BELIMO

# Technical data sheet NV24A-MP-RE

MP BUS

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

- **Actuating force 1000 N**
- **Nominal voltage AC/DC 24 V**
- **Control modulating, communicative 2...10 V variable**
- **Stroke 20 mm**
- **Communication via Belimo MP-Bus**
- **Conversion of sensor signals**

Picture may differ from product

## 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 | 1.5 W |
| | Power consumption in rest position | 0.5 W |
| | Power consumption for wire sizing | 3 VA |
| | Connection supply / control | Terminals 4 mm² (cable ø4...10 mm) |
| | Parallel operation | Yes (note the performance data) |
| **Data bus communication** | Communicative control | MP-Bus |
| | Number of nodes | MP-Bus max. 8 |
| **Functional data** | Actuating force motor | 1000 N |
| | Operating range Y | 2...10 V |
| | Input impedance | 100 kΩ |
| | Operating range Y variable | Start point 0.5...30 V<br>End point 2.5...32 V |
| | Operating modes optional | Open/close<br>3-point (AC only)<br>Modulating (DC 0...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<br>End point 2.5...10 V |
| | Position accuracy | ±5% |
| | Manual override | with push-button, can be locked |
| | Stroke | 20 mm |
| | Running time motor | 150 s / 20 mm |
| | Running time motor variable | 90...150 s |
| | Sound power level, motor | 45 dB(A) |
| | Adaptation setting range | manual (automatic on first power-up) |
| | Adaptation setting range variable | No action<br>Adaptation when switched on<br>Adaptation after pushing the manual override button |
| | Override control | MAX (maximum position) = 100%<br>MIN (minimum position) = 0%<br>ZS (intermediate position, AC only) = 50% |
| | Override control variable | MAX = (MIN + 33%)...100%<br>ZS = MIN...MAX |
| | Position indication | Mechanical, 5...20 mm stroke |

## Technical data

| | | |
|---|---|---|
| **Safety data** | Protection class IEC/EN | III, Safety Extra-Low Voltage (SELV) |
| | Power source UL | Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2 |
| | Housing | UL Enclosure Type 2 |
| | EMC | CE according to 2014/30/EU |
| | Low voltage directive | CE according to 2014/35/EU |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | UL Approval | cULus according to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1<br>The UL marking on the actuator depends on the production site, the device is UL-compliant in any case |
| | Type of action | Type 1 |
| | Rated impulse voltage supply / control | 0.8 kV |
| | Pollution degree | 3 |
| | Ambient humidity | Max. 95% RH, non-condensing |
| | Ambient temperature | 0...50°C [32...122°F] |
| | Storage temperature | -40...80°C [-40...176°F] |
| | Servicing | maintenance-free |
| **Weight** | Weight | 1.8 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 device and that it is ensured that the ambient conditions remain within the thresholds according to the data sheet at any time.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with 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

**Operating mode**

Conventional operation:

The actuator is connected with an analogue control signal Y (note the operating range) and drives to the position defined. The measuring voltage U serves for the electrical display of the actuator position 0...100% and as control signal for other actuators.

Operation on Bus:

The actuator receives its digital control 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.

**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.

## Product features

**Configurable device**
The factory settings cover the most common applications. Single parameters can be modified with Belimo Assistant 2.

**Mounting on third-party valves**
The RetroFIT+ actuators for installation on a wide range of valves from various manufacturers are comprised of an actuator, bracket, universal valve neck adapter and universal valve stem adapter. Adapt the valve neck and valve stem to begin with, then attach the RetroFIT+ bracket to the valve neck adapter. Now fit the RetroFIT+ actuator into the bracket and connect it to the valve. Whilst taking the position of the valve closing point into account, secure the actuator to the bracket and then conduct the commissioning process. The valve neck adapter/actuator can be rotated by 360° on the valve neck, provided the size of the installed valve permits.

**Mounting on Belimo valves**
Use standard actuators from Belimo for mounting on Belimo globe valves. The installation of RetroFIT+ actuators on Belimo globe valves is technically possible.

**Manual override**
Manual override with push-button possible (the gear train is disengaged for as long as the button is pressed or remains locked).

The stroke can be adjusted by using a hexagon socket screw key (4 mm), which is inserted into the top of the actuator. The stroke shaft extends when the key is rotated clockwise.

**High functional reliability**
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Position indication**
The stroke is indicated mechanically on the bracket with tabs. The stroke range adjusts itself automatically during operation.

**Home position**
Factory setting: Actuator stem is retracted.

The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaptation, which is when the operating range and position feedback adjust themselves to the mechanical setting range.

The actuator then moves into the position defined by the control signal.

**Adaptation and synchronisation**
An adaptation can be triggered manually by pressing the "Adaptation" button or with Belimo Assistant 2. Both mechanical end stops are detected during the adaptation (entire setting range).

Automatic synchronisation after pressing the manual override button is configured. The synchronisation is in the home position (0%).

The actuator then moves into the position defined by the control signal.

A range of settings can be made using Belimo Assistant 2.

**Setting direction of motion**
When actuated, the direction-of-stroke switch changes the direction of motion in normal operation.

## Accessories

**Tools**

| Description | Type |
|---|---|
| Service tool for wired and wireless setup, on-site operation and troubleshooting. | Belimo Assistant 2 |
| Belimo Assistant Link Bluetooth and USB to NFC and MP-Bus converter for configurable and communicative devices | LINK.10 |
| Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: 6-pin for connection to service socket | ZK1-GEN |
| Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: free wire end for connection to MP/PP terminal | ZK2-GEN |

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch 2x SPDT add-on | S2A-H |
| MP-Bus power supply for MP actuators | ZN230-24MP |

**Gateways**

| Description | Type |
|---|---|
| Gateway MP to BACnet MS/TP | UK24BAC |
| Gateway MP to Modbus RTU | UK24MOD |

**Mechanical accessories**

| Description | Type |
|---|---|
| Spacer ring for LDM, stroke 20 mm | ZNV-203 |

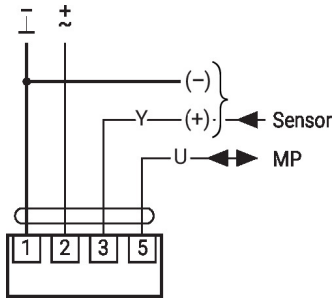
## Accessories

| Description | Type |
|---|---|
| Spacer ring for Sauter, stroke 20 mm | ZNV-204 |
| Adapter kit Danfoss | ZNV-205 |

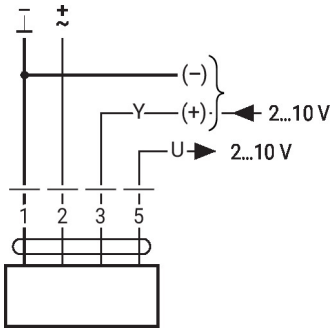
## Electrical installation

**Supply from isolating transformer.**
**Parallel connection of other actuators possible. Observe the performance data.**
**Direction of stroke switch factory setting: Actuator stem retracted (▲).**

MP-Bus



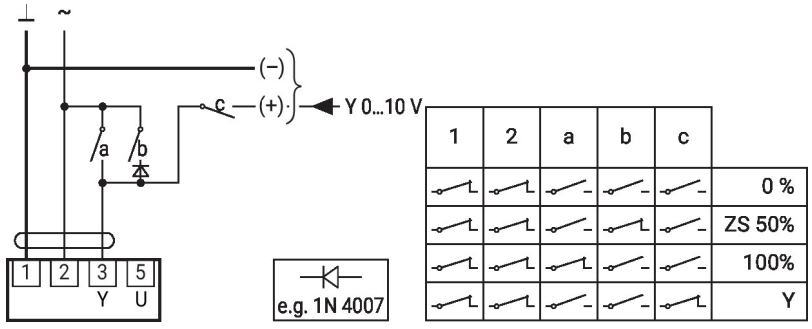

AC/DC 24 V, modulating




## Further electrical installations

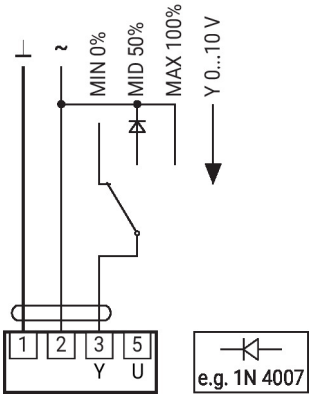
### Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts

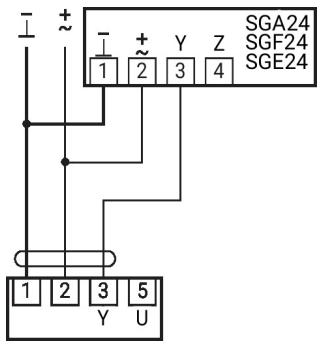



| 1 | 2 | a | b | c | |
|---|---|---|---|---|---|
| | | | | | 0 % |
| | | | | | ZS 50% |
| | | | | | 100% |
| | | | | | Y |

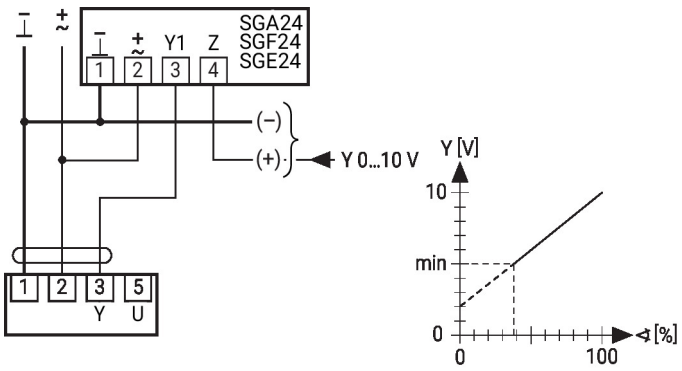
Override control with AC 24 V with rotary switch




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



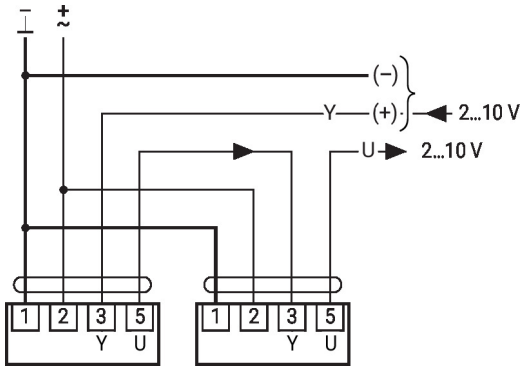

Minimum limit with positioner SG..



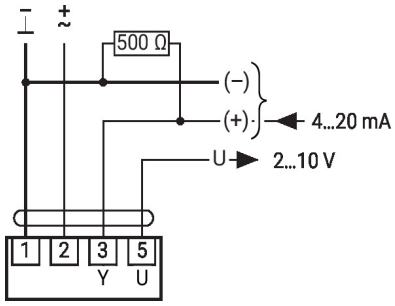
## Further electrical installations

### Functions with basic values (conventional mode)

Primary/secondary operation (position-dependent)

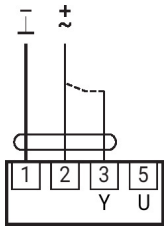



Control with 4...20 mA via external resistor




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

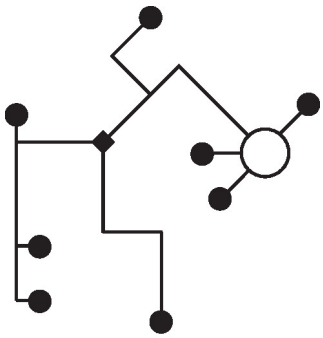
Functional check



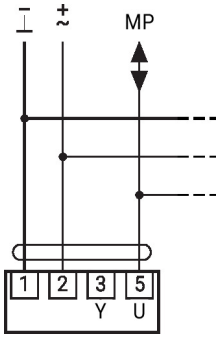

**Procedure**
1. Connect 24 V to connections 1 and 2
2. Disconnect connection 3:
– with direction of rotation L: Actuator rotates to the left
– with direction of rotation R: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
– Actuator runs in opposite direction

### 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

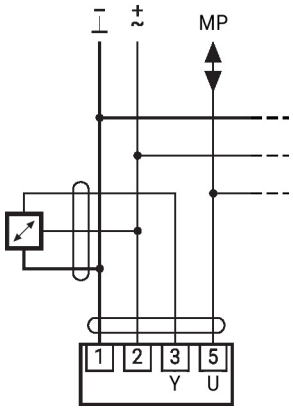



Max. 8 additional MP-Bus nodes

## Further electrical installations

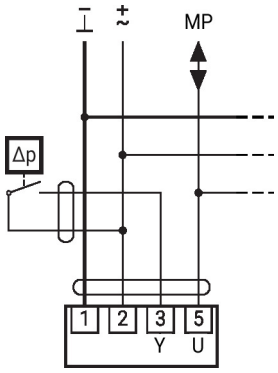
### MP-Bus

Connection of active sensors



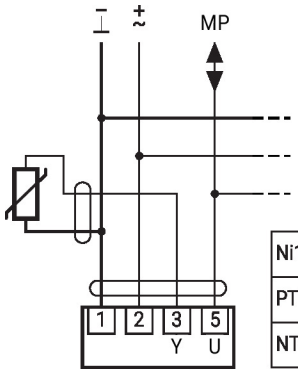

Max. 8 additional MP-Bus nodes
- Supply AC/DC 24 V
- Output signal 0...10 V (max. 0...32 V)
- Resolution 30 mV

Connection of external switching contact




Max. 8 additional MP-Bus nodes
- Switching current 16 mA @ 24 V
- Start point of the operating range must be configured on the MP actuator as ≥0.5 V

Connection of passive sensors

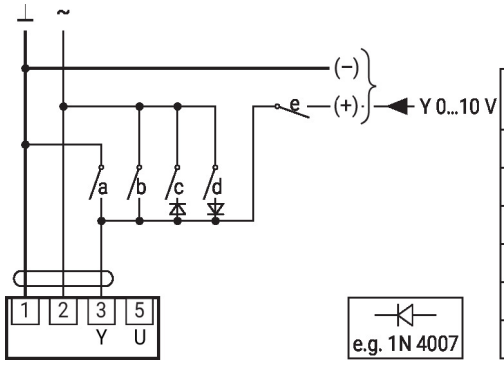



| | | |
|---|---|---|
| Ni1000 | –28...+98°C | 850...1600 Ω 2) |
| PT1000 | –35...+155°C | 850...1600 Ω 2) |
| NTC | –10...+160°C 1) | 200 Ω...60 kΩ 2) |

1) Depending on the type
2) Resolution 1 Ohm
Compensation of the measured value is recommended

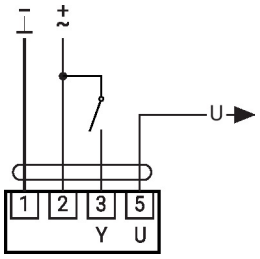
### Functions with specific parameters (configuration necessary)

Override control and limiting with AC 24 V with relay contacts




| 1 | 2 | a | b | c | d | e | |
|---|---|---|---|---|---|---|---|
| | | | | | | | Close1) |
| | | | | | | | MIN |
| | | | | | | | ZS |
| | | | | | | | MAX |
| | | | | | | | Open |
| | | | | | | | Y |

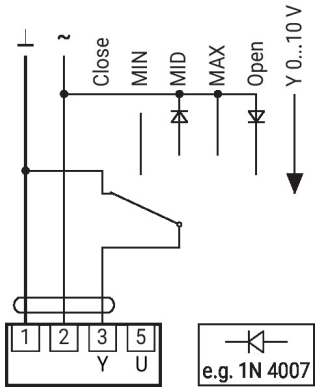
Control open/close



## Further electrical installations

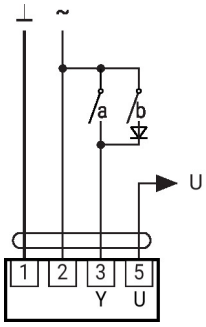
### Functions with specific parameters (configuration necessary)

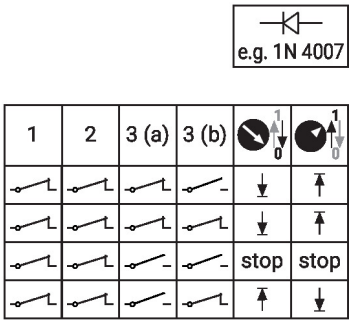
Override control and limiting with AC 24 V with rotary switch



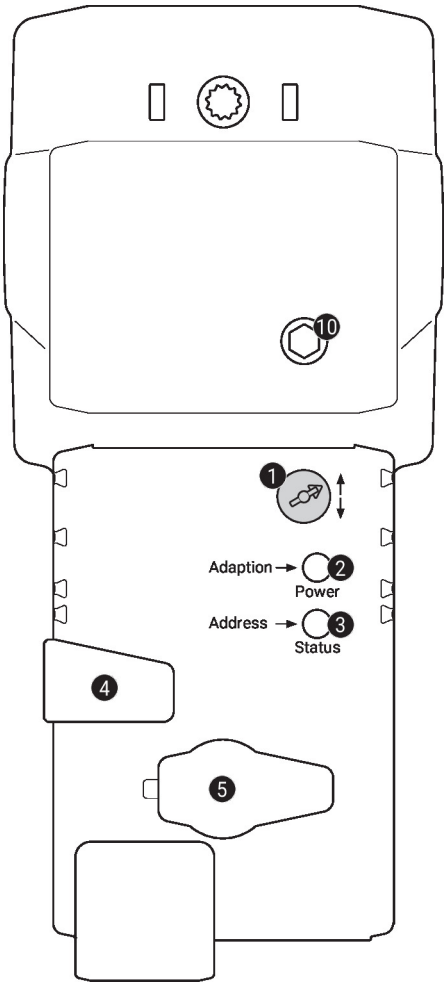

**Caution:**
The "Close" function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

Control 3-point with AC 24 V




## 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 |
| On: | Adaptation or synchronisation process active |
| Flickering: | MP-Bus communication active |
| Flashing: | Request for addressing from MP client |
| Press button: | Confirmation of the addressing |

**4 Manual override button**

| | |
|---|---|
| Press button: | Gear train disengages, motor stops, manual override possible |
| Release button: | Gear train engages, standard mode |

**5 Service plug**
For connecting configuration and service tools

**10 Manual override**

| | |
|---|---|
| Clockwise: | Actuator stem extends |
| Counterclockwise: | Actuator stem retracts |

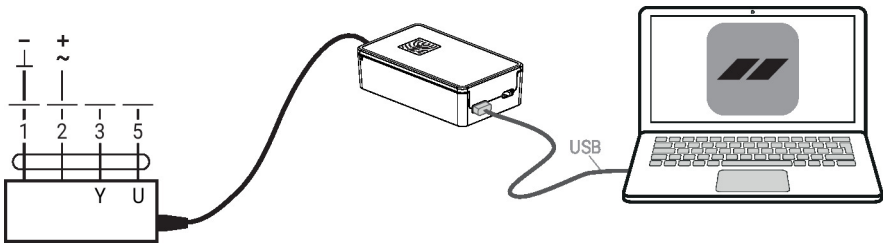
## Service

Using Belimo Assistant 2, device parameters can be modified. Belimo Assistant 2 can operate on a smartphone, tablet or PC. The available connection options vary depending on the hardware on which Belimo Assistant 2 is installed.

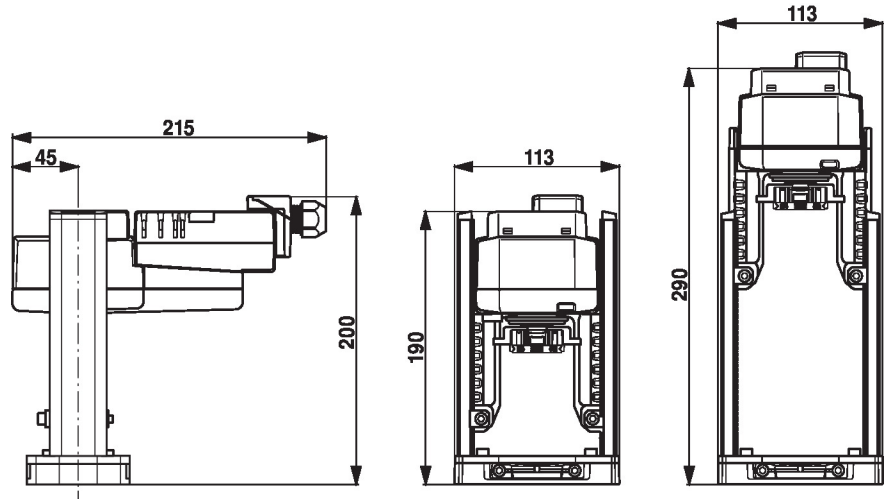
For more information about Belimo Assistant 2, refer to the Quick Guide – Belimo Assistant 2.

**Wired connection**

Belimo devices can be accessed by connecting Belimo Assistant Link to the USB port on a PC or laptop and to the Service Socket or MP-Bus wire on the device.




## Dimensions




## Further documentation

- Tool connections
- Introduction to MP-Bus Technology
- Overview MP Cooperation Partners
- Data sheets for globe valves
- Installation instructions for actuators
- Quick Guide – Belimo Assistant 2