

BXL: 3-way unit valve, PN 16

How energy efficiency is improved

Linear mixture for energy-efficient regulation

Features

- Ideally suited as a control valve for AXF 217S, AXM 217(S), AXS 315S and AXT 301 unit valve actuators
- Valve with male thread as per DIN EN ISO 228-1, class A
- Control passage A–AB open when the spindle is moved in
- Used as a control valve
- Valve body made of gunmetal
- Plug with EPDM soft seal
- Stainless-steel spindle
- Stuffing box with double O-ring seal
- Version with cap nut and flat seal

Technical data

Parameters

| | |
|--------------------------------------|---------------------------------|
| Nominal pressure | PN 16 |
| Operating pressure | Max. 16 bar at 130 °C |
| Operating temperature | 2...130 °C |
| Control passage valve characteristic | Linear |
| Mixing passage valve characteristic | Complementary, reduced |
| Valve stroke | 2.9 mm |
| Control passage leakage rate | Approx. 0.05% of K_{VS} value |
| Mixing passage leakage rate | Approx. 0.2% of K_{VS} 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) |

Overview of types

i The BXL 3-way valve must not be used as a 2-way valve

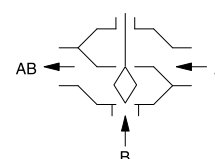
| Type | Nominal diameter | K_{VS} value | Weight |
|------------|------------------|-----------------------|---------|
| BXL025F200 | DN 25 | 6.5 m ³ /h | 1.2 kg |
| BXL040F200 | DN 40 | 9.5 m ³ /h | 2.35 kg |

Accessories

| Type | Description |
|------------|--------------------------------------------|
| 0361824025 | 3 threaded sleeves, R 1", flat-sealing |
| 0361824040 | 3 threaded sleeves, R 5/4", flat-sealing |
| 0361825028 | 3 solder nipple, Ø 28; flat-sealing, DN 25 |
| 0361825035 | 3 solder nipple, Ø 35; flat-sealing, DN 40 |
| 0361825042 | 3 solder nipple, Ø 42; flat-sealing, DN 40 |



BXL025F200



ValveDim app



Combination of BXL 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 Δp_{max} : Maximum admissible pressure drop in control mode at which the actuator reliably opens and closes the valve. Data for a static pressure of 6 bar.

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 |
| As control valve | Δp_{max} [bar] | Δp_{max} [bar] | Δp_{max} [bar] |
| BXL025F200 | 0.5 | 0.5 | 0.5 |
| BXL040F200 | 0.2 | 0.2 | 0.2 |
| Cannot be used as distribution valve | | | |

Pressure differences with thermal actuators

| Actuator | AXT301F100 AXT301F110 | AXT301F102 AXT301F112 | AXT301HF110 | AXT301HF112 |
|--------------------------------------|--------------------------|--------------------------|------------------------|------------------------|
| Voltage | 230 VAC | 24 VAC/DC | 230 VAC | 24 VAC/DC |
| Control signal | 2-point | 2-point | 2-point | 2-point |
| Running time | 48 s/mm | 48 s/mm | 52 s/mm | 52 s/mm |
| As control valve | Δp_{max} [bar] | Δp_{max} [bar] | Δp_{max} [bar] | Δp_{max} [bar] |
| BXL025F200 | 0.5 | 0.5 | 0.5 | 0.5 |
| BXL040F200 | 0.2 | 0.2 | 0.2 | 0.2 |
| Cannot be used as distribution valve | | | | |

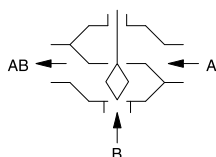
Pressure differences with thermal continuous actuators

| Actuator | AXS315SF102 AXS315SF202 |
|--------------------------------------|----------------------------|
| Voltage | 24 VAC/DC |
| Control signal | 0...10 V |
| Running time | 30 s/mm |
| As control valve | Δp_{max} [bar] |
| BXL025F200 | 0.5 |
| BXL040F200 | 0.2 |
| Cannot be used as distribution valve | |

Description of operation

The BXL 3-way valve can be moved to any intermediate position with a thermal or motorised actuator. When the spindle is pressed in, the control passage (passage A–AB) is open and the mixing passage B–AB is closed. It is reset by spring force in the valve.

Used as a control valve



The valve is used as a control valve in heating and cooling circuits of HVAC installations and may only be used for these purposes. 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 opens 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.

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.

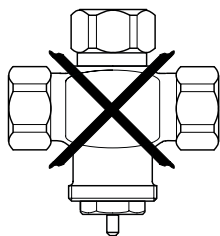
Engineering and fitting notes

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

The stuffing box must not be replaced when the valve is pressurised. 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 Δp_{\max} across the valve should not exceed the following values:

- BXL025F200: 0.3 bar
- BXL040F200: 0.2 bar

Additional information

| | Document no. |
|---------------------------------------|--------------|
| Fitting instructions for BXL | MV 505261 |
| 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 |
| Manual for SAUTER slide rule | 7000129001 |

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/ or scan the QR code



Design and materials

Valve body made of nickel-plated gunmetal, plug made of brass with EPDM sealing ring, spindle made of stainless steel, protective cap (or manual adjustment knob) made of plastic.

Material numbers as per DIN

| | DIN/EN material no. | DIN/EN designation |
|------------|---------------------|-----------------------------|
| Valve body | | CuSn3Zn8Pb-C as per EN 1982 |
| Spindle | 1.4034 | X46Cr13 as per DIN 17440 |
| Plug | CW614N | CuZn39Pb3 as per EN 12164 |

Definition of pressure differences

- 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 both 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. The following are considered: Static pressure and flow effects. This value ensures trouble-free stroke movement and tightness. 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 safety function with a rapid stroke movement, Δp_s can be greater than Δp_{\max} or Δp_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.
- 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 or steam pressure. For valves that close with pressure, the static pressure plus the pump pressure are used.

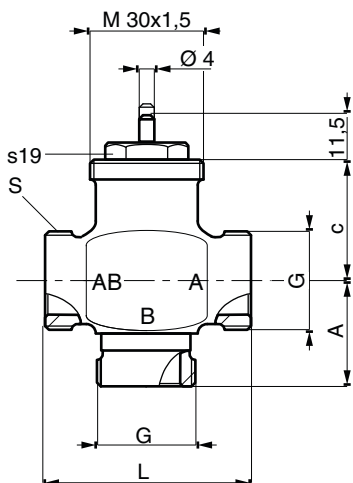
Disposal

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

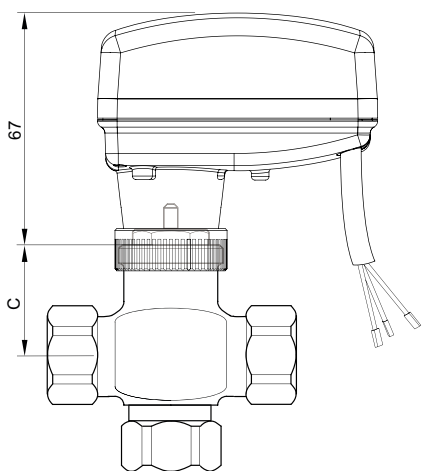
All dimensions in mm.



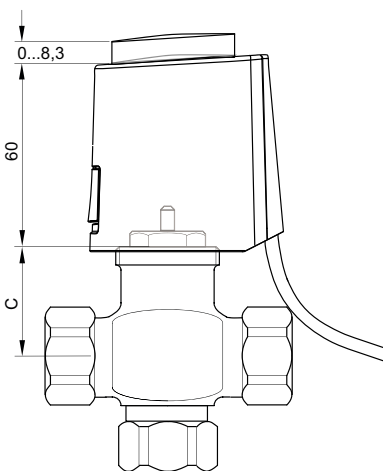
| Type | A | c | G | L | S |
|------------|----|----|---------|-----|----|
| BXL025F200 | 50 | 41 | G1 1/4A | 90 | 46 |
| BXL040F200 | 64 | 42 | G2A | 115 | 66 |

Combinations

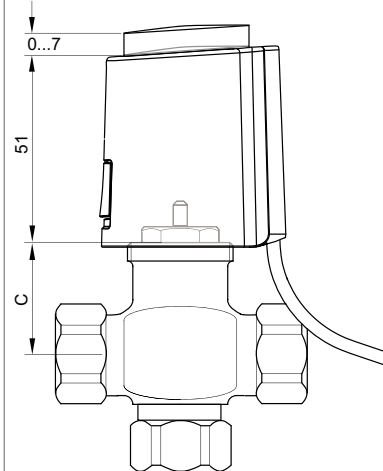
BXL with AXF 217S / AXM 217(S)



BXL with AXS 315S



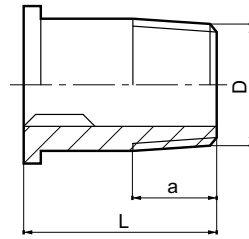
BXL with AXT 301



| Type | C |
|------------|----|
| BXL025F200 | 41 |
| BXL040F200 | 42 |

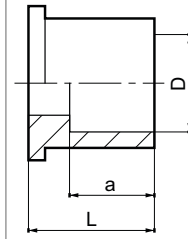
Accessories

Threaded sleeve 03618240**



| DN | D | a | L |
|----|---------|------|----|
| 25 | R 1 | 16,8 | 40 |
| 40 | R 1 1/4 | 19,1 | 46 |

Solder nipple 03618250**



| DN | D | a | L |
|----|----|----|----|
| 25 | 28 | 20 | 27 |
| 40 | 35 | 25 | 32 |
| 40 | 42 | 29 | 37 |