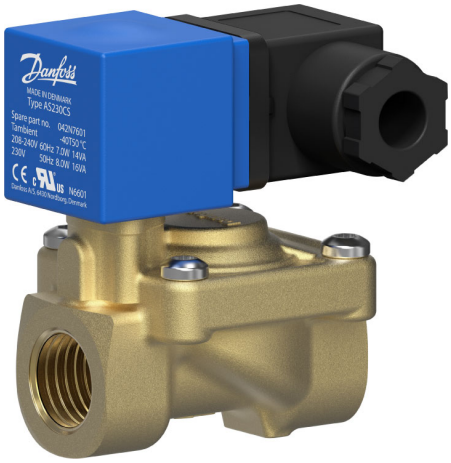
ENGINEERING TOMORROW

Data Sheet

Solenoid valve Type **EV220S**

Streamlined servo operated for water, air, and oil applications



EV220S is a range of streamlined compact servo-operated 2/2 way solenoid valves with connections from 1/4" to 2", special designed to fit in applications where space is limited.

EV220S can be used in the following applications :

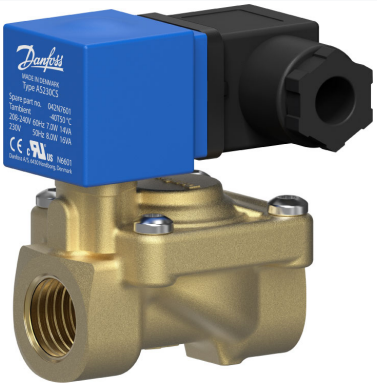
- Water shut off (EPDM version)
  - Building control
  - Commercial tap water supply, leak detection, heating and cooling
  - Water for industrial processing
  - Laundry and dishwashing
  - Car washing
- Oil, air neutral media's (FKM version)
  - Air Compressors
  - Factory processes
  - Pump cooling

Features

- Clip on coil
- Coil enclosure: Up to IP67
- WRAS approved with EPDM sealing
- NC and NO version
- 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
  - cURus

1 Portfolio overview

Table 1: Portfolio overview

Features	EV220S
	
Body material	Brass
DN [mm]	10-50
Connection	G1/4" - G2"
Sealing material	EPDM, FKM
Function	NC, NO
K_v [m^3/h]	1.6-32
Differential pressure range [bar]	0.2-10
Temperature range [°C]	-30-100

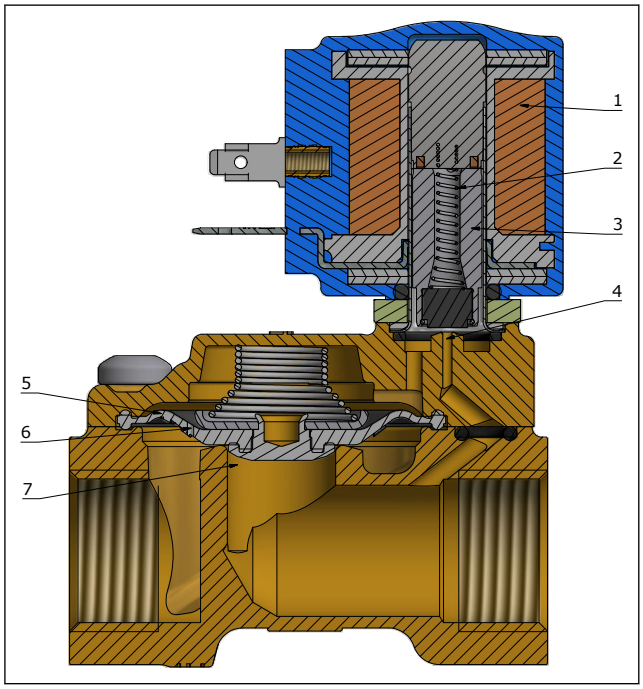
2 Functions

2.1 Function, NC

Coil voltage disconnected (Closed)
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



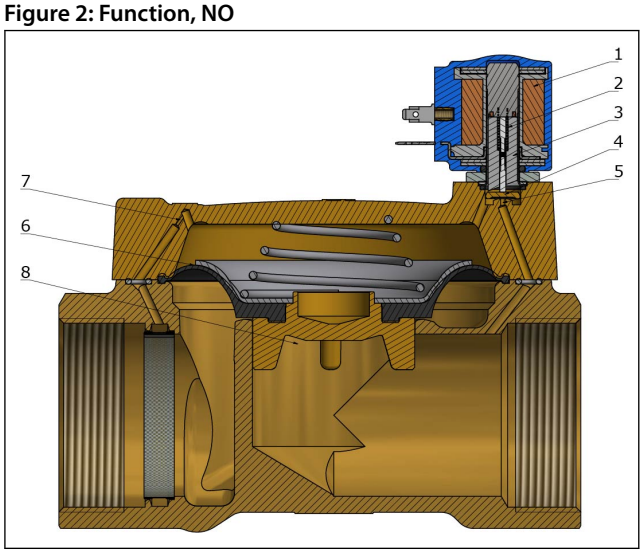
1	Coil
2	Armature spring
3	Armature
4	Pilot orifice
5	Diaphragm
6	Equalizing orifice
7	Main orifice

2.2 Function, NO

Coil voltage disconnected (Open)
When voltage is disconnected, the pilot orifice (5) is opened. Since the pilot orifice is larger than the equalizing orifice (7), pressure over the diaphragm (6) falls and the diaphragm is lifted clear of the main orifice (8). The valve stays open for as long as the required minimum differential pressure is present and voltage is not applied to the coil.

Coil voltage connected (Closed)
When voltage is applied to the coil (1), the armature spring (2) presses the armature (3) down against the pilot orifice (5). Pressure builds up over the diaphragm (6) via the equalizing orifice (7). The diaphragm closes the main orifice (8) as soon as the pressure over the diaphragm equals the inlet pressure. The valve stays closed for as long as voltage remains connected.

Figure 2: Function, NO

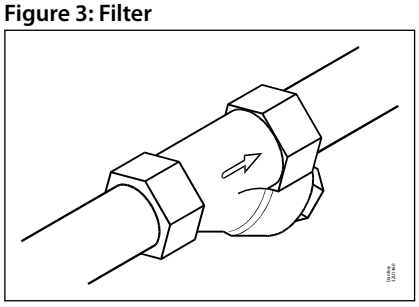


1	Coil
2	Armature spring
3	Armature
4	Armature seal
5	Pilot orifice
6	Diaphragm
7	Equalizing orifice
8	Main orifice

3 Applications

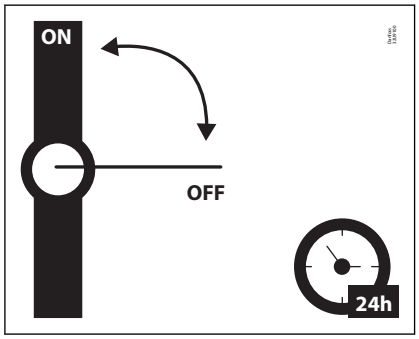
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

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



Guidelines for water

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)

4 Product specification

4.1 Technical data

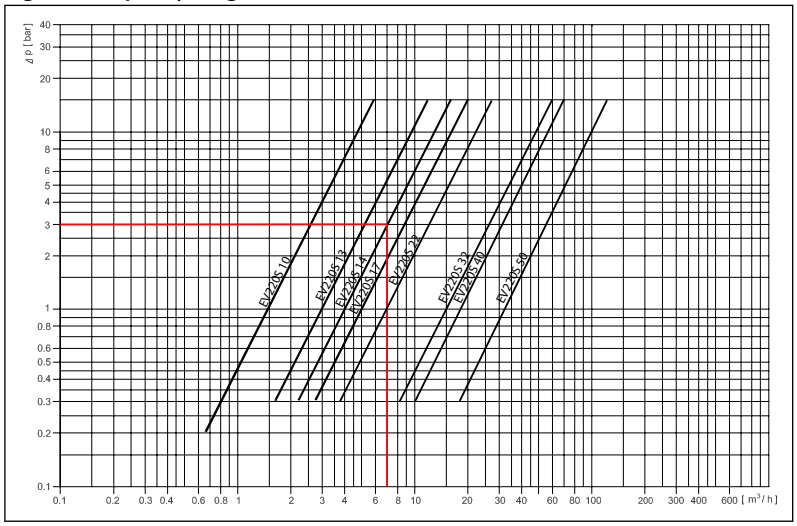
Table 2: Technical data

Media	EPDM	Water, drinking water, brine
	FKM	Oil, compressed air
Media temperature [°C]	EPDM	-30-100 °C
	EPDM WRAS	NC: 0 - 85 °C; NO: 0 - 60 °C
	FKM	-10 - 90 °C
Ambient temperature [°C]	Up to 50°C	
K_v value [m³/h]	DN10	1.6 m³/h
	DN13	3 m³/h
	DN14	4 m³/h
	DN17	5 m³/h
	DN22	7 m³/h
	DN32	15 m³/h
	DN40	18 m³/h
	DN50	32 m³/h
Min. Opening differential pressure [bar]	DN10	0.2 bar
	DN13-50	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 EV220S 14 at a differential pressure of 3 bar: Approx. 7 m³h

Figure 5: Capacity diagram



Time to open/close

Table 3: Time to open/close

Type	EV220S 10	EV220S 13	EV220S 14	EV220S 17	EV220S 22	EV220S 32	EV220S 40	EV220S 50
Time to open [ms][(1)]	50	100	200	200	200	2500	4000	5000
Time to close [ms][(1)]	300	400	500	500	500	4000	6000	10000

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

Materials

Table 4: Materials

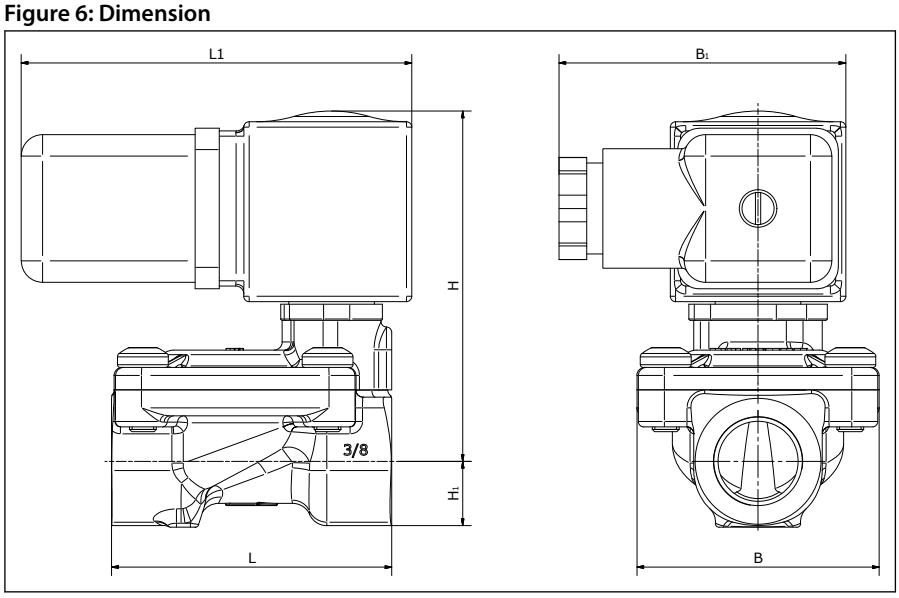
Components	Materials	Specifications
Valve body/cover	Brass	CW617N
Armature/armature stop	Stainless steel	W. no. 1.4105 / AISI 430FR
Armature tube	Stainless steel	W. no. 1.4303 / AISI 305
Spring	Stainless steel	W. no. 14310 / AISI 301
O-ring	EPDM, FKM	
Valve plate	EPDM, FKM	
Diaphragm	EPDM, FKM	

4.2 Dimension and weight

Table 5: Dimension and weight

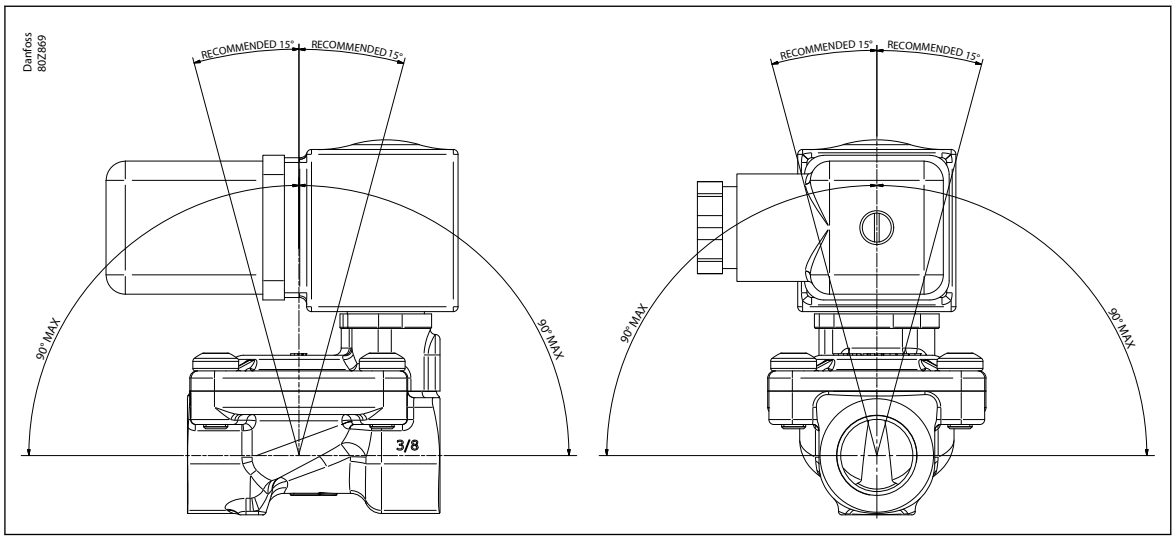
Type	Weight with coil & plug	L	L1	B	B1	H1	H[mm]
	[kg]	[mm]	[mm]	[mm]	[mm]	[mm]	NC / NO
EV220S 10	0.42	52.6	73	45.2	53.6	12	65.4
EV220S 13	0.40	58.2	73	45.2	53.6	12	65.4
EV220S 14	0.54	62	73	50.2	53.6	14.7	68.7
EV220S 17	0.50	68.2	73	50.2	53.6	14.7	68.7
EV220S 22	1.00	87.5	73	58.2	53.6	19.5	84.2
EV220S 32	2.00	116.0	73	80.4	53.6	24.8	96.1
EV220S 40	2.80	125.0	73	93.5	53.6	30.7	105.4
EV220S 50	4.30	160.5	73	113.0	53.6	34.9	110.9

Figure 6: Dimension



4.3 Mounting

Figure 7: Mounting angle



5 Ordering

5.1 Parts program

Table 6: Brass body, NC and NO

ISO228/1 Connection	Orifice	K_v value	Sealing	Coil type	Approvals	Function	
	[mm]	[m³/h]	EPDM/FKM			NC	NO
G1/4	10	1.6	EPDM		WRAS	042U4608	042U6108
			FKM			042U4609	042U6109
G3/8	10	1.6	EPDM		WRAS	042U4610	042U6110
			FKM			042U4611	042U6111
G1/2	13	3	EPDM		WRAS	042U4613	042U6113
			FKM			042U4612	042U6112
G1/2	14	4	EPDM		WRAS	042U4614	042U6114
				230V 50/60Hz 8W	WRAS	042U491432	042U651432
				24V 50/60Hz 9.5W	WRAS	042U491419	042U651419
			FKM			042U4615	042U6115
G3/4	17	5	EPDM		WRAS	042U4617	042U6117
				230V 50/60Hz 8W	WRAS	042U491732	042U651732
				24V 50/60Hz 9.5W	WRAS	042U491719	042U651719
			FKM			042U4618	042U6116
G1	22	7	EPDM		WRAS	042U4622	042U6122
				230V 50/60Hz 8W	WRAS	042U492232	042U652232
				24V 50/60Hz 9.5W	WRAS	042U492219	042U652219
			FKM			042U4623	042U6121
G114	32	15	EPDM		WRAS	042U4632	042U6132
				230V 50/60Hz 8W	WRAS	042u493232	
			FKM			042U4633	042U6131
G112	40	18	EPDM		WRAS	042U4640	042U6140
				230V 50/60Hz 8W	WRAS	042U494032	
			FKM			042U4641	042U6139
G2	50	32	EPDM		WRAS	042U4650	042U6150
				230V 50/60Hz 8W	WRAS	042u495032	
			FKM			042U4651	042U6149

5.2 Accessories

Coil

Figure 8: clip-on coils

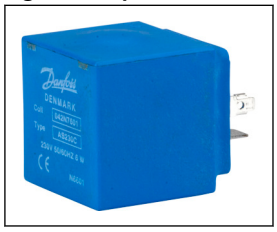


Table 7: AS/AZ compact UL recognised, clip-on coils

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 9: 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

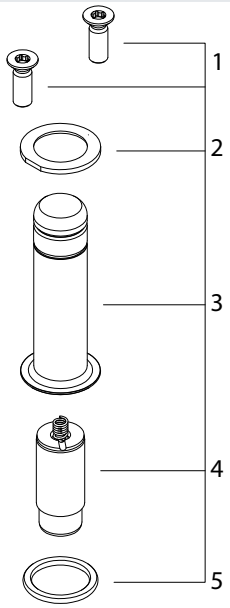
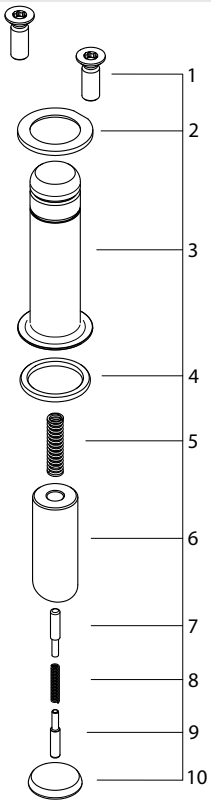
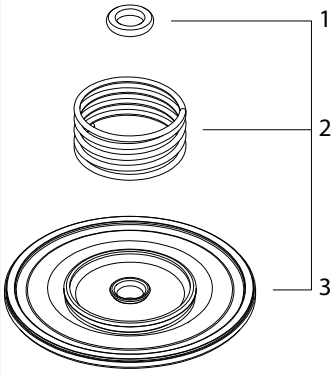
Figure 10: Type ET 20 M

Table 9: Type ET 20 M

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

Spare part kits

Table 10: Spare part kits EV220S DN10 to DN50

Type	Armature kit				Diaphragm kit	
	NC		NO		NC/NO	
	EPDM	FKM	EPDM	FKM	EPDM	FKM
Spare Part EV220S 10	042U2096	042U2097	042U2098	042U2099	042U2104	042U2105
Spare Part EV220S 13					042U2106	042U2107
Spare Part EV220S 14					042U2108	042U2109
Spare Part EV220S 17					042U2110	042U2111
Spare Part EV220S 22					042U2112	042U2113
Spare Part EV220S 32					042U2114	042U2115
Spare Part EV220S 40					042U2116	042U2117
Spare Part EV220S 50					042U2118	042U2119
						
	1. 2 x Screws 2. Washer 3. Armature tube 4. Armature + spring 5. O-ring		1. 2 x Screws 2. Washer 3. Armature tube 4. O-ring 5. Spring 6. Armature 7. Pin peek 8. Spring 9. Pin peek 10. Disk		1. O-ring 2. Spring 3. Diaprhagm	

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