

Data Sheet

Solenoid valve
Type **EV250B**

Assisted lift operated 2/2-way valve program is use in closed circuits with low differential pressure



EV250B with assisted lift can operate from zero and up to 10 bar differential pressure.

This 2/2-way valve program is especially to use in closed circuits with low differential pressure, but demanding moderate flow rates.

Valve body in dezincification resistant brass for ensuring a long life even in connection with aggressive steam media.

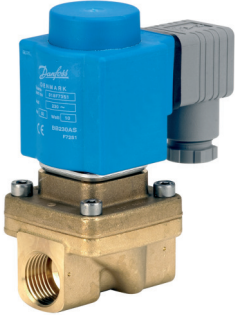
EV250B is compatible with the broad Danfoss coil program with enclosures from IP00 up to IP67. Medium temperatures up to 140 °C (low pressure steam).

Features and versions:

- For water, oil, compressed air and similar neutral media
- Clip on coil
- Ambient temperature: Up to 80 °C
- Coil enclosure: Up to IP67
- The valve can be used for rough vacuum
- Water hammer damped

1 Portfolio overview

Table 1: Portfolio overview

Features	EV250B
	
Body material	DZR Brass
DN [mm]	10 - 22
Connection	G $\frac{3}{8}$ " - G1"
Sealing material	EPDM, FKM
Function	NC, NO
Kv [m³/h]	2.5 - 7
Differential pressure range [bar]	0 - 10
Temperature range [°C]	-30 - 140

2 Functions

2.1 Function NC

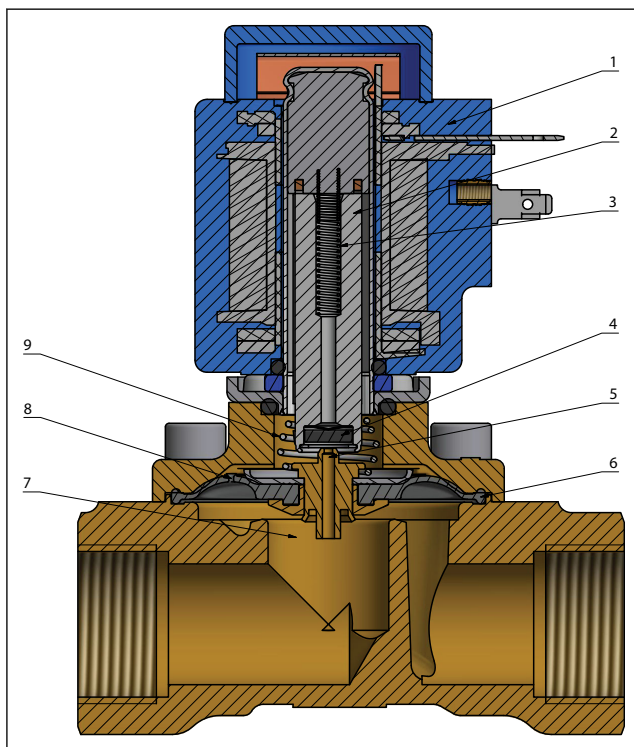
Coil voltage disconnected (closed):

When the supply voltage to the coil (1) is disconnected, the valve plate (4) is pressed down against the pilot orifice (5) by the closing spring (3). The pressure across the diaphragm (6) is built up via the equalizing orifice (8). The diaphragm closes the main orifice (7) as soon as the pressure across the diaphragm is equivalent to the inlet pressure below, due to the larger diameter of the upper side and/or the tension of the closing spring (3). The valve will be closed as long as the voltage to the coil is disconnected.

Coil voltage connected (open):

When voltage is applied to the coil, the armature (2) and the valve plate (4) are lifted clear of the pilot orifice (5).

If there is a differential pressure across the valve, the pressure above the diaphragm (6) drops as the pilot orifice is larger than the equalizing orifice. Therefore the diaphragm is lifted clear of the main orifice (7). If there is no differential pressure across the valve, the armature (2) draws the diaphragm (6) clear of the main orifice (7) using the assisted lift (9). The valve will be open for as long as there is voltage to the coil.



1	Coil
2	Armature
3	Closing spring
4	Valve plate
5	Pilot orifice
6	Diaphragm
7	Main orifice
8	Equalizing orifice
9	Assisted lift

2.2 Function NO

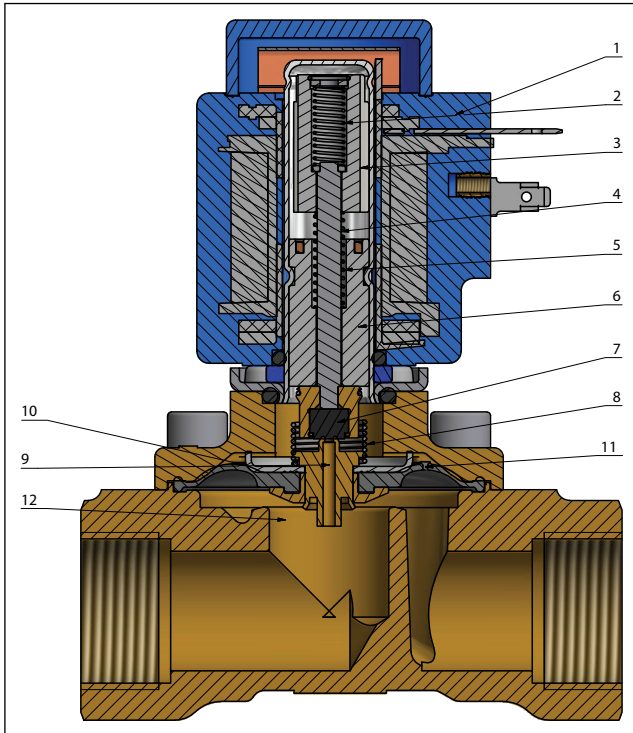
Coil voltage disconnected (valve is open):

When the supply voltage to the coil (1) is disconnected, the valve plate (7) are lifted clear of the pilot orifice (9) if there is a differential pressure across the valve. The pressure above the diaphragm (10) drops as the pilot orifice is larger than the equalizing orifice. Therefore the diaphragm is lifted clear of the main orifice (12). If there is no differential pressure across the valve, the opening spring (5) draws the diaphragm (10) clear of the main orifice (12) using the assisted lift (8). The valve will be open for as long as there is no voltage to the coil.

Coil voltage connected (valve is closed):

When the supply voltage to the coil (1) is connected, the armature (3) will compress the opening spring (5) and the closing spring will push the spindle (4)/ valve plate down against the pilot orifice (9). The pressure across the diaphragm (10) is built up via the equalising orifice (11). The diaphragm closes the main orifice (12) as soon as the pressure across the diaphragm is equivalent to the inlet pressure below, due to the larger diameter of the upper side and / or the tension of the closing spring (2). The valve will be closed as long as coil voltage is connected.

Solenoid valve, type EV250B

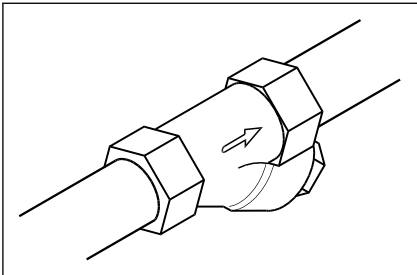


1	Coil
2	Closing spring
3	Armature
4	Spindle
5	Opening spring
6	Armature stop
7	Valve plate
8	Assisted lift
9	Pilot orifice
10	Diaphragm
11	Equalising orifice
12	Main orifice

3 Applications

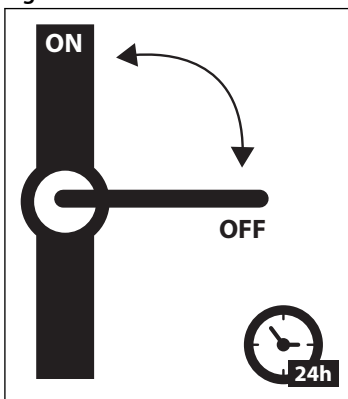
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

Figure 1: 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 2: 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

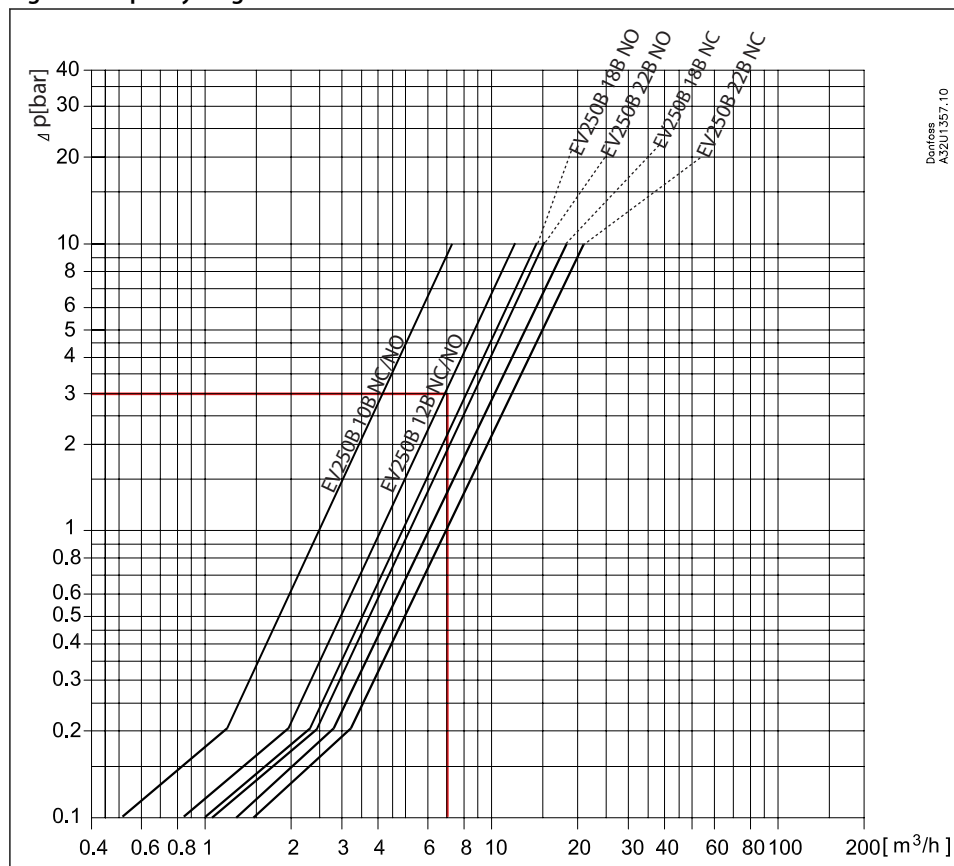
Table 2: Technical data

Media	EPDM	Water
	FKM	Oil, air and water
Media temperature [°C]	EPDM	-30 °C - 120 °C at 0 - 10 bar
	FKM	120 °C - 140 °C at 0 - 4 bar
Ambient temperature [°C]	Up to 80 °C	0 - 100 °C, for water max 60 °C
Kv value [m³/h]	DN10	2.5 m³/h
	DN12	4 m³/h
	DN18	6 m³/h NC / 4.9 m³/h NO
	DN22	7 m³/h NC / 5.2 m³/h NO
Min. Opening differential pressure [bar]	0 bar	
Max. Opening differential pressure [bar]	10 bar	
Max. working pressure [bar]	10 bar	
Max. test pressure [bar]	15 bar	
Pressure	Pressure range can be extended to use in rough vacuum, typically up to 99% vacuum (10 mbar), depending on the application.	
Tightness	Internally: Better than 0.4 mbar l/sec (25 ccm air per min.) Externally: Better than 1* 10 ⁻³ mbar l/sec (100% He)	
Viscosity [cSt]	Max. 50 cSt	

Capacity diagram

Example, water: EV250B 12 at differential pressure of 3 bar: Approx. 7 m³/h

Figure 3: Capacity diagram



Differential pressure range

Table 3: Differential pressure range

Connection ISO228/1	Function	Coil type BB, BE, BR, BY 10W AC BG 12W AC BG 20W DC BN 20W AC	Coil type BB/BE/BR/BY 18W DC ⁽¹⁾
		[Bar]	[Bar]
G $\frac{3}{8}$ - G1	NC	0-10	0-6
	NO	0-10	0-10

⁽¹⁾ 6 bar max. opening differential pressure is measured at 6% undervoltage (22.6 V DC hot coil), 50 °C ambient and 90 °C media temperature.

Time to open/close

Table 4: Time to open/close

Main type	EV250B 10BD	EV250B 12BD	EV250B 18BD	EV250B 22BD
Time to open [ms] ⁽¹⁾	100	100	150	150
Time to close [ms] ⁽¹⁾	100	100	100	100

⁽¹⁾ The times are indicative and apply to water. The exact times will depend on the pressure conditions.

Material

Table 5: Materials

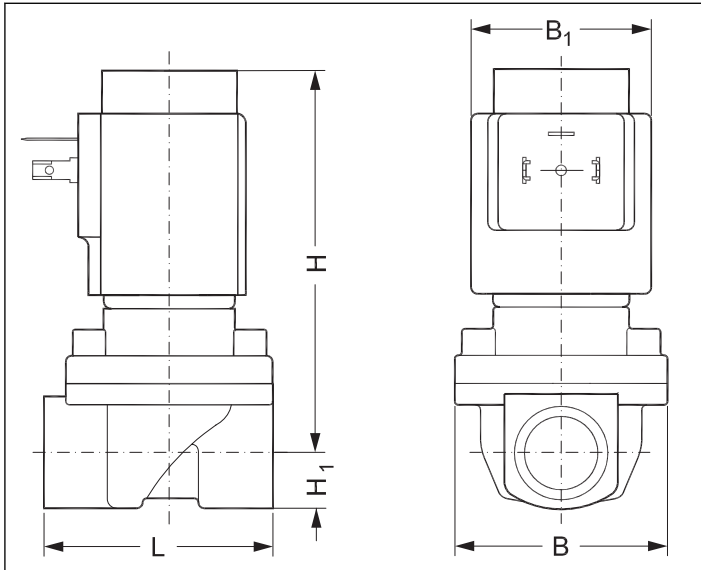
Components	Materials	Specifications
Valve body	DZR Brass	CuZn36Pb2As/CZ 132
Cover	Brass	W.no. 2.0402
Armature/armature stop	Stainless steel	W. no. 1.4105 / AISI 430FR
Armature tube	Stainless steel	W. no. 1.4306 / AISI 304L
Springs	Stainless steel	W. no. 1.4310 / AISI 301
O-ring	EPDM or FKM	
Valve plate	EPDM or FKM	
Diaphragm	EPDM or FKM	

4.2 Dimensions and Weights

Table 6: Dimensions and weight: DZR brass, NC and NO

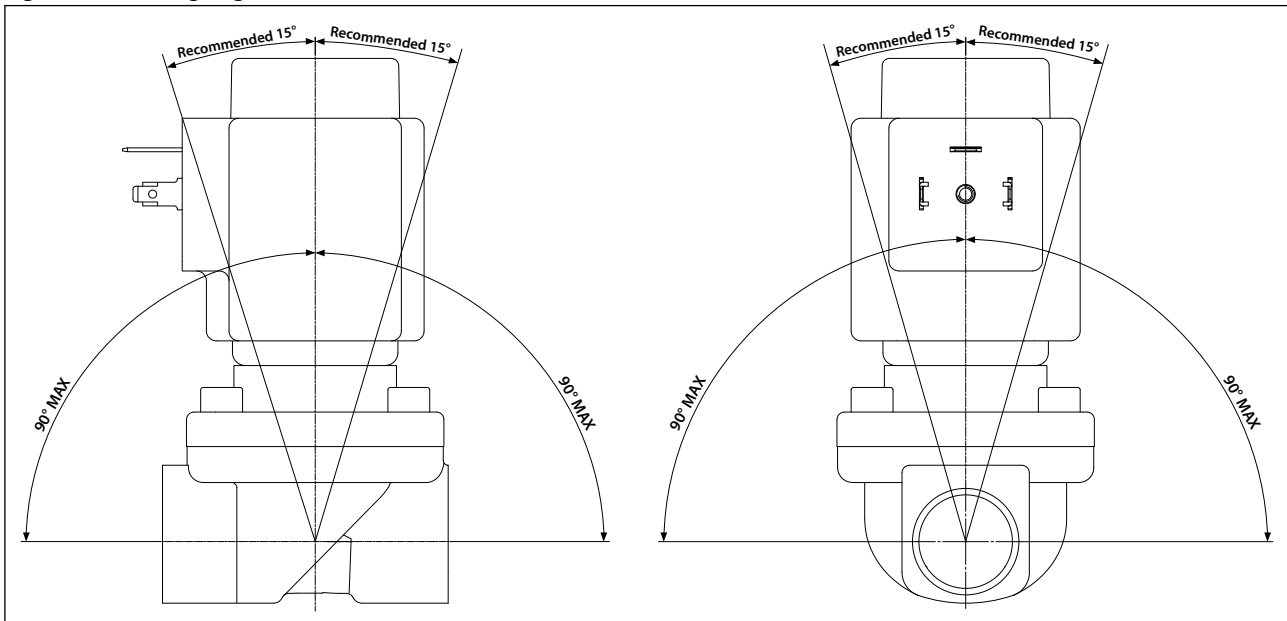
Type	Weight gross, valve body without coil [kg]	L [mm]	B [mm]	B ₁ [mm] / Coil type		H [mm]	H ₁ [mm]
				BB/BE/BR/BY	BG/BN		
EV250B 10	0.6	58	52.3	46	68	91	12.5
EV250B 12	0.6	58	52.3	46	68	91	12.5
EV250B 18	0.8	90.5	58	46	68	92	18
EV250B 22	1.1	90	58	46	68	96.3	22.3

Figure 4: Dimensions



4.3 Mounting

Figure 5: Mounting angle



5 Ordering

5.1 Parts program

Table 7: DZR brass, valve body NC and NO

Connection ISO228/1	Seal Material	Orifice [mm]	Kv value [m³/h]	Function	
				NC	NO
G 3/8	EPDM	10	2.5	032U5250	032U5350
	FKM			032U5251	032U5351
G 1/2	EPDM	12	4	032U5252	032U5352
	FKM			032U5253	032U5353
G 3/4	EPDM	18	6	032U5254	
	FKM			032U5255	
	EPDM	4.9		032U5354	
	FKM			032U5355	
G 1	EPDM	22	7	032U5256	
	FKM			032U5257	
	EPDM	5.2		032U5356	
	FKM			032U5357	

5.2 Accessories

Coils

Table 8: Below coils can be used with EV250B:

Coil	Type	Power consumption	Enclosure	Features
	BB / BY, clip on	11 - 16W AC 14 - 16W DC	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	11 - 17 W AC 15 - 16 W DC	IP67	With terminal box
	BF, clip on	11 - 16 W AC 14 - 16 W DC	IP67	With 1 m cable
	BG, clip on	11 - 16 W AC 16 - 20 W DC	IP67	With terminal box
	BN, clip on	22 W AC 20 W DC	IP67	Hum free With terminal box and 1 m cable

Solenoid valve, type EV250B

Cable plug

Figure 6: Cable plug

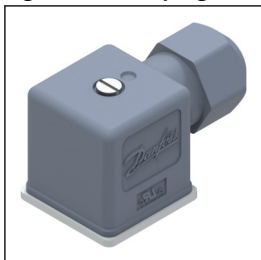


Table 9: Cable plug

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

Universal electronic multi-timer, type ET20M

Figure 7: ET20M



Application	Voltage [V AC]	To use with coil	Ambient temperature [°C]	Code number
External adjustable timing from 1 to 45 minutes with 1 to 15 seconds drain open. With manual override (test button). Electrical connection DIN 43650 A / EN 175 301-803-A	24 – 240	BB	-10 – 50	042N0185

Solenoid valve, type EV250B

Spare parts

Table 10: Actuator units NC/NO DZR

Type	Actuator unit NC		Actuator unit NO	
	EPDM	FKM	EPDM	FKM
EV250B 10-12BD	032U5315	032U5271	032U5319	032U5320
EV250B 18-22BD	032U5317	032U5273	032U5321	032U5322
	<p>1. O-ring for coil 2. 4 x screws 3. Armature tube 4. O-ring 5. Cover NC actuator unit with: 6. Armature + spring 7. Assist spring 8. Diaphragm</p>	<p>1. O-ring NC actuator unit with: 2. Armature + spring 3. Assist spring 4. Diaphragm</p>	<p>1. O-ring for coil 2. 4 x screws Complete NO actuator unit with: 3. Armature tube 4. O-ring 5. Cover 6. Assist spring 7. Diaphragm</p>	

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