

Data sheet

# Direct servo-operated solenoid valves for drinking water

## Type EV221BW



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 and versions:**

- For drinking water.
- Clip on coil
- Flow range Kv 1,5 – 6 m<sup>3</sup>/h
- Differential pressure 0,1 - 10 bar
- Media temperature range 0 – 90 °C
- Ambient temperature: Up to 80 °C
- Coil enclosure: Up to IP65
- Thread connections: G 3/8, G 1/2, G 3/4 & G 1
- DN 10, 14, 20, 22
- Viscosity: Up to 50 cSt
- Water hammer damped
- Body material in ECO Brass (lead free <0,1%) and dezincification resistant
- New generation EPDM sealings recommended for drinking water.
- ECO Brass NC/NO
- NC EV221BW ECO Brass 10, 14, 20 & 22
- NO EV221BW ECO Brass 10, 14 & 22

## Directives, approvals and certificates

### General

In accordance with

- Low Voltage Directive 2014/35/EU
  - EN60730-1: 2011
  - EN60730-2-8: 2002
- Pressure Equipment Directive 2014/68/EU
- RoHS Directive 2011/65/EU
  - Including amendment 2015/863/EU

### Drinking water approvals



- Valves are certified by RISE, notified body 1002. Valid in Denmark and Sweden. In accordance with Boverket Building Regulations (BBR 21, 2014-06-17) Certificate number SCO155-18



- Valves are certified by SINTEF. Valid in Norway. In accordance with NKB Product rules nr. 13, pkt. 3.2 – 3.6  
-NT VVS 100, pkt. 6.4.2 & 6.4.8  
-EN ISO 6509



- Inspection by DTI



- Valves are certified by Carso according to ACS guidelines, Circulaire 2002/571.



- Hygienic certificate B-BK-60210-1275/19. Issued by Polish National Institute of Public health (PZH).
- Wetted materials in accordance with 4MS (4 member states Germany, Holland, France and UK), DVGW, KTW and W270.

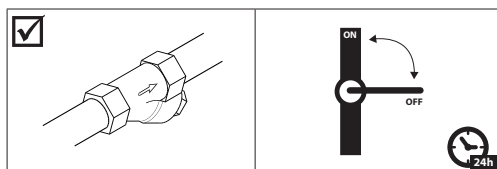
**EV221BW**  
**ECO brass valve body, NC**



Connection ISO 228/1	Seal material	Orifice size	K <sub>v</sub> - value [m³/h]	Media temperature min. to max. [°C]	Differential pressure min. to max. [bar] /coil type		Code number
					BB AC, BY, BE AC, BG AC/DC, BZ, BO	BB, BE, BO DC	
G 3/8	EPDM	10	1.5	0 – 90	0.1 – 10	0.1 – 10	132U1000
G 1/2	EPDM	10	1.5	0 – 90	0.1 – 10	0.1 – 10	132U1002
G 1/2	EPDM	14	2.5	0 – 90	0.3 – 10	–	132U1300
G 3/4	EPDM	20	6.0	0 – 90	0.3 – 10	–	132U2002
G 1	EPDM	22	6.0	0 – 90	0.3 – 10	–	132U2200

1) It is recommended to use a filter in front of the valve.

2) 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



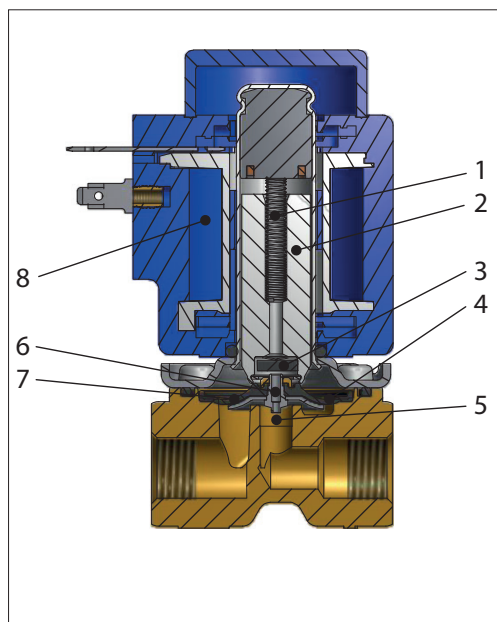
**Technical data,**  
**NC**

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

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

Installation	Vertical solenoid system is recommended.		
Max. working pressure	NC	DN 10 DN 14, 20, 22	0,1 - 10 bar 0,3 - 10 bar
Max. test pressure	EV221BW	15 bar	
Ambient temperature	BB, BY, BE, BG, BZ, BO AC/DC	Up to 50 °C	
Viscosity	Max. 50 cSt		
Materials	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	

## Function, NC



Pos. no.	Description
1	Armature spring
2	Armature
3	Valve plate
4	Equalizing orifice
5	Main orifice
6	Pilot orifice
7	Diaphragm
8	Coil

### 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.

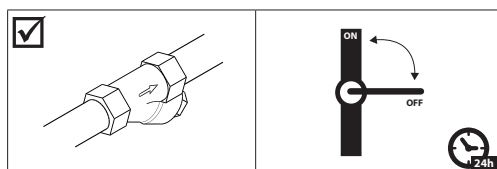
**EV221BW**  
ECO brass valve body, NO



Connection ISO 228/1	Seal material	Orifice size	K <sub>v</sub> - value [m <sup>3</sup> /h]	Media temperature min. to max. [°C]	Differential pressure min. to max. [bar] /coil type		Code number
					BB AC, BY, BE AC, BG AC/DC, BZ, BO	BB, BE, BO DC	
G 3/8	EPDM	10	1.5	0 – 90	0.1 – 10	0.1 – 10	132U1001
G 1/2	EPDM	10	1.5	0 – 90	0.1 – 10	0.1 – 10	132U1003
G 1/2	EPDM	14	2.5	0 – 90	0.3 – 10	–	132U1301
G 3/4	EPDM	20	6.0	0 – 90	0.3 – 10	–	132U2003
G 1	EPDM	22	6.0	0 – 90	0.1 – 10	–	132U2201

1) It is recommended to use a filter in front of the valve.

2) 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



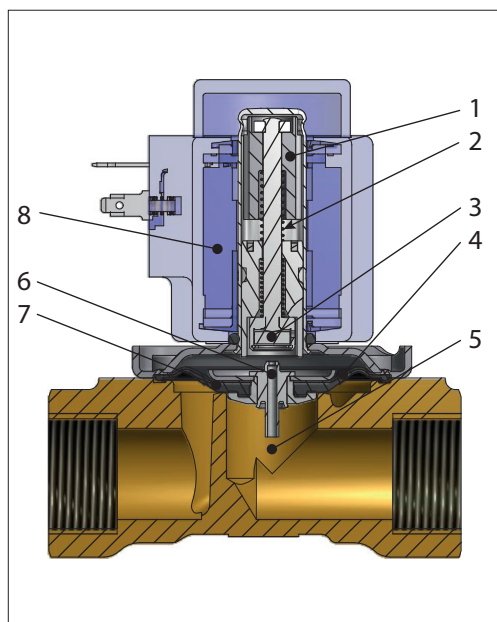
**Technical data,**  
**NO**

Type	EV221BW 10	EV221BW 14	EV221BW 20
Time to open [ms] <sup>1)</sup>	50	60	200
Time to close [ms] <sup>1)</sup>	300	300	500

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

Installation	Vertical solenoid system is recommended.		
Max. working pressure	NO	DN 10 DN 14-20	0.1 - 10 bar 0.3 - 10 bar
Max. test pressure	EV221BW	15 bar	
Ambient temperature	BB, BY, BE, BG, BZ, BO AC/DC	Up to 50 °C	
Viscosity	Max. 50 cSt		
Materials	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	

## Function, NO



Pos. no.	Description
1	Armature
2	Opening spring
3	Valve plate
4	Equalizing orifice
5	Main orifice
6	Pilot orifice
7	Diaphragm
8	Coil

### Coil voltage disconnected (closed):

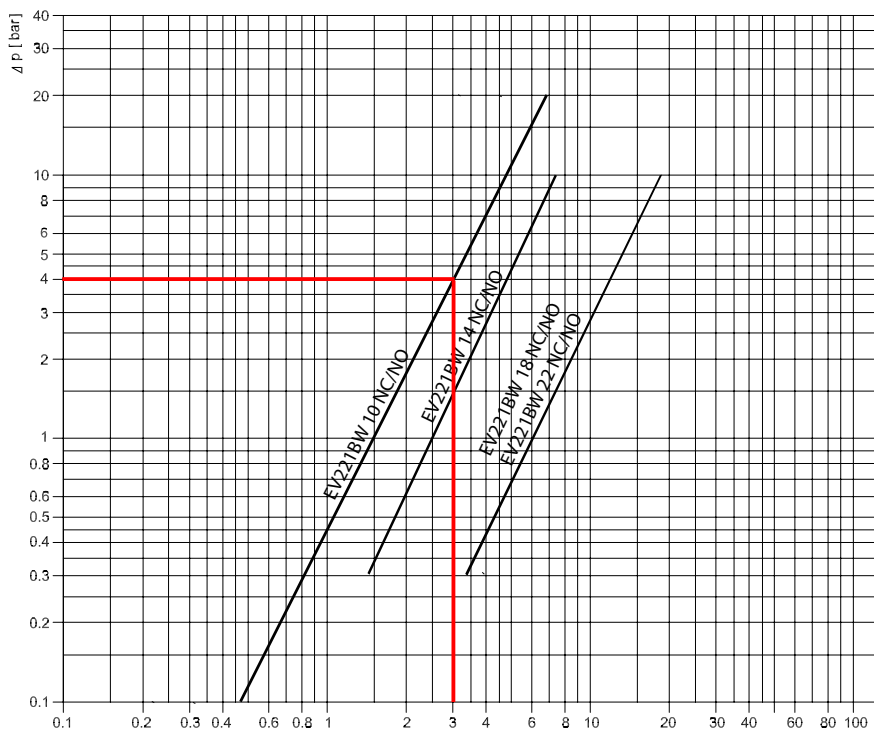
When the voltage to the coil (8) is disconnected, the pilot orifice (6) is open. As the pilot orifice is larger than the equalizing orifice (4), the pressure across the diaphragm (7) drops and therefore it is lifted clear of the main orifice (5). The valve will be open for as long as the minimum differential pressure across the valve is maintained, and for as long as the voltage to the coil is disconnected.

### Coil voltage connected (open):

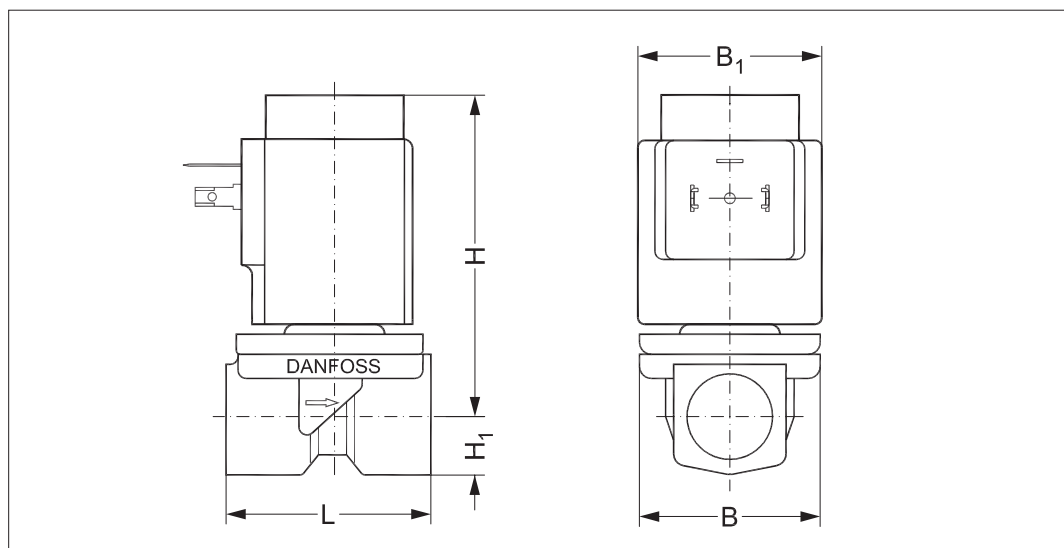
When voltage is applied to the coil, the valve plate (3) is pressed down against the pilot orifice (6). The pressure across the diaphragm (7) is built up via the equalizing orifice (4). The diaphragm closes the main orifice (5) as soon as the pressure across the diaphragm is equivalent to the inlet pressure. The valve will be closed for as long as there is voltage to the coil.

## Capacity diagram:

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



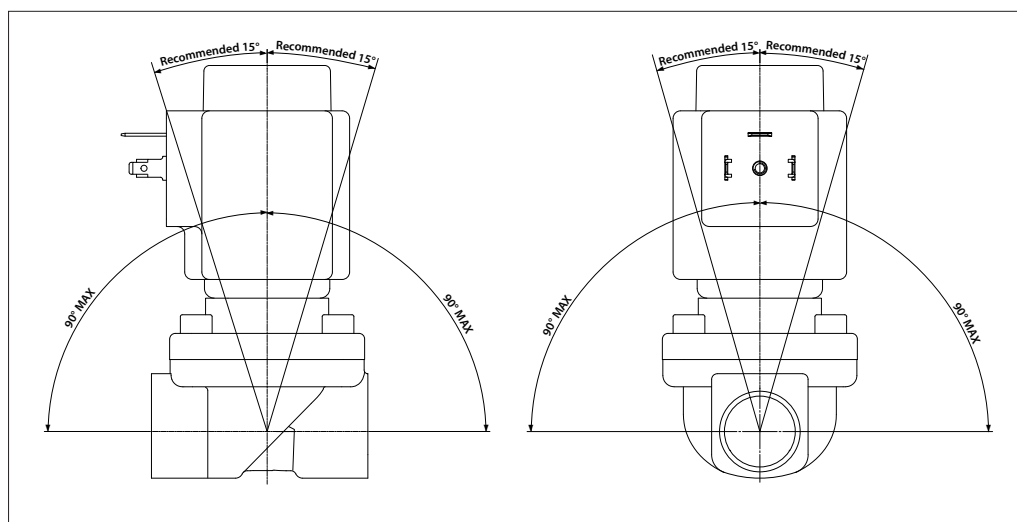
## Dimensions



## Dimension and weight: ECO brass NC and NO

Type	Weight gross valve body without coil [kg]	L [mm]	B [mm]	B1 [mm] / Coil type		H [mm]	H <sub>1</sub> [mm]
				BB / BE	BG		
EV221BW 10	0.29	51.5	48.0	46	68	81	13
EV221BW 14	0.35	58.0	54.0	46	68	81	13
EV221BW 20	0.65	90.0	60.0	46	68	87	22
EV221BW 22	0.65	90.0	60.0	46	68	91	22

## Mounting angle



**BB, clip on**



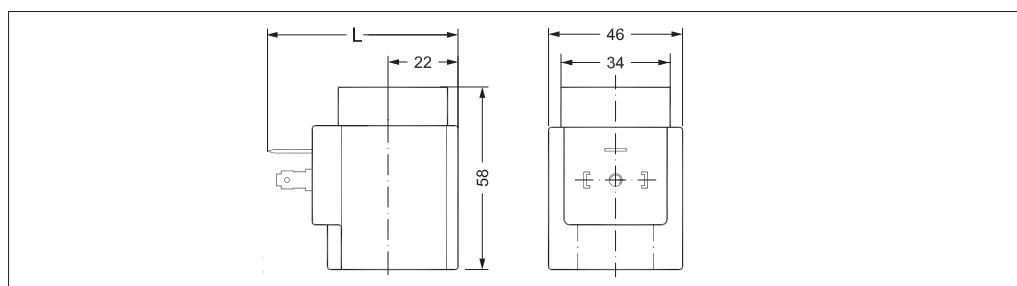
- Enclosure:
  - IP00 version with DIN 43650 A spade connectors
  - IP20 version with protective cap
  - IP65 version with mounted cable plug
- In accordance with:
  - RoHS Directive 2011/65/EU
  - Low Voltage Directive 2014/35/EU
    - EN60730-1
    - EN60730-2-8

Type	Tambient	Supply voltage	Voltage variation	Frequency	Control	Power consumption		Code no.
	[°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

**Technical data**

Design	In accordance with VDE 0580
Insulation of coil windings	Class H according to IEC 85
Connection	Spade connector in accordance with DIN 43650 form A
Enclosure, IEC 529	IP00 with spade connector, IP20 with protective cap, IP65 with cable plug
Duty rating	Continuous
Plug type	Cable plug (042N0156)

**Dimensions and weight**



L without cable plug	L with protective cap	L with cable plug	Weight
[mm]	[mm]	[mm]	[kg]
62	77	85	0.24

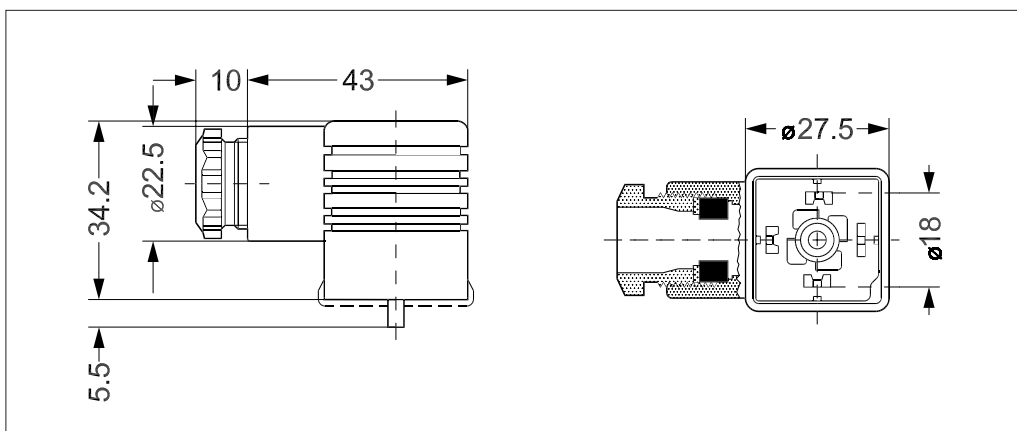


**Data sheet | Solenoid valves, type EV221BW**

**Accessories:  
Cable plug**



Type, Form A	Code no.
GDM 2011 (grey) cable plug according to DIN 43650-A PG11	042N0156



**EEC controller and coil unit**



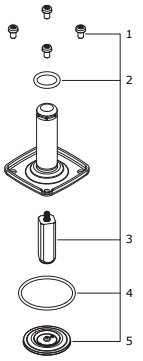
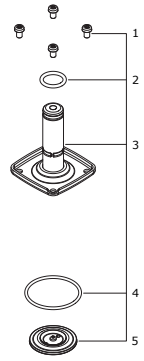
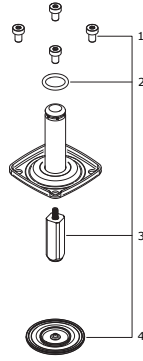
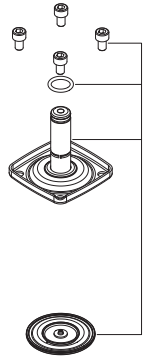
EEC controller and coil unit for solenoid valves type EV221BW.

The EEC gives the coil a short over-boost, and controls the armature speed:

- Complete unit in one code no
- Low power consumption (holding power: 4 W)
- Reduced noise during operation
- Increased MOPD compared to standard coils
- Increased lifetime of the solenoid valve
- Enclosure:
  - IP67 version
- In accordance with:
  - Low Voltage Directive 2014/35/EU
  - EN60730-1

Type	Tambient	Supply voltage	Voltage variation	Frequency	Control	Power consumption	Code no.
	[°C]	[V]		[Hz]		[W]	
BE240CS	-25 – 55	208 - 240	±10%	60	NC, NO	4	018F6783
		208 - 240	±10%	50	NC, NO	4	

**Spare part kits  
DN 15 to DN50**

Type	Actuator kit NC	Actuator kit NO	Actuator kit NC	Actuator kit NO
EV221BW DN 10 G 3/8	132U8010	132U8011	–	–
EV221BW DN 10 G 1/2	132U8010	132U8011	–	–
EV221BW DN 14 G 1/2	–	–	132U8014	132U8013
EV <sup>221</sup> BW DN 20 G 3/4	–	–	132U8022	132U8023
EV221BW DN 22 G 1	–	–	132U8022	132U8023
				
	1. 4x Screw 2. O-ring Coil 3. Armature + Spring 4. O-ring 5. Diaphragm	1. 4x Screw 2. O-ring Coil 3. NO unit 4. O-ring 5. Diaphragm	1. 4x Screw 2. O-ring 3. Armature + Spring 4. Diaphragm	1. 4x Screw 2. O-ring 3. NO unit 4. Diaphragm