



# Solenoid valve

## EV250B

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

## Description

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).

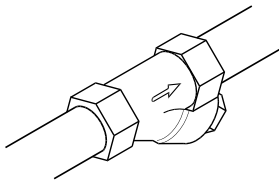
## Features & benefits

- 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

## Applications

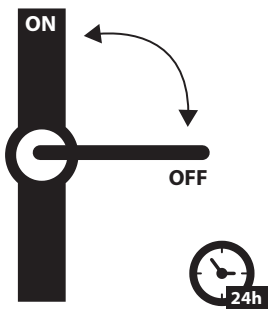
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

**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 / 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.

## Ordering







### Product code numbers

Connection type	Connection size [in]	Seal Material	Orifice size [mm]	Kv value [m <sup>3</sup> /h]	Function	Code number
G	3/8	EPDM	10.00	2.500	NC	032U5250
G	3/8	FKM	10.00	2.500	NC	032U5251
G	1/2	EPDM	12.00	4.000	NC	032U5252
G	1/2	FKM	12.00	4.000	NC	032U5253
G	3/4	EPDM	18.00	6.000	NC	032U5254
G	3/4	FKM	18.00	6.000	NC	032U5255
G	1	EPDM	22.00	7.000	NC	032U5256
G	1	FKM	22.00	7.000	NC	032U5257
NPT	1/2	EPDM	12.00	4.000	NC	032U5262
NPT	3/4	EPDM	18.00	6.000	NC	032U5264
NPT	1	EPDM	22.00	7.000	NC	032U5266
G	3/8	EPDM	10.00	2.500	NO	032U5339
G	3/8	EPDM	10.00	2.500	NO	032U5350
G	3/8	FKM	10.00	2.500	NO	032U5351
G	1/2	EPDM	12.00	4.000	NO	032U5352
G	1/2	FKM	12.00	4.000	NO	032U5353
G	3/4	EPDM	18.00	4.900	NO	032U5354
G	3/4	FKM	18.00	4.900	NO	032U5355
G	1	EPDM	22.00	5.200	NO	032U5356
G	1	FKM	22.00	5.200	NO	032U5357
NPT	1/2	FKM	12.00	4.000	NC	032U7633
NPT	3/4	FKM	18.00	6.000	NC	032U7635
NPT	1	FKM	22.00	7.000	NC	032U7637

## Accessories code numbers

### Coils

Table: Below coils can be used with EV250B:

Coil	Type	Power consumption	Enclosure	Feature
	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

## Cable plug

Figure: Cable plug



Table: Cable plug

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

## Universal electronic multi-timer, type ET20M

Figure: ET20M



Application	Voltage [V AC]	To use with coil	Ambient temperature [°C]	Code no.
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

## Spare parts code numbers


Table: Actuator units NC/NO DZR

Type	Actuator unit NC		Actuator unit NO	
	EPDM	FKM	EPDM	FKM
EV250B 10 – 12 BD	032U5315	032U5271	032U5319	032U5320
EV250B 18 – 22 BD	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>	

## Overview

### Product portfolio

Table: Portfolio overview

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

## Functions

### Function NC

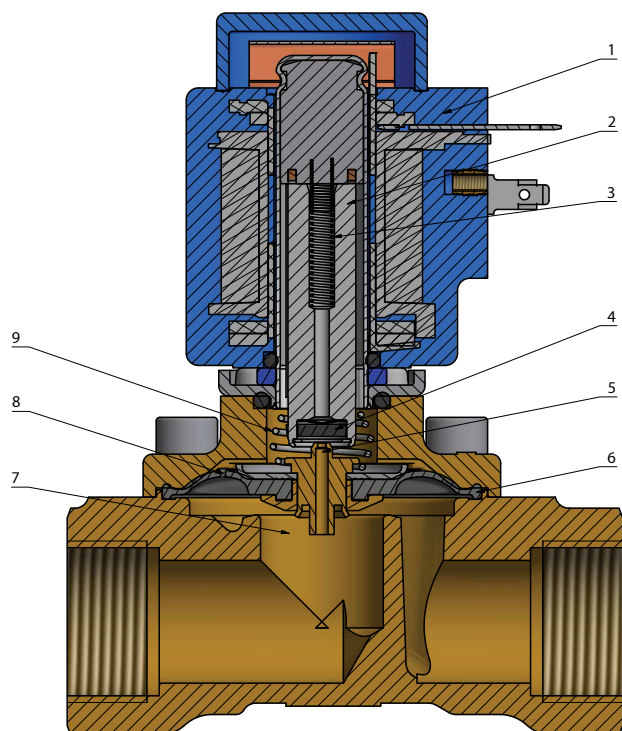
#### Coil voltage disconnected (closed):

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

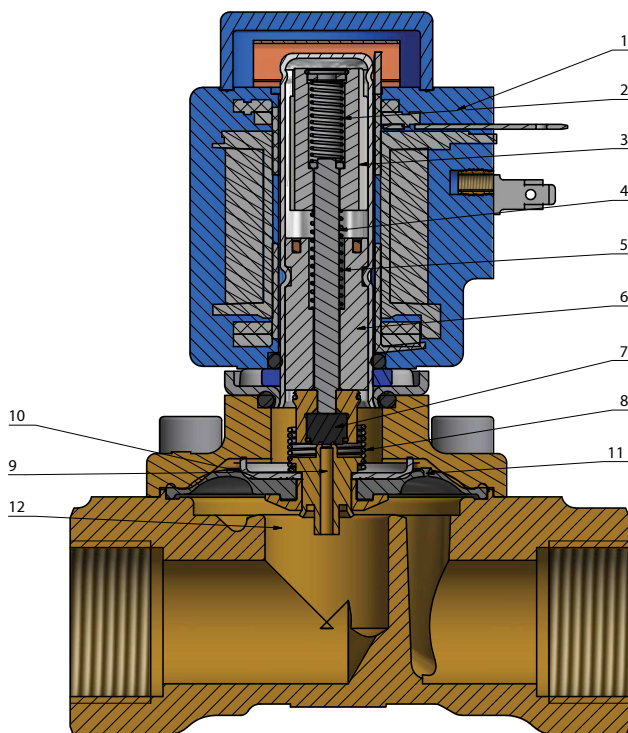
## Function NO

### 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 equalizing 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.



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.	Equalizing orifice
12.	Main orifice

## Product details

### General data

Table: Technical data

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

### Materials

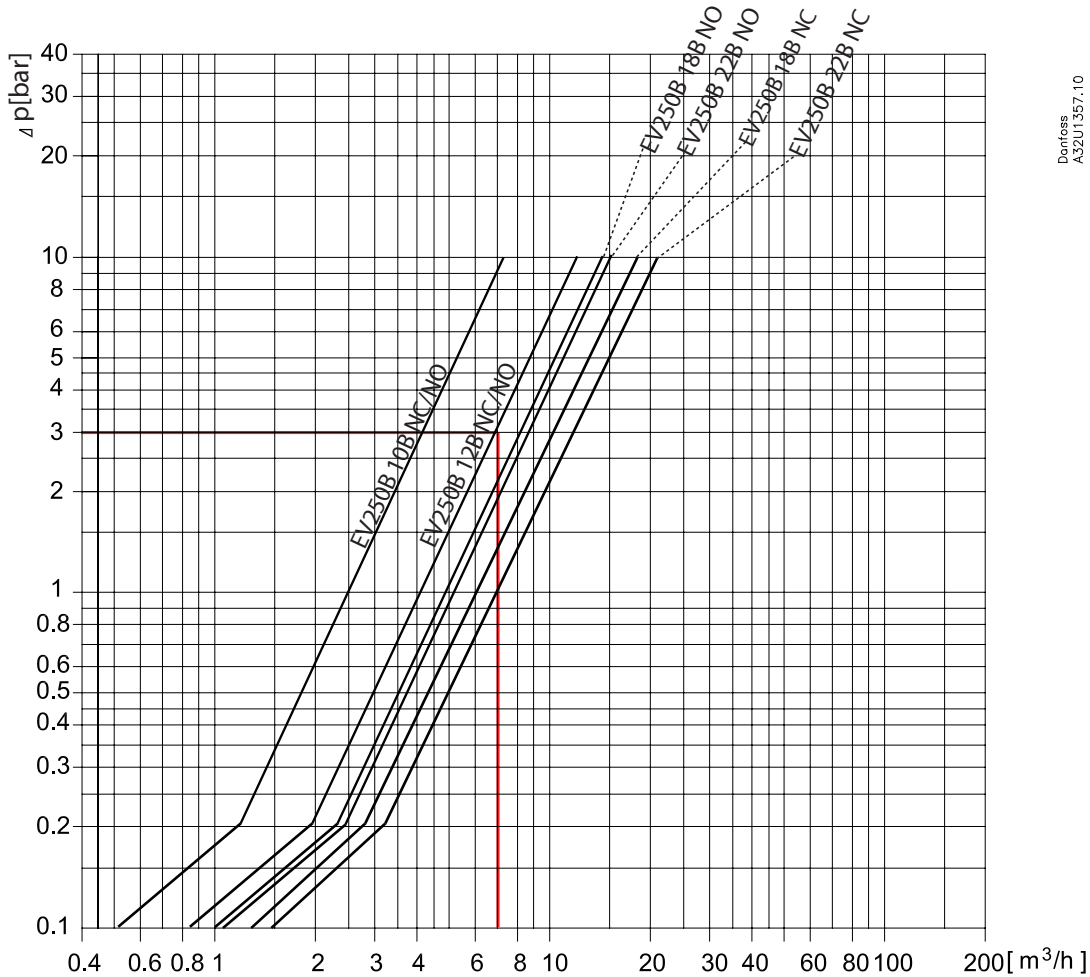
Table: Materials

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

## Capacity Capacity diagram

Example, water: EV250B 12 at differential pressure of 3 bar: Approx. 7 m<sup>3</sup>/h

Figure: Capacity diagram



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## Pressure and temperature data

### Differential pressure range

Table: 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 <sup>(1)</sup>
		[Bar]	[Bar]
G <sup>3</sup> / <sub>8</sub> – G1	NC	0 – 10	0 – 6
	NO	0 – 10	0 – 10

<sup>(1)</sup> 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: Time to open/close

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

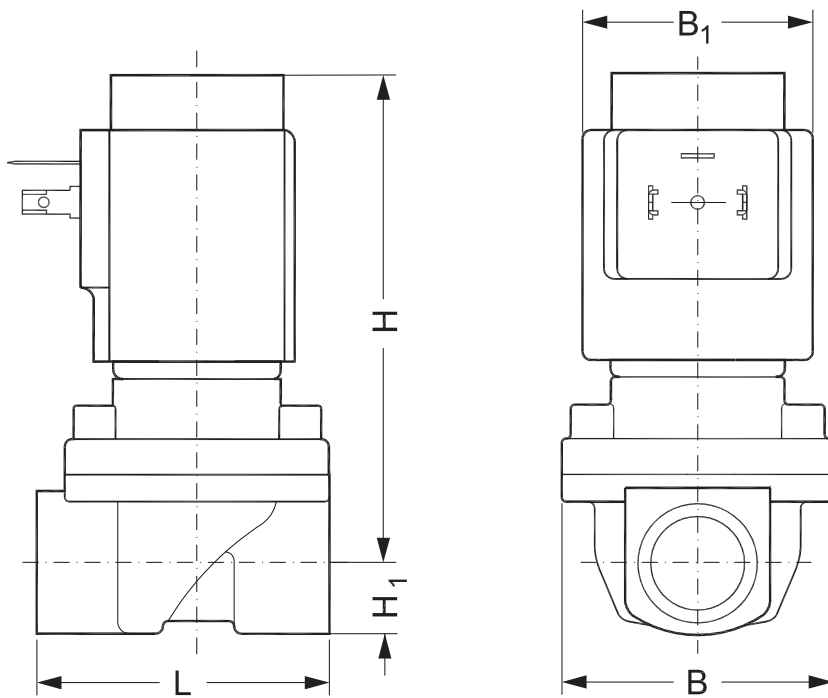
<sup>(1)</sup>The times are indicative and apply to water. The exact times will depend on the pressure conditions.

## Dimensions

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

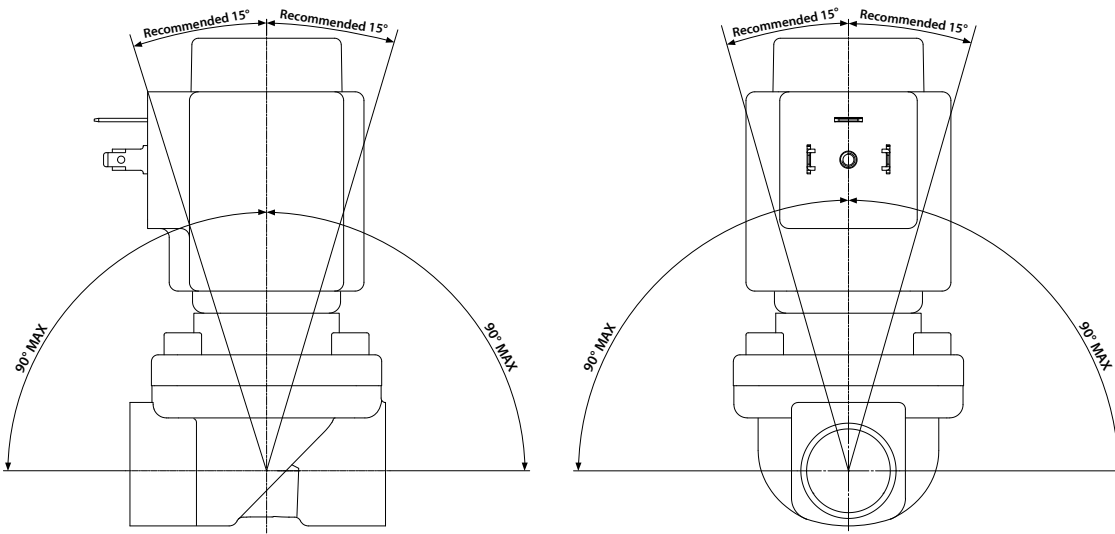
Type	Weight gross, valve body without coil [kg]	L [mm]	B [mm]	B <sub>1</sub> [mm] / Coil type		H [mm]	H <sub>1</sub> [mm]
				BB/BE/BR/BY	BG/BN		
EV250B 10	0.6	58	52.3	46	68	91	12.5
EV250B 12	0.6	58	52.3	46	68	91	12.5
EV250B 18	0.8	90.5	58	46	68	92	18
EV250B 22	1.1	90	58	46	68	96.3	22.3

Figure: Dimensions



## Mounting

Figure: Mounting angle



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EU Declaration	<a href="#">Danfoss EU 033F0683.05</a>	Danfoss	LVD, EU RoHS
UA Declaration	<a href="#">Danfoss UA 8481</a>	Danfoss	UA RoHS
Mechanical Safety Certificate	<a href="#">UL MH7648</a>	UL - Underwriters Laboratories inc.	
Pressure Safety Certificate	<a href="#">LLC CDC EURO-TYSK UA.TR.089.1015.02-22</a>	LLC CDC EURO TYSK - Ukraine	PED, Pressure
Manufacturer's Declaration	<a href="#">Danfoss MD 033F1140.01</a>	Danfoss	EU RoHS
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