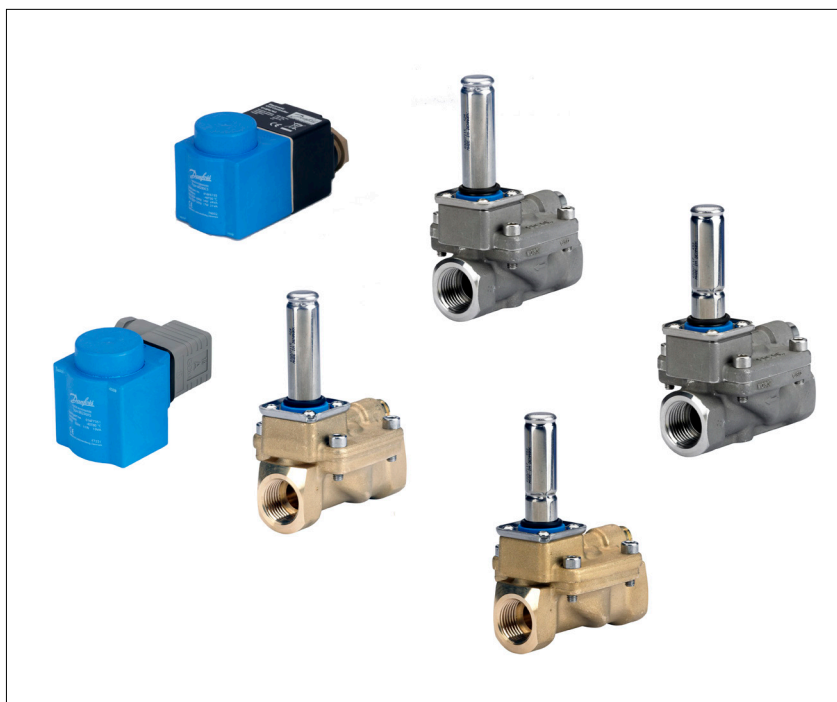


Data sheet

Solenoid valves for drinking water Types EV220BW and EV228BW



Solenoid valve range with drinking water approvals

- For water supply
- Houses and large apartments
 - Kitchen and bathrooms
- Commercial buildings
- Industrial buildings
- Zoning
- Laundry
- Diswashing
- Main inlet valves
- Machines and food processing

Features and versions

- Clip-on coil
- Flow range for water in Kv: 4 – 40 m³ / h
- Differential pressure: 0.3 – 10 bar
- Media temperature from 0 – 90 °C
- Ambient temperature: Up to 70 °C
- Coil enclosure: IP65
- Thread connections: From G 1/2 – G 2
- DN 15 – 50
- 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
- EV220BW 15-25 ECO brass NC/NO
- EV220BW 15-50 SS NC/NO
- EV228BW 15-25 ECO brass UN (Latching)
- EV228BW 15-50 SS UN (Latching)

Directives, approvals and certificates

General

- In accordance with
- Low Voltage Directive 2014/35/EU
 - EN60730-1
 - EN60730-2-8
 - Pressure Equipment Directive 2014/68/EU
 - RoHS Directive 2011/65/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.

EV220BW 15-25
ECO brass valve body, NC

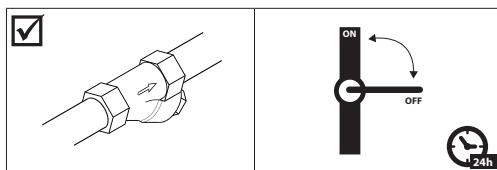


ISO228/1 connection	Seal material	Orifice size	K _v - value	Media temperature	Differential pressure	Code no.
		[mm]	[m ³ / h]	[°C]	[Bar]	
G ½	EPDM	15	4	0 – 90	0.3 – 10	132U1500
G ¾	EPDM	20	8	0 – 90	0.3 – 10	132U2000
G 1	EPDM	25	11	0 – 90	0.3 – 10	132U2500

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

Main Type	EV220BW 15 BE	EV220BW 20 BE	EV220BW 25 BE
Time to open [ms] ¹⁾	40	40	300
Time to close [ms] ¹⁾	350	1000	1000

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.

Installation	Optional, but vertical solenoid system is recommended		
Max. working pressure (MWP)	10 bar		
Max. test pressure	15 bar		
Ambient temperature	BB DC	Up to 50 °C	
	BB AC	Up to 70 °C	
	EEC BE240CS	Up to 55 °C	
Viscosity	Max. 50 cSt		
Materials	Valve body / cover	ECO brass	CW724R
	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
	Equalizing orifice	ECO brass	CW724R
	O-rings	EPDM	
	Valve plate	EPDM	
	Diaphragm	EPDM	

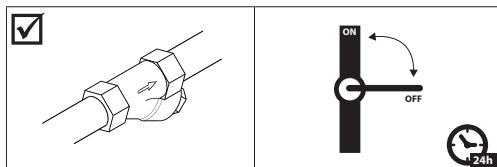
EV220BW 15-50
SS valve body NC



ISO228/1 connection	Seal material	Orifice size	K _v - value	Media temperature	Differential pressure	Code no.
		[mm]	[m ³ / h]	[°C]	[Bar]	
G ½	EPDM	15	4	0 – 90	0,3 – 10	132U1580
G ¾	EPDM	20	8	0 – 90	0,3 – 10	132U2080
G 1	EPDM	25	11	0 – 90	0,3 – 10	132U2580
G1 ¼	EPDM	32	18	0 – 90	0,3 – 10	132U3280
G1 ½	EPDM	40	24	0 – 90	0,3 – 10	132U4080
G 2	EPDM	50	40	0 – 90	0,3 – 10	132U5080

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.



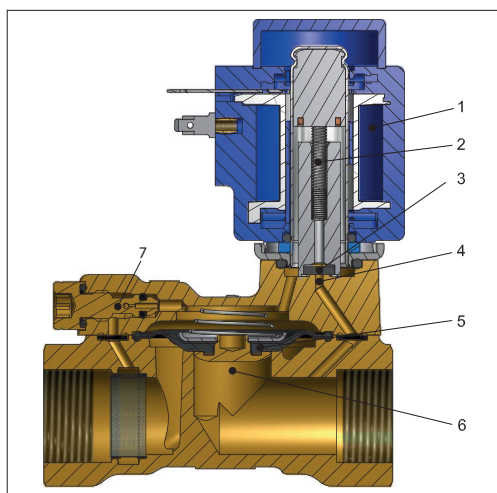
Technical data

Main Type	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW
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.

Installation	Optional, but vertical solenoid system is recommended		
Max. working pressure (MWP)	10 bar		
Max. test pressure	15 bar		
Ambient temperature	BB DC	Up to 50 °C	
	BB AC	Up to 70 °C	
	EEC BE240CS	Up to 55° C	
Viscosity	Max. 50 cSt		
Materials	Valve body / cover	Stainless Steel	W. no. 1.4404 / AISI316L
	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
	Equalizing orifice	Stainless steel	W. no. 1.4435 / AISI 316L
	O-rings	EPDM	
	Valve plate	EPDM	
	Diaphragm	EPDM	

Function, NC



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

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.

Data sheet | Solenoid valves for drinking water, Types EV220BW and EV228BW

**EV220BW 15-25
ECO brass valve body NO**

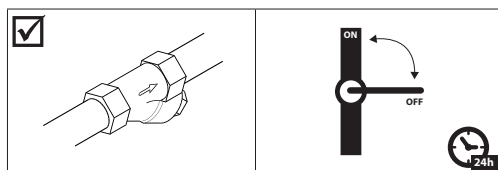


ISO228/1 connection	Seal material	Orifice size	K _v - value	Media temperature	Differential pressure	Code no.
		[mm]	[m ³ /h]	[°C]	[Bar]	
G 1/2	EPDM	15	4	0 – 90	0.3 – 10	132U1501
G 3/4	EPDM	20	8	0 – 90	0.3 – 10	132U2001
G 1	EPDM	25	11	0 – 90	0.3 – 10	132U2501

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

Main Type	EV220BW 15 BE	EV220BW 20 BE	EV220BW 25 BE
Time to open [ms] ¹⁾	40	40	300
Time to close [ms] ¹⁾	350	1000	1000

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.

Installation	Optional, but vertical solenoid system is recommended		
Max. working pressure (MWP)	10 bar		
Max. test pressure	15 bar		
Ambient temperature	BB DC	Up to 50 °C	
	BB AC	Up to 70 °C	
	EEC BE240CS	Up to 55 °C	
Viscosity	Max. 50 cSt		
Materials	Valve body / cover	ECO brass	CW724R
	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
	Equalizing orifice	ECO brass	CW724R
	O-rings	EPDM	
	Valve plate	EPDM	
	Diaphragm	EPDM	

Data sheet | Solenoid valves for drinking water, Types EV220BW and EV228BW

**EV220BW 15-50
SS valve body NO**

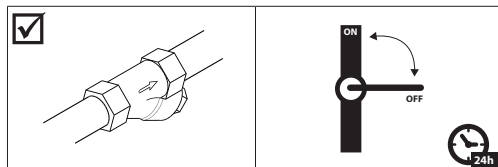


ISO228/1 connection	Seal material	Orifice size	K _v - value	Media temperature	Differential pressure	Code no.
		[mm]	[m ³ /h]	[°C]	[Bar]	
G ½	EPDM	15	4	0 – 90	0,3 – 10	132U1581
G ¾	EPDM	20	8	0 – 90	0,3 – 10	132U2081
G 1	EPDM	25	11	0 – 90	0,3 – 10	132U2581
G1 ¼	EPDM	32	18	0 – 90	0,3 – 10	132U3281
G1 ½	EPDM	40	24	0 – 90	0,3 – 10	132U4081
G 2	EPDM	50	40	0 – 90	0,3 – 10	132U5081

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.



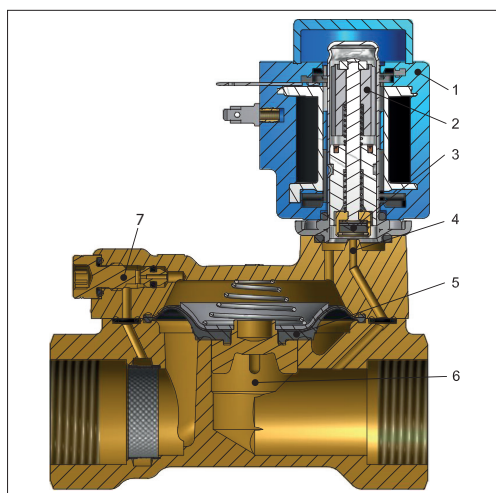
Technical data

Main Type	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW
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.

Installation	Optional, but vertical solenoid system is recommended		
Max. working pressure (MWP)	10 bar		
Max. test pressure	15 bar		
Ambient temperature	BB DC	Up to 50 °C	
	BB AC	Up to 70 °C	
	EEC BE240CS	Up to 55 °C	
Viscosity	Max. 50 cSt		
Materials	Valve body / cover	Stainless steel	W. no. 1.4404 / AISI 316L
	Armature	Stainless steel	W.no. 1.4105 / AISI 430FR
	Armature tube	Stainless steel	W.no. 1.4306 / AISI 304 L
	Armature stop	Stainless steel	W.no. 1.4105 / AISI 430FR
	Springs	Stainless steel	W.no. 1.4310 / AISI 301
	Equalizing orifice	Stainless steel	W. no. 1.4435 AISI 316L
	O-rings	EPDM	
	Valve plate	EPDM	
	Diaphragm	EPDM	

Function, NO



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

Coil voltage disconnected (closed):

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 (open):

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.

Data sheet | Solenoid valves for drinking water, Types EV220BW and EV228BW

EV228BW 15-25
ECO brass valve body UN,
latching

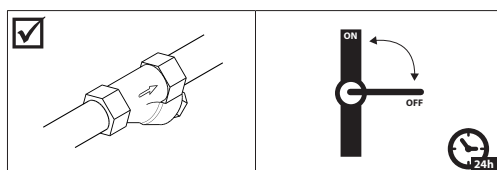


ISO228/1 connection	Seal material	Orifice size	K _v - value	Media temperature	Differential pressure	Code no.
		[mm]	[m ³ / h]	[°C]	[Bar]	
G 1/2	EPDM	15	4	0 – 70	0.3 – 10	132U2400
G 3/4	EPDM	20	8	0 – 70	0.3 – 10	132U2402
G 1	EPDM	25	11	0 – 70	0.3 – 10	132U2404

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

Main Type	EV228BW	EV228B 20B	EV228B 25B
Time to open [ms] ¹⁾	40	40	300
Time to close [ms] ¹⁾	350	1000	1000

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.

Installation	Optional, but vertical solenoid system is recommended		
Max. working pressure (MWP)	10 bar		
Max. test pressure	15 bar		
Ambient temperature	Up to 50 °C		
Viscosity	Max. 50 cSt		
Materials	Valve body / cover	ECO brass	CW724R
	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
	Equalizing orifice	ECO brass	CW724R
	O-rings	EPDM	
	Valve plate	EPDM	
Diaphragm	EPDM		
Switch power (on/off) 018F7396 (12V DC)			

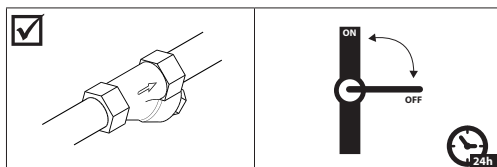
EV228BW 15-50
SS valve body UN, latching



ISO228/1 connection	Seal material	Orifice size	K _v - value	Media temperature	Differential pressure	Code no.
		[mm]	[m ³ / h]	[°C]	[Bar]	
G ½	EPDM	15 – 50	4	0 – 70	0.3 – 10	132U2401
G ¾	EPDM	20 – 50	8	0 – 70	0.3 – 10	132U2403
G 1	EPDM	25 – 50	11	0 – 70	0.3 – 10	132U2405
G1 ¼	EPDM	32 – 50	18	0 – 70	0.3 – 10	132U2407
G1 ½	EPDM	40 – 50	24	0 – 70	0.3 – 10	132U2409
G 2	EPDM	50 – 50	40	0 – 70	0.3 – 10	132U2411

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

Main Type	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW
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.

Installation	Optional, but vertical solenoid system is recommended		
Max. working pressure (MWP)	10 bar		
Max. test pressure	15 bar		
Ambient temperature	BB DC	Up to 50° C	
Viscosity	Max. 50 cSt		
Materials	Valve body / cover	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
	Equalizing orifice	Stainless steel	W. no. 1.4435 / AISI 316L
	O-rings	EPDM	
	Valve plate	EPDM	
	Diaphragm	EPDM	

Function UN, latching

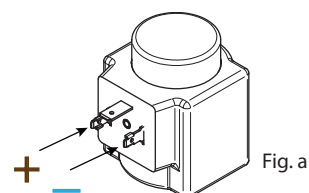
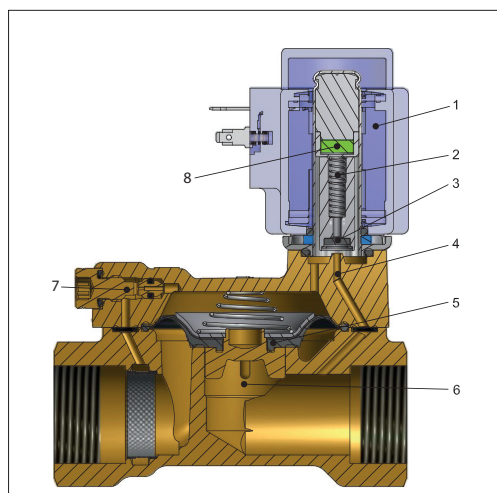


Fig. a

When — (minus) is supplied to the left terminal pin and + (plus) to the right (see fig. a), the valve plate 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 stay closed, until the poles are switched (see fig. b).

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

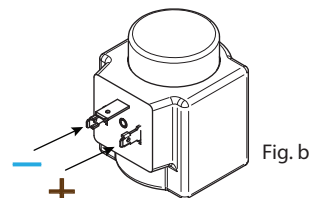
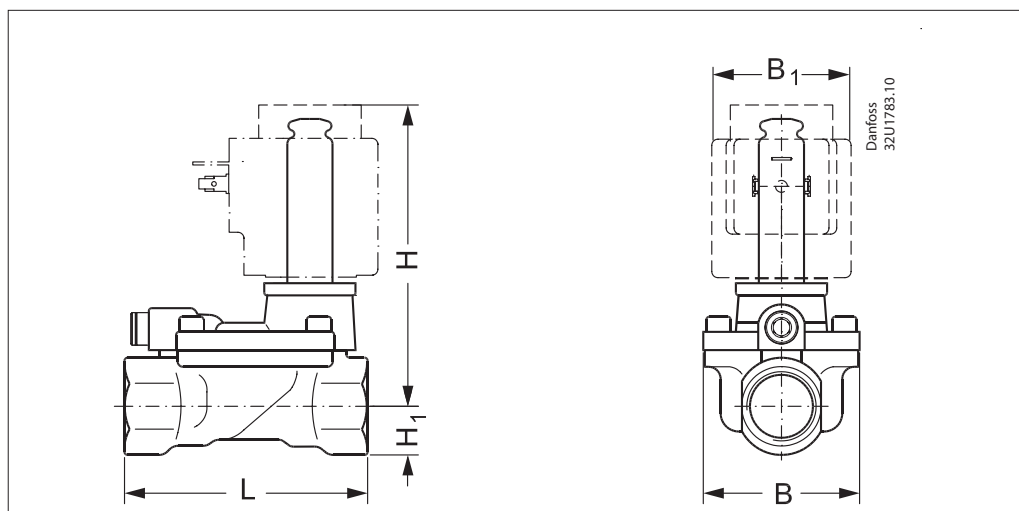


Fig. b

Switching poles

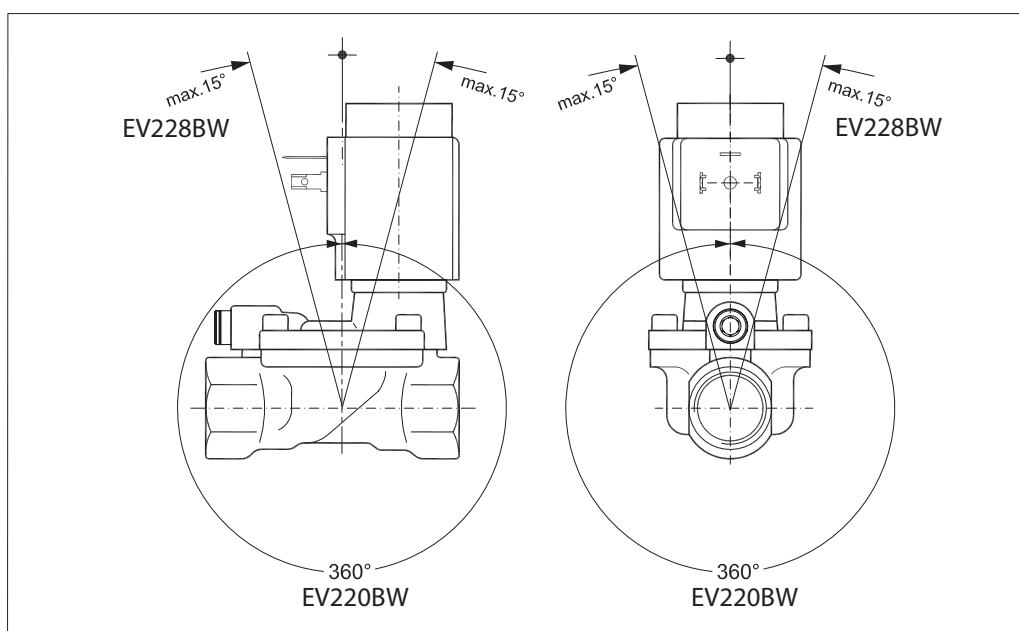
When + (plus) is supplied to the left terminal pin and — (minus) to the right (see fig. b), the pilot orifice (4) is opened. As the pilot orifice is larger than the equalizing orifice (7), the pressure across the diaphragm (5) drops and therefore it is lifted clear of the main orifice (6). The valve is now open for flow and will stay open as long as the minimum differential pressure across the valve is maintained, until the poles are switched back (see fig. a).

Dimensions and weight



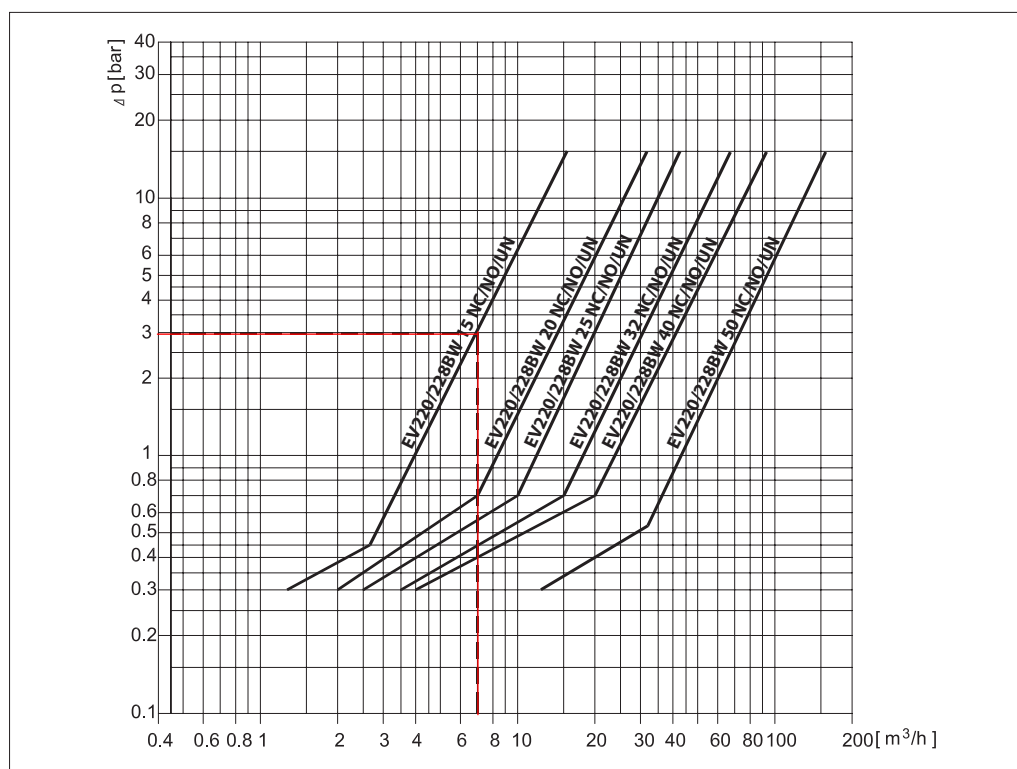
Type	L	B	B ₁ [mm] / coil type				H	H ₁	Weight without coil
	[mm]	[mm]	BA	BB / BE	BG / BO	BP	[mm]	[mm]	[kg]
EV220/228BW 15	80.0	52.0	32	46	68	45	99	15.0	0.7
EV220/228BW 20	90.0	58.0	32	46	68	45	103	18.0	0.9
EV220/228BW 25	109.0	70.0	32	46	68	45	113	22.0	1.3
EV220/228BW 32	120.0	82.0	32	46	68	45	120	27.0	2.0
EV220/228BW 40	130.0	95.0	32	46	68	45	129	32.0	3.0
EV220/228BW 50	162.0	113.0	32	46	68	45	135	37.0	4.8

Mounting angle



Capacity diagrams:

Example, water:
Capacity for EV220BW 15B at
differential pressure of 3 bar.
Approx. 7 m³/h



Data sheet | Solenoid valves for drinking water, Types EV220BW and EV228BW

**BB / BY,
High performance coils**



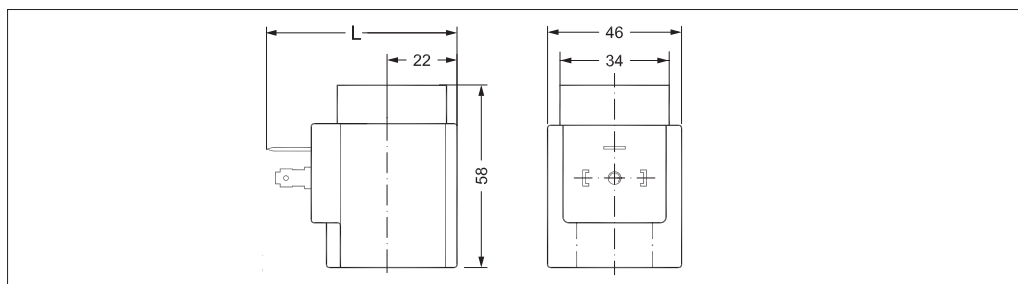
- Enclosure:
 - IP00 version with DIN 43650 A spade connectors
 - IP20 version with protective cap
 - IP65 version with mounted cable plug
- In accordance with:
 - RoHS Directive 2011/65/EU
 - Low Voltage Directive 2014/35/EU
 - EN60730-1
 - EN60730-2-8

Type	Tambient	Supply voltage	Voltage variation	Frequency	Control	Power consumption		Code no.
	[°C]	[V]		[Hz]		[W]	[VA]	
BB024AS	-40 – 80	24	-15%, +10%	50	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, UN (Latching)	13	–	018F7396
BB024DS	-40 – 50	24	±10%	DC	NC, NO, UN (Latching)	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

Accessories:
Cable plug



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

EEC and coil controller



EEC and coil controller for solenoid valves, type EV220B.

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

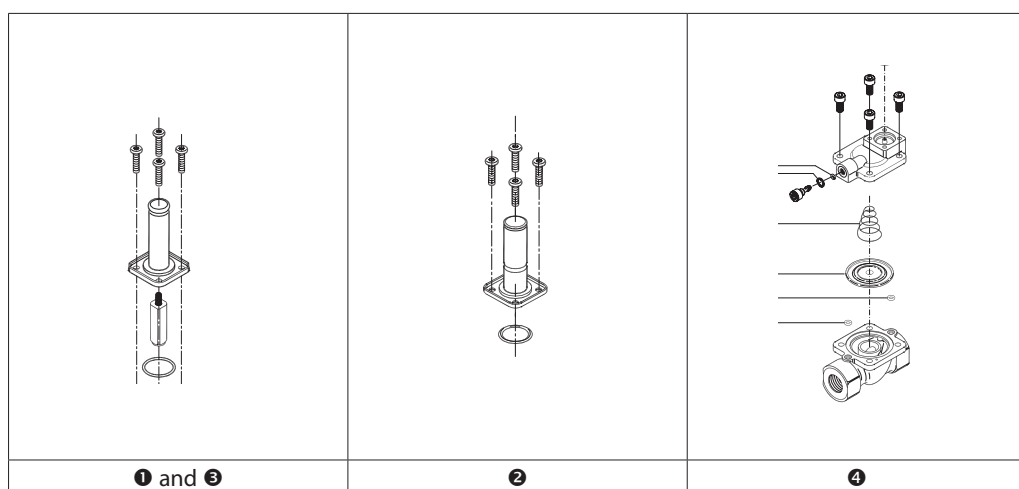
Type	Tambient	Supply voltage	Voltage variation	Frequency	Control	Power consumption	Code no.
	[°C]					[W]	
BE240CS	-25 – 55	208 - 240	±10%	60	NC, NO	4	018F6783
		208 - 240	±10%	50	NC, NO	4	

**Spare part kits
DN 15 to DN50**

Type	Actuator kit NC ❶	Actuator kit NO ❷	Actuator kit UN ❸	Diaphragm kit NC and NO ❹
EV220BW DN 15 / G1/2	132U8080	132U8081	132U8082	132U8016
EV220BW DN 20 / G3/4	132U8080	132U8081	132U8082	132U8021
EV220BW DN 25 G1	132U8080	132U8081	132U8082	132U8026
EV220BW DN 32 G 1 1/4	132U8080	132U8081	132U8082	132U8033
EV220BW DN 40 G 1 1/2	132U8080	132U8081	132U8082	132U8041
EV220BW DN 50 G 2	132U8080	132U8081	132U8082	132U8051

The kits contains

- ❶ NC armature tube, armature with spring, o-ring and 4 screws.
- ❷ NO unit, o-ring and 4 screws
- ❸ UN armature tube, armature, o-ring and 4 screws.
- ❹ Diaphragm, closing spring, 2 o-rings, equalising orifice + 2 o-rings and 4 screws



To get a complete actuator and diaphragm service 1), 2) or 3) and 4) should be ordered.
Fx. For EV220BW 15 / G1/2 NC needed ordering are 132U8080 and 132U8016.