Data sheet

Solenoid valves
Type EVU

EVU solenoid valves are designed to fit into compact refrigeration systems. Available in direct and pilot operated versions, they can be applied in liquid, suction, and hot gas lines with fluorinated refrigerants.

EVU solenoid valves can be used in many different refrigeration systems and are specially designed for:
- commercial refrigeration systems
- refrigeration appliances
- liquid coolers
- ice cube machines
- mobile refrigeration systems
- heat pump systems
- air conditioning units

EVU valves are available in straightway or angleway design. All valves are semi hermetically sealed and are not serviceable. The standard coil is available with 3-core cable connection, DIN plug and 0.25 US spade.

EVU valve bodies and coils are ordered separately in industrial pack.

Features

- Compact construction small dimensions, low weight for both valve and coil.
- Semi-hermetic construction. Metallic sealing between armature tube and valve body. Bimetal connections to the brass housing benefits:
  – high strength of joints and high vibration resistance
  – maximum external tightness within the whole temperature and pressure operation range
- Bimetal connections simple, fast soldering without the need of wet cloth or refrigration pliers.
- Direct and servo operated mini piston compact solenoid valve.
- Universal application for
  – liquid, suction, and hot gas applications
  – reduced power consumption
- Simple and fast mounting of coil
  – clip-on/off
- Small encapsulated coils with long life time under extreme conditions.
- Refrigerants:
  R744, R22/R407C, R404A/R507, R410A, R134a, R407A, R23.
  For other refrigerants, please contact Danfoss.
- Large MOPD range – up to 36 bar.

Approvals

Underwriter laboratories PED (97/23/EC A3.P3)

Low Voltage Directive (LVD) 2006/95/EC

Technical data

Refrigerants
R744, R22/R407C, R404A/R507, R410A, R134a, R407A, R23. For other refrigerants, please contact Danfoss.

Temperature of medium
-40 – 105 °C max. 130 °C during defrosting

Ambient temperature
-40 – 60 °C

MOPD operating range
0.02 bar up to 36 bar

Type	Opening differential pressure with standard coil Δp [bar]			Temperature of medium	Max. working pressure Ps	k_v-value [1]
	Min.	Max. (=MOPD) liquid [2]				
		6 W a.c.	14 W d.c.	[°C]	[bar]	[m³/h]
EVU 1	0.00	24 [3]	19	-40 – 105	70	0.10
EVU 2	0.02	36	28	-40 – 105	70	0.20
EVU 3	0.02	36	28	-40 – 105	70	0.30
EVU 4	0.02	36	28	-40 – 105	70	0.50
EVU 5	0.02	36	28	-40 – 105	70	0.65
EVU 6	0.02	36	28	-40 – 105	70	0.80
EVU 8	0.02	36	25	-40 – 105	70	1.00

[1] The k_v value is the water flow in m³/h at a pressure drop across the valve of 1 bar, ρ = 1000 kg/m³.

[2] MOPD for media in gas form is approx. 8 bar higher.

[3] For coil 208-240 V, 60 Hz, MOPD is 17 bar.

MOPD is measured with highest media and ambient temperature and 15% below nominal voltage.

Rated liquid and suction 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 th = 65 °C and subcooling of refrigerant Δt_{sub} = 4 K.

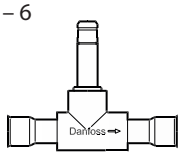
Type	Rated capacity [kW]											
	Liquid				Suction vapour				Hot gas			
	R22/ R407C	R134a	R404A/ R507	R410A	R22/ R407C	R134a	R404A/ R507	R410A	R22/ R407C	R134a	R404A/ R507	R410A
EVU 1	2.01	1.85	1.40	2.01	0.23	0.16	0.20	0.29	0.93	0.73	0.75	1.40
EVU 2	4.02	2.96	2.24	3.22	0.45	0.33	0.40	0.58	1.85	1.47	1.51	2.79
EVU 3	6.03	5.55	4.20	6.03	0.68	0.49	0.60	0.87	2.78	2.20	2.26	4.19
EVU 4	10.05	9.25	7.00	10.05	1.30	0.82	1.00	1.45	4.63	3.67	3.77	6.99
EVU 5	13.07	12.03	9.10	13.07	1.46	1.06	1.30	1.89	6.01	4.77	4.90	9.81
EVU 6	16.08	14.80	11.20	16.08	1.80	1.30	1.60	2.32	7.40	5.86	6.02	11.18
EVU 8	20.10	18.50	14.00	20.10	2.25	1.63	2.00	2.90	9.25	7.33	7.53	13.97

Capacity R744
Due to the fact that EVU only can be used for sub critical R744 application, capacity tables are not illustrated in this technical leaflet. For capacity dimension please refer to Danfoss' interactive calculation and selection tool CoolSelector® (DIR Calc).

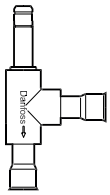
Ordering valve

Normally closed NC

EVU 1– 6



EVU 8

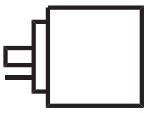


Type	Connection		Code no.	
	[in.]	[mm]	[in.]	[mm]
EVU 1	1/4	6	**032F7005**	**032F7004**
EVU 2	1/4	6	—	**032F5053**
EVU 3	1/4	6	**032F5024**	**032F5025**
EVU 3	3/8	10	**032F5026**	**032F5027**
EVU 4	1/4	6	—	—
EVU 4	3/8	10	—	**032F5037**
EVU 5	3/8	10	**032F7000**	**032F7001**
EVU 5	1/2	12	—	**032F7003**
EVU 6	3/8	10	**032F5046**	**032F5047**
EVU 6	1/2	12	**032F5049**	**032F5048**
EVU 8	1/2	12	—	**032F8009**

Ordering Coils

Alternating current a.c.

DIN spade connection



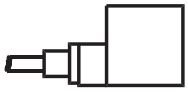
Type	Voltage	Frequency	Code no.		Power consumption
	[V]	[Hz]	Industrial pack with DIN plug [1] IP65	single pack	
EVU 1, EVU 2, EVU 3, EVU 4, EVU 5, EVU 6, EVU 8	24	50 / 60	—	**042N7608**	Holding: 6 W 12 VA In rush: 26 VA
	230	50 / 60	—	**042N7601**	
	240	50 / 60	—	**042N7602**	

[1] The three pins on the coil can be fitted with spade tabs, 6.3 mm wide (to DIN 46247). The two current carrying pins can also be fitted with spade tabs, 4.8. mm wide. Max. lead cross section: 1.5 mm².

If DIN plug is used (DIN 43650) the leads must be connected in the socket. The socket is fitted with a Pg 11 screwed entry for 6 – 12 mm.

Alternating current a.c.

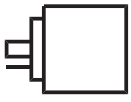
Cable connection



Type	Voltage	Frequency	Code no.		Power consumption
	[V]	[Hz]	Industrial pack with 1 m cable IP67	single pack	
EVU 1, EVU 2, EVU 3, EVU 4, EVU 5, EVU 6, EVU 8	115	50 / 60	—	**042N7662**	Holding: 6 W 12 VA In rush: 26 VA
	230	50 / 60	**042N8651**	**042N7651**	
	240	50 / 60	**042N8652**	—	

Alternating current a.c.

US DIN spade connection

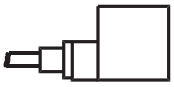


Type	Voltage	Frequency	Code no.		Power consumption
	[V]	[Hz]	Industrial pack with US DIN spade IP00	single pack	
EVU 1, EVU 2, EVU 3, EVU 4, EVU 5, EVU 6, EVU 8	208 – 240	50 / 60	**042N8201**	—	Holding: 7 W 14 VA In rush: 28 VA
	24	50 / 60	**042N8203**	—	

Ordering Coils

Direct current d.c.

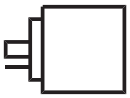
Cable connection



Type	Voltage [V]	Code no. Industrial pack with 1 m cable IP67	Code no. single pack	Power consumption
EVU 1, EVU 2, EVU 3, EVU 4, EVU 5, EVU 6, EVU 8	12	**042N8696**	**042N7696**	14 W
	24	**042N8697**	**042N7697**	14 W

Direct current d.c.

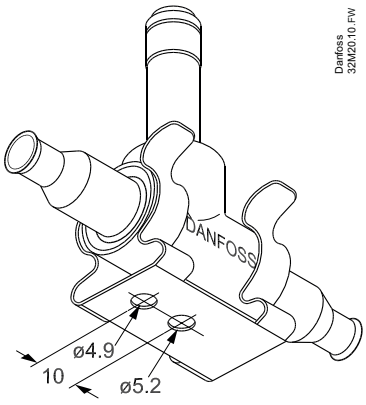
DIN spade connection



Type	Voltage [V]	Code no. Industrial pack with DIN spade IP00	Code no. single pack	Power consumption
EVU 1, EVU 2, EVU 3, EVU 4, EVU 5, EVU 6, EVU 8	12	**042N8686**	—	14 W
	24	**042N8687**	**042N7687**	14 W

* DC coils with 0.25 in. US spade can be supplied on request.

Accessories

Part	Description	Code no.
	DIN plug	**042N0156**
	O-ring for sealing the coil. Industrial pack (50 pcs.) **NB: Valve body suppplied with O-ring**	**032F6115**
	Bracket for fixing of valve. Industrial pack	**032F8036**

Capacity
Liquid capacity Q_l [kW]

Type	Liquid capacity Q_o [kW] at pressure drop across valve Δp [bar]					
	0.10	0.15	0.20	0.30	0.40	0.50
R22/R407C						
EVU 1	1.64	2.01	2.33	2.85	3.29	3.68
EVU 2	3.28	4.02	4.66	5.70	6.58	7.36
EVU 3	4.92	6.03	6.99	8.55	9.87	11.04
EVU 4	8.20	10.05	11.65	14.25	16.45	18.40
EVU 5	10.66	13.07	15.15	18.53	21.39	23.92
EVU 6	13.12	16.08	18.65	22.80	26.32	29.44
EVU 8	16.40	20.10	23.30	28.50	32.90	36.80
R134a						
EVU 1	1.52	1.85	2.14	2.63	3.03	3.39
EVU 2	2.43	2.96	3.42	4.21	4.85	5.42
EVU 3	4.56	5.55	6.42	7.89	9.09	10.17
EVU 4	7.60	9.25	10.70	13.15	15.15	16.95
EVU 5	9.88	12.03	13.91	17.10	19.70	22.04
EVU 6	12.16	14.80	17.12	21.04	24.24	27.12
EVU 8	15.20	18.50	21.40	26.30	30.30	33.90

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 factor for liquid temperature t_l

t_v [°C]	-10	0	10	15	20	25	30	35	40	45	50
R22/R407C	0.76	0.82	0.88	0.92	0.96	1.00	1.05	1.10	1.16	1.22	1.30
R134a	0.73	0.79	0.86	0.90	0.95	1.00	1.06	1.12	1.19	1.27	1.37

Capacity
Liquid capacity Q_l [kW]
(continued)

Type	Liquid capacity Q_o [kW] at pressure drop across valve Δp [bar]					
	0.10	0.15	0.20	0.30	0.40	0.50
R404A/R507						
EVU 1	1.52	1.40	1.62	1.99	2.29	2.57
EVU 2	1.84	2.24	2.59	3.18	3.66	4.11
EVU 3	3.45	4.20	4.86	5.97	6.87	7.71
EVU 4	5.75	7.00	8.10	9.95	11.45	12.85
EVU 5	7.48	9.10	10.53	12.94	14.89	16.71
EVU 6	9.20	11.20	12.96	15.92	18.32	20.56
EVU 8	11.50	14.00	16.20	19.90	22.90	25.70
R410A						
EVU 1	1.52	2.01	2.33	2.85	3.29	3.68
EVU 2	2.62	3.22	3.73	4.56	5.26	5.89
EVU 3	4.92	6.03	6.99	8.55	9.87	11.04
EVU 4	8.20	10.05	11.65	14.25	16.45	18.40
EVU 5	10.66	13.07	15.15	18.53	21.39	23.92
EVU 6	13.12	16.08	18.64	22.80	26.32	29.44
EVU 8	16.40	20.10	23.30	28.50	32.90	36.80

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 factor for liquid temperature t_l

t_v [°C]	-10	0	10	15	20	25	30	35	40	45	50
R404A	0.65	0.72	0.81	0.86	0.93	1.00	1.09	1.20	1.33	1.51	1.74
R507C	0.65	0.73	0.81	0.87	0.93	1.00	1.08	1.19	1.31	1.47	1.69
R410A	0.73	0.79	0.86	0.90	0.95	1.00	1.06	1.14	1.23	1.33	1.47

Capacity
Suction vapour capacity Q_e [kW]

Type	Pressure drop across valve Δp [bar]	Suction vapour capacity Q_e [kW] at evaporating temperature t_e [°C]					
		-40	-30	-20	-10	0	10
							R22/R407C
EVU 1	0.10	0.09	0.11	0.15	1.19	0.23	0.26
	0.15	0.11	0.14	0.18	0.23	0.28	0.33
	0.20	0.12	0.16	0.20	0.25	0.31	0.38
EVU 2	0.10	0.18	0.24	0.30	0.38	0.45	0.53
	0.15	0.22	0.28	0.35	0.45	0.55	0.65
	0.20	0.24	0.33	0.40	0.50	0.63	0.75
EVU 3	0.10	0.27	0.35	0.45	0.56	0.68	0.79
	0.15	0.33	0.41	0.53	0.68	0.83	0.98
	0.20	0.37	0.49	0.60	0.75	0.94	1.13
EVU 4	0.10	0.46	0.59	0.75	0.94	1.13	1.32
	0.15	0.55	0.69	0.88	1.13	1.38	1.63
	0.20	0.61	0.82	1.00	1.25	1.57	1.88
EVU 5	0.10	0.59	0.77	1.35	1.22	1.46	1.71
	0.15	0.71	0.90	1.57	1.46	1.79	2.11
	0.20	0.79	1.06	1.79	1.63	2.04	2.44
EVU 6	0.10	0.73	0.94	1.20	1.50	1.80	2.10
	0.15	0.87	1.10	1.40	1.80	2.20	2.60
	0.20	0.98	1.30	1.60	2.00	2.50	3.00
EVU 8	0.10	0.91	1.18	1.50	1.88	2.25	2.63
	0.15	1.09	1.38	1.75	2.25	2.75	3.25
	0.20	1.22	1.63	2.00	2.50	3.13	3.75

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 te and pressure drop Δp in 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 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 evaporating temperature t_e

t_v [°C]	10	15	20	25	30	35	40	45	50
R22/R407C	0.90	0.93	0.96	1.00	1.04	1.08	1.13	1.18	1.24

Capacity
Suction vapour capacity Q_e [kW]
(continued)

Type	Pressure drop across valve Δp [bar]	Suction vapour capacity Q_e [kW] at evaporating temperature t_e [°C]					
		-40	-30	-20	-10	0	10
							R134a
EVU 1	0.10	0.06	0.08	0.11	0.14	0.18	0.21
	0.15	0.07	0.09	0.13	0.16	0.21	0.25
	0.20	0.07	0.11	0.14	0.19	0.24	0.30
EVU 2	0.10	0.12	0.16	0.21	0.28	0.35	0.43
	0.15	0.13	0.19	0.25	0.33	0.43	0.50
	0.20	0.15	0.22	0.28	0.38	0.48	0.60
EVU 3	0.10	0.17	0.24	0.32	0.41	0.53	0.64
	0.15	0.20	0.28	0.38	0.49	0.64	0.75
	0.20	0.22	0.33	0.41	0.56	0.71	0.90
EVU 4	0.10	0.29	0.40	0.53	0.69	0.88	1.07
	0.15	0.33	0.47	0.63	0.82	1.07	1.25
	0.20	0.37	0.55	0.69	0.94	1.19	1.50
EVU 5	0.10	0.38	0.51	0.68	0.90	1.14	1.38
	0.15	0.43	0.60	0.81	1.06	1.38	1.63
	0.20	0.47	0.71	0.90	1.22	1.55	1.95
EVU 6	0.10	0.45	0.63	0.84	1.10	1.40	1.70
	0.15	0.53	0.74	1.00	1.30	1.70	2.00
	0.20	0.58	0.87	1.10	1.50	1.90	2.40
EVU 8	0.10	0.58	0.79	1.05	1.38	1.75	2.13
	0.15	0.66	0.93	1.25	1.63	2.13	2.50
	0.20	0.73	1.09	1.38	1.88	2.38	3.00

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 te and pressure drop Δp in 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 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 evaporating temperature t_e

t_v [°C]	10	15	20	25	30	35	40	45	50
R134a	0.88	0.92	0.96	1.00	1.05	1.10	1.16	1.23	1.31

Capacity
Suction vapour capacity Q_e [kW]
(continued)

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 te and pressure drop Δp in 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.

R404A/R507

Type	Pressure drop across valve Δp [bar]	Suction vapour capacity Q_e [kW] at evaporating temperature t_e [°C]					
		-40	-30	-20	-10	0	10
EVU 1	0.10	0.08	0.10	0.14	0.16	0.20	0.25
	0.15	0.09	0.12	0.16	0.20	0.25	0.30
	0.20	0.10	0.14	0.18	0.23	0.29	0.35
EVU 2	0.10	0.16	0.20	0.28	0.33	0.40	0.50
	0.15	0.18	0.24	0.33	0.40	0.50	0.60
	0.20	0.21	0.28	0.35	0.45	0.58	0.70
EVU 3	0.10	0.23	0.30	0.41	0.49	0.60	0.75
	0.15	0.27	0.36	0.49	0.60	0.75	0.90
	0.20	0.31	0.41	0.53	0.68	0.86	1.10
EVU 4	0.10	0.39	0.50	0.69	0.82	1.00	1.25
	0.15	0.46	0.61	0.82	1.00	1.25	1.50
	0.20	0.52	0.69	0.88	1.13	1.44	1.75
EVU 5	0.10	0.51	0.65	0.90	1.06	1.30	1.62
	0.15	0.59	0.79	1.06	1.30	1.62	1.95
	0.20	0.67	0.90	1.14	1.46	1.87	2.27
EVU 6	0.10	0.62	0.80	1.10	1.30	1.60	2.00
	0.15	0.73	0.97	1.30	1.60	2.00	2.40
	0.20	0.82	1.10	1.40	1.80	2.30	2.80
EVU 8	0.10	0.78	1.00	1.38	1.63	2.00	2.50
	0.15	0.91	1.21	1.63	2.00	2.50	3.00
	0.20	1.03	1.38	1.75	2.25	2.88	3.50

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 evaporating temperature t_e

t_v [°C]	10	15	20	25	30	35	40	45	50
R404A	0.84	0.89	0.94	1.00	1.07	1.16	1.26	1.40	1.57
R507	0.84	0.89	0.94	1.00	1.07	1.16	1.26	1.39	1.57

Capacity
Suction vapour capacity Q_e [kW]
(continued)

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 te and pressure drop Δp in 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.

Type	Pressure drop across valve Δp [bar]	Suction vapour capacity Q_e [kW] at evaporating temperature t_e [°C]					
		-40	-30	-20	-10	0	10
							R410A
EVU 1	0.10	0.12	0.16	0.20	0.24	0.29	0.33
	0.15	0.15	0.18	0.23	0.29	0.35	0.41
	0.20	0.17	0.22	0.26	0.32	0.40	0.47
EVU 2	0.10	0.25	0.31	0.39	0.48	0.57	0.66
	0.15	0.30	0.37	0.46	0.58	0.70	0.82
	0.20	0.30	0.44	0.52	0.65	0.80	0.95
EVU 3	0.10	0.37	0.47	0.59	0.72	0.86	0.99
	0.15	0.45	0.55	0.68	0.87	1.05	1.23
	0.20	0.51	0.65	0.79	0.97	1.19	1.42
EVU 4	0.10	0.62	0.78	0.98	1.21	1.43	1.66
	0.15	0.75	0.92	1.14	1.45	1.75	2.05
	0.20	0.86	1.09	1.31	1.62	1.99	2.37
EVU 5	0.10	0.81	1.01	1.27	1.57	1.86	2.15
	0.15	0.98	1.20	1.48	1.88	2.27	2.66
	0.20	1.11	1.42	1.70	2.1	2.59	3.07
EVU 6	0.10	0.99	1.25	1.56	1.93	2.29	2.65
	0.15	1.20	1.47	1.82	2.32	2.79	3.28
	0.20	1.37	1.74	2.1	2.58	3.18	3.78
EVU 8	0.10	1.24	1.56	1.95	2.41	2.86	3.31
	0.15	1.50	1.84	2.28	2.90	3.49	4.10
	0.20	1.71	2.18	2.62	3.23	3.98	4.73

Correction factors
When sizing valves, the plant capacity must be multiplied by a correction factor depending on liquid temperature tl ahead of valve/evaporator. When the corrected capacity is known, the selection can be made from the table.

Correction factors for evaporating temperature t_e

t_v [°C]	10	15	20	25	30	35	40	45	50
R410A	0.89	0.92	0.96	1.00	1.05	1.11	1.18	1.26	1.37

Capacity
Hot gas capacity Q_h [kW]

Type	Pressure drop across valve Δp [bar]	Hot gas capacity Q_h [kW]				
		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
						R22
EVU 1	0.10	0.30	0.31	0.33	0.34	0.35
	0.20	0.43	0.45	0.46	0.43	0.49
	0.40	0.60	0.64	0.66	0.69	0.70
	0.80	0.83	0.85	0.93	0.99	0.99
	1.60	1.16	1.24	1.30	1.35	1.36
EVU 2	0.10	0.60	0.63	0.65	0.68	0.70
	0.20	0.85	0.90	0.93	0.85	0.98
	0.40	1.20	1.28	1.33	1.38	1.40
	0.80	1.65	1.70	1.85	1.98	1.98
	1.60	2.33	2.48	1.60	2.70	2.73
EVU 3	0.10	0.90	0.94	0.98	1.01	1.05
	0.20	1.28	1.35	1.39	1.28	1.46
	0.40	1.80	1.91	1.99	2.06	2.10
	0.80	2.48	2.55	2.78	2.96	2.96
	1.60	3.49	3.71	3.90	4.05	4.09
EVU 4	0.10	1.50	1.57	1.63	1.69	1.75
	0.20	2.13	2.25	2.32	2.13	2.44
	0.40	3.00	3.19	3.32	3.44	3.50
	0.80	4.13	4.25	4.63	4.94	4.94
	1.60	5.82	6.19	6.50	6.75	6.82
EVU 5	0.10	1.95	2.03	2.11	2.20	2.27
	0.20	2.76	2.92	3.01	2.76	3.17
	0.40	3.90	4.15	4.31	4.47	4.55
	0.80	5.36	5.52	6.01	6.42	6.42
	1.60	7.56	8.05	8.45	8.77	8.86
EVU 6	0.10	2.40	2.50	2.60	2.70	2.80
	0.20	3.40	3.60	3.70	3.40	3.90
	0.40	4.80	5.10	5.30	5.50	5.60
	0.80	6.60	6.80	7.40	7.90	7.90
	1.60	9.30	9.90	10.40	10.80	10.90
EVU 8	0.10	3.00	3.13	3.25	3.38	3.50
	0.20	4.25	4.50	4.63	4.25	4.88
	0.40	6.00	6.38	6.63	6.88	7.00
	0.80	8.25	8.50	9.25	9.88	9.88
	1.60	11.63	12.38	13.00	13.50	13.63

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 evaporating temperature t_e.

Correction factors for evaporating temperature t_e

t_o [°C]	-40	-30	-20	-10	0	10
R22	0.92	0.95	0.98	1.00	1.02	1.04

Capacity
Hot gas capacity Q_h [kW]
(continued)

Type	Pressure drop across valve Δp [bar]	Hot gas capacity Q_h [kW]				
		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
						R134a
EVU 1	0.10	0.24	0.25	0.26	0.26	0.26
	0.20	0.34	0.36	0.37	0.38	0.37
	0.40	0.47	0.51	0.53	0.54	0.53
	0.80	0.66	0.70	0.73	0.77	0.76
	1.60	0.95	1.01	1.05	1.07	1.03
EVU 2	0.10	0.47	0.50	0.52	0.53	0.52
	0.20	0.67	0.71	0.74	0.75	0.74
	0.40	0.93	1.02	1.06	1.07	1.06
	0.80	1.32	1.41	1.47	1.54	1.52
	1.60	1.90	2.01	2.09	2.13	2.12
EVU 3	0.10	0.70	0.75	0.78	0.79	0.78
	0.20	1.01	1.07	1.11	1.13	1.11
	0.40	1.40	1.53	1.58	1.61	1.59
	0.80	1.98	2.11	2.20	2.31	2.28
	1.60	2.85	3.02	3.12	3.20	3.17
EVU 4	0.10	1.18	1.25	1.30	1.32	1.31
	0.20	1.68	1.78	1.85	1.88	1.86
	0.40	2.33	2.55	2.64	2.68	2.65
	0.80	3.31	3.52	3.67	3.85	3.80
	1.60	4.76	5.03	5.23	5.33	5.29
EVU 5	0.10	1.53	1.62	1.68	1.72	1.70
	0.20	2.18	2.31	2.40	2.44	2.41
	0.40	3.03	3.32	3.43	3.48	3.44
	0.80	4.30	4.57	4.77	5.00	4.94
	1.60	6.18	6.54	6.80	6.92	6.88
EVU 6	0.10	1.88	1.99	2.07	2.11	2.09
	0.20	2.69	2.84	2.95	3.00	2.97
	0.40	3.73	4.08	4.28	4.28	4.23
	0.80	5.29	5.60	5.86	6.16	6.08
	1.60	7.61	8.05	8.37	8.52	8.46
EVU 8	0.10	2.35	2.49	2.59	2.64	2.61
	0.20	3.36	3.55	3.69	3.75	3.71
	0.40	4.66	5.10	5.28	5.35	5.29
	0.80	6.61	7.03	7.33	7.70	7.60
	1.60	9.51	10.06	10.46	10.65	10.58

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 evaporating temperature t_e.

Correction factors for evaporating temperature t_e

t_o [°C]	-40	-30	-20	-10	0	10
R134a	0.88	0.92	0.96	1.00	1.04	1.08

Capacity
Hot gas capacity Q_h [kW]
(continued)

Type	Pressure drop across valve Δp [bar]	Hot gas capacity Q_h [kW]				
		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
		R404A/R507				
EVU 1	0.10	0.27	0.27	0.27	0.26	0.23
	0.20	0.38	0.39	0.38	0.36	0.33
	0.40	0.54	0.55	0.54	0.52	0.47
	0.80	0.74	0.76	0.75	0.74	0.67
	1.60	1.05	1.07	1.05	1.01	0.90
EVU 2	0.10	0.54	0.55	0.54	0.51	0.47
	0.20	0.76	0.77	0.76	0.73	0.66
	0.40	1.09	1.10	1.09	1.03	0.94
	0.80	1.49	1.51	1.51	1.48	1.34
	1.60	2.09	2.13	2.11	2.03	1.80
EVU 3	0.10	0.81	0.82	0.81	0.77	0.70
	0.20	1.14	1.16	1.14	1.09	0.99
	0.40	1.63	1.64	1.63	1.55	1.41
	0.80	2.23	2.27	2.26	2.22	2.01
	1.60	3.14	3.20	3.16	3.04	2.70
EVU 4	0.10	1.35	1.37	1.35	1.28	1.17
	0.20	1.90	1.93	1.91	1.82	1.65
	0.40	2.72	2.74	2.72	2.58	2.35
	0.80	3.72	3.78	3.77	3.70	3.36
	1.60	5.23	5.33	5.17	5.07	4.50
EVU 5	0.10	1.75	1.77	1.75	1.66	1.51
	0.20	2.46	2.50	2.50	2.36	2.14
	0.40	3.53	3.56	3.56	3.35	3.05
	0.80	4.83	4.91	4.91	4.81	4.36
	1.60	6.80	6.93	6.92	6.56	5.85
EVU 6	0.10	2.16	2.18	2.15	2.05	1.86
	0.20	3.03	3.08	3.05	2.90	2.64
	0.40	4.34	4.38	4.35	4.13	3.76
	0.80	5.94	6.05	6.02	5.92	5.37
	1.60	8.37	8.52	8.43	8.10	7.20
EVU 8	0.10	2.70	2.73	2.69	2.56	2.33
	0.20	3.79	3.85	3.81	3.63	3.30
	0.40	5.43	5.48	5.44	5.16	4.70
	0.80	7.43	7.56	7.53	7.40	6.70
	1.60	10.46	10.65	10.54	10.13	9.00

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 evaporating temperature t_e.

Correction factors for evaporating temperature t_e

t_o [°C]	-40	-30	-20	-10	0	10
R404A	0.85	0.90	0.95	1.00	1.05	1.09
R507	0.84	0.89	0.95	1.00	1.05	1.10

Capacity
Hot gas capacity Q_h [kW]
(continued)

Type	Pressure drop across valve Δp [bar]	Hot gas capacity Q_h [kW]				
		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
						R410A
EVU 1	0.10	0.47	0.49	0.49	0.49	0.47
	0.20	0.67	0.70	0.70	0.62	0.66
	0.40	0.95	0.99	1.00	1.00	0.95
	0.80	1.30	1.32	1.40	1.43	1.33
	1.60	1.84	1.92	1.96	1.96	1.84
EVU 2	0.10	0.95	0.97	0.98	0.98	0.95
	0.20	1.34	1.40	1.40	1.23	1.32
	0.40	1.90	1.99	2.00	2.00	1.89
	0.80	2.61	2.64	2.79	2.85	2.67
	1.60	3.68	3.84	3.93	3.92	3.68
EVU 3	0.10	1.42	1.46	1.47	1.47	1.42
	0.20	2.02	2.09	2.10	1.85	1.98
	0.40	2.84	2.97	3.00	2.99	2.84
	0.80	3.01	2.95	4.19	4.30	4.00
	1.60	5.51	5.76	5.89	5.87	5.52
EVU 4	0.10	2.37	2.43	2.46	2.45	2.37
	0.20	3.36	3.49	3.50	3.08	3.30
	0.40	4.74	4.95	5.01	4.99	4.73
	0.80	6.52	6.59	6.99	7.17	6.67
	1.60	9.19	9.60	9.82	9.79	9.20
EVU 5	0.10	3.08	3.15	3.19	3.18	3.07
	0.20	4.37	4.54	4.54	4.00	4.28
	0.40	6.16	6.43	6.51	6.49	6.14
	0.80	8.47	8.57	9.08	9.31	8.67
	1.60	11.95	12.47	12.76	12.73	11.96
EVU 6	0.10	3.79	3.88	3.93	3.92	3.78
	0.20	5.38	5.58	5.59	4.93	5.27
	0.40	7.58	7.91	8.01	7.98	7.56
	0.80	10.43	10.54	11.18	11.46	10.67
	1.60	14.70	15.35	15.70	15.66	14.72
EVU 8	0.10	4.74	4.85	4.91	4.90	4.73
	0.20	6.75	6.98	6.99	6.16	6.59
	0.40	9.48	6.98	10.01	9.98	9.45
	0.80	13.04	13.18	13.97	14.33	13.34
	1.60	18.38	19.19	19.63	19.58	18.40

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 evaporating temperature t_e.

Correction factors for evaporating temperature t_e

t_o [°C]	-40	-30	-20	-10	0	10
R410A	0.92	0.95	0.98	1.00	1.02	1.03

Capacity
Hot gas capacity G_h [kg/s]

Type	Hot gas temp. t_h [°C]	Cond. temp. t_c [°C]	Hot gas capacity G_h [kg/s] at pressure drop across valve Δp [bar]								
			0.50	1	2	3	4	5	6	7	8
R22/R407C											
EVU 1	90	25	0.003	0.005	0.006	0.007	0.007	0.007	0.007	0.007	0.007
	90	35	0.004	0.005	0.007	0.008	0.009	0.009	0.010	0.010	0.010
	90	45	0.004	0.006	0.008	0.010	0.011	0.011	0.012	0.012	0.012
EVU 2	90	25	0.007	0.009	0.012	0.014	0.015	0.015	0.015	0.015	0.015
	90	35	0.008	0.011	0.014	0.017	0.018	0.019	0.019	0.019	0.019
	90	45	0.009	0.012	0.017	0.020	0.022	0.023	0.024	0.024	0.024
EVU 3	90	25	0.010	0.014	0.018	0.021	0.022	0.022	0.022	0.022	0.022
	90	35	0.012	0.016	0.021	0.025	0.027	0.028	0.029	0.029	0.029
	90	45	0.023	0.018	0.025	0.029	0.032	0.035	0.036	0.036	0.037
EVU 4	90	25	0.017	0.023	0.031	0.035	0.037	0.037	0.037	0.037	0.037
	90	35	0.019	0.027	0.036	0.042	0.045	0.047	0.048	0.048	0.048
	90	45	0.022	0.031	0.042	0.049	0.054	0.058	0.060	0.061	0.061
EVU 5	90	25	0.022	0.030	0.040	0.045	0.047	0.048	0.048	0.048	0.048
	90	35	0.025	0.035	0.046	0.055	0.059	0.061	0.062	0.062	0.062
	90	45	0.028	0.040	0.054	0.064	0.070	0.075	0.077	0.079	0.079
EVU 6	90	25	0.027	0.037	0.049	0.055	0.058	0.059	0.059	0.059	0.059
	90	35	0.031	0.043	0.057	0.067	0.072	0.075	0.077	0.077	0.077
	90	45	0.035	0.049	0.066	0.078	0.086	0.092	0.095	0.097	0.098
EVU 8	90	25	0.034	0.046	0.061	0.069	0.073	0.074	0.074	0.074	0.074
	90	35	0.039	0.054	0.071	0.084	0.090	0.092	0.096	0.969	0.096
	90	45	0.043	0.061	0.083	0.098	0.108	0.115	0.119	0.121	0.122
R134a											
EVU 1	90	25	0.003	0.004	0.005	0.005	0.005	—	—	—	—
	90	35	0.004	0.005	0.006	0.007	0.007	0.007	0.007	—	—
	90	45	0.004	0.006	0.007	0.009	0.009	0.009	0.009	0.009	0.009
EVU 2	90	25	0.006	0.008	0.010	0.010	0.010	—	—	—	—
	90	35	0.007	0.010	0.012	0.014	0.014	0.014	0.014	—	—
	90	45	0.008	0.011	0.015	0.017	0.018	0.018	0.018	0.018	0.018
EVU 3	90	25	0.009	0.012	0.015	0.015	0.015	—	—	—	—
	90	35	0.011	0.014	0.018	0.021	0.021	0.021	0.021	—	—
	90	45	0.012	0.017	0.022	0.026	0.027	0.027	0.027	0.027	0.027
EVU 4	90	25	0.015	0.020	0.025	0.026	0.026	—	—	—	—
	90	35	0.018	0.024	0.031	0.035	0.035	0.035	0.035	—	—
	90	45	0.020	0.028	0.037	0.043	0.045	0.046	0.046	0.046	0.046
EVU 5	90	25	0.020	0.026	0.033	0.033	0.033	—	—	—	—
	90	35	0.023	0.031	0.040	0.045	0.046	0.046	0.046	—	—
	90	45	0.026	0.036	0.048	0.055	0.059	0.059	0.059	0.059	0.059
EVU 6	90	25	0.024	0.032	0.040	0.041	0.041	—	—	—	—
	90	35	0.028	0.038	0.049	0.055	0.056	0.056	0.056	—	—
	90	45	0.032	0.045	0.059	0.068	0.072	0.073	0.073	0.073	0.073
EVU 8	90	25	0.030	0.040	0.050	0.051	0.051	—	—	—	—
	90	35	0.035	0.048	0.061	0.069	0.070	0.070	0.070	—	—
	90	45	0.040	0.056	0.074	0.085	0.090	0.091	0.091	0.091	0.091

An increase in hot gas temperature of 10 K, reduces valve capacity approx. 2% and vice versa.

Capacity
Hot gas capacity G_h [kg/s]
(continued)

R404A/R507

Type	Hot gas temp. t_h [°C]	Cond. temp. t_c [°C]	Hot gas capacity G_h [kg/s] at pressure drop across valve Δp [bar]								
			0.50	1	2	3	4	5	6	7	8
EVU 1	90	25	0.004	0.006	0.008	0.009	0.010	0.010	0.010	0.010	0.010
	90	35	0.005	0.007	0.009	0.011	0.012	0.012	0.012	0.013	0.013
	90	45	0.005	0.008	0.010	0.012	0.014	0.014	0.015	0.015	0.016
EVU 2	90	25	0.009	0.012	0.016	0.018	0.019	0.019	0.020	0.020	0.020
	90	35	0.010	0.014	0.018	0.021	0.023	0.023	0.025	0.025	0.025
	90	45	0.011	0.015	0.020	0.024	0.027	0.027	0.029	0.031	0.032
EVU 3	90	25	0.013	0.012	0.023	0.027	0.029	0.029	0.030	0.030	0.030
	90	35	0.014	0.020	0.027	0.031	0.035	0.035	0.037	0.038	0.038
	90	45	0.016	0.023	0.030	0.036	0.041	0.041	0.044	0.046	0.048
EVU 4	90	25	0.022	0.030	0.039	0.045	0.048	0.048	0.050	0.050	0.050
	90	35	0.024	0.034	0.045	0.053	0.058	0.058	0.062	0.063	0.063
	90	45	0.027	0.038	0.051	0.060	0.068	0.068	0.073	0.077	0.080
EVU 5	90	25	0.028	0.038	0.051	0.059	0.062	0.062	0.064	0.065	0.065
	90	35	0.031	0.044	0.059	0.069	0.075	0.075	0.080	0.082	0.082
	90	45	0.035	0.049	0.066	0.079	0.088	0.088	0.094	0.099	0.104
EVU 6	90	25	0.034	0.047	0.062	0.072	0.077	0.077	0.079	0.080	0.080
	90	35	0.038	0.054	0.072	0.085	0.093	0.093	0.098	0.101	0.101
	90	45	0.043	0.061	0.082	0.097	0.108	0.108	0.116	0.122	0.128
EVU 8	90	25	0.043	0.059	0.078	0.090	0.096	0.096	0.099	0.100	0.100
	90	35	0.048	0.068	0.090	0.106	0.116	0.116	0.123	0.126	0.126
	90	45	0.054	0.076	0.102	0.121	0.135	0.135	0.145	0.153	0.160

R410A

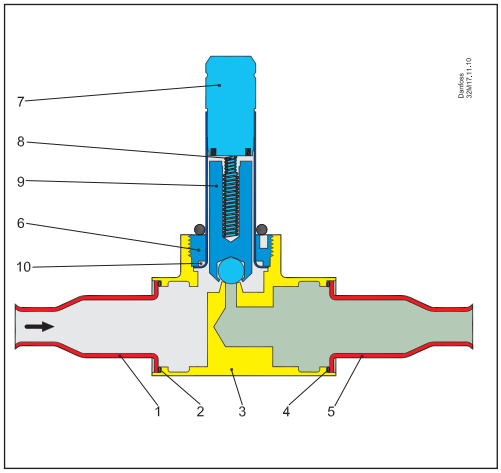
Type	Hot gas temp. t_h [°C]	Cond. temp. t_c [°C]	Hot gas capacity G_h [kg/s] at pressure drop across valve Δp [bar]								
			0.50	1	2	3	4	5	6	7	8
EVU 1	90	25	0.005	0.007	0.010	0.013	0.015	0.017	0.018	0.018	0.018
	90	35	0.006	0.008	0.012	0.015	0.017	1.019	0.021	0.022	0.022
	90	45	0.007	0.010	0.014	0.017	0.019	0.021	0.024	0.025	0.027
EVU 2	90	25	0.008	0.011	0.016	0.019	0.022	0.025	0.027	0.027	0.027
	90	35	0.009	0.013	0.018	0.022	0.025	0.028	0.031	0.033	0.033
	90	45	0.010	0.014	0.020	0.025	0.029	0.032	0.035	0.038	0.041
EVU 3	90	25	0.012	0.017	0.023	0.029	0.033	0.037	0.040	0.040	0.040
	90	35	0.013	0.019	0.027	0.033	0.038	0.042	0.046	0.050	0.050
	90	45	0.015	0.022	0.030	0.037	0.043	0.048	0.053	0.057	0.061
EVU 4	90	25	0.020	0.028	0.039	0.048	0.055	0.062	0.067	0.067	0.067
	90	35	0.022	0.031	0.044	0.054	0.063	0.070	0.077	0.083	0.083
	90	45	0.025	0.036	0.051	0.062	0.072	0.080	0.088	0.095	0.101
EVU 5	90	25	0.026	0.036	0.051	0.062	0.072	0.080	0.087	0.087	0.087
	90	35	0.029	0.041	0.058	0.071	0.082	0.091	0.100	0.108	0.108
	90	45	0.033	0.047	0.066	0.081	0.093	0.104	0.114	0.123	0.132
EVU 6	90	25	0.031	0.044	0.063	0.077	0.088	0.099	0.107	0.107	0.107
	90	35	0.036	0.050	0.071	0.087	0.101	0.112	0.123	0.133	0.133
	90	45	0.041	0.057	0.081	0.099	0.115	0.128	0.140	0.152	0.162
EVU 8	90	25	0.039	0.055	0.078	0.096	0.111	0.124	0.134	0.134	0.134
	90	35	0.044	0.063	0.089	0.109	0.126	0.141	0.154	0.166	0.166
	90	45	0.051	0.072	0.101	0.124	0.143	0.160	0.176	0.190	0.203

An increase in hot gas temperature of 10 K, reduces valve capacity approx. 2% and vice versa.

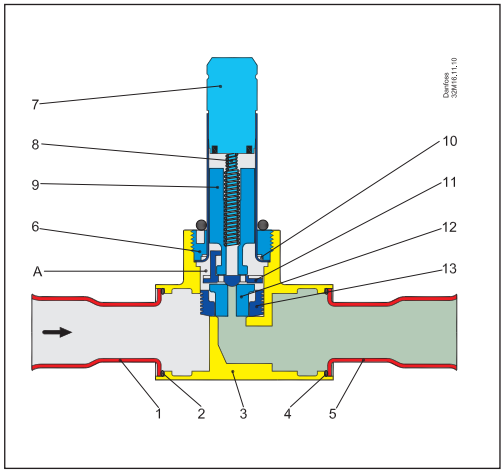
Design / Function

1. Solder connection
5. Solder connection
2. Solder ring
4. Solder ring
3. Valve housing
6. Union nut
7. Armature tube
8. Return spring
9. Armature
10. Support ring
11. Pilot plate (servo)
12. Seat plate (servo)
13. Piston (servo)

Direct operated



Servo operated



Direct operated
EVU 1 is direct operated. The valve opens directly for full flow when the armature (9) moves up into the magnetic field of the coil.

This means that the valve can operate a 0 bar differential pressure. Thus, inlet pressure and spring force act to close the valve when the coil is currentless.

Servo operated
EVU 2 to 8 are servo operated piston solenoid valves. The servo piston principle results in a fast operating and compact valve that is able to open against a high differential pressure. The valve closes rather soft, because the pilot system does not fully close before the main orifice has closed. This minimizes liquid hammer.

When the coil is currentless, the main orifice, seat plate (12) and pilot orifice (on the pilot plate (11)) 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 (9) is drawn up into the magnetic field and thus lifts the pilot plate (11) and opens for the pilot orifice so that the de-energising of the servo chamber (A) starts and the pressure is relieved to the level of the outlet side. As the inlet pressure that acts on the bottom of the piston (13) now is higher than the pressure in the servo chamber (A), the piston is moved upwards and lifts both the pilot plate (11) and the seat plate (12). When the seat plate is lifted, the main orifice opens for full flow.

Therefore a minimum differential pressure of 0.02 bar is necessary to open the valve and keep it open.

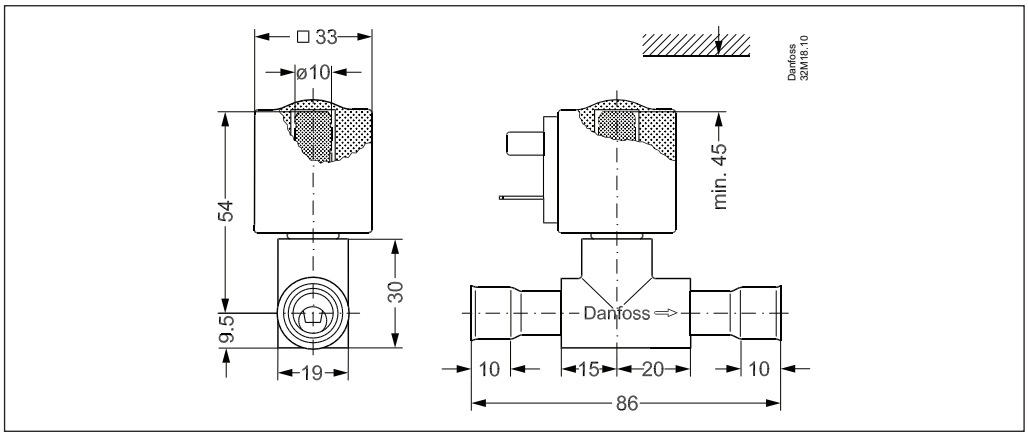
When the current to the coil is switched off, the spring (8) forces the armature (9) down towards the pilot plate (11). The pressure in the servo chamber (A) increases and the piston will no longer be able to hold the seat plate (12) in lifted position, by which the main orifice closes. The armature (9) continues its downwards movement until the pilot orifice on the pilot plate (11) is fully closed.

Material specifications

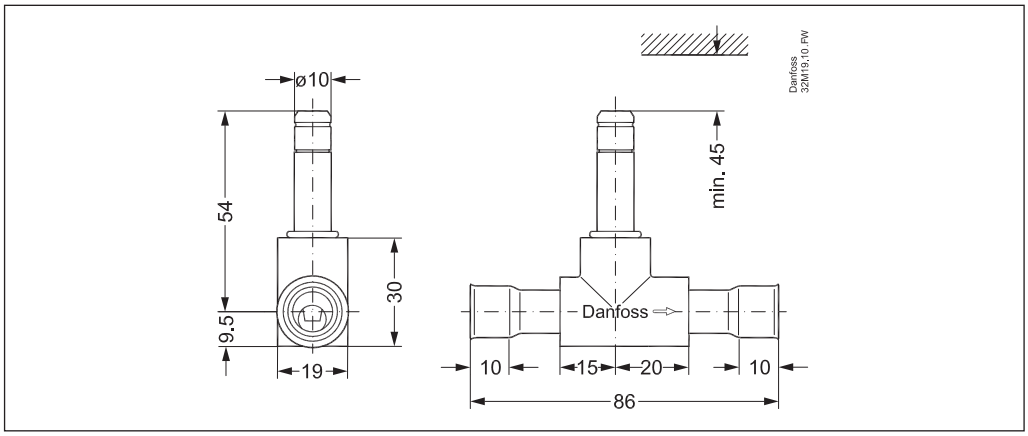
No.	Description	Material	Alloys	Mat. no.	Standard		
					W.no.	DIN	EN
1, 5	**Bi-metallic tube**	Stainless steel/Cu	—	—	—	—	—
2, 4	**Solder ring**	Silver	L-Ag 15P	CP102	—	1044	1044
3	**Valve body**	Brass	CuZn40Pb2	CW617N	2.0402	17672-1	12165
6	**Union nut**	Brass	CuZn39Pb2	CW612N	2.0380	17672-1	12164
7	**Armature tube**	Stainless steel	X6CrMoS17	—	1.4105	—	10088
8	**Spring**	Spring wire stainless	X10CrNi18-8	—	1.4310	—	10088
9	**Armature**	Stainless steel	X4CrMoS18	—	1.410SIL	—	10088
10	**Support ring**	Teflon	PTFE	—	—	—	—
11	**Pilot plate**	Thermoplast	PEEK	—	—	—	—
12	**Seat plate**	Teflon	PTFE	—	—	—	—
13	**Piston**	Brass	CuZn39Pb2	CW612N	2.0380	17672-1	12164

Dimensions [mm] and weight [kg]

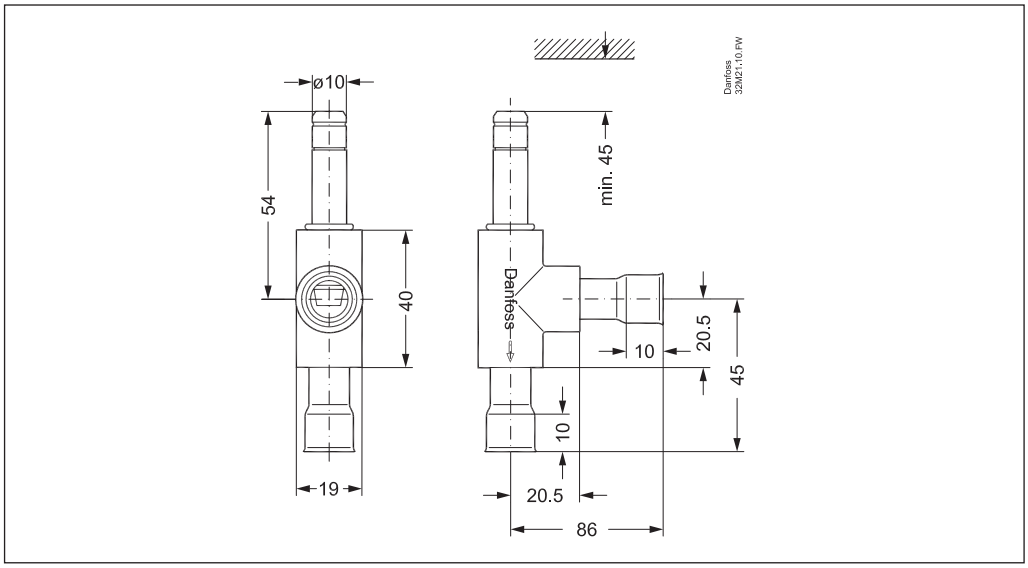
EVU 1 – 6, mounted with coil for DIN connection



EVU 1 – 6



EVU 8



Net weight of coil 6 W: approx. 0.1 kg
Net weight of coil with cable approx. 0.15 kg
Net weight of valve approx. 0.1 kg