



Solenoid valve

EV224B

Servo operated valve for air with oil for high pressure applications

Description

EV224B for compressed air, is a high pressure indirect servo-operated 2/2-way solenoid valve with working pressure up to 40 bar, medium temperature up to 60 °C and available in NC and NO versions.

Built-in pilot filter as standard, replaceable equalizing orifice, enclosures up to IP67 (depending on coil) ensure a reliable and satisfactory function.

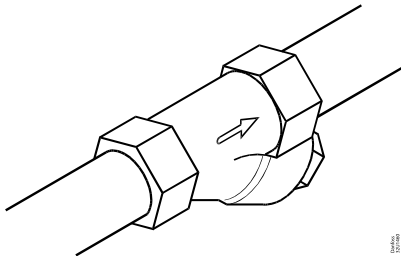
Features & benefits

- For compressed air and compressed air with mineral oil
- Ambient temperature: Up to 60 °C
- Coil enclosure: Up to IP67
- Clip on coil
- Built in filter for protection of pilot system

Applications

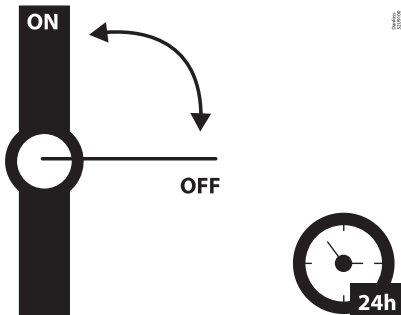
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

Figure: Filter



In water applications, exercise the valves at least once every 24 hours, meaning change the state of the valve. The valve exercise will minimize the risk of the valve sticking due to calcium carbonate, zinc or iron oxide build-up.

Figure: Exercise - Valve on/off



To minimize scaling, and corrosion attack it is recommended that the water passing the valve have the following values:

- Hardness 6 – 18 °dH to avoid scaling (chalk / limestone build up)
- Conductivity 50 – 800 µS/cm to avoid brass dezincification and corrosion
- Above 25 °C media temperature avoids stagnant water inside the valve to avoid dezincification and corrosion attack





Ordering

Product code numbers

| Connection type | Connection size [in] | Orifice size [mm] | Kv value [m ³ /h] | Seal Material | Function | Code number |
|-----------------|----------------------|-------------------|------------------------------|---------------|----------|-------------|
| G | 1/2 | 15.00 | 4.000 | NBR | NC | 032U8360 |
| G | 1/2 | 15.00 | 4.000 | NBR | NO | 032U8361 |
| G | 3/4 | 20.00 | 8.000 | NBR | NC | 032U8362 |
| G | 3/4 | 20.00 | 8.000 | NBR | NO | 032U8363 |
| G | 1 | 25.00 | 11.000 | NBR | NC | 032U8364 |
| G | 1 | 25.00 | 11.000 | NBR | NO | 032U8365 |
| G | 1/2 | 15.00 | 4.000 | NBR | NO | 032U838132 |

Accessories code numbers

Table: Below coils can be used with EV224B

| Coil | Type | Power consumption | Enclosure | Features |
|---|-------------|--------------------------------|---------------------------|--|
|  | BB, clip on | AC: 11 – 16 W DC: 13 – 16 W | IP00 with spade connector | IP20 with protective cap, IP67 with cable plug |
|  | BR, clip on | 12 – 14 W AC 16 W DC | IP00 with spade connector | IP20 with protective cap, IP67 with cable plug Design for marine application |
|  | BE, clip on | AC: 11 – 17 W DC: 13 – 15 W | IP67 | With terminal box |
|  | BG, clip-on | AC: 11 – 16 W DC: 16 – 20 W | IP67 | With terminal box |

Cable plug**Figure: Cable plug**

| Cable plug size | Description | Code no |
|-----------------|-----------------|----------|
| DIN 18 | Cable plug IP67 | 042N1256 |

Universal electronic multi-timer, Type ET20M**Figure: Universal electronic multi-timer, type ET20M**

| Application | AC Voltage [V] | To use with coil | Code no. |
|-------------|----------------|----------------------------|----------|
| BA024A | 24 – 240 | AL, AM, AS, AZ, BA, BD, BB | 042N0185 |

Spare parts code numbers

Table: Spare part kits


| Type | Actuator kit NC | Actuator kit NO | Diaphragm kit NC/NO ⁽¹⁾ |
|-----------|---|--|--|
| | Sealing | | |
| | NBR | NBR | FKM |
| EV224B 15 | 032U6156 | 032U6157 | 032U8118 |
| EV224B 20 | 032U6158 | 032U6159 | 032U8119 |
| EV224B 25 | 032U6160 | 032U6161 | - |
| | | | |
| | <ol style="list-style-type: none"> 1. O-ring for coil 2. Armature tube assembly 3. Armature with valve plate and spring 4. O-ring for the armature tube 5. 2x O-rings for the equalizing orifice 6. Closing spring 7. Diaphragm 8. 2 x O-rings for the pilot system | <ol style="list-style-type: none"> 1. O-ring for coil 2. NO actuator unit 3. O-ring for the armature tube 4. 2x O-rings for the equalizing orifice 5. Closing spring 6. Diaphragm 7. 2 x O-rings for the pilot system | <ol style="list-style-type: none"> 1. Closing spring 2. Diaphragm 3. 2 x O-rings for the pilot system |

¹⁾ FKM spare part kit for synthetic oil

Overview

Product portfolio

Table: Portfolio overview

| Features | EV224B |
|--|--|
| |  |
| Body material | Brass |
| DN [mm] | 15 – 25 |
| Connection | G½" – G1" |
| Sealing material | NBR |
| Function | NC, NO |
| K_v [m³/h] | 4 – 11 |
| Differential pressure range [bar] | 0.3 – 40 |
| Temperature range [°C] | -10 – 60 |

Functions

Function NC

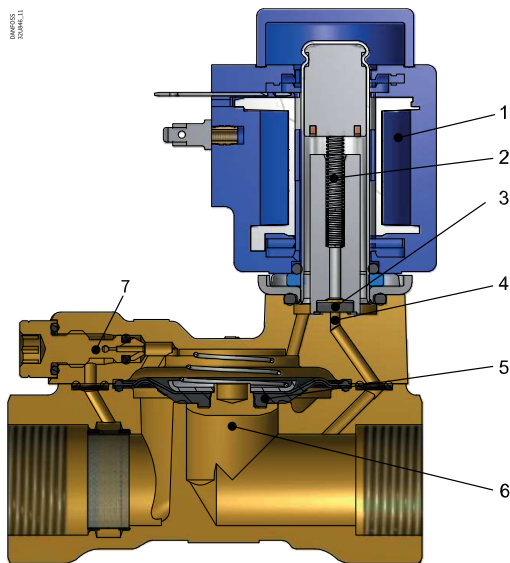
Coil voltage disconnected (closed)

When the voltage is disconnected, the valve plate (3) is pressed down against the pilot orifice (4) by the armature spring (2). The pressure across the diaphragm (5) is built up via the equalizing orifice (7). The diaphragm closes the main orifice (6) as soon as the pressure across the diaphragm is equivalent to the inlet pressure. The valve will be closed for as long as the voltage to the coil is disconnected.

Coil voltage connected (open)

When voltage is applied to the coil (1), the pilot orifice (4) is opened. As the pilot orifice is larger than the equalizing orifice (7), the pressure across the diaphragm (5) drops and therefore it is lifted clear of the main orifice (6). The valve is now open for unimpeded flow and will be open for as long as the minimum differential pressure across the valve is maintained, and for as long as there is voltage to the coil.

Figure: Function NC



| | |
|----|--------------------|
| 1. | Coil |
| 2. | Armature spring |
| 3. | Valve plate |
| 4. | Pilot orifice |
| 5. | Diaphragm |
| 6. | Main orifice |
| 7. | Equalizing orifice |

Function NO

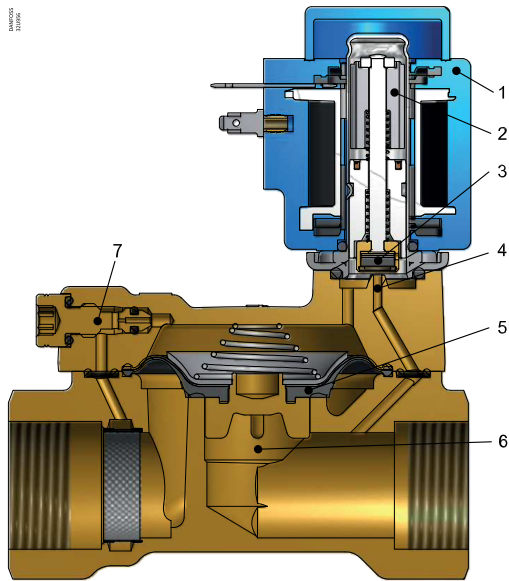
Coil voltage disconnected (open)

When the voltage to the coil (2) is disconnected, the pilot orifice (4) is open. As the pilot orifice is larger than the equalizing orifice (7), the pressure across the diaphragm (5) drops and therefore it is lifted clear of the main orifice (6). The valve will be open for as long as the minimum differential pressure across the valve is maintained, and for as long as the voltage to the coil is disconnected.

Coil voltage connected (closed)

When voltage is applied to the coil, the valve plate (3) is pressed down against the pilot orifice (4). The pressure across the diaphragm (5) is built up via the equalizing orifice (7). The diaphragm closes the main orifice (6) as soon as the pressure across the diaphragm is equivalent to the inlet pressure. The valve will be closed for as long as there is voltage to the coil.

Figure: Function NO



| | |
|----|--------------------|
| 1. | Coil |
| 2. | Armature spring |
| 3. | Valve plate |
| 4. | Pilot orifice |
| 5. | Diaphragm |
| 6. | Main orifice |
| 7. | Equalizing orifice |

Product details

General data

Table: Technical data

| | | |
|---|---|--|
| Media | NBR | For compressed air and compressed air with mineral oil |
| Media temperature | NBR | -10 – 60 °C |
| | Used with synthetic oils, and with media temperature between 40 – 60 °C, lifetime can be reduced. | |
| Ambient temperature | Up to 60 °C | |
| K_v value | DN15 | 4 m ³ /h |
| | DN20 | 8 m ³ /h |
| | DN25 | 11 m ³ /h |
| Min. Opening differential pressure | 0.3 bar | |
| Max. Opening differential pressure | G½ | 40 bar |
| | G¾ | 35 bar |
| | G1 | 33 bar |
| Max. working pressure | G½ | 40 bar |
| | G¾ | 35 bar |
| | G1 | 33 bar |
| Max. test pressure | G½ | 60 bar |
| | G¾ | 53 bar |
| | G1 | 50 bar |
| Min. burst pressure acc. EN12516 | G½ | 154 bar |
| | G¾ | 142 bar |
| | G1 | 134 bar |
| Viscosity | Max. 50 cSt | |

Materials

Table: Materials

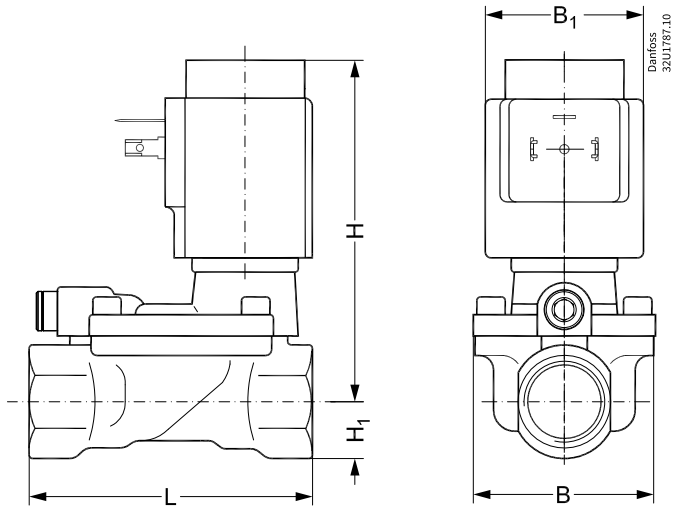
| Components | Materials | Specifications |
|----------------------|--------------------|---------------------------|
| Valve body | Brass | W.no. 2.0402 |
| Armature | Stainless steel | W.no. 1.4105 / AISI 430FR |
| Armature tube | Stainless steel | W.no. 1.4306 / AISI 304L |
| Armature stop | Stainless steel | W.no. 1.4105 / AISI 430FR |
| Diaphragm valve cone | Stainless steel | W.no. 1.4404 / AISI 316L |
| Springs | Stainless steel | W.no. 1.4310 / AISI 301FR |
| O-rings | NBR | |
| Valve plate | NC: NBR / NO: PTFE | |
| Diaphragm | NBR | |

Dimensions

Table: Dimension and weight, NC and NO

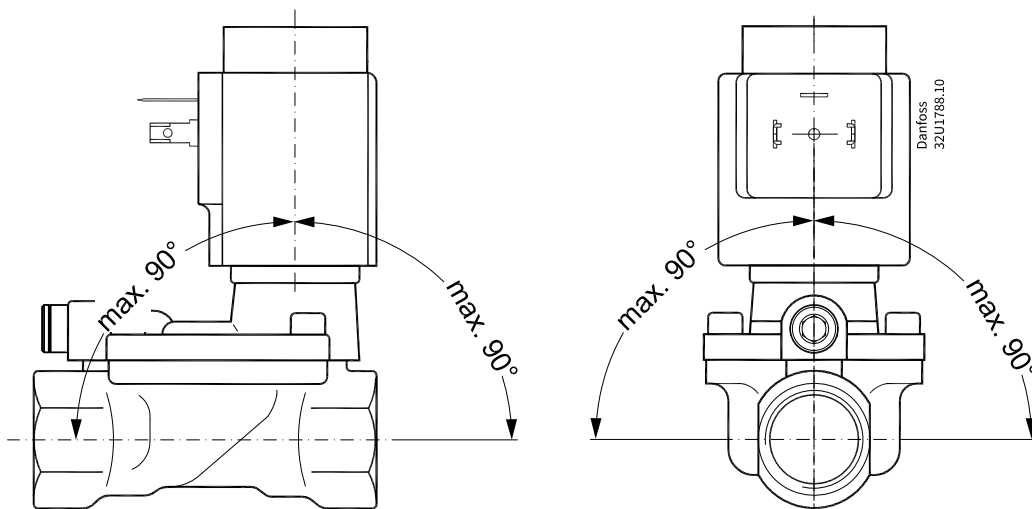
| Type | L [mm] | B [mm] | B ₁ [mm] Coil type | | H [mm] | H ₁ [mm] | Weight without coil [kg] |
|-----------|--------|--------|-------------------------------|----|--------|---------------------|--------------------------|
| | | | BB / BE | BG | | | |
| EV224B 15 | 80 | 52 | 46 | 68 | 99 | 15 | 0.8 |
| EV224B 20 | 90 | 58 | 46 | 68 | 103 | 18 | 1.0 |
| EV224B 25 | 109 | 70 | 46 | 68 | 113 | 22 | 1.4 |

Figure: Dimension



Installation

Figure: Mounting angle



Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

| Approval type | Title | Certification body | Approval topic |
|-----------------------------|---|-----------------------------|----------------|
| Manufacturer's Declaration | Danfoss MD 033F0232.AA | Danfoss | PED, Pressure |
| Manufacturer's Declaration | Danfoss MD 033F0699.00 | Danfoss | China RoHS |
| Export Control Declaration | Solenoid valves – Polymer, Bronze, Brass, Cast iron | Danfoss | |
| Pressure Safety Certificate | LLC CDC EURO-TYSK UA.TR.089.1015.02-22 | LLC CDC EURO TYSK - Ukraine | PED, Pressure |
| EU Declaration | Danfoss EU 033F0683.05 | Danfoss | LVD, EU RoHS |
| Manufacturer's Declaration | Danfoss MD 033F1140.01 | Danfoss | EU RoHS |

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