Data sheet

Solenoid Valve Type EVR for Hydrocarbons

EVR for Hydrocarbons is a direct or servo operated solenoid valve especially designed for liquid, suction, and hot gas lines with R290 (Propane), R600 (Butane) and R600a (Iso-butane) as refrigerant. All valves are marked with a label ”Attention Fire Hazard” (B3.2./ISO 3864). Furthermore, the marking is made so that the valve can be identified through whole lifetime.

EVR for Hydrocarbons is supplied as separate component, i.e. valve body and coil must be ordered separately.

Features

- Refrigerants
  R290 (Propane), R600 (Butane),
  R600a (Iso-butane)
  For other refrigerants, please contact Danfoss.
- The valves are designed for media temperatures up to 105 °C
- Connections
  Solder connections up to $^7/_8$ in.
  Extended ends for soldering make installation easy. It is not necessary to dismantle the valve when soldering
- Coils
  Wide choice of coils for a.c. and d.c.
  Fast and safe mounting of ”Clip-on”-coil
  MOPD up to 25 bar with 14 W coil

Terms of delivery

It should be noted that special terms of delivery apply to Danfoss controls for HC and corresponding flammable refrigerants: Please refer to RZ0ZM. All inquiries for EVR for HC will be dealt with as “inquiries for special versions”.

Delivery agreements on components can only be entered into within the EU or EFTA, and the export and re-export of plants or sections of plants containing Danfoss components are also limited to the EU and EFTA.

Product technology

The use of Danfoss Danfoss EVR for HC for R290, R600 and R600a in refrigeration plant is subject to explosion protection regulations for danger zone 2 (only rare or short term threat).

EVR for HC is, therefore, developed for this above mentioned requirement.

EVR for HC complies with the requirements for explosive atmospheres (94/9/EC) ac. ATEX zone 2.

EVR for HC complies with the requirements in the Pressure Equipment Directive (PED) (97/23/EC) fluid group I (flammable/toxic media).

EVR for HC is marked with a label showing "Attention Fire Hazard" (B.3.2 / ISO 3864).

Only Danfoss valves and controls released for use with flammable hydrocarbons must be used with these substances. The actual medium must be stated in the product data sheet and/or on the product.

Only original Danfoss spare parts approved for use with flammable hydrocarbons must be used.

Technical safety requirements

EVR for HC must be located within the EU and comply with the existing EU legislation, such as the Pressure Equipment Directive (PED) (97/23/EC), the directive concerning potential explosive atmospheres (ATEX), EN 378 and other relevant EU legislation.

Must always comply with any local directive, legislation and any ohter regulation applying in the area of installation.

Installation and maintenance

Only authorized persons, who are certified in installing and maintaining refrigeration plant containing flammable hydrocarbons, must do the installation and maintenance.

All requirements from local authorities, regarding using hydrocarbons in refrigeration systems, must be fulfilled.
The refrigeration system must be designed so no abnormal impact (e.g. abnormal vibration, liquid hammer, or pressure pulsations) can create risk for damage of the refrigeration system during operation.

Only original Danfoss spare parts approved for use with flammable hydrocarbons must be used.

The Danfoss products are classified according to the ATEX (94/9/EC) directive. Danfoss takes no responsibility for the classification of the refrigeration system.

Technical data

Valve

Refrigerants	R290 (Propane)
	R600 (Butane)
	R600a (Iso-butane)
Temperature of medium	-20 – 105 °C with 11, 13 or 14 V coil
	Max. 130 °C shortly during defrosting

Coil

Ambient temperature	11 or 14 W, 50 Hz a.c. coil -25 – 80 °C
	13 W, 50/60 Hz a.c. coil -25 – 50 °C
	20 W d.c. coil -25 – 50 °C
Enclosure for coil	IP67
Max. voltage variation	a.c. double frequency coils: ±10%
	a.c. coils for 230 V: -15 – 10%
	20 W d.c. coils: ±10%

Type [1]	**Opening differential pressure with standard coil Δp [bar]**				**Temperature of medium**	**Max. working pressure PS/MWP**	**k_v-value** [2]
		Max. (= MOPD) liquid [3]					
	Min.	**11 W a.c.**	**14 W a.c.**	**20 W d.c.**	**[°C]**	**[bar]**	**[m³/h]**
EVR 3	0.0	21	25	18	-40 – 105	35	0.27
EVR 6	0.05	21	25	18	-40 – 105	35	0.8
EVR 10	0.05	21	25	18	-40 – 105	35	1.9
EVR 15	0.05	21	25	18	-40 – 105	32	2.6
EVR 20 (a.c.)	0.05	21	25	13	-40 – 105	32	5.0
EVR 20 (d.c.)	0.05	—	—	16	-40 – 105	32	5.0

[1] All types listed are for hydrocarbon as refrigerant
[2] The k_v-value is the water flow in [m³/h] at a pressure drop across valve of 1 bar, ρ = 1000 kg/m³.
[3] MOPD (Max. Opening Pressure Differential) for media in gas form is approx. 1 bar greater

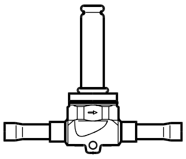
Type [1]	**Rated capacity [kW]**								
	Liquid			**Suction vapour**			**Hot gas**		
	R290	**R600**	**R600a**	**R290**	**R600**	**R600a**	**R290**	**R600**	**R600a**
EVR 3	6.36	7.12	6.35	0.76	0.41	0.46	2.70	1.78	1.87
EVR 6	18.80	21.10	18.80	2.26	1.20	1.35	8.00	5.26	5.55
EVR 10	44.65	50.12	44.65	5.38	2.85	3.21	19.00	12.50	13.19
EVR 15	61.10	69.59	61.10	7.36	3.90	4.39	26.00	17.11	18.04
EVR 20	117.50	131.90	117.50	14.15	7.50	8.45	19.00	12.50	13.19

[1] All types listed are for hydrocarbon as refrigerant

Rated liquid and suction vapour capacity is based on evaporating temperature t_e = -10 °C, liquid temperature ahead of the valve t_l = 25 °C, pressure drop in valve Δp = 0.15 bar.

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

Ordering

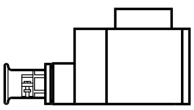


Valves

Type [1]	Connection		Code no. Solder ODF	
	[in.]	[mm]	[in.]	[mm]
EVRE 3	$^{1}/_{4}$	6	032G1004	032G1005
	$^{3}/_{8}$	—	032F1003	—
EVRE 6	$^{3}/_{8}$	—	032G1006	—
	$^{1}/_{2}$	—	032G1007	—
EVRE 10	$^{1}/_{2}$	—	032G1011	—
	—	16	—	032G1010
EVRE 15		16	—	032G1015
	$^{7}/_{8}$	—	032G1016	—
EVRE 20 (a.c.)	$^{7}/_{8}$	—	032G1020	—

[1] All types listed are for hydrocarbon as refrigerant

The EVR valves for HC must only be used with ATEX 94/9/EC approved coils for zone 2, mentioned in this data sheet.



Coils for EVR 3 – 20, a.c.

Voltage [V]	Frequency [Hz]	Code no. (with terminal box IP67)	Power consumption
24	50	**018F5707**	Holding: 11 W, 21 VA; In rush: 44 VA
230	50	**018F5701**	
240	50	**018F5702**	
230	50/60	**018F5732**	Holding: 13 W, 25 VA; In rush: 48 VA
24	50/60	**018F5727**	
24	50	**018F5807**	Holding: 14 W, 26 VA; In rush: 55 VA
110	50	**018F5811**	
230	50	**018F5801**	

Coils for EVR 3 – 20, d.c.

Voltage [V]	Frequency [Hz]	Code no. (with terminal box IP67)	Power consumption
24	—	**018F5857**	20 W

Must always be installed with fuse ahead of coil

Capacity

Liquid capacity Q_o [kW]

Type [1)]	Liquid capacity Q_o [kW] at pressure drop across valve Δp [bar]					
	0.1	0.15	0.2	0.3	0.4	0.5
R290 (Propane)						
EVR 3	5.20	6.35	7.33	8.98	10.36	11.61
EVR 6	15.40	18.80	21.70	26.60	30.70	34.40
EVR 10	36.58	44.65	51.55	63.18	72.92	81.70
EVR 15	50.05	61.10	70.54	86.45	99.79	111.80
EVR 20	96.25	117.50	135.65	166.25	191.90	215.00
R600 (Butane)						
EVR 3	5.81	7.12	8.20	10.06	11.61	13.00
EVR 6	17.20	21.10	24.30	29.80	34.40	38.50
EVR 10	40.85	50.12	57.72	70.78	81.70	91.45
EVR 15	55.90	68.59	78.99	96.85	111.80	125.14
EVR 20	107.50	131.90	151.90	186.25	215.00	240.65
R600a (Iso-butane)						
EVR 3	5.20	6.35	7.33	8.98	10.36	11.61
EVR 6	15.40	18.80	21.70	26.60	30.70	34.40
EVR 10	36.58	44.65	51.55	63.18	72.92	81.70
EVR 15	50.05	61.10	70.54	86.45	99.79	111.80
EVR 20	96.25	117.50	135.65	166.25	191.90	215.00

[1)] All types listed are for hydrocarbon as refrigerant

Capacities are based on liquid temperature t_l = 25 °C ahead of valve, evaporating temperature t_e = -10 °C superheat 0 K.

Correction factors
When sizing valves, the plant capacity must be multiplied by a correction factor depending on liquid temperature t_l ahead of valve/evaporator.

When the corrected capacity is known, the selection can be made from the table

Correction factors for liquid temperature t_l

t_l [°C]	-10	0	10	15	20	25	30	35	40	45	50
R290	0.77	0.82	0.88	0.92	0.96	1.0	1.05	1.10	1.16	1.23	1.31
R600	0.79	0.84	0.90	0.93	0.96	1.0	1.04	1.09	1.13	1.19	1.25
R600a	0.78	0.83	0.89	0.92	0.96	1.0	1.04	1.09	1.15	1.21	1.28

Capacity

Suction vapour capacity Q_o [kW]

Type [1)]	Pressure drop Δp [bar]	Suction vapour capacity Q_o [kW] at evaporating temperature t_e [°C]					
		-40	-30	-20	-10	0	10
R290 (Propane)							
EVR 3	0.1	0.32	0.41	0.51	0.62	0.76	0.90
	0.15	0.39	0.50	0.62	0.76	0.93	1.11
	0.2	0.45	0.58	0.72	0.88	1.07	1.28
EVR 6	0.1	0.94	1.21	1.50	1.85	2.24	2.68
	0.15	1.16	1.47	1.84	2.26	2.74	3.28
	0.2	1.33	1.70	2.12	2.61	3.16	3.79
EVR 10	0.1	2.24	2.87	3.57	4.39	5.32	6.37
	0.15	2.76	3.50	4.37	5.38	6.52	7.79
	0.2	3.15	4.05	5.04	6.19	7.51	9.01
EVR 15	0.1	3.07	3.93	4.89	6.01	7.28	8.71
	0.15	3.77	4.78	5.98	7.36	8.92	10.66
	0.2	4.32	5.54	6.89	8.48	10.27	12.32
EVR 20	0.1	5.90	7.55	9.40	11.55	14.00	16.75
	0.15	7.25	9.20	11.50	14.15	17.15	20.50
	0.2	8.30	10.65	13.25	16.30	19.75	23.70
R600 (Butane)							
EVR 3	0.1	—	0.20	0.26	0.33	0.42	0.51
	0.15	—	—	0.32	0.41	0.51	0.63
	0.2	—	—	—	0.47	0.51	0.63
EVR 6	0.1	—	0.58	0.77	0.98	1.24	1.52
	0.15	—	—	0.94	1.20	1.51	1.87
	0.2	—	—	—	1.38	1.74	2.15
EVR 10	0.1	—	1.39	1.82	2.34	2.95	3.61
	0.15	—	—	2.22	2.85	3.59	4.45
	0.2	—	—	—	3.29	4.14	5.11
EVR 15	0.1	—	1.90	2.50	3.20	4.03	4.94
	0.15	—	—	3.04	3.90	4.91	6.08
	0.2	—	—	—	4.50	5.67	6.99
EVR 20	0.1	—	3.65	4.80	6.15	7.75	9.50
	0.15	—	—	5.85	7.50	9.45	11.70
	0.2	—	—	—	8.65	10.90	13.45

[1)] All types listed are for hydrocarbon as refrigerant

Capacities are based on liquid temperature t_l = 25 °C ahead of evaporator.
The table values refer to the evaporator capacity and are given as a function of evaporating temperature t_e and pressure drop Δp across the valve.
Capacities are based on dry, saturated vapour ahead of valve.
During operation with superheated vapour ahead of valve, the capacities are reduced by 4% for each 10 K superheat.

Correction factors
When sizing valves, the evaporator capacity must be divided by a correction factor depending on liquid temperature t_l ahead of expansion valve.

When the corrected capacity is known, the selection can be made from the table

Correction factors for liquid temperature t_l

t_e [°C]	-10	0	10	15	20	25	30	35	40	45	50
R290	0.77	0.82	0.88	0.92	0.96	1.0	1.05	1.10	1.16	1.23	1.31
R600a	0.79	0.84	0.90	0.93	0.96	1.0	1.04	1.09	1.13	1.19	1.25

Capacity
(continued)

Suction vapour capacity Q_o [kW]

Type [1]	Pressure drop Δp [bar]	Suction vapour capacity Q_o [kW] at evaporating temperature t_e [°C]					
		-40	-30	-20	-10	0	10
R 600a (Iso-butane)							
EVR 3	0.1	0.17	0.23	0.29	0.38	0.47	0.58
	0.15	—	0.28	0.36	0.46	0.58	0.70
	0.2	—	0.32	0.42	0.53	0.66	0.81
EVR 6	0.1	0.51	0.67	0.87	1.11	1.38	1.70
	0.15	—	0.83	1.06	1.35	1.73	2.09
	0.2	—	0.94	1.23	1.56	1.94	2.40
EVR 10	0.1	1.22	1.60	2.07	2.64	3.29	4.05
	0.15	—	1.98	2.53	3.21	4.10	4.96
	0.2	—	2.24	2.93	3.71	4.62	5.70
EVR 15	0.1	1.66	2.18	2.83	3.61	4.50	5.54
	0.15	—	2.70	3.46	4.39	5.62	6.79
	0.2	—	3.07	4.00	5.07	6.32	7.80
EVR 20	0.1	3.20	4.20	5.45	6.95	8.65	10.65
	0.15	—	5.20	6.65	8.45	10.80	13.05
	0.2	—	5.90	7.70	9.75	12.15	15.00

[1] All types listed are for hydrocarbon as refrigerant

Capacities are based on liquid temperature t_l = 25 °C ahead of evaporator. The table values refer to the evaporator capacity and are given as a function of evaporating temperature t_e and pressure drop Δp across the valve. Capacities are based on dry, saturated vapour ahead of valve. During operation with superheated vapour ahead of valve, the capacities are reduced by 4% for each 10 K superheat.

Correction factors
When sizing valves, the evaporator capacity must be divided by a correction factor depending on liquid temperature t_l ahead of expansion valve.

When the corrected capacity is known, the selection can be made from the table

Correction factors for liquid temperature t_l

t_e [°C]	-10	0	10	15	20	25	30	35	40	45	50
R600a	0.78	0.83	0.89	0.92	0.96	1.0	1.04	1.09	1.15	1.21	1.28

Hot gas defrosting

With hot gas defrosting it is not normally possible to select a valve from condensing temperature t_c and evaporating temperature t_e.

This is because the pressure in the evaporator as a rule quickly rises to a value near that of the condensing pressure. It remains at this value until the defrosting is finished.

In most cases therefore, the valve will be selected from condensing temperature t_c and the pressure drop Δp across the valve, as shown in the example for heat recovery.

Heat recovery
The following is given:
Refrigerant: R290
Evaporating temperature: t_e= -30 °C
Condensing temperature: t_c= 40 °C
Hot gas temperature ahead of valve: t_h= 85 °C
Heat recovery condenser yield: Q_h= 8 kW

The correction factor for evaporating temperature t_e= -30° is given in the table as 1.06

The correction factor for hot gas temperature t_h= 85 °C has been calculated as 4%, which corresponds to a factor of 0.96
Q_h must be corrected with factors found:
$Q_h = 8 \times 1.06 \times 0.96 = 8.1$ kW

EVR 6 for HC would also be able to give the required capacity, but with Δp at approx. 0.8 bar. EVR 6 for HC is therefore too small.

EVR 10 for HC would be able to give the required capacity, but with Δp at approx. 0.2 bar.

EVR 15 for HC is so large that it is doubtful whether the necessary Δp at approx. 0.1 could be obtained.
EVR 15 for HC is therefore too large.

Result:
EVR 10 for HC is the correct valve for the given conditions.

Capacity

Hot gas capacity Qh [kW]

Type [1]	Pressure drop across the valve Δp [bar]	Evaporating temp. t_e = -10 °C, Hot gas temp. $t_h = t_c$+25 °C, Subcooling Δt_{sub} = 4 K — Condensing temperature t_c [°C] 20	30	40	50	60
R290 (Propane)						
EVR 3	0.1	0.94	0.97	0.97	0.95	0.89
	0.2	1.33	1.36	1.37	1.34	1.27
	0.4	1.88	1.93	1.93	1.89	1.79
	0.8	2.66	2.73	2.70	2.67	2.53
	1.6	3.78	3.86	3.87	3.78	3.58
EVR 6	0.1	2.79	2.86	2.87	2.80	2.65
	0.2	3.95	4.04	4.05	3.96	3.75
	0.4	5.58	5.72	5.73	5.60	5.30
	0.8	7.89	8.08	8.00	7.92	7.49
	1.6	11.20	11.43	11.48	11.20	10.61
EVR 10	0.1	6.63	6.80	6.82	6.65	6.29
	0.2	9.39	9.60	9.61	9.41	8.91
	0.4	13.26	13.59	13.60	13.30	12.60
	0.8	18.73	19.19	19.00	18.81	17.78
	1.6	26.60	27.15	27.27	26.60	25.19
EVR 15	0.1	9.07	9.31	9.33	9.10	8.61
	0.2	12.84	13.13	13.16	12.87	12.19
	0.4	18.15	18.59	18.62	18.20	17.34
	0.8	25.64	26.26	26.00	25.74	24.34
	1.6	36.40	37.15	37.31	36.40	34.48
EVR 20	0.1	17.45	17.90	17.95	17.50	16.55
	0.2	24.70	25.25	25.30	24.75	23.45
	0.4	34.90	35.75	35.80	35.00	33.15
	0.8	49.30	50.50	50.00	49.50	46.80
	1.6	70.00	71.45	71.75	70.00	66.30

[1] All types listed are for hydrocarbon as refrigerant

An increase in hot gas temperature t_h of 10 K, based on $t_h = t_c$+25 °C, reduces valve capacity approx. 2% and vice versa.
A change in evaporating temperature t_e changes valve capacity; see correction factor table below.

Correction factors
When sizing valves, the table value must be multiplied by a correction factor depending on evaporting temperature t_e.

When the corrected capacity is known, the selection can be made from the table.

Correction factors for evaporating temperature t_e

t_e [°C]	-40	-30	-20	-10	0	10
R290	1.09	1.06	1.03	1	0.97	0.93

Capacity
(continued)

Hot gas capacity Qh [kW]

Type [1]	Pressure drop across the valve Δp [bar]	Evaporating temp. t_e = -10 °C Hot gas temp. $t_h = t_c$+25 °C Subcooling Δt_{sub} = 4 K Condensing temperature t_c [°C] 20	30	40	50	60
R600 (Iso-butane)						
EVR 3	0.1	0.58	0.60	0.63	0.65	0.65
	0.2	0.82	0.85	0.89	0.91	0.92
	0.4	1.16	1.20	1.25	1.29	1.30
	0.8	—	1.69	1.78	1.82	1.83
	1.6	—	—	—	2.58	2.59
EVR 6	0.1	1.71	1.77	1.87	1.91	1.92
	0.2	2.43	2.51	2.62	2.70	2.71
	0.4	3.43	3.55	3.71	3.82	3.84
	0.8	—	5.01	5.26	5.40	5.43
	1.6	—	—	—	7.64	7.68
EVR 10	0.1	4.07	4.20	4.45	4.54	4.56
	0.2	5.78	5.97	6.23	6.42	6.44
	0.4	8.15	8.44	8.82	9.08	9.12
	0.8	—	11.89	12.50	12.83	12.90
	1.6	—	—	—	18.15	18.24
EVR 15	0.1	5.56	5.75	6.08	6.21	6.24
	0.2	7.90	8.16	8.53	8.79	8.81
	0.4	11.15	11.54	12.06	12.43	12.48
	0.8	—	16.28	17.11	17.55	17.65
	1.6	—	—	—	24.83	24.96
EVR 20	0.1	10.70	11.05	11.70	11.95	12.00
	0.2	15.20	15.70	16.40	16.90	16.95
	0.4	21.45	22.20	23.20	23.90	24.00
	0.8	—	31.30	32.90	33.75	33.95
	1.6	—	—	—	47.75	48.00

[1] All types listed are for hydrocarbon as refrigerant

An increase in hot gas temperature t_h of 10 K, based on $t_h = t_c$+25 °C, reduces valve capacity approx. 2% and vice versa.
A change in evaporating temperature t_e changes valve capacity; see correction factor table below.

Correction factors
When sizing valves, the table value must be multiplied by a correction factor depending on evaporting temperature t_e.

When the corrected capacity is known, the selection can be made from the table.

Correction factors for evaporating temperature t_e

t_e [°C]	-40	-30	-20	-10	0	10
R600	—	—	1.02	1	0.98	0.95

Capacity
(continued)

Hot gas capacity Qh [kW]

Type [1)]	Pressure drop across the valve Δp [bar]	Evaporating temp. t_e= -10 °C Hot gas temp. t_h = t_c+25 °C Subcooling Δt_{sub}= 4 K Condensing temperature t_c [°C] 20	30	40	50	60
R600a (Iso-butane)						
EVR 3	0.1	0.62	0.65	0.66	0.67	0.66
	0.2	0.87	0.91	0.94	0.95	0.93
	0.4	1.23	1.29	1.33	1.34	1.31
	0.8	1.74	1.82	1.87	1.89	1.86
	1.6	—	—	2.66	2.67	2.63
EVR 6	0.1	1.82	1.91	1.97	1.98	1.95
	0.2	2.57	2.70	2.78	2.80	2.75
	0.4	3.63	3.81	3.93	3.96	3.89
	0.8	5.14	5.40	5.55	5.60	5.50
	1.6	—	—	7.87	7.91	7.79
EVR 10	0.1	4.33	4.54	4.67	4.71	4.64
	0.2	6.10	6.42	6.61	6.65	6.54
	0.4	8.63	9.04	9.33	9.41	9.23
	0.8	12.22	12.83	13.19	13.30	13.07
	1.6	—	—	18.70	18.79	18.51
EVR 15	0.1	5.93	6.21	6.40	6.45	6.34
	0.2	8.35	8.79	9.05	9.10	8.94
	0.4	11.80	12.38	12.77	12.87	12.64
	0.8	16.72	17.55	18.04	18.20	17.89
	1.6	—	—	25.58	25.71	25.32
EVR 20	0.1	11.40	11.95	12.30	12.40	12.20
	0.2	16.05	16.90	17.40	17.50	17.20
	0.4	22.70	23.80	24.55	24.75	24.30
	0.8	32.15	33.75	34.70	35.00	34.40
	1.6	—	—	49.20	49.45	48.70

[1)] All types listed are for hydrocarbon as refrigerant

An increase in hot gas temperature t_h of 10 K, based on t_h= t_c+25 °C, reduces valve capacity approx. 2% and vice versa.
A change in evaporating temperature t_e changes valve capacity; see correction factor table below.

Correction factors
When sizing valves, the table value must be multiplied by a correction factor depending on evaporting temperature t_e.

When the corrected capacity is known, the selection can be made from the table.

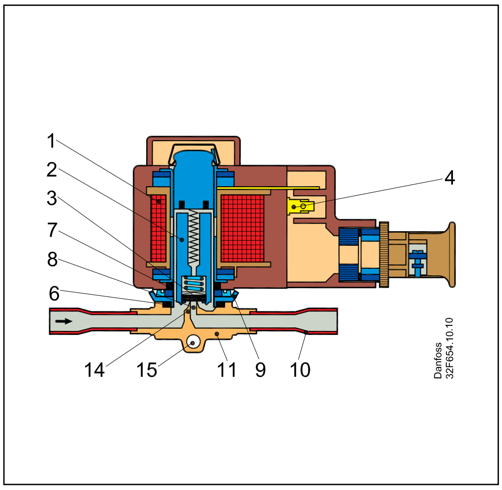
Correction factors for evaporating temperature t_e

t_e [°C]	-40	-30	-20	-10	0	10
R600a	—	1.04	1.02	1	0.98	0.95

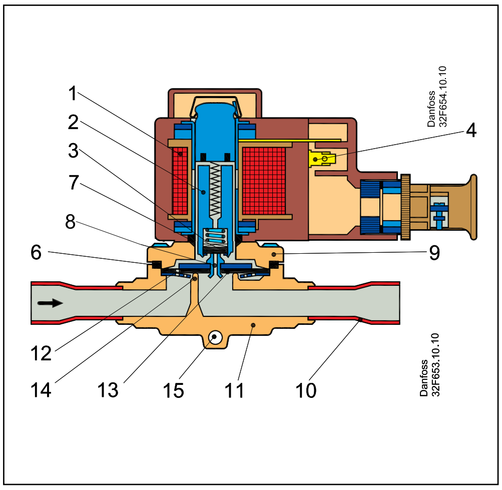
Design / Function

1. Coil
2. Armature
3. Valve plate / Pilot valve plate
4. DIN plug
5. Connection for flexible steel hose
6. Gasket
7. O-ring
8. Pilot orifice
9. Valve cover
10. Solder connection
11. Valve body
12. Equalization hole
13. Diaphragm
14. Valve seat
15. Mounting hole

EVR 3



EVR 10 (NC)



EVR solenoid valves for HC are designed on two different principles:
1. Direct operation
2. Servo operation

1. Direct operation
EVR 3 for HC is direct operated. The valve opens directly for full flow when the armature (2) moves up into the magnetic field of the coil. This means that the valve operates with a min. differential pressure of 0 bar.

The valve plate (3) is fitted directly on the armature (2).

Inlet pressure acts from above on the armature and the valve plate. Thus, inlet pressure and spring force, act to close the valve when the coil is de-energised.

2. Servo operation
EVR 6 – 20 for HC are servo operated with a "floating" diaphragm (13). The stainless steel pilot orifice (8) is placed in the centre of the diaphragm. The pilot valve plate (3) is fitted directly on the armature (2).
When the coil is de-energised, the main orifice and pilot orifice are closed. The pilot orifice and main orifice are held closed the armature spring force and the differential pressure between inlet and outlet sides.

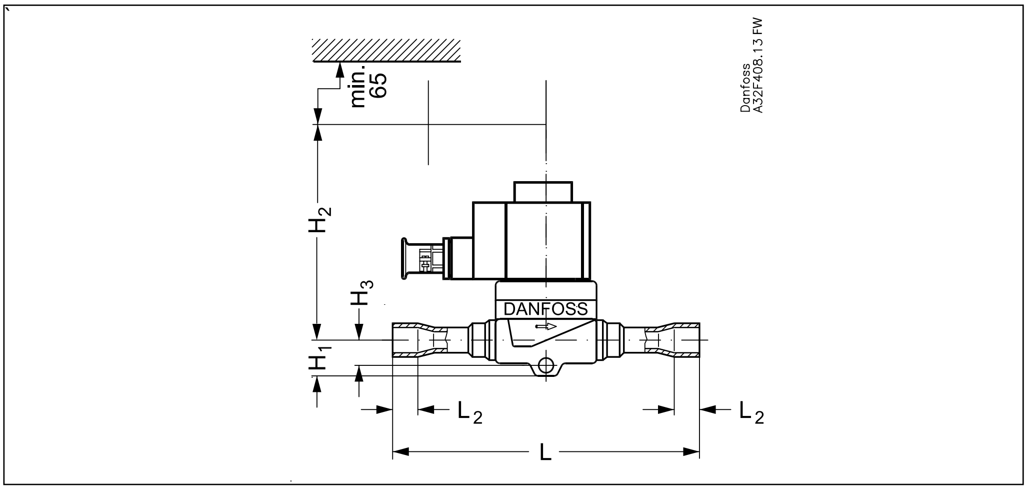
The differential pressure between inlet and outlet sides then presses the diaphragm away from the main orifice and opens it for full flow. Therefore a certain minimum differential pressure is necessary to open the valve and keep it open.

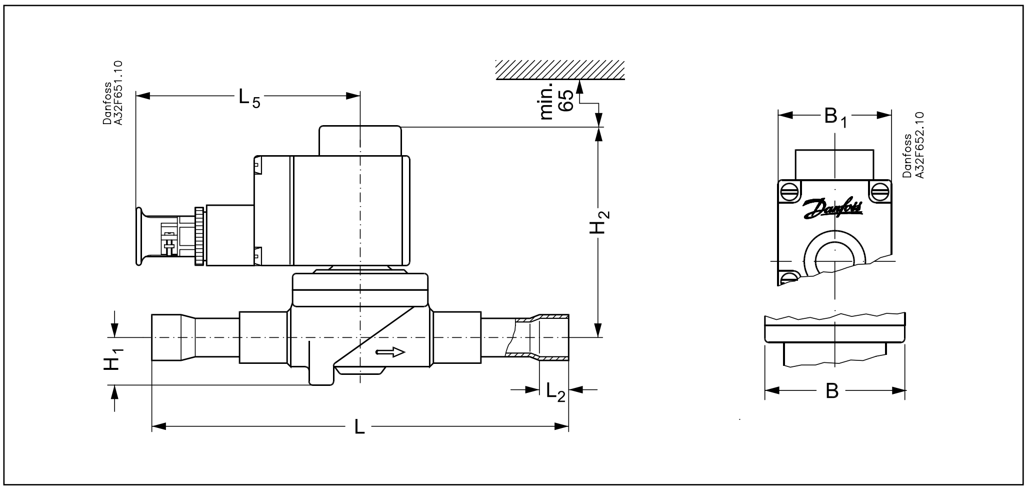
For EVR 6 – 20 valves for HC this differential pressure is 0.05 bar.

When current is switched off, the pilot orifice closes. Via the equalization hole (12) in the diaphragm, the pressure above the diaphragm then rises to the same value as the inlet pressure and the diaphragm closes the main orifice.

Dimensions [mm] and weights [kg]

EVR (NC) 3 – 20 for HC with solder connection





Net weight of coil
11 and 13 W: approx. 0.3 kg
14 and 20 W: approx. 0.5 kg

Type [1)]	Connection Solder [in.]	Connection Solder [mm]	H_1	H_2	H_3	H_4	L	L_2	L_5 max. 11/13 W	L_5 max. 14/20 W	B	B_1 max.	Net weight with coil [2)]
EVR 3	$^{1}/_{4}$	6	14	71	9	—	102	7	95	115	33	68	0.6
	$^{3}/_{8}$	10	14	73	9	—	117	9	95	115	33	68	0.6
EVR 6	$^{3}/_{8}$	10	14	78	10	—	111	9	95	115	36	68	0.6
	$^{1}/_{2}$	12	14	78	10	—	127	10	95	115	36	68	0.6
EVR 10	$^{1}/_{2}$	12	16	79	11	—	127	10	95	115	46	68	0.7
	$^{5}/_{8}$	16	16	79	11	—	160	12	95	115	46	68	0.7
EVR15	$^{5}/_{8}$	16	19	86	—	49	176	12	95	115	56	68	1.0
	$^{7}/_{8}$	22	19	86	—	—	176	17	95	115	56	68	1.0
EVR 20	$^{7}/_{8}$	22	20	90	—	53	191	17	95	115	72	68	1.5

[1)] All types listed are for hydrocarbon as refrigerant
[2)] Coil dependent