

## VUL: 2-way valve, PN 16

### How energy efficiency is improved

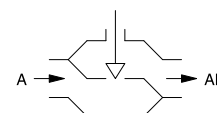
Absolutely no losses through leakage. Energy is restrained

### Features

- Regulation of heating zones, air secondary-treatment units and fan coil units in combination with AXF 217S, AXM 217(S), AXT 301 or AXS 315S actuators for unit valves
- Flat-sealing standard version or version with clamping ring screw fitting for pipe Ø 15 mm with DN 10
- Valve with male thread as per DIN EN ISO 228-1, class B
- Stuffing box can be replaced under system pressure
- Control passage A–AB is closed when the spindle is moved in
- Closes against the pressure
- Valve body made of nickel-plated cast brass for DN 10 and gunmetal for DN 15 and DN 20
- Plug with EPDM soft seal
- Stainless-steel spindle
- Stuffing box with double O-ring seal



VUL010F310



### Technical data

Parameters		
Nominal pressure		PN 16
Operating pressure		Max. 16 bar (up to 120 °C)
Operating temperature		2...120 °C
Valve characteristic		Equal percentage
Valve stroke <sup>1)</sup>		4 mm
Leakage rate		0.002% of K <sub>Vs</sub> value

Ambient conditions		
Operating temperature at valve		Max. 100 °C in combination with AXF 217S, AXM 217(S), AXS 315S and AXT 301

Standards, directives		
Pressure and temperature data		EN 764, EN 1333
Flow parameter		VDI/VDE 2173
PED 2014/68/EU		Fluid group II, No CE label (article 4.3)



ValveDim app

### Overview of types

Type	Nominal diameter	K <sub>Vs</sub> value	Connection	Weight
VUL010F340	DN 10	0.16 m³/h	G½" B	0.19 kg
VUL010F330	DN 10	0.4 m³/h	G½" B	0.18 kg
VUL010F320	DN 10	0.63 m³/h	G½" B	0.18 kg
VUL010F310	DN 10	1 m³/h	G½" B	0.18 kg
VUL010F300	DN 10	1.6 m³/h	G½" B	0.18 kg
VUL015F310	DN 15	2.5 m³/h	G¾" B	0.28 kg
VUL015F300	DN 15	3.5 m³/h	G¾" B	0.28 kg
VUL020F300	DN 20	4.5 m³/h	G1" B	0.33 kg
VUL010F630	DN 10	0.4 m³/h	Clamping ring version Ø15 mm	0.18 kg
VUL010F620	DN 10	0.63 m³/h	Clamping ring version Ø15 mm	0.18 kg
VUL010F610	DN 10	1 m³/h	Clamping ring version Ø15 mm	0.18 kg
VUL010F600	DN 10	1.6 m³/h	Clamping ring version Ø15 mm	0.18 kg

<sup>1)</sup> The valve stroke is limited by the actuator



## Accessories

Type	Description
0378133010	Threaded sleeve, R $\frac{3}{8}$ , flat-sealing, with cap nut and flat seal, G $\frac{1}{2}$ - R $\frac{3}{8}$
0378133015	Threaded sleeve, R $\frac{1}{2}$ , flat-sealing, with cap nut and flat seal, G $\frac{3}{4}$ - R $\frac{1}{2}$
0378133020	Threaded sleeve, R $\frac{3}{4}$ , flat-sealing, with cap nut and flat seal, G1 - R $\frac{3}{4}$
0378134010	Solder nipple, Ø 12, flat-sealing, with cap nut and flat seal, G $\frac{1}{2}$
0378134015	Solder nipple, Ø 15, flat-sealing, with cap nut and flat seal, G $\frac{3}{4}$
0378134020	Solder nipple, Ø 22, flat-sealing, with cap nut and flat seal, G1
0378135010	Clamping ring screw fitting for pipe Ø 15 mm, DN 10
0378145015	Clamping ring screw fitting for pipe Ø 15 mm, DN 15, flat-sealing, G $\frac{3}{4}$
0378145020	Clamping ring screw fitting for pipe Ø 22 mm, DN 20, flat-sealing, G1
0378128001	Stuffing box for VUL valves, can be replaced under pressure

## Combination of VUL with electric actuators

**i Warranty:** The technical data and pressure differences indicated here are applicable only in combination with SAUTER valve actuators. Any warranty will be invalidated 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.

**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 with motorised actuators

Actuator	AXF217SF404 AXF217SF405 AXM217SF402 AXM217SF404	AXM217F200	AXM217F202
Voltage	24 VAC/DC	230 VAC	24 VAC/DC
Control signal	0/2...10 V, 0...5 V, 5...10 V, 0/4...20 mA	2-/3-point	2-/3-point
Running time	8 s/mm	13 s/mm	13 s/mm
Closes against the pressure	$\Delta p_{max}$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_{max}$ [bar]
VUL010F340 VUL010F330 VUL010F320 VUL010F630 VUL010F620	4.0	4.0	4.0
VUL010F310 VUL010F300 VUL010F610 VUL010F600	3.8	3.8	3.8
VUL015F310 VUL015F300 VUL020F300	1.1	1.1	1.1
Cannot be used to close with the pressure			

## Pressure differences with thermal actuators

Actuator	AXT301F100 AXT301F110		AXT301F102 AXT301F112		AXT301F210	AXT301F212	AXT301HF110		AXT301HF112	
Voltage	230 VAC		24 VAC/DC		230 VAC	24 VAC/DC	230 VAC		24 VAC/DC	
Control signal	2-point		2-point		2-point	2-point	2-point		2-point	
Running time	48 s/mm		48 s/mm		48 s/mm	48 s/mm	52 s/mm		52 s/mm	
Closes against the pressure	$\Delta p_{max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_s$ [bar]
VUL010F340 VUL010F330 VUL010F320 VUL010F630 VUL010F620	4.0	6.0	4.0	6.0	4.0	4.0	4.0	6.0	4.0	6.0

Actuator	AXT301F100		AXT301F102		AXT301F210	AXT301F212	AXT301HF110		AXT301HF112	
	AXT301F110		AXT301F112							
VUL010F310 VUL010F300 VUL010F610 VUL010F600	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
VUL015F310 VUL015F300 VUL020F300	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Cannot be used to close with the pressure										

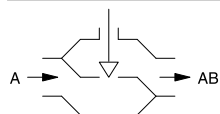
#### Pressure differences with thermal continuous actuators

Actuator	AXS315SF102		AXS315SF202
Voltage	24 VAC/DC		24 VAC/DC
Control signal	0...10 V		0...10 V
Running time	30 s/mm		30 s/mm
Closes against the pressure	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{\max}$ [bar]
VUL010F340 VUL010F330 VUL010F320 VUL010F630 VUL010F620	4.0	6.0	4.0
VUL010F310 VUL010F300 VUL010F610 VUL010F600	4.0	4.0	4.0
VUL015F310 VUL015F300 VUL020F300	1.1	1.1	1.1
Cannot be used to close with the pressure			

## Description of operation

The VUL 2-way valve can be moved to any intermediate position with a thermal or motorised actuator. When the spindle is pressed in, the valve is closed. It is reset by spring force in the valve.

#### Used with closing against the pressure



The valve may only be used with closing against the pressure. The direction of flow is marked on the valve.

The valve can be moved to the open or closed positions with the thermal actuator for unit valves AXT 301. In combination with the NC (normally closed) version of the actuator, the control passage of the valve closes in the event of a power failure.

The valve can be moved to any position with the AXS 315S continuous actuator for unit valves. The control signal is assigned linearly to the valve stroke and produces the equal-percentage characteristic in the valve. The positioner integrated in the actuator controls the actuator depending on positioning signal  $y$ . The continuous actuator positions the valve and, as soon as the position is reached, it stops.

The valve can be moved to any position with the AXM 217 motorised actuator for unit valves. With the AXF 217S and AXM 217S types (with positioner), the valve is continuously adjusted with a 0...10 V or 4...20 mA control signal.

The practically equal-percentage characteristic allows optimal control together with a continuous 0...10 V actuator.

### Intended use

This product is only allowed to be used in HVAC building systems for control and regulation purposes. Other uses require the prior consent of the manufacturer.

The section "Description of operation" and all product instructions in this data sheet must be observed.

Modifying or converting the product is not permitted.

### Improper use

The product is not suitable for:

- Safety applications
- Drinking water installations



#### Notice in accordance with California Proposition 65

The product contains lead. To be marketed in North America, the appropriate warnings must be affixed to the product or packaging.

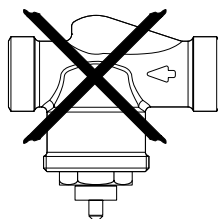
### Engineering and fitting notes

The valve may only be insulated up to the level of the cap nut or bayonet ring of the actuator.

The stuffing box may be replaced when pressurised. No additional tools are required. The stuffing box is sealed against the medium.

### Fitting position

Do not install the valve in a suspended position. The control unit could be damaged by the ingress of condensate or dripping water.



### Using with water

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

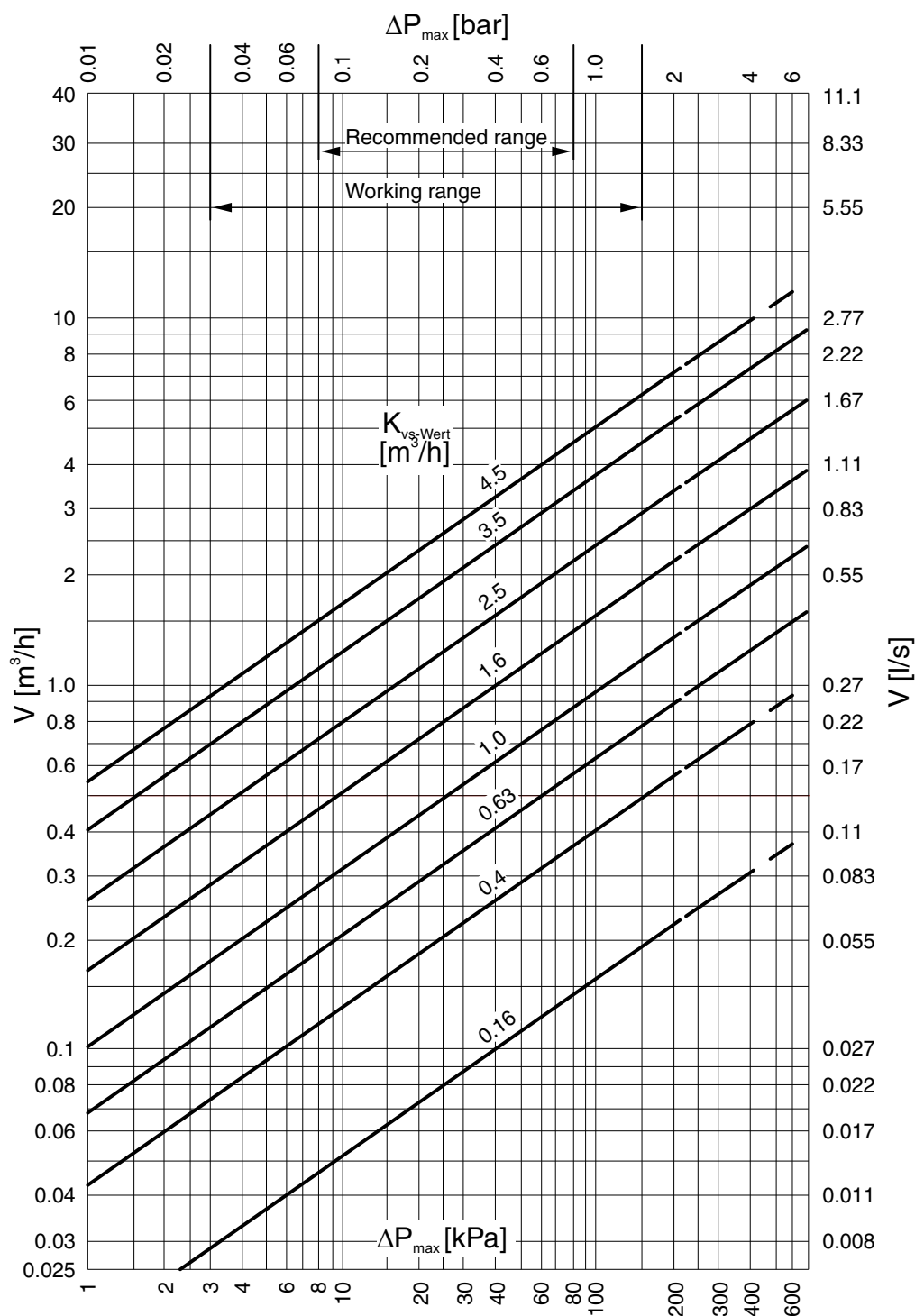
So that impurities are retained in the water (e.g. weld beads, rust particles, etc.) and the spindle seal is not damaged, we recommend installing collecting filters, for example one for each floor or pipe run. Requirements for water quality as per VDI 2035.

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 glycol is used, the recommended concentration is between 16% and 40%.

### Hydraulics and noise in plants

The valve can be used in a low-noise environment. To prevent flow noise, the pressure difference  $\Delta p_{\max}$  across the valve should not exceed 0.8 bar.

Flow-rate chart



Additional information

	Document no.
Fitting instructions for VUL	P100011092
Fitting instructions for AXF 217S	P100019389
Fitting instructions for AXM 217/217S	P100011418
Fitting instructions for AXS 315S	P100019937
Fitting instructions for AXT 301	P100019922
SAUTER slide rule for valve sizing	P100013496

	Document no.
Manual for SAUTER slide rule	7000129001
Declaration on materials and the environment	MD 55.008

### Valve design



SAUTER provides various tools for valve design and engineering:

- ValveDim smartphone app
- ValveDim PC program
- ValveDim slide rule

You can find the tools under the link [www.sauter-controls.com/en/performance/valve-calculation/](http://www.sauter-controls.com/en/performance/valve-calculation/) or scan the QR code



### Design and materials

DN 10: Valve body made of nickel-plated moulded brass.

DN 15 / DN 20: Valve body made of gunmetal.

Male thread as per ISO 228/1, class B, flat seal on housing. Stuffing box with O-ring made of ethylene propylene, plastic protective cap (or manual adjustment knob).

#### Material numbers as per DIN

	DIN/EN material no.	DIN/EN designation
Valve body (DN 10)	CW617N	CuZn40Pb2 as per EN 12164
Valve body (DN 15 / DN 20)	CC490K	CuSn3Zn8Pb5-C as per EN 1982
Valve seat (DN 10)	CW617N	CuZn40Pb2 as per EN 12164
Valve seat (DN 15 / DN 20)	CC490K	CuSn3Zn8Pb5-C as per EN 1982
Spindle	1.4310	X10CrNi18-8 as per EN 10088-1
Plug	CW617N	CuZn40Pb2 as per EN 12164
Stuffing box	CW617N	CuZn40Pb2 as per EN 12164

### Definition of pressure differences

**$\Delta p_v$ :** 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 both 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. The following are considered: Static pressure and flow effects. This value ensures trouble-free stroke movement and tightness. 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 safety function with a rapid stroke movement,  $\Delta p_s$  can be greater than  $\Delta p_{max}$  or  $\Delta p_v$ . The flow disturbing effects that arise here are quickly passed through. They are of secondary importance with this method 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 or steam pressure. For valves that close with pressure, the static pressure plus the pump pressure are used.

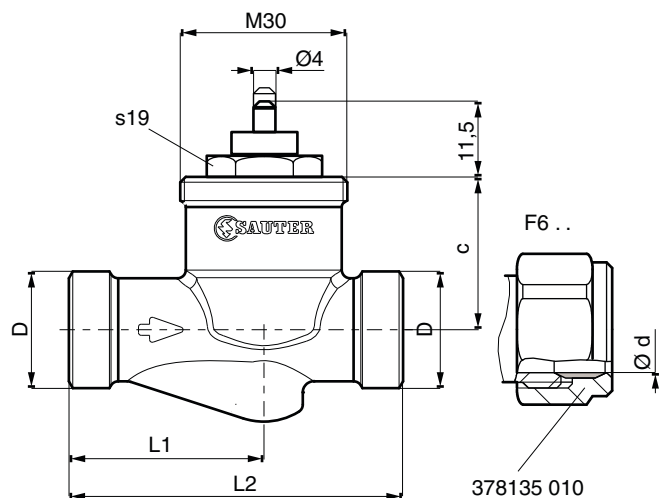
### Disposal

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

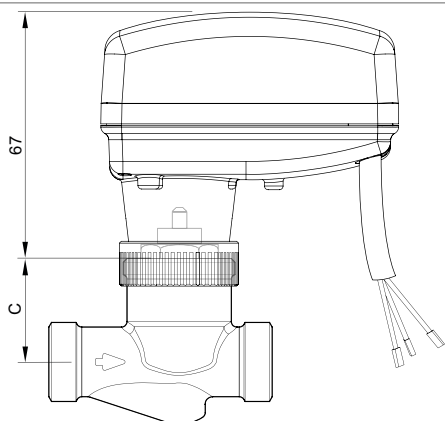
All dimensions in mm.



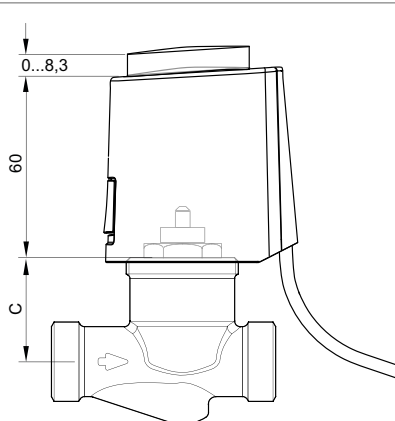
DN	D	d	L1	L2	c
10	G1/2	15	35	60	27,5
15	G3/4	-	36,5	65	33,7
20	G1	-	30	65	33,7

### Combinations

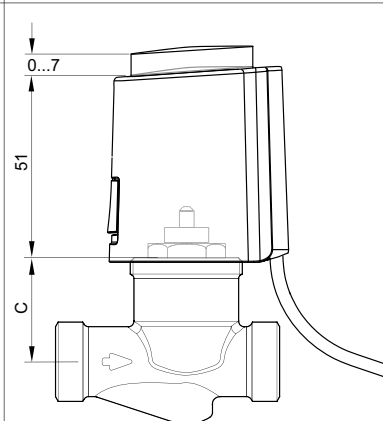
VUL with AXF 217S / AXM 217(S)



VUL with AXS 315S



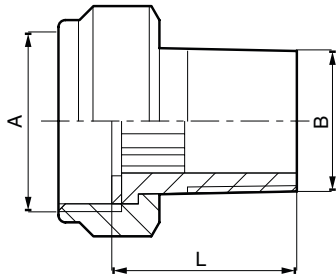
VUL with AXT 301



Type	C
VUL010F***	27.5
VUL015F***	33.7
VUL020F***	33.7

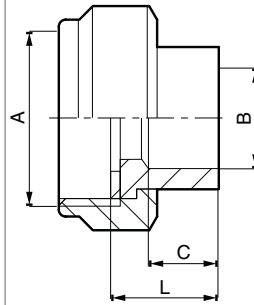
**Accessories**

Threaded sleeve 03781330\*\*



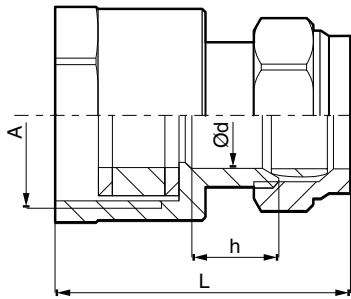
DN	A	B	L
10	G1/2	R3/8	24
15	G3/4	R1/2	27,5
20	G1	R3/4	32,5

Solder nipple 03781340\*\*



DN	A	B	C	L
10	G1/2	12	8,6	14
15	G3/4	15	10,6	15,5
20	G1	22	15,4	20

Clamping ring screw fitting 03781450\*\*



DN	A	L	Ød	h
15	G3/4	39,5	15,2	12,5
20	G1	41,5	22,2	16