Data sheet

Solenoid valve

EV220B

EV220B 6 – 22 :
General purpose valves for water, brine, air and oil applications

Description

EV220B 6 – EV220B 22 is a direct servo-operated 2/2-way solenoid valve program with connections from ¼" – 1". This program is especially for OEM applications demanding a robust solution and moderate flow rates.

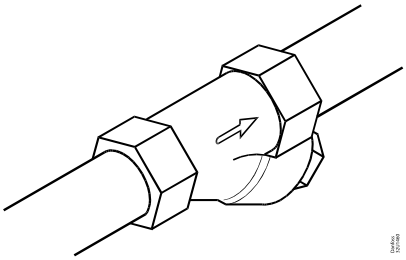
Features & benefits

- For water, oil, compressed air and similar neutral media
- Clip on coil
- Ambient temperature: Up to 80 °C
- Coil enclosure: Up to IP67

Applications

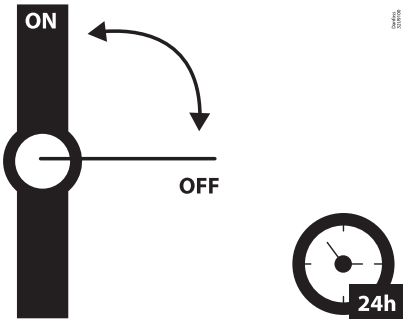
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

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

Parts program

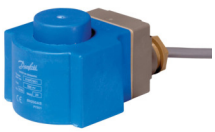
Table: Brass/DZR brass, valve body NC and NO

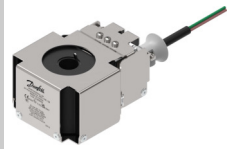
ISO228/1 connection	Orifice [mm]	K_v value [m^3/h]	Seal Material	Function		
				Brass		DZR brass
				NC	NO	NC
G ¼	6	0.7	EPDM	032U1236		
			FKM	032U1237		
G ⅜			EPDM	032U1241	032U1238	032U5807
			FKM	032U1242	032U1239	
	10	1.5	EPDM	032U1246		
			FKM	032U1247		
G ½			EPDM	032U1251		032U5810
			FKM	032U1252		
		1.0	FKM		032U1249	
	11.5	2.3	EPDM	032U1279		
	12	2.5	EPDM	032U1256		
			FKM	032U1255		
G ¾	18	6.0	EPDM	032U1261		
			FKM	032U1260		
G1	22		EPDM	032U1263		
			FKM	032U1266		

Accessories code numbers

Coils

Table: Coils used with EV220B 6 – EV220B 22

Coil	Type	Power consumption	Enclosure	Features
	BA / BD, screw on	8.5 – 15 W AC 14 W DC	IP00 with spade connector	IP20 with protective cap, IP67 with cable plug
	BB /BY, clip on	11 – 16 W AC 14 – 16 W 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 – 15 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
	BH, clip on	22 W AC	IP67	Hum free with terminal box and 1 m cable
	BN, clip on	19 W AC 20 W DC	IP67	Hum free with terminal box and 1 m cable

	BI, screw on	10 –10, 7 W AC 12 – 12, 5 W DC	IP67 only including seal kit 018Z0090	For explosion-risk environment zone 1. with terminal box and 5 m cable

For further information and for ordering, see separate data sheet for coils.

Cable plug

Table: Cable plug

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

Universal electronic multi-timer, type ET20M

Table: Universal electronic multi-timer

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	BA, BD, BB	-10 – 50	042N0185

Spare parts code numbers

Table: Actuator kit NC brass

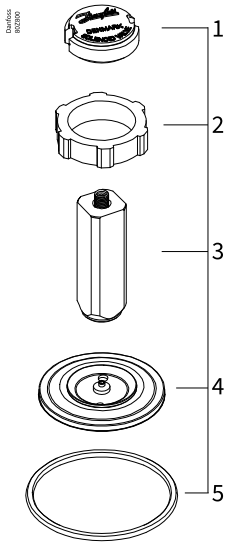
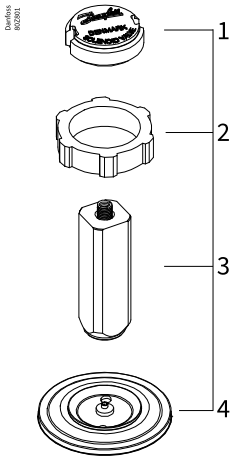
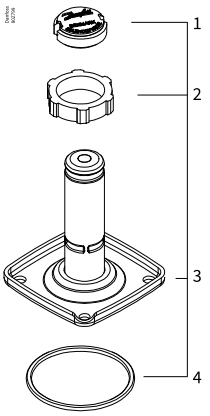
Type	Actuator kit NC			
	Sealing			
	EPDM	FKM	EPDM	FKM
EV220B 6B	032U1062	032U1063		
EV220B 10B – 11.5B	032U1065			
EV220B 10B		032U1066		
EV220B 12B			032U1068	032U1067
EV220B 18B – 22B			032U1070	032U1069
				
	1. Locking button 2. Nut for the coil 3. Armature with valve plate and spring 4. Diaphragm 5. O-ring		1. Locking button 2. Nut for the coil 3. Armature with valve plate and spring 4. Diaphragm	

Table: Assembled NO unit

Type	Assembled NO unit	
	Sealing	
	EPDM	FKM
EV220B 6B	032U0165	032U0166
EV220B 10B		032U0167
		
	1. Locking button 2. Locking nut 3. NO actuator unit 4. O-ring	

Overview

Product portfolio

Table: Portfolio overview

Features	EV220B 6 – 22	EV220B 6 –10	EV220B 6 –12
			
Body material	Brass	DZR Brass	Brass
DN [mm]	6, 10, 11.5, 12, 18, 22	6, 10	6, 10
Connection	G¼", G⅜", G½", G¾", G1"	G⅜", G½"	G⅜", G½"
Sealing material	EPDM, FKM	EPDM	EPDM, FKM
Function	NC	NC	NO
K_v [m^3/h]	0.7, 1.0, 1.5, 2.3, 2.5, 6.0	0.7, 1.0, 1.5	0.7, 1.0
Differential pressure range [bar]	0.1 – 20	0.1 – 20	0.1 – 10
Temperature range [°C]	-30 – 100 EPDM 0 – 100 FKM (Water max 60)	-30 – 100 EPDM	-30 – 100 EPDM 0 – 100 FKM (Water max 60)

Functions

Function NC

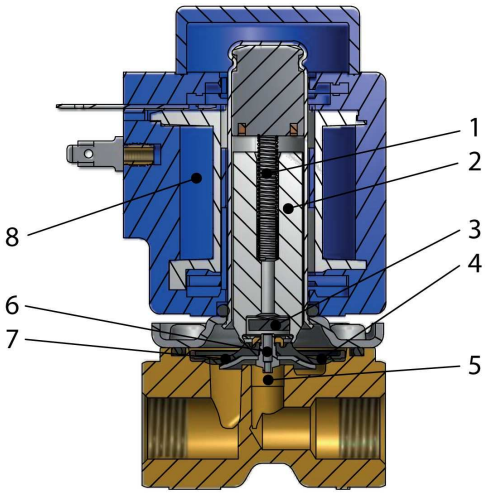
Coil voltage disconnected (closed)

When the supply voltage to the coil (8) is disconnected, the valve plate (3) is pressed down against the pilot orifice (6) by the armature spring (1). The pressure across the diaphragm (7) is built up via the equalizing orifice (4). The diaphragm closes the main orifice (5) 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, the pilot orifice (6) is opened. As the pilot orifice is larger than the equalizing orifice (4), the pressure across the diaphragm (7) drops and therefore it is lifted clear of the main orifice (5). The valve is now open 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: Function, NC



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

Function NO

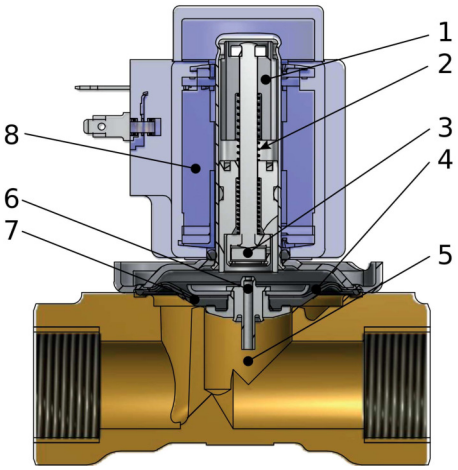
Coil voltage disconnected (open)

When the voltage to the coil (8) is disconnected, the pilot orifice (6) is open. As the pilot orifice is larger than the equalizing orifice (4), the pressure across the diaphragm (7) drops and therefore it is lifted clear of the main orifice (5). 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 (6). The pressure across the diaphragm (7) is built up via the equalizing orifice (4). The diaphragm closes the main orifice (5) 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: Function, NO



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

Product details

General data

Table: Technical data

Media	EPDM	Water	
	FKM	Oil and air	
Media temperature	EPDM	-30 – 100 °C	
	FKM	0 – 100 °C (Water max 60 °C)	
Ambient temperature	BA	Up to 40 °C	
	BD/BE DC/BB DC	Up to 50 °C	
	BB/BE AC/ BG	Up to 80 °C	
K_v value	DN6	0.7 m^3/h	
	DN10 NC	1.5 m^3/h	
	DN10 NO	1.0 m^3/h	
	DN11.5	2.3 m^3/h	
	DN12	2.5 m^3/h	
	DN18	6.0 m^3/h	
	DN22	6.0 m^3/h	
Min. Opening differential pressure	NC	DN6 – 10	0.1 bar
		DN11.5 – 22	0.3 bar
	NO	DN6-10	0.1 bar
		DN12	0.3 bar
Max. Opening differential pressure	NC	Up to 20 bar	
	NO	10 bar	
Max. working pressure	NC	Up to 20 bar (Equal to max. differential pressure)	
	NO	10 bar	
Max. test pressure	DN6 – 10	50 bar	
	DN11.5 – 22	16 bar	
Viscosity	Max. 50 cSt		

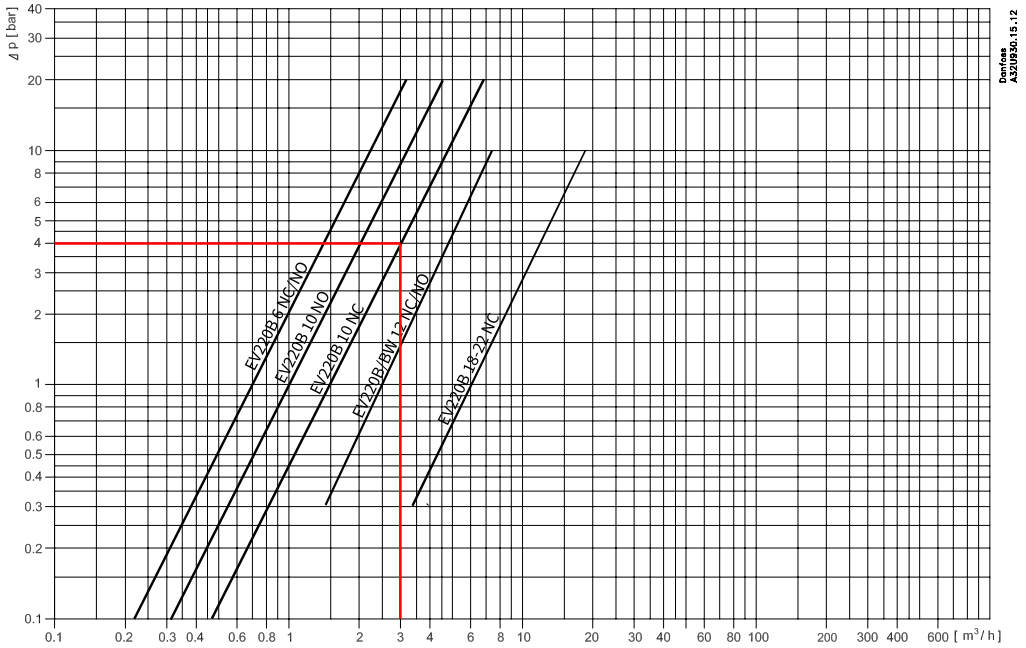
Materials

Components	Materials	Specifications
Valve body	Brass	W.no.2.0402
	DZR Brass	CNZn36Pb2AS (CZ132)
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
Springs	Stainless steel	W.no. 1.4310 / AISI 301
O-rings	EPDM or FKM	
Valve plate	EPDM or FKM	
Diaphragm	EPDM or FKM	

Capacity

Example, water: EV220B 10 NC, at 4 bar diff. pressure: Approx: 3 m^3/h

Figure: Capacity diagram



Time to open/close

Type	EV220B 6	EV220B 10	EV220B / BW 12	EV220B 18	EV220B 22
Time to open [ms] (1)	40	50	60	200	200
Time to close [ms] (1)	250	300	300	500	500

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

Pressure and temperature data

Differential pressure range

Connection ISO228/1	Orifice size [mm]	Differential pressure, min. to max [bar]							
		NC				NO			
		BA/BD	BE/BE/BR/BY	BB/BE/BR/BY	BG	BA/BD	BE/BE/BR/BY	BB/BE/BR/BY	BG
		9 [W AC]	10 [W AC]	18 [W DC]	12 [W AC]/ 20 [W DC]	9 [W AC]	10 [W AC]	18 [W DC]	12 [W AC] / 20 [W DC]
G¼"	6	0.1 – 20		0.1 – 10	0.1 – 20	0.1 – 10			
G⅜"	6	0.1 – 20		0.1 – 10	0.1 – 20	0.1 – 10			
G⅜"	10	0.1 – 20		0.1 – 10	0.1 – 20	0.1 – 10			
G½"	10	0.1 – 20		0.1 – 10	0.1 – 20	0.1 – 10			
G½"	11.5	0.1 – 10		0.1 – 10	0.1 – 10				
G½"	12	0.3 – 10			0.3 – 10	0.3 – 10			
G¾"	18	0.3 – 10			0.3 – 10				
G1"	22	0.3 – 10			0.3 – 10				

Dimensions

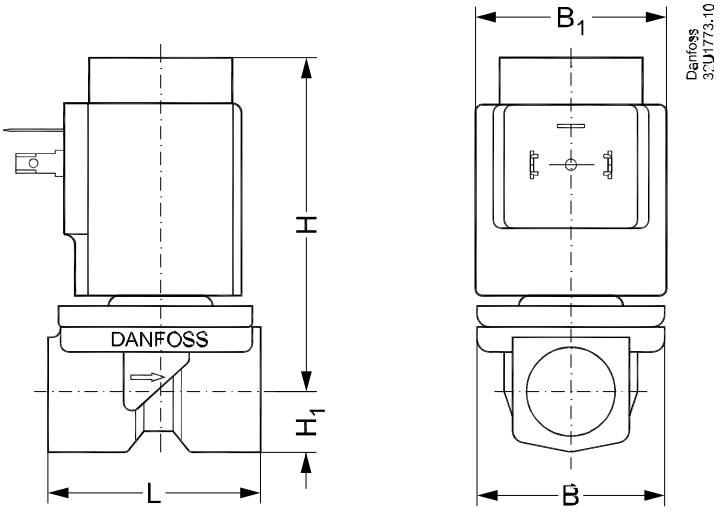
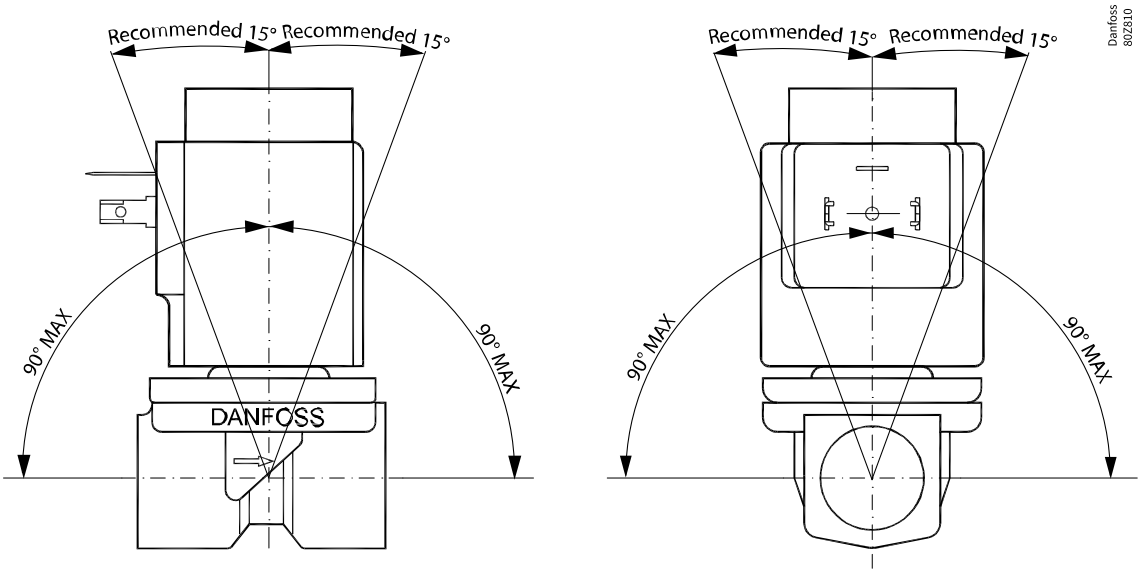


Table: Dimensions and weight: Brass, DZR brass, NC and NO

Type	Weight gross valve body without coil [kg]	L [mm]	B [mm]	B_1 [mm] / Coil type			H [mm]	H_1 [mm]
				BA	BB / BE	BG		
EV220B 6B	0.22	45.5	43.5	32	46	68	78	13
EV220B 10B	0.29	51.5	48	32	46	68	81	13
EV220B 11.5B	0.29	51.5	48	32	46	68	81	13
EV220B 12	0.35	58	54	32	46	68	81	13
EV220B 18B	0.65	90	60	32	46	68	87	22
EV220B 22B	0.65	90	60	32	46	68	91	22

Installation

Figure: Mounting angle



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Approval type	Title	Certification body	Approval topic
Manufacturer's Declaration	Danfoss MD 003N9613.AB	Danfoss	PED, Pressure
Export Control Declaration	Solenoid valves - Stainless steel	Danfoss	
Export Control Declaration	Solenoid valves – Polymer, Bronze, Brass, Cast iron	Danfoss	
EU Declaration	Danfoss EU 033F0683.05	Danfoss	LVD, EU RoHS
Mechanical Safety Certificate	UL MH7648	UL - Underwriters Laboratories inc.	
Pressure Safety Certificate	LLC CDC EURO-TYSK UA.TR.089.1015.02-22	LLC CDC EURO TYSK - Ukraine	PED, Pressure
EU Declaration	Danfoss EU 033F0682.AA	Danfoss	PED, LVD, Pressure, EU RoHS
Manufacturer's Declaration	Danfoss MD 033F1140.01	Danfoss	EU RoHS
Manufacturer's Declaration	Danfoss MD 033F0232.AA	Danfoss	PED, Pressure
Hygienic Certificate	PZH B-BK-60110-0524-2023	PZH - National Institute of Hygiene	Drinking Water
UK Declaration	Danfoss UK 033F1143.AB	Danfoss	EMC, PED, Pressure, UK RoHS
Hygienic Certificate	SINTEF 0685	SINTEF - SINTEF Byggforsk	Drinking Water

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