Basic Fail-Safe multifunction technology actuator for controlling dampers in typical commercial HVAC applications.

- **Torque motor 1400 in-lb [160 Nm]**
- **Nominal voltage AC 24...240 V / DC 24...125 V**
- **Control MFT/programmable**
- **Position feedback 2...10 V**
- **2x SPDT**

5-year warranty

Technical data

Electrical data	Nominal voltage	AC 24...240 V / DC 24...125 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...264 V / DC 19.2...137.5 V
	Power consumption in operation	52 W
	Power consumption in rest position	9 W
	Transformer sizing	with 24 V 54 VA / with 240 V 68 VA
	Auxiliary switch	2x SPDT, 1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V (II, reinforced insulation), 1x 12.5° / 1x 2.5...92.5°
	Switching capacity auxiliary switch	1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V (II, reinforced insulation)
	Electrical Connection	Terminal blocks, (PE) Ground-Screw
	Overload Protection	electronic throughout 0...95° rotation
Data bus communication	Communicative control	BACnet MS/TP Modbus RTU MP-Bus
Functional data	Torque motor	1400 in-lb [160 Nm]
	holding torque	50 Nm
	Operating range Y	2...10 V
	Operating range Y note	4...20 mA
	Input impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for On/Off
	Operating range Y variable	Start point 0.5...30 V End point 2.5...32 V
	Operating modes optional	variable (VDC, on/off, floating point)
	Position feedback U	2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	VDC variable
	Setting Fail-Safe Position	0...100%, adjustable with Belimo Assistant App (default setting 0%)
	Bridging time (PF)	2 s
	Bridging time (PF) variable	0...10 s
	Pre-charging time	5...20 s

Technical data

Functional data	Direction of motion motor	reversible with app
	Direction of motion fail-safe	reversible with app
	Manual override	7 mm hex crank, supplied
	Angle of rotation	95°
	Running Time (Motor)	35 s / 90°
	Running time motor variable	30...120 s
	Running time fail-safe	<30 s
	Noise level, motor	68 dB(A)
	Noise level, fail-safe	62 dB(A)
	Position indication	integral pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP66/67
	Degree of protection NEMA/UL	NEMA 4X
	Housing	UL Enclosure Type 4X
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	Ambient humidity	Max. 100% RH
	Ambient temperature	-22...122°F [-30...50°C]
	Servicing	maintenance-free
Weight	Weight	7.3 lb [3.3 kg]
Materials	Housing material	die cast aluminium polycarbonate cover

Product features

Default/Configuration

Default parameters for DC 2...10 V applications of the PKBUP-MFT actuator are assigned during manufacturing. These parameters can be edited in the field via NFC and the Belimo Assistant APP.

Application

PKB Series damper actuators are designed to accommodate a mounting bracket and coupler or linkage for remote linkage connection. A visual position indicator shows the actuators position through-out its stroke. For outdoor applications, the installed actuator must be mounted with the actuator at or above horizontal. For indoor applications the actuator can be in any position including upside down.

Operation

The PKB series provides 95° of rotation and a visual indicator shows the position of the damper actuator. The PKB series actuator uses a low power consumption brushless DC motor and is electronically protected against overload. A universal power supply is furnished to connect supply voltage in the range of AC 24...240 V and DC 24...125 V. Included is a smart heater with thermostat to eliminate condensation. Two auxiliary switches are provided; one set at 12.5° open and the other is field adjustable. Running time is field adjustable from 30...120 seconds by using the Near Field Communication (NFC) app and a smart phone.

†Use 60°C/75°C copper wire size range 12-28 AWG, stranded or solid. Use flexible metal conduit. Push the listed conduit fitting device over the actuator's cable to butt against the enclosure. Screw in conduit connector. Jacket the actuators input wiring with listed flexible conduit. Properly terminate the conduit in a suitable junction box. Rated impulse Voltage 4000 V. Type of action 1. Control pollution degree 3.

Product features

Bridging time

Power failures can be bridged up to a maximum of 10 s.

In the event of a power failure, the actuator will remain stationary in accordance with the set bridging time. If the power failure is greater than the set bridging time, the actuator will move into the selected fail-safe position.

The bridging time set at the factory is 2 s. It can be modified on site in operation by means of the Belimo service tool MFT-P.

Settings: The rotary knob must not be set to the "PROG FAIL-SAFE" position!

For retroactive adjustments of the bridging time with the Belimo service tool MFT-P or with the ZTH EU adjustment and diagnostic device only the values need to be entered.

Factory settings

Default parameters for DC 2...10 V applications of the PKBUP-MFT actuator are assigned during manufacturing. These parameters can be edited in the field via NFC and the Belimo Assistant APP.

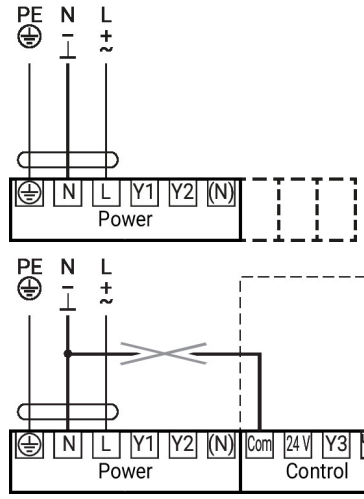
Accessories

Electrical accessories

Description	Type
Service tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH US

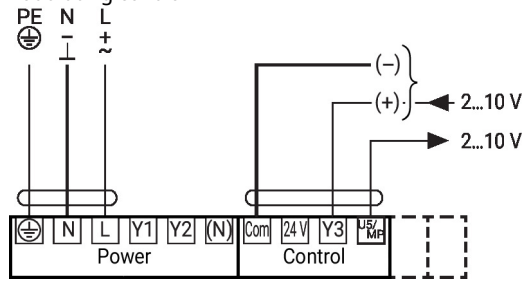
Electrical installation

AC 24...240 V / DC 24...125 V



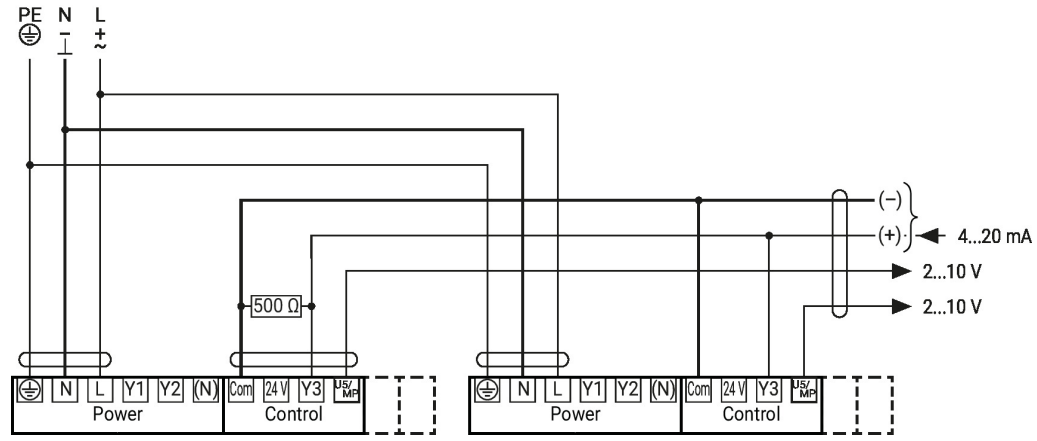
Power supply must not be connected to the signal terminals!

Modulating control



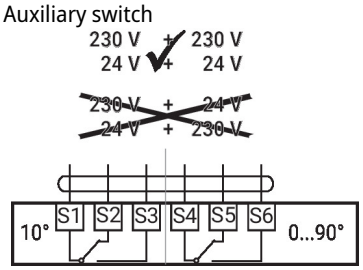
Electrical installation

Parallel circuit 4...20 mA



Setpoint 2...10 V

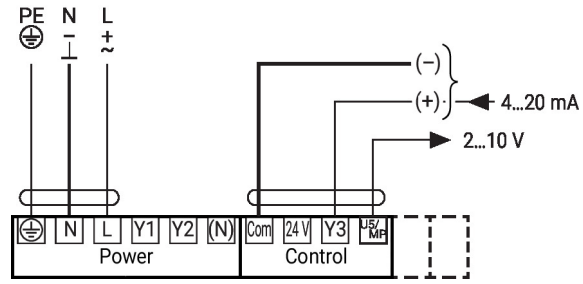
Auxiliary switch



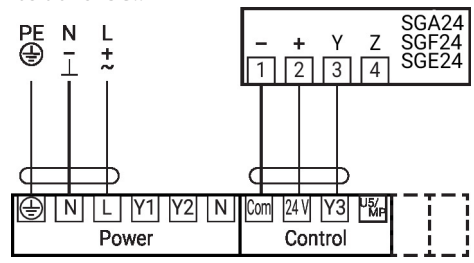
Functions

Functions with specific parameters (parametrization necessary)

Control 4...20 mA



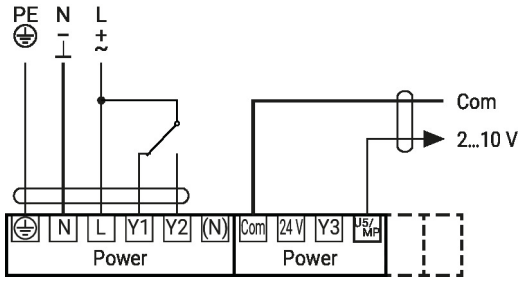
Positioner SG..

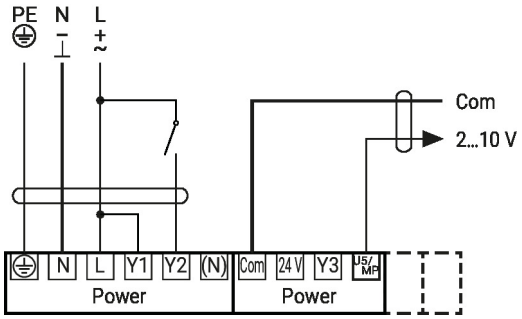


Note
Maximum output power «DC 24 V out» 1.2 W @ 50 mA!
A separate isolating transformer must be used for higher performance!

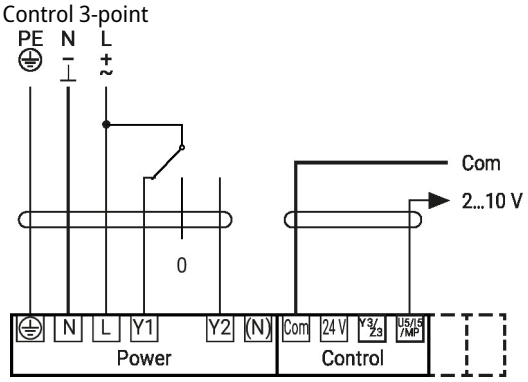
Functions with specific parameters (NFC)

Control on/off

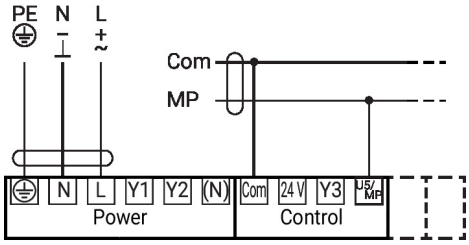




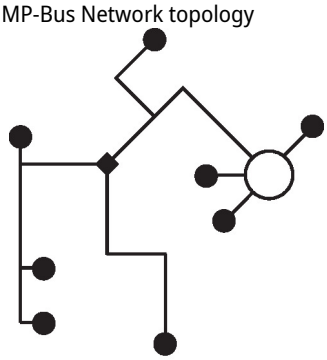
Control 3-point



Connection on the MP-Bus

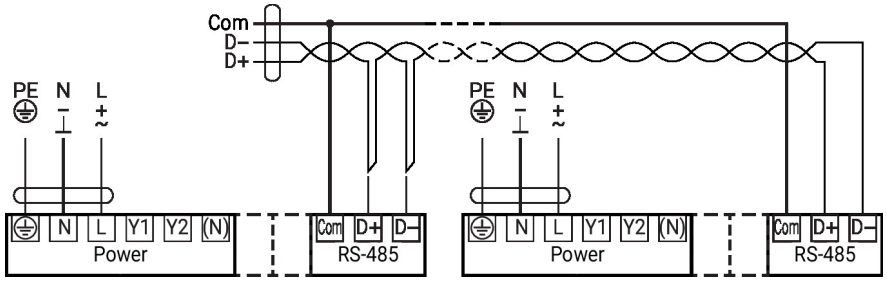


MP-Bus Network topology



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

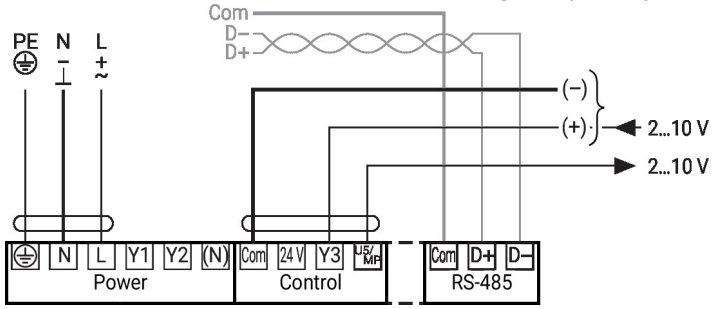
Connection BACnet MS/TP / Modbus RTU



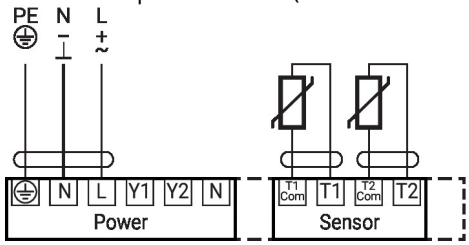
Functions

Functions with specific parameters (NFC)

Connection BACnet MS/TP / Modbus RTU with analogue setpoint (hybrid mode)



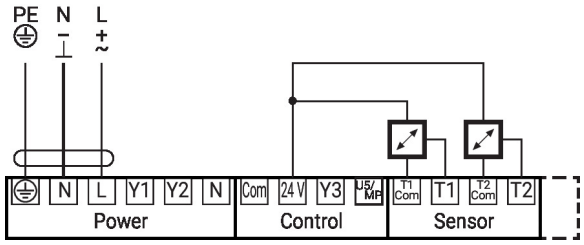
Connection of passive sensors (BACnet MS/TP / Modbus RTU)



1)	2)
200 Ω...2 kΩ	0.1 Ω
2 kΩ...10 kΩ	1 Ω
10 kΩ...55 kΩ	10 Ω

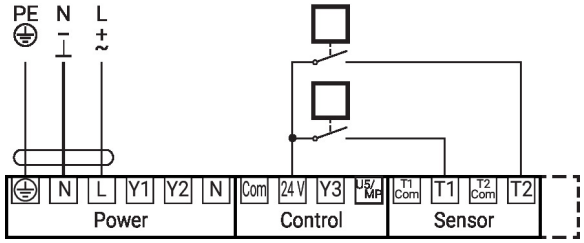
1) Resistance range
2) Resolution
Compensation of the measured value is recommended
- Suitable for Ni1000 and Pt1000
- Suitable Belimo types 01DT-..

Connection of active sensors (BACnet MS/TP / Modbus RTU)



Possible input voltage range:
0...10 V
Resolution 5 mV
To capture for example:
- Active temperature sensors
- Flow sensors
- Pressure / differential pressure sensors

Switching contact connection (BACnet MS/TP / Modbus RTU)



Switching contact requirements:
The switching contact must be able to switch a current of 16 mA at 24 V accurately.
To capture for example:
- Flow monitors
- Operation / malfunction messages of chillers

Dimensions