

## Data Sheet

Solenoid valve  
Type **EV225B**

Servo diaphragm operated for steam applications



EV225B is a servo-operated 2/2-way solenoid valve for use in steam applications.

The design is based on a PTFE diaphragm concept, ensuring highly reliable function when used in connection with contaminated steam.

Each valve body is made of dezincification resistant brass and the valve seats are made of stainless steel.




This ensures a long life even in when used with highly aggressive steam.

**Features and versions**

- Specifically designed for steam applications, 160 °C or 185 °C
- Clip on coil
- Ambient temperature: up to 40 °C
- Coil enclosure: up to IP65
- EV225B used with BQ coil: AC voltage up to 185 °C
- EV225B used with BN coil: DC voltage up to 160 °C
- EV225B used with BB coil: AC voltage up to 160 °C DC voltage up to 140 °C
- Connection: ISO 228/1

## 1 Portfolio overview

Table 1: Portfolio overview

Features	EV225B		
			
<b>Body material</b>	DZR brass	DZR brass	DZR brass
<b>DN [mm]</b>	6-25	10-25	10-25
<b>Connection</b>	G1/4" - G1"	G1/2"-G1"	G1/2"-G1"
<b>Sealing material</b>	PTFE	PTFE	PTFE
<b>Function</b>	NC	NC	NC
<b>K<sub>v</sub> [m<sup>3</sup>/h]</b>	0.9 - 6.0	2.2 - 6.0	2.2 - 6.0
<b>Differential pressure range [bar]</b>	0.2 - 10	0.2-10	0.2 - 5
<b>Temperature range [°C]</b>	0 - 185	0 - 185	0 - 160

## 2 Functions

### 2.1 Function NC

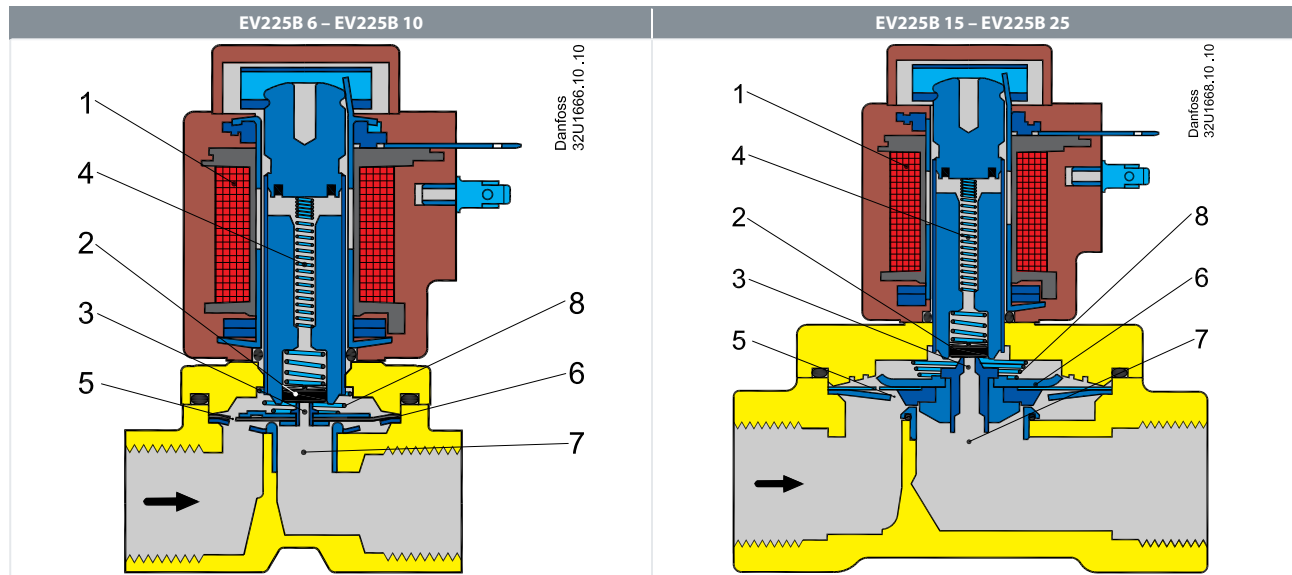
#### Coil voltage disconnected (closed)

When the voltage is disconnected, the valve plate (2) is pressed down against the pilot orifice (3) by the armature spring (4). The pressure across the diaphragm (6) is built up via the equalizing orifice (5). The diaphragm/piston closes the main orifice (7) as soon as the pressure across the diaphragm/piston 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 (3) is opened. As the pilot orifice is larger than the equalizing orifice (5), the pressure across the diaphragm (6) drops and therefore it is lifted clear of the main orifice (7). 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.

Table 2: Function NC

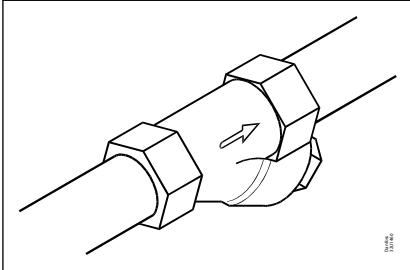


1.	Coil
2.	Valve plate
3.	Pilot orifice
4.	Armature spring
5.	Equalizing orifice
6.	Diaphragm
7.	Main orifice
8.	Closing spring

### 3 Applications

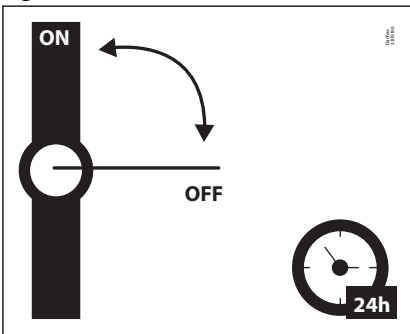
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

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  $\mu\text{S}/\text{cm}$  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 3: Technical data

<b>Media</b>	PTFE	Steam 160°C or 185°C
<b>Media temperature [°C] (Depending on which type of coil you used)</b>	AC coil	0-185°C
	DC coil	0-160°C
<b>Ambient temperature [°C]</b>	Max. 40 °C at a medium temperature of 185 °C	
<b>K<sub>v</sub> value [m³/h]</b>	DN6	0.9 m³/h
	DN10	2.2 m³/h
	DN15	3.0 m³/h
	DN20	5.0 m³/h
	DN25	6.0 m³/h
<b>Min. Opening differential pressure [bar]</b>	0.2 bar	
<b>Max. Opening differential pressure [bar]</b>	Up to 10 bar	
<b>Max. working pressure [bar]</b>	Up to 10 bar (Equal to max. differential pressure)	
<b>Max. test pressure [bar]</b>	25 bar (UL 429: 24.1 bar)	
<b>Viscosity [cSt]</b>	Max. 50 cSt	

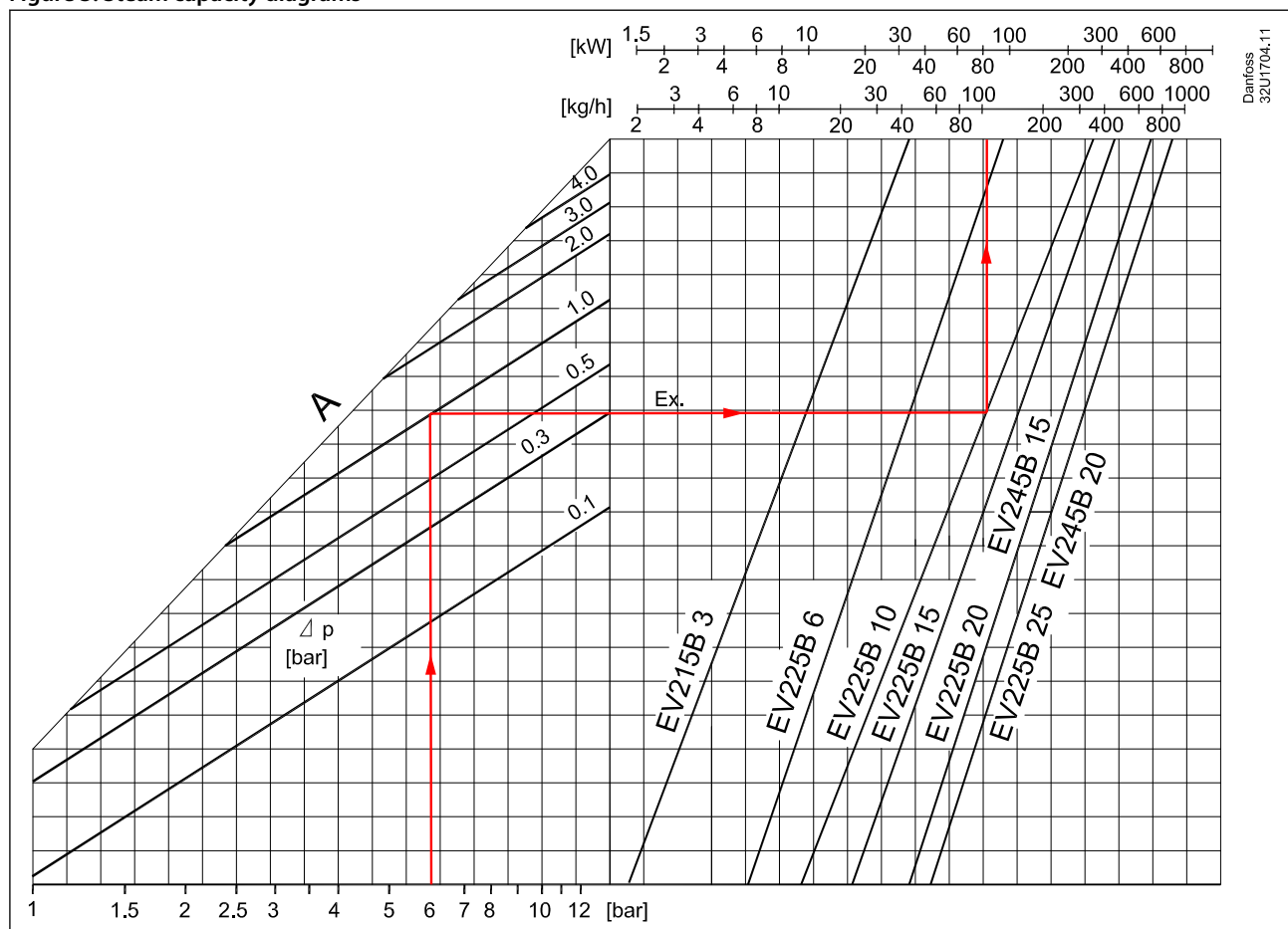
### Steam capacity diagrams

**Example:**

Capacity for EV225 10BD inlet pressure (p1) of 6 bar absolute, at differential pressure at 1 bar.

Approx. 100kg/h/80kW

Figure 3: Steam capacity diagrams



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## Solenoid valve, type EV225B

### Differential pressure range, NC

**Table 4: Differential pressure range**

Connection ISO228/1	Coil type BQ AC	Coil type BN DC	Coil type BB AC	Coil type BB DC
	[Bar]	[Bar]	[Bar]	[Bar]
G1/4 - G1	0.2 - 10	0.2 - 5	0.2 - 5	0.2 - 3.6

### Time to open/close

**Table 5: Time to open/close**

Main type	EV225B 6 – EV225B 25
Time to open [ms] <sup>(1)</sup>	Max. 0.2 s
Time to close [ms] <sup>(1)</sup>	Max. 0.2 s

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

### Materials

**Table 6: Materials**

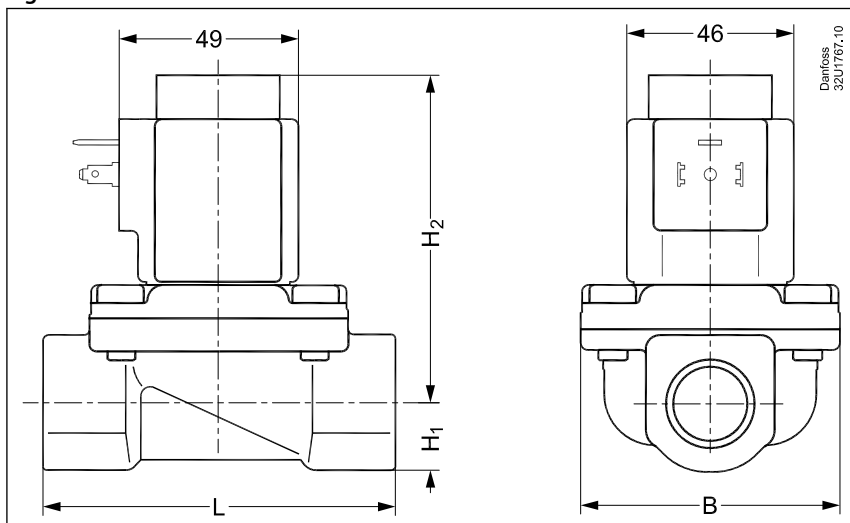
Components	Materials	Specifications
Valve body	DZR brass	
Armature/armature stop	Stainless steel	W. no. 1.4105 / AISI 430FR
Spring	Stainless steel	W. no. 1.4306 / AISI 304L
Armature tube	Stainless steel	W. no. 1.4310 / AISI 301
Diaphragm	PTFE	
Valve plate	PTFE	
Valve seat	Stainless steel	
External gaskets	O-ring: AFLAS	

## 4.2 Dimension and weight

**Table 7: Dimension and weight**

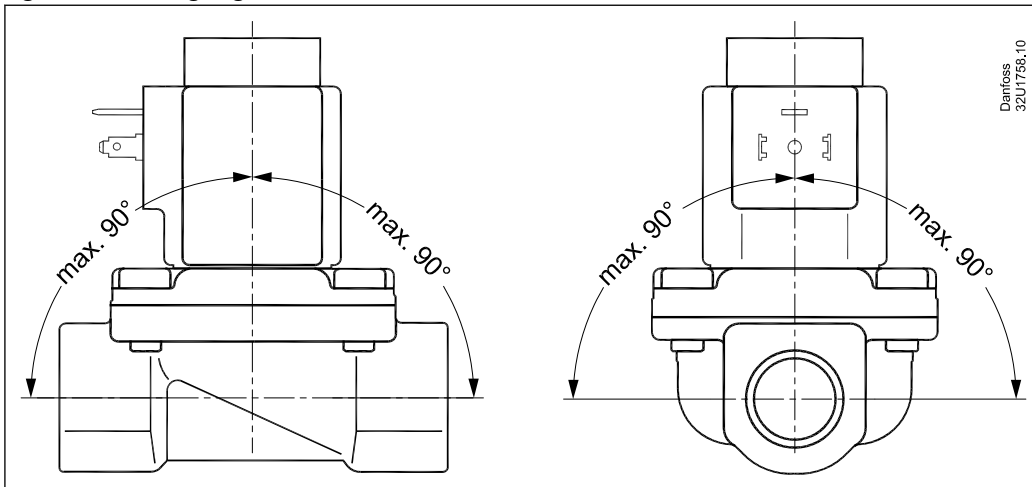
Type	L	B	H	H <sub>1</sub>	H <sub>2</sub>	Weight gross valve body with coil BQ, BB	Weight gross valve body with coil BN
	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[kg]
EV225B 6 BD	62	46	98	13	85	0.75	1.03
EV225B 10 BD	62	46	98	13	85	0.72	1.00
EV225B 15 BD	81	56	102	15	87	0.86	1.14
EV225B 20 BD	98	72	110	18	92	1.4	1.68
EV225B 25 BD	106	72	117	21	96	1.7	1.98

**Figure 4: Dimension**



### 4.3 Mounting

Figure 5: Mounting angle



## 5 Ordering

### 5.1 Parts program

Table 8: DZR brass, valve body NC

ISO228/1 connection	Orifice	K <sub>v</sub> value	Seal material	Code no. without coil	Code no. valve body with coil and power connector				
	[mm]	[m <sup>3</sup> /h]	PTFE		Coil type BQ024CS 24 V 60 Hz 24 V 50 Hz	Coil type BQ120BS 110-120 V 60 Hz	Coil type BQ240CS 208-240 V 60 Hz 230 V 50 Hz	Coil type BN024DS 24V DC	Coil type BQ22BS 220 V 60 Hz
G1/4	6	0.9	PTFE	032U3802					
G3/8	10	2.2		032U3803					
G1/2	10	2.2		032U3804		032U380420	032U380431	032U380402	032U380429
G1/2	15	3.0		032U3805			032U380531		032U380529
G3/4	20	5.0		032U3806	032U380616		032U380631	032U380602	032U380629
G1	25	6.0		032U3807			032U380731	032U380702	032U380729

### 5.2 Accessories

#### Coil

#### Coil type BQ AC Steam coil to 185 °C

Figure 6: Coil type BQ AC



Table 9: Coil type BQ AC Steam coil to 185 °C

Type	Tambient	Supply voltage	Voltage variation	Frequency	Power consumption		Approval	Code no.
	[°C]	[V]		[Hz]	[W]	[VA]		
BQ024CS	-40 – 40	24	-15%, 10%	50	10	17		018F4517
		24	-15%, 10%	60	9.0	16		
BQ120BS	40 – 40	110 / 120	-15%, 6%	60	13.5	19		018F4519
BQ240CS	-40 – 40	230	-15%, 6%	50	10	17		018F4511
		208 / 240	-6%, 6%	60	9.5	16		
BQ220BS	-40 40	220	-15%, 6%	60	12	19		018F4520

#### Coil type BN DC Steam coils to 160 °C

Figure 7: Coil type BN DC





## Solenoid valve, type EV225B

Table 10: Coil type BN DC Steam coils to 160 °C

Type	T ambient	Supply voltage	Voltage variation	Frequency	Power consumption		Approval	Code no.
	[°C]	[V]		[Hz]	[W]	[VA]		
BN024DS	-40 – 50	24	±10%	DC	20			018F6968

### Coil type BB AC Steam coils to 160 °C

Figure 8: Coil type BB AC



Table 11: Coil type BB AC Steam coils to 160 °C

Type	T ambient	Supply voltage	Voltage variation	Frequency	Power consumption		Code no.
	[°C]	[V]		[Hz]	[W]	[VA] <sup>19</sup>	
BB024AS	-40 – 80	24	-15%, 10%	50	11	018F7358	
BB115AS	-40 – 50	115	-15%, 10%	50	11	19	018F7361
BB230AS	-40 – 80	220 / 230	-15%, 10%	50	11	19	018F7351
BB240AS	-40 – 80	240	-15%, 10%	50	11	19	018F7352
BB440CS	-40 – 80	400	±10%	50	14	24	018F7353
		440	±10%	60	15	24	
BB024BS	-40 – 80	24	-15%, 10%	60	14	23	018F7365
BB110CS	-40 – 50	110	±10%	50	15	28	018F7360
		110	±10%	60	13	22	
BB230CS	-40 – 50	220 / 230	±10%	60	13	24	018F7363
		220 / 230	±10%	50	16	31	

### Type BB DC Steam coils to 140 °C

Table 12: Type BB DC Steam coils to 140 °C

Type	T ambient	Supply voltage	Voltage variation	Frequency	Power consumption		Code no.
	[°C]	[V]		[Hz]	[W]	[VA]	
BB012DS	-40 – 50	12	±10%	DC	14	–	018F7396
BB024DS	-40 – 50	24	±10%	DC	16	–	018F7397

### Cable plug

Figure 9: Cable plug



Table 13: Cable plug

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

## Universal electronic multi-timer, Type ET 20 M

Figure 10: Type ET 20 M



Table 14: Universal electronic multi-timer, Type ET 20 M

Type	Voltage	Suitable for coil types	Code no.
	[V]		
BA024A	24 - 240	AL, AM, AS, AZ, BA, BD, BB	042N0185

## Spare parts

Table 15: Actuator/diaphragm kit

Type	Actuator/diaphragm kit
	Sealing
	PTFE
EV225B 6 – 10	032U3171
EV225B 15	032U3172
EV225B 20 – 25	032U3173
	<ol style="list-style-type: none"> <li>1. Armature with valve plate and spring</li> <li>2. Closing spring</li> <li>3. Diaphragm</li> <li>4. O-ring</li> </ol>

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