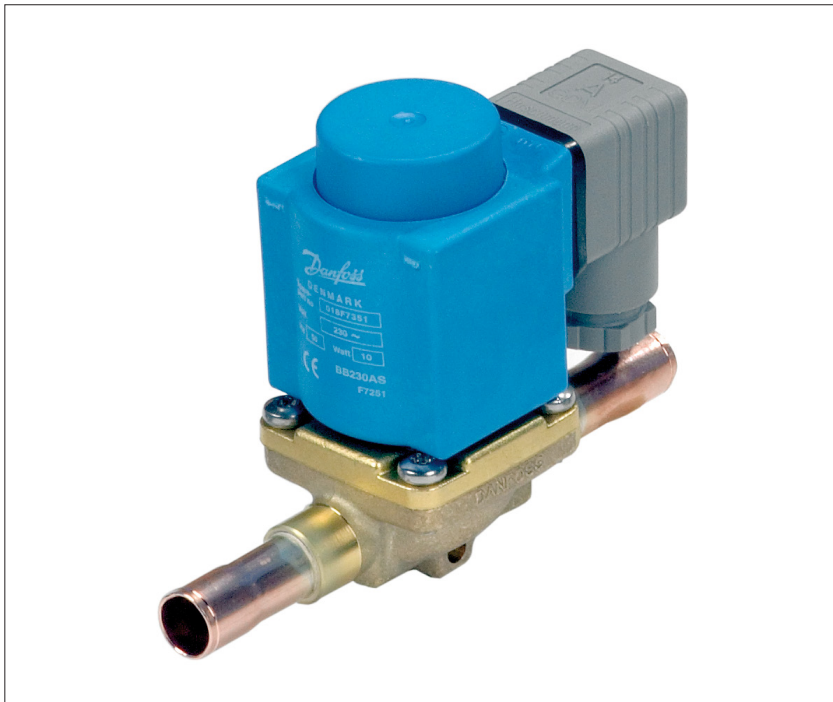


Data sheet

# Solenoid valve

Type EVO 100 - EVO 103



EVO solenoid valves are packed with coil BB230AS 230V/50Hz plus DIN plug and EVO direct or servo operated solenoid valve suitable for liquid, suction, and hot gas lines with most refrigerants, including flammable refrigerants.

## Features

- Complete range of solenoid valves for refrigeration, freezing and air conditioning plant
- Supplied in versions normally closed (NC) with de-energized coil
- Supplied with coil type BB230AS 230V/50Hz and DIN plug according to DIN 43650-A PG 11, enabling protection IP65 with mounted cable plug
- Suitable for most refrigerants, including flammable refrigerants
- Designed for media temperatures up to 105 °C
- Solder connections up to 16 mm and 5/8 in
- Extended ends on solder versions make the installation easy, eliminating the need to dismantle the valve when soldering in

## Approvals

- Pressure Equipment Directive (PED) 2014/68/EU
- Low Voltage Directive (LVD) 2014/35/EU
- EAC
- UA
- CQC
- RoHS II

**Technical data**

**Refrigerants**

R22/R407C, R134a, R404A/R507, R410A, R407A, R32, R290, R600, R600a, R1234yf, R1234ze, R404A, R407F, R407H, R125, R152A, R448A, R449A, R452A, and R450A.

For a complete list of approved refrigerants, visit [www.products.danfoss.com](http://www.products.danfoss.com) and search for individual code numbers, where refrigerants are listed as part of technical data.



**Special note for R152A, R32, R290, R600, R600a, R1234yf, and R1234ze:**

This product is validated in accordance to ISO 5149, IEC 60335. Ignition risk is evaluated in accordance to ISO 5149 and IEC 60335. See safety note at the bottom of this page.

**Media temperature**

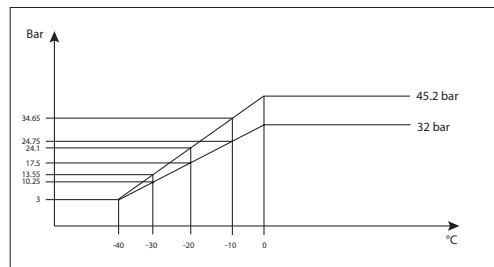
-40 – 105 °C  
Max. 130 °C during defrosting

**Ambient temperature and enclosure for coil**

80 °C IP65 with DIN plug mounted.

**Max. working pressure**

EVO solder connections: 45.2 bar.



Max. working pressure in bar in relation to media temperature in °C

**Capacity**

See  $K_v$  values from the table.

The  $K_v$  value is the water flow in [m<sup>3</sup>/h] at a pressure drop across valve of 1 bar,  $\rho = 1000 \text{ kg/m}^3$ .

See extended capacity tables later in this data sheet.

Type	Opening differential pressure with standard coil $\Delta p$ [bar]	
	Min.	Max. (= MOPD) liquid
		AC coil [10 W]
EVO 100	0.00	38
EVO 101	0.00	38
EVO 102	0.03	38
EVO 103	0.03	38



The EVO 100 - EVO 103 with solder connections can be applied on systems with R152A, R32, R290, R600, R600a, R1234yf, and R1234ze as the working fluid.

For countries where safety standards are not an indispensable part of the safety system Danfoss recommends the installer gets a third party approval of any system containing flammable refrigerant.

Note: please follow specific selection criteria stated in the datasheet for these particular refrigerants.

Data sheet | Solenoid valve, types EVO 100 - EVO 103

**Rated capacity [kW]**  
**For other refrigerants, refer to Coolselector®2**

EVO 101	R22/R407C	R134a	R404A/R507	R410A	R32	R290	R600a
<b>Liquid</b>							
EVO 100	3.02	2.79	2.04	2.96	4.23	3.36	3.38
EVO 101	5.43	5.02	3.68	5.32	7.61	6.05	6.09
EVO 102	17.90	16.56	12.12	17.55	25.09	19.93	20.07
EVO 103	37.62	34.80	25.47	36.88	52.71	41.88	42.17
<b>Suction vapour</b>							
EVO 100	0.33	0.24	0.29	0.42	0.54	0.41	0.23
EVO 101	0.60	0.44	0.52	0.75	0.96	0.73	0.41
EVO 102	1.98	1.44	1.72	2.48	3.18	2.42	1.35
EVO 103	4.15	3.02	3.62	5.22	6.67	5.09	2.83
<b>Hot gas</b>							
EVO 100	1.35	1.04	1.10	1.65	2.18	1.54	0.94
EVO 101	2.42	1.87	1.99	2.98	3.92	2.76	1.70
EVO 102	7.99	6.16	6.56	9.81	12.91	9.11	5.61
EVO 103	16.78	12.94	13.78	20.61	27.12	19.14	11.78

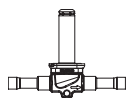
Rated liquid and suction vapor capacity is based on evaporating temperature  $t_e = -10\text{ °C}$ , liquid temperature ahead of valve  $t_l = 25\text{ °C}$ , pressure drop in valve  $\Delta p = 0.15\text{ bar}$ .

Rated hot gas capacity is based on condensing temperature  $t_c = 40\text{ °C}$ , pressure drop across valve  $\Delta p = 0.8\text{ bar}$ , hot gas temperature  $t_h = 65\text{ °C}$ , and subcooling of refrigerant  $\Delta t_{sub} = 4\text{ K}$ .

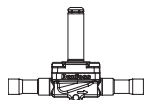
**Ordering**  
**EVO solder connection,**  
**Normally Closed (NC)**  
**- separate valve bodies**



EVO 100/EVO 101



EVO 102



EVO 103

Type	Solder connections		Kv value [m3/h]	Multipack quantity	EVO code no. (complete valves)
	[mm]	[inch]			
EVO 100	6		0.15	24	032L2010
EVO 100		1/4	0.15	24	032L2011
EVO 101	6		0.26	24	032L2030
EVO 101	10		0.26	24	032L2031
EVO 101		1/4	0.26	24	032L2032
EVO 102	10		1.0	12	032L2060
EVO 102	12		1.0	12	032L2061
EVO 103	12		2.2	12	032L2070
EVO 103	16	5/8	2.2	12	032L2071

All valves equipped with coil type BB230AS 230V/50 Hz code No. 018F7351 + DIN plug 042N0156

## Function

See Design drawings for additional details on the following pages

### **EVO solenoid valves are designed on two different principles:**

1. Direct operation
2. Servo operation

#### **1. Direct operation (NC)**

EVO 100 - EVO 101 are direct operated. The valves open directly for full flow when the armature (3) moves up into the magnetic field of the coil.

This means that the valves operate with a minimum differential pressure of 0 bar.

The seat plate is fitted directly on the armature (3).

Inlet pressure acts from above on the armature and the valve plate. Thus, the inlet pressure and spring force act to close the valve when there is no current in the coil.

#### **2. Servo operation (NC)**

EVO 102 - EVO 103 are servo operated with a "floating" diaphragm (4). The pilot orifice of stainless steel is placed in the center of the diaphragm. The seat plate is fitted directly to the armature (3). When there is no current in the coil, the main orifice and pilot orifice are closed. The pilot orifice and main orifice are held closed by the armature spring force and the differential pressure between inlet and outlet sides.

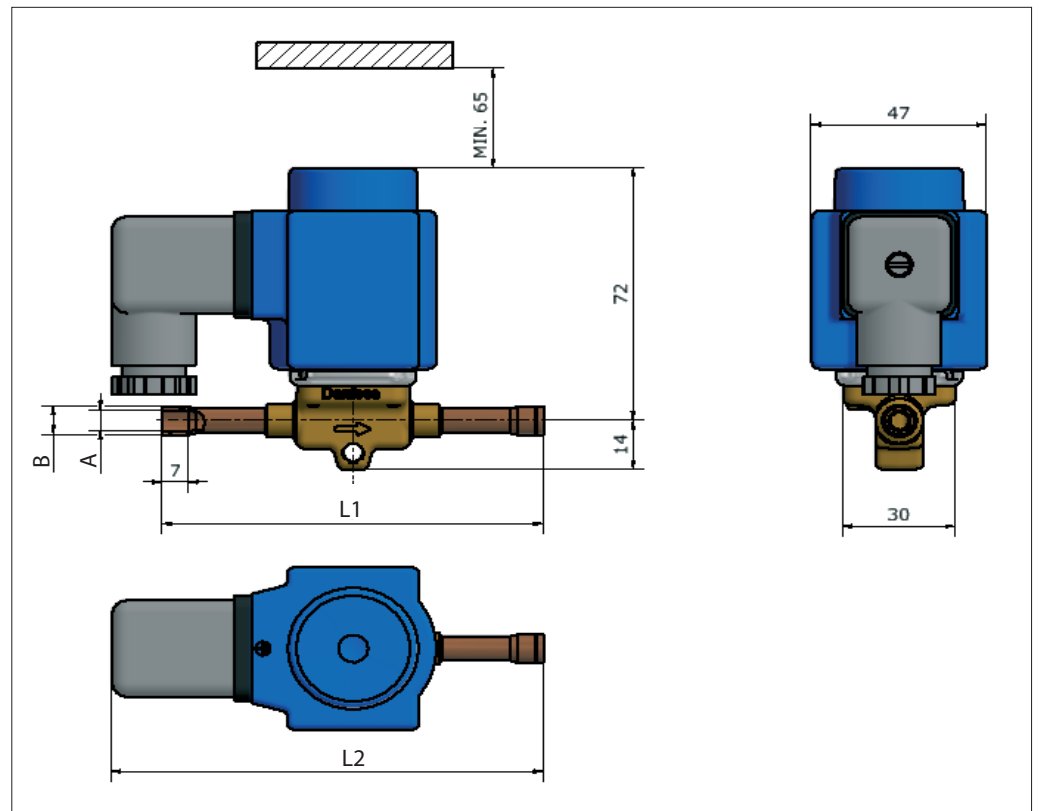
When current is applied to the coil, the armature is drawn up into the magnetic field and opens the pilot orifice. This relieves the pressure above the diaphragm, i.e. the space above the diaphragm becomes connected to the outlet side of the valve.

The differential pressure between inlet and outlet sides then presses the diaphragm away from the main orifice and opens it for full flow. Therefore a certain minimum differential pressure is necessary to open the valve and keep it open. EVO 102 - EVO 103 valves the minimum differential pressure for safe operation is 0.03 bar.

When the current is switched off, the pilot orifice is closed. Via the equalization holes in the diaphragm, the pressure above the diaphragm rises to the same value as the inlet pressure and the diaphragm closes the main orifice.

Alternatively, all EVO valves can be manually operated by removing the coil and force the valve open or closed by using a solenoid valve tester (permanent magnet) code no. 018F0091.

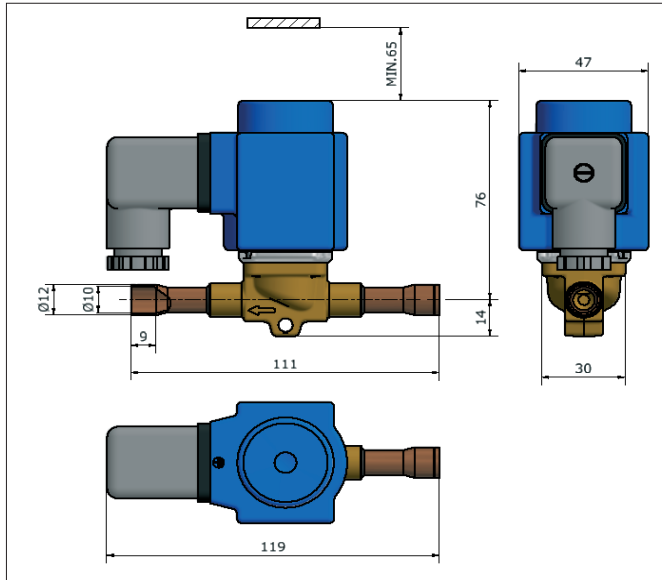
**EVO 100 - EVO 101**  
**Solder connection**  
**Dimensions [mm]**



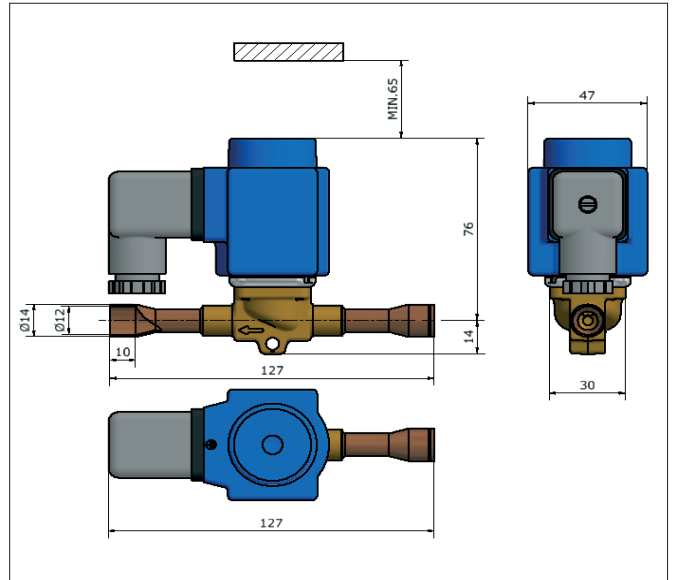
Type	Connection		Length		EVO code no. (complete valves)
	A	B	L1 [mm]	L2 [mm]	
EVO 100	6 mm	8 mm	101	115	032L2010
EVO 100	1/4 in	8 mm	101	115	032L2011
EVO 101	6 mm	8 mm	101	115	032L2030
EVO 101	10 mm	12 mm	117	123	032L2031
EVO 101	1/4 in	8 mm	101	115	032L2032

**EVO 102 - EVO 103 Solder connection - Dimensions [mm]**

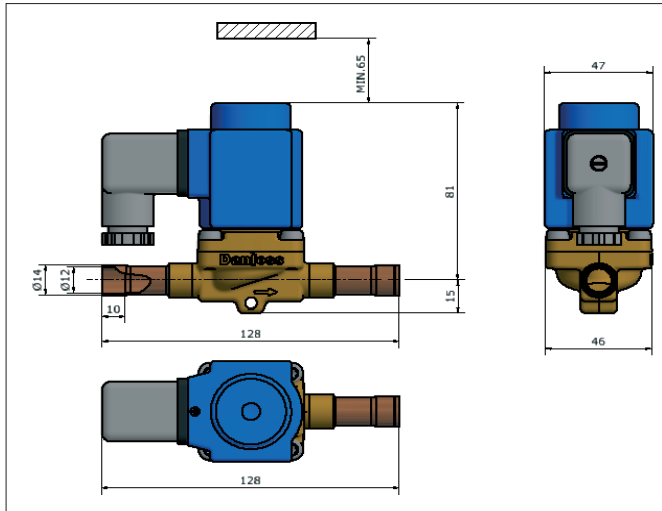
EVO 102 solder connection 10 mm (code no. 032L2060)



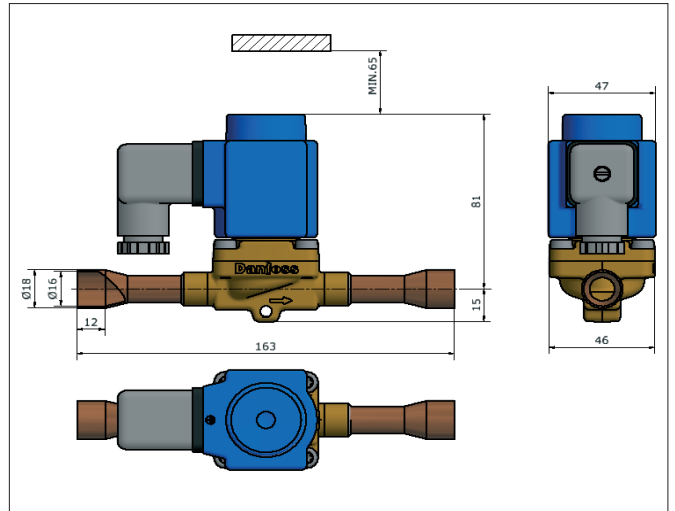
EVO 102 solder connection 12 mm (code no. 032L2061)



EVO 103 solder connection 12 mm (code no. 032L2070)



EVO 103 solder connection 16 mm / 5/8 in (code no. 032L2071)



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