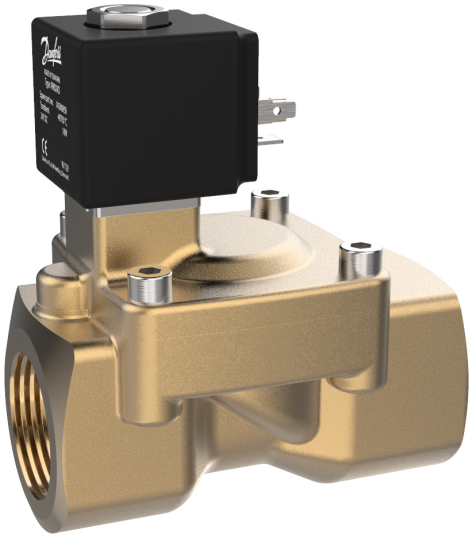
ENGINEERING TOMORROW

Data Sheet

Solenoid valve Type **EV220A**

Indirect servo operated for compact installation in various applications



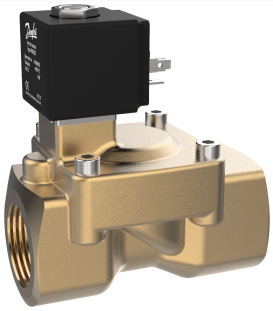
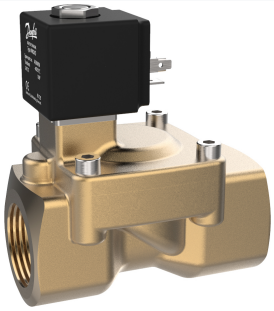
EV220A is a compact servo-operated 2/2-way solenoid valve program, especially designed for use in machines and equipment with limited space.

Features

- For water, oil, compressed air and similar neutral media
- Screw on coil
- Ambient temperatures: Up to 50 °C
- Enclosure: Up to IP65
- Low power consumption
- Liquid hammer damped

1 Portfolio overview

Table 1: Portfolio overview

Features	EV220A NC	EV220A NO
		
Body material	Brass	Brass
DN [mm]	6-50	6-22
Connection	G1/4" - G2"	G1/4" - G1"
Sealing material	EPDM, NBR, FKM	NBR
K_v [m^3/h]	1 - 32	1 - 7
Differential pressure range [bar]	0.2 - 16	0.2 - 16
Temperature range [°C]	-30 - 100	-10 - 90

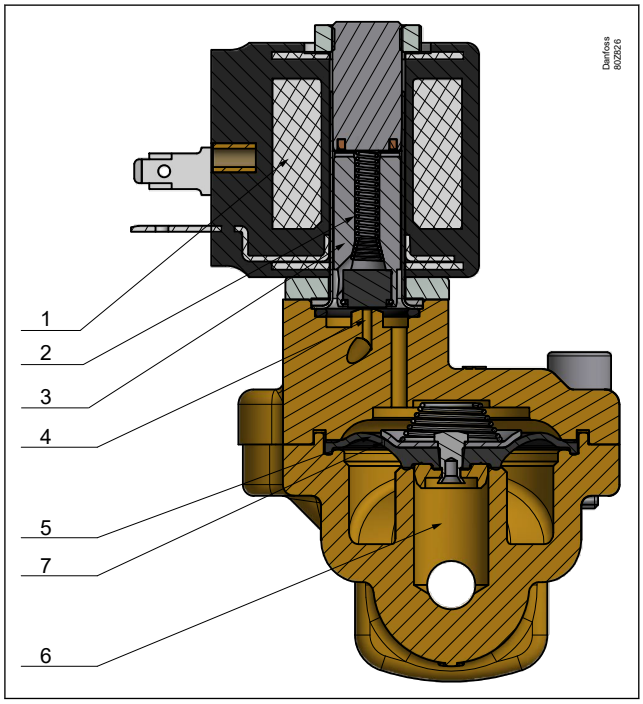
2 Functions

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 (7). The diaphragm closes the main orifice (6) 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 (7), pressure over the diaphragm (5) falls and the diaphragm is lifted clear of the main orifice (6). The valve stays open for as long as the required least differential pressure is present and voltage is applied to the coil.

Figure 1: Function, NC



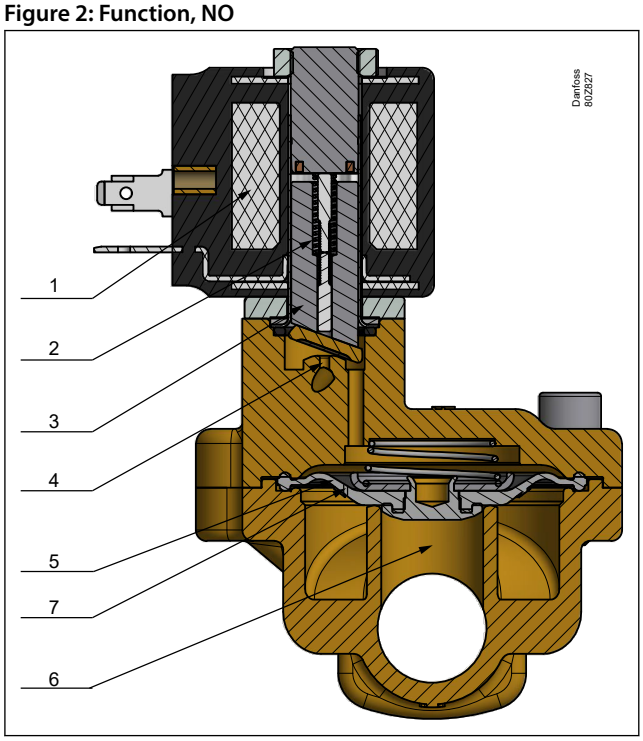
1.	Coil
2.	Armature spring
3.	Armature
4.	Pilot orifice
5.	Diaphragm
6.	Main orifice
7.	Equalizing orifice

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

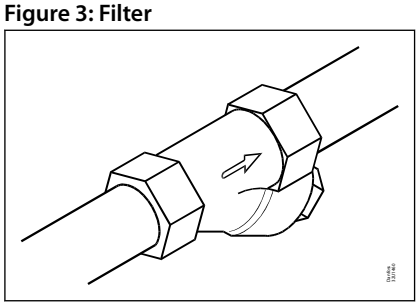


1.	Coil
2.	Armature spring
3.	Armature
4.	Pilot orifice
5.	Diaphragm
6.	Main orifice
7.	Equalizing orifice

3 Applications

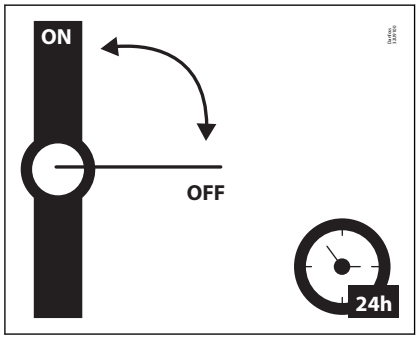
It is recommended to use a filter in front of the valve. Recommended filter 50 mesh (297 microns).

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.

4 Product specification

4.1 Technical data

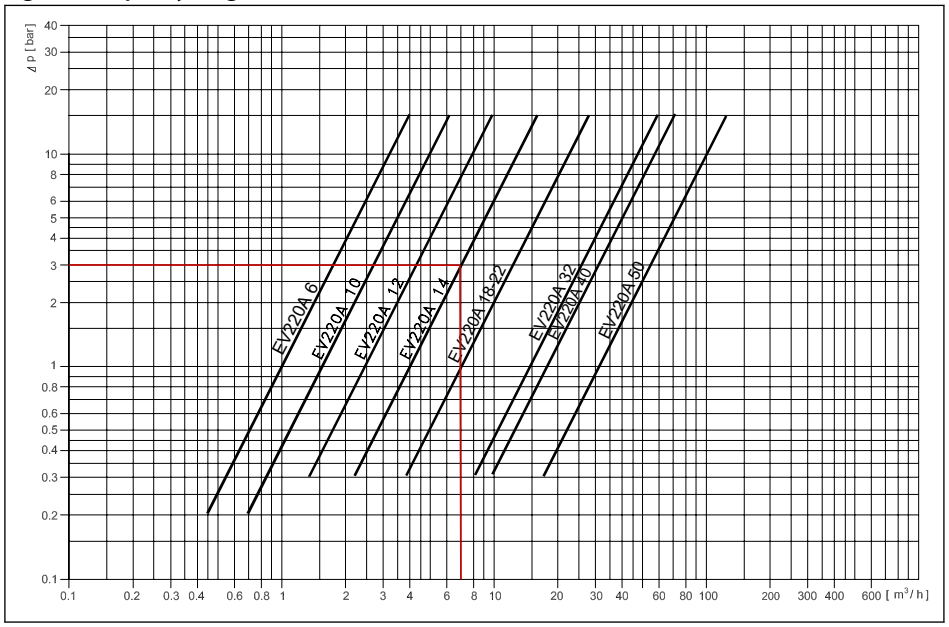
Table 2: Technical data

Media	NBR	For compressed air and oil
	FKM	For oil and air
	EPDM	For water
Media temperature [°C]	NBR	-10-90 °C
	FKM	0-100 °C (For water max 60 °C)
	EPDM	-30-100 °C
Ambient temperature [°C]	-40-50 °C	
K_v value [m³/h]	DN6	1 m³/h
	DN10	1.6 m³/h
	DN12	2.5 m³/h
	DN14	4 m³/h
	DN18	7 m³/h
	DN22	7 m³/h
	DN32	15 m³/h
	DN40	18 m³/h
	DN50	32 m³/h
Min. Opening differential pressure [bar]	DN6 - DN10	0.2 bar
	DN12 - 50	0.3 bar
Max. Opening differential pressure [bar]	DN6 - 50 EPDM/NBR	16 bar
	DN6 - 10 FKM	16 bar
	DN12 - 50 FKM	10 bar
Max. working pressure [bar]	Up to 16 bar (Equal to max. differential pressure)	
Max. test pressure [bar]	DN6 - 10	50 bar
	DN12 - 50	25 bar
Viscosity [cSt]	Max. 50 cSt	

Capacity diagram

Example for water: Capacity for EV220A at differential pressure of 3 bar: Approx. 7 m³h

Figure 5: Capacity diagram



Time to open/close

Table 3: Time to open/close

Type	EV220A 6B	EV220A 10B	EV220A 12B	EV220A 14B	EV220A 18B	EV220A 22B	EV220A 32B	EV220A 40B	EV220A 50B
Time to open [ms][1]	40	50	60	100	200	200	2500	4000	5000
Time to close [ms][1]	250	300	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

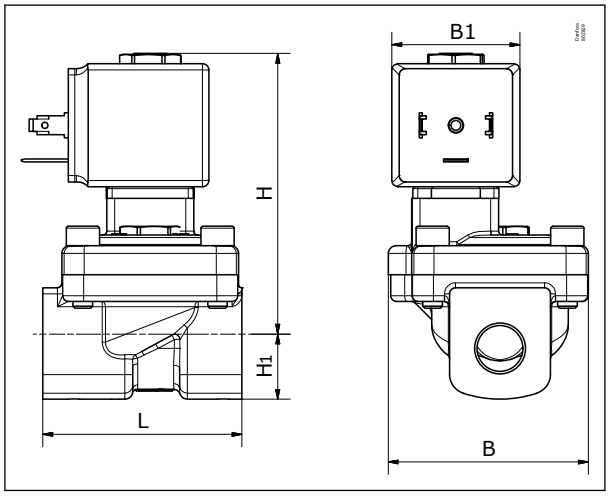
Components	Materials	Specification
Valve body/cover	Brass	W. no. 2.0401
Armature/armature stop	Stainless steel	W. no. 1.4105 / AISI 430FR
Armature tube	Stainless steel	W. no. 1.4303 / AISI 305
Spring	Stainless steel	W. no. 14310 / AISI 301
O-ring	NBR/EPDM/FKM	
Valve plate	NBR/EPDM/FKM	
Diaphragm	NBR/EPDM/FKM	

4.2 Dimensions and weights

Table 5: Dimensions and weights

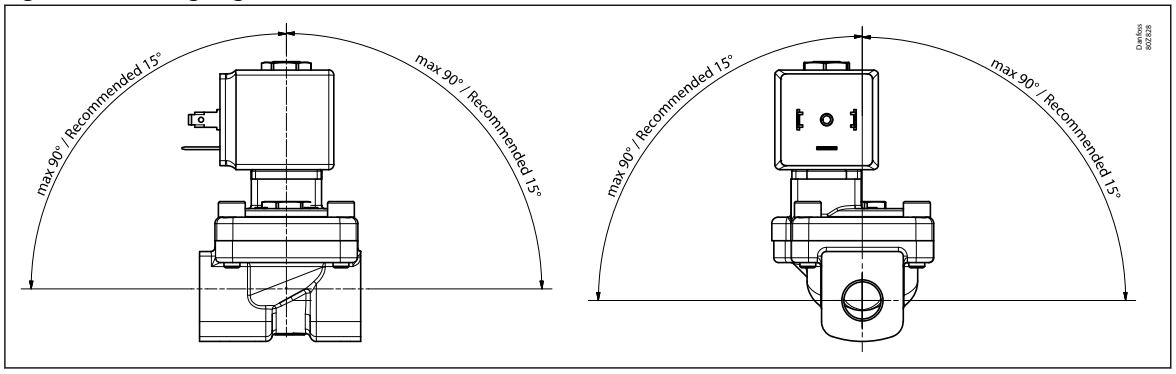
Type	Weight gross Valve body without coil	L	B	B1 [mm]	H1	H [mm]	
	[kg]	[mm]	[mm]	Coil AM	[mm]	NC	NO
EV220A 6B	0.46	51	50	33	13	76	80
EV220A 10B	0.44	51	50	33	13	76	80
EV220A 12B	0.52	58	58	33	13	77	81
EV220A 14B	0.50	58	58	33	13	77	81
EV220A 18B	0.72	90	58	33	18	78	82
EV220A 22B	1	90	58	33	22	83	87
EV220A 32B	2	120	82	33	27	95	
EV220A 40B	3.2	130	95	33	32	105	
EV220A 50B	4.3	162	113	33	37	111	

Figure 6: Dimensions



4.3 Mounting

Figure 7: Mounting angle



5 Ordering

5.1 Parts program

Table 6: Brass, valve body NC and NO

ISO228/1 connection	Orifice	K_v value	Sealing	Function	
	[mm]	[m³/h]	EPDM/NBR/FKM	NC	NO
G1/4	6	1	EPDM	042U4001	
			NBR	042U4003	042U4053
			FKM	042U4005	
G3/8	6	1	EPDM	042U4002	
			NBR	042U4004	
			FKM		
	10	1.6	EPDM	042U4011	
			NBR	042U4013	042U4064
			FKM	042U4015	
G1/2	10	1.6	EPDM	042U4012	
			NBR	042U4014	042U4073
			FKM	042U4016	
	12	2.5	EPDM	042U4021	
			NBR	042U4023	042U4074
			FKM	042U4025	
G1/2	14	4	EPDM	042U4022	
			NBR	042U4024	042U4082
			FKM	042U4026	
G3/4	18	7	EPDM	042U4031	
			NBR	042U4032	042U4092
			FKM	042U4033	
G1	22	7	EPDM	042U4041	
			NBR	042U4042	
			FKM	042U4043	
G11/4	32	15	EPDM	042U4085	
			NBR	042U4084	
			FKM	042U4095	
G11/2	40	18	EPDM	042U4087	
			NBR	042U4086	
			FKM	042U4096	
G2	50	32	EPDM	042U4089	
			NBR	042U4088	
			FKM	042U4097	

5.2 Accessories

Coil

Table 7: Below coil can be used with EV220A

Coil	Type	Power consumption	Enclosure
	AM	7.5 W AC 9.5 W DC	IP00 with spade connector IP65 with cable plug

Cable plug

Figure 8: Cable plug

Table 8: Cable plug

Application	Code no
GDM 2011 (grey) cable plug according to DIN 43650-A PG11	042N0156

Universal electronic multi-timer, Type ET 20 M

Figure 9: Type ET 20 M

Table 9: Type ET 20 M

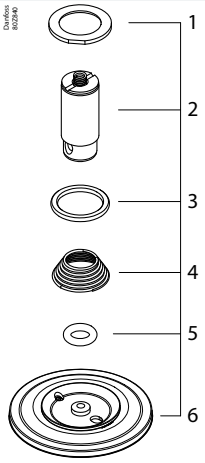
Type	Voltage	Suitable for coil types	Code no
	[V]		
BA024A	24 - 240	AL, AM, AS, AZ, BA, BD, BB	042N0185

Spare parts

Table 10: Spare parts kit, NC version

Type	Sealing		
	FKM	EPDM	NBR
EV220A 6-10B	042U1002	042U1000	042U1001
EV220A 12-14B	042U1005	042U1003	042U1004
EV220A 18-22B	042U1008	042U1006	042U1007
EV220A 32B		042U1037	042U1038
EV220A 40B		042U1039	042U1040

Type	Sealing		
	FKM	EPDM	NBR
EV220A 50B		042U1041	042U1042



1. Plastic washer
2. Armature assembly
3. O-ring
4. Diaphragm spring
5. O-ring
6. Diaphragm assembly

6 Online support

Danfoss offers a wide range of support along with our products, including digital product information, software, mobile apps, and expert guidance. See the possibilities below.

The Danfoss Product Store

The Danfoss Product Store is your one-stop shop for everything product related—no matter where you are in the world or what area of the cooling industry you work in. Get quick access to essential information like product specs, code numbers, technical documentation, certifications, accessories, and more.
Start browsing at store.danfoss.com.

Find technical documentation

Find the technical documentation you need to get your project up and running. Get direct access to our official collection of data sheets, certificates and declarations, manuals and guides, 3D models and drawings, case stories, brochures, and much more.

Start searching now at www.danfoss.com/en/service-and-support/documentation.

Danfoss Learning

Danfoss Learning is a free online learning platform. It features courses and materials specifically designed to help engineers, installers, service technicians, and wholesalers better understand the products, applications, industry topics, and trends that will help you do your job better.

Create your Danfoss Learning account for free at www.danfoss.com/en/service-and-support/learning.

Get local information and support

Local Danfoss websites are the main sources for help and information about our company and products. Find product availability, get the latest regional news, or connect with a nearby expert—all in your own language.

Find your local Danfoss website here: www.danfoss.com/en/choose-region.

Spare Parts

Get access to the Danfoss spare parts and service kit catalog right from your smartphone. The app contains a wide range of components for air conditioning and refrigeration applications, such as valves, strainers, pressure switches, and sensors.

Download the Spare Parts app for free at www.danfoss.com/en/service-and-support/downloads.