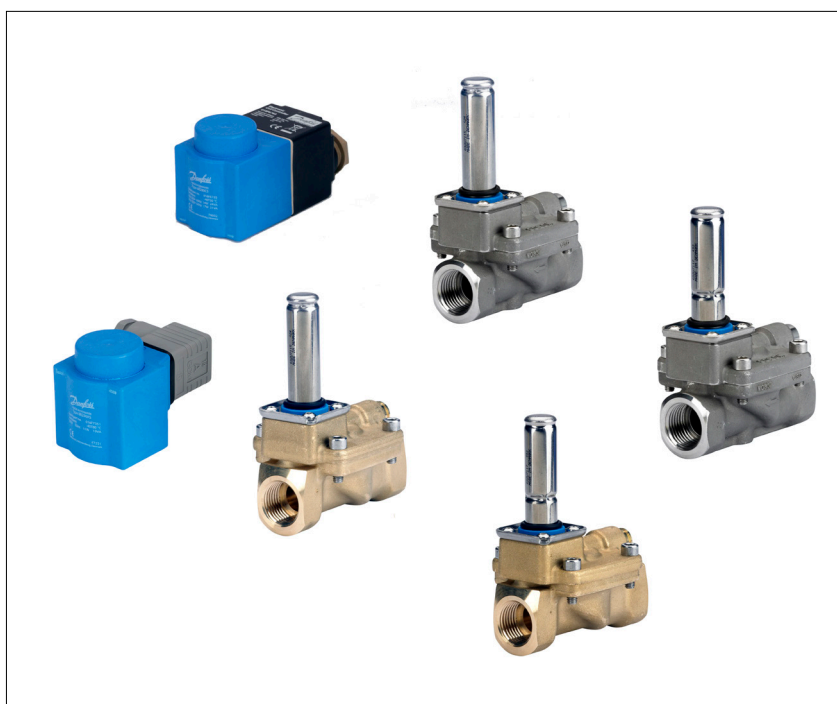


Data sheet

## 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 m<sup>3</sup> / h
- Differential pressure: 0.3 – 10 bar
- Media temperature from 0 – 90 °C
- Ambient temperature: Up to 80 °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
- 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 og 6.4.8
  - EN ISO 6509
- Inspection by DTI
- Valves are certified by Carso according to ACS guidelines, Circulaire 2002/571
- 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)

**EV220BW 15-25  
ECO brass valve body, NC**

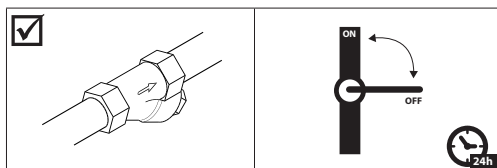

- In accordance with:
  - Low Voltage Directive 2014/35/EU
  - EN60730-1
  - EN60730-2-8
  - Pressure Equipment Directive 2014/68/EU
- RoHS Directive 2011/65/EU
- Wetted materials in accordance with BBR, DVGW, 4MS (4 member states Germany, Holland, France and UK), KTW and W270
- Certified by RISE
- Certified by SINTEF
- Inspection by DTI
- Certified by Carso (ACS)

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

<sup>1)</sup> It is recommended to use a filter in front of the valve.

<sup>2)</sup> 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] <sup>1)</sup>	40	40	300
Time to close [ms] <sup>1)</sup>	350	1000	1000

<sup>1)</sup> 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	25 bar		
Ambient temperature	BB DC	Up to 50 °C	
	BB AC	Up to 80 °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**

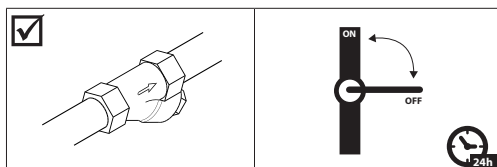

- In accordance with:
  - Low Voltage Directive 2014/35/EU
  - EN60730-1
  - EN60730-2-8
  - Pressure Equipment Directive 2014/68/EU
- RoHS Directive 2011/65/EU
- Wetted materials in accordance with BBR, DVGW, 4MS (4 member states Germany, Holland, France and UK), KTW and W270
- Certified by RISE
- Certified by SINTEF
- Inspection by DTI
- Certified by Carso (ACS)

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

<sup>1)</sup> It is recommended to use a filter in front of the valve.

<sup>2)</sup> 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**

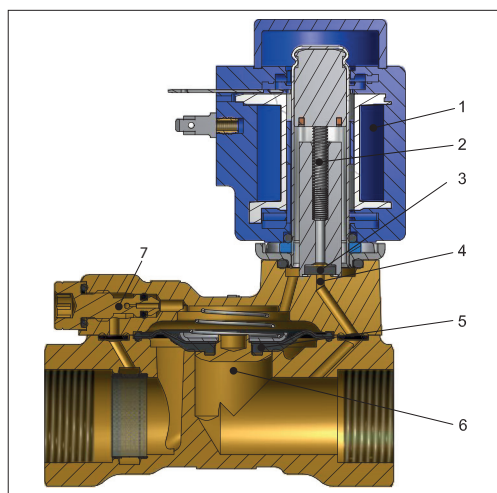
Main Type	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW
Time to open [ms] <sup>1)</sup>	40	40	300	1000	1500	5000
Time to close [ms] <sup>1)</sup>	350	1000	1000	2500	4000	10000

<sup>1)</sup> 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	25 bar		
Ambient temperature	BB DC	Up to 50 °C	
	BB AC	Up to 80 °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.

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

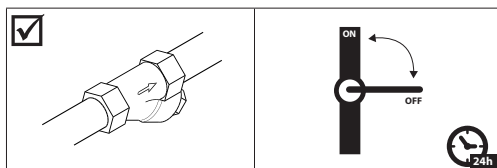

- In accordance with:
  - Low Voltage Directive 2014/35/EU
  - EN60730-1
  - EN60730-2-8
  - Pressure Equipment Directive 2014/68/EU
- RoHS Directive 2011/65/EU
- Wetted materials in accordance with BBR, DVGW, 4MS (4 member states Germany, Holland, France and UK), KTW and W270
- Certified by RISE
- Certified by SINTEF
- Inspection by DTI
- Certified by Carso (ACS)

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

<sup>1)</sup> It is recommended to use a filter in front of the valve.

<sup>2)</sup> 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] <sup>1)</sup>	40	40	300
Time to close [ms] <sup>1)</sup>	350	1000	1000

<sup>1)</sup> 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	25 bar		
Ambient temperature	BB DC	Up to 50 °C	
	BB AC	Up to 80° 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 NO**

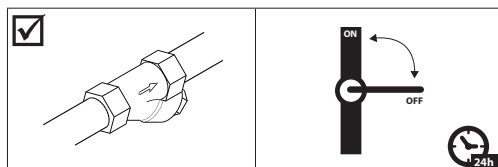

- In accordance with:
  - Low Voltage Directive 2014/35/EU
  - EN60730-1
  - EN60730-2-8
  - Pressure Equipment Directive 2014/68/EU
- RoHS Directive 2011/65/EU
- Wetted materials in accordance with BBR, DVGW, 4MS (4 member states Germany, Holland, France and UK), KTW and W270
- Certified by RISE
- Certified by SINTEF
- Inspection by DTI
- Certified by Carso (ACS)

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

<sup>1)</sup> It is recommended to use a filter in front of the valve.

<sup>2)</sup> 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.

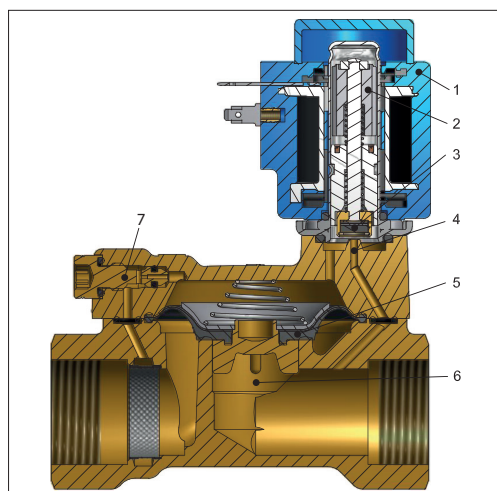

**Technical data**

Main Type	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW
Time to open [ms] <sup>1)</sup>	40	40	300	1000	1500	5000
Time to close [ms] <sup>1)</sup>	350	1000	1000	2500	4000	10000

<sup>1)</sup> 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	25 bar		
Ambient temperature	BB DC	Up to 50 °C	
	BB AC	Up to 80 °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 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, 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.

**EV228BW 15-25  
ECO brass valve body UN,  
latching**

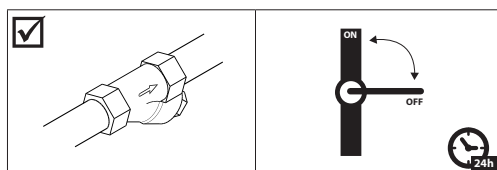

- In accordance with:
  - Low Voltage Directive 2014/35/EU
  - EN60730-1
  - EN60730-2-8
  - Pressure Equipment Directive 2014/68/EU
- RoHS Directive 2011/65/EU
- Wetted materials in accordance with BBR, DVGW, 4MS (4 member states Germany, Holland, France and UK), KTW and W270
- Certified by RISE
- Certified by SINTEF
- Inspection by DTI
- Certified by Carso (ACS)

ISO228/1 connection	Seal material	Orifice size	K <sub>v</sub> - value	Media temperature	Differential pressure	Code no.
		[mm]	[m <sup>3</sup> /h]	[°C]	[Bar]	
G 1/2	EPDM	15	4	0 – 60	0.3 – 10	<b>132U2400</b>
G 3/4	EPDM	20	8	0 – 60	0.3 – 10	<b>132U2402</b>
G 1	EPDM	25	11	0 – 60	0.3 – 10	<b>132U2404</b>

<sup>1)</sup> It is recommended to use a filter in front of the valve.

<sup>2)</sup> 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] <sup>1)</sup>	40	40	300
Time to close [ms] <sup>1)</sup>	350	1000	1000

<sup>1)</sup> 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		
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**

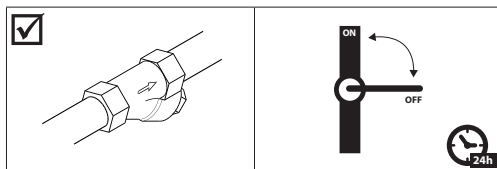

- In accordance with:
  - Low Voltage Directive 2014/35/EU
  - EN60730-1
  - EN60730-2-8
  - Pressure Equipment Directive 2014/68/EU
- RoHS Directive 2011/65/EU
- Wetted materials in accordance with BBR, DVGW, 4MS (4 member states Germany, Holland, France and UK), KTW and W270
- Certified by RISE
- Certified by SINTEF
- Inspection by DTI
- Certified by Carso (ACS)

ISO228/1 connection	Seal material	Orifice size	K <sub>v</sub> - value	Media temperature	Differential pressure	Code no.
		[mm]	[m <sup>3</sup> / h]	[°C]	[Bar]	
G ½	EPDM	15 – 50	4	0 – 60	0.3 – 10	<b>132U2401</b>
G ¾	EPDM	20 – 50	8	0 – 60	0.3 – 10	<b>132U2403</b>
G 1	EPDM	25 – 50	11	0 – 60	0.3 – 10	<b>132U2405</b>
G1 ¼	EPDM	32 – 50	18	0 – 60	0.3 – 10	<b>132U2407</b>
G1 ½	EPDM	40 – 50	24	0 – 60	0.3 – 10	<b>132U2409</b>
G 2	EPDM	50 – 50	40	0 – 60	0.3 – 10	<b>132U2411</b>

<sup>1)</sup> It is recommended to use a filter in front of the valve.

<sup>2)</sup> 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.

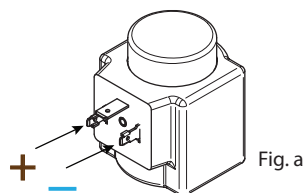
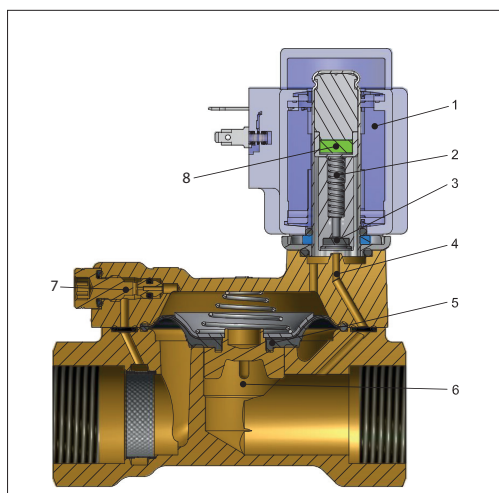

**Technical data**

Main Type	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW	EV220BW
Time to open [ms] <sup>1)</sup>	40	40	300	1000	1500	5000
Time to close [ms] <sup>1)</sup>	350	1000	1000	2500	4000	10000

<sup>1)</sup> 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.

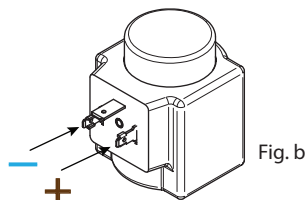
Installation	Optional, but vertical solenoid system is recommended		
Max. working pressure (MWP)	10 bar		
Max. test pressure	25 bar		
Ambient temperature	BB DC	Up to 50° C	
Viscosity	Max. 50 cSt		
Materials	Valve body / cover	Stainless steel	w. no. 1.4404 / AISI 316L
	Armature	Stainless steel	W.no. 1.4105 / 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



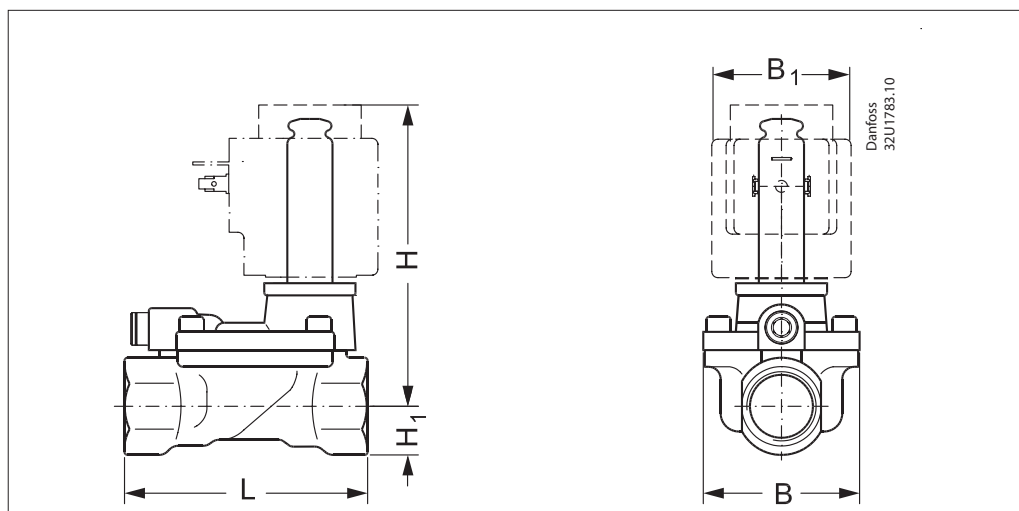
When **-** (minus) is supplied to the left terminal pin and **+** (plus) to the right (see fig. a), the valve plate is pressed down against the pilot orifice (4) by the armature spring (2). The pressure across the diaphragm (5) is built up via the equalizing orifice (7). The diaphragm closes the main 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



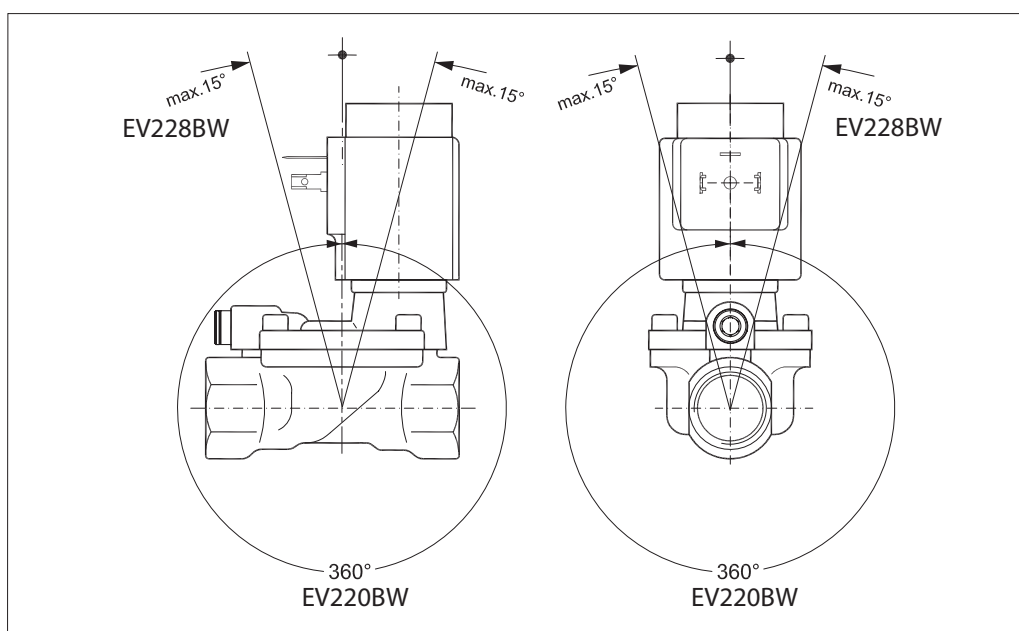
**Switching poles**  
When **+** (plus) is supplied to the left terminal pin and **-** (minus) to the right (see fig. b), the pilot orifice (4) is opened. As the pilot orifice is larger than the equalizing orifice (7), the pressure across the diaphragm (5) drops and therefore it is lifted clear of the 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



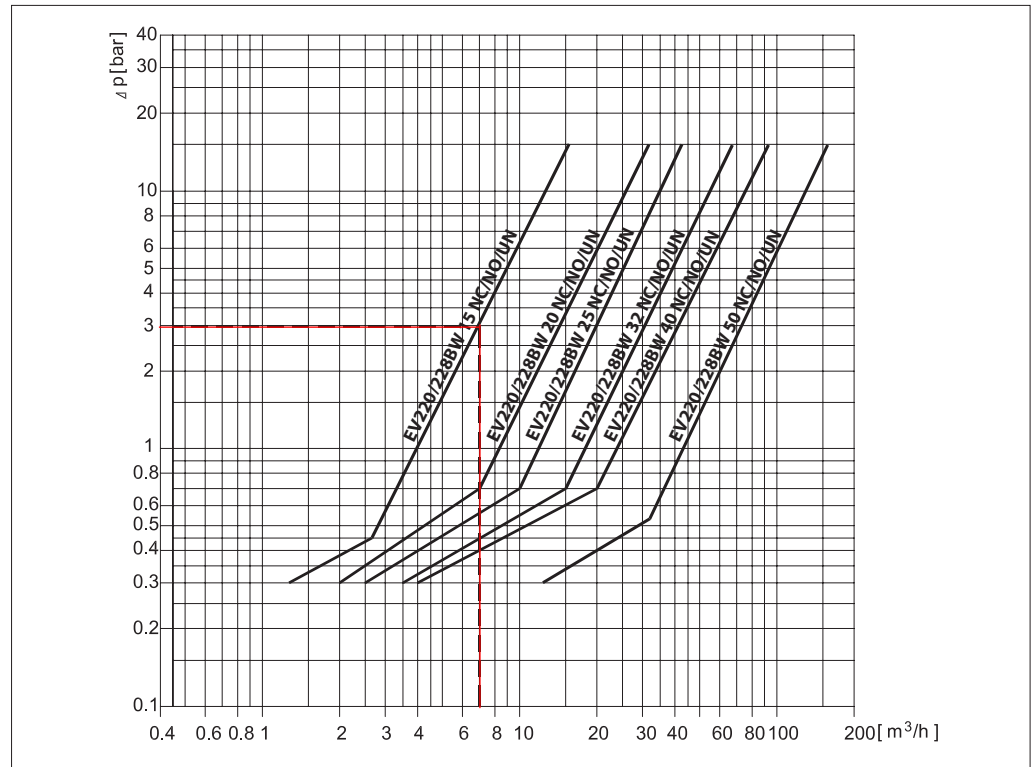
Type	L	B	B <sub>1</sub> [mm] / coil type				H	H <sub>1</sub>	Weight without coil
	[mm]	[mm]	BA	BB / BE	BG / BO	BP	[mm]	[mm]	[kg]
EV220/228BW 15	80.0	52.0	32	46	68	45	99	15.0	0.7
EV220/228BW 20	90.0	58.0	32	46	68	45	103	18.0	0.9
EV220/228BW 25	109.0	70.0	32	46	68	45	113	22.0	1.3
EV220/228BW 32	120.0	82.0	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 m<sup>3</sup>/h



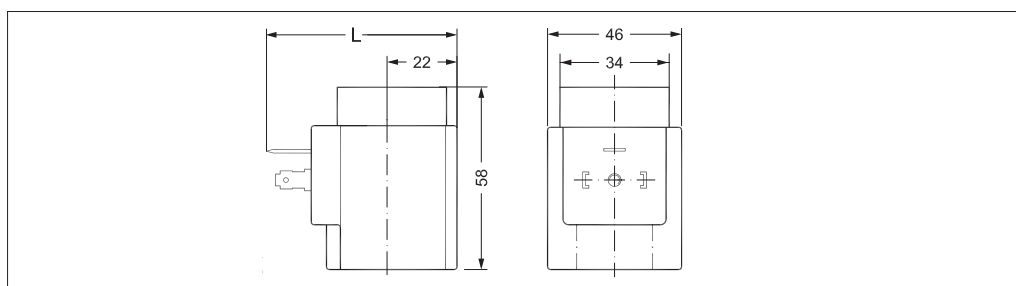
**BB / BY,  
High performance coils**


- 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]				[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**

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

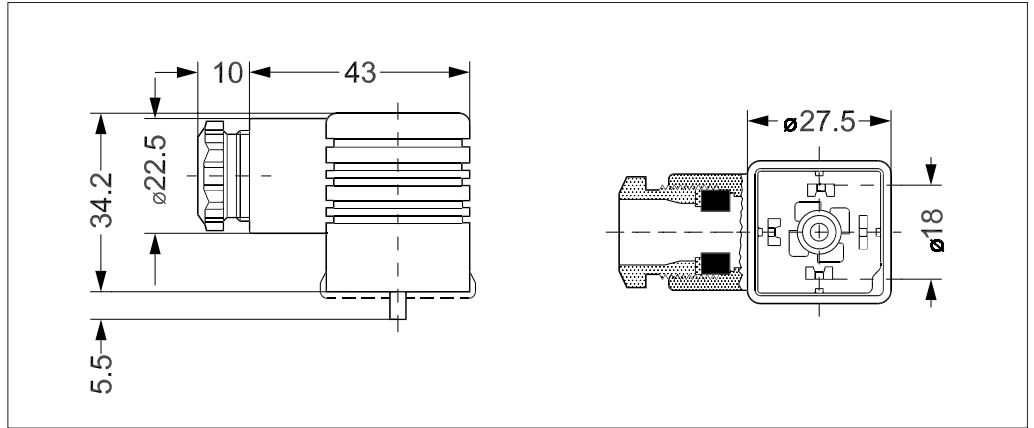
**Dimensions and weight**


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 Electronic coil controller**



EEC electronic coil controller for solenoid valves, type EV220B.

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

- 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		4	