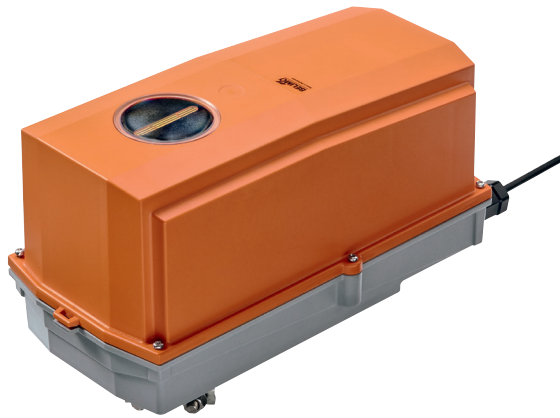


Communicative damper actuator for adjusting dampers in technical building installations

- Air damper size up to approx. 4 m<sup>2</sup>
- Torque motor 20 Nm
- Nominal voltage AC/DC 24 V
- Control modulating, communicative 2...10 V variable
- Position feedback 2...10 V variable
- Conversion of sensor signals
- Communication via Belimo MP-Bus
- Optimum weather protection for use outdoors (for use in ambient temperatures up to -40 °C, there is a separate actuator available with built-in heater ex works)


**Technical data**

<b>Electrical data</b>	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	8.5 W	
	Power consumption in rest position	3.5 W	
	Power consumption for wire sizing	11 VA	
	Connection supply / control	Cable 1 m, 4 x 0.75 mm <sup>2</sup> (halogen-free)	
	Parallel operation	Yes (note the performance data)	
	<b>Functional data</b>	Torque motor	20 Nm
		Torque fail-safe	20 Nm
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%	
Direction of motion motor		selectable with switch L/R	
Direction of motion note		Y = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)	
Direction of motion variable		electronically reversible	
Direction of motion fail-safe		L (ccw)	
Manual override		by means of hand crank and locking switch	
Angle of rotation		Max. 95°	
Angle of rotation note		adjustable starting at 33% in 2.5% steps (with mechanical end stop)	
Running time motor		150 s / 90°	
Running time motor variable		70...220 s	
Running time fail-safe		<20 s / 90°	
Running time fail-safe note		@ -20...50 °C / <60 s @ -30 °C	
Adaptation setting range		manual	
Adaptation setting range variable		No action Adaptation when switched on Adaptation after using the hand crank	
Override control		MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%	
Override control variable		MAX = (MIN + 32%)...100% MIN = 0%...(MAX - 32%) ZS = MIN...MAX	
Sound power level, motor		40 dB(A)	
Mechanical interface	Universal shaft clamp 12...26.7 mm		

## Technical data

<b>Functional data</b>	Position indication	Mechanically, pluggable
	Service life	Min. 60'000 fail-safe positions
<b>Safety</b>	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP66/67
	Degree of protection NEMA/UL	NEMA 4X
	Enclosure	UL Enclosure Type 4X
	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
	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.AA
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	4
	Ambient temperature	-30...50°C
Ambient temperature note	-40...50°C for actuator with integrated heating	
Storage temperature	-40...80°C	
Ambient humidity	Max. 100% r.H.	
Servicing	maintenance-free	
<b>Weight</b>	Weight	5.1 kg

## Safety notes



- The device must not be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- Junction boxes must at least correspond with enclosure IP degree of protection!
- The cover of the protective housing may be opened for adjustment and servicing. When it is closed afterwards, the housing must seal tight (see installation instructions).
- 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 cables must not be removed from the device installed in the interior.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section, the design, the installation site and the ventilation conditions must be observed.
- 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.
- The actuator is not designed for applications where chemical influences (gases, fluids) are present or for utilisation in corrosive environments in general.
- The actuator may not be used in plenary applications (e.g. suspended ceilings or raised floors).
- The materials used may be subjected to external influences (temperature, pressure, construction fastening, effect of chemical substances, etc.), which cannot be simulated in laboratory tests or field trials. In case of doubt, we definitely recommend that you carry out a test. This information does not imply any legal entitlement. Belimo will not be held liable and will provide no warranty.
- Flexible metallic cable conduits or threaded cable conduits of equal value are to be used for UL (NEMA) Type 4X applications.
- When used under high UV loads, e.g. extreme sunlight, the use of flexible metallic or equivalent cable conduits is recommended.

## Product features

<b>Fields of application</b>	The actuator is particularly suitable for utilisation in outdoor applications and is protected against the following weather conditions: <ul style="list-style-type: none"> <li>- UV radiation</li> <li>- Rain / Snow</li> <li>- Dirt / Dust</li> <li>- Air humidity</li> <li>- Alternating climate / frequent and severe temperature fluctuations (Recommendation: use the actuator with integrated factory-installed heating which can be ordered separately to prevent internal condensation)</li> </ul>
<b>Mode of operation</b>	<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. Measuring voltage U serves for the electrical display of the damper 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>
<b>Converter for sensors</b>	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.
<b>Parametrisable actuators</b>	The factory settings cover the most common applications. Single parameters can be modified with the Belimo Service Tools MFT-P or ZTH EU.
<b>Simple direct mounting</b>	Simple direct mounting on the damper shaft with a universal shaft clamp, supplied with an anti-rotation device to prevent the actuator from rotating.
<b>Manual override</b>	By using the hand crank the damper can be actuated manually and engaged with the locking switch at any position. Unlocking is carried out manually or automatically by applying the operating voltage. The housing cover must be removed for manual override.
<b>Adjustable angle of rotation</b>	Adjustable angle of rotation with mechanical end stop. The housing cover must be removed to set the angle of rotation.
<b>High functional reliability</b>	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
<b>Home position</b>	The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out a synchronisation. The synchronisation is in the home position (0%). The actuator then moves into the position defined by the positioning signal.
<b>Adaption and synchronisation</b>	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). Automatic synchronisation after actuating the hand crank is programmed. The synchronisation is in the home position (0%). The actuator then moves into the position defined by the positioning signal. A range of settings can be adapted using the PC-Tool (see MFT-P documentation)

## Accessories

	Description	Type
<b>Gateways</b>	Gateway MP to Modbus RTU	UK24MOD
	Gateway MP zu BACnet MS/TP	UK24BAC
	Gateway MP to LonWorks	UK24LON
	Gateway MP to KNX	UK24EIB
	<b>Description</b>	<b>Type</b>
<b>Electrical accessories</b>	Signal converter voltage/current 100 kΩ Supply AC/DC 24 V	Z-UIC
	Range controller for wall mounting	SBG24
	Positioner for wall mounting	SGA24
	Positioner for built-in mounting	SGE24
	Positioner for front-panel mounting	SGF24
	Positioner for wall mounting	CRP24-B1

Accessories

	Description	Type
	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
	Connecting board MP-Bus for wiring boxes EXT-WR-FP...-MP	ZFP2-MP
	MP-Bus power supply for MP actuators	ZN230-24MP
Mechanical accessories	Description	Type
	Cable gland for cable diameter $\varnothing$ 4...10 mm	Z-KB-PG11
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
	- Combination with auxiliary switch only on request. Please contact your Belimo representative! - Combination with feedback potentiometer only on request. Please contact your Belimo representative!	

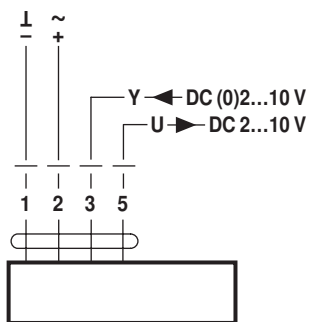
Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

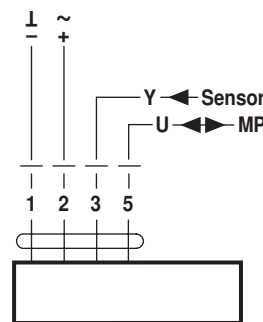
Wiring diagrams

AC/DC 24 V, modulating



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

Operation on the MP-Bus

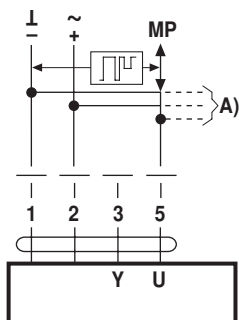


**Cable colours:**  
 1 = black  
 2 = red  
 3 = white  
 5 = orange

Functions

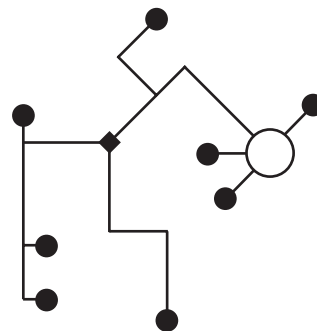
Functions when operated on MP-Bus

Connection on the MP-Bus



A) more actuators and sensors (max.8)

MP-Bus Network topology

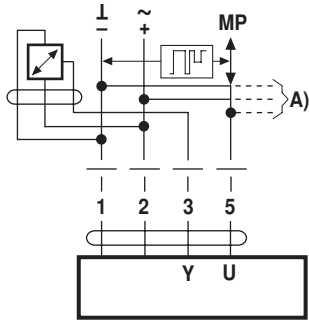


There are no restrictions for the network topology (star, ring, tree or mixed forms are permitted). Supply and communication in one and the same 3-wire cable

- no shielding or twisting necessary
- no terminating resistors required

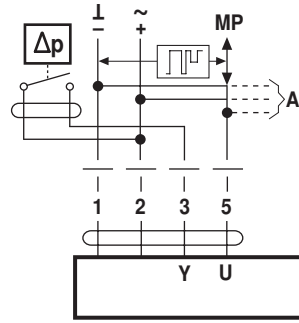
Functions

Connection of active sensors



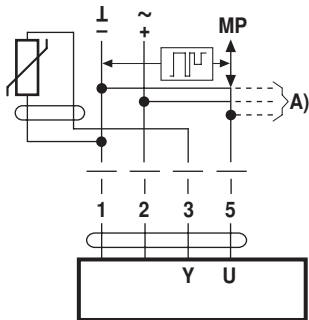
A) more actuators and sensors (max.8)  
 • Supply AC/DC 24 V  
 • Output signal DC 0...10 V (max. DC 0...32 V)  
 • Resolution 30 mV

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  $\geq 0.5$  V

Connection of passive sensors

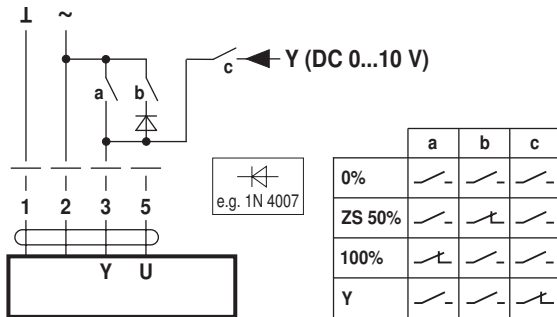


Ni1000	-28...+98 °C	850...1600 $\Omega^2$
PT1000	-35...+155 °C	850...1600 $\Omega^2$
NTC	-10...+160 °C <sup>1)</sup>	200 $\Omega$ ...60 k $\Omega^2$

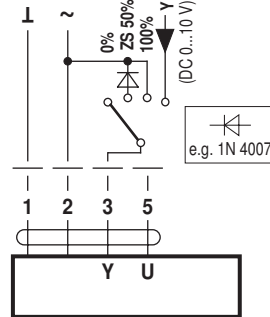
A) more actuators and sensors (max.8)  
 1) Depending on the type  
 2) Resolution 1 Ohm

Functions with basic values (conventional mode)

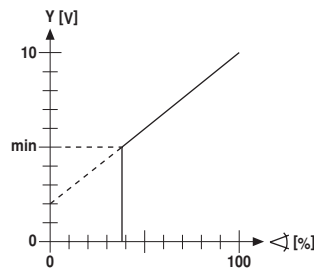
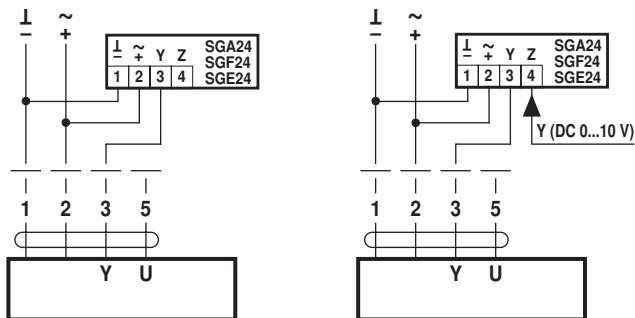
Override control with AC 24 V with relay contacts



Override control with AC 24 V with rotary switch

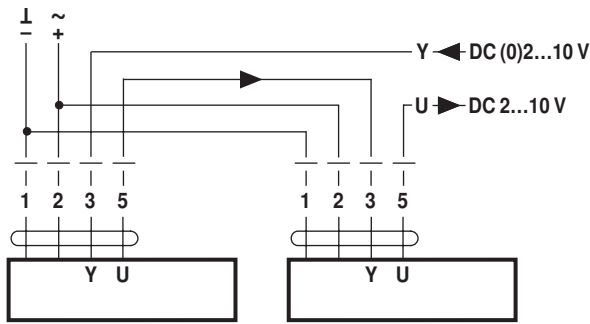


Control remotely 0...100% with positioner SG..

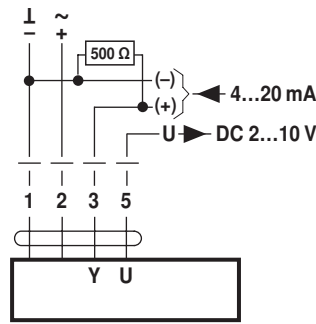


**Functions**

Follow-up control (position-dependent)



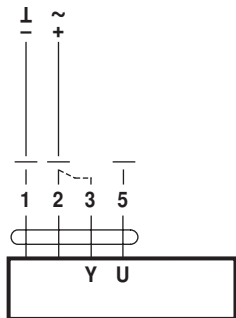
Control with 4...20 mA via external resistor



**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

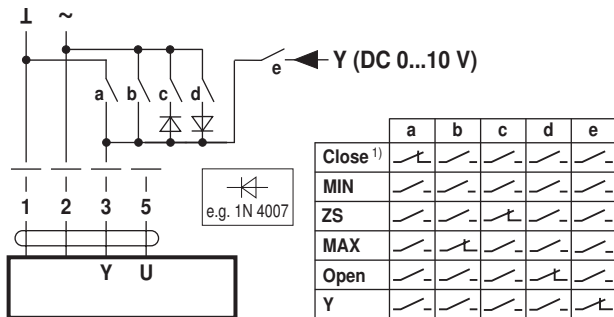


**Procedure**

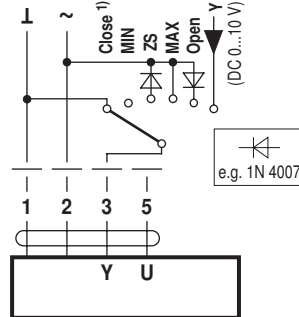
1. Connect 24V to connections 1 and 2
2. Disconnect connection 3:
  - with direction of rotation 0: Actuator rotates to the left
  - with direction of rotation 1: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
  - Actuator runs in opposite direction

**Functions for devices with specific parameters (Parametrisation necessary)**

Override control and limiting with AC 24 V with relay contacts

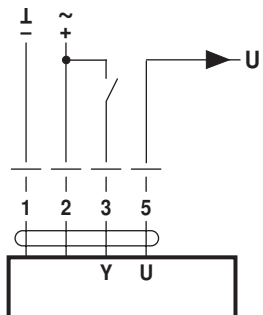


Override control and limiting with AC 24 V with rotary switch

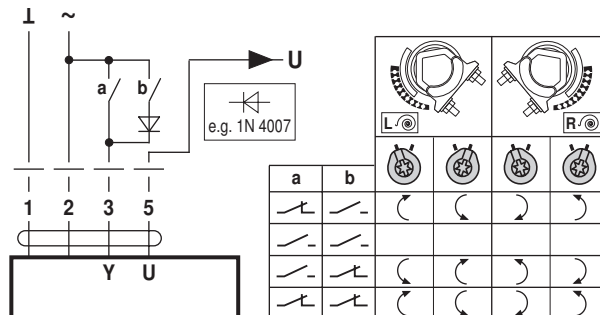


**1) Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

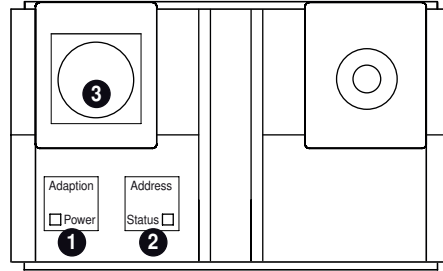
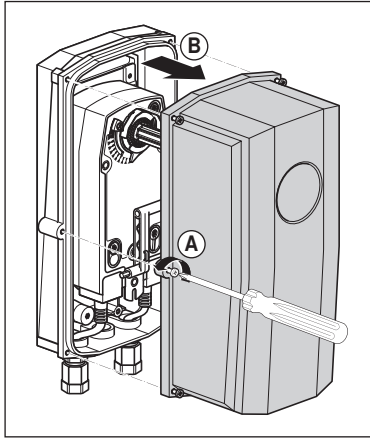
Control open/close



Control 3-point



## Operating controls and indicators



- 1 Membrane key and LED display green**  
 Off: No power supply or malfunction  
 On: In operation  
 Press button: Triggers angle of rotation adaptation, followed by standard mode
- 2 Membrane key and LED display gelb**  
 Off: Standard mode  
 Flickering: MP communication active  
 On: Adaptation and synchronising process active  
 Flashing: Request for addressing from MP master  
 Press button: Confirmation of the addressing
- 3 Service plug**  
 For connecting parameterisation and service tools

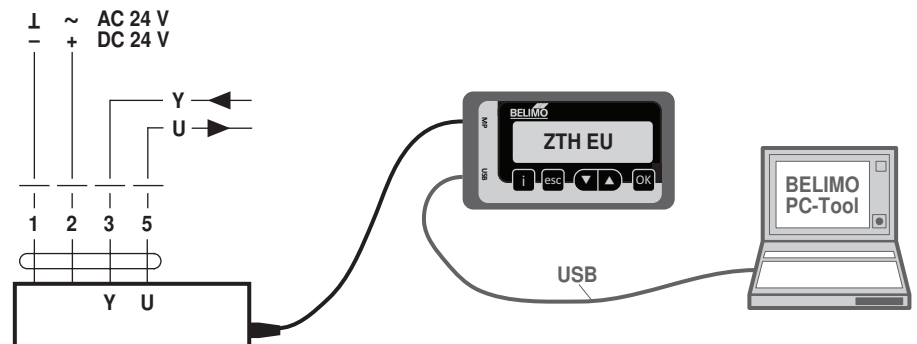
### Operating elements

The manual override, locking switch and direction of rotation switch elements are available on both sides.

## 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]

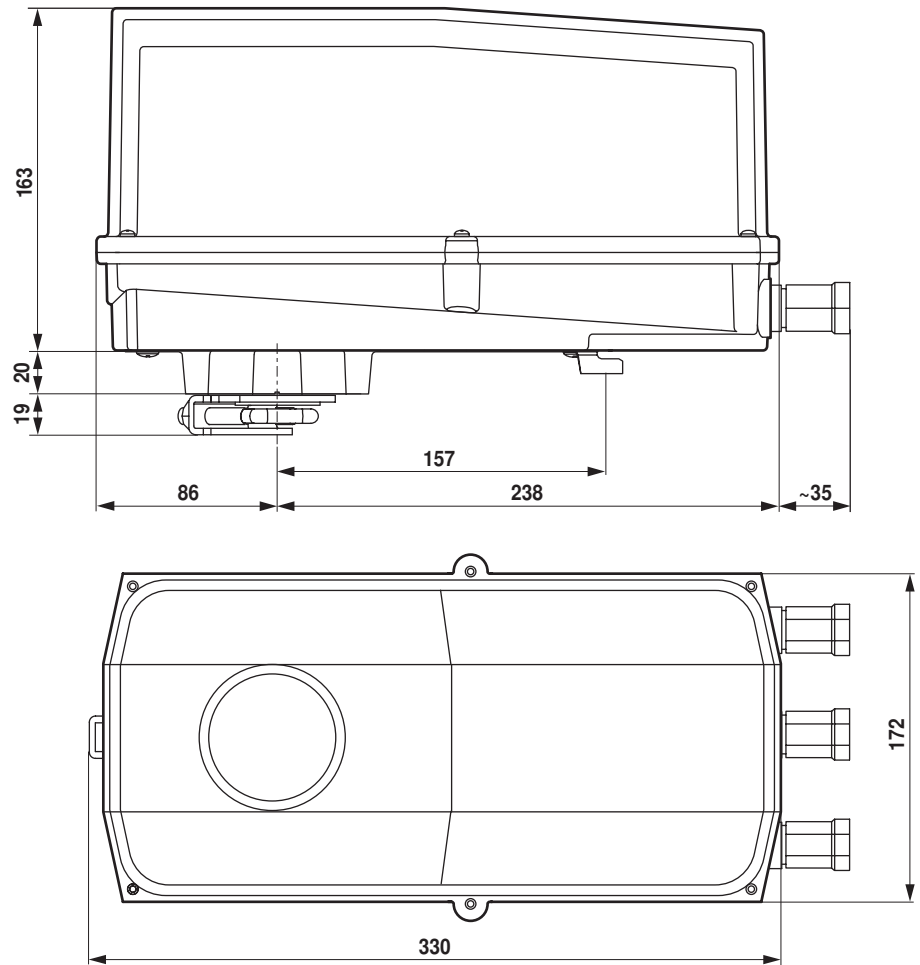
Spindle length

	-
	16...105 (Ø12...19) 16...45 (Ø19...26.7)

Clamping range

	12...22	12...18
	22...26.7	12...18

Dimensional drawings



Further documentation

- Overview MP Cooperation Partners
- Tool connections
- Introduction to MP-Bus Technology