

## VBG6, MR6

### 6-Way Valve and Actuator for 4-pipe systems

#### APPLICATION

VBG6 ball valves are designed as change-over valve to connect one 2-pipe heat exchanger (Fan-coil Unit or Ceiling) to the 4-pipe system, ideally together with the Kombi-FCU Pressure Independent Control Valve used for dynamic balancing.

The simultaneous rotation of two balls, mechanically connected to the one stem, opens supply and return ways on one side (e.g. cooling) and closes at the same time the other side (heating). That avoids any mixing between flows and reduce potential energy losses.

VBG6 valves are delivered with flow limiter kit in the valve box. That gives flexibility in flow rate adjustment by picking adequate limiter disk with Kv value displayed on. Each Kv value should be written during installation on the label stripped on the valve neck.

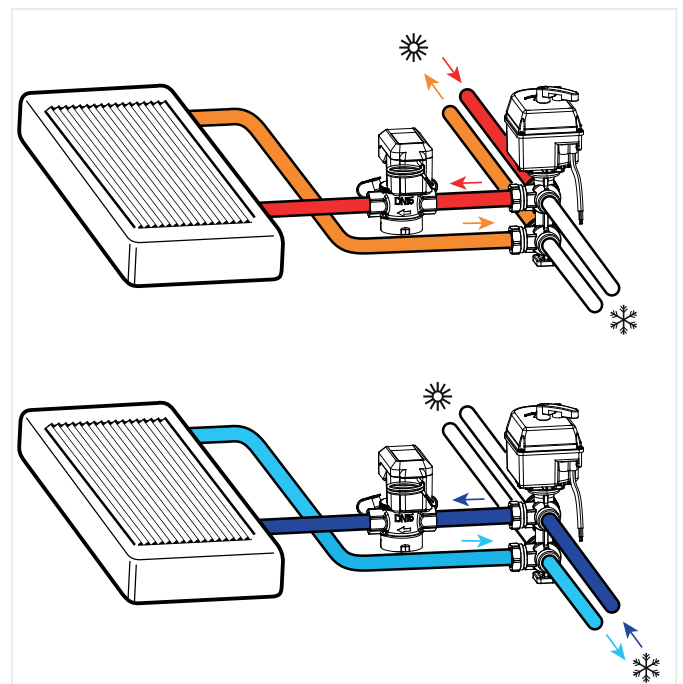
VBG6 valves are designed to be actuated by MR6 rotary valve actuators in two types. On/off actuator gives the basic change-over functionality, modulating enables setting mid-position to close the valve. Position feedback on modulating actuator shell be used for remote system monitoring and system check.

#### SPECIAL FEATURES

- Change-over Valve with scalable flow limitations covering all flow needs with only 3 valve versions
- In combination with modulating actuator option to close the valve in mid-position
- Externally threaded valve versions for easier installation
- Optional use of on/off or modulating actuator
- Modulating actuator with position feedback
- Pre-wired actuator with clear position indication and manual operation
- Can be combined with the Kombi-FCU for high accurate flow control; Ideal connection for 4-pipe systems including hydronic dynamic balancing



#### INSTALLATION EXAMPLE




## VALVES VBG6

### Technical Data

| Media                        |   |
|------------------------------|---|
| Controlled medium:           | Chilled or hot water according to VDI 2035 with up to 50 % Glycol (oxygen concentration less than 0.2 g/m <sup>3</sup> , pH 8...9.5; Fe<0.5 mg/kg; Cu<0.1 mg/kg). |
| Pressure values              |   |
| Nominal pressure rating:     | PN16  |
| Max. differential pressure : | 2bar  |
| Operating temperatures       |   |
| Media temperature:           | +2°...+110°   |
| Ambient temperature:         | 0°...+55°   |

| Specifications               |                                    |
|------------------------------|------------------------------------|
| Valve type:                  | 6-way ball valve, change over      |
| Leakage rate:                | Class A as per EN 12266-1/12 – P12 |
| Total operation angle:       | 90°                                |
| First side operation angle : | 0...32°                            |
| “Dead zone” operation angle: | 32°...58°                          |
| Second side operation angle: | 58°...90°                          |
| Flow characteristic:         | linear                             |
| Connection/Sizes             |                                    |
| Connection type:             | External BSPP, flat sealing        |

## CONSTRUCTION

| Overview   | Components               | Materials          |
|--|--------------------------|--------------------|
|  | Material body            | Brass              |
|  | Not depicted components: |                    |
|  | Inner parts              | Brass              |
|  | O-rings                  | EPDM, PTFE, FKM    |
|  | Packaging                | Separate unit pack |

## TECHNICAL CHARACTERISTICS

### kvs-Values

| DN size: | Kv max: | Kv flow limitation:    | O.S. no.: |
|----------|---------|------------------------|-----------|
| 15       | 1.25    | 0.25 / 0.40 / 0.63 / 1 | VBG6-15   |
| 20       | 2.8     | 0.7 / 1.0 / 1.6 / 2.1  | VBG6-20   |
| 20       | 4.0     | 2.5                    | VBG6-20F  |

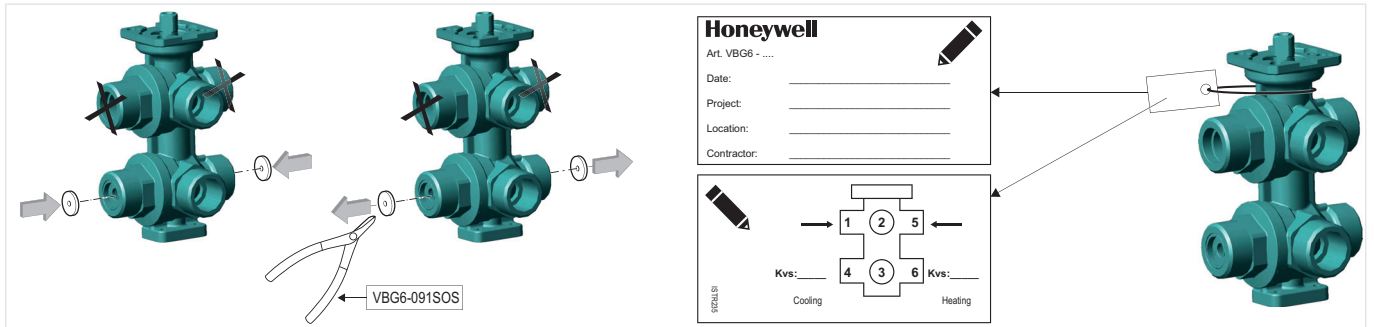
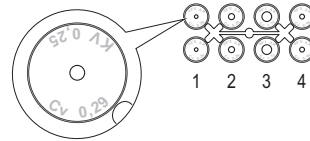
### Flow limiters by kv disks

VBG6 valves are supplied with the maximum flow rate defined by Kv max value.

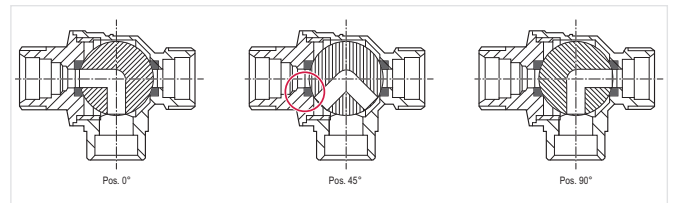
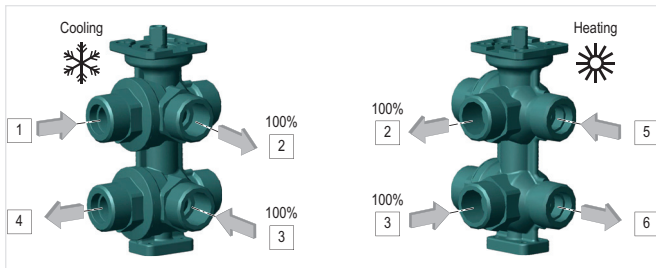
As there is typically heating flow much lower comparing to cooling one the valve should be adjusted on the flow rate.

VBG6 valves are delivered with flow limiter kit in the valve box. That gives flexibility in flow rate adjustment by picking adequate kv disk with Kv value displayed on. Each Kv value should be written during installation on the label stripped on the valve neck.

| VBG6-15 |                        | VBG6-20 |                       | VBG6-20HF |                       |
|---------|------------------------|---------|-----------------------|-----------|-----------------------|
| DN15    | Kv <sub>max</sub> 1.25 | DN20    | Kv <sub>max</sub> 2.8 | DN20      | Kv <sub>max</sub> 4.0 |
| 1       | 0.25                   | 1       | 0.7                   | 1         | 2.5                   |
| 2       | 0.40                   | 2       | 1.0                   |           |                       |
| 3       | 0.63                   | 3       | 1.6                   |           |                       |
| 4       | 1.00                   | 4       | 2.1                   |           |                       |



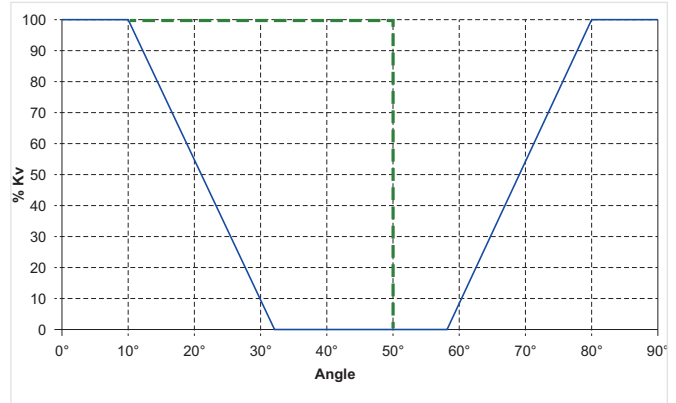
**Port connections**



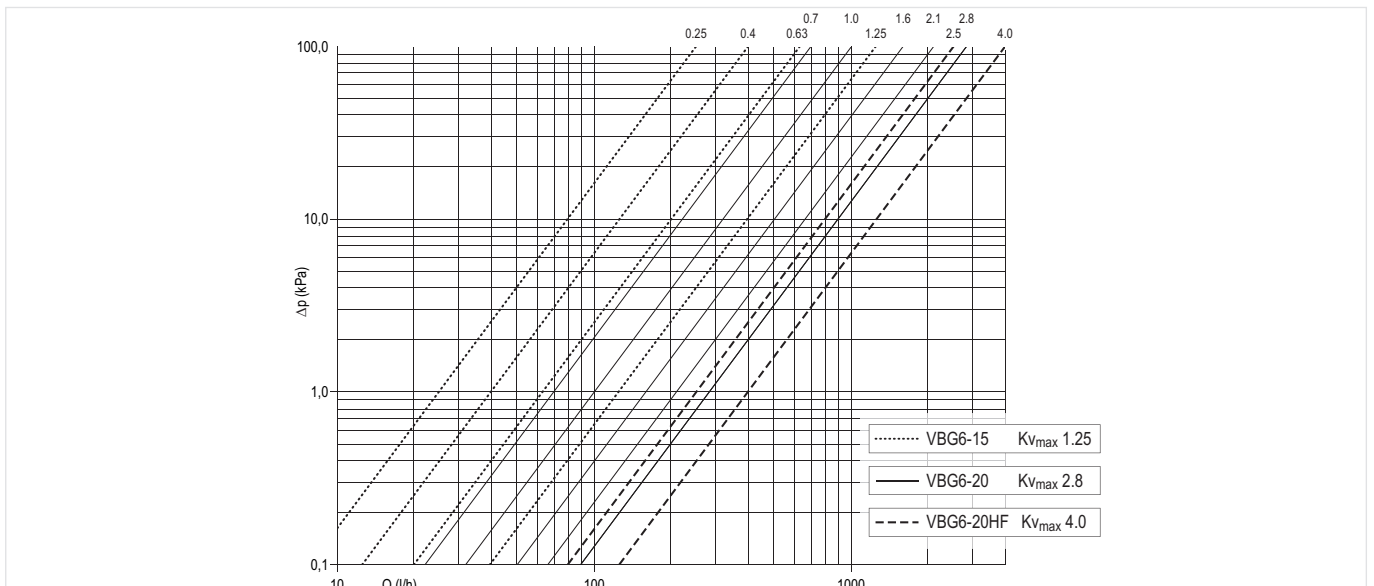
VBG6 valves are designed with integrated pressure relief functional device.

That integrated device prevents systems from potential damages caused by pressure changes when the valve is close (45°) and ambient temperature could heat-up or cool-down close circuit.

The integrated pressure relief device balance potential overpressure in the coils side with the main system pressure when VBG6 valve closes the coil circuit (up to rotations 50°).

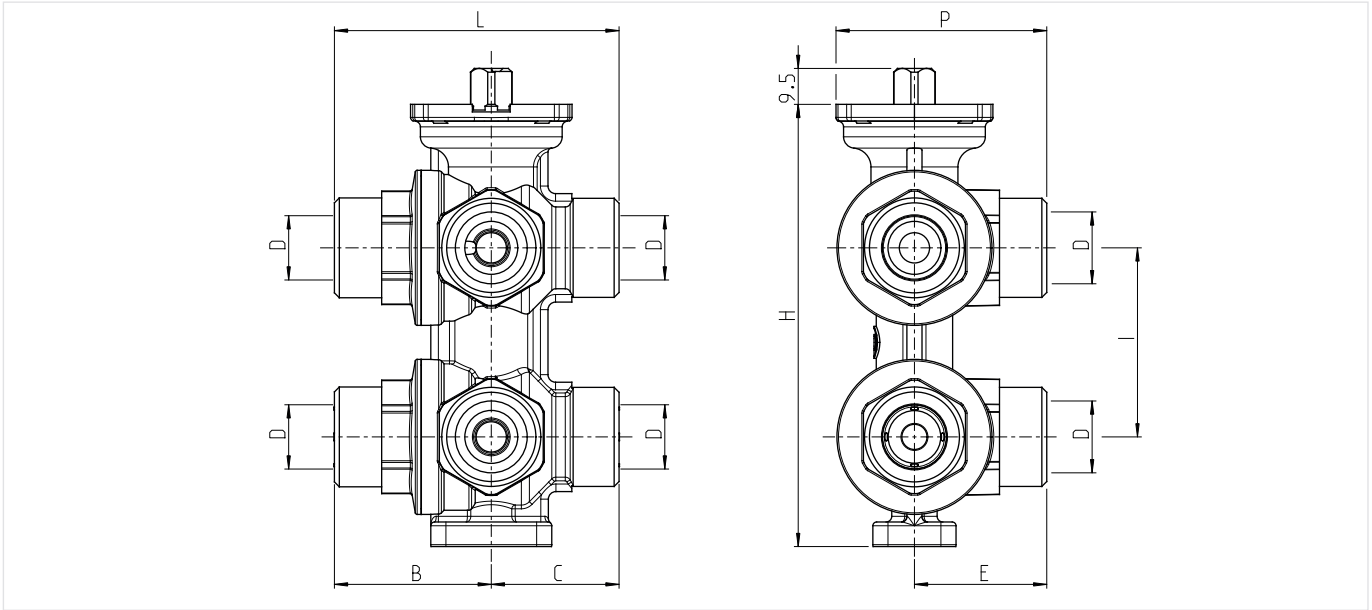


**Pressure drop characteristics**



## DIMENSIONS

### Valves






| Parameter              | Values |        |        |
|------------------------|--------|--------|--------|
| Nominal size diameter: | DN     | 15     | 20     |
| Connection:            | D      | G 3/4" | G 3/4" |
| Dimensions:            | B      | 41.5   | 47     |
|                        | C      | 33.8   | 39     |
|                        | E      | 35     | 41     |
|                        | G      | G 3/4" | G 3/4" |
|                        | H      | 117    | 141    |
|                        | I      | 50     | 60     |
|                        | P      | 55.9   | 62     |
|                        | L      | 75.3   | 86     |

## ORDERING INFORMATION

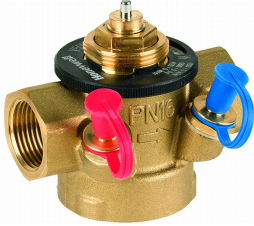
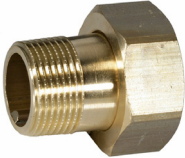
### Options

| Description:  | DN:  | O.S. no.: |
|---|------|-----------|
| 6-way valve; external threads, kv max 1.25; flow limiters 0.25/0.40/0.63/1.00 | DN15 | VBG6-15   |
| 6-way valve, external threads, kv max 2.8; flow limiters 0.7/1.0/1.6/2.1      | DN20 | VBG6-20   |
| 6-way valve, high flow; externals thread, kv max 4.00; flow limiter 2.5       | DN20 | VBG6-20HF |

**Accessories**

|   | Description                     | Part No.      |
|---|---------------------------------|---------------|
|  | <b>Fastening Base for VBG6</b>  |               |
|   |                                 | VBG6-063ZA    |
|  | <b>Insulation Shell</b>         |               |
|   | Insulation shell for DN15 type  | VBG6-063GI-15 |
|   | Insulation shell for DN20 types | VBG6-063GI-20 |
|  | <b>Pliers for KV Disks</b>      |               |
|   |                                 | VBG6-091SOS   |

**Suggested PICV for dynamic balancing**

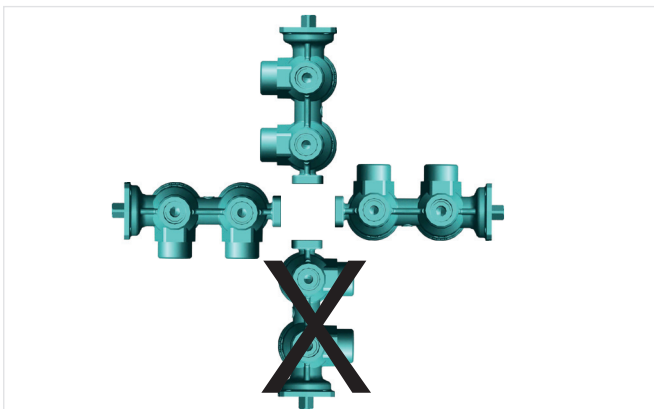
|   |   |            |
|---|---|------------|
|   | <b>V5005TY; DN15, DN20</b>                    |            |
|   |   | V5005TYxxx |
|  | <b>Piping to connect VBG6 to V5005TY DN15</b> |            |
|   |   | ACS-15T    |

**INSTALLATION GUIDELINES**

**Mounting**

For more-detailed information on mounting, see the Mounting Instructions supplied with each valve. Please strictly follow flow direction and port connection guidance. Cooling side must be connected to ports “1” and “4”!

The water quality must meet VDI 2035 requirements with max 50% of Glycol.



**TRANSPORTATION AND STORAGE**

Keep parts in their original packaging and unpack them shortly before use.

The following parameters apply during transportation and storage:

| Parameter                       | Value                    |
|---------------------------------|--------------------------|
| Environment:                    | clean, dry and dust free |
| Min. ambient temperature:       | - 20 °C                  |
| Max. ambient temperature:       | 70 °C                    |
| Min. ambient relative humidity: | 0 % *                    |
| Max. ambient relative humidity: | 55 % *                   |

\*non condensing

## ACTUATOR MR6



### Technical Data

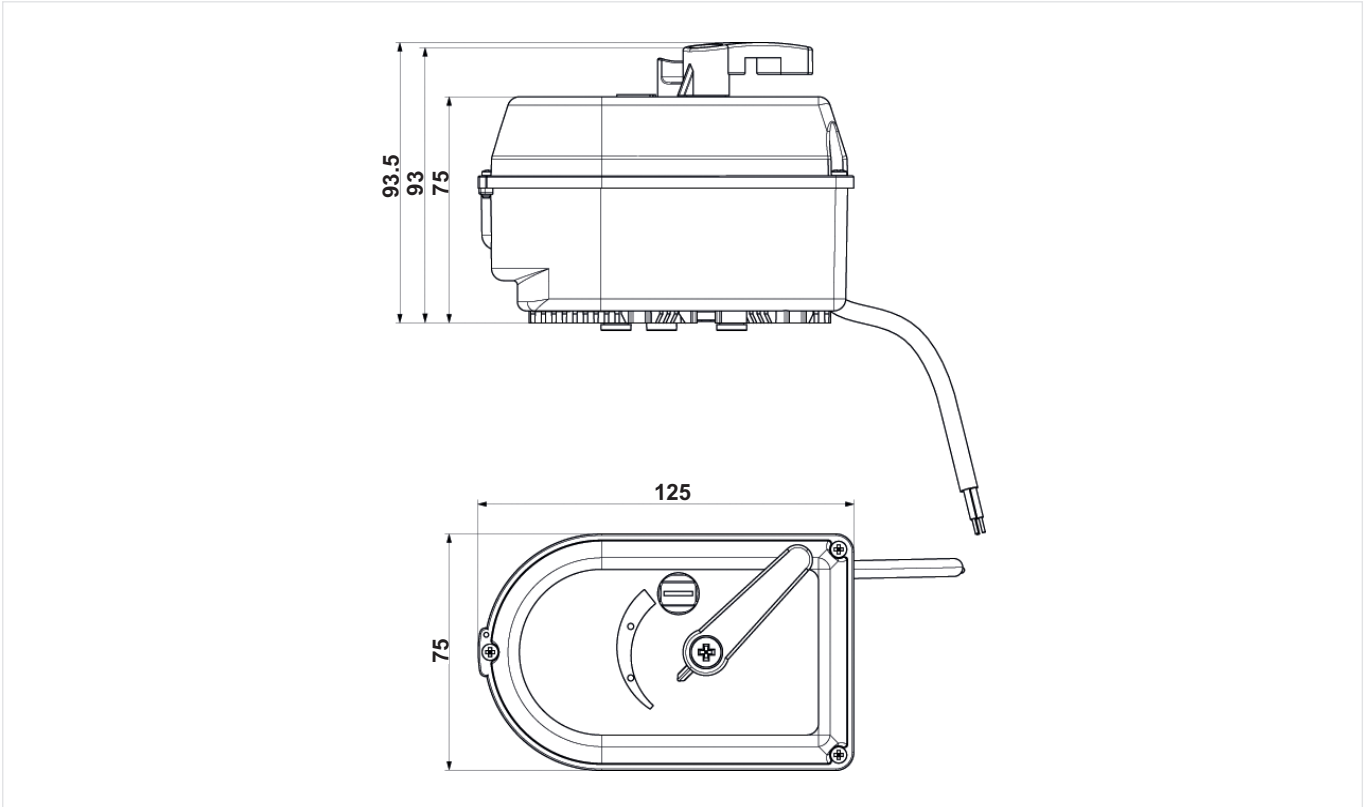
| Operating temperatures         |  |
|--------------------------------|--|
| Ambient temperature:           | 1°C...+55°C  |
| Media temperature :            | +2°C +110°C  |
| Specifications                 |  |
| Actuator type:                 | Rotary actuator for VBG6   |
| Power supply:                  | 24 VAC +/-15 %, 50Hz   |
| Control signal:                | ON/OFF (MR6-24-2POS);<br>modulating (MR6-24-010)                             |
| Power consumption:             | see "Actuator types"   |
| Nominal torque:                | 8 Nm   |
| Operating humidity range:      | 0 %...80 %, non-condensing   |
| Runtime:                       | 75 sec/90°   |
| Nominal operation angle:       | 90°  |
| Cable specification:           | 1 m fixed cable, 3x0.5 mm <sup>2</sup> ;<br>crimped                          |
| IP Rating / Protection degree: | IP44   |
| Environmental conditions:      | For use in home (residential, commercial, and light-industrial) environments |
| Protection class:              | II   |
| Approvals:                     | CE   |

## ORDERING INFORMATION

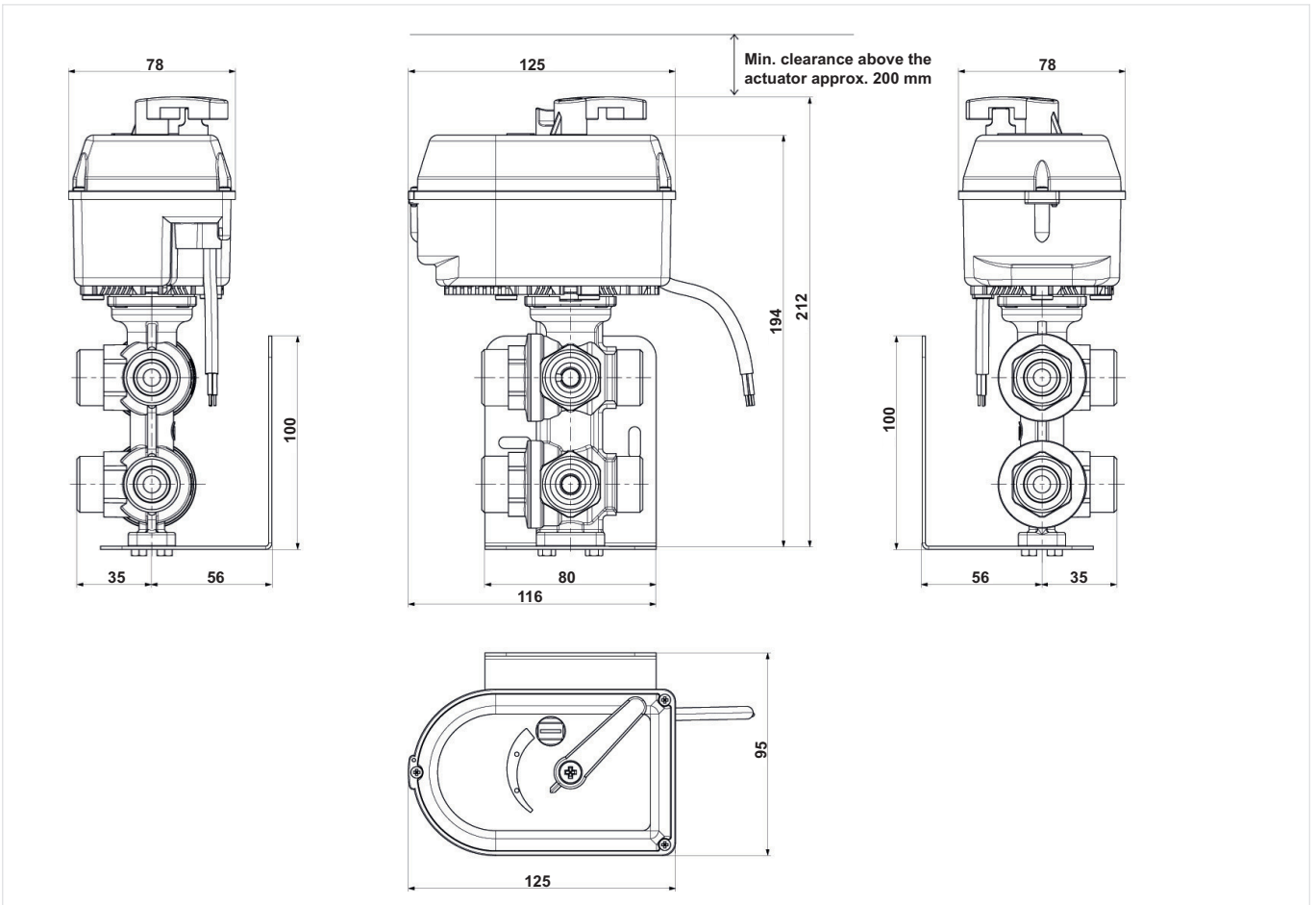
### Options

| O.S. no.    | Power Supply       | Control Signal  | Power consumption |     |                               | Cable                                |
|-------------|--------------------|---|-------------------|-----|-------------------------------|--------------------------------------|
|             |                    |   | Driving           |     | Holding                       |                                      |
|             |                    |   | W                 | VA  | W                             |                                      |
| MR6-24-2POS | 24 VAC ±15%; 50 Hz | on/off  | 3.0               | 3.0 | relay ON 0,6W<br>relay OFF 0W | 3 x 0,5 mm <sup>2</sup><br>1m length |
| MR6-24-010  | 24 VAC ±15%; 50 Hz | modulating 0 - 10 VDC, 4 - 20mA Input impedance: 26kΩ (position signal Y) | 2.5               | 2.5 | 0.3                           | 4 x 0,5 mm <sup>2</sup><br>1m length |

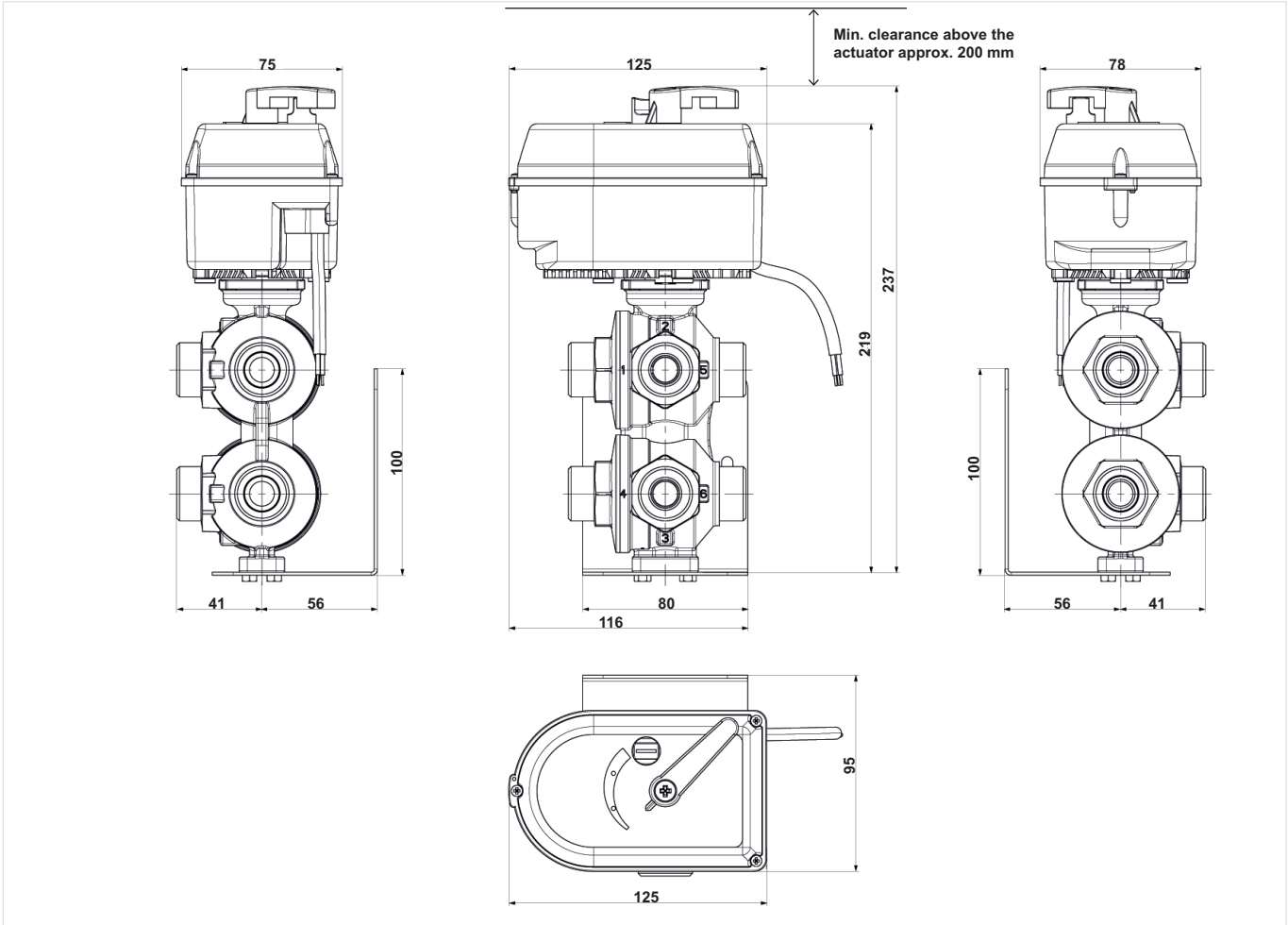
## DIMENSIONS



### MR6 with VBG6-15



**MR6 with VBG6-20/20HF**

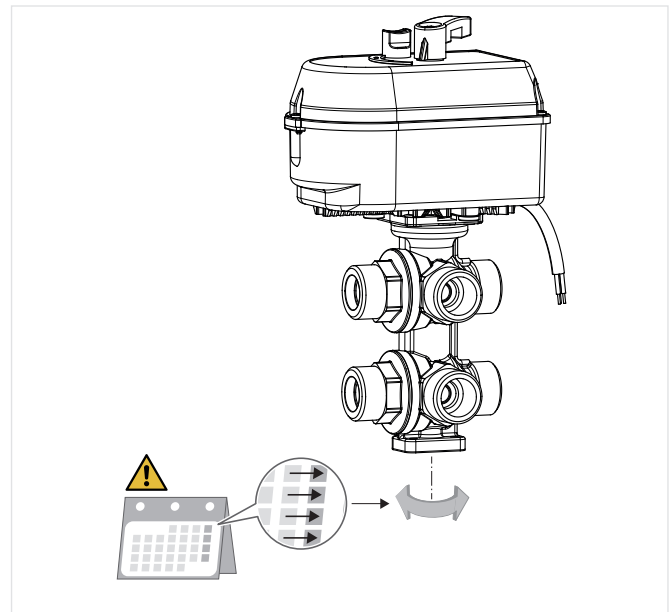
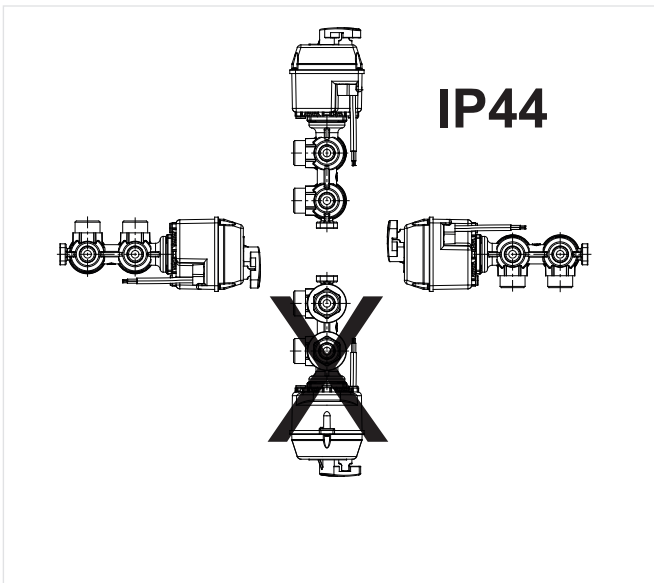


**INSTALLATION GUIDELINES**

**Mounting**

For more-detailed information on mounting, see the Mounting Instructions supplied with each actuator.

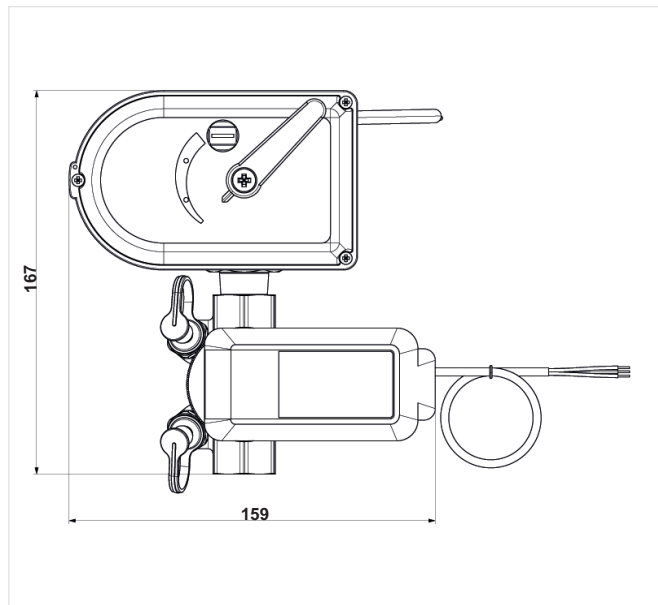
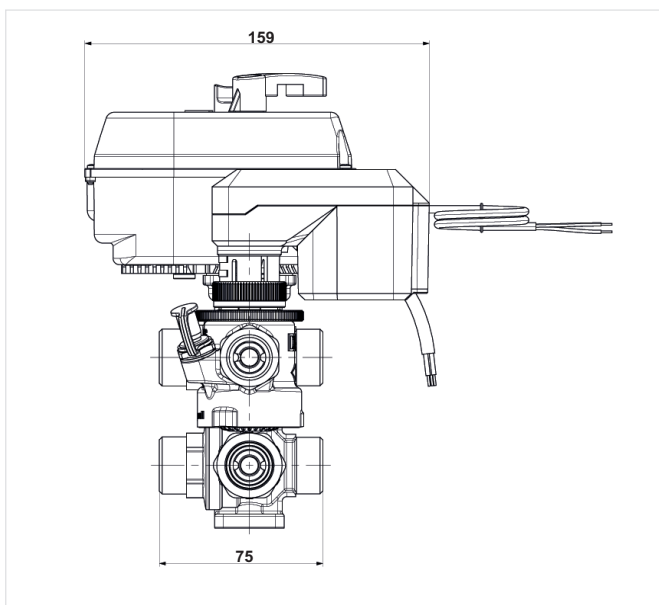
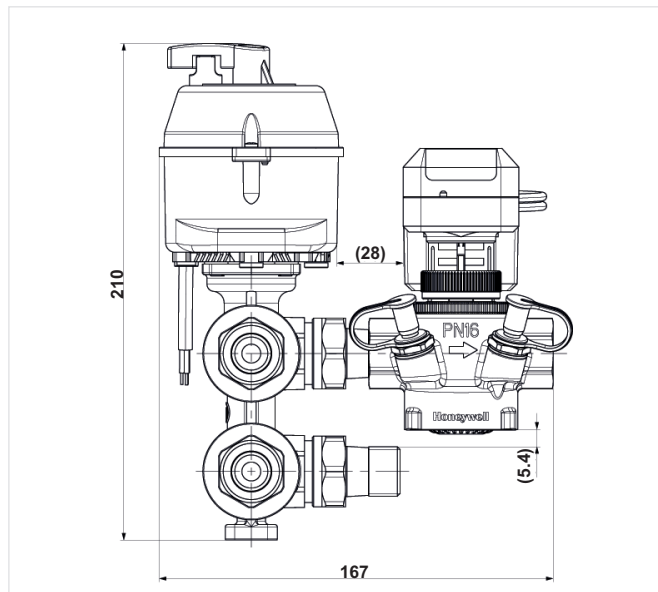
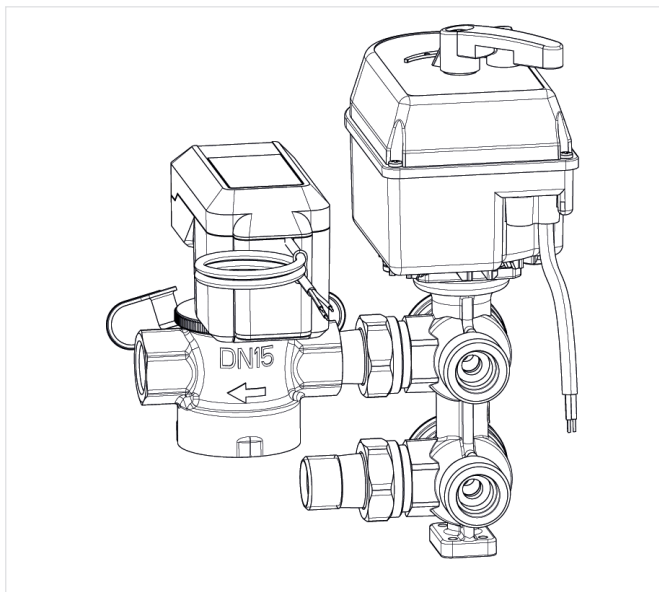
Recommendation: Turn the valve actuator at least once a week to avoid sticking the valve in one position



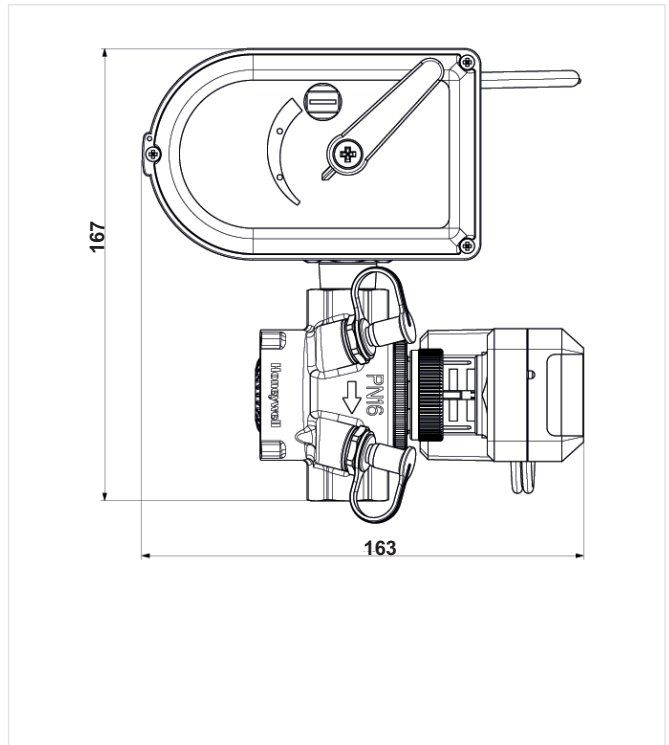
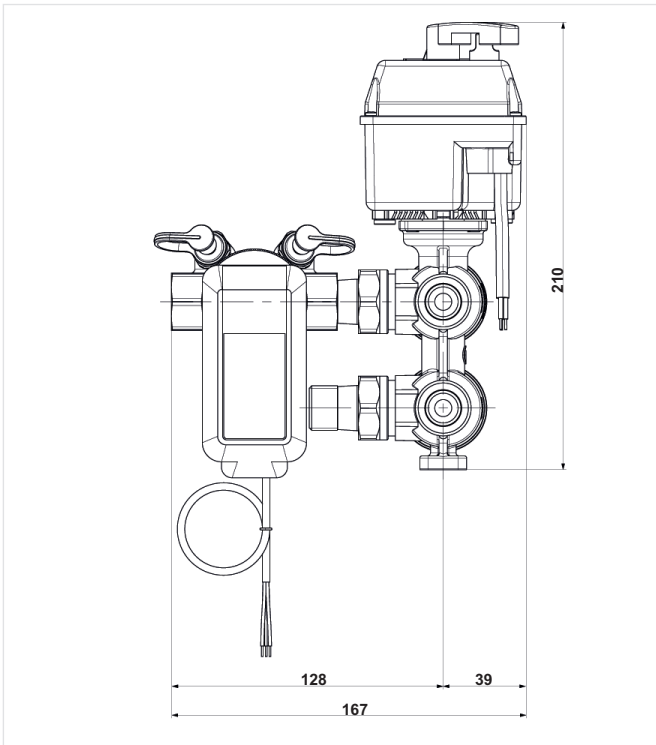
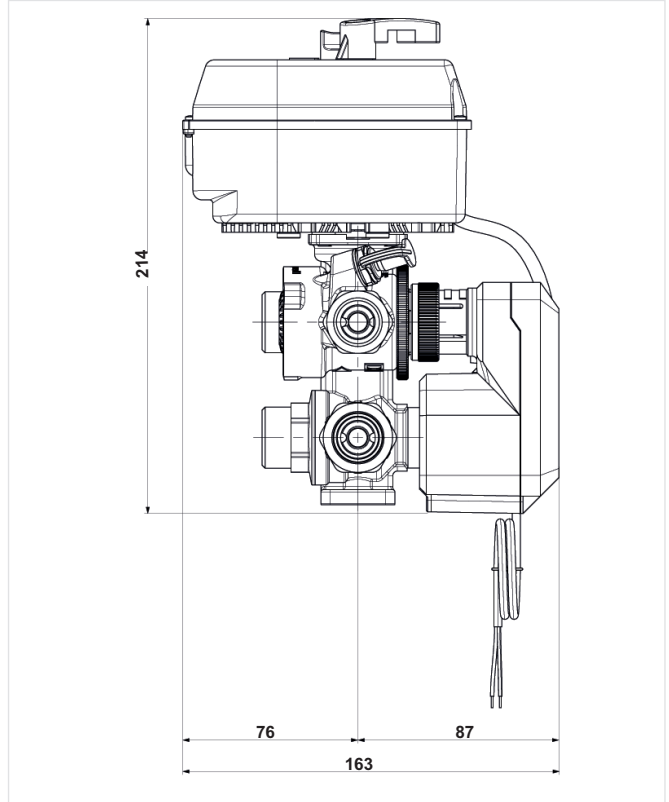
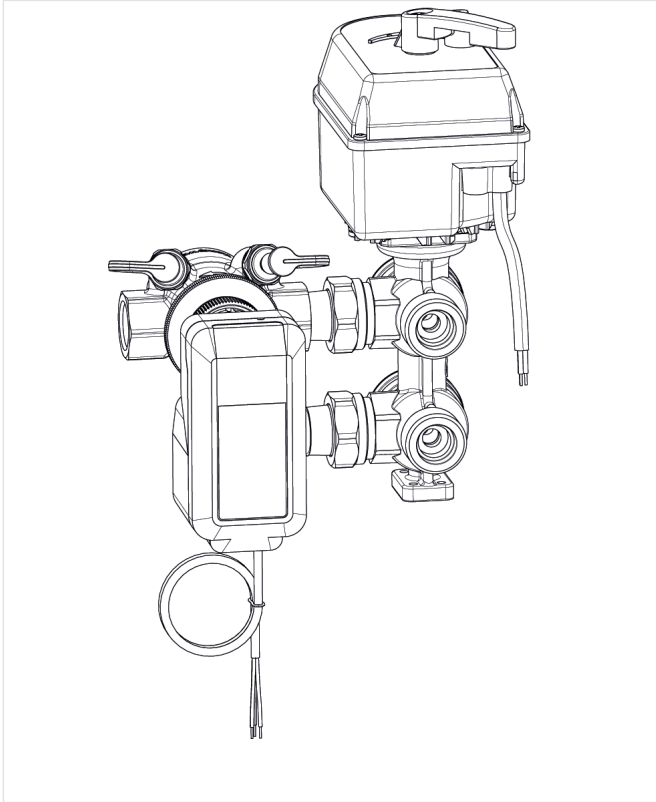


**VBG6-15 with Kombi-FCU DN15 (connected via ACS-15T)**

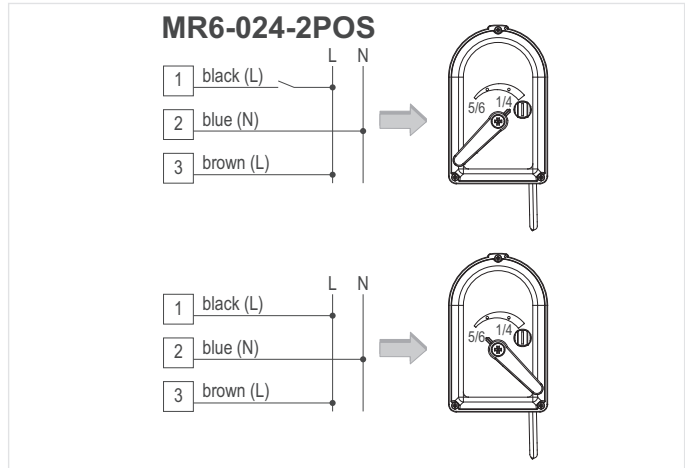
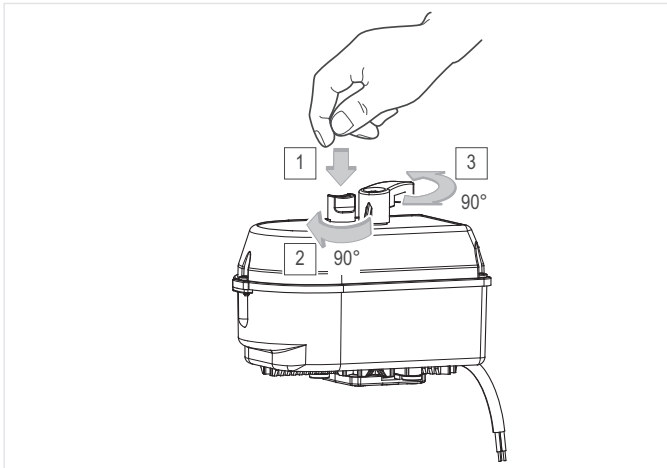
**Option 1**



Option 2



**Electrical Installation**



**MR6-024-010**

24 VAC, 50 Hz

- SN black - GND
- X Output Signal 0 - 10 VDC red - X (+)
- Y Control Signal 0 - 10 VDC, 4 - 20mA blue - Y (+)
- SP brown

**DIP Switches**

|     |       |      |
|-----|-------|------|
| DIP | CCW ↺ | CW ↻ |
| 1   | OFF   | ON   |

|     |     |    |
|-----|-----|----|
| DIP | ↙   | ↘  |
| 2   | OFF | ON |

| DIP                   | 0,16 - 9,84V<br>0 - 20mA | 2 - 9,84V<br>4 - 20mA | 0,16 - 4,88V | 5,12 - 9,84V |
|-----------------------|--------------------------|-----------------------|--------------|--------------|
| Con. sig. resolution: | 40mV                     | 40mV                  | 40mV         | 40mV         |
| 3                     | OFF                      | OFF                   | ON           | ON           |
| 4                     | OFF                      | ON                    | OFF          | ON           |

| DIP | U(V) | I(mA) |
|-----|------|-------|
| 5   | OFF  | ON    |

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