

## VUS: 2-way flanged valve, PN 40 (el.)

### How energy efficiency is improved

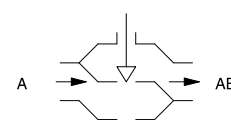
Efficiency means precise and reliable control

### Features

- Continuous control of cold, warm and hot water in closed circuits, and of steam
- In combination with valve actuators AVM 322(S), AVM 234S, AVN 224S and AVF 234S as control unit
- Continuous control of cold and hot water in closed circuits
- Water quality as per VDI 2035
- Valve with flange connection as per EN 1092-2, seal form B
- Silicone-free regulating valve, matt black
- Not suitable for drinking water or potentially explosive atmospheres
- Equal-percentage characteristic, can be set with SUT valve actuators to linear or quadratic
- The valve is closed when the spindle is moved in. Closing only against the pressure
- Valve body of cast steel; spindle, seat and plug of stainless steel
- Maintenance-free stuffing box, made of stainless steel, with spring-loaded PTFE washer up to 220 °C, with graphite seal up to 260 °C



VUS040F305



### Technical data

Parameters		
Nominal pressure	PN 40	
Connection	Flange as per EN 1092-2, form B	
Valve characteristic	Equal-percentage	
Control ratio	> 50 : 1	
Leakage rate	≤ 0.05% of $k_{VS}$ value	

Admissible ambient conditions		
Operating temperature <sup>1)</sup>	-10...260 °C	
Operating pressure	40 bar at -10...50 °C 36.3 bar at 120 °C 29.4 bar at 220 °C 27.8 bar at 260 °C	

Standards and directives		
Pressure and temperature data	EN 764, EN 1333	
Flow parameters	EN 60534	

Overview of types				
Type	Nominal diameter	$k_{VS}$ value	Valve stroke	Weight
VUS015F375	DN 15	0.16 m³/h	20 mm	5.1 kg
VUS015F365	DN 15	0.25 m³/h	20 mm	5.1 kg
VUS015F355	DN 15	0.4 m³/h	20 mm	5.1 kg
VUS015F345	DN 15	0.63 m³/h	20 mm	5.1 kg
VUS015F335	DN 15	1 m³/h	20 mm	5.1 kg
VUS015F325	DN 15	1.6 m³/h	20 mm	5.1 kg
VUS015F315	DN 15	2.5 m³/h	20 mm	5.1 kg
VUS015F305	DN 15	4 m³/h	20 mm	5.1 kg
VUS020F305	DN 20	6.3 m³/h	20 mm	5.9 kg
VUS025F305	DN 25	10 m³/h	20 mm	6.8 kg
VUS032F305	DN 32	16 m³/h	20 mm	8.4 kg
VUS040F305	DN 40	25 m³/h	20 mm	10.6 kg
VUS050F305	DN 50	40 m³/h	20 mm	13.2 kg
VUS065F305	DN 65	63 m³/h	30 mm	18.6 kg
VUS080F305	DN 80	100 m³/h	30 mm	25.1 kg

<sup>1)</sup> No stuffing box heater required down to -10 °C. Above 130 °C or 180 °C, use the relevant adaptor (accessory). Above 200 °C and up to 260 °C, use stuffing box with graphite seal (accessory)



Type	Nominal diameter	$k_{VS}$ value	Valve stroke	Weight
VUS100F305	DN 100	160 m³/h	30 mm	36.4 kg
VUS125F305	DN 125	220 m³/h	40 mm	56.4 kg
VUS150F305	DN 150	320 m³/h	40 mm	77.9 kg

#### Accessories

Type	Description
0372336180	Adaptor (required when temperature of the medium is 130...180 °C)
0372336240	Adaptor (required when temperature of the medium is 180...260 °C)
0378373001	Stuffing box with graphite seal for temperatures of 220...260 °C; DN 15...50
0378373002	Stuffing box with graphite seal for temperatures of 220...260 °C; DN 65...100
0378373003	Stuffing box with graphite seal for temperatures of 220...260 °C; DN 125...150

#### Combination of VUS with electrical actuators

- i** *Warranty: The technical data and pressure differences indicated here are applicable only in combination with SAUTER valve actuators. The warranty does not apply if used with valve actuators from other manufacturers.*
- i** *Definition of  $\Delta p_s$ : Maximum admissible pressure drop in the event of a malfunction (pipe break after the valve) at which the actuator reliably closes the valve by means of a return spring.*
- i** *Definition of  $\Delta p_{max}$ : Maximum admissible pressure drop in control mode at which the actuator reliably opens and closes the valve.*

#### Pressure differences

Actuator	AVM322F120 AVM322F122	AVM322SF132	AVM234SF132	AVF234SF132 AVF234SF232	AVN224SF132 AVN224SF232
Actuating power	1000 N	1000 N	2500 N	2000 N	1100 N
Control signal	2-/3-point	2-/3-pt., 0...10 V, 4...20 mA	2-/3-pt., 0...10 V, 4...20 mA	2-/3-pt., 0...10 V, 4...20 mA	2-/3-pt., 0...10 V, 4...20 mA
Running time DN 15...50	120/240 s	80/120 s	40/80/120 s	40/80/120 s	40/80/120 s
Running time DN 65...100	—	—	60/120/180 s	60/120/180 s	60/120/180 s
Running time DN 125, DN 150	—	—	80/160/240 s	80/160/240 s	80/160/240 s

#### $\Delta p$ [bar]

Closes against the pressure	$\Delta p_{max}$	$\Delta p_{max}$	$\Delta p_{max}$	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$
VUS015F375 VUS015F365 VUS015F355 VUS015F345 VUS015F335 VUS015F325 VUS015F315 VUS015F305 VUS020F305	35.0	35.0	40.0	40.0	25.0	24.5	25.0
VUS025F305	17.4	17.4	37.8	29.6	25.0	14.7	17.0
VUS032F305	12.2	12.2	28.7	22.5	21.0	11.1	10.5
VUS040F305	6.2	6.2	16.4	12.8	13.5	6.2	6.5
VUS050F305	3.7	3.7	10.5	8.2	8.5	3.9	4.0
VUS065F305	—	—	6.1	4.7	5.6	2.1	3.0
VUS080F305	—	—	3.9	3.0	3.4	1.3	2.0
VUS100F305	—	—	1.5	1.5	2.2	0.8	1.1
VUS125F305	—	—	1.0	1.0	1.6	0.4	0.8
VUS150F305	—	—	0.7	0.7	1.2	0.2	0.6

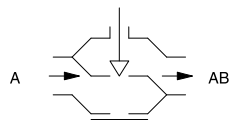
Cannot be used to close with the pressure

☀ At temperatures above 130 °C, accessories are required

## Description of operation

The valve can be moved to any intermediate position with an electric actuator. When the spindle is pressed in, the control passage of the valve is closed. These valves may only be used when closing "against the pressure". Observe the direction of flow shown on the valve. The flow parameters correspond to EN 60534.

## Closing against the pressure



These control valves are characterised by their reliability and precision and make an important contribution towards efficient regulation. They meet difficult challenges such as spring-controlled closing functions, overcoming high differential pressures, controlling medium temperatures and performing the shut-off function, all with a low noise level.

The valve spindle is automatically and firmly connected to the actuator spindle. The stainless steel plug controls the equal-percentage flow rate in the control passage. The tightness of the valve is ensured by the stainless steel ring pressed in the seat and the corresponding valve plug.

The stuffing box is maintenance-free. This consists of tapered PTFE rings and a spring. The spring ensures permanent tension on the seals, thus guaranteeing that they are leaktight against the spindle. In addition, a grease reserve ensures that the spindle is constantly lubricated. The grease reserve also stops particles that are present in the medium from penetrating to the PTFE seal.

## Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product documents must also be adhered to. Changing or converting the product is not admissible.

## Engineering and fitting notes

The valves are combined with the AVM 322(S) or AVM 234S valve actuators without a spring return or with the AVF 234S valve actuator with a spring return. The actuator is mounted directly on the valve and fastened with screws. The actuator is connected with the valve spindle automatically. During the commissioning of the system, the AVM 322(S), AVM 234S and AVF 234S actuators move out. The connector automatically closes the connection to the valve as soon as it reaches the lower valve seat. The stroke of the valve is also detected by the actuator, and no further adjustments are required. Therefore the force on the seat is always the same and the smallest amount of leakage is ensured. With the SUT actuators, the characteristic can be set to linear or quadratic as required.

## Additional technical data

SAUTER slide rule for valve sizing	P100013496
Technical manual on control units	7 000477 001
Parameters, fitting notes, control, general information	Applicable EN, DIN, AD, TRD and UVV regulations
CE conformity as per PED 97/23/EC (fluid group II) VUS 015...150: CE-0525 label	Category II
<b>Fitting instructions:</b>	
VUS	MV 506071
AVM 322	P100011900
AVM 234S	MV 505919
AVF 234S	MV 505920
AVN 224S	MV 505927
Declaration on materials and the environment	MD 56.125

## Fitting position

The control unit can be fitted in any position, but the hanging position is not recommended. Condensate, drops of water, etc. must be prevented from entering the actuator. With horizontal installation and no structural support for the actuator, the maximum admissible weight on the valve is 25 kg.

*At a medium temperature*

- **Up to 130 °C:**
  - In any position except suspended.

- **Over 130 °C:**

- At temperatures of over 130 °C or over 180 °C, a horizontal fitting position is recommended, and the appropriate adaptor for the temperature must be used. The adaptor can also be used as an extension to come out of the pipe insulation with the actuator. To protect the actuator from excessive heat, the piping must be insulated.

When the actuator is mounted on the valve, make sure the plug is not twisted on the stainless steel seat (this can damage the sealing surface). When insulating the valve, it may only be insulated up to the connecting clip of the actuator.

### Outdoor installation

We recommend protecting the devices from the weather if they are installed outside buildings.

### Using with steam

The valves can be used for steam applications up to 200 °C with the same  $\Delta p_{\max}$  values as listed in the combination tables. When using the valve, make sure that it does not operate mainly on the lower third of its stroke range. This position leads to an extremely high flow speed, which greatly reduces the serviceable life of the valve.

### Using with water

So that impurities are retained in the water (welding beads, rust particles, etc.) and the spindle seal is not damaged, we recommend installing collecting filters, for example one for each floor or pipe run. Requirements for water quality as per VDI 2035.

When using an additive in the water, the compatibility of the valve materials must be checked with the manufacturer of the medium. The materials table shown below may be used. When using glycol we recommend a concentration between 20% and 55%.

### Other information regarding hydraulics and noise in systems

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

The pressure difference  $\Delta p_v$  is the maximum pressure that may act on the valve regardless of the stroke position, in order that the risk of cavitation and erosion is limited. These values are irrespective of the actuator force. The cavitation accelerates wear on the plug and seat in the valve and causes noises. To prevent cavitation, which mainly occurs in applications with water or steam, the pressure differential  $\Delta p_{\max}$  should not exceed the value  $\Delta p_{\text{krit}}$ :

$$\Delta p_{\text{krit}} = (p_1 - p_v) \times 0.5$$

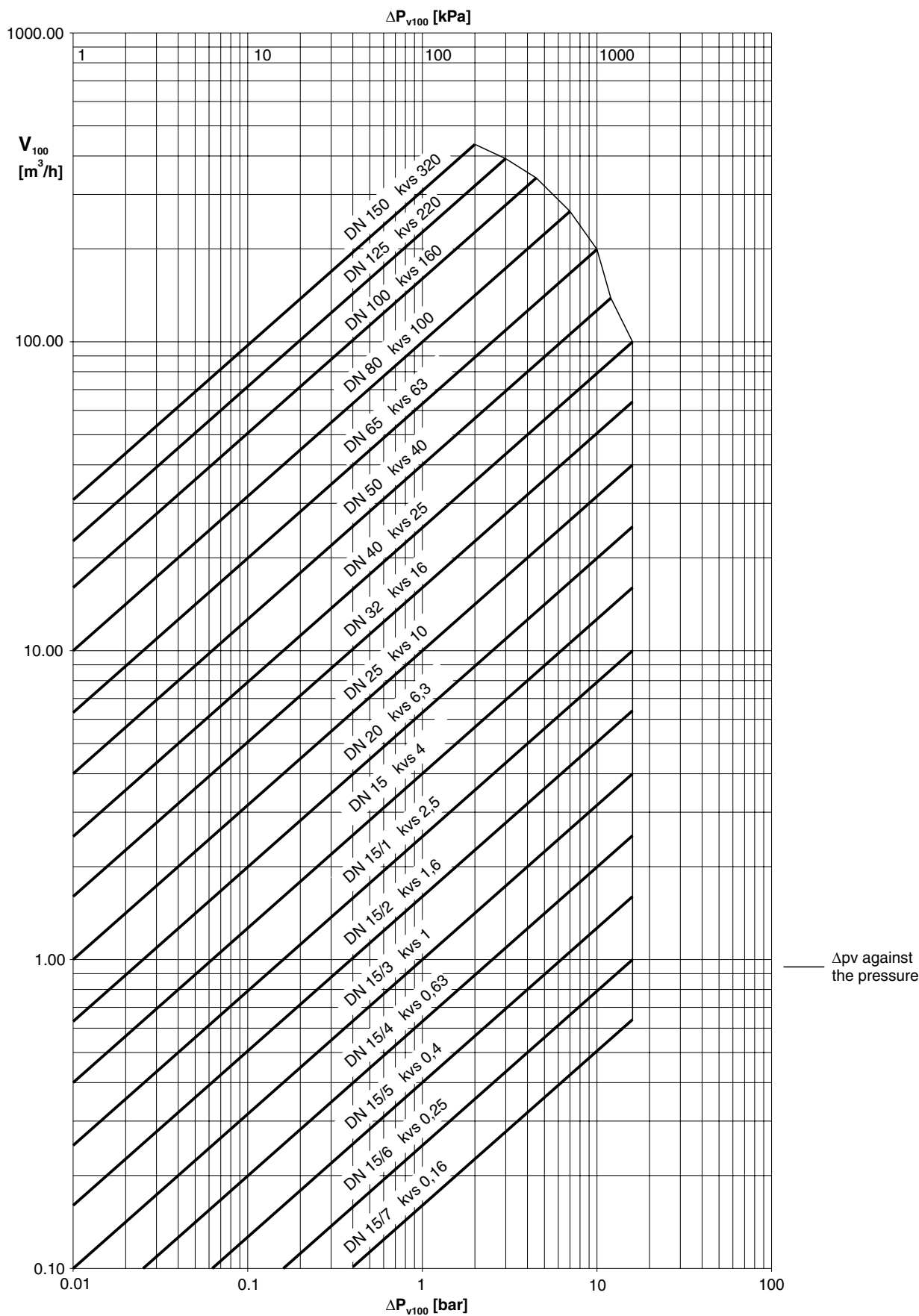
$p_1$  = upstream pressure before the valve (bar)

$p_v$  = steam pressure

The calculation works with absolute pressure.

For the spring return, the stated  $\Delta p_s$  values are also the permissible differential pressure up to which the actuator can guarantee that the valve is closed in the event of an incident. Because this is an emergency function with a fast stroke movement (using a spring), this value can exceed  $\Delta p_{\max}$ .

Flow-rate chart



Type	$\Delta p_v$	
	Against the pressure [bar]	With the pressure [bar]
VUS015F375	40	-

Type	$\Delta p_v$	
VUS015F365	40	-
VUS015F355	40	-
VUS015F345	40	-
VUS015F335	40	-
VUS015F325	40	-
VUS015F315	40	-
VUS015F305	40	-
VUS020F305	40	-
VUS025F305	40	-
VUS032F305	40	-
VUS040F305	30	-
VUS050F305	20	-
VUS065F305	8	-
VUS080F305	4	-
VUS100F305	1.5	-
VUS125F305	1	-
VUS150F305	0.7	-

#### Additional version information

Valve body made of cast steel as per EN 10213, code GP240GH+N, material number 1.0619+N with smooth drilled flanges as per EN 1092-1, seal form B. Valve body protected by matt paint RAL 9005 black. Recommended for the welding flange as per EN 1092-1. Valve fitting length as per EN 558-1, basic series 1. Flat seal on valve body made of asbestos-free material.

PTFE collar and sealing ring for stuffing box available as spare part no. 0378372

#### Material numbers as per DIN

	DIN material no.	DIN designation
Valve body	1.0619+N	GP240GH+N
Valve seat $k_{VS}$ 2.5. $K_{VS}$ 320	1.4021	X20Cr13
Valve seat $k_{VS}$ 0.16.. $K_{VS}$ 1.6	1.4571	X6CrNiMoTi1712-2
Spindle $k_{VS}$ 2.5.. $K_{VS}$ 320	1.4021	X20Cr13
Spindle $k_{VS}$ 0.16.. $K_{VS}$ 1.6	1.4571	X6CrNiMoTi1712-2
Plug $k_{VS}$ 2.5.. $K_{VS}$ 320	1.4021	X20Cr13
Plug $k_{VS}$ 0.16.. $K_{VS}$ 1.6	1.4571	X6CrNiMoTi1712-2
Stuffing box	1.4021	X20Cr13
Seal under stuffing box	Cu	DIN 7603

#### Additional details on the definitions of pressure difference

##### $\Delta p_v$ :

Maximum admissible pressure difference over the valve at every stroke position, limited by noise level and erosion.

With this parameter, the valve is characterised as a flow element with specific hydraulic behaviour.

Monitoring the cavitation and erosion along with the associated noise increases the service life and the operational capacity.

##### $\Delta p_{max}$ :

Maximum admissible pressure difference over the valve at which the actuator can reliably open and close the valve.

Static pressure and flow effects are considered. This value ensures trouble-free stroke movement and closing of the valve. The value  $\Delta p_v$  of the valve is never exceeded.

##### $\Delta p_s$ :

Maximum admissible pressure difference over the valve in the event of a malfunction (e.g. power failure, excessive temperature or pressure, pipe break) at which the actuator can close the valve tightly and, if necessary, maintain the entire operating pressure against atmospheric pressure. Because this is a quick-closing function with a rapid stroke movement,  $\Delta p_s$  can be greater than  $\Delta p_{max}$  or  $\Delta p_v$ . The disruptive flow effects that arise here are quickly passed through and are of minor importance in this mode of operation.

For 3-way valves, the values only apply to the control passage.

##### $\Delta p_{stat}$ :

Line pressure behind the valve. This essentially corresponds to the idle pressure when the pump is switched off, caused for example by the fluid level in the system, increased pressure due to pressure tanks, steam pressure, etc.

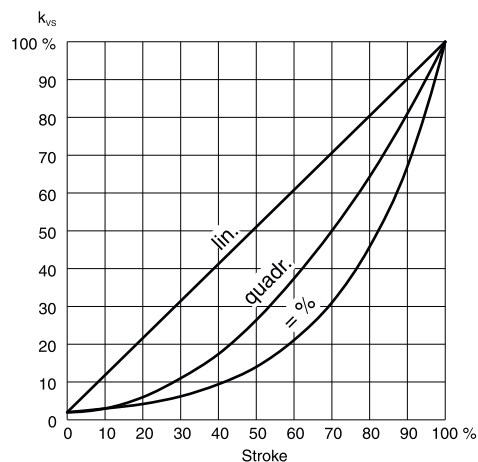
For valves that close with pressure, the static pressure plus the pump pressure are used.

#### Characteristic for actuators with positioner (only 24 V)

On actuator AVM 322(S), AVM 234S, AVF 234S or AVN 224S

Equal-percentage/linear/quadratic

Can be set using coding switch

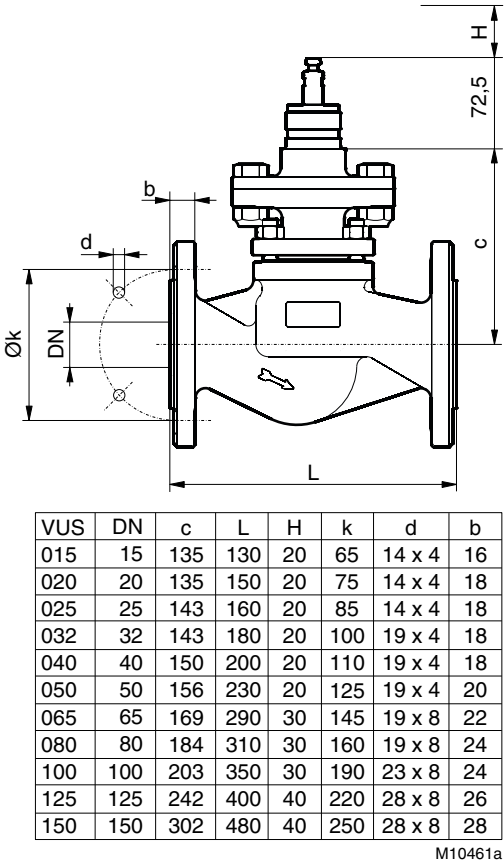


#### Disposal

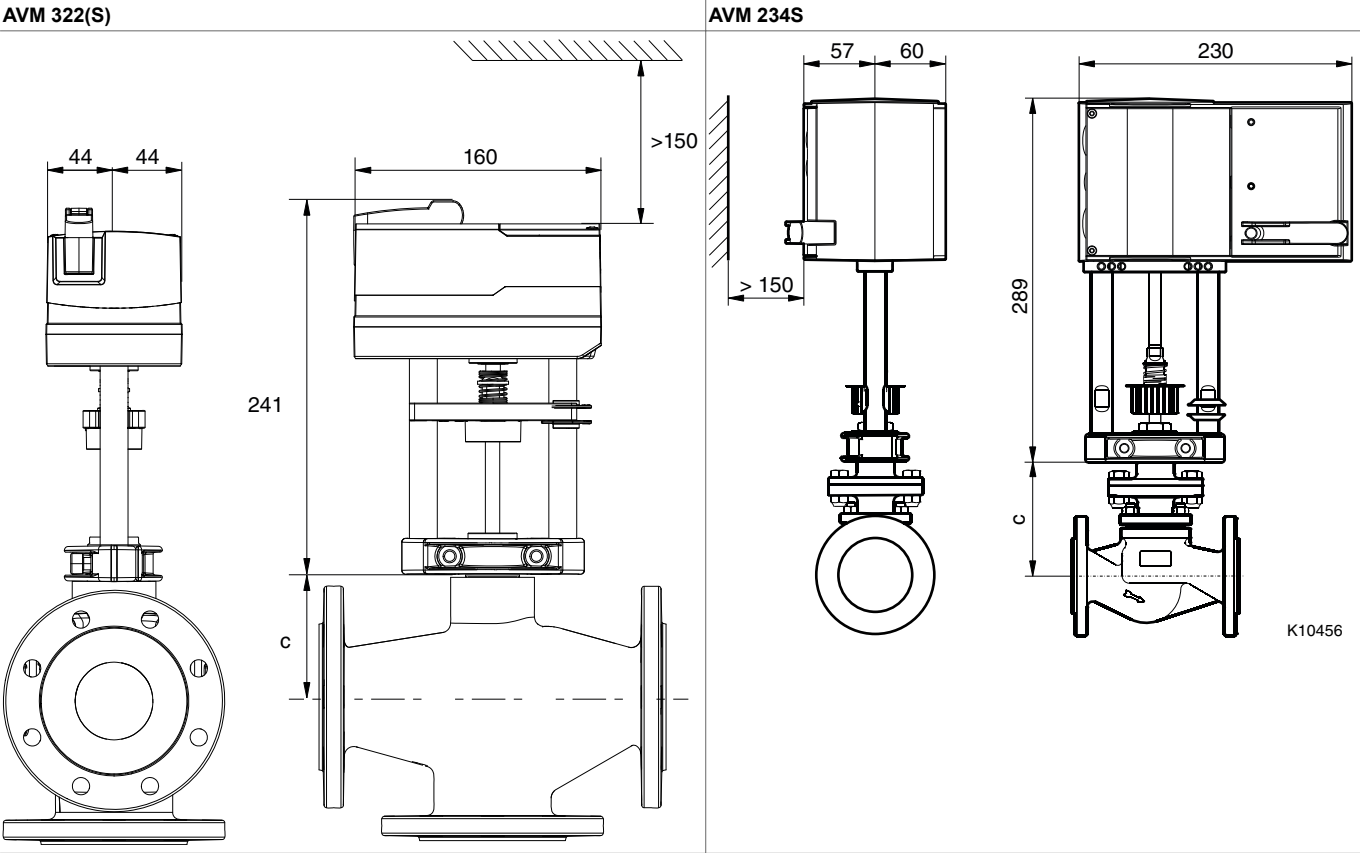
When disposing of the product, observe the currently applicable local laws.

More information on materials can be found in the Declaration on materials and the environment for this product.

Dimension drawing

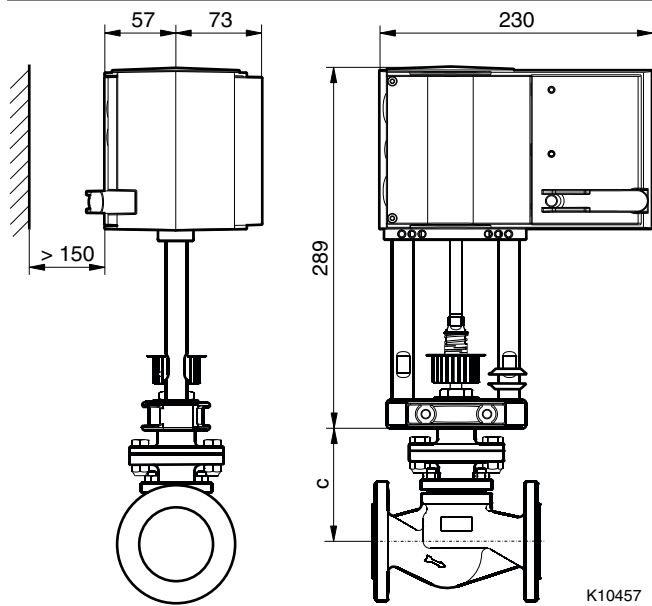


Combinations

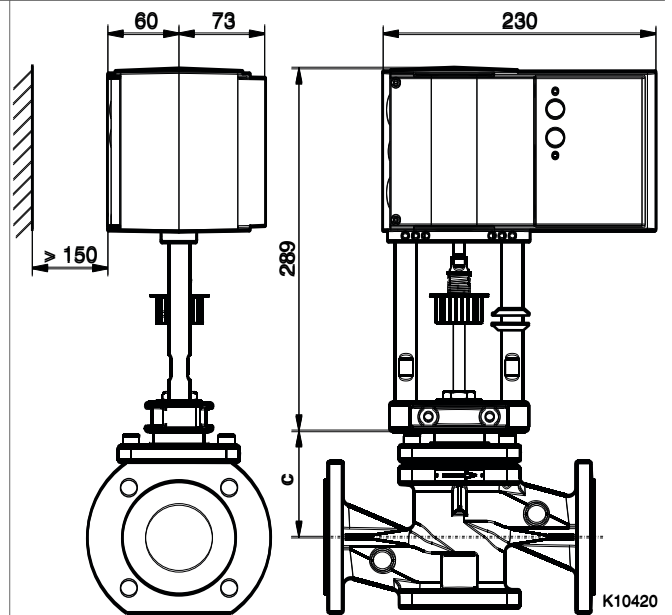




### AVF 234S

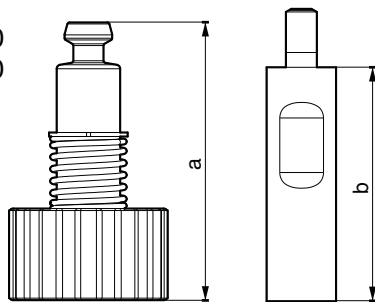


### AVN 224S



### Accessories

0372336 180  
0372336 240



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