Data sheet

Thermostatic expansion valve Type TD1 / TDE1

TD1 / TDE 1 is a thermostatic expansion valve designed to regulate liquid injection into evaporators with smaller capacities in refrigeration, heat pump and air conditioning systems. The liquid injection depends on the refrigerant superheat at the evaporator outlet, where the bulb must be placed.

TD1 / TDE 1 is constructed for soldering into hermetic sealed systems and supplied as angleway and straightway version. The product range includes different orifice and connection sizes.

TD1 / TDE 1 can be supplied with and without external equalization, with and without MOP and is only available in industrial pack.

Features

- Refrigerants:
  R134a, R22, R404A, R407C and R290.
- Rated capacities from 0.42 to 3.88 kW (0.12 to 1.11 TR) for R134a
- Patented double contact bulb
- Good temperature transfer from pipe to bulb
- Fast and easy to install
- Supplied with fixed superheat setting as well as adjustable straightway version as tool for setting identification.
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- Available with filter at the inlet side
- Version with and without bleed
- Compact and hermetic construction
- Laser welded stainless steel element:
  - optimum regulation properties
  - long life of diaphragm
  - high compressive strength
- Available with universal charge, range N or with MOP charge (MOP 15 °C (60 °F) and MOP 20 °C (68 °F)
- Compliance with ATEX hazard zone 2

Technical data

Max. bulb temperature: 120 °C (248 °F)
Max. valve housing temperature: 150 °C (302 °F)
Max. working pressure: PS/MWP = 34 bar (500 psig)
Max. test pressure: p_e = 37.5 bar (540 psig)

Connections: 6 x 10 mm (1/4 x 3/8 in.)
Other connections on demand

Equalization connections: 6mm (1/4 in.) solder ODF

Capillary tube length: 0.75 m (30 in.)

Bleed: 15 % / 30 %

Type / orifice	Rated capacity R134a		Rated capacity R407C		Rated capacity R404A		Rated capacity R290		Rated capacity R22	
	Tons TR	kW	Tons TR	kW	Tons TR	kW	Tons TR	kW	Tons TR	kW
TD1/TDE1 0	0.12	0.42	0.18	0.63	0.14	0.48	0.18	0.62	0.17	0.60
TD1/TDE1 1	0.24	0.83	0.36	1.26	0.27	0.95	0.35	1.23	0.34	1.19
TD1/TDE1 2	0.47	1.65	0.72	2.51	0.54	1.89	0.70	2.46	0.68	2.38
TD1/TDE1 3	0.61	2.13	0.92	3.22	0.69	2.42	0.90	3.15	0.87	3.05
TD1/TDE1 4	0.92	3.22	1.39	4.84	1.04	3.64	1.36	4.74	1.31	4.59
TD1/TDE1 5	1.11	3.88	1.71	5.94	1.29	4.48	1.67	5.82	1.61	5.63

Nominal capacity according to ARI standard

Units / Conditions	t_{evap}	t_{cond}	Subcooling
SI [°C]	4.40	38.00	1.00
US [°F]	40.00	100.00	1.80

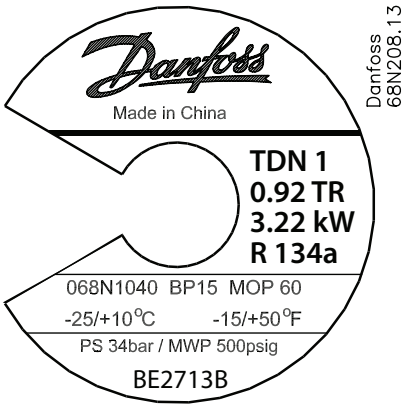
Standard and MOP valves

Refrigerant	Range N –40 / 10 °C (–40 / 50 °F) MOP - point	Range K –25 / 10 °C (–15 / 50 °F) MOP - point	Range AC –25 / 15 °C (–15 / 60 °F) MOP - point
R134a	without MOP	55 psig / 5 bar	70 psig / 5.8 bar
R22	without MOP	100 psig / 7.9 bar	120 psig / 9.3 bar
R404A	without MOP	120 psig / 9.3 bar	140 psig / 10.7 bar

To avoid charge migration when MOP valves are used, the bulb temperature must be lower than the thermostatic element temperature.

Identification

Essential valve data is given on the element label.



TDN1 = Type (N = R134a)
0.92 TR = Rated capacity $Q_{nom.}$ in Tons of Refrigeration
3.22 kW = Rated capacity $Q_{nom.}$ in kW
R134a = Refrigerant
–25 / 10 °C = Evaporating temperature range (°C)
–15 / 50 °F = Evaporating temperature range (°F)
068N1040 = Code number
BP15 = Bleed 15%
MOP 60 = Max. Operation Pressure
PS 34 bar = Max. Working Pressure
MWP 500 psig = Max. working pressure
BE2713B = Date marking
(BE = China, 27 = Production week, 13 = Year (2013), B = Tuesday)

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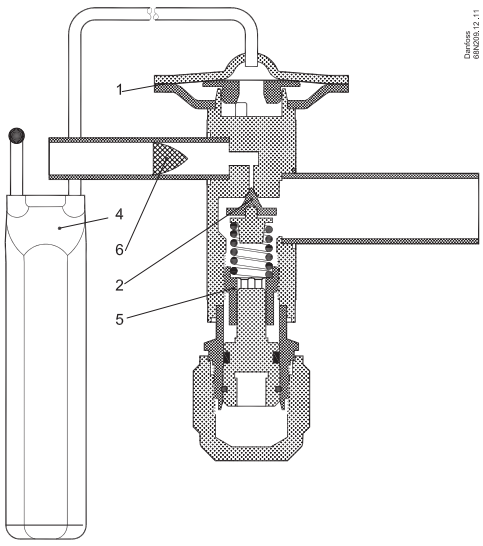
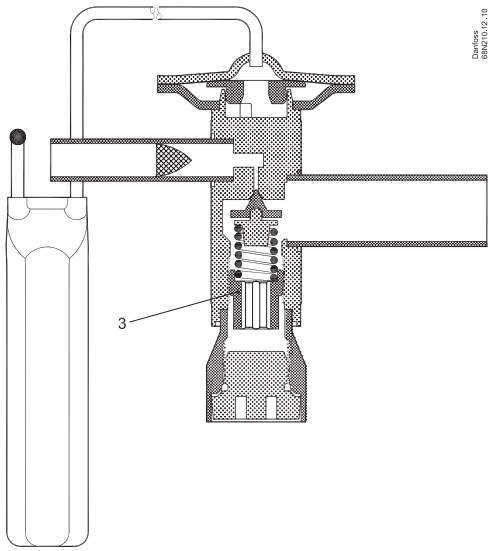
Design and function





1. Thermostatic element (diaphragm)
2. Fixed orifice assembly
3. Locked setting screw
4. Bulb with capillary tube
5. Static superheat adjustment
6. Strainer

The thermostatic element of the valve has a combination of diaphragm area and charge that in connection with a minimum hysteresis provide the best possible regulation characteristics.

Ordering

As the TD1 / TDE1 valve is an OEM valve, a code number programme has not been established.

Code numbers are available on demand.

TD1 / TDE1 valves are available in 32-off industrial pack as standard.

Accessories

Buld clips can be delivered separately:

Bulb clip diameter	**Code number** *(Industrial pack - 96 pcs.)*
8 mm ($^5/_{16}$ in.)	**068N2529**
10 mm ($^3/_8$ in.)	**068N2530**
12 mm ($^1/_2$ in.)	**068N2531**

Capacity

Capacity in kW, range N, -40 °C to 10 °C, opening superheat sh= 4 K

SI Units R290

Valve	Orifice no.	Cond. temp. [°C]	Evaporating [°C]											
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
TD1/TDE1	0	25	0.38	0.43	0.47	0.50	0.53	0.55	0.57	0.58	0.59	0.59	0.58	0.55
	1		0.75	0.85	0.93	1.00	1.06	1.10	1.14	1.16	1.18	1.18	1.16	1.10
	2		0.96	1.06	1.20	1.38	1.57	1.78	1.99	2.17	2.31	2.38	2.35	2.15
	3		1.04	1.32	1.58	1.84	2.09	2.33	2.55	2.76	2.95	3.09	3.16	3.05
	4		1.57	1.96	2.35	2.72	3.09	3.44	3.78	4.10	4.38	4.61	4.75	4.67
	5		1.58	1.96	2.35	2.77	3.21	3.68	4.18	4.69	5.19	5.63	5.91	5.80
TD1/TDE1	0	35	0.36	0.41	0.46	0.49	0.52	0.55	0.58	0.60	0.62	0.64	0.66	0.68
	1		0.71	0.82	0.91	0.98	1.05	1.10	1.15	1.19	1.24	1.28	1.32	1.35
	2		0.91	1.01	1.16	1.35	1.56	1.78	2.01	2.23	2.42	2.56	2.64	2.63
	3		0.99	1.26	1.53	1.80	2.06	2.31	2.57	2.82	3.07	3.30	3.52	3.70
	4		1.47	1.88	2.27	2.67	3.06	3.44	3.83	4.21	4.59	4.96	5.30	5.60
	5		1.51	1.87	2.26	2.69	3.15	3.66	4.21	4.81	5.45	6.11	6.78	7.40
TD1/TDE1	0	45	0.33	0.38	0.43	0.47	0.50	0.53	0.56	0.58	0.61	0.64	0.67	0.71
	1		0.65	0.76	0.85	0.92	0.99	1.05	1.11	1.17	1.22	1.28	1.35	1.42
	2		0.81	0.91	1.06	1.25	1.46	1.69	1.93	2.17	2.38	2.56	2.70	2.77
	3		0.89	1.16	1.42	1.69	1.95	2.21	2.48	2.74	3.02	3.29	3.57	3.84
	4		1.29	1.69	2.09	2.49	2.89	3.29	3.70	4.12	4.54	4.97	5.40	5.84
	5		1.38	1.72	2.09	2.51	2.97	3.48	4.06	4.70	5.41	6.18	7.02	7.89
TD1/TDE1	0	55	0.29	0.34	0.39	0.42	0.46	0.49	0.52	0.55	0.58	0.61	0.65	0.70
	1		0.56	0.67	0.76	0.83	0.90	0.97	1.03	1.09	1.16	1.23	1.31	1.40
	2		0.66	0.76	0.91	1.09	1.30	1.53	1.77	2.01	2.24	2.44	2.60	2.71
	3		0.74	1.00	1.26	1.52	1.77	2.03	2.30	2.57	2.85	3.14	3.44	3.75
	4		1.03	1.42	1.82	2.21	2.61	3.02	3.43	3.85	4.29	4.75	5.22	5.72
	5		1.18	1.49	1.84	2.24	2.69	3.20	3.78	4.43	5.17	5.99	6.90	7.90

Subcooling correction factor 'fsub'

Subcooling [K]	2	4	10	15	20	25	30	35	40	45	50
Collection Factor	0.98	1.00	1.07	1.12	1.17	1.23	1.28	1.33	1.39	1.44	1.49

Distributer correction factor 'fp' *

Evaporating temp.		-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
Pressure drop [bar]	0	1	1	1	1	1	1	1	1	1	1	1	1
	1	0.95	0.95	0.95	0.94	0.94	0.94	0.93	0.93	0.92	0.91	0.89	0.87
	1.5	0.92	0.92	0.92	0.92	0.91	0.91	0.90	0.89	0.88	0.86	0.84	0.79
	2	0.90	0.89	0.89	0.89	0.88	0.87	0.86	0.85	0.83	0.81	0.77	0.71

*calculated at 32°C condensing temperature

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Capacity (continued)

Capacity in TR, range N, -40 °C to 50 °F, opening superheat sh= 7 °F

US Units R290

Valve	Orifice no.	Cond. temp. [°F]	Evaporating [°F]											
			-40	-30	-20	-10	0	10	20	30	40	50	60	70
TD1/TDE1	0	75	0.11	0.12	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.16	0.15	0.11
	1		0.21	0.25	0.27	0.29	0.31	0.32	0.33	0.33	0.33	0.32	0.30	0.24
	2		0.27	0.30	0.35	0.41	0.47	0.54	0.60	0.64	0.67	0.65	0.58	0.42
	3		0.30	0.38	0.47	0.55	0.62	0.70	0.76	0.82	0.86	0.88	0.82	0.52
	4		0.45	0.57	0.69	0.81	0.92	1.03	1.13	1.22	1.29	1.32	1.27	1.02
	5		0.45	0.57	0.69	0.83	0.97	1.12	1.28	1.43	1.56	1.63	1.53	0.74
TD1/TDE1	0	95	0.10	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.18	0.19	0.19	0.19
	1		0.20	0.24	0.26	0.29	0.30	0.32	0.34	0.35	0.36	0.37	0.38	0.39
	2		0.26	0.29	0.34	0.40	0.47	0.54	0.61	0.68	0.72	0.75	0.75	0.69
	3		0.28	0.37	0.45	0.54	0.62	0.70	0.78	0.86	0.93	1.00	1.06	1.08
	4		0.42	0.55	0.67	0.79	0.92	1.04	1.16	1.28	1.40	1.51	1.60	1.65
	5		0.43	0.54	0.67	0.81	0.96	1.12	1.31	1.51	1.72	1.93	2.12	2.24
TD1/TDE1	0	115	0.09	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.22
	1		0.18	0.22	0.24	0.27	0.29	0.31	0.32	0.34	0.36	0.38	0.41	0.43
	2		0.23	0.26	0.31	0.37	0.44	0.52	0.59	0.66	0.72	0.77	0.79	0.78
	3		0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.01	1.10	1.18
	4		0.36	0.49	0.61	0.74	0.86	0.99	1.12	1.26	1.39	1.53	1.67	1.81
	5		0.39	0.49	0.61	0.75	0.90	1.07	1.27	1.48	1.73	1.99	2.28	2.56
TD1/TDE1	0	135	0.08	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.20	0.21
	1		0.15	0.19	0.21	0.24	0.26	0.28	0.30	0.32	0.34	0.37	0.40	0.43
	2		0.18	0.21	0.26	0.32	0.39	0.46	0.54	0.61	0.67	0.73	0.76	0.77
	3		0.20	0.28	0.36	0.44	0.52	0.60	0.69	0.78	0.87	0.96	1.06	1.17
	4		0.27	0.40	0.52	0.64	0.77	0.90	1.03	1.17	1.31	1.46	1.62	1.79
	5		0.32	0.42	0.53	0.66	0.80	0.97	1.17	1.40	1.65	1.94	2.26	2.61

Subcooling correction factor 'fsub'

Subcooling [°F]	2	7	10	15	20	25	30	35	40	45	50
Collection Factor	0.91	1.00	1.05	1.14	1.23	1.31	1.40	1.48	1.57	1.65	1.73

Distributer correction factor 'fp' *

Evaporating temp.		-40	-30	-20	-10	0	10	20	30	40	50	60	70
Pressure drop [psi]	0	1	1	1	1	1	1	1	1	1	1	1	1
	15	0.95	0.95	0.94	0.94	0.94	0.93	0.93	0.92	0.91	0.89	0.86	0.79
	25	0.91	0.91	0.91	0.90	0.90	0.89	0.88	0.86	0.84	0.81	0.75	0.62
	30	0.89	0.89	0.89	0.88	0.87	0.86	0.85	0.83	0.81	0.77	0.69	0.51

*calculated at 90°F condensing temperature

Capacity

Capacity in kW, range N, -40 °C to 10 °C, opening superheat sh= 4 K

SI Units R134a

Valve	Orifice no.	Cond. temp. [°C]	Evaporating [°C]											
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
TD1/TDE1	0	25	0.24	0.26	0.29	0.31	0.33	0.35	0.36	0.37	0.38	0.37	0.35	0.30
	1		0.47	0.52	0.57	0.61	0.65	0.69	0.72	0.74	0.74	0.73	0.69	0.61
	2		0.60	0.63	0.71	0.83	0.97	1.11	1.26	1.38	1.46	1.48	1.42	1.24
	3		0.65	0.80	0.96	1.13	1.30	1.47	1.62	1.76	1.86	1.92	1.88	1.70
	4		0.99	1.18	1.41	1.65	1.91	2.18	2.42	2.65	2.82	2.92	2.89	2.63
	5		0.98	1.18	1.43	1.71	2.01	2.33	2.66	2.97	3.24	3.42	3.44	3.13
TD1/TDE1	0	35	0.24	0.27	0.30	0.32	0.35	0.37	0.39	0.40	0.42	0.42	0.42	0.41
	1		0.48	0.54	0.59	0.64	0.69	0.73	0.77	0.80	0.83	0.84	0.83	0.81
	2		0.62	0.66	0.75	0.88	1.03	1.19	1.35	1.50	1.61	1.68	1.69	1.61
	3		0.68	0.83	1.00	1.18	1.37	1.55	1.74	1.91	2.06	2.18	2.26	2.28
	4		1.02	1.22	1.47	1.73	2.02	2.30	2.59	2.86	3.10	3.30	3.44	3.49
	5		1.02	1.23	1.48	1.78	2.11	2.47	2.85	3.24	3.62	3.98	4.29	4.48
TD1/TDE1	0	45	0.24	0.27	0.30	0.33	0.35	0.38	0.40	0.42	0.44	0.45	0.46	0.46
	1		0.48	0.54	0.60	0.65	0.70	0.75	0.80	0.84	0.87	0.90	0.91	0.92
	2		0.62	0.67	0.76	0.89	1.05	1.22	1.40	1.56	1.69	1.79	1.83	1.81
	3		0.67	0.83	1.01	1.19	1.39	1.59	1.78	1.97	2.15	2.31	2.44	2.53
	4		1.01	1.22	1.48	1.75	2.05	2.36	2.66	2.96	3.24	3.48	3.69	3.84
	5		1.03	1.23	1.49	1.79	2.14	2.52	2.94	3.37	3.82	4.28	4.71	5.12
TD1/TDE1	0	55	0.24	0.26	0.29	0.32	0.35	0.37	0.40	0.42	0.44	0.46	0.47	0.48
	1		0.47	0.52	0.58	0.64	0.69	0.75	0.80	0.84	0.88	0.92	0.94	0.96
	2		0.59	0.64	0.73	0.87	1.03	1.21	1.39	1.56	1.71	1.82	1.89	1.89
	3		0.64	0.80	0.98	1.17	1.37	1.57	1.78	1.98	2.17	2.34	2.50	2.62
	4		0.96	1.18	1.44	1.72	2.03	2.34	2.66	2.97	3.26	3.53	3.77	3.97
	5		0.99	1.19	1.44	1.75	2.10	2.50	2.93	3.40	3.89	4.40	4.92	5.42

Subcooling correction factor 'fsub'

Subcooling [K]	2	4	10	15	20	25	30	35	40	45	50
Collection Factor	0.98	1.00	1.07	1.12	1.18	1.23	1.29	1.34	1.40	1.45	1.50

Distributer correction factor 'fp' *

Evaporating temp.		-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
Pressure drop [bar]	0	1	1	1	1	1	1	1	1	1	1	1	1
	1	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.91	0.90	0.89	0.87	0.83
	1.5	0.90	0.89	0.89	0.89	0.88	0.88	0.87	0.86	0.84	0.82	0.79	0.74
	2	0.86	0.86	0.85	0.85	0.84	0.83	0.82	0.81	0.79	0.76	0.71	0.62

*calculated at 32°C condensing temperature

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Capacity (continued)

Capacity in TR, range N, -40 °C to 50 °F, opening superheat sh= 7 °F

US Units R134a

Valve	Orifice no.	Cond. temp. [°F]	Evaporating [°F]											
			-40	-30	-20	-10	0	10	20	30	40	50	60	70
TD1/TDE1	0	75	0.07	0.07	0.08	0.09	0.10	0.10	0.10	0.11	0.10	0.10	0.08	0.05
	1		0.13	0.15	0.16	0.18	0.19	0.20	0.21	0.21	0.20	0.19	0.16	0.12
	2		0.17	0.18	0.21	0.25	0.29	0.34	0.38	0.40	0.41	0.39	0.33	0.24
	3		0.18	0.23	0.28	0.33	0.39	0.44	0.48	0.52	0.53	0.52	0.44	0.19
	4		0.28	0.34	0.41	0.49	0.57	0.65	0.72	0.78	0.81	0.79	0.68	0.28
	5		0.28	0.34	0.42	0.51	0.61	0.71	0.80	0.89	0.94	0.94	0.79	0.17
TD1/TDE1	0	95	0.07	0.08	0.09	0.09	0.10	0.11	0.11	0.12	0.12	0.12	0.12	0.10
	1		0.14	0.15	0.17	0.19	0.20	0.21	0.23	0.23	0.24	0.24	0.23	0.21
	2		0.18	0.19	0.22	0.26	0.31	0.36	0.41	0.45	0.48	0.48	0.45	0.38
	3		0.19	0.24	0.30	0.35	0.41	0.47	0.53	0.58	0.62	0.64	0.65	0.61
	4		0.29	0.36	0.43	0.52	0.61	0.70	0.79	0.87	0.93	0.98	0.99	0.95
	5		0.29	0.36	0.44	0.54	0.64	0.76	0.88	1.01	1.12	1.22	1.28	1.26
TD1/TDE1	0	115	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.12	0.13	0.13	0.13	0.13
	1		0.14	0.16	0.17	0.19	0.21	0.22	0.23	0.25	0.26	0.26	0.26	0.26
	2		0.18	0.19	0.22	0.27	0.32	0.38	0.43	0.47	0.51	0.52	0.52	0.48
	3		0.19	0.24	0.30	0.36	0.42	0.48	0.54	0.60	0.65	0.70	0.73	0.74
	4		0.29	0.35	0.44	0.53	0.62	0.72	0.81	0.90	0.99	1.05	1.10	1.12
	5		0.29	0.36	0.44	0.54	0.65	0.78	0.92	1.06	1.21	1.35	1.48	1.58
TD1/TDE1	0	135	0.07	0.08	0.08	0.09	0.10	0.11	0.12	0.12	0.13	0.13	0.14	0.14
	1		0.13	0.15	0.17	0.19	0.20	0.22	0.23	0.25	0.26	0.27	0.28	0.28
	2		0.16	0.18	0.21	0.26	0.31	0.37	0.43	0.48	0.51	0.54	0.54	0.51
	3		0.18	0.23	0.29	0.35	0.41	0.48	0.54	0.60	0.66	0.71	0.75	0.78
	4		0.27	0.34	0.42	0.51	0.61	0.71	0.81	0.91	0.99	1.07	1.13	1.18
	5		0.28	0.34	0.42	0.52	0.64	0.77	0.92	1.07	1.24	1.40	1.57	1.73

Subcooling correction factor 'fsub'

Subcooling [°F]	2	7	10	15	20	25	30	35	40	45	50
Collection Factor	0.91	1.00	1.05	1.14	1.23	1.32	1.41	1.50	1.58	1.67	1.76

Distributer correction factor 'fp' *

Evaporating temp.		-40	-30	-20	-10	0	10	20	30	40	50	60	70
Pressure drop [psi]	0	1	1	1	1	1	1	1	1	1	1	1	1
	15	0.93	0.93	0.93	0.92	0.92	0.92	0.91	0.90	0.89	0.86	0.82	0.74
	25	0.88	0.88	0.87	0.87	0.86	0.85	0.84	0.82	0.80	0.76	0.68	0.50
	30	0.86	0.85	0.85	0.84	0.83	0.82	0.81	0.79	0.75	0.70	0.60	0.31

*calculated at 90°F condensing temperature

Capacity (continued)

Capacity in kW, range N, -40 °C to 10 °C, opening superheat sh= 4 K

SI Units R404A

Valve	Orifice no.	Cond. temp. [°C]	Evaporating [°C]											
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
TD1/TDE1	0	25	0.26	0.29	0.32	0.35	0.38	0.41	0.43	0.45	0.47	0.47	0.45	0.41
	1		0.52	0.58	0.65	0.71	0.76	0.82	0.86	0.90	0.92	0.92	0.90	0.82
	2		0.67	0.72	0.82	0.97	1.14	1.33	1.52	1.68	1.80	1.86	1.82	1.63
	3		0.73	0.90	1.09	1.29	1.51	1.73	1.94	2.14	2.30	2.41	2.45	2.32
	4		1.09	1.32	1.59	1.90	2.23	2.57	2.90	3.20	3.47	3.66	3.73	3.57
	5		1.11	1.32	1.60	1.94	2.33	2.75	3.19	3.64	4.06	4.41	4.61	4.49
TD1/TDE1	0	35	0.25	0.28	0.31	0.35	0.38	0.41	0.44	0.47	0.49	0.50	0.51	0.50
	1		0.50	0.56	0.63	0.69	0.76	0.82	0.87	0.92	0.96	0.99	1.01	1.00
	2		0.63	0.68	0.79	0.94	1.13	1.33	1.53	1.72	1.88	1.99	2.03	1.98
	3		0.68	0.86	1.05	1.27	1.49	1.73	1.96	2.18	2.39	2.56	2.70	2.78
	4		1.03	1.27	1.55	1.87	2.21	2.57	2.92	3.27	3.59	3.87	4.09	4.22
	5		1.06	1.27	1.55	1.89	2.29	2.74	3.23	3.74	4.26	4.77	5.24	5.61
TD1/TDE1	0	45	0.23	0.26	0.30	0.33	0.36	0.40	0.43	0.46	0.48	0.51	0.52	0.53
	1		0.45	0.52	0.59	0.66	0.73	0.79	0.85	0.91	0.96	1.00	1.04	1.06
	2		0.54	0.60	0.71	0.87	1.06	1.27	1.48	1.68	1.86	1.99	2.07	2.08
	3		0.61	0.78	0.98	1.20	1.42	1.66	1.90	2.14	2.36	2.56	2.74	2.89
	4		0.92	1.16	1.45	1.77	2.12	2.49	2.85	3.21	3.56	3.87	4.14	4.36
	5		0.97	1.16	1.43	1.77	2.18	2.64	3.15	3.69	4.27	4.86	5.45	6.01
TD1/TDE1	0	55	0.20	0.23	0.26	0.30	0.33	0.37	0.40	0.43	0.46	0.49	0.51	0.52
	1		0.39	0.46	0.53	0.60	0.67	0.74	0.80	0.86	0.92	0.97	1.02	1.05
	2		0.42	0.47	0.58	0.74	0.93	1.15	1.36	1.57	1.76	1.91	2.00	2.03
	3		0.50	0.67	0.86	1.08	1.31	1.55	1.79	2.03	2.26	2.47	2.67	2.83
	4		0.78	1.02	1.30	1.62	1.97	2.33	2.70	3.07	3.42	3.75	4.04	4.28
	5		0.83	1.00	1.26	1.59	1.99	2.45	2.97	3.54	4.14	4.78	5.43	6.08

Subcooling correction factor 'fsub'

Subcooling [K]	2	4	10	15	20	25	30	35	40	45	50
Collection Factor	0.97	1.00	1.09	1.17	1.24	1.32	1.39	1.46	1.53	1.61	1.68

Distributer correction factor 'fp' *

Evaporating temp.		-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
Pressure drop [bar]	0	1	1	1	1	1	1	1	1	1	1	1	1
	1	0.96	0.96	0.96	0.96	0.96	0.96	0.95	0.95	0.94	0.94	0.92	0.91
	1.5	0.94	0.94	0.94	0.94	0.94	0.93	0.93	0.92	0.91	0.90	0.88	0.86
	2	0.92	0.92	0.92	0.92	0.91	0.91	0.90	0.89	0.88	0.87	0.84	0.80

*calculated at 32°C condensing temperature

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Capacity (continued)

Capacity in TR, range N, -40 °C to 50 °F, opening superheat sh= 7 °F

US Units R404A

Valve	Orifice no.	Cond. temp. [°F]	Evaporating [°F]											
			-40	-30	-20	-10	0	10	20	30	40	50	60	70
TD1/TDE1	0	75	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.13	0.13	0.13	0.11	0.07
	1		0.15	0.17	0.19	0.21	0.22	0.24	0.25	0.26	0.26	0.25	0.22	0.15
	2		0.19	0.21	0.24	0.29	0.35	0.41	0.46	0.50	0.52	0.51	0.44	0.27
	3		0.21	0.26	0.32	0.39	0.46	0.52	0.59	0.64	0.68	0.68	0.62	0.38
	4		0.31	0.38	0.47	0.57	0.67	0.78	0.88	0.96	1.02	1.04	0.96	0.59
	5		0.32	0.39	0.48	0.59	0.71	0.85	0.99	1.12	1.23	1.28	1.19	0.65
TD1/TDE1	0	95	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.14	0.14	0.14	0.13
	1		0.14	0.16	0.18	0.20	0.22	0.24	0.26	0.27	0.28	0.29	0.28	0.27
	2		0.18	0.20	0.23	0.28	0.35	0.41	0.47	0.53	0.56	0.58	0.56	0.49
	3		0.19	0.25	0.31	0.38	0.45	0.53	0.60	0.66	0.72	0.77	0.79	0.78
	4		0.29	0.37	0.46	0.56	0.67	0.79	0.90	1.00	1.09	1.16	1.20	1.18
	5		0.30	0.37	0.46	0.57	0.71	0.85	1.01	1.18	1.34	1.49	1.60	1.65
TD1/TDE1	0	115	0.06	0.07	0.08	0.10	0.11	0.12	0.13	0.14	0.14	0.15	0.15	0.15
	1		0.13	0.15	0.17	0.19	0.21	0.23	0.25	0.27	0.28	0.29	0.30	0.30
	2		0.15	0.17	0.21	0.26	0.32	0.39	0.46	0.51	0.56	0.59	0.59	0.56
	3		0.17	0.22	0.29	0.36	0.43	0.51	0.58	0.65	0.72	0.78	0.82	0.85
	4		0.26	0.34	0.43	0.53	0.64	0.76	0.87	0.99	1.09	1.17	1.24	1.28
	5		0.27	0.33	0.42	0.53	0.67	0.82	0.99	1.17	1.36	1.55	1.73	1.89
TD1/TDE1	0	135	0.05	0.06	0.07	0.09	0.10	0.11	0.12	0.13	0.14	0.14	0.15	0.15
	1		0.11	0.13	0.15	0.17	0.19	0.21	0.24	0.25	0.27	0.29	0.30	0.30
	2		0.11	0.13	0.16	0.22	0.28	0.35	0.42	0.48	0.53	0.56	0.57	0.55
	3		0.13	0.19	0.25	0.32	0.39	0.47	0.54	0.62	0.69	0.75	0.80	0.84
	4		0.21	0.29	0.38	0.48	0.59	0.71	0.82	0.94	1.04	1.13	1.21	1.27
	5		0.22	0.28	0.36	0.47	0.61	0.76	0.93	1.12	1.32	1.53	1.74	1.95

Subcooling correction factor 'fsub'

Subcooling [°F]	2	7	10	15	20	25	30	35	40	45	50
Collection Factor	0.88	1.00	1.07	1.19	1.30	1.42	1.53	1.64	1.76	1.87	1.98

Distributer correction factor 'fp' *

Evaporating temp.		-40	-30	-20	-10	0	10	20	30	40	50	60	70
Pressure drop [psi]	0	1	1	1	1	1	1	1	1	1	1	1	1
	15	0.96	0.96	0.96	0.96	0.96	0.95	0.95	0.94	0.93	0.92	0.90	0.86
	25	0.94	0.93	0.93	0.93	0.92	0.92	0.91	0.90	0.89	0.87	0.83	0.75
	30	0.92	0.92	0.92	0.91	0.91	0.90	0.89	0.88	0.86	0.84	0.79	0.69

*calculated at 90°F condensing temperature

Capacity (continued)

Capacity in kW, range N, -40 °C to 10 °C, opening superheat sh= 4 K

SI Units R407C

Valve	Orifice no.	Cond. temp. [°C]	Evaporating [°C]											
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
TD1/TDE1	0	25	0.37	0.43	0.47	0.51	0.54	0.56	0.59	0.61	0.62	0.64	0.65	0.65
	1		0.75	0.85	0.94	1.01	1.07	1.12	1.17	1.20	1.24	1.27	1.29	1.30
	2		0.96	1.06	1.20	1.39	1.59	1.82	2.04	2.25	2.43	2.56	2.61	2.54
	3		1.04	1.32	1.59	1.85	2.11	2.37	2.62	2.86	3.10	3.32	3.50	3.60
	4		1.57	1.97	2.36	2.74	3.12	3.50	3.87	4.25	4.61	4.95	5.27	5.51
	5		1.58	1.96	2.36	2.79	3.25	3.75	4.29	4.86	5.45	6.04	6.56	6.84
TD1/TDE1	0	35	0.36	0.41	0.46	0.49	0.53	0.56	0.58	0.61	0.63	0.66	0.69	0.72
	1		0.71	0.82	0.91	0.98	1.05	1.11	1.16	1.21	1.26	1.32	1.37	1.43
	2		0.91	1.01	1.16	1.35	1.56	1.80	2.03	2.26	2.47	2.64	2.76	2.80
	3		0.99	1.26	1.54	1.80	2.07	2.33	2.60	2.87	3.14	3.41	3.68	3.94
	4		1.47	1.88	2.28	2.67	3.07	3.47	3.87	4.28	4.70	5.12	5.54	5.96
	5		1.51	1.87	2.27	2.69	3.16	3.68	4.25	4.88	5.57	6.31	7.09	7.88
TD1/TDE1	0	45	0.33	0.38	0.43	0.47	0.50	0.53	0.56	0.59	0.62	0.65	0.68	0.73
	1		0.65	0.76	0.85	0.92	0.99	1.05	1.11	1.17	1.23	1.30	1.37	1.45
	2		0.81	0.91	1.06	1.25	1.46	1.69	1.94	2.17	2.39	2.59	2.74	2.83
	3		0.89	1.16	1.42	1.68	1.95	2.21	2.48	2.75	3.03	3.32	3.62	3.93
	4		1.29	1.69	2.09	2.49	2.89	3.29	3.71	4.13	4.57	5.02	5.49	5.97
	5		1.38	1.72	2.09	2.50	2.97	3.48	4.07	4.72	5.44	6.24	7.12	8.07
TD1/TDE1	0	55	0.29	0.34	0.38	0.42	0.45	0.48	0.51	0.54	0.57	0.61	0.65	0.69
	1		0.56	0.66	0.75	0.83	0.90	0.96	1.02	1.08	1.15	1.22	1.30	1.39
	2		0.66	0.76	0.90	1.08	1.29	1.52	1.76	1.99	2.22	2.42	2.58	2.70
	3		0.74	1.00	1.25	1.51	1.76	2.02	2.28	2.55	2.83	3.12	3.42	3.74
	4		1.03	1.42	1.81	2.20	2.59	2.99	3.40	3.82	4.26	4.72	5.19	5.70
	5		1.18	1.49	1.83	2.23	2.67	3.17	3.75	4.39	5.13	5.95	6.86	7.87

Subcooling correction factor 'fsub'

Subcooling [K]	2	4	10	15	20	25	30	35	40	45	50
Collection Factor	0.98	1.00	1.07	1.12	1.18	1.24	1.29	1.35	1.40	1.46	1.51

Distributer correction factor 'fp' *

Evaporating temp.		-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
Pressure drop [bar]	0	1	1	1	1	1	1	1	1	1	1	1	1
	1	0.96	0.96	0.96	0.96	0.96	0.96	0.95	0.95	0.95	0.94	0.93	0.92
	1.5	0.94	0.94	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.91	0.90	0.88
	2	0.92	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.89	0.88	0.86	0.84

*calculated at 32°C condensing temperature

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Capacity (continued)

Capacity in TR, range N, -40 °C to 50 °F, opening superheat sh= 7 °F

US Units **R407C**

Valve	Orifice no.	Cond. temp. [°F]	Evaporating [°F]											
			-40	-30	-20	-10	0	10	20	30	40	50	60	70
TD1/TDE1	0	75	0.11	0.12	0.14	0.15	0.16	0.16	0.17	0.18	0.18	0.18	0.18	0.18
	1		0.21	0.25	0.27	0.29	0.31	0.33	0.34	0.35	0.36	0.36	0.36	0.39
	2		0.27	0.31	0.35	0.41	0.48	0.55	0.62	0.68	0.72	0.73	0.70	0.69
	3		0.30	0.38	0.47	0.55	0.63	0.71	0.79	0.86	0.93	0.98	1.00	0.84
	4		0.45	0.57	0.69	0.82	0.93	1.05	1.17	1.28	1.39	1.48	1.55	1.66
	5		0.45	0.57	0.70	0.84	0.99	1.15	1.32	1.50	1.68	1.83	1.87	1.21
TD1/TDE1	0	95	0.10	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22
	1		0.20	0.24	0.26	0.29	0.31	0.32	0.34	0.36	0.37	0.39	0.41	0.43
	2		0.26	0.29	0.34	0.40	0.47	0.55	0.62	0.69	0.75	0.78	0.80	0.76
	3		0.28	0.37	0.45	0.54	0.62	0.70	0.79	0.87	0.96	1.04	1.13	1.20
	4		0.42	0.55	0.67	0.80	0.92	1.05	1.18	1.31	1.44	1.57	1.71	1.83
	5		0.43	0.54	0.67	0.81	0.96	1.13	1.33	1.54	1.77	2.01	2.26	2.48
TD1/TDE1	0	115	0.09	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.21	0.22
	1		0.18	0.22	0.24	0.27	0.29	0.31	0.32	0.34	0.36	0.39	0.41	0.45
	2		0.23	0.26	0.31	0.37	0.44	0.51	0.59	0.66	0.73	0.78	0.80	0.81
	3		0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.93	1.02	1.12	1.22
	4		0.36	0.49	0.61	0.74	0.86	0.99	1.12	1.26	1.40	1.55	1.71	1.87
	5		0.39	0.49	0.61	0.75	0.90	1.07	1.27	1.49	1.74	2.02	2.32	2.65
TD1/TDE1	0	135	0.08	0.09	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.20	0.21
	1		0.15	0.19	0.21	0.24	0.26	0.28	0.30	0.32	0.34	0.36	0.39	0.43
	2		0.18	0.21	0.25	0.31	0.38	0.46	0.53	0.60	0.67	0.72	0.76	0.77
	3		0.20	0.28	0.36	0.44	0.52	0.60	0.68	0.77	0.86	0.95	1.05	1.16
	4		0.27	0.40	0.52	0.64	0.76	0.89	1.02	1.16	1.30	1.45	1.61	1.78
	5		0.32	0.42	0.53	0.65	0.80	0.96	1.16	1.38	1.64	1.92	2.24	2.60

Subcooling correction factor 'fsub'

Subcooling [°F]	2	7	10	15	20	25	30	35	40	45	50
Collection Factor	0.91	1.00	1.06	1.15	1.24	1.33	1.41	1.50	1.59	1.68	1.77

Distributer correction factor 'fp' *

Evaporating temp.		-40	-30	-20	-10	0	10	20	30	40	50	60	70
Pressure drop [psi]	0	1	1	1	1	1	1	1	1	1	1	1	1
	15	0.96	0.96	0.96	0.96	0.96	0.95	0.95	0.95	0.94	0.93	0.92	0.90
	25	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.91	0.90	0.88	0.86	0.82
	30	0.92	0.92	0.92	0.91	0.91	0.90	0.90	0.89	0.88	0.86	0.83	0.78

*calculated at 90°F condensing temperature

Capacity (continued)

Capacity in kW, range N, -40 °C to 10 °C, opening superheat sh= 4 K

SI Units R22

Valve	Orifice no.	Cond. temp. [°C]	Evaporating [°C]											
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
TD1/TDE1	0	25	0.37	0.42	0.46	0.49	0.51	0.53	0.54	0.55	0.56	0.56	0.54	0.51
	1		0.74	0.83	0.91	0.97	1.02	1.05	1.08	1.10	1.11	1.11	1.08	1.02
	2		0.94	1.03	1.16	1.33	1.51	1.71	1.89	2.05	2.17	2.23	2.19	2.00
	3		1.03	1.29	1.54	1.78	2.01	2.22	2.43	2.62	2.78	2.90	2.94	2.83
	4		1.54	1.92	2.28	2.63	2.97	3.29	3.59	3.88	4.13	4.32	4.42	4.33
	5		1.55	1.91	2.28	2.68	3.09	3.52	3.98	4.44	4.88	5.27	5.51	5.38
TD1/TDE1	0	35	0.36	0.41	0.46	0.49	0.52	0.54	0.56	0.58	0.60	0.61	0.63	0.64
	1		0.72	0.82	0.91	0.97	1.03	1.08	1.12	1.15	1.19	1.22	1.25	1.27
	2		0.92	1.02	1.16	1.33	1.53	1.74	1.95	2.15	2.32	2.45	2.51	2.48
	3		1.00	1.27	1.53	1.78	2.03	2.27	2.50	2.73	2.94	3.15	3.34	3.49
	4		1.49	1.88	2.27	2.64	3.01	3.37	3.72	4.07	4.41	4.73	5.03	5.28
	5		1.53	1.88	2.26	2.66	3.10	3.58	4.09	4.64	5.23	5.84	6.43	6.97
TD1/TDE1	0	45	0.35	0.40	0.44	0.48	0.51	0.53	0.56	0.58	0.60	0.63	0.65	0.68
	1		0.68	0.79	0.87	0.94	1.01	1.06	1.11	1.16	1.20	1.25	1.31	1.37
	2		0.85	0.95	1.09	1.28	1.48	1.71	1.93	2.15	2.34	2.50	2.62	2.67
	3		0.93	1.20	1.47	1.72	1.98	2.23	2.47	2.72	2.97	3.21	3.46	3.70
	4		1.35	1.76	2.16	2.55	2.93	3.32	3.70	4.08	4.46	4.85	5.24	5.62
	5		1.44	1.79	2.16	2.56	3.01	3.51	4.05	4.66	5.32	6.04	6.80	7.59
TD1/TDE1	0	55	0.32	0.37	0.41	0.45	0.48	0.51	0.53	0.56	0.59	0.62	0.65	0.69
	1		0.62	0.72	0.81	0.89	0.95	1.01	1.06	1.12	1.17	1.23	1.30	1.38
	2		0.72	0.82	0.97	1.16	1.37	1.60	1.83	2.06	2.27	2.45	2.59	2.67
	3		0.82	1.09	1.35	1.61	1.87	2.12	2.37	2.63	2.89	3.15	3.42	3.70
	4		1.13	1.55	1.95	2.35	2.75	3.14	3.54	3.94	4.35	4.77	5.20	5.64
	5		1.30	1.62	1.98	2.38	2.83	3.33	3.90	4.53	5.24	6.02	6.87	7.79

Subcooling correction factor 'fsub'

Subcooling [K]	2	4	10	15	20	25	30	35	40	45	50
Collection Factor	0.98	1.00	1.06	1.10	1.15	1.19	1.24	1.28	1.33	1.37	1.41

Distributer correction factor 'fp' *

Evaporating temp.		-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
Pressure drop [bar]	0	1	1	1	1	1	1	1	1	1	1	1	1
	1	0.96	0.95	0.95	0.95	0.95	0.95	0.94	0.94	0.93	0.92	0.91	0.89
	1.5	0.93	0.93	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.88	0.86	0.82
	2	0.91	0.91	0.90	0.90	0.90	0.89	0.88	0.87	0.86	0.84	0.81	0.76

*calculated at 32°C condensing temperature

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Capacity (continued)

Capacity in TR, range N, -40 °C to 50 °F, opening superheat sh= 7 °F

US Units R22

Valve	Orifice no.	Cond. temp. [°F]	Evaporating [°F]											
			-40	-30	-20	-10	0	10	20	30	40	50	60	70
TD1/TDE1	0	75	0.11	0.12	0.13	0.14	0.15	0.15	0.16	0.16	0.16	0.15	0.14	0.10
	1		0.21	0.24	0.26	0.28	0.29	0.30	0.31	0.31	0.31	0.30	0.27	0.22
	2		0.27	0.30	0.34	0.39	0.45	0.51	0.56	0.61	0.62	0.61	0.53	0.39
	3		0.29	0.37	0.45	0.53	0.60	0.66	0.72	0.77	0.81	0.81	0.76	0.48
	4		0.44	0.56	0.67	0.78	0.88	0.98	1.07	1.15	1.20	1.23	1.17	0.93
	5		0.44	0.55	0.67	0.80	0.93	1.07	1.21	1.34	1.46	1.52	1.42	0.68
TD1/TDE1	0	95	0.10	0.12	0.13	0.14	0.15	0.16	0.16	0.17	0.17	0.18	0.18	0.18
	1		0.21	0.24	0.26	0.28	0.30	0.31	0.32	0.34	0.35	0.35	0.36	0.36
	2		0.26	0.29	0.34	0.40	0.46	0.53	0.59	0.65	0.69	0.71	0.70	0.65
	3		0.28	0.37	0.45	0.53	0.61	0.68	0.75	0.82	0.89	0.95	0.99	1.01
	4		0.42	0.55	0.67	0.79	0.90	1.01	1.12	1.23	1.33	1.43	1.51	1.55
	5		0.43	0.55	0.67	0.80	0.94	1.10	1.27	1.45	1.64	1.83	2.00	2.10
TD1/TDE1	0	115	0.10	0.11	0.13	0.14	0.15	0.15	0.16	0.17	0.18	0.19	0.20	0.21
	1		0.19	0.23	0.25	0.27	0.29	0.31	0.32	0.34	0.35	0.37	0.39	0.41
	2		0.24	0.27	0.32	0.38	0.45	0.52	0.59	0.65	0.71	0.74	0.76	0.75
	3		0.26	0.35	0.43	0.51	0.59	0.67	0.75	0.83	0.90	0.98	1.06	1.13
	4		0.38	0.51	0.63	0.76	0.88	1.00	1.12	1.24	1.37	1.49	1.61	1.73
	5		0.41	0.51	0.63	0.76	0.91	1.08	1.26	1.47	1.69	1.94	2.19	2.45
TD1/TDE1	0	135	0.09	0.10	0.12	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.20	0.21
	1		0.17	0.20	0.23	0.25	0.27	0.29	0.31	0.33	0.35	0.37	0.39	0.42
	2		0.20	0.23	0.28	0.34	0.41	0.48	0.55	0.62	0.68	0.73	0.76	0.76
	3		0.22	0.31	0.39	0.47	0.55	0.63	0.71	0.80	0.88	0.97	1.05	1.15
	4		0.30	0.44	0.56	0.69	0.82	0.94	1.07	1.20	1.33	1.47	1.61	1.76
	5		0.36	0.46	0.57	0.70	0.85	1.02	1.21	1.43	1.67	1.95	2.25	2.57

Subcooling correction factor 'fsub'

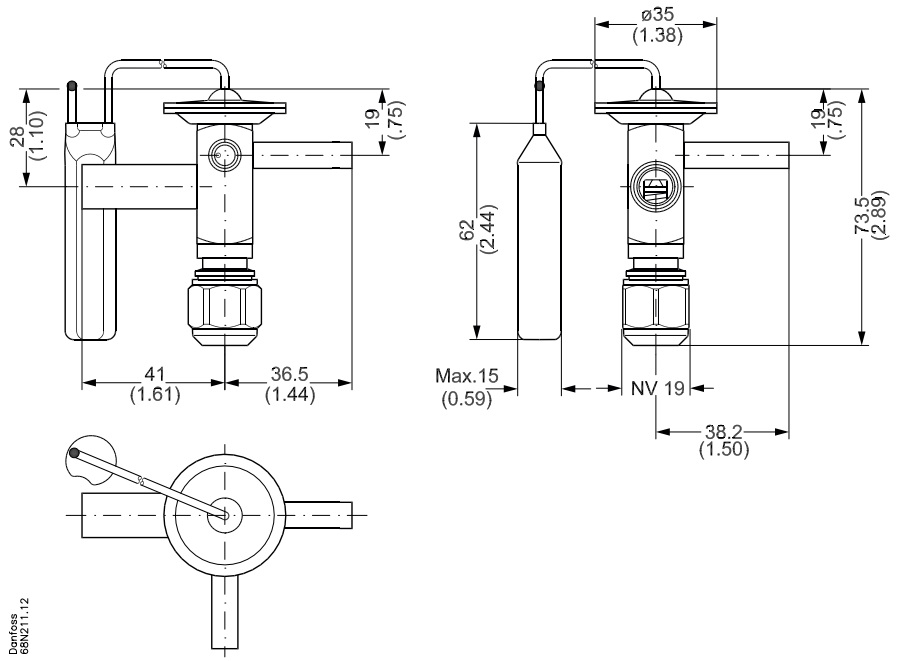
Subcooling [°F]	2	7	10	15	20	25	30	35	40	45	50
Collection Factor	0.92	1.00	1.05	1.12	1.19	1.27	1.34	1.41	1.49	1.56	1.63

Distributer correction factor 'fp' *

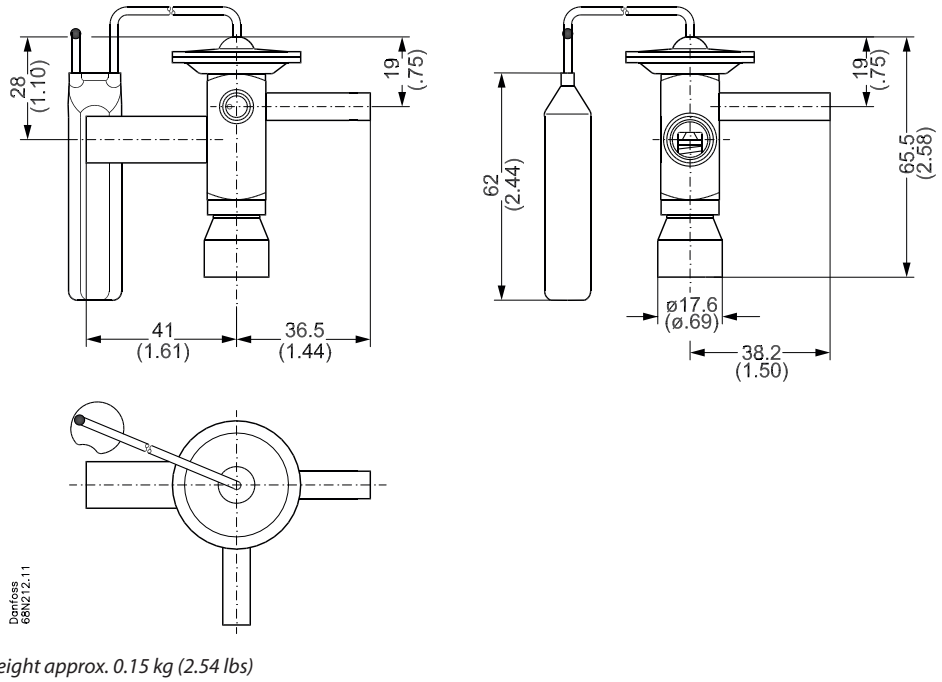
Evaporating temp.		-40	-30	-20	-10	0	10	20	30	40	50	60	70
Pressure drop [psi]	0	1	1	1	1	1	1	1	1	1	1	1	1
	15	0.95	0.95	0.95	0.95	0.95	0.94	0.94	0.93	0.92	0.91	0.88	0.82
	25	0.92	0.92	0.92	0.91	0.91	0.90	0.89	0.88	0.87	0.84	0.79	0.68
	30	0.91	0.90	0.90	0.90	0.89	0.88	0.87	0.86	0.84	0.80	0.74	0.60

*calculated at 90°F condensing temperature

Dimensions and weight
Units: mm (in.)



Weight approx. 0.15 kg (2.54 lbs)



Weight approx. 0.15 kg (2.54 lbs)

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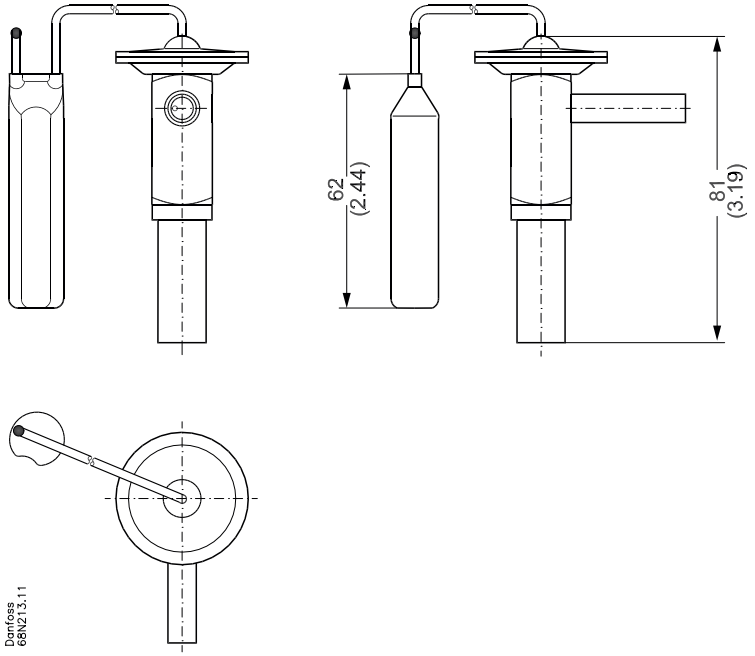
Dimensions and weight
Units: mm (in.)



Weight approx. 0.15 kg (2.54 lbs)

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