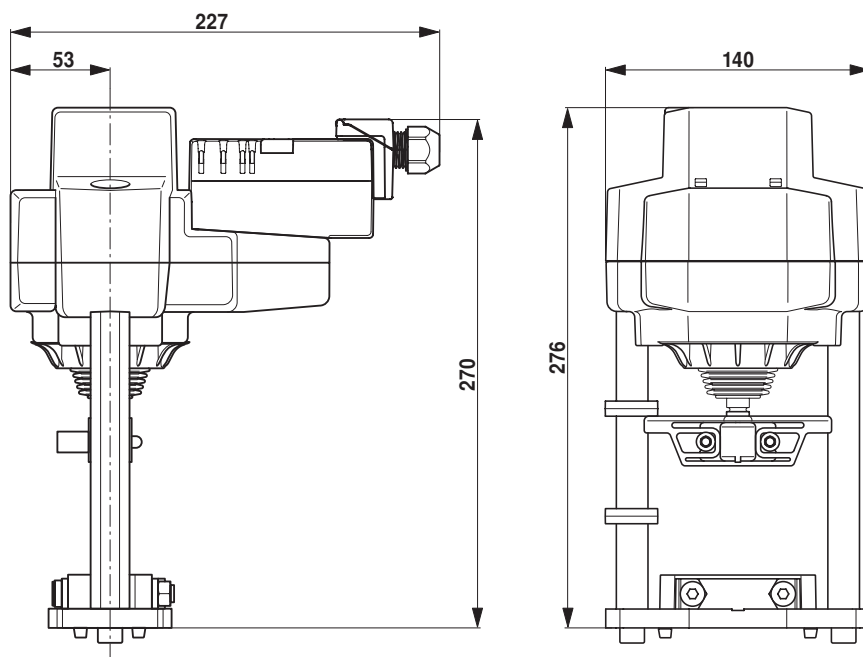
- 2** Off and **3** On Possible wiring error in power supply

Service

Service Tools connection The actuator can be parametrised by ZTH EU via the service socket. For an extended parametrisation the PC tool can be connected.

Connection ZTH EU / PC-Tool



Dimensions [mm]**Dimensional drawings****Further documentation**

- The complete product range for water applications
- Installation instructions for actuators and/or globe valves
- Data sheets for globe valves
- Notes for project planning 2-way and 3-way globe valves
- General notes for project planning
- Tool connections
- Introduction to MP-Bus Technology
- Overview MP Cooperation Partners