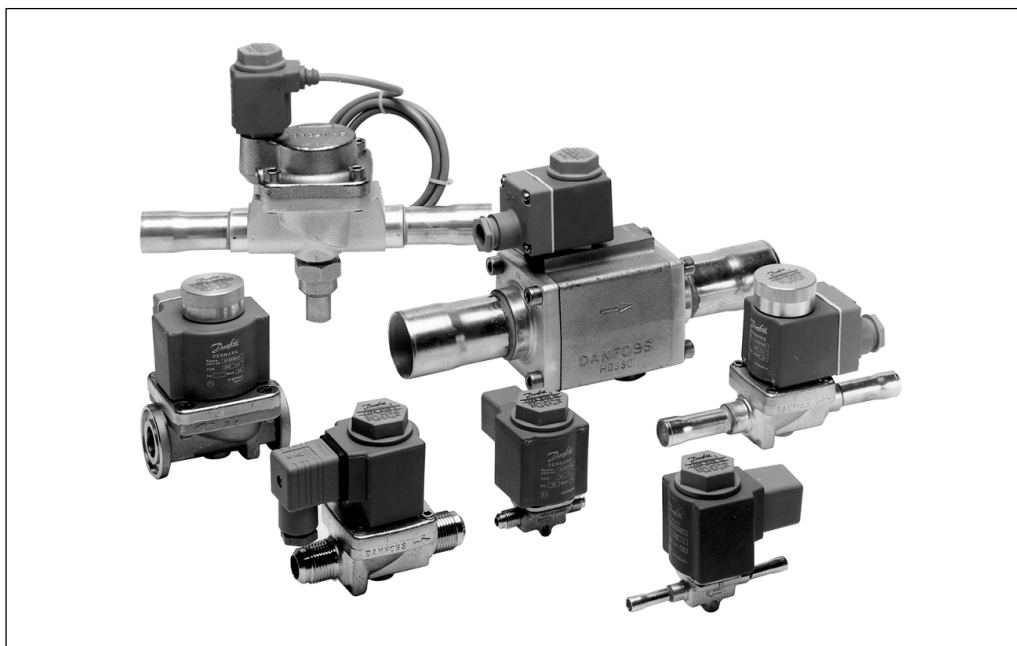


Introduction



EVR is a direct or servo operated solenoid valve for liquid, suction, and hot gas lines with fluorinated refrigerants.

EVR valves are supplied complete or as separate components, i.e. valve body, coil and flanges, if required, can be ordered separately.

Features

- Complete range of solenoid valves for refrigeration, freezing and air conditioning plant
- Supplied both normally closed (NC) and normally open (NO) with de-energized coil
- Wide choice of coils for a.c. and d.c.
- Suitable for all fluorinated refrigerants
- Designed for media temperatures up to 105°C
- MOPD up to 25 bar with 12 W coil
- Flare connections up to 5/8 in.
- Solder connections up to 2 1/8 in.
- Extended ends for soldering make installation easy
It is not necessary to dismantle the valve when soldering in.
- EVR are also available with flange connections

Approvals

DnV, Det norske Veritas, Norge
DSRK, Deutsche Schiffs-Revision
und -Klassifikation, Tyskland

® Polski Rejestr Statków, Polen
MRS, Maritime Register of Shipping, Russia

Versions with UL and CSA approval can be supplied to order.

Technical data

Refrigerants
CFC, HCFC, HFC

Temperature of medium
-40 → +105°C with 10 W or 12 W coil.
Max. 130°C during defrosting.

Ambient temperature and enclosure for coil
See "Coils for solenoid valves", RD.3J.B2.02

Technical data
(continued)

Type	Opening differential pressure with standard coil Δp bar				Temperature of medium °C	Max. working pressure PB bar	k_v value ¹⁾ m ³ /h
	Min.	Max. (= MOPD) liquid ²⁾					
		10 W a.c.	12 W a.c.	20 W d.c.			
EVR 2	0.0	25		18	-40 → 105	35	0.16
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 6 NO	0.05	21	25	21	-40 → 105	35	0.8
EVR 10	0.05	21	25	18	-40 → 105	35	1.9
EVR 10 NO	0.05	21	25	21	-40 → 105	35	1.9
EVR 15	0.05	21	25	18	-40 → 105	32	2.6
EVR 15 NO	0.05	21	25	21	-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
EVR 20 NO	0.05	19	25	19	-40 → 105	32	5.0
EVR 22	0.05	21	25	13	-40 → 105	32	6.0
EVR 22 NO	0.05	19	25	19	-40 → 105	32	6.0
EVR 25	0.20	21	25	18	-40 → 105	28	10.0
EVR 32	0.20	21	25	18	-40 → 105	28	16.0
EVR 40	0.20	21	25	18	-40 → 105	28	25.0

- 1) The k_v value is the water flow in m³/h at a pressure drop across valve of 1 bar, $\rho = 1000$ kg/m³.
2) MOPD for media in gas form is approx. 1 bar greater.

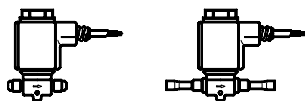
Type	Rated capacity kW											
	Liquid				Suction vapour				Hot gas			
	R 22	R 134a	R 404A/R 507	R 407C	R 22	R 134a	R 404A/R 507	R 407C	R 22	R 134a	R 404A/R 507	R 407C
EVR 2	3.20	2.90	2.20	3.01					1.50	1.20	1.20	1.46
EVR 3	5.40	5.00	3.80	5.08					2.50	2.00	2.00	2.43
EVR 6	16.10	14.80	11.20	15.13	1.80	1.30	1.60	1.66	7.40	5.90	6.00	7.18
EVR 10	38.20	35.30	26.70	35.91	4.30	3.10	3.90	3.96	17.50	13.90	14.30	16.98
EVR 15	52.30	48.30	36.50	49.16	5.90	4.20	5.30	5.43	24.00	19.00	19.60	23.28
EVR 20	101.00	92.80	70.30	94.94	11.40	8.10	10.20	10.49	46.20	36.60	37.70	44.81
EVR 22	121.00	111.00	84.30	113.74	13.70	9.70	12.20	12.60	55.40	43.90	45.20	53.74
EVR 25	201.00	186.00	141.00	188.94	22.80	16.30	20.40	20.98	92.30	73.20	75.30	89.53
EVR 32	322.00	297.00	225.00	302.68	36.50	26.10	32.60	33.58	148.00	117.00	120.00	143.56
EVR 40	503.00	464.00	351.00	472.82	57.00	40.80	51.00	52.44	231.00	183.00	188.00	224.07

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

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

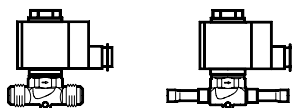
Ordering

Complete valves

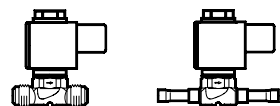


Normally closed (NC) with a.c. coil ¹⁾

Type	Connection		Code no. Valve body + 10 W a.c. coil with 1 m cable		
			Flare ²⁾	Solder ODF	
	in.	mm	in./mm	in.	mm
EVR 3	1/4	6	032F2032	032F2042	032F2052
EVR 6	3/8	10	032F2072	032F2082	032F2092
EVR 10	1/2	12	032F2102	032F2122	032F2132
EVR 15	5/8	16	032F2152	032F2192	032F2192



Type	Connection		Code no. Valve body + 10 W a.c. coil with terminal box		
			Flare ²⁾	Solder ODF	
	in.	mm	in./mm	in.	mm
EVR 3	1/4	6	032F2033	032F2043	032F2053
EVR 6	3/8	10	032F2073	032F2083	032F2093
EVR 10	1/2	12	032F2103	032F2123	032F2133
EVR 15	5/8	16	032F2153	032F2193	032F2193
EVR 20	7/8	22		032F2243	032F2243



Type	Connection		Code no. Valve body + 10 W a.c. coil with DIN plugs and protective cap		
			Flare ²⁾	Solder ODF	
	in.	mm	in./mm	in.	mm
EVR 2	1/4	6	032F2004	032F2014	032F2024
EVR 3	1/4	6	032F2034	032F2044	032F2054
EVR 6	3/8	10	032F2074	032F2084	032F2094
EVR 10	1/2	12	032F2104	032F2124	032F2134

¹⁾ Please specify code no., voltage and frequency. Voltage and frequency can also be given in the form of an appendix number, see table "Appendix numbers".

²⁾ Supplied without flare nuts.

Separate flare nuts:

1/4 in. or 6 mm, code no. **011L1101**

3/8 in. or 10 mm, code no. **011L1135**

1/2 in. or 12 mm, code no. **011L1103**

5/8 in. or 16 mm, code no. **011L1167**

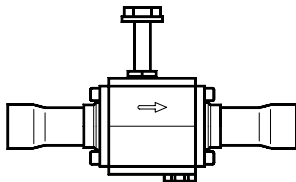
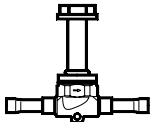
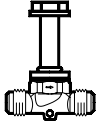
Appendix numbers

Voltage V	Frequency Hz	Energy consumpt. W	Appendix no.
12	50	10	15
24	50	10	16
42	50	10	17
48	50	10	18
115	50	10	22
220-230	50	10	31
240	50	10	33
380-400	50	10	37
420	50	10	38
24	60	10	14
115	60	10	20
220	60	10	29
240	60	10	30
110	50/60	10	21
220-230	50/60	10	32

Ordering (fortsat)

Components

Flare and solder connections



Separate valve bodies, normally closed (NC)

Type	Required coil type	Connection		Code no.				Valve body without coil	
				Flare 1)		Solder ODF		With manual operation	Without manual operation
		in.	mm	in./mm	in.	mm			
EVR 2	a.c.	1/4	6	032F1200	032F1201	032F1202			
EVR 3	a.c./d.c.	1/4	6	032F1205	032F1206	032F1207			
EVR 6		3/8	10	032F1203	032F1204	032F1208			
EVR 10		1/2	12	032F1235	032F1209	032F1236			
		1/2	12	032F1215	032F1217	032F1218			
EVR 15	5/8	16	032F1238	032F1214	032F1214				
	5/8	16	032F1221	032F1228	032F1228				
	5/8	16	032F1231 2)			032F1227			
EVR 20	a.c.	7/8	22		032F1225	032F1225			
		7/8	22				032F1254		
	1 1/8	28		032F1244	032F1245				
	d.c.	7/8	22		032F1264	032F1264			
7/8		22				032F1274			
EVR 22	a.c.	1 3/8	35		032F3267	032F3267			
EVR 25	a.c./d.c.	1 1/8					032F2200	032F2201	
			28				032F2205	032F2206	
		1 3/8	35				032F2207	032F2208	
1 3/8		35				042H1105	042H1106		
EVR 32		1 5/8					042H1103	042H1104	
EVR 40			42				042H1107	042H1108	
		1 5/8					042H1109	042H1110	
			42				042H1113	042H1114	
		2 1/8	54				042H1111	042H1112	

Separate valve bodies, normally open (NO) 3)

Type	Required coil type	Connection		Code no.				Valve body without coil 3)	
				Flare 1)		Solder ODF		in.	mm
		in.	mm	in.	mm				
EVR 6	a.c./d.c.	3/8	10	032F1289	032F1289	032F1290	032F1295		
EVR 10		1/2	12	032F1293	032F1293	032F1291	032F1296		
EVR 15		5/8	16	032F1297	032F1297	032F1299	032F1299		
		7/8	22			032F3270	032F3270		
EVR 20	7/8	22			032F1260	032F1260			
	1 1/8	28			032F1269	032F1279			
EVR 22	a.c.	1 3/8	35			032F3268	032F3268		

1) Valve bodies are supplied without flare nuts.

Separate flare nuts:

1/4 in. or 6 mm, code no. 011L1101

3/8 in. or 10 mm, code no. 011L1135

1/2 in. or 12 mm, code no. 011L1103

5/8 in. or 16 mm, code no. 011L1167

2) With manual operation.

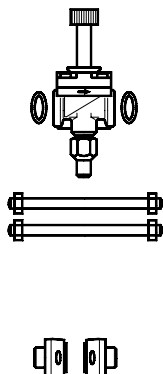
3) The normal range of coils can be used for the NO valves, with the exception of the double frequency versions of 110 V, 50/60 Hz and 220 V, 50/60 Hz.

Coils

See "Coils for solenoid valves", RD.3J.B2.02.

Ordering (continued)

Components
Flare and solder connections



Separate valve bodies, normally closed (NC)

Type	Required coil type	Connection	Code no. Valve body + gaskets + bolts; without coil and flanges	
			With manual operation	Without manual operation
EVR 15	a.c./d.c.	Flanges	032F1234	032F1224
EVR 20	a.c.		032F1253	032F1243
	d.c.		032F1273	032F1263

Coils

See "Coils for solenoid valves", RD.3J.B2.02.

Flange sets

Valve type	Connection		Code no.		
			Solder		Weld
	in.	mm	in.	mm	in.
EVR 15	1/2				027N1115
	5/8	16	027L1117	027L1116	
	3/4				027N1120
	7/8	22	027L1123	027L1122	
EVR 20	3/4				027N1220
	7/8	22	027L1223	027L1222	
	1				027N1225
	1 1/8	28	027L1229	027L1228	

Example

EVR 15 without manual operation,
code no. 032F1224

+ 1/2 in. weld flange set,
code no. 027N1115

+ coil with terminal box, 220 V, 50 Hz,
code no. 018Z6701
(See "Coils for solenoid valves", RD.3J.B2.02.).

Accessories

Description	Code no.
Mounting bracket for EVR 2, 3, 6 and 10	032F0197
Strainer FA for direct mounting	See "FA"

Capacity

R 22

Liquid capacity Q_e kW

Type	Liquid capacity Q_e kW at pressure drop across valve Δp bar				
	0.1	0.2	0.3	0.4	0.5
EVR 2	2.6	3.7	4.6	5.3	5.9
EVR 3	4.5	6.3	7.7	8.9	9.9
EVR 6	13.1	18.6	22.8	26.3	29.4
EVR 10	31.4	44.1	54.2	62.5	69.9
EVR 15	42.7	60.3	74.1	85.5	95.7
EVR 20	82.2	116.0	143.0	165.0	184.0
EVR 22	99.0	139.0	171.0	197.0	220.0
EVR 25	165.0	232.0	285.0	329.0	368.0
EVR 32	263.0	372.0	455.0	526.0	588.0
EVR 40	411.0	581.0	712.0	822.0	919.0

R 134a

Liquid capacity Q_e kW

Type	Liquid capacity Q_e kW at pressure drop across valve Δp bar				
	0.1	0.2	0.3	0.4	0.5
EVR 22.4	3.4	4.2	4.9	5.4	
EVR 34.1	5.8	7.1	8.2	9.1	
EVR 612.1	17.2	21.0	24.3	27.1	
EVR 10	28.8	40.7	49.9	57.6	64.4
EVR 15	39.4	55.7	68.3	78.8	88.1
EVR 20	75.8	107.0	131.0	152.0	170.0
EVR 22	90.9	129.0	158.0	182.0	203.0
EVR 25	152.0	214.0	263.0	303.0	339.0
EVR 32	243.0	343.0	420.0	485.0	542.0
EVR 40	379.0	536.0	656.0	758.0	847.0

R 404A/R 507

Liquid capacity Q_e kW

Type	Liquid capacity Q_e kW at pressure drop across valve Δp bar				
	0.1	0.2	0.3	0.4	0.5
EVR 2	1.8	2.6	3.2	3.7	4.1
EVR 3	3.1	4.4	5.4	6.2	6.9
EVR 6	9.2	13.0	15.9	18.4	20.5
EVR 10	21.8	30.8	37.8	43.6	48.8
EVR 15	29.8	42.2	51.7	59.6	66.8
EVR 20	57.4	81.1	99.4	115.0	128.0
EVR 22	68.9	97.4	119.0	138.0	169.0
EVR 25	115.0	162.0	199.0	230.0	257.0
EVR 32	184.0	260.0	318.0	367.0	411.0
EVR 40	287.0	406.0	497.0	574.0	642.0

Capacities are based on liquid temperature $t_l = +25^\circ\text{C}$ ahead of valve, evaporating temperature $t_e = -10^\circ\text{C}$, 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
R 22	0.76	0.82	0.88	0.92	0.96	1.0	1.05	1.10	1.16	1.22	1.30
R 134a	0.73	0.79	0.86	0.90	0.95	1.0	1.06	1.12	1.19	1.27	1.37
R 404A/R 507	0.65	0.72	0.81	0.86	0.93	1.0	1.09	1.20	1.33	1.51	1.74

R 407C

Capacity (continued)

Liquid capacity Q_e kW

Type	Liquid capacity Q_e kW at pressure drop across valve Δp bar				
	0.1	0.2	0.3	0.4	0.5
EVR 2	2.4	3.4	4.3	5.0	5.3
EVR 3	4.2	5.9	7.2	8.4	9.3
EVR 6	12.3	17.5	21.4	24.7	27.6
EVR 10	29.5	41.5	50.9	58.7	65.7
EVR 15	40.1	56.7	69.7	80.4	90.0
EVR 20	77.0	109.0	134.0	155.0	172.0
EVR 22	93.1	130.0	161.0	185.2	207.0
EVR 25	155.0	218.0	268.0	309.0	346.0
EVR 32	247.0	350.0	428.0	494.0	553.0
EVR 40	386.0	546.0	669.0	773.0	864.0

Capacities are based on liquid temperature $t_l = +25^\circ\text{C}$ ahead of valve, evaporating temperature $t_e = -10^\circ\text{C}$, and 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 based on liquid temperature t_l

t_l °C	-10	0	10	15	20	25	30	35	40	45	50
R 407C	0.71	0.78	0.85	0.89	0.94	1.0	1.06	1.14	1.23	1.33	1.46

R 22

Suction vapour capacity Q_e

Type	Pressure drop Δp bar	Suction vapour capacity Q_e kW at evaporating temperature t_e °C					
		-40	-30	-20	-10	0	+10
EVR 6	0.1	0.73	0.94	1.2	1.5	1.8	2.1
	0.15	0.87	1.1	1.4	1.8	2.2	2.6
	0.2	0.98	1.3	1.6	2.0	2.5	3.0
EVR 10	0.1	1.7	2.2	2.9	3.5	4.3	5.1
	0.15	2.1	2.7	3.4	4.3	5.2	6.2
	0.2	2.3	3.1	3.9	4.8	6.0	7.1
EVR 15	0.1	2.3	3.1	4.0	4.8	5.8	6.9
	0.15	2.8	3.7	4.7	5.9	7.1	8.5
	0.2	3.2	4.2	5.3	6.6	8.2	9.8
EVR 20	0.1	4.6	5.9	7.6	9.3	11.2	13.3
	0.15	5.4	7.1	9.1	11.4	13.9	16.7
	0.2	6.1	8.1	10.3	12.7	15.9	18.8
EVR 22	0.1	5.5	7.1	9.1	11.2	13.4	16.0
	0.15	6.5	8.5	10.7	13.7	16.4	20.0
	0.2	7.3	9.7	12.3	15.2	19.0	22.6
EVR 25	0.1	9.1	11.8	15.2	18.6	22.4	26.6
	0.15	10.9	14.2	17.9	22.8	27.4	32.6
	0.2	12.2	16.1	20.4	25.3	31.7	37.6
EVR 32	0.1	14.6	18.9	24.3	29.8	35.8	42.6
	0.15	17.4	22.7	28.8	36.5	43.8	52.2
	0.2	19.6	25.7	32.6	40.5	50.7	60.2
EVR 40	0.1	22.8	29.5	38.1	46.5	56.0	66.5
	0.15	27.2	35.4	45.0	57.0	68.6	81.5
	0.2	30.5	40.2	51.0	63.3	79.2	94.0

Capacities are based on liquid temperature $t_l = +25^\circ\text{C}$ 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 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_l °C	-10	0	10	15	20	25	30	35	40	45	50
R 22	0.76	0.82	0.88	0.92	0.96	1.0	1.05	1.10	1.16	1.22	1.30

Capacity
(continued)

R 134a

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
EVR 6	0.1	0.46	0.63	0.84	1.1	1.4	1.7
	0.15	0.53	0.74	1.0	1.3	1.7	2.0
	0.2	0.58	1.83	1.1	1.5	1.9	2.4
EVR 10	0.1	1.1	1.5	2.0	2.6	3.3	4.0
	0.15	1.3	1.8	2.4	3.1	4.0	4.9
	0.2	1.4	2.0	2.7	3.5	4.5	5.7
EVR 15	0.1	1.5	2.1	2.7	3.6	4.5	5.5
	0.15	1.7	2.4	3.3	4.2	5.5	6.7
	0.2	1.9	2.7	3.7	4.8	6.1	7.8
EVR 20	0.1	2.9	4.0	5.3	7.0	8.6	10.6
	0.15	3.3	4.7	6.3	8.1	10.6	13.0
	0.2	3.7	5.2	7.1	9.3	11.7	15.0
EVR 22	0.1	3.4	4.7	6.3	8.3	10.3	12.7
	0.15	4.0	5.6	7.5	9.7	12.7	15.5
	0.2	4.4	6.2	8.5	11.1	14.0	17.9
EVR 25	0.1	5.8	7.9	10.5	13.9	17.2	21.1
	0.15	6.6	9.3	12.5	16.3	21.1	25.9
	0.2	7.3	10.4	14.1	18.5	23.4	29.9
EVR 32	0.1	9.3	12.6	16.8	22.2	27.7	33.8
	0.15	10.6	14.9	20.0	26.1	33.8	41.4
	0.2	11.7	16.6	22.6	29.6	37.4	47.8
EVR 40	0.1	14.5	19.8	26.3	34.8	43.3	52.8
	0.15	16.5	23.3	31.3	40.8	52.8	64.8
	0.2	18.3	26.0	35.3	46.3	58.5	74.8

R 404A/R 507

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
EVR 6	0.1	0.62	0.8	1.1	1.3	1.6	2.0
	0.15	0.73	0.97	1.3	1.6	2.0	2.4
	0.2	0.82	1.1	1.4	1.8	2.3	2.8
EVR 100.15	0.1	1.5	1.9	2.5	3.2	3.9	4.7
	1.7	2.3	3.0	3.9	4.8	5.8	6.7
	0.2	2.0	2.6	3.4	4.3	5.5	6.7
EVR 15	0.1	2.0	2.6	3.5	4.3	5.3	6.4
	0.15	2.4	3.2	4.1	5.3	6.5	7.9
	0.2	2.7	3.6	4.7	5.9	7.5	9.1
EVR 20	0.1	3.9	5.0	6.7	8.3	10.2	12.3
	0.15	4.6	6.1	7.9	10.2	12.5	15.2
	0.2	5.2	6.9	9.0	11.4	14.4	17.5
EVR 22	0.1	4.6	6.0	8.0	10.0	12.2	14.8
	0.15	5.5	7.3	9.5	12.2	15.0	18.2
	0.2	6.2	8.3	10.8	13.6	17.3	21.0
EVR 25	0.1	7.7	10.1	13.3	16.6	20.4	24.6
	0.15	9.1	12.1	15.8	20.4	25.0	30.3
	0.2	10.3	13.8	18.0	22.7	28.8	35.0
EVR 32	0.1	12.3	16.2	21.3	26.6	32.6	39.4
	0.15	14.6	19.4	25.3	32.6	40.0	48.5
	0.2	16.5	22.0	28.8	36.3	46.1	56.0
EVR 40	0.1	19.3	25.3	33.3	41.5	51.0	61.5
	0.15	22.8	30.3	39.5	51.0	62.5	75.6
	0.2	25.8	34.5	45.0	56.8	72.1	87.5

Capacities are based on liquid temperature $t_l = +25^\circ\text{C}$ 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 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 based on liquid temperature t_l

t_l °C	-10	0	10	15	20	25	30	35	40	45	50
R 134a	0.73	0.79	0.86	0.90	0.95	1.0	1.06	1.12	1.19	1.27	1.37
R 404A/R 507	0.65	0.72	0.81	0.86	0.93	1.0	1.09	1.20	1.33	1.51	1.74

Capacity
(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
EVR 6	0.1	0.61	0.81	1.1	1.4	1.7	2.0
	0.15	0.72	0.95	1.3	1.7	2.1	2.5
	0.2	0.81	1.1	1.4	1.8	2.4	2.9
EVR 10	0.1	1.4	1.9	2.6	3.2	4.0	4.9
	0.15	1.7	2.3	3.0	4.0	4.9	6.0
	0.2	1.9	2.7	3.5	4.4	5.6	6.9
EVR 15	0.1	1.9	2.7	3.6	4.4	5.5	6.7
	0.15	2.3	3.2	4.2	5.4	6.7	8.2
	0.2	2.7	3.6	4.7	6.1	7.7	9.5
EVR 20	0.1	3.8	5.1	6.8	8.6	10.5	12.9
	0.15	4.5	6.1	8.1	10.5	13.1	16.2
	0.2	5.1	7.0	9.2	11.7	14.9	18.2
EVR 22	0.1	4.6	6.1	8.1	10.3	12.6	15.5
	0.15	5.4	7.3	9.5	12.6	15.4	19.4
	0.2	6.1	8.3	11.0	14.0	17.9	21.9
EVR 25	0.1	7.6	10.2	13.5	17.1	21.1	25.8
	0.15	9.1	12.2	15.9	21.0	25.8	31.6
	0.2	10.1	13.9	18.2	23.3	29.8	36.5
EVR 32	0.1	12.1	16.3	21.6	27.4	33.7	41.3
	0.15	14.4	19.5	25.6	33.6	41.2	50.6
	0.2	16.3	22.1	29.0	37.3	47.7	58.4
EVR 40	0.1	18.9	25.4	33.9	42.8	52.6	64.5
	0.15	22.6	30.4	40.1	52.4	64.5	79.1
	0.2	25.3	34.6	45.4	58.2	74.4	91.2

Capacities are based on liquid temperature $t_l = +25^\circ\text{C}$ 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 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 multiplied 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 based on liquid temperature t_l

t_l °C	-10	0	10	15	20	25	30	35	40	45	50
R 407C	0.71	0.78	0.85	0.89	0.94	1.0	1.06	1.14	1.23	1.33	1.46

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 pressure drop Δp across the valve, as shown in the example for heat recovery.

Heat recovery

The following is given:
Refrigerant = R 22
Evaporating temperature $t_e = -30^\circ\text{C}$
Condensing temperature $t_c = +40^\circ\text{C}$
Hot gas temperature ahead of valve $t_h = +85^\circ\text{C}$
Heat recovery condenser yield $Q_h = 8$ kW
The capacity table for R 22 with $t_c = +40^\circ\text{C}$ gives the the capacity for an EVR 10 as 8.9 kW, when pressure drop Δp is 0.2 bar.
The correction factor for $t_e = -30^\circ\text{C}$ is given in the table as 0.94.

The correction for hot gas temperature $t_h = +85^\circ\text{C}$ has been calculated as 4% which corresponds to a factor of 1.04.

Q_h must be corrected with factors found:
With $\Delta p = 0.2$ bar is
 $Q_h = 8.9 \times 0.94 \times 1.04 = 8.7$ kW.
With $\Delta p = 0.1$ bar, Q_h becomes only
 $6.3 \times 0.94 \times 1.04 = 6.2$ kW.

An EVR 6 would also be able to give the required capacity, but with Δp at approx. 1 bar.
The EVR 6 is therefore too small.

The EVR is so large that it is doubtful whether the necessary Δp of approx. 0.1 bar could be obtained.

An EVR 15 would therefore be too large.

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

Capacity
(continued)

R 22

Hot gas capacity Q_h kW

Type	Pressure drop across valve Δp bar	Hot gas capacity Q_h kW				
		Evaporating temp. $t_e = -10^\circ\text{C}$. Hot gas temp. $t_h = t_c + 25^\circ\text{C}$. Subcooling $\Delta t_{\text{sub}} = 4\text{ K}$				
		Condensing temperature t_c °C				
		+20	+30	+40	+50	+60
EVR 2	0.1	0.47	0.50	0.53	0.54	0.55
	0.2	0.67	0.71	0.75	0.77	0.78
	0.4	0.96	1.02	1.07	1.10	1.11
	0.8	1.32	1.37	1.48	1.57	1.59
	1.6	1.87	1.99	2.08	2.16	2.19
EVR 3	0.1	0.80	0.85	0.89	0.92	0.93
	0.2	1.14	1.20	1.26	1.30	1.32
	0.4	1.63	1.72	1.80	1.85	1.87
	0.8	2.23	2.31	2.49	2.65	2.68
	1.6	3.15	3.35	3.52	3.64	3.69
EVR 6	0.1	2.4	2.5	2.6	2.7	2.8
	0.2	3.4	3.6	3.7	3.4	3.9
	0.4	4.8	5.1	5.3	5.5	5.6
	0.8	6.6	6.8	7.4	7.9	7.9
	1.6	9.3	9.9	10.4	10.8	10.9
EVR 10	0.1	5.6	6.0	6.3	6.5	6.5
	0.2	8.0	8.5	8.9	9.2	9.3
	0.4	11.4	12.1	12.7	13.0	13.2
	0.8	15.7	16.2	17.5	18.7	18.9
	1.6	22.2	23.6	24.8	25.6	26.0
EVR 15	0.1	7.7	8.2	8.6	8.8	8.9
	0.2	11.0	11.6	12.1	12.5	12.7
	0.4	15.7	16.6	17.3	17.8	18.0
	0.8	21.5	22.2	24.0	25.5	25.9
	1.6	30.3	32.3	33.9	35.0	35.5
EVR 20	0.1	14.8	15.7	16.5	17.0	17.2
	0.2	21.1	22.3	23.4	24.1	24.4
	0.4	30.0	31.9	33.3	34.3	34.7
	0.8	41.3	42.7	46.2	49.1	49.6
	1.6	58.3	62.1	65.2	67.4	68.4
EVR 22	0.1	17.8	18.8	19.7	20.4	20.6
	0.2	25.3	26.8	28.0	28.9	29.3
	0.4	36.1	38.3	40.0	41.2	41.6
	0.8	49.5	51.2	55.4	58.9	59.5
	1.6	70.0	74.5	78.2	80.8	82.0
EVR 25	0.1	29.6	31.4	32.9	34.0	34.4
	0.2	42.1	44.6	46.7	48.2	48.8
	0.4	60.2	63.8	66.6	68.6	69.4
	0.8	82.5	87.9	92.3	98.2	99.2
	1.6	117.0	124.0	130.0	135.0	137.0
EVR 32	0.1	47.4	50.2	52.6	54.4	55.0
	0.2	67.4	71.4	74.7	77.1	78.1
	0.4	96.3	102.0	107.0	110.0	111.0
	0.8	132.0	140.0	148.0	157.0	159.0
	1.6	187.0	199.0	209.0	216.0	219.0
EVR 40	0.1	74.0	78.5	82.3	85.0	86.0
	0.2	105.0	112.0	117.0	121.0	122.0
	0.4	151.0	159.0	167.0	172.0	174.0
	0.8	206.0	222.0	231.0	246.0	248.0
	1.6	291.0	310.0	326.0	337.0	342.0

An increase in hot gas temperature t_h of 10 K, based on $t_h = t_c + 25^\circ\text{C}$, 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_e °C	-40	-30	-20	-10	0	+10
R 22	0.90	0.94	0.97	1.0	1.03	1.05

R 134a

Capacity
(continued)

Hot gas capacity Q_h kW

Type	Pressure drop across valve Δp bar	Hot gas capacity Q_h kW				
		Evaporating temp. $t_e = -10^\circ\text{C}$. Hot gas temp. $t_h = t_c + 25^\circ\text{C}$. Subcooling $\Delta t_{\text{sub}} = 4$ K				
		Condensing temperature t_c °C				
		+20	+30	+40	+50	+60
EVR 2	0.1	0.38	0.40	0.41	0.42	0.42
	0.2	0.54	0.57	0.59	0.60	0.59
	0.4	0.74	0.82	0.84	0.86	0.85
	0.8	1.06	1.13	1.17	1.23	1.22
	1.6	1.50	1.61	1.67	1.70	1.69
EVR 3	0.1	0.64	0.67	0.70	0.71	0.71
	0.2	0.91	0.96	0.99	1.01	1.00
	0.4	1.26	1.38	1.42	1.44	1.43
	0.8	1.79	1.90	1.98	2.08	2.05
	1.6	2.57	2.72	2.82	2.88	2.86
EVR 6	0.1	1.88	1.99	2.07	2.11	2.09
	0.2	2.69	2.84	2.95	3.00	2.97
	0.4	3.73	4.08	4.22	4.28	4.23
	0.8	5.29	5.62	5.86	6.16	6.08
	1.6	7.61	8.05	8.37	8.52	8.46
EVR 10	0.1	4.5	4.7	4.9	5.0	5.0
	0.2	6.4	6.8	7.0	7.1	7.1
	0.4	8.9	9.7	10.0	10.2	10.1
	0.8	12.6	13.3	13.9	14.6	14.4
	1.6	18.1	19.1	19.9	20.2	20.1
EVR 15	0.1	6.1	6.5	6.7	6.7	6.8
	0.2	8.7	9.2	9.6	9.7	9.7
	0.4	12.1	13.3	13.7	13.9	13.8
	0.8	17.2	18.3	19.0	20.0	19.8
	1.6	24.8	26.2	27.2	27.7	27.5
EVR 20	0.1	11.8	12.5	13.0	13.2	13.1
	0.2	16.8	17.8	18.4	18.7	18.6
	0.4	23.4	25.5	26.4	26.7	26.5
	0.8	33.1	35.1	36.6	38.5	38.0
	1.6	47.6	50.3	52.3	53.3	52.9
EVR 22	0.1	14.1	15.0	15.5	15.8	15.7
	0.2	20.2	21.3	22.1	22.6	22.3
	0.4	28.0	30.6	31.6	32.1	31.7
	0.8	39.7	42.2	43.9	46.2	45.6
	1.6	57.1	60.4	62.8	63.9	63.5
EVR 25	0.1	23.6	24.9	25.9	26.4	26.2
	0.2	33.6	35.5	36.8	37.4	37.1
	0.4	46.6	51.0	52.7	53.4	52.9
	0.8	66.2	70.2	73.2	77.0	76.0
	1.6	95.2	101.0	105.0	107.0	106.0
EVR 32	0.1	37.6	39.8	41.4	42.1	41.8
	0.2	53.8	56.8	58.9	59.8	59.4
	0.4	74.7	81.6	84.3	85.4	84.6
	0.8	106.0	112.0	117.0	123.0	122.0
	1.6	152.0	161.0	167.0	170.0	169.0
EVR 40	0.1	58.8	62.3	64.7	65.8	65.3
	0.2	84.1	88.8	92.1	93.5	92.8
	0.4	117.0	127.0	132.0	134.0	132.0
	0.8	166.0	176.0	183.0	192.0	190.0
	1.6	238.0	252.0	262.0	266.0	265.0

An increase in hot gas temperature t_h of 10 K, based on $t_h = t_c + 25^\circ\text{C}$, 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_e °C	-40	-30	-20	-10	0	+10
R 134a	0.88	0.92	0.98	1.0	1.04	1.08

Capacity
(continued)

R 404A/R 507

Hot gas capacity Q_h kW

Type	Pressure drop across valve Δp bar	Hot gas capacity Q_h kW				
		Evaporating temp. $t_e = -10^\circ\text{C}$. Hot gas temp. $t_h = t_c + 25^\circ\text{C}$. Subcooling $\Delta t_{\text{sub}} = 4$ K				
		Condensing temperature t_c °C				
		+20	+30	+40	+50	+60
EVR 2	0.1	0.43	0.44	0.43	0.40	0.37
	0.2	0.61	0.62	0.61	0.58	0.53
	0.4	0.87	0.87	0.87	0.82	0.75
	0.8	1.19	1.21	1.21	1.19	1.07
	1.6	1.68	1.70	1.69	1.62	1.48
EVR 3	0.1	0.73	0.74	0.73	0.69	0.63
	0.2	1.03	1.04	1.03	0.98	0.89
	0.4	1.46	1.48	1.47	1.39	1.27
	0.8	2.01	2.04	2.03	2.00	1.81
	1.6	2.83	2.87	2.84	2.74	2.50
EVR 6	0.1	2.16	2.18	2.15	2.05	1.86
	0.2	3.03	3.08	3.05	2.90	2.64
	0.4	4.34	4.38	4.35	4.13	3.76
	0.8	5.94	6.05	6.02	5.92	5.37
	1.6	8.37	8.52	8.43	8.10	7.40
EVR 10	0.1	5.1	5.2	5.1	4.9	4.4
	0.2	7.2	7.3	7.3	6.9	6.3
	0.4	10.3	10.4	10.3	9.8	8.9
	0.8	14.1	14.4	14.3	14.1	12.8
	1.6	19.9	20.3	20.0	19.2	17.6
EVR 15	0.1	7.0	7.1	7.0	6.7	6.1
	0.2	9.9	10.0	9.9	9.4	8.6
	0.4	14.1	14.3	14.2	13.4	12.2
	0.8	19.3	19.7	19.6	19.2	17.5
	1.6	27.2	27.7	27.6	26.3	24.1
EVR 20	0.1	13.4	13.7	13.5	12.8	11.6
	0.2	18.9	19.2	19.1	18.2	16.5
	0.4	27.1	27.4	27.2	25.8	23.5
	0.8	37.1	37.8	37.7	37.0	33.6
	1.6	52.4	53.3	52.6	50.6	46.2
EVR 22	0.1	16.1	16.4	16.1	15.4	14.0
	0.2	22.7	23.1	22.9	21.8	19.8
	0.4	32.5	32.9	32.7	31.0	28.2
	0.8	44.5	45.4	45.2	44.4	40.3
	1.6	62.8	64.0	63.2	60.8	55.5
EVR 25	0.1	26.8	27.4	26.9	25.6	23.3
	0.2	37.9	38.4	38.2	36.3	33.0
	0.4	54.2	54.9	54.5	51.7	47.0
	0.8	74.2	75.6	75.3	74.0	67.2
	1.6	105.0	107.0	105.0	101.0	92.5
EVR 32	0.1	43.0	43.8	43.0	40.9	37.3
	0.2	60.6	61.4	61.1	58.1	52.8
	0.4	86.7	87.8	87.2	82.7	75.2
	0.8	119.0	121.0	120.0	118.0	107.0
	1.6	167.0	171.0	168.0	162.0	148.0
EVR 40	0.1	67.0	68.5	67.3	64.0	58.3
	0.2	94.8	96.0	95.5	90.8	82.5
	0.4	136.0	137.0	136.0	129.0	117.0
	0.8	186.0	189.0	188.0	185.0	168.0
	1.6	262.0	266.0	263.0	253.0	231.0

An increase in hot gas temperature t_h of 10 K, based on $t_h = t_c + 25^\circ\text{C}$, 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_e °C	-40	-30	-20	-10	0	+10
R 404A/R 507	0.86	0.88	0.93	1.0	1.03	1.07

Capacity
(continued)

Hot gas capacity Q_h kW

Type	Pressure drop across valve Δp bar	Hot gas capacity Q_h kW				
		Evaporating temp. $t_e = -10^\circ\text{C}$. Hot gas temp. $t_h = t_c + 25^\circ\text{C}$. Subcooling $\Delta t_{\text{sub}} = 4$ K				
		Condensing temperature t_c °C				
		+20	+30	+40	+50	+60
EVR 2	0.1	0.53	0.55	0.57	0.56	0.54
	0.2	0.75	0.78	0.80	0.80	0.76
	0.4	1.08	1.12	1.14	1.14	1.09
	0.8	1.48	1.51	1.58	1.63	1.56
	1.6	2.09	2.19	2.23	2.25	2.15
EVR 3	0.1	0.9	0.94	0.95	0.96	0.91
	0.2	1.28	1.32	1.35	1.35	1.29
	0.4	1.83	1.89	1.93	1.92	1.83
	0.8	2.50	2.54	2.66	2.76	2.63
	1.6	3.53	3.69	3.77	3.79	3.62
EVR 6	0.1	2.7	2.8	2.8	2.8	2.7
	0.2	3.8	4.0	4.0	3.5	3.8
	0.4	5.4	5.6	5.7	5.7	5.5
	0.8	7.4	7.5	7.9	8.2	7.7
	1.6	10.4	10.9	11.1	11.2	10.7
EVR 10	0.1	6.3	6.6	6.7	6.8	6.4
	0.2	9.0	9.4	9.5	9.6	9.1
	0.4	12.8	13.3	13.6	13.5	12.9
	0.8	17.6	17.8	18.7	19.4	18.5
	1.6	24.9	26.0	26.5	26.6	25.5
EVR 15	0.1	8.6	9.0	9.2	9.2	8.7
	0.2	12.3	12.8	12.9	13	12.4
	0.4	17.6	18.3	18.5	18.5	17.6
	0.8	24.1	24.4	25.7	26.5	25.4
	1.6	33.9	35.5	36.3	36.4	34.8
EVR 20	0.1	16.6	17.3	17.7	17.7	16.9
	0.2	23.6	24.5	25.0	25.1	23.9
	0.4	33.6	35.1	35.6	35.7	34.0
	0.8	46.3	47	49.4	51.1	48.6
	1.6	65.3	68.3	69.8	70.1	67.0
EVR 22	0.1	19.9	20.7	21.1	21.2	20.2
	0.2	28.3	29.5	30.0	30.1	28.7
	0.4	40.4	42.1	42.8	42.8	40.8
	0.8	55.4	56.3	59.3	61.3	58.3
	1.6	78.4	82.0	83.7	84	80.4
EVR 25	0.1	33.2	34.5	35.2	35.4	33.7
	0.2	47.2	49.1	50.0	50.1	47.8
	0.4	67.4	70.2	71.3	71.3	68.0
	0.8	92.4	96.7	98.8	102.1	97.2
	1.6	131.0	136.4	139.1	140.4	134.3
EVR 32	0.1	53.1	55.2	56.3	56.6	53.9
	0.2	75.5	78.5	79.9	80.2	76.5
	0.4	107.9	112.2	114.5	114.4	108.8
	0.8	147.8	154.0	158.4	163.3	155.8
	1.6	209.4	218.9	223.6	224.6	214.6
EVR 40	0.1	82.9	86.4	88.1	88.4	84.3
	0.2	117.6	123.2	125.2	125.8	119.6
	0.4	169.1	174.9	178.7	178.9	170.5
	0.8	230.7	244.2	247.2	255.8	243.0
	1.6	325.9	341.0	348.8	350.5	335.2

An increase in hot gas temperature t_h of 10 K, based on $t_h = t_c + 25^\circ\text{C}$, 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_e °C	-40	-30	-20	-10	0	+10
R 407C	0.90	0.94	0.97	1.0	1.03	1.05

Capacity
(continued)

Hot gas capacity G_h kg/s

R 22

Type	Hot gas temperature t_h °C	Condensing temperature t_c °C	Hot gas capacity G_h kg/s at pressure drop across valve Δp bar								
			0.5	1	2	3	4	5	6	7	8
EVR 2	+90	+25	0.005	0.007	0.01	0.011	0.012	0.012	0.012	0.012	0.012
		+35	0.006	0.009	0.011	0.013	0.014	0.015	0.015	0.015	0.015
		+45	0.007	0.01	0.013	0.016	0.017	0.018	0.019	0.019	0.02
EVR 3		+25	0.009	0.012	0.016	0.019	0.02	0.02	0.02	0.02	0.02
		+35	0.01	0.014	0.019	0.022	0.024	0.025	0.026	0.026	0.026
		+45	0.012	0.016	0.022	0.026	0.029	0.031	0.032	0.033	0.033
EVR 6		+25	0.027	0.037	0.049	0.055	0.058	0.059	0.059	0.059	0.059
		+35	0.031	0.043	0.057	0.067	0.072	0.075	0.077	0.077	0.077
		+45	0.035	0.049	0.066	0.078	0.086	0.092	0.095	0.097	0.098
EVR 10	+25	0.064	0.088	0.116	0.131	0.139	0.14	0.14	0.14	0.14	
	+35	0.074	0.102	0.137	0.158	0.172	0.179	0.182	0.182	0.182	
	+45	0.084	0.116	0.158	0.185	0.205	0.218	0.227	0.231	0.232	
EVR 15	+25	0.084	0.116	0.153	0.173	0.182	0.184	0.184	0.184	0.184	
	+35	0.097	0.134	0.18	0.208	0.226	0.236	0.239	0.239	0.239	
	+45	0.11	0.153	0.208	0.244	0.269	0.287	0.298	0.304	0.305	
EVR 20	+25	0.169	0.231	0.305	0.346	0.365	0.368	0.368	0.368	0.368	
	+35	0.194	0.267	0.359	0.416	0.452	0.472	0.478	0.478	0.478	
	+45	0.22	0.305	0.415	0.488	0.539	0.574	0.597	0.608	0.611	
EVR 22	+25	0.203	0.277	0.366	0.415	0.438	0.442	0.442	0.442	0.442	
	+35	0.279	0.32	0.431	0.499	0.542	0.566	0.574	0.574	0.574	
	+45	0.264	0.366	0.498	0.586	0.647	0.689	0.716	0.722	0.733	
EVR 25	+25	0.331	0.453	0.599	0.677	0.715	0.722	0.722	0.722	0.722	
	+35	0.38	0.524	0.704	0.816	0.886	0.925	0.938	0.938	0.938	
	+45	0.431	0.598	0.814	0.956	1.056	1.125	1.169	1.192	1.197	
EVR 32	+25	0.539	0.739	0.976	1.106	1.168	1.179				
	+35	0.619	0.856	1.15	1.331	1.446	1.509	1.531			
	+45	0.704	0.978	1.329	1.562	1.723	1.837	1.909	1.947	1.955	
EVR 40	+25	0.843	1.155	1.525	1.728	1.825	1.843				
	+35	0.968	1.338	1.798	2.08	2.26	2.358	2.393			
	+45	1.1	1.528	2.078	2.44	2.693	2.87	2.983	3.043	3.055	

R 134a

Type	Hot gas temperature t_h °C	Condensing temperature t_c °C	Hot gas capacity G_h kg/s at pressure drop across valve Δp bar								
			0.5	1	2	3	4	5	6	7	8
EVR 2	+60	+25	0.005	0.007	0.008	0.008	0.008	0.012	0.012		
		+35	0.006	0.008	0.01	0.011	0.012	0.015	0.015	0.015	0.015
		+45	0.007	0.009	0.012	0.014	0.015	0.015	0.015	0.015	0.015
EVR 3		+25	0.008	0.011	0.011	0.014	0.014				
		+35	0.009	0.013	0.016	0.018	0.018	0.018	0.018		
		+45	0.01	0.016	0.02	0.023	0.025	0.025	0.025	0.025	0.025
EVR 6		+25	0.024	0.032	0.04	0.041	0.041				
		+35	0.028	0.038	0.049	0.055	0.056	0.056	0.056		
		+45	0.032	0.045	0.059	0.068	0.072	0.073	0.073	0.073	0.073
EVR 10	+25	0.057	0.075	0.094	0.098	0.098					
	+35	0.066	0.09	0.117	0.13	0.132	0.132	0.132			
	+45	0.076	0.107	0.141	0.161	0.17	0.172	0.172	0.172	0.172	
EVR 15	+25	0.074	0.1	0.124	0.129	0.129					
	+35	0.087	0.119	0.154	0.171	0.167	0.167	0.167			
	+45	0.1	0.14	0.185	0.212	0.223	0.225	0.225	0.225	0.225	
EVR 20	+25	0.149	0.199	0.247	0.258	0.258					
	+35	0.174	0.238	0.307	0.341	0.347	0.347	0.347			
	+45	0.2	0.28	0.37	0.423	0.447	0.452	0.452	0.452	0.452	
EVR 22	+25	0.179	0.239	0.296	0.31	0.31					
	+35	0.209	0.286	0.368	0.409	0.416	0.416	0.416			
	+45	0.24	0.336	0.444	0.508	0.536	0.542	0.542	0.542	0.542	
EVR 25	+25	0.292	0.391	0.486	0.506	0.506					
	+35	0.341	0.467	0.602	0.668	0.679	0.679	0.679			
	+45	0.393	0.549	0.725	0.83	0.876	0.885	0.885	0.885	0.885	
EVR 32	+25	0.478	0.638	0.793	0.826	0.826					
	+35	0.556	0.763	0.994	1.091	1.108	1.108	1.108			
	+45	0.641	0.897	1.197	1.354	1.432	1.446	1.446	1.446	1.446	
EVR 40	+25	0.747	0.998	1.24	1.291	1.291					
	+35	0.87	1.192	1.553	1.704	1.731	1.731	1.731			
	+45	1.002	1.402	1.87	2.117	2.237	2.259	2.259	2.259	2.259	

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

Capacity
(continued)

R 404A/R 507

Hot gas capacity G_h kg/s

Type	Hot gas temperature t_h °C	Condensing temperature t_c °C	Hot gas capacity G_h kg/s at pressure drop across valve Δp bar									
			0.5	1	2	3	4	5	6	7	8	
EVR 2	+60	+25	0.007	0.009	0.012	0.014	0.016	0.016	0.016	0.016	0.016	0.016
		+35	0.008	0.011	0.014	0.017	0.019	0.02	0.02	0.02	0.02	0.02
		+45	0.009	0.012	0.016	0.019	0.021	0.024	0.025	0.025	0.025	0.025
EVR 3		+25	0.011	0.016	0.021	0.024	0.026	0.026	0.027	0.027	0.027	0.027
		+35	0.013	0.018	0.024	0.029	0.031	0.033	0.035	0.035	0.035	0.035
		+45	0.015	0.02	0.028	0.032	0.037	0.039	0.041	0.043	0.043	0.043
EVR 6		+25	0.034	0.047	0.062	0.072	0.077	0.079	0.08	0.08	0.08	0.08
		+35	0.038	0.054	0.072	0.085	0.093	0.098	0.101	0.101	0.101	0.102
		+45	0.043	0.061	0.082	0.097	0.108	0.116	0.122	0.126	0.126	0.128
EVR 10	+25	0.08	0.11	0.148	0.17	0.183	0.188	0.19	0.19	0.19	0.19	
	+35	0.091	0.127	0.171	0.2	0.22	0.233	0.241	0.241	0.243	0.243	
	+45	0.102	0.143	0.194	0.23	0.257	0.277	0.288	0.3	0.303	0.303	
EVR 15	+25	0.105	0.146	0.195	0.224	0.24	0.247	0.249	0.249	0.249	0.249	
	+35	0.12	0.167	0.224	0.253	0.289	0.307	0.316	0.317	0.32	0.32	
	+45	0.135	0.189	0.225	0.303	0.339	0.365	0.38	0.393	0.399	0.399	
EVR 20	+25	0.21	0.29	0.39	0.448	0.48	0.495	0.5	0.5	0.5	0.5	
	+35	0.239	0.333	0.45	0.526	0.58	0.614	0.632	0.633	0.639	0.639	
	+45	0.27	0.375	0.51	0.606	0.677	0.729	0.76	0.785	0.799	0.799	
EVR 22	+25	0.252	0.348	0.468	0.538	0.576	0.594	0.6	0.6	0.6	0.6	
	+35	0.287	0.4	0.54	0.631	0.696	0.737	0.758	0.76	0.767	0.767	
	+45	0.324	0.45	0.612	0.727	0.812	0.875	0.912	0.942	0.959	0.959	
EVR 25	+25	0.411	0.57	0.763	0.878	0.942	0.969	0.978	0.978	0.978	0.978	
	+35	0.468	0.653	0.881	1.032	1.136	1.203	1.239	1.241	1.253	1.253	
	+45	0.529	0.734	1.0	1.188	1.326	1.43	1.49	1.539	1.566	1.566	
EVR 32	+25	0.672	0.931	1.245	1.432	1.539	1.581	1.581	1.581	1.581	1.581	
	+35	0.765	1.069	1.436	1.686	1.854	1.964	2.022	2.025	2.025	2.025	
	+45	0.862	1.198	1.632	1.939	2.186	2.34	2.433	2.513	2.557	2.557	
EVR 40	+25	1.05	1.454	1.946	2.238	2.406	2.471	2.471	2.471	2.471	2.471	
	+35	1.195	1.657	2.245	2.635	2.897	3.068	3.161	3.166	3.166	3.166	
	+45	1.348	1.873	2.55	3.03	3.384	3.65	3.801	3.926	3.995	3.995	

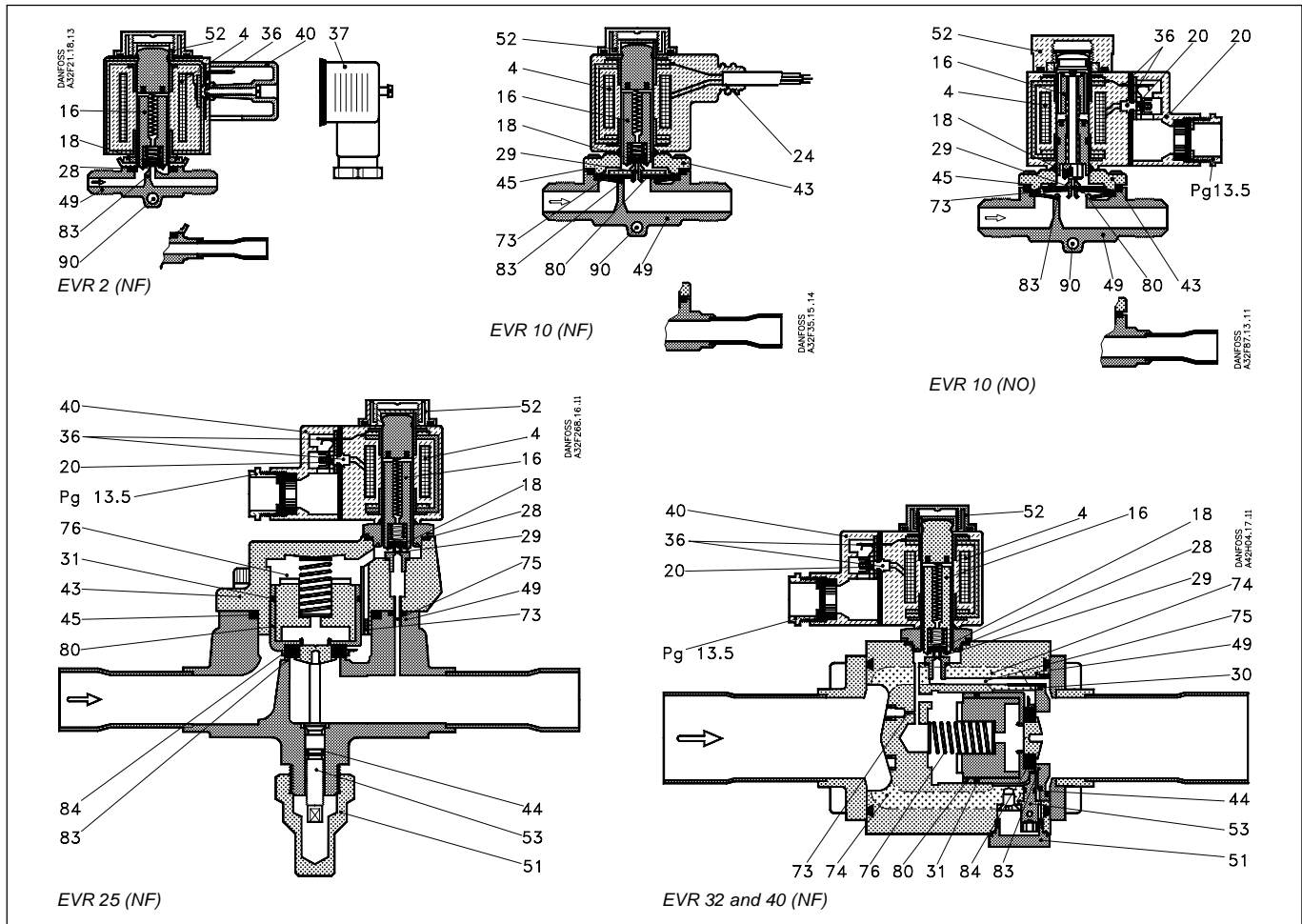
R 407C

Hot gas capacity G_h kg/s

Type	Hot gas temperature t_h °C	Condensing temperature t_c °C	Hot gas capacity G_h kg/s at pressure drop across valve Δp bar									
			0.5	1	2	3	4	5	6	7	8	
EVR 2	+90	+25	0.0054	0.0076	0.0108	0.0118	0.0130	0.0132	0.0132	0.0132	0.0132	0.0132
		+35	0.0065	0.0097	0.0118	0.0140	0.0151	0.0165	0.0165	0.0165	0.0165	0.0165
		+45	0.0076	0.0108	0.0140	0.0173	0.0184	0.0198	0.0209	0.0209	0.0209	0.022
EVR 3		+25	0.010	0.013	0.017	0.021	0.022	0.022	0.022	0.022	0.022	0.022
		+35	0.011	0.015	0.021	0.024	0.026	0.028	0.029	0.029	0.029	0.029
		+45	0.013	0.017	0.024	0.028	0.032	0.034	0.036	0.037	0.037	0.037
EVR 6		+25	0.029	0.040	0.053	0.06	0.063	0.065	0.065	0.065	0.065	0.065
		+35	0.033	0.046	0.062	0.073	0.078	0.083	0.085	0.085	0.085	0.085
		+45	0.038	0.053	0.071	0.085	0.094	0.101	0.105	0.108	0.109	0.109
EVR 10	+25	0.069	0.095	0.125	0.143	0.152	0.154	0.155	0.155	0.155	0.155	
	+35	0.08	0.11	0.148	0.172	0.187	0.197	0.202	0.202	0.202	0.202	
	+45	0.091	0.125	0.171	0.202	0.223	0.24	0.252	0.256	0.258	0.258	
EVR 15	+25	0.091	0.125	0.165	0.189	0.198	0.202	0.204	0.204	0.204	0.204	
	+35	0.105	0.145	0.194	0.227	0.246	0.26	0.265	0.265	0.265	0.265	
	+45	0.119	0.165	0.225	0.266	0.293	0.316	0.331	0.337	0.339	0.339	
EVR 20	+25	0.183	0.249	0.329	0.377	0.398	0.405	0.408	0.408	0.408	0.408	
	+35	0.21	0.288	0.388	0.453	0.493	0.519	0.531	0.531	0.531	0.531	
	+45	0.238	0.329	0.448	0.532	0.588	0.631	0.663	0.675	0.678	0.678	
EVR 22	+25	0.219	0.299	0.395	0.452	0.477	0.486	0.491	0.491	0.491	0.491	
	+35	0.301	0.346	0.465	0.544	0.591	0.623	0.637	0.637	0.637	0.637	
	+45	0.285	0.395	0.538	0.639	0.705	0.758	0.795	0.801	0.814	0.814	
EVR 25	+25	0.357	0.489	0.647	0.738	0.779	0.794	0.801	0.801	0.801	0.801	
	+35	0.41	0.566	0.76	0.889	0.966	1.018	1.041	1.041	1.041	1.041	
	+45	0.465	0.646	0.879	1.042	1.151	1.238	1.298	1.323	1.329	1.329	
EVR 32	+25	0.582	0.798	1.054	1.206	1.273	1.297					
	+35	0.669	0.924	1.242	1.451	1.576	1.66	1.699				
	+45	0.76	1.056	1.435	1.703	1.878	2.021	2.119	2.161	2.17	2.17	
EVR 40	+25	0.91	1.247	1.647	1.884	1.989	2.027					
	+35	1.045	1.445	1.942	2.267	2.463	2.594	2.656				
	+45	1.188	1.65	2.244	2.66	2.935	3.157	3.311	3.378	3.391	3.391	

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

Design / Function



- 4. Coil
- 16. Armature
- 18. Valve plate / Pilot valve plate
- 20. Earth terminal
- 24. Connection for flexible steel hose
- 28. Gasket
- 29. Pilot orifice
- 30. O-ring
- 31. Piston ring
- 36. DIN plug
- 37. DIN socket (to DIN 43650)
- 40. Protective cap/Terminal box
- 43. Valve cover
- 44. O-ring
- 45. Valve cover gasket
- 49. Valve body
- 50. Gasket
- 51. Threaded plug
- 52. Lock button and top nut
- 53. Manual operation spindle
- 73. Equalization hole
- 74. Main channel
- 75. Pilot channel
- 76. Compression spring
- 80. Diaphragm/Servo piston
- 83. Valve seat
- 84. Main valve plate
- 90. Mounting hole

EVR solenoid valves are designed on two different principles:

1. Direct operation
2. Servo operation

1. Direct operation

EVR 2 and 3 are direct operated. The valves open direct for full flow when the armature (16) moves up into the magnetic field of the coil. This means that the valves operate with a min. differential pressure of 0 bar. The teflon valve plate (18) is fitted direct on the armature (16). Inlet pressure acts from above on the armature and the valve plate. Thus, inlet pressure, spring force and the weight of the armature act to close the valve when the coil is currentless.

2. Servo operation

EVR 6 → 22 are servo operated with a "floating" diaphragm (80). The pilot orifice (29) of stainless steel is placed in the centre of the diaphragm. The teflon pilot valve plate (18) is fitted direct to the armature (16). When the coil is currentless, the main orifice and pilot orifice are closed. The pilot orifice and main orifice are held closed by the weight of the armature, 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.

For EVR 6 → 22 valves this differential pressure is 0.05 bar.

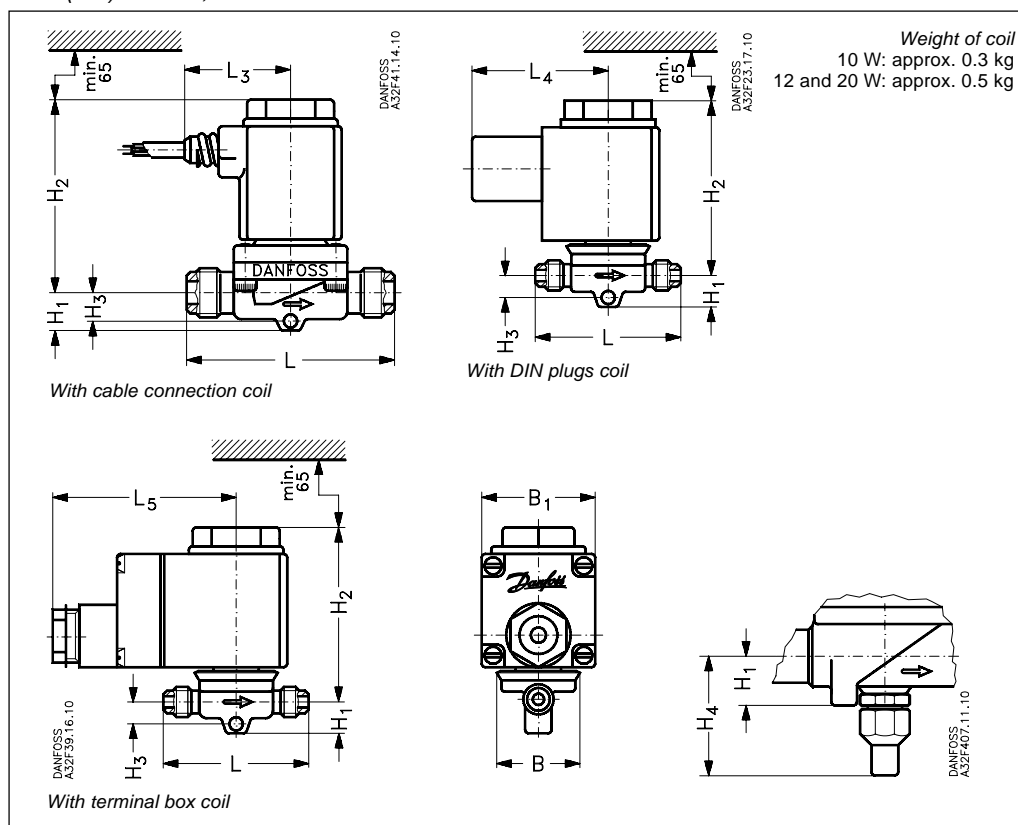
When current is switched off, the pilot orifice closes. Via the equalization holes (73) in the diaphragm, the pressure above the diaphragm then rises to the same value as the inlet pressure and the diaphragm closes the main orifice.

EVR 25, 32 and 40 are servo operated piston valves. The valves are closed with currentless coil. The servo piston (80) with main valve plate (84) closes against the valve seat (83) by means of the differential pressure between inlet and outlet side of the valve, the force of the compression spring (76) and possibly the piston weight. When current to the coil is switched on, the pilot orifice (29) opens. This relieves the pressure on the piston spring side of the valve.

The differential pressure will then open the valve. The minimum differential pressure needed for full opening of the valves is 0.07 bar. EVR (NO) has the opposite function to EVR (NC), i.e. it is open with de-energised coil. EVR (NO) is available with servo operation only.

Dimensions and weights

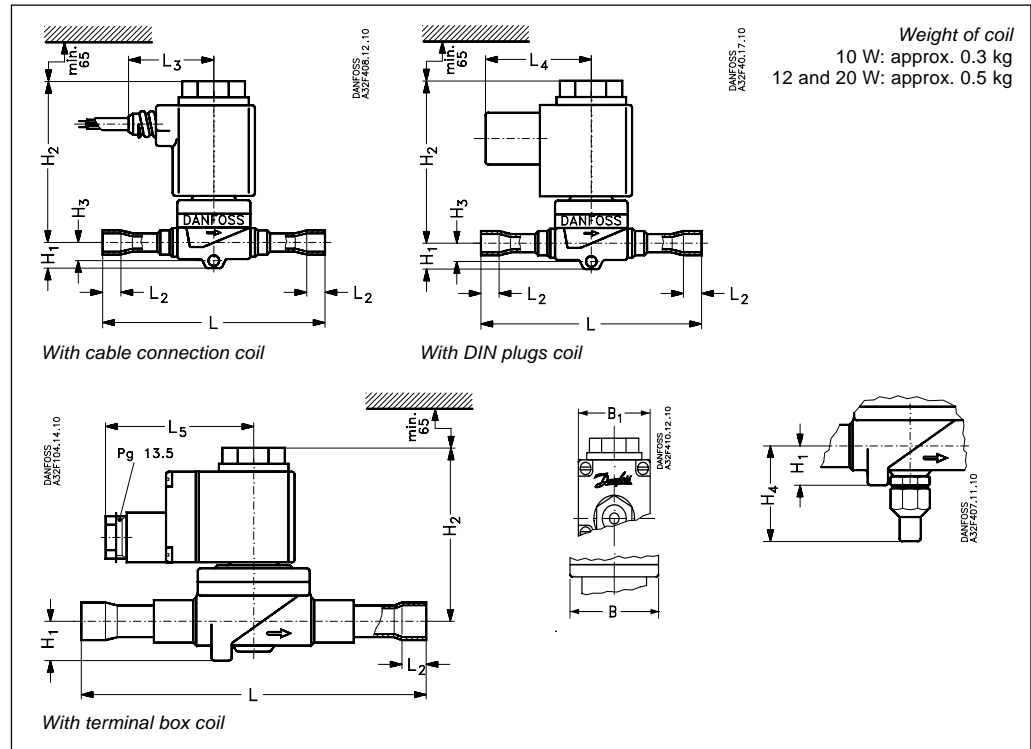
EVR (NC) 2 → 15, flare connection



Type	Connection Flare		H ₁	H ₂	H ₃	H ₄	L	L ₂	L ₃	L ₄	L ₅ max.		B	B ₁ max.	Weight with coil
	in.	mm									10 W	12/20 W			
EVR 2	1/4	6	14	71	9		59		45	54	75	85	33	68	0.5
EVR 3	1/4	6	14	71	9		59		45	54	75	85	33	68	0.5
	3/8	10	14	73	9		62		45	54	75	85	33	68	0.5
EVR 6	3/8	10	14	78	10		69		45	54	75	85	36	68	0.6
	1/2	12	14	78	10		75		45	54	75	85	36	68	0.6
EVR 10	1/2	12	16	79	11		84		45	54	75	85	46	68	0.8
	5/8	16	16	79	11		92		45	54	75	85	46	68	0.8
EVR 15	5/8	16	19	86		49	104		45	54	75	85	56	68	1.0

Dimensions and weights
(continued)

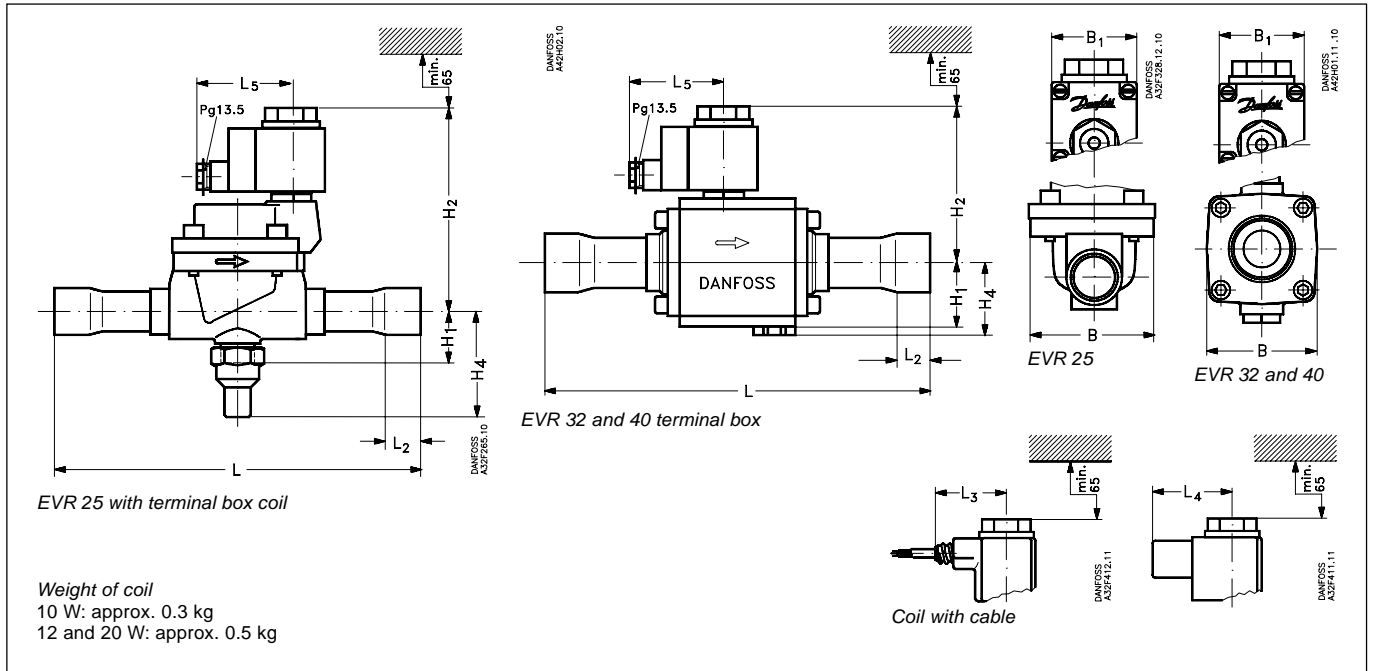
EVR (NC) 2 → 22, solder connection



Type	Connection Solder		H ₁ mm	H ₂ mm	H ₃ mm	H ₄ mm	L mm	L ₂ mm	L ₃ mm	L ₄ mm	L ₅ max.		B mm	B ₁ max. mm	Weight with coil kg
	in.	mm									10 W mm	12/20 W mm			
EVR 2	1/4	6	14	71	9		102	7	45	54	75	85	33	68	0.5
EVR 3	1/4	6	14	71	9		102	7	45	54	75	85	33	68	0.6
	3/8	10	14	73	9		117	9	45	54	75	85	33	68	0.6
EVR 6	3/8	10	14	78	10		111	9	45	54	75	85	36	68	0.6
	1/2	12	14	78	10		127	10	45	54	75	85	36	68	0.6
EVR 10	1/2	12	16	79	11		127	10	45	54	75	85	46	68	0.7
	5/8	16	16	79	11		160	12	45	54	75	85	46	68	0.7
EVR 15	5/8	16	19	86		49	176	12	45	54	75	85	56	68	1.0
	7/8	22	19	86			176	17	45	54	75	85	56	68	1.0
EVR 20	7/8	22	20	90		53	191	17	45	54	75	85	72	68	1.5
	1 1/8	28	20	90			214	22	45	54	75	85	72	68	1.5
EVR 22	1 3/8	35	20	90			281	25	45	54	75	85	72	68	1.5

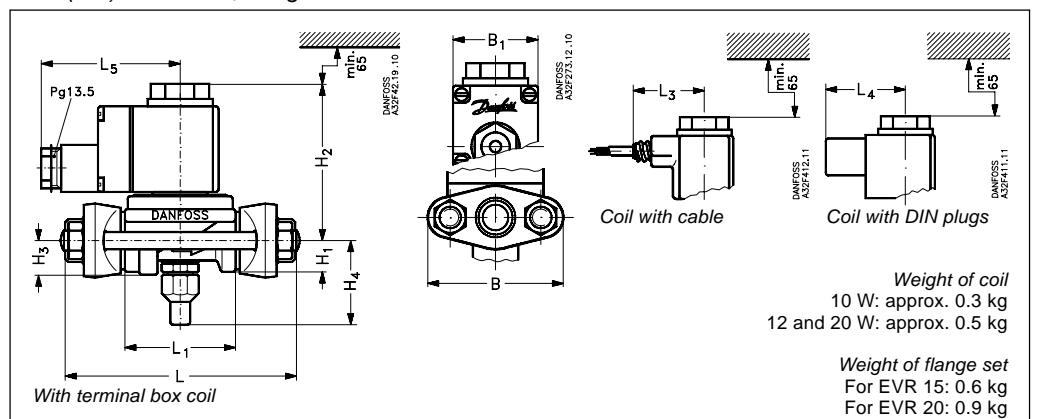
Dimensions and weights (continued)

EVR (NC) 25, 32 og 40, solder connection



Type	Connection Solder		H ₁	H ₂	H ₃	H ₄	L	L ₂	Coil with cable connection L ₃	Coil with DIN connection L ₄	Coil with terminal box L ₅ max.		B	B ₁ max.	Weight with coil kg
	in.	mm									10 W	12/20 W			
EVR 25	1 1/8	28	38	138		72	256	22	45	54	75	85	95	68	3.0
	1 3/8	35	38	138		72	281	25	45	54	75	85	95	68	3.3
EVR 32	1 3/8	35	47	111		53	281	25	45	54	75	85	80	68	4.5
	1 5/8	42	47	111		53	281	29	45	54	75	85	80	68	4.6
EVR 40	1 5/8	42	47	111		53	281	29	45	54	75	85	80	68	4.6
	2 1/8	54	47	111		53	281	34	45	54	75	85	80	68	4.6

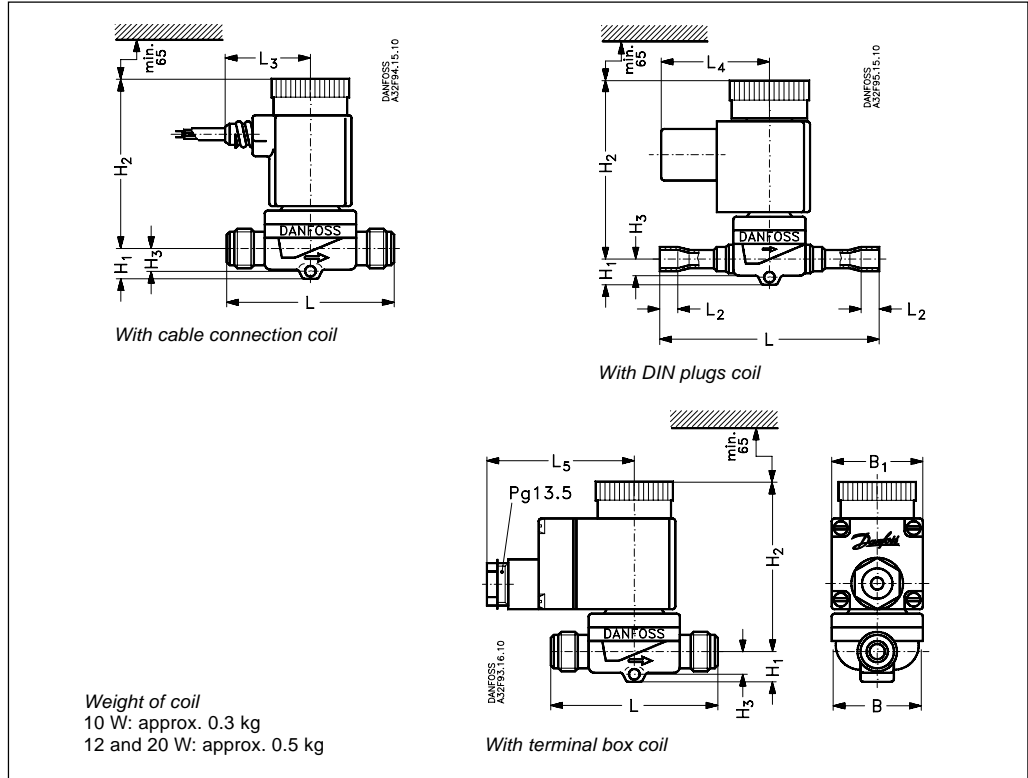
EVR (NC) 15 and 20, flange connection



Type	H ₁	H ₂	H ₃	H ₄	L	L ₁	L ₂	Coil with cable connection L ₃	Coil with DIN connection L ₄	Coil with terminal box L ₅ max.		B	B ₁ max.	Weight with coil excl. flanges kg
										10 W	12/20 W			
EVR 15	19	86	19	49	125	68		45	54	75	85	80	68	1.2
EVR 20	20	90	21	53	155	85		45	54	75	85	96	68	1.7

Dimensions and weights
(continued)

EVR (NO) 6 → 22, flare or solder connection



Type	H ₁ mm	H ₂ mm	H ₃ mm	H ₄ mm	L mm	L ₁ mm	L ₂ mm	Coil with cable connection L ₃ mm	Coil with DIN connection L ₄ mm	Coil with terminal box L ₅ max.		B mm	B ₁ max. mm	Weight with coil kg
										10 W mm	12/20 W mm			

Flare

EVR 6	14	88	10		69			45	54	75	85	36	68	0.6
EVR 10	16	89	11		84			45	54	75	85	46	68	0.7
EVR 15	19	96			104			45	54	75	85	56	68	0.9

Solder

EVR 6	14	88	10		111		9	45	54	75	85	36	68	0.6
EVR 10	16	89	11		127		10	45	54	75	85	46	68	0.7
EVR 15	19	96			176		12	45	54	75	85	56	68	0.9
EVR 20	20	100			191 ¹⁾		17 ¹⁾	45	54	75	85	72	68	1.5
EVR 22	20	100			281		25	45	54	75	85	72	68	1.5

¹⁾ Applies to 7/8 in. and 22 mm connections. For 1 1/8 in. and 28 mm connections is L = 214 mm and L₂ = 22 mm.

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DK-6430 Nordborg
Denmark