

Data Sheet

Thermostatic expansion valve Type **TD 1 / TDE 1**

Designed to regulate refrigerant injection into evaporators



TD 1 / TDE 1 is a thermostatic expansion valve designed to regulate refrigerant injection into evaporators. The injection depends on the refrigerant superheat at the evaporator outlet, where the bulb must be placed.

TD 1 / TDE 1 is constructed for soldering into hermetic sealed systems and supplied as angleway and straightway version.

OEM Applications:

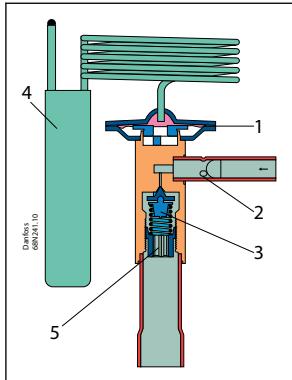
- GDM (Glass Door Merchandiser)
- Commercial fridge and freezer
- Heat Pump

Features

- Refrigerants: R134a, R290, R448A, R449A, R452A, R404A, R22, R407C. Other refrigerants are on request.
- Rated capacities from 0.4 to 3.8 kW / 0.11 to 1.1 TR for R134a.
- Double contact bulb:
 1. Fast and easy to install
 2. Good temperature transfer from pipe to bulb.
- Supplied with fixed superheat setting as well as adjustable straightway version for setting customization.
- Permanent filter at inlet.
- Optional bleed function.
- Compact and hermetic construction.
- Laser welded stainless steel element:
 1. optimum regulation properties
 2. long life of diaphragm
 3. high compressive strength
- MOP (Max. Operating Pressure) function is available.

Functions

Figure 1: Angle way fixed superheat setting



- | | |
|---|----------------------------------|
| 1 | Thermostatic element (diaphragm) |
| 2 | Strainer |
| 3 | Fixed orifice assembly |
| 4 | Bulb with capillary tube |
| 5 | Locked setting screw |

TD 1 / TDE 1 valves have a fixed orifice assembly. Both straight way and angle way configuration are available and the angle way version is designed with fixed superheat setting only.

The valves are available with internal or external pressure equalization. External pressure equalization should always be used on systems with liquid distributors.

The bulb with double contact is fixed with Danfoss bulb clip for quick, easy and reliable connection. It gives fast and precise reaction to temperature changes in the evaporator.

Product specification

Technical data

Max. bulb temperature: 120 °C / 248 °F

Max. valve housing temperature: 150 °C / 302 °F

Max. working pressure: PS/MWP = 34 bar / 500 psig

Max. test pressure: 37.5 bar / 540 psig

Capillary tube length: 0.75 m / 30 inch

Bleed: 15% or 30%

Table 1: Rated capacity ¹⁾

Orifice no.	R134a		R290		R22/R407C		R404A	
	TR	kW	TR	kW	TR	kW	TR	kW
0	0.11	0.4	0.16	0.6	0.15	0.53	0.12	0.42
1	0.23	0.8	0.34	1.2	0.32	1.10	0.25	0.88
2	0.45	1.6	0.65	2.3	0.62	2.20	0.50	1.80
3	0.60	2.1	0.87	3.0	0.83	2.90	0.66	2.30
4	0.90	3.1	1.30	4.6	1.24	4.34	1.00	3.50
5	1.10	3.8	1.60	5.6	1.52	5.31	1.21	4.24

NOTE:

This product is approved for R290 by ignition source assessment in accordance to standard EN ISO80079-36

¹⁾ The rated capacity is based on:

Evaporating temperature $t_e = 5 \text{ }^\circ\text{C} / 41 \text{ }^\circ\text{F}$

Condensing temperature $t_c = 32 \text{ }^\circ\text{C} / 90 \text{ }^\circ\text{F}$

Refrigerant temperature ahead of valve $t_l = 28 \text{ }^\circ\text{C} / 82 \text{ }^\circ\text{F}$

Table 2: Max. operating pressure

Refrigerant	Range K: -25 - +10 °C / -15 - +50 °F	Range AC: -25 - +15 °C / -15 - +60 °F
	MOP point in evaporating temperature t_e and evaporating pressure p_e	
	+15 °C / +60 °F	+ 20 °C / +68 °F
R134a	55 psig / 3.8 bar	70 psig / 4.8 bar
R290	90 psig / 6.3 bar	105 psig / 7.4 bar
R22	100 psig / 6.9 bar	120 psig / 8.1 bar
R407C	95 psig / 6.6 bar	110 psig / 7.8 bar
R404A	120 psig / 8.3 bar	140 psig / 9.9 bar

To avoid charge migration when MOP valves are used, the bulb temperature must be lower than the thermostatic element temperature.

Valve selection based on capacity calculation

As for extended capacity calculations and valve selection based on capacities and refrigerants, please refer to Coolselector[®]2. Rated and extended capacities are calculated with the Coolselector[®]2 calculation engine to ARI standards with the ASEREP equations based on laboratory measurements of selected valves.

Dimensions and Weight

Figure 2: TDE 1 Adjustable superheat setting, Weight approx. 0.15 kg (2.54 lbs)

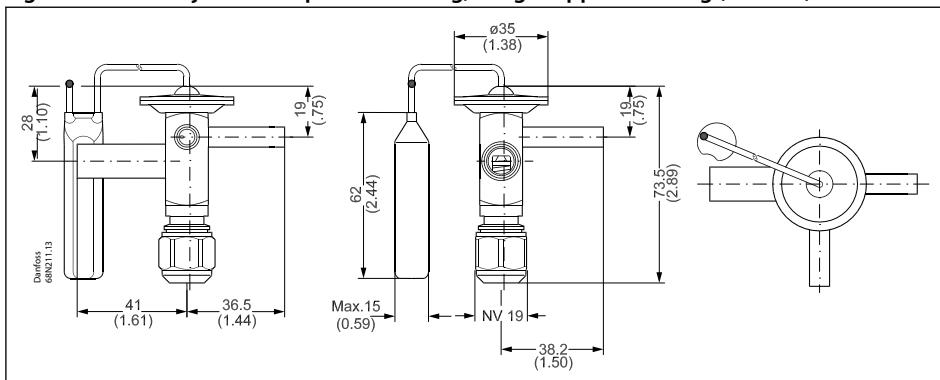


Figure 3: TDE 1 Fixed superheat setting, Weight approx. 0.15 kg (2.54 lbs)

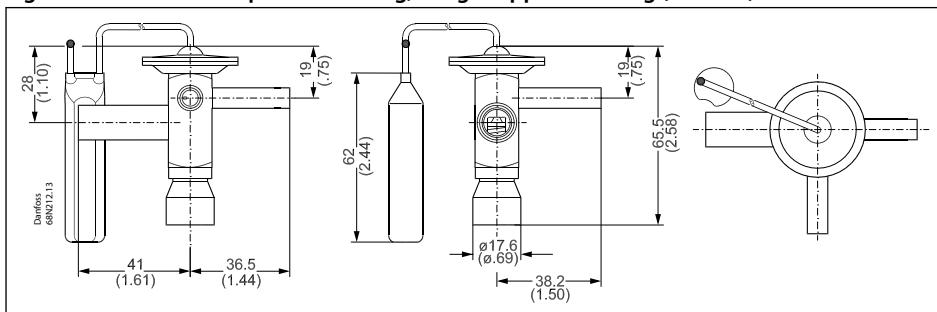
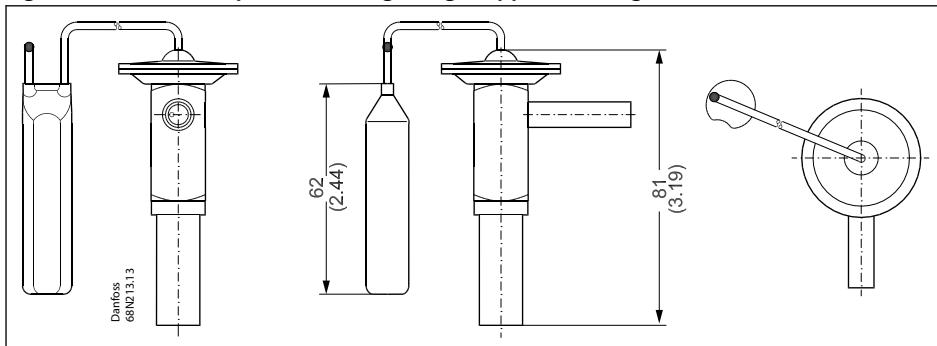
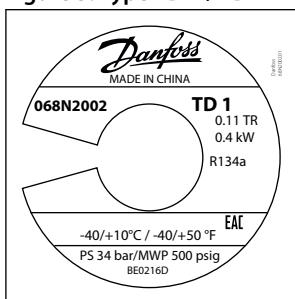


Figure 4: TD 1 Fixed superheat setting, Weight approx. 0.15 kg (2.54 lbs)



Identification

Figure 5: Type TD 1 / TDE 1



The valve is fitted with a product label (on top of the diaphragm) which holds information as follows: valve type, rated capacity, refrigerant, evaporating temperature range, MOP point, BP(bleed port %), max. working pressure PS/MWP and production date code.

TD 1 = internal equalization

TDE 1 = external equalization

0.11 TR = Rated capacity Q in TR

Thermostatic expansion valve, Type TD 1 / TDE 1

0.4 kW = Rated capacity Q in kW

R134a = Refrigerant

-40 / +10 °C / -40 / +50 °F = Evaporating temperature range

068N2002 = Code number

PS 34 bar/MWP 500 psig = Max. Working Pressure in bar and psig

BE0216D = Production date code (BE = China, 02 = Production week, 16 = Year 2016, D = Thursday)

Ordering

Figure 6: TD 1 / TDE 1



As the TD 1 / TDE 1 valve is typically an OEM valve, limited code number programme has been set up.

Other code numbers are available on demand.

The valves including bulb clip are supplied in multi pack or industrial pack.

Multi pack: 20 pcs pr. full pack, min. order quantity = 1 pcs.

Industrial pack: 32 pcs pr. pack (min. ordering quantity). Please contact Danfoss.

Table 3: Range N: -40 – +10 °C / -40 – +50 °F and Range AC: -25 – +15 °C / -15 – +60 °F with MOP 20 °C / 68 °F

Refrigerant	Type	Flow Direction	Orifice no.	Range	Rated capacity		Bleed	Conn. solder ODF Inlet x Outlet [in]		Code no. Multi pack
					TR	kW		[in]	[mm]	
R134a	TD 1	Angleway	0	N	0.11	0.4	-	1/4 x 3/8	-	068N2002
	TD 1	Angleway	1	N	0.23	0.8	-	1/4 x 3/8	-	068N2003
	TD 1	Angleway	1	N	0.23	0.8	15%	1/4 x 3/8	-	068N2004
	TD 1	Angleway	2	N	0.45	1.6	-	1/4 x 3/8	-	068N2006
	TD 1	Angleway	2	N	0.45	1.6	15%	1/4 x 3/8	-	068N2007
	TD 1	Angleway	3	N	0.6	2.1	-	1/4 x 3/8	-	068N2009
	TD 1	Angleway	3	N	0.6	2.1	15%	1/4 x 3/8	-	068N2010
	TD 1	Angleway	4	N	0.9	3.1	-	3/8 x 1/2	-	068N2012
	TD 1	Angleway	4	N	0.9	3.1	15%	3/8 x 1/2	-	068N2013
	TD 1	Angleway	5	N	1.1	3.8	-	3/8 x 1/2	-	068N2015
	TD 1	Angleway	5	N	1.1	3.8	15%	3/8 x 1/2	-	068N2027
	TD 1	Angleway	1	AC	0.23	0.8	-	-	6 x 10	068N2005
	TD 1	Angleway	2	AC	0.45	1.6	-	-	6 x 10	068N2008
	TD 1	Angleway	3	AC	0.6	2.1	-	-	6 x 10	068N2011
	TD 1	Angleway	4	AC	0.9	3.1	-	-	10 x 12	068N2014
	TD 1	Angleway	5	AC	1.1	3.8	-	-	10 x 12	068N2017
R290	TD 1	Angleway	0	N	0.16	0.6	-	1/4 x 3/8	-	068N1919
	TD 1	Angleway	1	N	0.34	1.2	-	1/4 x 3/8	-	068N2020
	TD 1	Angleway	2	N	0.65	2.3	-	1/4 x 3/8	-	068N2022
	TD 1	Angleway	3	N	0.87	3	-	1/4 x 3/8	-	068N2024
	TD 1	Angleway	4	N	1.3	4.6	-	3/8 x 1/2	-	068N2026
	TD 1	Angleway	5	N	1.6	5.6	-	3/8 x 1/2	-	068N2028
	TD 1	Angleway	1	AC	0.34	1.2	-	-	6 x 10	068N2021
	TD 1	Angleway	2	AC	0.65	2.3	-	-	6 x 10	068N2023
	TD 1	Angleway	3	AC	0.87	3	-	-	6 x 10	068N2025

The rated capacity is based on: Evaporating temperature $t_e = 5^\circ\text{C} / 41^\circ\text{F}$,

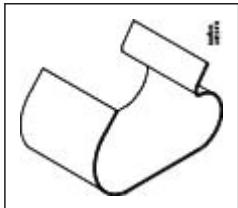
Thermostatic expansion valve, Type TD 1 / TDE 1

Condensing temperature $t_c = 32 \text{ }^{\circ}\text{C} / 90 \text{ }^{\circ}\text{F}$,
Refrigerant temperature ahead of valve $t_i = 28 \text{ }^{\circ}\text{C} / 82 \text{ }^{\circ}\text{F}$

Table 4: The bulb clips can also be sold separately

For tube diameter	Packing	Pcs / pack	Code no.
8 mm / 5/16 in	Industrial pack	96	068N2529
10 mm / 3/8 in	Industrial pack	96	068N2530
12 mm / 1/2 in	Industrial pack	96	068N2531

Figure 7: Bulb clip



Certificates, declarations and approvals

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

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

Table 5: Certificates, declarations and approvals

Document name	Document type	Document topic	Approval authority
033F4011	Manufacturers Declaration	RoHS	Danfoss
033F4006	Manufacturers Declaration	China RoHS	Danfoss
067R1068	Manufacturers Declaration	PED	Danfoss

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