

VUG: 2-way flanged valve, PN 25/16 (el.)

How energy efficiency is improved

Efficiency means precise and reliable control

Features

- Continuous control of cold 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 a control unit
- Water quality as per VDI 2035
- Valve with flange connection as per EN 1092-2, seal form B
- Nominal pressure 25 bar, except VUG065F316, nominal pressure 16 bar
- Not suitable for drinking water
- Complies with standard for control units as per DIN EN 14597¹⁾
- Regulating valve, free of silicone grease, painted black
- Equal-percentage characteristic, can be set with SUT (SAUTER Universal Technology) valve actuators to linear or quadratic
- The valve is closed when the spindle is moved out
- Closing procedure against the pressure or with the pressure
- Valve body made of ductile cast iron; seat and spindle of stainless steel
- Plugs of nominal diameter DN 15...50 made of stainless steel with glass-fibre-reinforced PTFE sealing ring
- Plugs of nominal diameter DN 65...150 made of stainless steel with metal-to-metal seal
- Maintenance-free stuffing box in brass with spring-loaded PTFE washer

Technical data

Parameters

Nominal pressure	PN 16/25
Connection	Flange as per EN 1092-2, form B
Valve characteristic	Equal-percentage
Control ratio of valve	> 50:1
Leakage rate at max. Δp_S	$\leq 0.05\%$ of K_{VS} value

Admissible ambient conditions

Operating temperature ²⁾	-20...200 °C
Operating pressure ³⁾	PN 16: 30 °C, 16 bar At 120 °C, 16 bar At 200 °C, 14 bar PN 25: 30 °C, 25 bar At 120 °C, 25 bar At 200 °C, 21.7 bar

Standards and directives

Pressure and temperature data	EN 764, EN 1333
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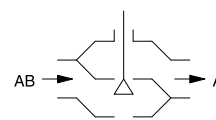
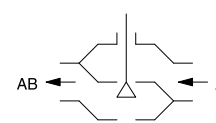
¹⁾ The VUG065F316 valve does not have TÜV approval. It does not bear the test institute code and is classified under category I of the Directive on Pressure Equipment. This valve can be used with the AVN224SF*** actuator, but not as a safety device. Use stuffing box heater at temperatures below 0 °C; use the relevant adapter (accessory) at temperatures above 130 °C or 180 °C. Down to -10 °C, as per AD code of practice W 10, use water with anti-freeze and brine solution. For use as per DIN EN 14597. When valve is combined with AVN 224S, admissible media temperature is > 0 °C.

²⁾ For cold water applications from -20...30 °C, the versions VUG***F3***S with a stuffing box containing silicone (e.g.: VUG015F304S) must be used. The valves VUG***F3***S do not comply with the standard for regulating units as per DIN EN 14597. VUG***F3***S are only available up to DN 125. Use stuffing box heater at temperatures below 0 °C; use the relevant adapter (accessory) at temperatures above 130 °C or 180 °C. Down to -10 °C, as per AD code of practice W 10, use water with anti-freeze and brine solution

³⁾ For operating pressure, see table: Pressure / temperature assignment



VUG032F304



Flow parameters	EN 60534
Test marks	TÜV ID: 13556

Overview of types

Type	Nominal diameter	K _{vs} value	Valve stroke	Connection	Weight
VUG015F374	DN 15	0.16 m³/h	20 mm	PN 25/16	4 kg
VUG015F364	DN 15	0.25 m³/h	20 mm	PN 25/16	4 kg
VUG015F354	DN 15	0.4 m³/h	20 mm	PN 25/16	4 kg
VUG015F344	DN 15	0.63 m³/h	20 mm	PN 25/16	4 kg
VUG015F334	DN 15	1 m³/h	20 mm	PN 25/16	4 kg
VUG015F324	DN 15	1.6 m³/h	20 mm	PN 25/16	4 kg
VUG015F314	DN 15	2.5 m³/h	20 mm	PN 25/16	4 kg
VUG015F304	DN 15	4 m³/h	20 mm	PN 25/16	4 kg
VUG020F304	DN 20	6.3 m³/h	20 mm	PN 25/16	5 kg
VUG025F304	DN 25	10 m³/h	20 mm	PN 25/16	5.6 kg
VUG032F304	DN 32	16 m³/h	20 mm	PN 25/16	9.1 kg
VUG040F304	DN 40	25 m³/h	20 mm	PN 25/16	11.2 kg
VUG050F304	DN 50	40 m³/h	20 mm	PN 25/16	13.8 kg
VUG065F316	DN 65	63 m³/h	40 mm	PN 16	25 kg
VUG065F304	DN 65	63 m³/h	40 mm	PN 25	25 kg
VUG080F304	DN 80	100 m³/h	40 mm	PN 25/16	37 kg
VUG100F304	DN 100	160 m³/h	40 mm	PN 25	50 kg
VUG125F304	DN 125	250 m³/h	40 mm	PN 25	75 kg
VUG150F304	DN 150	340 m³/h	40 mm	PN 25	100 kg

Accessories

Type	Description
0372336180	Adapter (required when temperature of the medium is 130...180 °C)
0372336240	Adaptor (required when temperature of the medium is 180...200 °C)
0378284100	Stuffing box heater 230V~, 15 W for medium below 0 °C
0378284102	Stuffing box heater 24V~, 15 W for medium below 0 °C
0378384001	Torsion protection DN 65...150
0560260001	Stuffing box for VUG/BUG for cold water application with grease containing silicone

Combination of VUG with electric 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 Δp_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 Δp_{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	2000 N	1100 N
Control signal	2-/3-point	2-/3-point, 0...10 V, 4...20 mA	2-/3-point, 0...10 V, 4...20 mA	2-/3-point, 0...10 V, 4...20 mA	2-/3-point, 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	40/80/120 s
Running time for DN 65...150	–	–	80/160/240 s	80/160/240 s	80/160/240 s	80/160/240 s

 Δp [bar]

Closes against the pressure	Δp_{max}	Δp_{max}	Δp_{max}	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s
VUG015F374 VUG015F364 VUG015F354 VUG015F344 VUG015F334 VUG015F324 VUG015F314 VUG015F304 VUG020F304	16.0	16.0	16.0	16.0	25.0	16.0	25.0	16.0	25.0
VUG025F304	15.2	15.2	16.0	16.0	25.0	16.0	25.0	16.0	17.0
VUG032F304	9.4	9.4	16.0	16.0	21.0	16.0	21.0	10.5	10.5
VUG040F304	6.1	6.1	16.0	13.5	13.5	13.5	13.5	6.5	6.5
VUG050F304	4.0	4.0	11.0	8.5	8.5	8.5	8.5	4.0	4.0
VUG065F316	–	–	7.1	5.6	5.6	5.6	5.6	–	–
VUG065F304	–	–	7.1	5.6	5.6	5.6	5.6	3.0	3.0
VUG080F304	–	–	4.7	3.4	3.4	3.4	3.4	2.0	2.0
VUG100F304	–	–	3.0	2.2	2.2	2.2	2.2	1.1	1.1
VUG125F304	–	–	2.0	1.6	1.6	1.6	1.6	0.8	0.8
VUG150F304	–	–	1.5	1.2	1.2	1.2	1.2	0.6	0.6

Closes with the pressure	Δp_{max}	Δp_{max}	Δp_{max}	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s
VUG015F374 VUG015F364 VUG015F354 VUG015F344 VUG015F334 VUG015F324 VUG015F314 VUG015F304 VUG020F304 VUG025F304 VUG032F304	6.0	6.0	6.0	6.0	25.0	6.0	25.0	6.0	25.0
VUG040F304	5.5	5.5	6.0	6.0	25.0	6.0	25.0	6.0	25.0
VUG050F304	3.5	3.5	6.0	6.0	25.0	6.0	25.0	4.0	25.0
VUG065F316	–	–	4.5	4.5	25.0	4.5	25.0	–	–
VUG065F304	–	–	4.5	4.5	25.0	4.5	25.0	2.6	25.0
VUG080F304	–	–	3.5	3.4	25.0	3.4	25.0	1.7	25.0
VUG100F304	–	–	3.0	2.2	25.0	2.2	25.0	1.1	25.0

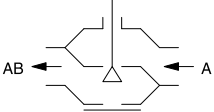
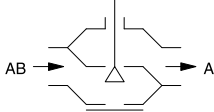
Actuator	AVM322F120	AVM322SF132	AVM234SF132	AVF234SF132		AVF234SF232		AVN224SF132	AVN224SF232
	AVM322F122								
VUG125F304	–	–	–	1.6	25.0	1.6	25.0	0.8	25.0
VUG150F304	–	–	–	1.0	25.0	1.0	25.0	0.6	25.0

💡 At temperatures above 130 °C, accessories are required

💡 Combination with AVN 224S: with safety function as per DIN EN 14597

Description of operation

The valve can be moved to any intermediate position with an electric actuator. When the spindle is moved out, the control passage of the valve is closed. These valves may be used in the “against the pressure” and “with the pressure” closing procedures. The direction of flow on the valve must be considered, or must be pasted over when using “with the pressure” (adhesive to be found in fitting instructions). The flow parameters correspond to EN 60534.

Closing procedure against the pressure	Closing procedure with the pressure
	

These regulating valves are characterised by their reliability and precision and make an important contribution towards efficient regulation. They meet difficult challenges such as safety functions, overcoming high differential pressures, controlling media 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 de luxe stainless steel SAUTER 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 housing and the corresponding plug. The stuffing box is maintenance-free. This consists of 6 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 regulations 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 or AVN 224S valve actuators 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. When the system is commissioned, the AVM 322(S), AVM 234S and AVF 234S actuator moves out and the connector automatically closes the connection to the valve when 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. When using AVN 224S valve actuators, the actuator must be initialised manually. For a more detailed description, see PDS 51.379 “Initialisation and feedback signal”.

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 accident prevention regulations
CE conformity: PED 2014/68/EU Fluid group II, liquid or with steam pressure VUG065F316: CE label VUG with AVN224SF132: CE-0035 label VUG without AVN224SF132: CE-0035 label	Category I Category IV Category II
Fitting instructions:	

DN 15...50	MV 505947
DN 65...150	MV 505973
AVM 322	P100011900
AVM 234S	MV 505919
AVF 234S	MV 505920
AVN 224S	MV 505927
Declaration on materials and the environment	MD 56.120

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 media 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 adapter for the temperature must be used. The adapter 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.

To increase the functional reliability of the valves, the system should conform to DIN EN 14336 (heating systems in buildings). DIN EN 14336 states, amongst other things, that the system has to be flushed through before being put into service.

Using with steam

The valves can be used for steam applications up to 200 °C with the same Δp_{\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%.

Approval for DIN EN 14597

With the exception of the VUG065F316, the valves can be used together with the valve actuator with emergency function AVN 224S as per DIN EN 14597.

Other information regarding hydraulics and noise in systems

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

The pressure difference Δp_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, the differential pressure on the valve should not exceed the value Δp_{crit} :

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

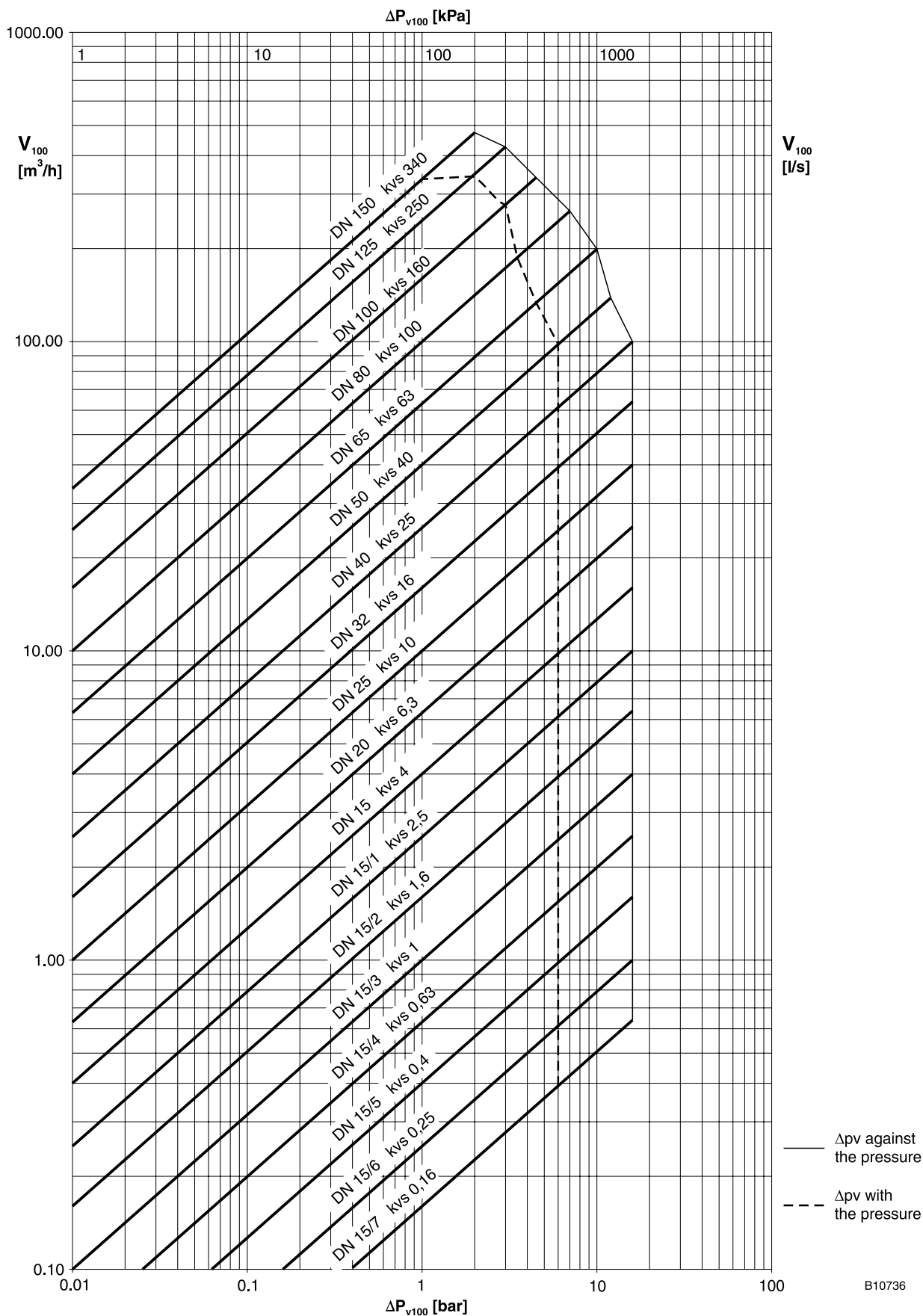
p_1 = upstream pressure before the valve (bar)

p_v = steam pressure at operating temperature (bar)

The calculation works with absolute pressure.

For the spring return, the stated Δp_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 Δp_{\max} .

VUG flow-rate chart



B10736

Type	Δp_v	
	Against the pressure [bar]	With the pressure [bar]
VUG015F374	16	6

Type	Δp_v	
VUG015F364	16	6
VUG015F354	16	6
VUG015F344	16	6
VUG015F334	16	6
VUG015F324	16	6
VUG015F314	16	6
VUG015F304	16	6
VUG020F304	16	6
VUG025F304	16	6
VUG032F304	16	6
VUG040F304	16	6
VUG050F304	12	6
VUG065F304	10	4.5
VUG065F316	10	4.5
VUG080F304	7	3.5
VUG100F304	4.5	3
VUG125F304	3	2
VUG150F304	2	1

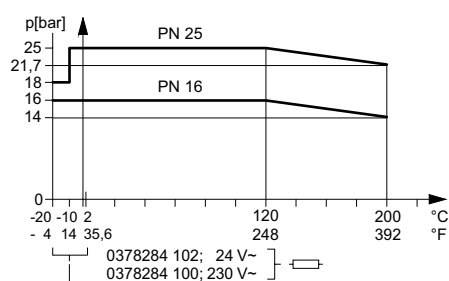
Additional version information

Valve body made of ductile cast iron as per EN 1563, code EN-GJS-400-18-LT, material number EN-JS 1025 with smooth drilled flanges as per EN 1092-2, seal form B. Valve body protected by matt paint RAL 9005 jet 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.

Material numbers as per DIN

	DIN material no.	DIN designation
Valve body	EN-JS1025	EN-GJS-400-18-LT (GGG40.3)
Valve seat	1.4021	X20Cr13
Spindle	1.4305	X8CrNiS18-9
Plug	1.4305	X8CrNiS18-9
Plug seal	PTFE	Glass-fibre reinforced
Stuffing box	CW617N	CuZn40Pb2
Seal under stuffing box	CW024A	Cu-DHP

Pressure / temperature assignment



Additional details on the definitions of pressure difference

Δp_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.

Δp_{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 Δp_v of the valve is never exceeded.

Δp_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, Δp_s can be greater than Δp_{max} or Δp_v . The disruptive flow effects that arise here are quickly passed through and are of minor importance in this method of operation.

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

 Δp_{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.

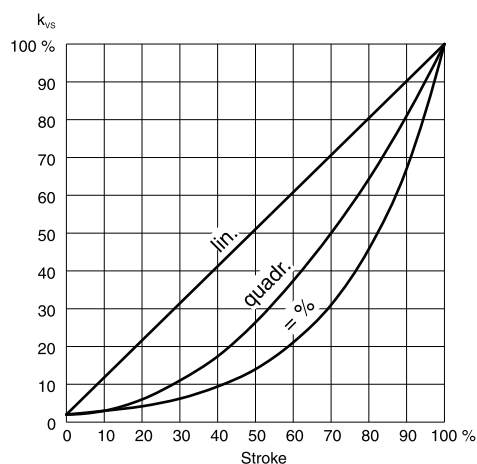
For valves that close with pressure, the static pressure plus the pump pressure are used.

Characteristic for actuators with positioner (only 24 V)

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

Equal-percentage/linear/quadratic

Can be set using coding switch

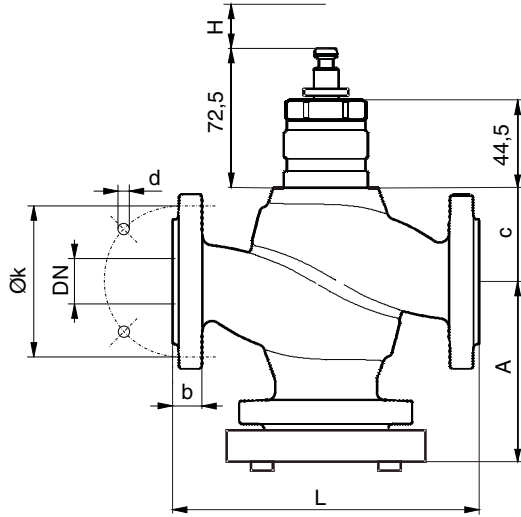
**Disposal**

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.

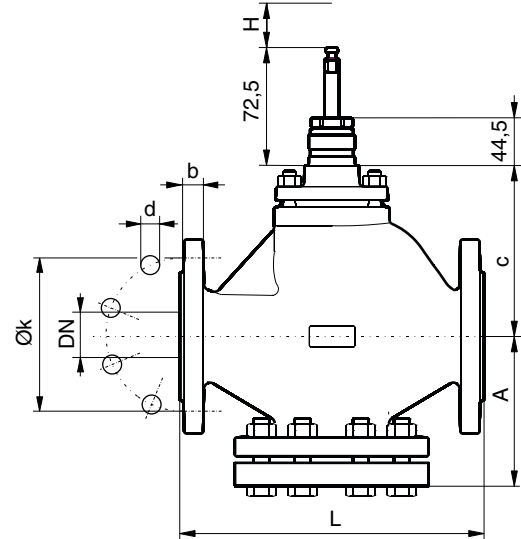
Dimension drawing

[mm]



VUG	DN	A	c	L	H	k	d	b
015	15	84	54	130	20	65	14 x 4	14
020	20	94	48	150	20	75	14 x 4	16
025	25	97	50	160	20	85	14 x 4	16
032	32	110	59	180	20	100	19 x 4	18
040	40	116	63	200	20	110	19 x 4	19
050	50	126	67	230	20	125	19 x 4	19
065	65/PN16	144	163	290	40	145	19 x 4	19

[mm]

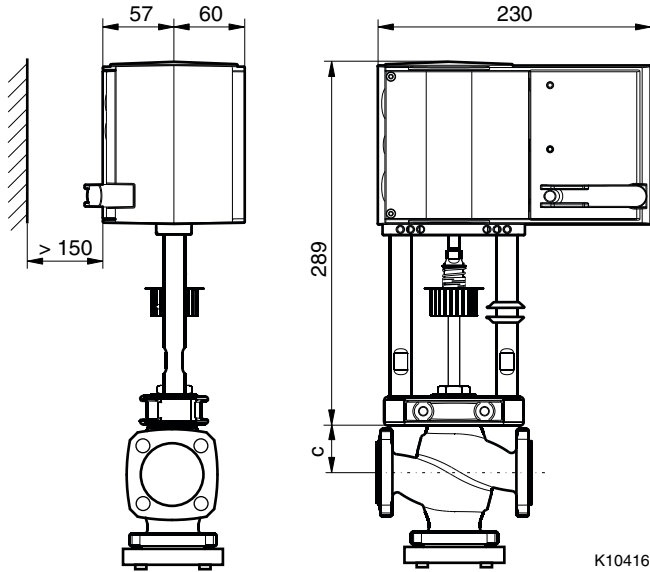


VUG	DN	A	c	L	H	k	d	b
065	65/PN25	144	163	290	40	145	19 x 8	19
080	80	156	182	310	40	160	19 x 8	19
100	100	176	183	350	40	190	23 x 8	19
125	125	228	223	400	40	220	28 x 8	19
150	150	242	257	480	40	250	28 x 8	20

Combinations

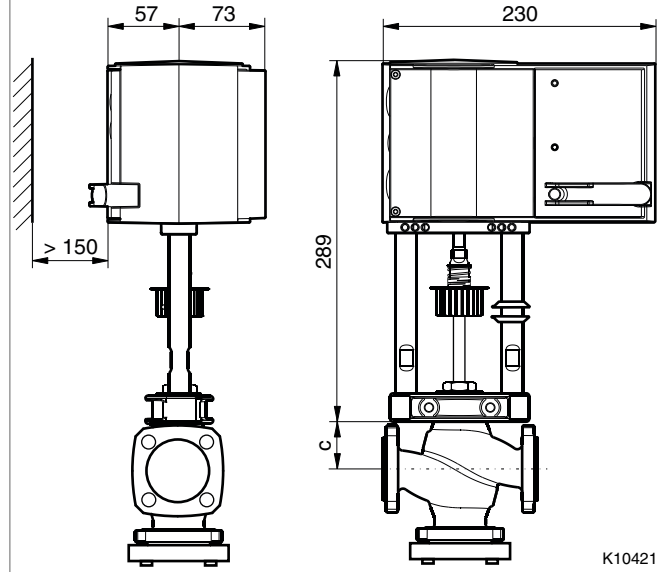
AVM 322(S)

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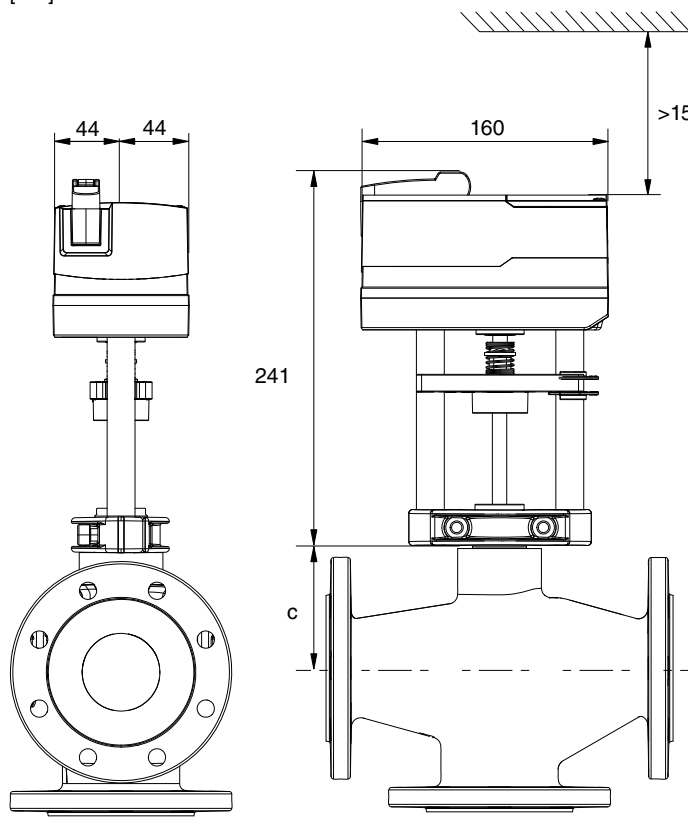
AVM 234S

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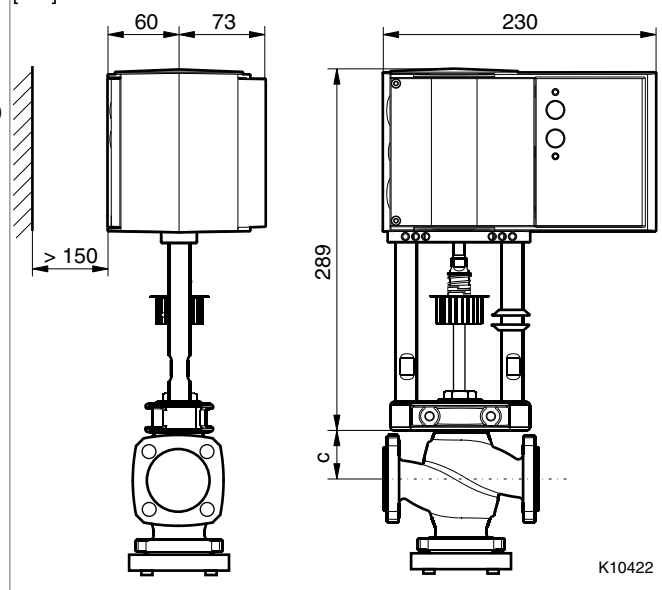
AVF 234S

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AVN 224S

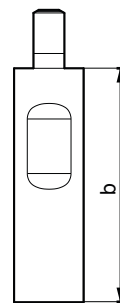
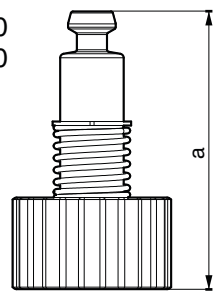
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K10422

Accessories

0372336 180
0372336 240



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

[mm]

0378284 100
0378284 102

