

# Regulating valves

## 636 series



01354/20



### Function

Regulating valves may be used in the closed circuits of heating and cooling systems, to control low rate (two-way valves) and to control temperature by mixing the primary circuit medium with the system return medium (three-way valves) in order to obtain the desired flow temperature to the utility.

They have one regulation port with an equal percentage characteristic and one by-pass port (three-way valves) with a linear characteristic. This adjustment characteristic guarantees the best possible system response to the various load conditions.

They can be used in conjunction with proportional actuators with a 0–10 V, or 2- or 3-point control signal, depending on the requirements of the thermal load to be controlled.

### Reference documentation

- Instruction sheet Digital regulator with functional synoptic for heating and cooling, code 161010.
- Instruction sheet 18057 1520 series Optimiser® digital climate regulator for heating.
- Instruction sheet 18075 1520 series Optimiser® digital climate regulator for heating and heating/cooling.

### Product range

|             |                                                           |                                                                  |
|-------------|-----------------------------------------------------------|------------------------------------------------------------------|
| Code 636.00 | Two-way regulating globe valve with threaded connection   | size DN 15–DN 50 (1/2"–2") F                                     |
| Code 636.10 | Three-way regulating globe valve with threaded connection | size DN 15–DN 50 (1/2"–2") F                                     |
| Code 636004 | Actuator for threaded regulating valves                   | 24 V electric supply; 2/3-point control signal, 0–10 V           |
| Code 636002 | Actuator for threaded regulating valves                   | 230 V electric supply; 2/3-point control signal                  |
| Code 636014 | Actuator for threaded regulating valves                   | 24 V electric supply; 2/3-point control signal, 0–10 V           |
| Code 636    | Three-way regulating globe valve with flanged connection  | size DN 15–DN 150                                                |
| Code 636024 | Actuator for flanged regulating valves                    | 24 V electric supply; 2/3-point control signal, 0–10 V / 4–20 mA |
| Code 636034 | Actuator for flanged regulating valves                    | 24 V electric supply; 2/3-point control signal, 0–10 V / 4–20 mA |

### Valve technical specifications

#### THREADED VERSION

##### Materials

|               |                                       |
|---------------|---------------------------------------|
| Body:         | brass CC752S                          |
| Seat:         | brass CC752S                          |
| Control stem: | stainless steel EN 10088-3 (AISI 303) |

##### Performance

|                                       |                                                                   |
|---------------------------------------|-------------------------------------------------------------------|
| Medium:                               | water, glycol solutions                                           |
| Max. percentage of glycol:            | 50 %                                                              |
| Max. working pressure:                | 16 bar                                                            |
| Working temperature range:            | 0–100 °C                                                          |
| Seepage class, main port:             | ≤ 0.05 % Kvs                                                      |
| Seepage class, by-pass:               | ≤ 1 % Kvs                                                         |
| Nominal stroke:                       | 8 mm                                                              |
| Regulation characteristic, main port: | equal percentage                                                  |
| Regulation characteristic, by-pass:   | linear                                                            |
| Connections:                          | Rp 1/2", 3/4", 1", 1 1/4", 1 1/2", 2"<br>(EN10226-1) F with union |

#### FLANGED VERSION

##### Materials

|                  |                                       |
|------------------|---------------------------------------|
| Body:            | grey cast iron EN-GJL-250             |
| Seat, main port: | grey cast iron EN-GJL-250             |
| Seat, by-pass:   | stainless steel EN 10088-3 (AISI 420) |
| Control stem:    | stainless steel EN 10088-3 (AISI 420) |

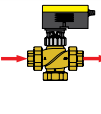
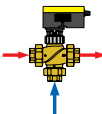
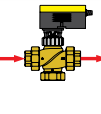
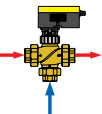
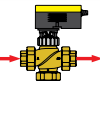
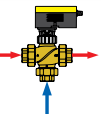
##### Performance

|                                       |                                                                                    |
|---------------------------------------|------------------------------------------------------------------------------------|
| Medium:                               | water, glycol solutions                                                            |
| Max. percentage of glycol:            | 50 %                                                                               |
| Max. working pressure:                | 16 bar                                                                             |
| Working temperature range:            | 0–100 °C                                                                           |
| Seepage class, main port:             | ≤ 0.1 % Kvs                                                                        |
| Nominal stroke:                       | 20 mm (DN 65–DN 80)<br>40 mm (DN 100–DN 150)                                       |
| Regulation characteristic, main port: | equal percentage                                                                   |
| Regulation characteristic, by-pass:   | linear                                                                             |
| Connections:                          | DN 65, 80, 100, 125, 150; PN 16<br>to be coupled with counterflange EN1092-1-GHISA |

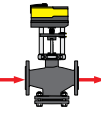
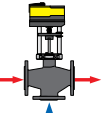
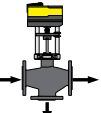
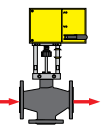
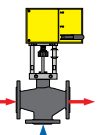
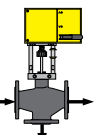
## Actuator technical specifications

|                           | <b>636004</b>                                                                     | <b>636002</b>                                                                     | <b>636014</b>                                                                     | <b>636024</b>                                                                       | <b>636034</b>                                                                       |
|---------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                           |  |  |  |  |  |
| Type                      | Synchronous motor                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Electric supply           | 24 V (AC)/(DC)                                                                    | 230 V (AC)/(DC)                                                                   | 24 V (AC)/(DC)                                                                    | 24 V (AC)/(DC)                                                                      |                                                                                     |
| Power consumption         | 4.8 W, 8.5 VA                                                                     | 2.0 W, 4.0 VA                                                                     | 4.9 W, 8.7 VA                                                                     | 3,5 VA                                                                              | 20 VA                                                                               |
| Control signal            | 2/3-point, 0–10 V                                                                 | 2/3-point                                                                         | 2/3-point, 0–10 V                                                                 | 2/3-point, 0–10 V / 4–20 mA                                                         |                                                                                     |
| Nominal force             | 250 N                                                                             | 500 N                                                                             | 500 N                                                                             | 1000 N                                                                              | 2500 N                                                                              |
| Protection class          | IP 54 (horizontal)                                                                | IP 54 (horizontal)                                                                | IP 54 (horizontal)                                                                | IP 54                                                                               | IP 66                                                                               |
| Operating time            | 35/60/120 s                                                                       | 120 s                                                                             | 60/120 s                                                                          | 80/120 s                                                                            | DN 65-DN 80:<br>40/80/120 s<br>DN 100-DN 150:<br>80/160/240 s                       |
| Ambient temperature range | -10–55 °C                                                                         | -10–55 °C                                                                         | -10–55 °C                                                                         | -10–55 °C                                                                           | -10–55 °C                                                                           |

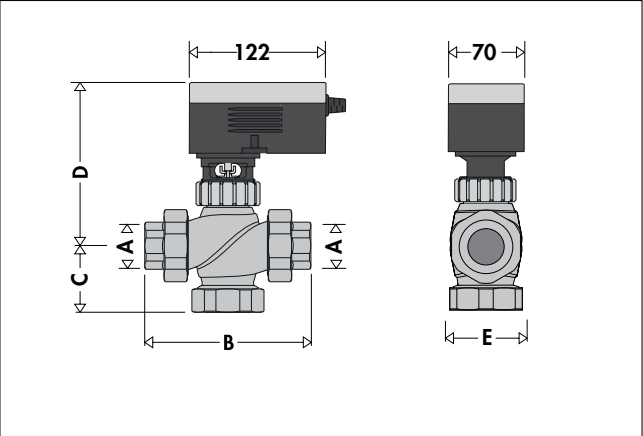
## Maximum working differential pressure

| Valve code | Kv  | Δp max. con <b>636004</b><br>(250 N)                                                |                                                                                     | Δp max. con <b>636002</b><br>(500 N)                                                |                                                                                     | Δp max. con <b>636014</b><br>(500 N)                                                |                                                                                      |
|------------|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|            |     |  |  |  |  |  |  |
| 6364.0     | 4   | 4 bar                                                                               |                                                                                     | 6 bar                                                                               |                                                                                     | 6 bar                                                                               |                                                                                      |
| 6365.0     | 6.3 | 4 bar                                                                               |                                                                                     | 5 bar                                                                               |                                                                                     | 5 bar                                                                               |                                                                                      |
| 6366.0     | 10  | 4 bar                                                                               | 3 bar                                                                               | 4 bar                                                                               |                                                                                     | 4 bar                                                                               |                                                                                      |
| 6367.0     | 16  | 3 bar                                                                               | 2 bar                                                                               | 3,5 bar                                                                             | 3,7 bar                                                                             | 3,5 bar                                                                             | 3,7 bar                                                                              |
| 6368.0     | 22  | 1,9 bar                                                                             | 1,2 bar                                                                             | 3 bar                                                                               | 2,7 bar                                                                             | 3 bar                                                                               | 2,7 bar                                                                              |
| 6369.0     | 28  | 1 bar                                                                               | 0,8 bar                                                                             | 2,4 bar                                                                             | 1,8 bar                                                                             | 2,4 bar                                                                             | 1,8 bar                                                                              |

The Δp max value given in the table is the maximum working differential pressure at which the actuator fitted on the valve moves the obturator correctly. This value depends on the installation configuration.

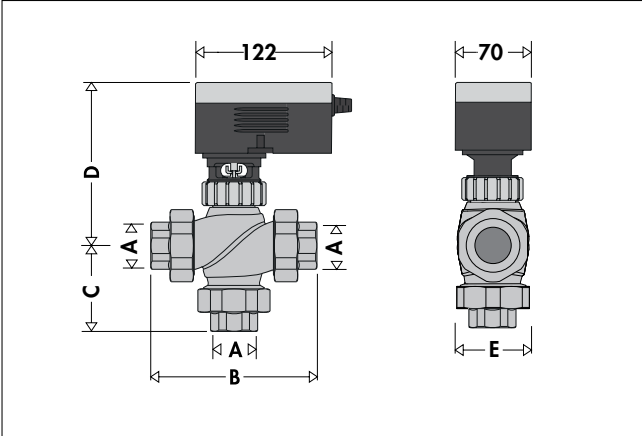
| Valve code | Kv  | Δp max. with <b>636024</b><br>(1000 N)                                              |                                                                                     |                                                                                     | ΔP max. with <b>636034</b><br>(2500 N)                                              |                                                                                     |                                                                                      |
|------------|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|            |     |  |  |  |  |  |  |
| 636060     | 63  | 2,5 bar                                                                             |                                                                                     |                                                                                     | 3 bar                                                                               | 1 bar                                                                               |                                                                                      |
| 636080     | 100 | 1,5 bar                                                                             |                                                                                     |                                                                                     | 3 bar                                                                               | 0,8 bar                                                                             |                                                                                      |
| 636100     | 160 | -                                                                                   |                                                                                     |                                                                                     | 2 bar                                                                               | 0,5 bar                                                                             |                                                                                      |
| 636120     | 220 | -                                                                                   |                                                                                     |                                                                                     | 1,5 bar                                                                             |                                                                                     |                                                                                      |
| 636150     | 320 | -                                                                                   |                                                                                     |                                                                                     | 1 bar                                                                               |                                                                                     |                                                                                      |

Dimensions

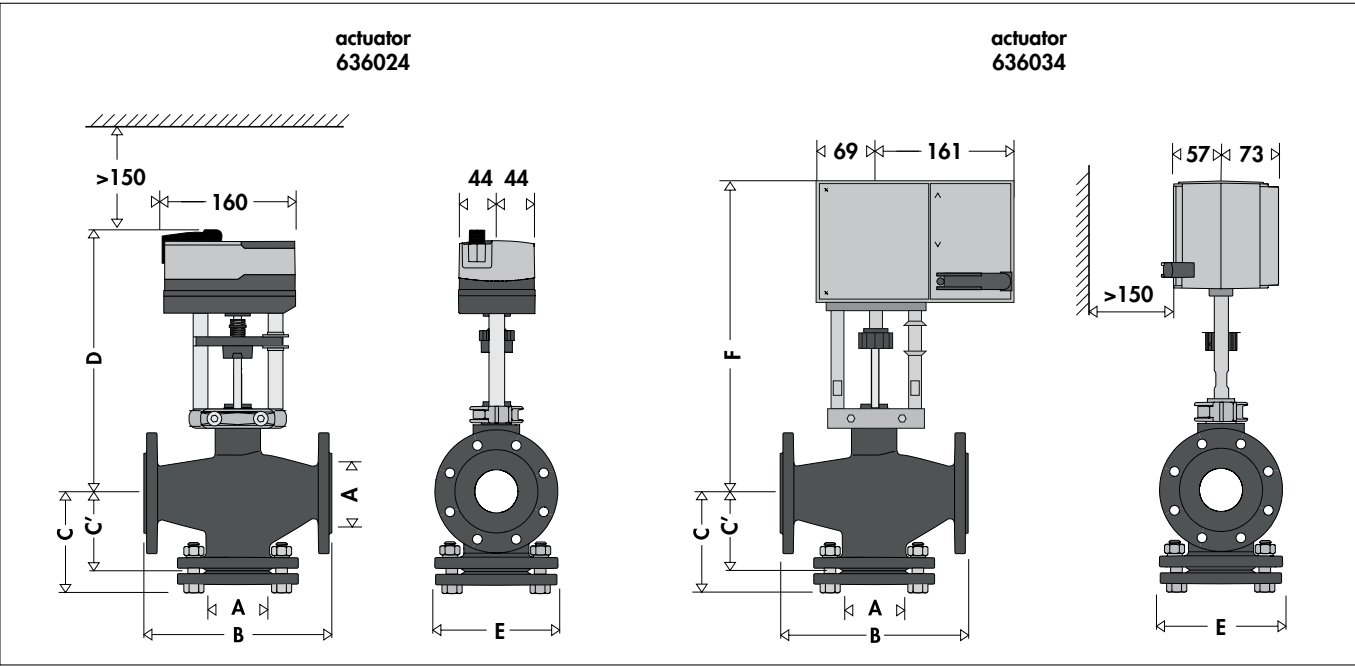


| Code   | A         | B   | C    | D   | E    | Weight (kg)* |
|--------|-----------|-----|------|-----|------|--------------|
| 636400 | 1/2" Rp   | 138 | 58,5 | 153 | 48,5 | 1,7          |
| 636500 | 3/4" Rp   | 143 | 58   | 146 | 54,5 | 2,0          |
| 636600 | 1" Rp     | 156 | 61   | 150 | 59   | 2,4          |
| 636700 | 1 1/4" Rp | 158 | 62,5 | 153 | 67   | 3,0          |
| 636800 | 1 1/2" Rp | 196 | 75   | 166 | 83,5 | 4,0          |
| 636900 | 2" Rp     | 215 | 87   | 175 | 92   | 5,4          |

(\*) with actuator 636002, 636004 o 636014



| Code   | A         | B   | C     | D   | E    | Weight (kg)* |
|--------|-----------|-----|-------|-----|------|--------------|
| 636410 | 1/2" Rp   | 138 | 69    | 153 | 48,5 | 1,8          |
| 636510 | 3/4" Rp   | 143 | 71    | 146 | 54,5 | 2,2          |
| 636610 | 1" Rp     | 156 | 78    | 150 | 59   | 2,6          |
| 636710 | 1 1/4" Rp | 158 | 78,5  | 153 | 67   | 3,3          |
| 636810 | 1 1/2" Rp | 196 | 98    | 166 | 83,5 | 4,5          |
| 636910 | 2" Rp     | 215 | 107,5 | 175 | 92   | 6,1          |



| Code   | A      | B   | C     | C' (3-way) | D   | E   | F   | Weight (kg)** | Weight (kg)*** |
|--------|--------|-----|-------|------------|-----|-----|-----|---------------|----------------|
| 636060 | DN 65  | 290 | 149,5 | 145        | 343 | 185 | 391 | 31            | 29,4           |
| 636080 | DN 80  | 310 | 161,5 | 155        | 353 | 200 | 401 | 37,4          | 35,8           |
| 636100 | DN 100 | 350 | 181,5 | 175        | 368 | 220 | 416 | -             | 46,9           |
| 636120 | DN 125 | 400 | 233,5 | 200        | 401 | 250 | 449 | -             | 67,6           |
| 636150 | DN 150 | 480 | 246,5 | 240        | 422 | 285 | 470 | -             | 94,6           |

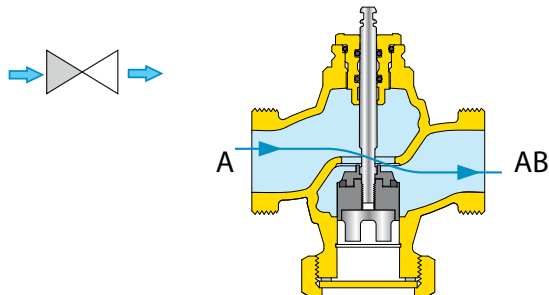
(\*\*) with actuator 636024 (\*\*\*) with actuator 636034

## Operating principle

### Two-way valve

These valves have two ports, so they have an inlet and an outlet. Conventionally the inlet is indicated with the letter "A" and the outlet with the letters "AB".

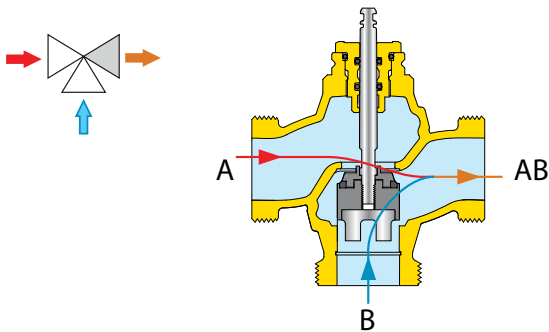
They consist of a valve body and an obturator, which varies the internal opening as it moves, thereby increasing or decreasing resistance to the flow. These characteristics make two-way valves suitable for controlling flow rate in plumbing circuits.



### Three-way valve

These valves have three ports, of which one, known as common and generally indicated with the letters "AB", remains always open. The other two ports, "A" and "B", also known as independent, may be partially open or closed according to the obturator movement.

They are made so that as one of the two independent ports gradually opens, the other one closes, and vice versa.

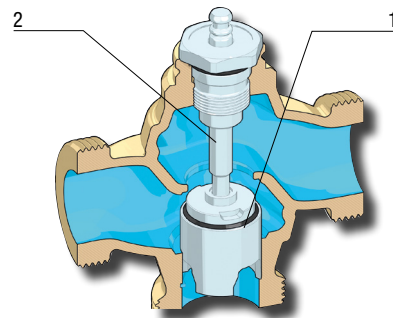


## Construction details

### Globe valve

The obturator (1) is connected mechanically to the stem (2), ensuring linear movement.

This characteristic gives the valve more accurate regulation, limited seepage and high resistance to static pressure.



### Actuators

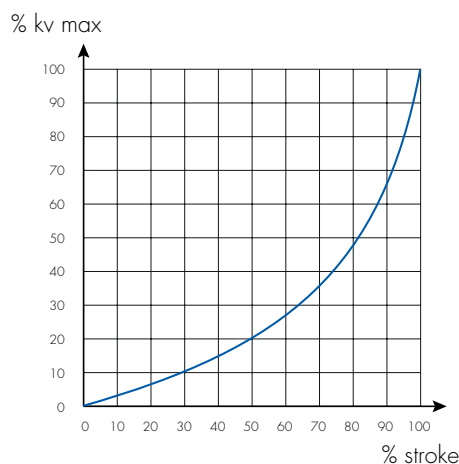
Actuators code 636..4 can be controlled by 1-point, 3-point or 0–10 V control signals, simply by varying the electrical connection configuration. Once wired correctly, they automatically recognise the control signal received from the control unit.

636 series actuators are available with a range of thrust force performances. This makes it possible to choose the most appropriate valve/actuator pairing for the maximum working differential pressure required by the application.

### Two-way valve regulation characteristic

They have equal percentage regulation, with a characteristic curve that tends to flatten at low amounts of opening, but that becomes "steeper" towards maximum opening.

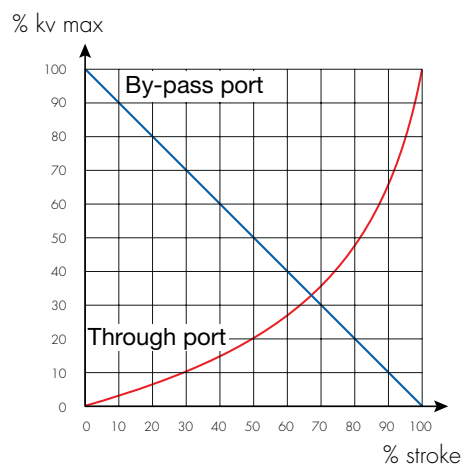
These valves make full use of the whole stroke in applications that require heat emission control.



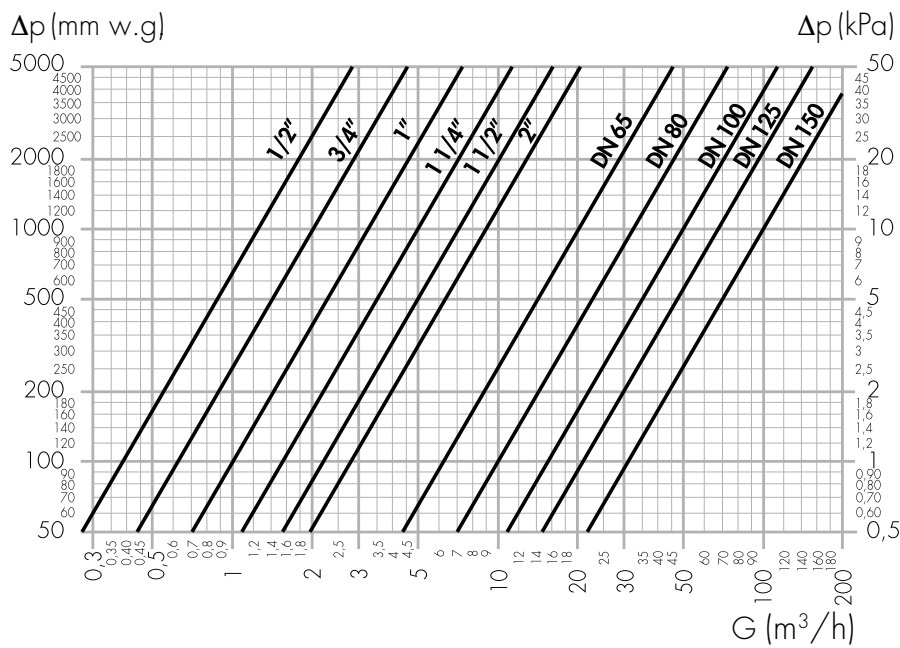
### Three-way valve regulation characteristic

The three-way valve has equal percentage regulation on the main port, while the by-pass port has linear regulation.

This adjustment characteristic guarantees the best possible system response to the various load conditions.



Hydraulic characteristics

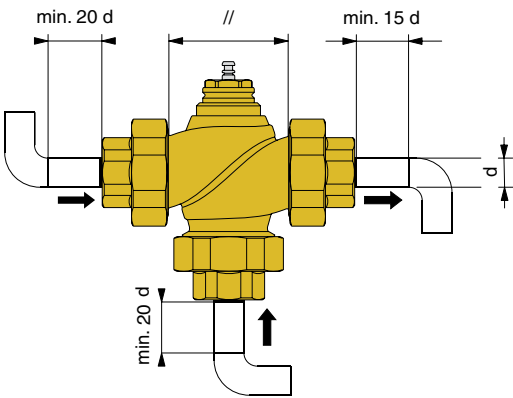


|                |       |       |        |        |        |    |
|----------------|-------|-------|--------|--------|--------|----|
| $\varnothing$  | 1/2"  | 3/4"  | 1"     | 1 1/4" | 1 1/2" | 2" |
| Kv ( $m^3/h$ ) | 4     | 6,3   | 10     | 16     | 22     | 28 |
| $\varnothing$  | DN 65 | DN 80 | DN 100 | DN 125 | DN 150 |    |
| Kv ( $m^3/h$ ) | 63    | 100   | 160    | 220    | 320    |    |

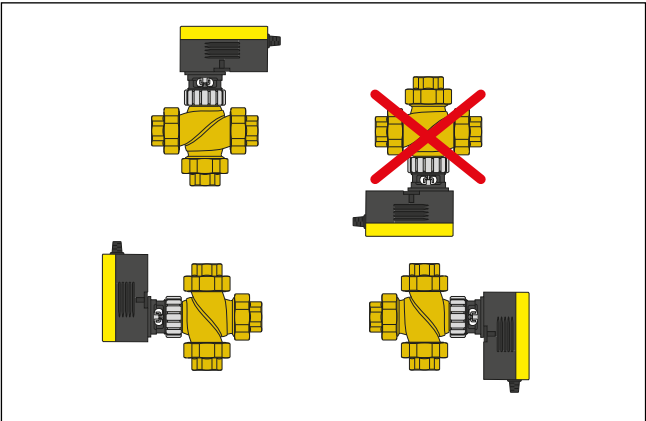
Installation

Recommended installation to prevent noisy water flow in the heating and cooling systems.

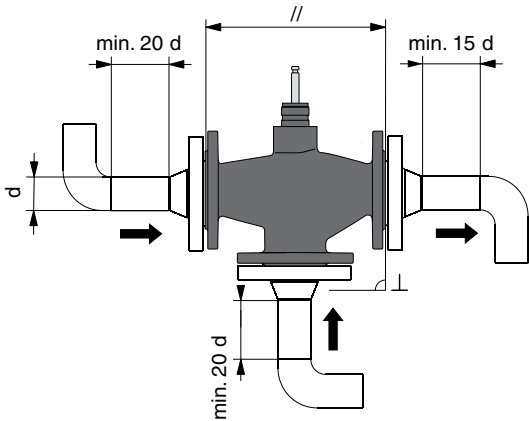
Threaded version



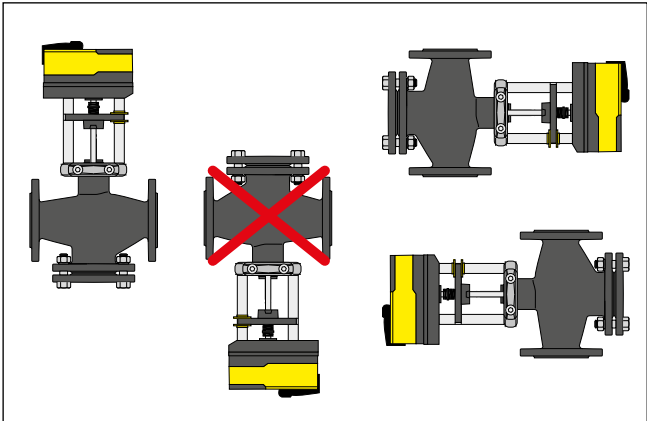
Do not install upside down.



Flanged version

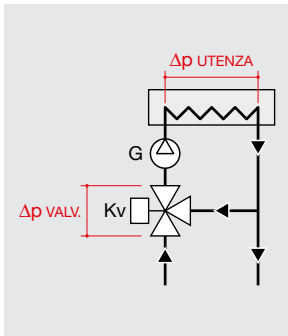


Do not install upside down.



## Dimensioning the mixing circuit

### Typical diagram



In a mixing circuit, the portion upstream from the three-way valve is usually a zone with negligible  $\Delta p$  (and there is normally a hydraulic separator). Therefore the main pressure drop is due to the three-way valve, giving it regulating authority. For this reason, the three-way valve can be dimensioned by considering an acceptable pressure drop for the utility circuit pump, which indicatively may be from 5 % to 15 % of the pressure drop in the utility circuit:

$$\Delta p_{VALV} \cong 0,05-0,15 \cdot \Delta p_{UTILITY}$$

Expressing the valve pressure drop as a function of the flow rate  $G$  and flow coefficient  $Kv$  gives the valve dimensioning relationship:

$$Kv = 0,25-0,45 \cdot G / \sqrt{100 \cdot \Delta p_{UTILITY}}$$

where:  $G$  = flow rate, l/h

$\Delta p_{UTILITY}$  = pressure drop of all components in the circuit, excluding the valve, kPa

$Kv$  = valve flow coefficient,  $m^3/h$

Alternatively, the dimensioning criteria described above can be represented graphically on specific diagrams: each coloured band corresponds to a choice of valve with hydraulic characteristics that are optimal for the design data.

### Example

Dimension a three-way valve for a mixing circuit in a radiant panel system with the following characteristics:

- Design flow rate:  $G = 2.000$  l/h
- Utility pressure drop:  $\Delta p_{UTILITY} = 23$  kPa

#### Analytical method:

Determine the flow coefficient  $Kv$  of the regulating valve:

$$Kv_{MIN} = 0,25 \cdot 2000 / \sqrt{100 \cdot 23} = 10,4 \text{ m}^3/h$$

$$Kv_{MAX} = 0,45 \cdot 2000 / \sqrt{100 \cdot 23} = 18,8 \text{ m}^3/h$$

Therefore the valve is chosen to be 1 1/4" with a coefficient  $Kv$  of 16  $m^3/h$

The valve pressure drop is:

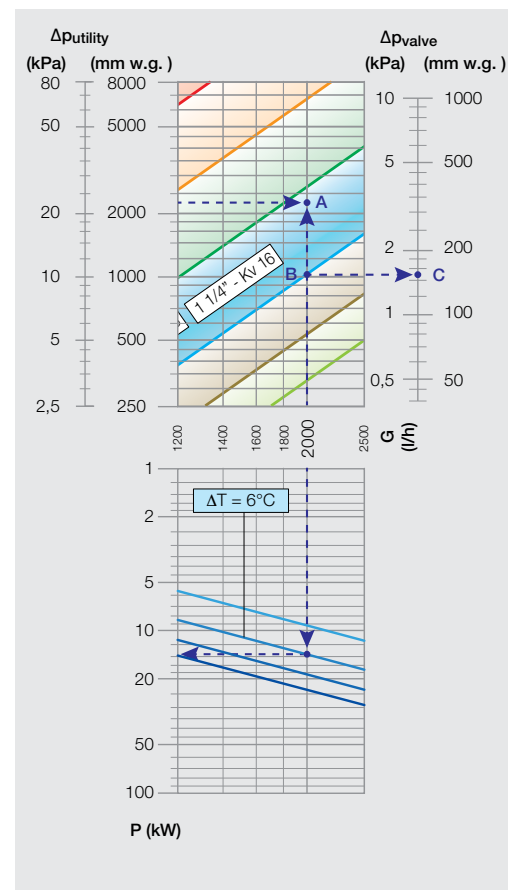
$$\Delta p_{VALV} = (0,01 \cdot G/Kv)^2 = (0,01 \cdot 2000/16)^2 = 1,5 \text{ kPa}$$

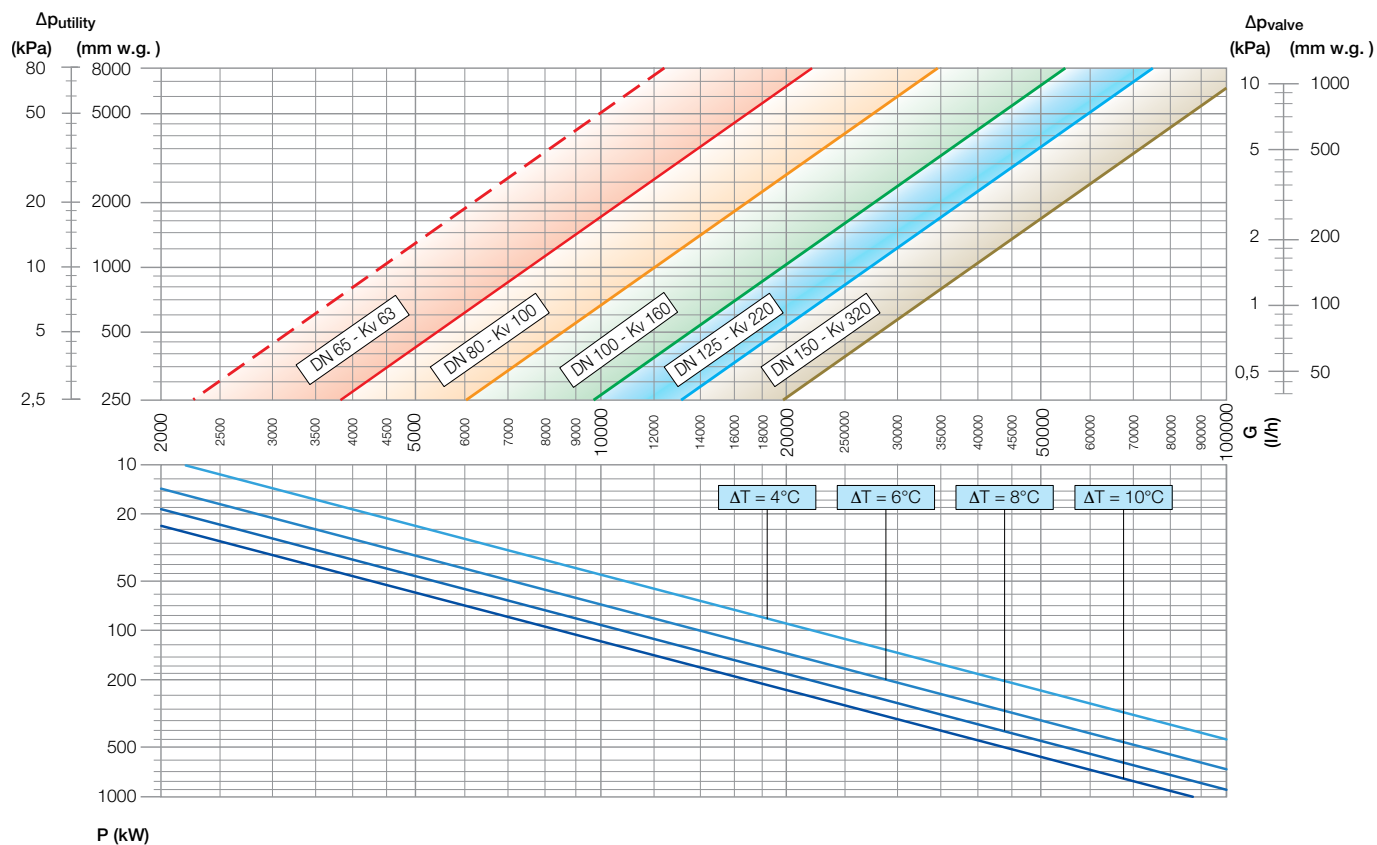
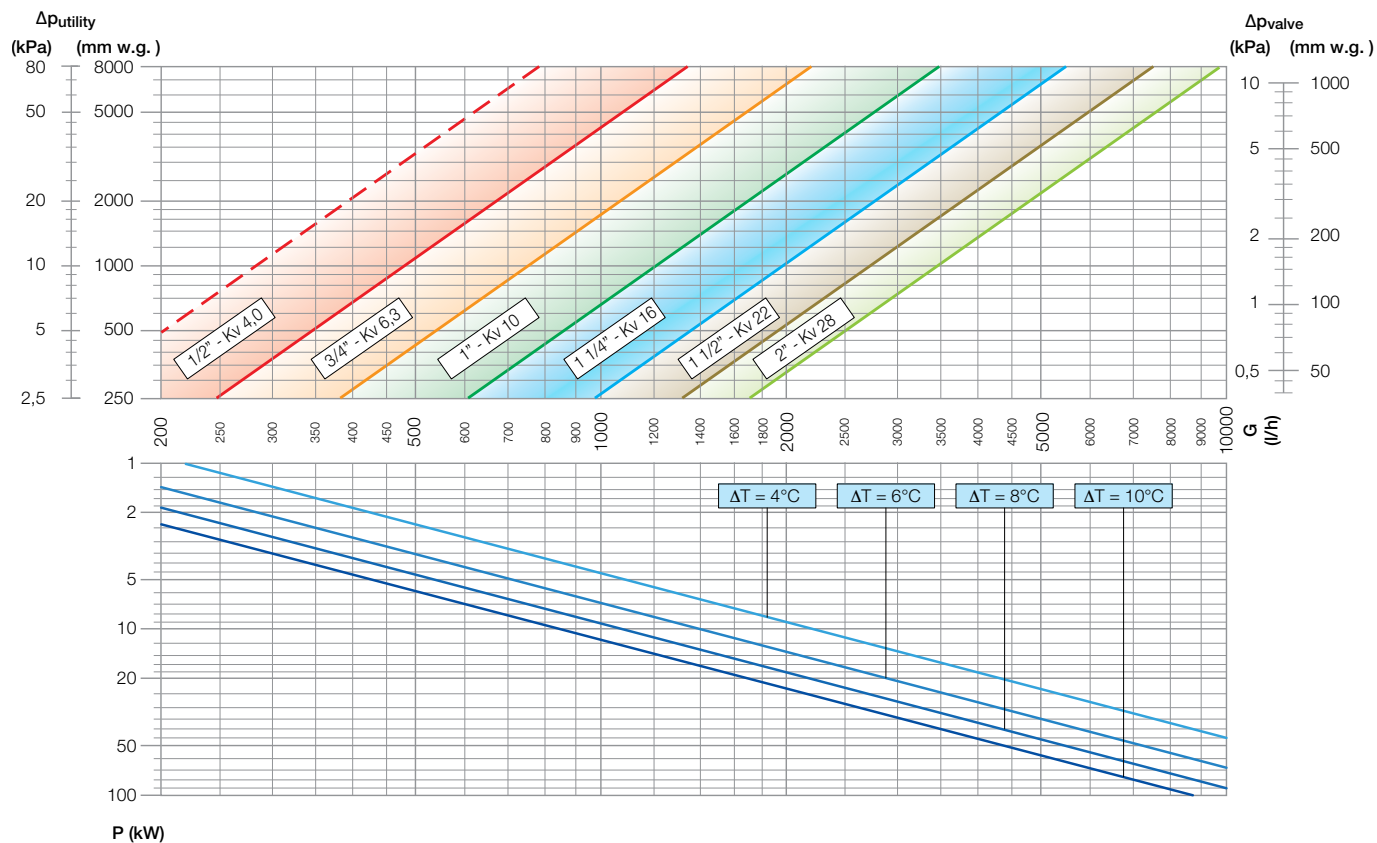
#### Graphical method:

Alternatively, the graphs on the facing page can be used.

Intersecting the flow rate  $G$  with the pressure drop  $\Delta p_{UTILITY}$  gives point A, which is within the band for the 1 1/4" valve. The valve pressure drop can be obtained by starting from point B (where the flow rate  $G$  intersects the curve for the chosen valve) and reading the corresponding value at point C on the relative axis.

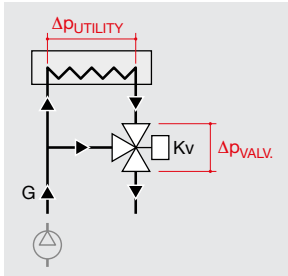
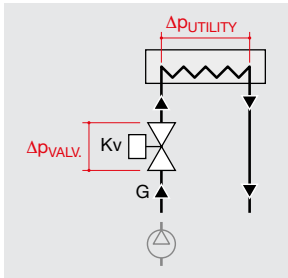
It is also possible to obtain the exchanged power from the graph below the chosen graph. In the example, assuming a temperature difference of 6 °C, we can estimate a power of 13,9 kW based on the design flow rate of 2000 l/h.





## Dimension a limiting (2-way) and diversion (3-way) circuit

### Typical diagram



In these two types of circuit, the two- or three-way regulating valve regulates the flow rate passing through the utility circuit. In such cases, it is important to have good authority by dimensioning the regulating valve to ensure that the pressure drop is not too low compared to that of the utility circuit. Recommended values for rapid dimensioning can be chosen considering:

$$\Delta p_{VALV} \approx 0,5 \div 1,0 \cdot \Delta p_{UTILITY}$$

Expressing the valve pressure drop as a function of the flow rate  $G$  and flow coefficient  $K_v$  gives the valve dimensioning relationship:

$$K_v = 0,10 \div 0,15 \cdot G / \sqrt{100 \cdot \Delta p_{UTILITY}}$$

where:  $G$  = flow rate, l/h

$\Delta p_{UTILITY}$  = pressure drop of all components in the circuit, excluding the valve, kPa.

$K_v$  = valve flow coefficient, m<sup>3</sup>/h

Alternatively, the dimensioning criteria described above can be represented graphically on specific diagrams: each coloured band corresponds to a choice of valve with hydraulic characteristics that are optimal for the design data.

### Example

Dimension a two-way valve to control the power of a heat exchanger with the following characteristics:

- Heat exchanger capacity:  $P = 500 \text{ kW}$
- Heat exchanger temperature difference:  $\Delta T = 10^\circ \text{C}$
- Utility pressure drop:  $\Delta p_{UTILITY} = 30 \text{ kPa}$

#### Analytical method:

Determine the nominal flow rate from the power and temperature difference:

$$G = P \cdot 860 / \Delta T = 500 \cdot 860 / 10 = 43000 \text{ l/h}$$

Determine the flow coefficient  $K_v$  of the regulating valve:

$$K_{v_{MIN}} = 0,10 \cdot 43000 / \sqrt{100 \cdot 30} = 78,5 \text{ m}^3/\text{h}$$

$$K_{v_{MAX}} = 0,15 \cdot 43000 / \sqrt{100 \cdot 30} = 117,7 \text{ m}^3/\text{h}$$

Therefore the valve is chosen to be DN 80 with a coefficient  $K_v$  of 100 m<sup>3</sup>/h. The valve pressure drop is:

$$\Delta p_{VALV} = (0,01 \cdot G / K_v)^2 = (0,01 \cdot 43000 / 100)^2 = 18,5 \text{ kPa}$$

The authority can be calculated for the chosen regulating valve using the specific formula:

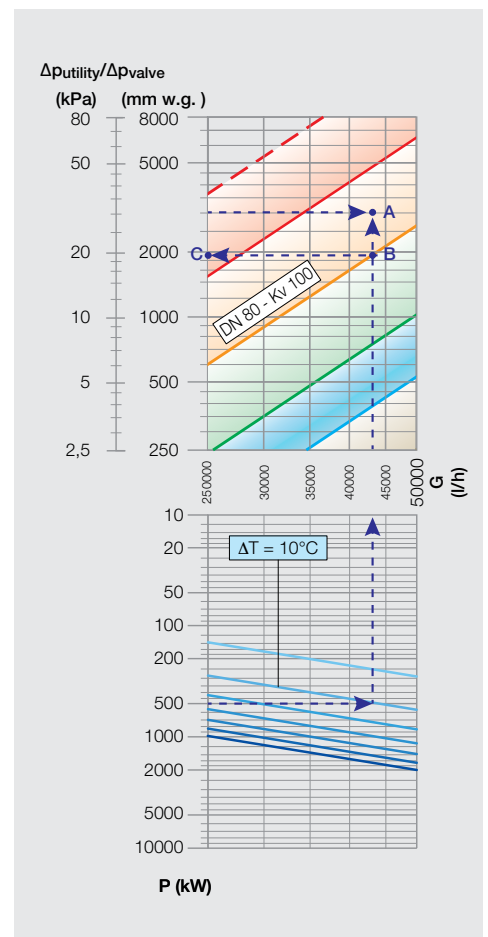
$$a = \Delta p_{VALV} / (\Delta p_{VALV} + \Delta p_{UTILITY})$$

$$a = 18,5 / (18,5 + 30) = 0,38$$

#### Graphical method:

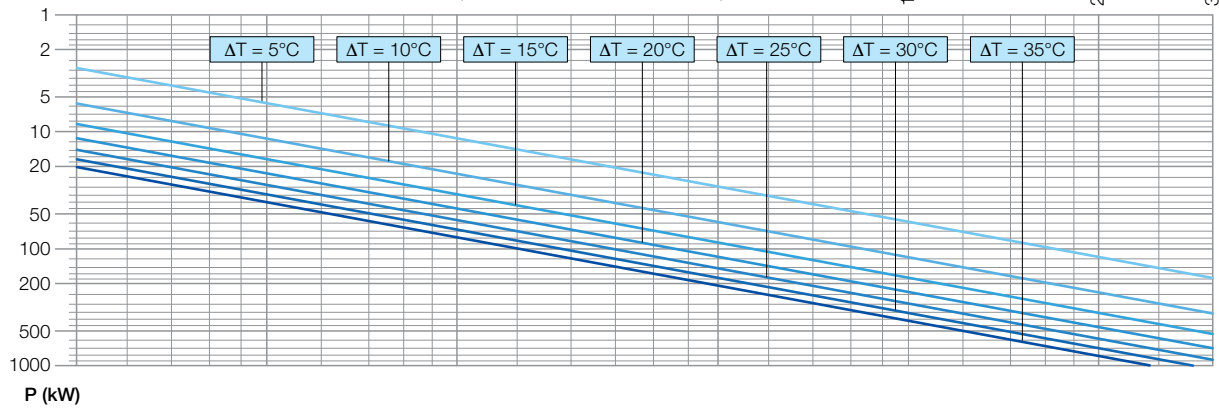
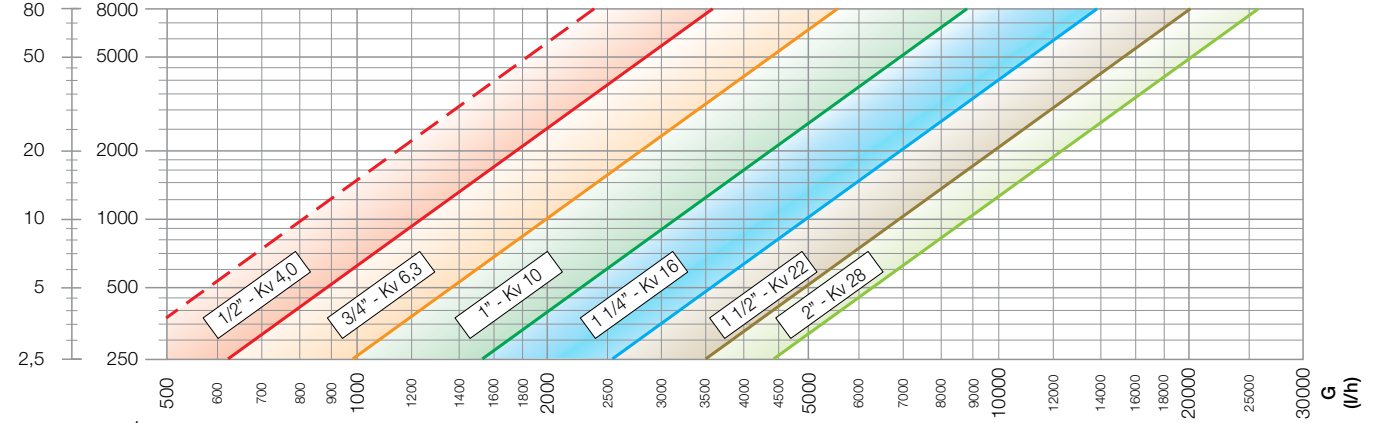
The design flow rate can be obtained from the graph below the dimensioning graph by finding the 500 kW heating capacity point on the line that corresponds to a temperature difference of 10 °C. Then find point A that corresponds to the pressure drop  $\Delta p_{UTILITY}$  within the band for the chosen DN 80 valve.

The valve pressure drop can be obtained from point B (where the flow rate  $G$  intersects the chosen valve) and reading the corresponding value at point C on the same axis.



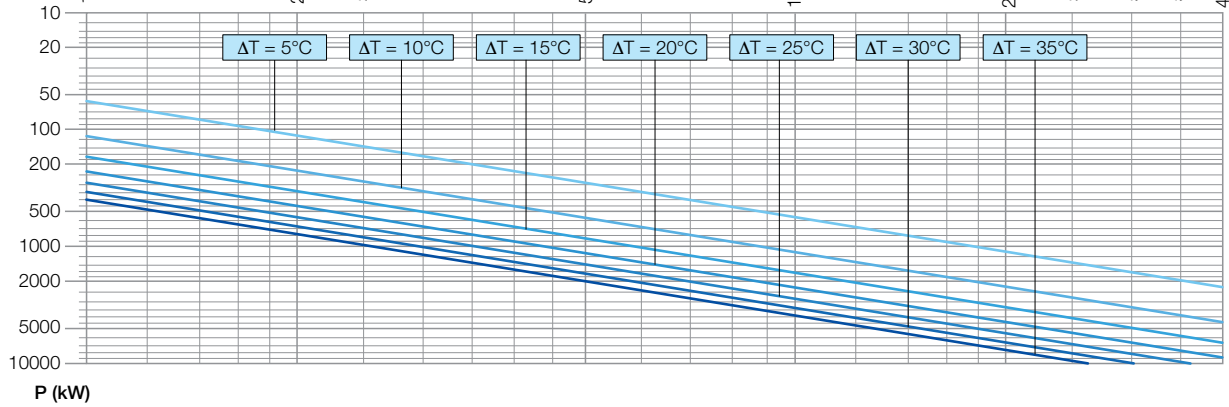
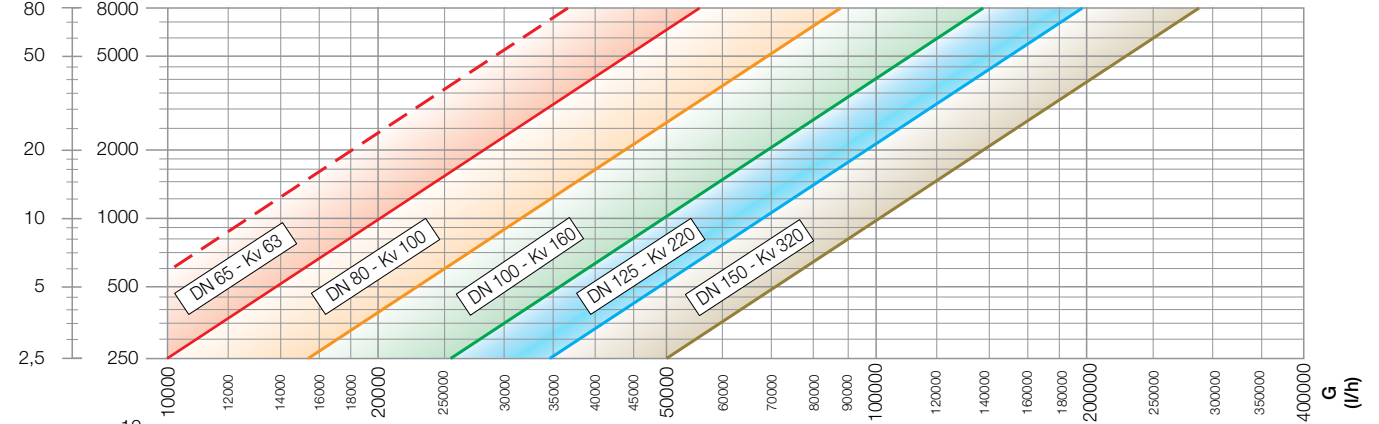
$\Delta p_{\text{utility}}/\Delta p_{\text{valve}}$

(kPa) (mm w.g.)



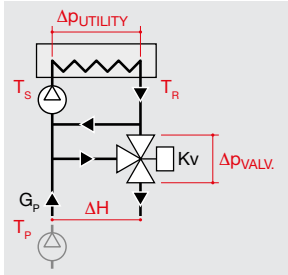
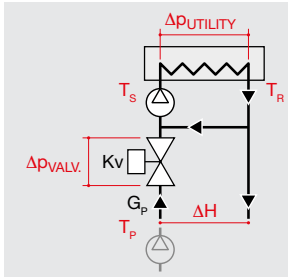
$\Delta p_{\text{utility}}/\Delta p_{\text{valve}}$

(kPa) (mm w.g.)



## Dimensioning an injection circuit

### Typical diagram



In an injection circuit, the by-pass line separates the utility circuit from the primary circuit in which the two- or three-way regulating valve is installed. Moreover, this circuit must always have an upstream pump in order to work. The correct authority value must be considered when dimensioning in order to ensure effective temperature regulation of the flow to the utility circuit. The valve pressure drop must therefore not be too low compared to the available head  $\Delta H$  upstream from the circuit. Recommended values for rapid dimensioning can be chosen considering:

$$\Delta p_{VALV} \cong 0,5-1,0 \cdot \Delta H$$

Expressing the valve pressure drop as a function of the flow rate  $G_p$  and flow coefficient  $Kv_{VALV}$  gives the valve dimensioning relationship:

$$Kv = 0,10-0,15 \cdot G_p / \sqrt{100 \cdot \Delta H}$$

where:  $G_p$  = flow rate in the primary circuit, l/h

$\Delta H$  = available head upstream from the circuit, kPa

$Kv$  = valve flow coefficient,  $m^3/h$

Alternatively, the dimensioning criteria described above can be represented graphically on specific diagrams: each coloured band corresponds to a choice of valve with hydraulic characteristics that are optimal for the design data.

### Example

Dimension a three-way valve to control the flow temperature for an injection circuit with the following characteristics:

- Primary circuit flow temperature:  $T_p = 70^\circ C$
- Secondary circuit flow temperature:  $T_s = 50^\circ C$
- Heating capacity:  $P = 90 \text{ kW}$
- Available head:  $\Delta H = 35 \text{ kPa}$
- Return temperature:  $T_R = 45^\circ C$

#### Analytical method:

Determine the temperature difference on the primary circuit:

$$\Delta T = T_p - T_R = 70 - 45 = 25^\circ C$$

Determine the flow rate in the primary circuit:

$$G_p = P \cdot 860 / \Delta T = 90 \cdot 860 / 25 = 3096 \text{ l/h}$$

Determine the flow coefficient  $Kv$  of the regulating valve:

$$Kv_{MIN} = 0,10 \cdot 3096 / \sqrt{100 \cdot 35} = 5,2 \text{ m}^3/h$$

$$Kv_{MAX} = 0,15 \cdot 3096 / \sqrt{100 \cdot 35} = 7,8 \text{ m}^3/h$$

Therefore the valve is chosen to be 3/4" with a coefficient  $Kv$  of  $6.3 \text{ m}^3/h$

The valve pressure drop is:

$$\Delta p_{VALV} = (0,01 \cdot G / Kv)^2 = (0,01 \cdot 3096 / 6.3)^2 = 24,1 \text{ kPa}$$

The authority can be calculated for the chosen regulating valve using the specific formula:

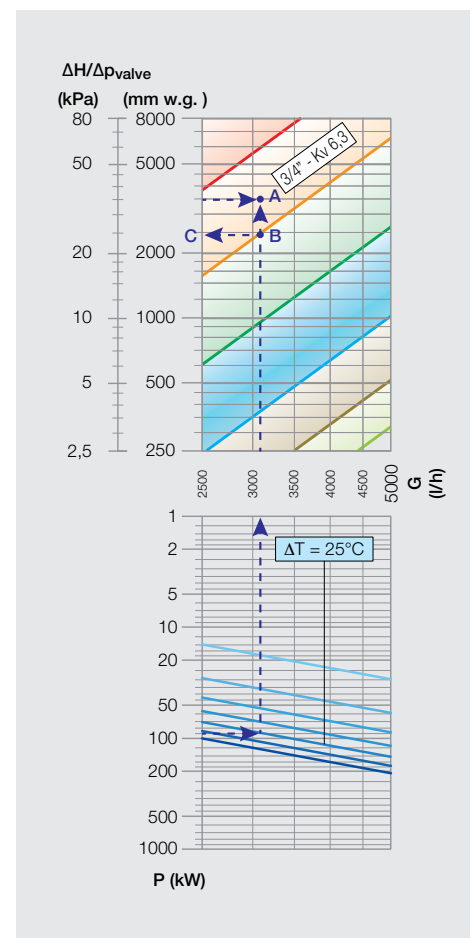
$$a = \Delta p_{VALV} / (\Delta p_{VALV} + \Delta H)$$

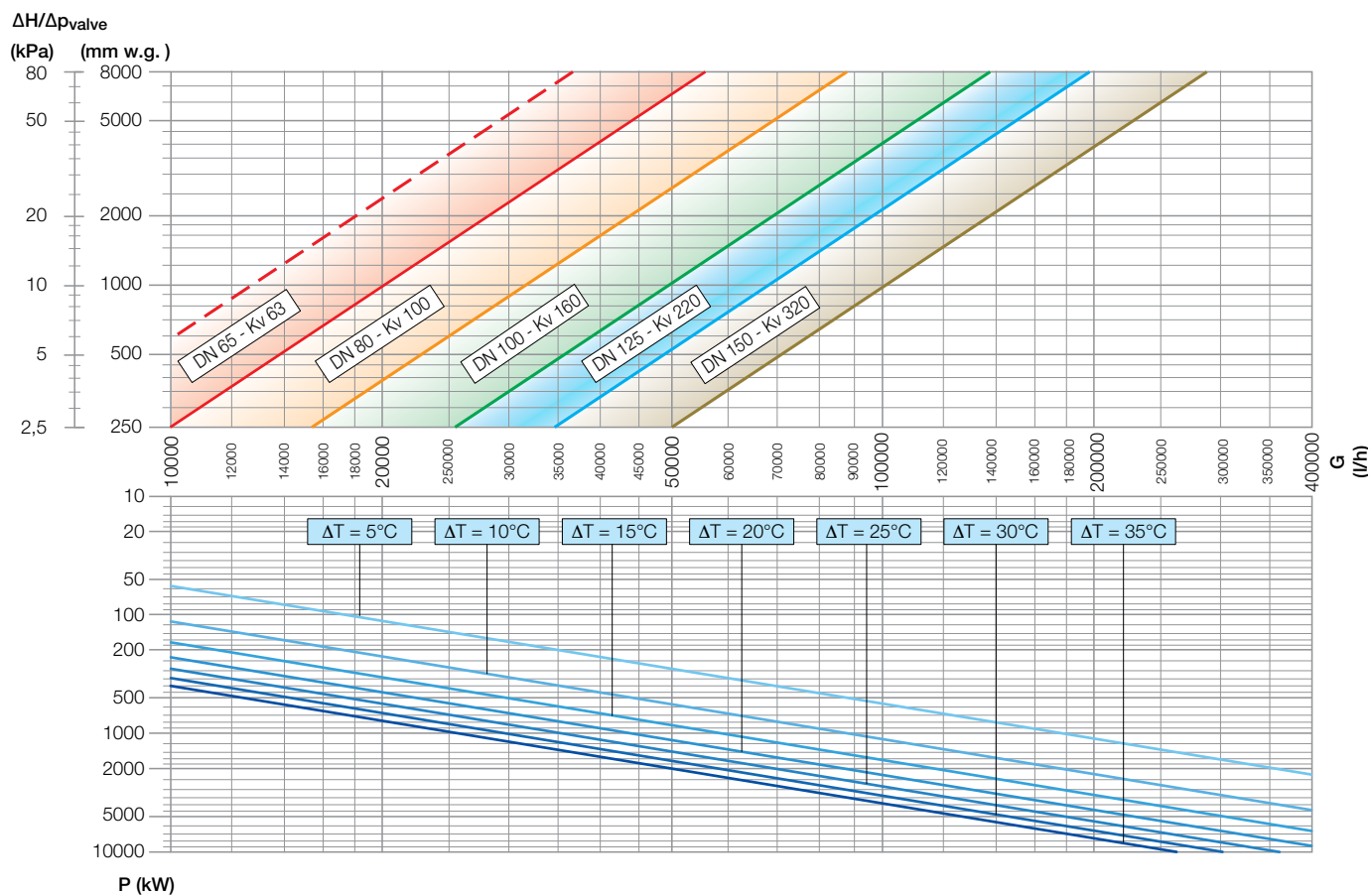
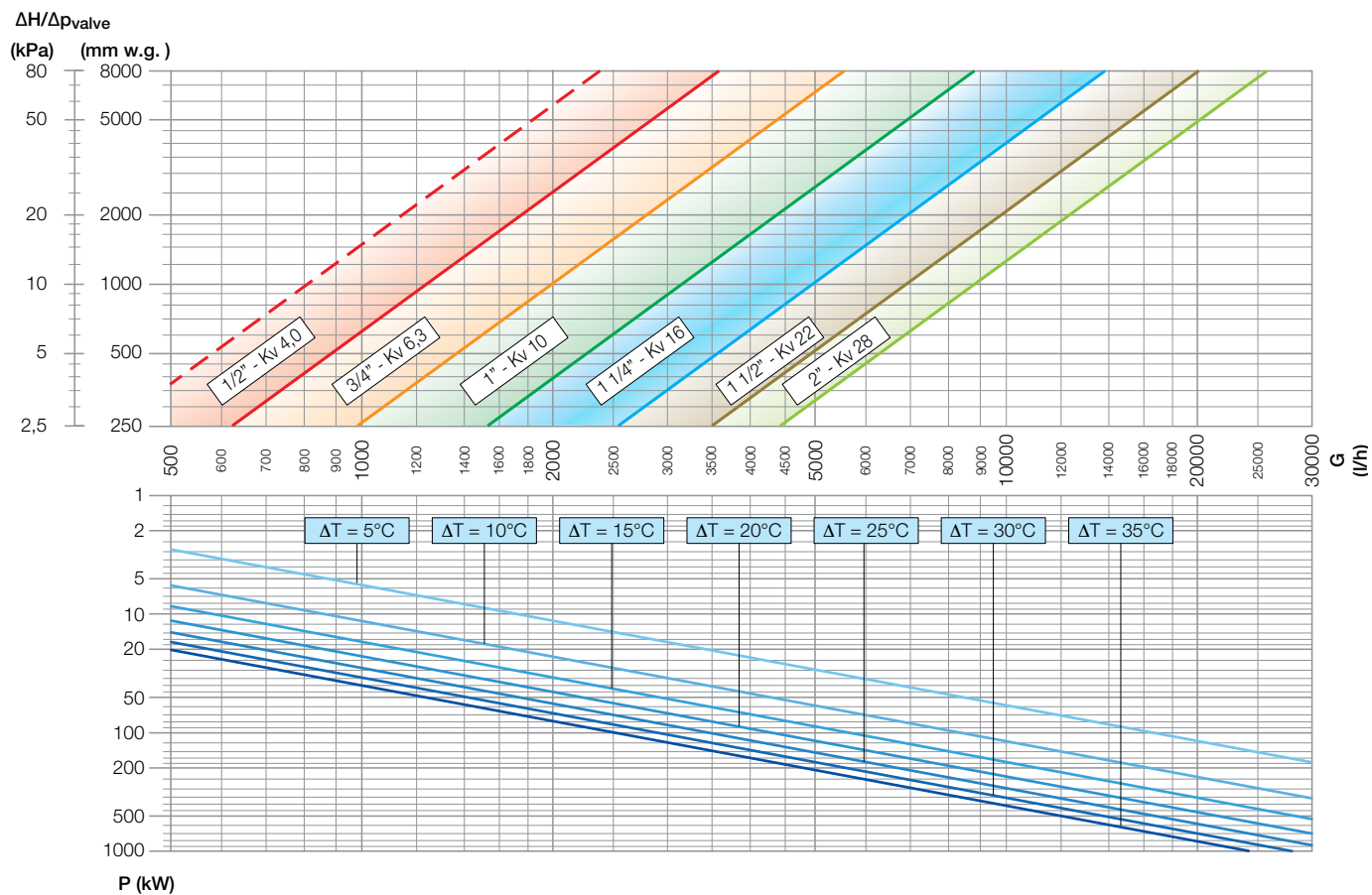
$$a = 24,1 / (24,1 + 35) = 0,40$$

#### Graphical method:

The design flow rate can be obtained from the graph below the dimensioning graph by finding the 90 kW heating capacity point on the line that corresponds to a temperature difference of  $25^\circ C$ . Then find point A that corresponds to the pressure drop  $\Delta H$  within the band for the chosen 3/4" valve.

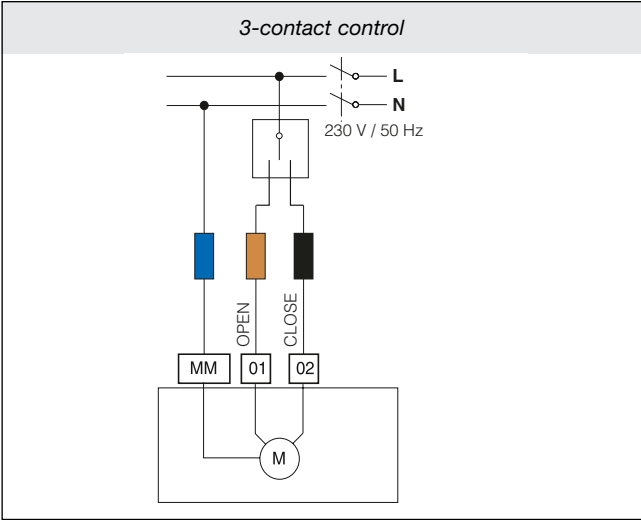
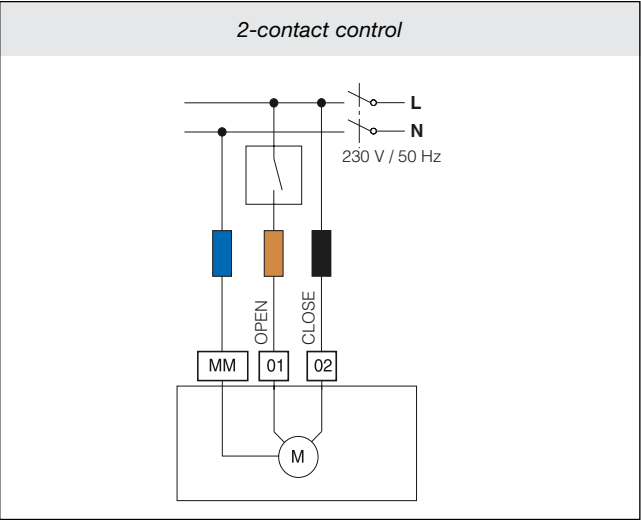
The valve pressure drop can be obtained from point B (where the flow rate  $G_p$  intersects the chosen valve) and reading the corresponding value at point C on the same axis.



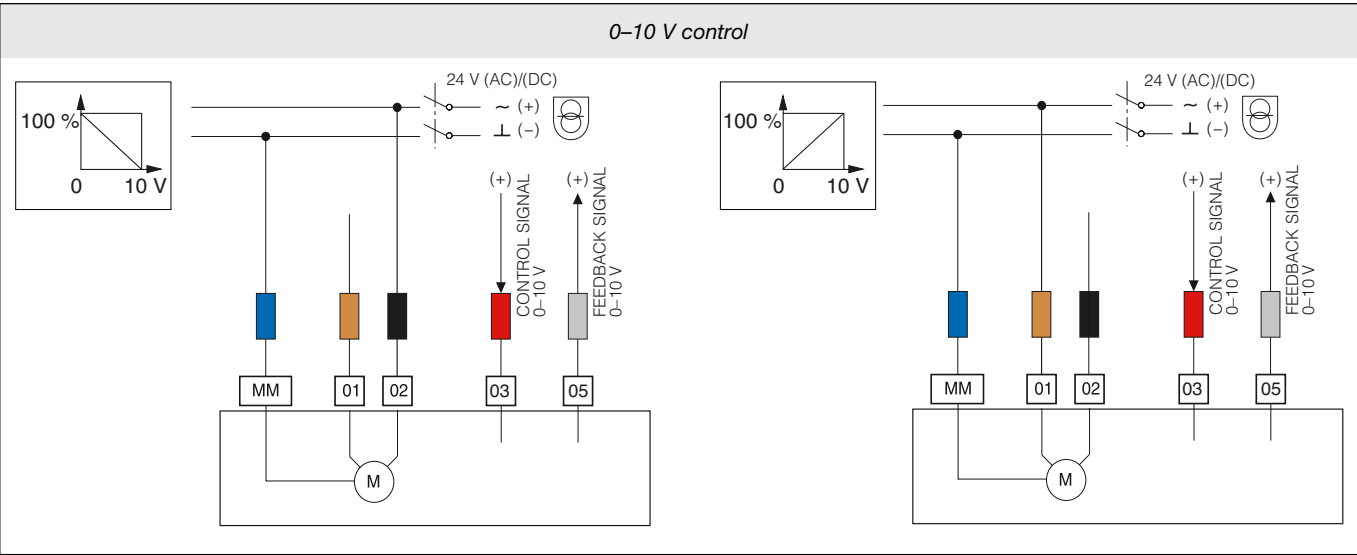
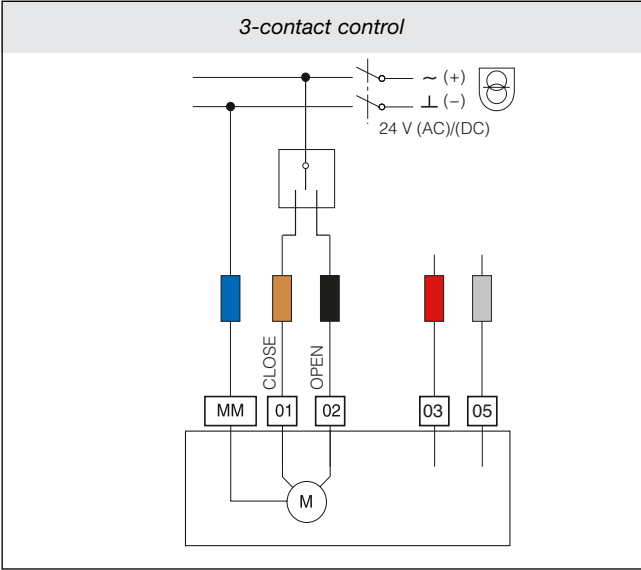
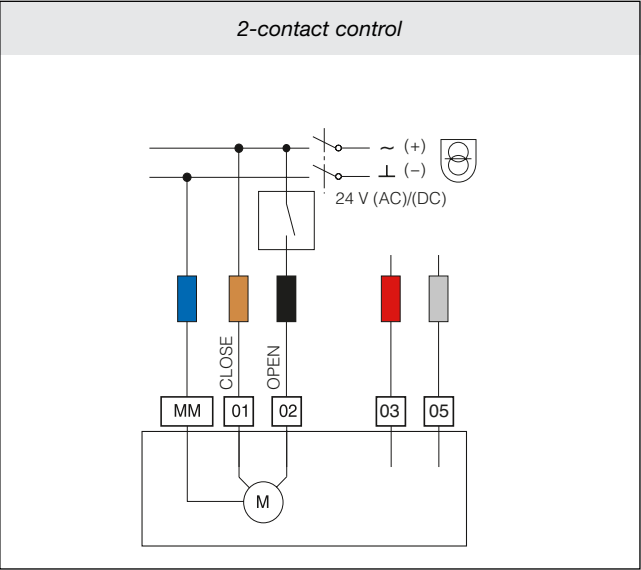


Wiring diagrams

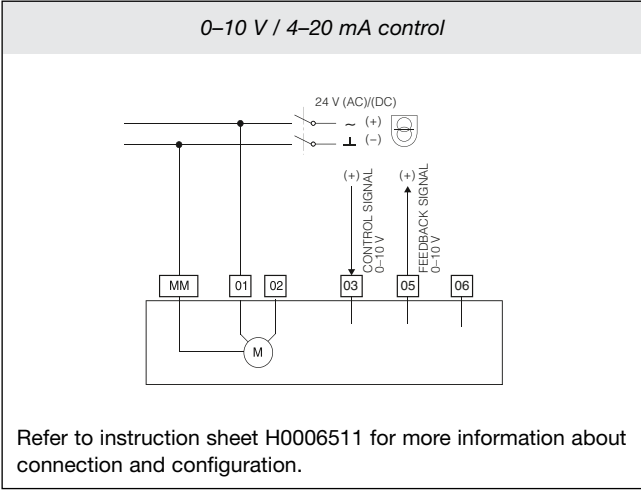
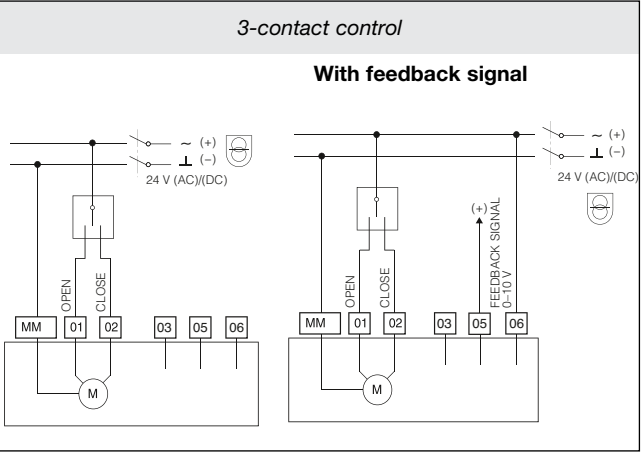
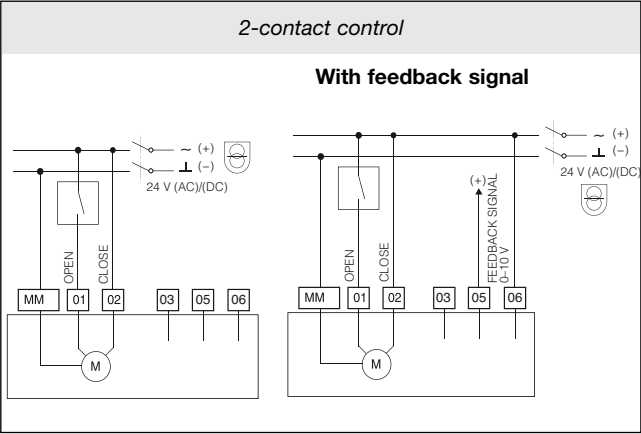
Actuator  
(code 636002)



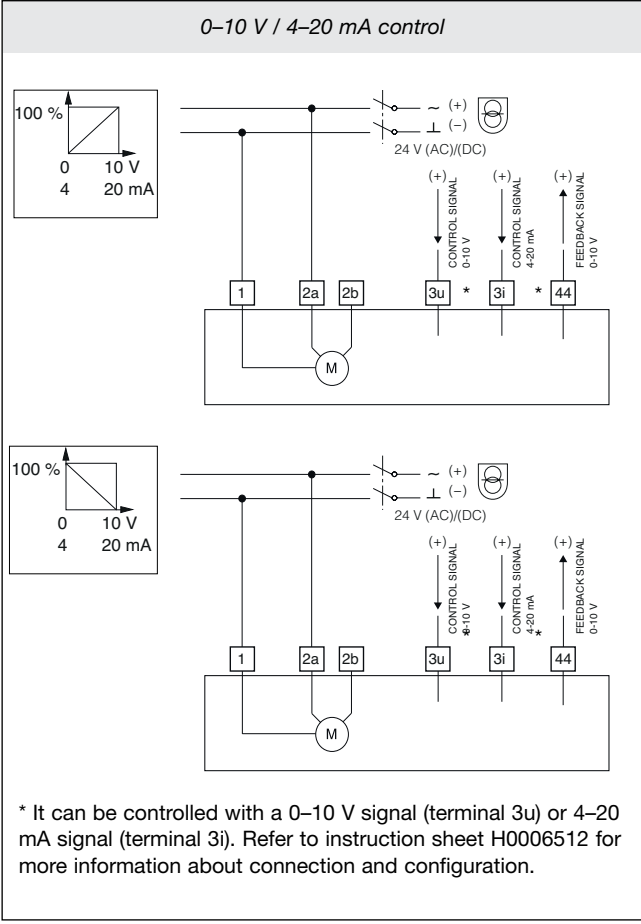
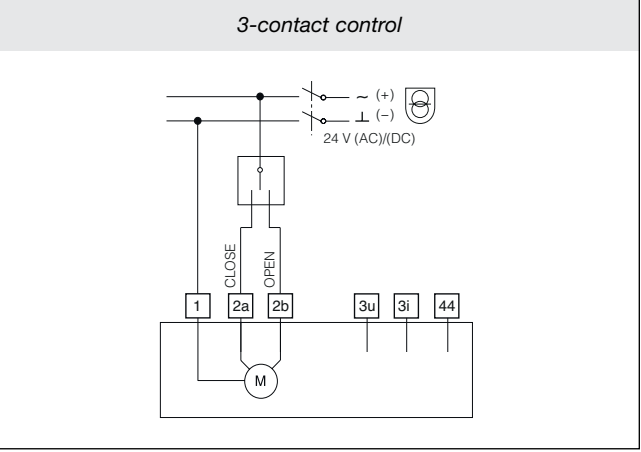
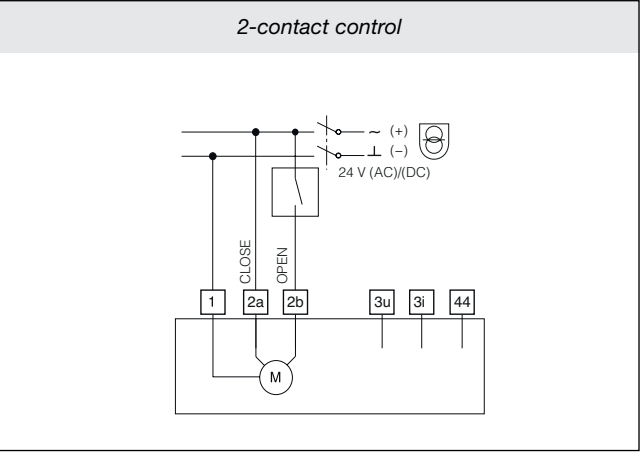
Actuator  
(code 636004 - code 636014)



**Actuator  
(code 636024)**

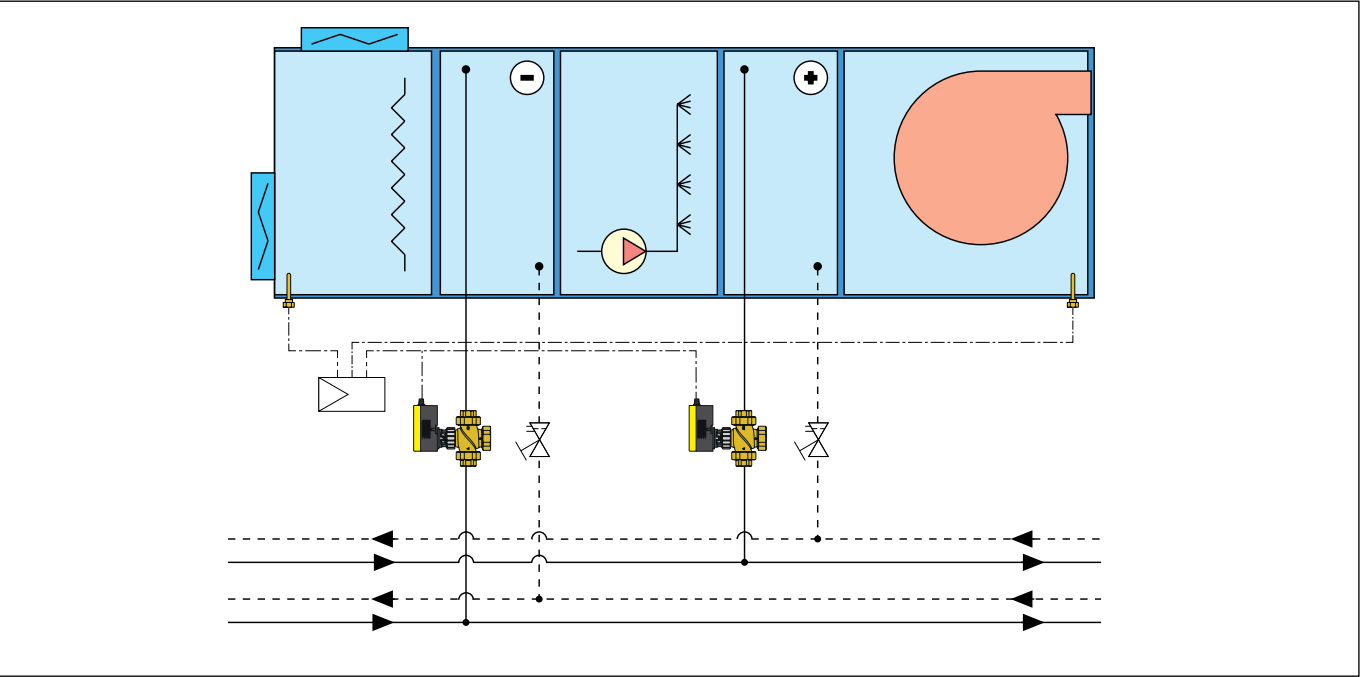


**Actuator  
(code 636034)**

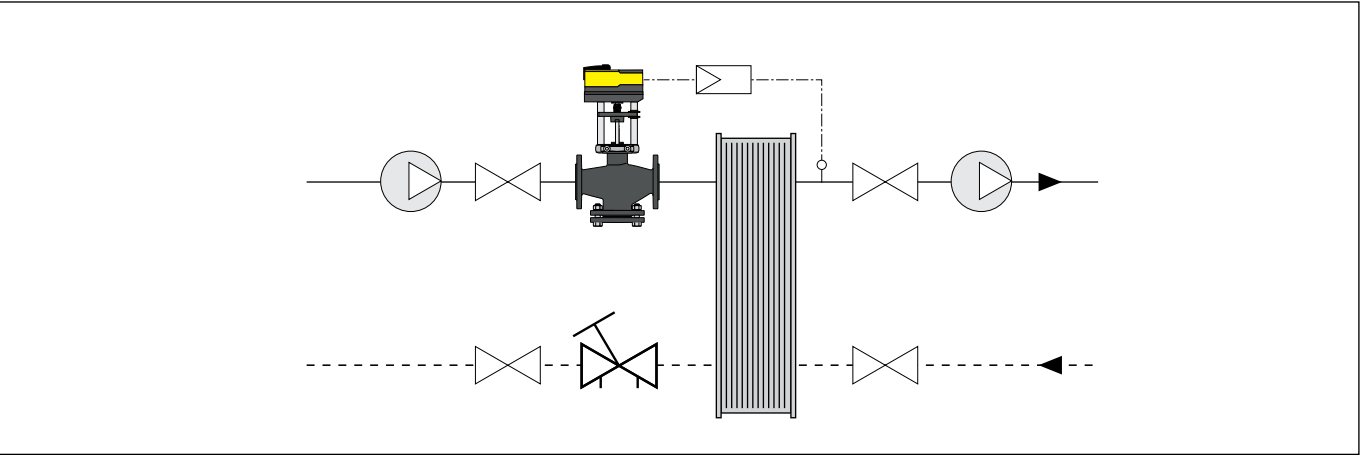


**Application diagrams**

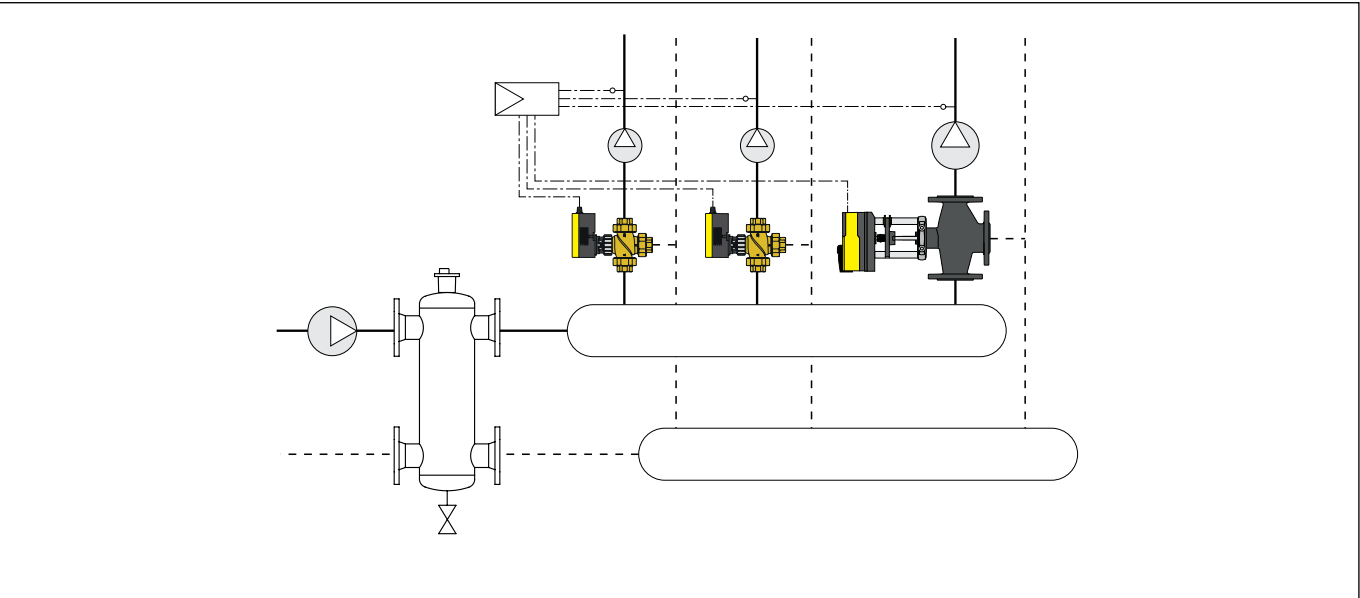
Air treatment coil regulation with two-way valves.



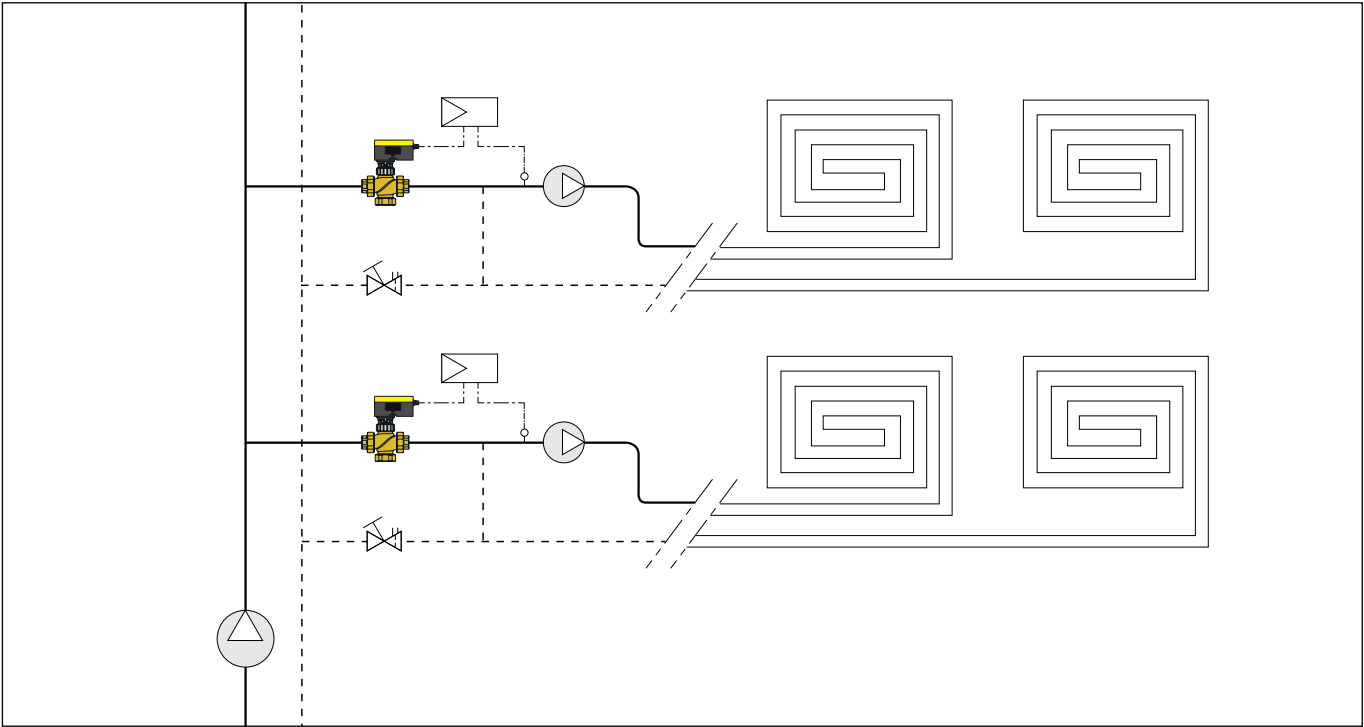
Secondary circuit temperature regulation with a two-way valve.



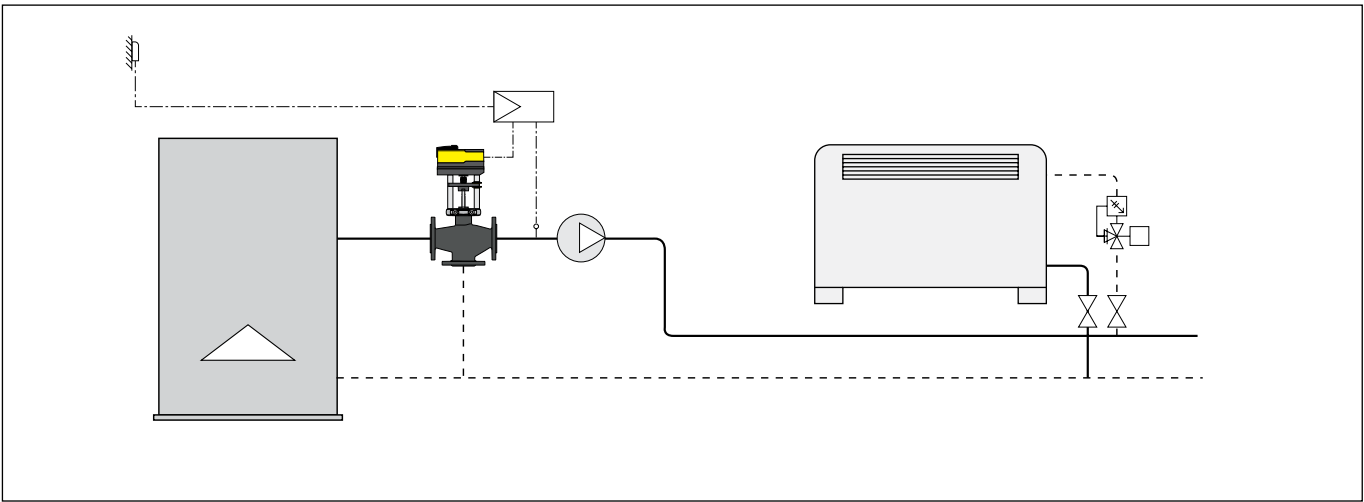
Regulation with a three-way valve in the central heating system.



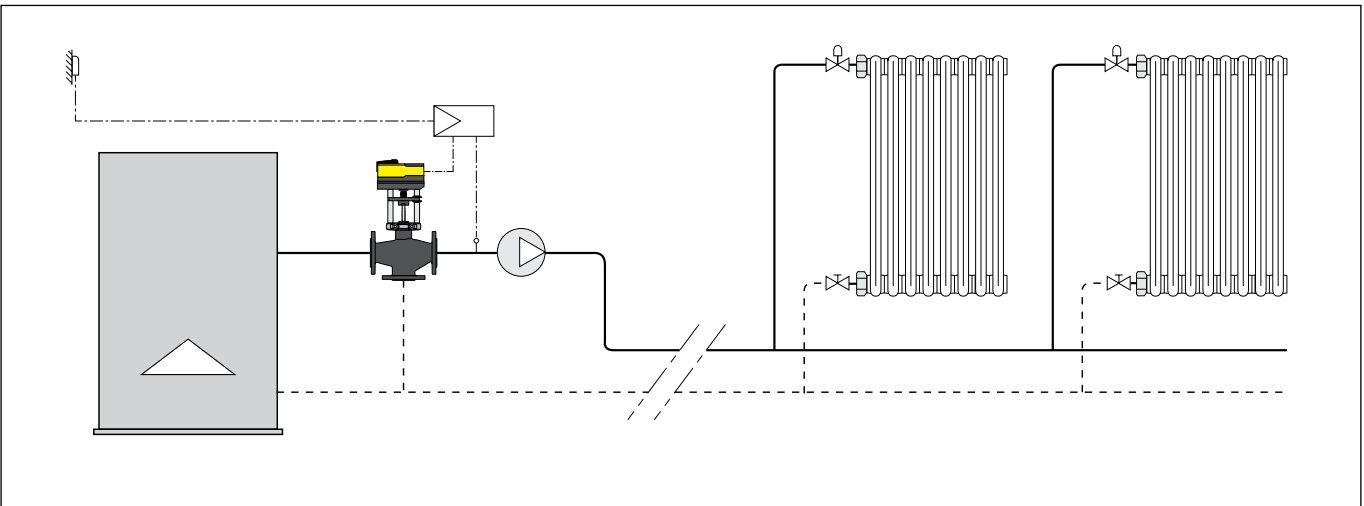
Temperature regulation with a two-way valve in utilities with radiant panel systems.



Outside compensated temperature regulation with a two-way valve in a central heating system.



Outside compensated temperature regulation with a three-way valve in a central heating system for radiator systems.



### 636 Series

Two-way regulating globe valve with threaded connection. Size DN 15 (from DN 15 to DN 50). Connections 1/2" (from 1/2" to 2") F (EN 10226-1) with union. Equal percentage regulation. **CR** dezincification resistant alloy body. Water and glycol solutions medium; max. percentage of glycol 50 %. Maximum working pressure 16 bar. Maximum differential pressure 10 bar (from 3/4" to 1 1/4"), 5 bar (1 1/2"-2"). Working temperature range 0–100 °C. Seepage class, main port ≤ 0,05 % Kvs, by-pass ≤ 1 % Kvs. Nominal stroke 8 mm.

### 636 Series

Three-way regulating globe valve with threaded connection. Size DN 15 (from DN 15 to DN 50). Connections 1/2" (from 1/2" to 2") F (EN 10226-1) with union. Main port regulation: equal percentage By-pass regulation: linear **CR** dezincification resistant alloy body. Water and glycol solutions medium; max. percentage of glycol 50 %. Maximum working pressure 16 bar. Maximum differential pressure 10 bar (from 3/4" to 1 1/4"), 5 bar (1 1/2"-2"). Working temperature range 0–100 °C. Seepage class, main port ≤ 0,05 % Kvs, by-pass ≤ 1 % Kvs. Nominal stroke 8 mm.

### Code 636004

Actuator for 636 series threaded control valves. Electric supply 24 V (ac). Power consumption 8,5 VA. Nominal force 250 N. Control signal: 2-point, 3-point, 0–10 V. Protection class IP 54. Operating time 35 s, 60 s, 120 s. Supply cable length 1,2 m. Ambient temperature range -10–55 °C; maximum humidity 95 %.

### Code 636002

Actuator for 636 series threaded control valves. Electric supply 230 V. Power consumption 4 VA. Nominal force 500 N. Control signal: 2-point, 3-point. Protection class IP 54. Operating time 120 s. Supply cable length 1,2 m. Ambient temperature range -10–55 °C; maximum humidity 95 %.

### Code 636014

Actuator for 636 series threaded control valves. Electric supply 24 V. Power consumption 8.7 VA. Nominal force 500 N. Control signal: 2-point, 3-point, 0–10 V. Protection class IP 54. Operating time 60 s, 120 s. Supply cable length 1,2 m. Ambient temperature range -10–55 °C; maximum humidity 95 %.

### 636 Series

Two/three-way regulating globe valve with flanged connection. Size DN 65 (from DN 65 to DN 150). Flanged connections, PN 16, coupling with counterflange EN 1092-1 (617 series). Main port regulation: equal percentage By-pass regulation: linear Grey cast iron body. Water and glycol solutions medium; max. percentage of glycol 50 %. Maximum working pressure 16 bar. Working temperature range -15–100 °C. Seepage class, main port ≤ 0,1 % Kvs, by-pass ≤ 1 % Kvs. Nominal stroke 20 mm (DN 65–DN 80), 40 mm (DN 100–DN150).

### Code 636024

Actuator for flanged regulating valves, codes 636060 and 636080. Electric supply 24 V. Power consumption 3.5 VA. Nominal force 1.000 N. Control signal: 2-point, 3-point, 0–10 V. Protection class IP 54. Operating time 80 s, 120 s. Ambient temperature range -10–55 °C; maximum humidity 85 % without condensation; transportation: -40–80 °C.

### Code 636034

Actuator for 636 series flanged control valves. Electric supply 24 V. Power consumption 20 VA. Nominal force 2.500 N. Control signal: 2-point, 3-point, 0–10 V. Protection class IP 66. Operating time 40 s / 80 s / 120 s (DN 65–80); 80 s / 160 s / 240 s (DN 100–150). Ambient temperature range -10–55 °C; maximum humidity 95 % without condensation:

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