

Data sheet

Thermostatic Expansion Valves

Type TR6



The TR6 series is a hermetic design. Designed and developed with features especially for use in applications such as:

- Residential
- Split Systems/ Heat pumps/ Geothermal
- Light Comm
- Rooftop units/ Heat pumps/ Split Systems/ Chillers

The TR6 design incorporates a forged brass body with the entire power element, including the capillary tube and bulb, fabricated from stainless steel. All valves are designed with balanced port which reduces the influence from varying condensing pressures. The valves can be delivered with special connections and fittings both at the inlet, outlet, and the equalizer connection.

Features

- Compact size - hermetic design, straightway configuration with external equalization.
- Refrigerants & rated capacities ranging up to
 - R22/R407C: 23.6 kW / 6.7 TR
 - R410A: 24.5 kW / 7 TR
- Laser-welded power element
 - Longer diaphragm life.
 - High Corrosion resistant.
- Stainless steel capillary tube
 - Tolerates more bending for easier installation and longer life.
 - High strength and vibration resistance.
- Stainless steel bulb
 - Self aligning
- Balance port design
- A complete program with and without internal check valve.
- Internal check valve design with low pressure drop in reverse flow.
- Adjustable or non-adjustable superheat, for customer specific factory setting.
- Bleed function available.
- Solder, chatleff and aeroquip connections.
- With external equalization.
- UL listed, file SA7200
- Antihunt bulb charge

Data sheet | Thermostatic expansion valves , type TR6

Valve program Standard versions

Refrigerants:
R22 / R407C and R410A

Operating range:
-10 – 15 °C / 15 – 60 °F

Setting:

- Fixed setting:
 - Static superheat in accordance with customers' specifications.
- Adjustable setting:
 - Factory static superheat of 4 K / 7.2 °F.

Packing:
Single or Multipack.
Industrial Pack for OEM specific valves only.

Versions:
All valves are in straightway versions.
With or without internal check valve.

Standard connections:
Inlet Solder ODF 3/8 in x Outlet Solder ODF 3/8 in
Eq. Cap. tube flare 1/4 in, 24.3 in length

Capillary tube length: 800 mm / 31.5 in

Options on request

Capillary tube lengths(approx.):
– 450 mm / 17.7 in
– 975 mm / 38.4 in

Options for Connections:

Inlet/Outlet:

- Inlet: Solder ODM 3/8 in, solder ODF 3/8 in, solder ODF 1/2 in, Chatleff male 3/4 in and Aeroquip male 3/8 in.
- Outlet: Solder ODF 3/8 in, solder ODF 1/2 in, solder ODF 5/8 in, Chatleff female 3/4 in short and long tail, Aeroquip female 3/8 in short and long tail.

Equalizer:

- Copper capillary tube size (approx.): Ø 1/8 in.
- Available configurations:**
- Solder ODM 1/8 in, lengths 9.5 in, 16.9 in, 24.3 in, 31.7 in.
 - Solder ODF 1/4 in, lengths 31.7 in and 39.1 in
 - Flare nut 1/4 in, lengths 9.5 in, 16.9 in, 24.3 in, 31.7 in

Technical data

Max. operating temperature

- Thermostatic element:
 - R22 / R407C: max. 100 °C / 212 °F
 - R410A: max. 100 °C / 212 °F
- Valve body:
 - 110 °C / 230 °F

Max. working pressure PS / MWP
45.5 bar / 660 psig

Max. test pressure
47 bar / 680 psig

Identification

Essential valve data is given on the power element.

Main valve data example:

- TR6** = Valve type
- R410A** = Refrigerant
- 4.00 TR** = Rated capacity Qnom in Tons of Refrigeration
- PS 45.5 bar / MWP 630 psig** = Max. working pressure in bar and psig
- 067L5955** = Code number
- BC4917D** = Date making (BC=Mexico, week 49, year 2017, weekday D=Thursday)
- 10 / +15 °C** = Evaporating temperature range in °C
- +15 / + 60 °F** = Evaporating temperature range in °F

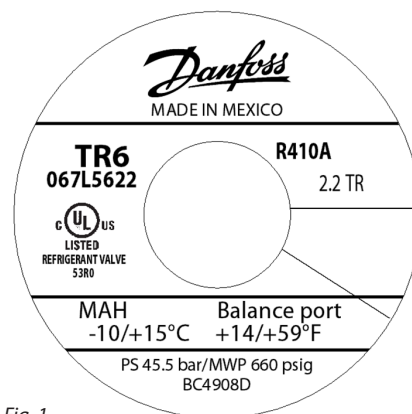


Fig. 1

Design and function

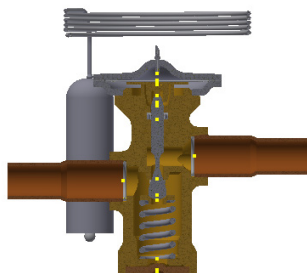
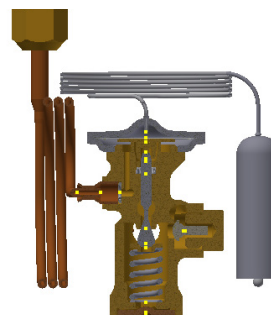


Fig. 2 TR6 with fixed setting



1. Bulb
2. Thermostatic element
3. Push pin seal
4. Balanced port
5. Check valve
6. Setting spindle for adjustment of static superheat (SS)
7. Equalizer
8. Inlet connection
9. Outlet connection

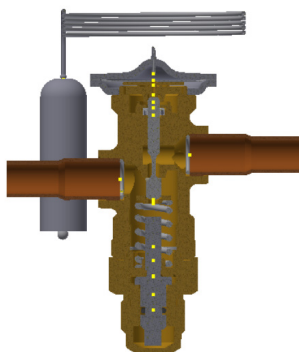


Fig. 3 TR6 with adjustable setting

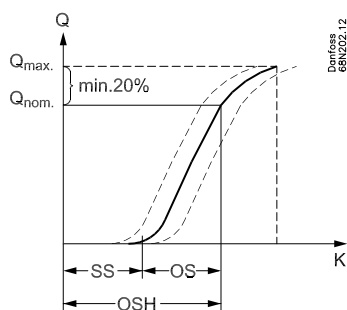
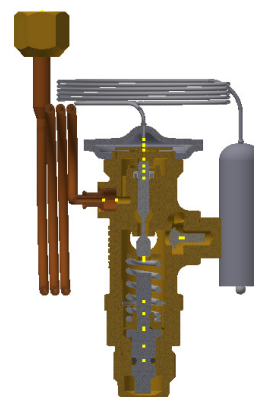


Fig. 4

The central push pin is sealed with a robust seal (pos. 3) that ensures maximum tightness and minimum friction through the lifetime of the valve.

The balanced port (pos. 4) ensures minimal superheat changes when condensing pressure varies. This feature makes the valve ideal for bi-flow operation.

Static superheat (SS) can be adjusted with the setting spindle (see fig. 3, pos. 6).

Terminology (fig.4)

- SS = Static superheat
- OS = Opening superheat at Nominal/ Rated Capacity
- OSH = SS + OS = Operating superheat

Example

Static superheat
 SS = 4K / 7.2 °F (factory setting)
 or according to customer specification.

Opening superheat at Nominal/ Rated Capacity
 OS = 4K / 7.2 °F

Opening superheat is defined as the required superheat to open the valve to nominal capacity.

Application

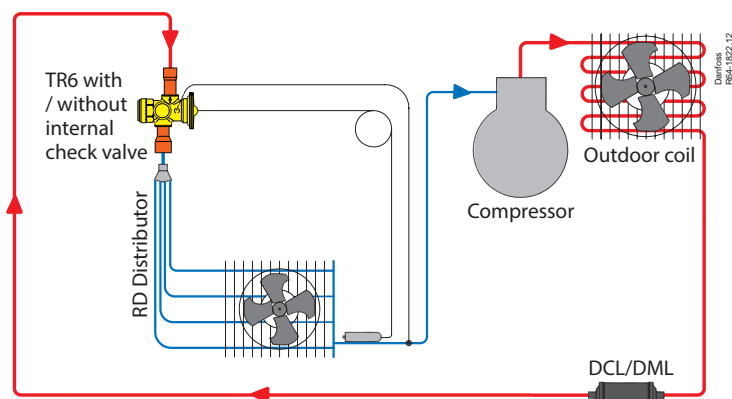


Fig. 5. Traditional air conditioning system, cooling only

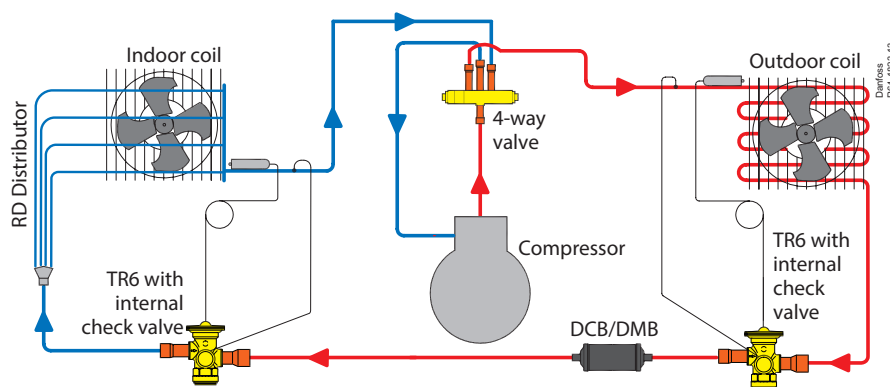


Fig. 6. Traditional air conditioning / heat pump system

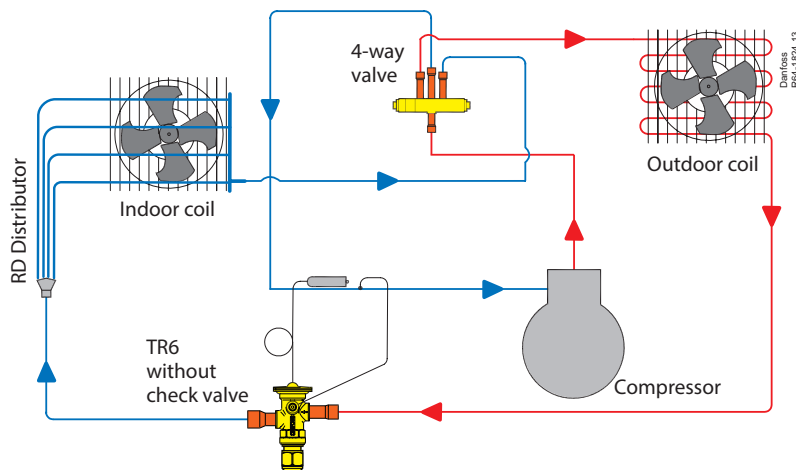


Fig. 7. Simplified air conditioning / heat pump system (bi-flow)

Fig. 5 illustrates the diagram of a traditional air conditioning system where the TR6 is controlling liquid injection in one direction only.

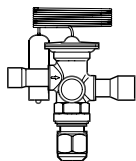
Fig. 6 illustrates a split air conditioning/heat pump system with two thermostatic expansion valves, one for cooling mode and one for heating mode. The thermostatic expansion valves each has a built-in check valve, which has the function of preventing flow in one direction and allowing the flow in the opposite direction. It means that one thermostatic expansion valve is controlling liquid injection into the indoor coil while the other thermostatic expansion valve is bypassing the metering device with the open check valve.

Fig. 7 illustrates a packaged air conditioning/heat pump system with a short distance between the indoor and outdoor heat-exchangers.

The two TR6 valves from fig 6 can be replaced by one TR6 valve without internal check valve, making use of the bi-flow feature of this thermostatic expansion valve. The single valve is controlling the liquid injection in both directions. The normal flow direction marked with an arrow on the valve body should be used for the primary function, i.e. cooling or heating.

Ordering

Adjustable setting



Temperature range = -10 – 15 °C / 15 – 60 °F, OS = 4 K / 7.2 °F **R22 / R407C and R410A**

Valve type	Orifice no.	Rated capacity						Connections solder ODF		Code no. Multi pack ²⁾
		R410A ¹⁾		R407C		R22		Inlet x Outlet [in]	Pressure equalization [in]	
		[KW]	[TR]	[KW]	[TR]	[KW]	[TR]			
TR6	3	–	–	9.82	2.80	11.02	3.13	3/8 x 3/8	1/4	067L5855
TR6	4	–	–	13.75	3.92	15.49	4.40	3/8 x 3/8	1/4	067L5856
TR6	5	–	–	16.39	4.67	18.40	5.23	3/8 x 3/8	1/4	067L5857
TR6	6	–	–	17.35	4.94	19.56	5.56	3/8 x 3/8	1/4	067L5858
TR6	7	–	–	20.89	5.95	23.78	6.76	3/8 x 3/8	1/4	067L5859
TR6	3	11.27	3.21	–	–	–	–	3/8 x 3/8	1/4	067L5955
TR6	4	15.91	4.53	–	–	–	–	3/8 x 3/8	1/4	067L5956
TR6	5	19.03	5.42	–	–	–	–	3/8 x 3/8	1/4	067L5957
TR6	6	20.20	5.75	–	–	–	–	3/8 x 3/8	1/4	067L5958
TR6	7	24.49	6.97	–	–	–	–	3/8 x 3/8	1/4	067L5959

¹⁾The rated capacity is based on:

Evaporating temperature t_e : 4.4 °C / 40 °F
 Condensing temperature t_c : 38 °C / 100 °F
 Refrigerant temperature ahead of valve t_i : 37 °C / 98 °F

²⁾ Kit part numbers consist of a valve, bulb strap, insulation tape, installation instruction, and the following connectors:

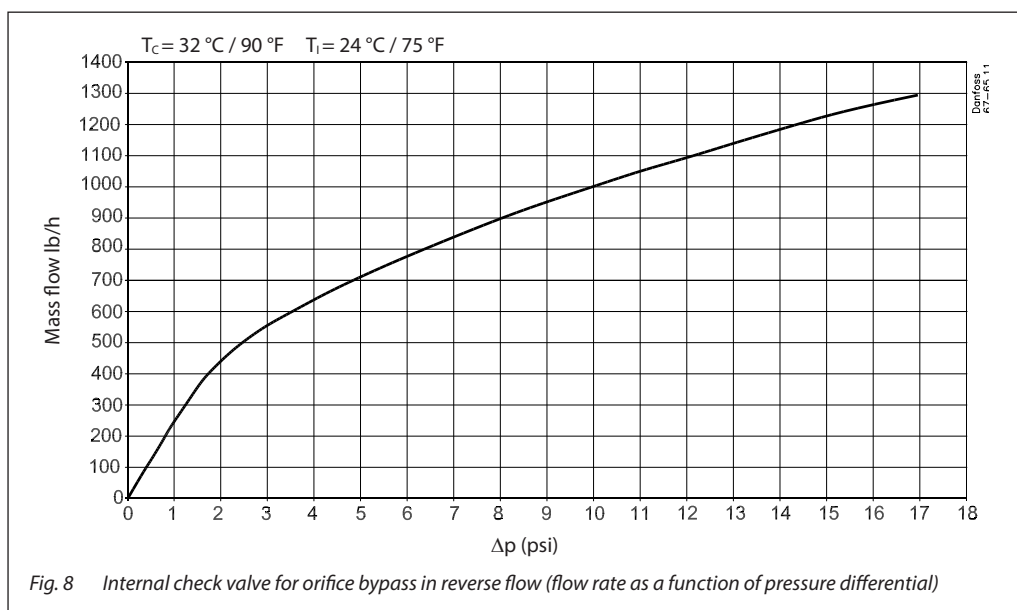
- 1 Chatleff female 3/4 in connector
- 1 Aeroquip female 3/8 in connector
- 1 Flare 3/8 in connector

TR6 with fixed superheat setting are available upon request.

Single pack = 1 valve kit in a box

Industrial pack = 12 pieces in one box

Check valve capacity



Capacity

Capacity in TR, range MAH -15 – 60 °F, opening superheat sh = 7.2°F

R22

US units

Type	Orifice no.	Condensing Temperature [°F]	Evaporating [°F]											
			-40	-30	-20	-10	0	10	20	30	40	50	60	70
			Capacity [TR]											
TR6	3	75	1.67	1.46	1.44	1.57	1.81	2.10	2.40	2.65	2.78	2.69	2.22	0.99
	4		2.39	2.12	2.11	2.28	2.60	3.00	3.41	3.76	3.96	3.85	3.19	1.35
	5		2.81	2.55	2.57	2.80	3.17	3.63	4.11	4.51	4.73	4.60	3.82	1.59
	6		2.98	2.71	2.72	2.96	3.36	3.85	4.37	4.81	5.06	4.94	4.11	1.68
	7		3.57	3.26	3.28	3.57	4.06	4.66	5.30	5.87	6.21	6.12	5.15	2.09
TR6	3	95	1.68	1.48	1.47	1.62	1.88	2.21	2.57	2.90	3.16	3.29	3.20	2.79
	4		2.44	2.16	2.14	2.33	2.67	3.12	3.61	4.08	4.46	4.67	4.59	4.07
	5		2.87	2.60	2.60	2.84	3.24	3.75	4.31	4.86	5.31	5.56	5.50	4.91
	6		3.05	2.75	2.75	2.99	3.42	3.96	4.56	5.15	5.65	5.94	5.91	5.32
	7		3.66	3.30	3.29	3.57	4.08	4.74	5.49	6.23	6.88	7.32	7.36	6.76
TR6	3	115	1.62	1.42	1.41	1.57	1.85	2.21	2.60	2.99	3.33	3.56	3.63	3.49
	4		2.37	2.08	2.05	2.24	2.60	3.07	3.61	4.15	4.63	5.00	5.17	5.05
	5		2.81	2.50	2.49	2.72	3.13	3.67	4.29	4.91	5.48	5.92	6.15	6.07
	6		2.99	2.65	2.62	2.85	3.28	3.86	4.51	5.18	5.80	6.30	6.59	6.55
	7		3.57	3.15	3.10	3.36	3.86	4.55	5.35	6.20	7.01	7.69	8.14	8.23
TR6	3	135	1.50	1.29	1.29	1.45	1.74	2.11	2.53	2.95	3.34	3.63	3.79	3.77
	4		2.21	1.89	1.85	2.04	2.40	2.89	3.45	4.04	4.58	5.04	5.34	5.42
	5		2.61	2.28	2.24	2.46	2.87	3.43	4.07	4.74	5.38	5.93	6.32	6.47
	6		2.78	2.41	2.35	2.56	2.99	3.57	4.25	4.97	5.67	6.28	6.74	6.95
	7		3.31	2.83	2.73	2.96	3.45	4.14	4.97	5.87	6.77	7.59	8.25	8.65
TR6	3	150	1.36	1.15	1.15	1.31	1.61	1.99	2.42	2.86	3.27	3.59	3.80	3.84
	4		2.02	1.69	1.64	1.82	2.18	2.67	3.25	3.85	4.43	4.94	5.30	5.47
	5		2.39	2.03	1.98	2.18	2.59	3.14	3.80	4.49	5.17	5.78	6.24	6.50
	6		2.55	2.14	2.06	2.25	2.67	3.25	3.94	4.69	5.42	6.09	6.63	6.96
	7		3.01	2.48	2.34	2.54	3.01	3.70	4.54	5.46	6.40	7.29	8.05	8.60

Note: Insufficient subcooling can produce flash gas.

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 7.2 °F.

The corrected capacity can be obtained by multiplying the evaporator capacity by the correction factor given below.

Capacity correction factor based on Subcooling $f_{sub} \Delta t_{sub}$

Subcooling [°F]	2	7	10	20	30	40	50	60	70	80	90
Correction factor	0.97	1.00	1.01	1.06	1.11	1.16	1.22	1.27	1.31	1.36	1.41

Capacity correction factor based on Distributer pressure drop f_p *)

Evaporating [°F]	Pressure drop [psi]												
	-40	-30	-20	-10	0	10	20	30	40	50	60	70	
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

Capacity

Capacity in TR, range MAH -10 – 15 °C, opening superheat sh = 4K

R22
SI units

Type	Orifice no.	Condensing Temperature [°C]	Evaporating [°C]					
			-10	-5	0	5	10	15
			Capacity [kW]					
TR6	3	25	7.88	8.82	9.58	9.98	9.76	8.53
	4		11.23	12.54	13.62	14.21	13.96	12.27
	5		13.56	15.06	16.30	16.98	16.68	14.70
	6		14.39	16.01	17.37	18.15	17.89	15.83
	7		17.41	19.45	21.20	22.30	22.17	19.81
TR6	3	35	8.28	9.41	10.43	11.21	11.58	11.35
	4		11.66	13.22	14.66	15.81	16.44	16.26
	5		13.99	15.78	17.46	18.80	19.58	19.44
	6		14.79	16.71	18.53	20.02	20.93	20.89
	7		17.72	20.12	22.44	24.43	25.75	25.99
TR6	3	45	8.34	9.59	10.77	11.78	12.47	12.70
	4		11.59	13.30	14.97	16.44	17.53	18.05
	5		13.83	15.79	17.73	19.45	20.79	21.50
	6		14.54	16.64	18.73	20.63	22.13	23.01
	7		17.22	19.83	22.47	24.95	27.02	28.41
TR6	3	55	8.11	9.44	10.74	11.89	12.78	13.28
	4		11.11	12.92	14.73	16.40	17.78	18.70
	5		13.16	15.23	17.33	19.29	20.96	22.15
	6		13.74	15.95	18.21	20.36	22.23	23.61
	7		16.05	18.76	21.60	24.38	26.89	28.92
TR6	3	65	7.64	9.03	10.40	11.66	12.67	13.34
	4		10.26	12.13	14.05	15.86	17.42	18.60
	5		12.04	14.18	16.39	18.51	20.40	21.89
	6		12.47	14.74	17.11	19.43	21.53	23.24
	7		14.28	17.05	20.01	22.97	25.77	28.19

Note: Insufficient subcooling can produce flash gas.

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 4K.

The corrected capacity can be obtained by multiplying the evaporator capacity by the correction factor given below.

Capacity correction factor based on Subcooling ' f_{sub} ' Δt_{sub}

Subcooling [K]	2	4	10	15	20	25	30	35	40	45	50
Correction factor	0.98	1.00	1.05	1.10	1.14	1.19	1.24	1.28	1.32	1.37	1.41

Capacity correction factor based on Distributer pressure drop f_p *)

Evaporating [°C]													
	-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	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

Capacity

Capacity in TR, range MAH -10 – 15 °C / -15 – 60 °F, opening superheat sh = 7.2 °F

R407C

US units

Type	Orifice no.	Condensing Temperature [°F]	Evaporating [°F]											
			-40	-30	-20	-10	0	10	20	30	40	50	60	70
TR6	3	75	1.65	1.45	1.41	1.50	1.68	1.93	2.22	2.50	2.74	2.87	2.79	2.29
	4		2.16	2.01	2.03	2.18	2.45	2.79	3.18	3.56	3.89	4.08	4.00	3.34
	5		2.49	2.39	2.46	2.67	3.00	3.40	3.85	4.29	4.67	4.89	4.80	4.04
	6		2.59	2.51	2.60	2.83	3.18	3.61	4.09	4.56	4.97	5.22	5.15	4.38
	7		2.96	2.94	3.10	3.41	3.84	4.37	4.94	5.52	6.04	6.39	6.38	5.55
TR6	3	95	1.67	1.46	1.40	1.48	1.66	1.93	2.24	2.57	2.89	3.16	3.31	3.30
	4		2.20	2.02	2.00	2.14	2.41	2.76	3.18	3.63	4.06	4.44	4.70	4.75
	5		2.54	2.39	2.42	2.62	2.93	3.35	3.83	4.35	4.85	5.29	5.61	5.70
	6		2.62	2.50	2.55	2.76	3.10	3.54	4.05	4.60	5.14	5.63	5.99	6.12
	7		2.98	2.90	3.01	3.29	3.71	4.25	4.86	5.53	6.20	6.83	7.34	7.61
TR6	3	115	1.63	1.39	1.31	1.37	1.55	1.81	2.14	2.49	2.85	3.17	3.43	3.58
	4		2.14	1.91	1.86	1.98	2.22	2.57	2.99	3.46	3.95	4.41	4.81	5.09
	5		2.46	2.25	2.25	2.40	2.70	3.10	3.59	4.13	4.68	5.22	5.70	6.06
	6		2.53	2.35	2.35	2.53	2.84	3.27	3.78	4.35	4.94	5.52	6.05	6.47
	7		2.83	2.69	2.74	2.98	3.36	3.88	4.49	5.18	5.91	6.64	7.34	7.94
TR6	3	135	1.51	1.24	1.14	1.18	1.35	1.60	1.92	2.28	2.66	3.01	3.32	3.55
	4		1.98	1.70	1.61	1.69	1.90	2.23	2.65	3.12	3.62	4.12	4.58	4.97
	5		2.25	1.99	1.93	2.04	2.30	2.68	3.16	3.69	4.27	4.84	5.39	5.86
	6		2.31	2.06	2.01	2.14	2.41	2.81	3.30	3.87	4.47	5.09	5.69	6.22
	7		2.54	2.32	2.30	2.48	2.81	3.29	3.87	4.55	5.28	6.05	6.82	7.55
TR6	3	150	1.37	1.08	0.96	0.99	1.14	1.38	1.70	2.06	2.44	2.80	3.13	3.39
	4		1.79	1.47	1.35	1.40	1.59	1.90	2.30	2.77	3.27	3.78	4.26	4.69
	5		2.02	1.71	1.61	1.69	1.92	2.27	2.72	3.25	3.82	4.40	4.97	5.48
	6		2.07	1.76	1.67	1.75	1.99	2.36	2.83	3.38	3.98	4.60	5.22	5.79
	7		2.23	1.94	1.87	1.99	2.28	2.72	3.27	3.92	4.65	5.41	6.19	6.96

Note: Insufficient subcooling can produce flash gas.

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 7.2 °F.

The corrected capacity can be obtained by multiplying the evaporator capacity by the correction factor given below.

Capacity correction factor based on Subcooling $f_{sub} \Delta t_{sub}$

Subcooling [°F]	2	7	10	20	30	40	50	60	70	80	90
Correction factor	0.97	1.00	1.02	1.08	1.14	1.20	1.27	1.33	1.39	1.45	1.51

Capacity correction factor based on Distributer pressure drop f_p *)

Evaporating [°F]	-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
	15	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	0.92	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

*) calculated at 90 °F condensing temperature

Capacity

Capacity in kW, for MAH -10 – 15 °C / -15 – 60 °F, opening superheat sh= 4 K

R407C

SI units

Type	Orifice no.	Condensing Temperature [°C]	Evaporating [°C]											
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
			Capacity [kW]											
TR6	3	25	5.82	5.17	4.97	5.15	5.63	6.35	7.21	8.15	9.06	9.81	10.26	10.16
	4		7.64	7.12	7.09	7.49	8.22	9.22	10.39	11.65	12.87	13.92	14.58	14.55
	5		8.82	8.45	8.59	9.15	10.07	11.25	12.62	14.07	15.48	16.68	17.46	17.45
	6		9.14	8.84	9.05	9.68	10.67	11.94	13.39	14.93	16.44	17.75	18.63	18.70
	7		10.46	10.35	10.76	11.62	12.87	14.42	16.18	18.05	19.91	21.58	22.80	23.12
TR6	3	35	5.89	5.18	4.94	5.09	5.56	6.30	7.22	8.24	9.30	10.29	11.11	11.64
	4		7.76	7.14	7.02	7.35	8.06	9.07	10.30	11.67	13.08	14.45	15.64	16.49
	5		8.94	8.44	8.47	8.96	9.84	11.03	12.46	14.03	15.67	17.25	18.64	19.67
	6		9.24	8.81	8.90	9.45	10.40	11.66	13.17	14.84	16.58	18.28	19.81	20.99
	7		10.48	10.20	10.48	11.24	12.43	13.97	15.80	17.81	19.94	22.07	24.05	25.70
TR6	3	45	5.76	4.98	4.67	4.78	5.22	5.95	6.88	7.95	9.08	10.19	11.20	12.01
	4		7.59	6.84	6.62	6.87	7.51	8.48	9.71	11.12	12.63	14.15	15.59	16.84
	5		8.70	8.05	7.95	8.33	9.14	10.28	11.70	13.31	15.04	16.79	18.47	19.96
	6		8.98	8.37	8.32	8.76	9.62	10.83	12.32	14.02	15.85	17.73	19.55	21.20
	7		10.06	9.59	9.69	10.32	11.39	12.86	14.65	16.69	18.91	21.22	23.53	25.71
TR6	3	55	5.42	4.55	4.18	4.23	4.63	5.33	6.25	7.33	8.48	9.66	10.77	11.73
	4		7.12	6.23	5.89	6.04	6.60	7.51	8.70	10.10	11.63	13.22	14.78	16.23
	5		8.11	7.29	7.04	7.30	8.00	9.07	10.43	12.03	13.77	15.59	17.39	19.10
	6		8.34	7.56	7.34	7.64	8.38	9.50	10.93	12.60	14.44	16.37	18.31	20.18
	7		9.21	8.51	8.42	8.87	9.80	11.15	12.85	14.84	17.04	19.40	21.82	24.23
TR6	3	65	4.88	3.93	3.48	3.46	3.81	4.47	5.36	6.42	7.58	8.78	9.93	10.98
	4		6.37	5.33	4.86	4.89	5.36	6.19	7.32	8.68	10.20	11.80	13.41	14.95
	5		7.18	6.18	5.78	5.89	6.47	7.43	8.72	10.25	11.96	13.78	15.63	17.43
	6		7.35	6.37	5.98	6.12	6.72	7.73	9.06	10.66	12.45	14.38	16.35	18.31
	7		7.93	7.00	6.70	6.95	7.70	8.90	10.47	12.35	14.49	16.81	19.24	21.71

Note: Insufficient subcooling can produce flash gas.

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 4K.

The corrected capacity can be obtained by multiplying the evaporator capacity by the correction factor given below.

Capacity correction factor based on Subcooling ' f_{sub} ' Δt_{sub}

Subcooling [K]	2	4	10	15	20	25	30	35	40	45	50
Correction factor	0.98	1.00	1.07	1.12	1.17	1.23	1.29	1.35	1.40	1.45	1.51

Capacity correction factor based on Distributer pressure drop f_p *)

Evaporating [°C]	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
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

Capacity

Capacity in TR, range MAH -10 – 15 °C / -15 – 60 °F, opening superheat sh = 7.2 °F

R410A

US units

Type	Orifice no.	Condensing Temperature [°F]	Evaporating [°F]											
			-40	-30	-20	-10	0	10	20	30	40	50	60	70
TR6	3	75	1.73	1.61	1.64	1.79	2.02	2.31	2.60	2.87	3.04	3.02	2.62	1.35
	4		2.32	2.26	2.37	2.61	2.95	3.35	3.75	4.11	4.34	4.32	3.78	1.95
	5		2.71	2.71	2.89	3.20	3.61	4.08	4.55	4.96	5.22	5.19	4.55	2.36
	6		2.82	2.85	3.05	3.40	3.84	4.33	4.84	5.28	5.57	5.56	4.89	2.56
	7		3.28	3.37	3.66	4.09	4.64	5.25	5.87	6.43	6.82	6.84	6.10	3.26
TR6	3	95	1.72	1.59	1.62	1.77	2.02	2.34	2.68	3.02	3.32	3.53	3.58	3.37
	4		2.31	2.23	2.33	2.57	2.93	3.35	3.82	4.29	4.70	5.00	5.11	4.88
	5		2.68	2.66	2.83	3.14	3.57	4.07	4.61	5.15	5.63	5.99	6.12	5.87
	6		2.79	2.79	2.98	3.32	3.77	4.31	4.89	5.46	5.98	6.38	6.55	6.32
	7		3.20	3.26	3.53	3.96	4.52	5.18	5.89	6.61	7.27	7.80	8.08	7.91
TR6	3	115	1.60	1.46	1.48	1.63	1.87	2.19	2.56	2.93	3.28	3.58	3.77	3.83
	4		2.15	2.04	2.11	2.34	2.68	3.12	3.60	4.11	4.59	5.02	5.33	5.47
	5		2.47	2.42	2.55	2.84	3.26	3.77	4.33	4.91	5.47	5.96	6.34	6.53
	6		2.57	2.52	2.68	2.99	3.43	3.97	4.57	5.19	5.79	6.33	6.76	7.00
	7		2.89	2.90	3.12	3.52	4.07	4.73	5.46	6.22	6.98	7.68	8.27	8.66
TR6	3	135	1.39	1.23	1.22	1.36	1.59	1.91	2.27	2.65	3.02	3.35	3.60	3.74
	4		1.84	1.69	1.73	1.93	2.25	2.67	3.15	3.66	4.16	4.63	5.02	5.29
	5		2.09	1.98	2.08	2.33	2.72	3.21	3.76	4.35	4.93	5.47	5.93	6.27
	6		2.15	2.05	2.16	2.44	2.85	3.36	3.95	4.57	5.19	5.78	6.29	6.69
	7		2.35	2.30	2.46	2.81	3.32	3.94	4.65	5.41	6.19	6.94	7.62	8.20
TR6	3	150	1.16	0.98	0.96	1.08	1.30	1.61	1.96	2.34	2.71	3.04	3.31	3.48
	4		1.51	1.33	1.34	1.51	1.81	2.21	2.68	3.18	3.68	4.15	4.56	4.87
	5		1.68	1.54	1.60	1.82	2.18	2.64	3.18	3.75	4.32	4.87	5.35	5.73
	6		1.71	1.58	1.64	1.88	2.26	2.75	3.31	3.91	4.53	5.12	5.65	6.08
	7		1.80	1.69	1.81	2.11	2.58	3.16	3.84	4.58	5.34	6.09	6.79	7.40

Note: Insufficient subcooling can produce flash gas.

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 7.2 °F.

The corrected capacity can be obtained by multiplying the evaporator capacity by the correction factor given below.

Capacity correction factor based on Subcooling $f_{sub} \Delta t_{sub}$

Subcooling [°F]	2	7	10	20	30	40	50	60	70	80	90
Correction factor	0.97	1.00	1.02	1.09	1.15	1.21	1.28	1.35	1.41	1.47	1.53

Capacity correction factor based on Distributer pressure drop f_p *)

Evaporating [°F]		-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
15	0.97		0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.95	0.94	0.93	0.89
25	0.95		0.95	0.95	0.95	0.94	0.94	0.93	0.93	0.92	0.90	0.87	0.81
30	0.94		0.94	0.94	0.93	0.93	0.93	0.92	0.91	0.90	0.88	0.84	0.77

*) calculated at 90 °F condensing temperature

Capacity

Capacity in kW, for MAH -10 – 15 °C / -15 – 60 °F, opening superheat sh= 4 K

R410A

SI units

Type	Orifice no.	Condensing Temperature [°C]	Evaporating [°C]											
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
TR6	3	25	6.09	5.69	5.73	6.12	6.78	7.64	8.59	9.54	10.36	10.90	10.92	9.99
	4		8.19	7.97	8.24	8.92	9.90	11.11	12.41	13.70	14.82	15.57	15.62	14.37
	5		9.55	9.53	10.02	10.92	12.14	13.57	15.10	16.59	17.87	18.72	18.76	17.28
	6		9.96	10.02	10.58	11.57	12.88	14.41	16.04	17.64	19.03	19.97	20.07	18.57
	7		11.55	11.81	12.62	13.90	15.54	17.43	19.44	21.42	23.17	24.42	24.70	23.09
TR6	3	35	6.05	5.62	5.65	6.05	6.74	7.65	8.70	9.81	10.87	11.79	12.43	12.63
	4		8.14	7.86	8.09	8.76	9.77	11.03	12.46	13.96	15.41	16.68	17.63	18.01
	5		9.45	9.36	9.80	10.68	11.92	13.43	15.10	16.83	18.50	19.98	21.08	21.56
	6		9.84	9.80	10.31	11.28	12.61	14.21	15.99	17.83	19.63	21.24	22.47	23.06
	7		11.28	11.43	12.18	13.43	15.09	17.06	19.24	21.52	23.76	25.81	27.46	28.42
TR6	3	45	5.71	5.24	5.23	5.61	6.29	7.22	8.30	9.47	10.64	11.72	12.63	13.25
	4		7.65	7.28	7.45	8.06	9.04	10.31	11.77	13.34	14.93	16.43	17.74	18.72
	5		8.82	8.63	8.98	9.80	11.00	12.49	14.19	16.01	17.84	19.58	21.11	22.28
	6		9.15	9.00	9.41	10.30	11.58	13.17	14.97	16.90	18.86	20.74	22.42	23.75
	7		10.33	10.35	10.97	12.13	13.72	15.67	17.87	20.24	22.66	25.03	27.21	29.04
TR6	3	55	5.07	4.55	4.49	4.82	5.48	6.38	7.46	8.64	9.84	11.00	12.01	12.81
	4		6.73	6.26	6.33	6.87	7.79	9.01	10.44	12.02	13.64	15.23	16.68	17.90
	5		7.68	7.35	7.59	8.31	9.43	10.87	12.53	14.34	16.21	18.04	19.73	21.18
	6		7.92	7.63	7.91	8.69	9.88	11.39	13.15	15.07	17.06	19.02	20.87	22.48
	7		8.73	8.57	9.03	10.05	11.53	13.38	15.52	17.86	20.30	22.75	25.12	27.27
TR6	3	65	4.15	3.55	3.43	3.71	4.32	5.18	6.23	7.39	8.59	9.76	10.81	11.68
	4		5.40	4.81	4.78	5.21	6.04	7.19	8.57	10.10	11.70	13.29	14.78	16.09
	5		6.04	5.57	5.67	6.27	7.28	8.62	10.20	11.96	13.79	15.61	17.34	18.88
	6		6.16	5.70	5.83	6.47	7.54	8.95	10.62	12.47	14.41	16.36	18.23	19.93
	7		6.49	6.12	6.40	7.25	8.57	10.28	12.30	14.54	16.91	19.33	21.71	23.94

Note: Insufficient subcooling can produce flash gas.

Correction for subcooling Δt_{sub}

The evaporator capacity used must be corrected if subcooling deviates from 4K.

The corrected capacity can be obtained by multiplying the evaporator capacity by the correction factor given below.

Capacity correction factor based on Subcooling ' f_{sub} ' Δt_{sub}

Subcooling [K]	2	4	10	15	20	25	30	35	40	45	50
Correction factor	0.98	1.00	1.07	1.13	1.19	1.24	1.31	1.36	1.42	1.48	1.53

Capacity correction factor based on Distributer pressure drop f_p *)

Evaporating [°C]		-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	0.97	0.97	0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.95	0.94	0.93
	1.5	0.96	0.96	0.96	0.95	0.95	0.95	0.95	0.94	0.93	0.93	0.91	0.89
	2	0.94	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.91	0.90	0.88	0.85

*) calculated at 32 °C condensing temperature

Sizing

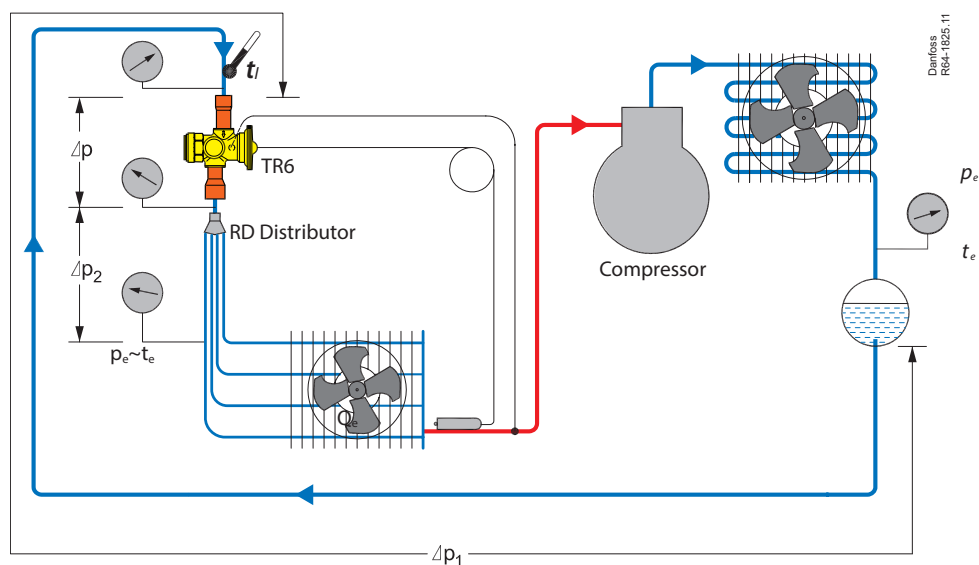


Fig. 9

Example:

Refrigerant	R410A	The corrected evaporator capacity then becomes
Evaporating temperature	$t_e = 45\text{ }^\circ\text{F}$	$4.0 \times 1.02 = 4.08\text{ TR}$
Condensing temperature	$t_c = 110\text{ }^\circ\text{F}$	As the selected valve must be equal to or slightly
Liquid line pressure drop in liquid line, drier and distributor system	$\Delta p_2 + \Delta p_1 = 35\text{ psi}$	larger than the corrected evaporator capacity
Pressure drop in valve	$\Delta p = 368 - 131 - 35 = 202\text{ psi}$	of 4.08 TR, the TR6 with orifice 4 would be a
Subcooling	$\Delta t_{sub} = t_c - t_l = 10\text{ }^\circ\text{F}$	suitable choice. Reference table below for rated
Evaporator capacity	$= 4.0\text{ TR}$	capacities.
Correction factor from table	$= 1.02$	

US units

Capacity in TR for MAH - 10 - 15°C / -15 - 60°F, static superheat SS

R410A

Type	Orifice no.	Pressure drop across valve Δ psi								Pressure drop across valve Δ psi							
		50	75	100	125	150	175	200	225	50	75	100	125	150	175	200	225
Evaporating temperature 0 °F										Evaporating temperature 20 °F							
TR6	3	1.38	1.64	1.81	1.93	2.00	2.03	2.05	2.04	1.92	2.24	2.44	2.56	2.64	2.68	2.69	2.69
	4	2.07	2.44	2.68	2.83	2.92	2.97	2.98	2.96	2.82	3.26	3.53	3.70	3.79	3.84	3.85	3.83
	5	2.58	3.02	3.30	3.48	3.58	3.63	3.64	3.62	3.45	3.98	4.30	4.49	4.60	4.65	4.65	4.62
	6	2.77	3.22	3.52	3.71	3.81	3.86	3.86	3.83	3.69	4.24	4.58	4.78	4.89	4.93	4.93	4.89
	7	3.41	3.96	4.30	4.51	4.62	4.66	4.65	4.61	4.53	5.19	5.59	5.81	5.93	5.97	5.95	5.89
Evaporating temperature 40 °F										Evaporating temperature 50 °F							
TR6	3	2.43	2.81	3.05	3.19	3.28	3.33	3.35	3.34	2.60	3.02	3.28	3.44	3.53	3.59	3.61	3.61
	4	3.50	4.03	4.36	4.55	4.66	4.71	4.73	4.71	3.74	4.32	4.68	4.89	5.01	5.07	5.09	5.07
	5	4.23	4.86	5.24	5.47	5.59	5.65	5.65	5.62	4.49	5.19	5.61	5.86	5.99	6.06	6.07	6.04
	6	4.52	5.19	5.59	5.82	5.95	6.00	6.00	5.96	4.82	5.56	6.00	6.25	6.39	6.45	6.46	6.42
	7	5.56	6.37	6.84	7.11	7.24	7.29	7.28	7.21	5.95	6.85	7.37	7.66	7.81	7.87	7.86	7.80

US units

Capacity in TR for MAH - 10 - 15 °C / -15 - 60 °F, static superheat SS

R22

Type	Orifice no.	Pressure drop across valve Δ psi								Pressure drop across valve Δ psi							
		50	75	100	125	150	175	200	225	50	75	100	125	150	175	200	225
Evaporating temperature 0 °F										Evaporating temperature 20 °F							
TR6	3	1.48	1.63	1.72	1.77	1.80	1.81	1.81	1.79	1.99	2.21	2.32	2.39	2.42	2.43	2.41	2.39
	4	2.17	2.38	2.50	2.56	2.59	2.59	2.57	2.53	2.88	3.17	3.31	3.39	3.41	3.41	3.38	3.33
	5	2.67	2.91	3.05	3.11	3.14	3.13	3.10	3.05	3.49	3.83	3.99	4.07	4.10	4.08	4.03	3.97
	6	2.85	3.11	3.24	3.30	3.32	3.30	3.26	3.21	3.72	4.07	4.24	4.32	4.33	4.31	4.25	4.18
	7	3.49	3.79	3.93	3.98	3.98	3.94	3.87	3.79	4.55	4.95	5.14	5.21	5.21	5.16	5.08	4.97
Evaporating temperature 40 °F										Evaporating temperature 50 °F							
TR6	3	2.61	3.01	3.27	3.36	3.35	3.32	3.28	3.22	2.56	2.96	3.24	3.41	3.54	3.63	3.69	3.72
	4	3.78	4.36	4.51	4.55	4.54	4.49	4.43	4.34	3.70	4.28	4.68	4.94	5.12	5.24	5.12	4.99
	5	4.55	5.13	5.28	5.33	5.33	5.27	5.19	5.09	4.45	5.16	5.64	5.95	6.14	6.02	5.89	5.75
	6	4.91	5.42	5.59	5.64	5.63	5.56	5.47	5.36	4.81	5.57	6.09	6.42	6.45	6.33	6.20	6.05
	7	6.00	6.53	6.73	6.79	6.76	6.67	6.55	6.40	6.07	7.03	7.68	7.81	7.72	7.58	7.42	7.23

Dimensions and weights

Fixed setting

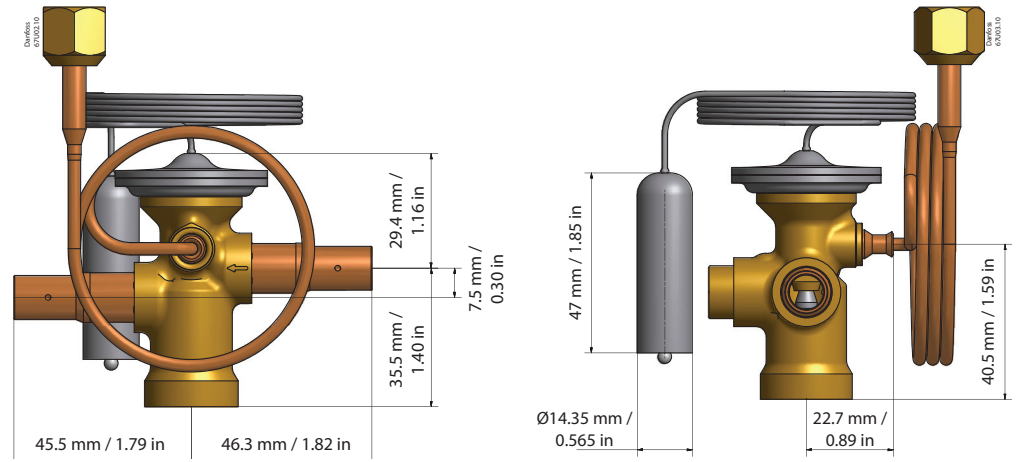


Fig. 10

Weight
0.305 kg
0.672 lbs

Adjustable setting

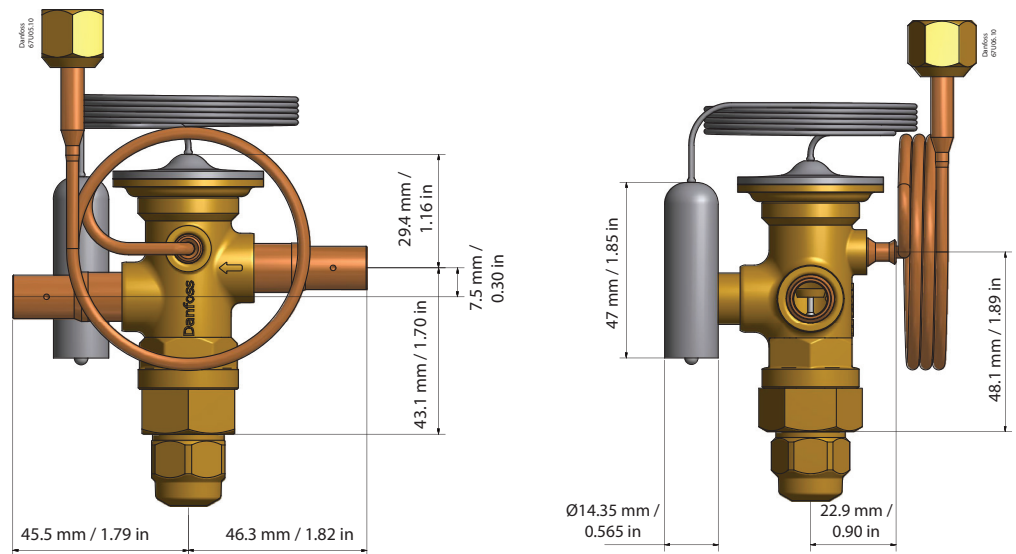


Fig. 11

Weight
0.361 kg
0.795 lbs