

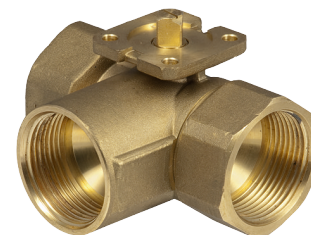
## BKLI: 3-way change-over ball valve (L) with female thread, PN 40

### How energy efficiency is improved

Efficiency means precise changeover with minimum leakage

### Features

- 3-way change-over ball valve with L-bore for use in closed circuits in heating, ventilation and air conditioning systems
- For changing over volume flows in combination with valve actuators AKM 105(S), 115(S) and AKF112, 113(S).
- Fast changeover in 6 s with valve actuator AKM115SF152
- Low torque due to collar mounted on O-ring
- Spindle with friction ring and double O-ring seal
- Ball valve with female thread as per ISO 7/1 Rp
- Body made of dezincification-resistant cast brass
- Ball made of dezincification-resistant brass, chrome-plated and polished surface
- Strainer and screw fitting available as accessories
- Water quality as per VDI 2035
- French drinking water approval ACS



BKLI025F300



### Technical data

#### Parameters

|                               |                         |
|-------------------------------|-------------------------|
| Nominal pressure              | 40 bar                  |
| Leakage rate, through passage | 0.0001 x $K_{VS}$ value |
| Leakage rate, bypass          | 0.0001 x $K_{VS}$ value |
| Angle of rotation             | 90°                     |

#### Ambient conditions

|                                     |   |
|-------------------------------------|---|
| Operating temperature <sup>1)</sup> | -10...130 °C, no condensation           |
| Operating pressure                  | 40 bar (-10...50 °C)<br>35 bar (130 °C) |

#### Overview of types

| Type        | Nominal diameter (DN) | Connection ISO 7/1 Rp | $K_{VS}$ value, control passage | Weight   |
|-------------|-----------------------|-----------------------|---------------------------------|----------|
| BKLI015F300 | DN 15                 | Rp 1/2"               | 5 m³/h                          | 0.306 kg |
| BKLI020F300 | DN 20                 | Rp 3/4"               | 9 m³/h                          | 0.375 kg |
| BKLI025F300 | DN 25                 | Rp 1"                 | 9 m³/h                          | 0.604 kg |
| BKLI032F300 | DN 32                 | Rp 1 1/4"             | 13 m³/h                         | 0.949 kg |
| BKLI040F300 | DN 40                 | Rp 1 1/2"             | 25 m³/h                         | 1.364 kg |
| BKLI050F300 | DN 50                 | Rp 2"                 | 37 m³/h                         | 2.215 kg |

#### Accessories

| Type       | Description  |
|------------|--|
| 0510240001 | Assembly kit for VK**/BK** ball valves as spare part and as accessory for rotary actuators ASF 112, 113 from index B |
| 0510240011 | Adaptor required when temperature of the medium < 5 °C   |
| 0510420001 | Adaptor required when temperature of the medium > 100 °C   |
| 0560283015 | 1 screw fitting of brass, flat-sealing, female thread/male thread for DN 15  |
| 0560283020 | 1 screw fitting of brass, flat-sealing, female thread/male thread for DN 20  |
| 0560283025 | 1 screw fitting of brass, flat-sealing, female thread/male thread for DN 25  |
| 0560283032 | 1 screw fitting of brass, flat-sealing, female thread/male thread for DN 32  |
| 0560283040 | 1 screw fitting of brass, flat-sealing, female thread/male thread for DN 40  |
| 0560283050 | 1 screw fitting of brass, flat-sealing, female thread/male thread for DN 50  |
| 0560332015 | Strainer in gun metal, -10...150 °C, mesh aperture 0.5 mm, DN 15   |
| 0560332020 | Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 20   |

<sup>1)</sup> At operating temperatures <5 °C and >100 °C, the appropriate accessories must be used.



| Type       | Description  |
|------------|--|
| 0560332025 | Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 25 |
| 0560332032 | Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 32 |
| 0560332040 | Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 40 |
| 0560332050 | Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 50 |

Combination of BKLI 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  $\Delta p_{max}$ :** Maximum admissible pressure drop in control mode at which the actuator reliably opens and closes the valve.

| Actuator          | AKM105F100 | AKM105F120 | AKM105F122 | AKM115F120 | AKM115F122 | AKM105SF132          | AKM115SF132          | AKM115SF152                   |
|-------------------|------------|------------|------------|------------|------------|----------------------|----------------------|-------------------------------|
| Torque            | 4 Nm       | 4 Nm       | 4 Nm       | 8 Nm       | 8 Nm       | 4 Nm                 | 8 Nm                 | 7 Nm                          |
| Control signal    | 2-/3-point | 2-/3-point | 2-/3-point | 2-/3-point | 2-/3-point | 2-/3-point, 0...10 V | 2-/3-point, 0...10 V | 2-/3-pt., 0...10 V, 4...20 mA |
| Running time      | 30 s       | 120 s      | 120 s      | 120 s      | 120 s      | 35/60/120 s          | 35/60/120 s          | 6 s                           |
| Operating voltage | 230 V~     | 230 V~     | 24 V~      | 230 V~     | 24 V~      | 24 V~/V=             | 24 V~/V=             | 24 V~/V=                      |

$\Delta p$  [bar]

|   | $\Delta p_{max}$ | $\Delta p_{max}$ | $\Delta p_{max}$ | $\Delta p_{max}$ | $\Delta p_{max}$ | $\Delta p_{max}$ | $\Delta p_{max}$ | $\Delta p_{max}$ |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| BKLI015F300<br>BKLI020F300<br>BKLI025F300 | 1.8              | 1.8              | 1.8              | 2.0              | 2.0              | 1.8              | 2.0              | 2.0              |
| BKLI032F300<br>BKLI040F300<br>BKLI050F300 | 1.2              | 1.2              | 1.2              | 2.0              | 2.0              | 1.2              | 2.0              | 2.0              |

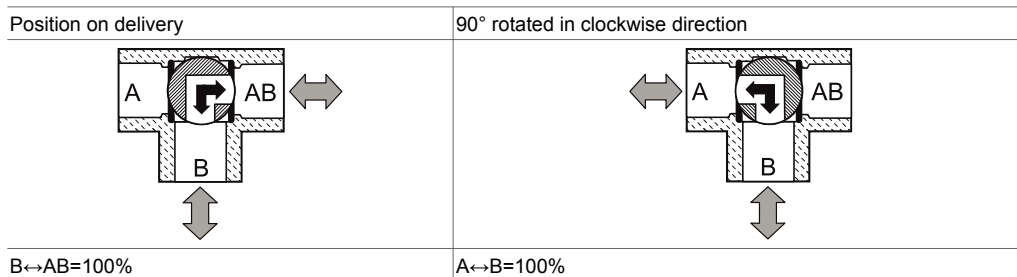
| Actuator          | AKF112F120 | AKF112F122 | AKF113F122 | AKF113SF122 |
|-------------------|------------|------------|------------|-------------|
| Torque            | 7 Nm       | 7 Nm       | 7 Nm       | 7 Nm        |
| Control signal    | 2-point    | 2-point    | 3-point    | 0...10 V    |
| Running time      | 90 s       | 90 s       | 90 s       | 90 s        |
| Operating voltage | 230 V~     | 24 V~/V=   | 24 V~/V=   | 24 V~/V=    |

$\Delta p$  [bar]

|  | $\Delta p_{max}$ | $\Delta p_s$ | $\Delta p_{max}$ | $\Delta p_s$ | $\Delta p_{max}$ | $\Delta p_s$ | $\Delta p_{max}$ | $\Delta p_s$ |
|--|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|
| BKLI015F300<br>BKLI020F300<br>BKLI025F300<br>BKLI032F300<br>BKLI040F300<br>BKLI050F300 | 2.0              | 5.4          | 2.0              | 5.4          | 2.0              | 5.4          | 2.0              | 5.4          |

Description of operation

The 3-way change-over ball valve is moved from one position to the other with an electric actuator.



These 3-way change-over ball valves are characterised by their reliability and precision and make an important contribution towards environmentally friendly regulation. They meet difficult challenges such as the quick-closing function and overcoming differential pressures, all with a low noise level. The spindle of the ball valve is automatically connected to the spindle carrier of the actuator. The

tightness of the ball is ensured by the PTFE collars incorporated into the body. An O-ring made of EPDM is inserted behind these two collars. These O-rings enable the ball and the two collars to make a small axial movement, providing a high level of tightness and small torques.

The tightness of the spindle is ensured by two O-rings.

### 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. Modifying or converting the product is not admissible.

### Engineering and fitting notes

The 3-way change-over ball valves are combined with rotary actuators with or without a spring return. The actuator is mounted directly on the ball valve and fastened with a bayonet connector. The actuator shaft is automatically connected to the spindle, whereby the stem of the ball valve is in an intermediate position. When the system is commissioned, the SUT actuator moves to the end position, and the two devices are connected automatically. The angle of rotation of the ball valve is also detected by the actuator, and no further adjustments are required. To avoid the ball valve being jammed in the end positions, the SUT actuator makes a movement of approx. 30° angle of rotation if the end positions of the positioning signal have not changed within 3 days.

So that impurities are retained in the water (welding beads, rust particles, etc.) and the PTFE collar is not damaged, it is recommended to install dirt filters, for example one for each floor or pipe run. For dirt filters, see the accessories, and note the usage and temperature range for each type. Water requirements according to VDI 2035.

All ball valves must be used in closed circuits only. In open circuits, an excessively high oxygen mixture can destroy the ball valves. To avoid this, an oxygen binding agent must be used; here the compatibility must be clarified with the manufacturer of the solution with regard to corrosion. The material list shown below may be used here.

The fittings are usually insulated in the systems. However, note that the flange into which the actuator is inserted is not insulated. To prevent any disturbing flow noise from being audible in quiet rooms, the pressure difference over the ball valve must not exceed 50% of the specified values.

The crank handle is fixed to the AKM actuators. To operate this crank handle, the manual adjustment knob on the actuator must be pushed downwards. The actuator remains inactive until this knob is shifted into the top position again. There is also a squared end on the crank handle that matches the squared end on the spindle of the ball valve.

### Additional technical data

|   |                             |
|---|-----------------------------|
| Technical information                                   |                             |
| Pressure and temperature data                           | EN 764, EN 1333             |
| Flow parameters   | EN 60534, page 3            |
| Technical manual on control units                       | 7000477001                  |
| Parameters, fitting notes, control, general information | Valid EN and DIN standards  |
| CE conformity as per PED 2014/68/EU                     | Fluid group II, no CE label |

### Using with water

When using water mixed with glycol or an inhibitor, the compatibility of the materials and seals used in the ball valve should be clarified with the manufacturer of the solution. The material list in the Declaration on materials and the environment MD 56.094 can be used for this purpose. When glycol is used, we recommend using a concentration of between 20% and 50%.

The ball valves are not suitable for potentially explosive atmospheres. The ball valves have the French drinking water approval ACS.

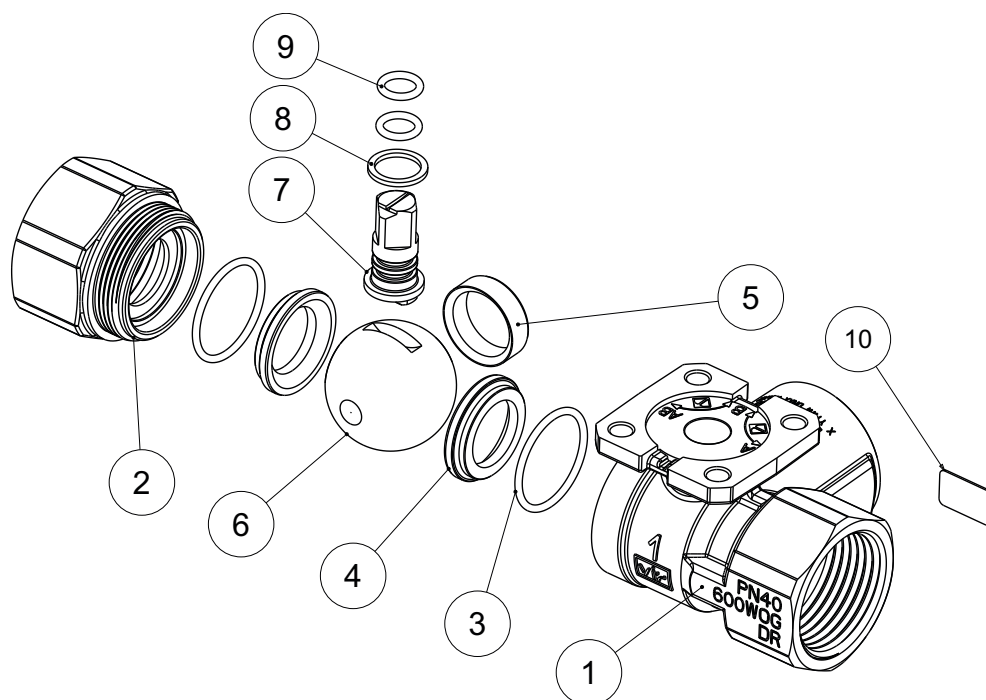
### Fitting position

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.

### Additional version information

The body of the ball valve is made of DZR moulded brass (EN 12165) with female thread, cylindrical, as per ISO 7/1 Rp. Spindle seal with double O-ring made of ethylene propylene.

## Material numbers as per DIN



|                                   | DIN material no. | DIN designation |
|-----------------------------------|------------------|-----------------|
| (1) Body of the ball valve        | CW602N           | CuZn36Pb2As     |
| (2) Connector                     | CW602N           | CuZn36Pb2As     |
| (3) O-ring                        | EPDM             |                 |
| (4) Collar                        | PTFE             |                 |
| (5) Collar                        | PTFE             |                 |
| (6) Ball, polished, chrome-plated | CW602N           | CuZn36Pb2As     |
| (7) Spindle                       | CW602N           | CuZn36Pb2As     |
| (8) Friction ring                 | PTFE/bronze/MoS2 |                 |
| (9) O-ring                        | EPDM             |                 |
| (10) Direction of flow indicator  | Aluminium        |                 |

## Additional details on the definitions of pressure difference

 $\Delta p_v$ :

Maximum admissible pressure difference over the ball valve at every angle of rotation, limited by noise level and erosion.

This parameter characterises the ball 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 ball valve at which the actuator can reliably open and close the ball valve.

The following are considered: Static pressure and flow effects. This value ensures trouble-free rotation movement and tightness. The value  $\Delta p_v$  of the ball valve is never exceeded.

 $\Delta p_s$ :

Maximum admissible pressure difference over the ball valve in the event of a malfunction (e.g. power failure, excessive temperature or pressure, pipe break) at which the actuator can close the ball valve tightly and, if necessary, maintain the entire operating pressure against atmospheric pressure. Because this is a quick-closing function with a rapid angle of rotation change for the 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 method of operation.

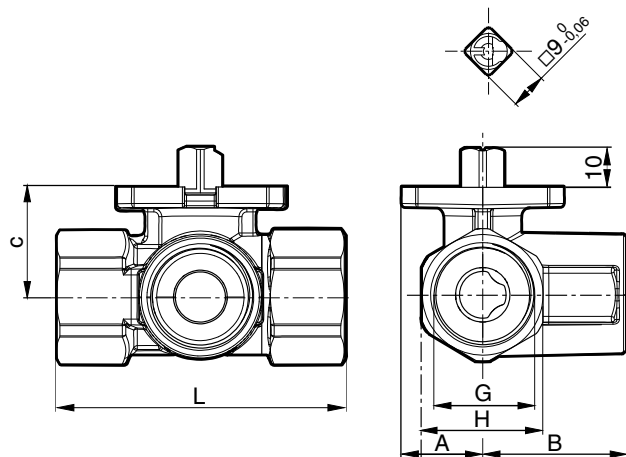
**$\Delta p_{stat}$  :**

Line pressure behind the ball 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.

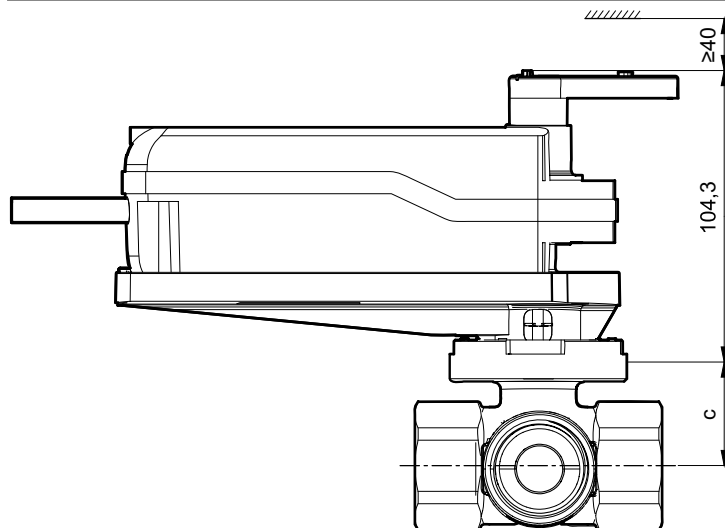
**Disposal**

The local, currently valid laws must be observed when disposing of the device.

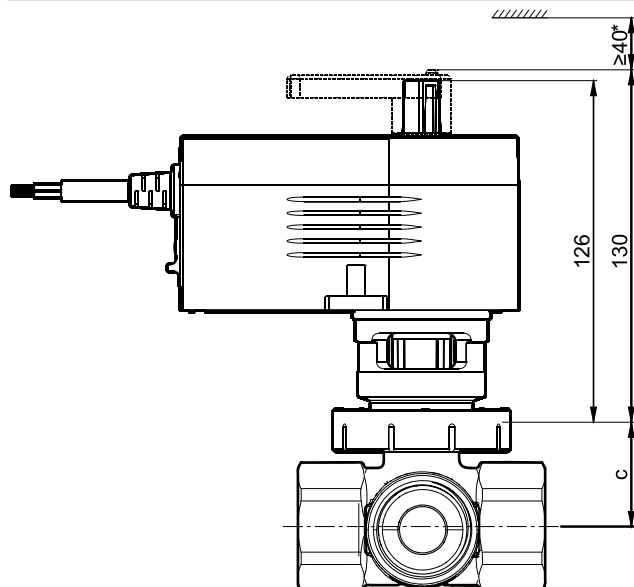
You will find more information on the materials and substances in the Declaration on materials and the environment for this product.

**Dimension drawing****Combinations**

AKF112, 113(S)



AKM105, 115(S)

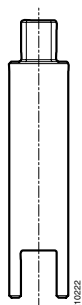
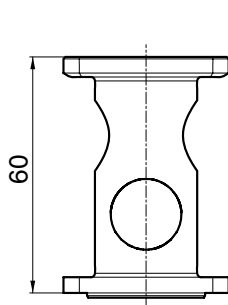


\* With accessory 0510480001 and 0510480002: ≥ 72 mm

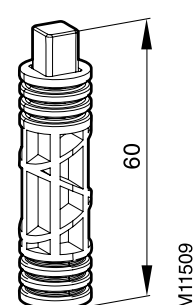
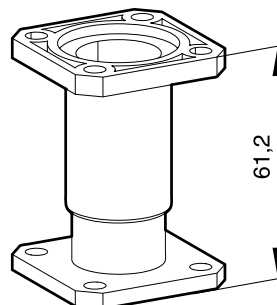
| DN | A mm | B mm | c mm | L mm | G     | H mm |
|----|------|------|------|------|-------|------|
| 15 | 21   | 34   | 28   | 67   | Rp ½  | 26   |
| 20 | 21   | 40   | 31   | 81   | Rp ¾  | 39   |
| 25 | 21   | 45   | 31   | 86   | Rp 1  | 39   |
| 32 | 21   | 53   | 34   | 99   | Rp 1¼ | 48   |
| 40 | 21   | 57   | 40   | 110  | Rp 1½ | 55   |
| 50 | 21   | 69   | 53   | 132  | Rp 2  | 67   |

Accessories

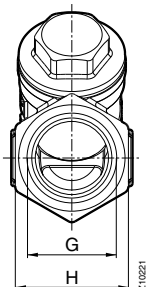
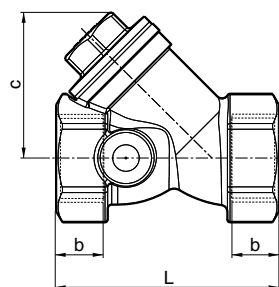
0510420001



0510240011

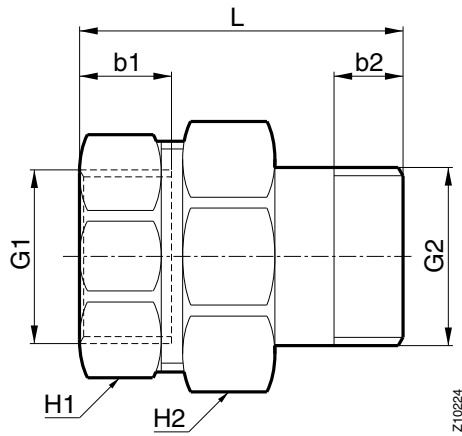


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| DN | b mm | c mm | G inch (ISO 228-1) | L mm | H mm |
|----|------|------|--------------------|------|------|
| 15 | 12   | 38   | G ½                | 54   | 27   |
| 20 | 15   | 43   | G ¾                | 67   | 34   |
| 25 | 16   | 53   | G 1                | 79   | 41   |
| 32 | 17   | 64   | G 1¼               | 98   | 51   |
| 40 | 18   | 70   | G 1½               | 106  | 57   |
| 50 | 20   | 85   | G 2                | 122  | 69   |

05602830 ...



| DN | b1<br>mm | b2<br>mm | G1 inch<br>(ISO<br>228-1 /<br>ISO 7/1) | G2 inch<br>(ISO<br>228-1) | L<br>mm | H1<br>mm | H2<br>mm |
|----|----------|----------|--|---------------------------|---------|----------|----------|
| 15 | 10       | 10       | Rp ½                                   | G ½                       | 46      | 26       | 30       |
| 20 | 12       | 12       | Rp ¾                                   | G ¾                       | 52      | 31       | 37       |
| 25 | 14       | 14       | Rp 1                                   | G 1                       | 60      | 40       | 46       |
| 32 | 16       | 16       | Rp 1¼                                  | G 1¼                      | 65      | 50       | 54       |
| 40 | 17       | 17       | Rp 1½                                  | G 1½                      | 76      | 54       | 64       |
| 50 | 20       | 20       | Rp 2                                   | G 2                       | 98      | 69       | 81       |