

## **Solenoid valves 2/2-way assisted lift operated type EV250B**

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**Introduction**

EV250B with assisted lift is especially to use in closed circuits with low differential pressure, but demanding moderate flow rates. Valve body in DZR brass ensures a long life, even in connection with aggressive steam media.

EV250B valves are supplied complete or as separate components i.e valve body and coil, can be ordered separately.


**Features**

- For heating systems and other systems with low and strongly fluctuating pressure conditions
- For water, oil, compressed air and similar neutral media
- $k_v$  value: Up to 7 m<sup>3</sup>/h
- Differential pressure: up to 10 bar
- Viscosity: Up to 50 cst
- Ambient temperature: Up to +80°C
- Media temperature from -30 to +140°C
- Coil enclosure: Up to IP 67
- Thread connections: From G 3/8 to G 1
- Also available with NPT thread. Please contact Danfoss.
- The valve can be used for rough vacuum

**Approvals**

EPDM versions in Normally Closed (NC) valves are WRAS approved.

Pressure Equipment Directive (PED) 97/23/EC

ATTESTATION DE CONFORMITE SANITAIRE (ACS)
Body material BD = Dezincification resistant brass with EPDM seal material
EV250B 10BD EV250B 12BD EV250B 18BD EV250B 22BD



Versions with UL approval can be supplied to order.



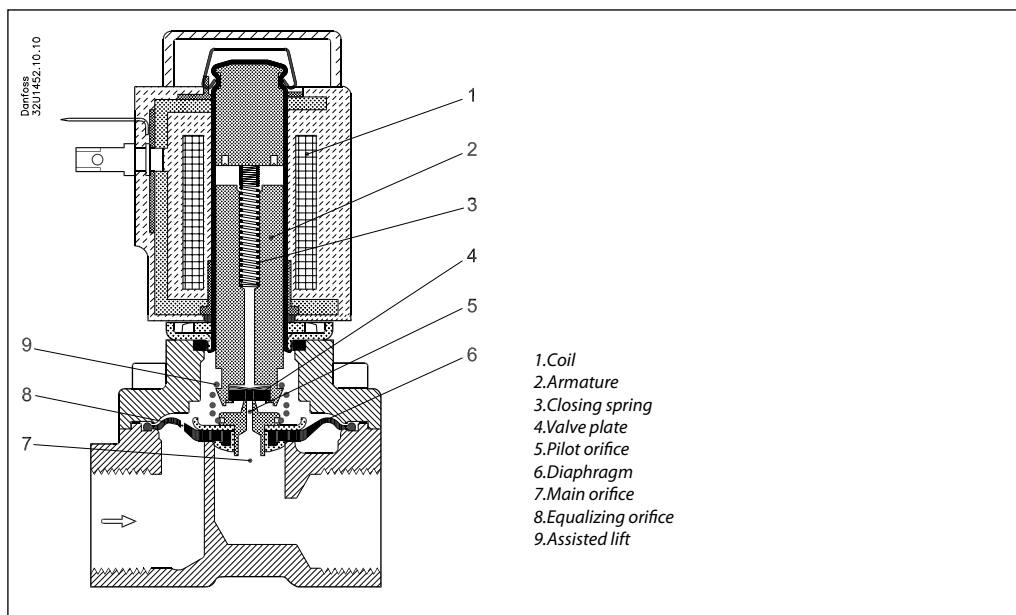
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Body material BD = Dezincification resistant brass with EPDM seal material
EV250B 10BD EV250B 12BD EV250B 18BD EV250B 22BD

**Technical data**

Main type	EV250B 10BD	EV250B 12BD	EV250B 18BD	EV250B 22BD
Installation	Vertical solenoid system is recommended			
Pressure range	See Ordering			
Max. test pressure	25 bar			
Tightness	Internally: Better than 0.4 mbar l/sec (25ccm air per min.) Externally: Better than $1 \cdot 10^{-3}$ mbar l/sec (100% He)			
Time to open1)	100 ms	100 ms	150 ms	150 ms
Time to close1)	100 ms	100 ms	100 ms	100 ms
Ambient temperature	Max. +80°C (depending on coil type, see data for the coil selected)			
Media temperature	EPDM: -30 → +120°C: 0 → 10 bar +120 → +140°C: 0 → 4 bar FKM: 0 → +100°C (water: max. +60°C)			
Viscosity	max. 50 cSt			
Materials	Valve body: DZR brass <sup>2)</sup> , CuZn36Pb2As/CZ 132 Cover: Brass....., W.no. 2.0402 Armature: Stainless steel, W.no. 1.4105 / AISI 430 FR Armature tube: Stainless steel, W.no. 1.4306 / AISI 304 L Armature stop: Stainless steel, W.no. 1.4105 / AISI 430 FR Springs: Stainless steel, W.no. 1.4310 / AISI 301 O-rings: EPDM or FKM Valve plate: EPDM or FKM Diaphragm: EPDM or FKM			

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

2) Dezincification resistant brass

**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.

**Ordering (NC) valve body**

Con- nection ISO 228/1	Seal material	k <sub>v</sub> value [m <sup>3</sup> /h]	Media temp.		Type designation		Permissible differential pressure (bar) / coil type <sup>3)</sup>					Code no.without coil	
			Min. [°C]	Max. [°C]	Main type	Specification	Min.	Max.					
								BB / BE		BG			BN
								10 W ac	18 W dc <sup>4)</sup>	12 W ac	20 W dc		20 W ac
G 3/8	EPDM <sup>1)</sup>	2.5	-30	+140	EV250B 10BD	G 38E NC000	0	10	6	10	10	10	<b>032U5250</b>
	FKM <sup>2)</sup>		0	+100	EV250B 10BD	G 38F NC000		10	6	10	10	10	<b>032U5251</b>
G 1/2	EPDM <sup>1)</sup>	4	-30	+140	EV250B 12BD	G 12E NC000	0	10	6	10	10	10	<b>032U5252</b>
	FKM <sup>2)</sup>		0	+100	EV250B 12BD	G 12F NC000		10	6	10	10	10	<b>032U5253</b>
G 3/4	EPDM <sup>1)</sup>	6	-30	+140	EV250B 18BD	G 34E NC000	0	10	6	10	10	10	<b>032U5254</b>
	FKM <sup>2)</sup>		0	+100	EV250B 18BD	G34F NC000		10	6	10	10	10	<b>032U5255</b>
G 1	EPDM <sup>1)</sup>	7	-30	+140	EV250B 22BD	G1E NC000	0	10	6	10	10	10	<b>032U5256</b>
	FKM <sup>2)</sup>		0	+100	EV250B 22BD	G1F NC000		10	6	10	10	10	<b>032U5257</b>

1) EPDM is suitable for water and steam

-30 → +120°C: 0 → 10 bar

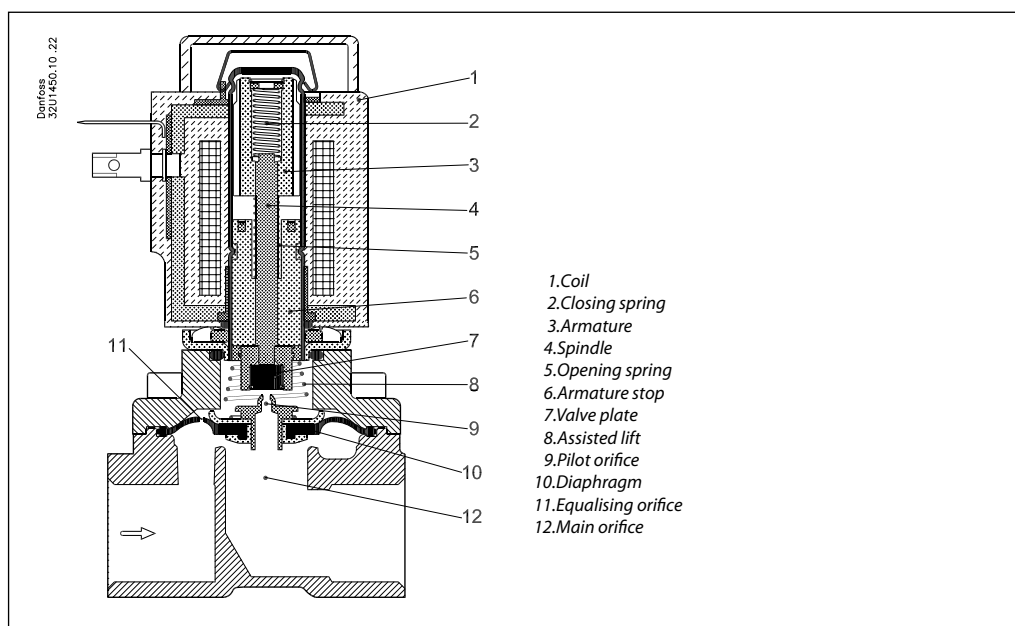
+120 → +140°C: 0 → 4 bar

2) FKM is suitable for oil, water and air (water: Max. +60°C)

3) Pressure range can be extended to use in rough vacuum, typically up to 99% vacuum (10 mbar), depending on the application.

4) **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. Outside these specifications please contact Danfoss.**

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.

Technical data

Main type	EV250B 10BD	EV250B 12BD	EV250B 18BD	EV250B 22BD
Installation	Vertical solenoid system is recommended			
Pressure range	See Ordering			
Max. test pressure	25 bar			
Tightness	Internally: Better than 0.4 mbar l/sec (25ccm air per min.) Externally: Better than $1 \cdot 10^{-3}$ mbar l/sec (100% He)			
Time to open <sup>1)</sup>	100 ms	100 ms	150 ms	150 ms
Time to close <sup>1)</sup>	100 ms	100 ms	100 ms	100 ms
Ambient temperature	Max. +80°C (depending on coil type, see data for the coil selected)			
Media temperature	EPDM: -30 → +120°C: 0 → 10 bar +120 → +140°C: 0 → 4 bar FKM: 0 → +100°C (water: max. +60°C)			
Viscosity	max. 50 cSt			
Materials	Valve body: DZR brass <sup>2)</sup> , CuZn36Pb2As/CZ 132 Cover: Brass....., W.no. 2.0402 Armature: Stainless steel, W.no. 1.4105 / AISI 430 FR Armature tube: Stainless steel, W.no. 1.4306 / AISI 304 L Armature stop: Stainless steel, W.no. 1.4105 / AISI 430 FR Springs: Stainless steel, W.no. 1.4310 / AISI 301 O-rings: EPDM or FKM Valve plate: EPDM or FKM Diaphragm: EPDM or FKM			

1) The times are indicative and apply to water. The exact times will depend on the pressure conditions.  
 2) Dezincification resistant brass

**Ordering (NO) valve body**

Con- nec- tion ISO 228/1	Seal material	k <sub>v</sub> value [m <sup>3</sup> /h]	Media temp.		Type designation		Permissible differential pressure (bar) / coil type <sup>3)</sup>					Code no. without coil	
			Min. [°C]	Max. [°C]	Main type	Specification	Min.	Max.					
								BB / BE		BG			BN
								10 W ac	18 W dc	12 W ac	20 W dc		
G 3/8	EPDM <sup>1)</sup>	2.5	-30	+140	EV250B 10BD	G 38E NO000	0	10	10	10	10	10	<b>032U5350</b>
	FKM <sup>2)</sup>		0	+100	EV250B 10BD	G 38F NO000		10	10	10	10	10	
G 1/2	EPDM <sup>1)</sup>	4	-30	+140	EV250B 12BD	G 12E NO000	0	10	10	10	10	10	<b>032U5352</b>
	FKM <sup>2)</sup>		0	+100	EV250B 12BD	G 12F NO000		10	10	10	10	10	
G 3/4	EPDM <sup>1)</sup>	4.9	-30	+140	EV250B 18BD	G 34E NO000	0	10	10	10	10	10	<b>032U5354</b>
	FKM <sup>2)</sup>		0	+100	EV250B 18BD	G34F NO000		10	10	10	10	10	
G 1	EPDM <sup>1)</sup>	5.2	-30	+140	EV250B 22BD	G1E NO000	0	10	10	10	10	10	<b>032U5356</b>
	FKM <sup>2)</sup>		0	+100	EV250B 22BD	G1F NO000		10	10	10	10	10	

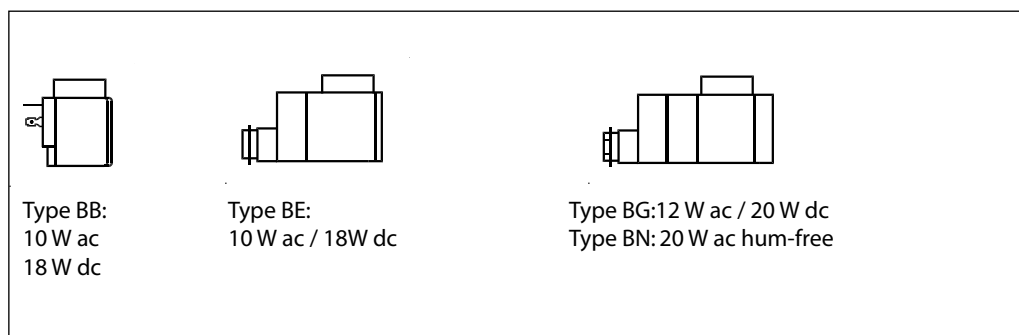
1) EPDM is suitable for water and steam

-30 → +120°C: 0 → 10 bar

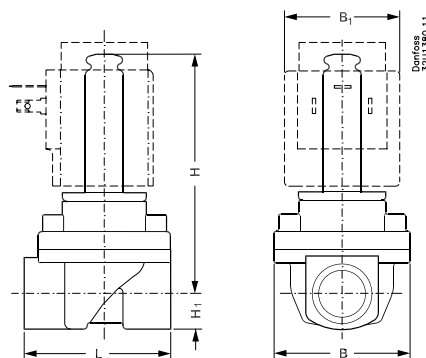
+120 → +140°C: 0 → 4 bar

2) FKM is suitable for oil, water and air (water: Max. +60°C)

3) Pressure range can be extended to use in rough vacuum, typically up to 99% vacuum (10 mbar), depending on the application.

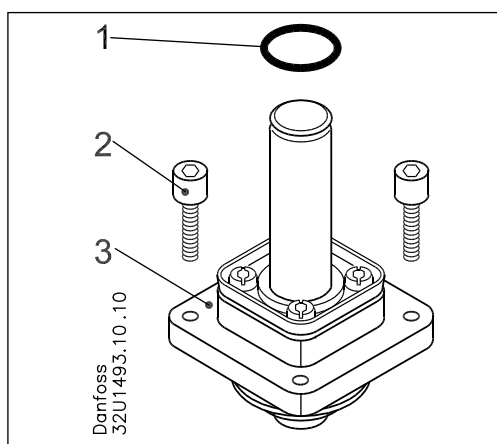
**Coil options**

**Ordering coils**

See separate data sheet for coils IC.PD.600.A

**Dimensions and weight**


Type	L [mm]	B [mm]	B1 [mm]		H <sub>1</sub> [mm]	H [mm]	Weight without coil [kg]
			coil type				
			BB/BE	BG/BN			
G 3/8	58	52.3	46	68	12.5	91	0.6
G 1/2	58	52.3	46	68	12.5	91	0.6
G 3/4	90.5	58	46	68	18	92	0.8
G 1	90	58	46	68	22.3	96.3	1.1

**Spare parts kit for NC EPDM seal material**

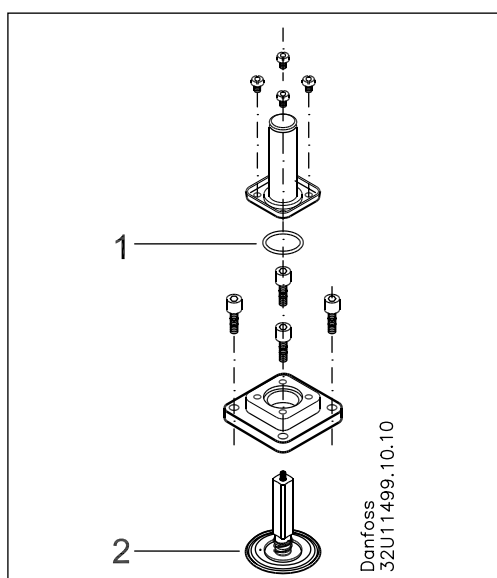


The spare parts kit comprises:

1. O-ring for coil.
2. 4 screws.
3. Complete NC actuator unit with diaphragm, assist spring, armature, closing spring, cover and armature tube.

For valve type	Seal material	Code no.
EV250B 10 - 12BD	EPDM	<b>032U5315</b>
EV250B 18 - 22BD	EPDM	<b>032U5317</b>

**Spare parts kit for NC FKM seal material**

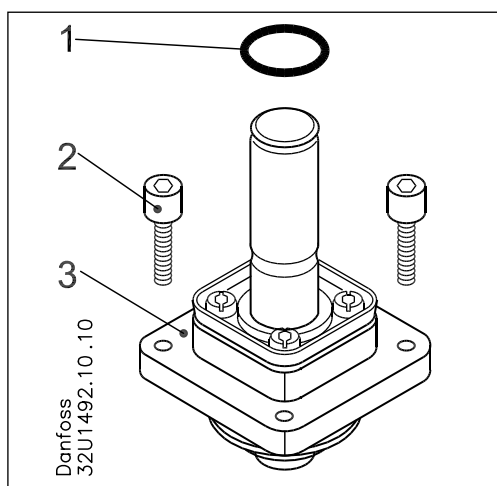


The spare parts kit comprises:

1. O-ring between armature tube and cover.
2. Service element consisting of an armature with valve plate and spring fitted on the diaphragm.

For valve type	Seal material	Code no.
EV250B 10 - 12BD	FKM	<b>032U5271</b>
EV250B 18 - 22BD	FKM	<b>032U5273</b>

**Spare parts kit for NO**



The spare parts kit comprises:

1. O-ring for coil.
2. 4 screws.
3. Complete NO actuator unit with diaphragm, assist spring, NO armature unit and cover.

For valve type	Seal material	Code no.
EV250B 10 - 12BD	EPDM	<b>032U5319</b>
EV250B 10 - 12BD	FKM	<b>032U5320</b>
EV250B 18 - 22BD	EPDM	<b>032U5321</b>
EV250B 18 - 22BD	FKM	<b>032U5322</b>