

## 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**

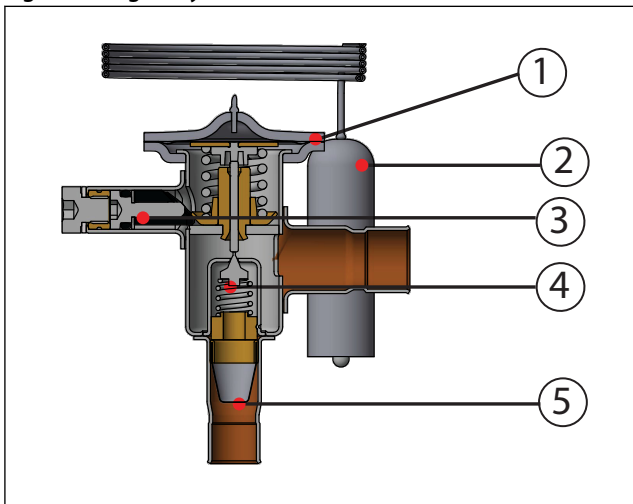
**Table 1: Overview of available versions**

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

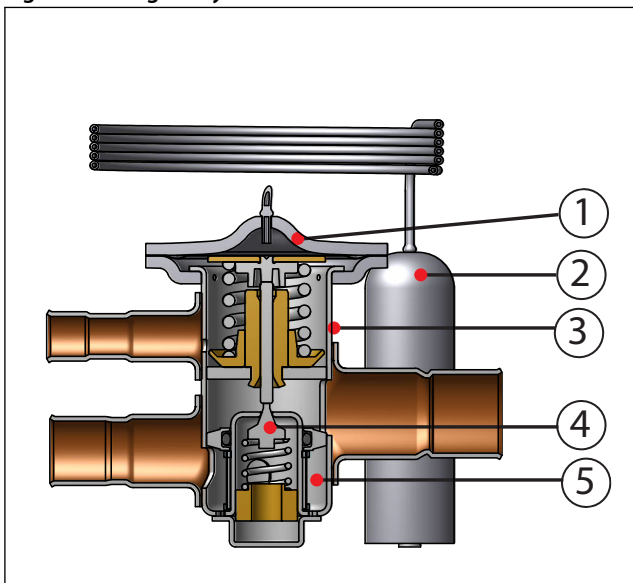
Thermostatic expansion valves maintain a constant superheat level at the evaporator outlet. It does this by controlling the amount of refrigerant that is injected into the evaporator, taking both the evaporator load and ambient temperatures into consideration. This both optimizes the efficiency of the 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: Angleyway



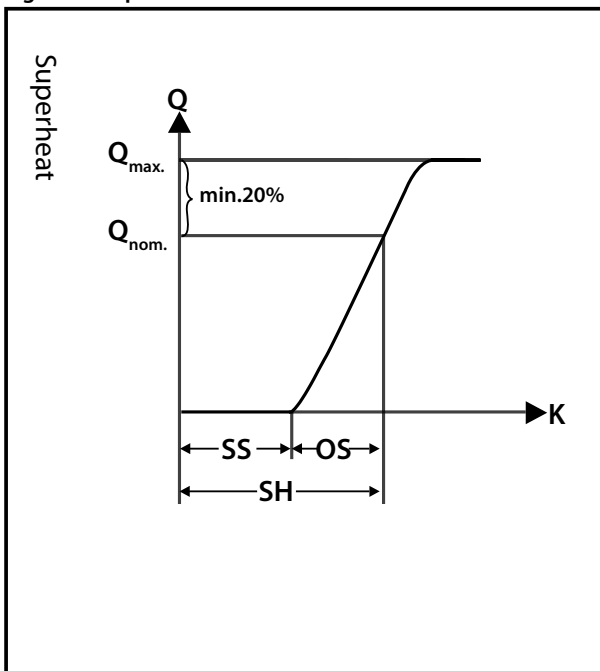
1	Thermostatic element with diaphragm
2	Bulb with capillary tube
3	Setting spindle for adjustment of static superheat SS
4	Orifice assembly
5	Filter

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
Q <sub>nom</sub>	Rated capacity
Q <sub>max</sub>	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 (Q<sub>nom</sub>).

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.

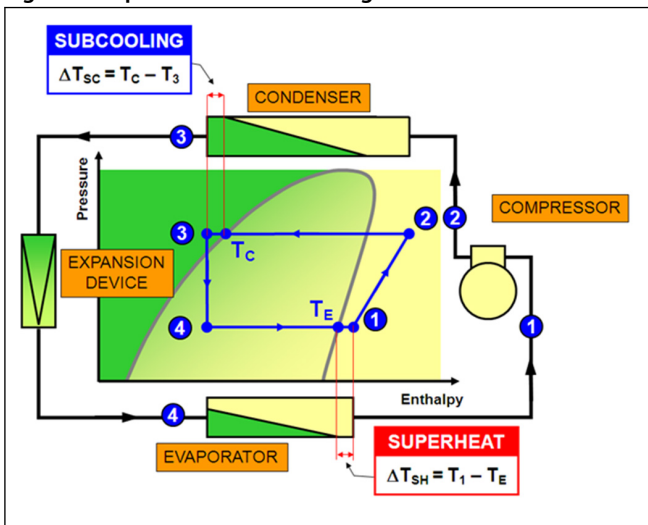
#### Total superheat

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

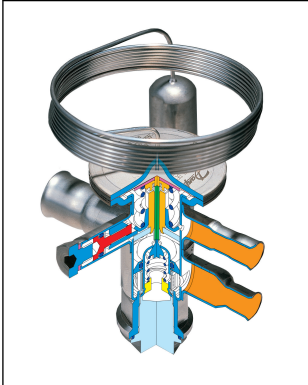
The TU stainless steel thermostatic expansion valve has significant installation advantages because it is a valve

## Thermostatic expansion valve, Type TU and TC

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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.

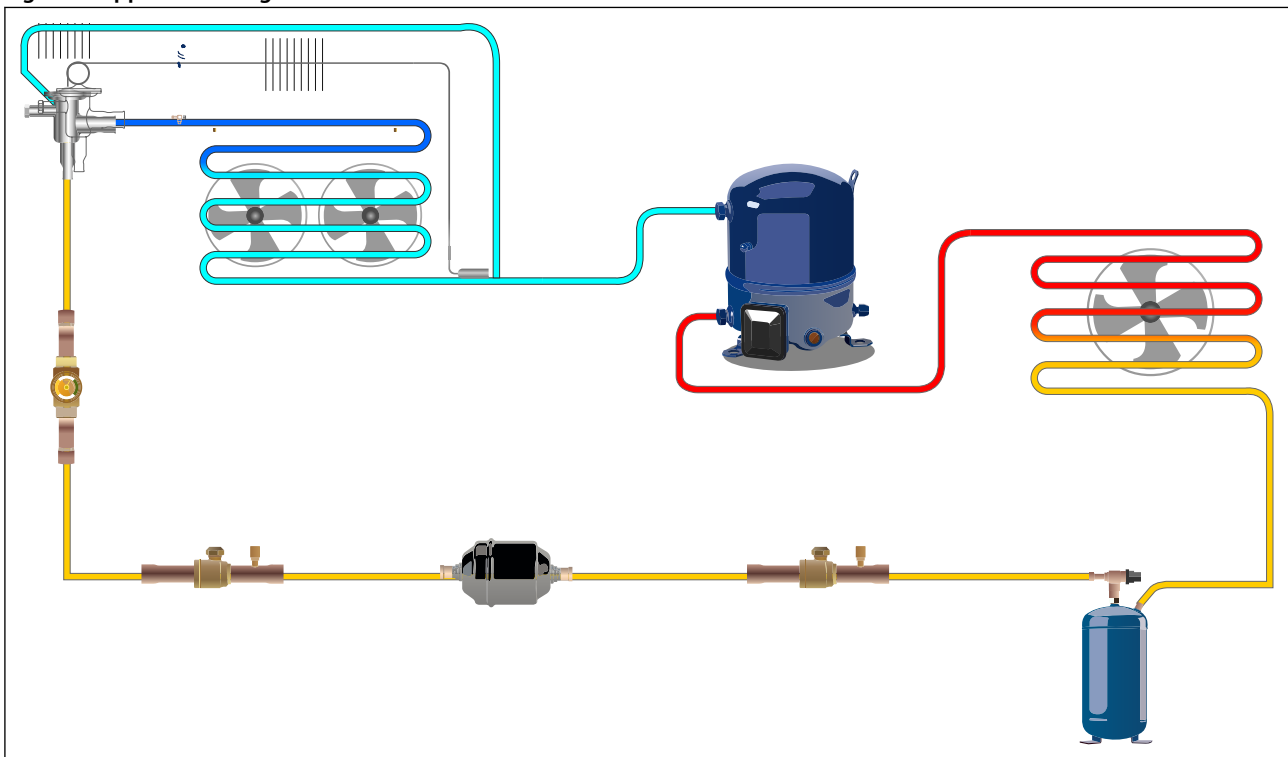
## Applications

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

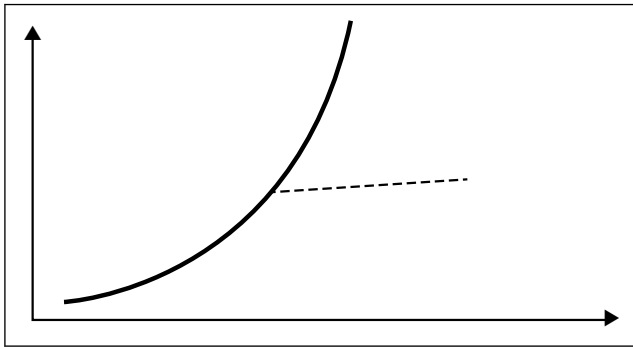
This is the standard charge, used in most applications. It is characterized by a very large operational evaporating temperature range, with only small variations in static superheat across the temperature range. It is available in two temperature ranges. One for normal (-40°C to +10°C / -40°F to 50°F)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

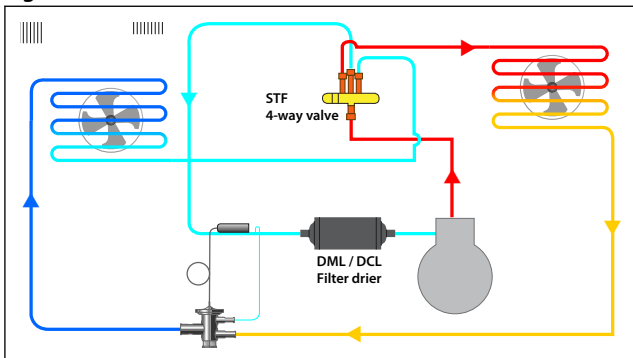
**Milk charge**

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

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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
<input type="radio"/>	TU - 5	9,53	N	1,576	0,394	190	6,862	0,33	
<input type="radio"/>	TU - 6	9,53	N	2,445	0,611	123	6,862	0,33	
<input checked="" type="radio"/>	TU - 7	9,53	N	3,239	0,810	93	6,862	0,33	
<input type="radio"/>	TU - 8	9,53	N	4,813	1,203	62	6,862	0,33	
<input type="radio"/>	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.

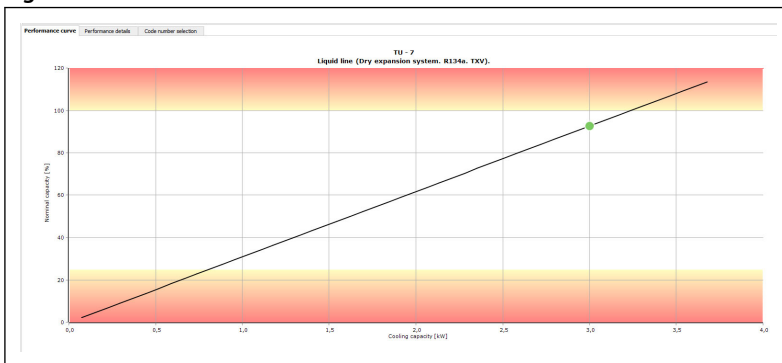
: 2. Coolselector determines pressure drop across the valve based on the condensing and evaporating temperatures. If the system is using a distributor, has valves in the liquid line or height variations between evaporator and condenser, the pressure drops from these components must be summarized, and 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.

## Thermostatic expansion valve, Type TU and TC

Figure 12: Coolselector2 Performance curve



### Step 6

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

Figure 13: Coolselector2 code number selection

Code number	Type	Orifice size	HSP Part	HSP Part	Equalization size	Equalization size	Orifice tube length	Multi Superheat	Quantity
068U429	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U430	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U431	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U432	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U433	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U434	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U435	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U436	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U437	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U438	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U439	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U440	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U441	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U442	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U443	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U444	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U445	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U446	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U447	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U448	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U449	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U450	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U451	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U452	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U453	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U454	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U455	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U456	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U457	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U458	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U459	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U460	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U461	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U462	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U463	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U464	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U465	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U466	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U467	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U468	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U469	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U470	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U471	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U472	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U473	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U474	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U475	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U476	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U477	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U478	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U479	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U480	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U481	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
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068U483	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U484	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U485	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U486	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U487	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U488	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U489	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U490	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U491	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U492	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U493	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U494	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U495	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U496	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U497	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U498	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U499	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	
068U500	ANCE	12"	15.0	15.0	1/4 IN	15.0	4.0	1	

## 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 refrigerants
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: 1/4 in, 3/8 in, 6 mm, 10 mm Outlet: 3/8 in, 1/2 in, 5/8 in, 10 mm, 12 mm, 16 mm
Connection sizes, Straightway	Inlet: 1/4 in, 3/8 in, 1/2 in, 6 mm, 10 mm, 12 mm Outlet: 3/8 in, 1/2 in, 5/8 in, 10 mm, 12 mm, 16 mm
Connection sizes, [External equalization]	1/4 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		R407C		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

## Thermostatic expansion valve, Type TU and TC

Type	Orifice	R410		R134		R407C		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  $t_e = 4.4\text{ °C} / 40\text{ °F}$

Liquid teperature  $t_l = 37\text{ °C} / 98\text{ °F}$

Condensing temperature  $t_c = 38\text{ °C} / 100\text{ °F}$

**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	0.41	0.12
TU	0	0.76	0.22	0.65	0.19	0.63	0.18	0.61	0.18	0.36	0.1	0.45	0.13
TU	1	1.1	0.32	0.94	0.28	0.93	0.27	0.9	0.26	0.53	0.15	0.68	0.19
TU	1	1.4	0.39	1.1	0.33	1.1	0.33	1.1	0.31	0.62	0.18	0.82	0.23
TU	3	1.7	0.5	1.5	0.43	1.4	0.42	1.4	0.41	0.82	0.23	1.1	0.30
TU	4	3.1	0.91	2.6	0.77	2.5	0.74	2.4	0.71	1.4	0.4	1.8	0.53
TU	5	4.2	1.2	3.5	1	3.4	1	3.2	1	1.8	0.53	2.5	0.70
TU	6	6.5	1.9	5.5	1.6	5.3	1.5	5.1	1.5	2.9	0.83	3.9	1.1
TU	7	8.6	2.5	7.2	2.1	7	2	6.7	2	3.8	1.1	5.1	1.5
TU	8	12.4	3.6	10.5	3.1	10.1	3	9.8	2.9	5.6	1.6	7.4	2.1
TU	9	17.1	5	14.4	4.2	13.9	4.1	13.6	4	7.7	2.2	10.3	2.9
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  $t_e = 4.4\text{ °C} / 40\text{ °F}$

Liquid teperature  $t_l = 37\text{ °C} / 98\text{ °F}$

Condensing temperature  $t_c = 38\text{ °C} / 100\text{ °F}$

**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  $t_e = 4.4\text{ °C} / 40\text{ °F}$

Liquid teperature  $t_l = 37\text{ °C} / 98\text{ °F}$

Condensing temperature  $t_c = 38\text{ °C} / 100\text{ °F}$

**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)

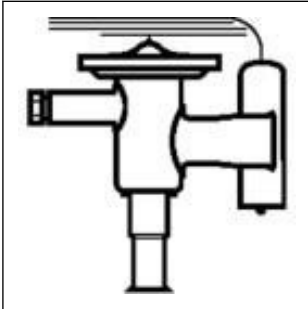


Figure 15: Straight flow (fixed orifice)

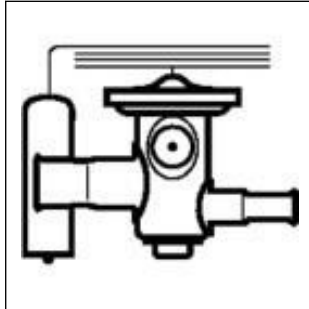


Figure 16: Straight flow (exchangeable orifice)

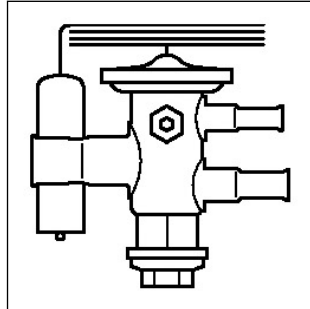


Figure 17: TU Angleway

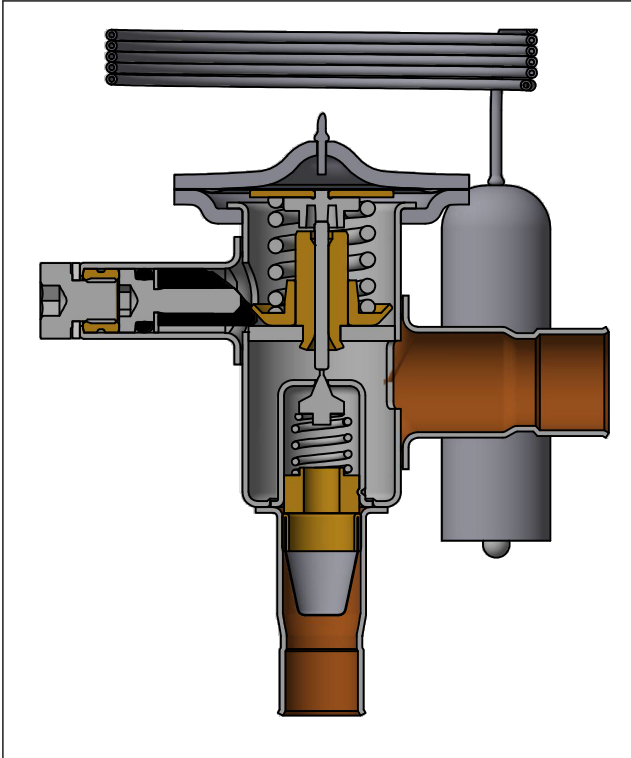
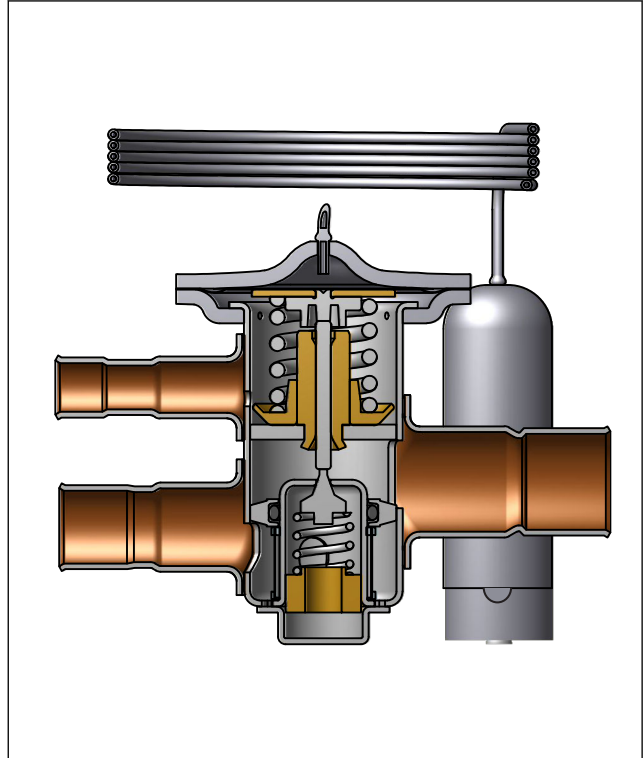


Figure 18: TU Straightway



Thermostatic expansion valve, Type TU and TC

Figure 19: TUA / TUAE (incl. orifice)

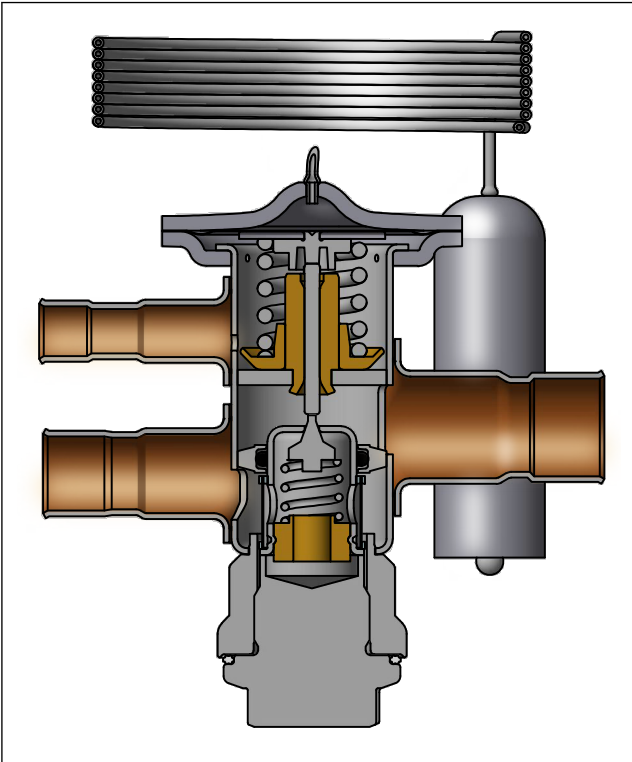


Figure 20: TC Angleway

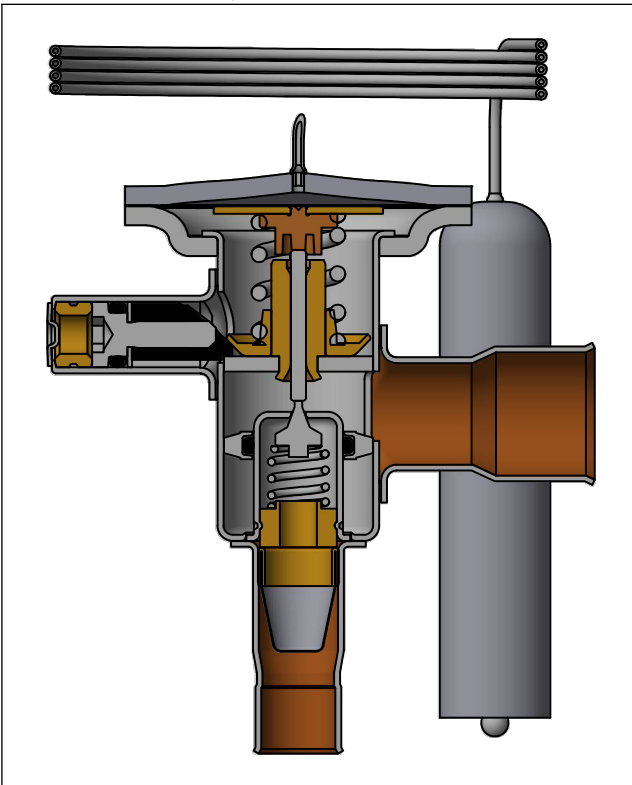
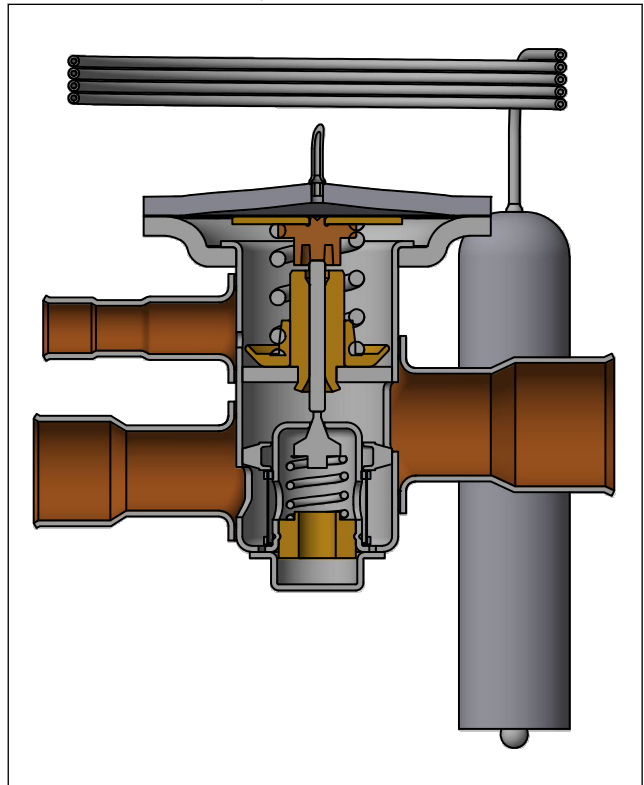
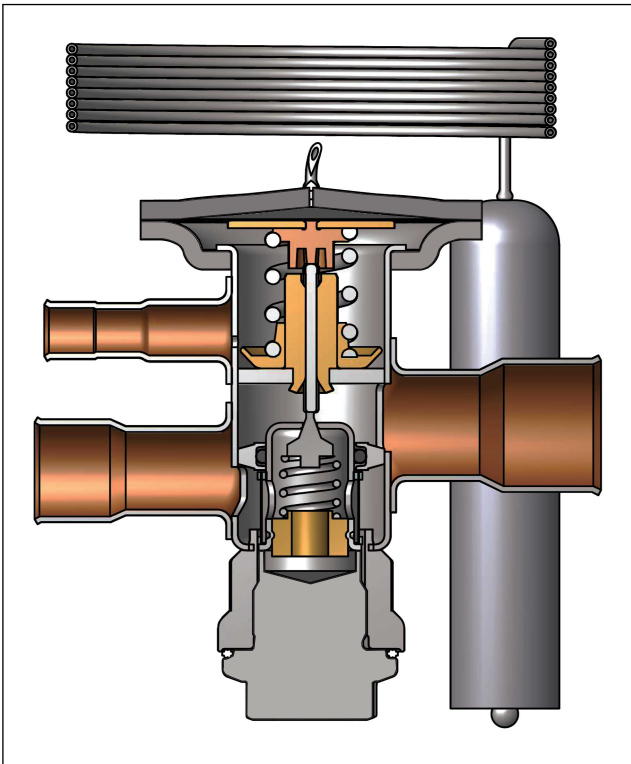


Figure 21: TC Straightway



## Thermostatic expansion valve, Type TU and TC

Figure 22: TCAE (incl. orifice)



### Dimensions

Figure 23: TUBE and TUCE

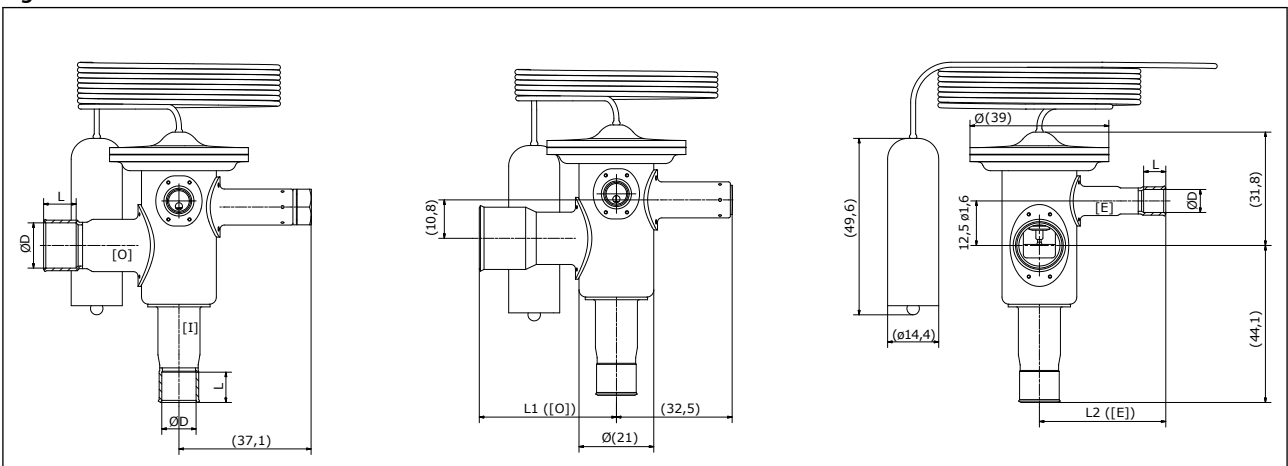


Table 7: Dimensions for TU and TC

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



## Thermostatic expansion valve, Type TU and TC

Figure 24: TUBE and TUCE

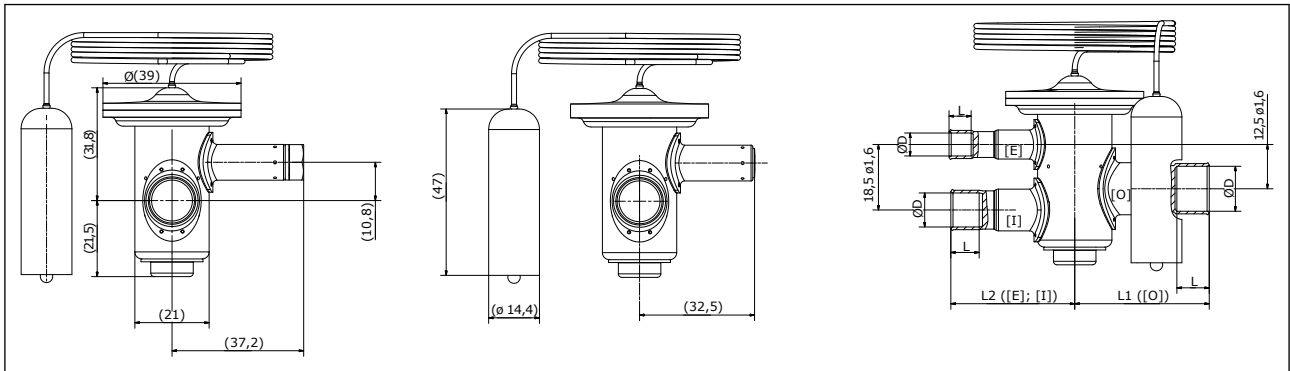


Table 8: Dimensions for TUBE and TUCE

Con. / Dim.	Size	[ØD]	[ØD] tolerance	[L]	[L] tolerance	[L1] ([O])	[L1] tolerance	[L2] ([E]; [I])	[L2] tolerance
Equalization [E]	6 mm	6.00	+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	-	-		
	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

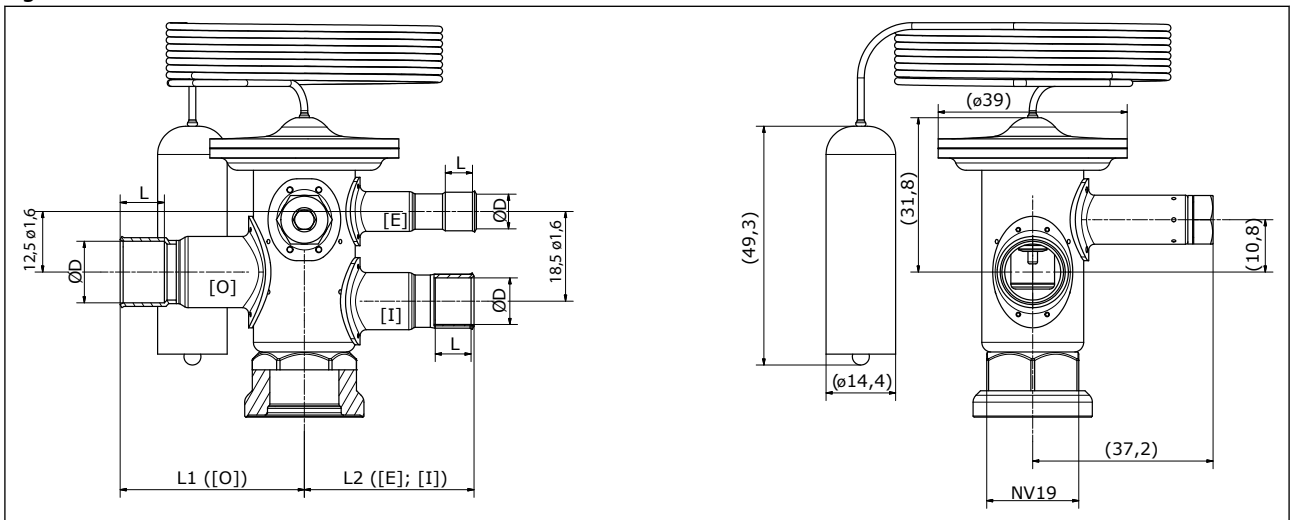


Table 9: Dimensions for TUAE

Con. / Dim.	Size	[ØD]	[ØD] tolerance	[L]	[L] tolerance	[L1] ([O])	[L1] tolerance	[L2] ([E]; [I])	[L2] tolerance
Equalization [E]	6 mm	6.00	+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	-	-		
	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		

Thermostatic expansion valve, Type TU and TC

Figure 26: TCBE and TCCE

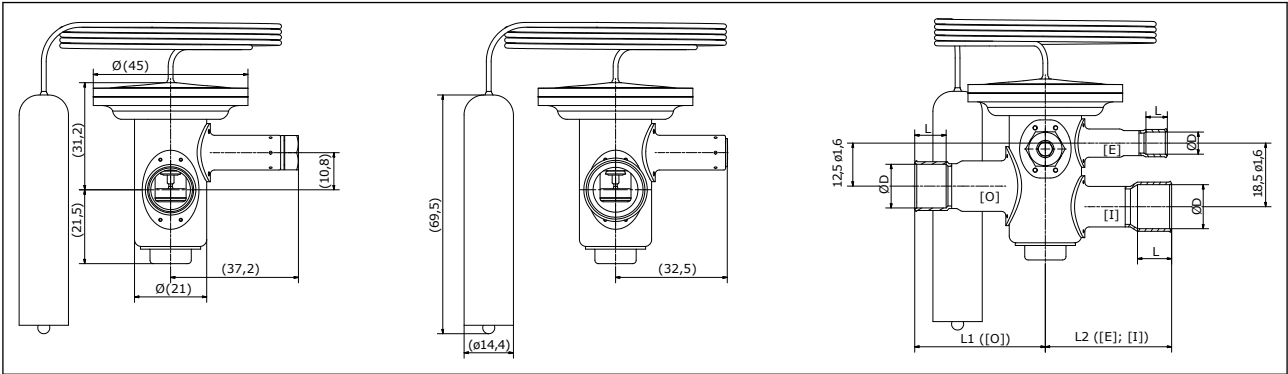
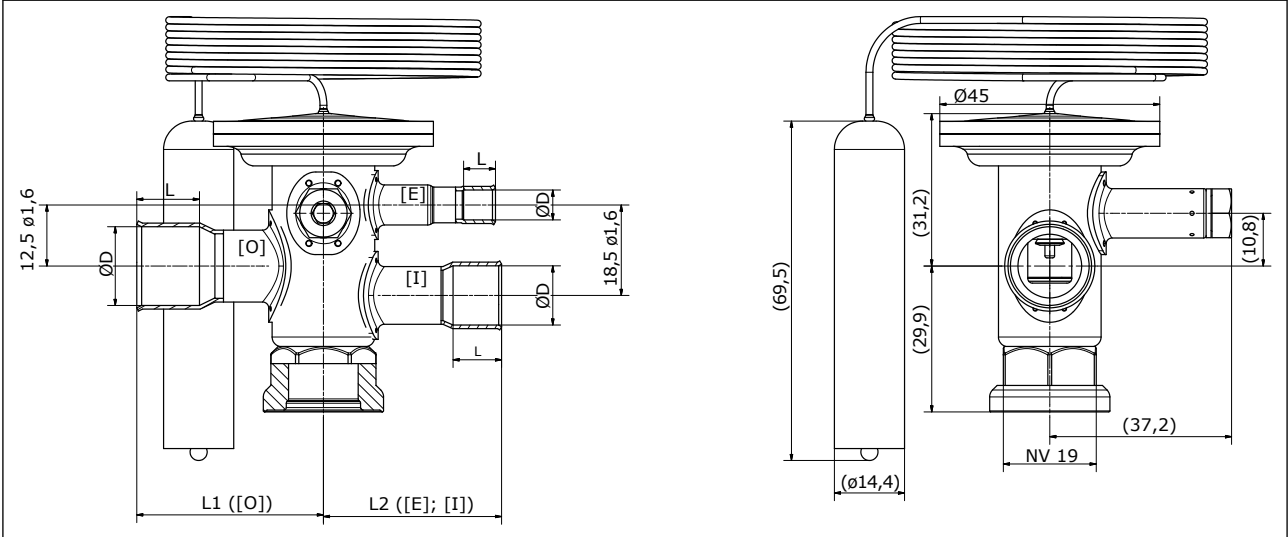


Table 10: Dimensions for TCBE and TCCE

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	-	-		
Outlet [O]	1/2 in	12.70		10	±1.4	-	-	38.5	±2
	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 27: TCAE



## Thermostatic expansion valve, Type TU and TC

**Table 11: Dimensions for TCAE**

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

### 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).

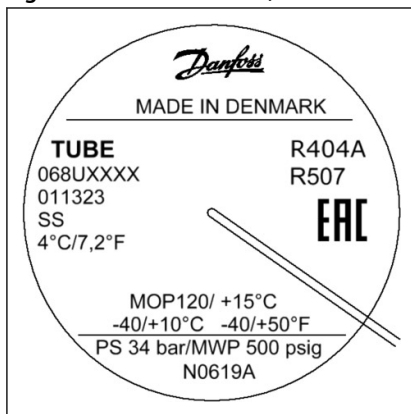
For valves and separate orifices with bleed (optional), the bleed size is marked on the valve body or orifice assembly respectively.

BP15 (= 15% bleed of nominal capacity).

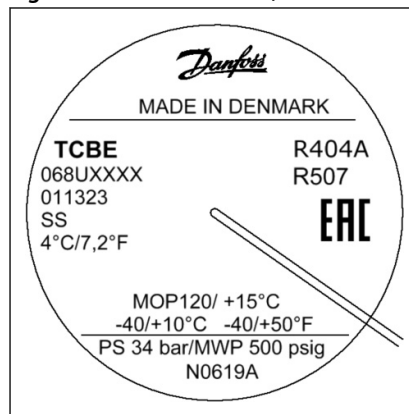
For valves with fixed superheat setting (types TUC, TUCE or TCCE), the static superheat is printed on the power element (e.g. SS 4°C/7.2°F).

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 = Monday)

Figure 30: Valve body, TUBE and TCBE

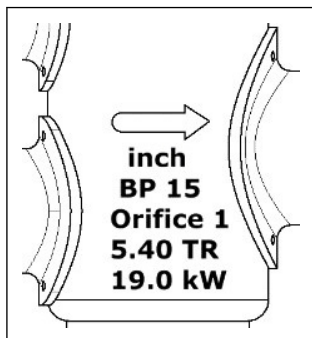


Table 13: Valve body, data example, Fig. 21:

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

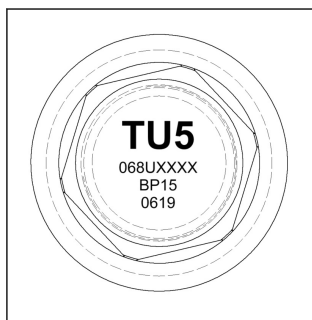


Table 14: Orifice assembly, data example (Fig. 22)

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

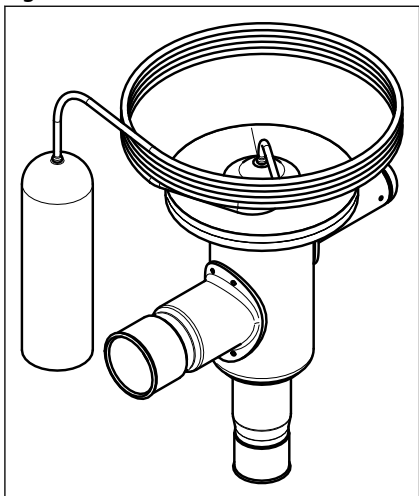


Figure 33: TUBE

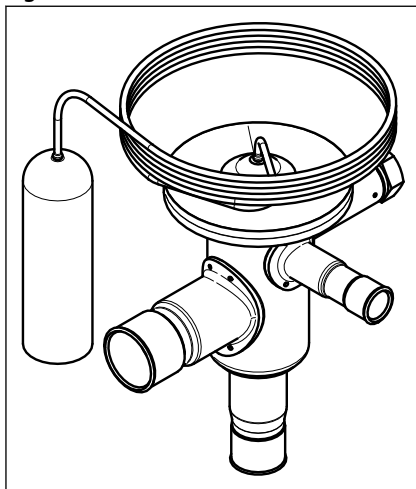


Table 15: Angle, TUB\_TUBE: Range N = -40 – +10 °C / -40 – +50 °F

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		068U1937	068U1917		
		8		3/8 x 1/2	068U1938	10 x 12	068U1918
		9		068U1939	-		
X		-		-	-		
00		-		-	-		
R410A	TUB	1	Internal	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		068U1973	068U1955		
		8		3/8 x 1/2	068U1974	10 x 12	068U1956
		9		068U1975	068U1957		
		X		-	-	-	
		00		-	-	-	

## Thermostatic expansion valve, Type TU and TC

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	6 x 12	068U2027	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	1/4 x 1/2	6 x 12	068U2022	068U2013	
		6			068U2023	068U2014	
		7	3/8 x 1/2	10 x 12	068U2024	068U2015	
		8			068U2025	068U2016	
		9			068U2026	068U2017	
R290	TUB	X	Internal	-	-	-	-
		00		-	-	-	-
		1		1/4 x 1/2	6 x 12	068U3731	-
		2				068U3732	-
		3				068U3733	-
		4				068U3735	068U3744
		5				-	068U3831
	6	-	068U3745				
	7	-	-				
	TUBE	5	1/4 x 3/8	6 x 12	068U3706	068U3717	
		6			068U3707	068U3718	
		7	3/8 x 1/2	10 x 12	068U3708	068U3719	
		8			068U3709	068U3720	
		9			068U3710	068U3721	
R404A / R507A	TUB	X	Internal	-	-	-	-
		00		-	-	-	-
		1		1/4 x 1/2	6 x 12	068U2094	068U2076
		2				068U2095	068U2077
		3				068U2096	068U2078
		4				068U2097	068U2079
		5				-	068U2080
	6	068U2099	068U2081				
	7	3/8 x 1/2	-	10 x 12	068U2082		
	TUBE	5	1/4 x 1/2	6 x 12	068U2107	068U2089	
		6			068U2108	068U2090	
		7	3/8 x 1/2	10 x 12	068U2109	068U2091	
		8			068U2110	068U2092	
		9			068U2111	068U2093	

Figure 34: TUB

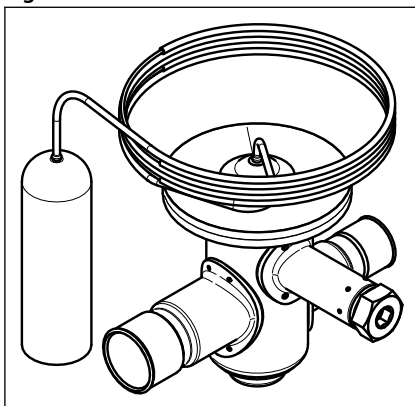
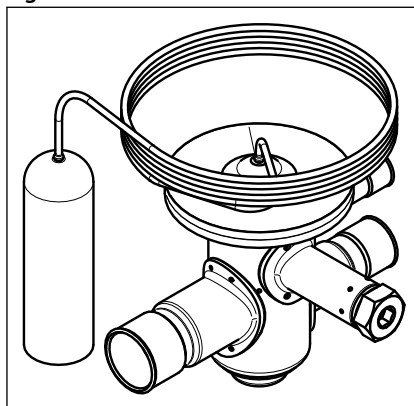


Figure 35: TUBE

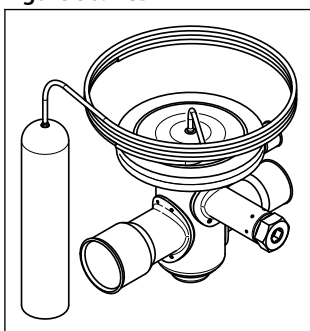


Thermostatic expansion valve, Type TU and TC

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		-	-		
		8		3/8 x 1/2	-		-
		9			068U3316		-
R134a / R513A	TUB	X	Internal	1/4 x 3/8	-	6 x 12	-
		00			-		-
		1			068U3656		068U2540
		2		-	-		
		3		-	068U2542		
		4		068U2561	068U2543		
		5		1/4 x 1/2	-		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			068U2609		-
		8		3/8 x 1/2	068U2610		-
		9			068U2611		-
-		-			-		
-		-			-		

Figure 36: TCBE

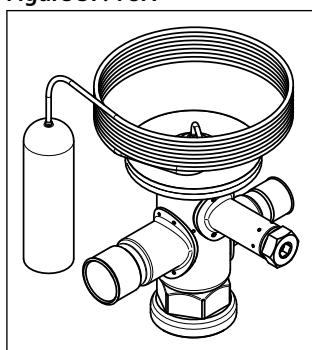


## Thermostatic expansion valve, Type TU and TC

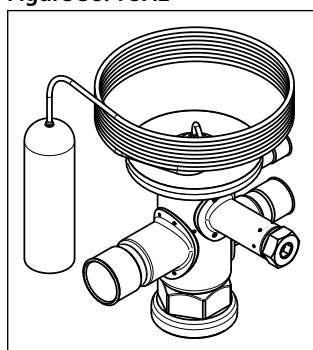
**Table 17: Straight, TCBE, Range N = -40 – +10 °C / -40 – +50 °F**

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		068U4384	12 x 16	068U4387	
		3		068U4385		068U4388	
<b>Range N MOP 95 psig / +15 °C</b>							
R407C	TCBE	1	External	1/2 x 5/8	068U4253	12 x 16	068U4261
		2			068U4254		068U4262
		3			-		068U4263
<b>Range N MOP 165 psig / +15 °C</b>							
R410A	TCBE	1	External	1/2 x 5/8	-	12 x 16	-
		2			068U4270		-
		3			-		068U4279
<b>Range N MOP 55 psig / +15 °C</b>							
R134a/R513A	TCBE	1	External	-	-	10 x 16	068U4228
		2			-	12 x 16	068U4230
		3			-	-	068U4231
<b>Range N MOP 120 psig / +15 °C</b>							
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



## Thermostatic expansion valve, Type TU and TC

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			
TUAE	B MOP		30 psig / -20 °C	3/8 x 1/2	068U2317	-	-				
	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			

## Thermostatic expansion valve, Type TU and TC

Refrigerant	Type	Range	MOP	Pressure eq.	Connection (in x out)			
					inch	Code No.	mm	Code No.
R454A	TUA	-	-	Internal	1/4 x 1/2	068U3963	-	-
					-	-	6 x 12	068U3966
	TUAE	-	-	External	1/4 x 1/2	068U3965	-	-
					-	-	6 x 12	068U3970

Figure 39: TCAE

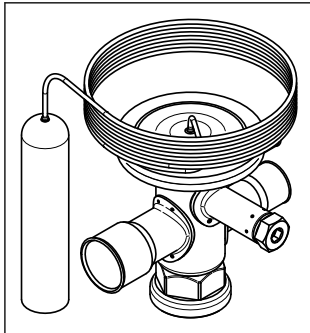


Table 19: Straight, TCAE, Range N = -40 – +10 °C / -40 – +50 °F

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

## Thermostatic expansion valve, Type TU and TC

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
	TCAE	9	-
9		15%	068U 1139
1		-	068U4100
1		15%	068U4097
2		-	068U4101
2		15%	068U4098
	3	-	068U4202
	3	15%	068U4099

## Accessories and spare parts

Figure 40: Bulb strap

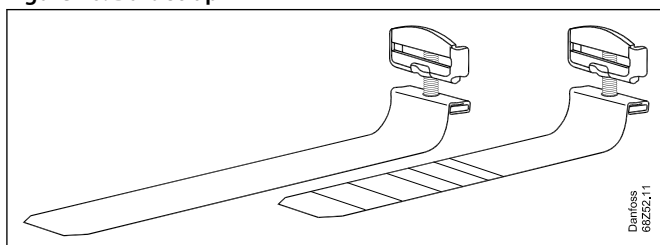


Table 21: Bulb strap for TU, TC, T2

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

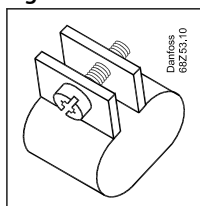


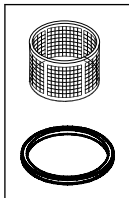
Table 22: Bulb strap for TU, TC, T2

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

## Thermostatic expansion valve, Type TU and TC

<b>I</b>	Industrial pack (OEM)
<b>M</b>	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

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**Table 24: Certificates, declarations, and approvals**

Document name	Document type	Document topic	Approval authority
RU Д-ДК.БЛ08.В.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
SA 7200	Mechanical - Safety Certificate	UL	UL

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