Data sheet



Solenoid valve

EV221BW

Direct servo operated for drinking water

Description

EV221BW 10, 14, 20 and 22 is a direct servo operated 2/2-way solenoid valve. This valve type is designed with EPDM seal, lead free dezincification resistant eco brass for drinking water applications.

- For water supply
- Houses and large apartments
- Kitchens and bathrooms
- Commercial buildings
- Industrial buildings
- Zoning
- Laundry
- Dishwashing
- Main intel valve
- Dosing machines
- Food processing

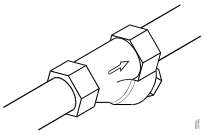
Features & benefits

- For drinking water
- Clip on coil
- Coil enclosure: up to IP67
- Water hammer damped
- Body material in eco brass (lead free <0.1%) and dizincification resistant
- New generation EPDM sealings recommended for drinking water

Applications

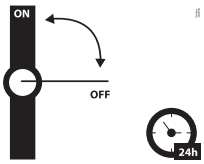
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

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



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

Table: Eco brass, valve body NC and NO

ISO228/1 connection	Orifice	K_v value	Seal material	Function (Eco brass)	
	[mm]	[m^3/h]		NC	NO
G⅜	10	1.5	EPDM	132U1000	132U1001
G½	10	1.5	EPDM	132U1002	132U1003
	14	2.5	EPDM	132U1300	132U1301
G¾	20	6.0	EPDM	132U2002	132U2003
G1	22	6.0	EPDM	132U2200	132U2201

Accessories code numbers

Coils

Figure: BB, clip on



Table: BB, clip on

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	NC/NO	11	19	018F7358
BB230AS	-40 – 80	220 – 230	-15%, +10%	50	NC/NO	11	19	018F7351
BB012DS	-40 – 50	12	±10%	DC	NC/NO	13	–	018F7396
BB024DS	-40 – 50	24	±10%	DC	NC/NO	16	–	018F7397

EEC controller and coil unit

Figure: EEC Electronic coil controller



Table: EEC Electronic coil controller

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	

Figure: Cable plug



Table: Cable plug

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

Spare parts code numbers



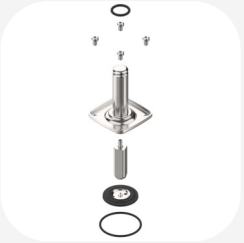
132U8023

Spare part, EV221BW 20/22BE NO, Diaphragm, actuator set

Product Type: Spare part, Used for product: EV221BW 20/22BE NO, Type designation: Diaphragm, actuator set, Service kit, Function: NO

Related products

132U2003 132U200531 132U200601 132U2201



132U8010

Spare part, EV221BW 10/12BE NC, Diaphragm, actuator set

Product Type: Spare part, Used for product: EV221BW 10/12BE NC, Type designation: Diaphragm, actuator set, Service kit, Function: NC

Related products

132U1000 132U1002



132U8011

Spare part, EV221BW 10/12BE NO, Diaphragm, actuator set

Product Type: Spare part, Used for product: EV221BW 10/12BE NO, Type designation: Diaphragm, actuator set, Service kit, Function: NO

Related products

132U1001 132U1003 132U100431 132U100501



132U8022

Spare part, EV221BW 20/22BE NC, Diaphragm, actuator set

Product Type: Spare part, Used for product: EV221BW 20/22BE NC, Type designation: Diaphragm, actuator set, Service kit, Function: NC

Related products

132U2002 132U2200



132U8014

Spare part, EV221BW 14BE NC, Diaphragm, actuator set

Product Type: Spare part, Used for product: EV221BW 14BE NC, Type designation: Diaphragm, actuator set, Service kit, Function: NC

Related products

132U1300



132U8013

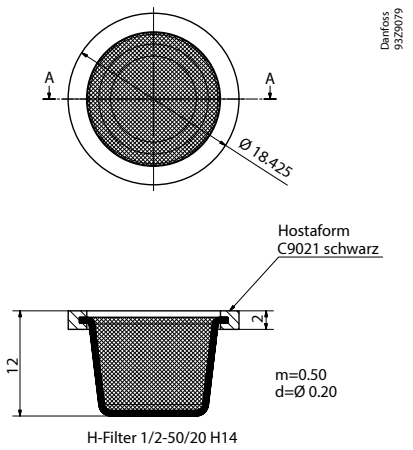
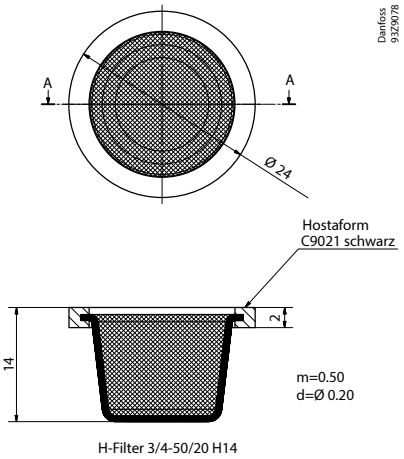
Spare part, EV221BW 14BE NO, Diaphragm, actuator set

Product Type: Spare part, Used for product: EV221BW 14BE NO, Type designation: Diaphragm, actuator set, Service kit, Function: NO

Related products

132U1301

Table: Filters for G½ and G¾ (NC+NO)

Type	G½	G¾
EV221BW DN 12 G½	132U8015	
EV221BW DN 18 G¾		132U8020
		

Overview

Product portfolio

Table: Portfolio overview

Features	EV221BW	EV221BW
		
Body material	Eco brass	Eco brass
DN [mm]	10 – 22	10 – 22
Connection [in]	G⅜ – G1	G⅜ – G1
Sealing material	EPDM	EPDM
Function	NC	NO
K_v [m^3/h]	1.5 – 6.0	1.5 – 6.0
Differential pressure range [bar]	0.1 – 10	0.1 – 10
Temperature range [°C]	-30 – 90	-30 – 90

Functions

Function NC

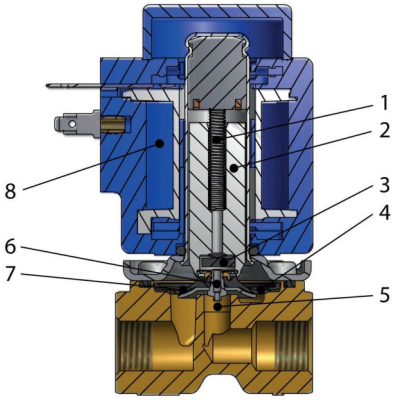
Coil voltage disconnected (closed)

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

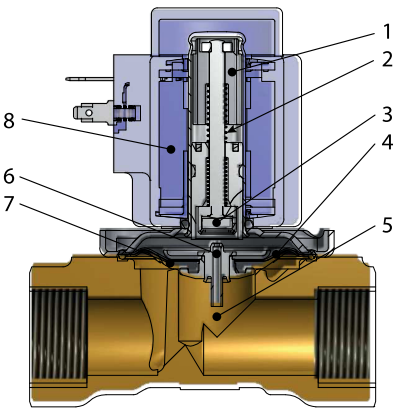
Coil voltage disconnected (closed)

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 (open)

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

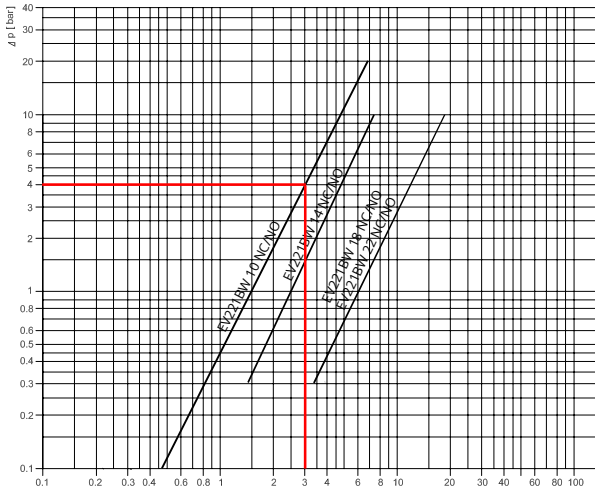
Media	EPDM	Drinking water
Media temperature [°C]	EPDM	-30 – 90
Ambient temperature [°C]	Up to 50	
K_v value [m^3/h]	DN10	1.5
	DN14	2.5
	DN20	6.0
	DN22	6.0
Min. opening differential pressure [bar]	DN10	0.1
	DN14-22	0.3
Max. opening differential pressure [bar]	10	
Max. working pressure [bar]	10	
Max. test pressure [bar]	15	
Viscosity [cSt]	Max. 50	

Materials

Components	Materials	Specifications
Valve body	Eco brass	CW724R
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	
Valve plate	EPDM	
Diaphragm	EPDM	

Capacity

Figure: Capacity diagram



Example, water: EV221BW 10NC at 4 bar diff. pressure. Approx: 3 m^3/h

Table: Time to open/close

Type	EV221BW 10	EV221BW 14	EV221BW 20	EV221BW 22
Time to open [ms](1)	50	60	200	200
Time to close [ms](1)	300	300	500	500

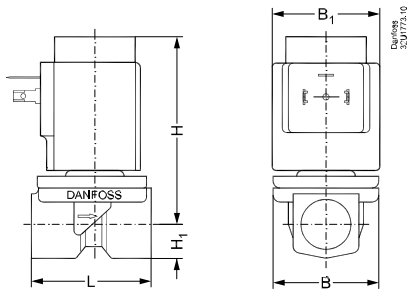
(1) The times are indicative and apply to water. The exact times will depend on the pressure conditions.

Dimensions

Table: Eco brass NC and NO

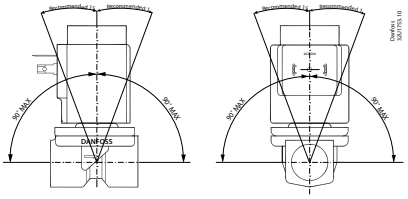
Type	Weight gross valve body without coil	L	B	B_1		H	H_1
	[kg]	[mm]	[mm]	BB / BE	BG	[mm]	[mm]
EV221BW 10	0.29	51	48.0	46	68	81	13
EV221BW 14	0.5	81	54.0	46	68	81	15
EV221BW 20	0.65	90.0	60.0	46	68	87	18
EV221BW 22	0.9	90.0	60.0	46	68	91	22

Figure: Dimension



Installation

Figure: Mounting angle



Certificates, declarations and approvals

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	CARSO 24 ACC LY 130	CARSO - Laboratoire Santé Environnement Hygiène de Lyon	Drinking Water
Hygienic Certificate	WRAS - 2205077	WRAS - Water Regulations Advisory Scheme	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 – 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.	
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	PED, Pressure
Hygienic Certificate	PZH B-BK-60110-1266/2023	PZH - National Institute of Hygiene	Drinking Water
Hygienic Certificate	WRAS 2205078	WRAS - Water Regulations Advisory Scheme	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	PED, Pressure

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