Data sheet

Thermostatic Expansion Valves, Type TE 2 for R744

For high pressure (CO_2 - 90 bar / 1305 psi)

Description

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.

With this new TE 2 version for CO_2, the use of a manual TXV together with a simpler case controller, create the unique possibility for building a CO_2 system, with a lower initial investment. This while still allowing constant data logging of temperatures.

Features & benefits

- Wide temperature range
  - Equally applicable in MT and LT applications
  - Is supplied with MOP (Maximum operating pressure)
- Interchangeable orifice assembly
  - Easy storage
  - Easy capacity matching
  - Better service
  - Easy cleaning and replacement of filter
- Rated capacities from 1 to 10.5 kW / 0.3 to 3.0 TR for CO_2

  Laser welded power element
  - Ensures diaphragms structural integrity and increase working life
- Laser engraving
  - Durable positive valve identification, no label that peels off over time
- Stainless steel capillary tube
  - Flexible and lightweight capillary tube
  - Tolerates more bending for trouble free installation and longer life
  - Greater resistance to vibration during operation, because of low weight
- Stainless steel bulb and Danfoss patented bulb strap
  - Fast and easy to install
  - Good temperature transfer from pipe to bulb
- Design protected
  Manufactured according to IATF 16949
  In order to allow capacities down to 1 kW / 0.3 TR R744, 4 new orifices (CZ, CY, CX and C0) have been designed
  These orifices will be used together with existing ones

Applications

The TE 2 for CO_2 is developed for use as thermostatic expansion valve for injecting in subcritical CO_2 applications. The valve is intended for use in smaller CO_2 systems where lower initial investments is considered a benefit. E.g., convenient stores or smaller cold rooms. By using a mechanical TXV instead of an electric expansion valve, a simpler case controller can be used and mounting of a pressure sensor in the case is not required.

Figure: Simplified CO_2 system, showing how the TE 2 valves can be used

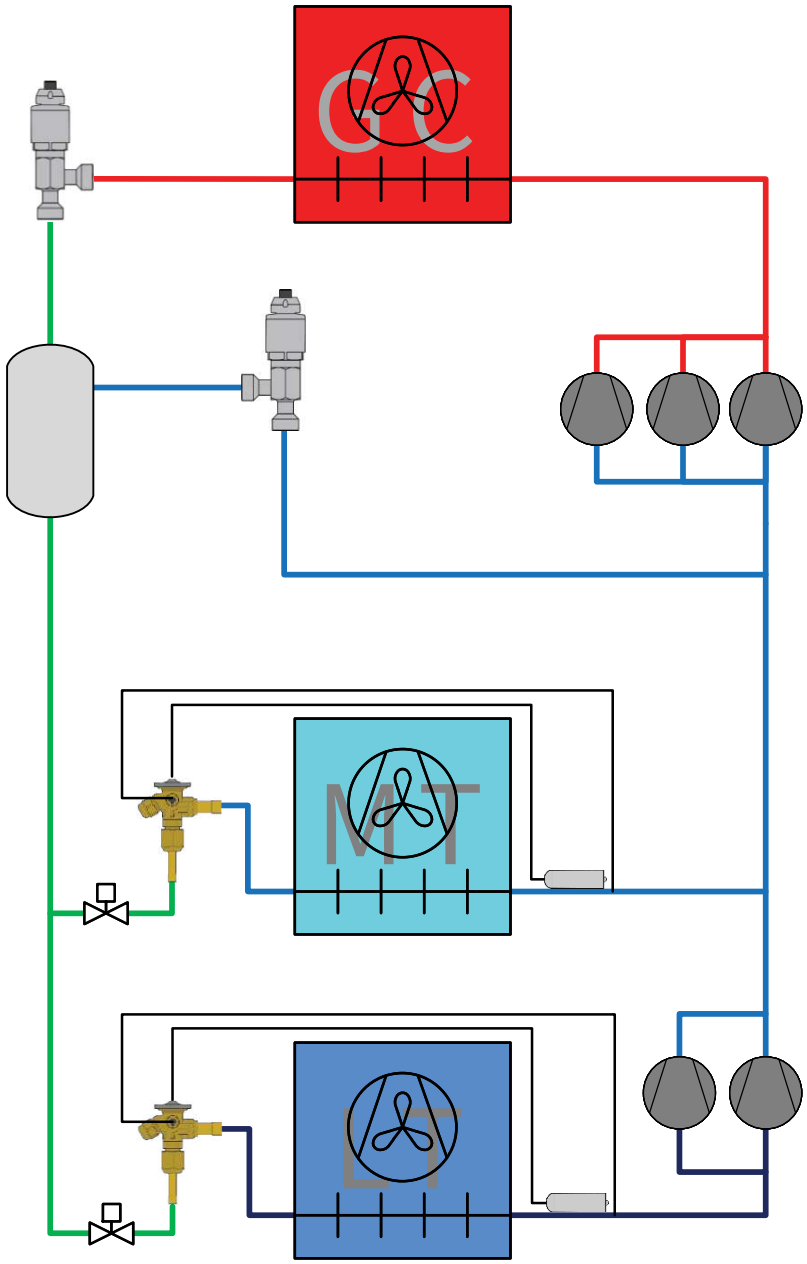
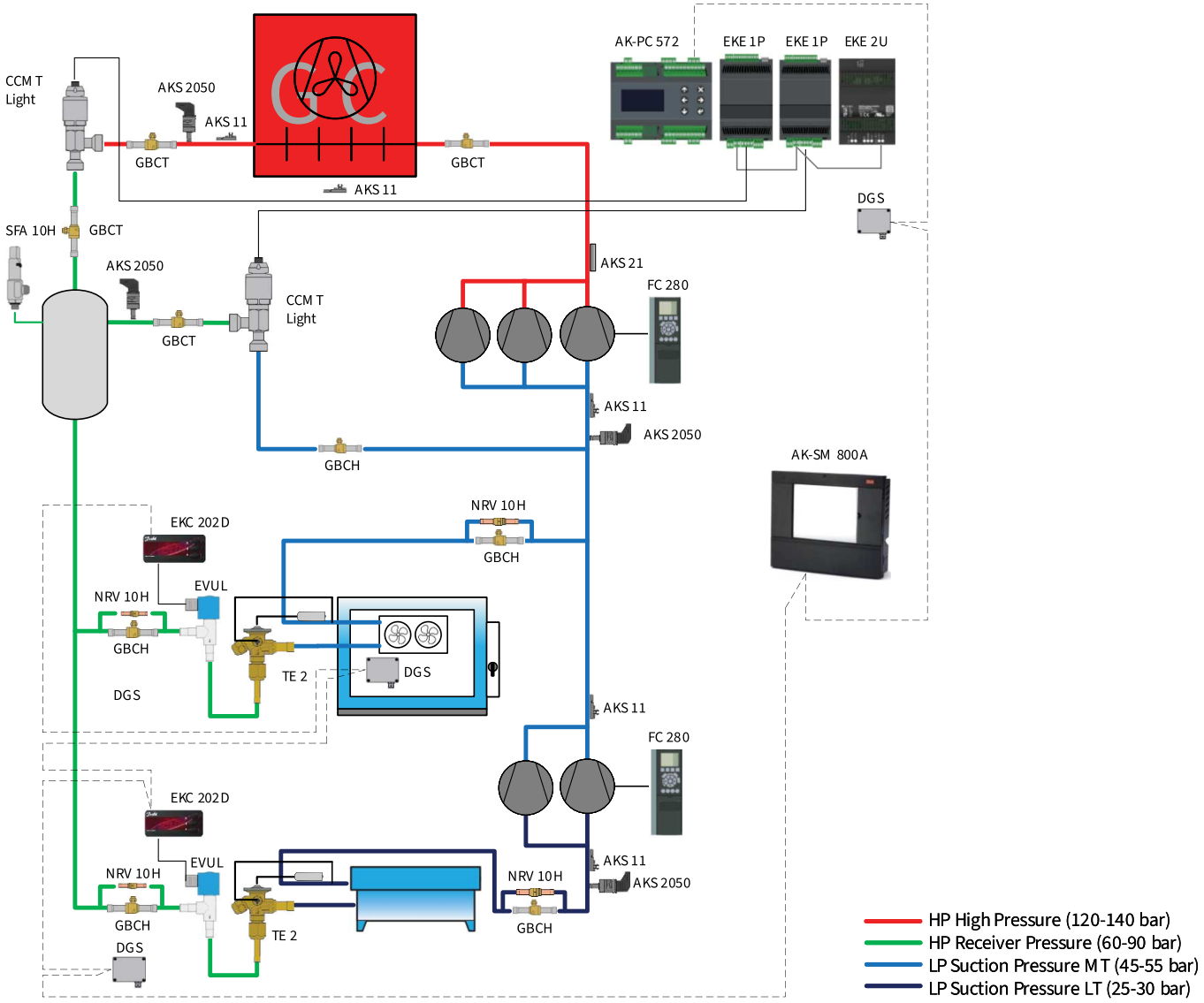


Figure: Application example for full system

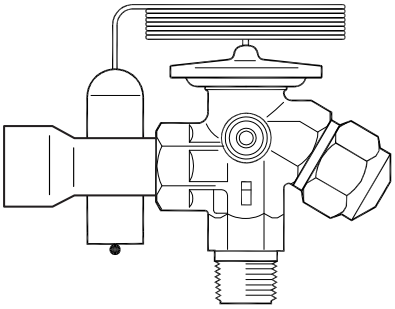


- With this new TE 2 version for CO_2, the use of a manual TXV together with a simpler case controller, create the unique possibility for building CO_2 systems with lower initial investments in the show case part of the system.
- Because a case controller is still used, temperatures can still be logged constantly
- Use of the TE 2 for CO_2 do not change the requirements for the rest of the system like compressors, gas cooler, receiver, and the like
- Typically used in combination with CO_2 condensing units, Self-contained units, and semi plug-in units
- Can be used in both cabinets and cold rooms

Ordering

Product code numbers

T2/TE 2 Thermostatic element with bulb strap
Figure: Flare x solder



Capillary tube:1.5 m
Range = -40 – 0 °C

Table: Flare x solder

Refrigerant	Type	Range		MOP		Pressure equalization solder	Connection flare inlet × solder outlet		Code no. Multi pack
		[°C]	[°F]	[°C]	[°F]	[in / mm]	[in]	[mm]	
R744	TE 2	-40 – 0	-40 – 32	5	41	¼	⅜ X ½	–	068Z2900
						6	–	10 x 12	068Z2901

Figure: Orifice assembly with filter for solder adaptor

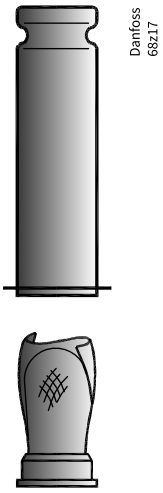
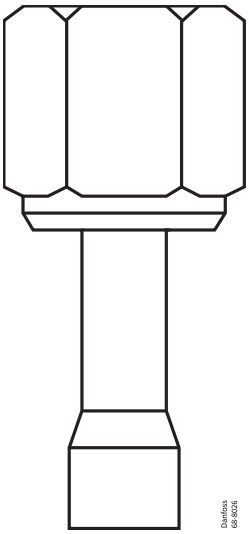


Table: Orifice assembly with filter for solder adaptor

Orifice no.	Code no.
CZ	068Z2100
CY	068Z2101
CX	068Z2102
C0	068Z2103
01	068-2091
02	068-2092
03	068-2093

Solder adaptor
Figure: Solder adaptor



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

To secure an optimal leak free connection to the liquid line of the TE 2 for CO_2, the solder adapter must be used. Only in this way the sealing requirements of DIN 8964 can be fulfilled.

SAE flare nut assemblies cannot secure the needed leakage level required in DIN 8964

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

When using the solder adapter, a special orifice assembly is required. Please use the following tables to select the appropriate adapter and, if needed, filter designed for use with the solder adapter.

Solder adaptor for filter drier (FSA) must not be used in the T 2 inlet.

Table: Solder adaptor without orifice assembly and filter

Connection ODF solder	Code no.
¼ in	068-2062
6 mm	068-2063
⅜ in	068-2060
10 mm	068-2061

Figure: Filter

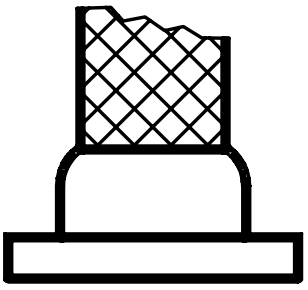
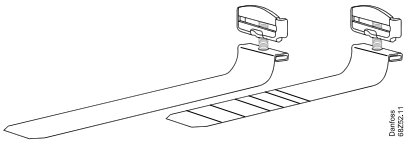


Table: Filter for solder adaptor

Description	Code no.
Filter excl. orifice assembly	068-0015

Bulb strap (Danfoss patented)
Figure: Bulb strap



Each valve is delivered with a Danfoss patented bulb strap. Spares can be ordered.

Table: Bulb strap (Danfoss patented)

Description	Pack mode	Quantity / pack	Code no.
Accessory bag with short bulb strap l/45	I	45	068U3525
Accessory bag with long bulb strap l/45	I	45	068U3527
Accessory bag with short bulb strap M/25	M	25	068U3520
Accessory bag with long bulb strap M/45	M	45	068U3528

Ordering EVUL solenoid valve
Figure: Valve type Danfoss 32F969.10

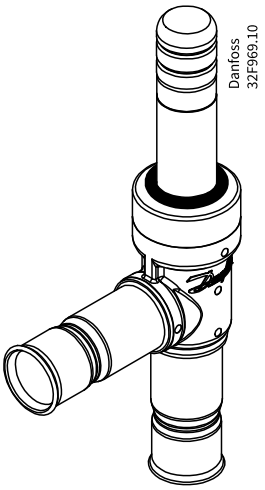


Table: Normally closed (NC)

Valve type	Connections	Industrial pack		Multi pack	Connections	Industrial pack		Multi pack
	[in.]	Code no.	Pcs.	Code no.	[mm]	Code no.	Pcs.	Code no.
EVUL 1	¼	032F8200	40	–	6	032F8227	40	–
	¼	–	–	032F9506	6	–	–	032F9508
EVUL 2	¼	032F8201	40	032F9510	6	032F8228	40	032F9516
EVUL 3	¼	032F8202	40	032F9511	6	032F8229	40	032F9517
	⅜	032F8203	40	–	10	032F8230	40	–
EVUL 4	¼	032F8204	40	032F9512	6	032F8231	40	032F9518
	⅜	032F8205	40	–	10	032F8232	40	–
	½	032F8206	40	–	12	032F8233	40	–

Single pack = 1 product in a box with installation guide
Multi pack = box with x pieces single pack (can be split)
Industrial pack = x pieces in one box (cannot be split)

Ordering coils for EVUL
If coils are below IP x 5, they must be protected against ultraviolet, moisture and major impact, especially the connection of coils.

Always Install a fuse ahead of the coil: rated current: two times of rated current, time lag: medium, to avoid short circuit.

The coil cannot be used in an area of more than pollution degree 2.

Follow the installation guide to mount the coil correctly, and apply O-ring for sealing to prevent moisture penetrating inside the coil

Figure: DIN spade connection

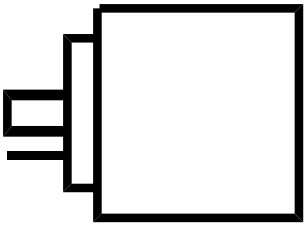


Table: Alternating current AC - with DIN plug [1] - IP65

Type	Ambient Temp. [°C]	Supply voltage [V]	Voltage variation	Frequency [Hz]	Power consumption		Industrial pack		Multi pack
					[W]	[VA]	Code no.	Pcs.	Code no.
AS230CS	-40 – 50	230	-15% – 10%	50	8	16	–	–	042N7601
		208 – 240	-15% – 10%	60	7	14			

[1] The three pins on the coil can be fitted with spade tabs, 6.3 mm wide (to DIN 46247). The two current carrying pins can also be fitted with spade tabs, 4.8. mm wide. Max. lead cross section: 1.5 mm^2. If DIN plug is used (DIN 43650) the leads must be connected in the socket.

Figure: Cable connection

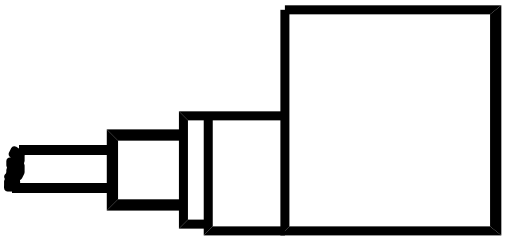
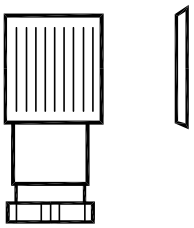


Table: Alternating current AC with 1 m cable - IP67

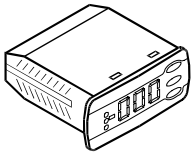
Type	Ambient Temp. [°C]	Supply voltage [V]	Voltage variation	Frequency [Hz]	Power consumption		Industrial pack		Multi pack
					[W]	[VA]	Code no.	Pcs.	Code no.
AU230CS	-40 – 50	230	-15% – 10%	50	7	14	042N8651	20	042N7651
		230	-15% – 10%	60	5	10			

Accessories code numbers

Accessories
Table: DIN plug

Part	Description	Multi pack	
		Code no.	Pcs.
	Din plug	042N1256	100

Controllers
Table: EKC 202D / EKC 202D1

Type		Function	Voltage supply	Code no.
EKC 202D		Refrigeration controller without data communication but prepared for mounting of one module	230 V AC	084B8536

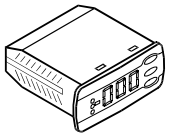
Type		Function	Voltage supply	Number	Code no.
EKC 202D1		Refrigeration controller without data communication but prepared for mounting of one module	230 V AC	1	084B8554
				30	084B8654

Table: AK-CC 55 compact

Type	Stat No: 69627 - Stat No Desc.: AK-CC 55	Packing	Qty.	Code no.
Ak-CC 55 Compact	Case controller for AKV or solenoid valve (including connectors)	S/M-pack		084B4081

Table: AK-RC 111

Type	Code no.
OPTYMA™ control single-phase (2 HP) including two sensors	080Z3220

Overview

Product portfolio

Related products

Controllers:

Figure: EKC 202D and EKC 202D1

Figure: AK-CC55 Compact

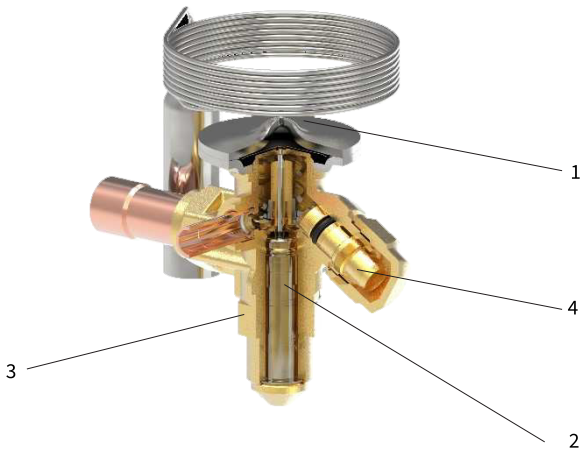
Figure: AK-RC 111

Solenoid valves:

Figure: EVUL plus Coils

Functions

Figure: Functions



1	Thermostatic element (diaphragm)
2	Interchangeable orifice assembly
3	Valve body
4	Superheat setting spindle (see instructions)

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

The TE 2 valves for CO_2 will not be available with internal pressure equalization and to work on sub critical systems, these versions have been upgraded to MWP 90 bar.

TE 2 valves have an interchangeable orifice assembly. The orifice assembly is suitable for all versions of valve body and refrigerants and in all evaporating temperature ranges. To ensure long operating life, the valve cone and seat are made of a special alloy with particularly good wear qualities.

The charge in the thermostatic element is adapted to the refrigerant and evaporating temperature and range, as laser engraved on the valve top.

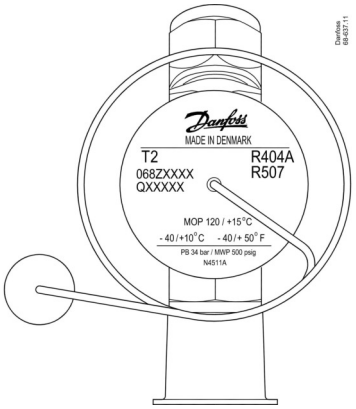
The bulb gives fast and precise reaction to temperature changes in the evaporator. The bulb is fixed with a Danfoss patented bulb strap for quick, easy, and reliable mounting. This secures a good thermal contact to the suction tube.

Product details

General data

Identification

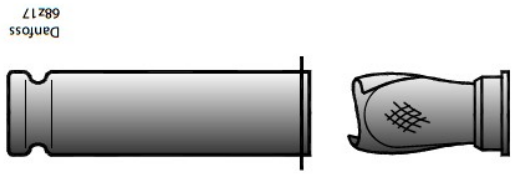
Figure: Identification



T 2	internal equalization
TE 2	external equalization
N	Nordborg, Denmark (BE = Wuqing, China)
45	week
11	2011
A	Monday

Production place and date N4511A
The thermostatic element has laser engraved data on top of the diaphragm. This engraving gives valve type (with code number), evaporating temperature range, MOP point, refrigerant, and max. working pressure. PS/MWP.

Figure: Orifice assembly and filter for TE 2 with solder adapter



Orifice assembly for T 2 and TE 2
The orifice assembly is marked with the orifice size (e.g. 06) and week stamp + last number in the year (e.g. 174). The orifice assembly number is also given on the lid of its plastic container.

Figure: Capillary tube label for TE 2

Capillary tube label for 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.

Capacity

Table: R744, Capacity in kW, opening superheat s_h = 2 K

Valve type	Orifice no.	Cond. Temp. [°C]	Evaporating [°C]								
			-40	-35	-30	-25	-20	-15	-10	-5	0
			Capacity [kW]								
TE 2	CZ	-5	1.44	1.53	1.6	1.61	1.54	1.38	1.09	–	–
TE 2	CY		1.92	2.05	2.14	2.16	2.09	1.88	1.48	–	–
TE 2	CX		2.07	2.22	2.32	2.35	2.28	2.07	1.64	–	–
TE 2	C0		3.76	3.96	4.06	4.02	3.81	3.36	2.59	–	–
TE 2	1		5.94	6.29	6.47	6.44	6.12	5.42	4.19	–	–
TE 2	2		9.67	10.5	11.1	11.4	11.1	10	8	–	–
TE 2	3		13.7	14.9	15.7	16.1	15.7	14.2	11.3	–	–
TE 2	CZ	0	1.48	1.59	1.69	1.74	1.74	1.65	1.46	1.13	–
TE 2	CY		1.97	2.13	2.26	2.34	2.35	2.24	1.99	1.55	–
TE 2	CX		2.12	2.3	2.45	2.55	2.57	2.47	2.22	1.74	–
TE 2	C0		3.87	4.12	4.29	4.36	4.29	4.02	3.5	2.66	–
TE 2	1		6.1	6.53	6.85	6.99	6.89	6.47	5.65	4.31	–
TE 2	2		9.9	10.9	11.8	12.4	12.5	12.1	10.8	8.45	–
TE 2	3		14	15.4	16.7	17.5	17.8	17.1	15.2	12	–
TE 2	CZ	5	1.49	1.62	1.74	1.83	1.87	1.85	1.74	1.51	1.16
TE 2	CY		1.99	2.17	2.33	2.46	2.52	2.5	2.37	2.09	1.61
TE 2	CX		2.14	2.34	2.53	2.67	2.76	2.76	2.63	2.35	1.83
TE 2	C0		3.91	4.2	4.43	4.58	4.61	4.49	4.17	3.59	2.69
TE 2	1		6.16	6.65	7.06	7.33	7.41	7.24	6.73	5.8	4.36
TE 2	2		9.98	11.1	12.1	13	13.6	13.6	12.9	11.3	8.79
TE 2	3		14.1	15.7	17.2	18.5	19.3	19.3	18.3	16	12.5
TE 2	CX	10	1.49	1.63	1.76	1.87	1.95	1.98	1.93	1.79	1.54
TE 2	CY		1.99	2.18	2.36	2.51	2.62	2.67	2.63	2.46	2.15
TE 2	CZ		2.13	2.35	2.55	2.73	2.86	2.93	2.91	2.77	2.45
TE 2	C0		3.9	4.22	4.48	4.68	4.8	4.79	4.62	4.24	3.6
TE 2	1		6.14	6.67	7.13	7.49	7.7	7.72	7.46	6.86	5.8
TE 2	2		9.93	11.1	12.2	13.3	14.2	14.7	14.5	13.5	11.7
TE 2	3		14.1	15.7	17.4	18.9	20.1	20.8	20.5	19.1	16.6
TE 2	CX	15	1.47	1.61	1.74	1.87	1.97	2.03	2.04	1.97	1.8
TE 2	CY		1.96	2.15	2.34	2.51	2.65	2.74	2.76	2.69	2.5
TE 2	CZ		2.1	2.31	2.52	2.72	2.89	3.01	3.06	3.02	2.85
TE 2	C0		3.84	4.17	4.45	4.68	4.85	4.92	4.86	4.64	4.2
TE 2	1		6.03	6.57	7.06	7.47	7.77	7.92	7.86	7.51	6.81
TE 2	2		9.75	10.9	12.1	13.3	14.4	15.1	15.4	14.9	13.7
TE 2	3		13.8	15.4	17.2	18.9	20.4	21.4	21.8	21.1	19.4

Table: Subcooling correction factor 'f_{sub}'

Subcooling [K]	0	2	10	15	20	25
Correction factor	0.97	1.00	1.13	1.20	1.28	1.35

Table: Distributer correction factor 'f_p' *

Pressure drop [bar]	Evaporating [°C]									
		-40	-35	-30	-25	-20	-15	-10	5	0
Pressure drop [bar]	0	0	1	1	1	1	1	1	1	1
	1	0.99	0.98	0.98	0.98	0.98	0.98	0.97	0.97	0.95
	1.5	0.98	0.98	0.98	0.97	0.97	0.97	0.96	0.95	0.92
	2	0.97	0.97	0.97	0.96	0.96	0.95	0.94	0.93	0.90

*calculated at 10 °C condensing temperature

Table: Capacity in TR, useful superheat s_h = 3.6 °F (US Units)

Valve type	Orifice no.	Cond. Temp. [°C]	Evaporating [°F]							
			-40	-30	-20	-10	0	10	20	30
			Capacity [TR]							
TE 2	CZ	20	0.4	0.42	0.44	0.43	0.39	0.31	–	–
TE 2	CY		0.53	0.57	0.59	0.58	0.53	0.42	–	–
TE 2	CX		0.57	0.61	0.63	0.63	0.58	0.47	–	–
TE 2	C0		1.04	1.09	1.1	1.07	0.96	0.75	–	–
TE 2	1		1.64	1.73	1.77	1.71	1.54	1.2	–	–
TE 2	2		2.67	2.9	3.05	3.05	2.82	2.27	–	–
TE 2	3		3.78	4.11	4.32	4.32	3.99	3.22	–	–
TE 2	CZ	30	0.41	0.44	0.47	0.48	0.46	0.42	0.32	–
TE 2	CY		0.55	0.6	0.63	0.65	0.63	0.57	0.45	–
TE 2	CX		0.59	0.64	0.68	0.7	0.69	0.63	0.5	–
TE 2	C0		1.07	1.15	1.19	1.19	1.14	1.01	0.77	–
TE 2	1		1.69	1.82	1.9	1.91	1.83	1.62	1.25	–
TE 2	2		2.75	3.04	3.29	3.42	3.37	3.06	2.42	–
TE 2	3		3.9	4.31	4.66	4.85	4.77	4.33	3.42	–
TE 2	CZ	40	0.41	0.45	0.49	0.51	0.52	0.49	0.44	0.33
TE 2	CY		0.55	0.61	0.66	0.69	0.7	0.67	0.6	0.46
TE 2	CX		0.6	0.66	0.71	0.75	0.76	0.74	0.67	0.53
TE 2	C0		1.09	1.17	1.24	1.27	1.26	1.19	1.04	0.78
TE 2	1		1.71	1.86	1.98	2.04	2.03	1.92	1.68	1.26
TE 2	2		2.77	3.11	3.42	3.67	3.77	3.65	3.25	2.53
TE 2	3		3.93	4.41	4.85	5.2	5.34	5.17	4.6	3.58
TE 2	CX	50	0.41	0.45	0.49	0.53	0.55	0.54	0.51	0.44
TE 2	CY		0.55	0.61	0.66	0.71	0.73	0.74	0.7	0.62
TE 2	CZ		0.59	0.66	0.72	0.77	0.8	0.81	0.78	0.7
TE 2	C0		1.08	1.18	1.26	1.31	1.33	1.31	1.22	1.04
TE 2	1		1.7	1.86	2	2.1	2.14	2.11	1.97	1.69
TE 2	2		2.75	3.1	3.46	3.78	4.01	4.05	3.85	3.36
TE 2	3		3.89	4.4	4.9	5.36	5.68	5.74	5.45	4.77
TE 2	CX	60	0.4	0.45	0.49	0.52	0.55	0.56	0.55	0.51
TE 2	CY		0.54	0.6	0.65	0.7	0.74	0.76	0.75	0.71
TE 2	CZ		0.58	0.64	0.71	0.76	0.81	0.84	0.84	0.81
TE 2	C0		1.05	1.15	1.24	1.3	1.35	1.35	1.31	1.2
TE 2	1		1.66	1.82	1.97	2.08	2.16	2.18	2.12	1.94
TE 2	2		2.67	3.03	3.4	3.76	4.06	4.23	4.19	3.9
TE 2	3		3.79	4.29	4.82	5.33	5.76	6	5.94	5.53

Table: Subcooling correction factor 'f_{sub}'

Subcooling [F]	1	5	10	20	30	4
Correction factor	1.00	1.03	1.08	1.17	1.25	1.34

Table: Distributer correction factor 'f_p' *

Pressure drop [bar]		**Evaporating [°F]**							
		-40	-30	-20	-10	0	10	20	30
	0	1	1	1	1	1	1	1	1
Pressure drop [psi]	15	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99
	25	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99
	30	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.98

*calculated at 50 °F condensing temperature

How to select a valve

Example:
Refrigerant = CO_2
Q (capacity) = 1.4 kW
T_{cond} (condensing temperature) = 25 °C
T_{evap} (evaporator temperature) = -10 °C
T_{sub} (subcooling temperature) = 2 K
D_{pd} (distributer pressure drop) = 1 bar

Q (capacity) = 1.4 kW
f_{sub} (subcooling correction factor) = 1.0
f_p (distribution correction factor) = 0.97

$$\frac{\mathrm{Q}}{\mathrm{fsub}\times\mathrm{fp}} = \text{selected capacity}$$

$$\frac{1}{1.0\times0.97} = 1.44\ \mathrm{kW}$$

The selection will be: TE2 orifice CX (1.64 kW > 1.44 kW)

Table: Capacity in kW, range N -40 °C to 10 °C. Opening superheat s_h = 2 K

R744(CO2)										
Valve type	Orifice no.	Cond. Temp. [°C]	Evaporating [°C]								
			-40	-35	-30	-25	-20	-15	-10	-5	-0
			Capacity [kW]								
TE 2	CZ	25	1.44	1.53	1.60	1.61	1.54	1.38	1.09	–	–
TE 2	CY		1.92	2.05	2.14	2.16	2.09	1.88	1.48	–	–
TE 2	CX		2.07	2.22	2.32	2.35	2.28	2.07	1.64	–	–
TE 2	C0		3.76	3.96	4.06	4.02	3.81	3.36	2.59	–	–
TE 2	01		5.94	6.29	6.47	6.44	6.12	5.42	4.19	–	–
TE 2	02		9.67	10.5	11.1	11.4	11.1	10.0	8.00	–	–
TE 2	03		13.7	14.9	15.7	16.1	15.7	14.2	11.3	–	–

Table: Subcooling correction factor 'f_{sub}'

Subcooling [K]	0	2	10	15	20	25
Correction factor	0.97	1.00	1.13	1.20	1.28	1.35

Table: Distributer correction factor 'f_p' *) --- pending table work

Pressure drop [bar]		Evaporating [°C]								
		-40	-35	-30	-25	-20	-15	-10	-5	0
"Pressure drop [bar]"	0	1	1	1	1	1	1	1	1	1
	1	0.99	0.98	0.98	0.98	0.98	0.98	0.97	0.97	0.95
	1.5	0.98	0.98	0.98	0.97	0.97	0.97	0.96	0.95	0.92
	2	0.97	0.97	0.97	0.96	0.96	0.95	0.94	0.93	0.90

*) calculated at 10 °C condensing temperature

Pressure and temperature data

Max. temperature
Bulb, when valve is installed: 100 °C / 212 °F
Bulb, element not mounted (during transport and storage): 65 °C / 149 °F

Min. temperature
TE 2: -40 °C / 104 °F

Max. test pressure
PT = 99 barg / 1435 psig

Max. working pressure
PS/MWP = 90 barg / 1305 psig

Table: Technical data

Refrigerant	**Range -40 – 0 °C / -40 – 32 °F**
MOP-point in evaporating temperature t_e and evaporating pressure p_e [1]	
5 °C / 41 °F	
R744 (CO_2)	640 psig / 44 bar (abs)

[1] Pe in bar gauge

Superheat

SS	Static superheat
OS	Opening superheat
SH = SS + OS	Total superheat
Q_{nom}	Rated capacity
Q_{max}	Maximum capacity

Standard static superheat setting SS is:
At MT conditions ($T_{evap.}$ = -10 °C / 14 °F): 2 K (2 °C / 3.6 °F)
At LT conditions ($T_{evap.}$ = -30 °C / -22 °F): 3 K (3 °C / 5.4 °C)

Static superheat SS can be adjusted with setting spindle:
At MT conditions ($T_{evap.}$ = -10 °C / 14 °F): From 1 K to 5 K (1 °C / 1.8 °F to 5 °C / 9 °F)
At LT conditions ($T_{evap.}$ = -30 °C / -22 °F): From 1 K to 7 K (1 °C / 1.8 °F to 7 °C / 12.6 °F)

The opening superheat OS is 2 K (2 °C / 3.6 °F) from when opening begins to where the valve gives its rated capacity Q_{nom}.

Example

Static superheat SS = 2 K
Opening superheat OS = 2 K
Total superheat SH = 2 + 2 = 4 K

Table: Range: -40 to 0 °C

Orifice no.	Rated capacity in kW	
	MT	LT
CZ	1.44	1.66
CY	1.97	2.23
CX	2.19	2.42
C0	3.46	4.23
01	5.58	6.75
02	10.6	11.6
03	15.0	16.4

The rated capacity for MT conditions is based on:
Evaporating temperature t_e = -10 °C
Condensing temperature t_c = 0 °C
Refrigerant temperature ahead of valve t_l = -1 °C

The rated capacity for LT conditions is based on:
Evaporating temperature t_e = 30 °C
Condensing temperature t_c = 0 °C
Refrigerant temperature ahead of valve t_l = -1 °C

Table: Range N: -40 to 41 °F

Orifice no.	R744 Rated capacity in tons (TR)	
	MT	LT
CZ	0.41	0.47
CY	0.56	0.64
CX	0.62	0.69
C0	0.98	1.21
01	1.59	1.92
02	3.02	3.30
03	4.28	4.68

The rated capacity for MT conditions is based on:
Evaporating temperature t_e = 14 °F
Condensing temperature t_c = 32 °F
Refrigerant temperature ahead of valve t_l = 30 °F

The rated capacity for LT conditions is based on:
Evaporating temperature t_e = -22 °F
Condensing temperature t_c = 32 °F
Refrigerant temperature ahead of valve t_l = 30 °F

Dimensions

Figure: Flare × solder (All dimentions are in mm)

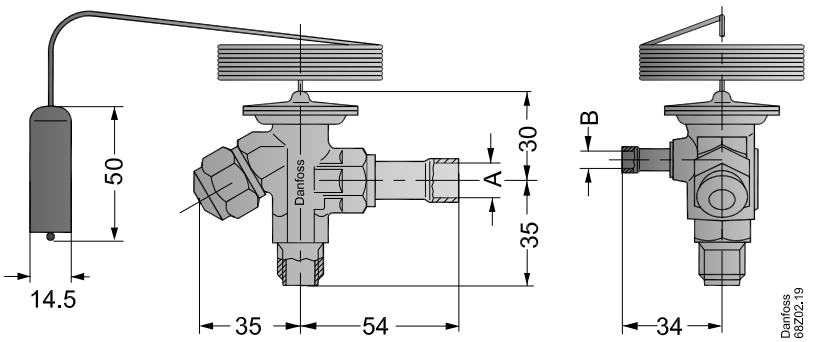


Table: Dimensions and weights

Flare × solder		
Outlet	**Equalization**	**Weight**
½" solder 12 mm solder	¼" solder 6 mm solder	0.3 / 0.7

Figure: Solder adaptor

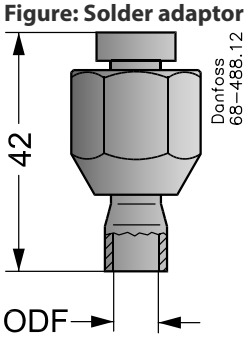


Table: Solder adaptor

Solder ODF		Weight
[in]	**[mm]**	**[kg / lb]**
¼	6	0.05 / 0.11
⅜	10	0.05 / 0.11

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.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
Manufacturer's Declaration	Danfoss MD 080R1251.01	Danfoss	EAEU RoHS
UA Declaration	UA 2024-06-27 electr. protection units for compressors	Danfoss	EMC, LVD
UA Declaration	Danfoss UA 8537	Danfoss	UA RoHS
Export Control Declaration	Cold room controllers	Danfoss	
EU-UK Declaration	Danfoss EU-UK 084R0814.03	Danfoss	EMC, LVD, EU RoHS, UK RoHS
Mechanical Safety Certificate	UL MH29671	UL - Underwriters Laboratories inc.	
Electrical Safety Certificate	UL E348648	UL - Underwriters Laboratories inc.	
Export Control Declaration	Solenoid Coils	Danfoss	
EU Declaration	Danfoss EU 033F0688.AK	Danfoss	EMC, LVD
UA Declaration	Danfoss UA 8505	Danfoss	UA RoHS
Export Control Declaration	T2, TE 2 valves, adaptor, orifice	Danfoss	
Manufacturer's Declaration	Danfoss MD 067R1068.AG	Danfoss	PED, Pressure
Manufacturer's Declaration	Danfoss MD 068U9616.03	Danfoss	China RoHS
Manufacturer's Declaration	Danfoss MD 068U9615.13	Danfoss	PED, Pressure, EU RoHS, ATEX, Explosive
Pressure Safety Certificate	LLC CDC EURO-TYSK UA.TR.089.1015.02-22	LLC CDC EURO TYSK - Ukraine	PED, Pressure
UA Declaration	Danfoss UA 2023-01-10 Valves PL01 PL40	Danfoss	PED, Pressure
Manufacturer's Declaration	Danfoss MD 033F4006 AC	Danfoss	China RoHS
EU Declaration	Danfoss EU 068U9904.03	Danfoss	EU RoHS
Export Control Declaration	Solenoid valves - EVUL - Stainless steel	Danfoss	
Manufacturer's Declaration	Danfoss MD 033F0687.AH	Danfoss	EU RoHS
Mechanical Safety Certificate	UL MH7648	UL - Underwriters Laboratories inc.	
Manufacturer's Declaration	Danfoss MD 033F0695.AA	Danfoss	China RoHS

Manufacturer's Declaration	Danfoss MD 033F1035.AR	Danfoss	PED, Pressure
Manufacturer's Declaration	Danfoss MD 032F9268.AD	Danfoss	
EMC Certificate	ACMA CF13198_AU-Rev.00	ACMA - Australian Communication and Media Authority	RCM
CB Test Certificate	CB US-35091-M1-UL	UL - Underwriters Laboratories inc.	
Manufacturer's Declaration	Danfoss MD 080R1237.01	Danfoss	EAEU RoHS
Export Control Declaration	Case/room controller (EEV)	Danfoss	
EU-UK Declaration	Danfoss EU-UK 084R0835.AB	Danfoss	EMC, LVD, EU RoHS, UK RoHS
EAC Declaration	EAC KZ 7100841.13.12.01062	EAC - Eurasian Customs Union	EMC
Electrical Safety Certificate	EAC KZ 7100841.01.01.01245	EAC - Eurasian Customs Union	EMC, LVD
Export Control Declaration	Refrigeration appliance control (TXV)	Danfoss	
Manufacturer's Declaration	Danfoss MD 080R1221.02	Danfoss	China RoHS
Manufacturer's Declaration	Danfoss MD 080R1205.01	Danfoss	EU RoHS
Electrical Safety Certificate	UL E31024	UL - Underwriters Laboratories inc.	
Manufacturer's Declaration	Danfoss MD-UK 080R1228.04	Danfoss	EU RoHS
Manufacturer's Declaration	Danfoss MD 080R0815.02	Danfoss	EAEU RoHS

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