ENGINEERING TOMORROW

Data Sheet

Solenoid valve Type **EV224B**

Servo operated valve for air with oil for high pressure applications

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

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

1 Portfolio overview

Table 1: Portfolio overview

Features	EV224B
	
Body material	Brass
DN [mm]	15 - 25
Connection	G½" - G1"
Sealing material	NBR
Function	NC, NO
K_v [m^3/h]	4 - 11
Differential pressure range [bar]	0.3 - 40
Temperature range [°C]	-10 - 60

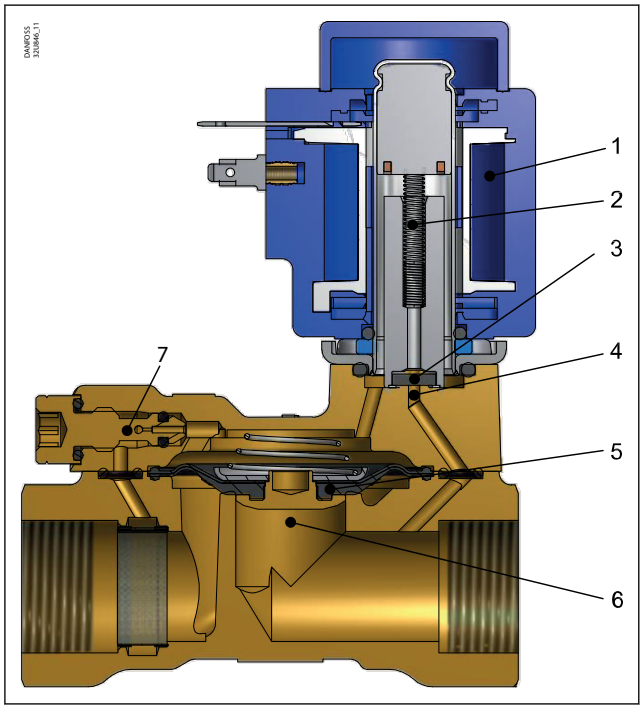
2 Functions

2.1 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 1: Function NC



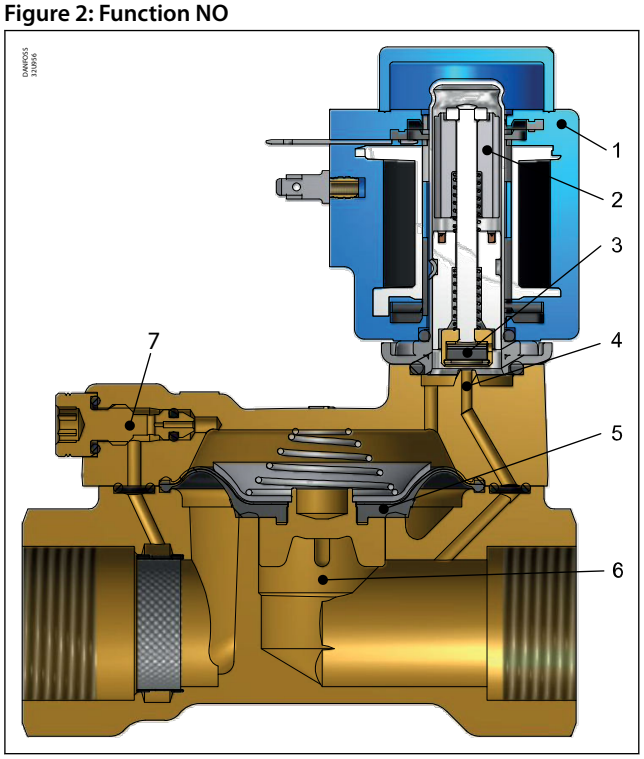
1.	Coil
2.	Armature spring
3.	Valve plate
4.	Pilot orifice
5.	Diaphragm
6.	Main orifice
7.	Equalizing orifice

2.2 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 2: Function NO

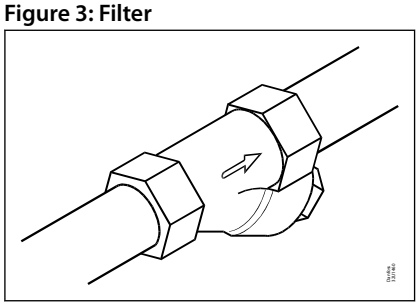


1.	Coil
2.	Armature spring
3.	Valve plate
4.	Pilot orifice
5.	Diaphragm
6.	Main orifice
7.	Equalizing orifice

3 Applications

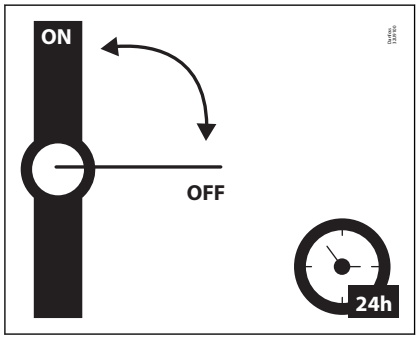
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

Figure 3: 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 4: 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 / lime stone build up).
- Conductivity 50 – 800 µS/cm to avoid brass dezincification and corrosion.
- Above 25°C media temperature avoid stagnant water inside the valve to avoid dezincification and corrosion attack.

4 Product specification

4.1 Technical data

Table 2: Technical data

Media	NBR	For compressed air and compressed air with mineral oil
Media temperature [°C]	NBR	-10 - 60 °C
	Used with synthetic oils, and with media temperature between 40 – 60 °C, life time can be reduced.	
Ambient temperature [°C]	Up to 60 °C	
Kv value [m³/h]	DN15	4 m³/h
	DN20	8 m³/h
	DN25	11 m³/h
Min. Opening differential pressure [bar]	0.3 bar	
Max. Opening differential pressure [bar]	G1/2	40 bar
	G3/4	35 bar
	G1	33 bar
Max. working pressure [bar]	G1/2	40 bar
	G3/4	35 bar
	G1	33 bar
Max. test pressure [bar]	G1/2	60 bar
	G3/4	53 bar
	G1	50 bar
Min. burst pressure acc. EN12516 [bar]	G1/2	154 bar
	G3/4	142 bar
	G1	134 bar
Viscosity [cSt]	Max. 50 cSt	

Materials

Table 3: Materials

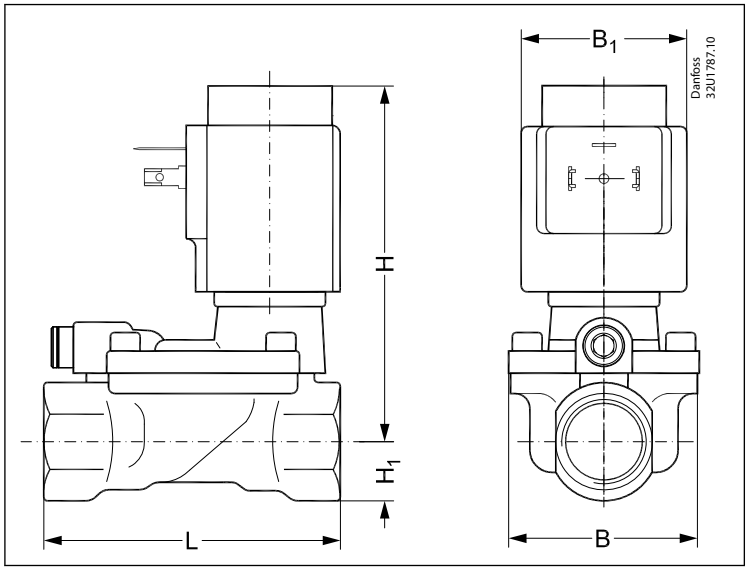
Components	Materials	Specifications
Valve body	Brass	W.no. 2.0402
Armature	Stainless steel	W.no. 1.4105 / AISI 430FR
Armature tube	Stainless steel	W.no. 1.4306 / AISI 304L
Armature stop	Stainless steel	W.no. 1.4105 / AISI 430FR
Diaphragm valve cone	Stainless steel	W.no. 1.4404 / AISI 316L
Springs	Stainless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

4.2 Dimension and weight

Table 4: Dimension and weight, NC and NO

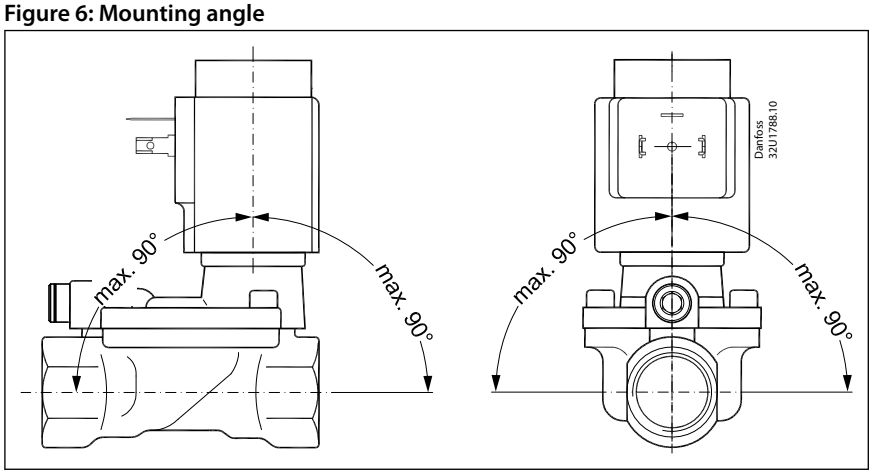
Type	L [mm]	B [mm]	B_1 [mm] Coil type		H [mm]	H_1 [mm]	Weight without coil [kg]
			BB / BE	BG			
EV224B 15	80	52	46	68	99	15	0.8
EV224B 20	90	58	46	68	103	18	1.0
EV224B 25	109	70	46	68	113	22	1.4

Figure 5: Dimension



4.3 Mounting angle

Figure 6: Mounting angle



5 Ordering

5.1 Parts program

Table 5: Brass, valve body NC and NO

ISO228/1 connection	Orifice	K_v value	Seal material	Function	
	[mm]	[m³/h]	NBR	NC	NO
G1/2	15	4	NBR	032U8360	032U8361
G3/4	20	8		032U8362	032U8363
G1	25	11		032U8364	032U8365

5.2 Accessories

Coils

Table 6: 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 7: Cable plug

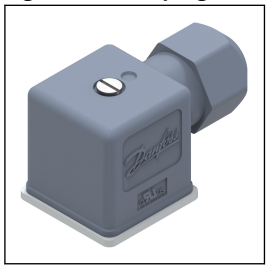


Table 7: Cable plug

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

Universal electronic multi-timer, Type ET20M

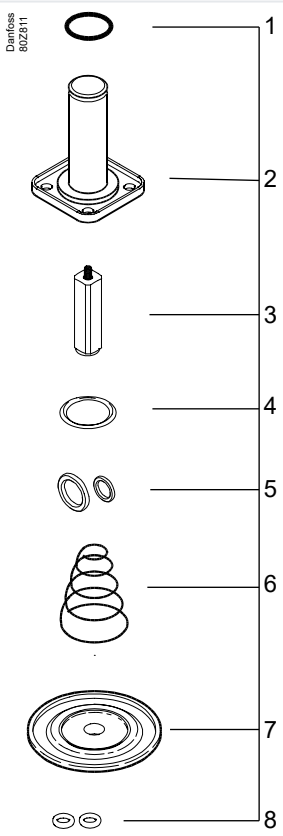
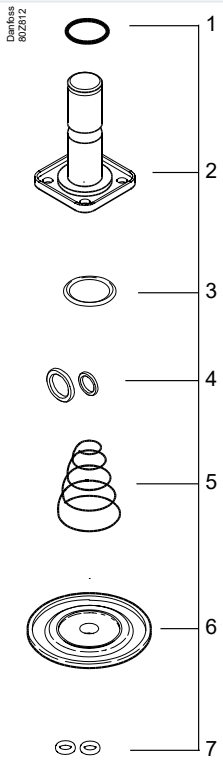
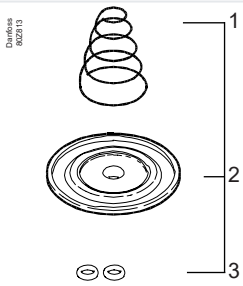
Figure 8: Universal electronic multi-timer, type ET20M

Table 8: Universal electronic multi-timer, type ET20M

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

Spare part kits

Table 9: 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	
			
	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	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	1. Closing spring 2. Diaphragm 3. 2 x O-rings for the pilot system

[1] FKM spare part kit for synthetic oil

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