Technical brochure

Solenoid valves
Type EVRA 3-40 and EVRAT 10-20

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

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

EVRAT is an assisted lift, servo operated solenoid valve for liquid, suction and hot gas lines with ammonia and fluorinated refrigerants.

EVRAT is specially designed to open - and stay open - at a pressure drop of 0 bar/psig.
The EVRAT solenoid valve is thus suitable for use in any system where the required opening differential pressure is 0 bar/psig.

EVRAT is available as components, i.e. valve body, flanges and coil must be ordered separately.
EVRAT 10, 15 and 20 have a spindle for manual operation.

Features

- Can be used for all non-flammable refrigerants, including R 717, and non-corrosive gases/ liquids - assuming seals of correct material are used
- Teflon gasket ensures a very high tightness across valve seat
- Low pressure drop across valve
- Wide range of flanges with connection dimensions in accordance with standards: DIN ANSI, SOC, SA and FPT
- Large range of coils
- Strainer type FA can be mounted directly on the valve body except for EVRA 32 and 40.
- Certification: Please contact Danfoss for an updated list with type approvals for the products.

Contents

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Design

Connections
There is a wide range of connection possibilities with EVRA 3 to 25
- Welding DIN (2448)
- Welding ANSI ($^3/_8$ - 1½ in. B36, 10 schedule 80, 2 in. B36.10 schedule 40)
- Welding collar ANSI (B 16.11)
- Solder connection ANSI (B 16.22
- FPT internal thread, NPT (ANSI/ASME B 1.20.1)

EVRA 32 and 40 are supplied with integrated flanges for:
- Welding DIN (2448)
- Welding ANSI (B 36.10)

Types
EVRA 3 is a direct operated solenoid valve that opens directly for the flow when current is applied to the coil of the solenoid valve.

EVRA 10 to 20 are servo operated solenoid valves with "floating" diaphragm that needs a differential pressure of min. 0.05 bar/ 0.725 psi for operation. Differential pressure for operation for EVRAT 10 to 20 is 0 bar/psi.

EVRA 25 to 40 are servo operated piston valves that need a differential pressure of min. 0.07 bar/ 1 psi for operation.

Valve body
Ductile iron GJS-400-18-LT

Approvals

DNV, Det Norske Veritas, Norway
Polski Rejestr Statków, Poland
MRS, Maritime Register of Shipping, Russia
Pressure Equipment Directive (PED) (97/23/EC)(EVRA 32 and 40 CE marked according to PED)
UL-listed with GP coils

Technical data

SI Units

Refrigerants
R 717 (NH_3), R 22, R 134a, R 404A, R 12, R 502 etc.

For ambient temperature and enclosure for coils
See "Coils for solenoid valves" page 42-47

Type	Opening differential pressure with standard coil Δp bar				Temperature of medium °C	Max. working pressure PB bar	k_v-value m^3/h
	Min.	Max. (= MOPD) liquid [2] 10 W a.c.	12 W a.c.	20 W d.c.			
EVRA 3	0.00	21	25	14	−40 → 105	42	0.23
EVRA 10	0.05	21	25	18			1.5
EVRAT 10	0.00	14	21	16			1.5
EVRA 15	0.05	21	25	18			2.7
EVRAT 15	0.00	14	21	16			2.7
EVRA 20	0.05	21	25	13			4.5
EVRAT 20	0.00	14	21	13			4.5
EVRA 25	0.20	21	25	14			10.0
EVRA 32	0.20	21	25	14			16.0
EVRA 40	0.20	21	25	14			25.0

[1]) The k_v value is the water flow in m^3/h at a pressure drop across valve of 1 bar, $\rho = 1000$ kg/m^3.
[2]) MOPD for media in gas form is approx. 1 bar greater.

US units

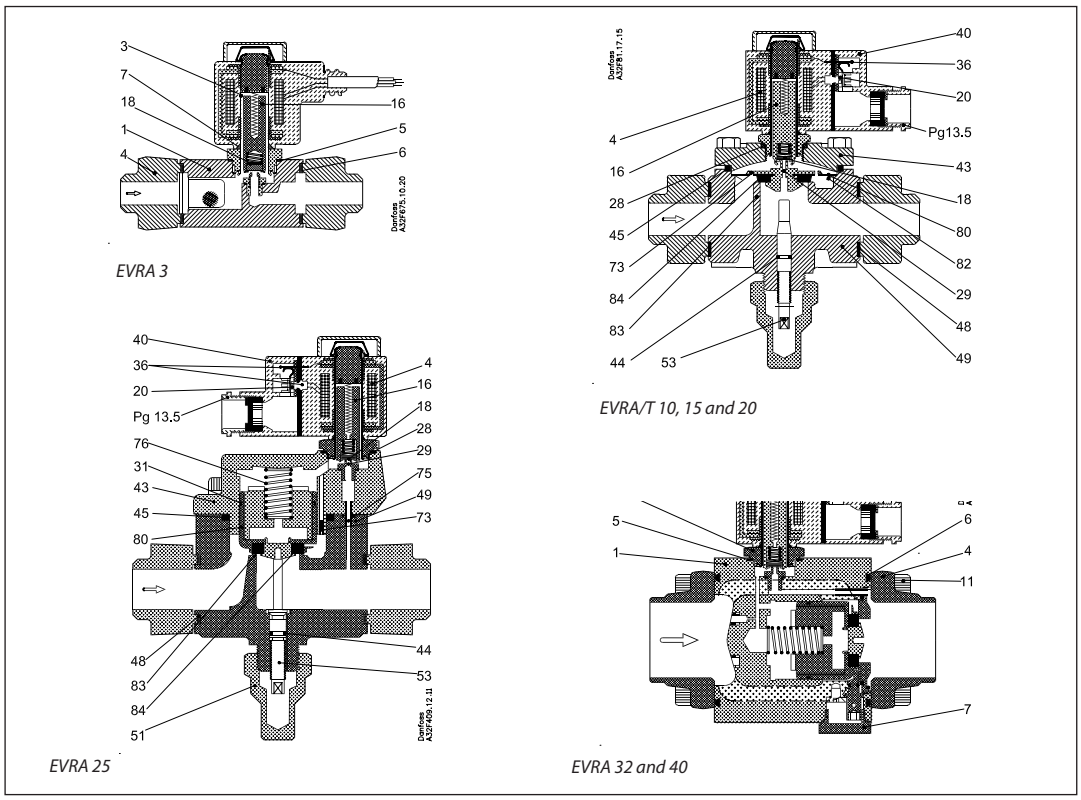
Temperature of medium
−40 → +221°F.
Max. 265°F during defrosting.

Type	Opening differential pressure with standard coil Δp psi				Temperature of medium °F	Max. working pressure PB psi	C_v-value gal
	Min.	Max. (= MOPD) liquid [2] 10 W a.c.	12 W a.c.	20 W d.c.			
EVRA 3	0.0	300	360	200	−40 → 220	609	0.27
EVRA 10	0.7	300	360	261			1.74
EVRAT 10	0.0	200	300	232			1.74
EVRA 15	0.7	300	360	261			3.14
EVRAT 15	0.00	200	300	232			3.14
EVRA 20	0.7	300	360	189			5.23
EVRAT 20	0.0	200	300	189			5.23
EVRA 25	3	300	360	200			11.6
EVRA 32	3	300	360	200			18.6
EVRA 40	3	300	360	200			20.0

The C_v value is the water flow in gal/min at a pressure drop across valve $\Delta p = 1$ psi, $\rho = 10$ lbs/gal
[2]) MOPD for media in gas form is approx. 14.5 psi greater.

Design
Function

4. Coil
16. Armature
18. Valve plate / Pilot valve plate
20. Earth terminal
28. Gasket
29. Pilot orifice
30. O-ring
31. Piston ring
36. DIN plug
40. Terminal box
43. Valve cover
44. O-ring
45. Valve cover gasket
48. Flange gasket
49. Valve body
51. Cover / Threaded plug
53. Manual operation spindle
59. Strainer
73. Equalization hole
74. Main channel
75. Pilot channel
76. Compression spring
80. Diaphragm/Servo piston
82. Support washer
83. Valve seat
84. Main valve plate



EVRA solenoid valves are designed on two different principles:
1. Direct operation
2. Servo operation

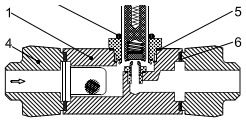
1. Direct operation
EVRA 3 is direct operated. The valve opens direct for full flow when the armature (16) moves up into the magnetic field of the coil. This means that the valve operates with a differential pressure of 0 bar/psi.
The teflon valve plate (18) is fitted direct on the armature (16).
Inlet 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
EVRA/T 10 → 20 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 EVRA 10 → 20 valves this differential pressure is 0.05 bar/ 0.725 psi while that of EVRAT 10 → 20 is 0 bar/psi.
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.

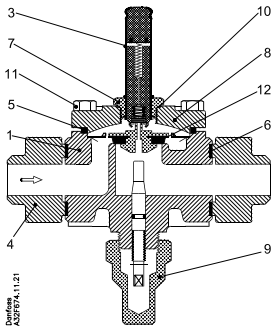
EVRA 25, 32 and 40 are servo operated piston valves. The valves are closed with currentless coil.
The servo piston (80) with main valve plate (84) closes against the valve seat (83) by means of the differential pressure between inlet and outlet side of the valve, the force of the compression spring (76) 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/ 1 psi.

Material specification

EVRA 3

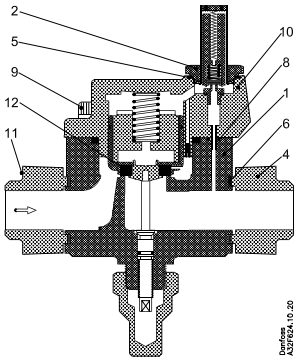


EVRA/T 10/15/20

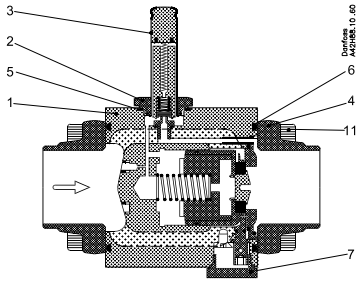


No.	Description	Solenoid valves	Material	Analysis	Mat.no.	W.no.	ISO	EN
1	Valve body	EVRA 3	Free-cutting steel	11MnPb30				10277-3
		EVRA/T 10/15/20	Cast-iron	GJS-400-18-LT				1563
3	Armature tube	EVRA 3/10/15/20	Stainless steel	X2CrNi19-11				10088
4	Flange	EVRA/T 3/10/15/20	Steel	S235JRG2				10025
5	Gasket	EVRA 3	Aluminium	Al 99.5				10210
		EVRA/T 10/15/20	Rubber	Cr				
6	Gasket	EVRA/T 3/10/15/20	asbestos-free					
7	Armature tube nut	EVRA/T 3/10/15/20	Stainless steel	X8CrNiS18-9				10088
8	Cover	EVRA/T 10/15/20	Cast-iron	GJS-400-18-LT				1563
9	Cover/ thread plug	EVRA/T 10/15/20	Free-cutting steel	11SMnPb30				10277-3
10	Gasket	EVRA/T 10/15/20	Aluminium	Al 99.5				10210
11	Bolts	EVRA/T 10/15/20	Stainless steel	A2-70			3506	
12	Valve seat	EVRA/T 10/15/20	Teflon (PTFE)					

EVRA 25

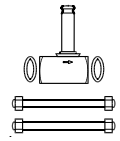


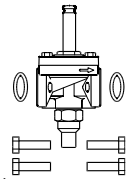
EVRA 32/40



No.	Description	Solenoid valves	Material	Analysis	Mat.no.	W.no.	ISO	EN
1	Valve body	EVRA 25/32/40	Cast-iron	GJS-400-18-LT				1563
2	Armature tube nut	EVRA 25/32/40	Stainless steel	X8CrNiS 18-9				10088
3	Armature tube	EVRA 25/32/40	Stainless steel	X2CrNi19-11				10088
4	Flange	EVRA 25	Steel	S235JRG2				10025
		EVRA 32/40	Steel	P285QH				10222-4
5	Gasket	EVRA 25/32/40	Aluminium	Al 99.5				10210
6	Gasket	EVRA 25	asbestos-free					
		EVRA 32/40	Rubber	Cr				
7	Cover/thread plug	EVRA 25	Free-cutting steel	11SMnPb30				10277-3
		EVRA 32/40	Stainless steel	X5CrNi17-10				10088
8	Gasket	EVRA 25	Rubber	CR				
9	Bolts	EVRA 25	Stainless steel	A2-70			3506	
10	Cover	EVRA 25	Cast-iron	GJS-400-18-LT				1563
11	Bolts	EVRA 25/32/40	Stainless steel	A2-70			3506	
12	Valve seat	EVRA 25	Teflon (PTFE)					

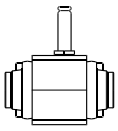
Ordering





Separate valve bodies, including flange gaskets and bolts

Type	Connection	Required coil type	**Code no.**
Valves without manual operation			
EVRA 3	See table *Flange set*	a.c. / d.c.	**032F3050**
Valves with manual operation			
EVRA 10	See table *Flange set*	a.c. / d.c.	**032F6210**
EVRAT 10		a.c. / d.c.	**032F6214**
EVRA 15		a.c. / d.c.	**032F6215**
EVRAT 15		a.c. / d.c.	**032F6216**
EVRA 20		a.c.	**032F6220**
EVRA 20		d.c.	**032F6221**
EVRAT 20		a.c. / d.c.	**032F6219**
EVRA 25		a.c. / d.c.	**032F6225**



Separate valve bodies with butt weld connections

Type	Butt weld connection		**Code no.**
		ANSI	
Valves with manual operation			
EVRA 32		1 ¼ in.	**042H1140**
EVRA 32		1 ½ in.	**042H1141**
EVRA 40		1 ½ in	**042H1142**
EVRA 40		2 in.	**042H1143**

Coils
See "Coils for solenoid valves", page 42-47

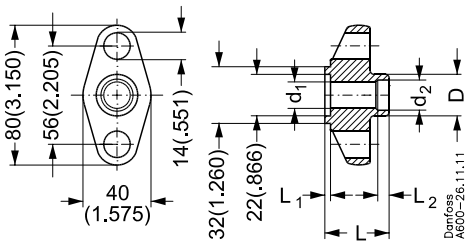
Accessories
Strainer FA for direct mounting, see "FA".

Flanges,
see the following pages.

Example
EVRA 15 valve body with manual operation,
code no. **032F6215**
+ $^{3}/_{4}$ in. **ANSI** weld flange set, code no. **027N2022**
+ coil with terminal box, 115 V, 60 Hz,
code no. **018F6710**

Ordering *(continued)*

Tongue/ tongue flange sets
for EVRA 3, EVRA/T 10 and EVRA/T 15
version 1.3



Each code no. includes two flanges

Butt welding ANSI B 36.10
Tongue flange sets

Connection		D	D	d_1	d_1	d_2	d_2	L	L	L_1	L_1	L_2	L_2	Code no.
mm	in.	mm	in.	mm	in.	mm	in.	mm	in	mm	in.	mm	in.	
10	3/8	17.1	0.673	10.7	0.421	10.7	0.421	32.5	1.280	3	0.118	6	0.236	**027N2020**
15	½	21.3	0.839	13.9	0.547	13.9	0.547							**027N2021**
20	¾	26.9	1.059	18.9	0.744	18.9	0.744							**027N2022**

Socket welding ANSI (B 16.11)
Tongue flange sets

Connection		D	D	d_1	d_1	d_2	d_2	L	L	L_1	L_1	L_2	L_2	Code no.
mm	in.	mm	in.	mm	in.	mm	in.	mm	in	mm	in.	mm	in.	
10	3/8	26	1.024	12.5	0.492	17.8	0.701	32.5	1.280	3	0.118	6	0.394	**027N2010**
15	½	31.6	1.244	15.8	0.622	22	0.866							**027N2011**

FPT internal thread, NPT (ANSI / ASME B 1.20.1)
Tongue flange sets

Connection		D	D	d_1	d_1	d_2	d_2	L	L	L_2	L_2	Code no.
mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	
10	3/8	26	1.024	14.3	0.563	3/8"-18 NPT	3/8"-18 NPT	32.5	1.477	3	0.118	**027G1005**
15	½	31.6	1.244	17.8	0.701	½"-14 NPT	½"-14 NPT		1.280			**027G1006**

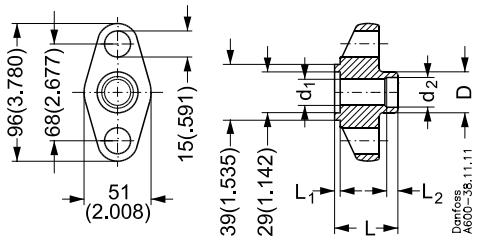
Solder ANSI B 16.22
Tongue flange sets

Connection		D	D	d_1	d_1	d_2	d_2	L	L	L_1	L_1	L_2	L_2	Code no.
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	
	5/8	21	0.827	13	0.512	16	0.630	29.5	2.122	3	0.118	15	0.591	**027L1117**
	7/8	27	1.063	19	0.748	22.1	0.869		1.161			22	0.866	**027L1123**

Separate flange gaskets,
ID 22 x OD 32 x 1.0 mm
(ID 0.866 x OD 1.260 x 0.039 in.):
Code no. 020-2133 (40 pcs). must be ordered separately

Ordering (continued)

Tongue/ tongue flange sets for EVRA/T 20 and EVRA 25 version 3



Each code no. includes two flanges

Butt welding ANSI B 36.10
Tongue flange sets

Connection		D	D	d_1	d_1	d_2	d_2	L	L	L_1	L_1	L_2	L_2	Code no.
mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	
20	¾	26.9	1.059	18.9	0.744	18.9	0.744	33	1.299	3	0.118	6	0.236	**027N3031**
25	1	33.7	1.327	24.5	0.965	24.5	0.965	37.5	1.476					**027N3032**
32	1¼	42.4	1.669	26	1.024	32.6	1.283	37.5	1.476					**027N3033**

Socket welding ANSI (B 16.11)
Tongue flange sets

Connection		D	D	d_1	d_1	d_2	d_2	L	L	L_1	L_1	L_2	L_2	Code no.
mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	
20	¾	37.4	1.472	21	0.827	27.4	1.079	33	1.299	3	0.118	13	0.512	**027N2001**
25	1	45.6	1.795	26.6	1.047	34.1	1.343							**027N2002**

FPT internal thread, NPT (ANSI / ASME B 1.20.1)
Tongue flange sets

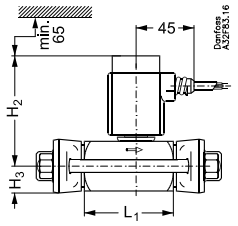
Connection		D	D	d_1	d_1	d_2	d_2	L	L	L_1	L_1	Code no.
mm	in.	mm	in.	mm	in.	mm	mm	mm	in.	mm	in.	
20	¾	37.4	1.472	23	0.906	¾"-14 NPT	¾"-14 NPT	33	1.299	3	0.118	**027N2001**
25	1	45.6	1.795	29	1.142	1"-11.5 NPT	1"-11.5 NPT					**027N2002**

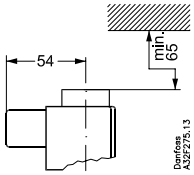
Soldering ANSI B 16.22
Tongue flange sets

Connection		D	D	d_1	d_1	d_2	d_2	L	L	L_1	L	L_1	L_1	Code no.
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	
	$^7/_8$	34	1.338	19	0.748	22	0.874	32	1.260	4	1.157	16.5	0.650	**027N1223**
	$1\ ^1/_8$			26	1.024	28.6	1.126	34	1.338			26	1.024	**027N1229**

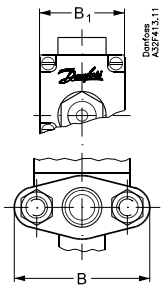
Separate flange gaskets,
ID 29 x OD 39 x 1.5 mm
(ID 1.142 x OD 1.535 x 0.059 in.)
Code no. 027F2175 (40 pcs.). must be ordered separately

Dimensions and weight

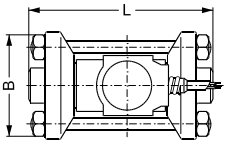




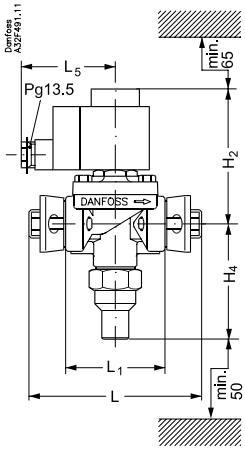
EVRA 3 → 20
Coil with DIN plugs



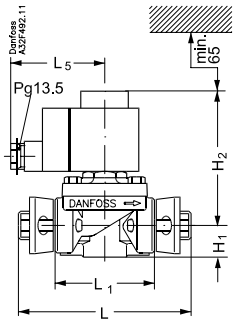
EVRA 3 → 20
Coil with terminal box



EVRA 3
Coil with cable



EVRA 10 → 20
Coil with terminal box



EVRA 10
Coil with terminal box

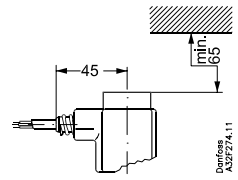
Weight of coil
10 W: approx. 0.3 kg/ 0.66 lb
12 and 20 W: approx. 0.5 kg/ 1.1 lb

Weight of flange set
For EVRA 3, 10 and 15: 0.6 kg/ 1.3 lb
For EVRA 20: 0.9 kg/ 2.0 lb

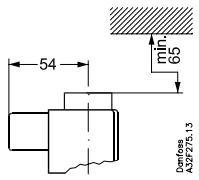
Valve size		H_1	H_2	H_3	H_4	L	L_1	L_5 max.		B	B_1 max.	Weight [1])	
								10W	12 W 20W			kg	lb
EVRA 3	mm		84	19		124	65	75	85	80	68	1.2	2.6
	in.		3.46	0.75		4.88	2.56	2.95	3.35	3.15	2.67		
EVRA/T 10	mm	22	100		81	130	68	75	85	80	68	1.7	3.7
	in.	0.9	3.94		3.19	5.12	2.68	2.95	3.35	3.15	2.67		
EVRA/T 15	mm		100		81	130	68	75	85	80	68	1.8	4.0
	in.		3.94		3.19	5.12	2.68	2.95	3.35	3.15	2.67		
EVRA/T 20	mm		110		77	155	85	75	85	96	68	2.7	5.9
	in.		3.94		3.03	6.10	3.35	2.95	3.35	3.78	2.67		

[1]) With coil, without flanges

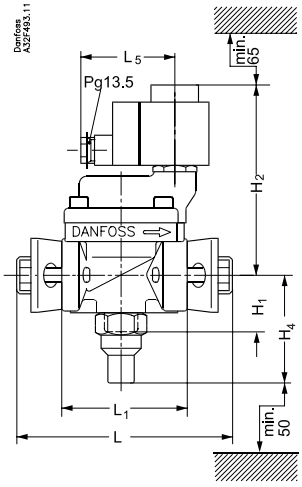
Dimension and weight
(continued)



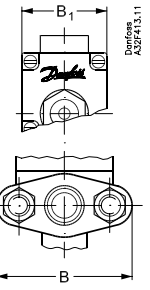
EVRA 25, 32 and 40
Coil with cable



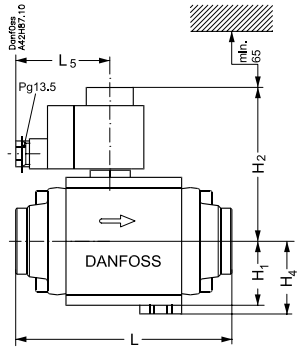
EVRA 25, 32 and 40
Coil with DIN plugs



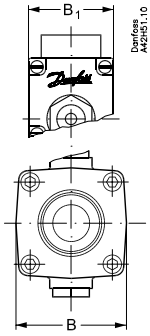
EVRA 25
Coil with terminal box



EVRA 25
Coil with terminal box



EVRA 32 and 40
Coil with terminal box



EVRA 32 and 40
Coil with
terminal box

Weight of coil
10 W: approx. 0.3 kg / 0.66 lb
12 and 20 W: approx. 0.5 kg/ 1.1 lb

Weight of flange set
For EVRA 25: 0.9 kg/ 2 lb

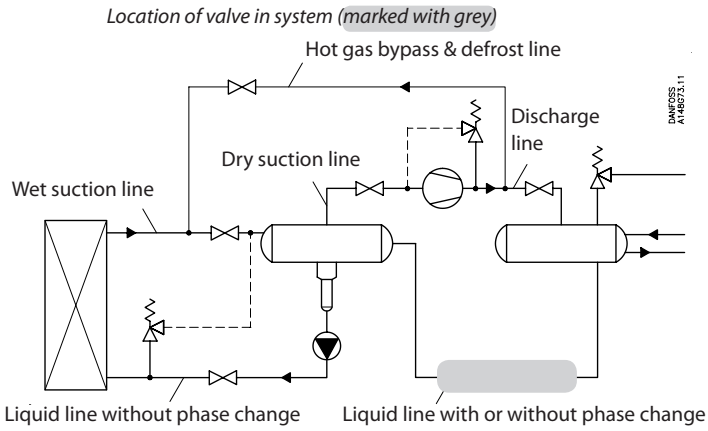
Valve size		H_1	H_2	H_3	H_4	L	L_1	L_5 max.		B	B_1 max.	Weight [1]	
								10W	12 W 20W			kg	lb
EVRA 25	mm	46	141		78	162	92	75	75	95	68	3.0	6.6
	in.	1.85	5.55		3.07	6.38	3.62	2.95	3.74	3.74	2.68		
EVRA 32	mm	47	115		53	175		75	80	80	68	4.0	8.8
	in.	1.85	4.53		2.09	6.89		2.95	3.15	3.15	2.68		
EVRA 40	mm	47	115		53	175		75	80	80	68	4.0	8.8
	in.	1.85	4.53		2.09	6.89		2.95	3.15	3.15	2.68		

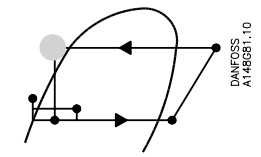
[1]) With coil, without flanges

Nominal capacities

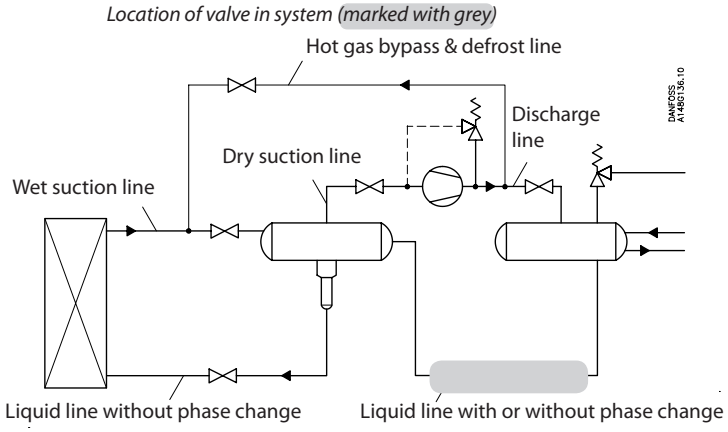
Liquid line

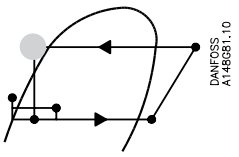
Pump



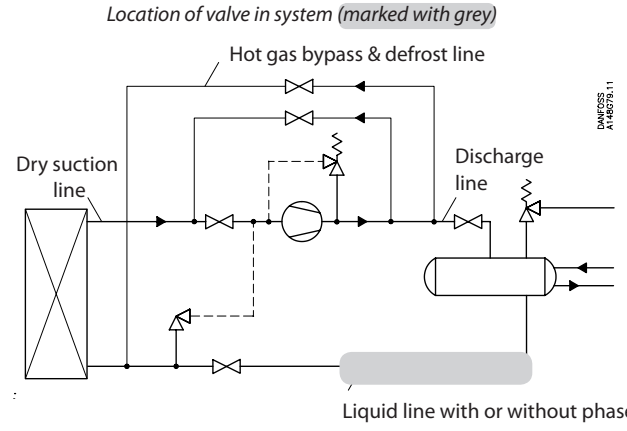


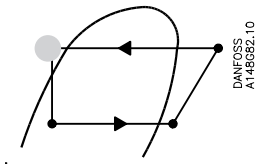
Gravity





DX





Nominal capacities

Liquid line

SI units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = –20°C
Q_0 = 300 kW
T_{liq} = 10°C
Max. ΔP = 0.3 bar

The capacity table is based on nominal conditions (ΔP = 0.2 bar, T_{liq} = 30°C).

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for Δp 0.3 bar $f_{\Delta P}$ = 0.82.

Correction factor for liquid temperature f_{Tliq} = 0.86.

$Q_n = Q_o \acute{} f_{\Delta P} \times f_{Tliq} = 300 \times 0.82 \times 0.86$
= 212 kW.

From the capacity table an EVRA 25 with Q_n = 217 kW is the correct selection for the application.

US units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = –20°F
Q_o = 100 TR
T_{liq} = 50°F
Max. ΔP = 5 psi

The capacity table is based on nominal conditions (ΔP = 3 psi, T_{liq} = 90°F).

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for ΔP 5 psi, $f_{\Delta P}$ = 0.79

Correction factor for liquid temperature = 50°F, f_{Tliq} = 0.87.

$Q_n = Q_o \times f_{\Delta P} \times f_{Tliq} = 100 \times 0.79 \times 0.87$
= 69 TR

From the capacity table an EVRA 25 with Q_n = 61 TR is the correct selection for the application.

Nominal capacities

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
ΔP = 0.2 bar

R 717

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	23.2	23.5	23.8	24.1	24.1	24.5	24.7
EVRA/T 10	1.5	151.1	153.3	155.0	157.2	158.9	160.0	161.1
EVRA/T 15	2.7	272.0	276.0	279.0	283.0	286.0	288.0	290.0
EVRA/T 20	4.5	453.3	460.0	465.0	471.7	476.7	480.0	483.3
EVRA 25	10.0	1007.4	1022.2	1033.3	1048.1	1059.3	1066.7	1074.1
EVRA 32	16.0	1611.9	1635.6	1653.3	1677.0	1694.8	1706.7	1718.5
EVRA 40	25.0	2518.5	2555.6	2583.3	2620.4	2648.1	2666.7	2685.2

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.82
–10°C	0.86
–0°C	0.88
10°C	0.92
20°C	0.96
30°C	**1.00**
40°C	1.04
50°C	1.09

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi

R 717

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.26	6.6	6.7	6.7	6.8	6.9	7.0	7.0
EVRA/T 10	1.72	43.3	43.8	43.8	44.4	44.9	45.5	46.0
EVRA/T 15	3.1	78.0	79.0	79.0	80.0	81.0	82.0	83.0
EVRA/T 20	5.16	129.8	131.5	131.5	133.2	134.8	136.5	138.2
EVRA 25	11.44	287.8	291.5	291.5	295.2	298.9	302.6	306.3
EVRA 32	18.35	461.7	467.6	467.6	473.5	479.5	485.4	491.3
EVRA 40	28.7	722.1	731.4	731.4	740.6	740.9	759.2	768.4

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.82
10°F	0.85
30°F	0.88
50°F	0.92
70°F	0.96
90°F	**1.00**
110°F	1.04
130°F	1.09

Nominal capacities

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
ΔP = 0.2 bar

R 22

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	4.7	4.9	5.0	5.1	5.2	5.4	5.5
EVRA/T 10	1.5	30.8	31.7	32.6	33.4	34.2	34.9	35.6
EVRA/T 15	2.7	55.5	57.1	58.7	60.2	61.6	62.9	64.0
EVRA/T 20	4.5	92.5	95.2	97.8	100.3	102.7	104.8	106.7
EVRA 25	10.0	205.6	211.5	217.4	223.0	228.1	233.0	237.0
EVRA 32	16.0	328.9	338.4	347.9	356.7	365.0	372.7	379.3
EVRA 40	25.0	513.9	528.7	543.5	557.4	570.4	582.4	592.6

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.71
–10°C	0.75
–0°C	0.80
10°C	0.86
20°C	0.92
30°C	**1.00**
40°C	1.09
50°C	1.22

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi

R 22

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.263	1.3	1.4	1.4	1.5	1.5	1.5	1.6
EVRA/T 10	1.719	8.8	9.1	9.2	9.5	9.8	9.9	10.1
EVRA/T 15	3.1	15.8	16.4	16.7	17.1	17.6	17.9	18.3
EVRA/T 20	5.16	26.3	27.3	27.7	28.5	29.3	29.8	30.5
EVRA 25	11.44	58.3	60.5	61.4	63.1	64.9	66.1	67.5
EVRA 32	18.6	94.8	98.4	99.9	102.6	105.6	107.4	109.8
EVRA 40	29.0	147.8	153.4	155.8	160.0	164.6	167.5	171.2

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.73
10°F	0.77
30°F	0.82
50°F	0.87
70°F	0.93
90°F	**1.00**
110°F	1.09
130°F	1.20

Nominal capacities

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
ΔP = 0.2 bar

R 134a

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	4.1	4.3	4.5	4.7	4.9	5.1	5.2
EVRA/T 10	1.5	26.8	28.1	29.4	30.6	31.8	33.0	34.1
EVRA/T 15	2.7	48.3	50.6	52.9	55.1	57.3	59.4	61.4
EVRA/T 20	4.5	80.5	84.3	88.2	91.8	95.5	99.0	102.3
EVRA 25	10.0	178.9	187.4	195.9	204.1	212.2	220.0	227.4
EVRA 32	16.0	286.2	299.9	313.5	326.5	339.6	352.0	363.9
EVRA 40	25.0	447.2	468.5	489.8	510.2	530.6	550.0	568.5

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.66
–10°C	0.70
–0°C	0.76
10°C	0.82
20°C	0.90
30°C	**1.00**
40°C	1.13
50°C	1.29

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi

R 134a

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.263	1.1	1.2	1.3	1.3	1.4	1.4	1.5
EVRA/T 10	1.719	7.5	7.9	8.3	8.7	9.1	9.4	9.8
EVRA/T 15	3.1	13.5	14.3	15.0	15.7	16.4	17.0	17.7
EVRA/T 20	5.16	22.5	23.7	24.9	26.1	27.3	28.3	29.4
EVRA 25	11.44	49.9	52.6	55.3	57.9	60.5	62.8	65.1
EVRA 32	18.6	81.1	85.6	89.9	94.2	98.3	102.2	105.9
EVRA 40	29.0	126.5	133.4	140.1	146.9	153.3	159.3	165.1

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.64
10°F	0.68
30°F	0.74
50°F	0.81
70°F	0.89
90°F	**1.00**
110°F	1.15
130°F	1.35

Nominal capacities

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
ΔP = 0.2 bar

R 404A

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	2.8	3.0	3.2	3.4	3.5	3.7	3.8
EVRA/T 10	1.5	18.5	19.7	20.9	22.1	23.1	24.2	25.1
EVRA/T 15	2.7	33.3	35.5	37.7	39.7	41.6	43.5	45.1
EVRA/T 20	4.5	55.5	59.2	62.8	66.2	69.3	72.5	75.2
EVRA 25	10.0	123.3	131.5	139.4	147.0	154.1	161.1	167.0
EVRA 32	16.0	197.3	210.4	223.3	235.3	246.5	257.8	267.3
EVRA 40	25.0	308.2	328.7	348.6	367.6	385.2	402.8	417.6

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.55
–10°C	0.60
–0°C	0.66
10°C	0.74
20°C	0.85
30°C	**1.00**
40°C	1.23
50°C	1.68

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi

R 404A

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.263	0.8	0.8	0.9	0.9	1.0	1.0	1.1
EVRA/T 10	1.719	5.1	5.5	5.8	6.2	6.5	6.8	7.1
EVRA/T 15	3.1	9.2	9.9	10.5	11.2	11.8	12.3	12.8
EVRA/T 20	5.16	15.3	16.4	17.5	18.6	19.6	20.5	21.3
EVRA 25	11.44	33.9	36.5	38.9	41.3	43.5	45.5	47.2
EVRA 32	18.6	55.1	59.3	63.2	67.1	70.7	74.0	76.8
EVRA 40	29.0	85.9	92.4	98.6	104.6	110.3	115.4	119.7

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

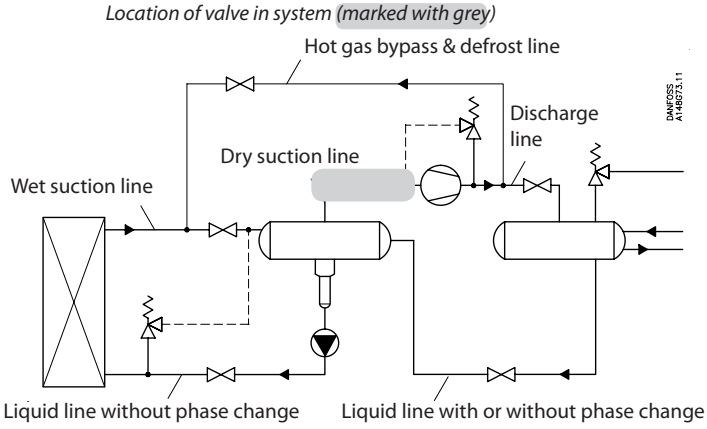
Correction factor for liquid temperature (T_{liq})

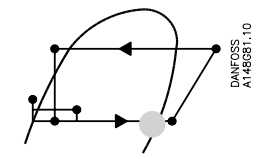
Liquid temperature	Correction factor
–10°F	0.52
10°F	0.57
30°F	0.63
50°F	0.72
70°F	0.83
90°F	**1.00**
110°F	1.29
130°F	1.92

Nominal capacities

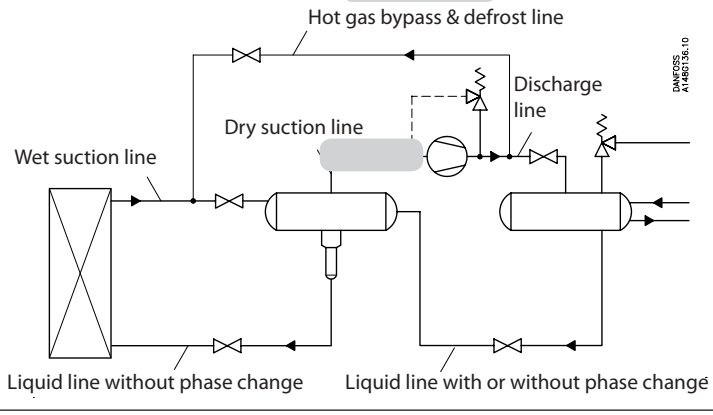
Dry suction line

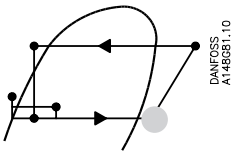
Pump



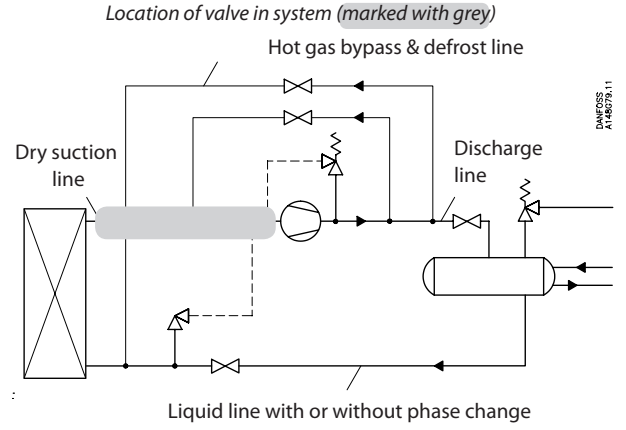


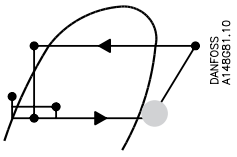
Gravity





DX





Nominal capacities

Dry suction line

SI units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = –20°C
Q_0 = 40 kW
T_{liq} = 10°C
T_s = 6°C
Max. ΔP = 0.3 bar

The capacity table is based on nominal conditions (pressure drop ΔP = 0.2 bar, T_{liq} = 30°C).

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for ΔP 0.3 bar $f_{\Delta P}$ = 0.82

Correction factor for liquid temperature f_{Tliq} = 0.86

$Q_n = Q_0 \times f_{\Delta P} \times f_{Tliq} \times f_{Ts}$
$= 40 \times 0.82 \times 0.86 = 28.2$ kW

From the capacity table an EVRA 32 with Q_n = 33 kW is the correct selection for the application.

US units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = 0°F
Q_0 = 20 TR
T_{liq} = 50°F
T_s = 10°F
Max. ΔP = 5 psi

The capacity table is based on nominal conditions (pressure drop ΔP = 3 psi, T_{liq} = 90°F)

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for ΔP 5 psi $f_{\Delta p}$ = 0.79

Correction factor for liquid temperature = 50°F, f_{Tliq} = 0.87

$Q_n = Q_0 \times f_{\Delta P} \times f_{Tliq} \times f_{Ts}$
$= 20 \times 0.79 \times 0.87 = 13.7$ TR

From the capacity table a EVRA 40 with Q_n = 15 TR is the correct selection for the application.

Nominal capacities

Dry suction line

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
ΔP = 0.2 bar

R 717

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.77	0.99	1.25	1.54	1.87	2.25	2.65
EVRA/T 10	1.5	5.01	6.46	8.15	10.06	12.22	14.66	17.28
EVRA/T 15	2.7	9.02	11.63	14.67	18.10	22.00	26.38	31.10
EVRA/T 20	4.5	15.03	19.38	24.45	30.17	36.67	43.97	51.83
EVRA 25	10.0	33.41	43.07	54.33	67.04	81.48	97.70	115.19
EVRA 32	16.0	53.45	68.92	86.93	107.26	130.37	156.33	184.30
EVRA 40	25.0	83.52	107.69	135.83	167.59	203.70	244.26	287.96

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for superheat (T_S)

T_s	Correction factor
6°C	1.00
8°C	1.00
10°C	1.00
12°C	1.00

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.82
–10°C	0.86
–0°C	0.88
10°C	0.92
20°C	0.96
30°C	**1.00**
40°C	1.04
50°C	1.09

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi

R 717

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.263	0.22	0.29	0.37	0.47	0.58	0.70	0.84
EVRA/T 10	1.719	1.43	1.90	2.44	3.07	3.79	4.59	5.48
EVRA/T 15	3.1	2.58	3.42	4.40	5.54	6.84	8.28	9.88
EVRA/T 20	5.16	4.29	5.69	7.32	9.22	11.39	13.78	16.45
EVRA 25	11.44	9.52	12.62	16.24	20.44	25.24	30.56	36.46
EVRA 32	18.6	15.27	20.24	26.05	32.79	40.49	49.01	58.48
EVRA 40	29.0	23.89	31.66	40.74	51.29	63.33	76.66	91.47

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for superheat (T_S)

T_s	Correction factor
10 °F	1.00
14 °F	**1.00**
18 °F	1.00
20 °F	1.00

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.82
10°F	0.85
30°F	0.88
50°F	0.92
70°F	0.96
90°F	**1.00**
110°F	1.04
130°F	1.09

Nominal capacities

Dry suction line

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
ΔP = 0.2 bar

R 22

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.3	0.4	0.5	0.6	0.7	0.8	1.0
EVRA/T 10	1.5	2.0	2.5	3.1	3.8	4.6	5.5	6.5
EVRA/T 15	2.7	3.6	4.5	5.7	6.9	8.3	9.9	11.6
EVRA/T 20	4.5	6.0	7.6	9.4	11.5	13.9	16.5	19.4
EVRA 25	10.0	13.3	16.8	20.9	25.6	30.8	36.6	43.1
EVRA 32	16.0	21.2	26.9	33.5	40.9	49.3	58.6	68.9
EVRA 40	25.0	33.1	42.0	52.3	63.9	77.0	91.6	107.7

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for superheat (T_S)

T_s	Correction factor
6°C	1.00
8°C	1.00
10°C	1.00
12°C	1.00

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.71
–10°C	0.75
–0°C	0.80
10°C	0.86
20°C	0.92
30°C	**1.00**
40°C	1.09
50°C	1.22

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi

R 22

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.263	0.263	0.1	0.1	0.2	0.2	0.3	0.3
EVRA/T 10	1.719	1.719	0.6	0.9	1.4	1.4	1.7	2.0
EVRA/T 15	3.1	3.1	1.0	1.7	2.6	2.6	3.1	3.7
EVRA/T 20	5.16	5.16	1.7	2.8	4.3	4.3	5.1	6.1
EVRA 25	11.44	11.44	3.7	6.2	9.4	9.4	11.4	13.5
EVRA 32	18.6	18.6	6.1	10.1	15.4	15.4	18.5	22.0
EVRA 40	29.0	29.0	9.4	15.7	23.9	23.9	28.8	34.2

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for superheat (T_S)

T_s	Correction factor
10 °F	1.00
14 °F	**1.00**
18 °F	1.00
20 °F	1.00

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.73
10°F	0.77
30°F	0.82
50°F	0.87
70°F	0.93
90°F	**1.00**
110°F	1.09
130°F	1.20

Nominal capacities

Dry suction line

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
ΔP = 0.2 bar

R 134a

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.2	0.3	0.3	0.4	0.5	0.7	0.8
EVRA/T 10	1.5	1.3	1.8	2.3	2.9	3.6	4.4	5.3
EVRA/T 15	2.7	2.4	3.2	4.1	5.2	6.4	7.9	9.5
EVRA/T 20	4.5	4.0	5.3	6.8	8.6	10.7	13.2	15.9
EVRA 25	10.0	8.8	11.7	15.0	19.1	23.7	29.3	35.3
EVRA 32	16.0	14.1	18.7	24.1	30.5	38.0	46.8	56.5
EVRA 40	25.0	22.0	29.2	37.6	47.7	59.4	73.1	88.2

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for superheat (T_S)

T_s	Correction factor
6°C	1.00
8°C	1.00
10°C	1.00
12°C	1.00

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.66
–10°C	0.70
–0°C	0.76
10°C	0.82
20°C	0.90
30°C	**1.00**
40°C	1.13
50°C	1.29

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi

R 134a

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.263	0.1	0.1	0.1	0.1	0.2	0.2	0.3
EVRA/T 10	1.719	0.4	0.5	0.7	0.9	1.1	1.4	1.7
EVRA/T 15	3.1	0.7	0.9	1.2	1.6	2.0	2.5	3.1
EVRA/T 20	5.16	1.1	1.5	2.0	2.6	3.3	4.1	5.1
EVRA 25	11.44	2.5	3.4	4.5	5.8	7.3	9.2	11.3
EVRA 32	18.6	4.0	5.5	7.3	9.4	11.9	14.9	18.3
EVRA 40	29.0	6.3	8.6	11.3	14.7	18.6	23.2	28.5

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for superheat (T_S)

T_s	Correction factor
10 °F	1.00
14 °F	**1.00**
18 °F	1.00
20 °F	1.00

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.64
10°F	0.68
30°F	0.74
50°F	0.81
70°F	0.89
90°F	**1.00**
110°F	1.15
130°F	1.35

Nominal capacities

Dry suction line

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
ΔP = 0.2 bar

R 404A

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.2	0.3	0.4	5.0	0.6	0.8	0.9
EVRA/T 10	1.5	1.6	2.1	2.6	3.3	4.1	4.9	5.9
EVRA/T 15	2.7	2.8	3.7	4.7	5.9	7.3	8.9	10.7
EVRA/T 20	4.5	4.7	6.2	7.9	9.8	12.2	14.8	17.8
EVRA 25	10.0	10.5	13.7	17.4	21.9	27.0	33.0	39.6
EVRA 32	16.0	16.8	21.9	27.9	35.0	43.2	52.7	63.3
EVRA 40	25.0	26.2	34.2	43.6	54.6	67.5	82.4	98.9

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for superheat (T_S)

T_s	Correction factor
6°C	1.00
8°C	1.00
10°C	1.00
12°C	1.00

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.55
–10°C	0.60
–0°C	0.66
10°C	0.74
20°C	0.85
30°C	**1.00**
40°C	1.23
50°C	1.68

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi

R 404A

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.263	0.1	0.1	0.1	0.2	0.2	0.2	0.3
EVRA/T 10	1.719	0.4	0.8	0.8	1.0	1.2	1.5	1.9
EVRA/T 15	3.1	0.8	1.4	1.4	1.8	2.2	2.8	3.4
EVRA/T 20	5.16	1.3	2.3	2.3	2.9	3.7	4.6	5.6
EVRA 25	11.44	2.9	5.1	5.1	6.5	8.2	10.2	12.4
EVRA 32	18.6	4.7	8.3	8.3	10.6	13.4	16.6	20.2
EVRA 40	29.0	7.4	12.9	12.9	16.6	20.9	25.8	31.5

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for superheat (T_S)

T_s	Correction factor
10 °F	1.00
14 °F	**1.00**
18 °F	1.00
20 °F	1.00

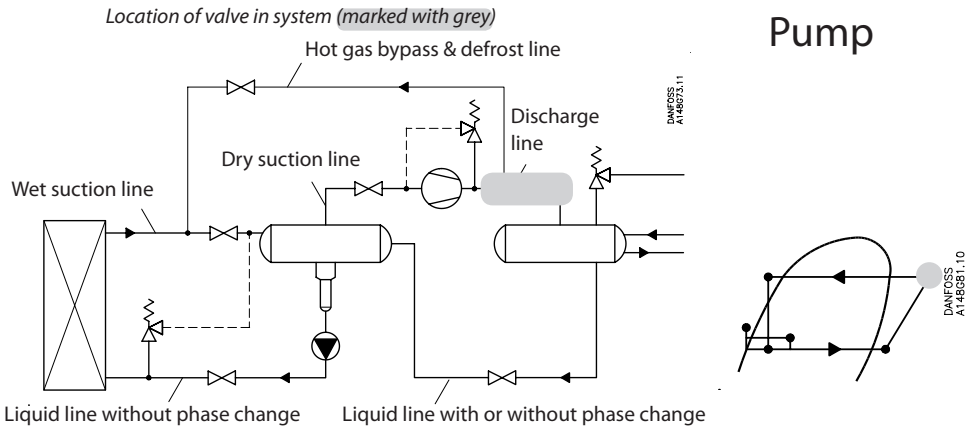
Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.52
10°F	0.57
30°F	0.63
50°F	0.72
70°F	0.83
90°F	**1.00**
110°F	1.29
130°F	1.92

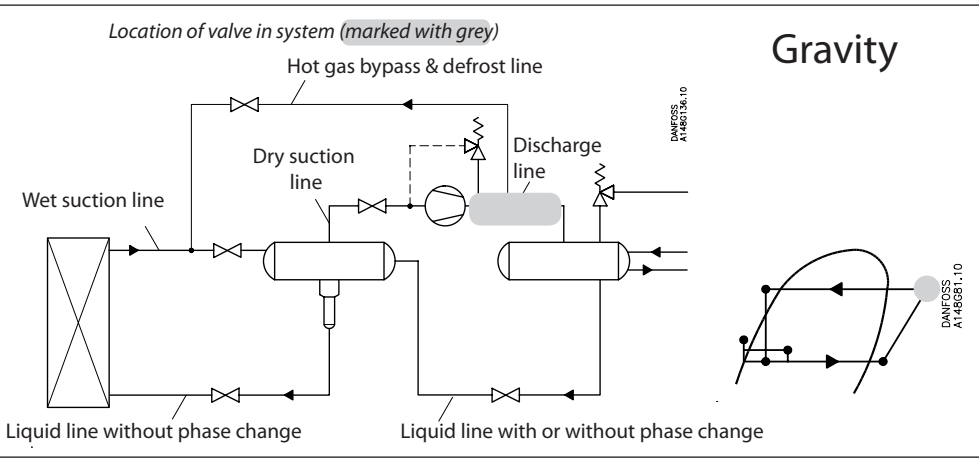
Nominal capacities

Discharge line

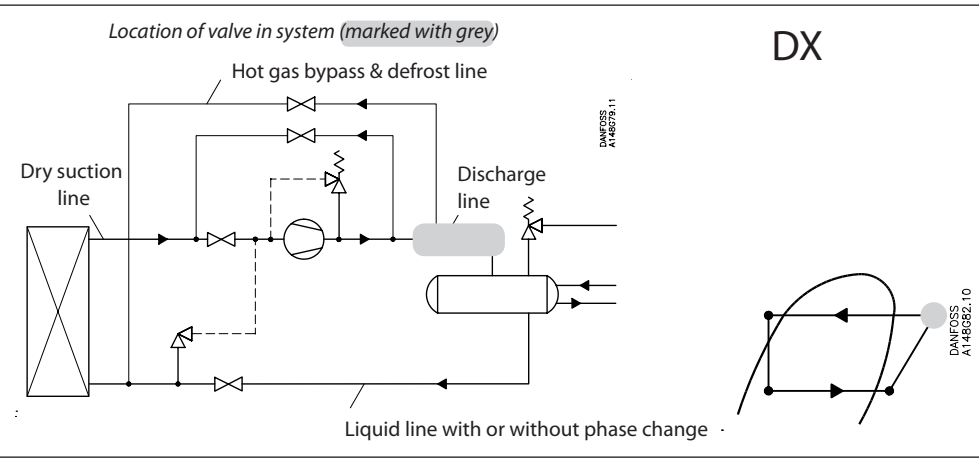
Pump



Gravity



DX



Nominal capacities

Discharge line

SI units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = –20°C
Q_o = 90 kW
T_{liq} = 10 °C
Max. ΔP = 0.4 bar
T_{disch} = 60°C

The capacity table is based on nominel conditions (ΔP = 0.2 bar, T_{liq} = 30°C, P_{disch}= 12 bar, T_{disch} = 80°C).

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for ΔP 0.4 bar $f_{\Delta P}$ = 0.72

Correction factor for liquid temperature f_{Tliq} = 0.86

Correction factor for T_{disch} 60°C, f_{disch} = 0.97

$Q_n = Q_o \times f_{\Delta P} \times f_{Tliq} \times f_{Tdisch}$
$= 90 \times 0.72 \times 0.92 \times 0.97 = 54$ kW.

From the capacity table an EVRA 32 with Q_n = 60.5 kW is the correct selection for the application.

US units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = 0°F
Q_o = 18 TR
T_{liq} = 50°F
Max. ΔP = 7 psi
T_{disch} = 120°F

The capacity table is based on nominel conditions (ΔP = 3 psi, T_{liq} = 90°F, P_{disch}= 185 psi, T_{disch} = 180°F).

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for ΔP 7 psi, $f_{\Delta P}$ = 0.67

Correction factor for liquid temperature = 50°F, f_{Tliq} = 0.87

Correction factor for T_{disch} 120°F, f_{disch} = 0.95

$Q_n = Q_o \times f_{\Delta P} \times f_{Tliq} \times f_{Tdisch}$
$= 18 \times 0.67 \times 0.92 \times 0.87 = 9.7$ TR

From the capacity table an EVRA 25 with Q_n = 10.9 TR is the correct selection for the application.

Nominal capacities

Discharge line

SI units

Capacity table for nominal conditions,
Q_N *[kW],*
T_{liq} = 30°C,
$P_{disch.}$ = 12 bar,
ΔP = 0.2 bar,
$T_{disch.}$ = 80°C

R 717

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	2.5	2.6	2.6	2.6	2.6	2.7	2.7
EVRA/T 10	1.5	16.4	16.7	17.2	17.1	17.2	17.4	17.5
EVRA/T 15	2.7	30.0	30.0	31.0	31.0	31.0	31.0	32.0
EVRA/T 20	4.5	49.0	50.0	51.0	51.0	52.0	52.0	53.0
EVRA 25	10.0	110.0	111.0	114.0	114.0	115.0	116.0	117.0
EVRA 32	16.0	175.0	178.0	182.0	182.0	184.0	186.0	187.0
EVRA 40	25.0	274.0	278.0	285.0	285.0	287.0	290.0	292.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.4	0.72
0.6	0.59
0.8	0.52
1.0	0.46
1.5	0.39
2.0	0.34
4.0	0.27

Correction factor for superheat (T_{disch})

T_s	Correction factor
50°C	0.96
60°C	0.97
80°C	**1.00**
90°C	1.01
100°C	1.03
110°C	1.04
120°C	1.06

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.82
–10°C	0.86
–0°C	0.88
10°C	0.92
20°C	0.96
30°C	**1.00**
40°C	1.04
50°C	1.09

US units

Capacity table for nominal conditions, Q_N *[Tons of Refrigeration],*
T_{liq} = 90°F,
ΔP = 3 psi,
$P_{disch.}$ = 185 psi,
$T_{disch.}$ = 180°F

R 717

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.7	0.7	0.8	0.8	0.8	0.8	0.8
EVRA/T 10	1.7	4.8	4.9	4.9	4.9	5.0	5.0	5.0
EVRA/T 15	3.1	8.7	8.8	8.9	8.9	9.0	9.0	9.1
EVRA/T 20	5.2	14.0	15.0	15.0	15.0	15.0	15.0	15.0
EVRA 25	11.6	32.0	33.0	33.0	33.0	33.0	33.0	34.0
EVRA 32	18.6	51.0	52.0	52.0	53.0	53.0	54.0	54.0
EVRA 40	29.0	79.0	81.0	81.0	83.0	84.0	84.0	84.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
5	0.79
7	0.67
10	0.56
15	0.47
20	0.41
30	0.35
60	0.28

Correction factor for superheat (T_{disch})

T_s	Correction factor
120 °F	0.95
140 °F	0.97
180 °F	**1.00**
200 °F	1.02
210 °F	1.02
230 °F	1.04
250 °F	1.05

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.82
10°F	0.85
30°F	0.88
50°F	0.92
70°F	0.96
90°F	**1.00**
110°F	1.04
130°F	1.09

Nominal capacities

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
$P_{disch.}$ = 12 bar,
ΔP = 0.2 bar,
$T_{disch.}$ = 80°C

R 22

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.8	0.8	0.9	0.9	0.9	0.9	0.9
EVRA/T 10	1.5	5.4	5.5	5.7	5.8	5.9	6.1	6.2
EVRA/T 15	2.7	9.6	9.9	10.2	10.5	10.7	10.9	11.1
EVRA/T 20	4.5	16.1	16.6	17.0	17.4	17.8	18.2	18.5
EVRA 25	10.0	35.7	36.8	37.8	38.8	39.7	40.5	41.2
EVRA 32	16.0	57.2	58.9	60.5	62.0	63.5	64.8	65.9
EVRA 40	25.0	89.3	92.0	94.5	96.9	99.2	101.2	103.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.4	0.72
0.6	0.59
0.8	0.52
1.0	0.46
1.5	0.39
2.0	0.34
4.0	0.27

Correction factor for superheat (T_{disch})

T_s	Correction factor
50°C	0.96
60°C	0.97
80°C	**1.00**
90°C	1.01
100°C	1.03
110°C	1.04
120°C	1.06

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.71
–10°C	0.75
–0°C	0.80
10°C	0.86
20°C	0.92
30°C	**1.00**
40°C	1.09
50°C	1.22

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi,
$P_{disch.}$ = 185 psi,
$T_{disch.}$ = 180 °F

R 22

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3
EVRA/T 10	1.7	1.5	1.6	1.6	1.7	1.7	1.8	1.8
EVRA/T 15	3.1	2.8	2.9	2.9	3.0	3.1	3.2	3.2
EVRA/T 20	5.2	4.6	4.8	4.9	5.1	5.2	5.3	5.4
EVRA 25	11.6	10.3	10.6	10.9	11.2	11.5	11.8	12.0
EVRA 32	18.6	16.4	17.0	17.5	18.0	18.4	18.8	19.2
EVRA 40	29.0	25.6	26.5	27.3	28.1	28.8	29.4	30.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
5	0.79
7	0.67
10	0.56
15	0.47
20	0.41
30	0.35
60	0.28

Correction factor for superheat (T_{disch})

T_s	Correction factor
120 °F	0.95
140 °F	0.97
180 °F	**1.00**
200 °F	1.02
210 °F	1.02
230 °F	1.04
250 °F	1.05

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.73
10°F	0.77
30°F	0.82
50°F	0.87
70°F	0.93
90°F	**1.00**
110°F	1.09
130°F	1.20

Nominal capacities

Discharge line

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
P_{disch} = 8 bar,
ΔP = 0.2 bar
T_{disch} = 80 °C

R 134a

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.6	0.7	0.7	0.7	0.7	0.8	0.8
EVRA/T 10	1.5	4.1	4.2	4.4	4.6	4.8	5.0	5.1
EVRA/T 15	2.7	7.3	7.6	8.0	8.3	8.6	9.0	9.3
EVRA/T 20	4.5	12.2	12.7	13.3	13.9	14.4	14.9	15.4
EVRA 25	10.0	27.0	28.3	29.6	30.8	32.0	33.2	34.9
EVRA 32	16.0	43.2	45.3	47.3	49.3	51.2	53.1	54.9
EVRA 40	25.0	67.6	70.8	73.9	77.0	80.1	83.0	85.8

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.4	0.72
0.6	0.59
0.8	0.52
1.0	0.46
1.5	0.39
2.0	0.34
4.0	0.27

Correction factor for superheat (T_{disch})

T_s	Correction factor
50°C	0.96
60°C	0.97
80°C	**1.00**
90°C	1.01
100°C	1.03
110°C	1.04
120°C	1.06

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.66
–10°C	0.70
–0°C	0.76
10°C	0.82
20°C	0.90
30°C	**1.00**
40°C	1.13
50°C	1.29

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi
P_{disch} = 120 psi,
T_{disch} = 180 °F

R 134a

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
EVRA/T 10	1.7	1.2	1.2	1.3	1.4	1.4	1.5	1.5
EVRA/T 15	3.1	2.1	2.2	2.3	2.5	2.6	2.7	2.8
EVRA/T 20	5.2	3.5	3.7	3.9	4.1	4.3	4.5	4.6
EVRA 25	11.6	7.9	8.3	8.7	9.1	9.5	9.9	10.3
EVRA 32	18.6	12.6	13.3	13.9	14.6	15.2	15.9	16.4
EVRA 40	29.0	19.7	20.7	21.8	22.8	23.7	24.8	25.7

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
5	0.79
7	0.67
10	0.56
15	0.47
20	0.41
30	0.35
60	0.28

Correction factor for superheat (T_{disch})

T_s	Correction factor
120 °F	0.95
140 °F	0.97
180 °F	**1.00**
200 °F	1.02
210 °F	1.02
230 °F	1.04
250 °F	1.05

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.64
10°F	0.68
30°F	0.74
50°F	0.81
70°F	0.89
90°F	**1.00**
110°F	1.15
130°F	1.35

Nominal capacities

Discharge line

SI units

Capacity table for nominal conditions, Q_N [kW],
T_{liq} = 30°C,
P_{disch} = 12 bar
ΔP = 0.2 bar,
T_{disch} = 80 °C

R 404A

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.6	0.7	0.7	0.7	0.7	0.8	0.8
EVRA/T 10	1.5	4.1	4.3	4.6	4.8	5.1	5.3	5.5
EVRA/T 15	2.7	7.3	7.8	8.3	8.7	9.1	9.5	9.9
EVRA/T 20	4.5	12.2	13.0	13.8	14.5	15.2	15.9	16.5
EVRA 25	10.0	27.1	28.9	30.6	32.3	33.8	35.3	36.6
EVRA 32	16.0	43.3	46.2	48.9	51.6	54.1	56.5	58.5
EVRA 40	25.0	67.7	72.1	76.5	80.6	84.6	88.2	91.5

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.4	0.72
0.6	0.59
0.8	0.52
1.0	0.46
1.5	0.39
2.0	0.34
4.0	0.27

Correction factor for superheat (T_{disch})

T_s	Correction factor
50°C	0.96
60°C	0.97
80°C	**1.00**
90°C	1.01
100°C	1.03
110°C	1.04
120°C	1.06

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–20°C	0.55
–10°C	0.60
–0°C	0.66
10°C	0.74
20°C	0.85
30°C	**1.00**
40°C	1.23
50°C	1.68

US units

Capacity table for nominal conditi [Tons of Refrigeration],
T_{liq} = 90°F,
ΔP = 3 psi,
P_{disch} = 185 psi,
T_{disch} = 180°F

R 404A

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
EVRA/T 10	1.7	1.1	1.2	1.4	1.4	1.4	1.5	1.6
EVRA/T 15	3.1	2.0	2.2	2.3	2.5	2.6	2.7	2.8
EVRA/T 20	5.2	3.4	3.6	3.9	4.1	4.3	4.6	4.7
EVRA 25	11.6	7.5	8.1	8.6	9.2	9.7	10.1	10.5
EVRA 32	18.6	12.1	13.0	13.8	14.7	15.4	16.2	16.8
EVRA 40	29.0	18.8	20.2	21.6	22.2	24.1	25.3	26.3

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
5	0.79
7	0.67
10	0.56
15	0.47
20	0.41
30	0.35
60	0.28

Correction factor for superheat (T_{disch})

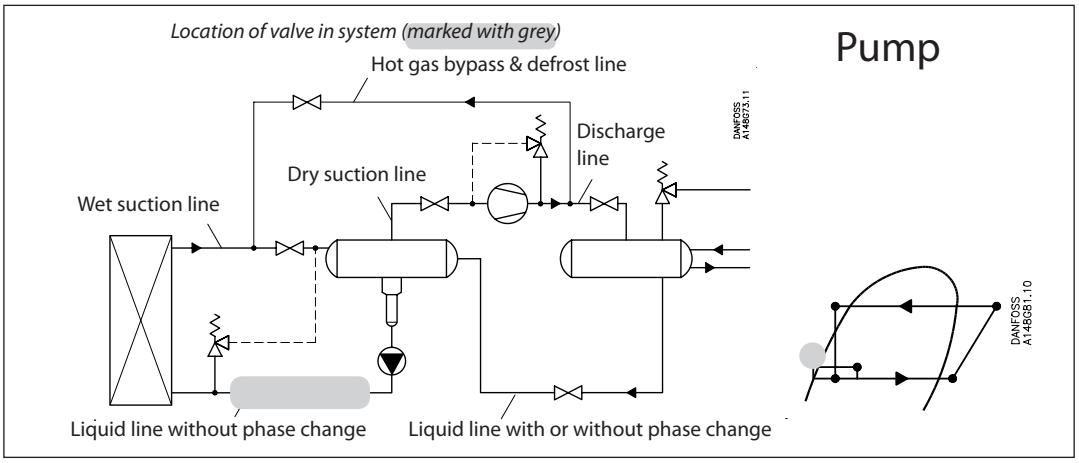
T_s	Correction factor
120 °F	0.95
140 °F	0.97
180 °F	**1.00**
200 °F	1.02
210 °F	1.02
230 °F	1.04
250 °F	1.05

Correction factor for liquid temperature (T_{liq})

Liquid temperature	Correction factor
–10°F	0.52
10°F	0.57
30°F	0.63
50°F	0.72
70°F	0.83
90°F	**1.00**
110°F	1.29
130°F	1.92

Nominal capacities

Pumped liquid line



SI units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = –20°C
Q_0 = 300 kW
circulation ratio = 3
Max. ΔP = 0.3 bar

The capacity table is based on nominal conditions (pressure drop ΔP = 0.3 bar, circulation ratio = 4).

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for ΔP 0.3 bar $f_{\Delta P} = 0.82$

Correction factor for circulation ratio $f_{circ} = 0.75$

$Q_n = Q_0 \times f_{\Delta p} \times f_{circ} = 300 \times 0.82 \times 0.75$
= 185 kW.

From the capacity table an EVRA 40 with Q_n = 199 kW is the correct selection for the application.

US units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = –20°F
Q_0 = 100 TR
Circulation ratio = 3
Max. ΔP = 5 psi

The capacity table is based on nominal conditions (pressure drop ΔP = 3 psi, circulation ratio = 4).

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for ΔP 5 psi $f_{\Delta p} = 0.79$
Correction factor for circulation ratio $f_{circ} = 0.75$

$Q_n = Q_0 \times f_{\Delta P} \times f_{circ} = 100 \times 0.79 \times 0.75 = 59$ TR

From the capacity table an EVRA 40 with Q_n = 60 TR is the correct selection for the application.

Nominal capacities

Pumped liquid line

SI units

Capacity table for nominal conditions, Q_N [kW],
circulation ratio = 4,
ΔP = 0.2 bar

R 717

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	8.1	7.9	7.7	7.4	7.1	6.8	6.6
EVRA/T 10	1.5	53.0	52.0	50.0	48.0	46.0	45.0	43.0
EVRA/T 15	2.7	96.0	93.0	90.0	87.0	84.0	80.0	77.0
EVRA/T 20	4.5	159.0	155.0	150.0	145.0	139.0	134.0	128.0
EVRA 25	10.0	354.0	344.0	333.0	321.0	310.0	298.0	285.0
EVRA 32	16.0	567.0	550.0	532.0	514.0	496.0	476.0	456.0
EVRA 40	25.0	886.0	859.0	832.0	804.0	775.0	744.0	712.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.5
3	0.75
4	**1.0**
6	1.5
8	2.0
10	2.5

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
circulation ratio = 4,
ΔP = 3 psi

R 717

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	2.4	2.3	2.2	2.1	2.0	1.9	1.8
EVRA/T 10	1.7	15.3	14.9	14.3	13.8	13.2	12.6	12.0
EVRA/T 15	3.1	27.6	26.7	25.8	24.8	23.8	22.6	21.5
EVRA/T 20	5.2	46.0	45.0	43.0	41.0	40.0	38.0	36.0
EVRA 25	11.6	102.0	99.0	96.0	92.0	88.0	84.0	80.0
EVRA 32	18.6	164.0	158.0	153.0	147.0	141.0	134.0	127.0
EVRA 40	29.0	256.0	248.0	239.0	230.0	220.0	209.0	199.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.5
3	0.75
4	**1.0**
6	1.5
8	2.0
10	2.5

Nominal capacities

Pumped liquid line

SI units

Capacity table for nominal conditions, Q_N [kW],
circulation ratio = 4,
ΔP = 0.2 bar

R 22

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	2.0	2.0	2.0	2.0	2.0	2.0	1.0
EVRA/T 10	1.5	13.0	12.0	12.0	11.0	11.0	10.0	10.0
EVRA/T 15	2.7	23.0	22.0	21.0	21.0	20.0	18.0	18.0
EVRA/T 20	4.5	39.0	37.0	36.0	34.0	33.0	31.0	31.0
EVRA 25	10.0	86.0	83.0	79.0	76.0	72.0	68.0	68.0
EVRA 32	16.0	138.0	133.0	127.0	122.0	116.0	109.0	109.0
EVRA 40	25.0	215.0	207.0	199.0	190.0	181.0	171.0	171.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.5
3	0.75
4	**1.0**
6	1.5
8	2.0
10	2.5

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
circulation ratio = 4,
ΔP = 3 psi

R 22

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.6	0.5	0.5	0.5	0.5	0.4	0.5
EVRA/T 10	1.7	4.0	4.0	3.0	3.0	3.0	3.0	3.0
EVRA/T 15	3.1	7.0	6.0	6.0	6.0	6.0	5.0	5.0
EVRA/T 20	5.2	11.0	11.0	10.0	10.0	9.0	9.0	8.0
EVRA 25	11.6	25.0	24.0	23.0	22.0	20.0	19.0	18.0
EVRA 32	18.6	40.0	38.0	36.0	35.0	33.0	30.0	28.0
EVRA 40	29.0	62.0	60.0	57.0	54.0	51.0	48.0	44.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.5
3	0.75
4	**1.0**
6	1.5
8	2.0
10	2.5

Nominal capacities

Pumped liquid line

SI units

Capacity table for nominal conditions, Q_N [kW],
circulation ratio = 4,
ΔP = 0.2 bar

R 134a

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	1.9	1.8	1.8	1.7	1.6	1.5	1.4
EVRA/T 10	1.5	12.0	12.0	11.0	11.0	10.0	10.0	9.3
EVRA/T 15	2.7	22.0	21.0	21.0	20.0	19.0	18.0	17.0
EVRA/T 20	4.5	37.0	36.0	34.0	33.0	31.0	30.0	28.0
EVRA 25	10.0	82.0	79.0	76.0	73.0	70.0	66.0	62.0
EVRA 32	16.0	132.0	127.0	122.0	117.0	112.0	106.0	100.0
EVRA 40	25.0	206.0	199.0	191.0	183.0	174.0	156.0	156.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.5
3	0.75
4	**1.0**
6	1.5
8	2.0
10	2.5

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
circulation ratio = 4,
ΔP = 3 psi

R 134a

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.5	0.5	0.5	0.5	0.5	0.4	0.4
EVRA/T 10	1.7	3.6	3.4	3.3	3.1	3.0	2.8	2.6
EVRA/T 15	3.1	6.4	6.2	5.9	5.6	5.3	5.0	4.6
EVRA/T 20	5.2	10.7	10.3	9.8	9.4	8.9	8.3	7.7
EVRA 25	11.6	24.0	23.0	22.0	21.0	20.0	18.0	17.0
EVRA 32	18.6	38.0	37.0	35.0	33.0	32.0	30.0	27.0
EVRA 40	29.0	60.0	57.0	65.0	52.0	49.0	46.0	43.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.5
3	0.75
4	**1.0**
6	1.5
8	2.0
10	2.5

Nominal capacities

Pumped liquid line

SI units

Capacity table for nominal conditions, Q_N [kW],
circulation ratio = 4,
ΔP = 0.2 bar

R 404A

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	2.0	2.0	1.0	1.0	1.0	1.0	1.0
EVRA/T 10	1.5	10.0	10.0	9.0	9.0	8.0	8.0	7.0
EVRA/T 15	2.7	19.0	18.0	17.0	16.0	15.0	14.0	13.0
EVRA/T 20	4.5	31.0	30.0	28.0	27.0	25.0	23.0	21.0
EVRA 25	10.0	69.0	66.0	63.0	59.0	55.0	51.0	47.0
EVRA 32	16.0	111.0	105.0	100.0	95.0	89.0	82.0	75.0
EVRA 40	25.0	174.0	164.0	157.0	148.0	138.0	128.0	117.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.5
3	0.75
4	**1.0**
6	1.5
8	2.0
10	2.5

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
circulation ratio = 4,
ΔP = 3 psi

R 404A

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.5	0.4	0.4	0.4	0.4	0.3	0.3
EVRA/T 10	1.7	3.0	3.0	3.0	3.0	2.0	2.0	2.0
EVRA/T 15	3.1	5.0	5.0	5.0	5.0	4.0	4.0	3.0
EVRA/T 20	5.2	9.0	9.0	8.0	8.0	7.0	6.0	6.0
EVRA 25	11.6	20.0	19.0	18.0	17.0	16.0	14.0	12.0
EVRA 32	18.6	32.0	30.0	29.0	27.0	25.0	22.0	20.0
EVRA 40	29.0	50.0	47.0	45.0	42.0	39.0	35.0	31.0

Correction factor for ΔP ($f_{\Delta P}$)

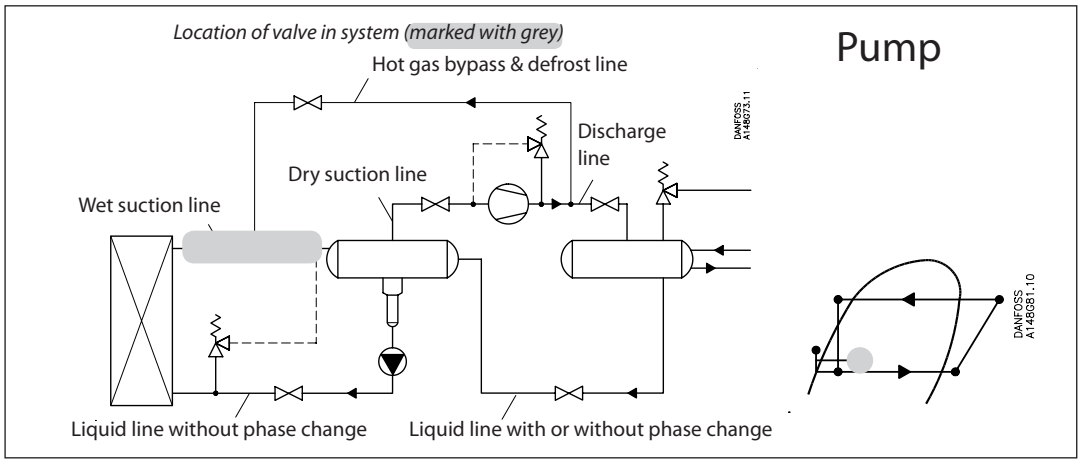
Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

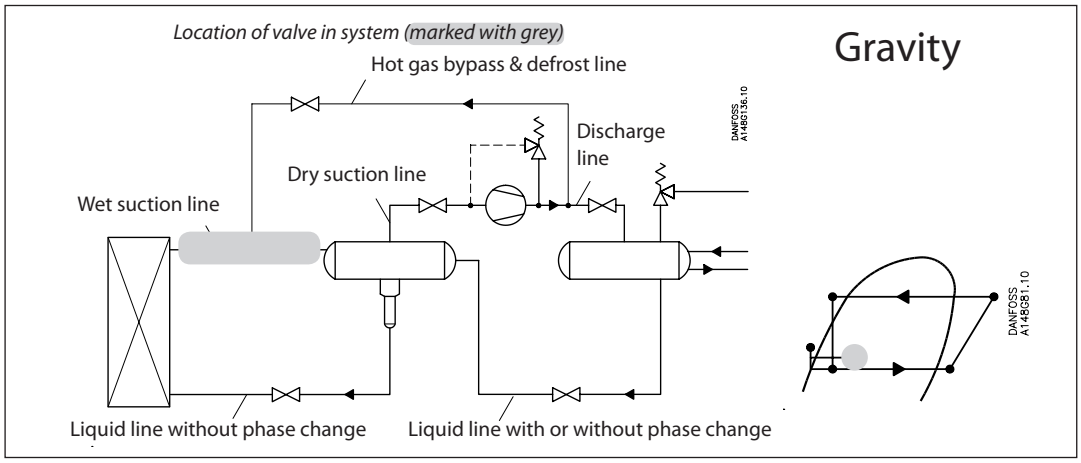
Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.5
3	0.75
4	**1.0**
6	1.5
8	2.0
10	2.5

Nominal capacities

Wet suction line





Nominal capacities

Wet suction line

SI units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = –20°C
Q_0 = 30 kW
Circulation ratio = 3
Max. ΔP = 0.3 bar

The capacity table is based on nominal conditions (pressure drop ΔP = 0.2 bar, circulation ratio = 4).

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for ΔP 0.3 bar $f_{\Delta P}$ = 0.82

Correction factor for circulation ratio f_{circ} = 0.75

$Q_n = Q_0 \times f_{\Delta P} \times f_{circ}$ = 30 x 0.82 × 0.75 = 18.5 kW.

From the capacity table an EVRA 32 with Q_n = 25 kW is the correct selection for the application.

US units

Calculation example (R 22 capacities):

Running conditions in a plant are as follows:

T_e = – 20°F
Q_0 = 10 TR
Circulation ratio = 3
Max. ΔP = 5 psi

The capacity table is based on nominal conditions (pressure drop ΔP = 3 psi, circulation ratio = 4).

The actual capacity must therefore be corrected to a nominal condition by multiplication with correction factors.

Correction factor for ΔP 5 psi $f_{\Delta p}$ = 0.79

Correction factor for circulation ratio f_{circ} = 0.75

$Q_n = Q_0 \times f_{\Delta P} \times f_{circ}$ = 10 × 0.79 × 0.75 = 3 TR

From the capacity table a EVRA 25 with Q_n = 3.8 TR is the correct selection for the application.

Nominal capacities

Wet suction line

SI units

Capacity table for nominal conditions, Q_N [kW],
circulation ratio = 4,
ΔP = 0.2 bar

R 717

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.5	0.7	0.8	1.0	1.1	1.3	1.5
EVRA/T 10	1.5	3.6	4.4	5.4	6.4	7.5	8.6	9.8
EVRA/T 15	2.7	6.4	7.9	9.6	11.5	13.5	15.5	17.6
EVRA/T 20	4.5	10.7	13.2	16.1	19.2	22.4	26.0	29.0
EVRA 25	10.0	23.7	29.4	36.0	43.0	50.0	57.0	65.0
EVRA 32	16.0	38.0	47.0	57.0	68.0	80.0	92.0	104.0
EVRA 40	25.0	59.0	74.0	89.0	106.0	125.0	144.0	163.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.77
3	0.90
4	**1.0**
6	1.13
8	1.20
10	1.25

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
circulation ratio = 4,
ΔP = 3 psi

R 717

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.5
EVRA/T 10	1.7	1.0	1.3	1.6	2.0	2.3	2.7	3.0
EVRA/T 15	3.1	1.8	2.3	2.9	3.5	4.2	4.8	5.5
EVRA/T 20	5.2	3.1	3.9	4.9	5.9	6.9	8.0	9.1
EVRA 25	11.6	6.8	8.7	10.8	13.0	15.4	17.8	20.2
EVRA 32	18.6	10.9	13.9	17.3	20.8	24.6	28.4	32.4
EVRA 40	29.0	17.1	21.7	27.0	32.5	38.0	44.0	51.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.77
3	0.90
4	**1.0**
6	1.13
8	1.20
10	1.25

Nominal capacities

Wet suction line

SI units

Capacity table for nominal conditions, Q_N [kW],
circulation ratio = 4,
ΔP = 0.2 bar

R 22

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.3	0.3	0.3	0.4	0.4	0.5	0.6
EVRA/T 10	1.5	1.6	2.0	2.3	2.7	3.0	3.4	3.7
EVRA/T 15	2.7	2.9	3.5	4.1	4.8	5.4	6.1	6.7
EVRA/T 20	4.5	4.9	5.9	6.9	8.0	9.0	10.0	11.0
EVRA 25	10.0	10.9	13.1	15.0	18.0	20.0	22.0	25.0
EVRA 32	16.0	17.0	21.0	25.0	28.0	32.0	36.0	40.0
EVRA 40	25.0	27.0	33.0	38.0	44.0	50.0	56.0	62.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.77
3	0.90
4	**1.0**
6	1.13
8	1.20
10	1.25

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
circulation ratio = 4,
ΔP = 3 psi

R 22

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2
EVRA/T 10	1.7	0.5	0.6	0.7	0.8	0.9	1.0	1.1
EVRA/T 15	3.1	0.9	1.0	1.2	1.4	1.6	1.9	2.0
EVRA/T 20	5.2	1.4	1.7	2.1	2.4	2.7	3.1	3.4
EVRA 25	11.6	3.2	3.8	4.6	5.3	6.1	7.0	8.0
EVRA 32	18.6	5.1	6.2	7.3	9.0	10.0	11.0	12.0
EVRA 40	29.0	8.0	10.0	11.0	13.0	15.0	17.0	19.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.77
3	0.90
4	**1.0**
6	1.13
8	1.20
10	1.25

Nominal capacities

Wet suction line

SI units

Capacity table for nominal conditions, Q_N [kW],
circulation ratio = 4,
ΔP = 0.2 bar

R 134a

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	2.0	2.0	2.0	2.0	2.0	2.0	1.0
EVRA/T 10	1.5	13.0	12.0	12.0	11.0	11.0	10.0	10.0
EVRA/T 15	2.7	23.0	22.0	21.0	21.0	20.0	18.0	17.0
EVRA/T 20	4.5	39.0	37.0	36.0	34.0	33.0	31.0	29.0
EVRA 25	10.0	86.0	83.0	79.0	76.0	72.0	68.0	64.0
EVRA 32	16.0	138.0	133.0	127.0	122.0	116.0	109.0	103.0
EVRA 40	25.0	215.0	207.0	199.0	190.0	181.0	171.0	161.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.77
3	0.90
4	**1.0**
6	1.13
8	1.20
10	1.25

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
circulation ratio = 4,
ΔP = 3 psi

R 134a

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.5
EVRA/T 10	1.7	1.0	1.3	1.6	2.0	2.3	2.7	3.0
EVRA/T 15	3.1	1.8	2.3	2.9	3.5	4.2	4.8	5.5
EVRA/T 20	5.2	3.1	3.9	4.9	5.9	6.9	8.0	9.1
EVRA 25	11.6	6.8	8.7	10.8	13.0	15.4	17.8	20.2
EVRA 32	18.6	10.9	13.9	17.3	20.8	24.6	28.4	32.4
EVRA 40	29.0	17.1	21.7	27.0	32.5	38.0	44.0	51.0

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.77
3	0.90
4	**1.0**
6	1.13
8	1.20
10	1.25

Nominal capacities

Wet suction line

SI units

Capacity table for nominal conditions, Q_N [kW],
circulation ratio = 4,
ΔP = 0.2 bar

R 404A

Type	k_v	Evaporating temperature T_e						
	m^3/h	–40°C	–30°C	–20°C	–10°C	–0°C	10°C	20°C
EVRA 3	0.23	0.3	0.3	0.3	0.4	0.4	0.5	0.5
EVRA/T 10	1.5	1.7	2.0	2.3	2.6	2.9	3.2	3.5
EVRA/T 15	2.7	3.0	3.5	4.1	4.7	5.3	5.8	6.3
EVRA/T 20	4.5	5.0	5.9	6.8	7.8	8.8	9.7	10.5
EVRA 25	10.0	11.1	13.0	15.2	17.4	19.5	21.5	23.4
EVRA 32	16.0	17.8	20.8	24.3	27.8	31.2	34.5	37.4
EVRA 40	25.0	27.7	32.6	38.0	43.8	48.8	53.9	58.4

Correction factor for ΔP ($f_{\Delta P}$)

Δp (bar)	Correction factor
0.2	**1.00**
0.25	0.89
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.77
3	0.90
4	**1.0**
6	1.13
8	1.20
10	1.25

US units

Capacity table for nominal conditions, Q_N [Tons of Refrigeration],
circulation ratio = 4,
ΔP = 3 psi

R 404A

Type	C_v	Evaporating temperature T_e						
	USgal/min.	–40°F	–20°F	0°F	20°F	40°F	60°F	80°F
EVRA 3	0.3	0.1	0.1	0.1	0.1	0.1	0,2	0.2
EVRA/T 10	1.7	0.5	0.6	0.7	0.8	0.9	1.0	1.1
EVRA/T 15	3.1	0.9	1.0	1.2	1.4	1.6	1.8	1.9
EVRA/T 20	5.2	1.4	1.7	2.0	2.3	2.6	2.9	3.2
EVRA 25	11.6	3.2	3.8	4.5	5.2	5.9	6.6	7.1
EVRA 32	18.6	5.1	6.1	7.2	8.3	9.4	10.5	11,3
EVRA 40	29.0	8.0	9.6	11.3	13.0	14.7	16.4	17.6

Correction factor for ΔP ($f_{\Delta P}$)

Δp (psi)	Correction factor
3	**1.00**
4	0.87
5	0.79
6	0.72
7	0.66
8	0.62

Correction factor for liquid temperature (T_{circ})

Liquid temperature	Correction factor
2	0.77
3	0.90
4	**1.0**
6	1.13
8	1.20
10	1.25

UL approved coil

This new range of coils is based on the 018F clip-on design and will replace the existing GP coil range. The new UL coil range is specially designed for the North American market.
To comply with the temperature requirements of UL, the coils are moulded in Rynite and to fulfil the special North American market requirements, the coils are available with Junction box and Conduit boss. The new coils are applicable with EVR, EVM, EVRA/T, EVRS/T and AKV/A.

Features

- Easy mounting and dismounting
- No loose parts during operation
- Suitable with all standard solenoid valves
- Available with junction box or conduit boss

Approvals

Listed with valves mentioned in file MH7648

Conformity with LVD 73/23/EC with amendments EN 60730-2-8

New code numbers

Valve type	Voltage V	Frequency Hz	Code no. Junction box NEMA 2	Code no. Conduit boss NEMA 4	Power consumption
Alternating current a.c.					
EVR EVM EVRA/T EVRS/T AKV/A	24	50/60	**018F7683**	**018F7693**	Holding: 14 W 28 VA Inrush: 49 V
	110	50/60	**018F7682**	**018F7692**	
	120	60			
	208 - 250	60	**018F7681**	**018F7691**	
	230	50			
Direct current d.c.					
	120			**018F7699**	20 W

Coils for solenoid valves

These Danfoss Clip-on coils are specially designed to operate in the aggressive environment of high humidity and temperature fluctuations that you find in most refrigeration systems.

The Clip-on fastening system ensures a faultless installation and makes the coils easy to mount and dismount. A Danfoss Clip-on coil can be mounted without any tools at all, and it is simple to dismount the coil by means of a screwdriver.

The Clip-on coils are available for the entire range of Danfoss solenoid valves for refrigeration, freezing and air conditioning purposes.

Features

- *Encapsulated coils with long operating life, even under extreme conditions*
- *Standard coils for a.c. or d.c.*
- *Standard coils available with DIN spade terminals and US 0.25" spade terminals*
- *Standard coils from 24 V to 240 V, 50, 60 or 50/60 Hz*
- *Standard coils dimensioned for max. opening differential pressure (MOPD) of up to 21 bar*
- *Coils can be fitted without the use of tools*

Approvals

UL recognized with EVR, EVRA, EVM

Technical data

Ambient temperature
14 W a.c. coil for NC (normally closed) valve:
–40 → +122°F

14 W a.c. coil for NO (normally open) valve:
–40 → +122°F

20 W d.c. coil for NC and NO valve:
–40 → +122°F

Permissible voltage variation

14 W a.c. coils: +10/ –15%
20 W d.c. coils: ±10%.

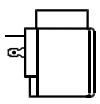
Enclosure
IP 00

Connection

DIN plugs
Can be fitted with cable plugs according to DIN 43560-A

US spades
Can be fitted with cable plugs for US 0.25" spade terminals

Ordering



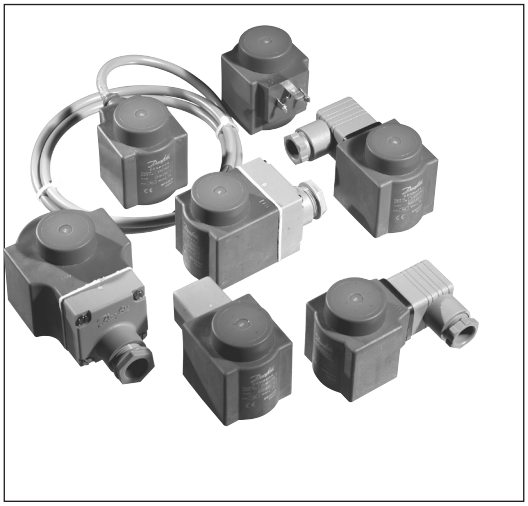
Valve type	Voltage V	Frequency Hz	Code no. With DIN space terminals	Code no. With US 0.25" spade terminals	Power consumption
Alternating current a.c.					
EVR EVRA/EVRAT EVM	208/240	60	**018F7658**	**018F7661**	Holding: 14 W 21 VA Inrush: 44 VA
	230	50	**018F7658**	**018F7661**	
	110	50/60	**018F7663**	**018F7660**	
	120	60	**018F7663**	**018F7660**	
	24	50/60	**018F7665**		

Clip-on coils for solenoid valves

These Danfoss Clip-on coils are specially designed to operate in the aggressive environment of high humidity and temperature fluctuations that you find in most refrigeration systems.

The new Clip-on fastening system ensures a faultless installation and makes the coils easy to mount and dismount. A Danfoss Clip-on coil can be mounted without any tools at all, and it is simple to dismount the coil by means of a screwdriver.

The Clip-on coils are available for the entire range of Danfoss solenoid valves for refrigeration, freezing and air conditioning purposes.



Features

- *Encapsulated coils with long operating life, even under extreme conditions*
- *Standard coils for a.c. or d.c.*
- *Standard coils available with 3-core cable, terminal box or DIN plugs*
- *Standard coils from 12 V to 420 V, 50, 60 or 50/60 Hz*
- *Standard coils dimensioned for max. opening differential pressure (MOPD) of up to 21 bar*
- *Coils can be fitted without the use of tools*

Technical data

Ambient temperature
10 or 12 W a.c. coil
for NC (normally closed) valve:
–40 → +80°C

10 W a.c. coil
for NO (normally open) valve:
–40 → +55°C

20 W d.c. coil
for NC and NO valve:
–40 → +50°C

Permissible voltage variation
10 and 12 W a.c. coils: +10 → –15% and as double frequency coils: ±10%
a.c. coils for 220-230 / 380-400 V: +6 → –15% and as double frequency coils: +6 → –10%
20 W d.c. coils: ±10%.

Enclosure
IP 67 with cable or terminal box
IP 20 with DIN plugs and protective cap
IP 65 with DIN socket
IP 00 with DIN plugs.

Approvals
See under the required solenoid valve.

Connection

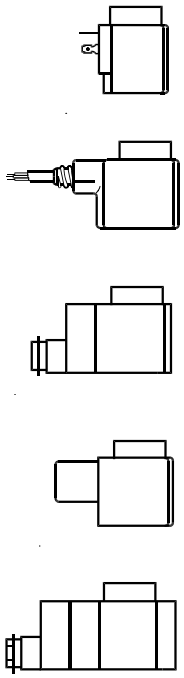
3-core cable
The external thread in the screwed cable entry suits flexible steel hose or corresponding cable protection.

Terminal box
Leads are connected to terminal screws in the terminal box. The box is fitted with a Pg 13.5 screwed entry for 6 → 14 mm cable.
Max. lead cross section: 2.5 mm^2.

DIN plugs
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 mm^2.
Use of the protective cap supplied will prevent inadvertent contact with live parts.

DIN socket
(to DIN 43650)
Leads are connected in the socket. The socket is fitted with a Pg 11 screwed entry for 6 → 12 mm.

Ordering
Clip-on coils



Valve type	Voltage V	Frequency Hz	Code no. With 1 m 3-core cable IP 67	Code no. With terminal box IP 67	Code no. With DIN plugs and protective cap IP 20	Code no. With DIN plugs **)	Appendix no.*)	Power consumption
Alternating current a.c.								
EVR 2 → 40 (NC) EVR 6 → 22 (NC) EVRC EVRA EVRAT EVRS/ EVRST PKVD EVM (NC)	12	50	**018F6256**	**018F6706**			15	Holding: 10 W Inrush: 44 VA
	24	50	**018F6257**	**018F6707**	**018F6182**	**018F7358**	16	
	42	50		**018F6708**			17	
	48	50		**018F6709**			18	
	115	50	**018F6261**	**018F6711**	**018F6186**	**018F7361**	22	
	220/230	50	**018F6251**	**018F6701**	**018F6176**	**018F7351**	31	
	240	50	**018F6252**	**018F6702**	**018F6177**	**018F7352**	33	
	380/400	50	**018F6253**	**018F6703**	**018F6178**		37	
	420	50		**018F6704**	**018F6179**		38	
	24	60	**018F6265**	**018F6715**	**018F6180**		14	
	115	60	**018F6260**	**018F6710**	**018F6185**		20	
	220	60	**018F6264**	**018F6714**	**018F6189**		29	
	240	60	**018F6263**	**018F6713**	**018F6188**		30	
	110	50/60	**018F6280**	**018F6730**	**018F6192**	**018F7360**	21	
	220/230	50/60	**018F6282**	**018F6732**	**018F6193**	**018F7363**	32	
Direct current d.c.								Coil type I
EVR 2→15 (NC) EVR 25→40 (NC/NO) EVR 6→15 (NC) EVR C 10→15 (NC) EVRA 3 →15 (NC) EVRA 25 →40 (NC) EVRAT 10 →15 (NC) EVRS/ EVRST 3 →15 PKVD EVM (NC)	12			**018F6856**			01	20 W
	24			**018F6857**			02	
	48			**018F6859**			04	
	110			**018F6860**			06	
	115			**018F6861**			07	
	220			**018F6851**			09	
Direct current d.c.								Coil type II
EVR 20→22 (NC/NO) EVR C 20 EVRA 20 EVRAT 20 EVRST	12			**018F6886**			01	20 W
	24			**018F6887**			02	
	48			**018F6889**			04	
	110			**018F6890**			06	
	115						07	
	220			**018F6881**			09	

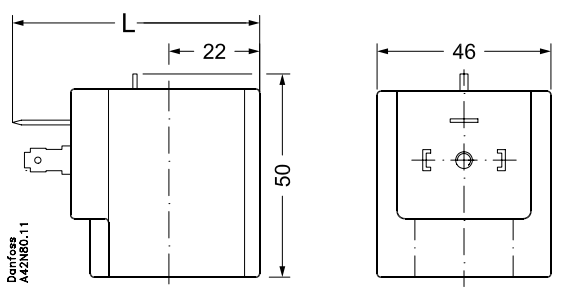
See "Opening differential pressure" under "Technical data" for the valve concerned.

**) Indicates voltage and frequency*

***) Can only be used with DIN socket*

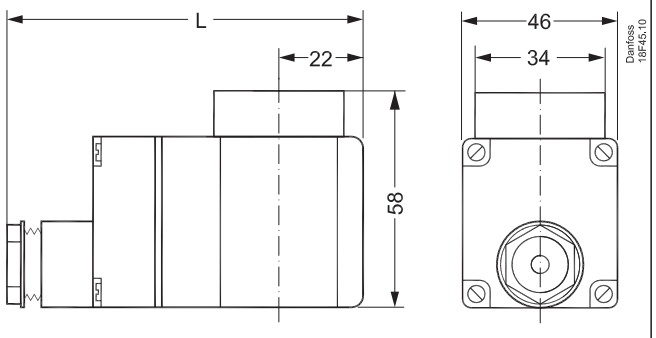
****) When replacing a coil with terminal box, it is sufficient to change the coil unit itself. Therefore, order coil with DIN plugs and protective cap.*

Dimensions and weight



	L
Without cable plug	62 mm

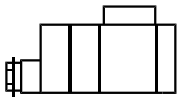
Weight: 0.24 kg



With terminal box	94 mm
With 1 m cable	65 mm

Weight: 0.30 kg

Ordering special coils



Valve type	Voltage V	Frequency Hz	**Code no.** With terminal box IP 67	Appendix no. Indicates voltage and frequency	Power consumption
Alternating current a.c.					
EVR 3 → 40 EVRC EVRA/ EVRAT EVRS/ EVRST PKVD EVM (NC/NO)	24	50	**018F6807**		Holding: 14 W 21 VA Inrush: 44 VA
	42	50			
	48	50	**018F6809**		
	110	50	**018F6811**		
	110/230	50	**018F6801**		
	240	50	**018F6802**		
	380/400	50	**018F6803**		
	24	60	**018F6815**		
	110	60	**018F6813**		
	220	60	**018F6814**		

See "Opening differential pressure" under "Technical data" for the valve concerned.

When replacing a coil with terminal box, it is sufficient to change the coil unit itself. Therefore, order coil with DIN plugs and protective cap.

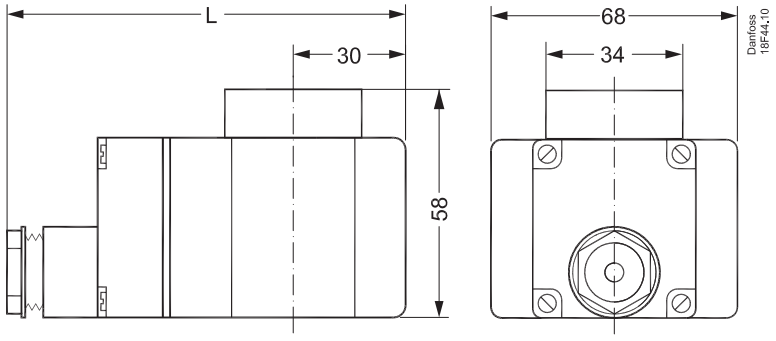
Accessories

Description	**Code no.**
DIN socket	**042N0156**
Terminal box with build-in light emmitting indicator diode for solenoid valves	**018Z0089**

Dimensions and weights
See under the required solenoid valve.

Dimensions and weight

12 W AC
20 W DC



	L
Without cable plug	112 mm

Weight: 0.50 kg

Coils for use in EX zone 2 EEx nA II T3

Danfoss has developed a series of ATEX approved coils for use in EX zone 2. The coils are equipped with clip-on fastening system for easy and faultless installation. Thus the coil can be installed without use of tools and easily dismounted by means of a screwdriver.

Features

- ATEX approved for use in EX zone 2
- Embedded coils with long lifetime - even under extreme conditons
- Available with 1 m 3-core cable or terminal
- Quick and safe mounting with "clip-on"coil
- Mounting on valve without use of tools
- Standard coils for a.c. and d.c.
- Standard coils from 24 to 240 V
- Standard coils dimensioned to max. opening differential pressure (MOPD) up to 21 bar

Approval

EExnAIIT3 DEMKO 01 ATEX 130591X

Technical data

Ambient temperature
- 11 or 14 W, 50 Hz a.c. coil –40 → +50°C
- 13 W, 50/60 Hz a.c. coil –25 → +50°C
- 20 W d.c. coil –25 → +50°C

Temperature of medium
max. 105°C/ 221°F

Enclosure for coil
- IP 67

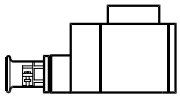
Permissible voltage variation
- 11 and 14 W a.c. coils: +10 → –15% and as double frequency coils: ±10%
- 20 W d.c. coils: ±10%

Connections

3-core cable
The external thread of the cable entry is suitable for flexible steel hose or similar cable protection

Terminal box
The cables are connected with the terminal screws in the terminal box which is equipped with a Pg 13.5 cable gland for 6 → 14 mm cable. Max. cable diam.: 2.5 mm^2

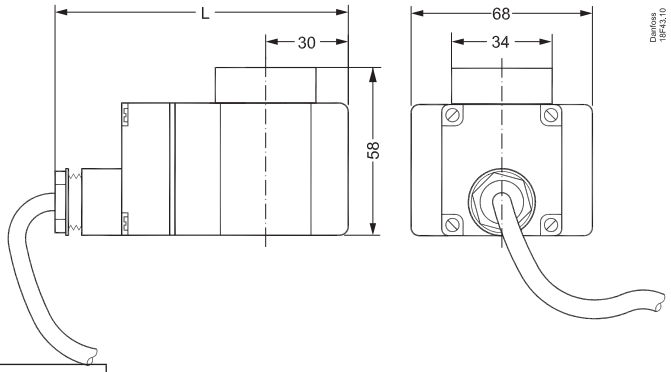
Ordering
Coils



Valve type	Voltage V	Frequency Hz	Code no. With 1 m 3-core cable IP 67	Code no. With t erminal box IP 67	Power consumption
Alternating current a.c.					
EVR 2 → 40 (NC) EVR 6 → 22 (NO) EVRC EVRA/EVRAT EVRS/EVRST PKVD EVM (NC)	24	50	**018F5257**	**018F5707**	Holding: 11 W 21 VA Inrush: 44 VA
	48	50	**018F5259**	**018F5709**	
	110	50	**018F5261**	**018F5711**	
	230	50	**018F5251**	**018F5701**	
	240	50	**018F5252**	**018F5702**	
	230	200	**018F5282**	**018F5732**	Holding: 13 W 25 VA Inrush: 48 VA
	24	24	**018F5277**	**018F5727**	
Alternating current a.c.					
EVR 2 → 40 (NC) EVR 6 → 22 (NO) EVRC EVRA/EVRAT EVRS/EVRST PKVD EVM (NC)	24	50		**018F5807**	Holding: 14 W 26 VA Inrush: 55 VA
	28	50		**018F5809**	
	110	50		**018F5811**	
	230	50		**018F5801**	
	240	50		**018F5802**	
Direct current d.c.					
EVR 2→15 (NC) EVR 25→40 (NC/NO) EVR 6→15 (NC) EVR C 10→15 (NC) EVRA 3 →15 (NC) EVRA 25 →40 (NC) EVRAT 10 →15 (NC) EVRS/ EVRST 3 →15 PKVD EVM (NC/NO)	24			**018F5857**	Holding: 14 W 26 VA Inrush: 55 VA

Must always be installed with fuse ahead of coil

Dimensions and weight



	L
With 1 m cable	112 mm

Weight: 0.60 kg