MAKING MODERN LIVING POSSIBLE

Thermostatic Expansion valves,
type TUA/TUAE

REFRIGERATION &
AIR CONDITIONING DIVISION

Technical leaflet

Contents

Introduction

TUA/TUAE valves are made of stainless steel and are therefore very suitable for refrigeration systems in the food industry.

TUA/TUAE valves are available with interchangeable orifice assembly in straightway versions.

TUA/TUAE has been specially developed for soldering into hermetic refrigeration systems.

TUA/TUAE valves can be used in many different forms of refrigeration systems, for example:

- Traditional refrigeration systems
- Heat pump systems
- Air conditioning units
- Refrigeration appliances
- Liquid coolers
- Ice cube machines
- Mobile refrigeration systems

Features

- Interchangeable orifice assembly designed for:
  - Easy mounting
  - Optimized tightness
- Bimetal connections
  - Simple, fast soldering without the need for wet cloth or refrigeration pliers.
- Refrigerants
  R22, R134a, R404A, R407C, R507, R410A and future refrigerants
- Capacities from 0.6 to 16 kW (0.17 to 4.5 TR) for R22
  - Large capacity range in small steps
- Stable regulation
- Biflow function (orifice 1 to 8)
- Compact design
  - small dimensions and low weight
- Stainless steel, solder version
  - high connection strength and tightness
  - capillary tube joints of high strength and vibration resistance
- Laser-welded, stainless steel thermostatic diaphragm element
  - optimum function
  - long diaphragm life
  - high pressure resistance
- Stainless steel bulb
  - simple and fast installation
  - good heat transfer from pipe to bulb
- Adjustable superheat
  - accurate setting
  - adjustable in operation
- Available with MOP (Max. Operating Pressure)
- Wide range of valves
- Interchangeable filter for easy cleaning
- Bleed orifices available on special request

Standard range

The standard range can be supplied in the following versions:

Range N	–40 to +10°C, without MOP
Range N	–40 to +10°C, MOP +15°C
Range NM	–40 to – 5°C, MOP 0°C
Range B	–60 to –25°C, without MOP
Range B	–60 to –25°C, MOP –20°C

Valves for special temperature ranges can be supplied.

Static superheat (SS) (R22, R134a, R404A, R407C and R410A):

Valves without MOP	5 K
Valves with MOP	4 K

Static superheat (SS) (R507):

Valves without MOP	6.4 K
Valves with MOP	5.4 K

Capillary tube length *1.5 m*

Connections:

Inlet	$^1/_4$ in./6 mm
	$^3/_8$ in./10 mm
Outlet	$^1/_2$ in./12 m

Technical data

Max. bulb temperature	100°C
Max. valve body temp.	120°C,
short-lived peak	150°C
Permissible working pressure (excl. R410A)	PS = 34 bar
Max. test pressure (excl. R410A)	p' = 37.5 bar
Max. working pressure, R410A	PS = 42.5 bar
Max. test pressure, R410A	p' = 47 bar

Biflow drift
With flow in the opposite direction, the rated capacity is reduced by up to 15%.
TUAE with orifice 0 and 9, all TUA and valves with MOP charges cannot be used for biflow operation.

MOP valves

When MOP valves are used, to avoid charge migration the bulb temperature must always be lower than the thermostatic element temperature.

MOP-points

Refrigerant	Range N −40 → +10°C	Range NM −40 → −5°C	Range B −60 → −25°C
	MOP point for evaporating temperature t_e and evaporating pressure p_e[1]		
	t_e = +15°C/+60°F	t_e = 0°C/+32°F	t_e = −20°C/−4°F
R22	p_e = 100 psig/6.9 bar	p_e = 60 psig/4.0 bar	p_e = 20 psig/1.5 bar
R134a	p_e = 55 psig/3.9 bar	p_e = 30 psig/1.9 bar	
R404A/R507	p_e = 120 psig/8.4 bar	p_e = 75 psig/5.0 bar	p_e = 30 psig/2.0 bar
R407C	p_e = 95 psig/6.6 bar	p_e = 50 psig/3.6bar	p_e = 20 psig/1.4 bar
R410A	p_e = 165 psig/11.5 bar	p_e = 100 psig/7.0 bar	p_e = 45 psig/3.0 bar

[1] p_e in bar gauge

Identification

Main valve data is given on the element (fig. 1), on the valve body (fig. 2) and on the bottom of the orifice assembly (fig. 3).

Example valve body

TUAE	= Type (E = external pressure equalisation)
068U2214	= Code number
R134a	= Refrigerant
MOP 55 / +15°C	= MOP-point in psig / °C
−40 / +10°C	= Evaporating temperature range in °C
−40 / +50°F	= Evaporating temperature range in °F
PS 34 bar/ MWP 500 psig	= Max. working pressure in bar/psig
1004B	= Date marking (week **10**, year 20**04**, weekday **B** = Tuesday)
⇒	= Normal flow direction
in.	= Connection in inches (mm = millimetres)

Example orifice assembly

TU	= Valve type
5	= Orifice number
068U1035	= Code no., orifice assembly incl. filter and gasket
104	= Date marking (Week **10**, Year 200**4**)

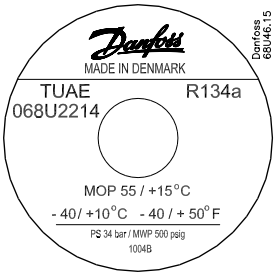


Fig. 1 Power element

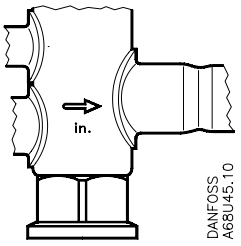


Fig. 2 Valve body

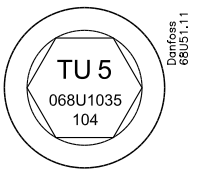


Fig. 3 Orifice assembly

Ordering, components with solder x solder connections

Thermostatic element, without orifice and filter, with bulb strap

R22, R134a, R404A, R407C, R507, R410A

Refrigerant	Valve type	Pressure equalization[1)]	Capillary tube	Connections		Code no.				
				Inlet x outlet		Range N −40 → +10°C		Range NM −40 → −5°C	Range B −60→ −25°C	
			m	in.	mm	Without MOP	MOP +15 °C	MOP 0 °C	Without MOP	MOP −20°C
R22	TUA	Int.	1.5	1/4 x 1/2		**068U2234**	**068U2242**			
	TUA	Int.	1.5		6 x 12	**068U2230**	**068U2238**			
	TUA	Int.	1.5	3/8 x 1/2		**068U2235**	**068U2243**			
	TUA	Int.	1.5		10 x 12	**068U2231**	**068U2239**			
	TUAE	Ext. 1/4 in.	1.5	1/4 x 1/2		**068U2236**	**068U2244**			
	TUAE	Ext. 6 mm	1.5		6 x 12	**068U2232**	**068U2240**			
	TUAE	Ext. 1/4 in.	1.5	3/8 x 1/2		**068U2237**	**068U2245**			
	TUAE	Ext. 6 mm	1.5		10 x 12	**068U2233**	**068U2241**			
R134a	TUA	Int.	1.5	1/4 x 1/2		**068U2204**	**068U2212**			
	TUA	Int.	1.5		6 x 12	**068U2200**	**068U2208**			
	TUA	Int.	1.5	3/8 x 1/2		**068U2205**	**068U2213**			
	TUA	Int.	1.5		10 x 12	**068U2201**	**068U2209**			
	TUAE	Ext. 1/4 in.	1.5	1/4 x 1/2		**068U2206**	**068U2214**			
	TUAE	Ext. 6 mm	1.5		6 x 12	**068U2202**	**068U2210**			
	TUAE	Ext. 1/4 in.	1.5	3/8 x 1/2		**068U2207**	**068U2215**			
	TUAE	Ext. 6 mm	1.5		10 x12	**068U2203**	**068U2211**			
R404A R507	TUA	Int.	1.5	1/4 x 1/2		**068U2284**	**068U2292**	**068U2300**	**068U2308**	**068U2316**
	TUA	Int.	1.5		6 x 12	**068U2280**	**068U2288**	**068U2296**	**068U2304**	**068U2312**
	TUA	Int.	1.5	3/8 x 1/2		**068U2285**	**068U2293**	**068U2301**	**068U2309**	**068U2317**
	TUA	Int.	1.5		10 x 12	**068U2281**	**068U2289**	**068U2297**	**068U2305**	**068U2313**
	TUAE	Ext. 1/4 in.	1.5	1/4 x 1/2		**068U2286**	**068U2294**	**068U2302**	**068U2310**	**068U2318**
	TUAE	Ext. 6 mm	1.5		6 x 12	**068U2282**	**068U2290**	**068U2298**	**068U2306**	**068U2314**
	TUAE	Ext. 1/4 in.	1.5	3/8 x 1/2		**068U2287**	**068U2295**	**068U2303**	**068U2311**	**068U2319**
	TUAE	Ext. 6 mm	1.5		10 x 12	**068U2283**	**068U2291**	**068U2299**	**068U2307**	**068U2315**
R407C	TUA	Int.	1.5	1/4 x 1/2		**068U2324**	**068U2332**			
	TUA	Int.	1.5		6 x 12	**068U2320**	**068U2328**			
	TUA	Int.	1.5	3/8 x 1/2		**068U2325**	**068U2333**			
	TUA	Int.	1.5		10 x 12	**068U2321**	**068U2329**			
	TUAE	Ext. 1/4 in.	1.5	1/4 x 1/2		**068U2326**	**068U2334**			
	TUAE	Ext. 6 mm	1.5		6 x 12	**068U2322**	**068U2330**			
	TUAE	Ext. 1/4 in.	1.5	3/8 x 1/2		**068U2327**	**068U2335**			
	TUAE	Ext. 6 mm	1.5		10 x 12	**068U2323**	**068U2331**			
R410A	TUA	Int.	1.5	3/8 x 1/2		**068U2414**				
	TUAE	Ext. 1/4 in.	1.5	3/8 x 1/2		**068U1714**				
	TUAE	Ext. 6 mm	1.5		10 x 12	**068U2780**				

Ordering (continued) *Orifice assembly with filter and gasket. Range N: –40 → +10°C*

Orifice no.	Rated capacity in kW[1]						Rated capacity in tons (TR)[1]						Code no.
	R22	R134a	R404A	R407C	R507	R410A	R22	R134a	R404A	R407C	R507	R410A	
0	0.60	0.47	0.47	0.63	0.45	-	0.17	0.13	0.13	0.18	0.13	-	**068U1030**
1	0.9	0.7	0.70	0.92	0.66	1.3	0.25	0.19	0.19	0.26	0.19	0.4	**068U1031**
2	1.3	1.0	1.0	1.4	1.0	2.1	0.36	0.28	0.28	0.38	0.27	0.6	**068U1032**
3	1.8	1.4	1.4	1.9	1.3	2.9	0.50	0.39	0.39	0.53	0.38	0.8	**068U1033**
4	2.6	2.1	2.1	2.8	2.0	4.5	0.75	0.59	0.60	0.80	0.57	1.3	**068U1034**
5	3.5	2.7	2.8	3.8	2.7	5.9	1.00	0.78	0.79	1.1	0.76	1.7	**068U1035**
6	5.3	4.1	4.2	5.7	4.0	9.0	1.5	1.2	1.2	1.6	1.1	2.5	**068U1036**
7	7.0	5.5	5.6	7.5	5.3	12.0	2.0	1.6	1.6	2.1	1.5	3.4	**068U1037**
8	11.0	8.2	8.4	11.0	8.0	18.0	3.0	2.3	2.4	3.2	2.3	5.0	**068U1038**
9	16.0	12.0	12.0	17.0	12.0	26.0	4.5	3.5	3.5	4.8	3.4	7.5	**068U1039**

Range B: –60 → –25°C

Orifice no.	Rated capacity in kW[1]				Rated capacity in tons (TR)[1]				Code no.
	R22	R404A	R407C	R507	R22	R404A	R407C	R507	
0	0.52	0.36	0.46	0.39	0.15	0.10	0.13	0.11	**068U1030**
1	0.68	0.50	0.58	0.53	0.19	0.14	0.16	0.15	**068U1031**
2	0.85	0.64	0.70	0.70	0.24	0.18	0.20	0.20	**068U1032**
3	1.2	0.89	1.0	1.0	0.34	0.25	0.28	0.28	**068U1033**
4	1.8	1.3	1.4	1.4	0.50	0.37	0.41	0.41	**068U1034**
5	2.3	1.8	1.9	1.9	0.66	0.50	0.55	0.55	**068U1035**
6	3.5	2.7	2.9	2.9	1.0	0.75	0.82	0.82	**068U1036**
7	4.7	3.5	3.9	3.9	1.3	1.0	1.1	1.1	**068U1037**
8	7.1	5.3	5.8	5.8	2.0	1.5	1.6	1.7	**068U1038**
9	10.4	7.8	8.5	8.6	2.9	2.2	2.4	2.4	**068U1039**

[1] Rated capacity $Q_{nom.}$ is based on:
Evaporating temperature
t_e = +5°C for range N and – 30°C for range B
Condensing temperature
t_c = +32°C
Refrigerant liquid temperature
t_l = +28°C
Opening superheat OS = 4 K

Spare parts
Gasket (24 pcs.): 068U0015
Note: to ensure tightness the orifice gasket *must* be exchanged each time the orifice assembly is unscrewed.
Filter (24 pcs.): 068U0016

Capacity

Capacity in kW for range N = –40 → +10°C and opening superheat OS = 4 K

R22

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature +10°C								**Evaporating temperature 0°C**							
TU	0	0.42	0.53	0.60	0.65	0.68	0.70	0.71	0.72	0.40	0.50	0.56	0.60	0.63	0.65	0.67	0.67
	1	0.61	0.79	0.89	1.0	1.0	1.0	1.1	1.1	0.55	0.71	0.80	0.86	0.91	0.93	0.95	0.96
	2	0.9	1.2	1.3	1.5	1.6	1.6	1.7	1.7	0.73	1.0	1.1	1.2	1.3	1.3	1.4	1.4
	3	1.2	1.6	1.8	2.0	2.1	2.2	2.3	2.3	1.0	1.3	1.5	1.7	1.8	1.8	1.9	1.9
	4	1.8	2.4	2.8	3.1	3.2	3.4	3.5	3.5	1.5	2.0	2.3	2.5	2.7	2.8	2.8	2.8
	5	2.4	3.2	3.7	4.1	4.3	4.5	4.6	4.7	2.0	2.7	3.1	3.4	3.5	3.7	3.8	3.8
	6	3.7	4.9	5.6	6.1	6.5	6.7	6.9	7.1	3.1	4.0	4.6	5.0	5.3	5.5	5.7	5.8
	7	4.9	6.5	7.5	8.2	8.6	9.0	9.2	9.4	4.1	5.4	6.2	6.7	7.1	7.4	7.6	7.7
	8	7.3	9.6	11.2	12.2	12.9	13.4	13.7	13.9	6.1	8.0	9.2	10.1	10.6	11.0	11.3	11.5
	9	10.9	14.5	16.7	18.2	19.3	20.0	20.5	20.9	9.1	12.1	13.8	15.0	15.9	16.4	16.8	17.1
		Evaporating temperature –10°C								**Evaporating temperature –20°C**							
TU	0	0.36	0.46	0.51	0.55	0.57	0.59	0.60	0.61		0.40	0.45	0.48	0.50	0.52	0.53	0.53
	1	0.47	0.62	0.70	0.75	0.79	0.81	0.82	0.83		0.51	0.57	0.62	0.65	0.67	0.68	0.69
	2	0.60	0.78	0.89	1.0	1.0	1.1	1.1	1.1		0.61	0.70	0.76	0.79	0.82	0.84	0.85
	3	0.8	1.1	1.3	1.4	1.4	1.5	1.5	1.5		0.9	1.0	1.1	1.1	1.2	1.2	1.2
	4	1.2	1.6	1.9	2.0	2.1	2.2	2.2	2.3		1.3	1.5	1.6	1.6	1.7	1.7	1.8
	5	1.7	2.2	2.5	2.7	2.8	2.9	3.0	3.0		1.7	1.9	2.1	2.2	2.3	2.3	2.3
	6	2.5	3.2	3.7	4.0	4.3	4.4	4.5	4.6		2.5	2.9	3.1	3.3	3.4	3.5	3.5
	7	3.3	4.3	5.0	5.4	5.7	5.9	6.0	6.1		3.4	3.9	4.2	4.4	4.5	4.6	4.7
	8	5.0	6.5	7.5	8.1	8.5	8.8	9.0	9.1		5.1	5.8	6.3	6.6	6.8	7.0	7.1
	9	7.4	9.7	11.1	12.0	12.6	13.1	13.3	13.5		7.6	8.6	9.3	9.7	10.1	10.3	10.4
		Evaporating temperature –30°C								**Evaporating temperature –40°C**							
TU	0		0.34	0.38	0.40	0.42	0.44	0.44	0.45			0.31	0.33	0.34	0.35	0.36	0.36
	1		0.39	0.45	0.48	0.51	0.52	0.53	0.54			0.33	0.36	0.38	0.39	0.39	0.40
	2		0.47	0.53	0.57	0.60	0.62	0.63	0.63			0.39	0.42	0.44	0.45	0.46	0.46
	3		0.66	0.74	0.80	0.84	0.87	0.88	0.89			0.55	0.59	0.61	0.63	0.64	0.65
	4		1.0	1.1	1.2	1.2	1.3	1.3	1.3			0.80	0.86	0.90	0.92	0.94	0.95
	5		1.3	1.5	1.6	1.7	1.7	1.7	1.8			1.1	1.2	1.2	1.2	1.3	1.3
	6		1.9	2.2	2.4	2.5	2.5	2.6	2.6			1.6	1.7	1.8	1.8	1.9	1.9
	7		2.6	2.9	3.2	3.3	3.4	3.5	3.5			2.1	2.3	2.4	2.5	2.5	2.5
	8		3.9	4.4	4.8	5.0	5.1	5.2	5.3			3.2	3.5	3.6	3.7	3.8	3.8
	9		5.7	6.5	7.0	7.3	7.5	7.7	7.7			4.7	5.1	5.3	5.5	5.5	5.6

Correction for subcooling Δt_{sub}
The evaporator capacity used must be corrected if subcooling deviates from 4 K.
The corrected capacity can be obtained by dividing the evaporator capacity by the correction factor given below.

Note:
Insufficient subcooling can produce flash gas.

Correction factor for subcooling Δt_{sub}

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.06	1.11	1.15	1.2	1.25	1.3	1.35	1.39	1.44

Selection example

Refrigerant = R22
Evaporating temperature t_e = –10°C
Pressure drop in valve Δp = 10 bar
Subcooling Δt_{sub} = 15 K
Evaporator capacity = 3 kW
Correction value (table) = 1.11
The corrected evaporator capacity thus becomes 3 divided by 1.11 = 2.7 kW

Since the expansion valve capacity must be equal to or slightly more than the corrected evaporator capacity of 2.7 kW, a TUB/TUBE with orifice 5 and a table capacity of 2.8 kW would be a suitable choice.

Capacity (continued)

Capacity in kW for range B = –60 → –25°C and opening superheat OS = 4 K

R22

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature –25°C								**Evaporating temperature –30°C**							
TU	0	0.36	0.45	0.50	0.54	0.56	0.58	0.59	0.59	0.33	0.42	0.46	0.49	0.52	0.53	0.54	0.54
	1	0.48	0.62	0.69	0.74	0.77	0.79	0.81	0.81	0.42	0.54	0.61	0.66	0.68	0.70	0.71	0.72
	2	0.61	0.79	0.89	0.96	1.01	1.04	1.06	1.07	0.52	0.67	0.75	0.81	0.85	0.88	0.89	0.90
	3	0.85	1.10	1.25	1.34	1.41	1.45	1.48	1.50	0.73	0.93	1.1	1.1	1.2	1.2	1.3	1.3
	4	1.3	1.6	1.9	2.0	2.1	2.1	2.2	2.2	1.1	1.4	1.6	1.7	1.8	1.8	1.8	1.9
	5	1.7	2.2	2.5	2.7	2.8	2.9	2.9	3.0	1.4	1.9	2.1	2.2	2.4	2.4	2.5	2.5
	6	2.5	3.3	3.7	4.0	4.2	4.3	4.4	4.5	2.1	2.8	3.1	3.4	3.5	3.6	3.7	3.7
	7	3.4	4.4	5.0	5.4	5.6	5.8	5.9	6.0	2.9	3.7	4.2	4.5	4.7	4.9	4.9	5.0
	8	5.1	6.6	7.5	8.0	8.4	8.7	8.9	8.9	4.3	5.6	6.3	6.8	7.1	7.3	7.4	7.5
	9	7.6	9.7	11.0	11.9	12.4	12.8	13.1	13.2	6.4	8.2	9.3	10.0	10.4	10.7	10.9	11.0
		Evaporating temperature –40°C								**Evaporating temperature –50°C**							
TU	0	0.27	0.34	0.37	0.40	0.42	0.43	0.43	0.44	0.20	0.25	0.28	0.30	0.31	0.32	0.33	0.33
	1	0.31	0.39	0.44	0.47	0.50	0.51	0.52	0.52	0.21	0.27	0.30	0.32	0.34	0.35	0.35	0.35
	2	0.36	0.46	0.52	0.56	0.59	0.60	0.61	0.62	0.25	0.31	0.35	0.38	0.39	0.40	0.41	0.41
	3	0.51	0.65	0.73	0.79	0.82	0.85	0.86	0.87	0.35	0.44	0.50	0.53	0.55	0.57	0.58	0.58
	4	0.75	0.96	1.1	1.2	1.2	1.2	1.3	1.3	0.51	0.65	0.72	0.77	0.81	0.83	0.84	0.85
	5	1.0	1.3	1.4	1.6	1.6	1.7	1.7	1.7	0.68	0.87	0.97	1.0	1.1	1.1	1.1	1.1
	6	1.5	1.9	2.2	2.3	2.4	2.5	2.5	2.6	1.0	1.3	1.4	1.5	1.6	1.7	1.7	1.7
	7	2.0	2.6	2.9	3.1	3.2	3.3	3.4	3.4	1.4	1.7	1.9	2.1	2.2	2.2	2.3	2.3
	8	3.0	3.9	4.4	4.7	4.9	5.0	5.1	5.2	2.1	2.6	2.9	3.1	3.3	3.4	3.4	3.4
	9	4.5	5.7	6.4	6.8	7.1	7.3	7.5	7.5	3.0	3.8	4.3	4.6	4.8	4.9	5.0	5.0
		Evaporating temperature –60°C															
TU	0	0.14	0.17	0.19	0.21	0.21	0.22	0.22	0.22								
	1	0.14	0.18	0.20	0.22	0.22	0.23	0.23	0.23								
	2	0.16	0.21	0.23	0.25	0.26	0.26	0.27	0.27								
	3	0.23	0.29	0.33	0.35	0.36	0.37	0.38	0.38								
	4	0.34	0.43	0.48	0.51	0.53	0.54	0.55	0.55								
	5	0.45	0.57	0.64	0.68	0.71	0.73	0.74	0.74								
	6	0.67	0.85	0.95	1.01	1.05	1.08	1.09	1.10								
	7	0.91	1.1	1.3	1.4	1.4	1.5	1.5	1.5								
	8	1.4	1.7	1.9	2.1	2.1	2.2	2.2	2.2								
	9	2.0	2.5	2.8	3.0	3.1	3.2	3.2	3.2								

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 4 K.
The corrected capacity can be obtained by dividing the evaporator capacity by the correction factor given below.

Note:
Insufficient subcooling can produce flash gas.

Correction factor for subcooling Δt_{sub}

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.06	1.11	1.15	1.2	1.25	1.3	1.35	1.39	1.44

Capacity (continued)

Capacity in kW for range N = –40 → +10°C and opening superheat OS = 4 K

R134a

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature +10°C								**Evaporating temperature 0°C**							
TU	0	0.38	0.46	0.50	0.53	0.54	0.54			0.35	0.42	0.46	0.48	0.49	0.49		
	1	0.57	0.69	0.76	0.79	0.81	0.81			0.50	0.61	0.66	0.69	0.70	0.71		
	2	0.82	1.1	1.2	1.2	1.3	1.3			0.66	0.84	0.93	0.98	1.0	1.0		
	3	1.1	1.4	1.6	1.7	1.8	1.8			0.92	1.2	1.3	1.4	1.4	1.4		
	4	1.7	2.2	2.5	2.6	2.7	2.7			1.4	1.8	1.9	2.0	2.1	2.1		
	5	2.3	2.9	3.3	3.5	3.6	3.6			1.8	2.3	2.6	2.7	2.8	2.8		
	6	3.4	4.4	4.9	5.2	5.4	5.5			2.8	3.5	3.9	4.1	4.2	4.3		
	7	4.6	5.9	6.6	7.0	7.2	7.2			3.7	4.7	5.2	5.5	5.6	5.7		
	8	6.8	8.7	9.8	10.3	10.6	10.8			5.5	7.0	7.8	8.2	8.4	8.5		
	9	10.2	13.1	14.6	15.5	15.9	16.0			8.3	10.4	11.5	12.2	12.4	12.5		
		Evaporating temperature –10°C								**Evaporating temperature –20°C**							
TU	0	0.31	0.37	0.40	0.42	0.43	0.43				0.31	0.34	0.35	0.35	0.35		
	1	0.41	0.51	0.55	0.58	0.58	0.58				0.39	0.43	0.44	0.45	0.45		
	2	0.51	0.64	0.70	0.74	0.75	0.76				0.47	0.51	0.53	0.54	0.54		
	3	0.71	0.89	0.98	1.0	1.1	1.1				0.65	0.72	0.75	0.76	0.76		
	4	1.1	1.3	1.5	1.5	1.6	1.6				0.96	1.05	1.10	1.12	1.1		
	5	1.4	1.8	2.0	2.1	2.1	2.1				1.3	1.4	1.5	1.5	1.5		
	6	2.1	2.7	2.9	3.1	3.1	3.2				1.9	2.1	2.2	2.2	2.2		
	7	2.8	3.5	3.9	4.1	4.2	4.2				2.6	2.8	3.0	3.0	3.0		
	8	4.3	5.3	5.9	6.2	6.3	6.3				3.9	4.3	4.4	4.5	4.5		
	9	6.3	7.9	8.7	9.1	9.3	9.3				5.7	6.2	6.5	6.6	6.6		
		Evaporating temperature –30°C								**Evaporating temperature –40°C**							
TU	0		0.25	0.27	0.28	0.28	0.28				0.18	0.19	0.20	0.20	0.20		
	1		0.28	0.30	0.32	0.32	0.32				0.19	0.21	0.21	0.21	0.21		
	2		0.32	0.35	0.37	0.37	0.37				0.22	0.24	0.25	0.25	0.25		
	3		0.46	0.50	0.52	0.53	0.52				0.31	0.34	0.35	0.35	0.35		
	4		0.67	0.73	0.76	0.77	0.76				0.45	0.49	0.50	0.51	0.51		
	5		0.90	0.98	1.02	1.03	1.0				0.61	0.66	0.68	0.68	0.68		
	6		1.3	1.5	1.5	1.5	1.5				0.90	0.97	1.0	1.0	1.0		
	7		1.8	2.0	2.0	2.1	2.1				1.2	1.3	1.4	1.4	1.4		
	8		2.7	3.0	3.1	3.1	3.1				1.8	2.0	2.1	2.1	2.1		
	9		4.0	4.3	4.5	4.5	4.5				2.7	2.9	3.0	3.0	3.0		

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 4 K.
The corrected capacity can be obtained by dividing the evaporator capacity by the correction factor given below.

Note:
Insufficient subcooling can produce flash gas.

Correction factor for subcooling Δt_{sub}

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.08	1.13	1.19	1.25	1.31	1.37	1.42	1.48	1.54

Capacity (continued)

Capacity in kW for range N = –40 → +10°C and opening superheat OS = 4 K

R404A/R507

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature +10°C								**Evaporating temperature 0°C**							
TU	0	0.32	0.40	0.44	0.46	0.46	0.46	0.45	0.44	0.31	0.39	0.42	0.44	0.44	0.44	0.43	0.42
	1	0.47	0.60	0.68	0.69	0.70	0.70	0.68	0.66	0.44	0.56	0.61	0.64	0.64	0.64	0.63	0.61
	2	0.70	0.91	1.0	1.1	1.1	1.1	1.1	1.1	0.60	0.77	0.87	0.92	0.94	0.94	0.93	0.90
	3	0.96	1.2	1.4	1.5	1.5	1.5	1.5	1.5	0.83	1.1	1.2	1.3	1.3	1.5	1.3	1.3
	4	1.5	1.9	2.1	2.3	2.3	2.3	2.3	2.2	1.3	1.6	1.8	1.9	2.0	2.0	1.9	1.9
	5	2.0	2.5	2.8	3.0	3.1	3.1	3.1	3.0	1.7	2.2	2.4	2.6	2.6	2.6	2.6	2.5
	6	2.9	3.8	4.3	4.5	4.7	4.7	4.6	4.5	2.5	3.2	3.6	3.8	3.9	3.9	3.9	3.8
	7	3.9	5.1	5.7	6.0	6.2	6.2	6.1	6.0	3.4	4.3	4.8	5.1	5.2	5.3	5.2	5.0
	8	5.8	7.5	8.4	9.0	9.2	9.2	9.1	8.9	5.0	6.5	7.2	7.6	7.8	7.8	7.7	7.5
	9	8.8	11.3	12.7	13.5	13.8	13.9	13.7	13.39	7.5	9.6	10.8	11.4	11.7	11.7	11.5	11.2
		Evaporating temperature –10°C								**Evaporating temperature –20°C**							
TU	0	0.29	0.36	0.39	0.40	0.41	0.41	0.40	0.39		0.32	0.35	0.36	0.36	0.36	0.35	0.34
	1	0.39	0.50	0.54	0.57	0.57	0.57	0.56	0.54		0.41	0.46	0.48	0.48	0.48	0.47	0.45
	2	0.50	0.64	0.71	0.75	0.76	0.76	0.75	0.73		0.51	0.56	0.59	0.60	0.60	0.59	0.57
	3	0.70	0.89	0.99	1.0	1.1	1.1	1.1	1.0		0.71	0.79	0.83	0.84	0.84	0.82	0.80
	4	1.0	1.3	1.5	1.6	1.6	1.6	1.6	1.5		1.1	1.2	1.2	1.2	1.2	1.2	1.2
	5	1.4	1.8	2.0	2.1	2.1	2.1	2.1	2.0		1.4	1.6	1.6	1.7	1.7	1.6	1.6
	6	2.1	2.7	3.0	3.1	3.2	3.2	3.1	3.1		2.1	2.3	2.4	2.5	2.5	2.4	2.4
	7	2.8	3.6	4.0	4.2	4.3	4.3	4.2	4.1		2.8	3.1	3.3	3.3	3.3	3.3	3.2
	8	4.2	5.3	5.9	6.3	6.4	6.4	6.3	6.1		4.3	4.7	4.9	5.0	5.0	4.9	4.8
	9	6.2	7.9	8.8	9.3	9.5	9.5	9.3	9.0		6.3	6.9	7.3	7.4	7.4	7.2	7.0
		Evaporating temperature –30°C								**Evaporating temperature –40°C**							
TU	0			0.3	0.31	0.31	0.31	0.3	0.29			0.24	0.25	0.25	0.25	0.24	0.23
	1			0.36	0.38	0.38	0.38	0.37	0.36			0.27	0.28	0.28	0.28	0.27	0.26
	2			0.43	0.45	0.45	0.45	0.44	0.43			0.32	0.33	0.33	0.33	0.32	0.31
	3			0.60	0.63	0.64	0.63	0.62	0.60			0.45	0.46	0.47	0.46	0.45	0.43
	4			0.89	0.93	0.94	0.93	0.91	0.88			0.65	0.68	0.68	0.67	0.66	0.63
	5			1.2	1.2	1.3	1.2	1.2	1.2			0.88	0.91	0.91	0.90	0.88	0.85
	6			1.8	1.9	1.9	1.9	1.8	1.8			1.3	1.4	1.4	1.3	1.3	1.3
	7			2.4	2.5	2.5	2.5	2.4	2.4			1.8	1.8	1.8	1.8	1.8	1.7
	8			3.6	3.7	3.8	3.8	3.7	3.6			2.6	2.7	2.8	2.7	2.7	2.6
	9			5.3	5.5	5.5	5.5	5.4	5.2			3.9	4.0	4.0	4.0	3.9	3.7

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 4 K.
The corrected capacity can be obtained by dividing the evaporator capacity by the correction factor given below.

Note:
Insufficient subcooling can produce flash gas.

Correction factor for subcooling Δt_{sub}

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.1	1.2	1.29	1.37	1.46	1.54	1.63	1.7	1.78

Capacity (continued)

Capacity in kW for range B = –60 → –25°C and opening superheat OS = 4 K

R404A/R507

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature –25°C								**Evaporating temperature –30°C**							
TU	0	0.30	0.36	0.39	0.40	0.40	0.40	0.39	0.38	0.28	0.33	0.36	0.37	0.37	0.37	0.36	0.35
	1	0.41	0.51	0.55	0.56	0.57	0.56	0.55	0.53	0.36	0.45	0.49	0.51	0.51	0.50	0.48	0.47
	2	0.53	0.66	0.73	0.76	0.77	0.77	0.75	0.73	0.45	0.57	0.62	0.65	0.65	0.65	0.64	0.61
	3	0.74	0.92	1.01	1.06	1.07	1.07	1.04	1.01	0.64	0.79	0.87	0.91	0.91	0.91	0.89	0.86
	4	1.1	1.4	1.5	1.6	1.6	1.6	1.6	1.5	1.0	1.2	1.3	1.3	1.4	1.3	1.3	1.3
	5	1.5	1.8	2.0	2.1	2.1	2.1	2.1	2.0	1.3	1.6	1.7	1.8	1.8	1.8	1.8	1.7
	6	2.2	2.8	3.0	3.2	3.2	3.2	3.1	3.0	1.9	2.4	2.6	2.7	2.7	2.7	2.6	2.6
	7	2.9	3.7	4.1	4.2	4.3	4.3	4.2	4.0	2.5	3.2	3.5	3.6	3.6	3.6	3.5	3.4
	8	4.4	5.5	6.1	6.3	6.4	6.4	6.3	6.1	3.8	4.7	5.2	5.4	5.5	5.4	5.3	5.1
	9	6.5	8.2	9.0	9.4	9.5	9.4	9.2	8.9	5.6	7.0	7.7	8.0	8.1	8.0	7.8	7.5
			Evaporating temperature –40°C								**Evaporating temperature –50°C**						
TU	0		0.28	0.30	0.30	0.31	0.30	0.29	0.28		0.22	0.23	0.24	0.24	0.23	0.22	0.21
	1		0.34	0.37	0.38	0.38	0.38	0.37	0.35		0.24	0.25	0.26	0.26	0.26	0.25	0.24
	2		0.40	0.44	0.45	0.46	0.45	0.44	0.42		0.27	0.30	0.31	0.31	0.30	0.29	0.28
	3		0.57	0.62	0.64	0.64	0.63	0.62	0.59		0.39	0.42	0.43	0.43	0.42	0.41	0.39
	4		0.83	0.91	0.94	0.94	0.93	0.91	0.87		0.57	0.61	0.63	0.63	0.62	0.60	0.57
	5		1.1	1.2	1.3	1.3	1.3	1.2	1.2		0.76	0.82	0.84	0.84	0.83	0.81	0.77
	6		1.7	1.8	1.9	1.9	1.9	1.8	1.8		1.1	1.2	1.3	1.3	1.2	1.2	1.2
	7		2.2	2.4	2.5	2.5	2.5	2.4	2.4		1.5	1.6	1.7	1.7	1.7	1.6	1.5
	8		3.4	3.7	3.8	3.8	3.8	3.7	3.5		2.3	2.5	2.6	2.6	2.5	2.4	2.3
	9		4.9	5.4	5.6	5.6	5.5	5.4	5.2		3.3	3.6	3.7	3.7	3.7	3.5	3.4
				Evaporating temperature –60°C													
TU	0			0.16	0.16	0.16	0.16	0.15	0.15								
	1			0.17	0.17	0.17	0.17	0.16	0.15								
	2			0.19	0.20	0.20	0.19	0.19	0.18								
	3			0.27	0.28	0.28	0.27	0.26	0.25								
	4			0.40	0.41	0.41	0.40	0.38	0.36								
	5			0.53	0.55	0.55	0.53	0.51	0.49								
	6			0.79	0.81	0.81	0.79	0.76	0.73								
	7			1.1	1.1	1.1	1.1	1.0	1.0								
	8			1.6	1.7	1.7	1.6	1.6	1.5								
	9			2.3	2.4	2.4	2.3	2.3	2.1								

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 4 K.
The corrected capacity can be obtained by dividing the evaporator capacity by the correction factor given below.

Note:
Insufficient subcooling can produce flash gas.

Correction factor for subcooling Δt_{sub}

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.1	1.2	1.29	1.37	1.46	1.54	1.63	1.7	1.78

Capacity (continued)

Capacity in kW for range N = –40 → +10°C and opening superheat OS = 4 K

R407C

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature +10°C								**Evaporating temperature 0°C**							
TU	0	0.43	0.54	0.60	0.64	0.67	0.68	0.68	0.68	0.41	0.51	0.56	0.60	0.62	0.63	0.63	0.63
	1	0.63	0.81	0.90	0.96	0.99	1.01	1.02	1.01	0.56	0.73	0.81	0.86	0.89	0.90	0.91	0.90
	2	0.90	1.2	1.4	1.5	1.5	1.6	1.6	1.6	0.8	1.0	1.1	1.2	1.2	1.3	1.3	1.3
	3	1.2	1.6	1.9	2.0	2.1	2.2	2.2	2.2	1.0	1.4	1.5	1.7	1.7	1.8	1.8	1.8
	4	1.9	2.5	2.8	3.1	3.2	3.3	3.3	3.3	1.6	2.1	2.3	2.5	2.6	2.7	2.7	2.7
	5	2.5	3.3	3.8	4.1	4.2	4.4	4.4	4.4	2.1	2.7	3.1	3.3	3.5	3.5	3.6	3.6
	6	3.8	5.0	5.7	6.1	6.4	6.6	6.7	6.7	3.1	4.1	4.6	5.0	5.2	5.3	5.4	5.4
	7	5.0	6.6	7.6	8.2	8.6	8.8	8.9	8.9	4.2	5.4	6.2	6.7	6.9	7.1	7.2	7.2
	8	7.5	9.9	11.2	12.2	12.7	13.0	13.2	13.2	6.3	8.2	9.3	9.9	10.4	10.6	10.7	10.7
	9	11.3	14.8	16.9	18.2	19.0	19.5	19.7	19.7	9.3	12.2	13.8	14.8	15.4	15.8	15.9	15.9
		Evaporating temperature –10°C								**Evaporating temperature –20°C**							
TU	0	0.37	0.46	0.51	0.54	0.55	0.56	0.57	0.56	0.33	0.40	0.44	0.47	0.48	0.49	0.49	0.49
	1	0.48	0.62	0.70	0.74	0.76	0.77	0.77	0.77	0.39	0.50	0.56	0.60	0.62	0.63	0.63	0.63
	2	0.60	0.78	0.88	0.94	0.98	1.00	1.01	1.01	0.47	0.60	0.68	0.72	0.75	0.76	0.77	0.76
	3	0.84	1.1	1.2	1.3	1.4	1.4	1.4	1.4	0.66	0.84	0.95	1.0	1.1	1.1	1.1	1.1
	4	1.3	1.6	1.8	2.0	2.0	2.1	2.1	2.1	0.98	1.3	1.4	1.5	1.6	1.6	1.6	1.6
	5	1.7	2.2	2.4	2.6	2.7	2.8	2.8	2.8	1.3	1.7	1.9	2.0	2.1	2.1	2.1	2.1
	6	2.5	3.2	3.7	3.9	4.1	4.2	4.2	4.2	1.9	2.5	2.8	3.0	3.1	3.2	3.2	3.2
	7	3.4	4.3	4.9	5.2	5.5	5.6	5.6	5.6	2.6	3.3	3.7	4.0	4.1	4.2	4.2	4.2
	8	5.0	6.5	7.4	7.9	8.2	8.4	8.4	8.4	3.9	5.0	5.7	6.0	6.2	6.4	6.4	6.4
	9	7.5	9.6	10.9	11.6	12.1	12.3	12.4	12.4	5.8	7.4	8.3	8.9	9.2	9.3	9.4	9.3
		Evaporating temperature –30°C								**Evaporating temperature –40°C**							
TU	0		0.26	0.29	0.31	0.32	0.32	0.32	0.31			0.29	0.31	0.32	0.32	0.32	0.31
	1		0.38	0.43	0.45	0.47	0.48	0.48	0.47			0.31	0.33	0.34	0.34	0.35	0.34
	2		0.45	0.50	0.53	0.55	0.56	0.56	0.56			0.36	0.38	0.40	0.40	0.40	0.40
	3		0.63	0.71	0.75	0.78	0.79	0.79	0.79			0.51	0.54	0.56	0.56	0.56	0.56
	4		0.93	1.0	1.1	1.1	1.2	1.2	1.2			0.75	0.79	0.81	0.82	0.82	0.82
	5		1.3	1.4	1.5	1.5	1.6	1.6	1.5			1.0	1.1	1.1	1.1	1.1	1.1
	6		1.9	2.1	2.2	2.3	2.3	2.3	2.3			1.5	1.6	1.6	1.6	1.6	1.6
	7		2.5	2.8	3.0	3.1	3.1	3.1	3.1			2.0	2.1	2.2	2.2	2.2	2.2
	8		3.8	4.2	4.5	4.6	4.7	4.7	4.7			3.0	3.2	3.3	3.3	3.3	3.3
	9		5.5	6.2	6.5	6.7	6.8	6.9	6.8			4.4	4.7	4.8	4.9	4.9	4.8

Correction for subcooling Δt_{sub}
The evaporator capacity used must be corrected if subcooling deviates from 4 K.
The corrected capacity can be obtained by dividing the evaporator capacity by the correction factor given below.

Note:
Insufficient subcooling can produce flash gas.

Correction factor for subcooling Δt_{sub}

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.08	1.14	1.21	1.27	1.33	1.39	1.45	1.51	1.57

Capacity (continued)

Capacity in kW for range B = –60 → –25°C and opening superheat OS = 4 K

R407C

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature –25°C								**Evaporating temperature –30°C**							
TU	0	0.34	0.42	0.46	0.49	0.50	0.51	0.51	0.50	0.31	0.38	0.42	0.44	0.45	0.46	0.46	0.46
	1	0.43	0.54	0.61	0.65	0.66	0.67	0.67	0.67	0.37	0.47	0.52	0.56	0.57	0.58	0.59	0.58
	2	0.52	0.67	0.75	0.79	0.82	0.83	0.84	0.83	0.45	0.56	0.63	0.67	0.69	0.70	0.70	0.70
	3	0.73	0.93	1.0	1.1	1.2	1.2	1.2	1.2	0.62	0.79	0.88	0.94	0.97	0.98	0.98	0.98
	4	1.1	1.4	1.5	1.6	1.7	1.7	1.7	1.7	0.92	1.2	1.3	1.4	1.4	1.4	1.5	1.4
	5	1.5	1.8	2.1	2.2	2.3	2.3	2.3	2.3	1.2	1.6	1.7	1.8	1.9	1.9	1.9	1.9
	6	2.2	2.8	3.1	3.3	3.4	3.5	3.5	3.5	1.8	2.3	2.6	2.8	2.9	2.9	2.9	2.9
	7	2.9	3.7	4.1	4.4	4.5	4.6	4.6	4.6	2.5	3.1	3.5	3.7	3.8	3.9	3.9	3.9
	8	4.4	5.6	6.2	6.6	6.8	7.0	7.0	6.9	3.7	4.7	5.3	5.6	5.8	5.8	5.9	5.8
	9	6.5	8.2	9.2	9.7	10.1	10.2	10.3	10.2	5.5	6.9	7.7	8.2	8.4	8.6	8.6	8.5
		Evaporating temperature –40°C								**Evaporating temperature –50°C**							
TU	0	0.24	0.30	0.33	0.35	0.36	0.36	0.36	0.36	0.17	0.22	0.24	0.25	0.26	0.26	0.26	0.26
	1	0.27	0.34	0.37	0.39	0.41	0.41	0.41	0.41	0.18	0.23	0.25	0.27	0.27	0.28	0.28	0.27
	2	0.31	0.39	0.44	0.46	0.47	0.48	0.48	0.48	0.21	0.27	0.29	0.31	0.32	0.32	0.32	0.32
	3	0.44	0.55	0.61	0.65	0.67	0.68	0.68	0.67	0.30	0.37	0.41	0.44	0.45	0.45	0.45	0.45
	4	0.65	0.81	0.90	0.95	0.98	0.99	0.99	0.98	0.44	0.55	0.60	0.63	0.65	0.66	0.66	0.65
	5	0.86	1.1	1.2	1.3	1.3	1.3	1.3	1.3	0.59	0.73	0.81	0.85	0.88	0.88	0.88	0.87
	6	1.3	1.6	1.8	1.9	2.0	2.0	2.0	2.0	0.87	1.1	1.2	1.3	1.3	1.3	1.3	1.3
	7	1.7	2.2	2.4	2.5	2.6	2.7	2.7	2.6	1.2	1.5	1.6	1.7	1.7	1.8	1.8	1.7
	8	2.6	3.3	3.6	3.9	4.0	4.0	4.0	4.0	1.8	2.2	2.4	2.6	2.6	2.7	2.7	2.6
	9	3.8	4.8	5.3	5.6	5.8	5.8	5.8	5.8	2.6	3.2	3.5	3.7	3.8	3.9	3.9	3.8
		Evaporating temperature –60°C															
TU	0	0.12	0.15	0.16	0.18	0.17	0.17	0.17	0.17								
	1	0.12	0.15	0.17	0.18	0.18	0.18	0.18	0.18								
	2	0.14	0.17	0.19	0.20	0.21	0.21	0.21	0.20								
	3	0.20	0.25	0.27	0.29	0.29	0.29	0.29	0.29								
	4	0.29	0.36	0.39	0.41	0.42	0.43	0.42	0.42								
	5	0.39	0.48	0.53	0.56	0.57	0.57	0.57	0.56								
	6	0.58	0.71	0.79	0.83	0.85	0.85	0.85	0.83								
	7	0.78	0.96	1.1	1.1	1.1	1.1	1.1	1.1								
	8	1.2	1.5	1.6	1.7	1.7	1.7	1.7	1.7								
	9	1.7	2.1	2.3	2.4	2.5	2.5	2.5	2.5								

Correction for subcooling Δt_{sub}
The evaporator capacity used must be corrected if subcooling deviates from 4 K.
The corrected capacity can be obtained by dividing the evaporator capacity by the correction factor given below.

Note:
Insufficient subcooling can produce flash gas.

Correction factor for subcooling Δt_{sub}

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.08	1.14	1.21	1.27	1.33	1.39	1.45	1.51	1.57

Capacity (continued)

Capacity in kW for range N = –40 → +10°C and opening superheat OS = 4 K

R410A

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		3	6	9	12	15	18	21	24	3	6	9	12	15	18	21	24
		Evaporating temperature +10°C								**Evaporating temperature 0°C**							
TU	0	0.56	0.72	0.80	0.85	0.87	0.88	0.87	0.85	0.56	0.70	0.78	0.83	0.85	0.86	0.85	0.84
	1	0.89	1.13	1.26	1.30	1.37	1.38	1.36	1.33	0.84	1.06	1.18	1.24	1.29	1.30	1.29	1.27
	2	1.45	1.90	2.2	2.3	2.4	2.5	2.4	2.4	1.25	1.64	1.86	1.99	2.1	2.1	2.1	2.1
	3	1.98	2.6	3.0	3.2	3.3	3.3	3.3	3.3	1.72	2.3	2.6	2.7	2.9	2.9	2.9	2.9
	4	3.1	4.1	4.6	4.9	5.1	5.2	5.1	5.0	2.6	3.5	3.9	4.2	4.3	4.4	4.4	4.3
	5	4.1	5.3	6.1	6.5	6.7	6.8	6.8	6.7	3.5	4.6	5.2	5.6	5.8	5.9	5.8	5.8
	6	6.2	8.1	9.2	9.9	10.3	10.5	10.4	10.2	5.3	6.9	7.9	8.4	8.7	8.9	8.9	8.8
	7	8.2	10.7	12.7	13.1	13.6	13.8	13.8	13.5	7.0	9.2	10.4	11.1	11.6	11.8	11.8	11.6
	8	12.1	15.8	18.0	19.3	20.0	20.3	20.2	19.9	10.4	13.7	15.5	16.6	17.2	17.5	17.5	17.2
	9	18.3	24.0	27.2	29.1	30.2	30.6	30.5	29.9	15.7	20.5	23.3	24.9	25.8	26.2	26.2	25.7
		Evaporating temperature –10°C								**Evaporating temperature –20°C**							
TU	0	0.53	0.67	0.74	0.78	0.80	0.81	0.81	0.79		0.60	0.67	0.70	0.72	0.73	0.73	0.72
	1	0.76	0.96	1.07	1.13	1.16	1.17	1.17	1.15		0.83	0.92	0.97	1.00	1.01	1.00	0.99
	2	1.04	1.35	1.52	1.63	1.69	1.72	1.72	1.70		1.06	1.20	1.28	1.32	1.34	1.34	1.33
	3	1.44	1.86	2.1	2.3	2.3	2.4	2.4	2.4		1.48	1.67	1.78	1.84	1.87	1.87	1.85
	4	2.2	2.8	3.2	3.4	3.5	3.6	3.6	3.5		2.2	2.5	2.7	2.7	2.8	2.8	2.8
	5	2.9	3.7	4.2	4.5	4.7	4.8	4.8	4.8		3.0	3.3	3.5	3.7	3.7	3.7	3.7
	6	4.3	5.6	6.4	6.8	7.1	7.2	7.2	7.1		4.4	5.0	5.3	5.5	5.6	5.6	5.5
	7	5.8	7.5	8.5	9.1	9.4	9.6	9.6	9.5		5.9	6.6	7.1	7.4	7.5	7.5	7.4
	8	8.6	11.2	12.7	13.6	14.1	14.3	14.3	14.1		8.9	10.0	10.7	11.0	11.2	11.2	11.1
	9	12.9	16.8	19.0	20.3	21.0	21.3	21.3	21.0		13.2	14.8	15.8	16.4	16.6	16.6	16.4
		Evaporating temperature –30°C								**Evaporating temperature –40°C**							
TU	0		0.52	0.58	0.61	0.63	0.63	0.63	0.62			0.48	0.50	0.52	0.52	0.52	0.51
	1		0.66	0.74	0.79	0.82	0.82	0.82	0.81			0.56	0.59	0.61	0.62	0.62	0.61
	2		0.81	0.90	0.96	1.00	1.01	1.01	1.00			0.66	0.70	0.72	0.73	0.73	0.72
	3		1.13	1.27	1.35	1.40	1.41	1.41	1.40			0.93	0.98	1.02	1.03	1.03	1.01
	4		1.67	1.87	2.0	2.1	2.1	2.1	2.1			1.36	1.45	1.49	1.51	1.50	1.48
	5		2.2	2.5	2.7	2.8	2.8	2.8	2.8			1.82	1.9	2.0	2.0	2.0	2.0
	6		3.3	3.7	4.0	4.1	4.2	4.2	4.1			2.7	2.9	3.0	3.0	3.0	3.0
	7		4.5	5.0	5.4	5.5	5.6	5.6	5.5			3.6	3.9	4.0	4.0	4.0	4.0
	8		6.7	7.6	8.0	8.3	8.4	8.4	8.3			5.5	5.8	6.0	6.1	6.1	6.0
	9		9.9	11.1	11.8	12.2	12.4	12.4	12.2			8.1	8.6	8.8	8.9	8.9	8.8

Correction for subcooling Δt_{sub}

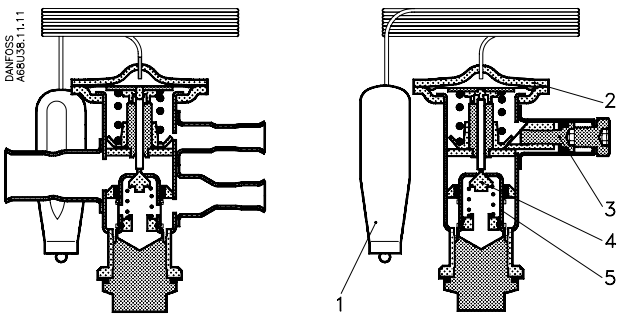
The evaporator capacity used must be corrected if subcooling deviates from 4 K.
The corrected capacity can be obtained by dividing the evaporator capacity by the correction factor given below.

Note:
Insufficient subcooling can produce flash gas.

Correction factor for subcooling Δt_{sub}

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.08	1.15	1.21	1.27	1.33	1.39	1.45	1.50	1.56

Design/Function



1. Bulb with capillary tube
2. Thermostatic element with diaphragm
3. Setting spindle for adjustment of static superheat SS
4. Orifice assembly
5. Filter

Fig. 4

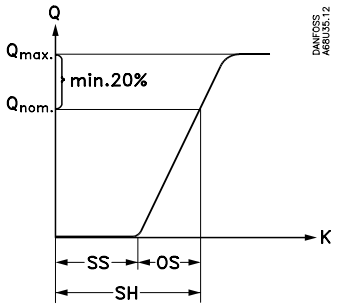


Fig. 5 Superheat

Superheat
See fig. 5
SS = static superheat
OS = opening superheat
SH = SS + OS = total superheat
Q_{nom} = rated capacity
Q_{max} = maximum capacity

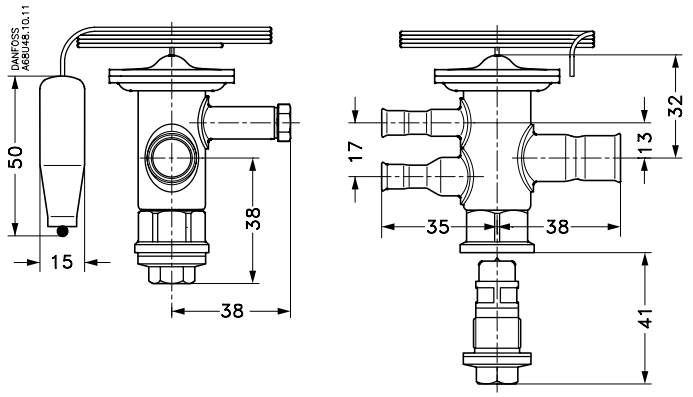
Static superheat SS can be adjusted with setting spindle 3, see fig. 4.

The standard superheat setting SS is 5 K for valves without MOP and 4 K for valves with MOP (except R507).
The opening superheat OS is 4 K from when opening begins to where the valve gives its rated capacity $Q_{nom.}$.

Example

Static superheat	SS = 5 K
Opening superheat	OS = 4 K
Total superheat	SH = 5 + 4 = 9 K

Dimensions and weight



Connection dimensions, see ordering table
Fig. 6 Straightway

Weight
0.16 kg