ENGINEERING TOMORROW

Data Sheet

Solenoid valve Type **EV220W**

Indirect servo operated for compact installation in various applications

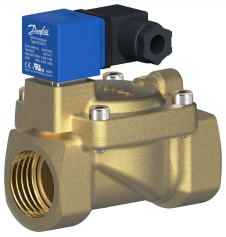
EV220W is a range of compact indirect servo-operated 2/2 way solenoid valves with connections from 3/8" to 2", especially designed for use within a limited space. This range has been designed for use within various markets, such as, the Industrial and HVAC markets, which demand an easy and reliable valve that is easy to setup and use.

Features and versions

- For water, oil, compressed air and similar neutral media
- NBR for air and oil
- WRAS approved with EPDM sealing; 0 – 90 °C NC version 0 – 50 °C NO version
- Standard equipped with clip on coil for dry and humid environments
- Enclosure: IP65

1 Portfolio overview

Table 1: Portfolio overview

Features	EV220W
	
Body material	Brass
DN [mm]	10-50
Connection	G3/8" - G2"
Sealing material	EPDM, NBR
Function	NC, NO
K_v [m^3/h]	1.6-32
Differential pressure range [bar]	0.2-10
Temperature range [°C]	-30-100

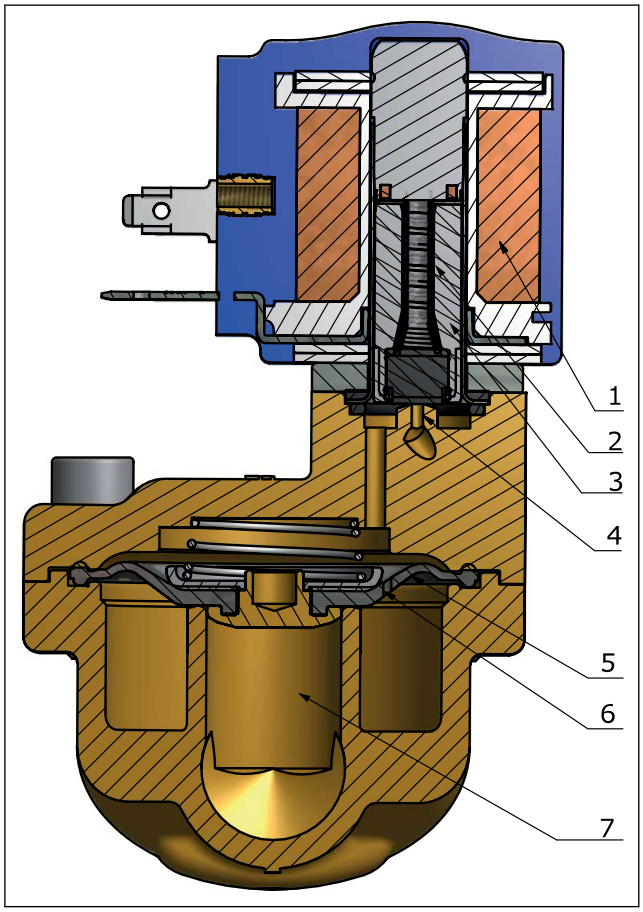
2 Functions

2.1 Function, NC

Coil voltage disconnected
When voltage is disconnected, the armature spring (2) presses the armature (3) down against the pilot orifice (4). Pressure builds up over the diaphragm (5) via the equalizing orifice (6). The diaphragm closes the main orifice (7) as soon as the pressure over the diaphragm equals the inlet pressure. The valve stays closed for as long as voltage remains disconnected.

Coil voltage connected (open)
When voltage is applied to the coil (1), the pilot orifice (4) is opened. Since the pilot orifice is larger than the equalizing orifice (6), pressure over the diaphragm (5) falls and the diaphragm is lifted clear of the main orifice (7). The valve stays open for as long as the required minimum differential pressure is present and voltage is applied to the coil.

Figure 1: Function, NC



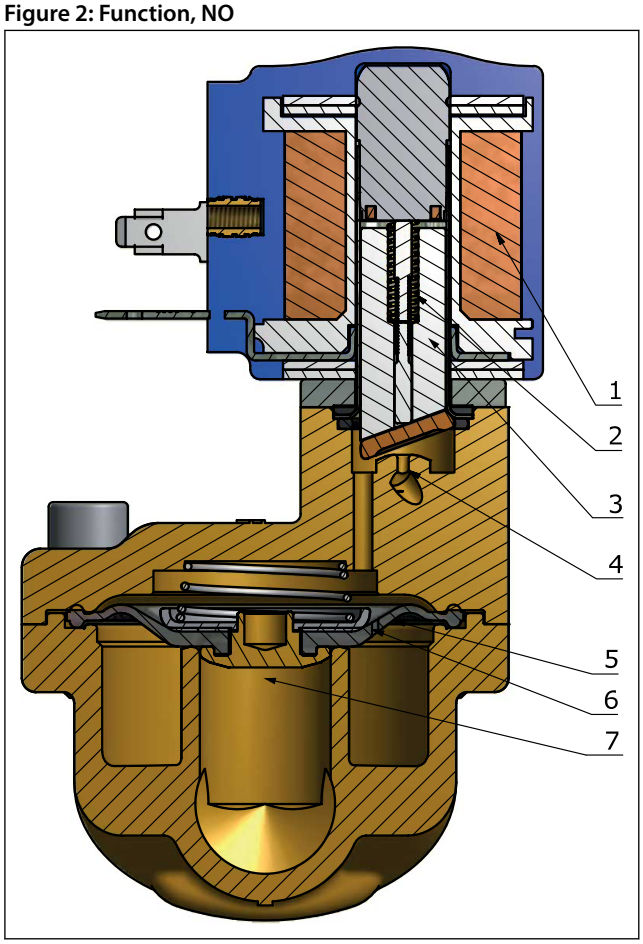
1	Coil
2	Armature spring
3	Armature
4	Pilot orifice
5	Diaphragm
6	Equalizing orifice
7	Main orifice

2.2 Function, NO

Coil voltage disconnected (Open)
When voltage is disconnected, the pilot orifice (4) is opened. Since the pilot orifice is larger than the equalizing orifice (6), pressure over the diaphragm (5) falls and the diaphragm is lifted clear of the main orifice (7). The valve stays open for as long as the required minimum differential pressure is present and voltage is applied to the coil.

Coil voltage connected (Close)
When voltage is applied to the coil (1), the armature spring (2) presses the armature (3) down against the pilot orifice (4). Pressure builds up over the diaphragm (5) via the equalizing orifice (6). The diaphragm closes the main orifice (7) as soon as the pressure over the diaphragm equals the inlet pressure. The valve stays closed for as long as voltage remains disconnected.

Figure 2: Function, NO

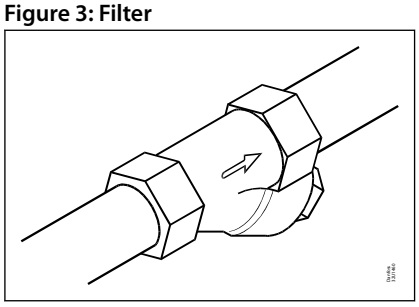


1	Coil
2	Armature spring
3	Armature
4	Pilot orifice
5	Diaphragm
6	Equalizing orifice
7	Main orifice

3 Applications

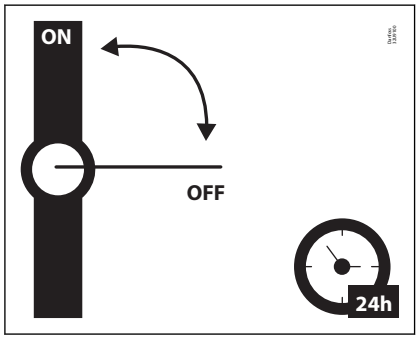
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

Figure 3: 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.

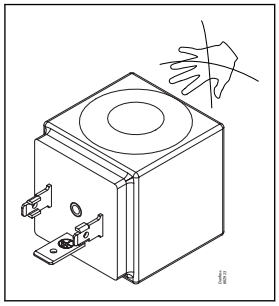
Figure 4: Exercise: Valve on/off



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.

Figure 5: Caution: Coil Risk



⚠ WARNING:

Risk of burns/fire if used for a continuous power-on time through hot coil surface.

- I Do not touch the coil with bare hands.
- I Keep the coil away from highly flammable substances with low ignition point.

4 Product specification

4.1 Technical data

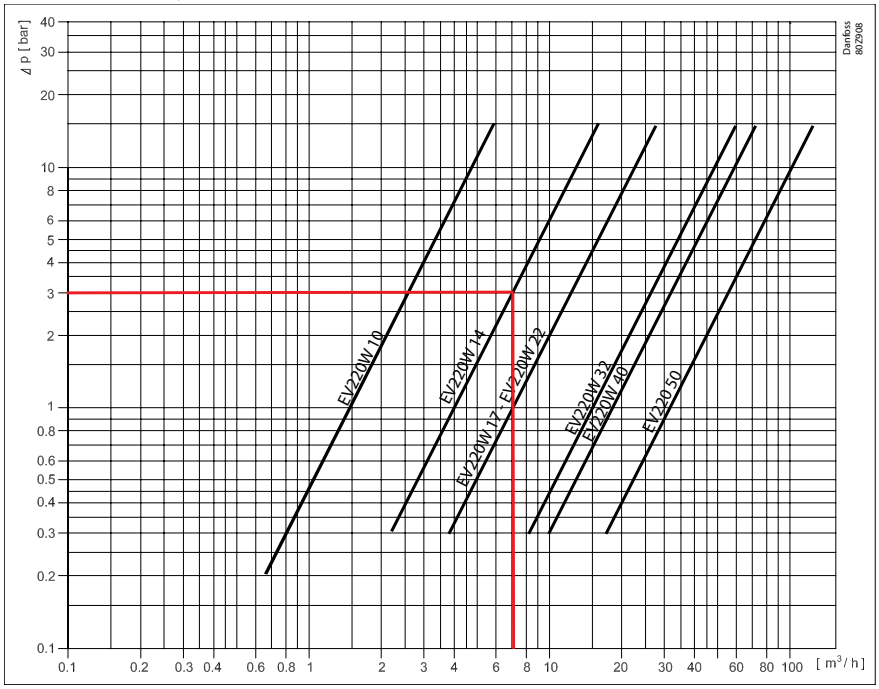
Table 2: Technical data

Media	NBR	For compressed air and oil
	EPDM	For water and drinking water (WRAS approvals)
Media temperature [°C]	NBR	-10 - 60°C
	EPDM	-30 - 100°C
	EPDM NC WRAS approved	0 - 90°C
	EPDM NO WRAS approved	0 - 50°C
Ambient temperature [°C]	-40-50°C	
K_v value [m^3/h]	DN10	1.6 m^3/h
	DN14	4 m^3/h
	DN18	7 m^3/h
	DN22	7 m^3/h
	DN32	15 m^3/h
	DN40	18 m^3/h
	DN50	32 m^3/h
Min. Opening differential pressure [bar]	DN10	0.2 bar
	DN14-50	0.3 bar
Max. Opening differential pressure [bar]	10 bar	
Max. working pressure [bar]	10 bar	
Max. test pressure [bar]	15 bar	
Viscosity [cSt]	Max. 50 cSt	

Capacity diagram

Example for water: Capacity for EV220W at a differential pressure of 3 bar: Approx. 7 m^3h

Figure 6: Capacity diagram



Time to open/close

Table 3: Time to open/close

Type	EV220W 10	EV220W 14	EV220W 18	EV220W 22	EV220W 32	EV220W 40	EV220W 50
Time to open [ms] (1)	50	100	200	200(1)	2500	4000	5000
Time to close [ms] (1)	300	400	500	500	4000	6000	10000

(1) Times are indicative and apply to water. Exact times will depend on pressure conditions.

Materials

Table 4: Materials

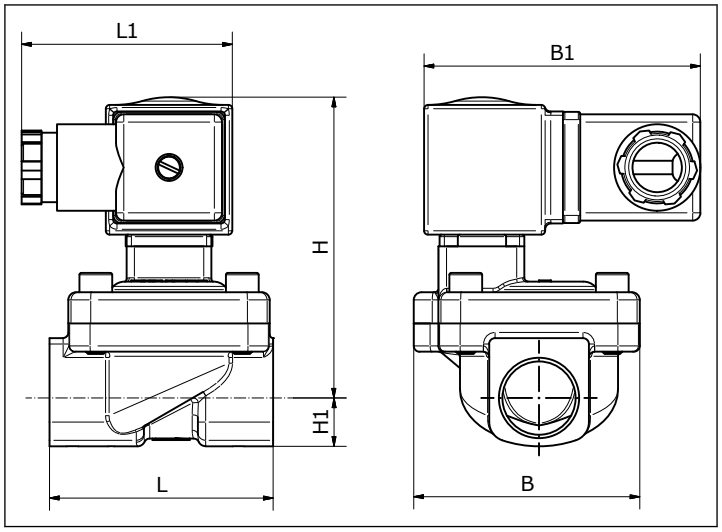
Components	Materials	Specifications
Valve body/cover	Brass	EN 12165, CW 617N
Armature/armature stop	Stainless steel	W. no. 1.4105 / AISI 430FR
Armature tube	Stainless steel	W. no. 1.4303 / AISI 305
Springs	Stainless steel	W. no. 14310 / AISI 301
O-ring	NBR/EPDM	
Valve plate	NBR/EPDM	
Diaphragm	NBR/EPDM	

4.2 Dimension and weight

Table 5: Dimension and weight

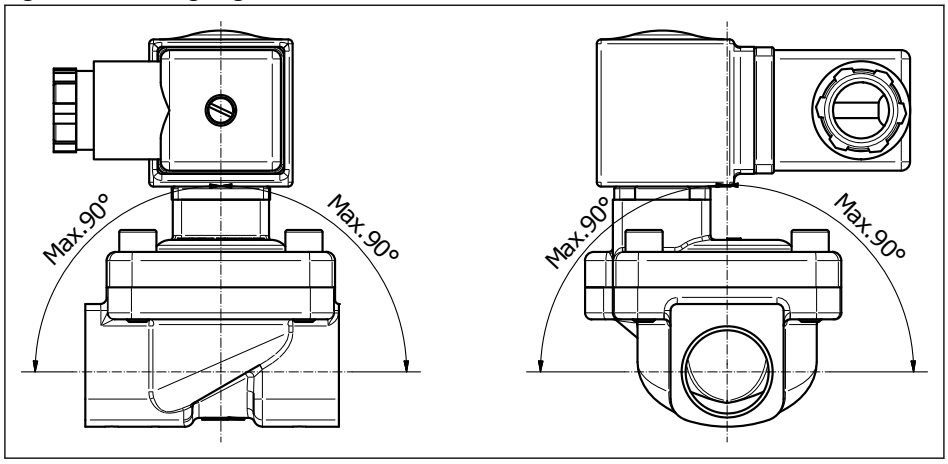
Type	Weight with AS coil [kg]	L [mm]	L1 [mm]	B [mm]	B1 [mm]	H1 [mm]	H [mm]	
					Coil AS		NC	NO
EV220W 10	0.56	51	50	50	70	13	77	81
EV220W 14	0.62	58	50	58	70	13	78	82
EV220W 18	0.84	90	50	58	70	18	79	83
EV220W 22	1.12	90	50	58	70	22	84	84
EV220W 32	2.12	120	50	82	70	27	96	96
EV220W 40	3.32	130	50	95	70	32	106	106
EV220W 50	4.42	162	50	113	70	37	112	112

Figure 7: Dimension



4.3 Mounting

Figure 8: Mounting angle



5 Ordering

5.1 Parts program

Table 6: Brass, valve body NC and NO

ISO228/1 connection	Orifice	K_v value	Coil type	Sealing	Approvals	Function	
	[mm]	[m³/h]		EPDM/NBR		NC	NO
G3/8	10	1.6		EPDM	WRAS	042U4410	042U4830
				NBR			
			230V 50/60Hz 8W	EPDM	WRAS	042U471032	042U413032
				NBR		042U426132	042U436132
			24V 50/60Hz 9.5W	EPDM	WRAS	042U471019	042U413019
				NBR		042U426119	042U436119
			24V DC 6.5W	EPDM	WRAS	042U471002	042U413002
				NBR		042U426102	042U436102
G1/2	14	4		EPDM	WRAS	042U4414	042U4833
				NBR			
			230V 50/60Hz 8W	EPDM	WRAS	042U471432	042U413332
				NBR		042U426432	042U436432
			24V 50/60Hz 9.5W	EPDM	WRAS	042U471419	042U413319
				NBR		042U426419	042U436419
			24V DC 6.5W	EPDM	WRAS	042U471402	042U413302
				NBR		042U426402	042U436402
G3/4	18	7		EPDM	WRAS	042U4418	042U4834
				NBR			
			230V 50/60Hz 8W	EPDM	WRAS	042U471832	042U413432
				NBR		042U426532	042U436532
			24V 50/60Hz 9.5W	EPDM	WRAS	042U471819	042U413419
				NBR		042U426519	042U436519
			24V DC 6.5W	EPDM	WRAS	042U471802	042U413402
				NBR		042U426502	042U436502
G1	22	7		EPDM	WRAS	042U4422	042U4835
				NBR			
			230V 50/60Hz 8W	EPDM	WRAS	042U472232	042U413532
				NBR		042U426632	042U436632
			24V 50/60Hz 9.5W	EPDM	WRAS	042U472219	042U413519
				NBR		042U426619	042U436619
			24V DC 6.5W	EPDM	WRAS	042U472202	042U413502
				NBR		042U426602	042U436602
G11/4	32	15		EPDM	WRAS	042U4432	042U4836
				NBR			
			230V 50/60Hz 8W	EPDM	WRAS	042U473232	042U413632
				NBR		042U426732	042U436732
			24V 50/60Hz 9.5W	EPDM	WRAS	042U473219	042U413619
				NBR		042U426719	042U436719
			24V DC 6.5W	EPDM	WRAS	042U473202	042U413602
				NBR		042U426702	042U436702

ISO228/1 connection	Orifice	K_v value	Coil type	Sealing	Approvals	Function	
	[mm]	[m³/h]		EPDM/NBR		NC	NO
G11/2	40	18		EPDM	WRAS	042U4440	042U4837
				NBR			
			230V 50/60Hz 8W	EPDM	WRAS	042U474032	042U413732
				NBR		042U426832	042U436832
			24V 50/60Hz 9.5W	EPDM	WRAS	042U474019	042U413719
				NBR		042U426819	042U436819
			24V DC 6.5W	EPDM	WRAS	042U474002	042U413702
				NBR		042U426802	042U436802
G2	50	32		EPDM	WRAS	042U4450	042U4838
				NBR			
			230V 50/60Hz 8W	EPDM	WRAS	042U475032	042U413832
				NBR		042U426932	042U436932
			24V 50/60Hz 9.5W	EPDM	WRAS	042U475019	042U413819
				NBR		042U426919	042U436919
			24V DC 6.5W	EPDM	WRAS	042U475002	042U413802
				NBR		042U426902	042U436902

5.2 Accessories

Coil

AS/AZ compact UL recognised, clip-on coils

Figure 9: clip-on coils

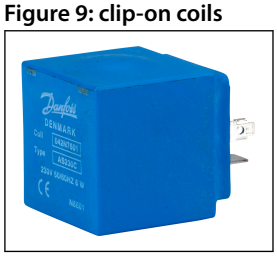


Table 7: AS/AZ compact UL recognised, clip-on coils

Type	Ambient temperature	Supply voltage	Voltage variation	Frequency	Power consumption		Code no.
	[°C]	[V]		[Hz]	[W]	[VA]	
AS024CS	-40 - 50	24	-10%, +6%	50	9.5	18	042N7608
		24	-10%, +6%	60	7.0	14	
AS230CS	-40 - 50	230	-10%, +6%	50	8.0	16	042N7601
		208 - 240	±6%	60	7.0	14	
AZ012DS	-40 - 50	12	-10%, +6%	DC	6.0		042N7616
AZ024DS	-40 - 50	24	-10%, +6%	DC	6.5		042N7617

Cable plug

Figure 10: Cable plug

Table 8: Cable plug

Cable plug size	Description	Code no.
DN 18	Cable plug IP65	042N1278

Universal electronic multi-timer, Type ET 20 M

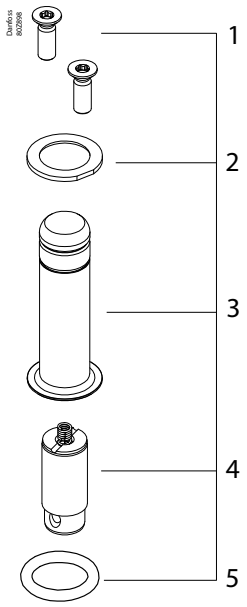
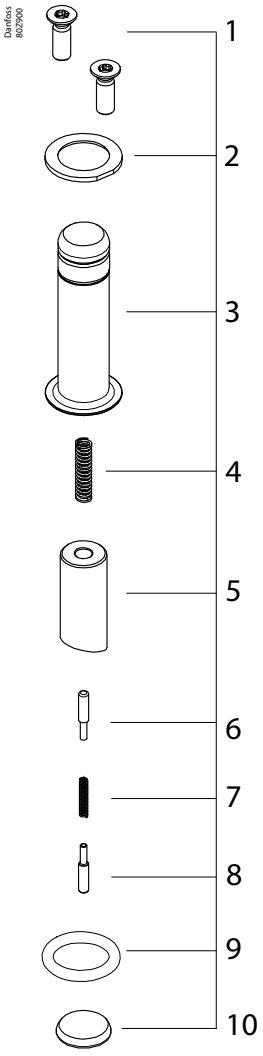
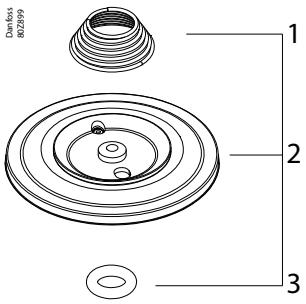
Figure 11: Type ET 20 M

Table 9: Type ET 20 M

Type	Voltage	Suitable for coil types	Code no.
	[V]		
BA024A	24 - 240	AL, AM, AS, AZ, BA, BD, BB	042N0185

Spare part

Table 10: Spare part kit DN10-50 in EPDM / NBR / FKM

Type	Armature kit				Diaprhagm kit		
	NC		NO		NC/NO		
	EPDM	FKM	EPDM	FKM	EPDM	NBR	FKM
Spare Part EV220W 10	042U2096	042U2097	042U2098	042U2099	042U2100	042U2101	
Spare Part EV220W 14					042U2102	042U2103	
Spare Part EV220W 18					042U2112		042U2113
Spare Part EV220W 22					042U2112		042U2113
Spare Part EV220W 32					042U2114		042U2115
Spare Part EV220W 40					042U2116		042U2117
Spare Part EV220W 50					042U2118		042U2119
							
	1. 2 x screws 2. Plastic washer 3. Armature tube 4. Armature + spring 5. O-ring		1. 2 x screws 2. Plastic washer 3. Armature tube 4. Armature spring 5. Armature 6. Pin peek 7. Armature spring 8. Pin peek 9. O-ring 10. Armature seal		1. Diaphragm spring 2. Diaphragm assembly 3. O-ring		

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