



Quick Selection

Catalogue for R410A

Introduction

Growing worldwide concerns about greenhouse effect and stratospheric ozone depletion have impacted many products we use in our daily lives and air conditioning systems are not an exception.

It has always been a priority for Danfoss to protect and preserve global environment through its manufacturing processes and product developments. Today, the air conditioning market is facing tough government pressure on energy savings and environment restrictions. R410A being a non-ozone depleting chemical able to improve energy efficiency, it is now proven that it will be the long-term replacement to HCFC refrigerants. Being ahead of market changes and to ease customer transition to R410A, Danfoss started to develop R410A components as early as 1997.

In addition to being environmental-friendly, extensive testing by OEM customers and independent laboratories on millions of installations already running around the world has shown that there are significant benefits for air conditioning units using R410A over other existing refrigerants mainly in terms of efficiency and reliability.

Among its proven benefits, air conditioning units using R410A have a higher cooling capacity and energy efficiency (EER) than units using R22 or R407C. R410A components have been redesigned over the past years and therefore utilize the most current technology available. R410A components are often smaller and lighter, redesigned to fit in smaller units with an equivalent cooling capacity than those using R407C or R22. The new generation of R410A compressors developed by Danfoss has significant improvement in noise and vibration levels enabling quieter air conditioning systems and less damaging vibrations.

For OEM customers and end-users, R410A leads to reduced maintenance expenses, improved cost control and lower energy bills which mean more comfort and more satisfaction.

Today, Danfoss is the only supplier on the market able to provide a full range of R410A components including controls, compressors and heat exchangers manufactured with the highest standards of quality and environmental friendliness. And, in addition to offering a full range of components, Danfoss can deliver complete, customized functions and subassemblies using a wide variety of Danfoss R410A products.

The Danfoss network is tailored to provide a quick and outstanding service to air conditioning OEM customers on a global level. Manufacturing facilities located throughout the world at the heart of the main air conditioning market areas utilise “state-of-the-art” processes and every product is thoroughly tested in accordance with the most demanding standards. Danfoss Air Conditioning professionals – world-wide application sales and service engineers – contribute to the success of OEM customers. Logistics and support centres are close to customer operations ensuring quick response wherever Danfoss air conditioning customer operates.

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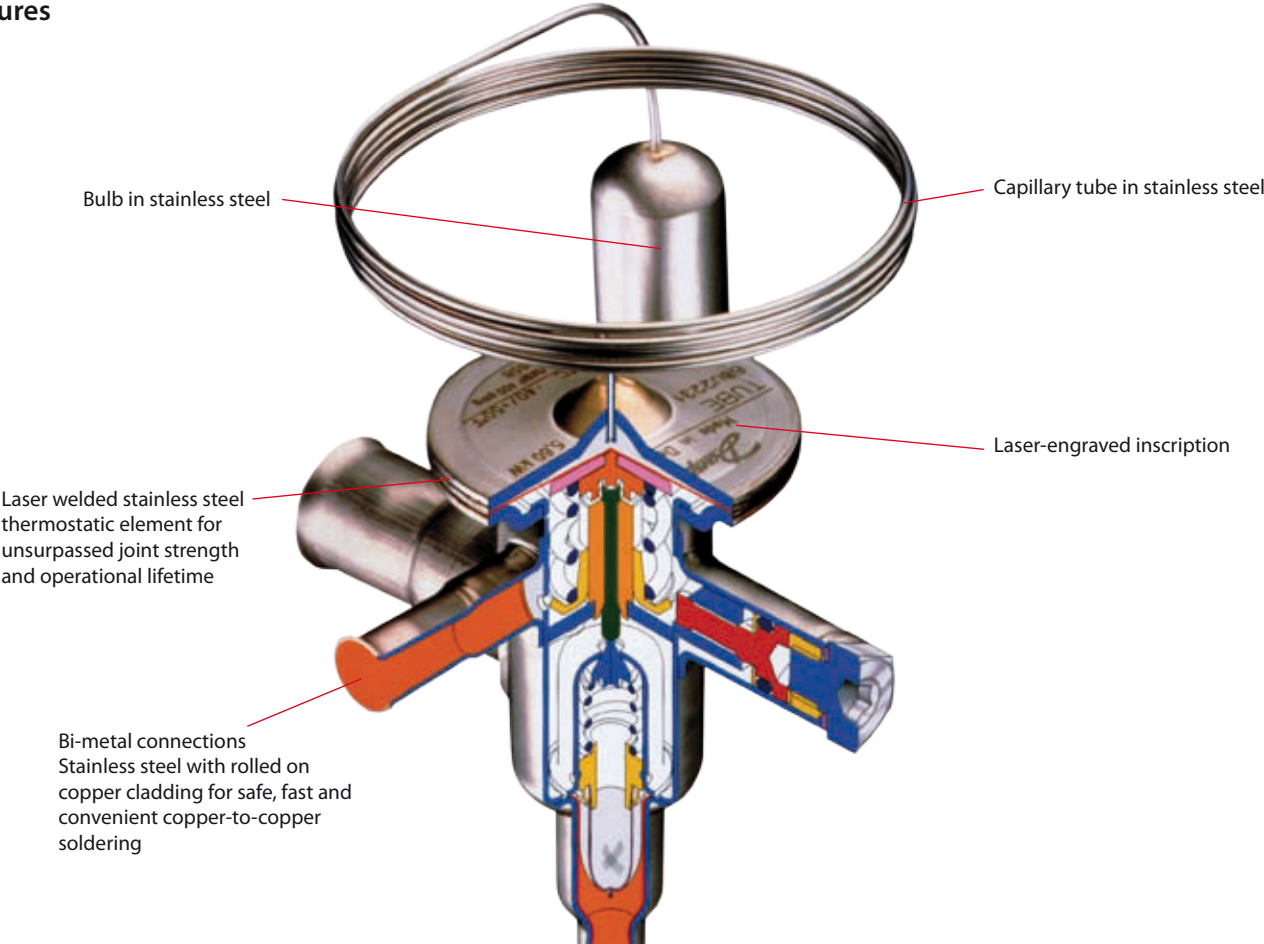
XGE/RGE 48



TUB/TUBE/ TCBE: superior by design and function

The function of a thermostatic expansion valve is determined by three fundamental pressures: the bulb pressure, the evaporating pressure and the spring pressure. When the expansion valve regulates, balance is created between bulb pressure on one side of the diaphragm and evaporating pressure plus spring force on the other side. The spring is used to set superheat.

Features



Applications	Advantages	Facts
- Heat pump systems - Air conditioning units - Liquid coolers	- 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. - Only 4 K opening superheat. - Bi-flow function.

Technical data and ordering: TUB/TUBE/ TCBE

Thermostatic element with orifice and bulb strap – range N = –40 → +10°C

R407C, R410A

Refrigerant	Type	Rated capacity Q _{nom.1)}		Orifice no.2)	Pressure equalisation	Connection Inlet × Outlet			
		kW	TR			in.	Code no.	mm	Code no.
R407C	TUB	0.92	0.26	1	int.			6 × 12	068U1901
	TUB	1.4	0.38	2	int.			6 × 12	068U1902
	TUB	1.9	0.53	3	int.			6 × 12	068U1903
	TUB	2.8	0.80	4	int.			6 × 12	068U1904
	TUB	3.8	1.10	5	int.			6 × 12	068U1905
	TUB	5.7	1.60	6	int.			6 × 12	068U1906
	TUB	7.5	2.10	7	int.			10 × 12	068U1907
	TUB	11.0	3.20	8	int.			10 × 12	068U1908
	TUB	17.0	4.80	9	int.			10 × 12	068U1909
	TUBE	0.92	0.26	1	ext.			6 × 12	068U1911
	TUBE	1.4	0.38	2	ext.			6 × 12	068U1912
	TUBE	1.9	0.53	3	ext.			6 × 12	068U1913
	TUBE	2.8	0.80	4	ext.			6 × 12	068U1914
	TUBE	3.8	1.10	5	ext.	1/4 × 1/2	068U1935	6 × 12	068U1915
	TUBE	5.7	1.60	6	ext.	1/4 × 1/2	068U1936	6 × 12	068U1916
	TUBE	7.5	2.10	7	ext.	3/8 × 1/2	068U1937	10 × 12	068U1917
	TUBE	11.0	3.20	8	ext.	3/8 × 1/2	068U1938	10 × 12	068U1918
	TUBE	17.0	4.80	9	ext.	3/8 × 1/2	068U1939	10 × 12	068U1919
R410A	TUB	1.3	0.4	1	int.	1/4 × 1/2	068U1958		
	TUB	2.1	0.6	2	int.	1/4 × 1/2	068U1959		
	TUB	2.9	0.8	3	int.	1/4 × 1/2	068U1960		
	TUB	4.5	1.3	4	int.	1/4 × 1/2	068U1961		
	TUB	5.9	1.7	5	int.	1/4 × 1/2	068U1962		
	TUB	9.0	2.5	6	int.	1/4 × 1/2	068U1963		
	TUBE	12.0	3.4	7	ext.	3/8 × 1/2	068U1973		
	TUBE	18.0	5.0	8	ext.	3/8 × 1/2	068U1974		
	TUBE	26.0	7.5	9	ext.	3/8 × 1/2	068U1975		

Valves with inch connections have ¼ in. pressure equalisation.
Valves with mm connections have 6 mm pressure equalisation.

- ¹⁾ Rated capacity Q_{nom.} is based on:
Evaporating temperature t_e = +5°C
Condensing temperature t_c = +32°C
Refrigerant liquid temperature t_l = +28°C
Opening superheat OS = 4 K
- ²⁾ TUBE with orifice 0 and 9 and all TUB (internal pressure equalisation) cannot be used for biflow operation.

Rated Capacities

Orifice no.	Range N: –40 to +10°C	
	Rated capacity in kW ²⁾	Rated capacity in tons (TR)
	R410A	R410A
0	-	-
1	1.3	0.4
2	2.1	0.6
3	2.9	0.8
4	4.5	1.3
5	5.9	1.7
6	9.0	2.5
7	12.0	3.4
8	18.0	5.0
9	26.0	7.5

¹⁾ Capillary tube length 1.5 m.

Technical data and ordering: TCBE

Ordering TCBE, straightway, thermostatic expansion valve with bulb strapR410A

Refrigerant	Type	Rated capacity 2)		Orifice no.	Pressure equalisation	Code no.					
						Connection inlet × outlet in. × in.	Range N –40/+10°C		Connection inlet × outlet mm × mm	Range N –40/+10°C	
		kW	TR				without MOP	with MOP		without MOP	with MOP
R410A	TCBE	23.0	6.5	1	ext.	3/8 × 5/8	068U4264	068U4268	10 × 16	068U4272	068U4276
	TCBE	23.0	6.5	1	ext.	1/2 × 5/8	068U4265	068U4269	12 × 16	068U4273	068U4277
	TCBE	27.5	7.8	2	ext.	1/2 × 5/8	068U4266	068U4270	12 × 16	068U4274	068U4278
	TCBE	34.0	9.8	31)	ext.	1/2 × 5/8	068U4267	068U4271	12 × 16	068U4275	068U4279

Capillary tube length 0.9 m

Valves with inch connections have 1/4 in. pressure equalisation.
Valves with mm connections have 6 mm pressure equalisation.

2) Rated capacity Q_{nom} is based on:
Evaporating temperature t_e = +5°C
Condensing temperature t_c = +32°C
Refrigerant liquid temperature t_l = +28°C
Opening superheat OS = 4 K

Rated capacities

Orifice no.	Range N: –40 to +10°C	
	Rated capacity in kW ¹⁾	Rated capacity in tons (TR)
	R410A	R410A
01	23.0	6.5
02	27.5	7.8
03 ²⁾	34.0	9.8

Capacities

R410A

Valve type/ Orifice	Cond. temp. ⁷⁾ [°C]	Capacity in [kW]				
		Evaporating temp. [°C]				
		–10	–5	0	5	10
TU / 00	25	0.77	0.78	0.78	0.76	0.71
TU / 01		1.11	1.15	1.17	1.16	1.11
TU / 02		1.60	1.7	1.8	1.9	1.9
TU / 03		2.2	2.4	2.6	2.6	2.6
TU / 04		3.3	3.6	3.9	4.0	4.0
TU / 05		4.4	4.8	5.1	5.3	5.3
TU / 06		6.7	7.3	7.8	8.1	8.0
TU / 07		8.9	9.7	10.3	10.7	10.7
TU / 08		13.3	14.5	15.3	15.8	15.7
TU / 09		19.9	21.6	23.0	23.9	23.7
TC / 01	35	17.3	18.2	18.7	18.7	17.9
TC / 02		21.9	23.0	23.7	23.7	22.8
TC / 03		28.4	29.6	30.3	30.2	28.8
TU / 00		0.80	0.83	0.84	0.85	0.83
TU / 01		1.16	1.22	1.27	1.30	1.30
TU / 02		1.7	1.9	2.0	2.2	2.3
TU / 03		2.4	2.6	2.8	3.0	3.1
TU / 04		3.6	3.9	4.3	4.6	4.8
TU / 05		4.7	5.2	5.7	6.1	6.3
TU / 06		7.1	7.9	8.6	9.2	9.7
TU / 07	45	9.5	10.5	11.4	12.2	12.9
TU / 08		14.2	15.6	16.9	18.0	18.8
TU / 09		21.1	23.3	25.4	27.1	28.5
TC / 01		18.5	19.7	20.7	21.3	21.6
TC / 02		23.5	25.0	26.2	27.1	27.5
TC / 03		30.4	32.2	33.6	34.5	34.8
TU / 00		0.80	0.83	0.86	0.87	0.87
TU / 01		1.17	1.23	1.29	1.34	1.4
TU / 02		1.7	1.9	2.1	2.3	2.4
TU / 03		2.4	2.7	2.9	3.1	3.3
TU / 04	55	3.6	4.0	4.4	4.8	5.1
TU / 05		4.8	5.3	5.8	6.3	6.8
TU / 06		7.2	8.0	8.9	9.6	10.3
TU / 07		9.6	10.7	11.7	12.8	13.7
TU / 08		14.3	15.9	17.4	18.8	20.1
TU / 09		21.3	23.7	26.1	28.3	30.3
TC / 01		18.8	20.1	21.4	22.4	23.1
TC / 02		23.9	25.6	27.2	28.5	29.5
TC / 03		31.1	33.1	34.9	36.3	37.2
TU / 00		0.77	0.80	0.83	0.85	0.86
TU / 01		1.12	1.19	1.26	1.31	1.3
TU / 02		1.67	1.9	2.1	2.2	2.4
TU / 03		2.3	2.6	2.9	3.1	3.3
TU / 04		3.4	3.9	4.3	4.7	5.1
TU / 05		4.7	5.2	5.7	6.3	6.8
TU / 06		6.9	7.8	8.7	9.5	10.4
TU / 07		9.2	10.4	11.5	12.6	13.7
TU / 08		13.8	15.5	17.1	18.6	20.1
TU / 09		20.5	23.0	25.5	28.0	30.3
TC / 01		18.3	19.7	21.0	22.2	23.2
TC / 02		23.3	25.2	26.9	28.4	29.7
TC / 03		30.5	32.6	34.5	36.1	37.4

When the subcooling ≠ 4 K then:
1. Table value x Factor = Plant capacity
2. Plant capacity / Factor = Table value

Example:

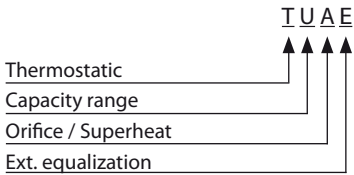
Q_{nom} = 10 kW
t_e = –10°C
t_c = 55°C
Δt_{sub} = 25 K

Selection:

1. TC, Orifice 01 = 10.3 kW x 1.25 = 12.9 kW → Valve too large

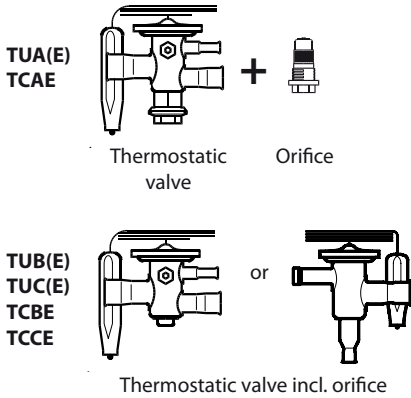
Right selection:

2. 10 kW / 1.25 = 8 kW → TU, Orifice 09



Orifice / Superheat		
	Exchangeable	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



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

Correction factor

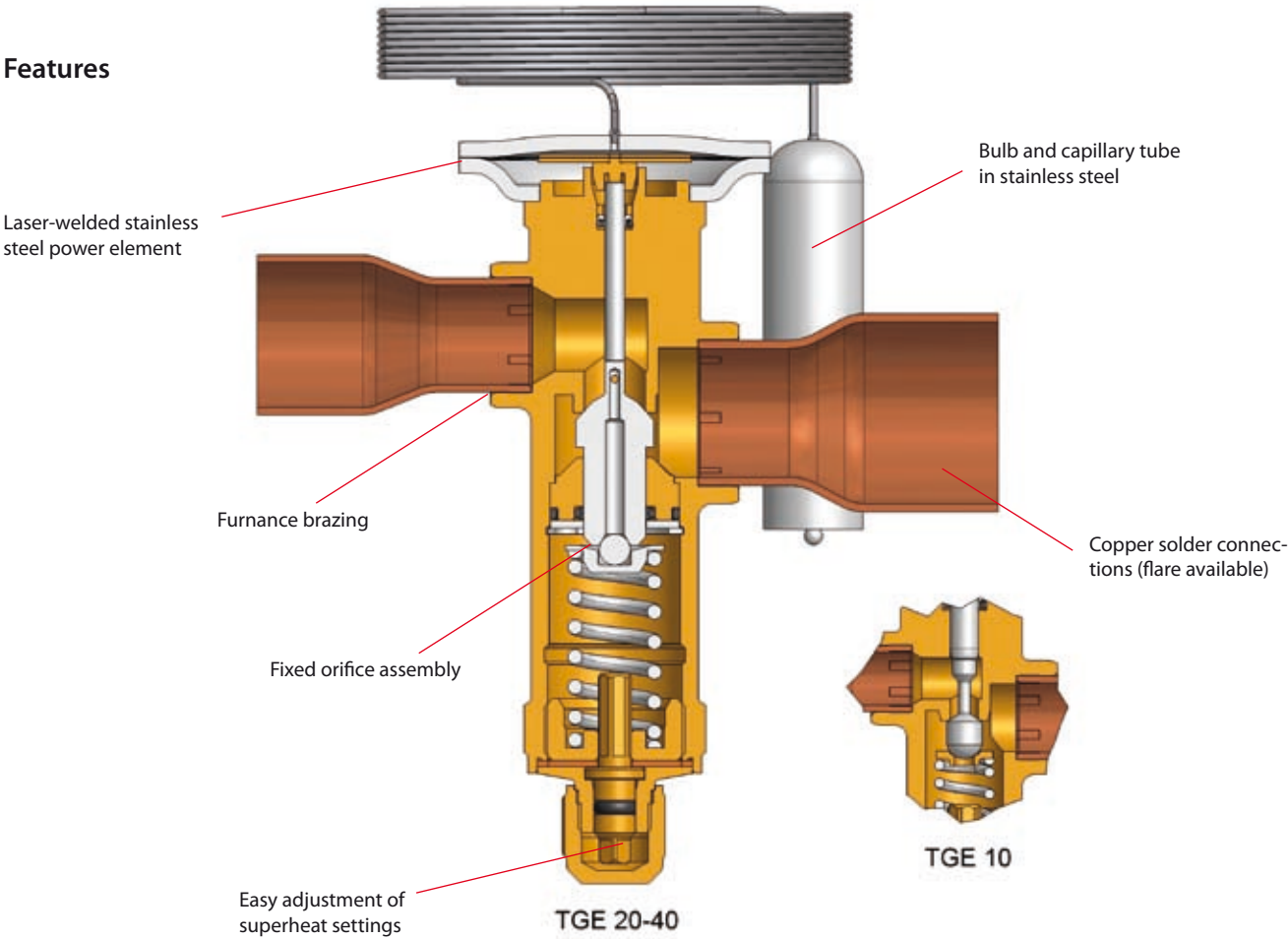
Refrigerant	Subcooling [K]										
	2	4	10	15	20	25	30	35	40	45	50
R410A	0.97	1	1.08	1.15	1.21	1.27	1.33	1.39	1.45	1.50	1.56



TGE: one valve for all purpose

TGE is a new dedicated designed series of thermostatic expansion valves with lots of technical innovations for all normal refrigerants including R410A. The hermetic tight design meets the environmental demands for today and future.

Features



Applications	Advantages	Facts
• Air conditioning systems, • Heat pump systems • Water chillers • Refrigerated containers, • Traditional refrigeration systems • Transport refrigeration	• Laser welded, stainless steel power element /capillary tube • Solder or flare connections (flare, MIO, ORFS) available • Stainless steel capillary tube for superior strength and ductility • Balance port (BP) • Version with MOP (Max. Operating Pressure) • Biflow with expansion in both diretions • Balance port (BP) • Adjustable superheat setting	• The capacity from 4 to 50 TR (14 kW to 175 kW) (R410A) • Max. working pressure 46 bar/ 667 psi • Cylindrical bulb design with new bulb strap • Opening superheat (OSH) max. 4°K • Adjustable superheat setting • Straightway flow

Technical data and ordering



R410A

Range N = -40 → +10°C SS = 4 K

Type and rated capacity Q _{nom.} 2) TR	Rated capacity Q _{nom.} 2) kW	Inch version			mm version		
		Connection Solder 1) ODF × ODF in.	Code no. Multi pack	Code no. Industrial pack	Connection Solder ODF × ODF mm	Code no. Multi pack	Code no. Industrial pack

TGE 10							
TGEL 3.7	13.0	3/8 × 5/8	067N3150	067N3170	10 × 16	067N3190	067N3210
TGEL 3.7	13.0	1/2 × 5/8	067N3151	067N3171	12 × 16	067N3191	067N3211
TGEL 4.9	17.2	1/2 × 7/8	067N3152	067N3172	12 × 22	067N3192	067N3212
TGEL 7.4	26.0	1/2 × 5/8	067N3153	067N3173	12 × 16	067N3193	067N3213
TGEL 7.4	26.0	1/2 × 7/8	067N3154	067N3174	12 × 22	067N3194	067N3214
TGEL 7.4	26.0	5/8 × 7/8	067N3155	067N3175	16 × 22	067N3195	067N3215
TGEL 9.9	34.7	5/8 × 7/8	067N3156	067N3176	16 × 22	067N3196	067N3216
TGEL 13.6	47.6	5/8 × 7/8	067N3157	067N3177	16 × 22	067N3197	067N3217
TGEL 13.6	47.6	5/8 × 1 1/8	067N3158	067N3178	16 × 28	067N3198	067N3218

TGE 20							
TGEL 15.5	54.3	5/8 × 7/8	067N3159	067N3179	16 × 22	067N3199	067N3219
TGEL 15.5	54.3	5/8 × 1 1/8	067N3160	067N3180	16 × 28	067N3200	067N3220
TGEL 19.8	69.3	5/8 × 1 1/8	067N3161	067N3181	16 × 28	067N3201	067N3221
TGEL 19.8	69.3	7/8 × 1 1/8	067N3162	067N3182	22 × 28	067N3202	067N3222
TGEL 24.7	86.5	7/8 × 1 1/8	067N3163	067N3183	22 × 28	067N3203	067N3223
TGEL 24.7	86.5	7/8 × 1 3/8	067N3164	067N3184	28 × 28	067N3204	067N3224

TGE 40							
TGEL 32.1	112.4	7/8 × 1 1/8	067N3165	067N3185	22 × 35	067N3205	067N3225
TGEL 32.1	112.4	1 1/8 × 1 3/8	067N3166	067N3186	28 × 35	067N3206	067N3226
TGEL 37.1	130.0	7/8 × 1 3/8	067N3167	067N3187	22 × 35	067N3207	067N3227
TGEL 37.1	130.0	1 1/8 × 1 3/8	067N3168	067N3188	28 × 35	067N3208	067N3228
TGEL 49.4	173.0	1 1/8 × 1 3/8	067N3169	067N3189	28 × 35	067N3209	067N3229

Range K = -25 → +10°C with MOP 167 psig/12.5 bar abs. SS = 4 K

Type and rated capacity Q _{nom.} 2) TR	Rated capacity Q _{nom.} 2) kW	Inch version			mm version		
		Connection Solder 1) ODF × ODF in.	Code no. Multi pack	Code no. Industrial pack	Connection Solder ODF × ODF mm	Code no. Multi pack	Code no. Industrial pack

TGE 10							
TGEL 3.7	13.0	3/8 × 5/8	067N3000	067N3020	10 × 16	067N3040	067N3060
TGEL 3.7	13.0	1/2 × 5/8	067N3001	067N3021	12 × 16	067N3041	067N3061
TGEL 4.9	17.2	1/2 × 7/8	067N3002	067N3022	12 × 22	067N3042	067N3062
TGEL 7.4	26.0	1/2 × 5/8	067N3003	067N3023	12 × 16	067N3043	067N3063
TGEL 7.4	26.0	1/2 × 7/8	067N3004	067N3024	12 × 22	067N3044	067N3064
TGEL 7.4	26.0	5/8 × 7/8	067N3005	067N3025	16 × 22	067N3045	067N3065
TGEL 9.9	34.7	5/8 × 7/8	067N3006	067N3026	16 × 22	067N3046	067N3066
TGEL 13.6	47.6	5/8 × 7/8	067N3007	067N3027	16 × 22	067N3047	067N3067
TGEL 13.6	47.6	5/8 × 1 1/8	067N3008	067N3028	16 × 28	067N3048	067N3068

TGE 20							
TGEL 15.5	54.3	5/8 × 7/8	067N3009	067N3029	16 × 22	067N3049	067N3069
TGEL 15.5	54.3	5/8 × 1 1/8	067N3010	067N3030	16 × 28	067N3050	067N3070
TGEL 19.8	69.3	5/8 × 1 1/8	067N3011	067N3031	16 × 28	067N3051	067N3071
TGEL 19.8	69.3	7/8 × 1 1/8	067N3012	067N3032	22 × 28	067N3052	067N3072
TGEL 24.7	86.5	7/8 × 1 1/8	067N3013	067N3033	22 × 28	067N3053	067N3073
TGEL 24.7	86.5	7/8 × 1 3/8	067N3014	067N3034	28 × 28	067N3054	067N3074

TGE 40							
TGEL 32.1	112.4	7/8 × 1 3/8	067N3015	067N3035	22 × 35	067N3055	067N3075
TGEL 32.1	112.4	1 1/8 × 1 3/8	067N3016	067N3036	28 × 35	067N3056	067N3076
TGEL 37.1	130.0	7/8 × 1 3/8	067N3017	067N3037	22 × 35	067N3057	067N3077
TGEL 37.1	130.0	1 1/8 × 1 3/8	067N3018	067N3038	28 × 35	067N3058	067N3078
TGEL 49.4	173.0	1 1/8 × 1 3/8	067N3019	067N3039	28 × 35	067N3059	067N3079

1) Pressure equalisation = 1/4 in (6 mm) ODF
1)The rated capacity is based on:
- evaporating temperature t_e = 5°C
- liquid temperature t_l = 28°C
- condensing temperature t_c = 32°C

Capacity in kW

R410A

Type and rated capacity	Rated capacity [kW]	Pressure drop across the valve Δp bar								Pressure drop across the valve Δp bar							
		3	6	9	12	15	18	21	24	3	6	9	12	15	18	21	24
		Evaporating temperature +5°C								Evaporating temperature 0°C							
TGEL 3.7	13.0	8.2	10.6	11.9	12.5	12.8	12.8	12.6	12.3	7.9	10.1	11.3	11.8	12.1	12.1	11.9	11.7
TGEL 4.9	17.2	11.2	14.4	16.2	16.9	17.2	17.2	16.9	16.5	10.8	13.9	15.4	16.0	16.3	16.3	16.0	15.6
TGEL 7.4	26.0	16.6	21.3	23.7	24.7	25.0	24.9	24.4	23.6	16.0	20.5	22.6	23.5	23.7	23.6	23.1	22.4
TGEL 9.9	34.7	22.0	28.2	31.3	32.6	32.9	32.6	31.9	30.8	21.4	27.3	30.0	31.1	31.4	31.1	30.4	29.3
TGEL 13.6	47.6	29.4	38.1	43.0	45.4	46.5	46.8	46.4	45.5	28.9	37.4	41.8	43.9	44.9	45.2	44.8	43.9

Capacity in Tons

R410A

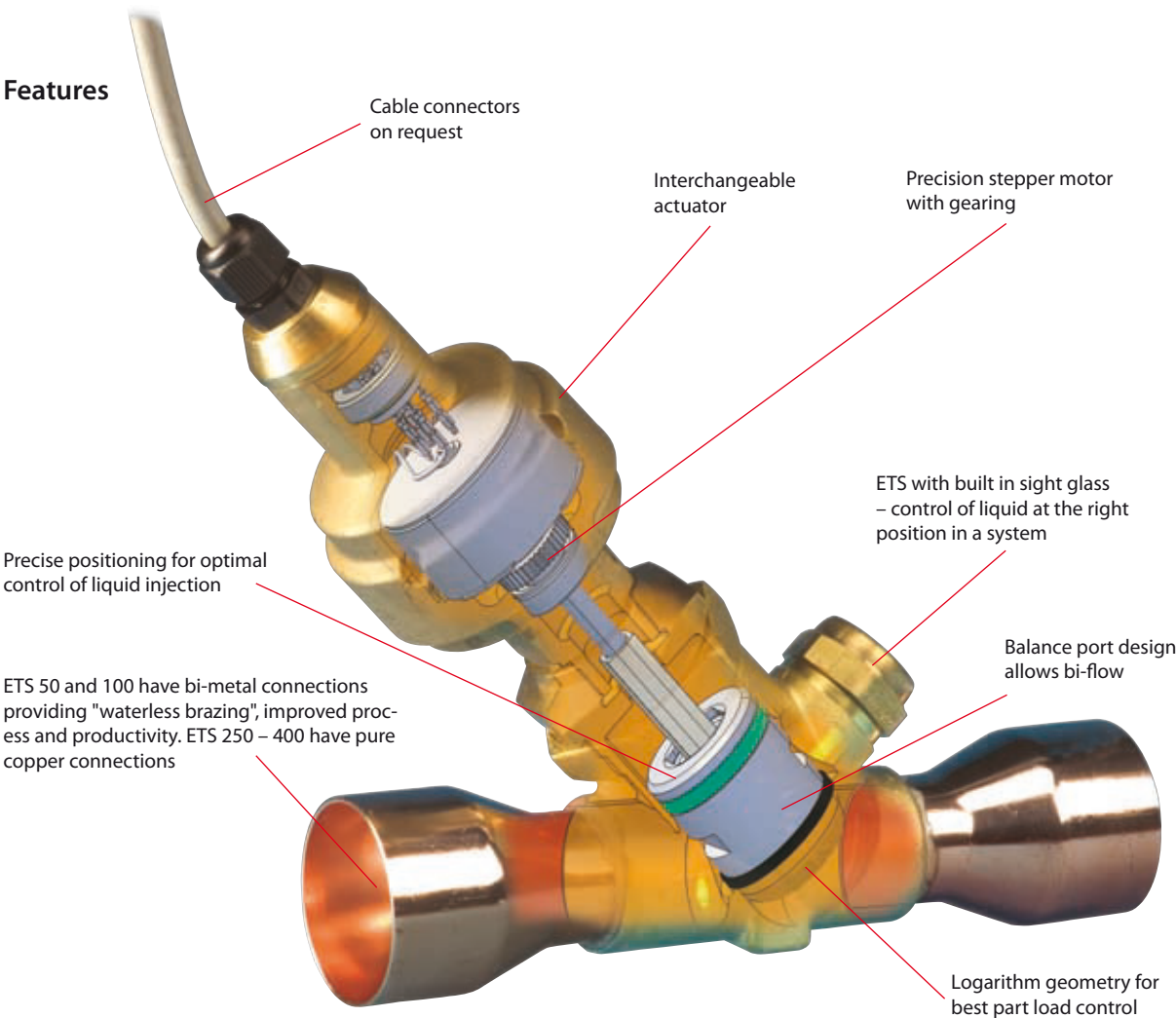
Type	Rated capacity [tons]	Pressure drop across the valve Δp psig								Pressure drop across the valve Δp psig							
		40	70	100	130	160	190	220	250	40	70	100	130	160	190	220	250
Evaporating temperature +30°F										Evaporating temperature +20°F							
TGEL 3.7	3.7	2.3	3.0	3.3	3.4	3.4	3.4	3.3	3.1	2.2	2.8	3.0	3.1	3.2	3.1	3.0	2.9
TGEL 4.9	4.9	3.2	4.1	4.4	4.6	4.6	4.5	4.4	4.2	3.0	3.8	4.1	4.2	4.2	4.2	4.1	3.9
TGEL 7.4	7.4	4.8	6.0	6.5	6.7	6.6	6.5	6.3	6.0	4.5	5.6	6.1	6.2	6.2	6.0	5.8	5.6
TGEL 9.9	9.9	6.4	8.0	8.6	8.8	8.8	8.6	8.2	7.8	6.1	7.6	8.1	8.2	8.2	8.0	7.7	7.3
TGEL 13.6	13.6	8.6	11.0	12.1	12.6	12.7	12.6	12.3	11.9	8.4	10.6	11.5	11.9	12.0	11.9	11.6	11.2



ETS : Precision and reliability

ETS is a series of electrically operated 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. The ETS needs a current or voltage driver as a partner to be operated.

Features



Applications	Advantages	Facts
Air conditioning units	- For manual operation and service of ETS valves an AST-g service driver is available. - Balanced design providing bi-flow operation as well as solenoid tight shut-off function in both flow directions at MOPD 33 bar (478.6 psig). 150 steps/sec. (constant voltage drive) 2625 - 3810 step depending on chopper model. 8.5 - 12.7 sec. with chopper current.	- Reference position: Overdriving against the full close position - ETS 50 and 100 are designed for HFC/ HCFC conditions including R410A, providing 45.5 bar (659.9 psig) working pressure. - Solenoid tight shut-off function.

Technical data and ordering

Valve incl. actuator – Industrial pack (9 pcs.)

Type	Connection		Connection	
	ODF × ODF in	Code no. Industrial pack	ODF × ODF mm	Code no. Industrial pack
ETS 50B	$\frac{7}{8} \times \frac{7}{8}$	034G1000	22 × 22	034G1050
	$\frac{7}{8} \times 1\frac{1}{8}$	034G1001	22 × 28	034G1051
	$\frac{7}{8} \times 1\frac{3}{8}$	034G1002	22 × 35	034G1052
	$1\frac{1}{8} \times 1\frac{1}{8}$	034G1003	28 × 28	034G1053
	$1\frac{1}{8} \times 1\frac{3}{8}$	034G1004	28 × 35	034G1054
ETS 100B	$1\frac{1}{8} \times 1\frac{1}{8}$	034G0000	28 × 28	034G0050
	$1\frac{1}{8} \times 1\frac{3}{8}$	034G0001	28 × 35	034G0051
	$1\frac{1}{8} \times 1\frac{5}{8}$	034G0002	28 × 42	034G0052
	$1\frac{3}{8} \times 1\frac{3}{8}$	034G0003	35 × 35	034G0053
	$1\frac{3}{8} \times 1\frac{5}{8}$	034G0004	35 × 42	034G0054
	$1\frac{5}{8} \times 1\frac{5}{8}$	034G0005	42 × 42	034G0055

Valve incl. actuator and sight glass – Single pack

Type	Connection		
	ODF × ODF [in.]	ODF × ODF [mm]	Code no. Single pack
ETS 50B ²⁾	$\frac{7}{8} \times \frac{7}{8}$	22 × 22	034G1008
	$\frac{7}{8} \times 1\frac{1}{8}$	22 × 28	034G1005
	$1\frac{1}{8} \times 1\frac{1}{8}$	28 × 28	034G1006
ETS 100B	$1\frac{1}{8} \times 1\frac{1}{8}$	28 × 28	034G0007
	$1\frac{3}{8} \times 1\frac{3}{8}$	35 × 35	034G0008

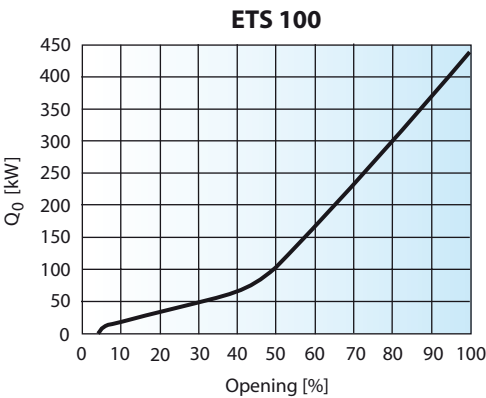
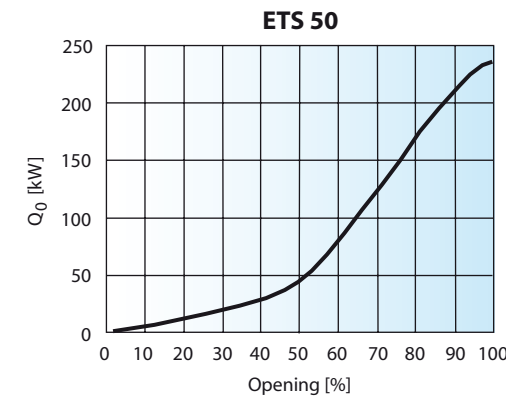
Capacities

Type	Rated capacity ¹⁾	
	R410A	
	kW	TR
ETS 50B ²⁾	262.3	75.7
ETS 100B	488.4	140.9

¹⁾ The rated capacity is based on:
Evaporating temperature t_e : 5°C (40°F)
Liquid temperature t_l : 28°C (82°F)
Condensing temperature t_c : 32°C (90°F)
Full stroke opening.

²⁾ ETS 25B is available upon request. Please contact Danfoss.
Note: ETS 25B is half the capacity of ETS 50B.

Valve operation



Capacity based on: R407C
 t_e = 5°C (40°F)
 t_l = 28°C (82°F)
 t_c = 32°C (90°F)



EKD 316 – Controller for evaporators

The EKD 316 controller for electronic expansion valves can operate as a standalone controller or as interface (driver) between a central system and an electronic expansion valve. The EKD 316 controller is compatible with all Danfoss ETS and KVS valves. It is designed specifically for evaporator control in water chillers and rooftop units. Only parameters needed for those applications are shown in the menus. Once the parameters are set with an EKA 164A Universal Setting Module, they can be read via the EKA 164A or via Modbus communication protocol.



Functions

- Superheat control
- MOP function
- ON-OFF input allows manual valve closing
- Valve opening degree can be manually set
- User programmable alarm output
- Single or double loop (using extra sensor) PI regulation
- Bipolar constant current stepper motor driver

Advantages

- Compatible with all Danfoss ETS and KVS stepper motor valves
- 24 Volt a.c or d.c.
- Quick, easy plug-in connectors
- Modbus communication
- Can be remote from valveMounts on DIN rail
- Standalone or slave using any standard voltage or current analog signal
- Battery backup terminals
- Ratiometric pressure transmitter input connection
- User programmable for any of 31 common refrigerants

Technical data and ordering

Technical data

Supply voltage	24 V a.c. +/-15% 50/60 Hz, 10 VA (supply voltage galvanically isolated from the input and output signals)	
Power consumption	Controller	5 VA
	ETS step motor	1.3 VA
Input signal	Current signal	4-20 mA or 0-20 mA
	Voltage	0-10 V or 1-5 V
	Digital input from external contact function	
Ditital (on-off input	1 for switched valve shutdown	
Analog sensor inputs	2 for Pt1000 temperature sensors	
	1 for AKS 32R pressure transmitter	
Alarm relay	1 pcs. SPST	AC-1: 4 A (ohmic)
		AC-15: 3 A (inductive)
Step motor output	Step motor output	
Data communication	MODBUS	
Environments	0 to 131°F (0 to +55°C), during operations-	
	40 to 158°F (-40 to +70°C), during transport	
	20 - 80% Rh, not condensed	
Enclosure	Shockproof, vibration- proof	
	IP 20	
Weight	0.6 lb (300 g)	
Mounting	DIN rail	
Operation	External display type EKA 164A	
Approvals	EU Low Voltage Directive and EMC demands re CE-marking	
	complied with.	
	LVD-tested acc. to EN 60730-1 and EN 60730-2-9	
Battery backup	EMC-tested acc. to EN50081-1 and EN 50082-2	
	18 V dc min. 100 mAh required	
Max. distance between controller and valve	16.4 ft (5 m)	

The installation of data communications must comply with the requirements described in literature sheet no. RC8AC

Ordering

Type	Description	Code no.
EKD 316	Superheat controller	084B8040
EKA 164A	Display (with MODBUS communication)	084B8563

Accessories

AKA 211	Cable filter *	084B2238
AKS 21	Pt 1000 Sensor	084N2003
AKS 32R	Pressure transmitter -1/12 bar, 0.3%	060G0090

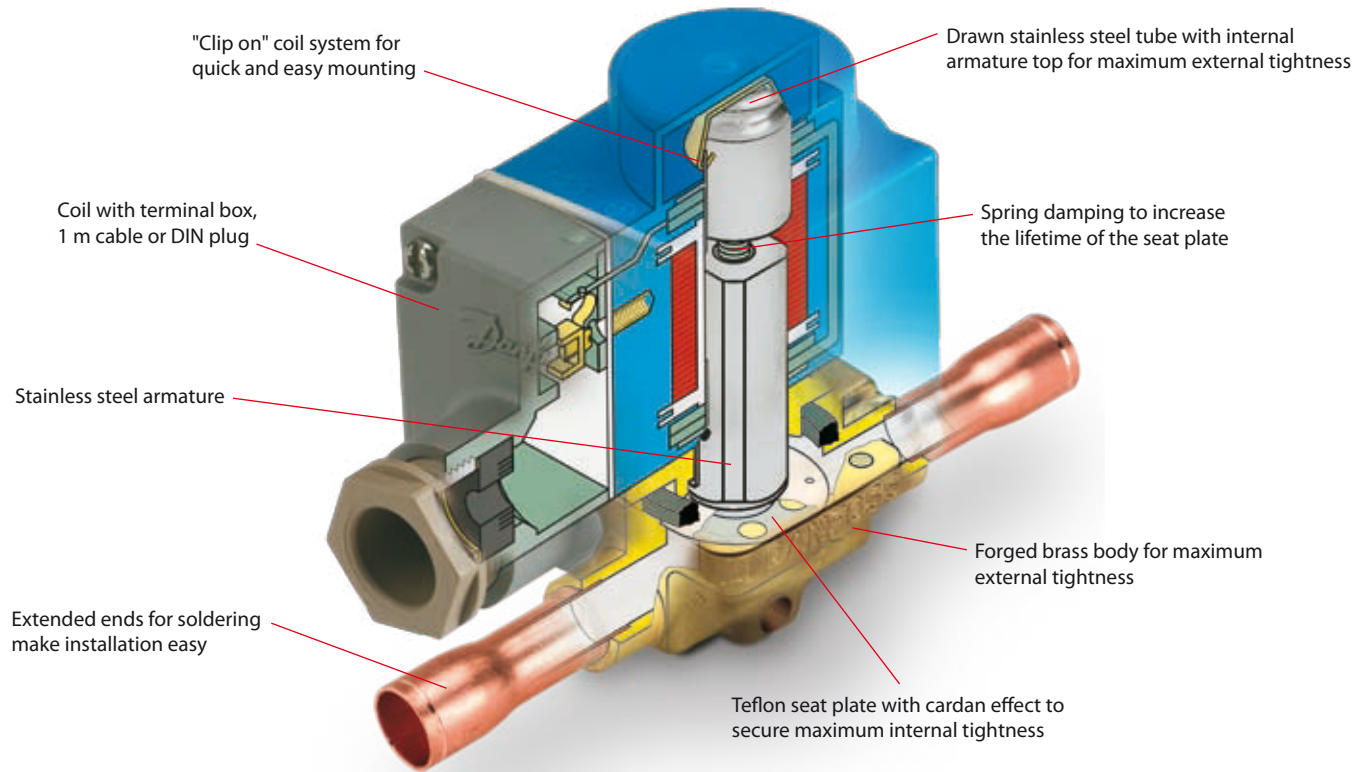
* When cable lengths exceed 5 m, max. cable length with filter: 50 m



EVRH: high reliability and flexibility

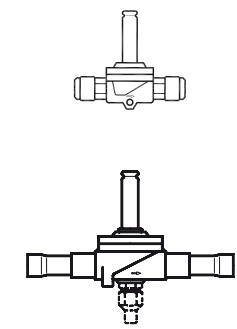
EVR valves are direct or servo-operated solenoid valves for liquid, suction and hot gas lines. They are suitable for condensing units and power packs in all refrigeration, freezing and air conditioning applications and are compatible with fluorinated refrigerants, including high-pressure refrigerants such as R410A (EVRH). The valves can be delivered as normally open and normally closed valves as well as with or without manual operation.

Features



Applications	Advantages	Facts
- Heat pump systems - Air conditioning units - Liquid coolers	- Complete programme of valves and coils for every application. - Wide range of coils for a.c. and d.c. - Wide range of connection types and sizes. - Normally open or normally closed. - With or without manual operation. - High reliability and durability due to maximum internal and external tightness.	- Temperature range: -40 to 105°C - Max. working pressure (MWP 45,2 bar) - MOPD up to 38 bar with 20 W a.c. coil. 100% test of functionality, internal/external leakage and electrical characteristics.

Technical data and ordering



Separate valve bodies, normally closed (NC)

Type	Required coil type	Connection		Code no. ¹⁾				k _v value ²⁾
				Valve body without coil				
		in.	mm	in.	mm	With manual operation	Without manual operation	
EVR 2	a.c.	¼	6	032F1201	032F1202			0.16
EVR 3	a.c./d.c.	¼	6	032F1206	032F1207			0.27
		¾	10	032F1204	032F1208			
EVRH 6		¾	10	032F1052	032F1053			0.8
EVRH 10		½	12	032F1054	032F1055			1.9
EVRH 15		¾	16	032F1056	032F1056			2.6
EVRH 20	a.c.	7/8	22	032F1057	032F1057			5.0
	d.c.	7/8	22	032F1058	032F1058			

EVRH22.25.32 and 40 for R410A can be supplied on request. Please contact Danfoss

Mounting bracket

Mounting bracket	For mounting EVR 2, 3, 6 and 10	032F0197
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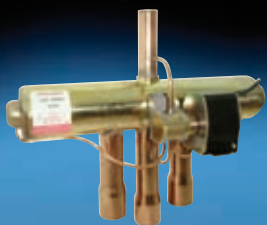
Coils - alternating current a.c.

Type	Voltage V	Frequency Hz	Code no. ¹⁾				Appendix no.	Power consumption
			With 1 m 3-core cable IP 67	With terminal box IP 67	With DIN plugs and protective cap IP 20	With DIN plugs		
EVR 2 → 40 (NC)	12	50	018F6256	018F6706	018F6181		15	Holding: 10 W 21 VA Inrush: 44 VA
	24	50	018F6257	018F6707	018F6182	018F7358	16	
	42	50	018F6258	018F6708	018F6183		17	
	48	50	018F6259	018F6709	018F6184		18	
	115	50	018F6261	018F6711	018F6186	018F7361	22	
	220-230	50	018F6251	018F6701	018F6176	018F7351	31	
	240	50	018F6252	018F6702	018F6177	018F7352	33	
	380-400	50	018F6253	018F6703	018F6178		37	
	420	50	018F6254	018F6704	018F6179		38	
	24	60	018F6265	018F6715	018F6190		14	
	115	60	018F6260	018F6710	018F6185		20	
	220	60	018F6264	018F6714	018F6189		29	
	240	60	018F6263	018F6713	018F6188		30	
	110	50/60	018F6280	018F6730	018F6192	018F7360	21	
	220-230	50/60	018F6282	018F6732	018F6193	018F7363	32	

Terminal box with LED light indicator

Terminal box	With built-in light emitting indicator diode for solenoid valves	018Z0089
DIN socket		042N0156

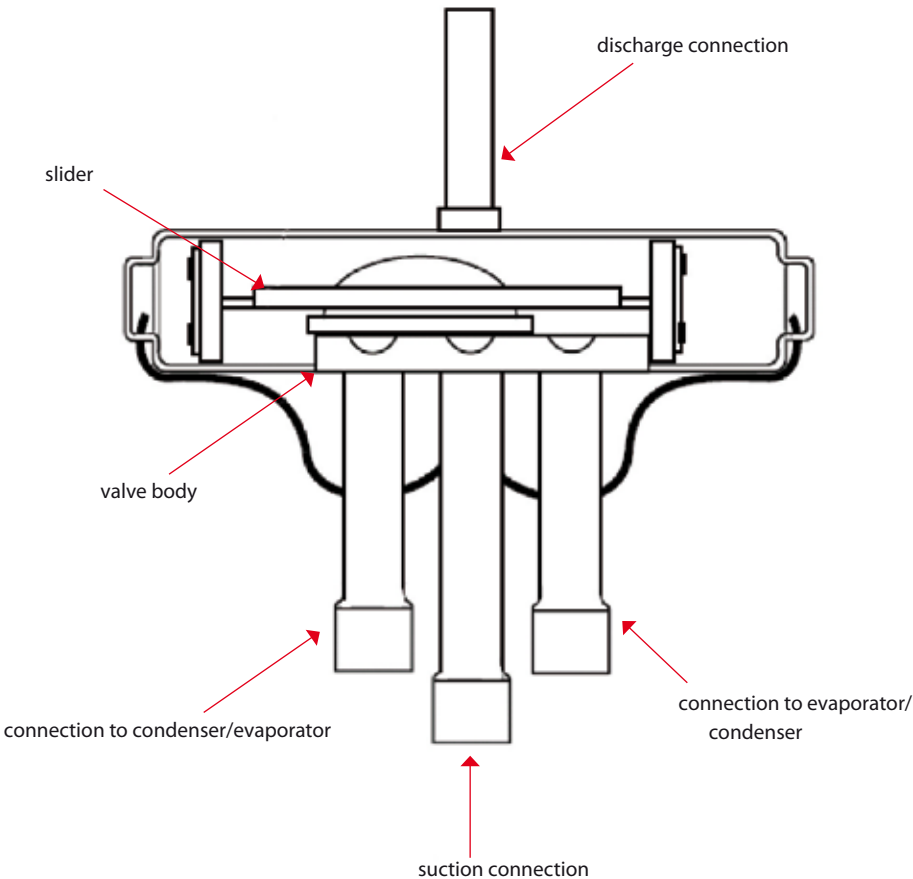
¹⁾ Code numbers in bold are normally on stock and a shorter delivery time can therefore be expected.
²⁾ The k_v value is the water flow in m³/h at a pressure drop across valve of 1 bar, ρ = 1000 kg/m³.



VHV and STF: 4-way reversing valves

Pilot operated 4-way reversing valves allow an inversion of the refrigeration cycle, changing from cooling mode in summer to heating mode in winter. 4 way valves are also used in defrost cycles in order to allow hot gas to be sent into iced up evaporators. The cycle inversion is initiated by a small solenoid pilot valve, which controls the movement of a slider, and in turn governs the refrigerant flow path. The valve is connected to the discharge and suction of the compressor.

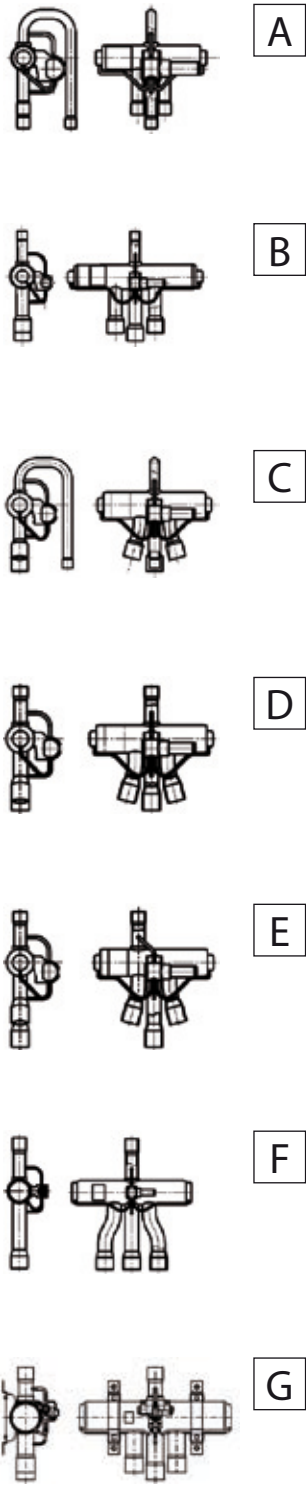
Features



Applications	Advantages	Facts
- Reversing chillers - Packaged air conditioning systems - Room air conditioning systems	- Each model can be used with R410A refrigerant as well as R407C, R134a, R404A, R22 - Different tube diameters and configurations available - Designed for instantaneous changeover with minimum pressure differential - Minimized leakage in the valve - Reduced pressure drop due to unique design (shape of internal elements)	- Wide application range for all commonly used refrigerants: (R134A, R404A, R407C, R22 and R410A) - Max. working pressure: 45 bar - Ambient temperature: -20 to 55°C - Full capacity range up to 400 kW - Largest valve available on the market (VHV-6001) 30 years of experience and know-how

Technical data and ordering

Model	Discharge		Suction		Nominal capacity ¹⁾	Style	Code no.	Box qty
	mm	inch	mm	in.				
STF-0101G	8.10	5/16	9.70	3/8	5.87	A	061L1206	4
STF-0101G	8.10	5/16	9.70	3/8	5.87	A	061L1188	45
STF-0104G	8.10	5/16	9.70	3/8	6.93	A	061L1143	45
STF-0201G	9.70	3/8	12.95	1/2	11.2	A	061L1207	3
STF-0201G	9.70	3/8	12.95	1/2	11.2	A	061L1144	32
STF-0202G	9.70	3/8	12.95	1/2	11.2	A	061L1139	32
STF-0204G	9.70	3/8	16.03	5/8	11.2	D	061L1145	32
STF-0205G	8.10	5/16	12.95	1/2	11.2	B	061L1146	32
STF-0208G	9.70	3/8	16.03	5/8	11.2	C	061L1147	32
STF-0209G	9.70	3/8	12.95	1/2	11.2	B	061L1148	32
STF-0214G	12.95	1/2	16.03	5/8	11.2	D	061L1149	32
STF-0301G	12.95	1/2	16.15	5/8	13.59	E	061L1208	4
STF-0301G	12.95	1/2	16.15	5/8	13.59	E	061L1150	32
STF-0306G	12.95	1/2	19.2	3/4	13.59	E	061L1151	32
STF-0401G	12.80	1/2	19.15	3/4	24.8	B	061L1209	2
STF-0401G	12.80	1/2	19.15	3/4	24.8	B	061L1152	24
STF-0404G	12.80	1/2	19.15	3/4	24.8	B	061L1193	24
STF-0409G	12.80	1/2	22.40	7/8	24.8	B	061L1154	24
STF-0413G	16.00	5/8	22.40	7/8	24.8	B	061L1155	24
STF-0420G	12.80	1/2	22.40	7/8	28.26	B	061L1156	24
STF-0712G	19.15	3/4	22.30	7/8	42.11	B	061L1223	1
STF-0712G	19.15	3/4	22.30	7/8	42.11	B	061L1195	6
STF-0715G	22.50	7/8	28.70	1 1/8	42.11	B	061L1158	6
STF-0728G	22.50	7/8	22.30	7/8	42.11	B	061L1160	6
STF-1511G	22.50	7/8	28.90	1 1/8	46.9	F	061L1224	1
STF-1513G	22.50	7/8	35.22	1 3/8	46.9	F	061L1217	1
STF-1514G	28.90	1 1/8	35.22	1 3/8	46.9	F	061L1218	1
STF-2011G	22.50	7/8	28.90	1 1/8	59.98	B	061L1219	1
STF-2017G	28.70	1 1/8	45.15	1 3/8	59.98	B	061L1225	1
VHV-2501 ²⁾	25.70	1	32.05	1 1/4	90.62	G	061L1175	1
VHV-2505	28.70	1 1/8	45.15	1 3/8	90.62	G	061L1191	1
VHV-2506	28.70	1 1/8	41.70	1 5/8	90.62	G	061L1192	1
VHV-3001	32.05	1 1/4	38.40	1 1/2	127.96	G	061L1176	1
VHV-3003	28.50 ³⁾	1 1/8	41.70	1 5/8	127.96	G	061L1183	1
VHV-4001	38.35	1 1/2	45.15	1 3/4	178.6	G	061L1179	1
VHV-4002	41.20 ³⁾	1 5/8	41.70	1 5/8	178.6	G	061L1184	1
VHV-5001	38.35	1 1/2	54.40	2 1/8	225.58	G	061L1180	1
VHV-5002	41.20 ³⁾	1 5/8	54.40	2 1/8	225.58	G	061L1185	1
VHV-6001	41.20 ³⁾	1 5/8	67.00	2 5/8	342.19	G	061L1186	1



Model ⁴⁾	Cable length mm	Rated voltage	Code no.	Box qty
STF-01AB500A1	600	24 V AC	061F2092	10
STF-01AB503B1	1200	24 V AC	061L2038	100
STF-01AJ506B1	600	220-240 V AC	061L2093	10
STF-01AJ504F1	1200	208-240 V AC	061L2016	100
STF-01AJ504F1	1200	208-240 V AC	061L2094	10
STF-01AJ512D1	2000	220-240 V AC	061L2095	10
STF-01AJ512D1	2000	220-240 V AC	061L2074	60

1) The nominal capacities for R410A: Cond. t° 38°C, evap. t° 5°C superheat 5°C, subcooling 0°C, Δp 0.2 bar
2) STF coils can be used with all STF and VHV valves



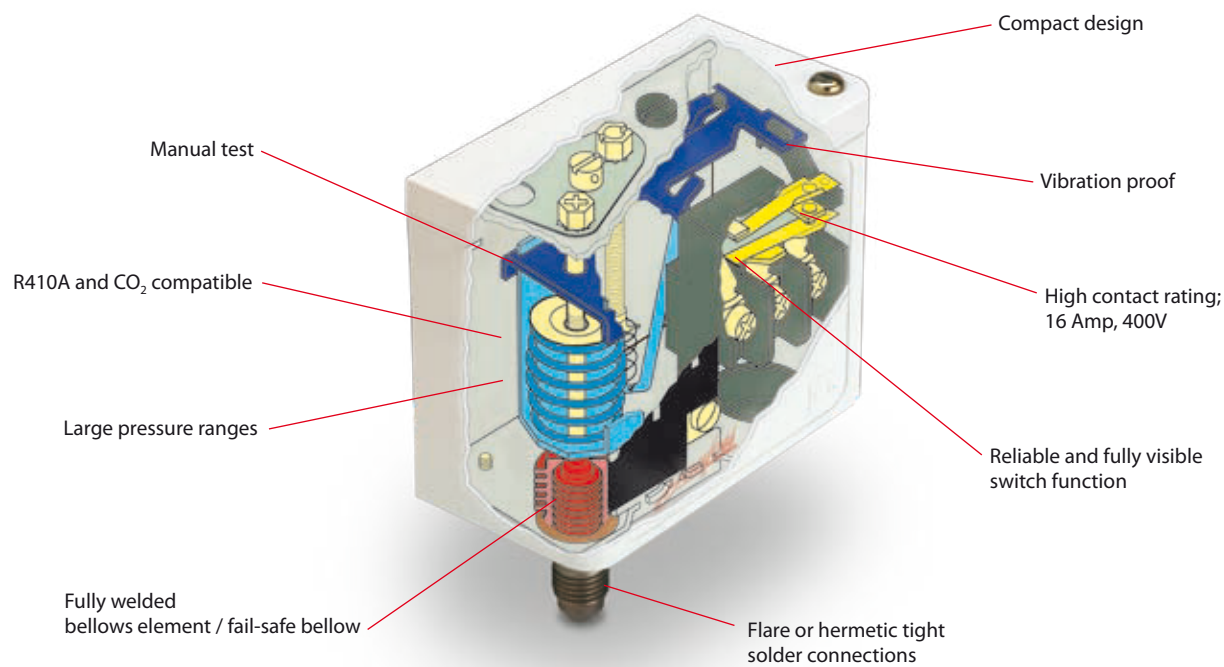


KP: excellent operation and easy installation

KP pressure controls are designed to protect refrigeration systems from excessively high discharge pressures, excessively low suction pressures, to start/stop compressors or to operate fans of aircooled condensers.

The enhanced contact system for 16 Amp makes it possible to operate electrical motors up to 2 kW directly, without the use of contactors.

Features



Applications	Advantages	Facts
- Heat pump systems - Air conditioning units - Liquid coolers	- Easy to handle compact design with large and visible scale plates. - Particularly vibration and shock resistant. - Accurate and reliable compressor operation due to excellent electro-mechanical function. - Easy functional check with manual test function of contact system (no tools). - Easy to install electrical connection which also facilitates rack mounting.	- Approval: CE and UL. - Pressure controls available with flare, solder or capillary tube connections. - IP 30 and IP 44 enclosures available. - KP with fail-safe bellows element. - Max working pressure 46.5 bar

Technical data and ordering



Pressure controls with DIN 32733 approval, for fluorinated refrigerants

Type ²⁾	Pressure	Low pressure (LP)		High pressure (HP)		Reset		Contact system	Code no. ¹⁾		
		Regulating range bar	Differential Δp bar	Regulating range bar	Differential Δp bar	LP	HP		¼ in. 6 mm flare	¼ in. ODF solder	6 mm ODF solder
KP 1	Low	-0.2 → 7.5	0.7 → 4.0			Aut.		SPDT	060-110166	060-111266	060-111066
		-0.9 → 7.0	Fixed 0.7			Man.			060-110366	060-111166	060-110966
KP 2	Low	-0.2 → 5.0	0.4 → 1.5			Aut.		SPDT	060-112066		060-112366
KP 6W	High			8 → 42	4 → 10		Aut.	SPDT	060-519066		
KP 6B	High			8 → 42	Fixed 4		Man.	SPDT	060-519166		

Mounting brackets

Type	Code no. ¹⁾
Wall bracket	060-105566
Angle bracket	060-105666

¹⁾ Code numbers in bold are normally on stock and a shorter delivery time can therefore be expected.

²⁾ KP 6, 7 and 17 with fail-safe bellows element.



ACB: Cartridge Pressure Controls

The ACB series cartridge switches, are small disc type pressure controls manufactured by Danfoss Saginomiya in Poland. The core steps of the manufacturing process of these controls are carried out using precision manufacturing techniques, and within a clean-room environment. This ensures that product specifications can be guaranteed over a longer period, providing reliable performance during the whole product lifetime.

Features

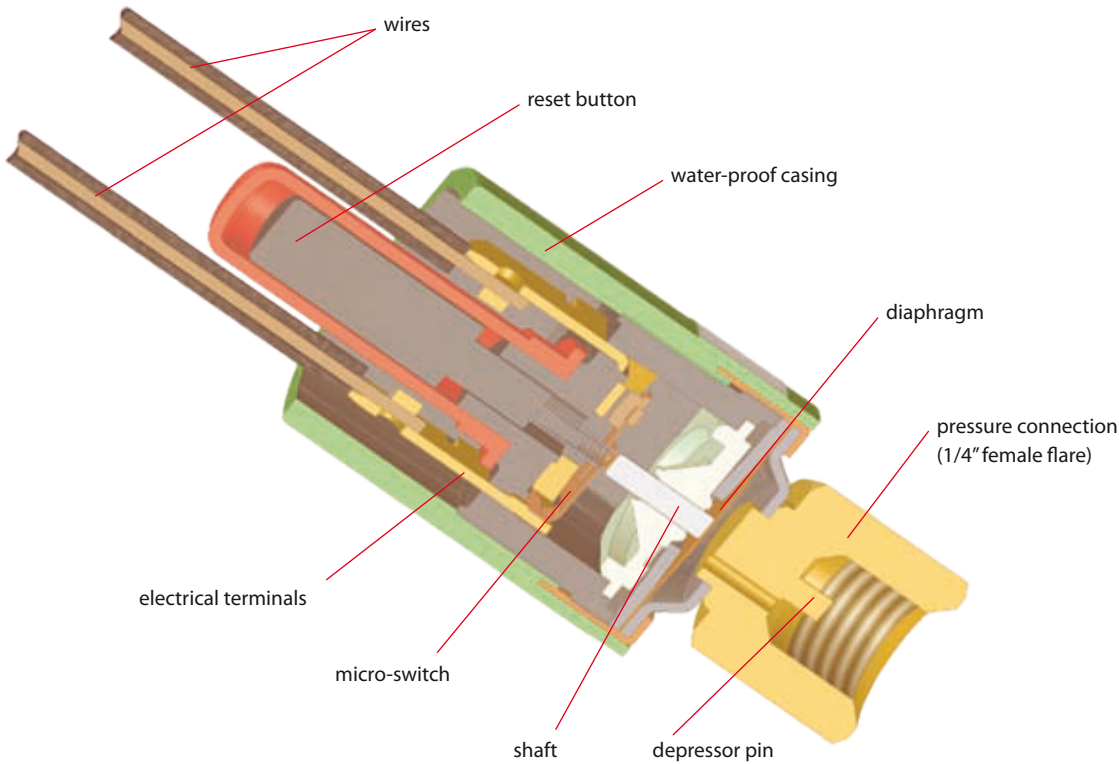


Fig.: type SPST manual reset

Applications	Advantages	Facts
- Heat pump systems - Air conditioning units - Liquid coolers	- Compact and easy to install - Excellent reliability and repeatability - Wide choice of specifications: set-point, pressure connection, electrical connection - Over 100million pcs installed in the field	- CE, TÜV, VDE, UL and C-UL approvals (SPDT man. only CE approvals) - Contact load up to 6 A (250 V AC) - Normally Closed (NC), Normally Open (NO) or SPDT contact system - Spades or cables (1,5 m cable for standard program) - Pressure range from - 0,50 bar to 45 bar - Automatic or manual reset - IP 65 (water proof version with cables) and IP 40 (version with spade connectors) available

Technical data and ordering

Application	Reset	Cut out	Cut in	Contact system/ enclosure type: W-water-proof 1) S-with spades 2)	Connection		
		bar	bar		Solder		1/4" female flare
					6mm	1/4"	
High pressure cut out	automatic	42 ± 1,2	33 ± 2,0	SPST-NC / W	061F7515	061F7516	061F7517
	manual			-	-	061F9575	
	automatic			SPDT / W	-	-	061F9052
Low pressure cut-out	automatic	0,5 ± 0,4	1,5 ± 0,3	SPST-NO / W	061F7518	061F7519	061F7520
		0,5 ± 0,5	1,5 ± 0,5	SPST-NO / S	-	061F7402	061F7400
				SPDT / S	-	061F9106	061F9102
	automatic	0,7 ± 0,5	1,7 ± 0,4	SPST-NO / W	061F7521	061F7522	061F7523
				SPDT / W	-	-	061F9058
		0,7 ± 0,5	1,7 ± 0,5	SPST-NO / S	-	061F7403	061F7401
	SPDT / S			-	061F9105	061F9101	
	automatic	1,7 ± 0,5	2,7 ± 0,4	SPST-NO / W	061F7524	061F7525	061F7526
	Fan Control	automatic	8,5 ± 1,2	11 ± 0,8	SPST-NO / W	061F8491	-
13 ± 1,5			16 ± 1,0	061F8334		-	061F8333

¹⁾ Waterproof models (IP 65) with 1,5 m wires AWG18, packed per 20 pcs

²⁾ Models with spade connectors (IP 40), packed per 50 pcs



Sensors and transmitters

Danfoss can supply a wide range of sensors and transmitters for electronic control of refrigeration applications.



Temperature sensors

- Temperature sensors are temperature dependent resistance sensors.
- The sensors are adjusted and meet the tolerance requirements of DIN IEC 751 class B.
- Sensors in the EKS series are mainly for use in air conditioning and comfort applications where there is a focus on the design of the unit and where the requirements to the temperature regulation are less demanding.
- The EKS sensors consist of a PTC element (1000 ohm at 25°C).

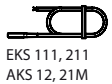
Pressure transmitters

- AKS pressure transmitters are designed for precise and energy optimized control.
- The robust design makes AKS suitable for a wide range of applications, such as:
 - Air conditioning systems-Refrigeration plants
 - Process control applications
 - Laboratory applications
- Product range:
 - 4 - 20 mA (AKS 33, AKS 3000)
 - 1 - 5 V d.c.,
 - 1 - 6 V d.c.,
 - 0 - 10 V d.c. (AKS 32)10
 - 90% ratiometric output (AKS 32R)

Technical data and code numbers

Temperature sensors

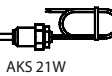
Type	Code number	Signal	Measure range	Sensor tube	Electrical connection	Cable length
EKS 111	084N1178	PTC1000	-55 → 100°C	Round	Cable with pins	1.5 m
EKS 111	084N1179	PTC1000	-55 → 100°C	Round	Cable with pins	3.5 m
EKS 111	084N1182	PTC1000	-55 → 100°C	Round	AMP Plug	3.5 m
EKS 211	084B4404	NTC5000	-40 → 80°C	Round	Cable	3.5 m
EKS 211	084N1220	NTC5000	-40 → 80°C	Round	Cable	1.5 m
AKS12	084N0036	PT1000	-40 → 80°C	Round	Cable	1.5 m
AKS12	084N0045	PT1000	-40 → 80°C	Round	AMP Plug	5.5 m
AKS 11	084N0003	PT1000	-50 → 100°C	Concave	Cable	3.5 m
AKS 11	084N0005	PT1000	-50 → 100°C	Concave	Cable	5.5 m
AKS 11	084N0008	PT1000	-50 → 100°C	Concave	Cable	8.5 m
AKS 21 M	084N2003	PT1000	-70 → 180°C	Round	Cable	2.5 m
AKS 21 W	084N2017	PT1000	-70 → 180°C	Sensor pipe	Cable	2.5 m
AKS 21 D	084N2035	PT1000	-40 → 80°C	Channel bulb	Terminal socket/Type B	-
Accessories	060G1034				Plug 3 + E (female) + 5 m cable	-



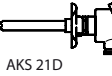
EKS 111, 211
AKS 12, 21M



AKS 11



AKS 21W



AKS 21D

Pressure transmitters

Type	Code number	Signal	Measure range	Max. working pressure	Electrical connection	Connection
------	-------------	--------	---------------	-----------------------	-----------------------	------------

AKS 32/32R, 10-90% rated output signal, 4.75-8 V d.c., 0.3% FS

AKS 32	060G2069	0.5 → 4.5 V	-1/12 bar	33 bar	DIN 43650-A Connection without plug	7/16-20 UNF flare
AKS 32	060G2071	0.5 → 4.5 V	-1/34 bar	55 bar		
AKS 32R	060G0090	0.5 → 4.5 V	-1/12 bar	33 bar		
AKS 32R	060G1036	0.5 → 4.5 V	-1/34 bar	55 bar		



AKS 32



AKS 32R

AKS 33, 4-20 mA output signal, 10-30V d.c. supply voltage, 0.3% FS

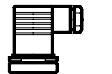
AKS 33	060G2048	4 → 20 mA	-1/6 bar	33 bar	DIN 43650-A Plug Pg 9	7/16-20 UNF flare
AKS 33	060G2050	4 → 20 mA	-1/12 bar	33 bar		
AKS 33	060G2045	4 → 20 mA	-1/20 bar	40 bar		
AKS 33	060G2051	4 → 20 mA	-1/34 bar	55 bar		G3/8 EN 837
AKS 33	060G2104	4 → 20 mA	-1/6 bar	33 bar		
AKS 33	060G2105	4 → 20 mA	-1/12 bar	33 bar		
AKS 33	060G2107	4 → 20 mA	-1/34 bar	55 bar		



AKS 33

AKS 3000, 4-20 mA output signal, 10-30V d.c. supply voltage, 1.0% FS

AKS 3000	060G1323	4 → 20 mA	-1/12 bar	33 bar	DIN 43650-A Plug Pg 9	7/16-20 UNF flare
AKS 3000	060G1327	4 → 20 mA	0/30 bar	55 bar	DIN 43650-A Plug Pg 9	G3/8 EN 837
AKS 3000	060G1896	4 → 20 mA	-1/12 bar	33 bar	DIN 43650-A Plug Pg 9	G3/8 EN 837
AKS 3000	060G1041	4 → 20 mA	0/25 bar	40 bar	DIN 43650-A Plug Pg 9	G3/8 EN 837
AKS 3000	060G1066	4 → 20 mA	0/40 bar	100 bar	DIN 43650-A Plug Pg 9	G3/8 EN 837



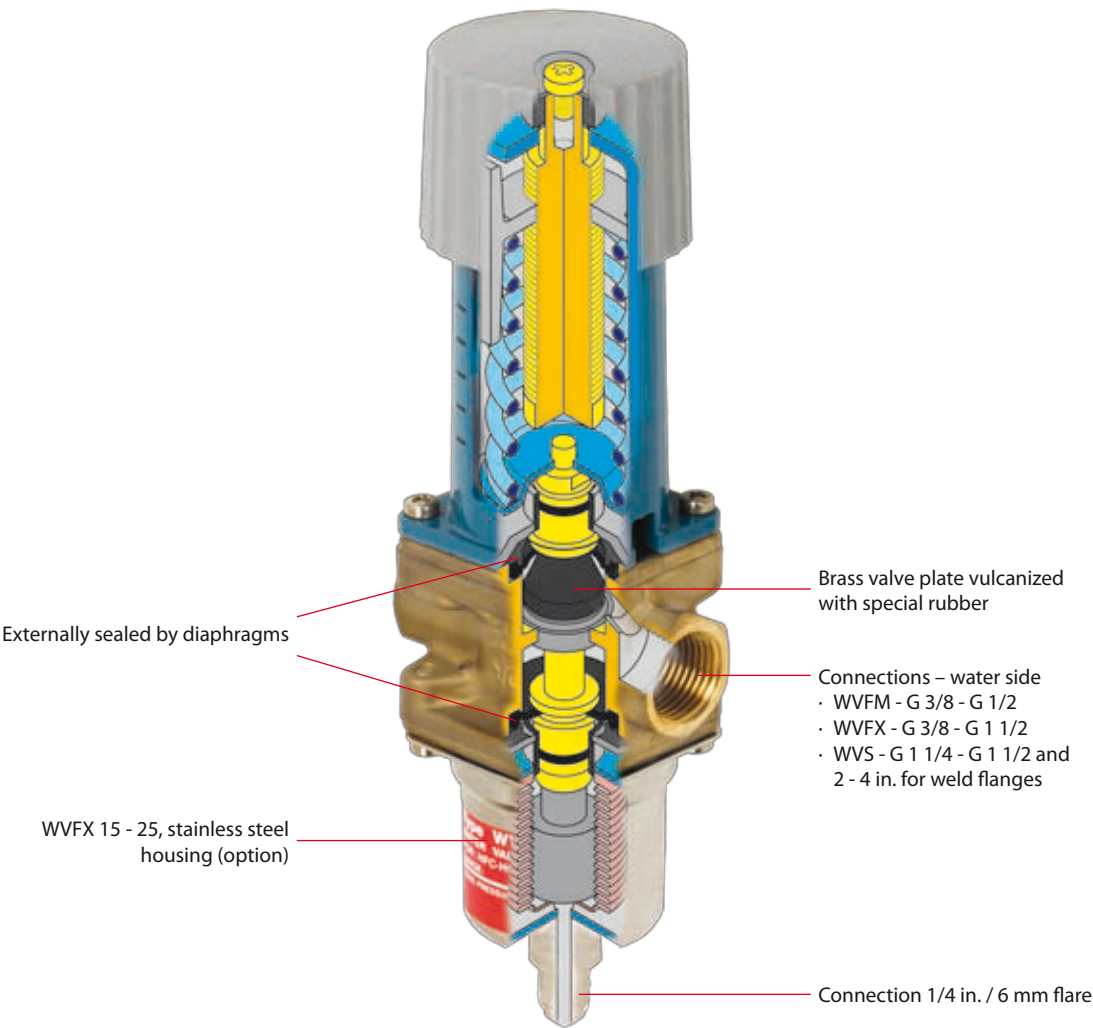
AKS 3000



WVFX: Correct condensing and receiver pressure

The pressure controlled water valve WVFX are used for regulating the flow of water in plants with water-cooled condensers. The water valve modulates the condensing pressure to maintain it at a constant level during operation. When the refrigeration plant is stopped, the cooling water flow is shut off automatically.

Features



Technical data and ordering



WVFX, complete valves

Type	Connection		Range bar	Code no.
	Water side ISO 228/1	Condenser side		
WVFX 10	G 3/8	1/4 in. / 6 mm flare	15 → 29	003N1410
WVFX 15	G 1/2	1/4 in. / 6 mm flare	15 → 29	003N2104
WVFX 20	G 3/4	1/4 in. / 6 mm flare	15 → 29	003N3410
WVFX 25	G 1	1/4 in. / 6 mm flare	15 → 29	003N4410

Accessories

Description	Code no.
1 m capillary tube 1/4 in. (6 mm) flare coupling nuts at each end	060-0071
Bracket for WVFX 10 → 25	003N0388

Technical data

Type	Refrigerant	Condenser side			Media	Liquid side		k _v value ¹⁾ m ³ /h
		Control press. adjust- able closing press. bar	Max. work- ing pressure PB bar	Max. test pres- sure p' bar		Max. work- ing pressure PB bar	Max. test pres- sure p' bar	
WVFX 10	CFC, HCFC, HFC	3.5 → 16.0	26.4	29.0	Fresh water, neutral brine	16	24	1.4
WVFX 10 2)		4.0 → 23.0	26.4	29.0		16	24	1.4
WVFX 15		3.5 → 16.0	26.4	29.0		16	24	1.9
WVFX 15 2)		4.0 → 23.0	26.4	29.0		16	24	1.9
WVFX 20		3.5 → 16.0	26.4	29.0		16	24	3.4
WVFX 20 2)		4.0 → 23.0	26.4	29.0		16	24	3.4
WVFX 25		3.5 → 16.0	26.4	29.0		16	24	5.5
WVFX 25 2)		4.0 → 23.0	26.4	29.0		16	24	5.5

1) The k_v value is the flow of water in m³/h at a pressure drop across valve of 1 bar, ρ = 1000 kg/m³.
2) Fully open valve requires 33% higher pressure than a WVFX, range 3.5 → 16 bar.

Applications

- Air conditioning units
- Other applications with watercooled condenser

Advantages

- The valves are pressure-relieved in such a way that a variation in the water pressure will not affect their setting.

Facts

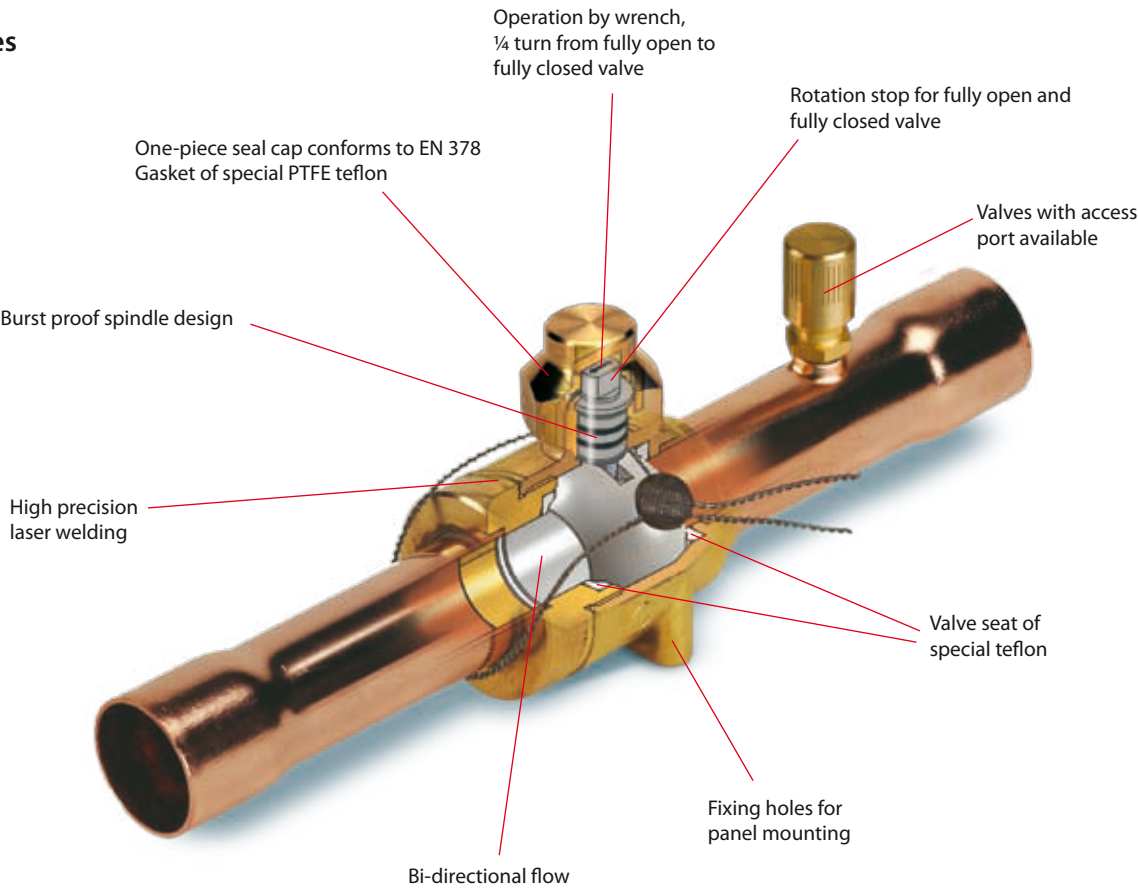
- Below 20% of max. capacity the WVS will act as an on-off regulator.
- Max working pressure: 45.2 bar



GBC: excellent mounting and service

GBC ball valves are manually operated shut-off valves suitable for bi-directional flow. Ball valves are used in liquid, suction and hot gas lines in refrigeration, freezing and air conditioning systems. The GBC bi-directional ball valves can be delivered with or without external access port. The valves have one-piece wire seal cap to prevent unintentional cap removal or tampering between services.

Features



Applications

- GBC valves are used in liquid, suction and hot gas lines in all and air conditioning systems with fluorinated refrigerants.

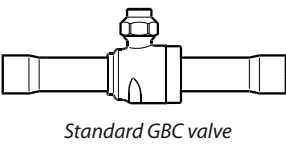
Advantages

- Full flow with minimum pressure drop.
- Bi-directional flow, i.e. valve orientation is unimportant.
- Slimline design ensures easy operational handling.
- Burst proof spindle design prevents liquid from being trapped internally.
- Valve seat of special teflon to secure maximum tightness and a long life-time.
- The available access port saves money if service of the system is necessary.

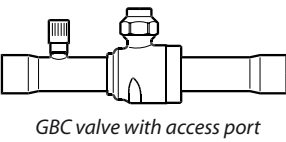
Facts

- Temperature range: -40 to +150°C
- Max. working pressure (PS/MWP) 45 bar (650 psig).
- Test pressure: 65 bar (940 psig).
- Approvals: UL, CSA and CE.

Technical data and ordering



Standard GBC valve



GBC valve with access port

Standard valve

Type	Solder ODF connection		Solder ODF connection		k _v value ¹⁾
	in.	Code no. ²⁾	mm	Code no. ²⁾	
GBC 6s	1/4	009G7020	6	009G7030	2.0
GBC 10s	3/8	009G7021	10	009G7031	5.7
GBC 12s	1/2	009G7022	12	009G7032	10.6
GBC 16s	5/8	009G7023	16	009G7023	14.1
GBC 18s	3/4	009G7024	18	009G7035	20.4
GBC 22s	7/8	009G7025	22	009G7025	28.2
GBC 28s	1 1/8	009G7026	28	009G7033	52.0
GBC 35s	1 3/8	009G7027	35	009G7027	80.9
GBC 42s	1 5/8	009G7028	42	009G7034	121
GBC 54s	2 1/8	009G7029	54	009G7029	225
GBC 67s	2 5/8	009G7036			246
GBC 79s	3 1/8	009G7037			223

Valve with access port

Type	Solder ODF connection		Solder ODF connection		k _v value ¹⁾
	in.	Code no. ²⁾	mm	Code no. ²⁾	
GBC 6s	1/4	009G7050	6	009G7060	2.0
GBC 10s	3/8	009G7051	10	009G7061	5.7
GBC 12s	1/2	009G7052	12	009G7062	10.6
GBC 16s	5/8	009G7053	16	009G7053	14.1
GBC 18s	3/4	009G7054	18	009G7065	20.4
GBC 22s	7/8	009G7055	22	009G7055	28.2
GBC 28s	1 1/8	009G7056	28	009G7063	52.0
GBC 35s	1 3/8	009G7057	35	009G7057	80.9
GBC 42s	1 5/8	009G7058	42	009G7064	121
GBC 54s	2 1/8	009G7059	54	009G7059	225
GBC 67s	2 5/8	009G7066			246
GBC 79s	3 1/8	009G7067			223

¹⁾ CFD calculated values (Computational Fluid Dynamics)

²⁾ Code numbers in bold are normally on stock and a shorter delivery time can, therefore, be expected.

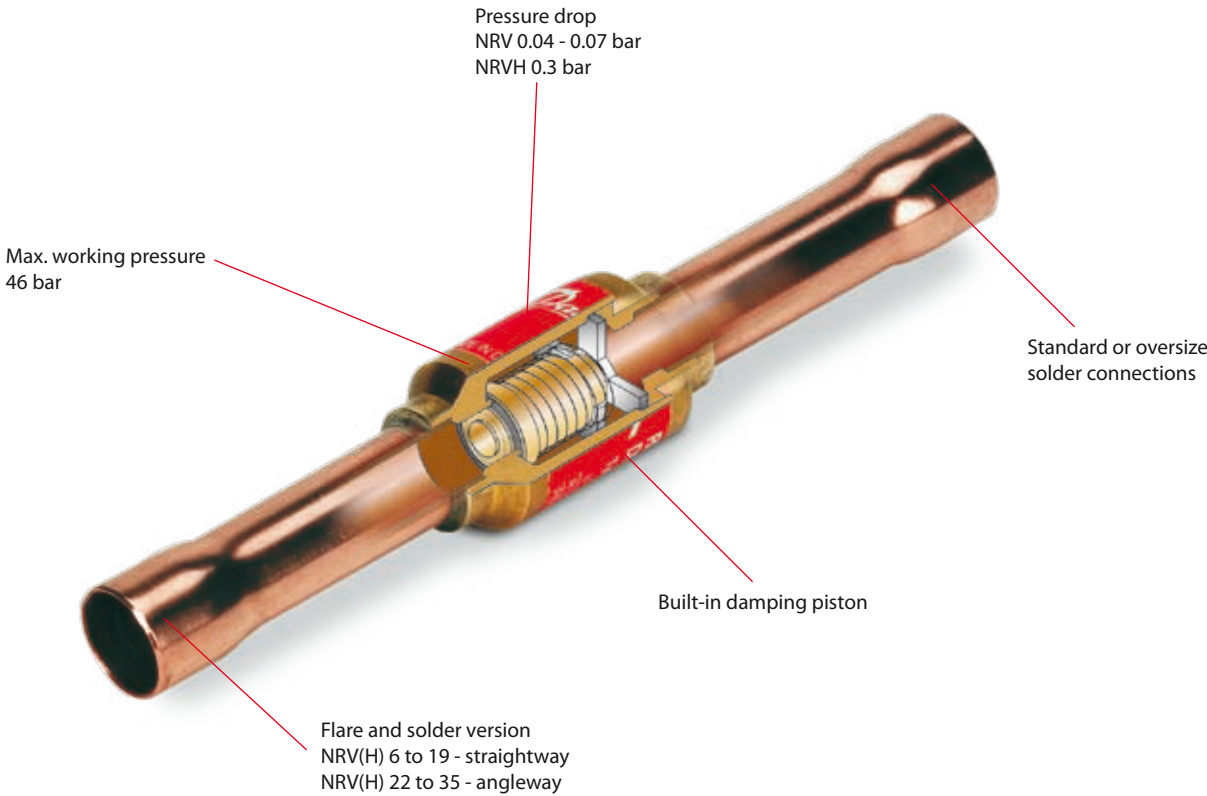




NRV and NRVH: correct flow direction - flexible to use

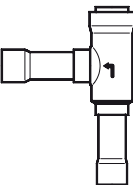
NRV and NRVH check valves can be used in liquid, suction and hot gas lines in refrigeration and air conditioning plants with fluorinated refrigerants. The valves ensure the correct flow direction and prevent back-condensation from a warm part of the system to the cold evaporator. A built-in damping piston makes the valves suitable for installation in lines where pulsation can occur, e.g. in the discharge line from the compressor.

Features



Applications	Advantages	Facts
- Heat pump systems - Air conditioning units - Liquid coolers	- Resonance problems can be avoided at partial load in the refrigeration plant. - Oversize connections provide flexibility in use. - Prevents back-condensation from warm to cold system part. - Ensures correct flow direction.	- Both straightway and angleway versions. - Max. working pressure PS/MWP = 46 bar - Max. test pressure p' = 60 bar - Temperature of the medium -50 → 140°C

Technical data and ordering



Type	Version	Connection		Pressure drop across valve Δp bar ²⁾	k _v -value ³⁾ m ³ /h	Max. working pressure
			in.		mm	
			Size	Code no. ¹⁾	Size	Code no. ¹⁾
NRV6	Flare		¼	020-1040	6	020-1040
NRV 10			¾	020-1041	10	020-1041
NRV 12			½	020-1042	12	020-1042
NRV 16			¾	020-1043	16	020-1043
NRV 19			¾	020-1044	19	020-1044
NRV 6s	Straightway		¼	020-1010	6	020-1014
NRV 6s ⁴⁾			¾	020-1057	10	020-1050
NRVH 6s ⁴⁾			¾	020-1069	10	020-1062
NRV 10s			¾	020-1011	10	020-1015
NRVH 10s			¾	020-1046	10	020-1036
NRV 10s ⁴⁾			½	020-1058	12	020-1051
NRVH 10s ⁴⁾			½	020-1070	12	020-1063
NRV 12s			½	020-1012	12	020-1016
NRVH 12s			½	020-1039	12	020-1037
NRV 12s ⁴⁾			¾	020-1052	16	020-1052
NRVH 12s ⁴⁾			¾	020-1064	16	020-1064
NRV 16s			¾	020-1018	16	020-1018
NRVH 16s			¾	020-1038	16	020-1038
NRV 16s ⁴⁾			-	-	18	020-1053
NRVH 16s ⁴⁾			-	-	18	020-1065
NRV 16s ⁴⁾			¾	020-1059	19	020-1059
NRVH 16s ⁴⁾			¾	020-1071	19	020-1071
NRV 19s			-	-	18	020-1017
NRVH 19s			-	-	18	020-1008
NRV 19s			¾	020-1019	19	020-1019
NRVH 19s			¾	020-1023	19	020-1023
NRV 19s ⁴⁾			¾	020-1054	22	020-1054
NRVH 19s ⁴⁾			¾	020-1066	22	020-1066
NRV 22s	Angleway		¾	020-1020	22	020-1020
NRVH 22s			¾	020-1032	22	020-1032
NRV 22s ⁴⁾			1½	020-1060	28	020-1055
NRVH 22s ⁴⁾			1½	020-1072	28	020-1067
NRV 28s			1½	020-1021	28	020-1025
NRVH 28s			1½	020-1029	28	020-1033
NRV 28s ⁴⁾			1¾	020-1056	35	020-1056
NRVH 28s ⁴⁾			1¾	020-1068	35	020-1068
NRV 35s			1¾	020-1026	35	020-1026
NRVH 35s			1¾	020-1034	35	020-1034
NRV 35s ⁴⁾			1¾	020-1061	42	020-1027
NRVH 35s ⁴⁾			1¾	020-1073	42	020-1035

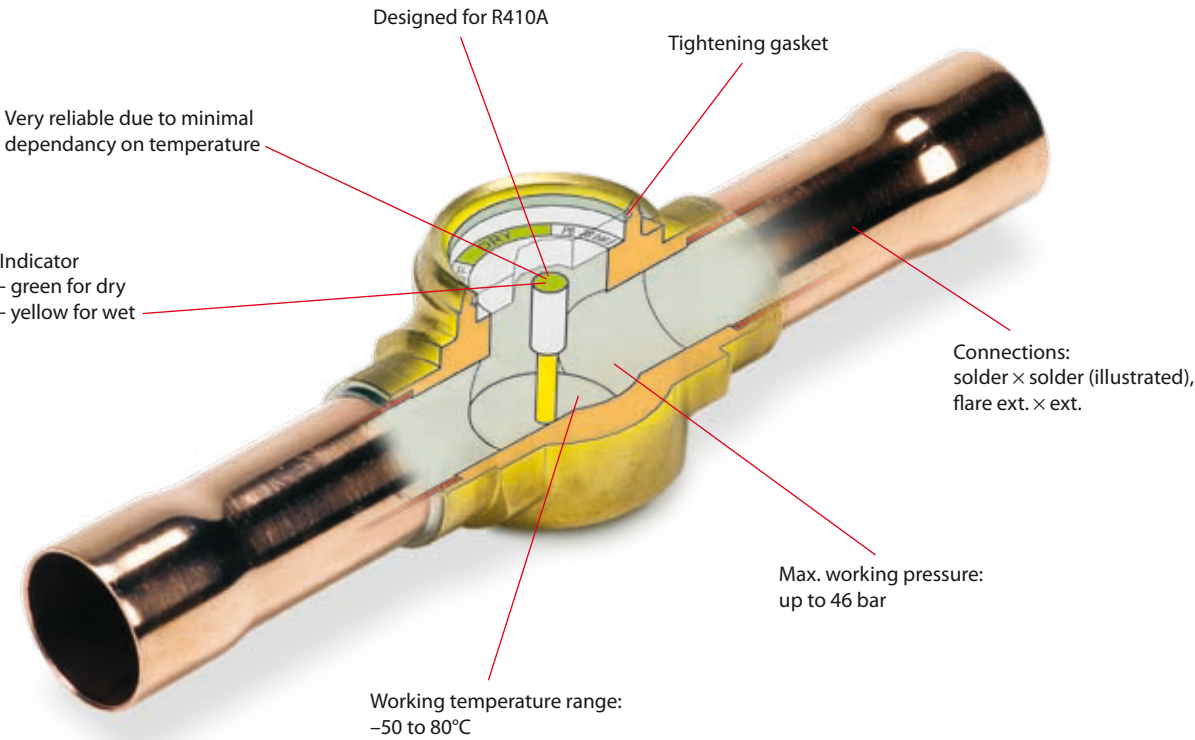
¹⁾ Code numbers in bold are normally on stock and a shorter delivery time can, therefore, be expected.
²⁾ Δp = the minimum pressure at which the valve is completely open.
The NRVH with a stronger spring is used in the discharge line from compressors connected in parallel.
³⁾ The k_v value is the flow of water in m³/h at a pressure drop across valve of 1 bar, ρ = 1000 kg/m³.
⁴⁾ Oversize connections.



SGH, SGRH: secure optimal protection

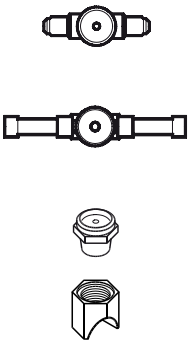
Sight glasses are mostly installed in the liquid line between the filter drier and the expansion valve to monitor the condition of the refrigerant. The SGH is mainly used to indicate the condition of the refrigerant as well as the liquid level in the receiver or the oil level in the compressor and has no moisture indicator. The SGH and SGRH are equipped with sensitive indicators that reflects a colour, depending on the moisture content in the refrigerant.

Features



Technical data and ordering

	Moisture content ppm = parts per million					
	Green - dry	Intermed. color	Yellow - wet	Green - dry	Intermed. color	Yellow - wet
SGH and SGRH	Liquid temperature 25°C			Liquid temperature 43°C		
R410A	< 20	20 - 165	> 165	< 40	40 - 350	> 350



Type	Version	Connection		Code no.	MWP
		in.	mm		
SGH 6	Flare, ext. x ext.	¼ × ¼	6 × 6	014-1660	46
SGH 6s SGH 10s SGH 12s SGH 16s SGH 22s SGH 22s	Solder, ODF x ODF	¼ × ¼ ¾ × ¾ ½ × ½ ¾ × ¾ ¾ × ¾ 1 ½ × 1 ½	16 × 16 22 × 22	014-1090 014-1092 014-1091 014-1094 014-1096 014-1098	46
SGRH for saddle	M		M20 × 1.5	014-1601	46
Sight glass saddle for SGRH	Tube fitting (M20 × ½)	3 ½	-	014-1072	-

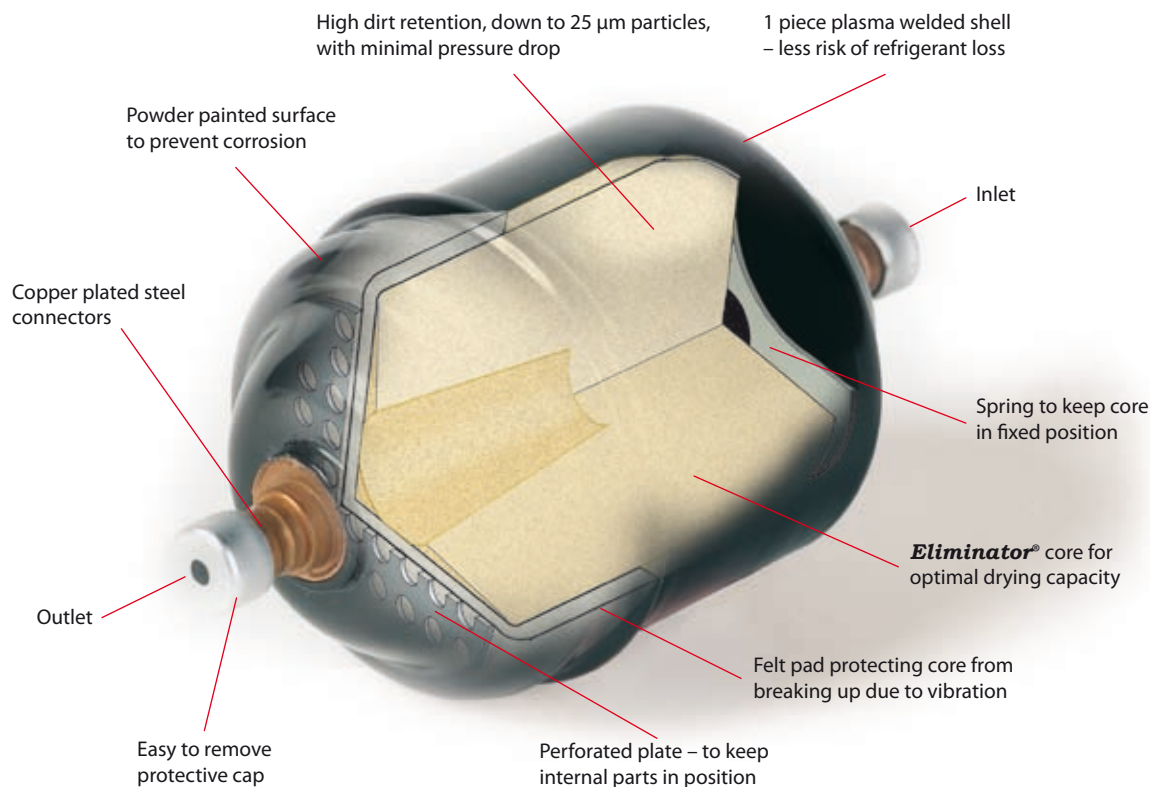
Applications	Advantages	Facts
- Heat pump systems - Air conditioning units - Liquid coolers	- Best visual indication of moisture (minimal dependence on temperature). - Flare connections are 4-sided for quick installation. - Extended solder connections. - Glass diameter permits high working pressures.	- Designed for R410A. - Flare-/solder connection or socket type. - Wide range with sizes from 6 to 22 mm. - Max. working pressure: up to 46 bar. - Working temperature: -50 to 80°C. - Approvals: PED, UL, GOST.



DML: Excellent protection of your refrigeration system

The DML liquid line filter driers protect refrigeration and air conditioning systems from moisture, acids and solid particles. The 100% solid molecular sieve core, assures a high drying capacity and avoids acid formation in the system.

Features

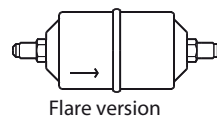
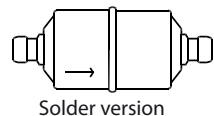


Applications	Advantages	Facts
Air conditioning units	- High moisture adsorption at both high and low Humidity levels. - High drying capacity avoiding risk of acid formation in the system - Copper plated solder connection - no need of wet cloth during installation	100% 3Å molecular sieve core. - Optimized for HFC refrigerants (R134a, R404A, R410A, etc.) with POE and PAG oils. Compatible with R22. - MWP (PS): up to 42 bar (610 psi). - HCFC & HFC refrigerants. - Available with flare- or solder connectors (copper-plated steel). - Wide range with sizes from 3 to 75 cubicinches. - UL and PED approvals – label indicating internal free volume. - Can be installed in any position provided "the arrow" is in the direction of flow.

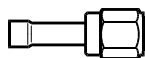
Technical data and ordering

Filter drier

Type	Connection		Solid core		Drying capacity [kg refrigerant] ¹⁾						Liquid capacity in kW ²⁾			Solder		Flare
			Surface [cm ³]	Volume [cm ³]	R134a		R404A R507		R22 R407C R410A		R134a	R404A R507	R22 R407C R410A	Code no. ³⁾	Code no. ³⁾	Code no. ³⁾
	in.	mm			24°C	52°C	24°C	52°C	24°C	52°C				in.	mm	
DML 032	1/4	6	65	41	5.5	5	7.5	4.5	4.5	4	7	5	7	023Z4552 ⁴⁾	023Z4551 ⁴⁾	023Z5035 ⁴⁾
DML 033	3/8	10									17	13	19	023Z4555	023Z4554	023Z5036 ⁴⁾
DML 052	1/4	6	75	65	8.5	8	13	7.5	8	7	7	5	8	023Z4559	023Z4558	023Z5037
DML 053	3/8	10									18	14	19	023Z4562	023Z4561	023Z5038
DML 082	1/4	6									7	5	8	023Z4567	023Z4566	023Z5039
DML 083	3/8	10	110	100	12.5	12	20	11.5	12.5	11	19	14	21	023Z4570	023Z4569	023Z5040
DML 084	1/2	12									26	20	29	023Z4572	023Z4571	023Z5041
DML 085	5/8	16									42	31	46	023Z4573	023Z4573	023Z5073
DML 162	1/4	6									7	5	8	023Z4575	023Z4574	023Z5042
DML 163	3/8	10									22	16	24	023Z4578	023Z4577	023Z5043
DML 164	1/2	12	175	225	27	25.5	43.5	24	27	23	30	22	33	023Z4580	023Z4579	023Z5044
DML 165	5/8	16									43	30	47	023Z4581	023Z4581	023Z5045
DML 166	3/4	19									44	31	48	023Z4582	023Z4582	023Z5046
DML 303	3/8	10									21	15	23	023Z4585	023Z4584	023Z0049
DML 304	1/2	12									31	22	34	023Z4587	023Z4586	023Z0050
DML 305	5/8	16	330	480	57	54	92.5	51	57	48.5	45	33	49	023Z4588	023Z4588	023Z0051
DML 306	3/4	19									62	45	68	023Z4589	023Z4589	023Z0193
DML 307	7/8	22									62	45	68	023Z4590	023Z4590	
DML 414	1/2	12									32	23	35	023Z4594	023Z4593	023Z0109
DML 415	5/8	16	400	650	80	75	130	70	80	74	53	37	58	023Z4595	023Z4595	023Z0110
DML 417	7/8	22									91	65	100	023Z4596	023Z4596	
DML 606	3/4	19									44	32	48	023Z4601	023Z4601	
DML 607	7/8	22	660	960	113	107	185	101	114	97	75	54	82	023Z4602	023Z4602	
DML 609	1 1/8	28									87	64	95	023Z4604	023Z4603	
DML 757	7/8	22	800	1300	160	150	260	140	160	148	82	60	90	023Z4605	023Z4605	
DML 759	1 1/8	28									94	68	102	023Z4607	023Z4606	



- ¹⁾ Drying capacity is based on following moisture content test standards before and after drying:
R410A: From 1050 ppm W to 60 ppm W.
²⁾ Given in accordance with ARI 710-86 for t_a = -15°C (5°F), t_e = 30°C (85°F) and Δp = 0.07 bar (1 psig).
³⁾ Code numbers in bold are normally on stock and a shorter delivery time can therefore be expected.
⁴⁾ Wire mesh in filter drier outlet.



Flare / solder adapter

Type	Connection flare x solder in.	Code no. ³⁾ for 1 pc	Code no. ³⁾ for 2 pcs.
FSA 22	1/4 x 1/4	023U8012	023U8002
FSA 32	3/8 x 1/4	023U8022	-
FSA 33	3/8 x 3/8	023U8014	023U8004
FSA 44	1/2 x 1/2	023U8016	023U8006
FSA 516m	5/8 x 5/8	023U8017	023U8007
FSA 66	3/4 x 3/4	023U8020	023U8010

Accessories

Copper seal	Size	Qty.	Code no. ³⁾
B2 - 4 spec.	1/4 in./6 mm	300	011L4025
B2 - 6	3/8 in./10 mm	300	011L4017
B2 - 8	1/2 in./12 mm	200	011L4018

Type	Connection flare x solder mm	Code no. ³⁾ for 1 pc	Code no. ³⁾ for 2 pcs.
FSA 26m	1/4 x 6	023U8011	023U8001
FSA 36m	3/8 x 6	023U8021	-
FSA 310m	3/8 x 10	023U8013	023U8003
FSA 412m	1/2 x 12	023U8015	023U8005
FSA 516m	5/8 x 16	023U8017	023U8007
FSA 618m	3/4 x 18	023U8019	023U8009

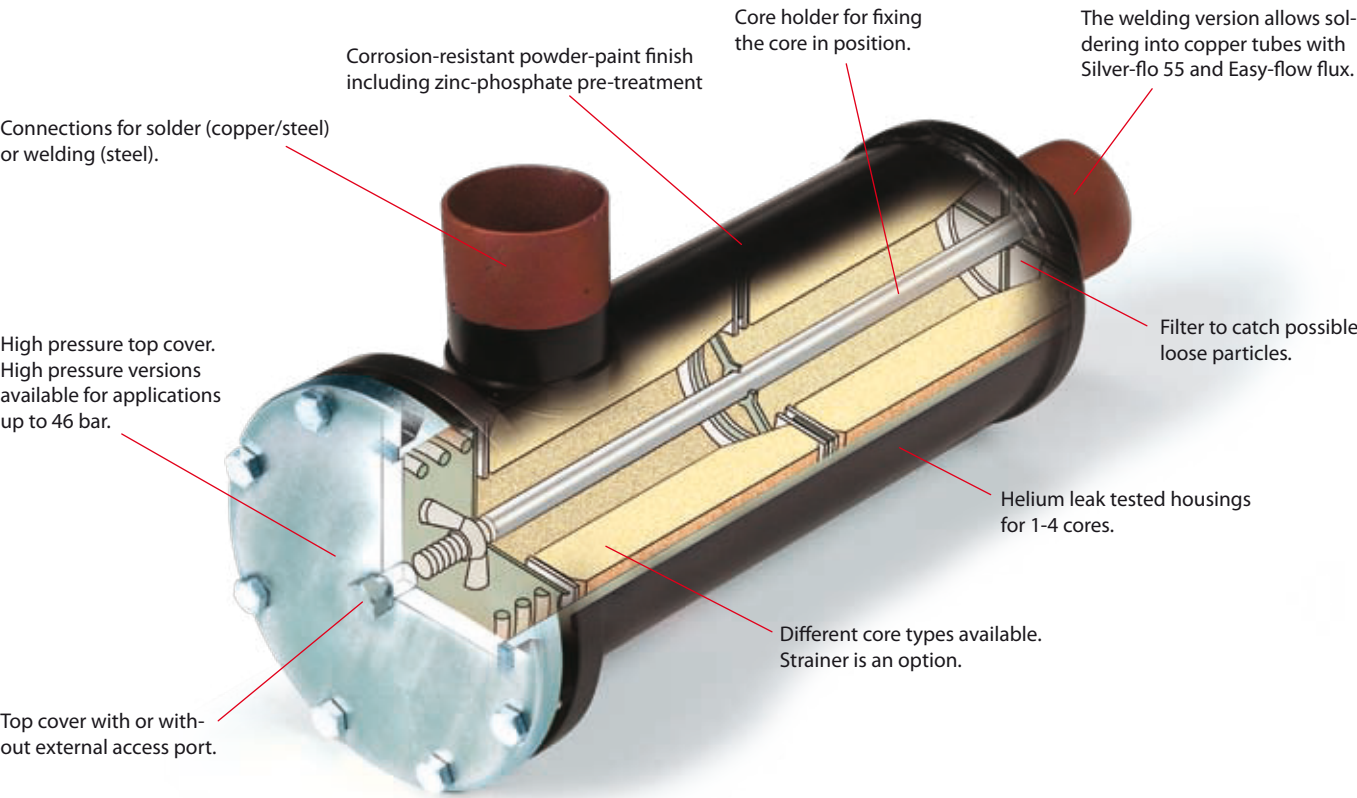
Copper seal	Size	Qty.	Code no. ³⁾
B2 -10	5/8 in./16 mm	100	011L4019
B2 -12	3/4 in./18 mm	50	011L4020



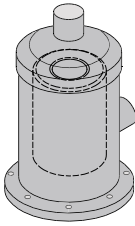
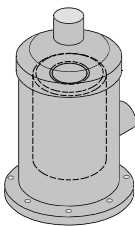
DCR: compact design for easy installation and service

DCR filter driers protect air conditioning systems from moisture, acids and solid particles. They utilise (a) replaceable solid core(s) and are suitable for liquid and suction line installation in both single and multi-compressor configurations. The solid core assures a high drying capacity and avoids acid formation in the system.

Features



Capacities



48-DM

Type	Number of cores	Drying capacity [kg refrigerant] ¹⁾		Liquid capacity [kW] ²⁾
		R410A		R410A
		24°C	52°C	
DCR 0485 DCR 0487 DCR 0489 DCR 04811 DCR 04813 DCR 04817 DCR 04821	1	83.0	71.0	88 153 206 259 259 259 259
DCR 0967 DCR 0969 DCR 09611 DCR 09613 DCR 09617	2	166.0	142.0	155 240 326 396 396

48-DC

Type	Number of cores	Drying capacity [kg refrigerant] ¹⁾		Liquid capacity [kW] ²⁾
		R410A		R410A
		24°C	52°C	
DCR 0485 DCR 0487 DCR 0489 DCR 04811 DCR 04813 DCR 04817 DCR 04821	1	70.5	60.0	88 153 206 259 259 259 259
DCR 0967 DCR 0969 DCR 09611 DCR 09613 DCR 09617	2	141.0	120.0	155 240 326 396 396

¹⁾ Drying capacity is based on the following moisture contents before and after drying:
R410A: From 1050 ppm W to 60 ppm W.

²⁾ Liquid capacity given in accordance with ARI 710-2002 evaporating temperature $t_e = -15^{\circ}\text{C}$, condensing temperature $t_c = +30^{\circ}\text{C}$ and pressure drop across filter drier $\Delta p = 0.07$ bar.

Drying capacity [g of water] ³⁾

48-DA

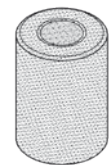
Type	Number of cores	Evaporating temperature t _e [°C]			Acid capacity ⁴⁾ [g]
		−40	−20	4.4	
		R410A			
DCR 048	1	42	35	25	26.6
DCR 096	2	84	70	50	53.3

³⁾ Drying capacity is expressed during drying in:
R410C: EPD = 10 ppm W, corresponding to a dew point temperature = -40°C

⁴⁾ Adsorption capacity of oleic acid at 0.05 TAN (Total Acid Number).

Applications	Advantages	Facts
Commercial air conditioning systems with R410A refrigerant.	- Highly efficient dirt retaining capabilities on both the suction and the liquid line. - Can be used in all environments, including marine applications. - The new core holder requires minimum free space to remove the core for replacement. - One of the 8 holes for fixing the screws in the cover has a split screw hole to keep the cover in place (very easy to place the cover back in position and fix the screws). - Can be installed in any position.	48 - DM core for liquid line application (100% molecular sieve for HFC). Provides high moisture adsorption at low and high condensing temperatures. Effective protection against impurities. 48 - DC core for liquid line application (80% molecular sieve and 20% activated alumina. Effectively adsorbs moisture and acid in the system. 48 - DA core for suction line after a compressor burn-out (30% molecular sieve and 70% activated alumina for CFC/HCFC/HFC). 48 - F strainer for suction line.

Capacities



Recommended plant capacity [kW] ⁵⁾ in suction line - burn-out

Type	Evaporating temperature t _e [°C]		
	-40	-20	4.4
	Pressure drop [Δp bar]		
	0.04	0.10	0.21
	R410A		
DCR 0485	3.1	8.9	21.0
DCR 0487	5.8	16.1	37.8
DCR 0489	7.8	21.6	50.7
DCR 04811	10.0	27.3	63.3
DCR 04813	10.0	27.3	63.3
DCR 04817	10.0	27.3	63.3
DCR 04821	10.0	27.3	63.3
DCR 0965	3.3	9.2	21.6
DCR 0967	5.8	16.2	38.1
DCR 0969	8.7	24.6	58.3
DCR 09611	11.9	33.4	79.3
DCR 09613	14.1	39.9	95.2
DCR 09617	14.1	39.9	95.2
DCR 09621	14.1	39.9	95.2
DCR 1445	3.5	10.0	22.8
DCR 1447	6.6	18.9	42.9
DCR 1449	8.8	25.1	57.2
DCR 14411	13.2	38.1	92.2
DCR 14413	13.2	38.1	92.2
DCR 14417	13.2	38.1	92.2
DCR 14421	13.2	38.1	92.2
DCR 1925	4.2	11.5	27.3
DCR 1927	7.9	21.6	51.4
DCR 1929	10.6	28.9	68.9
DCR 19211	14.8	41.8	99.4
DCR 19213	18.0	51.1	122.1
DCR 19217	18.0	51.1	122.1
DCR 19221	18.0	51.1	122.1

⁵⁾ Recommended plant capacity is given in accordance with ARI-Standard 710-2002 at:
Evaporating temperature t_e = 4.4°C
Condensing temperature t_c = 32.2°C

Strainer mounted in suction line

48-F

Refrigerant	R410A		
Evaporating temperature [°C]	-40	-20	4.4
Pressure drop [Δp bar]	0.04	0.10	0.21
Recommended plant capacity [kW]	15	47	113

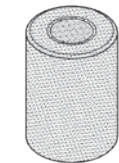
Strainer mounted in liquid line ⁶⁾

Refrigerant	R410A
Recommended plant capacity [kW]	390

⁶⁾ Recommended plant capacity is given in accordance with ARI-Standard 710-2002 at:
Evaporating temperature t_e = -15°C
Condensing temperature t_c = +30°C
Pressure drop across filter drier Δp = 0.07 bar

The data given apply to DCR 04811 with 48-F core.

Technical data and ordering



Replaceable
solid core



Strainer

High-pressure steel connectors

DCR 0487	1	7/8	22	3/4	023U7451	46 bar
DCR 0489		-	28	1	023U7452	
DCR0489		1 1/8	-	1	023U7453	
DCR 04811		1 3/8	35	1 1/4	023U7454	
DCR 04813		1 5/8	-	1 1/2	023U7455	
DCR 04817		2 1/8	54	2	023U7457	
DCR 0967	2	7/8	22	3/4	023U7458	46 bar
DCR 0969		1 1/8	-	1	023U7459	
DCR 09611		1 3/8	35	1 1/4	023U7461	
DCR 09613		1 5/8	-	1 1/2	023U7462	
DCR 09617		2 1/8	54	2	023U7464	

DCR inserts with gasket

Type	Material	Code no. ⁷⁾ 8 pcs.
48-DM solid core	100% molecular sieve	023U1392
48-DM solid core	100% molecular sieve (with special gasket kit)	023U1496
48-DC solid core	80% molecular sieve & 20% Al ₂ O ₃	023U4381
48-DA solid core	30% molecular sieve & 70% Al ₂ O ₃	023U5381
48-F strainer		023U1921

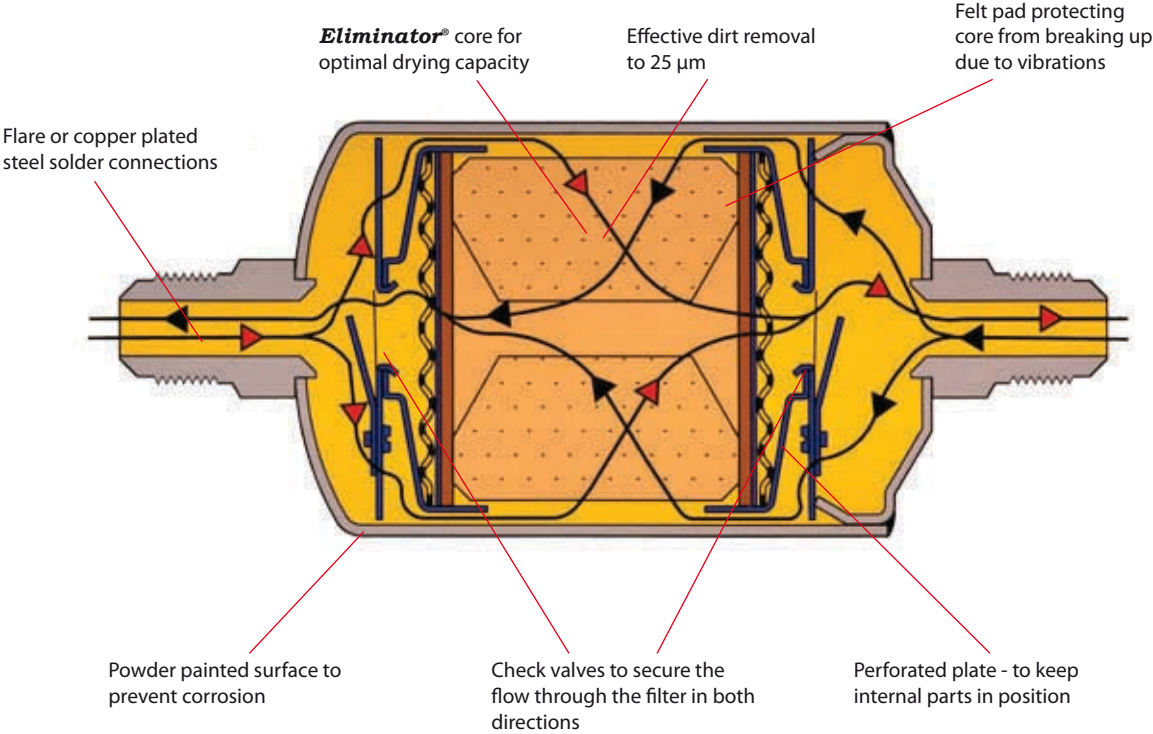
⁷⁾ Code numbers in bold are normally on stock and a shorter delivery time can, therefore, be expected.



DMB: Drying out in bi-flow systems

Bi-flow filter driers have built-in check valves which ensure that refrigerant liquid always flows through the filter driers from the outer side of the filter core towards the center. Thus all dirt particles are retained irrespective of flow direction. DMB filter driers ensure fast and effective adsorption of moisture as well as organic and inorganic acids.

Features



Technical data and ordering

Solder (Cu-plated - ODF)

Type	Conn. in.	Code no.	Conn. mm	Code no.
DMB 082s	1/4	023Z1473	6	023Z1461
DMB 083s	3/8	023Z1472	10	023Z1459
DMB 084s	1/2	023Z1471	12	023Z1457
DMB 163s	3/8	023Z1476	10	023Z1455
DMB 164s	1/2	023Z1475	12	023Z1453
DMB 165s	5/8	023Z1474	16	023Z1474
DMB 304s	1/2	023Z1479	12	023Z1451
DMB 305s	5/8	023Z1478	16	023Z1478
DMB 307s	7/8	023Z1477	22	023Z1477

Flare

Type	Conn. in.		Code no.
DMB 082	1/4	6	023Z1412
DMB 083	3/8	10	023Z1411
DMB 084	1/2	12	023Z1410
DMB 162	1/4	6	023Z1416
DMB 163	3/8	10	023Z1415
DMB 164	1/2	12	023Z1414
DMB 165	5/8	16	023Z1413
DMB 303	3/8	10	023Z1419
DMB 304	1/2	12	023Z1418
DMB 305	5/8	16	023Z1417

Drying and liquid capacity

Type	Drying capacity [kg refrigerant] ¹⁾		Liquid capacity [kW] ²⁾	Max Working Pressure PS [bar]
	R410A		R410A	
	24°C	52°C		
DMB 082 / 082s	8.0	7.3	4.3	42
DMB 083 / 083s			8.2	42
DMB 084 / 084s			9.2	42
DMB 162	15.4	14.1	8.8	42
DMB 163 / 163s			20	42
DMB 164 / 164s			32	42
DMB 165 / 165s			40	42
DMB 303	37.8	34.6	21	42
DMB 304 / 304s			31	42
DMB 305 / 305s			42	42
DMB 307s			47	35

¹⁾ Drying capacity is based on following moisture content test standards before and after drying:
R410A: From 1050 ppm W to 60 ppm W.

²⁾ Capacity given in accordance with ARI 710-86
te = -15°C (5°F)
tc = 30°C (86°F)
Δp = 0.07 bar (1 psig).

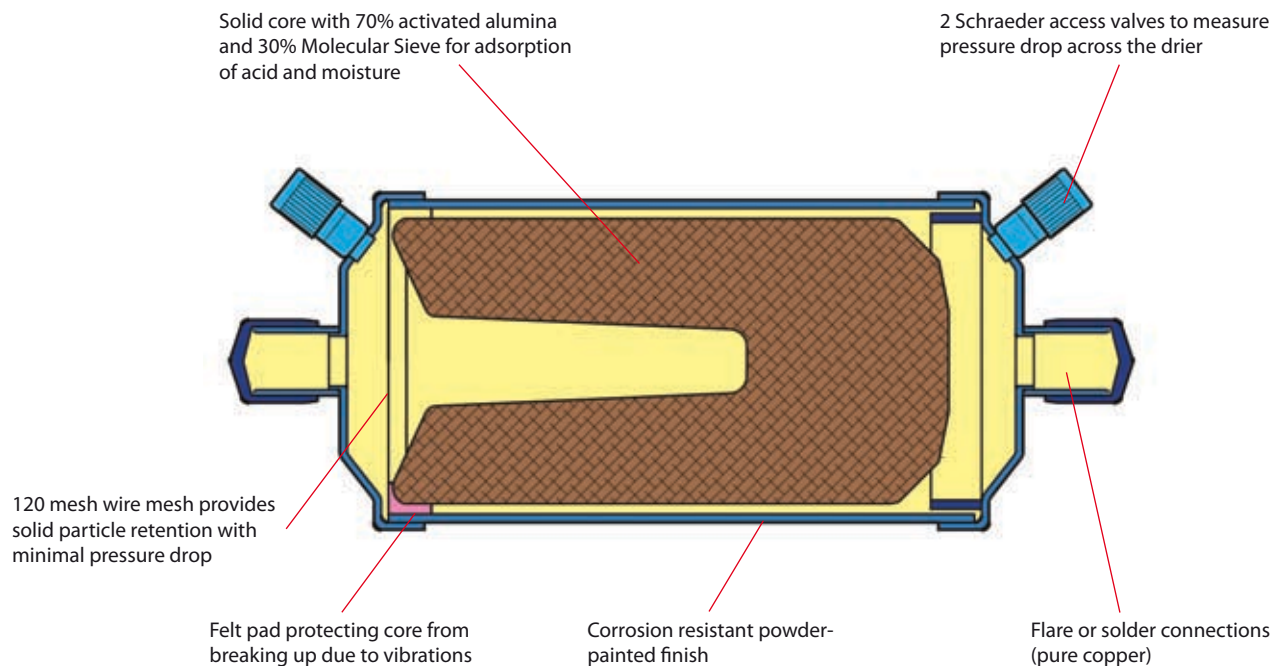
Applications	Advantages	Facts
- Heat pumps - Air conditioning units	- No dirt released by reversing the flow direction - The check valves are not sensitive to dirt and give minimum restriction, irrespective of flow direction - When building heat pump systems, the use of Bi-flow filters can, depending on the type of system, save up to ten solder connections. This reduces production costs and the number of potential leakage points.	- DMB filter driers contain a solid core consisting of 100% 3Å Molecular Sieve. - DMB filter driers are especially suitable for heat pumps with HFC refrigerant and polyolester oil with additives - Optimum flow characteristics and dirt retention - Specially designed for HCFC refrigerants and mineral oil, and also with HFC refrigerants and polyolester oil.



DAS: Clean up your refrigerant

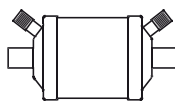
Eliminator® burn-out filter driers type DAS are used in the suction line to clean up refrigeration and AC-systems with fluorinated refrigerants after a compressor motor burn-out. The solid core, which is composed of 70% activated alumina and 30% Molecular Sieve, adsorbs harmful acids as well as moisture. By adsorbing these acids, the DAS burn-out filter drier protects the new compressor against premature failure.

Features



Technical data and ordering

Ordering



Flare

Type	Connection in.	Code no.
DAS 083	3/8	023Z1001
DAS 084	1/2	023Z1002
DAS 164	1/2	023Z1007
DAS 165	5/8	023Z1008

Solder

Type	Connection in.	Code no.
DAS 083	3/8	023Z1003
DAS 084	1/2	023Z1004
DAS 085	5/8	023Z1005
DAS 086	3/4	023Z1006
DAS 164	1/2	023Z1009
DAS 165	5/8	023Z1010
DAS 166	3/4	023Z1011
DAS 167	7/8	023Z1012
DAS 305	5/8	023Z1013
DAS 306	3/4	023Z1014
DAS 307	7/8	023Z1015
DAS 309	1 1/8	023Z1016
DAS 417	7/8	023Z1017
DAS 419	1 1/8	023Z1018
DAS 607	7/8	023Z1019
DAS 609	1 1/8	023Z1020

Capacities

	Rated capacity, Q _n ¹⁾		Acid capacity ²⁾
	R410A		
	[TR]	[kW]	[g]
DAS 083	1.7	6.0	3.8
DAS 084	2.9	10.0	
DAS 085	4.1	14.5	
DAS 086	5.4	19.0	
DAS 164	3.0	10.5	8.6
DAS 165	4.3	15.0	
DAS 166	5.7	20.0	
DAS 167	6.3	22.0	
DAS 305	5.1	18.0	18.2
DAS 306	6.3	22.0	
DAS 307	7.4	26.0	
DAS 309	8.9	31.0	
DAS 417	8.6	30.0	24.3
DAS 419	10.0	35.0	
DAS 607	5.7	20.0	36.5

¹⁾ Rated capacity is stated at: evaporating temperature t_e = 4°C pressure drop Δp = 0.21 bar
²⁾ Adsorption capacity of oleic acid at 0.05 TAN (Total Acid Number).

Capacities for other temperatures than 4°C are calculated by use of correction factors. Divide your actual evaporator capacity with the correction factor given for your actual evaporating temperature.
Look up the capacity table for the necessary rated capacity.

$$Q_e / F_e = Q_n$$

Q_e = Actual evaporator capacity
Q_n = Nominal capacity
F_e = Correction factor

Correction factors. F_e evaporating temperatures [°C]

[°C]	4	0	-5	-10	-15	-20	-25	-30	-35	-40
F _e	1	0.9	0.75	0.6	0.5	0.4	0.35	0.25	0.2	0.15

Example

To select a burn-out filter drier for a R22 plant with an evaporator capacity at 8.5 kW at -20°C you may use a burn-out filter drier with a rated capacity of 8.5/0.4 = 21.25 kW or bigger. For example DAS 306.

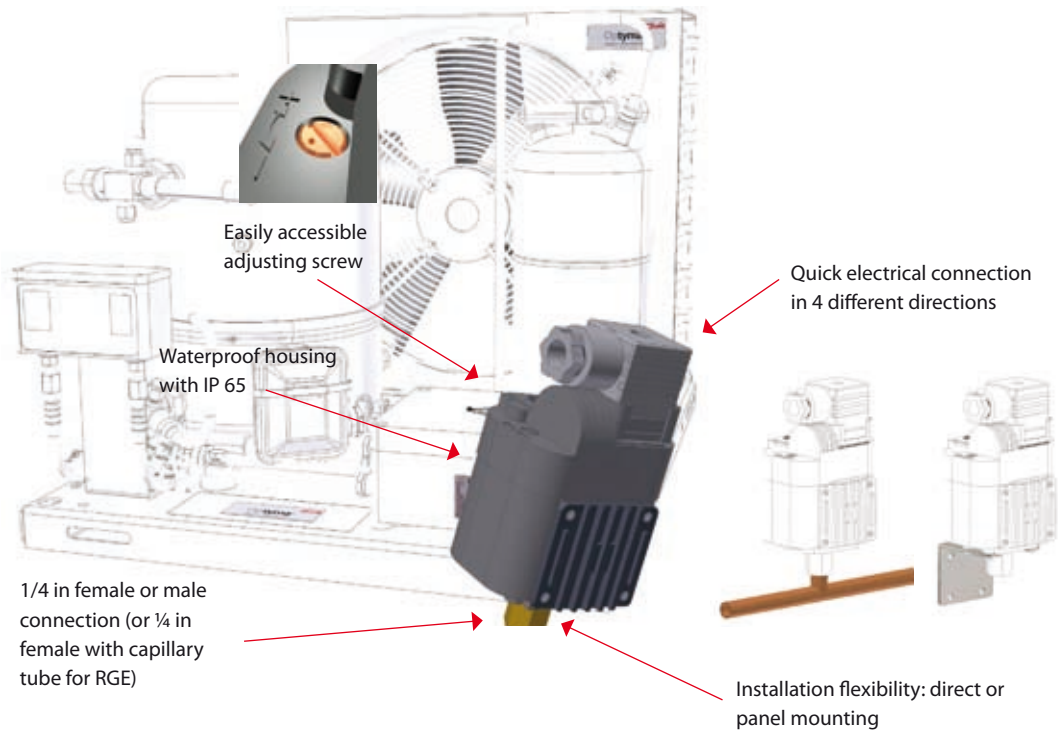
Applications	Advantages	Facts
· Air conditioning units	· The large diameter of the burn-out filter drier means that flow velocity is suitably low and the pressure drop minimal. · Powder formation is eliminated because the solid core grains are bonded and cannot move against each other.	· Allows installation with any orientation provided the flow is in the arrow direction · Available in sizes from 8 to 60 cubic inches · For use with CFC, HCFC and HFC refrigerants



XGE/RGE: Condenser fan speed controls

Fan speed control is becoming increasingly widespread in different air conditioning units, with the benefits of reduced noise and stable condensing pressures under different climatic conditions. The XGE range is very compact and offers the ideal solution for reliable fan control for most units where small fans are used. For medium to large sized fans (single and three phase) the RGE range offers a simple and efficient fan speed control solution.

Features



Applications	Advantages	Facts
· Packaged air conditioners and chillers	· Simple to install and easy setting · “All in one”: senses pressure and controls fan speed · Reliable sensing mechanism · XGE: - Compact & light weight (length: 112 mm – diameter: 66 mm – weight: 180 g) - Can be directly mounted onto the refrigeration line or fixed onto a simple bracket (accessory) and screwed to a panel - Easily accessible adjusting screw on the top surface - Easy wiring and electrical connection - Specially designed heat dissipation radiator to prevent overheating	· Electrical rating from 3 to 8A (single phase) and 5 to 7A (3 phase) · Enclosure: IP 65 (XGE) and IP 54 (RGE) · Full CE / EMC approved · Dual frequency: 50/60 Hz · Max. working pressure: 47 bar · With low speed operation it is possible to select either minimum speed operation or cut-off operation

Technical data and ordering



Model	Mode ¹⁾	Pressure connection	Adjusting range [bar]	P-band [bar]	Pre-setting [bar]	Rated motor rating [A]	No. of phase/ voltage [VAC]	Code no.
XGE-6C	C	1/4 in female flare	22-39	7	28	0.2-3	1 / 200-240	061H3160
XGE-6CB	C	1/4 in male flare	22-39	7	28	0.2-3	1 / 200-240	061H3162
XGE-6M	M	1/4 in female flare	22-39	7	28	0.2-3	1 / 200-240	061H3260
XGE-6MB	M	1/4 in male flare	22-39	7	28	0.2-3	1 / 200-240	061H3262
RGE-Z1N6-7DS	C or M	1/4 in female flare	16-39	8	32	0.2-4	1 / 200-240	061H3021
RGE-Z1P6-7DS	C or M	1/4 in female flare	16-39	8	32	0.2-6	1 / 200-240	061H3022
RGE-Z1Q6-7DS	C or M	1/4 in female flare	16-39	8	32	0.2-8	1 / 200-240	061H3023
RGE-Z3R6-7DS	C or M	1/4 in female flare	16-39	8	32	0.2-5	3 / 200-240	061H3027
RGE-X3R6-7DS	C or M	1/4 in female flare	16-39	8	32	0.2-5	3 / 380-415	061H3028
RGE-Z3T6-7DS	C or M	1/4 in female flare	16-39	8	32	0.2-7	3 / 200-240	061H3051

¹⁾ C = Cut-off, M = Min. speed

Accessories

Model	Description	Dimensions	Code no.
XGE-AE01	Fixing bracket accessory for panel mount	H: 38 mm, W: 42 mm, D: 45 mm	061H3102





Scroll compressors

Scroll compressors perfectly suit applications like:

- Water chillers
- Self-contained air conditioning units
- Split systems
- Central air handling units
- Heat pumps
- Residential air conditioning

The complete solution for air-conditioning applications

Designed for excellence in performance, silence and endurance, Danfoss Scroll Compressors are the quietest, most reliable and longest-lasting compressors you can get. Available in a full range of capacities from 2,5 to 30 hp, they provide the perfect fit for any application, from light commercial to large commercial applications, and help you handle even the toughest challenges in the HVAC&R industry.

There is no contact between the scroll flanks in a Performer scroll compressor. The ultra-precise scroll profiles, with controlled orbit, roll and slide on an oil film without friction or wear. Floating tip seals ensure axial sealing with low friction losses. With these techniques, built into an optimised upper shell design, the Scroll compressor combines high energy efficiency with low sound and vibration characteristics.

Danfoss Scroll Compressors are available in a large variety of single and tandem models for R407C, R134a, R410A and R22 refrigerants.

Product advantages	Customer benefits
· Simple, lightweight and compact construction for easy assembly · Lowest sound level in HVAC&R industry · Optimised for easy integration and servicing in existing systems · Minimised friction and wear · Optimised upper shell design · 100% suction gas cooled and shielded motor · Large oil reserve · Large internal free volume · Large refrigerant charge capacity	· Easy to install and service · Silent operation · Low energy consumption · Long lifetime · Low running costs · High thermal working conditions · Constant performance

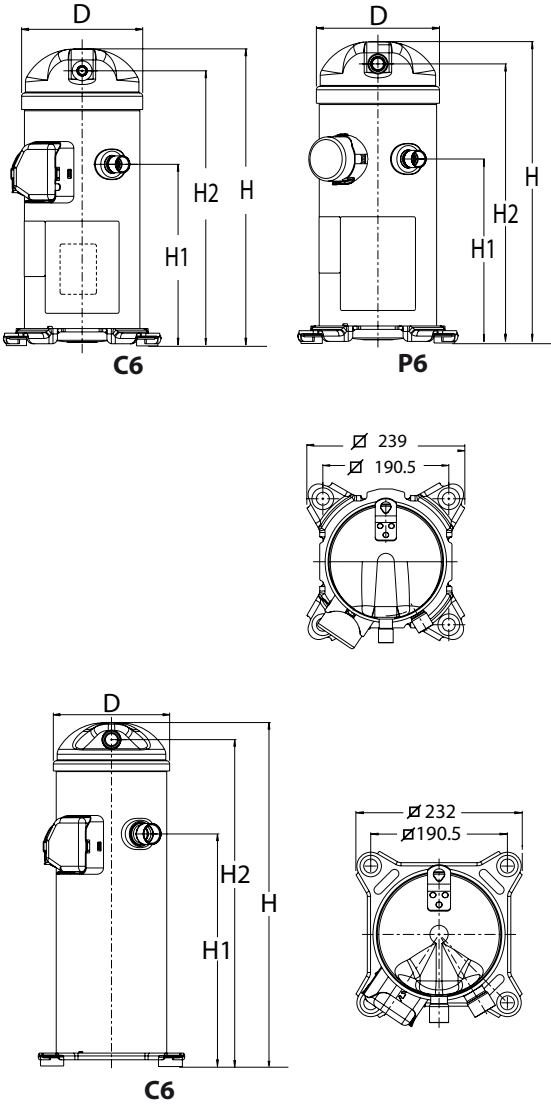
Dimensions

R22	R407C	R410A	D	H	H1	H2
HRM032	HRP038	HRH031	165	420	257	386
HRM034	HRP040	HRH032				
HRM040	HRP042	HRH034				
HRM042		HRH036				
HRM045	HRP045	HRH038	165	446	282	412
HRM047	HRP047	HRH040				
HRM048	HRP048	HRH041				
HRM051	HRP051	HRH044				
HRM054	HRP054	HRH049	184	462	287	429
HRM058	HRP058	HRH051				
HRM060	HRP060	HRH054				
HLM068	HLP068	HRH056				
HLM072	HLP072	HLH068				
HLM075	HLP075	HLJ072				
HLM078	HLP081	HLJ083				
HLM081						

All dimensions in mm

R22	R407C	D	H	H1	H2
HCM094	HCP094	184	539	372	512
HCM109	HCP109	184	548	372	522
HCM120	HCP120				

All dimensions in mm



Please check with Danfoss for availability of C6 / P6 and other features.

Type

Size

Motor

Features

HRH

036

U1L

P6

Application:
H: high temperature / air conditioning

Family:
C: light commercial scroll
R: residential scroll (new platform)
L: light commercial scroll (new platform)

Refrigerant & lubricant:
M: R22, mineral or alkylbenzene oil
P: R407C, POE lubricant
H: R410A, POE lubricant
J: R410A, PVE lubricant

Nominal capacity:
In thousand Btu/h at 60 Hz,
ARI conditions

Model variation
T: design optimized for 7.2/54.4 (45/130)
U: design optimized for 7.2/37.8 (45/100)

Other features

	Oil sight glass	Oil equalisation	Oil drain	LP gauge port
2	None	None	None	Schrader
6	None	None	None	None
7	Threaded	None	None	None
8	None	Brazed	None	None

Tubing and electrical connections
P: brazed connections, spade terminals
C: brazed connections, screw terminals

Motor protection
L: internal motor protection

Motor voltage code
1: 208-230V/1~/60 Hz
2: 208-230V/3~/60 Hz
4: 380-400V/3~/50 Hz & 460V/3~/60 Hz
5: 220-240V/1~/50 Hz & 265V/1~/60 Hz
7: 500V/3~/50 Hz & 575V/ 3~/60 Hz
9: 380V/3~/60 Hz

HRH/HLH/HLJ

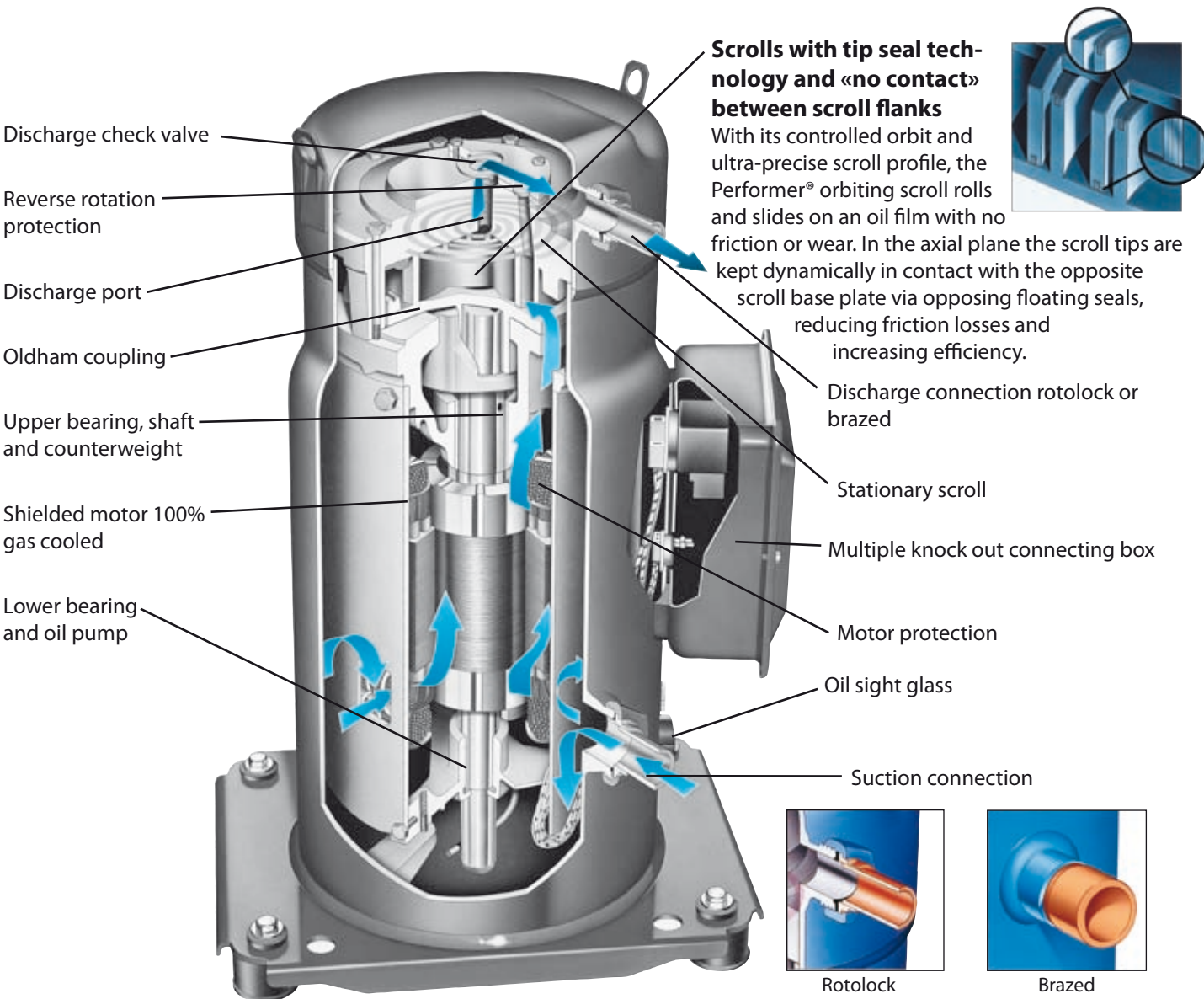
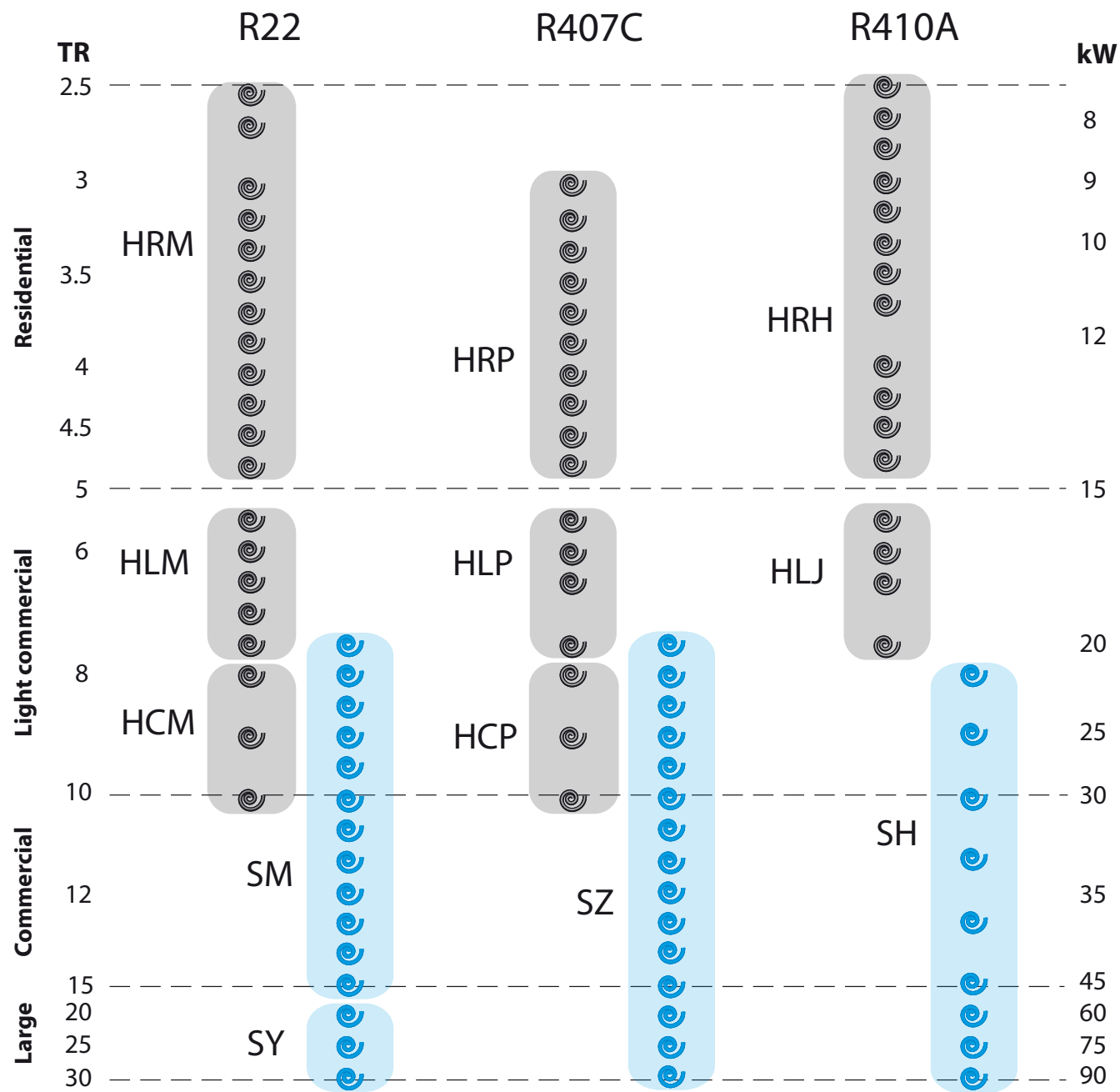
Performance data

R410A

	Model	To	-25		-20		-15		-10		-5		0		5		10	
		Tc	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe
		35	45	55	35	45	55	35	45	55	35	45	35	45	35	45	35	45
RESIDENTIAL SCROLL	HRH031U4	35	-	-	3 040	1.85	4 100	1.82	5 270	1.77	6 520	1.72	7 810	1.67	9 110	1.63	10 390	1.60
		45	-	-	-	-	-	-	4 410	2.31	5 610	2.24	6 850	2.17	8 100	2.11	9 330	2.07
		55	-	-	-	-	-	-	-	-	4 510	2.95	5 720	2.84	6 930	2.75	8 110	2.68
	HRH032U4	35	-	-	3 080	1.82	4 150	1.78	5 340	1.74	6 600	1.69	7 910	1.64	9 230	1.60	10 530	1.56
		45	-	-	-	-	-	-	4 480	2.32	5 700	2.25	6 960	2.18	8 230	2.12	9 470	2.08
		55	-	-	-	-	-	-	-	-	4 590	3.04	5 820	2.93	7 060	2.83	8 260	2.76
	HRH034U4*	35	*															
		45																
		55																
	HRH036U4	35	-	-	3 560	2.11	4 790	2.07	6 150	2.02	7 610	1.96	9 120	1.90	10 640	1.85	12 130	1.82
		45	-	-	-	-	-	-	5 160	2.67	6 560	2.59	8 020	2.51	9 480	2.44	10 910	2.40
		55	-	-	-	-	-	-	-	-	5 290	3.45	6 700	3.33	8 120	3.22	9 500	3.14
	HRH038U4	35	-	-	3 770	2.29	5 070	2.25	6 520	2.20	8 060	2.13	9 660	2.07	11 280	2.02	12 860	1.98
		45	-	-	-	-	-	-	5 440	2.88	6 920	2.79	8 450	2.71	9 990	2.64	11 500	2.58
		55	-	-	-	-	-	-	-	-	5 540	3.70	7 020	3.56	8 510	3.45	9 950	3.36
	HRH040U4	35	-	-	4 090	2.49	5 510	2.45	7 080	2.39	8 760	2.32	10 500	2.25	12 250	2.19	13 970	2.15
		45	-	-	-	-	-	-	5 950	3.10	7 570	3.01	9 250	2.92	10 940	2.84	12 580	2.79
		55	-	-	-	-	-	-	-	-	6 110	3.95	7 750	3.81	9 390	3.69	10 990	3.59
	HRH044U4	35	-	-	4 360	2.55	5 870	2.50	7 540	2.44	9 330	2.37	11 180	2.30	13 050	2.24	14 880	2.19
		45	-	-	-	-	-	-	6 330	3.28	8 050	3.18	9 830	3.09	11 630	3.00	13 380	2.95
		55	-	-	-	-	-	-	-	-	6 490	4.33	8 220	4.18	9 960	4.05	11 660	3.94
	HRH049U4	35	-	-	4 830	2.92	6 500	2.87	8 350	2.80	10 340	2.72	12 390	2.64	14 450	2.57	16 480	2.52
		45	-	-	-	-	-	-	7 040	3.57	8 960	3.46	10 940	3.36	12 940	3.27	14 890	3.21
		55	-	-	-	-	-	-	-	-	7 260	4.45	9 190	4.29	11 140	4.15	13 040	4.05
	HRH051U4	35	-	-	5 140	2.99	6 920	2.94	8 890	2.86	11 000	2.78	13 180	2.70	15 380	2.63	17 540	2.58
		45	-	-	-	-	-	-	7 490	3.69	9 530	3.57	11 640	3.47	13 760	3.38	15 830	3.31
		55	-	-	-	-	-	-	-	-	7 710	4.64	9 770	4.47	11 840	4.33	13 850	4.22
	HRH054U4	35	-	-	5 370	3.21	7 230	3.16	9 290	3.08	11 500	2.99	13 780	2.90	16 080	2.83	18 330	2.78
		45	-	-	-	-	-	-	7 800	3.91	9 920	3.80	12 120	3.68	14 320	3.58	16 480	3.52
		55	-	-	-	-	-	-	-	-	7 990	4.85	10 130	4.68	12 270	4.53	14 360	4.41
	HRH056U4	35	-	-	5 560	3.22	7 490	3.16	9 620	3.08	11 910	2.99	14 270	2.90	16 650	2.83	18 980	2.78
		45	-	-	-	-	-	-	8 080	3.99	10 280	3.86	12 550	3.75	14 840	3.65	17 080	3.58
		55	-	-	-	-	-	-	-	-	8 290	5.05	10 500	4.87	12 730	4.71	14 900	4.59
LIGHT COMMERCIAL SCROLL	HLH061T4	35	5 140	3.13	6 700	3.17	8 370	3.21	10 230	3.23	12 360	3.23	14 870	3.21	17 830	3.16	21 330	3.09
		45	-	-	5 180	3.91	7 060	3.95	8 990	3.99	11 040	4.01	13 300	4.01	15 870	3.99	18 840	3.94
		55	-	-	-	-	-	-	7 020	4.95	9 230	4.97	11 510	4.98	13 940	4.97	16 610	4.94
	HLH068T4	35	5 730	3.42	7 480	3.47	9 340	3.51	11 420	3.53	13 800	3.53	16 590	3.51	19 900	3.46	23 810	3.38
		45	-	-	5 760	4.24	7 860	4.29	10 000	4.33	12 290	4.35	14 810	4.35	17 670	4.32	20 970	4.27
		55	-	-	-	-	-	-	7 790	5.31	10 250	5.34	12 770	5.35	15 470	5.34	18 440	5.30
	HLJ072T5¹	35	6 100	3.82	7 990	3.88	9 990	3.92	12 200	3.94	14 740	3.94	17 730	3.92	21 260	3.86	25 460	3.77
		45	-	-	5 950	4.83	8 180	4.88	10 430	4.92	12 820	4.94	15 440	4.94	18 420	4.91	21 870	4.86
		55	-	-	-	-	-	-	7 870	6.16	10 390	6.19	12 950	6.20	15 670	6.19	18 670	6.15
	HLJ083T5¹	35	6 990	4.43	9 170	4.49	11 460	4.54	14 010	4.56	16 920	4.56	20 340	4.53	24 400	4.47	29 230	4.36
		45	-	-	6 710	5.57	9 260	5.63	11 820	5.68	14 520	5.70	17 490	5.70	20 870	5.67	24 780	5.61
		55	-	-	-	-	-	-	8 760	7.10	11 580	7.13	14 440	7.14	17 480	7.13	20 810	7.08

* Consult Danfoss for product availability

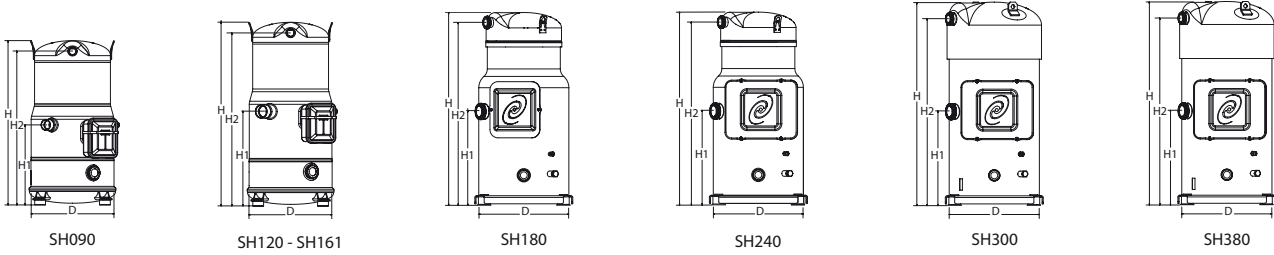
Legend: To: Evaporating temperature in °C
Tc: Condensing temperature in °C
Qo: Cooling capacity in W
Pe: Power input in kW
Superheat = 11.1 K
Subcooling = 8.3 K
Voltage: 400 V/3/50 Hz
1: Voltage: 220-240 V/1/50 Hz



PRODUCT RANGE

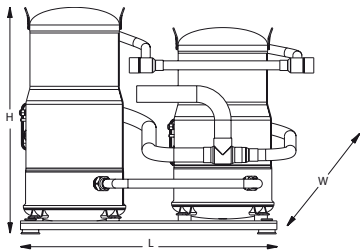
Model	Voltage code - Nominal voltage - Range				
	3	4	6	7	9
	200-230/3/60	400/3/50 460/3/60	230/3/50	500/3/50 575/3/60	380/3/60
SH090	●	●	●	●	●
SH120	●	●	●	●	●
SH161	●	●	●	●	●
SH180	●●	●●	-	●●	●●
SH240	●●	●●	-	●●	●●
SH300	●●	●●	-	●●	●●
SH380	●●	●●	-	●●	●●

● Brazed version ● Rotolock version

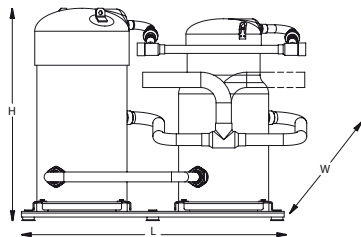


Tandem model	Composition	Voltage code - Nominal voltage - Range				
		3	4	6	7	9
		200-230/3/60	400/3/50 460/3/60	230/3/50	500/3/50 575/3/60	380/3/60
SH182	SH090 + SH090	●	●	●	●	●
SH210	SH120 + SH090	●	●	●	●	●
SH242	SH120 + SH120	●	●	●	●	●
SH281	SH161 + SH120	●	●	●	●	●
SH322	SH161 + SH161	●	●	●	●	●
SH360	SH180 + SH180	●	●	-	●	●
SH420	SH240 + SH180	●	●	-	●	●
SH480	SH300 + SH180	●	●	-	●	●
SH482	SH240 + SH240	●	●	-	●	●
SH540	SH300 + SH240	●	●	-	●	●
SH600	SH300 + SH300	●	●	-	●	●
SH760	SH380 + SH380	●	●	-	●	●

Tandem model	Dimensions		
	L (mm)	W (mm)	H (mm)
SH182	732	425	506
SH210	732	425	563
SH242	724	425	563
SH281	724	425	563
SH322	724	425	563
SH360	985	526	700
SH420	987	533	700
SH480	987	535	737
SH482	985	533	700
SH540	987	535	737
SH600	985	535	737
SH760	990	535	770



SH182 - SH210 - SH242 - SH281 - SH322



SH360 - SH420 - SH480 - SH482 - SH540 - SH600 - SH760

NAMEPLATE REFERENCE

SH

300

A

4

AB

A

SH: Scroll, for R410A

Nominal capacity in thousand Btu/h at 60 Hz, R410A, ARI conditions

UL index

Motor voltage code: 3: 200-230/3/60
4: 380-400/3/50 - 460/3/60
6: 230/3/50
7: 500/3/50 - 575/3/60
9: 380/3/60

Evolution index

Motor protection
L: Internal overload protector
A: Electronic, 24V
B: Electronic, SH180: 230V
SH240-300: 115/230V
C: Customized electrical box

Suction and discharge connections
A: Brazed connections
M: Rotolock connections

SH - R410A

50 Hz PERFORMANCE DATA

	To	-20		-15		-10		-5		0		5		10		15	
Model	Tc	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe
SH090-4	35	9 730	4.5	12 140	4.6	14 960	4.7	18 230	4.8	21 990	4.8	26 310	4.9	31 230	4.9	36 790	4.9
	45	8 460	5.6	10 670	5.7	13 220	5.7	16 180	5.8	19 590	5.9	23 510	5.9	27 970	6.0	33 040	6.0
	55	-	-	-	-	11 330	7.1	13 930	7.1	16 940	7.2	20 410	7.2	24 390	7.3	28 930	7.4
SH120-4	35	13 070	5.9	16 310	6.0	20 090	6.1	24 480	6.2	29 540	6.3	35 330	6.4	41 930	6.5	49 400	6.5
	45	11 370	7.4	14 340	7.4	17 780	7.5	21 750	7.6	26 330	7.7	31 590	7.8	37 580	7.9	44 380	7.9
	55	-	-	-	-	15 220	9.3	18 720	9.4	22 760	9.5	27 420	9.5	32 750	9.6	38 820	9.7
SH161-4	35	17 320	7.8	21 470	7.9	26 300	7.9	31 900	8.0	38 350	8.0	45 730	8.1	54 120	8.2	63 620	8.4
	45	15 080	9.8	18 890	9.8	23 310	9.8	28 420	9.8	34 310	9.9	41 050	9.9	48 730	10.0	57 450	10.1
	55	-	-	-	-	19 850	12.4	24 350	12.3	29 540	12.3	35 520	12.3	42 380	12.3	50 200	12.3
SH180-4	35	19 200	9.4	23 870	9.3	29 340	9.2	35 740	9.2	43 150	9.1	51 690	9.1	61 460	9.1	72 560	9.1
	45	16 080	11.8	20 530	11.6	25 670	11.4	31 610	11.3	38 450	11.3	46 310	11.2	55 280	11.2	65 470	11.2
	55	-	-	-	-	21 790	14.3	27 120	14.1	33 230	14.0	40 240	13.9	48 260	13.9	57 400	13.9
SH240-4	35	26 450	12.2	32 880	12.2	40 380	12.2	49 070	12.2	59 080	12.2	70 540	12.2	83 570	12.3	98 300	12.6
	45	22 840	15.2	28 750	15.3	35 610	15.3	43 550	15.3	52 680	15.2	63 140	15.2	75 070	15.2	88 570	15.3
	55	-	-	-	-	30 370	19.2	37 400	19.2	45 520	19.1	54 850	19.1	65 540	19.0	77 710	19.0
SH300-4	35	33 720	16.0	41 790	16.1	51 210	16.2	62 140	16.2	74 710	16.2	89 110	16.2	105 470	16.2	123 970	16.2
	45	29 260	19.5	36 720	19.7	45 390	19.7	55 410	19.8	66 960	19.8	80 190	19.8	95 250	19.8	112 320	19.7
	55	-	-	-	-	38 620	24.3	47 480	24.3	57 730	24.4	69 540	24.3	83 060	24.3	98 470	24.2
SH380-4	35	40 130	18.7	49 630	18.7	60 680	18.7	73 500	18.8	88 250	18.9	105 140	19.0	124 360	19.1	146 090	19.1
	45	35 000	23.0	43 710	22.9	53 800	22.9	65 460	23.0	78 890	23.1	94 280	23.2	111 820	23.3	131 710	23.4
	55	-	-	-	-	45 930	28.3	56 170	28.3	68 020	28.4	81 660	28.5	97 290	28.6	115 110	28.7
SH182-4	35	19 180	9.0	23 930	9.2	29 470	9.4	35 900	9.5	43 330	9.6	51 830	9.8	61 520	9.8	72 480	9.9
	45	16 670	11.2	21 010	11.3	26 050	11.4	31 870	11.6	38 600	11.7	46 310	11.9	55 110	12.0	65 100	12.1
	55	-	-	-	-	22 320	14.2	27 450	14.3	33 380	14.4	40 210	14.5	48 050	14.6	56 990	14.7
SH210-4	35	22 460	10.5	28 030	10.6	34 520	10.8	42 060	11.0	50 760	11.2	60 720	11.3	72 060	11.4	84 900	11.5
	45	19 540	13.0	24 630	13.1	30 530	13.3	37 360	13.4	45 240	13.6	54 270	13.7	64 570	13.9	76 260	14.0
	55	-	-	-	-	26 150	16.4	32 160	16.5	39 110	16.7	47 110	16.8	56 280	16.9	66 740	17.0
SH242-4	35	25 750	11.9	32 130	12.1	39 580	12.3	48 220	12.5	58 180	12.7	69 600	12.8	82 600	12.9	97 320	13.0
	45	22 400	14.7	28 240	14.9	35 020	15.1	42 850	15.2	51 880	15.4	62 230	15.6	74 030	15.7	87 430	15.9
	55	-	-	-	-	29 980	18.7	36 880	18.8	44 840	18.9	54 010	19.1	64 510	19.2	76 480	19.3
SH281-4	35	29 930	13.8	37 210	13.9	45 690	14.1	55 530	14.2	66 860	14.3	79 840	14.5	94 610	14.7	111 320	14.9
	45	26 050	17.2	32 730	17.3	40 470	17.4	49 420	17.5	59 730	17.6	71 550	17.7	85 020	17.8	100 300	18.0
	55	-	-	-	-	34 540	21.7	42 420	21.8	51 520	21.8	62 000	21.9	74 000	21.9	87 690	22.0
SH322-4	35	34 110	15.7	42 290	15.7	51 810	15.8	62 840	15.9	75 540	16.0	90 080	16.2	106 620	16.4	125 330	16.7
	45	29 700	19.6	37 220	19.6	45 930	19.7	55 990	19.7	67 580	19.7	80 870	19.8	96 010	19.9	113 170	20.1
	55	-	-	-	-	39 110	24.7	47 960	24.7	58 200	24.6	69 980	24.6	83 500	24.6	98 900	24.7
SH360-4	35	37 820	18.8	47 020	18.6	57 810	18.4	70 400	18.3	85 010	18.3	101 830	18.2	121 080	18.2	142 950	18.1
	45	31 670	23.6	40 450	23.2	50 580	22.9	62 280	22.7	75 760	22.5	91 230	22.4	108 900	22.4	128 980	22.4
	55	-	-	-	-	42 930	28.6	53 420	28.3	65 460	28.0	79 270	27.8	95 080	27.8	113 080	27.7
SH420-4	35	44 960	21.6	55 890	21.5	68 680	21.4	83 540	21.4	100 700	21.3	120 400	21.3	142 860	21.4	168 300	21.6
	45	38 330	27.0	48 540	26.9	60 360	26.7	74 030	26.6	89 770	26.5	107 810	26.4	128 390	26.4	151 730	26.5
	55	-	-	-	-	51 380	33.5	63 550	33.3	77 560	33.1	93 670	33.0	112 100	32.9	133 080	32.8
SH480-4	35	52 120	25.5	64 680	25.4	79 350	25.4	96 410	25.4	116 100	25.4	138 690	25.3	164 430	25.3	193 580	25.3
	45	44 660	31.4	56 390	31.3	69 990	31.2	85 720	31.1	103 830	31.1	124 600	31.0	148 270	31.0	175 120	30.9
	55	-	-	-	-	59 500	38.6	73 480	38.5	89 600	38.4	108 130	38.3	129 360	38.2	153 530	38.1
SH482-4	35	52 110	24.4	64 770	24.4	79 540	24.4	96 670	24.3	116 390	24.3	138 970	24.4	164 630	24.7	193 640	25.1
	45	44 990	30.3	56 640	30.5	70 150	30.5	85 780	30.5	103 780	30.4	124 400	30.3	147 880	30.4	174 490	30.5
	55	-	-	-	-	59 830	38.3	73 680	38.3	89 670	38.2	108 060	38.1	129 120	38.0	153 090	37.9
SH540-4	35	59 270	28.2	73 550	28.3	90 220	28.4	109 540	28.4	131 790	28.4	157 250	28.4	186 210	28.5	218 930	28.8
	45	51 310	34.7	64 490	34.9	79 780	35.0	97 470	35.0	117 850	35.0	141 180	35.0	167 770	35.0	197 880	35.0
	55	-	-	-	-	67 960	43.4	83 610	43.5	101 700	43.5	122 530	43.4	146 370	43.3	173 540	43.2
SH600-4	35	66 430	32.0	82 340	32.2	100 890	32.3	122 410	32.4	147 190	32.4	175 540	32.4	207 780	32.4	244 210	32.4
	45	57 640	39.0	72 340	39.3	89 410	39.5	109 160	39.6	131 910	39.6	157 970	39.5	187 650	39.5	221 270	39.4
	55	-	-	-	-	76 080	48.5	93 530	48.6	113 730	48.7	136 990	48.6	163 630	48.6	193 990	48.4
SH760-4	35	80 260	37.4	99 250	37.4	121 370	37.5	147 000	37.7	176 510	37.8	210 290	38.0	248 720	38.1	292 170	38.1
	45	70 000	46.0	87 420	45.9	107 600	45.9	130 930	46.0	157 790	46.2	188 570	46.5	223 650	46.7	263 420	46.8
	55	-	-	-	-	91 850	56.7	112 350	56.7	136 040	56.8	163 310	57.0	194 580	57.2	230 230	57.4

SH - R410A

60 Hz PERFORMANCE DATA

Model	To	-20		-15		-10		-5		0		5		10		15	
	Tc	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe	Qo	Pe
SH090-4	35	11 800	5.4	14 690	5.5	18 050	5.6	21 940	5.7	26 440	5.8	31 590	5.9	37 450	6.0	44 100	6.1
	45	10 340	6.7	12 990	6.7	16 060	6.8	19 620	6.9	23 720	7.0	28 430	7.1	33 800	7.2	39 890	7.3
	55	-	-	-	-	13 830	8.4	16 980	8.5	20 620	8.5	24 820	8.6	29 630	8.7	35 120	8.8
SH120-4	35	16 010	7.2	19 930	7.3	24 490	7.4	29 760	7.5	35 840	7.7	42 790	7.8	50 710	8.1	59 660	8.3
	45	13 990	8.8	17 630	8.9	21 820	9.0	26 640	9.1	32 180	9.2	38 520	9.4	45 740	9.5	53 910	9.8
	55	-	-	-	-	18 730	11.1	23 050	11.1	28 010	11.2	33 680	11.3	40 150	11.5	47 490	11.6
SH161-4	35	21 390	9.2	26 330	9.3	32 080	9.5	38 740	9.6	46 420	9.7	55 210	9.9	65 220	10.1	76 560	10.3
	45	18 740	11.4	23 260	11.5	28 510	11.6	34 590	11.7	41 590	11.8	49 630	11.9	58 800	12.1	69 220	12.2
	55	-	-	-	-	24 480	14.3	29 850	14.4	36 070	14.5	43 240	14.6	51 460	14.7	60 830	14.8
SH180-4	35	24 030	10.8	29 730	10.8	36 350	10.9	44 030	10.9	52 900	10.9	63 090	10.9	74 730	10.9	87 960	10.9
	45	20 280	13.5	25 600	13.5	31 740	13.5	38 820	13.5	46 970	13.5	56 340	13.6	67 050	13.6	79 230	13.6
	55	-	-	-	-	26 960	16.8	33 350	16.7	40 710	16.7	49 160	16.7	58 850	16.7	69 900	16.7
SH240-4	35	32 870	14.5	40 560	14.6	49 510	14.6	59 880	14.7	71 820	14.7	85 500	14.8	101 070	15.0	118 700	15.3
	45	28 840	17.9	35 880	18.0	44 040	18.1	53 470	18.2	64 330	18.3	76 790	18.3	91 000	18.4	107 130	18.5
	55	-	-	-	-	38 010	22.5	46 350	22.6	55 980	22.7	67 060	22.7	79 760	22.8	94 230	22.9
SH300-4	35	40 840	19.1	50 620	19.3	62 000	19.4	75 200	19.5	90 390	19.6	107 800	19.7	127 620	19.8	150 060	20.0
	45	35 730	23.2	44 700	23.4	55 100	23.6	67 130	23.7	81 000	23.8	96 900	23.8	115 030	23.9	135 610	24.0
	55	-	-	-	-	47 350	28.8	57 970	28.9	70 260	29.0	84 410	29.1	100 620	29.1	119 100	29.1
SH380-4	35	48 760	22.6	60 230	22.7	73 640	22.9	89 230	23.0	107 250	23.2	127 950	23.4	151 580	23.8	178 390	24.3
	45	42 710	27.5	53 170	27.7	65 360	27.8	79 540	27.9	95 960	28.0	114 860	28.2	136 480	28.4	161 090	28.8
	55	-	-	-	-	56 080	34.0	68 560	34.1	83 070	34.2	99 870	34.3	119 210	34.5	141 320	34.7
SH182-4	35	23 250	10.8	28 930	11.0	35 550	11.2	43 230	11.4	52 080	11.6	62 220	11.8	73 780	12.1	86 870	12.3
	45	20 370	13.3	25 590	13.5	31 640	13.7	38 650	13.8	46 730	14.0	56 000	14.2	66 580	14.4	78 590	14.6
	55	-	-	-	-	27 240	16.8	33 450	16.9	40 630	17.1	48 890	17.3	58 370	17.4	69 180	17.6
SH210-4	35	27 390	12.6	34 090	12.8	41 900	13.0	50 930	13.2	61 340	13.5	73 260	13.8	86 840	14.1	102 200	14.5
	45	23 970	15.5	30 160	15.6	37 310	15.8	45 560	16.0	55 060	16.2	65 940	16.5	78 340	16.8	92 400	17.1
	55	-	-	-	-	32 070	19.5	39 430	19.6	47 900	19.8	57 620	20.0	68 730	20.2	81 370	20.4
SH242-4	35	31 530	14.3	39 260	14.5	48 240	14.7	58 630	15.0	70 600	15.3	84 300	15.7	99 890	16.1	117 530	16.6
	45	27 570	17.6	34 720	17.8	42 980	17.9	52 480	18.2	63 400	18.4	75 890	18.7	90 110	19.1	106 210	19.5
	55	-	-	-	-	36 890	22.1	45 410	22.3	55 170	22.4	66 350	22.6	79 090	22.9	93 560	23.2
SH281-4	35	36 840	16.4	45 570	16.6	55 720	16.8	67 480	17.1	81 020	17.4	96 530	17.8	114 190	18.1	134 180	18.6
	45	32 240	20.2	40 280	20.3	49 570	20.5	60 310	20.8	72 670	21.0	86 830	21.3	102 970	21.6	121 290	22.0
	55	-	-	-	-	42 560	25.4	52 110	25.5	63 120	25.7	75 760	25.9	90 230	26.1	106 700	26.4
SH322-4	35	42 140	18.4	51 870	18.7	63 200	18.9	76 320	19.2	91 440	19.5	108 760	19.8	128 490	20.2	150 820	20.6
	45	36 910	22.7	45 830	22.9	56 170	23.1	68 140	23.3	81 930	23.6	97 770	23.8	115 840	24.1	136 360	24.5
	55	-	-	-	-	48 230	28.7	58 810	28.8	71 060	28.9	85 180	29.1	101 370	29.3	119 830	29.6
SH360-4	35	47 330	21.5	58 570	21.7	71 620	21.8	86 750	21.8	104 210	21.9	124 280	21.9	147 210	21.8	173 270	21.8
	45	39 950	27.1	50 440	27.1	62 530	27.1	76 470	27.1	92 540	27.1	110 990	27.1	132 080	27.2	156 080	27.3
	55	-	-	-	-	53 120	33.6	65 710	33.5	80 200	33.3	96 850	33.3	115 930	33.3	137 690	33.5
SH420-4	35	56 040	25.2	69 240	25.4	84 580	25.5	102 360	25.6	122 850	25.7	146 360	25.8	173 160	25.9	203 550	26.2
	45	48 380	31.4	60 560	31.6	74 640	31.7	90 900	31.7	109 640	31.8	131 130	31.9	155 680	32.0	183 560	32.2
	55	-	-	-	-	64 000	39.3	78 510	39.4	95 240	39.4	114 480	39.4	136 530	39.5	161 660	39.6
SH480-4	35	63 890	29.9	79 140	30.1	96 880	30.3	117 440	30.4	141 140	30.5	168 330	30.6	199 320	30.8	234 440	31.0
	45	55 170	36.7	69 250	36.9	85 540	37.1	104 360	37.2	126 050	37.3	150 940	37.4	179 350	37.5	211 620	37.6
	55	-	-	-	-	73 200	45.6	89 960	45.7	109 310	45.7	131 570	45.7	157 080	45.7	186 160	45.8
SH482-4	35	64 750	28.9	79 910	29.1	97 540	29.2	117 960	29.3	141 490	29.5	168 430	29.7	199 110	30.0	233 830	30.5
	45	56 820	35.7	70 690	36.0	86 750	36.3	105 330	36.4	126 730	36.5	151 280	36.6	179 270	36.8	211 040	37.0
	55	-	-	-	-	74 880	45.0	91 310	45.2	110 280	45.4	132 110	45.5	157 130	45.6	185 630	45.7
SH540-4	35	72 600	33.6	89 810	33.8	109 850	34.0	133 050	34.2	159 780	34.3	190 400	34.5	225 260	34.8	264 720	35.3
	45	63 610	41.0	79 380	41.4	97 650	41.7	118 790	41.9	143 150	42.0	171 080	42.1	202 950	42.3	239 100	42.5
	55	-	-	-	-	84 080	51.3	102 760	51.6	124 350	51.7	149 200	51.8	177 680	51.9	210 130	52.0
SH600-4	35	80 450	38.2	99 720	38.5	122 150	38.8	148 130	39.0	178 080	39.1	212 370	39.3	251 420	39.6	295 610	40.0
	45	70 400	46.3	88 070	46.8	108 550	47.1	132 250	47.3	159 570	47.5	190 890	47.6	226 620	47.8	267 160	48.0
	55	-	-	-	-	93 270	57.6	114 210	57.9	138 420	58.0	166 290	58.1	198 230	58.1	234 630	58.1
SH760-4	35	97 520	45.2	120 460	45.5	147 270	45.7	178 450	46.0	214 500	46.3	255 900	46.9	303 160	47.6	356 780	48.6
	45	85 420	54.9	106 340	55.3	130 730	55.6	159 090	55.8	191 920	56.1	229 710	56.4	272 970	56.8	322 180	57.5
	55	-	-	-	-	112 160	67.9	137 120	68.2	166 150	68.4	199 750	68.7	238 410	69.0	282 650	69.4

Performance data for SH090-120-161-380 and corresponding tandem models are provisional data

Legend: To: Evaporating temperature in °C Qo: Cooling capacity in W
Tc: Condensing temperature in °C Pe: Power input in kW Superheat = 11.1 K Voltage: 460 V / 3 / 60 Hz
Subcooling = 8.3 K

CODE NUMBERS

Compressor model	Connections	Motor protection	Code numbers for industrial packs				
			3	4	6	7	9
			200-230/3/60	400/3/50 460/3/60	230/3/50	500/3/50 575/3/60	380/3/60
SH090	Brazed	Internal	120H0002	120H0004	120H0006	120H0008	120H0010
SH120	Brazed	Internal	120H0012	120H0014	120H0016	120H0018	120H0020
SH161	Brazed	Internal	120H0022	120H0024	120H0026	120H0028	120H0030
SH180	Brazed	M24	120H0032	120H0040	-	120H0048	120H0056
	Brazed	M230	120H0034	120H0042	-	120H0050	120H0058
	Rotolock	M24	120H0036	120H0044	-	120H0052	120H0060
	Rotolock	M230	120H0038	120H0046	-	120H0054	120H0062
SH240	Brazed	M24	120H0064	120H0075	-	120H0086	120H0097
	Brazed	M115-230	120H0066	120H0077	-	120H0088	120H0099
	Rotolock	M24	120H0071	120H0082	-	120H0093	120H0104
	Rotolock	M115-230	120H0073	120H0084	-	120H0095	120H0106
SH300	Brazed	M24	120H0108	120H0119	-	120H0130	120H0141
	Brazed	M115-230	120H0110	120H0121	-	120H0132	120H0143
	Rotolock	M24	120H0115	120H0126	-	120H0137	120H0148
	Rotolock	M115-230	120H0117	120H0128	-	120H0139	120H0150
SH380	Brazed	M24	120H0152	120H0160	-	120H0168	120H0176
	Brazed	M115-230	120H0154	120H0162	-	120H0170	120H0178
	Rotolock	M24	120H0156	120H0164	-	120H0172	120H0180
	Rotolock	M115-230	120H0158	120H0166	-	120H0174	120H0182



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Danfoss Refrigeration & Air Conditioning is a worldwide manufacturer with a leading position in industrial, commercial and supermarket refrigeration as well as air conditioning and climate solutions.

We focus on our core business of making quality products, components and systems that enhance performance and reduce total life cycle costs – the key to major savings.



*Controls for
Commercial Refrigeration*



*Controls for
Industrial Refrigeration*



*Electronic Controls &
Sensors*



Industrial Automation



Household Compressors



Commercial Compressors



Sub-Assemblies



Thermostats



*Brazed plate
heat exchangers*

We offer a single source for one of the widest ranges of innovative refrigeration and air conditioning components and systems in the world. And, we back technical solutions with business solutions to help your company reduce costs, streamline processes and achieve your business goals.

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