

VUS: Through flanged valve, PN 40

Regulating valve, free of silicone grease, for continuous control of cold water, warm water, hot water, steam or air in HVAC installations. Condition of the water in accordance with VDI 2035. Used together with the AVM 234S, AVF 234S and AVN 224S actuators as a regulating unit. Valve tested to DIN 32730 ¹⁾.

Valve body of cast steel (GP240GH+N), painted black. Spindle, valve seat and valve plug of stainless steel. Stuffing box of stainless steel with spring-loaded Teflon disk. Interchangeable valve characteristic: equal-percentage, linear or quadratic with SUT actuators. Closes against the pressure. Used with PN 40 counter flanges. When the spindle is retracted, the valve is closed.

| Type | Nominal diameter DN | Connection | k _{VS} value m ³ /h | Weight kg |
|--------------|------------------------|------------|--|--------------|
| VUS 015 F375 | 15 | PN 40 | 0,16 | 5,1 |
| VUS 015 F365 | 15 | PN 40 | 0,25 | 5,1 |
| VUS 015 F355 | 15 | PN 40 | 0,40 | 5,1 |
| VUS 015 F345 | 15 | PN 40 | 0,63 | 5,1 |
| VUS 015 F335 | 15 | PN 40 | 1,0 | 5,1 |
| VUS 015 F325 | 15 | PN 40 | 1,6 | 5,1 |
| VUS 015 F315 | 15 | PN 40 | 2,5 | 5,1 |
| VUS 015 F305 | 15 | PN 40 | 4,0 | 5,1 |
| VUS 020 F305 | 20 | PN 40 | 6,3 | 5,9 |
| VUS 025 F305 | 25 | PN 40 | 10,0 | 6,8 |
| VUS 032 F305 | 32 | PN 40 | 16,0 | 8,4 |
| VUS 040 F305 | 40 | PN 40 | 25,0 | 10,6 |
| VUS 050 F305 | 50 | PN 40 | 40,0 | 13,2 |
| VUS 065 F305 | 65 | PN 40 | 63,0 | 18,6 |
| VUS 080 F305 | 80 | PN 40 | 100,0 | 25,1 |
| VUS 100 F305 | 100 | PN 40 | 160,0 | 36,4 |
| VUS 125 F305 | 125 | PN 40 | 220,0 | 56,4 |
| VUS 150 F305 | 150 | PN 40 | 320,0 | 77,9 |

| | | | |
|-------------------------------------|----------------------------------|--------------------------|------------------------|
| Operating temperature ¹⁾ | -10...220 °C | Valve stroke | |
| Operating pressure ²⁾ | | DN 15...50 | 20 mm |
| at -10...50 °C | 40,0 bar | DN 65...100 | 30 mm |
| at 120 °C | 36,3 bar | DN 125...150 | 40 mm |
| at 220 °C | 29,4 bar | Dimension drawing | M10461 |
| Valve characteristic | equal-percentage | Fitting instructions | MV 506071 |
| Valve rangeability | > 50:1 | AVM 234 assembly | MV 505919 |
| Packing box | stainless steel/Teflon | AVF 234 assembly | MV 505920 |
| Leakage rate at max. Δps: | ≤ 0,05% of k _{vs} value | AVN 224 assembly | MV 505927 |
| | | Declaration on materials | MD 56.125 |

Accessories

- 0372336 180*** Adaptor (required for media 130...180 °C; MV 505902)
0372336 240* Adaptor (required for media 180...240 °C; MV 505902)
0378373 001 Stuffing box with graphite seal for temp. 220...260 °C; DN 15...50; MV 506080
0378373 002 Stuffing box with graphite seal for temp. 220...260 °C; DN 65...100; MV 506080
0378373 003 Stuffing box with graphite seal for temp. 220...260 °C; DN 125...150; MV 506080

^{*}) Dimension drawing or wiring diagram are available under the same number

1) Down to -10 °C, no stuffing box heater is required. At temperatures between -10 °C and -60 °C, use special version with bellows-type mechanical seal (available on request, only to DN 100). Application: water with anti-freeze (glycol to 55% and brine solution), max. operating pressure 30 bar.
Above 130 °C or 180 °C, use the relevant adaptor (accessory). Above 220 °C and up to 260 °C, use stuffing box with graphite seal (accessory).

2) For operating pressure, see table of pressure and temperature values

Warranty The technical data and pressure differences stated above apply only when used in combination with Sauter actuators. If used together with actuators of a different manufacturer, the warranty becomes invalid.

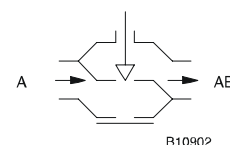
N.B.: These valves should be used only for closing against the pressure. Valves for closing with the pressure can be ordered on request as a special version.

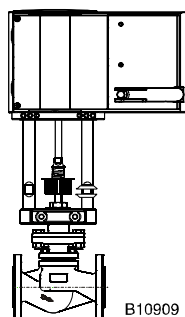


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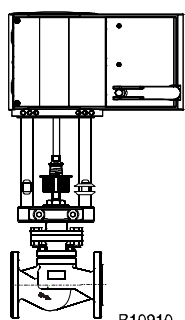


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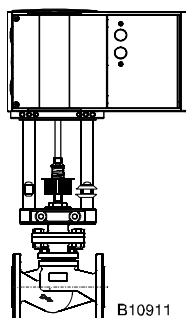


VUS combined with electric actuator (combination without 230 V module or accessory).

| | | | |
|-----------------|---|--------------|--------------------|
| Actuator | without spring return, 2500 N pushing force | | |
| Type: | AVM 234 S F132 (24 V) | | |
| Running time: | 2/4/6 s/mm | | |
| Input: | 2pt/3pt/0...10 V/4...20 mA | | |
| Valve | Against the pressure | | |
| | Δp_{max} | Δp_s | close/off pressure |
| VUS 015 | 40,0 | – | 40,0 |
| VUS 020 | 40,0 | – | 40,0 |
| VUS 025 | 37,8 | – | 37,8 |
| VUS 032 | 28,7 | – | 28,7 |
| VUS 040 | 16,4 | – | 16,4 |
| VUS 050 | 10,5 | – | 10,5 |
| VUS 065 | 6,1 | – | 6,1 |
| VUS 080 | 3,9 | – | 4,0 |
| VUS 100 | 1,5 | – | 1,5 |
| VUS 125 | 1,0 | – | 1,0 |
| VUS 150 | 0,7 | – | 1,0 |



| | | | |
|-----------------|--|--------------|--------------------|
| Actuator | with spring return, 2000 N pushing force | | |
| Type: | AVF 234 S F232 (24 V) | | |
| Running time: | 2/4/6 s/mm | | |
| Input: | 2pt/3pt/0...10 V/4...20 mA | | |
| Spring return: | 15 ... 30 s | | |
| Valve | Against the pressure | | |
| | Δp_{max} | Δp_s | close/off pressure |
| VUS 015 | 40,0 | 25,0 | 40,0 |
| VUS 020 | 40,0 | 25,0 | 40,0 |
| VUS 025 | 29,6 | 25,0 | 29,6 |
| VUS 032 | 22,5 | 21,0 | 22,5 |
| VUS 040 | 12,8 | 13,5 | 12,8 |
| VUS 050 | 8,2 | 8,5 | 8,2 |
| VUS 065 | 4,7 | 5,6 | 4,7 |
| VUS 080 | 3,0 | 3,4 | 3,0 |
| VUS 100 | 1,5 | 2,2 | 1,5 |
| VUS 125 | 1,0 | 1,6 | 1,0 |
| VUS 150 | 0,7 | 1,2 | 0,7 |



| | | | |
|-----------------|---|--------------|--------------------|
| Actuator | with emergency function, 1100 N pushing force | | |
| Type: | AVN 224 S F232 (24 V) | | |
| Running time: | 2/4/6 s/mm | | |
| Input: | 2pt/3pt/0...10 V/4...20 mA | | |
| Spring return: | 15 ... 30 s | | |
| Valve | Against the pressure | | |
| | Δp_{max} | Δp_s | close/off pressure |
| VUS 015 | 24,5 | 25,0 | 25,0 |
| VUS 020 | 24,5 | 25,0 | 25,0 |
| VUS 025 | 14,7 | 17,0 | 17,0 |
| VUS 032 | 11,1 | 10,5 | 10,5 |
| VUS 040 | 6,2 | 6,5 | 6,5 |
| VUS 050 | 3,9 | 4,0 | 4,0 |
| VUS 065 | 2,1 | 3,0 | 3,0 |
| VUS 080 | 1,3 | 2,0 | 2,0 |
| VUS 100 | 0,8 | 1,1 | 1,1 |
| VUS 125 | 0,4 | 0,8 | 0,8 |
| VUS 150 | 0,2 | 0,6 | 0,6 |

Valve: For F-variant, technical data and accessories see table of valve types.

Actuator: For F-variant, technical data, accessories and fitting position, see table of valve types.

Example: VUS 040 F305 / AVM 234S F132

Δp_{max} [bar]= Max. permissible pressure difference across the valve at which the drive can still firmly open and close the valve while taking Δp_v into account.

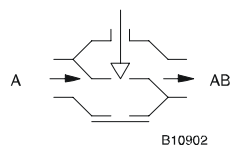
Δp_s [bar]= Max. permissible pressure difference across the valve at which, in the event of a malfunction (pipe break after the valve), the drive can close the valve firmly and quickly.

close/off pressure [bar]= Max. possible pressure difference across the valve in control mode, at which the drive can still firmly open and close the valve. The serviceable life may be reduced. Cavitation, erosion and surges may damage the valve. The values apply only when the valve is fitted to the drive as a unit.

Operation

Using an electric drive, the valve can be moved to any position. The valve's control passage closes when the valve spindle is retracted. These valves can be used to close against the pressure. Please observe the direction of flow marked on the valve itself. Fluidic variables in accordance with EN 60534.

Closes against the pressure



Description

These control valves are distinguished by their great reliability and accuracy and make an important contribution towards efficient control. They run very quietly and meet sophisticated requirements, e.g. provide closing functions with spring, overcome differential pressures, control the temperature of the medium and provide a cut-off function.

The valve spindle is fixed to the drive spindle automatically. The stainless-steel plug regulates an equal-percentage throughflow in the control passage. The valve's high level of seal is guaranteed by a stainless-steel ring pressed into the valve seat and by the appropriate valve plug.

The stuffing box requires no maintenance. It comprises conically formed Teflon rings and a spring. The spring ensures a permanent tension on the seals, which guarantees their tightness with regard to the valve spindle. In addition, a supply of grease ensures that the valve spindle is always lubricated. Furthermore, the grease prevents any particles in the medium from reaching the Teflon seal.

Engineering and fitting notes

The valves are combined with either the AVM 234S actuators without spring return or the AVF 234S, AVN 224S actuators with spring return. The drive is slotted onto the valve and fixed with screws. The drive locks onto the valve spindle automatically. When the installation is put into service for the first time, the AVM 234S and the AVF 234S actuators extend and the coupling automatically makes the connection to the valve as soon as it reaches the lower valve seat. The valve stroke is also detected by the actuator; no further settings are necessary. The force acting on the seat is, therefore, always constant, ensuring the lowest possible amount of leakage. These actuators allow the characteristic to be changed from linear to quadratic or vice versa.

If AVN 224S damper drives are employed, the drive must be manually initialised. For a full description of this, see PDS 51.379: 'Initialisation and feedback signal'.

Fitting position

The control unit can be fitted in any position except facing downwards. The ingress of condensate, drops of water etc. into the drive should be prevented. If fitted horizontally, and with regard to the valve spindle, the maximum permissible weight on the valve is 25 kg unless the actuator is supported (to be carried out by the client) or is subject to forces acting otherwise.

Up to 130°C In any position except facing downwards.

Above 130°C At temperatures above 130 °C or 180 °C, the valve should be fitted in the horizontal position and the correct adaptor for the relevant temperature should be employed. The adaptor can also serve as an extension, allowing the actuator to protrude from the piping insulation. To protect the actuator against heat, the pipes should be insulated.

When fitting the drive to the valve, care must be taken not to turn the valve plug on the stainless-steel seat, otherwise the seal may be damaged. When insulating the valve, the insulation should not extend beyond the connecting clamp on the drive.

Fitting outdoors

If the devices are fitted outdoors, we recommend that additional measures be taken to protect them against the effects of the weather.

Using with steam

The valves can be used for steam applications up to 200°C with the same Δp_{\max} values. We recommend, however, that the valves be used only for open/close operations. When used as a control valve, care should be taken to ensure that valve does not function largely in the bottom third of its stroke range. This results in an extremely high flow speed, which greatly reduces the valve's serviceable life.

Using with water

In order to restrain contaminants in the water (e.g. welding beads, rust particles etc.) and prevent the spindle seal from being damaged, we recommend the employment of collective filters, e.g. for each floor or feed pipe. The composition of the water should be in accordance with VDI 2035. If an auxiliary medium is used, please contact the supplier of the medium in order to clarify whether the valve materials are compatible. Please refer to the materials table below. If glycol is used, we recommend a concentration of between 20% and 55%. The valves are not suitable for use with drinking water or in zones where there is a risk of explosion.

Other notes concerning hydraulics and noise in installations

The valves can be employed in a low-noise environment. To prevent noise, the Δp_{\max} pressure differences listed below should not be exceeded. These values are listed as recommended values in the table of pressure losses.

The pressure difference Δp_v is the highest pressure permitted to act on the valve, regardless of the stroke position, so that the risk of cavitation and erosion is limited. The force of the actuator has no influence on these values. Cavitation accelerates wear and causes noise. In order to prevent cavitation, particularly in applications with steam, the pressure difference Δp_{\max} should not exceed the value

$$\Delta p_{\text{crit}} = (p_1 - p_v) \times 0,5$$

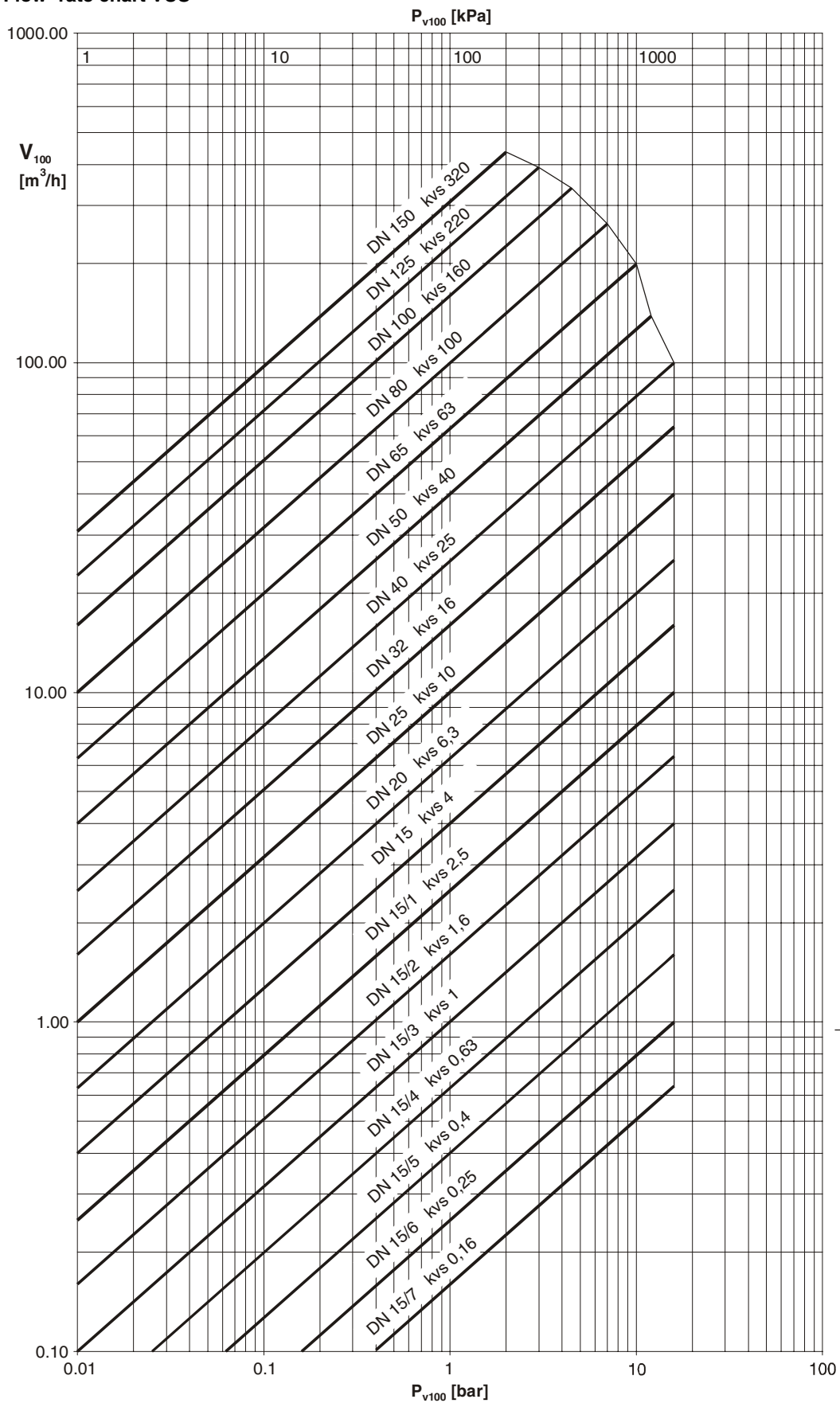
p_1 = Upstream pressure before the valve (bar)

p_v = Steam pressure

Absolute pressure was used in these calculations.

The close/off pressure values are the maximal pressures at which the actuator can still move the valve with its own force. Please note that the valve may be damaged by cavitation and erosion if these pressures are used and the pressure difference Δp_{\max} is exceeded. As far as the spring-return function is concerned, the stated Δp_s values also represent the permissible differential pressure, up to which the actuator can still close the valve in the event of an emergency. Since this is a quick-close functions with fast stroke (by means of a spring), this value may exceed Δp_{\max} .

Flow-rate chart VUS



— Δp_v gegen den Druck
 Δp_v contre la pression
 Δp_v against the pressure

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Additional technical data

| Type | Δp_v | |
|--------------|----------------------|-------------------|
| | Against the pressure | With the pressure |
| VUS 015 F375 | 40 bar | — |
| VUS 015 F365 | 40 bar | — |
| VUS 015 F355 | 40 bar | — |
| VUS 015 F345 | 40 bar | — |
| VUS 015 F335 | 40 bar | — |
| VUS 015 F325 | 40 bar | — |
| VUS 015 F315 | 40 bar | — |
| VUS 015 F305 | 40 bar | — |
| VUS 020 F305 | 40 bar | — |
| VUS 025 F305 | 40 bar | — |
| VUS 032 F305 | 40 bar | — |
| VUS 040 F305 | 30 bar | — |
| VUS 050 F305 | 20 bar | — |
| VUS 065 F305 | 8 bar | — |
| VUS 080 F305 | 4 bar | — |
| VUS 100 F305 | 1,5 bar | — |
| VUS 125 F305 | 1 bar | — |
| VUS 150 F305 | 0,7 bar | — |

Pressure and temperature specifications
 Flow parameters
 Sauter slide rule for valve sizing
 Slide rule manual
 Technical manual: 'Valves and drives'
 Parameters, Installation Notes, Control, General Information

EN 764, EN 1333
 EN 60534 (Page 2)
 7 090011 003
 7 000129 003
 7 000477 003
 Valid EN, DIN,
 AD, TRD and UVV
 regulations
 97/23/EG
 Category II

CE conformity, Directive on Pressure Equipment (Fluid Group II)
 VUS 15 to VUS 150 CE-0525 mark
 Combination with AVN 224S valve drive, not certified as per DIN 32730 or EN 14597

Additional details on model types

Valve body of cast steel as per DIN EN 10213, code GP240GH+N, material number 1.0619+N, with smooth-drilled flanges as per EN 1092-1, Form B sealing strip. Valve body protected by matt black paint (RAL 9005). Recommended for the welding-neck flange as per EN 1092-1. Valve fitting width as per EN 558-1, Series 1. Flat seal on the body of the valve is of asbestos-free material.

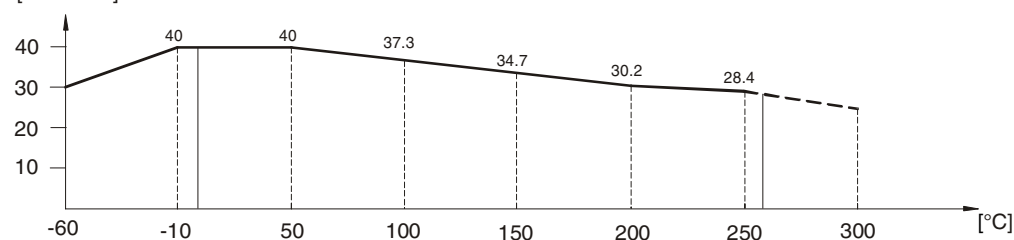
PTFE collar and sealing ring available for stuffing box as spare parts under order number 0378372

Material numbers as per DIN

| | DIN material no. | DIN code |
|---|------------------|-------------------------|
| Valve body | 1.0619+N | GP240GH+N |
| Valve seat k_{vs} 2,5... k_{vs} 320 | 1.4021 | X 20 Cr 13 |
| k_{vs} 0,16... k_{vs} 1,6 | 1.4571 | X 6 Cr Ni Mo Ti 17 12 2 |
| Spindle k_{vs} 2,5... k_{vs} 320 | 1.4021 | X 20 Cr 13 |
| k_{vs} 0,16... k_{vs} 6 | 1.4571 | X 6 Cr Ni Mo Ti 17 12 2 |
| Plug k_{vs} 2,5... k_{vs} | 1.4021 | X 20 Cr 13 |
| k_{vs} 0,16... k_{vs} 1,6 | 1.4571 | X 6 Cr Ni Mo Ti 17 12 2 |
| Stuffing box | 1.4021 | X 20 Cr 13 |
| Seal underneath packing box | Cu | DIN 7603 |

Pressure- /Temperature- Relation

[bar / bars]



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Explanation of terms used

Δp_v

Maximum permissible pressure difference across the valve in any stroke position, limited by the noise level and erosion.

The valve as a traversed element is defined by this parameter specifically in its hydraulic behaviour. By monitoring cavitation, erosion and the noise thus produced, improvements can be achieved in both life expectancy and durability.

Δp_{max}

Maximum permissible pressure difference across the valve at which the drive can firmly open and close the valve.

Static pressure and fluidic influences are taken into account. This value helps to maintain a smooth stroke action and the high level of sealing. In doing so, the valve's Δp_v value is never exceeded.

Δp_s

Maximum permissible pressure difference across the valve in the event of a malfunction (e.g. power failure, excess temperature or pressure, burst pipe) at which the drive can firmly close the valve and, if necessary, hold the full operating pressure against atmospheric pressure. Since this is a quick-close functions with 'fast' stroke, Δp_s can be larger than Δp_{max} or, respectively, Δp_v . The resultant fluidic disturbances are soon overcome and play a minor role here.

On the three-way valves, the values apply only for the control passage.

Δp_{stat}

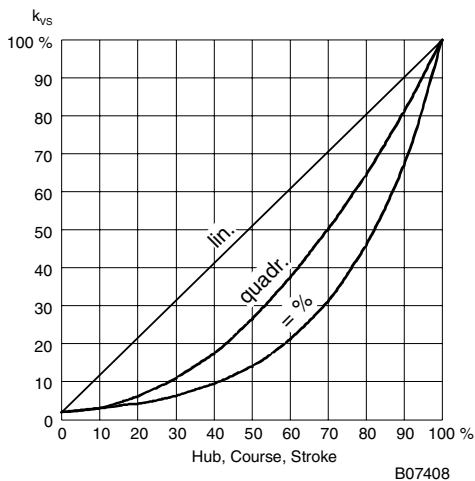
Line pressure behind the valve. This corresponds largely to the dead pressure when the pump is switched off, e.g. due to the level of liquid in the installation, an increase in pressure via the pressure store, steam pressure etc.

For valves that close with the pressure, the static pressure plus the pump pressure should be used.

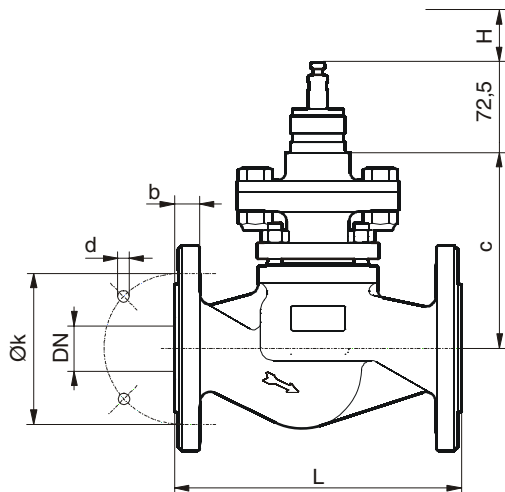
Characteristic for actuators with positioner (24 V only)

On the AVM 234S, AVF 234S or AVN 224S actuator

Equal-percentage/linear/quadratic
settable using the coding switch



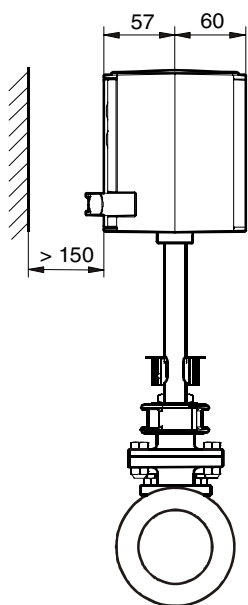
Dimension drawings



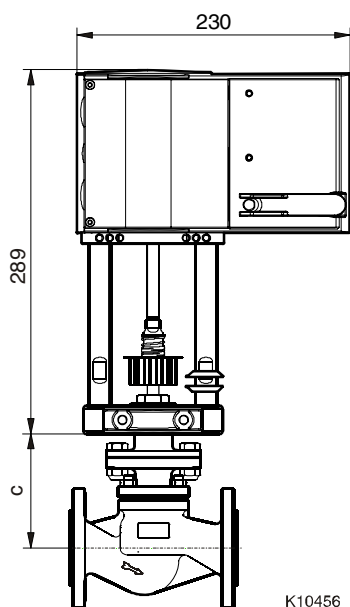
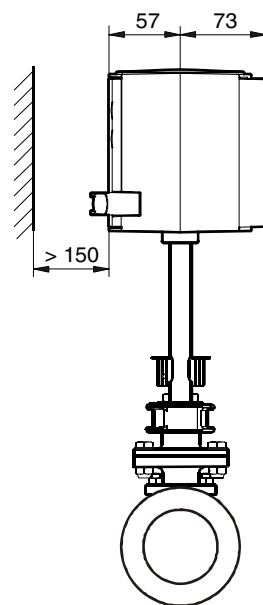
| VUS | DN | c | L | H | k | d | b |
|-----|-----|-----|-----|----|-----|--------|----|
| 015 | 15 | 135 | 130 | 20 | 65 | 14 x 4 | 16 |
| 020 | 20 | 135 | 150 | 20 | 75 | 14 x 4 | 18 |
| 025 | 25 | 143 | 160 | 20 | 85 | 14 x 4 | 18 |
| 032 | 32 | 143 | 180 | 20 | 100 | 19 x 4 | 18 |
| 040 | 40 | 150 | 200 | 20 | 110 | 19 x 4 | 18 |
| 050 | 50 | 156 | 230 | 20 | 125 | 19 x 4 | 20 |
| 065 | 65 | 169 | 290 | 30 | 145 | 19 x 8 | 22 |
| 080 | 80 | 184 | 310 | 30 | 160 | 19 x 8 | 24 |
| 100 | 100 | 203 | 350 | 30 | 190 | 23 x 8 | 24 |
| 125 | 125 | 242 | 400 | 40 | 220 | 28 x 8 | 26 |
| 150 | 150 | 302 | 480 | 40 | 250 | 28 x 8 | 28 |

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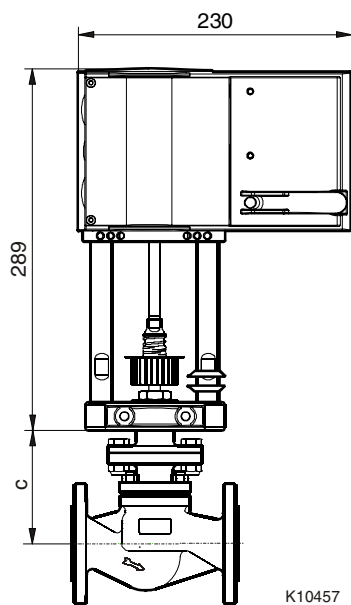
AVM



AVF

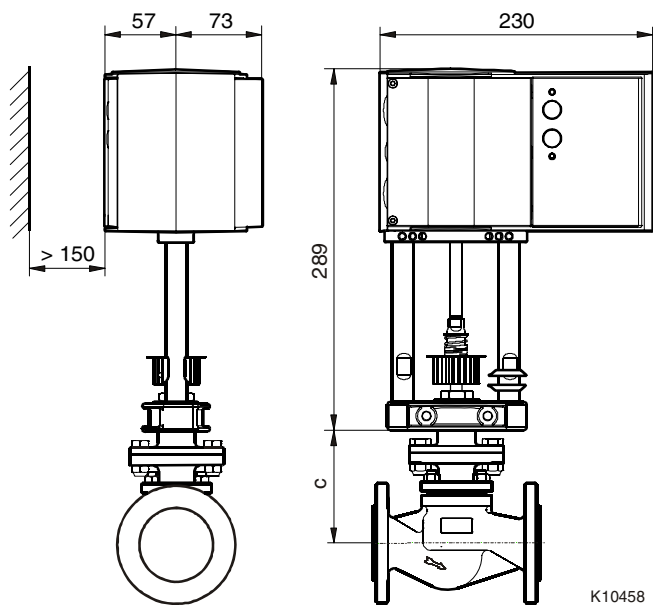


K10456



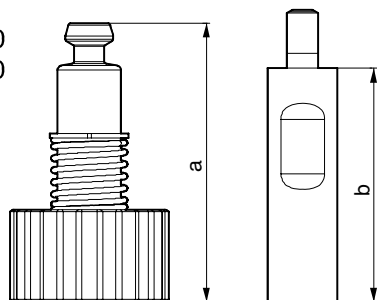
K10457

AVN



Accessories

0372336 180
0372336 240



| 0372336 | T (°C) | a (mm) | b (mm) |
|---------|--------|--------|--------|
| 180 | 180 | 69,4 | 60 |
| 240 | 260 | 109,4 | 100 |

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