ENGINEERING TOMORROW

Data Sheet

Thermostatic expansion valve Type **TU** and **TC**

Thermostatic expansion valves maintain a constant superheat level at the evaporator outlet

The thermostatic expansion valves TUA/TUAE, TCAE with exchangeable orifice, TUB/TUBE/ TCBE with fixed orifice and TUC/TUCE/TCCE with fixed orifice and fixed superheat setting, are made of stainless steel and therefore especially well suited to refrigeration systems in the food industry and where aggressive environments exist. These thermostatic expansion valves have been developed and designed especially for easy and quick soldering into hermetic refrigeration systems.

The valves are offered in the following rated capacities

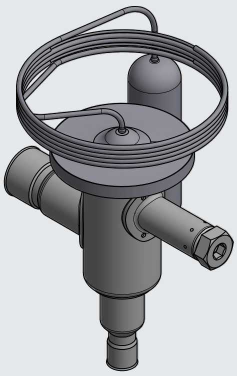
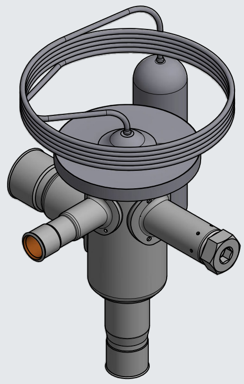
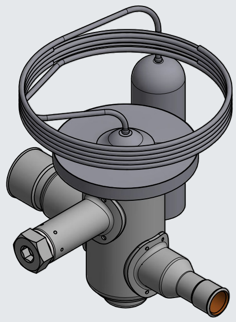
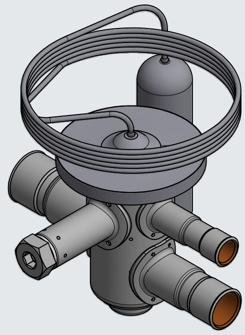
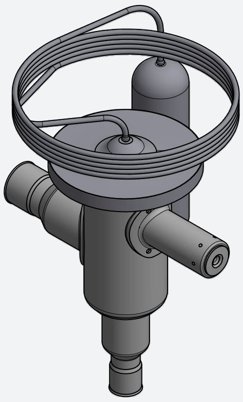
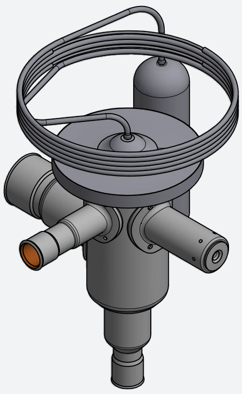
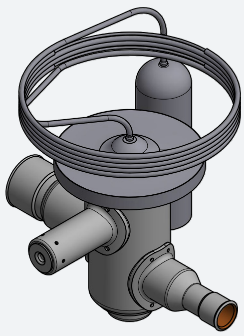
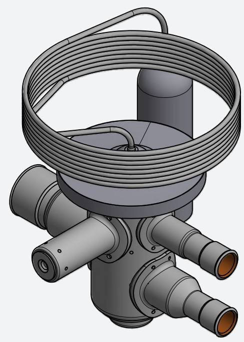
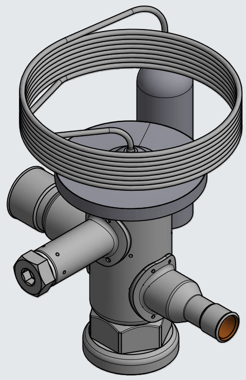
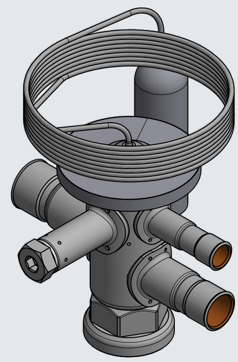
1. From 0.5 kW / 0.14 TR, up to 17.0 kW / 4.8 TR R407C (TU)
2. From 19.0 kW / 5.4 TR up to 28.5 kW / 8.1 TR R407C (TC)

Features

- **Bi-metal connections**
  1. Fast and easy brazing process – no wet wrap needed.
  2. Braze alloys with as little as 5% Ag can be used.
- **Compact, lightweight design**
  1. Flexible and easy integration in any system.
- **Stainless steel**
  1. High body strength.
  2. High corrosion resistance.
  3. High vibration resistance
- **Laser-welded power element**
  1. Ensures diaphragm´s structural integrity and lengthens life.
- **Stainless steel capillary tube**
  1. Flexible lightweight capillary tube, tolerates more bending for trouble-free installation and longer life.
  2. Greater resistance to vibration during operation because of low weight.
- **Laser engraving**
  1. Durable positive valve identification; no label that peels off over time.
  2. Customer-specific engraving available on request.
- **Fully hermetic brazed and laser-welded design**
  1. Hermetic valve in accordance with EU F-gas Regulation EU 517/2014.
  2. No external leakage which saves costs on maintenance and refrigerant loss.
  3. Protecting the environment and climate
- **Manufactured according to IATF16949**
  1. Quality and reliability that are second to none.

Portfolio overview

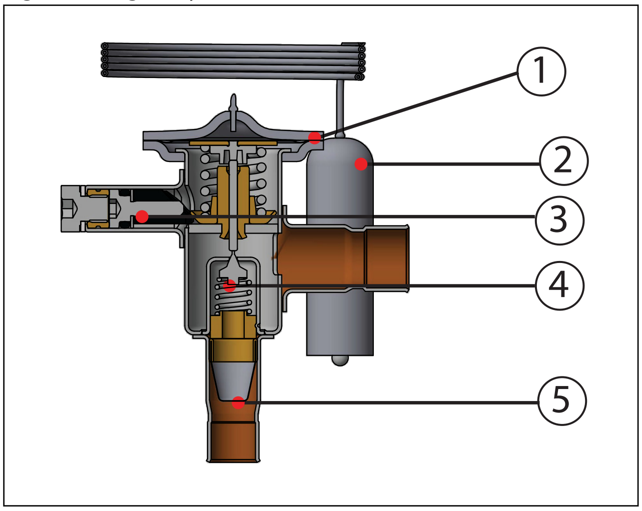
Table 1: Overview of available versions

Type	Angleway		Straightway	
	Internal pressure equalization	External pressure equalization	Internal pressure equalization	External pressure equalization
TUB/TUBE/TCBE Adjustable superheat				
TUC/TUCE/TCCE Non-adjustable superheat				
TUA/TUAE/TCAE Adjustable superheat and exchangeable orifice				

Functions

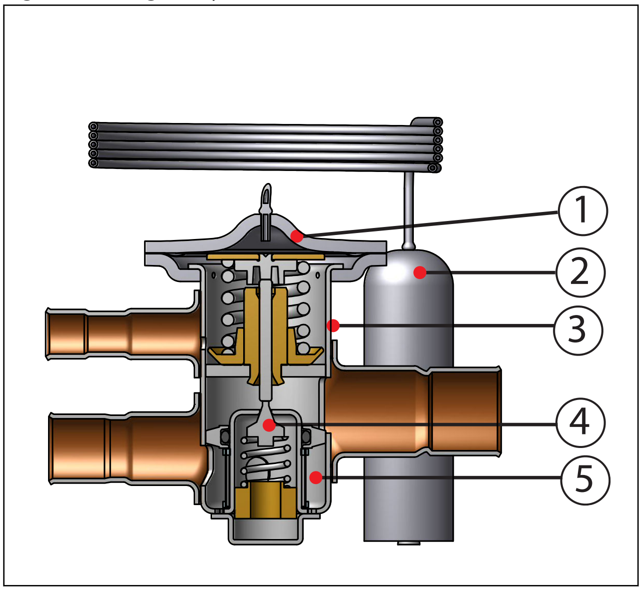
Thermostatic expansion valves maintain a constant superheat level at the evaporator outlet. It does this by controlling the amount of refrigerant that is injected into the evaporator, taking both the evaporator load and ambient temperatures into consideration. This both optimizes the efficiency of the refrigeration system and prevents liquid refrigerant from entering the suction line, possibly causing damage to the compressor. Particularly when compared to systems that use capillary tubes, the thermostatic expansion valve will offer a significant energy saving.

Figure 1: Angleway



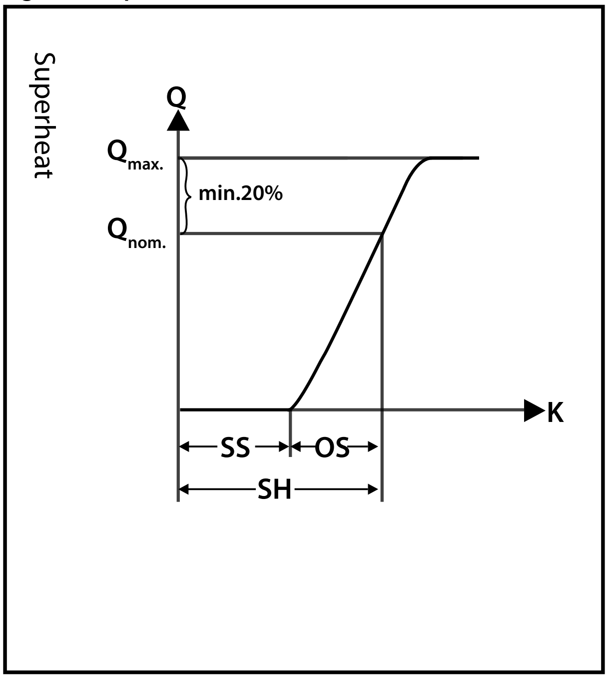
1	Thermostatic element with diaphragm
2	Bulb with capillary tube
3	Setting spindle for adjustment of static superheat SS
4	Orifice assembly
5	Filter

Figure 2: Straightway



1	Thermostatic element with diaphragm
2	Bulb with capillary tube
3	Setting spindle for adjustment of static superheat SS (behind valve, not visible)
4	Orifice assembly
5	Filter

Figure 3: Superheat



SS	Static superheat
OS	Opening superheat
SH = SS + OS	Total superheat
Qnom	Rated capacity
Qmax	Maximum capacity

Static superheat (SS) can be adjusted by turning the setting spindle (3), (TUB/TUBE/TCBE) Static Superheat cannot be adjusted on TUC/TUCE/TCCE.

The superheat setting is 4K for all standard valves. The opening superheat is 4K, measured from when the valve begins to open to when the valve gives its rated capacity (Qnom).

Table 2: Example

Features	Value
Static superheat	SS = 4K
Opening Superheat	OS = 4K
Total superheat	SH = 4 + 4 = 8K

Operation

Superheat

Superheat is the controlling parameter of a TXV. Superheat, measured at the evaporator outlet, is defined as the number of degrees the refrigerant vapor is heated above its saturation temperature (boiling point), at a specific pressure. Liquid entering the compressor causes serious damage. To prevent this, the TXV will maintain a certain minimum superheat. When discussing superheat in relation to TXV valve operation, the following terms are used:

Static superheat

Static superheat, SS is the superheat above which the valve will begin to open.

Opening superheat

Opening superheat, OS, is the amount of superheat above static superheat, SS, required to produce a given valve capacity.

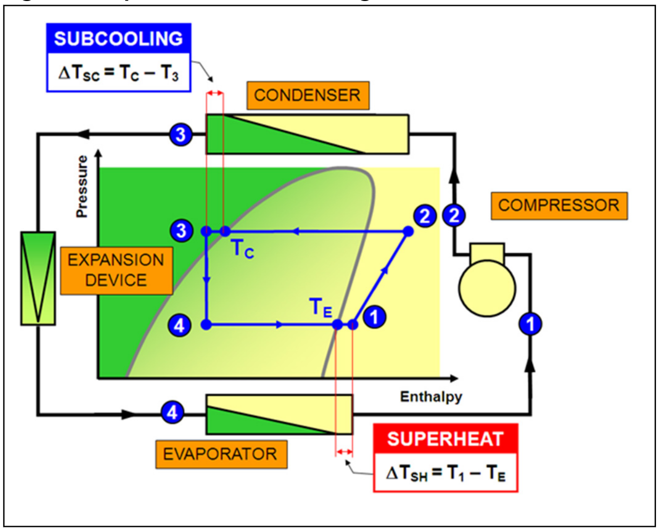
Total superheat

Total superheat is static superheat plus opening superheat, and is what is measured at the evaporator outlet.

Subcooling

Subcooling, measured at the condenser outlet, is defined as the number of degrees a liquid refrigerant is cooled below its saturation temperature (boiling point), at a specific pressure. Subcooling is necessary to prevent flash gas forming in the liquid line. Depending on system design, various levels of subcooling may be needed. In most cases, 2 to 5K of subcooling is adequate. If flash gas forms in the liquid line, the capacity of the TXV will be greatly reduced.

Figure 4: Superheat and Subcooling



TU stainless steel technology

Figure 5: Type TU and TC

Benefits of stainless steel

The fact that the TU is an all-stainless steel expansion valve offers a number of benefits:

- Stainless steel is far more corrosion- resistant than traditional valve materials.
- Stainless steel valves require no surface treatment.
- Stainless steel capillary tubes are three times stronger and twenty times more resistant to vibration than copper capillary tubes.
- Stainless steel has a greater strength- to-weight ratio, making TU valves lighter and more compact.
- Stainless steel diaphragms have greater strength and corrosion resistance for a longer life.

Danfoss precision port design

The TU thermostatic expansion valve introduces precision port design, incorporating four features that ensure superior repeatable performance over an extended valve life.

- Laser welding of the power element preserves the structural uniformity of the diaphragm, assuring consistent operation.
- A precision-machined pushrod and bushing make a practically frictionless seal with no need for a packing gland.
- The free-floating pushrod is self-aligning and eliminates binding.
- The precision-machined cone and orifice accurately meter refrigerant under all operating conditions.

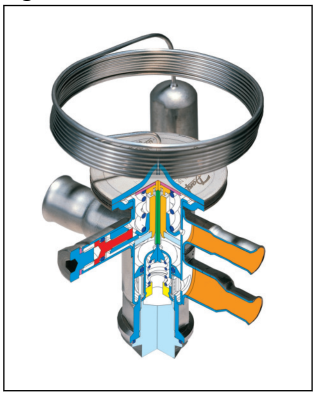
High quality

The TU is manufactured on fully automated, process-monitored production lines. Cellularized computer-monitored technology ensures uniform high quality and that, when delivered, every valve meets Danfoss quality standards and customer specifications. Cellularized production also makes possible simultaneous production of large and small quantities of standard and custom version valves.

Advanced technology - fast and easy installation

The TU stainless steel thermostatic expansion valve has significant installation advantages because it is a valve designed specifically for soldering. The TU can be installed in less than half the time required for traditional brass-bodied valves. The valve connections are made of copper and stainless steel bi-metal which makes installation easy, reliable, and fast.

Figure 6: TUAE



No need for a wet cloth

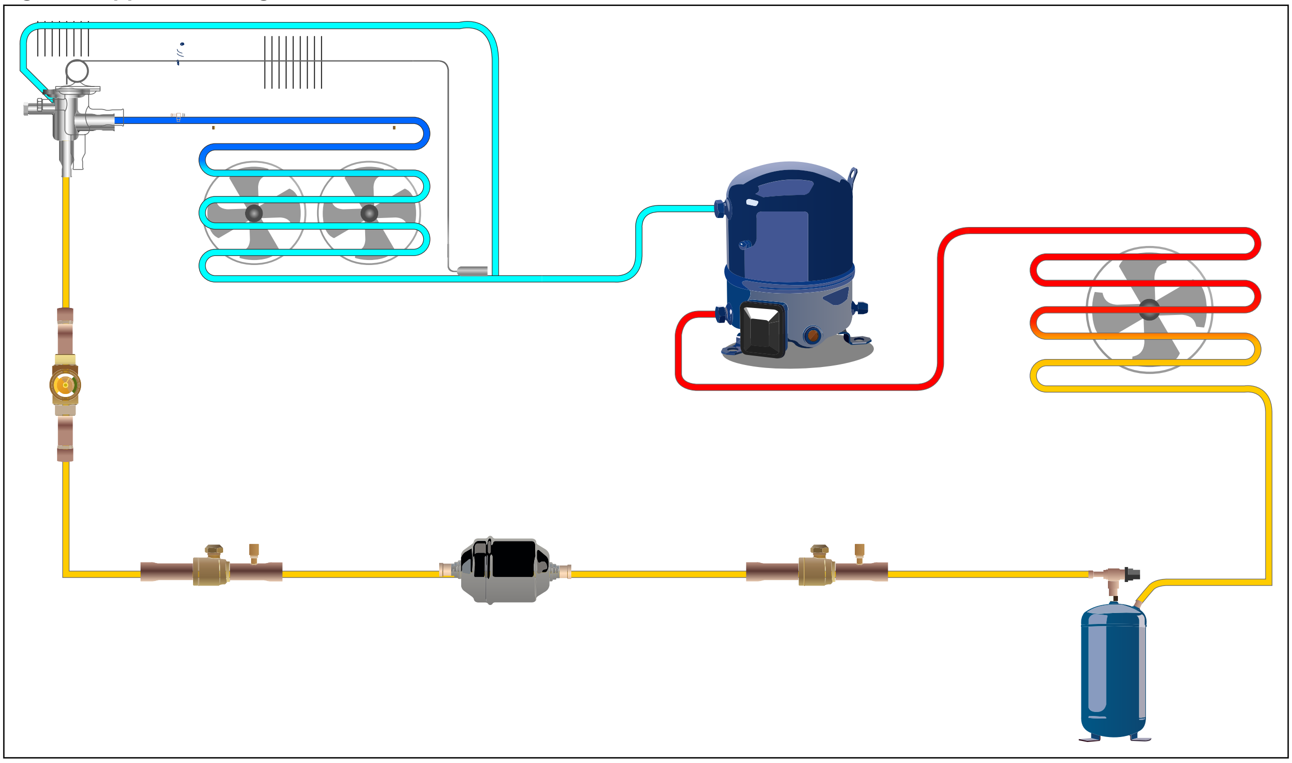
Bi-metal has a very low thermal conductivity, actually only 10% that of copper, so heat applied during soldering remains largely in the copper layer of the connection tube, instead of being conducted to the valve body. External cooling is unnecessary. The result is less energy consumption and better solder quality. At the same time, the diaphragm's structural integrity is preserved.

Applications

Thermostatic expansion valves regulate the amount of refrigerant that is injected into the evaporator. It does this to keep a constant superheat level at the outlet of the evaporator, thereby preventing liquid refrigerant from entering the suction line and possibly causing damage to the compressor.

Typical applications for TU and TC valves are:
- Conventional refrigeration systems
- Heat pump systems
- Air conditioning systems
- Specialty refrigeration appliances
- Liquid chillers
- Ice machines
- Transport refrigeration

Figure 7: Application Diagram

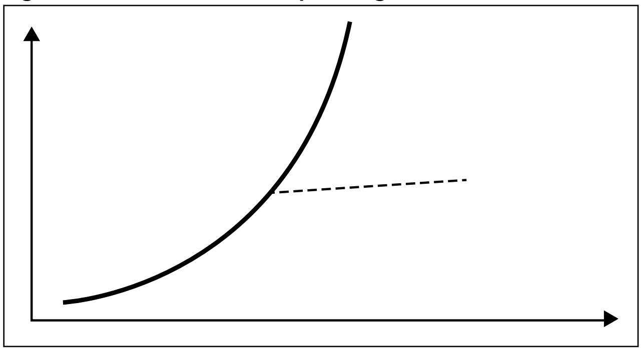


Available charges

Universal charge
This is the standard charge, used in most applications. It is characterized by a very large operational evaporating temperature range, with only small variations in static superheat across the temperature range. It is available in two temperature ranges. One for normal (-40°C to +10°C / -40°F to 50°F) and one for low (-60 to -25°C / -76°F to -13°F) temperature applications.

MOP charge (MOP = Maximum Operating Pressure)
The MOP charge is used to protect the compressor motor against overload during start-up. A valve with MOP charge will throttle liquid injection into the evaporator and thus prevent the evaporating pressure from rising above the specified MOP point. Above the MOP point, any increase in sensor temperature results in only minimal additional opening of the expansion valve. A number of different MOP points are available

Figure 8: MOP = Maximum Operating Pressure



NOTE:
The MOP point will change if the factory superheat setting of the expansion valve is changed. If the setting is reduced, the MOP point will go up and vice versa.

MAH charge
The Danfoss Marinite Anti-Hunt (MAH) charge can be used in dynamic systems, often A/C systems. Here it reduces valve hunting during evaporator load changes, thereby helping to maintain stable system superheat and improve system performance.

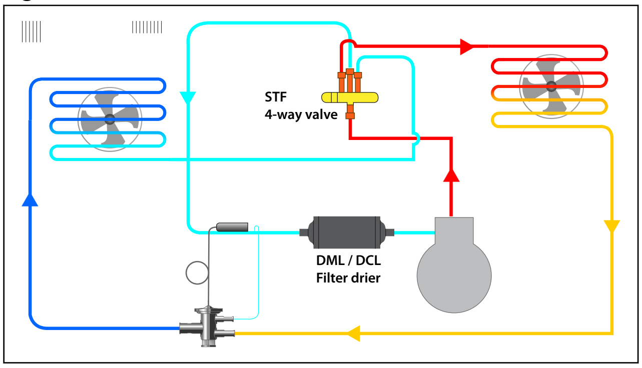
F-charge
The F-charge is designed for refrigeration systems where low total superheat is required. Valves with this charge are delivered with an optimized low static superheat setting which allows for installation with no or minimal field adjustment. The F-charge also includes the Danfoss MAH function, as described above.

Ice charge
The ice charge is designed with an optimized static superheat characteristic, which allows for optimal function, particularly in Ice cubers, where low superheat is required in order to fully utilize the entire evaporator coil.

Milk charge
The milk charge is designed for use in milk cooling tanks where a limitation of the suction pressure is required, but where an MOP valve would suffer from charge migration.

Bi-flow
Bi-flow function is sometimes used in systems with 4-way reversing valves where hot gas defrosts, or heating cycles are required. Only externally equalized TU valves with orifices X to 8 and externally equalized TC valves with orifices 1 and 2 – without MOP charges, can be used in bi-flow mode. When used in reverse direction, the rated valve capacity will be reduced by up to 15%. Valves for bi-flow operation should be installed so that the normal refrigerant flow is towards the main evaporator

Figure 9: Bi-flow



Sizing example

How to select a TU or TC thermostatic expansion valve.
Example: Refrigerant: R134a
Cooling capacity: 3KW
Evaporating temperature: -10 °C

Condensing temperature: 35 °C
Total (useful) superheat: 8K
Subcooling: 6K

This guide will help select a thermostatic expansion valve based on the above system parameters using the Coolselector tool.

Step 1

Open the Coolselector tool and select thermostatic expansion valve. Coolselector can be downloaded from https://www.danfoss.com/en/service-and-support/downloads/dcs/coolselector-2/ or used online on http://coolselectoronline.danfoss.com

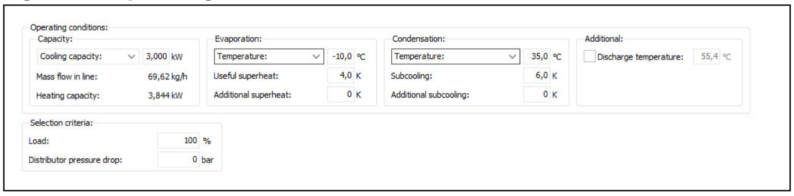
Step 2

Select TU/TC from product families and the refrigerant. For this example: R134a.

Step 3

Fill in the operating conditions at the top as per the system parameters stated in the example.

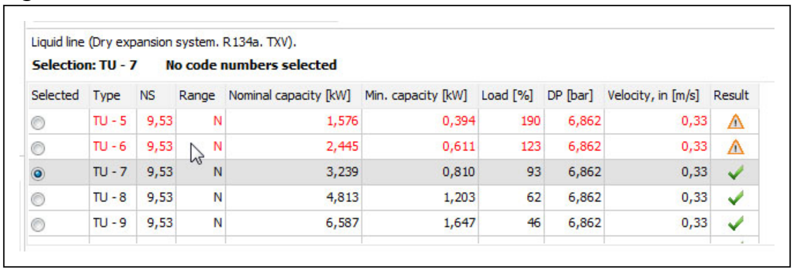
Figure 10: Operating conditions



Step 4

Now select the appropriate orifice size from the list provided by the tool. For this example, the tool suggests TU-7, which is the valve size closest to 100% load.

Figure 11: Coolselector2 Selection TU



Liquid line (Dry expansion system. R134a. TXV).

Selection: TU - 7 **No code numbers selected**

Selected	Type	NS	Range	Nominal capacity [kW]	Min. capacity [kW]	Load [%]	DP [bar]	Velocity, in [m/s]	Result
○	TU - 5	9,53	N	1,576	0,394	190	6,862	0,33	⚠
○	TU - 6	9,53	N	2,445	0,611	123	6,862	0,33	⚠
●	TU - 7	9,53	N	3,239	0,810	93	6,862	0,33	✓
○	TU - 8	9,53	N	4,813	1,203	62	6,862	0,33	✓
○	TU - 9	9,53	N	6,587	1,647	46	6,862	0,33	✓

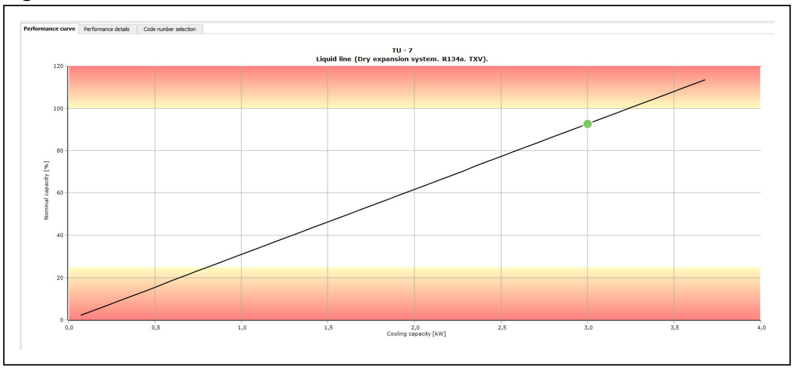
: 1. Always remember to include sub cooling in the selection parameters. It is important for TXV selection. When all other parameters remain constant, an increase in sub cooling will increase the capacity of the thermostatic expansion valve. Insufficient sub cooling can create flash gas before the valve and high sub cooling can create lesser flash gas after the valve.

: 2. Coolselector determines pressure drop across the valve based on the condensing and evaporating temperatures. If the system is using a distributor, has valves in the liquid line or height variations between evaporator and condenser, the pressure drops from these components must be summarized, and given as input to the tool, using the "Distributor pressure drop" field. The capacity of the thermostatic expansion valve is influenced by these pressure drops.

Step 5

The code number for the valve can be selected based on additional parameters like specific charge, equalization, connector type, connection size etc. at the code number selection tab. The performance details will also be shown in detail under the Performance details tab.

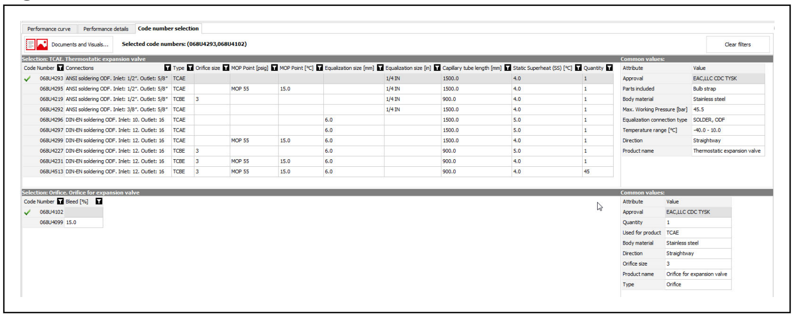
Figure 12: Coolselector2 Performance curve



Step 6

For list of code numbers, click the “Code number selection” tab.

Figure 13: Coolselector2 code number selection



Performance curve | Performance details | Code number selection

Documents and Visuals...

Selected code numbers: (068U4293,068U4102)

Clear filters

Selection: TCAE. Thermostatic expansion valve

Code Number	Connections	Type	Orifice size	MOP Point [psig]	MOP Point [°C]	Equalization size [mm]	Equalization size [in]	Capillary tube length [mm]	Static Superheat (SS) [°C]	Quantity
✓ 068U4293	ANSI soldering ODF. Inlet: 1/2”. Outlet: 5/8”	TCAE					1/4 IN	1500.0	4.0	1
068U4295	ANSI soldering ODF. Inlet: 1/2”. Outlet: 5/8”	TCAE		MOP 55	15.0		1/4 IN	1500.0	4.0	1
068U4219	ANSI soldering ODF. Inlet: 1/2”. Outlet: 5/8”	TCBE	3				1/4 IN	900.0	4.0	1
068U4292	ANSI soldering ODF. Inlet: 3/8”. Outlet: 5/8”	TCAE					1/4 IN	1500.0	4.0	1
068U4296	DIN-EN soldering ODF. Inlet: 10. Outlet: 16	TCAE				6.0		1500.0	5.0	1
068U4297	DIN-EN soldering ODF. Inlet: 12. Outlet: 16	TCAE				6.0		1500.0	5.0	1
068U4299	DIN-EN soldering ODF. Inlet: 12. Outlet: 16	TCAE		MOP 55	15.0	6.0		1500.0	4.0	1
068U4227	DIN-EN soldering ODF. Inlet: 12. Outlet: 16	TCBE	3			6.0		900.0	5.0	1
068U4231	DIN-EN soldering ODF. Inlet: 12. Outlet: 16	TCBE	3	MOP 55	15.0	6.0		900.0	4.0	1
068U4513	DIN-EN soldering ODF. Inlet: 12. Outlet: 16	TCBE	3	MOP 55	15.0	6.0		900.0	4.0	45

Common values:

Attribute	Value
Approval	EAC,LLC CDC TYSK
Parts included	Bulb strap
Body material	Stainless steel
Max. Working Pressure [bar]	45.5
Equalization connection type	SOLDER, ODF
Temperature range [°C]	-40.0 - 10.0
Direction	Straightway
Product name	Thermostatic expansion valve

Selection: Orifice. Orifice for expansion valve

Code Number	Bleed [%]
✓ 068U4102	
068U4099	15.0

Common values:

Attribute	Value
Approval	EAC,LLC CDC TYSK
Quantity	1
Used for product	TCAE
Body material	Stainless steel
Direction	Straightway
Orifice size	3
Product name	Orifice for expansion valve
Type	Orifice

Product specification

Technical data

Table 3: Technical data

Types	Description
Charges available for following refrigerants	R290, R134a, R513A, R404A, R407A, R407C, R407F, R448A, R449A, R507, R410A, R452A, R600a, R454C, R455A, R1234yf, R1234ze(E), R454A TU and TC valves are continually evaluated for use with newer refrigerants. For further information please contact Danfoss.
Ignition assessment	Positive. Zone 2 (Category 3, IIA) TUA/TUAE and TCAE only approved for A1 refrig-erants
Complies with PED	Yes, fluid group 2, Article 4 paragraph 3, DN < 25 (inner bore)
Standard charge ranges with MOP	-40 – +10 °C / -40 – +50 °F MOP +15 °C / + 60 °F -40 – -5 °C / -40 – +25 °F MOP 0 °C / +32 °F -60 – -25 °C / -75 – -15 °F MOP -20 °C / -4 °F (not for R134a and R513A) For other ranges, please contact Danfoss.
Max. working pressure PS/MWP	TU (non R410A): 34 bar(g) / 500 psi(g) TU (R410A): 45.5 bar(g) / 660 psi(g) TC (all): 45.5 bar(g) / 660 psi(g)
Connection type	Solder, ODF
Connection sizes, Angleway	Inlet: ¼ in, 3/8 in, 6 mm, 10 mm Outlet: 3/8 in, ½ in, 5/8 in, 10 mm, 12 mm, 16 mm
Connection sizes, Straightway	Inlet: ¼ in, 3/8 in, ½ in, 6 mm, 10 mm, 12 mm Outlet: 3/8 in, ½ in, 5/8 in, 10 mm, 12 mm, 16 mm
Connection sizes, [External equalization]	¼ in, 6 mm
Orifices, TUB(E), TUC(E)	X, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
Orifices TUA(E)	1, 2, 3, 4, 5, 6, 7, 8, 9
Orifices TCAE, TCBE, TCCE	1, 2, 3
Bleed	15% (of nominal capacity) available. For 30%, contact Danfoss.
Biflow operation	With flow in the opposite direction, the rated capacity is reduced by up to 15%.
Biflow not recommended in	TU with orifice 9 TC with orifice 3 All valves with MOP charges
Biflow not possible in	All valves with internal equalization
Environmental transport/storage temperature and humidity	Max. +65 °C / +150 °F, Humidity: <100% RH
Max. body temperature (mounting/operation)	+120°C / +250°F (short lived peak: +150°C / +300°F)
Min. body temperature	See Evaporating temperature range low end.
Max. bulb temperature (operation)	Standard valves: +100°C / +212°F Valves with MOP charges: +150°C / +300°F
Static superheat (SS)	Standard 4K / 7.2°F Customer-specific settings and non-adjustable valves are available. Please contact Danfoss.
Material of product	Body: Stainless steel Capillary tube: Stainless steel Connector: Bimetal (stainless steel and copper)
Standard capillary tube lengths	TU: 0.8 m / 31.5 in TC: 0.9 m / 35 in
Special capillary tube lengths available	0.3 m / 11.8 in, 0.45 m / 18.0 in and 1.5 m / 59 in
Inlet strainer	TU orifice X - 4 = 100 mesh / All other TU and TC = 50 mesh / TU and TC angle = 80 mesh
Serviceable	No
Corrosion	Passed salt spray test (EN ISO 9227 NSS) and ASTM prohesion (ASTM G85) test. Both 2000 hours

Capacity tables

Table 4: Type TU and TC

Type	Orifice	R410		R134		R407		R404A/R507		R290		R22	
		[kw]	[TR]	[kw]	[TR]	[kw]	[TR]	[kw]	[TR]	[kw]	[TR]	[kw]	[TR]
TU	X	0.74	0.21	0.32	0.09	0.5	0.15	0.37	0.11	0.49	0.14	0.48	0.13
TU	0	0.99	0.28	0.42	0.12	0.66	0.19	0.49	0.14	0.64	0.18	0.63	0.18
TU	1	1.3	0.38	0.61	0.17	0.94	0.27	0.71	0.21	0.94	0.27	0.92	0.26
TU	1	1.7	0.49	0.72	0.2	1.1	0.33	0.87	0.26	1.1	0.32	1.1	0.31
TU	3	2.1	0.61	0.95	0.27	1.5	0.42	1.1	0.33	1.5	0.41	1.4	0.4

Type	Orifice	R410		R134		R407		R404A/R507		R290		R22	
		[kw]	[TR]	[kw]	[TR]	[kw]	[TR]	[kw]	[TR]	[kw]	[TR]	[kw]	[TR]
TU	4	4.1	1.2	1.6	0.45	2.5	0.74	2	0.59	2.6	0.72	2.5	0.7
TU	5	5.3	1.5	2.1	0.6	3.4	0.98	2.7	0.79	3.4	0.96	3.4	0.93
TU	6	8.5	2.4	3.4	0.94	5.3	1.5	4.2	1.2	5.3	1.5	5.3	1.5
TU	7	11.2	3.2	4.4	1.3	7	2	5.6	1.6	7	2	7	1.9
TU	8	15.8	4.5	6.5	1.8	10.2	3	8	2.4	10.2	2.9	10.1	2.8
TU	9	23.1	6.6	9	2.5	14	4.1	11.3	3.4	14.3	4.1	14.1	4
TC	1	21.2	6.1	13	3.7	17.8	5.1	13	3.8	19.1	5.4	18.3	5.1
TC	2	24.5	7	14.9	4.2	20.4	5.9	15.1	4.4	22.2	6.3	21.2	5.9
TC	3	30.6	8.9	18.6	5.2	25.2	7.3	18.9	5.6	27.9	7.9	26.7	7.4

The rated capacity is based on:
Evaporating temperature t_e = 4.4 °C / 40 °F
Liquid teperature t_l = 37 °C / 98 °F
Condensing temperature t_c = 38 °C / 100 °F

Table 5: Type TU and TC

Type	Orifice	R407F		R407A		R448A		R449A		R513A		R452A	
		[kw]	[TR]	[kw]	[TR]	[kw]	[TR]	[kw]	[TR]	[kw]	[TR]	[kw]	[TR]
TU	X	0.58	0.17	0.49	0.14	0.48	0.14	0.47	0.14	0.28	0.08	0.28	0.08
TU	0	0.76	0.22	0.65	0.19	0.63	0.18	0.61	0.18	0.36	0.1	0.31	0.09
TU	1	1.1	0.32	0.94	0.28	0.93	0.27	0.9	0.26	0.53	0.15	0.46	0.13
TU	1	1.4	0.39	1.1	0.33	1.1	0.33	1.1	0.31	0.62	0.18	0.55	0.16
TU	3	1.7	0.5	1.5	0.43	1.4	0.42	1.4	0.41	0.82	0.23	0.72	0.2
TU	4	3.1	0.91	2.6	0.77	2.5	0.74	2.4	0.71	1.4	0.4	1.3	0.36
TU	5	4.2	1.2	3.5	1	3.4	1	3.2	1	1.8	0.53	1.7	0.48
TU	6	6.5	1.9	5.5	1.6	5.3	1.5	5.1	1.5	2.9	0.83	2.7	0.75
TU	7	8.6	2.5	7.2	2.1	7	2	6.7	2	3.8	1.1	3.5	0.99
TU	8	12.4	3.6	10.5	3.1	10.1	3	9.8	2.9	5.6	1.6	5.1	1.4
TU	9	17.1	5	14.4	4.2	13.9	4.1	13.6	4	7.7	2.2	7.2	2.1
TC	1	20.6	5.9	17.6	5.1	17.6	5.1	16.9	4.9	11.5	3.3	12.6	3.6
TC	2	24	6.9	20.3	5.9	20.3	5.9	19.3	5.6	13.2	3.8	14.5	4.1
TC	3	30.1	8.7	25.2	7.4	25.1	7.4	23.9	7	16.5	4.7	18.1	5.2

The rated capacity is based on:
Evaporating temperature t_e = 4.4 °C / 40 °F
Liquid teperature t_l = 37 °C / 98 °F
Condensing temperature t_c = 38 °C / 100 °F

Table 6: Type TU and TC

Type	Orifice	R454A		R454C		R455A		R1234yf		R1234ze(E)	
		[kW}	[TR]	[kW}	[TR]	[kW}	[TR]	[kW}	[TR]	[kW}	[TR]
TU	X	0.59	0.17	0.46	0.13	0.52	0.15	0.27	0.08	0.20	0.06
TU	0	0.65	0.19	0.50	0.14	0.57	0.16	0.30	0.08	0.21	0.06
TU	1	0.99	0.28	0.76	0.22	0.87	0.25	0.45	0.13	0.32	0.09
TU	2	1.2	0.34	0.91	0.26	1.0	0.30	0.53	0.15	0.37	0.10
TU	3	1.6	0.44	1.2	0.34	1.4	0.38	0.69	0.20	0.49	0.14
TU	4	2.8	0.79	2.0	0.58	2.4	0.67	1.2	0.34	0.80	0.23
TU	5	3.7	1.1	2.7	0.78	3.2	0.90	1.6	0.45	1.1	0.30
TU	6	5.9	1.7	4.3	1.2	4.9	1.4	2.5	0.70	1.7	0.47
TU	7	7.8	2.2	5.6	1.6	6.5	1.9	3.3	0.92	2.2	0.62
TU	8	11.1	3.2	8.2	2.3	9.5	2.7	4.8	1.4	3.3	0.93
TU	9	15.7	4.5	11.2	3.2	12.9	3.7	6.6	1.9	4.4	1.2

The rated capacity is based on:
Evaporating temperature t_e = 4.4 °C / 40 °F
Liquid teperature t_l = 37 °C / 98 °F
Condensing temperature t_c = 38 °C / 100 °F

Design

TU and TC valves are basically identical, except for the larger diaphragm on the TC. The larger diaphragm allows for more travel of the orifice cone, which gives the TC valve more capacity than the TU valve.

TU and TC valves are available in both Straightway and Angleway versions. TUA(E) and TCAE only as straight flow.

Figure 14: Angle flow (fixed orifice)

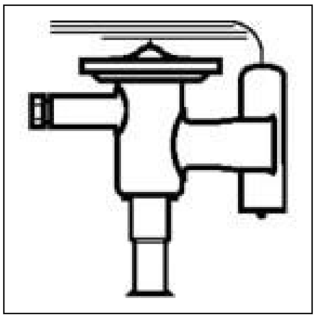


Figure 15: Straight flow (fixed orifice)

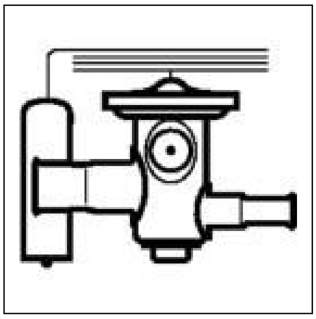


Figure 16: Straight flow (exchangeable orifice)

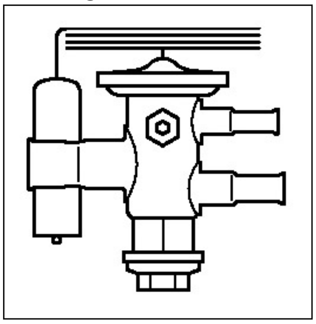


Figure 17: TU Angleway

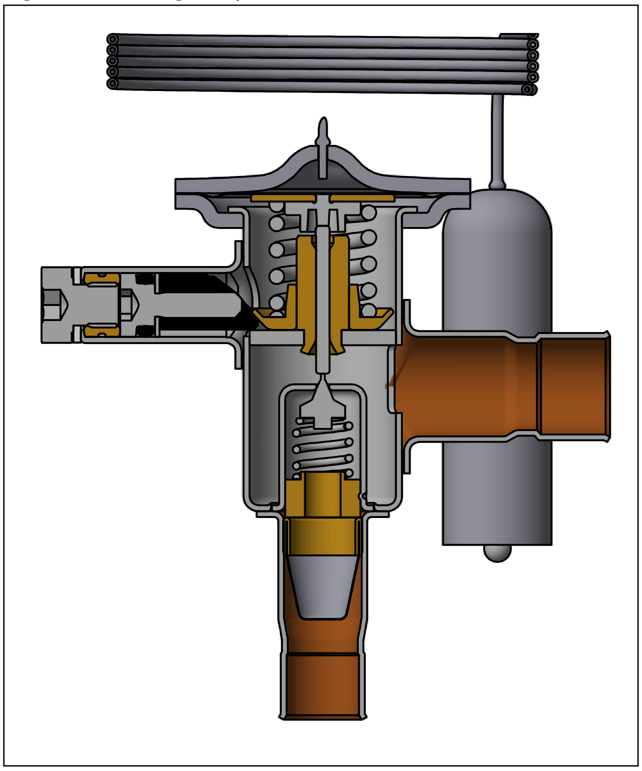


Figure 18: TU Straightway

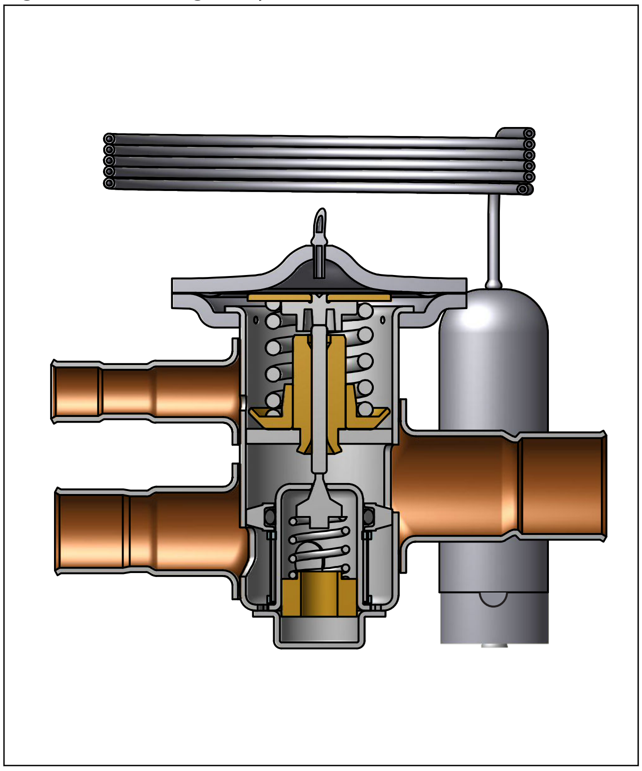


Figure 19: TUA / TUAE (incl. orifice)

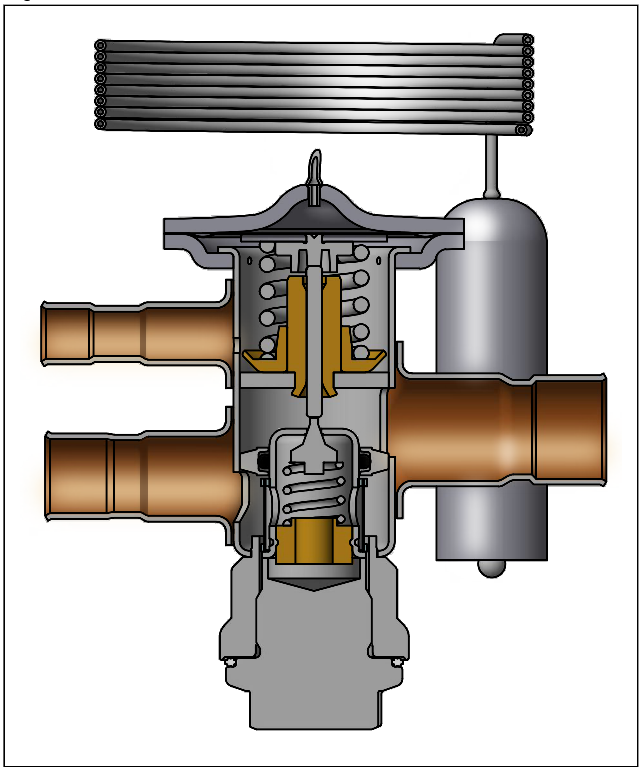


Figure 20: TC Angleway

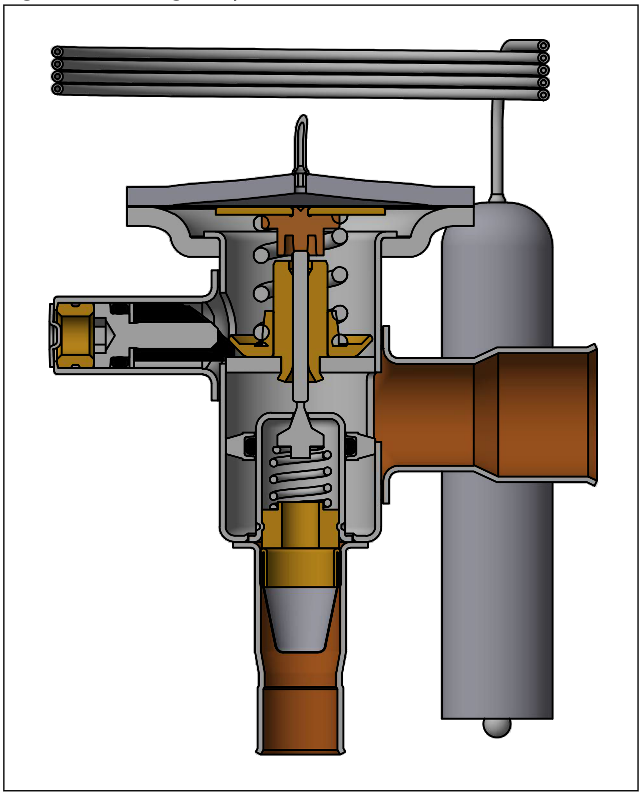


Figure 21: TC Straightway

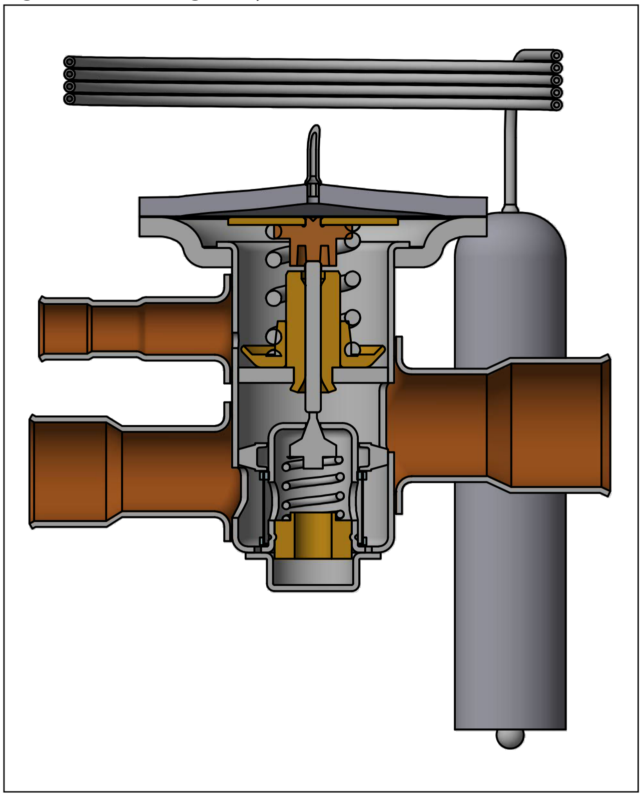
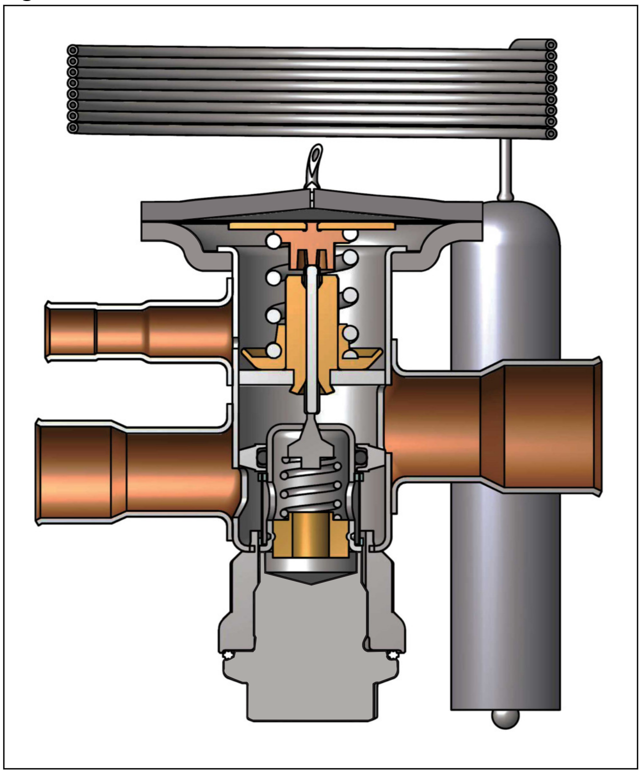


Figure 22: TCAE (incl. orifice)



Dimensions

Figure 23: TUBE and TUCE

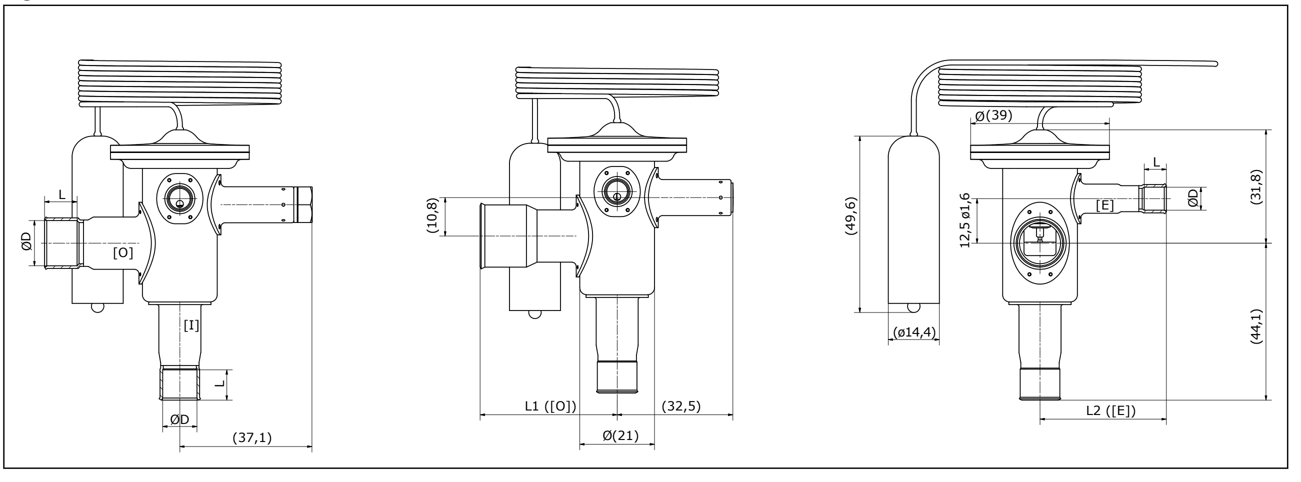


Table 7: Dimensions for TU and TC

Con. / Dim.	Size	[øD]	[øD] tolerance	[L]	[L] tolerance	[L1] ([O])	[L1] tolerance	[L2] ([E]; [I])	[L2] tolerance
Equalization [E]	6 mm	6.00	+0.155 +0.065	7	±1.2	-	-	35.5	±2
	1/4 in	6.35		7	±1.2	-	-		
Inlet [I]	6 mm	6.00		7	±1.2	-	-	-	-
	1/4 in	6.35		7	±1.2	-	-	-	-
	3/8 in	9.52		8	±1.2	-	-	-	-
	10 mm	10.00		9	±1.2	-	-	-	-
	1/2 in	12.70		10	±1.4	-	-	-	-
Outlet [O]	3/8 in	9.52		8	±1.2	38.5	±2	-	-
	12 mm	12.00		10	±1.4			-	-
	1/2 in	12.70		10	±1.4			-	-
	5/8 in	15.88		12	±1.4	41.5	±2	-	-

Figure 24: TUBE and TUCE

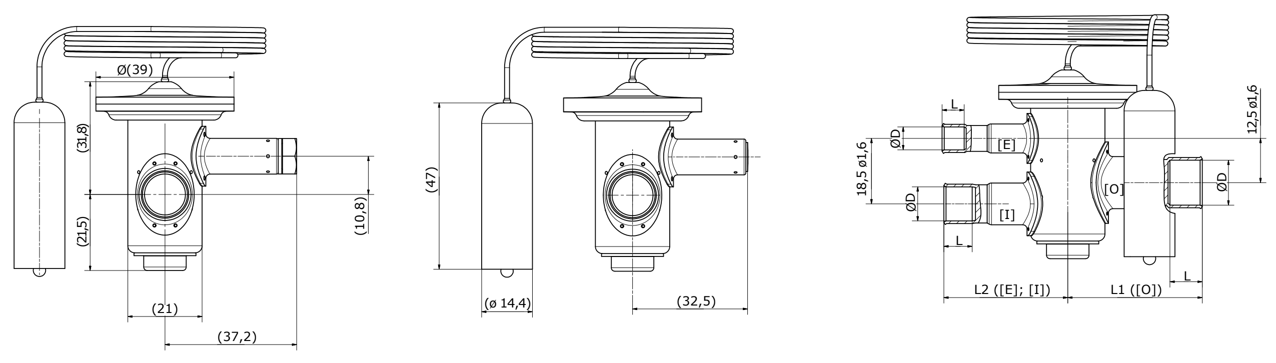


Table 8: Dimensions for TUBE and TUCE

Con. / Dim.	Size	[øD]	[øD] tolerance	[L]	[L] tolerance	[L1] ([O])	[L1] tolerance	[L2] ([E]; [I])	[L2] tolerance
Equalization [E]	6 mm	6.00		7	±1.2	-	-		
	1/4 in	6.35		7	±1.2	-	-		
Inlet [I]	6 mm	6.00		7	±1.2	-	-	35.5	±2
	1/4 in	6.35		7	±1.2	-	-		
	3/8 in	9.52	+0.155 +0.065	8	±1.2	-	-		
	10 mm	10.00		9	±1.2	-	-		
	1/2 in	12.70		10	±1.4	-	-	38.5	±2
Outlet [O]	3/8 in	9.52		8	±1.2			-	-
	12 mm	12.00		10	±1.4	38.5	±2	-	-
	1/2 in	12.70		10	±1.4			-	-
	5/8 in	15.88		12	±1.4	41.5	±2	-	-

Figure 25: TUAE

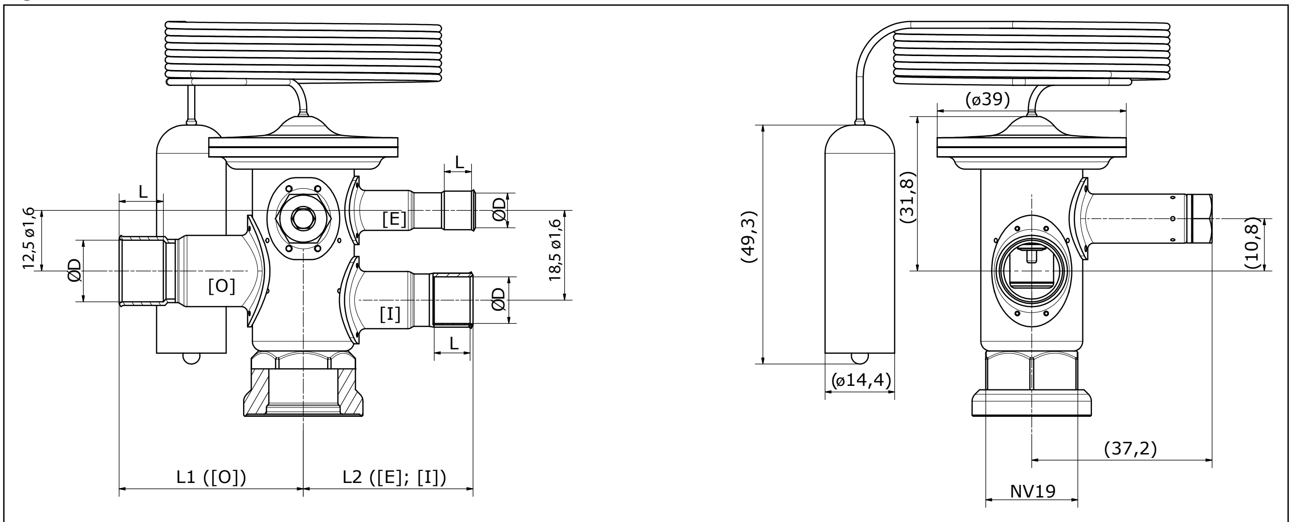


Table 9: Dimensions for TUAE

Con. / Dim.	Size	[øD]	[øD] tolerance	[L]	[L] tolerance	[L1] ([O])	[L1] tolerance	[L2] ([E]; [I])	[L2] tolerance
Equalization [E]	6 mm	6.00		7	±1.2	-	-		
	1/4 in	6.35		7	±1.2	-	-		
Inlet [I]	6 mm	6.00		7	±1.2	-	-	35.5	±2
	1/4 in	6.35		7	±1.2	-	-		
	3/8 in	9.52	+0.155 +0.065	8	±1.2	-	-		
	10 mm	10.00		9	±1.2	-	-		
	1/2 in	12.70		10	±1.4	-	-	38.5	±2
Outlet [O]	3/8 in	9.52		8	±1.2			-	-
	12 mm	12.00		10	±1.4	38.5	±2	-	-
	1/2 in	12.70		10	±1.4			-	-
	5/8 in	15.88		12	±1.4	41.5	±2	-	-

Figure 26: TCBE and TCCE

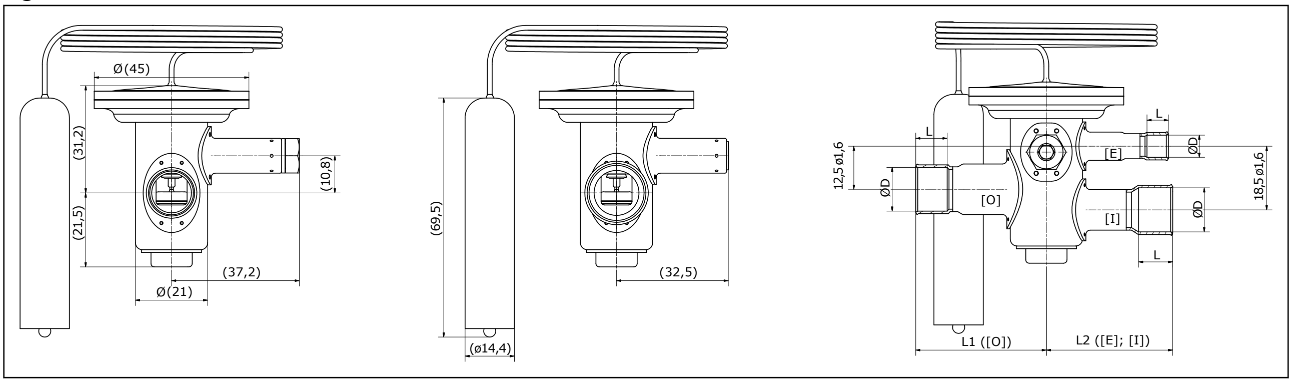


Table 10: Dimensions for TCBE and TCCE

Con. / Dim.	Size	[øD]	[øD] tolerance	[L]	[L] tolerance	[L1] ([O])	[L1] tolerance	[L2] ([E]; [I])	[L2] tolerance
Equalization [E]	6 mm	6.00	+0.155 +0.065	7	±1.2	-	-	35.5	±2
	1/4 in	6.35		7	±1.2	-	-		
Inlet [I]	6 mm	6.00		7	±1.2	-	-		
	1/4 in	6.35		7	±1.2	-	-		
	3/8 in	9.52		8	±1.2	-	-		
	10 mm	10.00		9	±1.2	-	-		
	1/2 in	12.70		10	±1.4	-	-	38.5	±2
Outlet [O]	3/8 in	9.52		8	±1.2	38.5	±2	-	-
	12 mm	12.00		10	±1.4			-	-
	1/2 in	12.70		10	±1.4			-	-
	5/8 in	15.88		12	±1.4	41.5	±2	-	-

Figure 27: TCAE

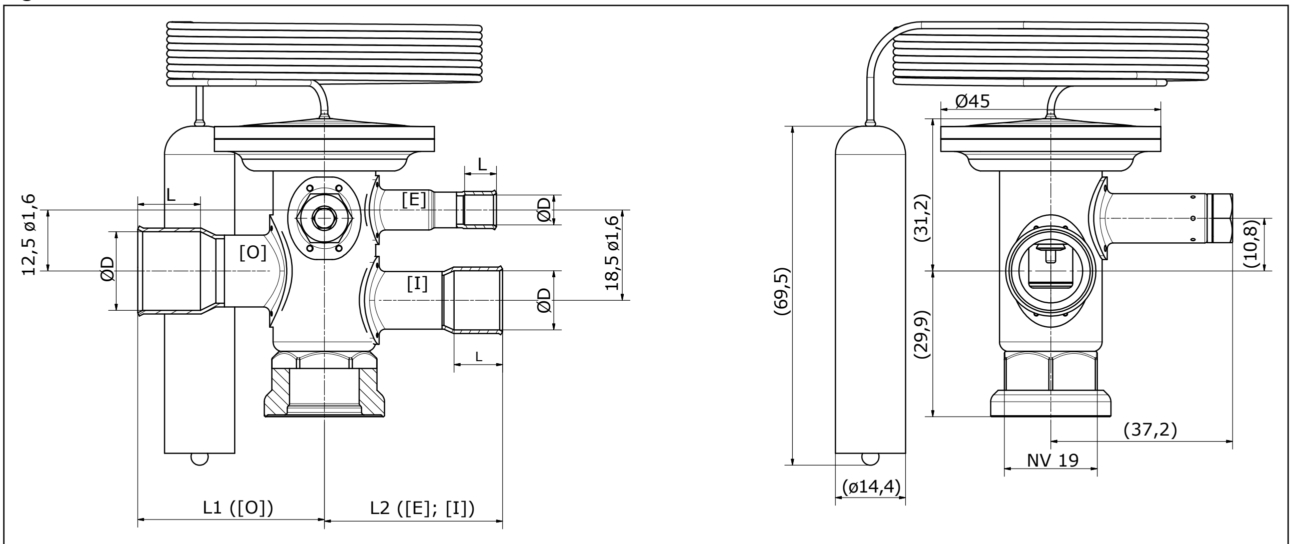


Table 11: Dimensions for TCAE

Con. / Dim.	Size	[øD]	[øD] tolerance	[L]	[L] tolerance	[L1] ([O])	[L1] tolerance	[L2] ([E]; [I])	[L2] tolerance
Equalization [E]	6 mm	6.00	+0.155 +0.065	7	±1.2	-	-	35.5	±2
	1/4 in	6.35		7	±1.2	-	-		
Inlet [I]	6 mm	6.00		7	±1.2	-	-		
	1/4 in	6.35		7	±1.2	-	-		
	3/8 in	9.52		8	±1.2	-	-		
	10 mm	10.00		9	±1.2	-	-		
	1/2 in	12.70		10	±1.4	-	-	38.5	±2
Outlet [O]	3/8 in	9.52		8	±1.2	38.5	±2	-	-
	12 mm	12.00		10	±1.4			-	-
	1/2 in	12.70		10	±1.4			-	-
	5/8 in	15.88		12	±1.4	41.5	±2	-	-

Identification

Main valve data is given on the power element (Fig. 19 and 20), on the valve body (Fig. 21) and on the orifice assembly (Fig. 22).

For valves and separate orifices with bleed (optional), the bleed size is marked on the valve body or orifice assembly respectively.

BP15 (= 15% bleed of nominal capacity).

For valves with fixed superheat setting (types TUC, TUCE or TCCE), the static superheat is printed on the power element (e.g. SS 4°C/7.2°F).

All standard valves are marked with EAC, in case they need to be exported to Eurasia.

Figure 28: Power element, TUBE

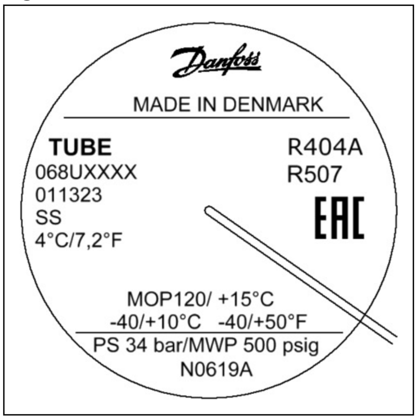


Figure 29: Power element, TCBE

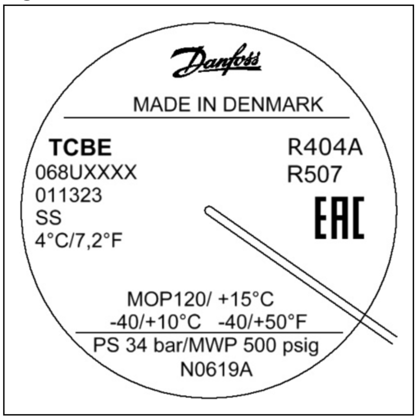


Table 12: Power element, data example, Fig. 19 and 20:

TUBE	Type (E = external pressure equalization)
068Uxxxx	Code number
R404A/R507	Refrigerant
MOP 55/+15°C	MOP-point in psig and °C (optional)
-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 and psig
N0619A	Date marking (N = Nordborg, week 06, year 2019, weekday A = Thursday)

Figure 30: Valve body, TUBE and TCBE

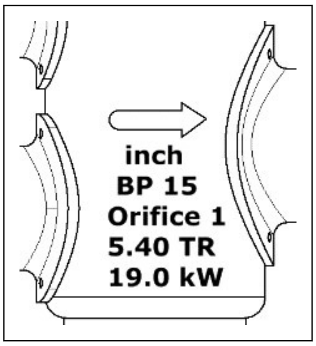


Table 13: Valve body, data example, Fig. 21:

Arrow	Normal flow direction
Inch	Connection in Inches (MM = millimeters)
BP15	15% bleed (optional)
Orifice 1	Orifice number 1
5.40 TR	Rated capacity Qnom, in tons of refrigeration
19.0 kW	Rated capacity Qnom, in kW

Figure 31: TUA / TCA orifice

Table 14: Orifice assembly, data example (Fig. 22)

TU	Orifice for valve type (TUA or TCA)
5	Orifice assembly number
068Uxxxx	Code number, orifice with filter and gasket
0619	Date marking (week 06, year 19)

Ordering

Figure 32: TUB

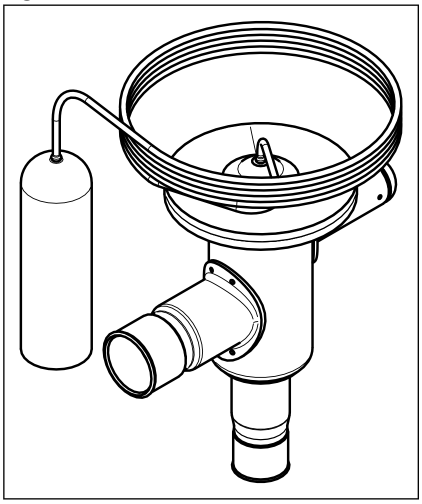


Figure 33: TUBE

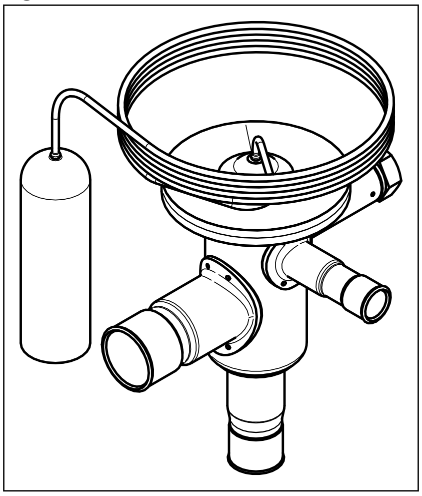


Table 15: Angle, TUB_TUBE: Range N = -40 – +10 °C / -40 – +50 °F

Refrigerant	Type	Orifice No.	Pressure eq.	Connection (in x out)			
				inch	Code No.	mm	Code No.
R407C	TUB	X	Internal	1/4 x 1/2	-	6 x 12	-
		00			-		-
		1			-		068U1901
		2			-		-
		3			-		068U1903
		4			-		068U1904
		5			-		068U1905
		6		3/8 x 1/2	068U1890		068U1906
		7		-	-	10 x 12	068U1907
	TUBE	5	External	3/8 x 1/2	068U1897	6 x 12	068U1915
		6		1/4 x 1/2	068U1936		068U1916
		7		3/8 x 1/2	068U1937	10 x 12	068U1917
		8			068U1938		068U1918
		9			068U1939		-
R410A	TUB	X	Internal	-	-	-	-
		00		-	-		-
		1		1/4 x 1/2	068U1958		-
		2			068U1959		-
		3			068U1960		-
		4			068U1961		-
		5			068U1962		-
		6			068U1963		-
		7		3/8 x 1/2	068U1964		-
	TUBE	5	External	1/4 x 1/2	068U1971	6 x 12	068U1953
		6			068U1972		068U1954
		7		3/8 x 1/2	068U1973	10 x 12	068U1955
		8			068U1974		068U1956
		9			068U1975		068U1957

Refrigerant	Type	Orifice No.	Pressure eq.	Connection (in x out)			
				inch	Code No.	mm	Code No.
R134a	TUB	X	Internal	-	-	-	-
		00		-	-	-	-
		1		1/4 x 1/2	068U2027	6 x 12	068U2000
		2			068U2028		068U2001
		3			068U2029		068U2002
		4			068U2030		068U2003
		5			068U2031		068U2004
		6			068U2032		068U2005
		7		3/8 x 1/2	-	10 x 12	068U2006
	TUBE	5	External	1/4 x 1/2	068U2022	6 x 12	068U2013
		6			068U2023		068U2014
		7		3/8 x 1/2	068U2024	10 x 12	068U2015
		8			068U2025		068U2016
		9			068U2026		068U2017
R290	TUB	X	Internal	1/4 x 1/2	-	6 x 12	-
		00			-		-
		1			068U3731		-
		2			068U3732		-
		3			068U3733		-
		4			068U3735		068U3744
		5			-		068U3831
		6			-		068U3745
		7			-		-
	TUBE	5	External	1/4 x 3/8	068U3706	6 x 12	068U3717
		6			068U3707		068U3718
		7			068U3708		068U3719
		8		3/8 x 1/2	068U3709	10 x 12	068U3720
		9			068U3710		068U3721
R404A / R507A	TUB	X	Internal	1/4 x 1/2	-	6 x 12	-
		00			-		-
		1			068U2094		068U2076
		2			068U2095		068U2077
		3			068U2096		068U2078
		4			068U2097		068U2079
		5			-		068U2080
		6			068U2099		068U2081
		7		3/8 x 1/2	068U2100	10 x 12	068U2082
	TUBE	5	External	1/4 x 1/2	068U2107	6 x 12	068U2089
		6			068U2108		068U2090
		7		3/8 x 1/2	068U2109	10 x 12	068U2091
		8			068U2110		068U2092
		9			068U2111		068U2093

Figure 34: TUB

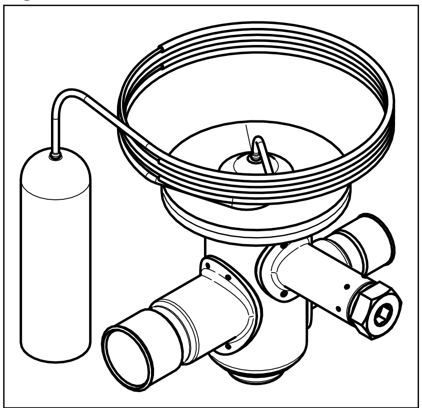


Figure 35: TUBE

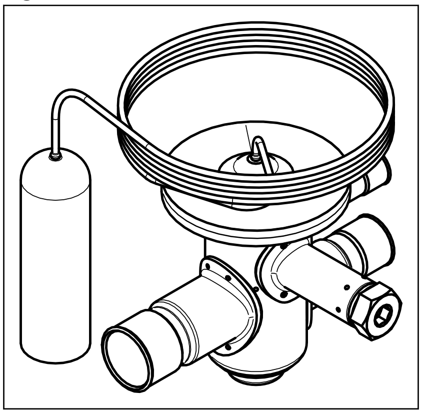


Table 16: Straight, TUB_TUBE, Range N = -40 – +10 °C / -40 – +50 °F

Refrigerant	Type	Orifice No.	Pressure eq.	Connection (in x out)			
				inch	Code No.	mm	Code No.
R407C	TUB	7	Internal	3/8 x 1/2	068U2647	-	-
	TUBE	5	External	1/4 x 1/2	068U2655	6 x 12	-
		6			-		068U2636
		7		3/8 x 1/2	068U2657	10 x 12	068U2637
		8			068U2658		068U2638
		9			068U2659		-
R410A	TUBE	6	External	1/4 x 1/2	-	-	-
		7		3/8 x 1/2	-		-
		8			-		-
		9			068U3316		-
R134a / R513A	TUB	X	Internal	1/4 x 3/8	-	6 x 12	-
		00			-		-
		1			068U3656		068U2540
		2			-		-
		3			-		068U2542
		4		1/4 x 1/2	068U2561		068U2543
		5			-		068U2544
		6			-		-
		7		3/8 x 1/2	-		-
	TUBE	5	External	3/8 x 1/2	068U3498	10 x 12	-
		6			068U3818		-
		7			068U2573		068U2555
		8			068U2574		-
		9			068U2575		-
R290	TUB	X	Internal	1/4 x 3/8	068U3700	6 x 12	068U3711
		00			068U3701		068U3712
R404A / R507A	TUB	X	Internal	1/4 x 1/2	-	6 x 12	-
		00			-		-
		1			068U2594		068U3495
		2			-		-
		3			-		-
		4			-		068U2579
		5			-		-
		6			-		-
		7		3/8 x 1/2	-	10 x 12	-
	TUBE	5	External	1/4 x 1/2	068U2607	-	-
		6			068U2608		-
		7		3/8 x 1/2	068U2609	-	-
		8			068U2610		-
		9			068U2611		-

Figure 36: TCBE

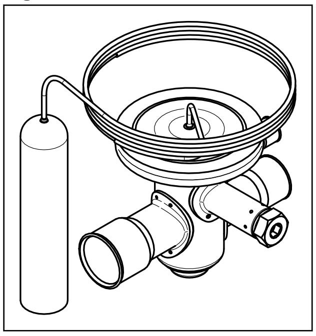


Table 17: Straight, TCBE, Range N = -40 – +10 °C / -40 – +50 °F

Refrigerant	Type	Orifice No.	Pressure eq.	Connection (in x out)			
				inch	Code No.	mm	Code No.
R407C	TCBE	1	External	1/2 x 5/8	068U4257	12 x 16	068U4249
		2			068U4258		068U4250
		3			068U4251		068U4259
R410A	TCBE	1	External	1/2 x 5/8	068U4265	12 x 16	068U4273
		2			068U4266		068U4274
		3			068U4267		068U4275
R134a / R513A	TCBE	1	External	1/2 x 5/8	068U4217	12 x 16	068U4225
		2			068U4218		068U4226
		3			068U4219		068U4227
R404A / R507A	TCBE	1	External	1/2 x 5/8	-	12 x 16	068U4241
		2			068U4234		068U4242
		3			068U4235		068U4243
R290	TCBE	1	External	3/8 x 5/8	068U4383	10 x 16	068U4386
		2		1/2 x 5/8	068U4384	12 x 16	068U4387
		3			068U4385		068U4388
Range N MOP 95 psig / +15 °C							
R407C	TCBE	1	External	1/2 x 5/8	068U4253	12 x 16	068U4261
		2			068U4254		068U4262
		3			-		068U4263
Range N MOP 165 psig / +15 °C							
R410A	TCBE	1	External	1/2 x 5/8	-	12 x 16	-
		2			068U4270		-
		3			-		068U4279
Range N MOP 55 psig / +15 °C							
R134a/R513A	TCBE	1	External	-	-	10 x 16	068U4228
		2			-	12 x 16	068U4230
		3			-		068U4231
Range N MOP 120 psig / +15 °C							
R404A / R507A	TCBE	1	External	-	-	10 x 16	068U4244
		2			-	12 x 16	068U4246
		3			-		068U4247

Figure 37: TUA

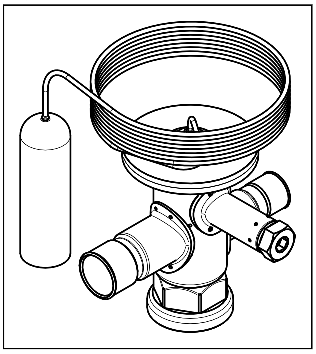


Figure 38: TUAE

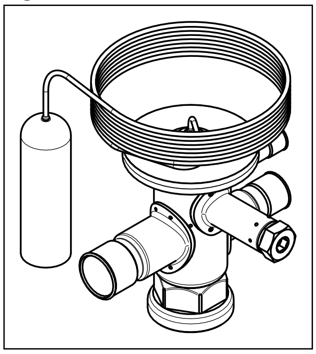


Table 18: Straight, TUA_TUAE, Range N = -40 – +10 °C / -40 – +50 °F

Refrigerant	Type	Range	MOP	Pressure eq.	Connection (in x out)			
					inch	Code No.	mm	Code No.
R407C	TUA	N	-	Internal	1/4 x 1/2	068U2324	06 x 12	068U2320
		N	-		3/8 x 1/2	068U2325	10 x 12	068U2321
		N MOP	95 psig / +15 °C		1/4 x 1/2	068U2332	-	-
		N MOP	95 psig / +15 °C		3/8 x 1/2	068U2333	-	-
	TUAE	N	-	External	1/4 x 1/2	068U2326	06 x 12	068U2322
		N	-		3/8 x 1/2	068U2327	10 x 12	068U2323
		N MOP	95 psig / +15 °C		-	-	06 x 12	068U2330
		N MOP	95 psig / +15 °C		3/8 x 1/2	068U2335	10 x 12	068U2331

Refrigerant	Type	Range	MOP	Pressure eq.	Connection (in x out)			
					inch	Code No.	mm	Code No.
R410A	TUA	N	-	Internal	3/8 x 1/2	068U2414	-	-
	TUAE	N	-	External	-	-	10 x 12	068U2780
		N MOP	165 psig / +15 °C		3/8 x 1/2	068U2939	-	-
		B MOP	55 psig / -15 °C		-	-	10 x 12	068U2450
R134a	TUA	N	-	Internal	1/4 x 1/2	068U2204	6 x 12	068U2200
		N	-		3/8 x 1/2	068U2205	10 X 12	068U2201
		N MOP	55 psig / +15 °C		1/4 x 1/2	068U2212	6 x 12	068U2208
		N MOP	55 psig / +15 °C		3/8 x 1/2	068U2213	-	-
	TUAE	F	-	External	1/4 x 1/2	068U1256	-	-
		F	-		3/8 x 1/2	068U1257	-	-
		N	-		1/4 x 1/2	068U2206	6 x 12	068U2202
		N	-		3/8 x 1/2	068U2207	10 X 12	068U2203
		N MOP	55 psig / +15 °C		1/4 x 1/2	068U2214	-	-
		N MOP	55 psig / +15 °C		3/8 x 1/2	068U2215	10 X 12	068U2211
R404A / R507A	TUA	N	-	Internal	1/4 x 1/2	068U2284	6 x 12	068U2280
		N	-		3/8 x 1/2	068U2285	10 x 12	068U2281
		N MOP	120 psig / +15 °C		1/4 X 1/2	068U2292	-	-
		N MOP	120 psig / +15 °C		3/8 x 1/2	068U2293	-	-
		NM	75 psig / 0°C		1/4 X 1/2	068U2300	6 x 12	068U2296
		B	-		1/4 x 1/2	068U2308	-	-
		B	-v		3/8 x 1/2	068U2309	-	-
		B MOP	30 psig / -20 °C		1/4 x 1/2	068U2316	6 x 12	068U2312
		B MOP	30 psig / -20 °C		3/8 x 1/2	068U2317	-	-
	TUAE	F	-	External	1/4 x 1/2	068U1252	-	-
		F	-		3/8 x 1/2	068U1253	-	-
		N	-		1/4 x 1/2	068U2286	6 x 12	068U2282
		N	-		3/8 x 1/2	068U2287	10 x 12	068U2283
		N MOP	120 psig / +15 °C		3/8 x 1/2	068U2295		-
		NL	50 psig / -10 °C		1/4 x 1/2	068U2931	-	-
		B MOP	30 psig / -20 °C		1/4 x 1/2	068U2318		-
		B MOP	30 psig / -20 °C		3/8 x 1/2	068U2319	10 x 12	068U2315
R407A	TUAE	F	-	External	1/4 x 1/2	068U1258	-	-
		F	-		3/8 x 1/2	068U1259	-	-
R407F	TUAE	F	-	External	1/4 x 1/2	068U1250	-	-
		F	-		3/8 x 1/2	068U1251	-	-
R134a / R513A	TUAE	F	-	External	1/4 x 1/2	068U1256	-	-
		F	-		3/8 x 1/2	068U1257	-	-
R448A	TUAE	F	-	External	1/4 x 1/2	068U3772	-	-
		F	-		3/8 x 1/2	068U3773	-	-
R449A	TUAE	F	-	External	1/4 x 1/2	068U3776	-	-
		F	-		3/8 x 1/2	068U3858	-	-
R454C	TUA	-	-	Internal	1/4 x 1/2	068U3948	-	-
					-	-	6 x 12	068U3949
	TUAE	-	-	External	1/4 x 1/2	068U3950	-	-
					-	-	6 x 12	068U3951
R455A	TUA	-	-	Internal	1/4 x 1/2	068U3952	-	-
					-	-	6 x 12	068U3953
	TUAE	-	-	External	1/4 x 1/2	068U3954	-	-
					-	-	6 x 12	068U3955
R1234yf	TUA	-	-	Internal	1/4 x 1/2	068U3956	-	-
					-	-	6 x 12	068U3957
	TUAE	-	-	External	1/4 x 1/2	068U3958	-	-
					-	-	6 x 12	068U3959
R1234ze(E)	TUA	-	-	Internal	1/4 x 1/2	068U3960	-	-
					-	-	6 x 12	068U3962
	TUAE	-	-	External	1/4 x 1/2	068U3961	-	-
					-	-	6 x 12	068U3964

<table>
<tr><th rowspan="2">Refrigerant</th><th rowspan="2">Type</th><th rowspan="2">Range</th><th rowspan="2">MOP</th><th rowspan="2">Pressure eq.</th><th colspan="4">Connection (in x out)</th></tr>
<tr><th>inch</th><th>Code No.</th><th>mm</th><th>Code No.</th></tr>
<tr><td rowspan="4">R454A</td><td rowspan="2">TUA</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">Internal</td><td>1/4 x 1/2</td><td>068U3963</td><td>-</td><td>-</td></tr>
<tr><td>-</td><td>-</td><td>6 x 12</td><td>068U3966</td></tr>
<tr><td rowspan="2">TUAE</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">External</td><td>1/4 x 1/2</td><td>068U3965</td><td>-</td><td>-</td></tr>
<tr><td>-</td><td>-</td><td>6 x 12</td><td>068U3970</td></tr>
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Figure 39: TCAE

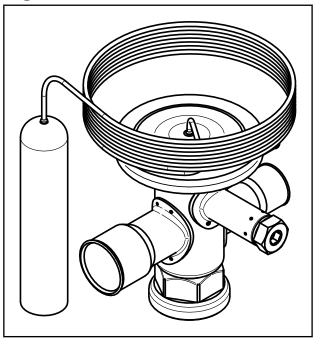

Table 19: Straight, TCAE, Range N = -40 – +10 °C / -40 – +50 °F

<table>
<tr><th rowspan="2">Refrigerant</th><th rowspan="2">Type</th><th rowspan="2">Range</th><th rowspan="2">MOP</th><th rowspan="2">Pressure eq.</th><th colspan="4">Connection (in x out)</th></tr>
<tr><th>inch</th><th>Code No.</th><th>mm</th><th>Code No.</th></tr>
<tr><td rowspan="4">R407C</td><td rowspan="4">TCAE</td><td>N</td><td>-</td><td rowspan="4">External</td><td>3/8 x 5/8</td><td>068U4324</td><td>10 x 16</td><td>068U4328</td></tr>
<tr><td>N</td><td>-</td><td>1/2 x 5/8</td><td>068U4325</td><td>12 x 16</td><td>068U4329</td></tr>
<tr><td>N MOP</td><td>95 psig / +15 °C</td><td>3/8 x 5/8</td><td>068U4326</td><td>-</td><td>-</td></tr>
<tr><td>N MOP</td><td>95 psig / +15 °C</td><td>1/2 x 5/8</td><td>068U4327</td><td>12 x 16</td><td>068U4331</td></tr>
<tr><td rowspan="3">R410A</td><td rowspan="3">TCAE</td><td>N</td><td>-</td><td rowspan="3">External</td><td>3/8 x 5/8</td><td>068U4336</td><td>-</td><td>-</td></tr>
<tr><td>N</td><td>-</td><td rowspan="2">1/2 x 5/8</td><td>068U4337</td><td>12 x 16</td><td>068U4341</td></tr>
<tr><td>N MOP</td><td>165 psig / +15 °C</td><td>068U4339</td><td>12 x 16</td><td>068U4343</td></tr>
<tr><td rowspan="3">R134a/R513A</td><td rowspan="3">TCAE</td><td>N</td><td>-</td><td rowspan="3">External</td><td>3/8 x 5/8</td><td>068U4292</td><td>10 x 16</td><td>068U4296</td></tr>
<tr><td>N</td><td>-</td><td rowspan="2">1/2 x 5/8</td><td>068U4293</td><td>12 x 16</td><td>068U4297</td></tr>
<tr><td>N MOP</td><td>55 psig / +15 °C</td><td>068U4295</td><td>12 x 16</td><td>068U4299</td></tr>
<tr><td rowspan="5">R404A / R507A</td><td rowspan="5">TCAE</td><td>N</td><td>-</td><td rowspan="5">External</td><td>3/8 x 5/8</td><td>068U4304</td><td>10 x 16</td><td>068U4308</td></tr>
<tr><td>N</td><td>-</td><td rowspan="4">1/2 x 5/8</td><td>068U4305</td><td>12 x 16</td><td>068U4309</td></tr>
<tr><td>N MOP</td><td>120 psig / +15 °C</td><td>068U4307</td><td>10 x 16</td><td>068U4310</td></tr>
<tr><td>B</td><td>-</td><td>068U4317</td><td>12 x 16</td><td>068U4321</td></tr>
<tr><td>B MOP</td><td>30 psig / -20 °C</td><td>068U4319</td><td>10 x 16</td><td>068U4322</td></tr>
<tr><td>R448A</td><td rowspan="2">TCAE</td><td>N</td><td>-</td><td rowspan="2">External</td><td rowspan="2">1/2 x 5/8</td><td>068U4598</td><td>-</td><td>-</td></tr>
<tr><td>R449A</td><td>N</td><td>-</td><td>068U4599</td><td>-</td><td>-</td></tr>
</table>

Table 20: TUA / TUAE and TCAE, orifice assembly With inlet screen and gasket

Type	Orifice No.	Bleed	Code No.
TUA / TUAE	0	-	068U1030
	1	-	068U1031
	1	15%	068U1131
	2	-	068U1032
	2	15%	068U1132
	3	-	068U1033
	3	15%	068U1133
	4	-	068U1034
	4	15%	068U1134
	5	-	068U1035
	5	15%	068U1135
	6	-	068U1036
	6	15%	068U1136
	7	-	068U1037
	7	15%	068U1137
	8	-	068U1038
	8	15%	068U1138
	9	-	068U1039
	9	15%	068U 1139
TCAE	1	-	068U4100
	1	15%	068U4097
	2	-	068U4101
	2	15%	068U4098
	3	-	068U4202
	3	15%	068U4099

Accessories and spare parts

Figure 40: Bulb strap

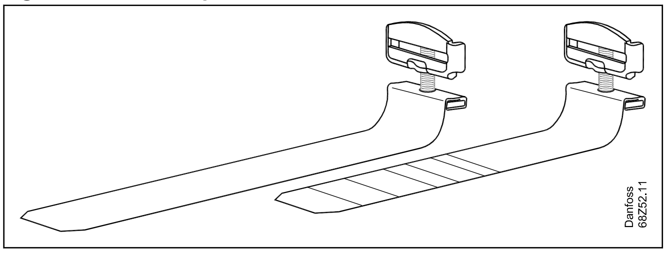

Table 21: Bulb strap for TU, TC, T2

Code no.	Description	Pack mode	Quantity / pack
068U3505	Bulb strap 0.4 mm Max. 28 mm tube	I	45
068U3506	Bulb strap 0.4 mm Max. 50 mm tube	I	45
068U3507	Bulb strap 0.4 mm Max. 28 mm tube	M	25
068U3508	Bulb strap 0.4 mm Max. 50 mm tube	M	25

Figure 41: OEM bulb strap

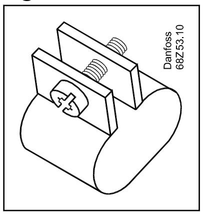

Table 22: Bulb strap for TU, TC, T2

Code no.	Description	Pack mode	Quantity / pack
068U3509	OEM bulb strap 3/8 in tube	I	45
068U3510	OEM bulb strap 1/2 in tube	I	45
068U3511	OEM bulb strap 5/8 in tube	I	45

I	Industrial pack (OEM)
M	Multipack (Wholesaler)

Figure 42: Spare parts TUA / TUAE and TCAE

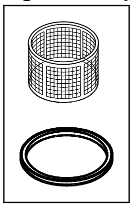

Table 23: TUA / TUAE and TCAE

Code no.	Description	Pack mode	Quantity pack
068U1706	Inlet screen TUA/TUAE 0 - 4	Industrial packing	24
068U0016	Inlet screen TUA/TUAE 5 - 9, TCAE 1 - 3	Industrial packing	24
068U0015	Gasket	Industrial packing	24

NOTE:
To secure tightness, the orifice gasket must be changed each time the orifice is disassembled

Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 24: Certificates, declarations, and approvals

Document name	Document type	Document topic	Approval authority
RU Д-DK.БЛ08.B.00191_18	EAC Declaration	Machinery & Equipment	EAC
068U9615.06	Manufacturers Declaration	PED/RoHS	Danfoss
068U9616.01	Manufacturers Declaration	China RoHS	Danfoss
068U9903.01	EU Declaration	RoHS	Danfoss

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