

## BUD: Flanged three-way valves, PN 6

### How energy efficiency is improved

Accurate control with high reliability.

### Areas of application

Continuous control of cold/hot water and air in closed networks<sup>1)</sup> and flow temperature control in heating systems. Water quality as per VDI 2035. Assembly with AVP 242 to AVP 244 actuators as a regulating unit.

### Features

- Nominal pressure 6 bar
- Control valve contains no silicone grease; painted black
- Nominal diameters DN15 to DN100
- Equal-percentage characteristic
- Linear mixing passage characteristic
- With the spindle retracted, the valve is closed
- Application as control valve or diverting valve

### Technical description

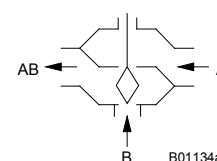
- Valve with flange connection as per EN 1092-2, Form B raised face
- Valve body and seat in cast iron
- Stainless steel spindle
- Brass plug in nominal diameters DN15 to DN50, with glass-fibre-reinforced PTFE sealing ring
- Brass plug in nominal diameters DN65 to DN100, metal-on-metal seal
- Stuffing box made of brass with EPDM wiper ring and double O-ring seal



T1.0989



Y07545



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Type	Nominal diameter DN	Connection PN	$k_{VS}$ value $m^3/h$	Weight kg
BUD 015 F320	15	6	1.6	3.2
BUD 015 F310	15	6	2.5	3.2
BUD 015 F300	15	6	4.0	3.2
BUD 020 F300	25	6	6.3	4.1
BUD 025 F300	25	6	10	4.7
BUD 032 F300	32	6	16	7.1
BUD 040 F300	40	6	22	8.4
BUD 050 F300	50	6	28	10.9
BUD 050 F200	50	6	40	11.2
BUD 065 F300	65	6	49	11.9
BUD 065 F200	65	6	63	11.9
BUD 080 F300	80	6	78	17.7
BUD 080 F200	80	6	100	17.7
BUD 100 F300	100	6	124	26.0
BUD 100 F200	100	6	160	26.0

Operating temperature	-10...150 °C <sup>2)</sup>	Stuffing box	2 O-rings, EPDM
Operating pressure	6 bar	Leakage rate at max. $\Delta p_s$	
Valve characteristic for		control passage	$\leq 0.05\%$ of $k_{VS}$ value
control passage F200	linear	mixing passage	$\leq 1\%$ of $k_{VS}$ value
control passage F300	equal-percentage	Stroke DN 15...50	8 mm
mixing passage	linear	DN 65...80	20 mm
Valve control ratio	> 50:1	DN 100	40 mm

### Accessories

- 0372240 001\*** Manual adjuster for valves with 8 mm stroke; MV 505813
- 0372249 001\*** Adaptor required when temperature of medium >100 °C up to 130 °C (recommended at temperatures of < 10 °C) from DN 15 to DN 50, MV 505932
- 0372249 002\*** Adaptor required when temperature of medium >130 °C up to 150 °C, from DN 15 to DN 50, MV 505932
- 0372336 180** Adaptor required when temperature of medium. >130 °C / >150 °C from DN 65, MV 505902
- 0378284 100\*** Stuffing box heater, 230 V~; 15 W, for media below 0 °C, DN 15...100, MV 505978
- 0378284 102\*** Stuffing box heater, 24 V~; 15 W, for media below 0 °C, DN 15...100, MV 505978
- 0378368 001** Complete replacement stuffing box for DN 15 to DN 50
- 0378369 001** Complete replacement stuffing box for DN 65 to DN 100

<sup>\*)</sup> Dimension drawing or wiring diagram available under the same number

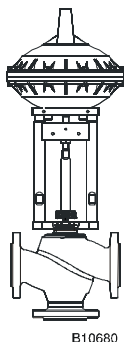
<sup>1)</sup> Air humidity must not exceed 75%

<sup>2)</sup> At temperatures below 0 °C, use the stuffing box heater; at temperatures above 100 °C, use the temperature adaptor (accessory).

Dimension drawing	DN 15...50	M10470	Fitting instructions	Assembly AVP 242 F001	MV 506041
	DN 65...100	M10440	Assembly AVP 242 F021		MV 506012
Fitting instructions	Valve DN 15...50	MV 506008	Assembly AVP 243 / 244		MV 506013
	Valve DN 65...100	MV 505964	Declaration on materials		MD 76.111

Warranty The technical data and pressure differences indicated here are only applicable in combination with Sauter actuators. Any warranty shall lapse if actuators from other manufacturers are used.

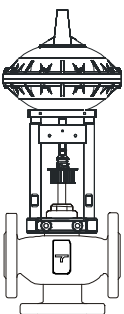
### Combination of BUD, PN 6 with pneumatic drive AVP 242



B10680

Drive	AVP 242 F001		
Perm. press. $p_{stat}$	$\leq 6$ bar		
Running time <sup>1)</sup>	8 s		
Stroke	8 mm		
Valve	$\Delta p_{max}$	$\Delta p_s$	
BUD 015	6.0	6.0	
BUD 020	6.0	6.0	
BUD 025	6.0	6.0	
BUD 032	6.0	6.0	
BUD 040	4	4.0	
BUD 050	2.5	2.5	

For temperatures above 100 °C, accessories are required

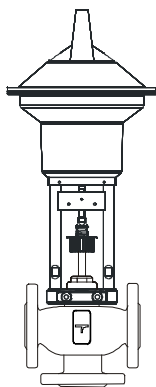


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Drive	AVP 242 F021		
Perm. press. $p_{stat}$	$\leq 6$ bar		
Running time <sup>1)</sup>	8 s		
Stroke	20 mm		
Valve	$\Delta p_{max}$	$\Delta p_s$	
BUD 065	1.0	1.5	
BUD 080	1.0	1.0	

For temperatures above 130 °C, accessories are required

### Combination of BUD, PN 6 with pneumatic drive AVP 243 / 244



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Drive	AVP 243 F021		AVP 244 F021	
Perm. press. $p_{stat}$	$\leq 6$ bar		$\leq 6$ bar	
Running time <sup>1)</sup>	24 s		40 s	
Stroke	20 mm		20 mm	
Valve	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$
BUD 065	2	2.3	3.0	4.5
BUD 080	1.3	1.5	3.0	3.0

For temperatures above 130 °C, accessories are required

Drive	AVP 243 F031		AVP 244 F031	
Perm. press. $p_{stat}$	$\leq 6$ bar		$\leq 6$ bar	
Running time <sup>1)</sup>	24 s		40 s	
Stroke	40 mm		40 mm	
Valve	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$
BUD 100	0.9	1.0	2	2

For temperatures above 130 °C, accessories are required

<sup>1)</sup> In relation to the Centair air rate (400 l/h) and to a pipe with length of 20 m and diameter of 4 mm

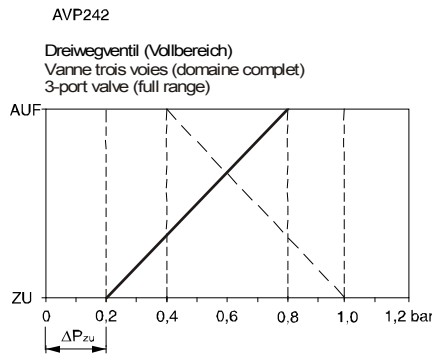
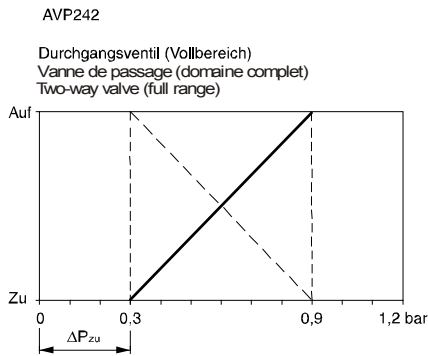
Valve: Variant F, for technical data and accessories see Valve Type Table  
 Drive: Variant F, for technical data, accessories and installation position see section 71  
 Example: BUD 065 F300 / AVP 243 F031  
 Valve control passage A-AB is closed when actuator is pressureless = factory setting  
 Valve control passage A-AB is open when actuator is pressureless = on request

$\Delta p_{max}$  [bar]= Maximum permitted pressure difference across the valve at which the drive can still reliably open and close the valve, taking account of  $\Delta P_v$ .

$\Delta p_s$  [bar]= Maximum permitted pressure difference across the valve in case of a fault (pipe break downstream of the valve) at which the drive can close the valve reliably with 'fast' performance of the stroke

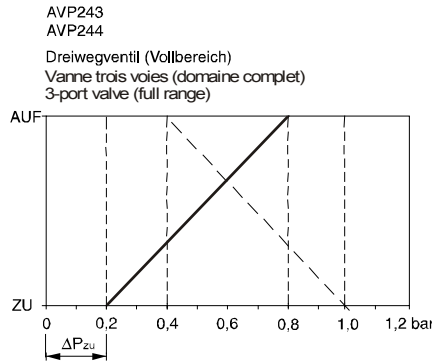
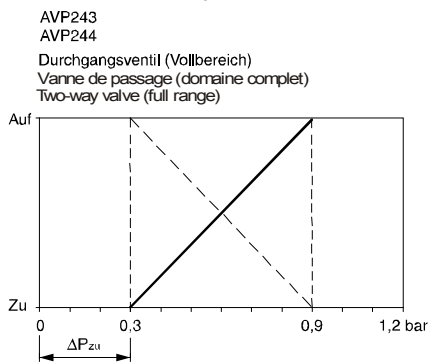
**Pressure-stroke characteristic (with valve fitted)**

**Characteristic is not adjustable:**



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**Characteristic is adjustable:**



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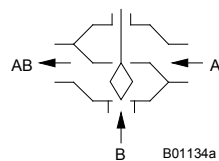
- = CLOSED without pressure (function E)
- = OPEN without pressure (function A)

**Sequences with XSP31 are possible**

**Function**

The valve can be moved to any position by means of a pneumatic drive. If the valve stem is extended, the control passage of the valve is closed. The valves must be used only as a 'control valve'. The direction of flow marked on the valve must be observed. Usage as a diverting valve is not permissible with pneumatic drives, since it would cause pressure surges. The fluidic parameters comply with EN 60534.

**Used as a control valve**



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**Description**

The key features of these control valves are their high reliability and precision, and they make a major contribution towards environment-friendly control. They meet demanding requirements including emergency positioning functions, coping with differential pressures, controlling the medium temperature and providing a shut-off function; all this is achieved with a low noise level.

An automatic and fixed connection is made between the valve stem and the drive shaft. The plug (which is made of brass) controls an equal-percentage flow in the control passage. To compensate for the complementary characteristic of the consumer and to guarantee an identical quantity of medium regardless of the valve position, the mixing passage acts with a linear characteristic. The tightness of this valve is guaranteed by the seat which is machined in the body.

The stuffing box is maintenance-free; it consists of a brass body, 2 O-rings and a grease reserve. This is free of silicone grease and no silicone oil must be used for the stem. The grease reserve prevents particles that might be present in the medium from reaching the upper O-ring.

**Engineering and fitting notes**

The drive is placed directly on top of the valve and is fixed with screws. The connection between the drive and the valve stem is made automatically. The closing point must be set as described in the installation instructions (MV 506012 AVP 242 or MV 506013 AVP 243/244).

**Installation position**

The final control element can be installed in any position, except facing downwards. Condensate and water drips etc. must be prevented from penetrating into the drive. With a horizontal installed position and in relation to the valve stem, the permitted maximum drive (or other) weight is 25 kg unless a support is provided by the customer or others.

When fitting the drive onto the valve, you must make sure that the plug is not rotated on the seat (this would damage the sealing surface). If the valve is insulated, the insulation must only extend as far as the connecting clip of the drive.

**Applications with steam**

The valves must not be used for applications involving steam.

**Applications with water**

To ensure that impurities in the water (such as welding beads or particles of rust, etc.) are retained and the stem seal is not damaged, it is advisable to install collective filters, e.g. for each storey or pipe run. Water quality requirements conform to VDI 2035. If an additional medium is used, the compatibility of the materials must be clarified with the manufacturer of the medium. The Material Table shown below can be used for this purpose. If glycol is used, we recommend that a concentration of between 20% and 55% should be selected.

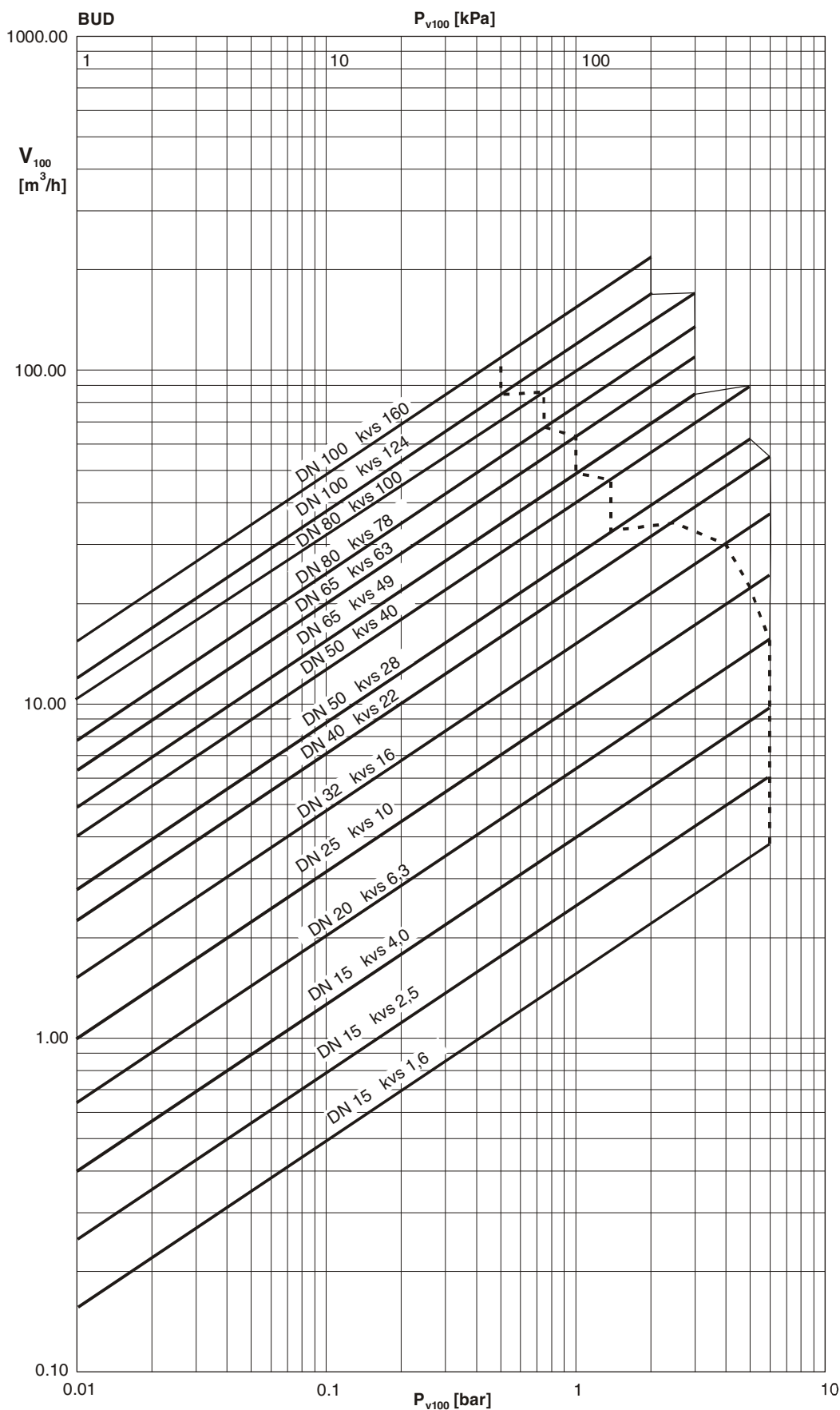
The valves are not suitable for drinking water or in zones where there is a risk of explosions.

**Other notes concerning hydraulics and noises in systems**

The valves can be used in a low-noise environment. To avoid noises, the pressure differences  $\Delta p_{\max}$  listed below should not be exceeded.

The close/off pressure values which are also listed represent the maximum pressures at which the drive can still use its own force to move the valve. It should be pointed out here that if these pressures are used and the pressure difference  $\Delta p_{\max}$  is exceeded, the valve may sustain damage due to cavitation and erosion. In case of a spring return function, the stated  $\Delta p_s$  values also represent the permitted differential pressure up to which the drive guarantees closure of the valve in case of an incident. As this is a safety function with 'fast' passage through the stroke (by means of the spring), this value may exceed  $\Delta p_{\max}$ .

Pressure loss table



Type	$\Delta p_v$ used as a control valve
<b>BUD 015 F320</b>	6
<b>BUD 015 F310</b>	6
<b>BUD 015 F300</b>	6
<b>BUD 020 F300</b>	6
<b>BUD 025 F300</b>	6
<b>BUD 032 F300</b>	6
<b>BUD 040 F300</b>	6
<b>BUD 050 F...</b>	5
<b>BUD 065 F...</b>	3
<b>BUD 080 F...</b>	3
<b>BUD 100 F...</b>	2

**Additional technical data**

- Pressure and temperature data  
 Parameters related to flow mechanics  
 Sauter slide rule for valve sizing  
 Manual for slide rule  
 Technical manual: 'Regulating Units'  
 Parameters, installation notes, control, general

EN 764, EN 1333  
 VDI/VDE 2173  
 7 090011 001  
 7 000129 001  
 7 000477 001  
 Valid EN, DIN, AD,  
 TRD and UVV  
 specifications/regula  
 tions  
 97/23/EC  
 Article 3.3

- CE conformity, Pressure Equipment Directive (fluid group II)  
 BUD 015 to BUD 100: no CE symbol

**Additional information**

Valve body made of grey cast iron to EN 1563, code EN-GJL-250, material number EN-JL 1040 with smooth drilled flanges to EN 1092-2, form B, sealing strip. Valve body to RAL 9005, dark black. Recommendation for welding-neck flange as per EN 1092-2. Overall valve length to EN 558-1, basic series 1. Flat seal on valve body made of asbestos-free material.

**DIN material numbers**

	DIN material numbers	DIN designation
Valve body	EN-JL 1040	EN-GJL-250 (GG25)
Valve seat	EN-JL 1040	EN-GJL-250
Stem	1.4305	X 8 Cr Ni S 18-9
Plug	CW 617 W	CuZn40Pb2
Plug seal	PTFE	
Stuffing box	CW 617 W	CuZn40Pb2
Valve body	EN-JL 1040	EN-GJL-250 (GG25)

**Detailed information on pressure difference definitions**

**$\Delta p_v$ :**

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.

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

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 smooth stroke action and valve sealing. In doing so, the valve's  $\Delta p_v$  value is not exceeded.

**$\Delta p_s$ :**

Maximum permissible pressure difference across the valve in the event of a malfunction (e.g. power failure) at which the drive can firmly close the valve and, if necessary, hold the full operating pressure against atmospheric pressure. Since this is a safety function with 'fast' stroke,  $\Delta p_s$  can be larger than  $\Delta p_{max}$  or, respectively,  $\Delta p_v$ . 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.

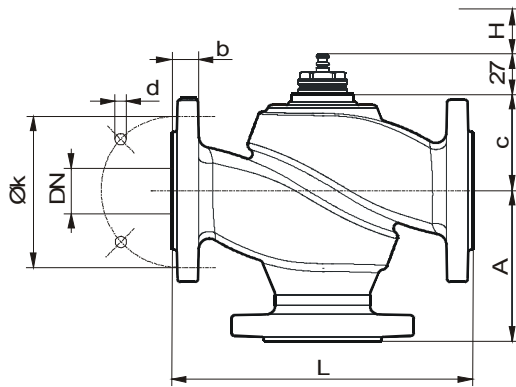
**$\Delta p_{stat}$ :**

Line pressure across 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 plant, an increase in pressure via the pressure store, steam pressure etc.

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

**Dimension drawings**

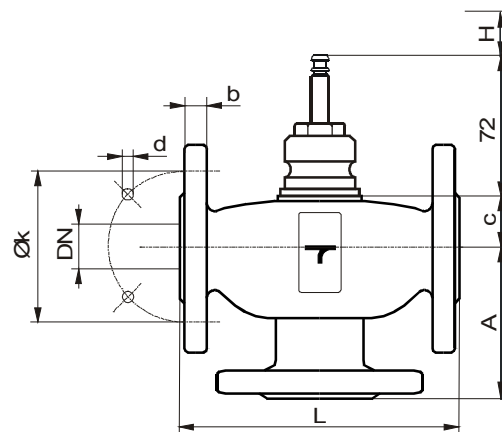
**DN 15...50**



VUD, BUD	DN	A	c	L	H	k	d	b
015	15	70	41,5	130	8	55	11 x 4	14
020	20	75	48	150	8	65	11 x 4	16
025	25	80	54,5	160	8	75	11 x 4	16
032	32	95	60,5	180	8	90	14 x 4	18
040	40	100	70,5	200	8	100	14 x 4	18
050	50	115	71	230	8	110	14 x 4	20

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**DN65...100**

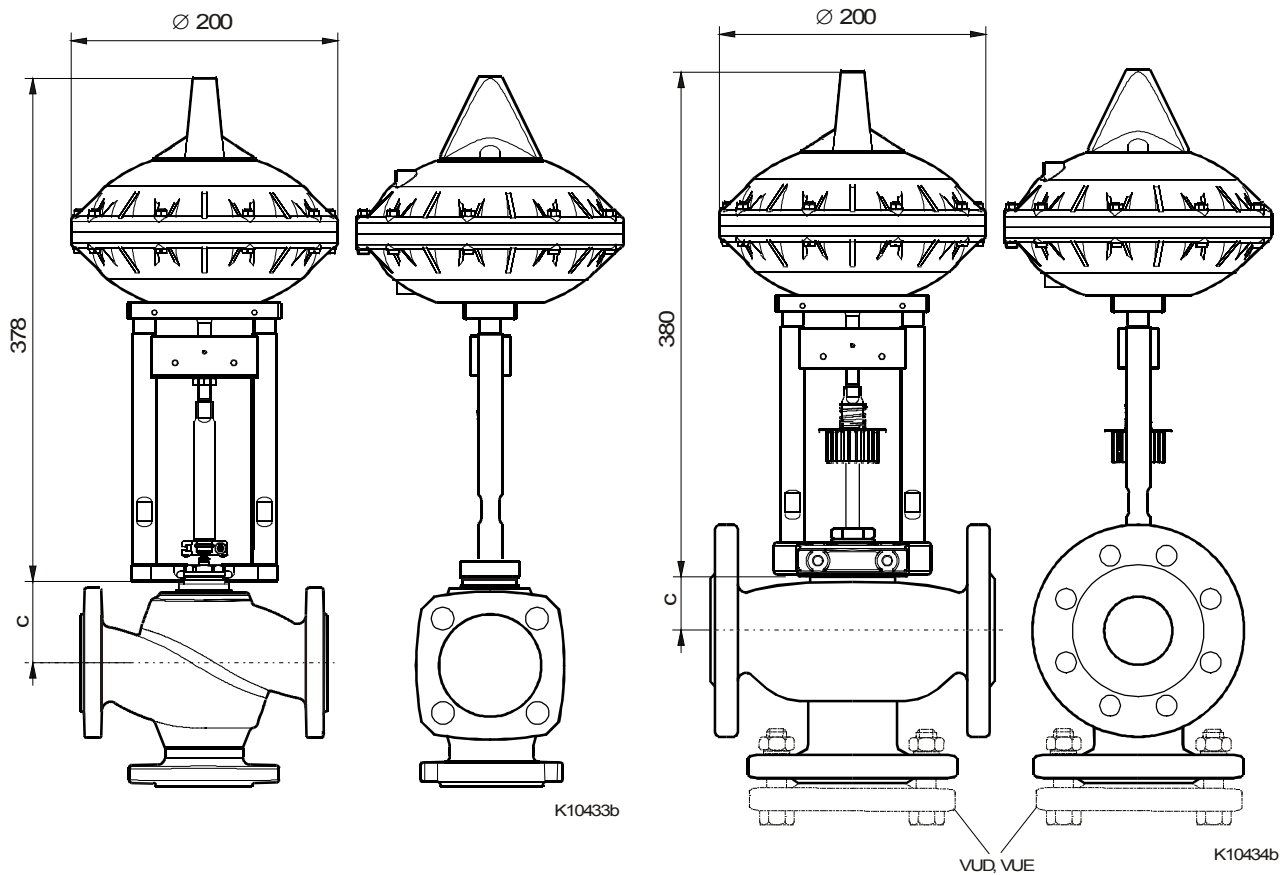


BUD	DN	A	c	L	H	k	d	b
065	65	120	62	240	20	130	14 x 4	16
080	80	130	62	260	20	150	19 x 4	18
100	100	150	93	300	40	170	19 x 4	18

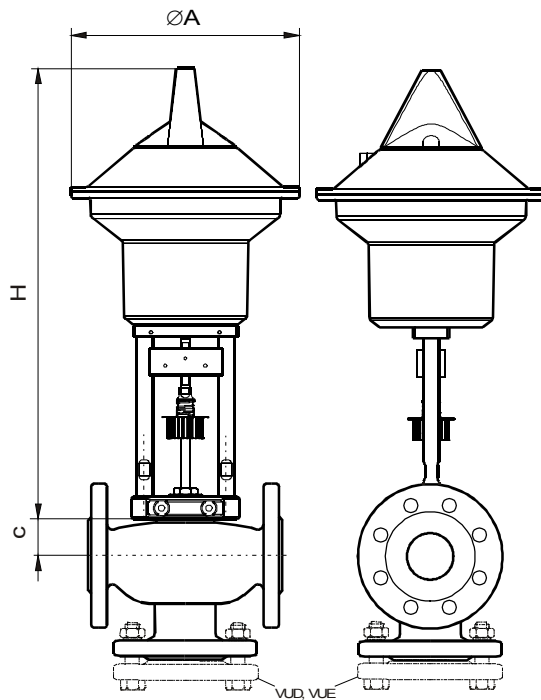
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AVP 242 F001

AVP 242 F021



AVP 243/244

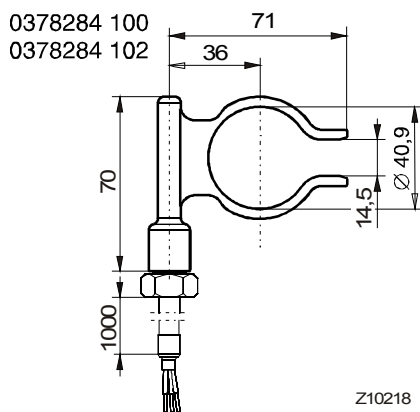
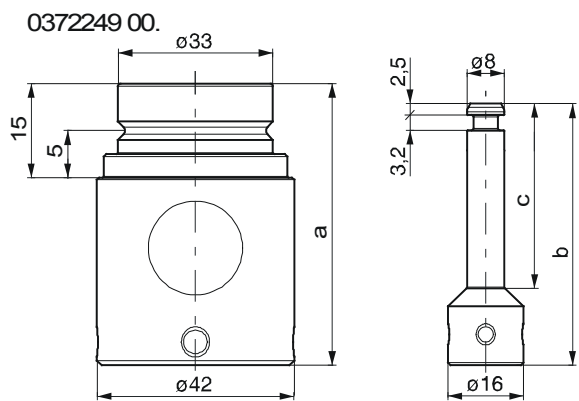


AVP ...	A	H
243 F021	250	497
243 F031	250	517
244 F021	335	536
244 F031	335	556

K10435a



Accessories



Z10218

	a [mm]	b [mm]	c [mm]
0372249 001	60	55,8	40
0372249 002	80	75,8	60

Z10220