Data sheet

Solenoid valve

EV220BW

Indirect servo operated valves for drinking water

Description

Solenoid valve range with drinking water approvals: for water supply, houses and large apartments (kitchen and bathrooms), commercial buildings, industrial buildings, zoning, laundry, dishwashing, main inlet valves, machines and food processing, shut off, heating and cooling with water and brine.
DZR Eco brass for neutral and slightly aggressive liquids and non-flammable gases. SS for neutral and aggressive liquids and non-flammable gases.

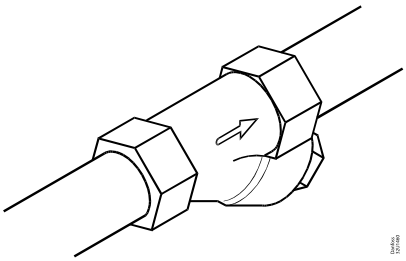
Features & benefits

- Clip-on coil
- Ambient temperature: up to 70 °C
- Coil enclosure: up to IP67
- Water hammer damped
- Built-in filter
- Body material in Eco brass (Lead free < 0,1 %) or Stainless steel
- New generation EPDM sealings recommended for drinking water

Applications

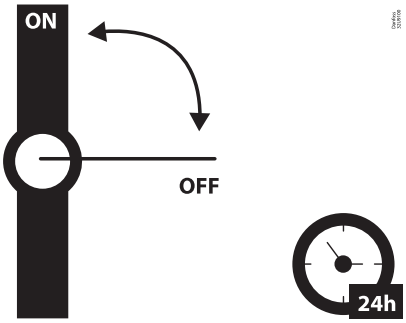
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

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



Guidelines for water

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.
- Drinking water (Ph 6 – 9)

Ordering

Product code numbers

Parts program
Table: Eco brass and stainless steel, valve body NC, NO and UN

ISO228/1 connection	Orifice	K_v value	Body material	Function	
				EV220BW	
	[mm]	[m³/h]	Eco brass /Stainless steel	NC	NO
G½	15	4	Eco brass	132U1500	132U1501
			Stainless steel	132U1580	132U1581
G¾	20	8	Eco brass	132U2000	132U2001
			Stainless steel	132U2080	132U2081
G1	25	11	Eco brass	132U2500	132U2501
			Stainless steel	132U2580	132U2581
G1¼	32	18	Eco brass	132U3200	132U3201
			Stainless steel	132U3280	132U3281
G1½	40	24	Eco brass	132U4000	132U4001
			Stainless steel	132U4080	132U4081
G2	50	40	Eco brass	132U5000	132U5001
			Stainless steel	132U5080	132U5081

(1) UN latching control need a special controller to pole switch + and –. Can only use DC (Direct current) coils. Function UN, latching

Accessories code numbers

Coil

BB High performance coils

Table: BB High performance coils

Type	$T_{ambient}$	Supply voltage	Voltage variation	Frequency	Control	Power consumption		Code number
	[°C]	[V]		[Hz]		[W]	[VA]	
BB024AS	-40 – 80	24	-15%, +10%	50	NO, NC	11	19	018F7358
BB230AS	-40 – 80	220 – 230	-15%, +10%	50	NO, NC	11	19	018F7351
BB012DS	-40 – 50	12	±10%	DC	NC, NO	13	–	018F7396
BB024DS	-40 – 50	24	±10%	DC	NC, NO	16	–	018F7397

EEC and coil controller

Table: Technical data

Type	$T_{ambient}$	Supply voltage	Voltage variation	Frequency	Control	Power consumption	Code number
	[°C]	[V]		[Hz]		[W]	
BE240CS	-25 – 55	208 – 240	±10%	60	NC, NO	4	018F6783
		208 – 240	±10%	50	NC, NO	4	

Cable plug

Table: Cable plug

Cable plug size	Description	Code number
DIN 18	Cable plug IP67	042N1256

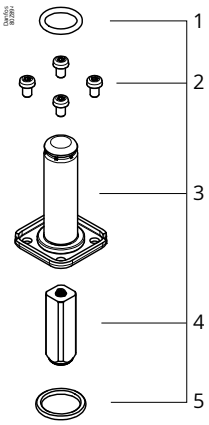
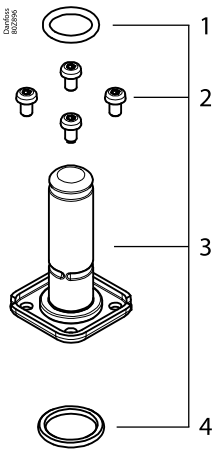
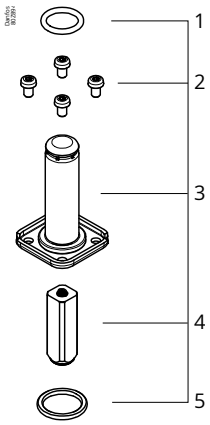
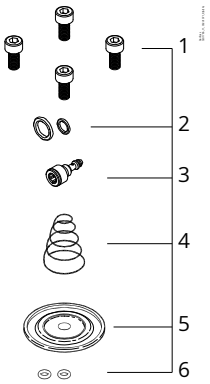
Universal electronic multi-timer, Type ET 20 M

Table: Type ET 20 M

Type	Voltage	Suitable for coil types	Code number
	[V]		
BA024A	24 – 240	AL, AM, AS, AZ, BA, BD, BB	042N0185

Spare parts code numbers

Table: Spare part kit DN15-50 in EPDM and stainless steel

Type	Actuator kit NC for EV220BW	Actuator kit NO for EV220BW	Actuator kit UN for EV220BW	Diaphragm kit for EV220BW
EV220BW DN 15	132U8080	132U8081	132U8082	132U8016
EV220BW DN 20	132U8080	132U8081	132U8082	132U8021
EV220BW DN 25	132U8080	132U8081	132U8082	132U8026
EV220BW DN 32	132U8080	132U8081	132U8082	132U8033
EV220BW DN 40	132U8080	132U8081	132U8082	132U8041
EV220BW DN 50	132U8080	132U8081	132U8082	132U8051
				
	1. O-ring 2. 4 x Screws 3. Armature tube 4. Armature with spring 5. O-ring	1. O-ring 2. 4 x Screws 3. NO unit 4. O-ring	1. O-ring 2. 4 x Screws 3. Armature tube 4. Armature with spring 5. O-ring	1. 4 x Screws 2. 2 x O-rings 3. Equalizing orifice 4. Closing spring 5. Diaphragm 6. 2 x O-ring

Overview

Product portfolio

Table: Portfolio overview

Features	EV220BW NC/NO	EV220BW NC/NO
		
Body material	Eco brass	Stainless steel
DN [mm]	15 – 50	15 – 50
Connection	G½" – G2"	G½" – G2"
Sealing material	EPDM	EPDM
Function	NC/NO	NC/NO
K_v [m^3/h]	4 – 40	4 – 40
Differential pressure range [bar]	0.3 – 10	0.3 – 10
Temperature range [°C]	-30 – 90	-30 – 90

(1) UN latching control need a special controller to pole switch + and –. Can only use DC (Direct current) coils. UN, latching valves are only using power max. 1 to 2 sec. at each operation, open or close. See page 2.3 Function UN, latching, see *Function UN, latching*.

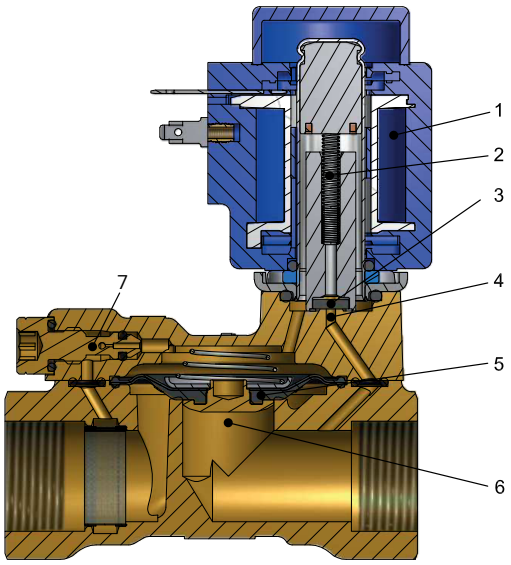
Functions

Function, NC

Coil voltage disconnected (closed)
When the voltage is disconnected, the valve plate (3) is pressed down against the pilot orifice (4) by the armature spring (2). The pressure across the diaphragm (5) is built up via the equalizing orifice (7). The diaphragm closes the main orifice (6) 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 (1), the pilot orifice (4) is opened. As the pilot orifice is larger than the equalizing orifice (7), the pressure across the diaphragm (5) drops and therefore it is lifted clear of the main orifice (6). 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.

Figure: Function, NC



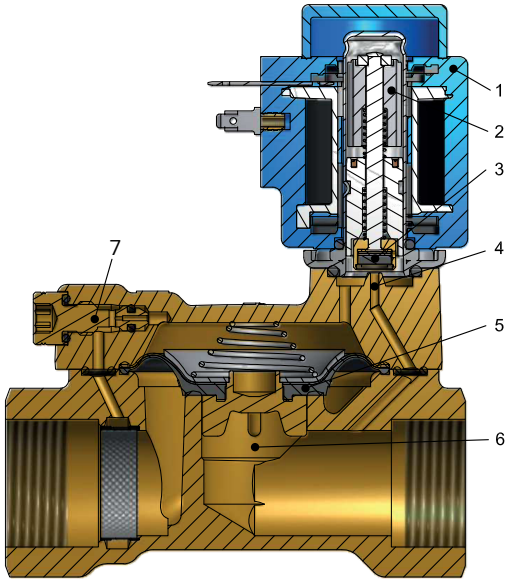
1.	Coil
2.	Armature spring
3.	Valve plate
4.	Pilot orifice
5.	Diaphragm
6.	Main orifice
7.	Equalizing orifice

Function, NO

Coil voltage disconnected (open)
When the voltage to the coil (1) is disconnected, the pilot orifice (4) is open. As the pilot orifice is larger than the equalizing orifice (7), the pressure across the diaphragm (5) drops and therefore it is lifted clear of the main orifice (6). 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 (4). The pressure across the diaphragm (5) is built up via the equalizing orifice (7). The diaphragm closes the main orifice (6) 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

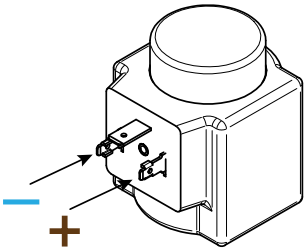


1.	Coil
2.	Armature
3.	Valve plate
4.	Pilot orifice
5.	Diaphragm
6.	Main orifice
7.	Equalizing orifice

Function UN, latching

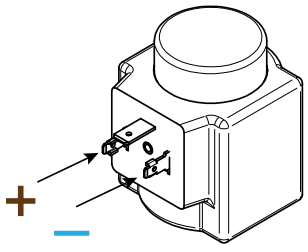
UN, latching valves are only using power max. 1 to 2 sec. at each operation, open or close.

Figure: Open



When – (minus) is supplied to the left terminal pin and + (plus) to the right (see figure 3), the pilot orifice (4) is opened. As the pilot orifice is larger than the equalizing orifice (7), the pressure across the diaphragm (5) drops and therefore it is lifted clear of the main orifice (6). The UN latching function means voltage – (minus) and + (plus) should only be supplied for max 1 to 2 sec. The permanent magnet (8) will hold the armature in open position. The valve is now open for flow and stay open as long as the minimum differential pressure across the valve is maintained. At high, low or no flow / differential pressure the latching actuator will stay open without energy consumption.

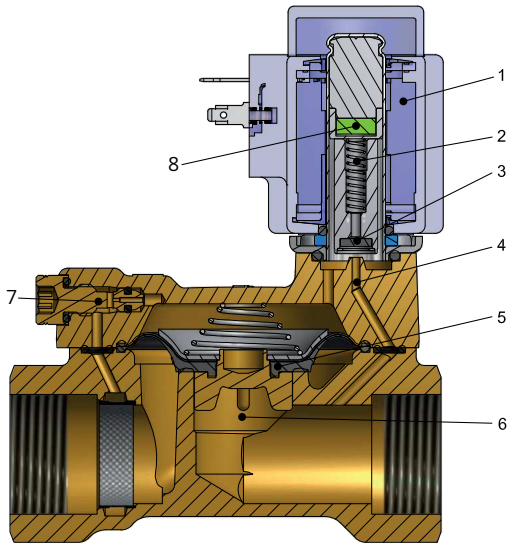
Figure: Close



Switching poles

When + (plus) is supplied to the left terminal pin and – (minus) to the right (see figure 4), the force of the permanent magnet is nullified by the coil's magnetic field, and the valve plate is pressed down. The pressure across the diaphragm (5) is built up via the equalizing orifice (7). The diaphragm closes the main orifice (6) as soon as the pressure across the diaphragm is equivalent to the inlet pressure (Plus) and – (minus) should also, as for the opening be supplied for max. 1 to 2 sec. The valve will stay closed, until the poles are switched (see Figure: Open).

Figure: Function UN, latching



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

Product details

General data

Table: Technical data

Media	EPDM	Drinking water
Media temperature	EV220BW EPDM	-30 – 90 °C
Ambient temperature	BB DC	Up 50 °C
	BB AC	Up 80 °C
	EEC BE240CS	Up 55 °C
K_v value	DN15	4 m^3/h
	DN20	8 m^3/h
	DN25	11 m^3/h
	DN32	18 m^3/h
	DN40	24 m^3/h
	DN50	40 m^3/h
Min. Opening differential pressure	0.3 bar	
Max. Opening differential pressure	10 bar	
Max. working pressure	10 bar	
Max. test pressure	15 bar	
Viscosity	Max. 50 cSt	

Materials

Table: Materials

Components	Materials	Specifications
Valve body/cover	Eco brass	CW724R
	Stainless steel	W. no. 1.4404 / AISI 316L
Equalizing orifice	Eco brass	CW724R
	Stainless steel	W. no. 1.4404 / AISI 316L
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	
Valve plate	EPDM	
Diaphragm	EPDM	

Capacity

Example, water: Capacity for EV220BW 15B at differential pressure of 3 bar: approx. 7 m^3/h

Figure: Capacity diagram

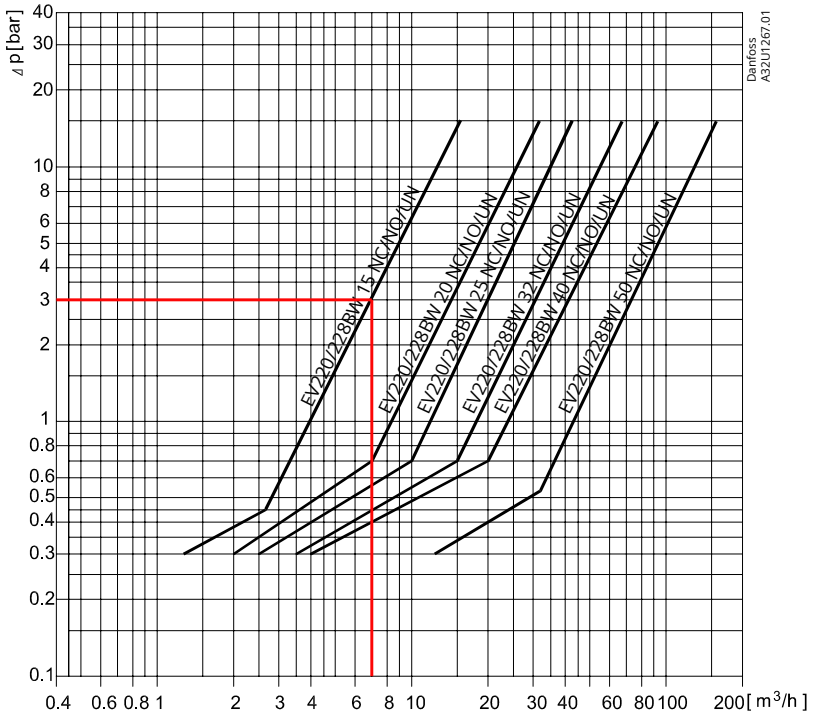


Table: Time to open/close

Main type	EV220BW 15	EV220BW 20	EV220BW 25	EV220BW 32	EV220BW 40	EV220BW 50
Time to open [ms] (1)	40	40	300	1000	1500	5000
Time to close [ms] (1)	350	1000	1000	2500	4000	10000

(1) The times are indicative and apply to water. The exact times will depend on the pressure conditions. Closing times can be changed by replacement of the equalizing orifice.

Dimensions

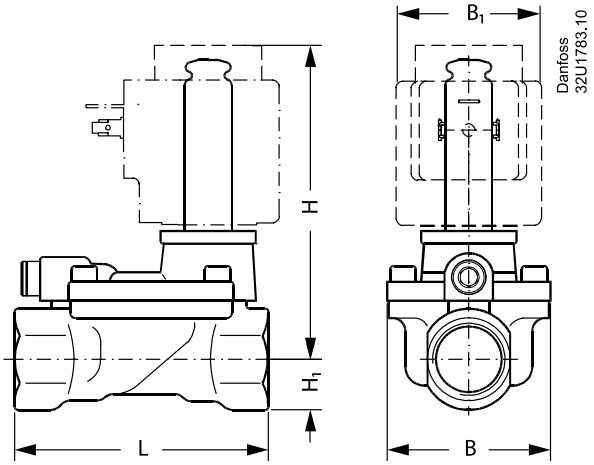
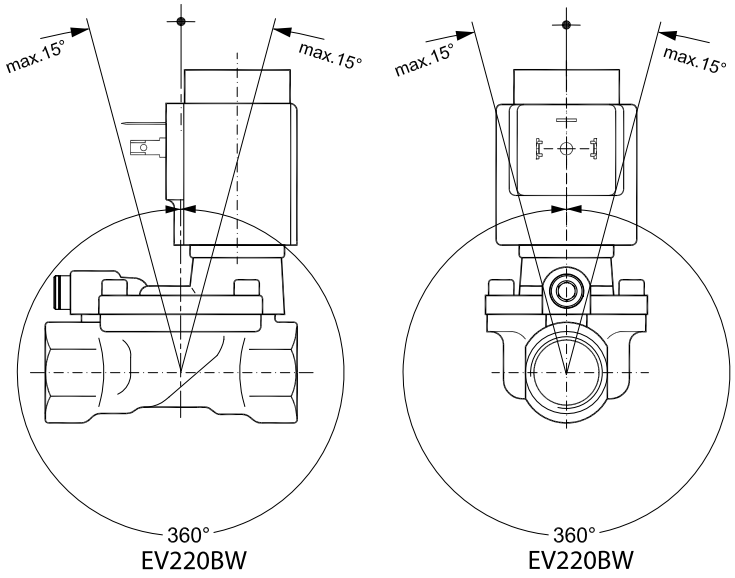


Table: Dimension and weight

Type	L	B	B_1 [mm] / coil type				H	H_1	Weight without coil
	[mm]	[mm]	BA	BB / BE	BG / BO	BP	[mm]	[mm]	[kg]
EV220BW 15	80.0	52.0	32	46	68	45	99	15.0	0.7
EV220BW 20	90.0	58.0	32	46	68	45	103	18.0	0.9
EV220BW 25	109.0	70.0	32	46	68	45	113	22.0	1.3
EV220BW 32	120.0	82.0	32	46	68	45	120	27.0	2.0
EV220BW 40	130.0	95.0	32	46	68	45	129	32.0	3.0
EV220BW 50	162.0	113.0	32	46	68	45	135	37.0	4.8

Installation

Figure: Mounting angle



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The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
Hygienic Certificate	PZH B-BK-60110-1266/2023	PZH - National Institute of Hygiene	Drinking Water
Hygienic Certificate	Drinking water safety permit, Danfoss A/S., solenoid valve family No: 50326-6/2023/KTEF	NNGYK - National Public Health & Pharmaceutical Center, Hungary	Drinking Water
Manufacturer's Declaration	Danfoss MD 033F0232.AA	Danfoss	Pressure, PED
Hygienic Certificate	CARSO 24 ACC LY 130	CARSO - Laboratoire Santé Environnement Hygiène de Lyon	Drinking Water
Hygienic Certificate	RISE SC0155-18	RISE - Research Institute of Sweden AB	Drinking Water
Hygienic Certificate	SINTEF 3468	SINTEF - SINTEF Byggforsk	Drinking Water
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
EU Declaration	Danfoss EU 033F0682.AA	Danfoss	LVD, Pressure, PED, EU RoHS
Mechanical Safety Certificate	UL MH7648	UL - Underwriters Laboratories inc.	
Manufacturer's Declaration	Danfoss MD 033F1135.00	Danfoss	Drinking Water
Pressure Safety Certificate	LLC CDC EURO-TYSK UA.TR.089.1015.02-22	LLC CDC EURO TYSK - Ukraine	Pressure, PED
Hygienic Certificate	WRAS 2204055	WRAS - Water Regulations Advisory Scheme	Drinking Water
UK Declaration	Danfoss UK 033F1143.AB	Danfoss	Pressure, EMC, PED, UK RoHS
Manufacturer's Declaration	Danfoss MD 033F1140.01	Danfoss	EU RoHS
Hygienic Certificate	WRAS 2303017	WRAS - Water Regulations Advisory Scheme	Drinking Water
Hygienic Certificate	WRAS 2205026	WRAS - Water Regulations Advisory Scheme	Drinking Water
Hygienic Certificate	WRAS 2305064	WRAS - Water Regulations Advisory Scheme	Drinking Water

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