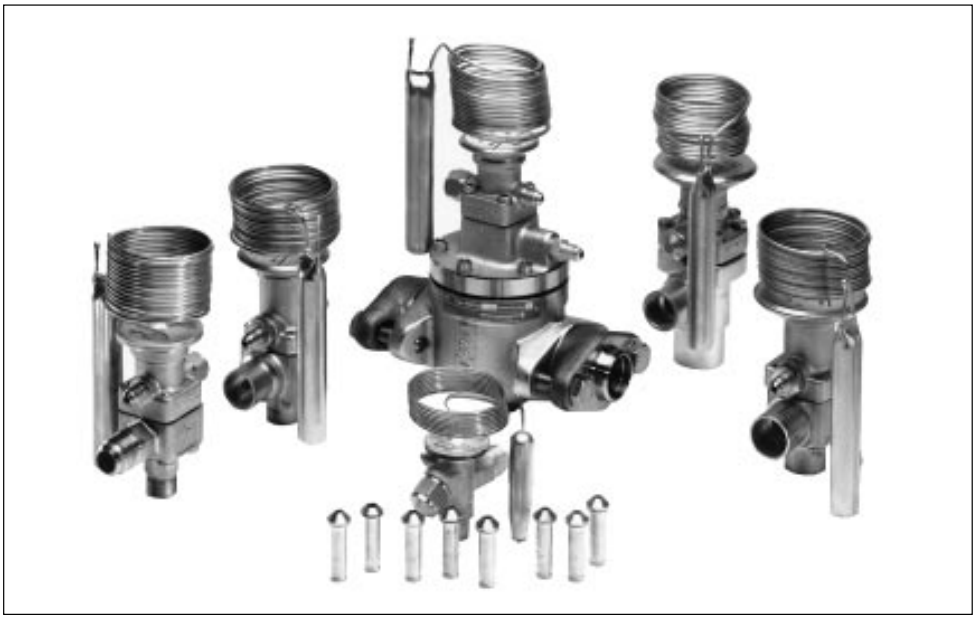
Thermostatic expansion valves type T, TE and PHT

Introduction



Thermostatic expansion valves regulate the injection of refrigerant liquid into evaporators. Injection is controlled by the refrigerant superheat.

Therefore the valves are especially suitable for liquid injection in "dry" evaporators where the superheat at the evaporator outlet is proportional to the evaporator load.

Features

- *Large temperature range:*
  –60 to +50°C
  Equally applicable to freezing, refrigeration and air conditioning plant.
- *Interchangeable orifice assembly*
  – easier stocking
  – easy capacity matching
  – better service.
- *Rated capacities from 0.5 to 1890 kW*
  (0.15 to 540 TR) for R 22
- *Can be supplied with MOP*
  (Max. Operating Pressure)
  Protects the compressor motor against excessive evaporating pressure.
- *Patented double contact bulb*
  Fast and easy to install.
  Good temperature transfer from pipe to bulb.

Overview of expansion valves for fluorinated refrigerants

Type	Rated capacity R 22 kW	Evaporating temperature range[1]					Refrigerants			MOP	Inter-changeable orifice	Conntections		
		N	NM	NL	B	A	R 22	R 134a R 12	R 404A R 502			Flare	ODF solder	Flange
T 2/TE 2	0.5 → 15.5	×	×	×	×		×	×	×	×	×	×	×	
TE 5	10.5 → 42	×	×	×	×		×	×	×	×	×	×	×	
TE 12	15.5 → 63	×	×	×	×		×	×	×	×	×		×	×
TE 20	105	×	×	×	×		×	×	×	×	×		×	
TE 55	175 → 295	×			×		×	×	×	×	×		×	
PHT	105 → 1890	×			×	×	×	×	×	×				×
TQ	14.5 → 404	×	×	×	×		×	×	×		×	×	×	×
PHTQ	145 → 2179	×	×	×	×		×	×	×					×

[1]) Range N: –40°C to +10°C
Range NM: –40°C to –5°C
Range NL: –40°C to –15°C
Range B: –60°C to –25°C
Range A: +10°C to +50°C

Technical data

Max. temperature
Bulb, when valve is installed: 100°C
Complete, valve not installed: 60°C

Min. temperature
– T 2 → TE 55: –60°C
– PHT: 50°C

Max. test pressure
T 2, TE 2: p' = 36 bar
TE 5, TE 12, TE 20, TE 55, PHT: p' = 28 bar

Permissible working pressure
T 2, TE 2: PB = 28 bar
TE 5 → TE 55 and PHT: PB = 22 bar

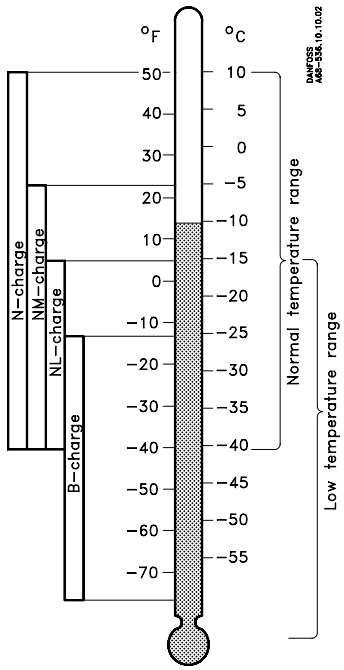
MOP-points

Refrigerant	Range N –40 → +10°C	Range NM –40 → –5°C	Range NL –40 → –15°C	Range B –60 → –25°C
	MOP-point in evaporating temperature t_e and evaporating pressure p_e			
	approx. +15°C / +60°F	approx. 0°C / +32°F	approx. –10°C / +15°F	approx. –20°C / –4°F
R 22	100 psig / 8 bar abs.	60 psig / 5.2 bar abs.	35 psig / 3.5 bar abs.	20 psig / 2.4 bar abs.
R 134a	55 psig / 5 bar abs.	30 psig / 3.1 bar abs.	15 psig / 2.1 bar abs.	
R 404A	120 psig / 9.3 bar abs.	75 psig / 6.2 bar abs.	50 psig / 4.4 bar abs.	30 psig / 3.1 bar abs.
R 12	55 psig / 5 bar abs.	30 psig / 3.1 bar abs.	15 psig / 2.1 bar abs.	
R 502	110 psig / 8.8 bar abs.	70 psig / 5.9 bar abs.	45 psig / 4.2 bar abs.	30 psig / 3.1 bar abs.

MOP = **M**ax. **O**perating **P**ressure

MOP is the evaporating pressure at which the expansion valve will shut off liquid injection in the evaporator and thus prevent the evaporating pressure from rising.
Rising bulb temperature will not open the expansion valve when MOP is reached.

If the superheat factory setting of the expansion valve is changed, the MOP point changes.
If the superheat setting increases, the MOP point is reduced and vice versa, if the MOP point increases, the superheat setting is reduced.



Operating range for thermostatic expansion valves

Sizing

Sizing the thermostatic expansion valve is dependent on:
– max. evaporator load
– evaporating temperature,
– condensing temperature
– liquid subcooling

The pressure drop across the expansion valve is the difference between the compressor condensing and evaporating pressures minus the pressure drop in piping and through distributors.

The following example illustrates the conditions that must be taken into consideration.

Example
Refrigerant = R 22
Required valve connection = solder, straightway
Evaporator capacity Q_e = 9 kW
Evaporating temperature
t_e = 10°C (~p_e = 3.6 bar)
Condensing temperature
t_c +36°C (~p_c = 13.9 bar)

Evaporator with six sections.
Size and length of liquid line,
dia. 1⁄2 in., l = 25 m
Since the evaporator is placed 6 m higher than the receiver, h = 6 m.
A suitable expansion valve and liquid distributor is required.

A.
Determination of pressure drop

The evaporating pressure p_e is subtracted from the condensing pressure p_c. Values p_e and p_c are determined by the values given for t_e and t_c. These can be obtained from a refrigerant table or a Danfoss calculator.
$p_c - p_e$ = 13.9 bar - 3.6 bar
$p_c - p_e$ = 10.3 bar

To obtain the actual pressure drop across the expansion valve, not only is it necessary to subtract p_e from p_c, a series of other pressure drops must be subtracted

1. Pressure drop Δp_1 in the liquid line.
   This can, for example, be determined using the Danfoss publication "Pipe Dimensioning":
   $\Delta p_1 = 25 \times 0.0034$ bar
   $\Delta p_1 \approx 0.1$ bar

2. The assumed pressure drop, p_2, in filter drier, sight glass, manual shut-off valve and pipe bends:
   $\Delta p_2 \approx 0.2$ bar.

3. Pressure drop Δp_3 in the vertical liquid line (because of the height difference, h = 6 m). This is given in the table below:
   Δp_3 = 0.7 bar

Refrig-erant	Static pressure drop, Δp_3 bar at height difference h between evaporator and receiver				
	6 m	12 m	18 m	24 m	30 m
R 22	0.7	1.4	2.1	2.8	3.5
R 134a	0.7	1.4	2.1	2.8	3.6
R 404A	0.6	1.3	1.9	2.5	3.2
R 12	0.8	1.5	2.3	3.1	3.9
R 502	0.7	1.5	2.2	2.9	3.7

4. Pressure drop Δp_4 in the liquid distributor:
   $\Delta p_4 \approx 0.5$ bar

5. Pressure drop Δp_5 in the distributor tubes:
   $\Delta p_5 \approx 0.5$ bar

Total pressure drop across expansion valve:
$\Delta p = (p_c - p_e) - (\Delta p_1 + \Delta p_2 + \Delta p_3 + \Delta p_4 + \Delta p_5)$
$\Delta p \approx 10.3 - (0.1 + 0.2 + 0.7 + 0.5 + 0.5)$
$\Delta p \approx 8.3$ bar

B.
Determination of capacity Q_e

Valve type	Orifice no.	Pressure drop across valve Δp bar							
		2	4	6	**8**	**10**	12	14	16
Evaporating temperature 10°C									
TX 2/TEX 2-0.15	0X	0.37	0.47	0.53	0.57	0.60	0.63	0.64	0.64
TX 2/TEX 2-0.3	00	0.79	0.96	1.1	1.2	1.2	1.3	1.3	1.3
TX 2/TEX 2-0.7	01	1.6	2.0	2.3	2.5	2.6	2.7	2.8	2.8
TX 2/TEX 2-1.0	02	2.2	2.9	3.3	3.6	3.8	4.0	4.1	4.1
TX 2/TEX 2-1.5	03	3.9	5.1	5.9	6.4	6.8	7.1	7.3	7.3
TX 2/TEX 2-2.3	04	5.8	7.6	8.7	**9.5**	**10.1**	10.5	10.8	10.9
TX 2/TEX 2-3.0	05	7.4	9.6	11.0	12.0	12.8	13.3	13.6	13.8
TX 2/TEX 2-4.5	06	9.1	11.8	13.5	14.7	15.6	16.2	16.6	16.8

From the table for t_e = –10°C and Δp = 8.3 by interpolation:

$$Q_e = 9.5 + \frac{8.3 - 8}{10 - 8} \ (10.1 - 9.5)$$

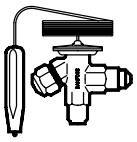
Q_e = 9.6 kW

The table indicates that a TEX 2-2.3 with orifice 04 should be used.
The table capacities are based on 4°C subcooling ahead of valve.

Generally, the maximum capacity of a valve is approx. 20% higher than the figure given in the table.

Ordering

Complete valves
T 2 and TE 2
with flare connections



Range N (without MOP): –40 to +10°C

R 22, R 134a, R 404A

Refrigerant	Valve type	Rated capacity kW [1]	Orifice no.	Pressure equalization	Connection in inch		Code no.
					Inlet	Outlet	
R 22	TX 2-0.15	0.5	0X	Int.	3/8	1/2	68Z6362
	TX 2-0.3	1.0	00	Int.	3/8	1/2	68Z6334
	TX 2-0.7	2.5	01	Int.	3/8	1/2	68Z6040
	TX 2-1.0	3.5	02	Int.	3/8	1/2	68Z6077
	TX 2-1.5	5.2	03	Int.	3/8	1/2	68Z6042
	TX 2-2.3	8.0	04	Int.	3/8	1/2	68Z6043
	TX 2-3.0	10.5	05	Int.	3/8	1/2	68Z6044
	TX 2-4.5	15.5	06	Int.	3/8	1/2	68Z6078
	TEX 2-0.15	0.5	0X	Ext.	3/8	1/2	68Z6363
	TEX 2-0.3	1.0	00	Ext.	3/8	1/2	68Z6052
	TEX 2-0.7	2.5	01	Ext.	3/8	1/2	68Z6047
	TEX 2-1.0	3.5	02	Ext.	3/8	1/2	68Z6084
	TEX 2-1.5	5.2	03	Ext.	3/8	1/2	68Z6049
	TEX 2-2.3	8.0	04	Ext.	3/8	1/2	68Z6050
	TEX 2-3.0	10.5	05	Ext.	3/8	1/2	68Z6051
	TEX 2-4.5	15.5	06	Ext.	3/8	1/2	68Z6085
R 134a	TN 2-0.25	0.9	00	Int.	3/8	1/2	68Z6302
	TN 2-0.5	1.8	01	Int.	3/8	1/2	68Z6303
	TN 2-0.8	2.6	02	Int.	3/8	1/2	68Z6304
	TN 2-1.3	4.6	03	Int.	3/8	1/2	68Z6305
	TN 2-1.9	6.7	04	Int.	3/8	1/2	68Z6306
	TN 2-2.5	8.6	05	Int.	3/8	1/2	68Z6307
	TN 2-3.0	10.5	06	Int.	3/8	1/2	68Z6308
	TEN 2-0.25	0.9	00	Ext.	3/8	1/2	68Z6309
	TEN 2-0.5	1.8	01	Ext.	3/8	1/2	68Z6310
	TEN 2-0.8	2.6	02	Ext.	3/8	1/2	68Z6311
	TEN 2-1.3	4.6	03	Ext.	3/8	1/2	68Z6312
	TEN 2-1.9	6.7	04	Ext.	3/8	1/2	68Z6313
	TEN 2-2.5	8.6	05	Ext.	3/8	1/2	68Z6314
	TEN 2-3.0	10.5	06	Ext.	3/8	1/2	68Z6315
R 404A	TS 2-0.21	0.7	00	Int.	3/8	1/2	68Z6386
	TS 2-0.45	1.6	01	Int.	3/8	1/2	68Z6387
	TS 2-0.6	2.1	02	Int.	3/8	1/2	68Z6388
	TS 2-1.2	4.2	03	Int.	3/8	1/2	68Z6389
	TS 2-1.7	6.0	04	Int.	3/8	1/2	68Z6390
	TS 2- 2.2	7.7	05	Int.	3/8	1/2	68Z6391
	TS 2-2.6	9.1	06	Int.	3/8	1/2	68Z6392
	TES 2-0.21	0.7	00	Ext.	3/8	1/2	68Z6393
	TES 2-0.45	1.6	01	Ext.	3/8	1/2	68Z6394
	TES 2-0.6	2.1	02	Ext.	3/8	1/2	68Z6395
	TES 2-1.2	4.2	03	Ext.	3/8	1/2	68Z6396
	TES 2-1.7	6.0	04	Ext.	3/8	1/2	68Z6397
	TES 2- 2.2	7.7	05	Ext.	3/8	1/2	68Z6398
	TES 2-2.6	9.1	06	Ext.	3/8	1/2	68Z6399

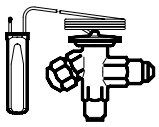
[1] The rated capacity is based on:
- evaporating temperature t_e = +5°C
- condensing temperature t_c = +32°C
- refrigerant temperature ahead of valve t_l = +28°C

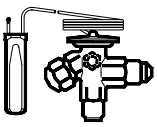
Explanation of type designation
Example: TEN 2-0.5
T = thermostatic expansion valve
E = external pressure equalization
¼ in./6 mm flare
N = refrigerant R 134a, yellow label with blue bar
(X = R 22, green label)
(S = R 404a, white label with lilac bar)
2-0.5 = valve size

Capacity tables
See extended capacity tables.

Ordering (continued)

Complete valves
T 2 and TE 2
with flare connections





1) The rated capacity is based on:
- evaporating temperature t_e = +5°C
- condensing temperature t_c = +32°C
- refrigerant temperature ahead of valve t_l = +28°C

Range N (without MOP): –40 to +10°C

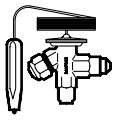
R 12, R 502

Refrigerant	Valve type	Rated capacity kW 1)	Orifice no.	Pressure equalization	Connection in inch		Code no.
					Inlet	Outlet	
R 12	TF 2-0.2	0.7	00	Int.	⅜	½	**68-4035**
	TF 2-0.3	1.0	01	Int.	⅜	½	**68-6014**
	TF 2-0.5	1.7	02	Int.	⅜	½	**68-6019**
	TF 2-1.0	3.5	03	Int.	⅜	½	**68-6016**
	TF 2-1.5	5.2	04	Int.	⅜	½	**68-6017**
	TF 2-2.0	7.0	05	Int.	⅜	½	**68-6018**
	TF 2-3.0	10.5	06	Int.	⅜	½	**68-6020**
	TEF 2-0.3	1.0	01	Ext.	⅜	½	**68-6021**
	TEF 2-0.5	1.7	02	Ext.	⅜	½	**68-6070**
	TEF 2-1.0	3.5	03	Ext.	⅜	½	**68-6023**
	TEF 2-1.5	5.2	04	Ext.	⅜	½	**68-6024**
	TEF 2-2.0	7.0	05	Ext.	⅜	½	**68-6025**
	TEF 2-3.0	10.5	06	Ext.	⅜	½	**68-6071**
R 502	TY 2-0.3	1.0	01	Int.	⅜	½	**68-6065**
	TY 2-0.6	2.1	02	Int.	⅜	½	**68-6111**
	TY 2-1.0	3.5	03	Int.	⅜	½	**68-6067**
	TY 2-1.5	5.2	04	Int.	⅜	½	**68-6068**
	TY 2-2.0	7.0	05	Int.	⅜	½	**68-6069**
	TY 2-3.0	10.5	06	Int.	⅜	½	**68-6112**
	TEY 2-0.3	1.0	01	Ext.	⅜	½	**68-6072**
	TEY 2-0.6	2.1	02	Ext.	⅜	½	**68-6118**
	TEY 2-1.0	3.5	03	Ext.	⅜	½	**68-6074**
	TEY 2-1.5	5.2	04	Ext.	⅜	½	**68-6075**
	TEY 2-2.0	7.0	05	Ext.	⅜	½	**68-6076**
	TEY 2-3.0	10.5	06	Ext.	⅜	½	**68-6119**

Explanation of type designation
Example: TEF 2-0.3
T = thermostatic expansion valve
E = external pressure equalization ¼ in. / 6 mm flare
F = refrigerant R 12, yellow label (Y = R 502, lilac label
2-0.3 = valve size

Extended capacity tables for R 12 and R 502:
Please contact Danfoss.

Ordering, components with flare × flare connection



Thermostatic element, without orifice, filter cone, nuts, with sensor band

Refrig-erant	Valve type	Pressure equaliz-ation [1]	Capillary tube	Connection Inlet × Outlet		Code no.					
						Range N –40 to +10°C		Range NM –40 to –5°C	Range NL –40 to –15°C	Range B –60 to –25°C	
			m	in. × in.	mm × mm	Without MOP	With MOP	With MOP	With MOP	Without MOP	With MOP
R 22	TX 2 TX 2	Int. Int.	1.5 5	⅜ × ½ ⅜ × ½	10 × 12 10 × 12	**68Z3206** **68Z3238**	**68Z3208**	**68Z3224**	**68Z3226**	**68Z3207**	**68Z3228**
	TEX 2 TEX 2	Ext. Ext.	1.5 5	⅜ × ½ ⅜ × ½	10 × 12 10 × 12	**68Z3209** **68Z3239**	**68Z3211**	**68Z3225**	**68Z3227**	**68Z3210**	**68Z3229**
R 134a	TN 2	Int.	1.5	⅜ × ½	10 × 12	**68Z3346**	**68Z3347**	**68Z3393**	**68Z3369**		
	TEN 2	Ext.	1.5	⅜ × ½	10 × 12	**68Z3348**	**68Z3349**	**68Z3392**	**68Z3370**		
R 404A	TS 2	Int.	1.5	⅜ × ½	10 × 12	**68Z3400**	**68Z3402**	**68Z3406**	**68Z3408**	**68Z3401**	**68Z3410**
	TES 2	Ext.	1.5	⅜ × ½	10 × 12	**68Z3403**	**68Z3405**	**68Z3407**	**68Z3409**	**68Z3404**	**68Z3411**
R 12	TF 2 TF 2	Int. Int.	1.5 5	⅜ × ½ ⅜ × ½	10 × 12 10 × 12	**68-3202** **68-3219**	**68-3236**	**68-3220**	**68-3222**		
	TEF 2 TEF 2	Ext. Ext.	1.5 5	⅜ × ½ ⅜ × ½	10 × 12 10 × 12	**68-3204** **68-3218**	**68-3237**	**68-3221**	**68-3223**		
R 502	TY 2	Int.	1.5	⅜ × ½	10 × 12	**68-3212**	**68-3214**	**68-3230**	**68-3232**	**68-3213**	**68-3234**
	TEY 2	Ext.	1.5	⅜ × ½	10 × 12	**68-3215**	**68-3217**	**68-3231**	**68-3233**	**68-3216**	**68-3235**

[1]) Valves with inch connections have ¼ inch pressure equalization.

Orifice assembly with filter

The rated capacity is based on:
Evaporating temperature t_e = +5°C for range N and t_e = –30°C for range B
Condensing temperature t_c = +32°C
Refrigerant temperature ahead of valve t_l = +28°C

Range N: –40 to +10°C

Orifice no.	Rated capacity in tons (TR)					Rated capacity in kW					Code no.
	R 22	R 134a	R 404A	R 12	R 502	R 22	R 134a	R 404A	R 12	R 502	
0X	0.15	0.11	0.11			0.5	0.4	0.38			**68-2002**
00	0.3	0.25	0.21	0.2	0.2	1.0	0.9	0.7	0.7	0.7	**68-2003**
01	0.7	0.5	0.45	0.3	0.3	2.5	1.8	1.6	1.0	1.0	**68-2010**
02	1.0	0.8	0.6	0.5	0.5	3.5	2.6	2.1	1.7	2.1	**68-2015**
03	1.5	1.3	1.2	1.0	1.0	5.2	4.6	4.2	3.5	3.5	**68-2006**
04	2.3	1.9	1.7	1.5	1.5	8.0	6.7	6.0	5.2	5.2	**68-2007**
05	3.0	2.5	2.2	2.0	2.0	10.5	8.6	7.7	7.0	7.0	**68-2008**
06	4.5	3.0	2.6	3.0	3.0	15.5	10.5	9.1	10.5	10.5	**68-2009**

Range B: –60 to –25°C

0X	0.15		0.11			0.5		0.38			**68-2002**
00	0.2		0.21		0.2	0.7		0.7		0.7	**68-2003**
01	0.3		0.45		0.3	1.0		1.6		1.0	**68-2010**
02	0.6		0.6		0.5	2.1		2.1		1.7	**68-2015**
03	0.8		1.0		0.8	2.8		3.5		2.8	**68-2006**
04	1.2		1.4		1.2	4.2		4.9		4.2	**68-2007**
05	1.5		1.7		1.5	5.2		6.0		5.2	**68-2008**
06	2.0		1.9		2.0	7.0		6.6		7.0	**68-2009**

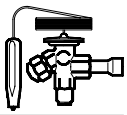
Flare connections

Connection for copper tubing with outside diameter		Reducer for copper tubing with outside diameter		Code no.	
in.	mm	in.	mm	Excl. nickel plating	Incl. nickel plating
¼	6			**11L1101**	**11L1201**
⅜	10			**11L1135**	**11L1235**
½	12			**11L1103**	**11L1203**
		¼	6	**11L1107**	**11L1207**

Example
A TE 2 thermostatic expansion valve consists of two elements + flare nuts if required:
– 1 thermostatic element
– 1 orifice assembly and flare nuts

When ordering one thermostatic expansion valve, TEX 2 with orifice 01, five code numbers are required:
– 1-off thermostatic element, **68Z3209**
– 1-off orifice assembly 01, **68-2010**
– 1-off ⅜ in. flare nut, **11L1135**
– 1-off ½ in. flare nut, **11L1103**
– 1-off ¼ in. flare nut, **11L1101**

Ordering, components with flare × solder connection



Thermostatic element, without orifice, filter cone, nuts, with sensor band

Refrigerant	Valve type	Pressure equaliz-ation [1]	Capillary tube	Connection			Code no.				
				Inlet Flare	Outlet ODF solder		Range N –40 to +10°C		Range NL –40 to –15°C	Range B –60 to –25°C	
			m	in.	in.	mm	Without MOP	With MOP	With MOP	Without MOP	With MOP
R 22	TX 2	Int.	1.5	3/8	1/2		**68Z3281**	**68Z3287**		**68Z3357**	**68Z3319**
	TX 2	Int.	1.5	3/8		12	**68Z3302**	**68Z3308**	**68Z3366**	**68Z3361**	**68Z3276**
	TEX 2	Ext.	1.5	3/8	1/2		**68Z3284**	**68Z3290**		**68Z3359**	**68Z3320**
	TEX 2	Ext.	1.5	3/8		12	**68Z3305**	**68Z3311**	**68Z3367**	**68Z3363**	**68Z3277**
R 134a	TN 2	Int.	1.5	3/8	1/2		**68Z3383**	**68Z3387**			
	TN 2	Int.	1.5	3/8		12	**68Z3384**	**68Z3388**			
	TEN 2	Ext.	1.5	3/8	1/2		**68Z3385**	**68Z3389**			
	TEN 2	Ext.	1.5	3/8		12	**68Z3386**	**68Z3390**			
R 404A	TS 2	Int.	1.5	3/8	1/2		**68Z3414**	**68Z3416**	**68Z3429**	**68Z3418**	**68Z3420**
	TS 2	Int.	1.5	3/8		12	**68Z3435**	**68Z3423**	**68Z3436**	**68Z3425**	**68Z3427**
	TES 2	Ext.	1.5	3/8	1/2		**68Z3415**	**68Z3417**	**68Z3430**	**68Z3419**	**68Z3421**
	TES 2	Ext.	1.5	3/8		12	**68Z3422**	**68Z3424**	**68Z3437**	**68Z3426**	**68Z3428**
R 12	TF 2	Int.	1.5	3/8	1/2		**68-3280**	**68-3286**			
	TF 2	Int.	1.5	3/8		12	**68-3301**	**68-3307**			
	TEF 2	Ext.	1.5	3/8	1/2		**68-3283**	**68-3289**			
	TEF 2	Ext.	1.5	3/8		12	**68-3304**	**68-3310**			
R 502	TY 2	Int.	1.5	3/8	1/2		**68-3282**	**68-3288**		**68-3292**	**68-3294**
	TY 2	Int.	1.5	3/8		12	**68-3303**	**68-3309**		**68-3313**	**68-3315**
	TEY 2	Ext.	1.5	3/8	1/2		**68-3285**	**68-3291**		**68-3293**	**68-3295**
	TEY 2	Ext.	1.5	3/8		12	**68-3306**	**68-3312**		**68-3314**	**68-3316**

[1]) Valves with inch connections have 1/4 inch pressure equalization. Valves with mm connections have 6 mm pressure equalization.

Orifice assembly with filter

The rated capacity is based on:
Evaporating temperature t_e = +5°C for range N and t_e = –30°C for range B
Condensing temperature t_c = +32°C
Refrigerant temperature ahead of valve t_l = +28°C

Range N: –40 to +10°C

Orifice no.	Rated capacity in tons (TR)					Rated capacity in kW					Code no.
	R 22	R 134a	R 404A	R 12	R 502	R 22	R 134a	R 404A	R 12	R 502	
0X	0.15	0.11	0.11			0.5	0.4	0.38			**68-2002**
00	0.3	0.25	0.21	0.2	0.2	1.0	0.9	0.7	0.7	0.7	**68-2003**
01	0.7	0.5	0.45	0.3	0.3	2.5	1.8	1.6	1.0	1.0	**68-2010**
02	1.0	0.8	0.6	0.5	0.5	3.5	2.6	2.1	1.7	2.1	**68-2015**
03	1.5	1.3	1.2	1.0	1.0	5.2	4.6	4.2	3.5	3.5	**68-2006**
04	2.3	1.9	1.7	1.5	1.5	8.0	6.7	6.0	5.2	5.2	**68-2007**
05	3.0	2.5	2.2	2.0	2.0	10.5	8.6	7.7	7.0	7.0	**68-2008**
06	4.5	3.0	2.6	3.0	3.0	15.5	10.5	9.1	10.5	10.5	**68-2009**

Range B: –60 to –25°C

0X	0.15		0.11			0.5		0.38			**68-2002**
00	0.2		0.21		0.2	0.7		0.7		0.7	**68-2003**
01	0.3		0.45		0.3	1.0		1.6		1.0	**68-2010**
02	0.6		0.6		0.5	2.1		2.1		1.7	**68-2015**
03	0.8		1.0		0.8	2.8		3.5		2.8	**68-2006**
04	1.2		1.4		1.2	4.2		4.9		4.2	**68-2007**
05	1.5		1.7		1.5	5.2		6.0		5.2	**68-2008**
06	2.0		1.9		2.0	7.0		6.6		7.0	**68-2009**

Solder adaptor

The adaptor is for use with thermostatic expansion valves T 2 and TE 2 with flare × solder connections. When the adaptor is fitted correctly it meets the sealing requirements of DIN 8964.

The adaptor offers the following advantages:
- The orifice assembly can be replaced.
- The filter can be cleaned or replaced.

The standard orifice in T 2 and TE 2 can be used with the solder adaptor when the expansion valve filter is replaced with a separately ordered filter.
Only in this way can the sealing requirements of DIN 8964 be fulfilled.
A solder adaptor is also available for filter driers.

Solder adaptor without orifice assembly and filter

Connection ODF solder	Code no.
1/4 in.	**68-2062**
6 mm	**68-2063**
3/8 in.	**68-2060**
10 mm	**68-2061**

Filter for solder adaptor

Description	Code no.
Filter excl. orifice assembly	**68-0015**

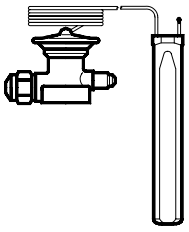
Orifice assembly with filter for solder adaptor

Orifice no.	Code no.
0X	**68-2089**
00	**68-2090**
01	**68-2091**
02	**68-2092**
03	**68-2093**
04	**68-2094**
05	**68-2095**
06	**68-2096**

Flare connections
See previous page.

Ordering
(continued)

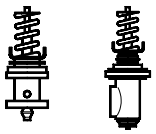
R 22



Thermostatic element

Valve type	Pressure equalization	Capillary tube	Code no.					
			Range N –40 to +10°C		Range NM –40 to –5°C	Range NL –40 to –15°C	Range B –60 to –25°C	
	¼ in. / 6 mm	m	Without MOP	With MOP	With MOP	With MOP	Without MOP	With MOP
TEX 5	Ext. [1])	3	**68B3250**	**68B3267**	**68B3249**	**68B3253**	**68B3263**	**68B3251**
TEX 12	Ext.	3	**68B3210**	**68B3227**	**68B3207**	**68B3213**		**68B3211**
TEX 12	Ext.	5	**68B3209**					**68B3212**
TEX 20	Ext.	3	**68B3274**	**68B3286**	**68B3273**	**68B3275**		**68B3276**
TEX 20	Ext.	5	**68B3290**					**68B3287**
TEX 55	Ext.	3	**68G3205**	**68G3220**				**68G3207**
TEX 55	Ext.	5	**68G3209**					**68G3217**

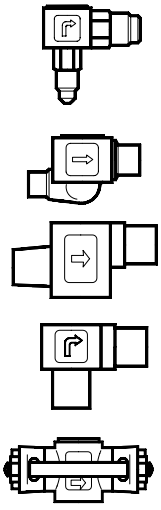
[1]) Pressure equalization with solder connector can be supplied on contacting Danfoss.



Orifice assembly

Valve type	Rated capacity Range N: –40 to 10°C kW	Rated capacity Range B: –60/55 to –25°C kW	Orifice no.	**Code no.**
TEX 5-3	19.7	19.7	01	**68B2089**
TEX 5-4.5	26.9	26.9	02	**68B2090**
TEX 5-7.5	38.8	38.8	03	**68B2091**
TEX 5-12	55.3	55.3	04	**68B2092**
TEX 12-4.5	26.8	26.8	01	**68B2005**
TEX 12-7.5	43.4	43.4	02	**68B2006**
TEX 12-12	64.0	64.0	03	**68B2007**
TEX 12-18	84.4	84.4	04	**68B2008**
TEX 20-30	108.0	70.0	01	**68B2172**
TEX 55-50	239.0	148.0	01	**68G2005**
TEX 55-85	356.0	228.0	02	**68G2006**

The rated capacity is based on:
Evaporating temperature t_e = +5°C for range N and t_e = –30°C for range B
Condensing temperature t_c = +32°C
Refrigerant temperature ahead of valve t_l = +28°C



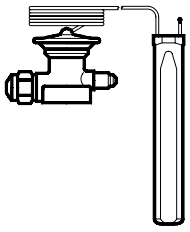
Valve body

Type	Orifice no.	Connection Inlet × Outlet		Code no.			
		in.	mm	Flare angleway	Solder angleway	Solder straightway	Solder flanges
TE 5	01 - 03 03 04	½ × ⅝ ½ × ⅞ ⅝ × ⅞		**68B4013**	**68B4009** **68B4010** **68B4011**	**68B4007** **68B4008**	
TE 5	01- 03 03 04		12 × 16 12 × 22 16 × 22	**68B4013**	**68B4004** **68B4005** **68B4012**	**68B4002** **68B4003**	
TE 12	01 - 02 03 - 04 03 - 04	⅝ × ⅞ ⅞ × 1 ⅞ × 1⅛			**68B4022** [1]) **68B4023** [2])	**68B4020** [1]) **68B4021** [2])	**68B4025** [1]) **68B4026** [1])
TE 12	01 - 02 03 - 04 03 - 04		16 × 22 22 × 25 22 × 28		 **68B4017** [2])	**68B4018** [1]) **68B4016** [2])	**68B4027** [1]) **68B4015** [1])
TE 20	01 01	⅞ × 1⅛	 22 × 28		**68B4023** [1]) **68B4017** [1])	**68B4021** [1]) **68B4016** [1])	
TE 55	01- 02 01- 02	1⅛ × 1⅜	 28 × 35		**68G4004** [1]) **68G4002** [1])	**68G4003** [1]) **68G4001** [1])	

[1]) ODF × ODF
[2]) ODF × ODM
ODF = Internal diameter
ODM = External diameter

Ordering
(continued)

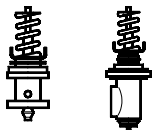
R 134a



Thermostatic element

Valve type	Pressure eaualization	Capillary tube	Code no.			
			Range N –40 to +10°C		Range NM –40 to –5°C	Range NL –40 to –15°C
	¼ in. / 6 mm	m	Without MOP	With MOP	With MOP	With MOP
TEN 5	Ext. [1])	3	**68B3297**	**68B3298**	**68B3360**	**68B3327**
TEN 12	Ext.	3	**68B3232**	**68B3233**	**68B3364**	**68B3365**
TEN 12	Ext.	5	**68B3363**			
TEN 20	Ext.	3	**68B3292**	**68B3293**	**68B3371**	
TEN 20	Ext.	5	**68B3370**			
TEN 55	Ext.	3	**68G3222**	**68G3223**	**68G3231**	**68G3232**
TEN 55	Ext.	5	**68G3230**			

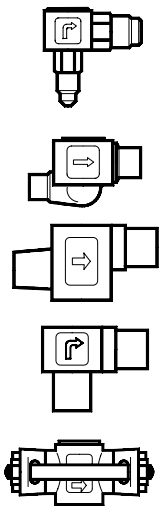
[1]) Pressure equalization with solder connector can be supplied on contacting Danfoss.



Orifice assembly

Valve type	Rated capacity kW	Orifice no.	**Code no.**
TEN 5-3.7	12.9	01	**68B2089**
TEN 5-5.4	19.1	02	**68B2090**
TEN 5-8.3	29.1	03	**68B2091**
TEN 5-11.2	39.6	04	**68B2092**
TEN 12-4.7	16.7	01	**68B2005**
TEN 12-7.7	27.2	02	**68B2006**
TEN 12-11.4	40.0	03	**68B2007**
TEN 12-15	53.0	04	**68B2008**
TEN 20-18	65.0	01	**68B2170**
TEN 55-41	145.0	01	**68G2001**
TEN 55-62	220.0	02	**68G2002**

The rated capacity is based on:
Evaporating temperature t_e = +5°C
Condensing temperature t_c = +32°C
Refrigerant temperature ahead of valve t_l = +28°C

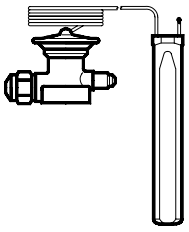


Valve body

Type	Orifice no.	Connection Inlet × Outlet		Code no.			
		in.	mm	Flare angleway	Solder angleway	Solder straightway	Solder flanges
TE 5	01 - 03 03 04	½ × ⅝ ½ × ⅞ ⅝ × ⅞		**68B4013**	**68B4009** **68B4010** **68B4011**	**68B4007** **68B4008**	
TE 5	01- 03 03 04		12 × 16 12 × 22 16 × 22	**68B4013**	**68B4004** **68B4005** **68B4012**	**68B4002** **68B4003**	
TE 12	01 - 02 03 - 04 03 - 04	⅝ × ⅞ ⅞ × 1 ⅞ × 1⅛			**68B4022** [1]) **68B4023** [2])	**68B4020** [1]) **68B4021** [2])	**68B4025** [1]) **68B4026** [1])
TE 12	01 - 02 03 - 04 03 - 04		16 × 22 22 × 25 22 × 28		 **68B4017** [2])	**68B4018** [1]) **68B4016** [2])	**68B4027** [1]) **68B4015** [1])
TE 20	01 01	⅞ × 1⅛	 22 × 28		**68B4023** [1]) **68B4017** [1])	**68B4021** [1]) **68B4016** [1])	
TE 55	01- 02 01- 02	1⅛ × 1⅜	 28 × 35		**68G4004** [1]) **68G4002** [1])	**68G4003** [1]) **68G4001** [1])	

[1]) ODF × ODF
[2]) ODF × ODM
ODF = Internal diameter
ODM = External diameter

Ordering
(continued)

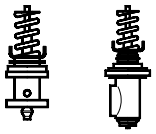


R 404A

Thermostatic element

Valve type	Pressure equalization	Capillary tube	Code no.					
			Range N –40 to +10°C		Range NM –40 to –5°C	Range NL –40 to –15°C	Range B –60 to –25°C	
	¼ in. / 6 mm	m	Without MOP	With MOP	With MOP	With MOP	Without MOP	With MOP
TES 5	Ext. [1]	3	**68B3342**		**68B3357**	**68B3358**	**68B3344**	**68B3343**
TES 12	Ext.	3	**68B3347**		**68B3345**	**68B3348**		**68B3349**
TES 12	Ext.	5	**68B3346**					**68B3350**
TES 20	Ext.	3	**68B3352**		**68B3351**	**68B3353**		**68B3354**
TES 20	Ext.	5	**68B3356**					**68B3355**
TES 55	Ext.	3	**68G3302**		**68G3303**	**68G3304**		**68G3305**
TES 55	Ext.	5	**68G3301**					**68G3306**

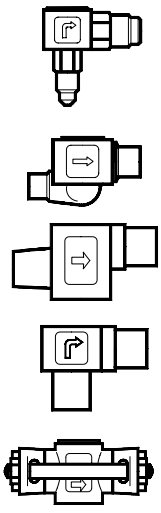
[1])Pressure equalization with solder connector can be supplied on contacting Danfoss.



Orifice assembly

Valve type	Rated capacity range N: –40 to 10°C kW	Rated capacity range B: –60/55 to –25°C kW	Orifice no.	**Code no.**
TES 5-3.7	13.0	13.0	01	**68B2089**
TES 5-5.0	17.6	17.6	02	**68B2090**
TES 5-7.2	25.3	25.3	03	**68B2091**
TES 5-10.3	36.2	36.2	04	**68B2092**
TES12-4.2	14.8	14.8	01	**68B2005**
TES 12-6.8	23.9	23.9	02	**68B2006**
TES 12-10.0	35.2	35.2	03	**68B2007**
TES 12-13.4	47.1	47.1	04	**68B2008**
TES 20-16.5	59.0	41.0	01	**68B2175**
TES 55-37.0	130.0	95.0	01	**68G2011**
TES 55-56.0	197.0	144.0	02	**68G2012**

The rated capacity is based on:
Evaporating temperature t_e = +5°C for range N and t_e = –30°C for range B
Condensing temperature t_c = +32°C
Refrigerant temperature ahead of valve t_l = +28°C



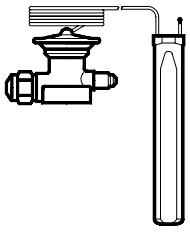
Valve body

Type	Orifice no.	Connection Inlet × Outlet		Code no.			
		in.	mm	Flare angleway	Solder angleway	Solder straightway	Solder flanges
TE 5	01 - 03 03 04	½ × ⅝ ½ × ⅞ ⅝ × ⅞		**68B4013**	**68B4009** **68B4010** **68B4011**	**68B4007** **68B4008**	
TE 5	01- 03 03 04		12 × 16 12 × 22 16 × 22	**68B4013**	**68B4004** **68B4005** **68B4012**	**68B4002** **68B4003**	
TE 12	01 - 02 03 - 04 03 - 04	⅝ × ⅞ ⅞ × 1 ⅞ × 1⅛			**68B4022** [1]) **68B4023** [2])	**68B4020** [1]) **68B4021** [2])	**68B4025** [1]) **68B4026** [1])
TE 12	01 - 02 03 - 04 03 - 04		16 × 22 22 × 25 22 × 28		 **68B4017** [2])	**68B4018** [1]) **68B4016** [2])	**68B4027** [1]) **68B4015** [1])
TE 20	01 01	⅞ × 1⅛	 22 × 28		**68B4023** [1]) **68B4017** [1])	**68B4021** [1]) **68B4016** [1])	
TE 55	01- 02 01- 02	1⅛ × 1⅜	 28 × 35		**68G4004** [1]) **68G4002** [1])	**68G4003** [1]) **68G4001** [1])	

[1]) ODF × ODF
[2]) ODF × ODM
ODF = Internal diameter
ODM = External diameter

Ordering
(continued)

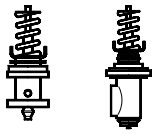
R 12



Thermostatic element

Valve type	Pressure eaualization	Capillary tube	Code no.			
			Range N –40 to + 10°C		Range NM –40 to –5°C	Range NL –40 to –15°C
	¼ in. / 6 mm	m	Without MOP	With MOP	With MOP	With MOP
TEF 5	Ext. [1])	3	**68B3244**	**68B3266**	**68B3242**	**68B3245**
TEF 12	Ext.	3	**68B3204**	**68B3228**	**68B3201**	**68B3205**
TEF 12	Ext.	5	**68B3203**			
TEF 20	Ext.	3	**68B3270**	**68B3285**	**68B3271**	
TEF 20	Ext.	5	**68B3289**			
TEF 55	Ext.	3	**68G3201**		**68G3202**	**68G3203**
TEF 55	Ext.	5	**68G3204**			

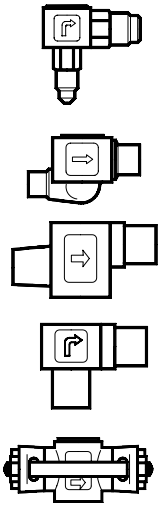
[1]) Pressure equalization with solder connector can be supplied on contacting Danfoss.



Orifice assembly

Valve type	Rated capacity kW	Orifice no.	**Code no.**
TEF 5-2	12.3	01	**68B2089**
TEF 5-3	16.8	02	**68B2090**
TEF 5-5	24.0	03	**68B2091**
TEF 5-8	34.3	04	**68B2092**
TEF 12-3	14.0	01	**68B2005**
TEF 12-5	22.8	02	**68B2006**
TEF 12-8	33.5	03	**68B2007**
TEF 12-12	44.6	04	**68B2008**
TEF 20-20	56.0	01	**68B2170**
TEF 55-33	124.0	01	**68G2001**
TEF 55-55	188.0	02	**68G2002**

The rated capacity is based on:
Evaporating temperature t_e = +5°C
Condensing temperature t_c = +32°C
Refrigerant temperature ahead of valve t_l = +28°C

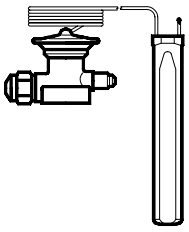


Valve body

Type	Orifice no.	Connection Inlet × Outlet		Code no.			
		in.	mm	Flare angleway	Solder angleway	Solder straightway	Solder flanges
TE 5	01 - 03 03 04	½ × ⅝ ½ × ⅞ ⅝ × ⅞		**68B4013**	**68B4009** **68B4010** **68B4011**	**68B4007** **68B4008**	
TE 5	01- 03 03 04		12 × 16 12 × 22 16 × 22	**68B4013**	**68B4004** **68B4005** **68B4012**	**68B4002** **68B4003**	
TE 12	01 - 02 03 - 04 03 - 04	⅝ × ⅞ ⅞ × 1 ⅞ × 1⅛			**68B4022** [1]) **68B4023** [2])	**68B4020** [1]) **68B4021** [2])	**68B4025** [1]) **68B4026** [1])
TE 12	01 - 02 03 - 04 03 - 04		16 × 22 22 × 25 22 × 28		 **68B4017** [2])	**68B4018** [1]) **68B4016** [2])	**68B4027** [1]) **68B4015** [1])
TE 20	01 01	⅞ × 1⅛	 22 × 28		**68B4023** [1]) **68B4017** [1])	**68B4021** [1]) **68B4016** [1])	
TE 55	01- 02 01- 02	1⅛ × 1⅜	 28 × 35		**68G4004** [1]) **68G4002** [1])	**68G4003** [1]) **68G4001** [1])	

[1]) ODF × ODF
[2]) ODF × ODM
ODF = Internal diameter
ODM = External diameter

Ordering

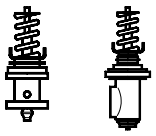


Thermostatic element

R 502

Valve type	Pressure equalization	Capillary tube	Code no.					
			Range N –40 to +10°C		Range NM –40 to –5°C	Range NL –40 to –15°C	Range B –60 to –25°C	
	¼ in. / 6 mm	m	Without MOP	With MOP	With MOP	With MOP	Without MOP	With MOP
TEY 5	Ext. [1]	3	**68B3257**		**68B3259**	**68B3261**	**68B3265**	**68B3258**
TEY 12	Ext.	3	**68B3218**		**68B3215**	**68B3221**		**68B3219**
TEY 12	Ext.	5	**68B3217**					**68B3220**
TEY 20	Ext.	3	**68B3280**		**68B3279**	**68B3281**		**68B3282**
TEY 20	Ext.	5	**68B3291**					**68B3288**
TEY 55	Ext.	3	**68G3211**					**68G3213**
TEY 55	Ext.	5	**68G3210**					**68G3218**

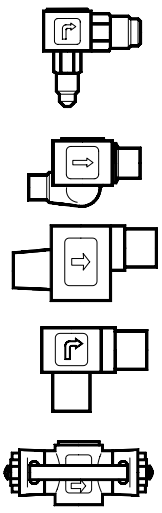
[1]) Pressure equalization with solder connector can be supplied on contacting Danfoss.



Orifice assembly

Valve type	Rated capacity range N: –40 to 10°C kW	Rated capacity range B: –60/55 to –25°C kW	Orifice no.	**Code no.**
TEY 5-2	13.5	13.5	01	**68B2089**
TEY 5-3	18.5	18.5	02	**68B2090**
TEY 5-5	27.0	27.0	03	**68B2091**
TEY 5-8	38.5	38.5	04	**68B2092**
TEY12-3	17.8	17.8	01	**68B2005**
TEY 12-5	28.9	28.9	02	**68B2006**
TEY 12-8	42.5	42.5	03	**68B2007**
TEY 12-12	56.5	56.5	04	**68B2008**
TEY 20-20	83.0	53.0	01	**68B2175**
TEY 55-24	187.0	112.0	01	**68G2011**
TEY 55-40	275.0	171.0	02	**68G2012**

The rated capacity is based on:
Evaporating temperature t_e = +5°C for range N and t_e = –30°C for range B
Condensing temperature t_c = +32°C
Refrigerant temperature ahead of valve t_l = +28°C



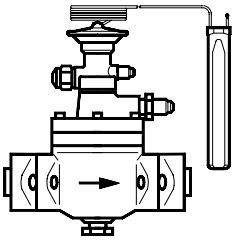
Valve body

Type	Orifice no.	Connection Inlet × Outlet		Code no.			
		in.	mm	Flare angleway	Solder angleway	Solder straightway	Solder flanges
TE 5	01 - 03 03 04	½ × ⅝ ½ × ⅞ ⅝ × ⅞		**68B4013**	**68B4009** **68B4010** **68B4011**	**68B4007** **68B4008**	
TE 5	01- 03 03 04		12 × 16 12 × 22 16 × 22	**68B4013**	**68B4004** **68B4005** **68B4012**	**68B4002** **68B4003**	
TE 12	01 - 02 03 - 04 03 - 04	⅝ × ⅞ ⅞ × 1 ⅞ × 1⅛			**68B4022** [1]) **68B4023** [2])	**68B4020** [1]) **68B4021** [2])	**68B4025** [1]) **68B4026** [1])
TE 12	01 - 02 03 - 04 03 - 04		16 × 22 22 × 25 22 × 28		 **68B4017** [2])	**68B4018** [1]) **68B4016** [2])	**68B4027** [1]) **68B4015** [1])
TE 20	01 01	⅞ × 1⅛	 22 × 28		**68B4023** [1]) **68B4017** [1])	**68B4021** [1]) **68B4016** [1])	
TE 55	01- 02 01- 02	1⅛ × 1⅜	 28 × 35		**68G4004** [1]) **68G4002** [1])	**68G4003** [1]) **68G4001** [1])	

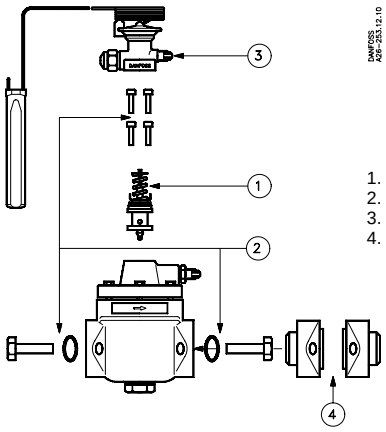
[1]) ODF × ODF
[2]) ODF × ODM
ODF = Internal diameter
ODM = External diameter

Ordering (continued)

Components



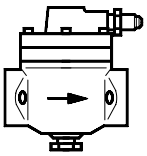
PHT 85
Solder or weld flanges



1. Orifice assembly for pilot valve
2. Valve body, flange gaskets, flange bolts and screws
3. Thermostatic element (incl. accessory bag with screws)
4. Flange set

1. Pilot orifice assembly

Type	**Code no.**
PHT	**68B2089**

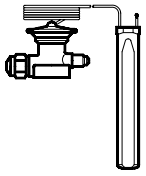


2. Valve body, flange gaskets, flange bolts and screws

Type	Orifice no.	Rated capacity [1] R 22		Rated capacity [1] 134a				Rated capacity [1] R 12				**Code no.**
		Range N: –40 to +10°C		Range N: –40 to +10°C		Range A: +10 to +50°C		Range N: –40 to +10°C		Range A: +10 to +50°C		
		TR	kW	TR	kW	TR	kW	TR	kW	TR	kW	
PHT 85	1	30	105	16	55	20	69	12	42	15	53	**26H0160**
PHT 85	2	50	175	26	92	33	114	20	70	25	88	**26H0161**
PHT 85	3	80	280	39	138	52	182	30	105	40	140	**26H0162**
PHT 85	4	130	455	59	208	72	273	45	158	60	210	**26H0163**
PHT 125	1	225	790	125	438	156	545	95	333	120	420	**26H0164**
PHT 300	1	325	1140	178	622	221	773	135	473	170	595	**26H0165**
PHT 300	2	540	1890	309	1083	351	1227	235	823	270	945	**26H0166**

[1]) The rated capacity for range N is based on evaporating temperature t_e = +5°C, condensing temperature t_c = +32°C, and refrigerant liquid temperature ahead of valve t_l = +28°C.
The rated capacity for range A is based on evaporating temperature t_e = +5°C, condensing temperature t_c = +42°C, and refrigerant liquid temperature ahead of valve t_l = +38°C.

See following pages for extended capacity tables.



3. Thermostatic element (incl. accessory bag with screws)

Range	Refrigerant	**Code no.**	
		3 m capillary tube	5 m capillary tube
–40 to +10 °C	R 22	**68B3303**	**68B3304**
	R 22, MOP 100 psig		**68B3306**
	R 134a	**68B3310**	**68B3315**
	R 134a, MOP 55 psig	**68B3316**	**68B3317**
	R 12	**68B3301**	**68B3302**
	R 502	**68B3305**	
+10 to +50 °C	R 134a		**68B3318**
	R 12		**68B3307**

4. Flange set

Valve flange	Flange type	Weld flanges		Solder flanges			
		in.	**Code no.**	in.	**Code no.**	mm	**Code no.**
PHT 85	2	1	**27N1025**				
PHT 85	2			1⅛	**27L1029**	28	**27L1028**
PHT 85	2			1⅜	**27L1035**	35	**27L1035**
PHT 125	3 A	1¼	**27N1032**				
PHT 300	4 A	1½	**27N1040**				
PHT 300	4 A	2	**27N1050**				

Capacity in KW for Range N: –40°C to +10°C

R 22

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature +10°C								**Evaporating temperature 0°C**							
TX 2/TEX 2-0.15	0X	0.37	0.48	0.55	0.60	0.63	0.65	0.65	0.67	0.37	0.48	0.55	0.59	0.63	0.65	0.66	0.66
TX2/TEX 2-0.3	00	0.87	1.1	1.2	1.3	1.4	1.4	1.4	1.5	0.84	1.0	1.2	1.3	1.3	1.4	1.4	1.4
TX2/TEX 2-0.7	01	2.2	2.8	3.2	3.4	3.6	3.7	3.8	3.8	1.9	2.4	2.7	3.0	3.1	3.2	3.3	3.3
TX2/TEX 2-1.0	02	3.0	4.0	4.7	5.1	5.4	5.6	5.8	5.8	2.6	3.4	4.0	4.3	4.6	4.8	4.9	5.0
TX2/TEX 2-1.5	03	5.4	7.2	8.3	9.1	9.7	10.0	10.2	10.3	4.6	6.1	7.1	7.8	8.2	8.5	8.7	8.8
TX2/TEX 2-2.3	04	8.1	10.8	12.5	13.8	14.5	15.0	15.4	15.5	6.9	9.1	10.5	11.5	12.2	12.7	13.0	13.2
TX2/TEX 2-3.0	05	10.2	13.6	15.7	17.2	18.3	18.9	19.3	19.5	8.8	11.6	13.3	14.6	15.5	16.1	16.4	16.6
TX2/TEX 2-4.5	06	12.6	16.7	19.3	21.0	22.3	23.1	29.5	23.7	10.8	14.2	16.3	17.8	18.9	19.6	20.0	20.2
TEX 5-3	01	12.4	16.3	18.8	20.5	21.7	22.4	22.8	23.0	12.8	16.7	19.1	20.8	22.0	22.7	23.2	23.3
TEX 5-4.5	02	17.2	22.5	25.9	28.1	29.7	30.6	31.1	31.3	17.7	22.9	26.1	28.3	29.9	30.9	31.5	31.7
TEX 5-7.5	03	25.3	32.8	37.4	40.6	42.6	43.9	44.5	44.7	25.9	33.0	37.5	40.6	42.8	44.2	45.0	45.3
TEX 5-12	04	35.8	46.6	53.3	57.8	60.8	62.6	63.6	63.9	36.6	47.0	53.5	58.0	61.2	63.2	64.3	64.7
TEX 12-4.5	01	16.8	22.5	26.1	28.6	30.3	31.4	32.1	32.3	16.1	21.2	24.5	26.8	28.5	29.6	30.3	30.6
TEX 12-7.5	02	27.3	36.4	42.1	46.1	48.8	50.7	51.6	52.0	26.2	34.5	39.8	43.5	46.1	47.8	48.9	49.3
TEX 12-12	03	40.2	53.3	61.6	67.2	71.1	73.5	74.9	75.5	38.7	50.8	58.5	63.9	67.7	70.3	71.9	72.6
TEX 12-18	04	53.2	70.2	80.9	88.1	93.0	96.1	97.8	98.5	51.7	67.6	77.8	85.0	90.2	93.7	95.8	96.9
TEX 20-30	01	72.0	94.4	108	118	124	129	131	132	66.3	86.0	98.5	107	113	118	120	121
TEX 55-50	01	158	209	241	263	278	287	293	295	145	190	218	237	251	260	265	267
TEX 55-85	02	239	313	360	391	412	425	432	434	221	286	326	355	375	388	395	397
PHTX 85	1	67.3	95.0	112	124	133	139	142	144	56.7	76.6	93.4	103	111	115	119	121
PHTX 85	2	109	151	178	196	209	217	222	224	94.4	131	153	169	180	188	194	196
PHTX 85	3	174	244	287	316	336	349	356	360	147	206	241	265	283	295	303	306
PHTX 85	4	299	422	493	542	572	594	606	611	230	331	391	432	460	480	495	500
PHTX 125	1	518	605	695	803	876	927	957	982	454	573	698	763	813	840	863	870
PHTX 300	1	786	1048	1211	1317	1387	1432	1455	1476	671	887	1022	1110	1182	1216	1250	1271
PHTX 300	2	1290	1688	1935	2096	2202	2269	2302	2327	1133	1471	1685	1827	1941	1997	2048	2077
		Evaporating temperature –10°C								**Evaporating temperature –20°C**							
TX 2/TEX 2-0.15	0X	0.37	0.47	0.53	0.57	0.60	0.63	0.64	0.64		0.44	0.50	0.54	0.57	0.59	0.61	0.61
TX 2/TEX 2-0.3	00	0.79	0.96	1.1	1.2	1.2	1.3	1.3	1.3		0.88	1.0	1.1	1.1	1.2	1.2	1.2
TX 2/TEX 2-0.7	01	1.6	2.0	2.3	2.5	2.6	2.7	2.8	2.8		1.7	1.9	2.0	2.2	2.3	2.3	2.3
TX 2/TEX 2-1.0	02	2.2	2.9	3.3	3.6	3.8	4.0	4.1	4.1		2.4	2.7	2.9	3.1	3.2	3.3	3.3
TX 2/TEX 2-1.5	03	3.9	5.1	5.9	6.4	6.8	7.1	7.3	7.3		4.2	4.8	5.2	5.5	5.8	5.9	6.0
TX 2/TEX 2-2.3	04	5.8	7.6	8.7	9.5	10.1	10.5	10.8	10.9		6.2	7.1	7.7	8.2	8.5	8.7	8.8
TX 2/TEX 2-3.0	05	7.4	9.6	11.0	12.0	12.8	13.3	13.6	13.8		7.9	9.0	9.8	10.3	10.8	11.0	11.2
TX 2/TEX 2-4.5	06	9.1	11.8	13.5	14.7	15.6	16.2	16.6	16.8		9.6	11.0	11.9	12.6	13.1	13.5	13.7
TEX 5-3	01	11.1	14.3	16.3	17.7	18.8	19.5	19.9	20.1		11.5	13.0	14.1	15.0	15.6	16.0	16.2
TEX 5-4.5	02	15.4	19.7	22.4	24.3	25.7	26.7	27.3	27.6		15.9	18.1	19.6	20.8	21.6	22.1	22.4
TEX 5-7.5	03	22.7	28.7	32.7	35.6	37.8	39.4	40.4	40.9		23.2	26.3	28.7	30.6	32.0	32.9	33.5
TEX 5-12	04	32.3	41.1	46.8	51.0	54.1	56.3	57.7	58.4		33.2	37.7	41.1	43.7	45.7	47.0	47.8
TEX 12-4.5	01		18.7	21.4	23.4	24.8	25.8	26.4	26.6		15.9	18.1	19.6	20.8	21.6	22.1	22.4
TEX 12-7.5	02		30.4	34.8	37.9	40.2	41.8	42.8	43.2		25.9	29.4	32.0	33.9	35.2	36.1	36.5
TEX 12-12	03		44.5	50.9	55.6	59.0	61.4	62.9	63.7		37.7	42.9	46.7	49.6	51.7	53.1	53.9
TEX 12-18	04		59.1	67.7	74.0	78.7	82.1	84.3	85.6		49.9	57.0	62.3	66.4	69.6	71.8	73.1
TEX 20-30	01		75.4	85.9	93.6	99.2	103	106	107		63.7	72.4	78.8	83.8	87.4	90.0	91.4
TEX 55-50	01		166	189	205	217	225	229	231		140	158	171	181	187	191	193
TEX 55-85	02		251	285	309	327	339	346	349		213	240	260	275	285	291	294
PHTX 85	1	46.0	64.0	74.9	82.9	88.4	92.9	94.5	97.4		49.6	57.8	63.3	68.2	71.5	73.1	75.3
PHTX 85	2	78.4	108	126	139	148	156	159	163		85.6	99.5	109	117	123	125	129
PHTX 85	3	119	166	195	215	228	239	245	248		129	151	166	178	186	192	195
PHTX 85	4	153	231	276	310	334	350	361	368		139	165	187	205	215	230	234
PHTX 125	1	381	505	582	637	677	707	727	730		403	465	511	541	567	585	591
PHTX 300	1	552	723	827	898	957	1002	1034	1040		570	648	711	751	789	821	818
PHTX 300	2	953	1228	1401	1522	1620	1695	1747	1757		990	1124	1233	1304	1370	1425	1422

Correction for subcooling Δt_{sub}

The evaporator capacities used must be corrected if subcooling deviates from 4 K. The corrected capacity can be obtained by dividing the required evaporator capacity by the correction factor below. Selections can then be made from the tables above.

Note:
Insufficient subcooling can produce flash gas.

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.07	1.13	1.19	1.25	1.32	1.38	1.45	1.53	1.59

Example
Refrigerant = R 22
Evaporator capacity Q_e = 5 kW
Subcooling = 10 K

Correction factor from table = 1.07
Corrected capacity = 5 ÷ 1.07 = 4.67 kW

Capacity in KW for range N: –40°C to +10°C

R 22

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature –30°C								**Evaporating temperature –40°C**							
TX 2/TEX 2-0.15	0X		0.40	0.45	0.49	0.52	0.55	0.56	0.57			0.42	0.45	0.48	0.50	0.52	0.53
TX 2/TEX 2-0.3	00		0.79	0.90	0.96	1.0	1.1	1.1	1.1			0.80	0.86	0.92	0.95	0.98	0.99
TX 2/TEX 2-0.7	01		1.4	1.5	1.7	1.8	1.8	1.9	1.9			1.3	1.4	1.4	1.5	1.5	1.6
TX 2/TEX 2-1.0	02		1.9	2.2	2.7	2.5	2.6	2.6	2.7			1.7	1.9	2.0	2.0	2.1	2.1
TX 2/TEX 2-1.5	03		3.4	3.9	4.2	4.4	4.6	4.7	4.8			3.1	3.4	3.5	3.7	3.8	3.8
TX 2/TEX 2-2.3	04		5.0	5.7	6.2	6.5	6.8	7.0	7.1			4.6	4.9	5.2	5.4	5.6	5.7
TX 2/TEX 2-3.0	05		6.4	7.2	7.8	8.3	8.6	8.8	9.0			5.8	6.3	6.6	6.9	7.1	7.2
TX 2/TEX 2-4.5	06		7.8	8.8	9.6	10.1	10.5	10.8	11.0			7.1	7.7	8.1	8.4	8.7	8.8
TEX 5-3	01		9.0	10.2	11.1	11.7	12.2	12.5	12.7			7.9	8.5	9.0	9.4	9.7	9.8
TEX 5-4.5	02		12.6	14.3	15.4	16.4	17.0	17.5	17.8			11.1	12.0	12.7	13.3	13.7	13.9
TEX 5-7.5	03		18.3	20.8	22.7	24.2	25.4	26.2	26.8			16.2	17.7	19.0	19.9	20.7	21.2
TEX 5-12	04		26.3	29.8	32.5	34.6	36.3	37.5	38.2			23.2	25.3	27.1	28.5	29.5	30.2
TEX 12-4.5	01			14.8	16.0	16.9	17.6	18.0	18.3			11.9	12.8	13.5	14.0	14.4	14.6
TEX 12-7.5	02			24.2	26.2	27.7	28.8	29.5	29.9			19.4	21.0	22.2	23.1	23.7	24.1
TEX 12-12	03			35.1	38.1	40.5	42.4	43.7	44.5			28.1	30.6	32.6	34.1	35.3	36.1
TEX 12-18	04			46.6	51.0	54.6	57.4	59.6	61.0			37.4	41.1	44.2	46.8	48.8	50.3
TEX 20-30	01			59.2	64.5	68.8	72.0	74.4	75.8			47.5	51.8	55.4	58.2	60.4	61.9
TEX 55-50	01			129	139	146	151	155	156			102	110	116	120	122	123
TEX 55-85	02			197	212	224	232	237	240			158	170	178	185	189	191
PHTX 85	1		36.6	42.8	46.8	49.8	52.2	54.3	55.9			30.6	33.6	36.1	38.0	39.4	40.2
PHTX 85	2		64.1	74.7	81.7	86.9	91.1	94.6	97.4			54.0	59.2	63.7	66.9	69.4	70.4
PHTX 85	3		95.3	112	124	132	138	144	147			79.9	88.5	94.7	99.7	104	107
PHTX 85	4		100	120	134	145	153	158	161			84.7	95.5	103	111	115	119
PHTX 125	1		310	358	390	413	434	449	461			266	289	309	321	339	340
PHTX 300	1		429	487	536	570	598	621	627			364	399	430	454	467	474
PHTX 300	2		759	862	949	1011	1062	1104	1115			655	719	775	820	844	857

Correction for subcooling Δt_{sub}

The evaporator capacities used must be corrected if subcooling deviates from 4 K. The corrected capacity can be obtained by dividing the required evaporator capacity by the correction factor below. Selections can then be made from the tables above.

Note:
Insufficient subcooling can produce flash gas.

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.07	1.13	1.19	1.25	1.32	1.38	1.45	1.53	1.59

Example
Refrigerant = R 22
Evaporator capacity Q_e = 5 kW
Subcooling = 10 K

Correction factor from table = 1.07
Corrected capacity = 5 ÷ 1.07 = 4.67 kW

Capacity in kW for range B: –60°C to –25°C

R 22

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature –25°C								**Evaporating temperature –30°C**							
TX 2/TEX 2-0.2	00	0.69	0.83	0.94	1.0	1.1	1.1	1.1	1.2	0.66	0.79	0.89	0.96	1.0	1.1	1.1	1.1
TX 2/TEX 2-0.3	01	1.2	1.5	1.7	1.9	2.0	2.0	2.1	2.1	1.1	1.4	1.5	1.7	1.8	1.8	1.9	1.9
TX 2/TEX 2-0.6	02	1.7	2.1	2.4	2.6	2.8	2.9	2.9	3.0	1.5	1.9	2.2	2.3	2.5	2.6	2.6	2.7
TX 2/TEX 2-0.8	03	3.0	3.8	4.3	4.7	5.0	5.2	5.3	5.3	2.7	3.4	3.9	4.2	4.4	4.6	4.7	4.8
TX 2/TEX 2-1.2	04	4.4	5.6	6.4	6.9	7.3	7.6	7.8	7.9	3.9	5.0	5.7	6.2	6.5	6.8	7.0	7.1
TX 2/TEX 2-1.5	05	5.6	7.1	8.1	8.7	9.3	9.6	9.9	10.0	5.0	6.4	7.2	7.8	8.3	8.6	8.8	9.0
TX 2/TEX 2-2.0	06	6.8	8.7	9.8	10.7	11.3	11.8	12.1	12.3	6.1	7.8	8.8	9.6	10.1	10.5	10.8	11.0
TEX 5-3	01	8.1	10.2	11.6	12.5	13.3	13.8	14.2	14.4	7.2	9.0	10.2	11.1	11.7	12.2	12.5	12.7
TEX 5-4.5	02	11.3	14.2	16.1	17.4	18.5	19.2	19.7	20.0	10.1	12.6	14.3	15.4	16.4	17.0	17.5	17.8
TEX 5-7.5	03	16.4	20.7	23.5	25.6	27.3	28.6	29.5	30.0	14.6	18.3	20.8	22.7	24.2	25.4	26.2	26.8
TEX 5-12	04	23.5	29.6	33.6	36.6	39.0	40.8	42.1	42.8	20.9	26.3	29.8	32.5	34.6	36.3	37.5	38.2
TEX 12-4.5	01	11.3	14.5	16.4	17.8	18.8	19.6	20.0	20.3	10.2	13.1	14.8	16.0	16.9	17.6	18.0	18.3
TEX 12-7.5	02	18.5	23.6	26.8	29.0	30.7	31.9	32.7	33.2	16.8	21.4	24.2	26.2	27.7	28.8	29.5	29.9
TEX 12-12	03	26.8	34.2	38.9	42.3	45.0	46.9	48.3	49.1	24.3	30.9	35.1	38.1	40.5	42.4	43.7	44.5
TEX 12-18	04	35.4	45.3	51.7	56.6	60.4	63.4	65.6	67.0	32.0	40.8	46.6	51.0	54.6	57.4	59.6	61.0
TEX 20-20	01	46.0	58.0	66.0	72.0	76.0	80.0	82.0	83.0	41.0	52.0	59.0	65.0	69.0	72.0	74.0	76.0
TEX 55-35	01	100	127	143	155	163	169	173	174	91.0	115	129	139	146	151	155	156
TEX 55-60	02	154	194	218	236	249	258	264	267	140	175	197	212	224	232	237	240
		Evaporating temperature –40°C								**Evaporating temperature –50°C**							
TX 2/TEX 2-0.2	00	0.60	0.71	0.80	0.86	0.92	0.95	0.98	0.99	0.54	0.65	0.72	0.78	0.82	0.85	0.87	0.88
TX 2/TEX 2-0.3	01	0.90	1.1	1.3	1.4	1.4	1.5	1.5	1.6	0.74	0.92	1.0	1.1	1.2	1.2	1.3	1.3
TX 2/TEX 2-0.6	02	1.2	1.6	1.7	1.9	2.0	2.1	2.1	2.1	1.0	1.3	1.4	1.5	1.6	1.7	1.7	1.7
TX 2/TEX 2-0.8	03	2.2	2.8	3.1	3.4	3.5	3.7	3.8	3.8	1.8	2.3	2.6	2.7	2.9	3.0	3.1	3.1
TX 2/TEX 2-1.2	04	3.2	4.0	4.6	4.9	5.2	5.4	5.6	5.7	2.6	3.3	3.7	4.0	4.2	4.4	4.5	4.6
TX 2/TEX 2-1.5	05	4.1	5.1	5.8	6.3	6.6	6.9	7.1	7.2	3.4	4.2	4.7	5.1	5.4	5.6	5.8	5.9
TX 2/TEX 2-2.0	06	5.0	6.3	7.1	7.7	8.1	8.4	8.7	8.8	4.1	5.1	5.8	6.2	6.6	6.9	7.1	7.2
TEX 5-3	01	5.6	7.0	7.9	8.5	9.0	9.4	9.7	9.8		5.5	6.1	6.6	7.0	7.3	7.5	7.7
TEX 5-4.5	02	7.9	9.9	11.1	12.0	12.7	13.3	13.7	13.9		7.7	8.7	9.4	9.9	10.4	10.7	10.9
TEX 5-7.5	03	11.4	14.3	16.2	17.7	19.0	19.9	20.7	21.2		11.2	12.7	13.9	14.9	15.8	16.4	16.9
TEX 5-12	04	16.3	20.5	23.2	25.3	27.1	28.5	29.5	30.2		16.0	18.2	19.9	21.3	22.5	23.4	24.1
TEX 12-4.5	01	8.3	10.5	11.9	12.8	13.5	14.0	14.4	14.6		8.5	9.5	10.2	10.8	11.2	11.5	11.7
TEX 12-7.5	02	13.7	17.2	19.4	21.0	22.2	23.1	23.7	24.1		13.9	15.5	16.8	17.7	18.5	19.0	19.4
TEX 12-12	03	19.6	24.8	28.1	30.6	32.6	34.1	35.3	36.1		19.8	22.5	24.5	26.2	27.6	28.6	29.4
TEX 12-18	04	25.5	32.6	37.4	41.1	44.2	46.8	48.8	50.3		25.9	29.9	33.1	35.9	38.2	40.2	41.6
TEX 20-20	01	33.0	42.0	47.0	52.0	55.0	58.0	60.0	62.0		33.0	38.0	42.0	45.0	47.0	49.0	51.0
TEX 55-35	01	73.0	92.0	102	110	116	120	122	123		73.0	81.0	87.0	91.0	94.0	96.0	97.0
TEX 55-60	02	114	141	158	170	178	185	189	191		113	126	135	142	147	150	151
		Evaporating temperature –55°C								**Evaporating temperature –60°C**							
TX 2/TEX 2-0.2	00									0.50	0.60	0.66	0.71	0.75	0.77	0.79	0.80
TX 2/TEX 2-0.3	01									0.64	0.79	0.88	0.95	1.0	1.0	1.1	1.1
TX 2/TEX 2-0.6	02									0.9	1.1	1.2	1.3	1.4	1.4	1.4	1.4
TX 2/TEX 2-0.8	03									1.6	1.9	2.2	2.3	2.4	2.5	2.6	2.6
TX 2/TEX 2-1.2	04									2.2	2.8	3.1	3.4	3.6	3.7	3.8	3.9
TX 2/TEX 2-1.5	05									2.9	3.6	4.0	4.3	4.6	4.8	4.9	5.0
TX 2/TEX 2-2.0	06									3.5	4.4	4.9	5.3	5.6	5.8	6.0	6.1
TEX 5-3	01										4.4	4.9	5.3	5.6	5.9	6.1	6.2
TEX 5-4.5	02										6.2	7.0	7.6	8.0	8.4	8.6	8.8
TEX 5-7.5	03										9.0	10.3	11.3	12.1	12.9	13.5	13.9
TEX 5-12	04										12.9	14.7	16.1	17.3	18.3	19.2	19.8
TEX 12-4.5	01		7.6	8.5	9.2	9.7	10.1	10.4	10.5								
TEX 12-7.5	02		12.5	14.0	15.1	16.0	16.7	17.2	17.5								
TEX 12-12	03		17.8	20.3	22.1	23.7	25.0	26.0	26.7								
TEX 12-18	04		23.3	27.0	30.0	32.6	34.8	36.7	38.2								
TEX 20-20	01		30.0	34.0	37.0	40.0	43.0	45.0	46.0								
TEX 55-35	01		66.0	73.0	78.0	82.0	84.0	86.0	87.0								
TEX 55-60	02		102	113	121	127	131	134	135								

Correction for subcooling Δt_{sub}

The evaporator capacities used must be corrected if subcooling deviates from 4 K. The corrected capacity can be obtained by dividing the required evaporator capacity by the correction factor below. Selections can then be made from the tables above.

Note:
Insufficient subcooling can produce flash gas.

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.07	1.13	1.19	1.25	1.32	1.38	1.45	1.53	1.59

Capacity in kW

Range N: –40°C to +10°C

R 134a

Valve type	Orifice no.	Pressure drop across valve Δp bar					Pressure drop across valve Δp bar				
		2	4	6	8	10	2	4	6	8	10
		Evaporating temperature +10°C					**Evaporating temperature 0°C**				
TN 2/TEN 2 - 0.11	0X	0.34	0.43	0.47	0.50	0.51	0.33	0.42	0.46	0.47	0.49
TN 2/TEN 2 - 0.25	00	0.71	0.86	0.93	0.97	0.98	0.65	0.78	0.86	0.89	0.91
TN 2/TEN 2 - 0.5	01	1.50	1.86	2.05	2.15	2.19	1.25	1.55	1.71	1.80	1.83
TN 2/TEN 2 - 0.8	02	2.03	2.63	2.96	3.14	3.23	1.69	2.17	2.43	2.58	2.64
TN 2/TEN 2 - 1.3	03	3.64	4.71	5.29	5.61	5.77	3.04	3.89	4.36	4.61	4.73
TN 2/TEN 2 - 1.9	04	5.40	6.98	7.84	8.32	8.55	4.47	5.72	6.42	6.80	6.97
TN 2/TEN 2 - 2.5	05	6.86	8.85	9.93	10.8	10.9	5.69	7.27	8.14	8.62	8.83
TN 2/TEN 2 - 3.0	06	8.42	10.8	12.1	12.8	13.2	6.98	8.89	9.95	10.5	10.8
TEN 5 - 3.7	01	10.4	13.3	14.8	15.6	16.0	8.76	11.1	12.4	13.0	13.3
TEN 5 - 5.4	02	15.7	19.6	21.9	22.9	23.4	13.2	16.6	18.4	19.4	19.8
TEN 5 - 8.3	03	22.8	28.3	31.2	32.6	33.3	19.5	24.3	27.0	28.5	29.2
TEN 5 - 11.2	04	32.3	40.4	44.6	46.7	47.7	27.8	34.7	38.7	40.8	41.8
TEN 12 - 4.7	01	13.1	17.0	19.0	20.1	20.7	11.4	14.6	16.3	17.3	17.7
TEN 12 - 7.7	02	21.3	27.5	30.9	32.7	33.5	18.6	23.8	26.8	28.1	28.8
TEN 12 - 11.4	03	31.4	40.4	45.3	47.9	49.2	27.2	34.7	38.9	41.1	42.2
TEN 12 - 15	04	42.0	53.8	60.2	63.7	65.5	36.3	46.1	51.7	54.9	56.5
TEN 20 - 18	01	52.8	67.1	74.7	78.8	80.7	45.6	57.5	64.2	67.8	69.5
TEN 55 - 41	01	116.8	128.0	166.8	175.9	180.0	101.1	128.0	142.5	150.1	153.2
TEN 55 - 62	02	178.5	226.2	251.2	264.0	269.8	155.2	194.8	216.2	227.4	231.8
PHTN 85	1	45.0	62.0	71.0	76.0	79.0	36.0	49.0	56.0	60.0	62.0
PHTN 85	2	77.0	104	118	127	131	62	84	96	103	106
PHTN 85	3	118	161	183	196	201	93	128	146	157	161
PHTN 85	4	169	239	273	293	305	102	152	179	197	206
PHTN 125	1	372	486	545	576	591	304	399	448	477	488
PHTN 300	1	537	697	775	824	842	433	560	625	668	686
PHTN 300	2	927	1184	1303	1380	1407	762	974	1081	1149	1176
		Evaporating temperature –10°C					**Evaporating temperature –20°C**				
TN 2/TEN 2 - 0.11	0X	0.30	0.38	0.43	0.44	0.44	0.28	0.35	0.39	0.41	0.42
TN 2TEN 2 - 0.25	00	0.59	0.70	0.77	0.81	0.82	0.53	0.62	0.69	0.72	0.73
TN 2/TEN 2 - 0.5	01	1.01	1.25	1.39	1.46	1.49	0.81	1.00	1.11	1.17	1.19
TN 2/TEN 2 - 0.8	02	1.38	1.75	1.95	2.06	2.11	1.11	1.39	1.54	1.62	1.65
TN 2/TEN 2 - 1.3	03	2.48	3.13	3.49	3.69	3.77	2.00	2.48	2.75	2.90	2.96
TN 2/TEN 2 - 1.9	04	3.63	4.59	5.12	5.42	5.55	2.90	3.62	4.02	4.25	4.35
TN 2/TEN 2 - 2.5	05	4.62	5.83	6.51	6.88	7.05	3.70	4.60	5.11	5.40	5.53
TN 2/TEN 2 - 3.0	06	5.66	7.12	7.95	8.40	8.61	4.52	5.62	6.24	6.60	6.76
TEN 5 - 3.7	01	7.01	8.77	9.75	10.3	10.5	5.46	6.75	7.48	7.90	8.07
TEN 5 - 5.4	02	10.6	13.2	14.7	15.5	15.8	8.30	10.2	11.4	12.0	12.3
TEN 5 - 8.3	03	15.5	19.3	21.5	22.8	23.5	12.0	14.9	16.7	17.8	18.3
TEN 5 - 11.2	04	22.2	27.6	30.8	32.7	33.6	17.2	21.3	23.9	25.4	26.2
TEN 12 - 4.7	01	9.57	12.1	13.5	14.3	14.6	7.82	9.73	10.8	11.4	11.7
TEN 12 - 7.7	02	15.7	19.8	22.0	23.3	23.8	12.8	15.9	17.7	18.7	19.1
TEN 12 - 11.4	03	22.8	28.7	32.1	34.0	34.9	18.4	23.0	25.6	27.3	28.0
TEN 12 - 15	04	30.1	38.0	42.7	45.5	46.9	24.1	30.3	34.1	36.6	37.9
TEN 20 - 18	01	38.0	47.5	53.0	56.2	57.8	30.6	38.0	42.5	45.2	46.6
TEN 55 - 41	01	84.6	105.6	117.1	123.1	125.5	68.7	84.5	93.2	97.8	99.5
TEN 55 - 62	02	130.2	161.5	178.8	188.1	191.6	106.0	129.9	143.3	150.6	153.3
PHTN 85	1	27.0	36.0	41.0	44.0	46.0		25.0	29.0	31.0	32.0
PHTN 85	2	47.0	64.0	73.0	77.0	80.0		44.0	50.0	54.0	56.0
PHTN 85	3	69.0	95.0	109	117	120		64.0	75.0	81.0	83.0
PHTN 85	4	73.0	103	119	128	132		69.0	82.0	89.0	92.0
PHTN 125	1	232	306	345	367	375		216	246	264	268
PHTN 300	1	330	422	478	508	526		294	339	363	376
PHTN 300	2	591	748	846	895	925		531	612	655	678

Correction for subcooling Δt_{sub}

The evaporator capacities used must be corrected if subcooling deviates from 4 K. The corrected capacity can be obtained by dividing the required evaporator capacity by the correction factor below. Selections can then be made from the tables above.

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.07	1.13	1.19	1.25	1.32	1.38	1.45	1.53	1.59

Note:
Insufficient subcooling can produce flash gas.

Capacity in kW
(continued)

Range N: –40°C to +10°C

R 134a

Valve type	Orifice no.	Pressure drop across valve Δp bar					Pressure drop across valve Δp bar				
		2	4	6	8	10	2	4	6	8	10
		Evaporating temperature –30°C					**Evaporating temperature –40°C**				
TN 2/TEN 2 - 0.11	0X	0.25	0.32	0.35	0.37	0.38	0.23	0.28	0.32	0.33	0.34
TN 2/TEN 2 - 0.25	00	0.48	0.55	0.61	0.64	0.64	0.44	0.50	0.54	0.56	0.57
TN 2/TEN 2 - 0.5	01	0.66	0.80	0.88	0.93	0.95	0.54	0.65	0.72	0.76	0.77
TN 2/TEN 2 - 0.8	02	0.90	1.10	1.21	1.27	1.29	0.74	0.89	0.98	1.02	1.04
TN 2/TEN 2 - 1.3	03	1.60	1.97	2.17	2.28	2.32	1.32	1.60	1.75	1.84	1.86
TN 2/TEN 2 - 1.9	04	2.32	2.85	3.16	3.33	3.41	1.90	2.31	2.55	2.68	2.74
TN 2/TEN 2 - 2.5	05	2.95	3.63	4.02	4.24	4.34	2.42	2.94	3.24	3.42	3.49
TN 2/TEN 2 - 3.0	06	3.61	4.43	4.91	5.18	5.31	2.95	3.59	3.96	4.18	4.28
TEN 5 - 3.7	01	4.19	5.13	5.66	5.97	6.11	3.27	3.96	4.36	4.59	4.69
TEN 5 - 5.4	02	6.39	7.81	8.65	9.15	9.38	4.99	6.06	6.70	7.08	7.25
TEN 5 - 8.3	03	9.18	11.4	12.7	13.6	14.1	7.11	8.78	9.87	10.6	11.0
TEN 5 - 11.2	04	13.2	16.3	18.2	19.5	20.2	10.2	12.6	14.1	15.1	15.7
TEN 12 - 4.7	01	6.27	7.71	8.51	8.96	9.14	5.08	6.17	6.78	7.12	7.26
TEN 12 - 7.7	02	10.3	12.6	13.9	14.7	15.0	8.31	10.1	11.1	11.7	12.0
TEN 12 - 11.4	03	14.6	18.1	20.2	21.5	22.2	11.7	14.4	16.1	17.2	17.7
TEN 12 - 15	04	18.9	23.7	26.8	28.9	30.2	15.0	18.8	21.4	23.2	24.4
TEN 20 - 18	01	24.2	30.0	33.5	35.8	37.1	19.4	23.9	26.8	28.7	29.8
TEN 55 - 41	01	54.9	66.6	73.0	76.4	77.5	44.4	53.2	58.0	60.4	61.1
TEN 55 - 62	02	84.9	102.9	112.9	118.4	120.3	68.8	82.6	90.1	94.1	95.3
PHTN 85	1		15.0	18.0	19.0	21.0		9.0	10.0	12.0	12.0
PHTN 85	2		27.0	32.0	34.0	36.0		16.0	18.0	21.0	21.0
PHTN 85	3		40.0	47.0	51.0	53.0		23.0	27.0	30.0	31.0
PHTN 85	4		42.0	51.0	56.0	60.0		24.0	30.0	33.0	35.0
PHTN 125	1		141	161	171	180		87.0	99.0	108	112
PHTN 300	1		197	227	246	253		126	147	158	164
PHTN 300	2		362	416	450	465		234	273	292	304

Correction for subcooling Δt_{sub}

The evaporator capacities used must be corrected if subcooling deviates from 4 K. The corrected capacity can be obtained by dividing the required evaporator capacity by the correction factor below. Selections can then be made from the tables above.

Note:
Insufficient subcooling can produce flash gas.

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.07	1.13	1.19	1.25	1.32	1.38	1.45	1.53	1.59

Capacity in kW
(continued)

Range A: +10°C to +50°C

R 134a

Valve type	Orifice no.	Pressure drop across valve Δp bar					Pressure drop across valve Δp bar				
		2	4	6	8	10	2	4	6	8	10
		Evaporating temperature +50°C					**Evaporating temperature +40°C**				
PHTN 85	1	70.0	92.0	105	115	121	70.0	96.0	111	121	127
PHTN 85	2	105	138	159	172	183	107	145	166	181	190
PHTN 85	3	179	233	267	289	305	178	243	276	302	316
PHTN 85	4	324	417	472	508	535	316	426	483	524	551
PHTN 125	1	439	569	647	699	738	471	601	674	728	762
PHTN 300	1	723	790	936	1065	1160	778	989	1108	1196	1251
PHTN 300	2	1153	1477	1670	1799	1891	1234	1548	1724	1857	1943
		Evaporating temperature +30°C					**Evaporating temperature +20°C**				
PHTN 85	1	64.0	87.0	100	108	114	56	77.0	88.0	94.0	98.0
PHTN 85	2	102	137	156	168	178	93	125	142	152	158
PHTN 85	3	165	223	253	271	286	146	198	225	239	249
PHTN 85	4	286	387	435	462	489	240	272	330	372	394
PHTN 125	1	485	628	698	738	772	445	578	643	677	699
PHTN 300	1	737	950	1058	1121	1176	658	853	944	993	1029
PHTN 300	2	1201	1515	1672	1765	1852	1102	1400	1535	1608	1661
		Evaporating temperature +10°C					**Evaporating temperature 0°C**				
PHTN 85	1	47.0	65.0	74.0	80.0	82.0	38.0	53.0	60.0	65.0	67.0
PHTN 85	2	80.0	109	124	132	137	66	90	103	110	113
PHTN 85	3	123	169	192	205	211	100	137	158	169	173
PHTN 85	4	182	258	292	315	325	117	178	206	225	234
PHTN 125	1	387	507	564	597	609	324	423	475	506	515
PHTN 300	1	563	730	810	859	876	464	599	669	713	731
PHTN 300	2	963	1229	1353	1427	1453	808	1033	1147	1216	1243
		Evaporating temperature –10°C									
PHTN 85	1	30.0	42.0	48.0	51.0	52.0					
PHTN 85	2	52.0	72.0	82.0	88.0	90.0					
PHTN 85	3	77.0	107	124	132	136					
PHTN 85	4	83.0	118	136	146	150					
PHTN 125	1	262	340	385	406	418					
PHTN 300	1	372	475	533	568	583					
PHTN 300	2	657	832	934	991	1016					

Correction for subcooling Δt_{sub}

The evaporator capacities used must be corrected if subcooling deviates from 4 K. The corrected capacity can be obtained by dividing the required evaporator capacity by the correction factor below. Selections can then be made from the tables above.

Note:
Insufficient subcooling can produce flash gas.

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.07	1.13	1.19	1.25	1.32	1.38	1.45	1.53	1.59

Capacity in kW for range N: –40°C to +10°C

R 404 A

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature +10°C								**Evaporating temperature +0°C**							
TS2/TES 2 - 0.11	0X	0.28	0.36	0.40	0.42	0.44	0.44	0.44	0.44	0.27	0.35	0.39	0.40	0.41	0.41	0.41	0.42
TS 2/TES 2 - 0.21	00	0.63	0.76	0.83	0.87	0.89	0.90	0.92	0.92	0.58	0.71	0.78	0.81	0.83	0.83	0.83	0.84
TS 2/TES 2 - 0.45	01	1.35	1.71	1.88	1.98	2.04	2.06	2.07	2.08	1.13	1.43	1.61	1.68	1.72	1.72	1.72	1.72
TS 2/TES 2 - 0.6	02	1.84	2.42	2.74	2.92	3.03	3.06	3.08	3.08	1.53	2.00	2.28	2.42	2.50	2.52	2.52	2.51
TS 2/TES 2 - 1.2	03	3.29	4.31	4.89	5.22	5.40	5.47	5.52	5.52	2.75	3.59	4.08	4.34	4.47	4.49	4.49	4.48
TS 2/TES 2 - 1.7	04	4.88	6.40	7.25	7.73	8.01	8.12	8.19	8.20	4.05	5.30	6.00	6.4	6.59	6.65	6.66	6.65
TS 2/TES 2 - 2.2	05	6.21	8.12	9.18	9.77	10.12	10.25	10.32	10.33	5.17	6.73	7.62	8.11	8.35	8.40	8.43	8.40
TS 2/TES 2 - 2.6	06	7.61	9.93	11.21	11.92	12.33	12.49	12.58	12.60	6.33	8.23	9.31	9.9	10.19	10.26	10.28	10.26
TES 5 - 3.7	01	9.9	12.8	14.3	15.1	15.5	15.7	15.8	15.8	9.4	12.1	13.7	14.5	14.9	14.9	14.9	14.9
TES 5 - 5.0	02	13.6	17.4	19.4	20.5	21.0	21.2	21.4	21.3	13.0	16.6	18.6	19.6	20.1	20.2	20.2	20.2
TES 5 - 7.2	03	19.9	25.1	27.7	29.1	29.9	30.2	30.4	30.4	19.3	24.4	27.3	28.8	29.5	29.6	29.6	29.5
TES 5 - 10.3	04	28.2	35.8	39.7	41.7	42.8	43.2	43.5	43.5	27.4	34.9	39.1	41.4	42.4	42.4	42.4	42.3
TES 12 - 4.2	01	11.8	15.5	17.5	18.7	19.4	19.6	19.8	19.8	10.3	13.5	15.3	16.31	6.7	16.8	16.9	16.8
TES 12 - 6.8	02	19.2	25.2	28.5	30.3	31.3	31.7	31.9	32.0	16.9	22.0	24.8	26.4	27.2	27.4	27.4	27.3
TES 12 - 10.0	03	28.4	37.0	41.8	44.5	46.0	46.6	47.0	47.0	24.7	32.2	36.4	38.7	39.9	40.2	40.3	40.3
TES 12 - 13.4	04	38.0	49.4	55.7	59.2	61.2	62.1	62.7	63.0	33.0	42.8	48.5	51.7	53.4	53.9	54.2	54.4
TES 20 - 16.7	01	48.0	62.0	69.0	73.0	75.0	76.0	77.0	77.0	42.0	53.0	60.0	64.0	66.0	66.0	66.0	66.0
TES 55 - 37.0	01	106	137	154	164	169	170	171	171	92	119	134	142	145	146	145	145
TES 55 - 56.0	02	161	208	232	245	252	254	255	255	141	181	203	214	219	219	219	218
		Evaporating temperature –10°C								**Evaporating temperature –20°C**							
TS2/TES 2 - 0.11	0X	0.26	0.33	0.38	0.39	0.40	0.40	0.40	0.40		0.31	0.35	0.37	0.38	0.37	0.38	0.38
TS 2/TES 2 - 0.21	00	0.53	0.66	0.73	0.76	0.78	0.78	0.78	0.78		0.59	0.67	0.70	0.71	0.71	0.71	0.71
TS 2/TES 2 - 0.45	01	0.96	1.21	1.37	1.44	1.47	1.47	1.46	1.45		0.99	1.11	1.18	1.22	1.22	1.21	1.19
TS 2/TES 2 - 0.6	02	1.31	1.68	1.91	2.03	2.09	2.08	2.07	2.06		1.36	1.54	1.64	1.68	1.70	1.67	1.65
TS 2/TES 2 - 1.2	03	2.33	3.03	3.42	3.64	3.74	3.74	3.72	3.68		2.44	2.75	2.96	3.03	3.04	3.01	2.96
TS 2/TES 2 - 1.7	04	3.42	4.42	5.02	5.35	5.50	5.51	5.49	5.46		3.55	4.02	4.34	4.45	4.48	4.45	4.40
TS 2/TES 2 - 2.2	05	4.36	5.63	6.37	6.79	6.98	6.99	6.96	6.93		4.52	5.12	5.51	5.66	5.70	5.65	5.59
TS 2/TES 2 - 2.6	06	5.34	6.89	7.79	8.30	8.53	8.54	8.51	8.46		5.53	6.26	6.73	6.91	6.97	6.91	6.84
TES 5 - 3.7	01	7.9	10.1	11.3	12.0	12.4	12.4	12.3	12.2		7.9	8.9	9.6	9.8	9.9	9.8	9.7
TES 5 - 5.0	02	10.9	13.9	15.6	16.6	17.0	17.0	16.9	16.8		11.0	12.4	13.3	13.7	13.8	13.6	13.5
TES 5 - 7.2	03	16.0	20.4	23.0	24.5	25.1	25.2	25.2	25.2		16.1	18.3	19.8	20.5	20.7	20.6	20.6
TES 5 - 10.3	04	22.9	29.1	32.9	35.0	36.0	36.2	36.1	36.1		23.1	26.2	28.4	29.3	29.6	29.6	29.4
TES 12 - 4.2	01	9.0	11.7	13.2	14.1	14.5	14.5	14.4	14.3		6.2	10.9	11.7	12.0	12.0	11.9	11.7
TES 12 - 6.8	02	14.8	19.1	21.6	23.0	23.6	23.6	23.5	23.3		15.7	17.8	19.1	19.6	19.7	19.5	19.3
TES 12 - 10.0	03	21.6	27.8	31.5	33.6	34.7	34.8	34.7	34.6		22.8	25.9	28.0	28.8	29.2	29.1	28.9
TES 12 - 13.4	04	28.6	37.0	42.1	45.1	46.7	47.1	47.2	47.2		30.2	34.6	37.6	39.1	39.9	39.9	40.0
TES 20 - 16.7	01	36.0	46.0	52.0	56.0	57.0	58.0	58.0	57.0		38.0	43.0	47.0	48.0	49.0	49.0	48.0
TES 55 - 37.0	01	80.0	103	115	122	125	125	123	122		84.0	94.0	101	103	103	101	100
TES 55 - 56.0	02	124	157	176	186	190	190	188	186		129	145	155	158	158	156	153
		Evaporating temperature –30°C								**Evaporating temperature –40°C**							
TS 2/TES 2 - 0.11	0X			0.32	0.34	0.36	0.35	0.35	0.34			0.29	0.31	0.32	0.31	0.32	0.31
TS 2/TES 2 - 0.21	00			0.60	0.63	0.64	0.64	0.64	0.64			0.53	0.55	0.56	0.56	0.56	0.54
TS 2/TES 2 - 0.45	01			0.90	0.96	0.99	0.98	0.97	0.95			0.71	0.76	0.78	0.77	0.76	0.74
TS 2/TES 2 - 0.6	02			1.23	1.30	1.34	1.34	1.32	1.28			0.96	1.01	1.04	1.04	1.02	0.99
TS 2/TES 2 - 1.2	03			2.20	2.34	2.42	2.41	2.38	2.33			1.72	1.83	1.88	1.88	1.84	1.79
TS 2/TES 2 - 1.7	04			3.20	3.43	3.55	3.56	3.53	3.48			2.50	2.68	2.77	2.78	2.75	2.70
TS 2/TES 2 - 2.2	05			4.08	4.36	4.52	4.55	4.49	4.43			3.19	3.41	3.54	3.55	3.50	3.44
TS 2/TES 2 - 2.6	06			4.99	5.34	5.53	5.57	5.50	5.42			3.90	4.18	4.33	4.36	4.30	4.22
TES 5 - 3.7	01			6.9	7.3	7.6	7.6	7.5	7.5			5.1	5.5	5.7	5.7	5.6	5.5
TES 5 - 5.0	02			9.7	10.3	10.7	10.7	10.6	10.5			7.2	7.7	8.0	8.0	7.9	7.8
TES 5 - 7.2	03			14.3	15.4	16.2	16.4	16.3	16.2			10.7	11.6	12.3	12.5	12.5	12.4
TES 5 - 10.3	04			20.5	22.1	23.1	23.4	23.3	23.2			15.3	16.6	17.5	17.8	17.8	17.7
TES 12 - 4.2	01			8.7	9.3	9.6	9.6	9.5	9.3			6.7	7.2	7.4	7.4	7.3	7.2
TES 12 - 6.8	02			14.3	15.3	15.8	15.9	15.7	15.4			11.1	11.8	12.3	12.3	12.1	11.9
TES 12 - 10.0	03			20.8	22.4	23.4	23.7	23.5	23.4			16.1	17.4	18.3	18.6	18.5	18.4
TES 12 - 13.4	04			27.8	30.3	32.0	32.7	32.9	32.9			21.6	23.8	25.3	26.1	26.3	26.5
TES 20 -16.7	01			35.0	37.0	39.0	40.0	40.0	39.0			27.0	29.0	31.0	31.0	31.0	31.0
TES 55 -37.0	01			75.0	80.0	82.0	81.0	80.0	78.0			58.0	61.0	62.0	62.0	60.0	59.0
TES 55 - 56.0	02			116	123	127	126	124	121			90.0	95.0	97.0	97.0	94.0	92.0

Correction for subcooling Δt_{sub}

The evaporator capacities used must be corrected if subcooling deviates from 4 K. The corrected capacity can be obtained by dividing the required evaporator capacity by the correction factor next page. Selections can then be made from the tables above.

Capacity in kW for range B: –60 to –25°C

R 404 A

Valve type	Orifice no.	Pressure drop across valve Δp bar								Pressure drop across valve Δp bar							
		2	4	6	8	10	12	14	16	2	4	6	8	10	12	14	16
		Evaporating temperature –25°C								**Evaporating temperature –30°C**							
TS 2/TES 2 - 0.21	00	0.49	0.59	0.63	0.65	0.67	0.77	0.68	0.67	0.47	0.56	0.60	0.62	0.63	0.64	0.64	0.63
TS 2/TES 2 - 0.45	01	0.75	0.92	1.01	1.06	1.09	1.09	1.09	1.08	0.67	0.82	0.91	0.95	0.97	0.97	0.97	0.96
TS 2/TES 2 - 0.6	02	0.98	1.25	1.39	1.46	1.49	1.51	1.51	1.49	0.88	1.11	1.24	1.30	1.33	1.33	1.33	1.32
TS 2/TES 2 - 1.0	03	1.76	2.24	2.50	2.63	2.69	2.72	2.73	2.69	1.59	2.00	2.23	2.33	2.38	2.40	2.40	2.37
TS 2/TES 2 - 1.4	04	2.58	3.29	3.65	3.85	3.95	4.00	4.00	3.96	2.31	2.92	3.25	3.41	3.49	3.53	3.53	3.50
TS 2/TES 2 - 1.7	05	3.29	4.19	4.66	4.90	5.02	5.09	5.09	5.05	2.95	3.73	4.14	4.35	4.45	4.49	4.50	4.45
TS 2/TES 2 - 1.9	06	4.04	5.13	5.70	5.99	6.14	6.22	6.23	6.17	3.62	4.57	5.06	5.32	5.44	5.50	5.50	5.45
TES 5 - 3.7	01	8.1	8.5	8.6	9.1	9.2	9.4	9.5	9.5	7.7	8.1	8.3	8.6	8.9	9.1	9.1	9.2
TES 5 - 5.0	02	12.0	12.5	13.0	13.5	14.7	15.3	15.9	16.0	11.2	11.7	12.2	12.6	13.4	14.2	14.7	14.8
TES 5 - 7.2	03	19.8	20.5	21.3	22.3	24.4	25.1	25.8	26.2	18.0	18.2	18.8	19.6	20.8	21.8	22.9	23.4
TES 5 - 10.3	04	20.0	24.0	26.0	27.0	27.5	28.0	28.5	29.0	18.0	22.0	24.8	25.0	25.5	26.0	26.3	26.5
TES 12 - 4.2	01	9.8	12.8	13.6	14.6	15.1	15.4	15.5	15.9	9.4	11.1	12.3	13.0	13.3	13.5	13.6	14.1
TES 12 - 6.8	02	18.4	21.2	22.8	24.9	25.7	25.8	26.2	26.3	16.5	18.6	20.2	21.5	22.1	22.2	22.4	22.8
TES 12 - 10.0	03	30.5	35.3	37.4	41.7	42.4	43.0	43.2	43.6	27.7	30.7	33.8	35.8	36.5	37.1	37.4	37.9
TES 12 - 13.4	04	34.3	40.2	42.8	47.0	48.4	48.8	49.1	49.3	30.5	34.4	37.7	40.5	40.9	41.4	41.6	42.1
TES 20 - 11.7	01	34.0	41.0	46.0	50.0	51.0	52.0	53.0	53.0	30.0	37.0	40.0	43.0	45.0	45.0	46.0	47.0
TES 55 - 27.0	01	71.0	91.0	97.0	104	109	109	111	112	63.0	79.0	86.0	93.0	94.0	95.0	96.0	96.0
TES 55 - 41.0	02	111	140	147	161	170	171	174	175	99.0	124	132	143	145	146	147	149
		Evaporating temperature –40°C								**Evaporating temperature –50°C**							
TS 2/TES 2 - 0.21	00		0.49	0.53	0.55	0.56	0.56	0.56	0.56		0.43	0.47	0.48	0.48	0.48	0.48	0.48
TS 2/TES 2 - 0.45	01		0.65	0.72	0.75	0.77	0.77	0.77	0.75		0.51	0.57	0.60	0.60	0.60	0.60	0.59
TS 2/TES 2 - 0.6	02		0.88	0.97	1.02	1.03	1.03	1.02	1.01		0.69	0.75	0.78	0.79	0.79	0.78	0.77
TS 2/TES 2 - 1.0	03		1.58	1.74	1.82	1.85	1.86	1.84	1.82		1.23	1.35	1.42	1.43	1.43	1.42	1.39
TS 2/TES 2 - 1.4	04		2.28	2.54	2.66	2.71	2.73	2.72	2.69		1.78	1.97	2.06	2.10	2.10	2.09	2.07
TS 2/TES 2 - 1.7	05		2.92	3.23	3.39	3.45	3.48	3.47	3.43		2.28	2.51	2.63	2.68	2.69	2.67	2.64
TS 2/TES 2 - 1.9	06		3.57	3.95	4.14	4.23	4.30	4.25	4.21		2.78	3.07	3.22	3.28	3.29	3.28	3.24
TES 5 - 3.7	01		6.3	6.6	6.7	7.1	7.2	7.3	7.5		4.4	4.6	4.7	4.8	4.9	4.9	5.3
TES 5 - 5.0	02		10.0	10.1	10.3	10.5	11.0	11.3	11.4		7.8	7.9	8.2	8.3	8.3	8.4	8.6
TES 5 - 7.2	03		14.2	14.4	14.6	15.3	15.8	16.1	16.4		10.3	10.5	10.6	10.7	11.0	11.1	11.3
TES 5 - 10.3	04		17.5	19.5	20.0	20.5	21.0	21.0	21.2		13.5	15.0	15.5	16.0	16.0	16.0	15.5
TES 12 - 4.2	01		9.0	9.6	10.0	10.5	10.6	10.8	10.9		7.1	7.4	7.8	7.9	8.0	8.1	8.3
TES 12 - 6.8	02		14.8	15.8	16.2	16.7	17.0	17.1	17.5		11.4	11.8	12.4	12.9	13.1	13.3	13.4
TES 12 - 10.0	03		24.7	27.0	27.0	28.2	28.5	28.8	29.1		19.5	20.5	21.0	21.7	21.9	22.1	22.7
TES 12 - 13.4	04		27.7	29.4	30.5	31.9	32.1	32.3	32.6		21.9	23.1	23.9	24.4	24.9	25.1	25.4
TES 20 - 11.7	01		31.0	33.0	34.0	34.0	35.0	35.0	35.0		26.0	26.0	27.0	27.0	27.0	28.0	28.0
TES 55 - 27.0	01		63.0	67.0	70.0	73.0	74.0	75.0	76.0		46.0	48.0	50.0	51.0	52.0	53.0	54.0
TES 55 - 41.0	02		98.0	106	108	114	115	115	116		74.0	78.0	79.0	81.0	82.0	82.0	83.0
		Evaporating temperature –55°C								**Evaporating temperature –60°C**							
TS 2/TES 2 - 0.21	00											0.41	0.43	0.43	0.42	0.42	0.41
TS 2/TES 2 - 0.45	01											0.46	0.47	0.48	0.47	0.47	0.46
TS 2/TES 2 - 0.6	02											0.60	0.62	0.62	0.62	0.61	0.59
TS 2/TES 2 - 1.0	03											1.07	1.11	1.12	1.11	1.10	1.07
TS 2/TES 2 - 1.4	04											1.56	1.63	1.65	1.64	1.64	1.61
TS 2/TES 2 - 1.7	05											1.98	2.08	2.10	2.10	2.09	2.06
TS 2/TES 2 - 1.9	06											2.42	2.54	2.58	2.58	2.57	2.53
TES 5 - 3.7	01											3.0	3.3	3.4	3.4	3.4	3.5
TES 5 - 5.0	02											6.6	6.8	6.9	6.9	7.1	7.3
TES 5 - 7.2	03											7.8	7.9	8.0	8.1	8.2	8.2
TES 5 - 10.3	04											11.5	12.0	12.2	12.3	12.2	12.0
TES 12 - 4.2	01			6.3	6.9	7.0	7.1	7.3	7.8								
TES 12 - 6.8	02			10.7	10.9	11.2	11.3	11.4	11.5								
TES 12 - 10.0	03			17.9	18.5	18.9	19.2	19.5	19.7								
TES 12 - 13.4	04			20.2	20.5	20.9	21.3	21.6	22.0								
TES 20 -11.7	01			24.0	24.0	25.0	25.0	26.0	26.0								
TES 55 - 27.0	01			39.0	39.0	41.0	41.0	42.0	42.0								
TES 55 - 41.0	02			63.0	64.0	65.0	65.0	66.0	66.0								

Correction for subcooling Δt_{sub}

The evaporator capacities used must be corrected if subcooling deviates from 4 K. The corrected capacity can be obtained by dividing the required evaporator capacity by the correction factor below. Selections can then be made from the tables above.

Note:
Insufficient subcooling can produce flash gas.

Δt_{sub}	4 K	10 K	15 K	20 K	25 K	30 K	35 K	40 K	45 K	50 K
Correction factor	1.00	1.07	1.13	1.19	1.25	1.32	1.38	1.45	1.53	1.59

Design
Function

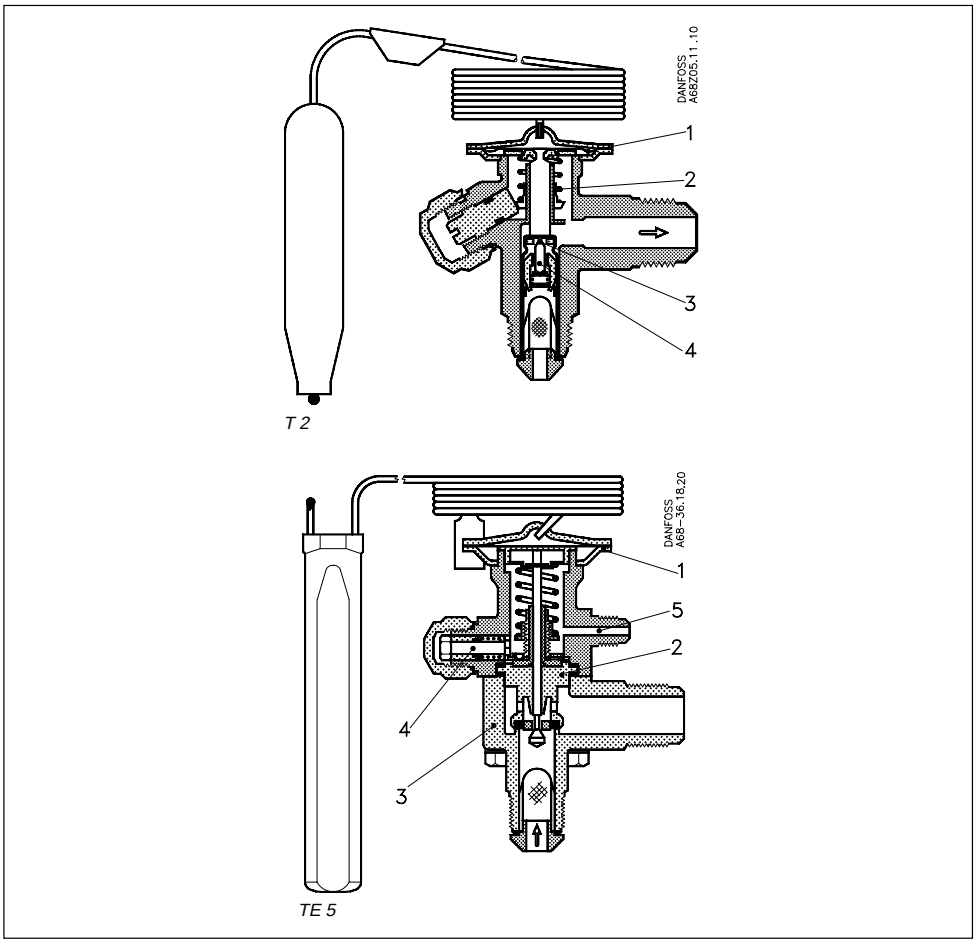
General
T, TE and PHT valves have an interchangeable orifice assembly.

T, TE and PHT valves are built up of three interchangeable main components:
I. Thermostatic element, 1
II. Orifice assembly, 2
Insert in PHT main valve, 7
III. Valve body with connections, 3

T/TE 2, TE 5, TE 12, PHT 85
For the same valve type and refrigerant, the associated orifice assembly is suitable for all versions of valve body and in all evaporating temperature ranges.

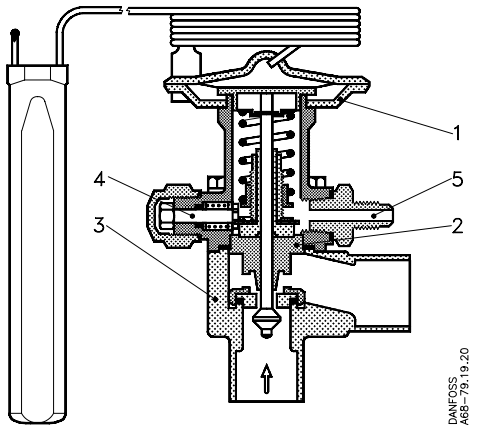
The charge in the thermostatic element depends on the evaporating temperature range.
The valves can be equipped with internal or external pressure equalization.
External pressure equalization should always be used on systems with liquid distributors.
The double contact bulb gives fast and precise reaction to temperature changes in the evaporator. It also makes fitting the bulb quick and easy.
The valves are able to withstand the effects that normally occur with hot gas defrosting.

To ensure long operating life, the valve cone and seat are made of a special alloy with particularly good wear qualities.

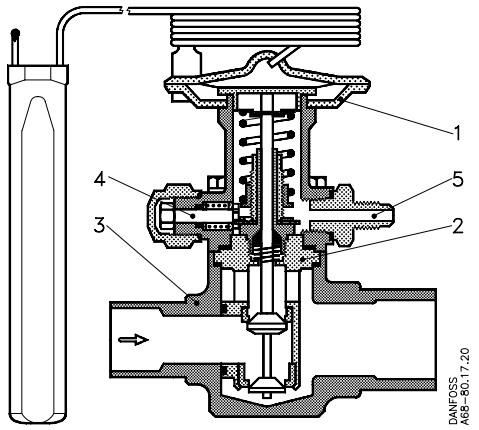


1. Thermostatic element (diaphragm)
2. Interchangeable orifice assembly
3. Valve body
4. Superheat setting spindle (see instructions)
5. Ext. pressure equalizing connection with ¼ in./6 mm flare

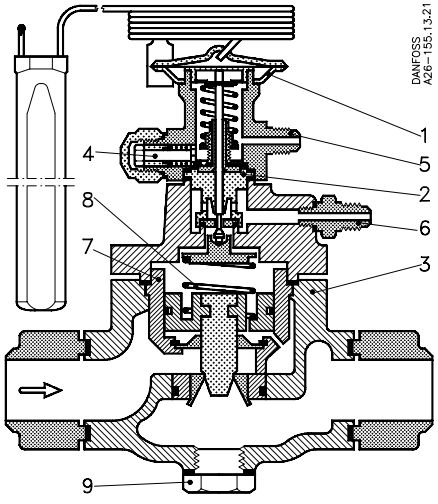
Design
Function
(Continued)



TE 12 / TE 20



TE 55



PHT 85

1. Thermostatic element (diaphragm)
2. Interchangeable orifice assembly
3. Valve body
4. Superheat setting spindle (see instructions)
5. Ext. pressure equalizing connection with 1⁄4 in./6 mm flare nut
6. Pilot connection
7. Insert in main valve
8. Main spring
9. Bottom plug

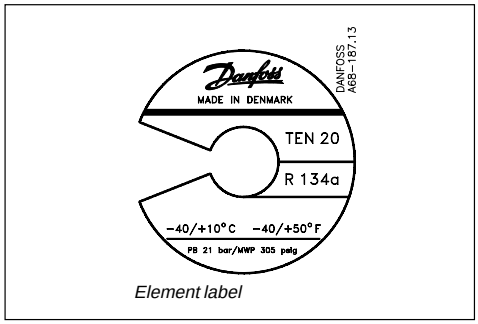
Identification

The thermostatic element is fitted with a coloured label (on top of the diaphragm). The colour code refers to the refrigerant for which the valve is designed:

– green	=	R 22	= X
– yellow with blue bar	=	R 134a	= N
– white with lilac bar	=	R 404A	= S
– yellow	=	R 12	= F
– lilac	=	R 502	= Y

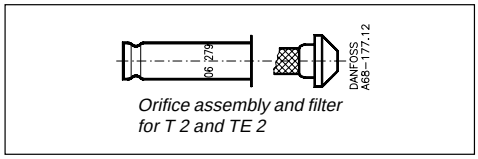
The label gives valve type, evaporating temperature range, MOP point, refrigerant, and max. test pressure, PB.

On T 2 and TE 2 with steel capillary tube this information is etched on with a laser.
With TE 20, TE 55 and PHT 85 the rated capacity is stamped on a band label fastened to the valve.



Element label

Orifice assembly for T 2 and TE 2
The orifice assembly is marked with the orifice size (03) and week stamp (404). The valve strainer is also shown in the figure.
The orifice assembly number is also given on the lid of its plastic container.

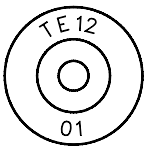


Orifice assembly and filter for T 2 and TE 2

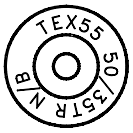
Orifice assembly for TE 5, TE 12, 20 and 55
The orifice assembly is marked on top of the spring cup, e.g. as shown in the figure.
For a given size of valve, the same orifice assembly can be used for valves with ranges N and B.

The thermostatic elements are different however:

- *On TE 5 and TE 12*
  the upper stamp (TE 12) indicates for which valve type the orifice can be used. The lower stamp (01) is the orifice size.
- *On TE 20 and TE 55*
  the upper stamp (N/B 50/35 TR) indicates the rated capacity in the two evaporating temperature ranges N and B, and the refrigerant.
  (50/35 TR = 175 kW in range N and 123 kW in range B. 22 = R 22)
  The lower stamp (TEX 55) refers to the valve type for which the assembly can be used.



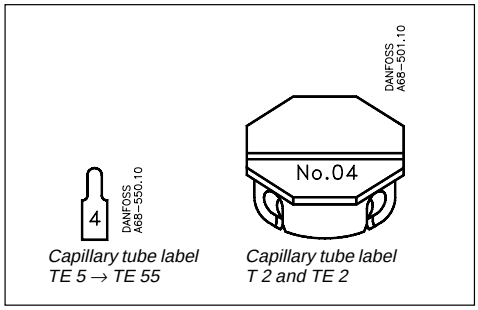
Orifice assembly marking for TE 5 and TE 12



Orifice assembly marking for TE 20 and TE 55

Capillary tube label for T 2 and TE 2
The label gives the orifice size (04) and consists of the lid of the orifice assembly plastic container. It can easily be fastened around the expansion valve capillary tube to clearly identify the valve size.

Capillary tube label for TE 5 to TE 55
The label gives the orifice size (04). A new label always accompanies a new orifice assembly.

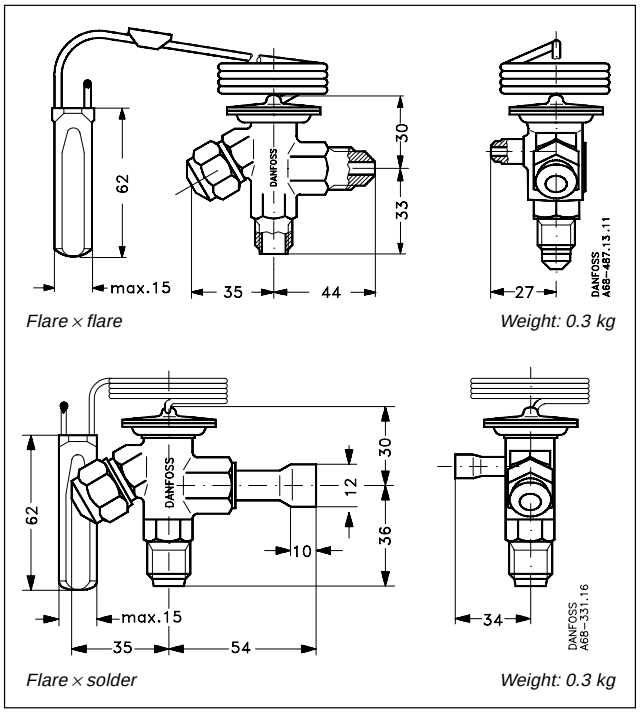


Capillary tube label TE 5 → TE 55

Capillary tube label T 2 and TE 2

Dimensions and weights

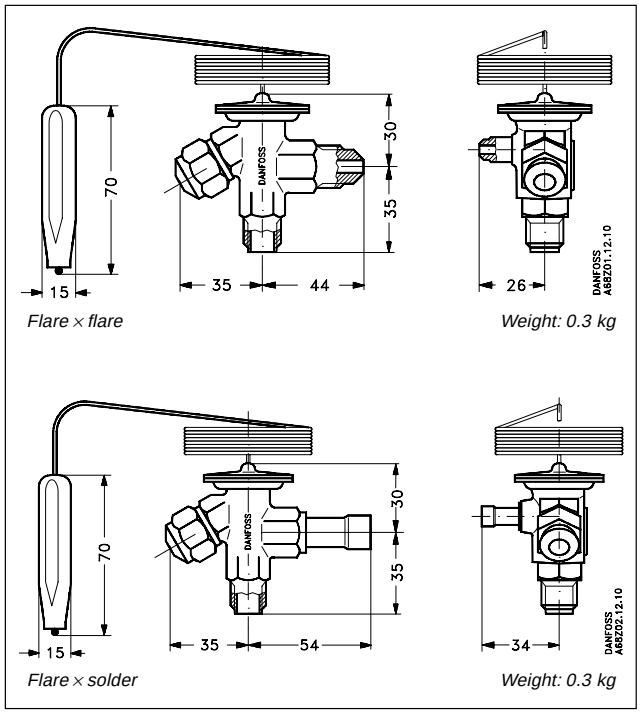
T 2 and TE 2 (Code no.: 68-xxxx)



Flare × flare — *Weight: 0.3 kg*

Flare × solder — *Weight: 0.3 kg*

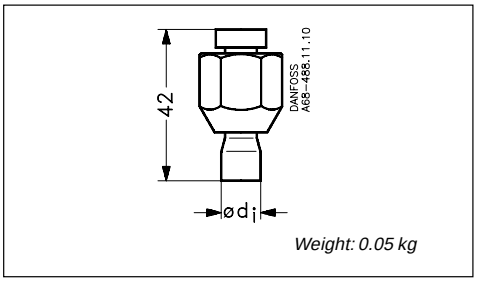
T 2 and TE 2 (Code no.: 68Zxxxx)



Flare × flare — *Weight: 0.3 kg*

Flare × solder — *Weight: 0.3 kg*

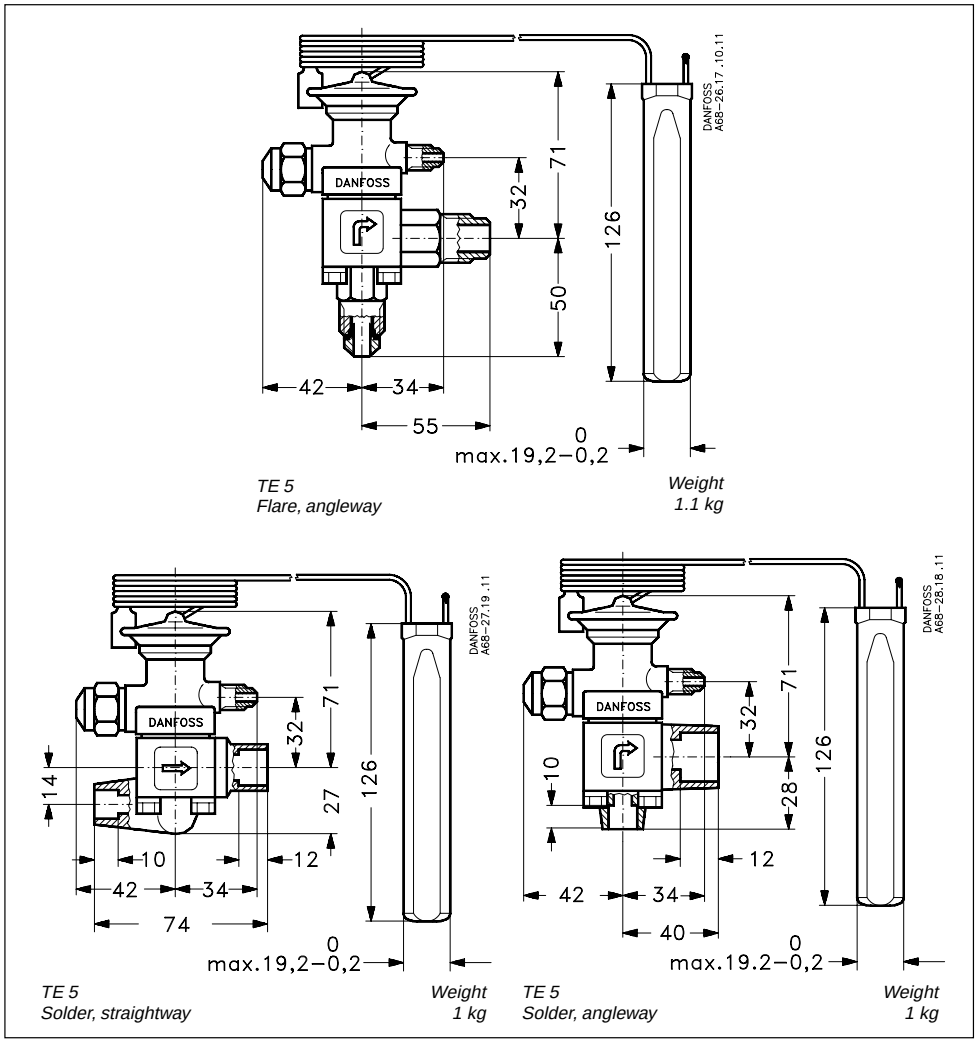
Solder adaptor for T 2 and TE 2



Weight: 0.05 kg

$Ød_i$	
in.	mm
1/4	6
3/8	10

Dimensions and weights
(continued)



TE 5
Flare, angleway
Weight 1.1 kg

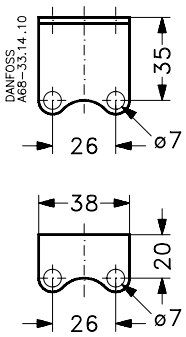
TE 5
Solder, straightway
Weight 1 kg

TE 5
Solder, angleway
Weight 1 kg

Type TE 5

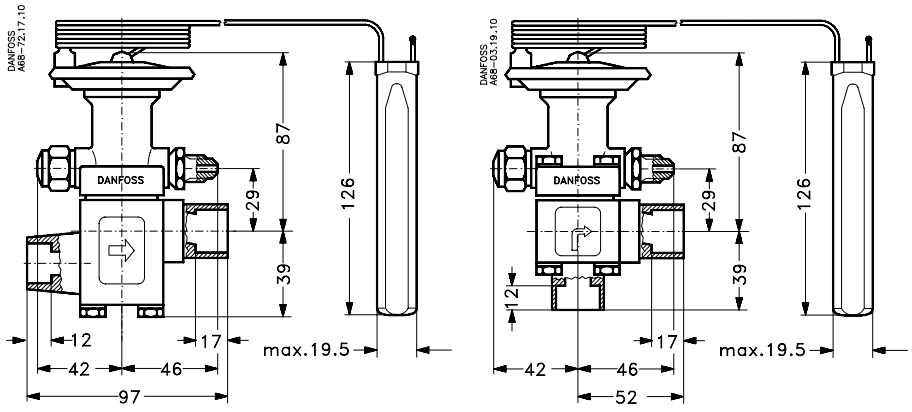
Inlet side $\varnothing D_1$	L_1 mm
½ in./12 mm ODF	10
⅝ in./16 mm ODF	10

Outlet side $\varnothing D_2$	L_1 mm
⅝ in./16 mm ODF	12
⅞ in./22 mm ODF	17



Bracket for TE 5

Dimensions and weights
(continued)

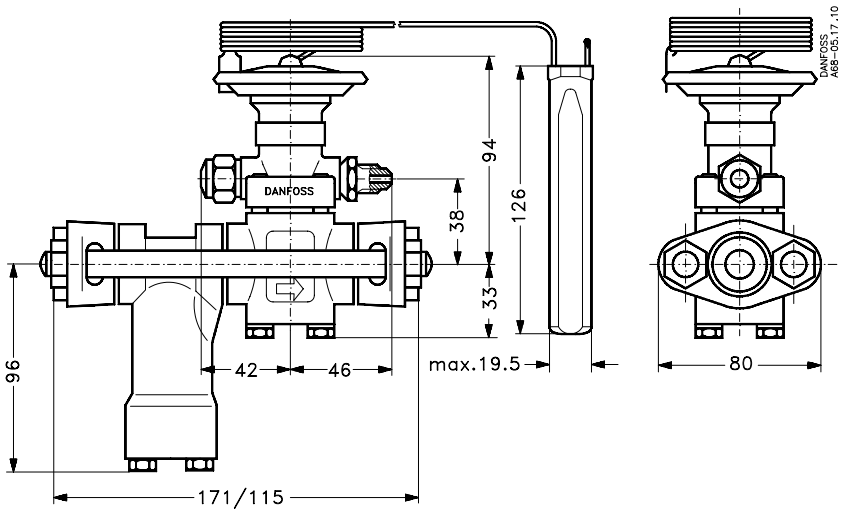


TE 12 and 20
Solder, straightway

Weight
TE 12: 1.5 kg
TE 20: 1.7 kg

TE 12 and 20
Solder, angleway

Weight
TE 12: 1.5 kg
TE 20: 1.6 kg



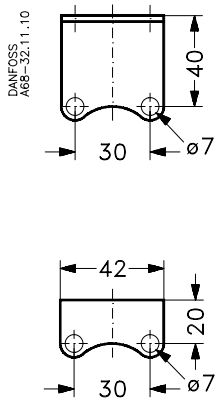
TE 12
Solder flanges, straightway

Weight
Without filter: 2.3 kg
With filter: 3.2 kg

Type TE 12-20

Inlet side $\varnothing D_1$	L_1 mm
5/8 in./16 mm ODF	12
7/8 in./22 mm ODF	17

Outlet side $\varnothing D_2$	L_1 mm
7/8 in./22 mm ODF	17
1 1/8 in./28 mm ODF	25



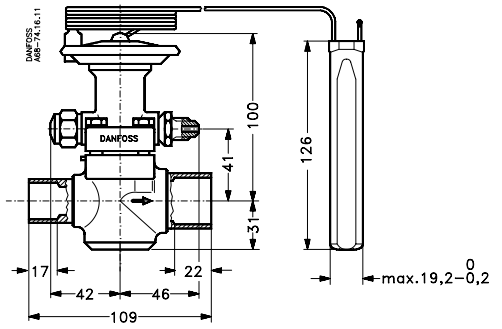
Bracket
for TE 12 and TE 20

Dimensions and weights
(continued)

Type TE 55

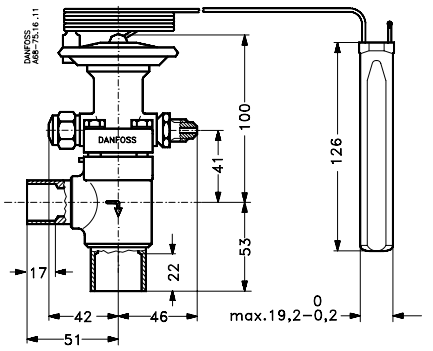
Inlet side $\varnothing D_1$	L_1 mm
⅞ in./22 mm ODF	17
1⅛ in./28 mm ODM	25

Outlet side $\varnothing D_2$	L_1 mm
1⅛ in./28 mm ODF	22
1⅜ in./35 mm ODM	27



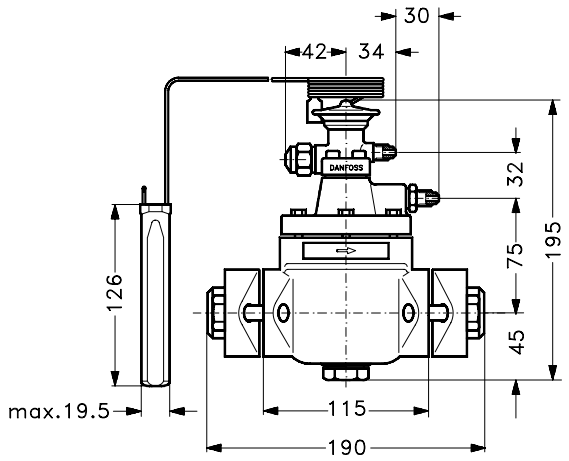
TE 55
Solder, straightway

Weight
1.7 kg

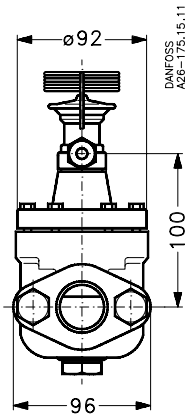


TE 55
Solder, straightway

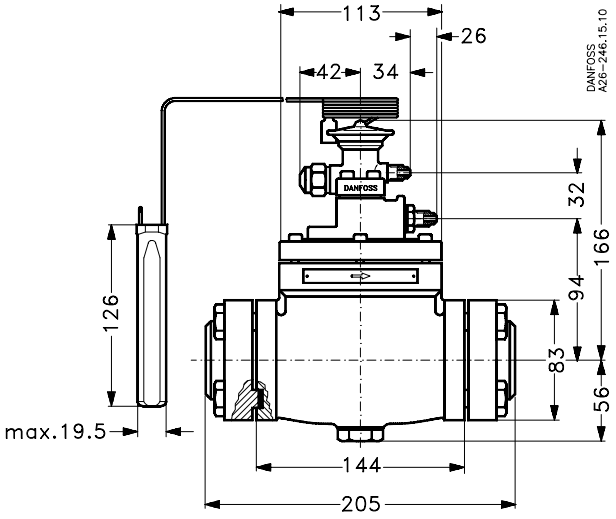
Weight
1.6 kg



PHT 85
Solder or weld flanges

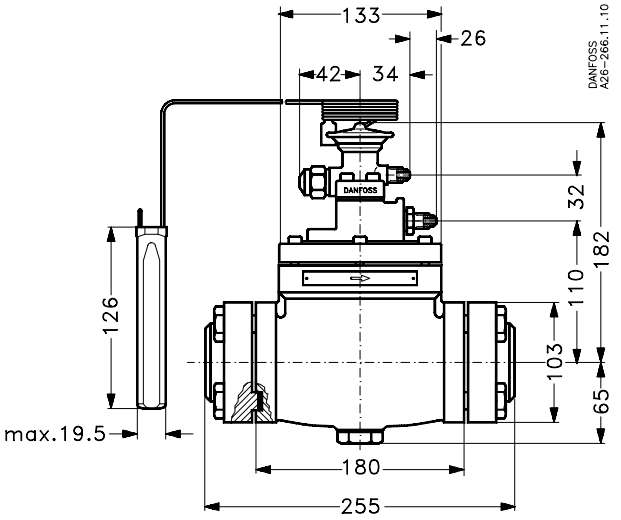


Weight
4.5 kg



PHT 125
Weld flanges

Weight
9.5 kg



PHT 200 and 300
Weld flanges

Weight
15.5 kg