

T2/TE2 – Thermostatic expansion valves

T2/TE2 thermostatic expansion valves are used for liquid injection into evaporators on both refrigeration and air conditioning systems using fluorinated refrigerants e.g. R22/R407C, R134a, R404A/R507, R407C, R407F, R407A.

T2/TE2 valves are supplied as parts programme, with separate thermostatic element/valve body, and orifice assembly. Available as angleway valves with flare x flare or flare x solder connections, with internal and external equalization.

Features T2/TE2



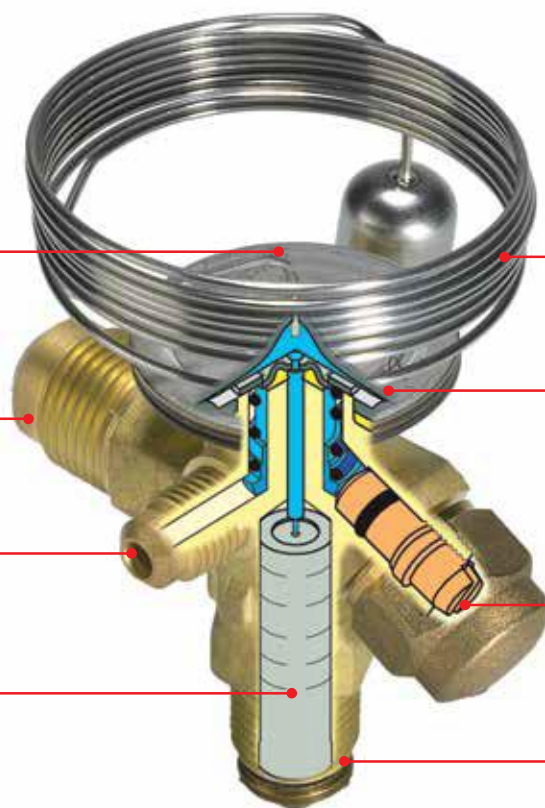
Laser-welded power element in stainless steel

- long diaphragm life
- high pressure tolerance and working pressure
- high corrosion resistance

Flare or solder outlet

Flare or solder pressure equalization

Interchangeable orifice assembly with dirt protection strainer



Stainless steel capillary tube and bulb:

- high corrosion resistance
- high strength and vibration resistance

Laser-engraved label

Easy adjustment of superheat setting

Flare inlet
Solder adaptor available as an option

Facts

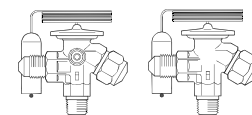
Applications:

- Traditional refrigeration
- Heat pump systems
- Air conditioning units
- Liquid coolers
- Transport refrigeration

- Large temperature range. Equally applicable to freezing, refrigeration and air conditioning applications
- Interchangeable orifice assembly
 - easy stocking
 - easy capacity matching
 - better service

- Can be supplied with MOP (Max. Operating Pressure) Protects the compressor motor against excessive evaporating pressure during normal operation
- Valves for special temperature ranges and refrigerants can be supplied
- Flare/solder adaptor can be supplied

Technical data and ordering



T2/TE2

Thermostatic element with bulb strap (flare x flare)

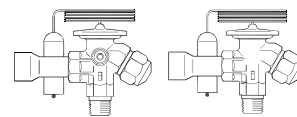
Refrigerant	Type	Range	MOP	Pressure equalization Flare	Connection flare inlet x outlet		Code no.
					[in.]	[mm]	
R22/R407C	TX 2	-40 - 10 °C	-	-	3/8 x 1/2	10 x 12	068Z3206
		-40 - 10 °C	15 °C	-	3/8 x 1/2	10 x 12	068Z3208
		-40 - -5 °C	0 °C	-	3/8 x 1/2	10 x 12	068Z3224
		-40 - -15 °C	-10 °C	-	3/8 x 1/2	10 x 12	068Z3226
		-60 - -25 °C	-	-	3/8 x 1/2	10 x 12	068Z3207
		-60 - -25 °C	-20 °C	-	3/8 x 1/2	10 x 12	068Z3228
	TEX 2	-40 - 10 °C	-	1/4 in.	3/8 x 1/2	10 x 12	068Z3209
		-40 - 10 °C	15 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3211
		-40 - -5 °C	0 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3225
		-40 - -15 °C	-10 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3227
		-60 - -25 °C	-	1/4 in.	3/8 x 1/2	10 x 12	068Z3210
R407C	TZ 2	-40 - 10 °C	-	-	3/8 x 1/2	10 x 12	068Z3496
		-40 - 10 °C	15 °C	-	3/8 x 1/2	10 x 12	068Z3516
	TEZ 2	-40 - 10 °C	-	1/4 in.	3/8 x 1/2	10 x 12	068Z3501
		-40 - 10 °C	15 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3517
R134a	TN 2	-40 - 10 °C	-	-	3/8 x 1/2	10 x 12	068Z3346
		-40 - 10 °C	15 °C	-	3/8 x 1/2	10 x 12	068Z3347
		-40 - -5 °C	0 °C	-	3/8 x 1/2	10 x 12	068Z3393
		-40 - -15 °C	-10 °C	-	3/8 x 1/2	10 x 12	068Z3369
	TEN 2	-40 - 10 °C	-	1/4 in.	3/8 x 1/2	10 x 12	068Z3348
		-40 - 10 °C	15 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3349
		-40 - -5 °C	0 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3392
		-40 - -15 °C	-10 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3370
R404A/R507	TS 2	-40 - 10 °C	-	-	3/8 x 1/2	10 x 12	068Z3400
		-40 - 10 °C	15 °C	-	3/8 x 1/2	10 x 12	068Z3402
		-40 - -5 °C	0 °C	-	3/8 x 1/2	10 x 12	068Z3406
		-40 - -15 °C	-10 °C	-	3/8 x 1/2	10 x 12	068Z3408
		-60 - -25 °C	-	-	3/8 x 1/2	10 x 12	068Z3401
		-60 - -25 °C	-20 °C	-	3/8 x 1/2	10 x 12	068Z3410
	TES 2	-40 - 10 °C	-	1/4 in.	3/8 x 1/2	10 x 12	068Z3403
		-40 - 10 °C	15 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3405
		-40 - -5 °C	0 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3407
		-40 - -15 °C	-10 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3409
		-60 - -25 °C	-	1/4 in.	3/8 x 1/2	10 x 12	068Z3404
		-60 - -25 °C	-20 °C	1/4 in.	3/8 x 1/2	10 x 12	068Z3411
R407F/R407A	T2	-40 - 10 °C	-	-	3/8 x 1/2	10 x 12	068Z3715
	TE2	-40 - 10 °C	-	1/4 in.	3/8 x 1/2	10 x 12	068Z3714

Capillary tube: 1.5 m.
Range N = -40 - 10 °C.
Range B = -60 - -25 °C.
Range NM = -40 - -5 °C MOP 0 °C.
Range NL = -40 - -15 °C MOP -10 °C.

Technical data and ordering

T2/TE2

Thermostatic element with bulb strap (flare x solder)



Refrigerant	Type	Range	MOP	Pressure equalization solder	Connection		Code no.
					inlet (Flare) x outlet (Solder)		
					[in.]	[mm]	
R22/R407C	TX 2	-40 – 10 °C	–	–	3/8 x 1/2	–	068Z3281
		-40 – 10 °C	–	–	–	10 x 12	068Z3302
		-40 – 10 °C	15 °C	–	3/8 x 1/2	–	068Z3287
		-40 – 10 °C	15 °C	–	–	10 x 12	068Z3308
		-60 – -25 °C	–	–	3/8 x 1/2	–	068Z3357
		-60 – -25 °C	–	–	–	10 x 12	068Z3361
	TEX 2	-40 – 10 °C	–	1/4 in.	3/8 x 1/2	–	068Z3284
		-40 – 10 °C	–	6 mm	–	10 x 12	068Z3305
		-40 – 10 °C	15 °C	1/4 in.	3/8 x 1/2	–	068Z3290
		-40 – 10 °C	15 °C	6 mm	–	10 x 12	068Z3311
		-40 – -15 °C	-10 °C	6 mm	–	10 x 12	068Z3367
		-60 – -25 °C	–	1/4 in.	3/8 x 1/2	–	068Z3359
R407C	TZ 2	-40 – 10 °C	–	–	–	10 x 12	068Z3502
		-40 – 10 °C	15 °C	–	3/8 x 1/2	–	068Z3329
		-40 – 10 °C	15 °C	–	–	10 x 12	068Z3514
	TEZ 2	-40 – 10 °C	–	1/4 in.	3/8 x 1/2	–	068Z3446
		-40 – 10 °C	–	6 mm	–	10 x 12	068Z3503
		-40 – 10 °C	15 °C	1/4 in.	3/8 x 1/2	–	068Z3447
		-40 – 10 °C	15 °C	6 mm	–	10 x 12	068Z3515
R134a	TN 2	-40 – 10 °C	–	–	3/8 x 1/2	–	068Z3383
		-40 – 10 °C	–	–	–	10 x 12	068Z3384
		-40 – 10 °C	15 °C	–	3/8 x 1/2	–	068Z3387
		-40 – 10 °C	15 °C	–	–	10 x 12	068Z3388
	TEN 2	-40 – 10 °C	–	1/4 in.	3/8 x 1/2	–	068Z3385
		-40 – 10 °C	–	6 mm	–	10 x 12	068Z3386
		-40 – 10 °C	15 °C	1/4 in.	3/8 x 1/2	–	068Z3389
		-40 – 10 °C	15 °C	6 mm	–	10 x 12	068Z3390
R404A/R507	TS 2	-40 – 10 °C	–	–	3/8 x 1/2	–	068Z3414
		-40 – 10 °C	–	–	–	10 x 12	068Z3435
		-40 – 10 °C	15 °C	–	3/8 x 1/2	–	068Z3416
		-40 – 10 °C	15 °C	–	–	10x12	068Z3423
		-40 – -15 °C	-10 °C	–	3/8 x 1/2	–	068Z3429
		-40 – -15 °C	-10 °C	–	–	10x12	068Z3436
		-60 – -25 °C	–	–	3/8 x 1/2	–	068Z3418
		-60 – -25 °C	–	–	–	10 x 12	068Z3425
		-60 – -25 °C	-20 °C	–	3/8 x 1/2	–	068Z3420
		-60 – -25 °C	-20 °C	–	–	10 x 12	068Z3427
	TES 2	-40 – 10 °C	–	1/4 in.	3/8 x 1/2	–	068Z3415
		-40 – 10 °C	–	6 mm	–	10 x 12	068Z3422
		-40 – 10 °C	15 °C	1/4 in.	3/8 x 1/2	–	068Z3417
		-40 – 10 °C	15 °C	6 mm	–	10x12	068Z3424
		-40 – -15 °C	-10 °C	1/4 in.	3/8 x 1/2	–	068Z3430
		-40 – -15 °C	-10 °C	6 mm	–	10x12	068Z3437
		-60 – -25 °C	–	1/4 in.	3/8 x 1/2	–	068Z3419
		-60 – -25 °C	–	6 mm	–	10 x 12	068Z3426
		-60 – -25 °C	-20 °C	1/4 in.	3/8 x 1/2	–	068Z3421
		-60 – -25 °C	-20 °C	6 mm	–	10 x 12	068Z3428
R407F/R407A	T2	-40 – 10 °C	–	–	3/8 x 1/2	–	068Z3716
	TE2	-40 – 10 °C	–	1/4 in.	3/8 x 1/2	–	068Z3713

*) For R407C plants, please select valves from the dedicated R407C program.

Capillary tube: 1.5 m.
Range N = -40 – 10 °C.
Range B = -60 – -25 °C.

Technical data and ordering

T2/TE2

Orifice assembly for flare version

Type	Orifice	R134a		R404A/R507		R407C		R407F		R407A		R22		Code no.
		[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	
T2/TE2	0X	0.68	0.19	0.64	0.18	0.92	0.26	1.0	0.3	0.9	0.2	0.90	0.25	068-2002
	00	1.2	0.34	1.3	0.37	1.8	0.51	2.0	0.6	1.7	0.5	1.8	0.51	068-2003
	01	2.1	0.59	2.6	0.75	3.5	1.0	3.9	1.1	3.4	1.0	3.5	0.99	068-2010
	02	2.5	0.73	3.7	1.1	4.8	1.4	5.4	1.5	4.7	1.3	4.7	1.3	068-2015
	03	4.3	1.2	6.3	1.8	8.1	2.3	9.2	2.6	8.0	2.3	8.0	2.3	068-2006
	04	6.4	1.8	9.9	2.8	12.4	3.5	14.3	4.1	12.4	3.5	12.1	3.5	068-2007
	05	8.4	2.3	13.0	3.7	16.5	4.7	19.0	5.4	16.3	4.6	16.7	4.8	068-2008
	06	10.1	2.9	15.5	4.4	19.7	5.6	22.9	6.5	19.6	5.6	19.7	5.6	068-2009

T2/TE2

Orifice assembly for solder adapter version

Type	Orifice	R134a		R404A/R507		R407C		R407F		R407A		R22		Code no.
		[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	
T2/TE2	0X	0.68	0.19	0.64	0.18	0.92	0.26	1.0	0.3	0.9	0.2	0.90	0.25	068-2089
	00	1.2	0.34	1.3	0.37	1.8	0.51	2.0	0.6	1.7	0.5	1.8	0.51	068-2090
	01	2.1	0.59	2.6	0.75	3.5	1.0	3.9	1.1	3.4	1.0	3.5	0.99	068-2091
	02	2.5	0.73	3.7	1.1	4.8	1.4	5.4	1.5	4.7	1.3	4.7	1.3	068-2092
	03	4.3	1.2	6.3	1.8	8.1	2.3	9.2	2.6	8.0	2.3	8.0	2.3	068-2093
	04	6.4	1.8	9.9	2.8	12.4	3.5	14.3	4.1	12.4	3.5	12.1	3.5	068-2094
	05	8.4	2.3	13.0	3.7	16.5	4.7	19.0	5.4	16.3	4.6	16.7	4.8	068-2095
	06	10.1	2.9	15.5	4.4	19.7	5.6	22.9	6.5	19.6	5.6	19.7	5.6	068-2096

The rated capacity is based on:
 Evaporating temperature $t_e = 4.4^\circ\text{C}$ for range N.
 Condensing temperature $t_c = 38^\circ\text{C}$.
 Refrigerant temperature ahead of valve $t_i = 37^\circ\text{C}$.

Solder adaptor without orifice assembly

Connection – ODF solder	Code no.
1/4 in.	068-2062
6 mm	068-2063
6 mm	068-4101 ¹⁾
3/8 in.	068-2060
10 mm	068-2061
10 mm	068-4100 ¹⁾

¹⁾ Including filter.

Filter as accessories

Filter type	Code no.
For flare connection	068-0003
For solder adaptor	068-0015

The adaptor is for use with thermostatic expansion valves T2 and TE2.

When the adaptor is fitted correctly it meets the sealing requirements of DIN 8964. The flare orifice in T2 and TE2 can be used with a solder adaptor when the orifice filter is replaced with a specific filter intended for solder adaptors.

Only in this way the sealing requirements of DIN 8964 can be fulfilled. Solder adaptors for filter driers (FSA) must not be used on the T2 inlet.

TE5-55 – Thermostatic expansion valves

TE5-TE55 thermostatic expansion valves regulate the injection of refrigerant liquid into evaporators for medium sized plants. 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 should

always be kept constant. TE5-TE55 valves are supplied as parts programme, built up of three main components – thermostatic element, orifice assembly, and valve body with connections, and have external pressure equalization. Refrigerants: R22/R407C, R134a, R404A/R507, R407C.

Features TE5-55



Laser-welded power element in stainless steel

- longer diaphragm life
- high pressure tolerance and working pressure
- high corrosion resistance

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

Stainless steel capillary tube and bulb

- high corrosion resistance
- high strength and vibration resistance

Large parts programme ensures minimal stocks

Easy adjustment of superheat setting

More connection possibilities

- solder x solder
- flare x flare
- flanges
- straightway or angleway

Facts

Applications:

- Traditional refrigeration
- Air conditioning units
- Water chillers

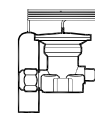
- Interchangeable orifice assembly designed for:
 - easy assembly and mounting
 - optimised capacity matching
 - balanced port (TE55 only)
- Large temperature range -60 – 10 °C
- Available with MOP

- (Max. Operating Pressure)
- Wide capacity range
- Refrigerants: R22, R134a, R404A/R507, R407C
- Maximum Working Pressure: 28 bar

Technical data and ordering



Thermostatic element + Orifice + Valve body



TE5 – TE55 - R407C

Thermostatic element – including bulb strap

Type	Range	MOP	Pressure equalization	Capillary tube	Code no.
			1/4 in./6 mm	[m]	
TEZ 5	-40 – 10 °C	–	Ext.	3	067B3278
	-40 – 10 °C	15 °C	Ext.	3	067B3277
TEZ 12	-40 – 10 °C	–	Ext.	3	067B3366
	-40 – 10 °C	15 °C	Ext.	3	067B3367
TEZ 20	-40 – 10 °C	–	Ext.	5	067B3371
	-40 – 10 °C	15 °C	Ext.	5	067B3372
TEZ 55	-40 – 10 °C	–	Ext.	5	067G3240
	-40 – 10 °C	15 °C	Ext.	5	067G3241

For R407C plants, please select valves from the dedicated R407C program.

TE5 – TE55 - R134a

Thermostatic element – including bulb strap

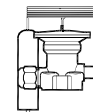
Type	Range	MOP	Pressure equalization	Capillary tube	Code no.
			1/4 in./6 mm	[m]	
TEN 5	-40 – 10 °C	–	Ext.	3	067B3297
	-40 – 10 °C	15 °C	Ext.	3	067B3298
	-40 – 10 °C	0 °C	Ext.	3	067B3360
TEN 12	-40 – 10 °C	–	Ext.	3	067B3232
	-40 – 10 °C	15 °C	Ext.	3	067B3233
	-40 – 10 °C	0 °C	Ext.	5	067B3363
TEN 20	-40 – 10 °C	–	Ext.	3	067B3292
	-40 – 10 °C	15 °C	Ext.	3	067B3293
	-40 – 10 °C	0 °C	Ext.	5	067B3370
TEN 55	-40 – 10 °C	–	Ext.	3	067G3222
	-40 – 10 °C	15 °C	Ext.	3	067G3223
	-40 – 10 °C	0 °C	Ext.	5	067G3230

TE5 – TE55 - R404A/R507

Thermostatic element – including bulb strap

Type	Range	MOP	Pressure equalization	Capillary tube	Code no.
			1/4 in./6 mm	[m]	
TES 5	-40 – 10 °C	–	Ext.	3	067B3342
	-40 – 5 °C	0 °C	Ext.	3	067B3357
	-40 – 15 °C	-10 °C	Ext.	3	067B3358
	-60 – 25 °C	–	Ext.	3	067B3344
	-60 – 25 °C	-20 °C	Ext.	3	067B3343
TES 12	-40 – 10 °C	–	Ext.	3	067B3347
	-40 – 5 °C	0 °C	Ext.	3	067B3345
	-40 – 15 °C	-10 °C	Ext.	3	067B3348
	-60 – 25 °C	-20 °C	Ext.	3	067B3349
	-40 – 10 °C	–	Ext.	5	067B3346
TES 20	-60 – 25 °C	-20 °C	Ext.	5	067B3350
	-40 – 10 °C	–	Ext.	3	067B3352
	-40 – 5 °C	0 °C	Ext.	3	067B3351
	-40 – 15 °C	-10 °C	Ext.	3	067B3353
	-60 – 25 °C	-20 °C	Ext.	3	067B3354
TES 55	-40 – 10 °C	–	Ext.	5	067B3356
	-60 – 25 °C	-20 °C	Ext.	5	067B3355
	-40 – 10 °C	–	Ext.	3	067G3302
	-40 – 5 °C	0 °C	Ext.	3	067G3303
	-40 – 15 °C	-10 °C	Ext.	3	067G3304
	-20 °C	-20 °C	Ext.	3	067G3305
	-20 °C	-20 °C	Ext.	3	067G3306
	-20 °C	-20 °C	Ext.	5	067G3306

Technical data and ordering



TE5 – TE55 - R22/R407C

Thermostatic element – including bulb strap

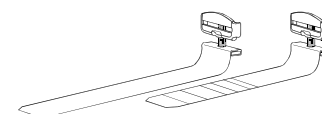
Type	Range	MOP	Pressure equalization	Capillary tube	Code no.
			1/4 in./6 mm	[m]	
TEX 5	-40 – 10 °C	–	Ext	3	067B3250
	-40 – 10 °C	15 °C	Ext	3	067B3267
	-40 – -5 °C	0 °C	Ext	3	067B3249
	-40 – -15 °C	-10 °C	Ext	3	067B3253
	-60 – -25 °C	–	Ext	3	067B3263
	-60 – -25 °C	-20 °C	Ext	3	067B3251
TEX 12	-40 – 10 °C	–	Ext	3	067B3210
	-40 – 10 °C	15 °C	Ext	3	067B3227
	-40 – -5 °C	0 °C	Ext	3	067B3207
	-40 – -15 °C	-10 °C	Ext	3	067B3213
	-60 – -25 °C	-20 °C	Ext	3	067B3211
	-40 – 10 °C	–	Ext	3	067B3209
TEX 20	-60 – -25 °C	-20 °C	Ext	3	067B3212
	-40 – 10 °C	–	Ext	3	067B3274
	-40 – 10 °C	15 °C	Ext	3	067B3286
	-40 – -5 °C	0 °C	Ext	3	067B3273
	-40 – -15 °C	-10 °C	Ext	3	067B3275
	-60 – -25 °C	-20 °C	Ext	3	067B3276
TEX 55	-40 – 10 °C	–	Ext	3	067B3290
	-60 – -25 °C	-20 °C	Ext	3	067B3287
	-40 – 10 °C	–	Ext	3	067G3205
	-40 – 10 °C	15 °C	Ext	3	067G3220
	-40 – -5 °C	0 °C	Ext	3	067G3206
	-60 – -25 °C	-20 °C	Ext	3	067G3207
	-40 – 10 °C	–	Ext	3	067G3209
	-60 – -25 °C	-20 °C	Ext	3	067G3217

For R407C plants, please select valves from the dedicated R407C program.

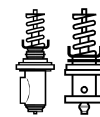
Range N = -40 – 10 °C.
Range NM = -40 – -5 °C.
Range NL = -40 – -15 °C.
Range B = -60 – -25 °C.

Bulb strap (delivered with the element)

Type	Length [mm]	Max. diameter of suction line	Code no.
TE5 and TE12	225	2 1/8 in. (53 mm)	067N0558
TE20 and TE55	350	3 1/8 in. (78 mm)	067N0559



Technical data and ordering



TE5 – TE55

Orifice assembly

Type	Orifice	R134a		R404A/R507		R407C		R22		Code no.
		[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	
TE5	0.5	6.68	1.91	8.17	2.33	10.70	3.06	10.40	2.97	067B2788
	1	12.20	3.49	14.90	4.26	19.60	5.60	19.10	5.46	067B2789
	2	17.00	4.86	20.50	5.86	27.20	7.77	26.30	7.51	067B2790
	3	21.80	6.23	26.30	7.51	34.80	9.94	33.80	9.66	067B2791
TE12	4	29.70	8.49	35.70	10.20	47.40	13.5	46.00	13.10	067B2792
	5	37.70	10.80	50.70	14.50	55.80	15.9	57.20	16.30	067B2708
	6	50.10	14.30	64.00	18.30	73.90	21.1	76.30	21.80	067B2709
	7	65.70	18.80	81.30	23.20	94.30	26.9	97.80	27.90	067B2710
TE20	8	77.80	22.20	87.10	24.90	118.00	33.7	128.00	36.60	067B2771
	9	92.30	26.40	102.0	29.10	136.00	38.9	150.00	42.90	067B2773
TE55 *)	9B	77.18	21.95	84.81	24.12	112.00	31.74	113.00	32.23	067G2705
TE55	10	111.0	31.70	128.0	36.60	161.00	46.0	169.00	48.30	067G2701
	11	122.0	34.90	138.0	39.40	175.00	50.0	184.00	52.60	067G2704
	12	134.0	38.30	152.0	43.40	191.00	54.6	202.00	57.70	067G2707
	13	166.0	47.40	182.0	52.00	232.00	66.3	245.00	70.00	067G2710

The rated capacity is based on:

Evaporating temperature: $t_e = 4.4^\circ\text{C}$.

Condensing temperature: $t_c = 38^\circ\text{C}$.

Refrigerant temperature ahead of valve: $t_1 = 37^\circ\text{C}$.

Opening superheat $sh = 4\text{ K}$.

*) For specifications, please contact Danfoss.

Technical data and ordering

TE5 – TE55

Valve body

Type	Version	Connection inlet × Outlet		Code no.
		[in.]	[mm]	
TE5	Flare angleway	$\frac{1}{2} \times \frac{5}{8}$	12×16	067B4013
	Solder angleway	$\frac{1}{2} \times \frac{5}{8}$	–	067B4009 ¹⁾
	Solder angleway	$\frac{1}{2} \times \frac{7}{8}$	–	067B4010 ¹⁾
	Solder angleway	$\frac{5}{8} \times \frac{7}{8}$	–	067B4011 ¹⁾
	Solder angleway	$\frac{7}{8} \times 1\frac{1}{8}$	–	067B4034 ²⁾
	Solder angleway	–	12×16	067B4004 ¹⁾
	Solder angleway	–	12×22	067B4005 ¹⁾
	Solder angleway	–	16×22	067B4012 ¹⁾
	Solder angleway	–	22×28	067B4037 ²⁾
	Solder straightway	$\frac{1}{2} \times \frac{5}{8}$	–	067B4007 ¹⁾
	Solder straightway	$\frac{1}{2} \times \frac{7}{8}$	–	067B4008 ¹⁾
	Solder straightway	$\frac{5}{8} \times \frac{7}{8}$	–	067B4032 ¹⁾
	Solder straightway	$\frac{7}{8} \times 1\frac{1}{8}$	–	067B4033 ²⁾
	Solder straightway	–	12×16	067B4002 ¹⁾
	Solder straightway	–	12×22	067B4003 ¹⁾
	Solder straightway	–	16×22	067B4035 ¹⁾
	Solder straightway	–	22×28	067B4036 ²⁾
TE12	Solder angleway	$\frac{7}{8} \times 1\frac{1}{8}$	–	067B4023 ²⁾
	Solder angleway	–	22×28	067B4017 ²⁾
	Solder straightway	$\frac{5}{8} \times \frac{7}{8}$	–	067B4020 ¹⁾
	Solder straightway	$\frac{7}{8} \times 1\frac{1}{8}$	–	067B4021 ²⁾
	Solder straightway	–	22×28	067B4016 ²⁾
	Solder flanges	$\frac{5}{8} \times \frac{7}{8}$	–	067B4025 ¹⁾
	Solder flanges	$\frac{7}{8} \times 1$	–	067B4026 ¹⁾
	Solder flanges	–	16×22	067B4027 ¹⁾
TE20	Solder flanges	–	22×25	067B4015 ¹⁾
	Solder angleway	$\frac{7}{8} \times 1\frac{1}{8}$	22×28	067B4023 ²⁾
	Solder angleway	$\frac{7}{8} \times 1\frac{1}{8}$	22×28	067B4017 ²⁾
	Solder straightway	$\frac{7}{8} \times 1\frac{1}{8}$	–	067B4021 ²⁾
TE55	Solder straightway	–	22×28	067B4016 ²⁾
	Solder angleway	$1\frac{1}{8} \times 1\frac{3}{8}$	28×35	067G4004 ³⁾
	Solder angleway	$1\frac{1}{8} \times 1\frac{3}{8}$	28×35	067G4002 ³⁾
	Solder straightway	$1\frac{1}{8} \times 1\frac{3}{8}$	28×35	067G4003 ³⁾
	Solder straightway	$1\frac{1}{8} \times 1\frac{3}{8}$	28×35	067G4001 ³⁾

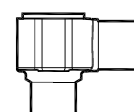
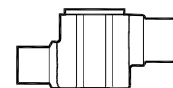
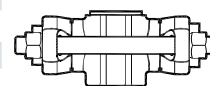
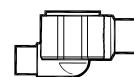
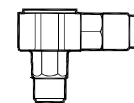
¹⁾ ODF × ODF.

²⁾ ODF × ODM.

³⁾ ODM × ODM.

ODF = internal diameter.

ODM = External diameter.



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هابر صنعت TUA/TUAE/TCAE – Thermostatic expansion valves

TUA/TUAE stainless steel thermostatic expansion valves are used for liquid injection into evaporators on both refrigeration and air conditioning systems using fluorinated refrigerants e.g. R22, R134a, R404A, R407C, R507, or R410A. TUA/TUAE valves are compact in design, light weight and have steel/copper bi-metal connections for

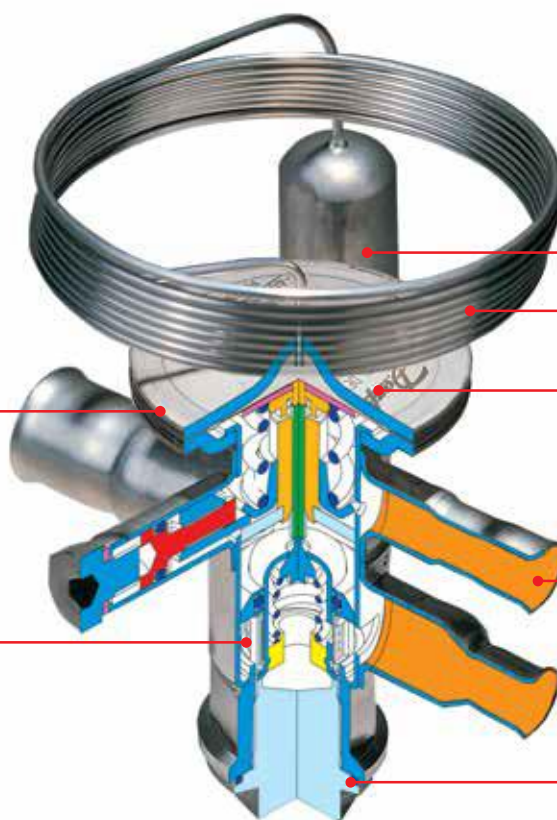
fast soldering. TUA/TUAE valves are supplied as parts programme, with separate thermostatic element/valve body, and orifice assembly. TUA has internal equalization, TUAE external equalization. TUA/TUAE are straightway valves, and have adjustable superheat setting.

Features TUA/TUAE/TCAE



Laser welded stainless steel thermostatic element for unsurpassed joint strength and operational lifetime

Separate strainer, mounted on the orifice assembly for easy maintenance and cleaning



Stainless steel capillary tube and bulb:

- high corrosion resistance
- high strength and vibration resistance

Laser-engraved label

Bi-metal connections
Stainless steel with rolled on copper cladding for safe, fast and convenient copper-to-copper soldering

Orifice assembly with an unmatched hermetic seal

Facts

Applications:

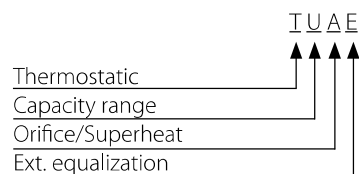
- Traditional refrigeration
- Heat pump systems
- Air conditioning units
- Liquid coolers
- Ice cube machines
- Transport refrigeration

- The use of stainless steel makes the valves light and strong
- Bi-metal connections for safe, fast and convenient soldering
- Stainless steel capillary tube for superior strength and ductility
- Allen key superheat setting screw is convenient and space-saving compared to the standard screwdriver adjustment used in most conventional valves

- Can be supplied with MOP (Max. Operating Pressure) Protects the compressor motor against excessive evaporating pressure during normal operation
- Valves for special temperature ranges can be supplied
- 4 K opening superheat
- Bi-flow function

تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
TUA: Only orifice 8,
TCAE: Only orifice 1 and 2)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

Technical data



Orifice/Superheat

	Interchangeable	Adjustable
A	YES	YES
B	NO	YES
C	NO	NO

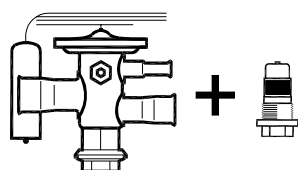
N = -40 °C – 10 °C.

NM = -40 °C – -5 °C with MOP.

NL = -40 °C – -15 °C with MOP.

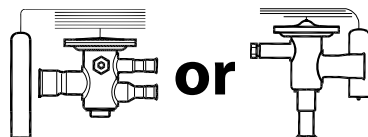
B = -60 °C – -25 °C with MOP.

TUA(E)
TCAE



Thermostatic valve + Orifice

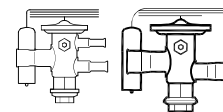
TUB(E)
TUC(E)
TCBE
TCCE



Thermostatic valve including Orifice

Valve types **TUB(E)/TUC(E)** and **TCBE/TCCE** can be replaced by **TUA(E)** and **TCAE** types

Technical data and ordering



TUA/TUAE - Solder

Thermostatic element with bulb strap

Refrigerant	Type	Range	MOP	Pressure equalization solder	Connections solder inlet x outlet		Code no.
					[in.]	[mm]	
R22/R407C	TUA	-40 – 10 °C	–	int.	1/4 x 1/2	–	068U2234
		-40 – 10 °C	–	int.	–	6 x 12	068U2230
		-40 – 10 °C	–	int.	3/8 x 1/2	–	068U2235
		-40 – 10 °C	–	int.	–	10 x 12	068U2231
		-40 – 10 °C	15 °C	int.	1/4 x 1/2	–	068U2212
		-40 – 10 °C	15 °C	int.	–	6 x 12	068U2208
	TUAE	-40 – 10 °C	15 °C	int.	3/8 x 1/2	–	068U2213
		-40 – 10 °C	–	ext.	1/4 x 1/2	–	068U2236
		-40 – 10 °C	–	ext.	3/8 x 1/2	–	068U2237
		-40 – 10 °C	–	ext.	–	10 x 12	068U2233
		-40 – 10 °C	15 °C	ext.	3/8 x 1/2	–	068U2245
		-40 – 10 °C	15 °C	ext.	–	10 x 12	068U2241
R134a	TUA	-40 – 10 °C	–	int.	1/4 x 1/2	–	068U2204
		-40 – 10 °C	–	int.	–	6 x 12	068U2200
		-40 – 10 °C	–	int.	3/8 x 1/2	–	068U2205
		-40 – 10 °C	–	int.	–	10 x 12	068U2201
		-40 – 10 °C	15 °C	int.	1/4 x 1/2	–	068U2292
		-40 – 10 °C	15 °C	int.	3/8 x 1/2	–	068U2293
	TUAE	-40 – 10 °C	–	ext.	1/4 x 1/2	–	068U2206
		-40 – 10 °C	–	ext.	–	6 x 12	068U2202
		-40 – 10 °C	–	ext.	3/8 x 1/2	–	068U2207
		-40 – 10 °C	–	ext.	–	10 x 12	068U2203
		-40 – 10 °C	15 °C	ext.	1/4 x 1/2	–	068U2214
		-40 – 10 °C	15 °C	ext.	3/8 x 1/2	–	068U2215
R404A/R507	TUA	-40 – 10 °C	–	int.	1/4 x 1/2	–	068U2284
		-40 – 10 °C	–	int.	–	6 x 12	068U2280
		-40 – 10 °C	–	int.	3/8 x 1/2	–	068U2285
		-40 – 10 °C	–	int.	–	10 x 12	068U2281
		-60 – -25 °C	–	int.	1/4 x 1/2	–	068U2308
		-60 – -25 °C	–	int.	3/8 x 1/2	–	068U2309
		-40 – -5 °C	0 °C	int.	1/4 x 1/2	–	068U2300
		-40 – -5 °C	0 °C	int.	–	6 x 12	068U2296
		-40 – 10 °C	15 °C	int.	1/4 x 1/2	–	068U2332
		-40 – 10 °C	15 °C	int.	3/8 x 1/2	–	068U2333
		-60 – -25 °C	-20 °C	int.	1/4 x 1/2	–	068U2316
		-60 – -25 °C	-20 °C	int.	–	6 x 12	068U2312
	TUAE	-60 – -25 °C	-20 °C	int.	3/8 x 1/2	–	068U2317
		-40 – 10 °C	–	ext.	1/4 x 1/2	–	068U2286
		-40 – 10 °C	–	ext.	–	6 x 12	068U2282
		-40 – 10 °C	–	ext.	3/8 x 1/2	–	068U2287
		-40 – 10 °C	–	ext.	–	10 x 12	068U2283
		-40 – 10 °C	15 °C	ext.	3/8 x 1/2	–	068U2295
		-40 – -5 °C	0 °C	ext.	3/8 x 1/2	–	068U2303
		-40 – -5 °C	0 °C	ext.	–	10 x 12	068U2299
		-60 – -25 °C	-20 °C	ext.	1/4 x 1/2	–	068U2318
		-60 – -25 °C	-20 °C	ext.	3/8 x 1/2	–	068U2319
		-60 – -25 °C	-20 °C	ext.	–	10 x 12	068U2315

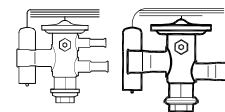
Valves with in. connections have 1/4 in. pressure equalization - Valves with mm connections have 6 mm pressure equalization.

Capillary tube: 1.5 m.
Range N = -40 – 10 °C.
Range NM = -40 – -5 °C.
Range B = -60 – -25 °C.

Technical data and ordering

TUA/TUAE - Solder

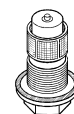
Thermostatic element with bulb strap



Refrigerant	Type	Range	MOP	Pressure equalization ¹⁾	Connections inlet x outlet		Code no.
					[in.]	[mm]	
R407C	TUA	-40 - 10 °C	-	int.	1/4 x 1/2	-	068U2324
		-40 - 10 °C	-	int.	-	6 x 12	068U2320
		-40 - 10 °C	-	int.	3/8 x 1/2	-	068U2325
		-40 - 10 °C	-	int.	-	10 x 12	068U2321
	TUAE	-40 - 10 °C	-	ext.	1/4 x 1/2	-	068U2326
		-40 - 10 °C	-	ext.	-	6 x 12	068U2322
		-40 - 10 °C	-	ext.	3/8 x 1/2	-	068U2327
		-40 - 10 °C	-	ext.	-	10 x 12	068U2323
		-40 - 10 °C	15 °C	ext.	-	6 x 12	068U2330
		-40 - 10 °C	15 °C	ext.	3/8 x 1/2	-	068U2335
R410A	TUA	-40 - 10 °C	-	int.	3/8 x 1/2	-	068U2414
	TUAE	-40 - 10 °C	-	ext.	3/8 x 1/2	-	068U1714
		-40 - 10 °C	-	ext.	-	10 x 12	068U2780
R404A/R507	TUA	-40 - 10 °C	-	int.	1/4 x 1/2	-	068U2308
		-40 - 10 °C	-	int.	3/8 x 1/2	-	068U2309
		-60 - -25 °C	-20 °C	int.	1/4 x 1/2	-	068U2316
		-60 - -25 °C	-20 °C	int.	-	6 x 12	068U2312
	TUAE	-60 - -25 °C	-20 °C	int.	3/8 x 1/2	-	068U2317
		-60 - -25 °C	-20 °C	ext.	1/4 x 1/2	-	068U2318
		-60 - -25 °C	-20 °C	ext.	3/8 x 1/2	-	068U2319
		-60 - -25 °C	-20 °C	ext.	-	10 x 12	068U2315

¹⁾ Valves with in. connections have 1/4 in. pressure equalization - Valves with mm connections have 6 mm pressure equalization.

Capillary tube: 1.5 m.
Range N = -40 - 10 °C.
Range B = -60 - -25 °C.



TUA/TUAE

Orifice assembly with filter and gasket

Valve	Orifice no.	Bleed	R134a		R404A/R507		R407C		R22		R410A		Code no.
			[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	
TUA/TUAE	0	-	0.42	0.12	0.48	0.14	0.66	0.19	0.63	0.18	0.99	0.28	068U1030
	1	-	0.61	0.18	0.71	0.20	0.94	0.27	0.92	0.26	1.3	0.38	068U1031
	1	15 %	0.61	0.18	0.71	0.20	0.94	0.27	0.92	0.26	1.3	0.38	068U1131
	2	-	0.72	0.21	0.87	0.25	1.1	0.32	1.1	0.32	1.7	0.48	068U1032
	2	15 %	0.72	0.21	0.87	0.25	1.1	0.32	1.1	0.32	1.7	0.48	068U1132
	3	-	0.94	0.27	1.1	0.32	1.5	0.42	1.4	0.41	2.1	0.60	068U1033
	3	15 %	0.94	0.27	1.1	0.32	1.5	0.42	1.4	0.41	2.1	0.60	068U1133
	4	-	1.6	0.46	2.0	0.57	2.5	0.72	2.5	0.72	4.1	1.2	068U1034
	4	15 %	1.6	0.46	2.0	0.57	2.5	0.72	2.5	0.72	4.1	1.2	068U1134
	5	-	2.1	0.61	2.7	0.76	3.4	0.96	3.4	0.96	5.3	1.5	068U1035
	5	15 %	2.1	0.61	2.7	0.76	3.4	0.96	3.4	0.96	5.3	1.5	068U1135
	6	-	3.4	0.95	4.2	1.1	5.3	1.5	5.3	1.5	8.5	2.4	068U1036
	6	15 %	3.4	0.95	4.2	1.1	5.3	1.5	5.3	1.5	8.5	2.4	068U1136
	7	-	4.4	1.3	5.6	1.6	7.0	2.0	7.0	2.0	11.2	3.2	068U1037
	7	15 %	4.4	1.3	5.6	1.6	7.0	2.0	7.0	2.0	11.2	3.2	068U1137
	8	-	6.5	1.9	8.0	2.3	10.2	2.9	10.1	2.9	15.8	4.5	068U1038
	8	15 %	6.5	1.9	8.0	2.3	10.2	2.9	10.1	2.9	15.8	4.5	068U1138
	9 ¹⁾	-	9.0	2.6	11.3	3.2	14.0	4.0	14.1	4.0	23.1	6.6	068U1039
	9 ¹⁾	15 %	9.0	2.6	11.3	3.2	14.0	4.0	14.1	4.0	23.1	6.6	068U1139

The rated capacity is based on:

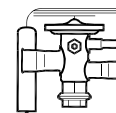
Evaporating temperature t_e = -4 °C for range N.

Condensing temperature t_c = 38 °C.

Refrigerant temperature ahead of valve t_v = 37 °C.

¹⁾ TUAE with Ref. no. 9 cannot be used for Biflow operation.

Technical data and ordering



TCAE

Thermostatic element, with bulb strap

Refrigerant	Type	Range	MOP	Pressure equalization	Connection inlet × outlet		Code no.
					[in.]	[mm]	
R22/R407C	TCAE	-40 – 10 °C	–	1/4 in.	3/8 × 5/8	–	068U4280
		-40 – 10 °C	–	1/4 in.	1/2 × 5/8	–	068U4281
		-40 – 10 °C	15 °C	1/4 in.	1/2 × 5/8	–	068U4283
		-40 – 10 °C	0 °C	6 mm	–	12 × 16	068U4291
R134a	TCAE	-40 – 10 °C	–	1/4 in.	3/8 × 5/8	–	068U4292
		-40 – 10 °C	–	1/4 in.	1/2 × 5/8	–	068U4293
		-40 – 10 °C	–	6 mm	–	10 × 16	068U4296
		-40 – 10 °C	–	6 mm	–	12 × 16	068U4297
		-40 – 10 °C	15 °C	1/4 in.	1/2 × 5/8	–	068U4295
		-40 – 10 °C	15 °C	6 mm	–	12 × 16	068U4299
		-40 – 10 °C	–	1/4 in.	3/8 × 5/8	–	068U4304
R404A/R507	TCAE	-40 – 10 °C	–	1/4 in.	1/2 × 5/8	–	068U4305
		-40 – 10 °C	–	6 mm	–	10 × 16	068U4308
		-40 – 10 °C	–	6 mm	–	12 × 16	068U4309
		-40 – 10 °C	15 °C	1/4 in.	1/2 × 5/8	–	068U4307
R404A/R507	TCAE	-40 – 10 °C	15 °C	6 mm	–	10 × 16	068U4310
		-40 – 5 °C	0 °C	1/4 in.	1/2 × 5/8	–	068U4313
		-40 – 5 °C	0 °C	6 mm	–	10 × 16	068U4314
		-40 – 5 °C	0 °C	6 mm	–	12 × 16	068U4315
		-60 – -25 °C	–	1/4 in.	1/2 × 5/8	–	068U4317
		-60 – -25 °C	–	6 mm	–	12 × 16	068U4321
		-60 – -25 °C	-20 °C	1/4 in.	1/2 × 5/8	–	068U4319
		-60 – -25 °C	-20 °C	6 mm	–	10 × 16	068U4322
R407C	TCAE	-40 – 10 °C	–	1/4 in.	3/8 × 5/8	–	068U4324
		-40 – 10 °C	–	1/4 in.	1/2 × 5/8	–	068U4325
		-40 – 10 °C	–	6 mm	–	10 × 16	068U4328
		-40 – 10 °C	–	6 mm	–	12 × 16	068U4329
		-40 – 10 °C	15 °C	1/4 in.	3/8 × 5/8	–	068U4326
		-40 – 10 °C	15 °C	1/4 in.	1/2 × 5/8	–	068U4327
		-40 – 10 °C	15 °C	6 mm	–	12 × 16	068U4331
R410A	TCAE	-40 – 10 °C	–	1/4 in.	3/8 × 5/8	–	068U4336
		-40 – 10 °C	–	1/4 in.	1/2 × 5/8	–	068U4337
		-40 – 10 °C	–	6 mm	–	12 × 16	068U4341
		-40 – 10 °C	15 °C	1/4 in.	1/2 × 5/8	–	068U4339
		-40 – 10 °C	15 °C	6 mm	–	12 × 16	068U4343

Valves with in. connections have 1/4 in. pressure equalization - Valves with mm connections have 6 mm pressure equalization.

Capillary tube: 1.5 m.

Range N = -40 – 10 °C.

Range NM = -40 – -5 °C.

Range B = -60 – -25 °C.

Technical data and ordering

TCAE

Orifice assembly with filter and gasket



Type	Orifice no.	Bleed	R134a		R404A/R507		R407C		R22		R410A		Code no.
			[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	
TCAE	1	–	13.0	3.7	13.0	3.7	17.8	5.1	18.3	5.2	21.2	6.0	068U4100
	1	15 %	13.0	3.7	13.0	3.7	17.8	5.1	18.3	5.2	21.2	6.0	068U4097
	2	–	14.9	4.3	15.1	4.3	20.4	5.8	21.2	6.0	24.5	7.0	068U4101
	2	15 %	14.9	4.3	15.1	4.3	20.4	5.8	21.2	6.0	24.5	7.0	068U4098
	3 *)	–	18.6	5.3	18.9	5.4	25.2	7.2	26.7	7.6	30.6	8.7	068U4102
	3 *)	15 %	18.6	5.3	18.9	5.4	25.2	7.2	26.7	7.6	30.6	8.7	068U4099

The rated capacity is based on:

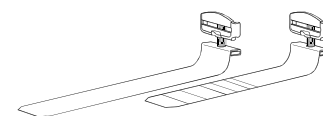
Evaporating temperature $t_e = 4.4^\circ\text{C}$ for range N.

Condensing temperature $t_c = 38^\circ\text{C}$.

Refrigerant temperature ahead of valve $t_1 = 37^\circ\text{C}$.

*) TCAE with orifice no. 3 cannot be used for bilflow operation.

Bulb strap (delivered with the valve) and accessories



Type	Length [mm]	Max. diameter of suction line	Code no.
TCAE	110	1 1/8 in. (28 mm)	068U3507
Accessories	190	2 in. (50 mm)	068U3508

TUB/TUBE/TCBE – Thermostatic expansion valves

TUB/TUBE/TCBE stainless steel thermostatic expansion valves are used for liquid injection into evaporators on both refrigeration and air conditioning systems using fluorinated refrigerants e.g. R22, R134a, R404A, R407C, R507, or R410A.

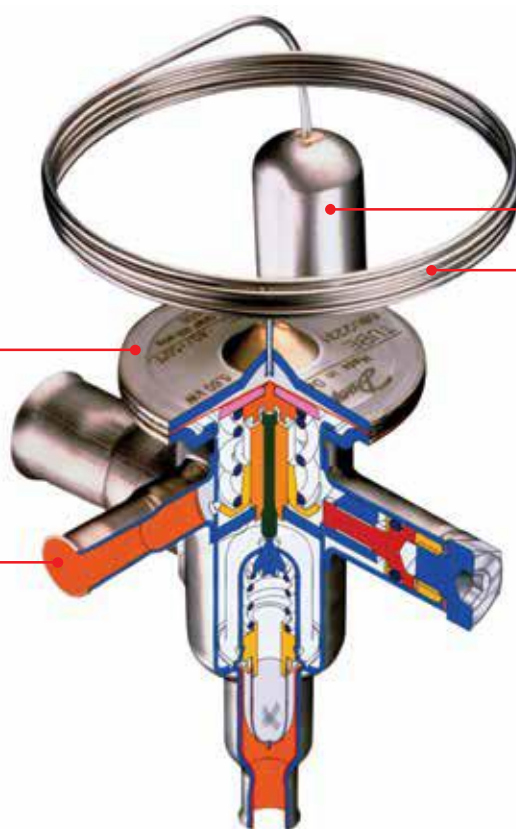
TUB/TUBE/TCBE valves are compact in design, light weight and have steel/copper bi-metal connections for fast soldering. TUB has internal equalization, TUBE external equalization. TUB/TUBE and TCBE are available in straightway or angleway versions, have a fixed orifice and adjustable superheat.

Features TUB/TUBE/TCBE



Laser welded stainless steel thermostatic element for unsurpassed joint strength and operational lifetime

Bi-metal connections
Stainless steel with rolled on copper cladding for safe, fast and convenient copper-to-copper soldering



Stainless steel capillary tube and bulb:

- high corrosion resistance
- high strength and vibration resistance

Facts

Applications:

- Traditional refrigeration
- Heat pump systems
- Air conditioning units
- Liquid coolers
- Ice cube machines
- Transport refrigeration

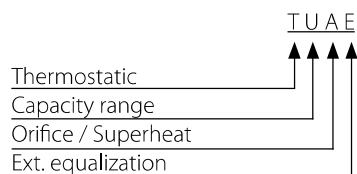
- The use of stainless steel makes the valves light and strong
- Bi-metal connections for safe, fast and convenient soldering
- Stainless steel capillary tube for superior strength and ductility
- Allen key superheat setting screw is convenient and space-saving compared to the standard screwdriver adjustment used in most conventional valves

- Can be supplied with MOP (Max. Operating Pressure) - protects the compressor motor against excessive evaporating pressure during normal operation
- Valves for special temperature ranges can be supplied
- 4 K opening superheat
- Bi-flow function
- Can be supplied as non adjustable OEM

تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)

روبروی پالایشگاه نفت پارس، پلاک ۱۲

Technical data



Orifice/Superheat

	Interchangeable	Adjustable
A	YES	YES
B	NO	YES
C	NO	NO

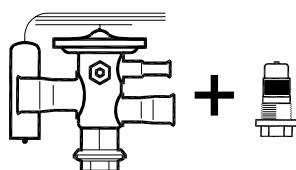
N = -40 °C – 10 °C.

NM = -40 °C – -5 °C with MOP.

NL = -40 °C – -15 °C with MOP.

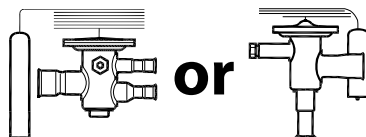
B = -60 °C – -25 °C with MOP.

TUA(E)
TCAE



Thermostatic valve + Orifice

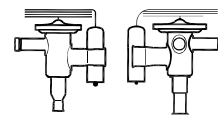
TUB(E)
TUC(E)
TCBE
TCCE



Thermostatic valve including Orifice

Valve types **TUB(E)/TUC(E)** and **TCBE/TCCE** can be replaced by **TUA(E)** and **TCAE** types.

Technical data and ordering



TUB/TUBE

Thermostatic element, angle way, with bulb strap

Refrigerant	Type	Orifice no. ²⁾	Range	Rated capacity Q _{nom.} ¹⁾		Pressure equalization	Connection inlet × Outlet		Code no.
				[kW]	[TR]		[in.]	[mm]	
R22/R407C	TUB	1	-40 – 10 °C	0.92	0.26	int.	1/4 × 1/2	–	068U2057
		2	-40 – 10 °C	1.1	0.32	int.	1/4 × 1/2	–	068U2058
		3	-40 – 10 °C	1.4	0.41	int.	1/4 × 1/2	–	068U2059
		4	-40 – 10 °C	2.5	0.72	int.	1/4 × 1/2	–	068U2060
		5	-40 – 10 °C	3.4	0.96	int.	1/4 × 1/2	–	068U2061
		6	-40 – 10 °C	5.3	1.5	int.	1/4 × 1/2	–	068U2062
		7	-40 – 10 °C	7.0	2.0	int.	3/8 × 1/2	–	068U2063
		8	-40 – 10 °C	10.1	2.9	int.	3/8 × 1/2	–	068U2064
	TUBE	5	-40 – 10 °C	3.4	0.96	ext.	1/4 × 1/2	–	068U2071
		6	-40 – 10 °C	5.3	1.5	ext.	1/4 × 1/2	–	068U2072
		7	-40 – 10 °C	7.0	2.0	ext.	3/8 × 1/2	–	068U2073
		8	-40 – 10 °C	10.1	2.9	ext.	3/8 × 1/2	–	068U2074
		9	-40 – 10 °C	14.1	4.0	ext.	3/8 × 1/2	–	068U2075
R407C	TUB	1	-40 – 10 °C	0.94	0.27	int.	–	6 × 12	068U1901
		3	-40 – 10 °C	1.5	0.42	int.	–	6 × 12	068U1903
		4	-40 – 10 °C	2.5	0.72	int.	–	6 × 12	068U1904
		5	-40 – 10 °C	3.4	0.96	int.	–	6 × 12	068U1905
		6	-40 – 10 °C	5.3	1.5	int.	–	6 × 12	068U1906
		7	-40 – 10 °C	7.0	2.0	int.	–	10 × 12	068U1907
		8	-40 – 10 °C	10.2	2.9	int.	–	10 × 12	068U1908
		9	-40 – 10 °C	14.0	4.0	int.	–	10 × 12	068U1909
	TUBE	2	-40 – 10 °C	1.1	0.32	ext.	–	6 × 12	068U1912
		3	-40 – 10 °C	1.5	0.42	ext.	–	6 × 12	068U1913
		4	-40 – 10 °C	2.5	0.72	ext.	–	6 × 12	068U1914
		5	-40 – 10 °C	3.4	0.96	ext.	1/4 × 1/2	–	068U1935
		5	-40 – 10 °C	3.4	0.96	ext.	–	6 × 12	068U1915
		6	-40 – 10 °C	5.3	1.5	ext.	1/4 × 1/2	–	068U1936
		6	-40 – 10 °C	5.3	1.5	ext.	–	6 × 12	068U1916
		7	-40 – 10 °C	7.0	2.0	ext.	3/8 × 1/2	–	068U1937
		7	-40 – 10 °C	7.0	2.0	ext.	–	10 × 12	068U1917
		8	-40 – 10 °C	10.2	2.9	ext.	3/8 × 1/2	–	068U1938
		8	-40 – 10 °C	10.2	2.9	ext.	–	10 × 12	068U1918
		9	-40 – 10 °C	14.0	4.0	ext.	3/8 × 1/2	–	068U1939
		9	-40 – 10 °C	14.0	4.0	ext.	–	10 × 12	068U1919
R410A	TUB	1	-40 – 10 °C	1.34	0.38	int.	1/4 × 1/2	–	068U1958
		2	-40 – 10 °C	1.7	0.48	int.	1/4 × 1/2	–	068U1959
		3	-40 – 10 °C	2.1	0.60	int.	1/4 × 1/2	–	068U1960
		4	-40 – 10 °C	4.1	1.2	int.	1/4 × 1/2	–	068U1961
		5	-40 – 10 °C	5.3	1.5	int.	1/4 × 1/2	–	068U1962
		6	-40 – 10 °C	8.5	2.4	int.	1/4 × 1/2	–	068U1963
	TUBE	7	-40 – 10 °C	11.2	3.2	ext.	3/8 × 1/2	–	068U1973
		8	-40 – 10 °C	15.8	4.5	ext.	3/8 × 1/2	–	068U1974
		9	-40 – 10 °C	23.1	6.6	ext.	3/8 × 1/2	–	068U1975

Valves with in. connections have 1/4 in. pressure equalization - Valves with mm connections have 6 mm pressure equalization.

¹⁾ Rated capacity Q_{nom.} is based on:

Evaporating temperature: t_e = 4.4 °C.

Condensing temperature: t_c = 38 °C.

Refrigerant liquid temperature: t_l = 37 °C.

Opening superheat: OS = 4 K.

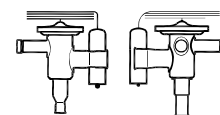
²⁾ TUBE with orifice 0 and 9 and all TUB (internal pressure equalization) cannot be used for biflow operation.

³⁾ For R407C plants, please select valves from the dedicated R407C program.

Technical data and ordering

TUB/TUBE

Thermostatic element, angle way, with bulb strap



Refrigerant	Type	Orifice no. ²⁾	Range	Rated capacity Q _{nom.} ¹⁾		Pressure equalization	Connection inlet × Outlet		Code no.
				[kW]	[TR]		[in.]	[mm]	
R134a	TUB	0	-40 – 10 °C	0.42	0.12	int.	1/4 × 1/2	-	068U2660
		1	-40 – 10 °C	0.61	0.17	int.	1/4 × 1/2	-	068U2027
		1	-40 – 10 °C	0.61	0.17	int.	-	6 × 12	068U2000
		2	-40 – 10 °C	0.72	0.20	int.	1/4 × 1/2	-	068U2028
		2	-40 – 10 °C	0.72	0.20	int.	-	6 × 12	068U2001
		3	-40 – 10 °C	0.95	0.27	int.	1/4 × 1/2	-	068U2029
		3	-40 – 10 °C	0.95	0.27	int.	-	6 × 12	068U2002
		4	-40 – 10 °C	1.6	0.46	int.	1/4 × 1/2	-	068U2030
		4	-40 – 10 °C	1.6	0.46	int.	-	6 × 12	068U2003
		5	-40 – 10 °C	2.1	0.61	int.	1/4 × 1/2	-	068U2031
		5	-40 – 10 °C	2.1	0.61	int.	-	6 × 12	068U2004
		6	-40 – 10 °C	3.4	0.95	int.	1/4 × 1/2	-	068U2032
	TUBE	6	-40 – 10 °C	3.4	0.95	int.	-	6 × 12	068U2005
		1	-40 – 10 °C	0.61	0.17	ext.	-	6 × 12	068U2009
		2	-40 – 10 °C	0.72	0.20	ext.	-	6 × 12	068U2010
		3	-40 – 10 °C	0.95	0.27	ext.	1/4 × 1/2	-	068U2020
		3	-40 – 10 °C	0.95	0.27	ext.	-	6 × 12	068U2011
		4	-40 – 10 °C	1.6	0.46	ext.	1/4 × 1/2	-	068U2021
		4	-40 – 10 °C	1.6	0.46	ext.	-	6 × 12	068U2012
		5	-40 – 10 °C	2.1	0.61	ext.	1/4 × 1/2	-	068U2022
		5	-40 – 10 °C	2.1	0.61	ext.	-	6 × 12	068U2013
		6	-40 – 10 °C	3.4	0.95	ext.	1/4 × 1/2	-	068U2023
		6	-40 – 10 °C	3.4	0.95	ext.	-	6 × 12	068U2014
		7	-40 – 10 °C	4.4	1.3	ext.	3/8 × 1/2	-	068U2024
		7	-40 – 10 °C	4.4	1.3	ext.	-	10 × 12	068U2015
		8	-40 – 10 °C	6.5	1.9	ext.	3/8 × 1/2	-	068U2025
		8	-40 – 10 °C	6.5	1.9	ext.	-	10 × 12	068U2016
		9	-40 – 10 °C	9.0	2.6	ext.	3/8 × 1/2	-	068U2026
		9	-40 – 10 °C	9.0	2.6	ext.	-	10 × 12	068U2017
R404A/R507	TUB	1	-40 – 10 °C	0.71	0.20	int.	1/4 × 1/2	-	068U2094
		1	-40 – 10 °C	0.71	0.20	int.	-	6 × 12	068U2076
		2	-40 – 10 °C	0.87	0.25	int.	1/4 × 1/2	-	068U2095
		2	-40 – 10 °C	0.87	0.25	int.	-	6 × 12	068U2077
		3	-40 – 10 °C	1.1	0.32	int.	1/4 × 1/2	-	068U2096
		3	-40 – 10 °C	1.1	0.32	int.	-	6 × 12	068U2078
		4	-40 – 10 °C	2.0	0.57	int.	1/4 × 1/2	-	068U2097
		4	-40 – 10 °C	2.0	0.57	int.	-	6 × 12	068U2079
	TUBE	5	-40 – 10 °C	2.7	0.76	int.	1/4 × 1/2	-	068U2098
		5	-40 – 10 °C	2.7	0.76	int.	-	6 × 12	068U2080
		6	-40 – 10 °C	4.2	1.2	int.	1/4 × 1/2	-	068U2099
		1	-40 – 10 °C	0.71	0.20	ext.	1/4 × 1/2	-	068U2103
		2	-40 – 10 °C	0.87	0.25	ext.	1/4 × 1/2	-	068U2104
		2	-40 – 10 °C	0.87	0.25	ext.	-	6 × 12	068U2086
		3	-40 – 10 °C	1.1	0.32	ext.	1/4 × 1/2	-	068U2105
		3	-40 – 10 °C	1.1	0.32	ext.	-	6 × 12	068U2087
		4	-40 – 10 °C	2.0	0.57	ext.	1/4 × 1/2	-	068U2106
		4	-40 – 10 °C	2.0	0.57	ext.	-	6 × 12	068U2088
		5	-40 – 10 °C	2.7	0.76	ext.	1/4 × 1/2	-	068U2107
		5	-40 – 10 °C	2.7	0.76	ext.	-	6 × 12	068U2089
		6	-40 – 10 °C	4.2	1.2	ext.	1/4 × 1/2	-	068U2108
		6	-40 – 10 °C	4.2	1.2	ext.	-	6 × 12	068U2090
		7	-40 – 10 °C	5.6	1.6	ext.	3/8 × 1/2	-	068U2109
		7	-40 – 10 °C	5.6	1.6	ext.	-	10 × 12	068U2091
		8	-40 – 10 °C	8.0	2.3	ext.	3/8 × 1/2	-	068U2110
		8	-40 – 10 °C	8.0	2.3	ext.	-	10 × 12	068U2092
		9	-40 – 10 °C	11.3	3.2	ext.	3/8 × 1/2	-	068U2111
		9	-40 – 10 °C	11.3	3.2	ext.	-	10 × 12	068U2093

Valves with in. connections have 1/4 in. pressure equalization - Valves with mm connections have 6 mm pressure equalization.

¹⁾ Rated capacity Q_{nom.} is based on:

Evaporating temperature: t_e = 4.4 °C.

Condensing temperature: t_c = 38 °C.

Refrigerant quality: x = 0.9.

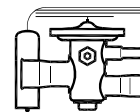
Opening superheat: OS = 4 K.

²⁾ TUB with orifice 0 and 9 and all TUB (internal pressure equalization) cannot be used for bilflow operation.

Technical data and ordering

TCBE

Thermostatic element, Straight way, with bulb strap



Refrigerant	Type	Orifice no. ²⁾	Range	MOP	Rated capacity Q _{nom.} ¹⁾		Pressure equalization	Connection inlet/Outlet		Code no. Range no.
					[kW]	[TR]		[in.]	[mm]	
R22/R407C	TCBE	1	-40 – 10 °C	-	18.3	5.2	ext.	1/2 × 3/8	-	068U4201
		1	-40 – 10 °C	15 °C	18.3	5.2	ext.	3/8 × 3/8	-	068U4204
		1	-40 – 10 °C	15 °C	18.3	5.2	ext.	1/2 × 3/8	-	068U4205
		1	-40 – 10 °C	15 °C	18.3	5.2	ext.	-	10 x 16	068U4213
		2	-40 – 10 °C	-	21.2	6.0	ext.	1/2 × 3/8	-	068U4202
		3	-40 – 10 °C	15 °C	26.7	7.6	ext.	1/2 × 3/8	-	068U4207
R134a	TCBE	1	-40 – 10 °C	-	13	3.7	ext.	1/2 × 3/8	-	068U4217
		1	-40 – 10 °C	-	13	3.7	ext.	-	12 x 16	068U4241
		2	-40 – 10 °C	-	14.9	4.3	ext.	1/2 × 3/8	-	068U4218
		2	-40 – 10 °C	-	15.1	4.3	ext.	-	12 x 16	068U4242
		3	-40 – 10 °C	-	18.6	5.3	ext.	1/2 × 3/8	-	068U4219
		3	-40 – 10 °C	-	19.8	5.4	ext.	-	12 x 16	068U4243
R404A/R507	TCBE	1	-40 – 10 °C	-	13	3.7	ext.	-	12 x 16	068U4241
		1	-40 – 10 °C	15 °C	13	3.7	ext.	-	10 x 16	068U4244
		2	-40 – 10 °C	-	15.1	4.3	ext.	1/2 × 3/8	-	068U4234
		2	-40 – 10 °C	-	15.1	4.3	ext.	-	12 x 16	068U4242
		2	-40 – 10 °C	15 °C	15.1	4.3	ext.	-	12 x 16	068U4246
		3	-40 – 10 °C	-	19.8	5.4	ext.	1/2 × 3/8	-	068U4235
		3	-40 – 10 °C	-	19.8	5.4	ext.	-	12 x 16	068U4243
		3	-40 – 10 °C	15 °C	19.8	5.4	ext.	-	12 x 16	068U4247
R407C	TCBE	1	-40 – 10 °C	-	17.8	5.1	ext.	3/8 × 3/8	-	068U4248
		1	-40 – 10 °C	-	17.8	5.1	ext.	1/2 × 3/8	-	068U4249
		1	-40 – 10 °C	15 °C	17.8	5.1	ext.	1/2 × 3/8	-	068U4253
		1	-40 – 10 °C	-	17.8	5.1	ext.	-	10 x 16	068U4256
		1	-40 – 10 °C	-	17.8	5.1	ext.	-	12 x 16	068U4257
		1	-40 – 10 °C	15 °C	17.8	5.1	ext.	-	10 x 16	068U4260
		1	-40 – 10 °C	15 °C	17.8	5.1	ext.	-	12 x 16	068U4261
		2	-40 – 10 °C	-	20.4	5.8	ext.	1/2 × 3/8	-	068U4250
		2	-40 – 10 °C	15 °C	20.4	5.8	ext.	1/2 × 3/8	-	068U4254
		2	-40 – 10 °C	-	20.4	5.8	ext.	-	12 x 16	068U4258
		2	-40 – 10 °C	15 °C	20.4	5.8	ext.	-	12 x 16	068U4262
		3	-40 – 10 °C	-	25.2	7.2	ext.	1/2 × 3/8	-	068U4251
		3	-40 – 10 °C	-	25.2	7.2	ext.	-	12 x 16	068U4259
		3	-40 – 10 °C	15 °C	25.2	7.2	ext.	-	12 x 16	068U4263

Valves with in. connections have 1/4 in. pressure equalization - Valves with mm connections have 6 mm pressure equalization.

¹⁾ Rated capacity Q_{nom.} is based on:

Evaporating temperature: t_e = 4.4 °C.

Condensing temperature: t_c = 38 °C.

Refrigerant liquid temperature: t_l = 37 °C.

Opening superheat: OS = 4 K.

²⁾ TUBE with orifice 0 and 9 and all TUB (internal pressure equalization) cannot be used for biflow operation.

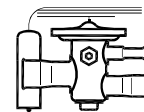
Capillary tube: 0.8 m.

Range N = -40 – 10 °C.

Technical data and ordering

TCBE

Thermostatic element, Straight way, with bulb strap



Refrigerant	Type	Orifice no. ²⁾	Range	MOP	Rated capacity Q _{nom.} ¹⁾		Pressure equalization	Connection inlet/Outlet		Code no. Range no.
					[kW]	[TR]		[in.]	[mm]	
R22/R407C	TCBE	1	-40 – 10 °C	-	18.3	5.2	ext.	1/2 × 5/8	-	068U4201
		1	-40 – 10 °C	15 °C	18.3	5.2	ext.	3/8 × 5/8	-	068U4204
		1	-40 – 10 °C	15 °C	18.3	5.2	ext.	1/2 × 5/8	-	068U4205
		1	-40 – 10 °C	15 °C	18.3	5.2	ext.	-	10 x 16	068U4213
		2	-40 – 10 °C	-	21.2	6.0	ext.	1/2 × 5/8	-	068U4202
		3	-40 – 10 °C	15 °C	26.7	7.6	ext.	1/2 × 5/8	-	068U4207
R134a	TCBE	1	-40 – 10 °C	-	13	3.7	ext.	1/2 × 5/8	-	068U4217
		2	-40 – 10 °C	-	14.9	4.3	ext.	1/2 × 5/8	-	068U4218
		3	-40 – 10 °C	-	18.6	5.3	ext.	1/2 × 5/8	-	068U4219
R404A/R507	TCBE	1	-40 – 10 °C	-	13	3.7	ext.	-	12 x 16	068U4241
		1	-40 – 10 °C	15 °C	13	3.7	ext.	-	10 x 16	068U4244
		2	-40 – 10 °C	-	15.1	4.3	ext.	1/2 × 5/8	-	068U4234
		2	-40 – 10 °C	-	15.1	4.3	ext.	-	12 x 16	068U4242
		2	-40 – 10 °C	15 °C	15.1	4.3	ext.	-	12 x 16	068U4246
		3	-40 – 10 °C	-	19.8	5.4	ext.	1/2 × 5/8	-	068U4235
		3	-40 – 10 °C	-	19.8	5.4	ext.	-	12 x 16	068U4243
		3	-40 – 10 °C	15 °C	19.8	5.4	ext.	-	12 x 16	068U4247
R407C	TCBE	1	-40 – 10 °C	-	17.8	5.1	ext.	3/8 × 5/8	-	068U4248
		1	-40 – 10 °C	-	17.8	5.1	ext.	1/2 × 5/8	-	068U4249
		1	-40 – 10 °C	15 °C	17.8	5.1	ext.	1/2 × 5/8	-	068U4253
		1	-40 – 10 °C	-	17.8	5.1	ext.	-	10 x 16	068U4256
		1	-40 – 10 °C	-	17.8	5.1	ext.	-	12 x 16	068U4257
		1	-40 – 10 °C	15 °C	17.8	5.1	ext.	-	10 x 16	068U4260
		1	-40 – 10 °C	15 °C	17.8	5.1	ext.	-	12 x 16	068U4261
		2	-40 – 10 °C	-	20.4	5.8	ext.	1/2 × 5/8	-	068U4250
		2	-40 – 10 °C	15 °C	20.4	5.8	ext.	1/2 × 5/8	-	068U4254
		2	-40 – 10 °C	-	20.4	5.8	ext.	-	12 x 16	068U4258
		2	-40 – 10 °C	15 °C	20.4	5.8	ext.	-	12 x 16	068U4262
		3	-40 – 10 °C	-	25.2	7.2	ext.	1/2 × 5/8	-	068U4251
		3	-40 – 10 °C	-	25.2	7.2	ext.	-	12 x 16	068U4259
		3	-40 – 10 °C	15 °C	25.2	7.2	ext.	-	12 x 16	068U4263
		3	-40 – 10 °C	15 °C	25.2	7.2	ext.	-	12 x 16	068U4263
R410A	TCBE	1	-40 – 10 °C	No	21.2	6	ext.	3/8 × 5/8	-	068U4264
		1	-40 – 10 °C	No	21.2	6	ext.	1/2 × 5/8	-	068U4265
		1	-40 – 10 °C	No	21.2	6	ext.	-	10 x 16	068U4260
		1	-40 – 10 °C	No	21.2	6	ext.	-	12 x 16	068U4273
		2	-40 – 10 °C	No	24.5	7	ext.	1/2 × 5/8	-	068U4266
		2	-40 – 10 °C	With	24.5	7	ext.	1/2 × 5/8	-	068U4270
		2	-40 – 10 °C	No	24.5	7	ext.	-	12 x 16	068U4274
		3	-40 – 10 °C	No	30.6	8.7	ext.	1/2 × 5/8	-	068U4267
		3	-40 – 10 °C	No	30.6	8.7	ext.	-	12 x 16	068U4275
		3	-40 – 10 °C	With	30.6	8.7	ext.	-	12 x 16	068U4279

Valves with in. connections have 1/4 in. pressure equalization - Valves with mm connections have 6 mm pressure equalization.

¹⁾ Rated capacity Q_{nom.} is based on:

Evaporating temperature: t_e = +4.4 °C.

Condensing temperature: t_c = +38 °C.

Refrigerant liquid temperature: t_l = +37 °C.

Opening superheat: OS = 4 K.

²⁾ TUBE with orifice 0 and 9 and all TUB (internal pressure equalization) cannot be used for biflow operation.

ETS 6 – Electric expansion valve

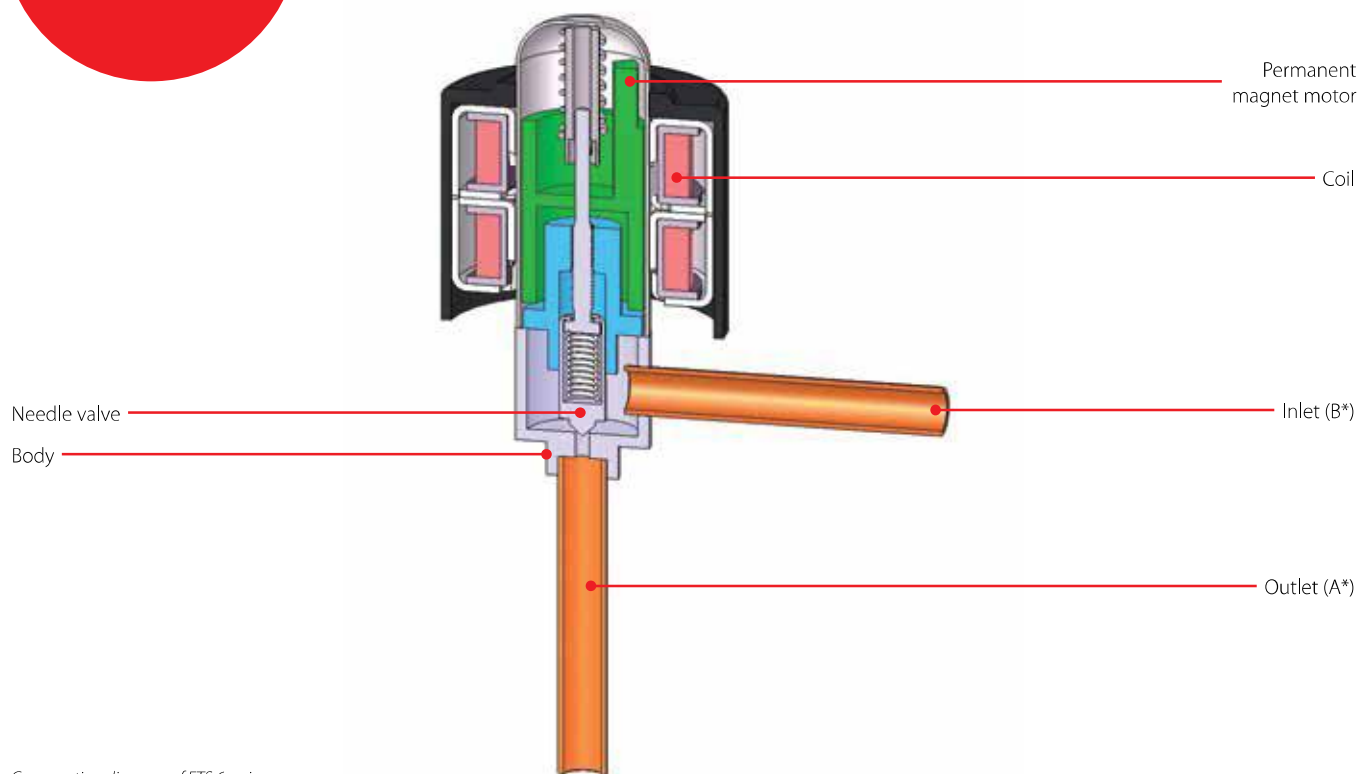
ETS 6 are compact and lightweight electric expansion valves for all common refrigerants: R410A, R407C, R404A, R134a, R22.

Bi-flow operation is possible for heat pump systems.

The valve operation is by means of a uni-polar motor, which can be controlled by a number of controllers from Danfoss or third party vendors.

With a Danfoss EKD 316 and EIM 336 (current drivers) and an AKS sensor, an accuracy better than ± 0.5 K can be obtained.

Features ETS 6



Cross section diagram of ETS 6 series
* Refers to refrigerant flow in cooling mode

Facts

Applications:

- Heat Pumps
- Modular Air Cooled Chillers
- VRF
- Multi Split
- Inverter Mini Split
- Bus air conditioning
- IT cooling

- Precision flow control with high resolution
- Proven know-how and high reliability
- Power saving design that enables energy efficiency
- Compact and lightweight hermetic design with removable coil

- Bi-flow operation for reversible systems
- ETS 6 are designed for: R410A, R407C, R404A, R507, R134a, R22 and other refrigerants, for other refrigerants, please contact your local Danfoss representative
- Controller: EKD 316

Technical data and ordering

ETS 6

Technical data

Maximum working pressure	47 bar
Compatible refrigerants	R410A, R407C, R404A, R507, R134a, R22 and other refrigerants For other refrigerants, please contact your local Danfoss representative
Refrigerant oil	All mineral oils and ester oils (to lubricate ETS 6 valve)
Ambient temperature	-30 – 70 °C
Fluid Temperature	-30 – 70 °C
Durability	- Tested for 60 Million total pulses supplied to the valve during partially open valve, which is comparable to 150.000 cycles if the valve is operated between 100 to 300 pulses open - Tested for 30.000 full stroke cycles including 20 pulse overdrive at each closing
Ambient humidity	95 % RH or less
Modulation	Permanent magnet type direct operating stepper motor
Excitation method	1-2 phase
Electrical connection	JST XHP-6 and JST XHP-5
Excitation speed	min. 30 pps (pulses per second) to max. 90 pps, recommended 31.3 pps
Operating range	0 to 480 pulses, no holding power required (NOTE: do not apply more than 520 pulses)
Full motion transit time	e.g. 16 sec at 30 pps, 6 sec at 80 pps
Installation position	With coil on the upper side and the valve/coil assembly within $\pm 15^\circ$ of the vertical axis
Liquid line solenoid valve	If using a liquid line solenoid valve, it must be installed in such a way that it does not create liquid hammering in ETS 6 valve
Max. coil winding temperature	115 °C
Approvals	CE, UL, RoHS, CQC

ETS 6 - Valve excl. coil

Valve ordering

Type	Orifice	Nominal Capacity [kW]					Connection (solder)		Valve tube configuration	MWP	MOPD	Max. Reverse Pressure ¹⁾	Flow direction charact.	Code no.
	[mm]	R22	R134a	R404A/ R507	R407C	R410A	A [mm]	B [mm]		[bar]	[bar]	[bar]		
Single pack, Code no.														
ETS 6 - 10	1	2.6	2	1.8	2.7	3.1	7.94	7.94	90°	47	35	35	Bi-flow	034G5005
ETS 6 - 14	1.4	5.8	4.5	4.1	5.9	6.8	7.94	7.94	90°	47	35	20	Bi-flow	034G5015
ETS 6 - 18	1.8	10.3	8.1	7.3	10.6	12.1	6.35	6.35	90°	47	35	28	Bi-flow	034G5026
ETS 6 - 25	2.5	19.6	15.3	13.8	20.1	23	7.94	7.94	90°	47	35	22	Bi-flow	034G5035
ETS 6 - 32	3.2	28.8	22.5	20.3	29.6	33.9	7.94	7.94	90°	47	28	12 *)	Bi-flow	034G5055
ETS 6 - 40	4	39.1	30.6	27.6	40.2	46	7.94	7.94	90°	47	21	7	Bi-flow	034G5065
I-pack, Code no., (100 units per box)														
ETS 6 - 10	1	2.6	2	1.8	2.7	3.1	7.94	7.94	90°	47	35	35	Bi-flow	034G5000
ETS 6 - 14	1.4	5.8	4.5	4.1	5.9	6.8	7.94	7.94	90°	47	35	20	Bi-flow	034G5010
ETS 6 - 18	1.8	10.3	8.1	7.3	10.6	12.1	6.35	6.35	90°	47	35	28	Bi-flow	034G5024
ETS 6 - 25	2.5	19.6	15.3	13.8	20.1	23	7.94	7.94	90°	47	35	22	Bi-flow	034G5030
ETS 6 - 32	3.2	28.8	22.5	20.3	29.6	33.9	7.94	7.94	90°	47	28	12 *)	Bi-flow	034G5050
ETS 6 - 40	4	39.1	30.6	27.6	40.2	46	7.94	7.94	90°	47	21	7	Bi-flow	034G5060

Nominal Capacity based on:

CT = 38 °C, ET = 5 °C, SC = 0 °C, SH = 0 °C.

*) Please contact Danfoss if higher maximum reverse pressure valve is required.

¹⁾ Max. Reverse Pressure = Pressure as which the valve can still close tightly in reverse direction (from A to B, see figure 1).

Coil for ETS 6

Ordering

Model No.	Voltage (current)	Enclosure	Insulation	Cable length [m]	Connector	Code no.
			class			
Coil ordering for ETS 6, Single pack						
ETS 6 Coil	12 VDC (0.26A/phase)	IP 66	Class "E" (UL Class 105 (A))	0.7	JST XHP-6	034G5105
	12 VDC (0.26A/phase)	IP 66	Class "E" (UL Class 105 (A))	0.7	JST XHP-5	034G5115
	12 VDC (0.26A/phase)	IP 66	Class "E" (UL Class 105 (A))	1.5	JST XHP-5	034G5145
	12 VDC (0.26A/phase)	IP 66	Class "E" (UL Class 105 (A))	3.0	JST XHP-5	034G5135

ETS 12.5 - ETS 400 – Electric expansion valves

ETS 12.5 - ETS 400 are electric expansion valves for precise liquid injection in evaporators for air conditioning and refrigeration applications.

The valve piston and linear positioning design is fully balanced, providing bi-flow feature as well as solenoid tight shut-OFF function in both flow directions.

ETS valves are operated with a current or voltage driver such as Danfoss Controllers EKC 316A, EKC 312 or EKD316.

ETS valve is compatible with all common refrigerant such as R410A, R407C, R404A, R134a, R22 and R507.

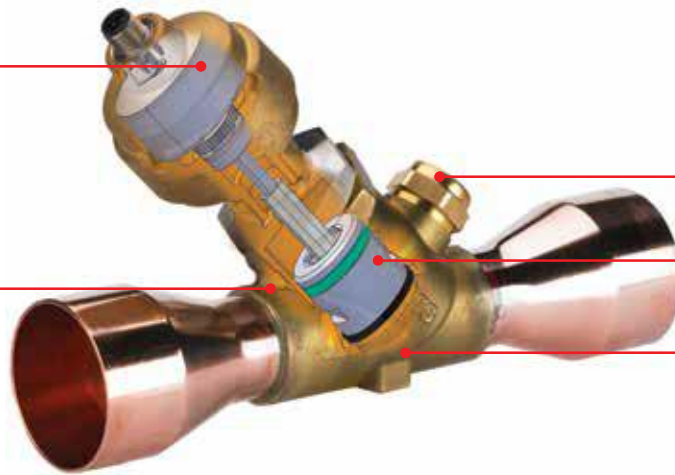
Special ETS versions for systems with R744 (CO₂) are available.

Features ETS 12.5 - 400



Actuator with low energy consumption

Precise positioning for optimal control of liquid injection



Build-in sight glass

Tight by shut-off, no solenoid valve needed

Balanced piston design removes need of holding current and prevents steps loss.

Facts

Applications:

- Heat pumps
- Refrigeration
- Air conditioning
- Chillers

- ETS 50 and ETS 100 feature improved process and productivity due to waterless brazing i.e. soldering without wet cloth for cooling
- ETS 50 to ETS 400 are all designed with built-in sight glass with moisture indicator
- Internal and external corrosion resistant design
- ETS valve is compatible with all common refrigerants such as R410A, R407C, R404A, R134a, R22 and R507

- Precise positioning for optimal control of liquid injection
- ETS 12.5, ETS 25, ETS 100 provides working pressure of 45.5 bar and ETS 250, ETS 400 provides 34 bar
- EKC 316A, 312 and EKD 316 are examples of Danfoss controllers with drivers matching the ETS requirements
- Equipped with M12 connector for cable connection (cable and connector assemblies as accessories)

Technical data and ordering

02

ETS 12.5 - ETS 400

Technical data

Compatible refrigerants	R410A, R407C, R404A, R507, R134a, R22 and other refrigerants (special valves for R744 (CO ₂) are available) For other refrigerants, please contact your local Danfoss representative
Refrigerant oil	All mineral oils and ester oils Full life time of ETS can only be ensured if oil is present in the system
Comply with PED compliance	Yes
MOPD normal flow	33 bar
MOPD reverse flow	ETS 12.5, ETS 25, ETS 50, ETS 100: 33 bar ETS 250, ETS 400: 10 bar
Max. working pressure (PS/MWP)	ETS 12.5, ETS 25, ETS 50, ETS 100: 45.5 bar ETS 250, ETS 400: 34 bar
Refrigerant temperature range	-40 – 65 °C
Ambient temperature	-40 – 60 °C
Material of construction	ETS 50, ETS 100: Body and AST enclosure in brass, connections in bi-metal (stainless steel/copper) ETS 12.5, ETS 250, ETS 400: Body and AST enclosure in brass, connections in copper

03

04

05

06

ETS 12.5 - ETS 400

Electrical data

Motor enclosure	IP67
Stepper motor type	Bi-polar - permanent magnet
Step mode	2 phase full step
Phase resistance	52 Ω ± 10 %
Phase inductance	85 mH
Holding current	Depends on application. Full current allowed (100 % duty cycle)
Step angle	7.5° (motor) 0.9° (lead screw) Gearing ratio 8.5:1
Nominal voltage	(Constant voltage drive) 12 V d.c. -4 % +15 %, 150 steps/sec
Phase current	(Using chopper drive) 100 mA RMS -4 % +15 %
Max. total power	Voltage / current drive: 5.5/1.3 W (UL: NEC class 2)
Step rate	150 steps/sec (constant voltage drive) 0-300 steps/sec 300 recommended (chopper current drive)
Total steps	ETS 12.5, ETS 25, ETS 50: 2625 [+160/-0] steps ETS 100: 3530 [160/0] steps ETS 250 and ETS 400: 3810 [+160/-0] steps
Full travel time	ETS 12.5, ETS 25, ETS 50: 17/8.5 sec (voltage/current) ETS 100: 23/11.5 sec (voltage/current) ETS 250 and ETS 400: 25.4/12.7 sec (voltage/current)
Lifting height	ETS 12.5, ETS 25, ETS 50: 13 mm ETS 100: 16 mm ETS 250 and ETS 400: 17.2 mm
Reference position	Overdriving against the full close position
Electrical connection	M12 connector

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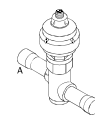
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Technical data and ordering

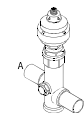


ETS ETS 12.5 - ETS 25 - Valve included actuator

Ordering

Type	Rated capacity ¹⁾										Connection			Code no.
	R410A		R407C		R22		R134a		R404A		ODF × ODF (A × B)			
	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[in.]	[mm]		
Straight way, Single Pack														
ETS 12.5	70	20	63	18	57	16	45	13	43	12	$\frac{1}{2} \times \frac{1}{2}$	—	034G4209	
	70	20	63	18	57	16	45	13	43	12	—	12 × 12	034G4208	
	70	20	63	18	57	16	45	13	43	12	$\frac{5}{8} \times \frac{5}{8}$	16 × 16	034G4210	
	70	20	63	18	57	16	45	13	43	12	$\frac{7}{8} \times \frac{7}{8}$	22 × 22	034G4211	
ETS 25	144	41	129	37	117	34	93	27	88	25	$\frac{1}{2} \times \frac{1}{2}$	—	034G4201	
	144	41	129	37	117	34	93	27	88	25	—	12 × 12	034G4200	
	144	41	129	37	117	34	93	27	88	25	$\frac{5}{8} \times \frac{5}{8}$	16 × 16	034G4202	
	144	41	129	37	117	34	93	27	88	25	$\frac{7}{8} \times \frac{7}{8}$	22 × 22	034G4203	
Angle way, Single Pack														
ETS 12.5	70	20	63	18	57	16	45	13	43	12	$\frac{1}{2} \times \frac{1}{2}$	—	034G4213	
	70	20	63	18	57	16	45	13	43	12	—	12 × 12	034G4212	
	70	20	63	18	57	16	45	13	43	12	$\frac{5}{8} \times \frac{5}{8}$	16 × 16	034G4214	
	70	20	63	18	57	16	45	13	43	12	$\frac{7}{8} \times \frac{7}{8}$	22 × 22	034G4215	
ETS 25	144	41	129	37	117	34	93	27	88	25	$\frac{1}{2} \times \frac{1}{2}$	—	034G4205	
	144	41	129	37	117	34	93	27	88	25	—	12 × 12	034G4204	
	144	41	129	37	117	34	93	27	88	25	$\frac{5}{8} \times \frac{5}{8}$	16 × 16	034G4206	
	144	41	129	37	117	34	93	27	88	25	$\frac{7}{8} \times \frac{7}{8}$	22 × 22	034G4207	

ETS 12.5 and ETS 25 do not feature sight glass.

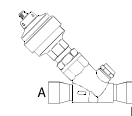


ETS 50 - ETS 100 - Valve included actuator

Ordering

Type	Rated capacity ¹⁾										Connection		
	R410A		R407C		R22		R134a		R404A		ODF × ODF (A × B)		Code no.
	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[in.]	[mm]	Single pack
ETS 50	262.3	75.7	240.5	69.1	215	62	170	48.9	161.4	46.3	7/8 × 7/8	22 × 22	034G1708
	262.3	75.7	240.5	69.1	215	62	170	48.9	161.4	46.3	7/8 × 1 1/8	22 × 28	034G1705
	262.3	75.7	240.5	69.1	215	62	170	48.9	161.4	46.3	1 1/8 × 1 1/8	28 × 28	034G1706
	262.3	75.7	240.5	69.1	215	62	170	48.9	161.4	46.3	1 1/8 × 1 3/8	28 × 35	034G1704
ETS 100	488.4	140.9	447.8	128.7	400.4	115.4	316.5	91.2	300.5	86.6	1 1/8 × 1 1/8	28 × 28	034G0507
	488.4	140.9	447.8	128.7	400.4	115.4	316.5	91.2	300.5	86.6	1 1/8 × 1 3/8	28 × 35	034G0501
	488.4	140.9	447.8	128.7	400.4	115.4	316.5	91.2	300.5	86.6	1 3/8 × 1 3/8	35 × 35	034G0508
	488.4	140.9	447.8	128.7	400.4	115.4	316.5	91.2	300.5	86.6	1 3/8 × 1 5/8	—	034G0505

ETS 50 and ETS 100 have integrated sight glass.



ETS 250/ETS 400 - Valve included actuator

Ordering

Type	Rated capacity ¹⁾								Connection		
	R407C		R22		R134a		R404A		ODF × ODF (A × B)		Code no.
	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[in.]	[mm]	Single pack
ETS 250	1212	349	1106	319	874	252	828	239	1⅞ × 1⅞	28 × 28	034G2600
	1212	349	1106	319	874	252	828	239	1⅜ × 1⅜	35 × 35	034G2601
	1212	349	1106	319	874	252	828	239	1⅝ × 1⅝	—	034G2602
	1212	349	1106	319	874	252	828	239	—	42 × 42	034G2611
ETS 400	1933	556	1764	509	1394	402	1320	381	1⅞ × 1⅞	—	034G3500
	1933	556	1764	509	1394	402	1320	381	2⅛ × 2⅛	54 × 54	034G3501

ETS 250 and ETS 400 have integrated sight glass.

¹⁾ The Rated capacity is based on:

Evaporating temperature te: 5 °C.

Liquid temperature tl: 28 °C.

Condensing temperature tc: 32 °C.

Full stroke opening in normal flow direction.

Technical data and ordering

ETS for R744 (CO₂)

Ordering

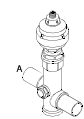
Type	Connection	Code no. Single pack
	ODF × ODF (A × B) [in.]	
ETS 12.5	7/8 × 7/8	034G4220
ETS 25	7/8 × 7/8	034G4219
ETS 50	1 1/8 × 1 1/8	034G1714
ETS 100	1 1/8 × 1 1/8	034G0515

ETS 50 and ETS 100 have integrated sight glass.

ETS for CO₂ can be used for expansion as well as gas bypass.

ETS for CO₂ Applications (MWP 45.5 bar).

For capacities please contact Danfoss.



M12 Female - Connector Cable

Ordering

Cable quality	Temperature range	Cable length (L)		Design	Code no.
	[°C]	[m]	[ft]		
Single pack					
Jacket: PVC	-50 – 80 °C	2	6.6	M12 actuator connector to 4 flying wires for driver connection	034G2201
	-50 – 80 °C	8	26.2		034G2200
Jacket: CPE	-40 – 80 °C	2	6.6		034G2202
	-40 – 80 °C	3	9.8		034G2203
	-40 – 80 °C	5	16.4		034G2205
Industrial pack (20 pcs)					
Jacket: PVC	-50 – 80 °C	2 m	6.6 ft	M12 actuator connector to 4 flying wires for driver connection	034G2330
	-50 – 80 °C	8 m	26.2 ft		034G2323
Jacket: CPE	-40 – 80 °C	2 m	6.6 ft		034G2331

Accessory

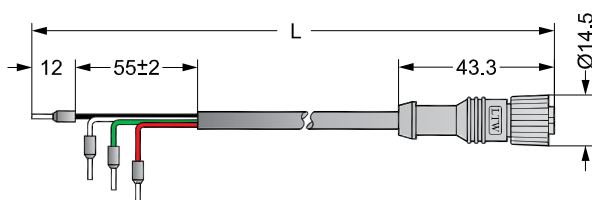
Type	Description	Type designation	Code no.
			Multy pack (20 pcs)
Cable	Cable filter for ETS valve	AKA 211	084B2238

Cable specifications

Type	Jacket	Colour	UV resistant	Insulation	Connection	Outer diameter	M12 connector	Special
PVC cables	Half Matt PVC	Black	Yes	SR-PVC	4 wires (0.33 mm ² (22 AWG))	5.0 mm	PU (polyurethane)	UL VW-1
CPE cables	CPE	Gray	Yes	EPR	4 wires (0.5 mm ² (20 AWG))	6.3 mm	PU (polyurethane)	Resistant to gear oil, diesel oil, ethylene glycol, propylene glycol



CPE cables are recommended for outdoor application.



- 1 – Red
- 2 – Green
- 3 – White
- 4 – Black

CCM – Electric expansion valve

هایپر صنعت

CCM are electric expansion valves designed specifically for operation in CO₂ systems with working pressures of up to 90 bar and an MOPD up to 50 bar.

CCM functions both as an expansion valve, and as a gas bypass valve with back-pressure regulation in subcritical applications.

The pressure rating allows for operation in environments where system standby capability is required without the need for auxiliary cooling systems during servicing or power outages.

Features CCM



With standard M12 plug

Low power consumption

Combined butt weld and solder connection

Precise flow control

Bi-flow operation possible

Facts

Application:

- Gas bypass in a transcritical CO₂ booster system
- liquid expansion for CO₂, CO₂ cascades or CO₂ evaporators

- Up to 90 bar working pressure to accommodate CO₂ system pressures during standstill conditions
- Precise positioning for optimal control of intermediate pressures in transcritical CO₂ systems or liquid injection in heat exchangers
- Possibility of bi-flow operation

MOPD up to 50 bar
Tel: ۰۲۱-۴۸۰۰۰۰۴۹

Fax: ۰۲۱-۴۴۹۹۴۶۴۲

- Combined stainless steel butt weld/solder connections for installation in copper piped systems (K65 alloy or standard) as well as steel piped systems
- Standard M12 connector for simple and flexible connection to the motor driver
- UL recognized
- For manual operation and service of the CCM an AST-g service driver is available

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روبروی پالایشگاه نفت پارس، پلاک ۱۲

Technical data and ordering

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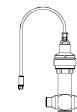
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CCM

Technical data

Parameter	CCM
Compatibility	R744 (CO ₂)
MOPD	50 bar
Max. working pressure (PS/MWP)	90 bar
Refrigerant temperature range	-40 – 60 °C
Ambient temperature	-40 – 60 °C
Material specification	Stainless steel



CCM

Electrical data

Parameter	CCM
Motor enclosure	IP67
Stepper motor type	Bi-polar - permanent magnet
Step mode	2 phase full step
Phase resistance	52 Ω ± 10 %
Phase inductance	85 mH
Holding current	Depends on application Full current allowed (100 % duty cycle)
Step angle	7.5° (motor) 0.9° (lead screw) Gearing ratio 8.5:1
Nominal voltage	(Constant voltage drive) 12 V d.c. -4 % + 15 %, 150 steps/sec
Phase current	(Using chopper drive) 100 mA RMS -4 % + 15 %
Max. total power	Voltage/current drive: 5.5/1.3 W (UL: NEC class 2)
Step rate	150 steps/sec. (constant voltage drive) 0-300 steps/sec. 300 recommended (chopper current drive)
Total steps	CCM 10, 20, 30 2625 [+160/-0] steps CCM 40 3530 [+160/-0] steps
Full travel time	CCM 10, 20, 30 17/8.5 sec. (voltage/current) CCM 40 23/11.5 sec. (voltage/current)
Lifting height	CCM 10, 20, 30 13 mm CCM 40 16 mm
Reference position	Overdriving against the full close position
Electrical connection	4 wire 0.5 mm ² (0.02 in. ²), 0.3 m long cable
Total stroke	13 mm/16 mm (0.5 in.)

Stepper motor switch sequence:

CCM				Connector
	4	Black	4	
	3	White	3	
	2	Green	2	
	1	Red	1	
	Connection 1	Wire colour	Connection 2	
	Pin Out			

Stepper motor switch sequence:

STEP	Coil I		Coil II	
	Red	Green	White	Black
↑ CLOSING ↑				
1	+	-	+	-
2	+	-	-	+
3	-	+	-	+
4	-	+	+	-
1	+	-	+	-
↓ OPENING ↓				

Technical data and ordering

Valve included actuator

Ordering

Type	Connections (Combi)		k _v value ²⁾	Code no. single pack
	Weld ¹⁾ [in.]	Solder ODF × ODF [in.]		
CCM 10	1/2 × 1/2	5/8 × 5/8	0.7	027H7188
CCM 20	3/4 × 3/4	7/8 × 7/8	1.6	027H7187
CCM 30	1 × 1	1 1/8 × 1 1/8	2.4	027H7186
CCM 40	1 × 1	1 1/8 × 1 1/8	4.2	027H7185

¹⁾ OD according to EN 10220.

²⁾ The k_v value is the water flow in [m³/h] at a pressure drop across valve of 1 bar, ρ = 1000 kg/m³.

Accessories

Type	Description	Code no.
	Cable with M12 connector - 8 meter (26.2 ft.)	034G2323

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CCMT – Electric expansion valve

CCMT are electric expansion valves designed specifically for operation in CO₂ systems. CCMT is used as an expansion valve, as a pressure regulator for the gascooler or as a gas bypass valve with back-pressure regulation in transcritical or subcritical applications.

Designed for CO₂ systems with maximum working pressure of 140 bar.

Applicable to R744 (CO₂) and other common refrigerants. CCMT is compatible with oil types PAG, POE and PVE.

Features CCMT



Stainless steel
corrosion
resistance design,
inside and outside

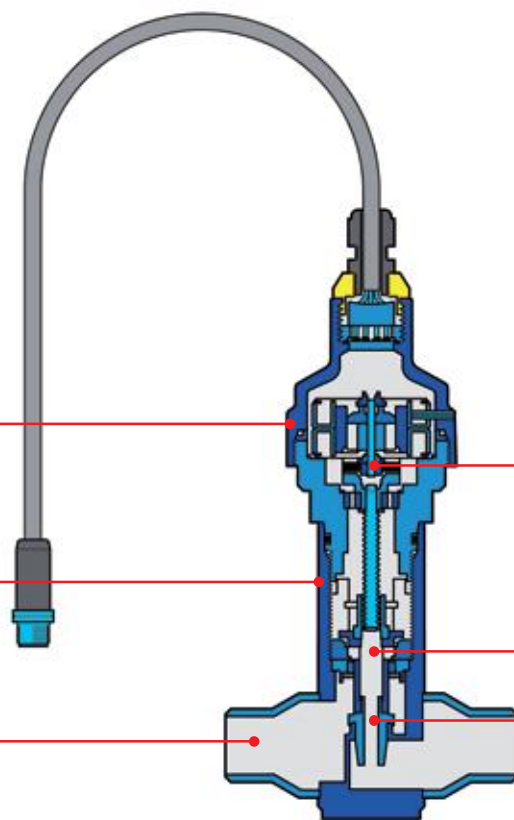
Designed for R744 (CO₂)
Max. working pressure 140 bar
(UL approved)

Combined butt weld and
solder connections

Low power consumption

Ballanced port design

Precise flow control



Facts

Application:

- High pressure valve
- Gas bypass in a transcritical CO₂ booster system
- Liquid expansion for CO₂, CO₂ cascades or CO₂ evaporators

- Designed for CO₂ systems with maximum working pressure of 140 bar.
- UL approved
- Applicable to R744 (CO₂) and other common refrigerants. The CCMT is compatible with the oil types PAG, POE and PVE
- Regulating cone ensures optimum regulating accuracy, particularly at part load
- Patented cone and balance design

- Combined butt weld and solder connections
- Top part with build-in strainer
- MOPD up to 90 bar (1305 psi)
- Standard M12 connector for simple and flexible connection to the motor driver
- Low weight and compact design
- Easy to service.

Insert easily taken out by removing top
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• For manual operation and service of the
روبروی پالایشگاه نفت پارس، پلاک ۱۲

Technical data and ordering

CCMT

Technical data

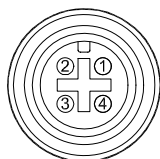
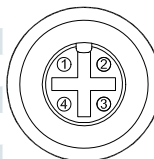
Parameter	CCMT
Compatibility	R744 (CO ₂) and other refrigerants Not applicable for flammable refrigerants and Ammonia
MOPD	90 bar
Max. working pressure (PS/MWP)	140 bar
Refrigerant temperature range	-40 – 60 °C
Ambient temperature	-40 – 60 °C
Comply with PED compliance	Fluid group 1/Article 3, paragraph 3
Material specification	Stainless steel
Step angle	7.5° (motor) 0.9° (lead screw) Gearing ratio 8.5:1
Step rate	max. 150 steps/sec (constant voltage drive) max. 300 steps/sec (chopper current drive)
Total steps	CCMT 2, CCMT 4, CCMT 8: 1100 [+80/-0] steps
Total stroke	4.8 mm
Full travel time	CCMT 2, CCMT 4, CCMT 8: 5 sec. at 220 steps/sec
Reference position	Overdriving against the full close position
Approval	CE, UL, RoHS

CCMT

Electrical data

Parameter	CCMT
Stepper motor type	Bi-polar - permanent magnet
Motor enclosure	IP 67
Step mode	2 phase full step
Phase resistance	52 Ω ± 10 %
Phase inductance	85 mH
Holding current	Depends on application Full current allowed (100 % duty cycle)
Nominal voltage	(Constant voltage drive) 12 V dc -4 % + 15 %, 150 steps/sec
Phase current	(Using chopper drive) 100 mA RMS -4 % + 15 %
Max. total power	Voltage/current drive: 5.5/1.3 W (UL: NEC class 2)
Electrical connection	4 wire 0.5 mm ² , 0.3 m long cable

Stepper motor switch sequence:

CCMT				Connector
	4	Black	4	
	3	White	3	
	2	Green	2	
	1	Red	1	
	Connection 1		Connection 2	
		Wire colour		
		Pin Out		

Stepper motor switch sequence:

STEP	Coil I		Coil II	
	Red	Green	White	Black
1	+	-	+	-
2	+	-	-	+
3	-	+	-	+
4	-	+	+	-
1	+	-	+	-

↑ CLOSING ↑

↓ OPENING ↓

Technical data and ordering

Valve incl. actuator

Ordering

Type	Connections (Combi)		k _v value ²⁾	Max. working pressure [bar]	Code no.
	Weld ¹⁾ [in.]	Solder ODF × ODF [in.]			
Standard					
CCMT 2	1/2 × 1/2	5/8 × 5/8	0.17	140	027H7200
CCMT 4	1/2 × 1/2	5/8 × 5/8	0.45	140	027H7201
CCMT 8	1/2 × 1/2	5/8 × 5/8	0.8	140	027H7202

¹⁾ OD according to EN 10220.

²⁾ The k_v value is the water flow in [m³/h] at a pressure drop across valve of 1 bar, ρ = 1000 kg/m³.

Accessories

Type	Description	Code no.
	Cable with M12 connector - 8 meter (26.2 ft.)	034G2323
AST-G	Manual valve driver for service	034G0013
EKD 316	Controller/driver	084B8040
EKA 164A	Display	084B8563
AKA 211	Cable filter	084B2238

Spareparts

Type	Description	Code no.
	O-ring spare part kit for CCM/CCMT (2 O-rings)	027H7230

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AKV – Electric expansion valve

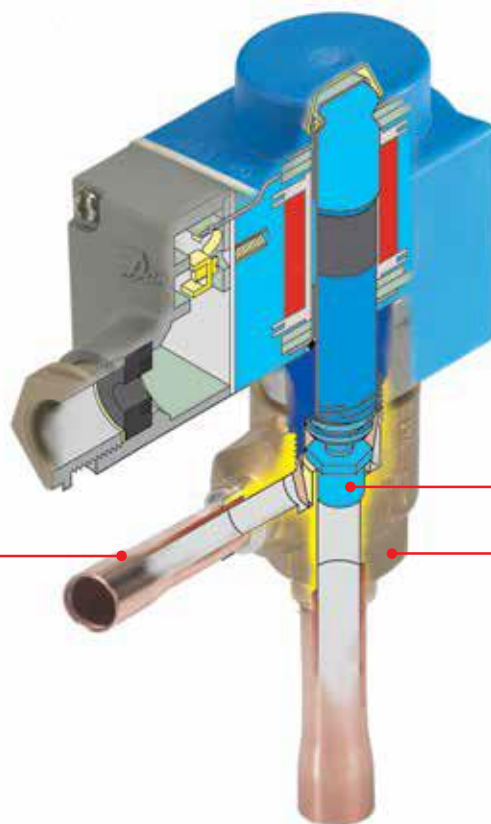
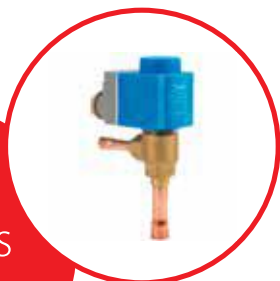
AKV are electrically operated expansion valves designed for refrigerating plants.

The AKV valves are designed for use with a controller from Danfoss' range of ADAP-KOOL® controllers.

The AKV valves are supplied as parts programme with separate valve body and coil (with terminal box, cable or DIN plug).

AKV has exchangeable orifice. Refrigerants: R744, R22/R407C, R404A/R507, R410A, R134a, R407A, R23.

Features AKV



Available with ODF solder connections
(AKV 15 and 20 – straight way,
AKV 10 angle way)

The orifice assembly
is replaceable

Both expansion valve
and solenoid valve

Facts

Applications:

- Traditional refrigeration
- Cold rooms
- Water chillers

- The AKV valves are supplied as a part programme, as follows:
 - separate valve incl. exchangeable orifice
 - separate coil
- The valve requires no adjustment
- The AKV 10 valves cover a capacity range from 0.6 kW to 14 kW (404A/R507) and are divided into 7 capacity ranges

The AKV 15 valves cover a capacity range from 14 kW to 85 kW (404A/R507) and are divided into 4 capacity ranges

- The AKV 20 valves cover a capacity range from 56 kW to 530 kW (404A/R507) and are divided into 5 capacity ranges
- The AKV valves can be used for the following refrigerants: R744, R22/R407C, R404A/R507, R410A, R134a, R407A, R23. For other refrigerants, please contact Danfoss

Technical data and ordering

AKV

Technical data

Valve type	AKV 10	AKV 15	AKV 20
Tolerance of coil voltage	10/-15 %	10/-15 %	10/-15 %
Enclosure to IEC 529	IP67	IP67	IP67
Working principle	PWM	PWM	PWM
Recommended period of time	6 Seconds	6 Seconds	6 Seconds
Capacity (404A/R507)	0.6 – 14 kW	14 – 85 kW	56 – 530 kW
Regulation range (Capacity range)	10 – 100 %	10 – 100 %	10 – 100 %
Connection	Solder	Solder	Solder or weld
Evaporating temperature	-50 – 60 °C	-50 – 60 °C	-40 – 60 °C
Ambient temperature	-50 – 50 °C	-40 – 50 °C	-40 – 50 °C
Leak of valve seat	<0.02 % of k _v -value	<0.02 % of k _v -value	< 0.02 % of k _v -value
MOPD	18 bar	22 bar	18 bar
Filter, replaceable	Internal 100 µm	External 100 µm	External 100 µm
Max. working pressure	AKV 10-1 – 6 PS=52 bar g AKV 10-7 PS=42 bar g	AKV 15-1,2,3 PS 42 bar g AKV 15-4 PS 28 bar g	28 bar g

Ordering

AKV 10 - Valve excluded coil

Valve type	Rated capacity kW ¹⁾				k _v value [m³/h]	Connections	
	R22/R407C	R134a	R404A/R507	R407C		Inlet × outlet [in.]	Code no.
Solder ODF (in.)							
AKV 10-1	1.0	0.9	0.8	1.1	0.010	3⁄8 × ½	068F1161
AKV 10-2	1.6	1.4	1.3	1.7	0.017	3⁄8 × ½	068F1164
AKV 10-3	2.6	2.1	2.0	2.5	0.025	3⁄8 × ½	068F1167
AKV 10-4	4.1	3.4	3.1	4.0	0.046	3⁄8 × ½	068F1170
AKV 10-5	6.4	5.3	4.9	6.4	0.064	3⁄8 × ½	068F1173
AKV 10-6	10.2	8.5	7.8	10.1	0.114	3⁄8 × ½	068F1176
AKV 10-7	16.3	13.5	12.5	17.0	0.209	½ × 5⁄8	068F1179
Solder ODF (mm)							
AKV 10-1	1.0	0.9	0.8	1.1	0.010	10 × 12	068F1162
AKV 10-2	1.6	1.4	1.3	1.7	0.017	10 × 12	068F1165
AKV 10-3	2.6	2.1	2.0	2.5	0.025	10 × 12	068F1168
AKV 10-4	4.1	3.4	3.1	4.0	0.046	10 × 12	068F1171
AKV 10-5	6.4	5.3	4.9	6.4	0.064	10 × 12	068F1174
AKV 10-6	10.2	8.5	7.8	10.1	0.114	10 × 12	068F1177
AKV 10-7	16.3	13.5	12.5	17.0	0.209	12 × 16	068F1180

AKV 15 - Valve excluded coil

Solder ODF (in.)							
AKV 15-1	25.5	21.2	19.6	25.2	0.25	3/4 × 3/4	068F5000
AKV 15-2	40.8	33.8	31.4	40.4	0.40	3/4 × 3/4	068F5005
AKV 15-3	64.3	53.3	49.4	63.7	0.63	7/8 × 7/8	068F5010
AKV 15-4	102	84.6	78.3	101	1.0	1 1/8 × 1 1/8	068F5015
Solder ODF (mm)							
AKV 15-1	25.5	21.2	19.6	25.2	0.25	18 × 18	068F5001
AKV 15-2	40.8	33.8	31.4	40.4	0.40	18 × 18	068F5006
AKV 15-3	64.3	53.3	49.4	63.7	0.63	22 × 22	068F5010
AKV 15-4	102	84.6	78.3	101	1.0	28 × 28	068F5016

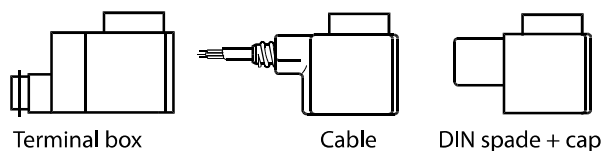
AKV 20 - Valve excluded coil

Solder ODF (in.)							
AKV 20-1	102	84.6	78.3	101	1.0	1 3/8 × 1 3/8	042H2020
AKV 20-2	163	135	125	170	1.6	1 3/8 × 1 3/8	042H2022
AKV 20-3	255	212	196	252	2.5	1 5/8 × 1 5/8	042H2024
AKV 20-4	408	338	314	404	4.0	2 1/8 × 2 1/8	042H2027
AKV 20-5	643	533	494	637	6.3	2 1/8 × 2 1/8	042H2029
Solder ODF (mm)							
AKV 20-1	102	84.6	78.3	101	1.0	35 × 35	042H2020
AKV 20-2	163	135	125	170	1.6	35 × 35	042H2022
AKV 20-3	255	212	196	252	2.5	42 × 42	042H2025
AKV 20-4	408	338	314	404	4.0	54 × 54	042H2027
AKV 20-5	643	533	494	637	6.3	54 × 54	042H2029
Weld (in.)							
AKV 20-1	102	84.6	78.3	101	1.0	1 1/4 × 1 1/4	042H2021
AKV 20-2	163	135	125	170	1.6	1 1/4 × 1 1/4	042H2023
AKV 20-3	255	212	196	252	2.5	1 1/4 × 1 1/4	042H2026
AKV 20-4	408	338	314	404	4.0	2 × 2	042H2030
AKV 20-5	643	533	494	637	6.3	2 × 2	042H2030

Technical data and ordering

Coils for AKV valves

Ordering



d.c. coils	Connection	Valve size and orifice no.						Code no.
		AKV 10-1 AKV 10-2 AKV 10-3 AKV 10-4 AKV 10-5	AKV 10-6	AKV 10-7	AKV 15-1 AKV 15-2 AKV 15-3 AKV 15-4	AKV 20-1 AKV 20-2 AKV 20-3	AKV 20-4 AKV 20-5	
220 V d.c. 20 W, standard	Terminal box	+	+	+	+	+	+	018F6851
100 V d.c. 18 W, special	Terminal box	+	+	+	+	+	+	018F6780
230 V d.c. 18 W, special	Terminal box	+	+	+	+	+	+	018F6781 ¹⁾
	DIN spade	+	+	+	+	+	+	018F6991 ¹⁾
230 V d.c. 18 W, special	2.5 m cable	+	+	+	+	+	+	018F6288 ¹⁾
	4.0 m cable	+	+	+	+	+	+	018F6278 ¹⁾
	8.0 m cable	+	+	+	+	+	+	018F6279 ¹⁾

¹⁾ Recommended for commercial refrigeration plant.

a.c. coils	Connection							Code no.
240 V a.c. 10 W, 50 Hz	Terminal box	+	+	-	+	-	-	018F6702
	DIN spade + cap	+	+	-	+	-	-	018F6177
240 V a.c. 10 W, 60 Hz	Terminal box	+	+	-	+	-	-	018F6713
240 V a.c. 12 W, 50 Hz	Terminal box	+	+	+	+	+	-	018F6802
230 V a.c. 10 W, 50 Hz	Terminal box	+	+	-	+	-	-	018F6701
	DIN spade + cap	+	+	-	+	-	-	018F6176
230 V a.c. 10 W, 60 Hz	Terminal box	+	+	-	+	-	-	018F6714
	DIN spade + cap	+	+	-	+	-	-	018F6189
230 V a.c. 10 W, 50/60 Hz	Terminal box	+	+	-	+	-	-	018F6732
	DIN spade + cap	+	+	-	+	-	-	018F6193
230 V a.c. 12 W, 50 Hz	Terminal box	+	+	-	+	+	-	018F6801
230 V a.c. 12 W, 60 Hz	Terminal box	+	+	-	+	+	-	018F6814
230 V a.c. 20 W, 50 Hz	Terminal box	+	+	+	+	+	+	018F6905
115 V a.c. 10 W, 50 Hz	Terminal box	+	+	-	+	-	-	018F6711
	DIN spade + cap	+	+	-	+	-	-	018F6186
115 V a.c. 10 W, 60 Hz	Terminal box	+	+	-	+	-	-	018F6710
	DIN spade + cap	+	+	-	+	-	-	018F6185
110 V a.c. 12 W, 50 Hz	Terminal box	+	+	-	+	+	-	018F6811
110 V a.c. 12 W, 60 Hz	Terminal box	+	+	-	+	+	-	018F6813
110 V a.c. 20 W, 50 Hz	Terminal box	+	+	+	+	+	+	018Z6904
24 V a.c. 10 W, 50 Hz	Terminal box	+	-	-	+	-	-	018F6707
	DIN spade + cap	+	-	-	+	-	-	018F6182
24 V a.c. 10 W, 60 Hz	Terminal box	-	-	-	+	-	-	018F6715
	DIN spade + cap	-	-	-	+	-	-	018F6190
24 V a.c. 12 W, 50 Hz	Terminal box	+	-	-	+	+	+	018F6807
24 V a.c. 12 W, 60 Hz	Terminal box	+	-	-	+	+	+	018F6815
24 V a.c. 20 W, 50 Hz	Terminal box	+	+	+	+	+	+	018F6901
24 V a.c. 20 W, 60 Hz	Terminal box	+	+	+	+	+	+	018F6902

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AKVH – Electric expansion valve

AKVH are electrically operated expansion valves designed for refrigerating plants using R744 refrigerant.

The AKVH valves are designed for use with a controller from Danfoss' range of ADAP- KOOL® controllers.

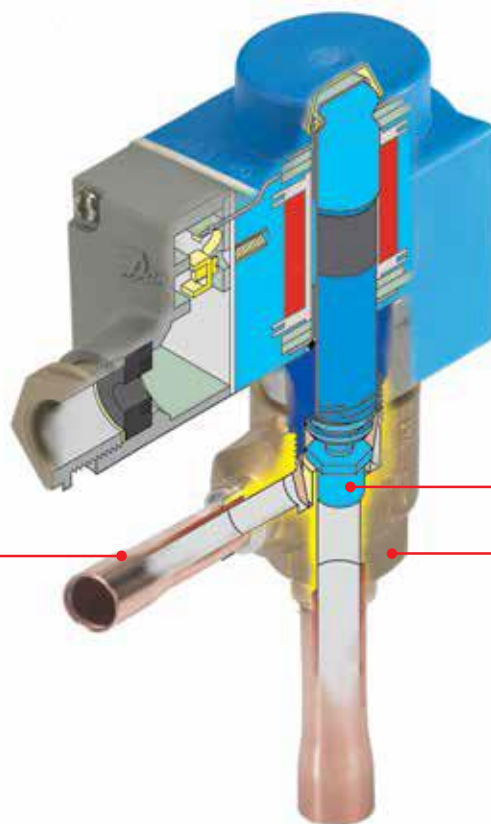
The AKVH valves are supplied as parts programme with separate valve body and coil with electronic controller, for lower valve noise

level and power consumption, higher valve MOPD, and longer valve lifetime.

AKVH has exchangeable orifice.

The AKVH 10 valves cover a capacity range from 0.4 kW to 11 kW in refrigeration applications and 0.8 kW to 22 kW in freezing applications.

Features AKVH



Available with ODF solder connections in angle-way

The orifice assembly is replaceable

Both expansion valve and solenoid valve

Facts

Applications:

- Traditional refrigeration using R744 (CO₂) as refrigerant
- Cold rooms
- Water chillers

- The AKV valves are supplied as a part programme, as follows:
 - separate valve incl. exchangeable orifice
 - separate coil
- The valve requires no adjustment
- Coil with Electronic coil controller for lower valve noise level, energy saving, higher valve MOPD and longer valve lifetime

- The AKVH 10 valve covers a capacity range from 0.4 kW to 11 kW (refrigeration) and 0.8 kW to 22 kW (for freezing) and is divided into 7 capacity ranges
- The AKVH is used for R744 (CO₂) refrigerant

Technical data and ordering

AKVH

Technical data

Valve type	AKVH 10
Tolerance of coil voltage	10/-15 %
Enclosure to IEC 529	IP67
Working principle	PWM
Recommended period of time	6 Seconds
Capacity (R744)	0.4 kW to 11 kW ¹⁾ - 0.8 kW to 22 kW ²⁾
Regulation range (Capacity range)	10 – 100 %
Connection	Solder
Evaporating temperature	-60 – 60 °C
Ambient temperature	-50 – 50 °C
Leak of valve seat	<0.02 % of kv-value
MOPD	35 bar
Filter, replaceable	Internal 100 µm
Max. working pressure	AKVH10-0 to 6 PS = 90 barg ³⁾

¹⁾ Refrigeration.

²⁾ Freezing.

³⁾ 90 barg under stand still conditions, but under normal operating conditions, there must be liquid to the inlet of the valve.

Coil with electronic coil controller

Technical data

Noise level	Minimum 5 dB
Softstart	Yes
Nominal voltage	208 – 240 VAC 50/60 Hz
Power	4 W
Ambient temperature	During operation: -20 – 55 °C
Enclosure to IEC 529	IP67
Wire dimension	1 – 1.5 mm ²
Approvals	CE: Low voltage and EMC directives
Neutral, phase and earth in socket	Yes



Coil must only be used together with electronic coil controller.

Tolerance of supply voltage: 10 – -15 %.

AKVH 10 - Valve excl. coil

Rated capacity and Ordering

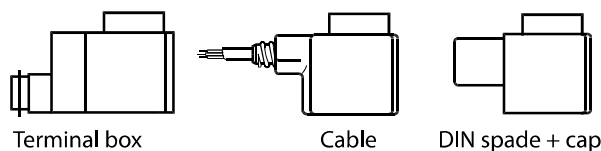
Valve type/ orifice no.	Rated capacity (R744) [kW] ¹⁾		k _v ¹⁾ value [m³/h]	Code no.
	Refrigeration	Freezing		
Connections, Solder ODF, Industrial pack 32 valves each, 3/8 × 1/2 [in.]				
AKVH 10-0	0.4	0.8	0.003	068F4068
AKVH 10-1	1.1	2.2	0.010	068F4069
AKVH 10-2	1.7	3.5	0.017	068F4070
AKVH 10-3	2.6	5.4	0.025	068F4071
AKVH 10-4	4.3	8.7	0.046	068F4072
AKVH 10-5	6.7	13.6	0.064	068F4073
AKVH 10-6	10.7	21.7	0.114	068F4074
Connections, Solder ODF, Industrial pack 32 valves each, 10 × 12 [mm]				
AKVH 10-0	0.4	0.8	0.003	068F4058
AKVH 10-1	1.1	2.2	0.010	068F4059
AKVH 10-2	1.7	3.5	0.017	068F4060
AKVH 10-3	2.6	5.4	0.025	068F4061
AKVH 10-4	4.3	8.7	0.046	068F4062
AKVH 10-5	6.7	13.6	0.064	068F4063
AKVH 10-6	10.7	21.7	0.114	068F4064
Connections, Solder ODF, Single pack 1 valve each, 3/8 × 1/2 [inch.]				
AKVH 10-0	0.4	0.8	0.003	068F4078
AKVH 10-1	1.1	2.2	0.010	068F4079
AKVH 10-2	1.7	3.5	0.017	068F4080
AKVH 10-3	2.6	5.4	0.025	068F4081
AKVH 10-4	4.3	8.7	0.046	068F4082
AKVH 10-5	6.7	13.6	0.064	068F4083
AKVH 10-6	10.7	21.7	0.114	068F4084
Connections, Solder ODF, Single pack 1 valve each, 10 × 12 [mm]				
AKVH 10-0	0.4	0.8	0.003	068F4088
AKVH 10-1	1.1	2.2	0.010	068F4089
AKVH 10-2	1.7	3.5	0.017	068F4090
AKVH 10-3	2.6	5.4	0.025	068F4091
AKVH 10-4	4.3	8.7	0.046	068F4093
AKVH 10-5	6.7	13.6	0.064	068F4094
AKVH 10-6	10.7	21.7	0.114	068F4094

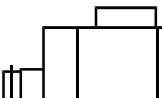
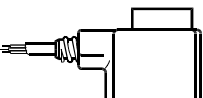
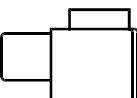


Technical data and ordering

Coils for AKVH valves

Ordering



			Valve size and orifice no.				
			18 bar		35 bar ³⁾		
			AKVH 10-1 AKVH 10-2 AKVH 10-3 AKVH 10-4 AKVH 10-5	AKVH 10-6	AKVH 10-0 AKVH 10-1 AKVH 10-2 AKVH 10-3 AKVH 10-4 AKVH 10-5	AKVH 10-6	
Terminal box	Cable	DIN spade + cap					
d.c. coils	Connection					Code no.	
220 V d.c. 20 W, standard	Terminal box		+	+	+	+	018F6851
100 V d.c. 18 W, special	Terminal box		+	+	+	–	018F6780
230 V d.c. 18 W, special	Terminal box		+	+	+	–	018F6781 ¹⁾
	DIN spade + cap		+	+	+	–	018F6991 ¹⁾
230 V d.c. 18 W, special	with 2.5 m cable		+	+	+	–	018F6288 ¹⁾
	with 4.0 m cable		+	+	+	–	018F6278 ¹⁾
	with 8.0 m cable		+	+	+	–	018F6279 ¹⁾

¹⁾ Recommended for commercial refrigeration plant.

a.c. coils	Connection					Code no.
115 V a.c. 10 W, 50 Hz	Terminal box	+	+	-	-	018F6711
115 V a.c. 10 W, 60 Hz	Terminal box	+	+	-	-	018F6710
	DIN spade + cap	+	+	-	-	018F6185
110 V a.c. 12 W, 50 Hz	Terminal box	+	+	+	-	018F6811
110 V a.c. 12 W, 60 Hz	Terminal box	+	+	-	-	018F6813
24 V a.c. 10 W, 50 Hz	Terminal box	+	-	-	-	018F6707
	DIN spade + cap	+	-	-	-	018F6182
24 V a.c. 12 W, 50 Hz	Terminal box	+	-	-	-	018F6807
24 V a.c. 12 W, 60 Hz	Terminal box	+	-	-	-	018F6815
24 V a.c. 20 W, 50 Hz	Terminal box	+	+	+	+	018F6901
24 V a.c. 20 W, 60 Hz	Terminal box	+	+	+	+	018F6902

 For voltage supply of 208-240 V-AC
always use coil with electronic coil

EEC - Coil with electronic coil controller

Ordering

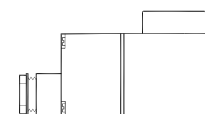
AC coil	18 bar		35 bar ²⁾		Code no.
208 - 240 VAC, 50/60 Hz, 4 W	+	+	+	+	018F6783

Coil with electronic coil controller type EEC is delivered as multipack.

¹⁾ Recommended for commercial refrigeration plant.

²⁾ If operated consistently at or near MOPD, the service interval will decrease.

³⁾ If operated consistently at or near MOPD, the service interval will decrease.



Capacities in kW

R744

Valve type	Capacity in kW at pressure drop across valve Δp [bar] ¹⁾								
	2	4	6	8	10	12	14	16	18
AKVH 10-0	0.33	0.44	0.53	0.59	0.65	0.70	0.73	0.76	0.78
AKVH 10-1	0.9	1.2	1.5	1.6	1.8	1.9	2.0	2.1	2.1
AKVH 10-2	1.4	2.0	2.3	2.6	2.8	3.1	3.2	3.3	3.4
AKVH 10-3	2.2	3.1	3.7	4.1	4.4	4.8	5.0	5.2	5.4
AKVH 10-4	3.6	4.9	5.8	6.5	7.1	7.7	8.0	8.3	8.5
AKVH 10-5	5.6	7.7	9.2	10.2	11.1	12.0	12.6	13.0	13.5
AKVH 10-6	9.0	12.3	14.6	16.3	17.6	19.1	20.0	20.8	21.5

R744

Valve type	Capacity in kW at pressure drop across valve Δp [bar] ¹⁾								
	20	22	24	26	28	30	32	34	35
AKVH 10-0	0.80	0.81	0.82	0.84	0.85	0.85	0.86	0.87	0.87
AKVH 10-1	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4
AKVH 10-2	3.5	3.6	3.7	3.7	3.8	3.8	3.8	3.8	3.8
AKVH 10-3	5.5	5.6	5.7	5.8	5.9	5.9	6.0	6.0	6.0
AKVH 10-4	8.8	8.9	9.1	9.3	9.4	9.5	9.5	9.6	9.6
AKVH 10-5	13.8	14.1	14.4	14.6	14.8	14.9	15.0	15.0	15.0
AKVH 10-6	22.0	22.4	22.9	23.3	23.5	23.7	23.9	23.9	24.0

¹⁾ Rated capacities are based on:
Subcooling $t_{sub}=4\text{ K}$.
Evaporating temperature $t_e=-25\text{ }^{\circ}\text{C}$.
Superheating $t_{sup}=5\text{ K}$.