

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

### How energy efficiency is improved

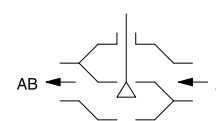
Efficiency means precise and reliable control

### Features

- Continuous control of cold and hot water in closed circuits
- Together with pneumatic actuators AVP 242, AVP 243 and AVP 244
- 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
- Regulating valve, free of silicone grease, painted black
- The valve is closed when the spindle is moved out
- Closing against the pressure
- Valve body of ductile cast iron; seat and spindle of stainless steel
- Plugs of nominal diameters DN 15...50 of stainless steel with glass-fibre-reinforced PTFE sealing ring
- Plugs of nominal diameters DN 65...150 are made of stainless steel with metal-to-metal seal
- Maintenance-free stuffing box in brass with spring-loaded PTFE washer



VUG032F304



### Technical data

#### Parameters

Nominal pressure	PN16/25
Connection	Flange as per EN 1092-2, form B
Valve characteristic	Equal-percentage
Control ratio of valve	> 50:1
Leakage rate at max. $\Delta p_s$	$\leq 0.05\%$ of $k_{VS}$ value

#### Admissible ambient conditions

Operating temperature <sup>1)</sup>	30...200 °C
Operating pressure <sup>2)</sup>	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
Flow parameters	EN 60534

#### Overview of types

Type	Nominal diameter	$k_{VS}$ value	Valve stroke	Connection	Weight
VUG015F374	DN 15	0.16 m <sup>3</sup> /h	20 mm	PN 25/16	4 kg
VUG015F364	DN 15	0.25 m <sup>3</sup> /h	20 mm	PN 25/16	4 kg
VUG015F354	DN 15	0.4 m <sup>3</sup> /h	20 mm	PN 25/16	4 kg
VUG015F344	DN 15	0.63 m <sup>3</sup> /h	20 mm	PN 25/16	4 kg
VUG015F334	DN 15	1 m <sup>3</sup> /h	20 mm	PN 25/16	4 kg
VUG015F324	DN 15	1.6 m <sup>3</sup> /h	20 mm	PN 25/16	4 kg
VUG015F314	DN 15	2.5 m <sup>3</sup> /h	20 mm	PN 25/16	4 kg
VUG015F304	DN 15	4 m <sup>3</sup> /h	20 mm	PN 25/16	4 kg
VUG020F304	DN 20	6.3 m <sup>3</sup> /h	20 mm	PN 25/16	5 kg

<sup>1)</sup> 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. VUG\*\*\*F3\*\*S are only available up to DN125.  
Use stuffing box heater at temperatures below 0 °C; use the relevant adaptor (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

<sup>2)</sup> For operating pressure, see table: Pressure / temperature assignment



Type	Nominal diameter	$k_{vs}$ value	Valve stroke	Connection	Weight
VUG025F304	DN 25	10 m <sup>3</sup> /h	20 mm	PN 25/16	5.6 kg
VUG032F304	DN 32	16 m <sup>3</sup> /h	20 mm	PN 25/16	9.1 kg
VUG040F304	DN 40	25 m <sup>3</sup> /h	20 mm	PN 25/16	11.2 kg
VUG050F304	DN 50	40 m <sup>3</sup> /h	20 mm	PN 25/16	13.8 kg
VUG065F316	DN 65	63 m <sup>3</sup> /h	40 mm	PN 16	25 kg
VUG065F304	DN 65	63 m <sup>3</sup> /h	40 mm	PN 25	25 kg
VUG080F304	DN 80	100 m <sup>3</sup> /h	40 mm	PN 25/16	37 kg
VUG100F304	DN 100	160 m <sup>3</sup> /h	40 mm	PN 25	50 kg
VUG125F304	DN 125	250 m <sup>3</sup> /h	40 mm	PN 25	75 kg
VUG150F304	DN 150	340 m <sup>3</sup> /h	40 mm	PN 25	100 kg

#### Accessories

Type	Description
0372336180	Adapter (required when temperature of the medium is 130...150 °C) from DN 65
0372336240	Adaptor (required when temperature of the medium is 180...240 °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

#### Combination of VUG with pneumatic actuator

**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.*

**i** *The running time is based on the centair air flow rate (400 l<sub>r</sub>/h) and on a supply line with a length of 20 m and a diameter of 4 mm.*

#### Pressure differences

Actuator	AVP242F021	AVP243F021	AVP244F021	AVP243F031	AVP244F031
Admissible pressure $p_{stat}$	≤ 25 bar	≤ 25 bar	≤ 25 bar	≤ 25 bar	≤ 25 bar
Running time	8 s	24 s	40 s	24 s	40 s
Stroke	20 mm	20 mm	20 mm	40 mm	40 mm

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

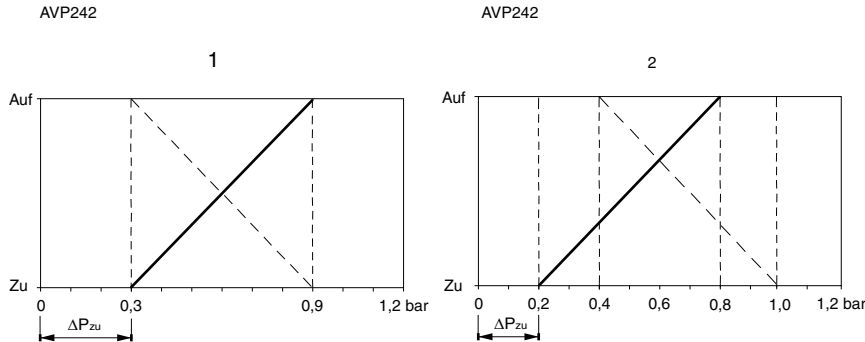
Closes against the pressure	$\Delta p$ [bar]									
	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$
VUG015F374										
VUG015F364										
VUG015F354										
VUG015F344										
VUG015F334	16.0	16.5	16.0	22.7	16.0	25.0	–	–	–	–
VUG015F324										
VUG015F314										
VUG015F304										
VUG020F304	13.0	13.0	16.0	18.0	16.0	25.0	–	–	–	–
VUG025F304	8.8	8.8	12.2	12.2	16.0	24.5	–	–	–	–
VUG032F304	5.5	5.5	7.8	7.8	15.5	15.5	–	–	–	–
VUG040F304	3.7	3.7	5.2	5.2	10.3	10.3	–	–	–	–
VUG050F304	2.5	2.5	3.3	3.3	6.6	6.6	–	–	–	–
VUG065F316	–	–	–	–	–	–	2.2	2.2	4.4	4.4
VUG065F304										
VUG080F304	–	–	–	–	–	–	1.5	1.5	3.0	3.0
VUG100F304	–	–	–	–	–	–	1.0	1.0	2.0	2.0
VUG125F304	–	–	–	–	–	–	0.7	0.7	1.3	1.3

Actuator	AVP242F021		AVP243F021		AVP244F021		AVP243F031		AVP244F031	
VUG150F304	-	-	-	-	-	-	0.5	0.5	1.0	1.0

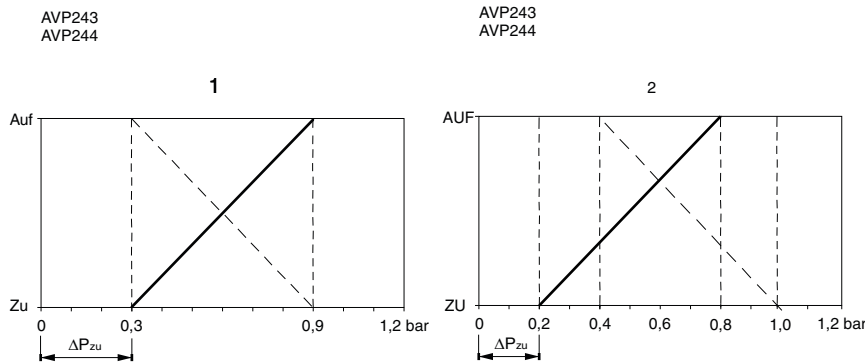
Cannot be used to close with the pressure

☛ At temperatures above 130 °C, accessories are required

**Pressure-stroke characteristic (with valve attached), characteristic not adjustable:**



**Adjustable characteristic:**



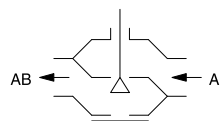
———— = normally closed (function E)  
 - - - - - = normally open (function A)

Sequences possible with XSP31

**Description of operation**

The valve can be moved to any intermediate position with a pneumatic actuator. When the spindle is moved out, the control passage of the valve is closed. Observe the direction of flow shown on the valve. Closing with pressure is not permitted with pneumatic actuators, because this would cause pressure surges. The flow parameters correspond to EN 60534.

**Closes against the operating pressure**



These control valves are characterised by their reliability and precision and make an important contribution towards efficient regulation. They meet challenges such as safety functions, overcoming great differential pressures, controlling medium temperatures and performing the shut-off function, all in a low-noise form.

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

### Engineering and fitting notes

The actuator is mounted directly on the valve and fastened with screws. The actuator is connected with the valve spindle automatically. The closing point must be adjusted as described in the fitting instructions (MV 506012 for AVP 242 or MV 506013 for AVP 243/244).

### 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)	Category I
VUG065F316: CE label	Category II
VUG: CE-0035 label	
<b>Fitting instructions:</b>	
DN 15...15	MV 505947
DN 65...150	MV 505973
AVP 242	MV 506012
AVP 243/244	MV 505813
Declaration on materials and the environment	MD 76.120

### 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 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.

If a split range of adjustment, more precise adjustment, faster adjustment and increased air capacity or reversible direction of operation is required, the actuator can be equipped with an XSP 31 positioner, see section 79.

### 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.

Water requirements according to 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. Cavitation accelerates wear 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  $\Delta p_{\text{krit}}$ :

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

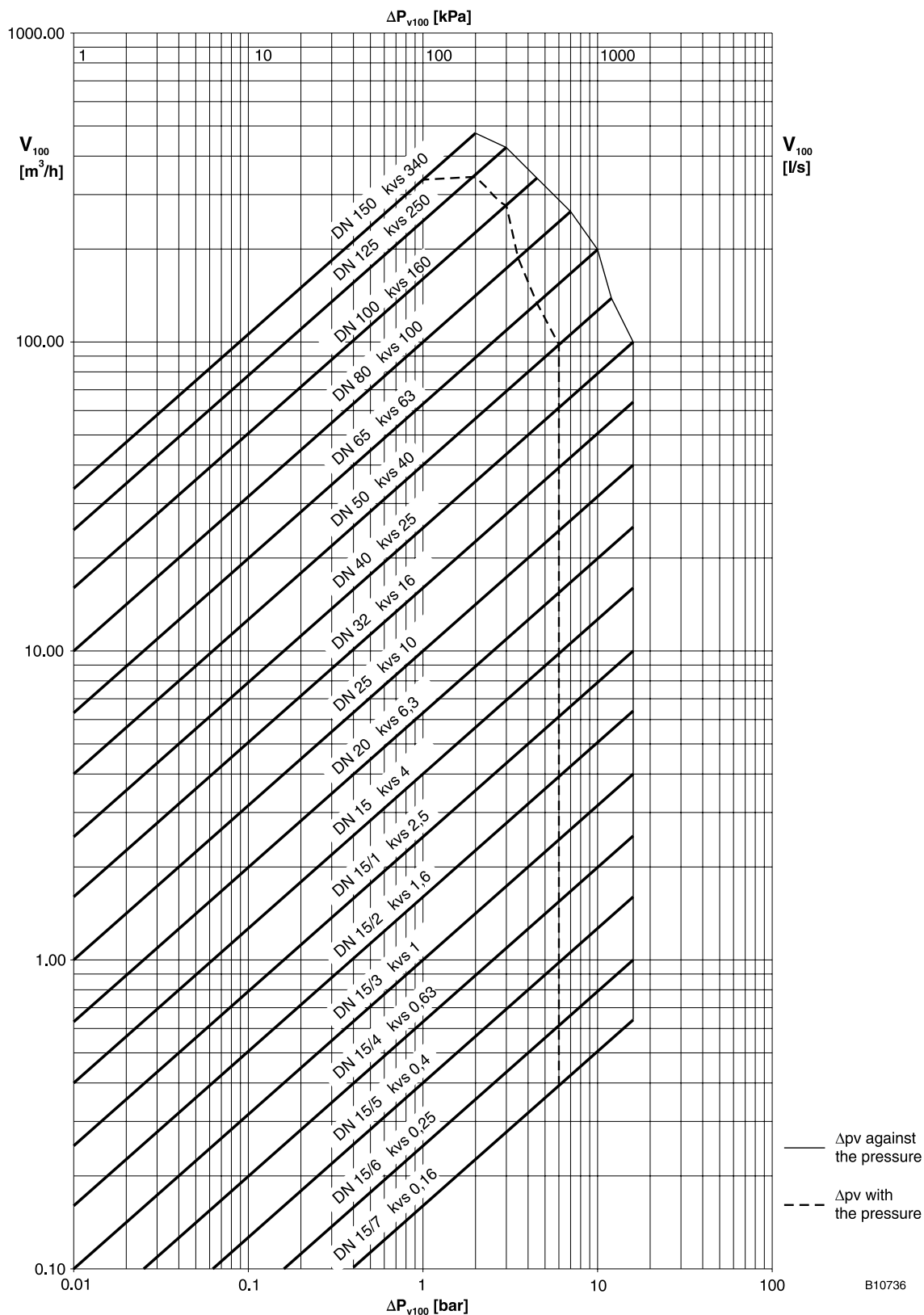
$p_1$  = upstream pressure before the valve (bar)

$p_v$  = 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  $\Delta p_{\max}$ .

VUG flow-rate chart



Type	$\Delta p_v$	
	Against the pressure [bar]	With the pressure [bar]
VUG015F374	16	-
VUG015F364	16	-
VUG015F354	16	-
VUG015F344	16	-
VUG015F334	16	-

Type	$\Delta p_v$	
VUG015F324	16	-
VUG015F314	16	-
VUG015F304	16	-
VUG020F304	16	-
VUG025F304	16	-
VUG032F304	16	-
VUG040F304	16	-
VUG050F304	12	-
VUG065F304	10	-
VUG080F304	7	-
VUG100F304	4.5	-
VUG125F304	3	-
VUG150F304	2	-

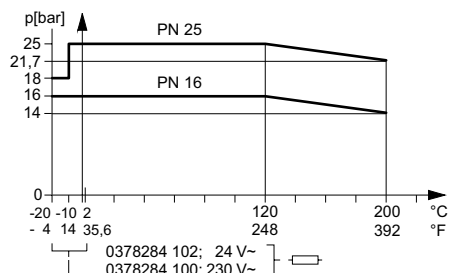
### Additional version information

Valve body made of ductile cast iron as per EN 1563, code EN-GJL-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

#### $\Delta p_v$ :

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

This parameter characterises the valve 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.

This takes account of static pressure and flow effects. 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.

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 dormant pressure when the pump is switched off, for example caused by the fluid level in the system, increased pressure due to pressure tanks, steam pressure, etc.

On valves that close under pressure, the static pressure plus the pump pressure must be used.

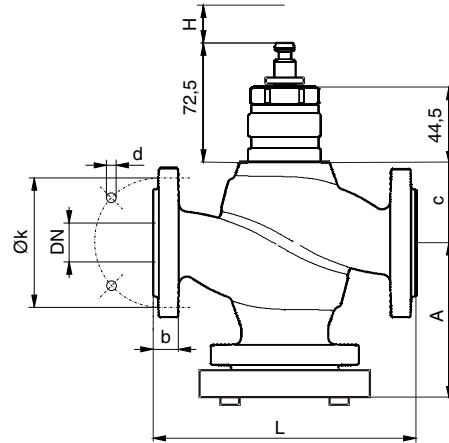
**Disposal**

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.

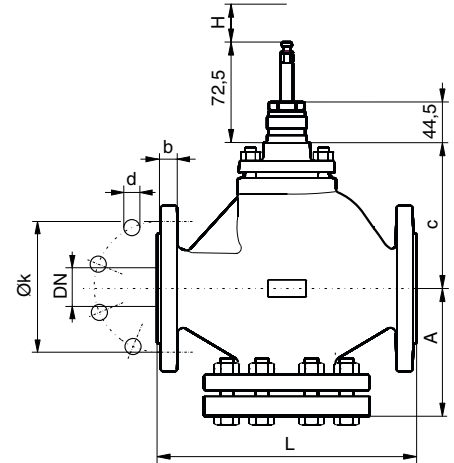
**Dimension drawings**

**DN 15...50 (65)**



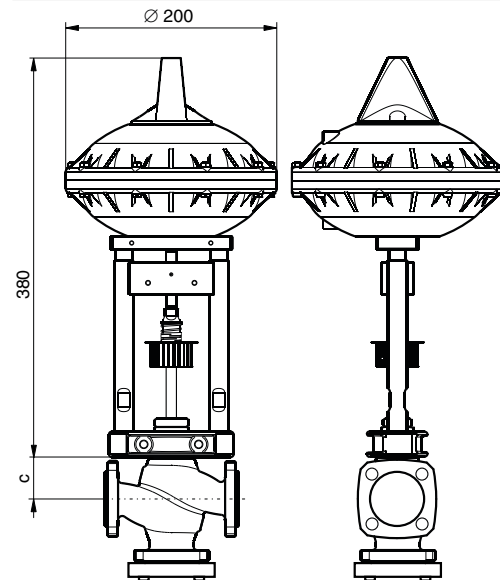
VUG	DN	A	c	L	H	k	d	b
015	15	84	54	130	20	65	14 x 4	14
020	20	94	48	150	20	75	14 x 4	16
025	25	97	50	160	20	85	14 x 4	16
032	32	110	59	180	20	100	19 x 4	18
040	40	116	63	200	20	110	19 x 4	19
050	50	126	67	230	20	125	19 x 4	19
065	65/ PN16	144	163	290	40	145	19 x 4	19

**DN65...150**



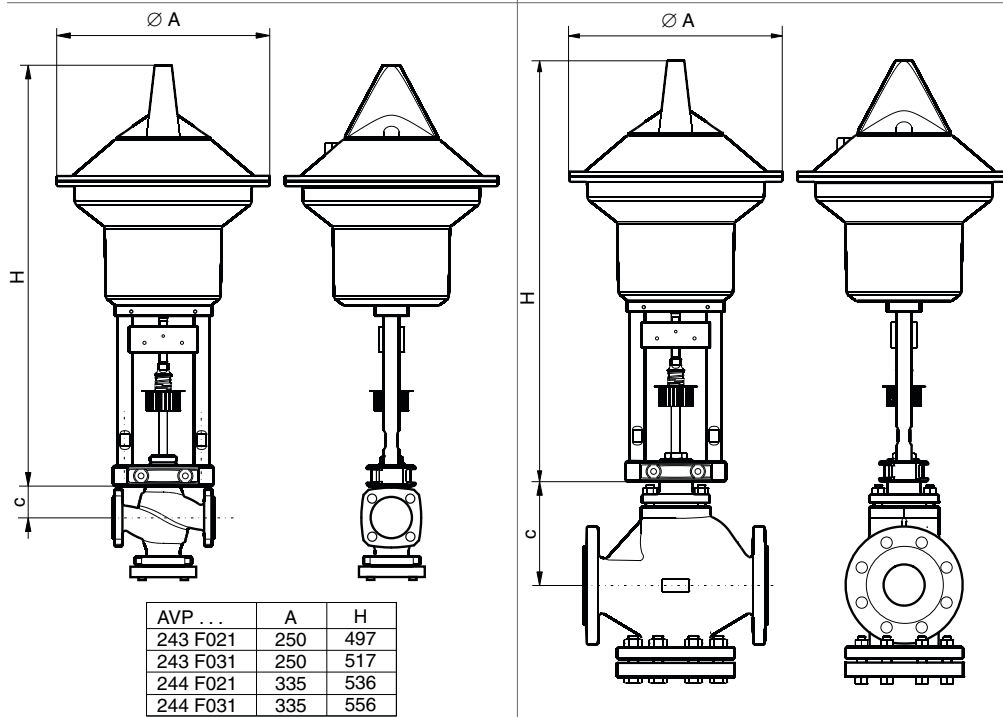
VUG	DN	A	c	L	H	k	d	b
065	65/ PN25	144	163	290	40	145	19 x 8	19
080	80	156	182	310	40	160	19 x 8	19
100	100	176	183	350	40	190	23 x 8	19
125	125	228	223	400	40	220	28 x 8	19
150	150	242	257	480	40	250	28 x 8	20

**AVP242F021**



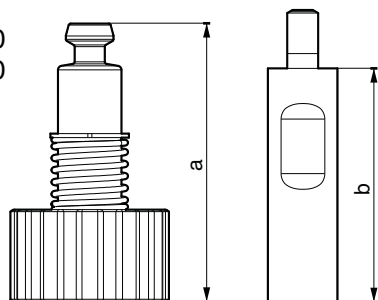


AVP 243/244



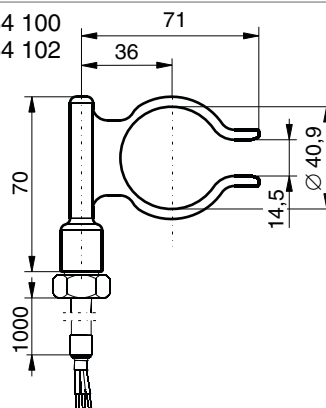
Accessories

0372336 180  
0372336 240

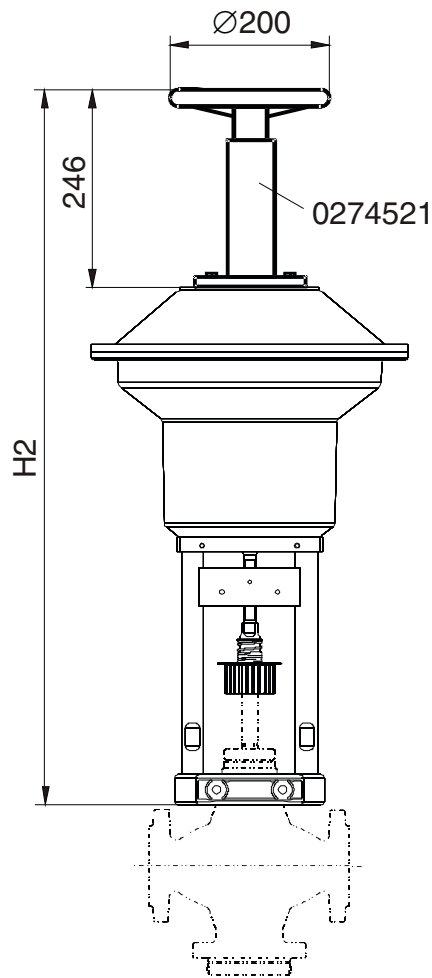


0372336	T (°C)	a (mm)	b (mm)
180	180	69,4	60
240	240	109,4	100

0378284 100  
0378284 102



AVP 243/244



AVP ...	H2
243 F021	656
243 F031	676
244 F021	695
244 F031	715