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Danfoss

Food Retail Service Parts Catalog

A collection of the best components
and controls for **Supermarkets**

50,000

food retail
installations
worldwide

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TUA/TUAE—Thermostatic Expansion Valves



Danfoss TUA/TUAE stainless steel thermostatic expansion valves feature solder inlet and outlet connections. By pairing one valve body with one of ten replaceable orifices, a contractor can satisfy applications from -40°F to $+50^{\circ}\text{F}$ and up to $4\frac{1}{2}$ tons capacity (see capacity chart for specifics).

Product Selection

1. Select Valve Body

Equalization	R-22	R-407C	R-404A	R-134a
Internal	068U2235		068U2285	068U2205
External	068U2237		068U2287	068U2207

All valves above have $\frac{3}{8}$ in. \times $\frac{1}{2}$ in. solder ODF connections and are designed for evaporator temperatures -40°F to $+50^{\circ}\text{F}$ (N charge). Other variations available, please contact your local Danfoss authorized wholesaler.

2. Select Orifice

TUA/TUAE valve capacities are based on the installed orifice. To select the correct size, use one of the two methods below:

A. System characteristics: Select the orifice using appropriate refrigerant, evaporator temperature, and system capacity.

OR

B. Nominal capacity of the installed valve: Use the nominal capacity of the originally installed valve and match with the nominal capacity in chart (3rd column from left).

Easy to carry kits for truck stock

All TUA/TUAE valve bodies and orifice featured on the next page and a hex key for superheat adjustment. **068U7000**

Both TUA/TUAE valve bodies and orifices and T2/TE2 and orifices plus gaskets for TUA/TUAE and a hex key for superheat adjustment. **068U7001**

Kits are plastic cases with foam inserts, all valves and orifices, and instructions for selection and installation of the valves. Empty kits and foam available upon request.

TUA and TUAE (IF EXACT CAPACITY CANNOT BE FOUND, USE NEXT LARGER ORIFICE)

R-22		R-407C	Evaporator temperature (°F)										
Orifice size	Danfoss Code No.	Nominal capacity of installed valve ¹ (tons)	-40	-30	-20	-10	0	10	20	30	40	50	
			Rated capacity ² (tons)										
0	068U1030	$\frac{1}{8}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	
1	068U1031	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{4}$	
2	068U1032	$\frac{1}{4}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{3}$	
3	068U1033	$\frac{1}{3}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	
4	068U1034	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	
5	068U1035	$\frac{3}{4}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	
6	068U1036	$1\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{1}{2}$	
7	068U1037	2	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	2	
8	068U1038	$2\frac{3}{4}$	1	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{3}$	$2\frac{1}{2}$	3	3	
9	068U1039	4	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	

R-404A		Evaporator temperature (°F)										
Orifice size	Danfoss Code No.	Nominal capacity of installed valve ¹ (tons)	-40	-30	-20	-10	0	10	20	30	40	50
			Rated capacity ² (tons)									
0	068U1030	$\frac{1}{8}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
1	068U1031	$\frac{1}{5}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
2	068U1032	$\frac{1}{4}$	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
3	068U1033	$\frac{1}{3}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
4	068U1034	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
5	068U1035	$\frac{3}{4}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
6	068U1036	$1\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	1	$1\frac{1}{3}$
7	068U1037	$1\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{4}$
8	068U1038	$2\frac{1}{3}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1	$1\frac{1}{3}$	$1\frac{1}{2}$	2	2	$2\frac{1}{3}$	$2\frac{1}{2}$
9	068U1039	$3\frac{1}{3}$	$\frac{3}{4}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$3\frac{3}{4}$

R-134a			Evaporator temperature (°F)										
Orifice size	Danfoss Code No.	Nominal capacity of installed valve ¹ (tons)	-40	-30	-20	-10	0	10	20	30	40	50	
			Rated capacity ² (tons)										
0	068U1030	1/8	1/30	1/20	1/20	1/20	1/15	1/15	1/10	1/10	1/6	1/6	
1	068U1031	1/8	1/20	1/15	1/15	1/10	1/10	1/8	1/6	1/6	1/6	1/5	
2	068U1032	1/8	1/15	1/15	1/15	1/10	1/8	1/6	1/6	1/6	1/5	1/5	
3	068U1033	1/4	1/15	1/10	1/8	1/8	1/6	1/5	1/5	1/5	1/4	1/4	
4	068U1034	1/8	1/6	1/6	1/5	1/5	1/4	1/4	1/3	1/3	1/3	1/2	
5	068U1035	1/2	1/5	1/5	1/4	1/4	1/3	1/3	1/2	1/2	1/2	1/2	
6	068U1036	3/4	1/4	1/4	1/3	1/3	1/2	1/2	3/4	3/4	1	1	
7	068U1037	1 1/4	1/3	1/3	1/2	1/2	3/4	3/4	1	1	1 1/4	1 1/2	
8	068U1038	1 3/4	1/2	1/2	3/4	3/4	1	1 1/4	1 1/2	1 3/4	2	2	
9	068U1039	2 1/2	3/4	1	1	1 1/3	1 1/2	1 3/4	2	2 1/2	2 3/4	3	

All capacity data is in accordance to ARI 750-2007.

¹ Nominal capacity based on condensing temperature of 100 °F, a vapor free liquid temperature of 98 °F ahead of the expansion valve and an evaporator temperature of 40 °F.

² Capacity based on condensing temperature of 95 °F and a vapor free liquid temperature of 85 °F ahead of the expansion valve.

TUA/TUAE Spare Parts and Accessories

Description	Notes	Danfoss Code No.
TUA/TUAE truck stock kit (minimizer kit)	All TUA/TUAE valve bodies and orifice featured in this document and a hex key for superheat adjustment.	068U700
TUA/TUAE and T2/TE2 truckstock Kit (maximizer kit)	Both TUA/TUAE valve bodies and orifices and T2/TE2 and orifices plus gaskets for TUA/TUAE and a hex key for superheat adjustment.	068U7001
Bulb strap		068U3507
Metal gasket (24 pcs.)		068U0015
Filter for orifices 0-4 (clear; 24 pcs.)		068U1706
Filter for orifices 5-9 (blue; 24 pcs.)		068U0016

ETS—Electric Expansion Valves



ETS is a series of stepper motor electrically operated expansion valves for precise liquid injection in evaporators for air conditioning and refrigeration applications. They cannot be used with flammable hydrocarbons. The valve piston and linear positioning mechanism is fully balanced, providing bidirectional flow capability and tight solenoid shut off in both flow directions.

Danfoss Type	R-410A (tons)	R-22 (tons)	R-134a (tons)	R-404A (tons)	Solder ODF Connection		Danfoss Code No.
					Inlet (in.)	Outlet (in.)	
ETS 12.5	20	16	13	12	1/2	1/2	034G4209
ETS 12.5	20	16	13	12	5/8	5/8	034G4210
ETS 12.5	20	16	13	12	7/8	7/8	034G4211
ETS 25	41	34	27	25	5/8	5/8	034G4202
ETS 25	41	34	27	25	7/8	7/8	034G4203
ETS 50	75.7	62	48.9	46.3	1 1/8	1 1/8	034G1706
ETS 100	140.9	115.4	91.2	86.6	1 3/8	1 3/8	034G0508

The rated capacity is based on an evaporation temperature of 40 °F, liquid temperature of 82 °F, and condensing temperature of 90 °F.

ETS Spare Parts and Accessories

Description	Danfoss Code No.
AST-G Service Driver: used to manually open or close valve	034G0013
M12 cable, 26 ft.	034G2323
M12 cable, 6 ft.	034G2330
Cable filter for long wire runs (in excess of 32 ft.); permits wire runs of up to 328 ft.	034G2238

AKV/AKVH—Electric Expansion Valves



AKV and AKVH valves are pulse modulating electrically operated expansion valves. They feature a replaceable coil, wide range of coils for both DC and AC, quiet operation, energy efficient operation, and long valve life, and the ability to operate as both as expansion and solenoid valve. AKV valves are designed for R-744, R-22/R-407C, R-404A/R-507, R-410A, R-134a, R-407A, R-23, and other refrigerants and should be paired with standard BJ/BX coils (page 8). AKVH valves are designed for CO₂ and should be paired with high MOPD (Maximum Operation Pressure Differential) BX/BJ coils (page 8).

AKV valves for fluorinated refrigerants

Danfoss Type	Rated Capacity (tons)			Solder ODF Connection (in.)		Danfoss Code No.
	R-22	R-134a	R-404A	Inlet (in.)	Outlet (in.)	
AKV 10-1	0.3	0.3	0.23	3/8	1/2	068F1210
AKV 10-2	0.5	0.4	0.37	3/8	1/2	068F1213
AKV 10-3	0.7	0.6	0.57	3/8	1/2	068F1216
AKV 10-4	1.2	1	0.88	3/8	1/2	068F1219
AKV 10-5	1.8	1.5	1.39	3/8	1/2	068F1222
AKV 10-6	2.9	2.4	2.22	3/8	1/2	068F1225
AKV 10-7	4.6	3.8	3.55	1/2	5/8	068F1228
AKV 15-1	7.3	6	5.57	3/4	3/4	068F5035
AKV 15-2	11.6	9.6	8.93	3/4	3/4	068F5036
AKV 15-3	18.3	15.2	14.05	7/8	7/8	068F5037
AKV 15-4	29	24.1	22.26	1 1/8	1 1/8	068F5038

Rated capacities are based on condensing temperature of 90 °F, liquid temperature of 82 °F, and evaporating temperature of 40 °F.

AKV valves should be paired with standard BJ/BX coils (page 8)

AKVH Valves for CO₂

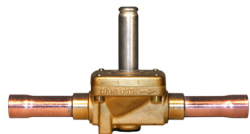
Danfoss Type	Rated Capacity CO ₂ (tons)		Solder ODF Connection (in.)		Danfoss Code No.
	Refrigeration	Freezing	Inlet (in.)	Outlet (in.)	
AKVH 10-1	0.3	0.6	3/8	1/2	068F4079
AKVH 10-2	0.5	1	3/8	1/2	068F4080
AKVH 10-3	0.7	1.5	3/8	1/2	068F4081
AKVH 10-4	1.2	2.5	3/8	1/2	068F4082
AKVH 10-5	1.9	3.9	3/8	1/2	068F4083
AKVH 10-6	3	6.2	3/8	1/2	068F4084

AKVH valves should be paired with high MOPD BJ/BX coils (page 8).

AKV/AKVH Orifices and Filter/Gasket Kits

Description	Danfoss Code No.
AKV 10 Orifice Kit #0-#3	068F5283
AKV 10 Orifice Kit #4-#6	068F5284
AKV 10 Orifice Kit #7-#8	068F5285
AKV 15 Orifice Kit #1	068F5265
AKV 15 Orifice Kit #2	068F5266
AKV 15 Orifice Kit #3	068F5267
AKV 15 Orifice Kit #4-#6	068F5268
AKV 10 Armature Kit	068F0541
AKV 15 Armature Kit	068F5045
Filter and Gasket Set	068F0540

EVR—Solenoid Valves



EVR solenoid valves are direct- or servo-operated for liquid, suction, and hot gas lines. They are available in both normally closed (NC) and normally open (NO) versions and feature interchangeable AC and DC coils. In standard applications pair BJ/BX coils with EVR valves. These can be found on the next page.

EVR Solenoid Valves

Danfoss Type	Rated capacity (liquid tons)			Solder ODF connection (in.)	Port size (in.)	Max. working pressure (psig)	Danfoss Code No. ¹	
	R-22	R-134a	R-404A				with manual stem NEW	without manual stem NEW
	R-407C		R-507A					
EVR 3	2.03	1.55	1.40	¼	⅜	655		032F1205
EVR 3	2.03	1.55	1.40	⅜	⅜	655		032F1204
EVR 6	5.83	4.43	4.01	⅜	15/64	655	032L7116	032L7115
EVR 6	5.83	4.43	4.01	½	15/64	655	032L7144	032L1209
EVR 8	8.01	6.09	5.52	½	5/16	655	032I7148	032L7121
EVR 10	13.80	10.50	9.53	5/8	3/8	500	032L7149	032L1214
EVR 15	18.90	14.40	13.00	5/8	9/16	460		032L1228
EVR 18	24.60	18.70	17.00	7/8	19/32	460	032L1004	
EVR 20	36.40	27.70	25.10	7/8	7/8	460	032L1177	032L1240
EVR 22	43.70	33.30	30.10	1 1/8	15/16	460	032L7137	032L7145
EVR 25	72.80	55.40	50.20	1 3/8	1	400	032L1194	032L2208
EVR 32	116.50	88.70	80.30	1 5/8	7/8	400	032L1103	032L1244

¹Valve body is normally closed (NC) and excludes coil. Additional code nos. available in Coolselector® or contact Danfoss

EVR Spare Parts and Accessories

Description	Applicable Danfoss Types	Danfoss Code No.
Permanent magnet coil for servicing and testing	all	018F0091
Service kit: O-ring, (4) screws, armature assembly, rubber gaskets	EVR 2, 3	032F0181
Service kit: diaphragm, O-ring for armature tube, (4) screws T20, (4) screws T15, armature assembly, rubber gasket, O-ring for steel cover, square cover, square gasket for steel cover, support rings	EVR 6	032F8166
Service kit: diaphragm assembly, O-ring, (4) screws, armature assembly, rubber gasket	EVR 10	032F0185
Service kit: diaphragm assembly, O-ring, (4) screws, armature assembly, rubber gasket, flange gasket	EVR 15, 18	032F0187
Service kit: diaphragm assembly, O-ring, (4) screws, armature assembly, compression spring, rubber gasket	EVR 20, 22	032F0189
Manual spindle	EVR 20, 22	032F0193
Piston service kit: (2) O-ring, spring, piston assembly, plastic block, rubber gasket, piston ring	EVR 25	032F3236
Pilot service kit: armature tube assembly, armature, (2) Al. gaskets, orifice, O-rings	EVR 25	042H0161
Seal kit: (2) Al. gaskets, (3) O-rings, (2) rubber gaskets	EVR 25	032F3235
Piston service kit: (5) O-ring, Al. gasket, piston assembly, plastic block, gasket, piston ring, spring	EVR 32	042H0172
Pilot service kit: armature tube assembly, armature, (2) Al. gaskets, orifice, O-rings	EVR 32	042H0165
Seal kit: (4) O-rings, (2) A. gaskets, gasket	EVR 32	042H0160
Piston service seal kit: (5) O-rings, Al. gasket, piston assembly, plastic block, gasket, piston ring, spring	EVR 40	042H0173
Seal kit: (5) O-rings, (2) Al. gaskets, gaskets	EVR 40	042H0160

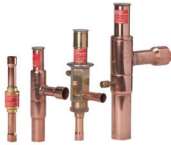
BJ/BX—Solenoid Coils



BJ/BX coils are designed to be used with Danfoss electric expansion and solenoid valves. They offer easy mounting and dismantling and high-reliability. EVR solenoid valves and AKV electric expansion valves should be paired with standard BJ/BX coils while AKVH electronic expansion valves for high pressure refrigerants should be paired with high MOPD BJ/BX coils.

Coil type	Voltage (V)	Frequency (Hz)	Power consumption (W)	Danfoss Type (junction box)	Length of wire (in.)	Danfoss Code No.	Danfoss Type (conduit boss)	Length of wire (in.)	Danfoss Code No.
Standard Coil	24	50/60	14	BJ024CS	7	018F4100	BX024CS	18	018F4102
	110	50/60	16	BJ120CS	7	018F4110	BX120CS	18	018F4112
	120	60	15						
	208–240	60	14	BJ240CS	7	018F4120	BX240CS	18	018F4122
	230	50	17						
High MOPD Coil	120	60	16	BJ120BS	7	018F4130	BX120BS	98	018F4131
	208	60	16	BJ208BS	7	018F4132	BX208BS	98	018F4133
	240	60	16	BJ240BS	7	018F4134	BX240BS	98	018F4135

KVP/KVL/KVR/NRD/KVC/CPCE—Pressure Regulators



Danfoss has a variety of pressure regulators to control the low and high pressure sides and efficient function of a refrigeration system under varying load conditions.

Application	Danfoss Type	Rated capacity (tons)				Solder ODF Connection Inlet (in.)	Setting Range (psig)	Factory setting (psig)	Maximum Working Pressure (psig)	Maximum Test Pressure (psig)	Minimum Temp. of Medium (°F)	Maximum Temp of Medium (°F)	Danfoss Code No.
		R-22	R-134a	R-404A	R-407C								
Evaporating Pressure Regulator	KVP 12	1.30	0.90	1.20	1.20	½	0 to 80	29	260	286	–50	265	034L0023
	KVP 15	1.30	0.90	1.20	1.20	¾	0 to 80	29	260	286	–50	265	034L0029
	KVP 22	1.30	0.90	1.20	1.20	¾	0 to 80	29	260	286	–50	265	034L0025
	KVP 28	2.80	1.90	2.40	2.60	1 ¼	0 to 80	29	260	286	–50	265	034L0026
	KVP 35	2.80	1.90	2.40	2.60	1 ¾	0 to 80	29	260	286	–50	265	034L0032
Crankcase Pressure Regulator	KVL 12	1.20	0.80	1.00	1.10	½	3 to 87	29	260	286	–75	266	034L0043
	KVL 15	1.20	0.80	1.00	1.10	¾	3 to 87	29	260	286	–75	266	034L0049
	KVL 22	1.20	0.80	1.00	1.10	¾	3 to 87	29	260	286	–75	266	034L0045
	KVL 28	4.10	2.60	3.40	3.80	1 ¼	3 to 87	29	260	286	–75	266	034L0046
	KVL 35	4.10	2.60	3.40	3.80	1 ¾	3 to 87	29	260	286	–75	266	034L0052
Condensing Pressure Regulator	KVR 12	Liquid: 12.70 Hot gas: 4.13	Liquid: 11.80 Hot gas: 3.03	Liquid: 8.20 Hot gas: 3.27	Liquid: 13.80 Hot gas: 4.50	½	73 to 254	145	406	450	–50	266	034L0093
	KVR 15	Liquid: 12.70 Hot gas: 4.13	Liquid: 11.80 Hot gas: 3.03	Liquid: 8.20 Hot gas: 3.27	Liquid: 13.80 Hot gas: 4.50	¾	73 to 254	145	406	450	–50	266	034L0097
	KVR 22	Liquid: 12.70 Hot gas: 4.13	Liquid: 11.80 Hot gas: 3.03	Liquid: 8.20 Hot gas: 3.27	Liquid: 13.80 Hot gas: 4.50	¾	73 to 254	145	406	450	–50	266	034L0094
	KVR 28	Liquid: 32.60 Hot gas: 10.93	Liquid: 30.20 Hot gas: 8.04	Liquid: 20.90 Hot gas: 8.66	Liquid: 35.50 Hot gas: 11.91	1 ¼	73 to 254	145	406	450	–50	266	034L0095
	KVR 35	Liquid: 32.60 Hot gas: 10.93	Liquid: 30.20 Hot gas: 8.04	Liquid: 20.90 Hot gas: 8.66	Liquid: 35.50 Hot gas: 11.91	1 ¾	73 to 254	145	406	450	–50	266	034L0100
Differential Pressure Regulator	NRD 12s ¹					½	73 to 254	145	667	870	–50	266	020-1132
Hot Gas Bypass	KVC 12	2.14	1.36	2.02	2.31	½	3 to 87	29	406	450	–50	266	034L0143
	KVC 15	4.17	2.65	3.93	4.5	¾	3 to 87	29	406	450	–50	266	034L0147
	KVC 22	5.35	3.41	5.04	5.78	¾	3 to 87	29	406	450	–50	266	034L0144
	CPCE 12	6.20	4.30	6.30	6.70	½	0 to 87	5.8	406	450	–58	285	034N0082
	CPCE 15	9.20	6.30	9.10	9.90	¾	0 to 87	5.8	406	450	–58	285	034N0083
CPCE 22	12.20	8.40	12.10	12.20	¾	0 to 87	5.8	406	450	–58	285	034N0084	

¹NRD generally used in conjunction with a KVR to regulate the condensing pressure.

GBC/GBC H—Ball Valves



GBC ball valves are manually operated shut-off valves suitable for bi-directional flow. They can be used in liquid, suction and hot gas lines. Features include: ball status indicator on spindle top, laser welded construction, burst-proof spindle design, holes for panel mounting. GBC H ball valves have been designed and tested to meet the high pressure requirements of CO₂.

Standard Ball Valves

Danfoss Type	Solder ODF connection (in.)	CV Value (gal/min)	Working pressure (psig)	Test pressure (psig)	Danfoss Code No.
GBC 6s	¼	2.27	650	940	009G8050
GBC 10s	⅜	6.57		940	009G8051
GBC 12s	½	12.23		940	009G8052
GBC 16s	⅝	16.31		940	009G8053
GBC 18s	¾	23.61		940	009G8054
GBC 22s	7⁄8	32.56		940	009G8065
GBC 28s	1 ¼	60.05		940	009G8066
GBC 35s	1 ⅜	93.51		940	009G8067
GBC 42s	1 ⅝	139.96		940	009G8068
GBC 54s	2 ¼	260.05		940	009G8059
GBC 67s	2 ⅝	358.36		725	009G8069

Ball Valves for High Pressure Refrigerants (CO₂)

Danfoss Type	Solder ODF connection (in.)	CV Value (gal/min)	Working pressure (psig)	Danfoss Code No.
GBC 6s H	¼	1.09	1305	009G7415
GBC 10s H	⅜	3.52		009G7416
GBC 12s H	½	8.05		009G7417
GBC 16s H	⅝	11.11		009G7418
GBC 18s H	¾	17.88		009G7419
GBC 22s H	7⁄8	24.64		009G7420

SGP—Sight Glasses



Danfoss sight glasses indicate the presence of moisture in refrigeration and air conditioning systems.

Danfoss Type	Version	Connection (in.)	Ambient temp. (°F)	Max. working pressure (psig)	Danfoss Code No.
SGP 6 N	Flare int. x ext.	¼ x ¼	-60 to 175	750	014L0171
SGP 10 N		⅜ x ⅜			014L0172
SGP 12 N		½ x ½			014L0173
SGP 6s N	ODF x ODF solder	¼ x ¼			014L0181
SGP 10s N		⅜ x ⅜			014L0182
SGP 12s N		½ x ½			014L0183
SGP 16s N		⅝ x ⅝			014L0145
SGP 22s N		7⁄8 x 7⁄8			014L0186
SGP 1/2 RN		NPT			½

Filter Driers



Danfoss filter driers function as simple drop-in replacements for most driers sold in the aftermarket or installed on equipment by manufacturers. All Danfoss filter driers are constructed with a solid core design to maximize moisture removal while minimizing pressure drop. DC cores and DCL filter driers include both moisture and acid adsorption properties. DM cores and DML filter driers only include moisture adsorption properties. Danfoss recommends the use of DC cores and DCL filter driers for standard liquid line aftermarket applications and DM cores and DML filter driers when acid reduction is not necessary, typically OEM assembly. For acid reduction after a burnout, Danfoss recommends a suction line DAS filter driers or DA cores. For CO₂ applications, Danfoss recommends DM cores or DMT filter driers.

DCL/DCB Filter Driers

Danfoss Type	Connection (in.)	Max. working pressure (psig)	Drying capacity (lbs. of refrigerant)								Liquid capacity (tons)				Danfoss Code No.
			R-134a		R-404A		R-22		R-410A		R-134a	R-404A	R-22	R-410A	
			75 °F	125 °F	75 °F	125 °F	75 °F	125 °F	75 °F	125 °F					
DCL 1.52/2.8mms	¼ solder	667	5.10	4.60	5.30	5.10	5.10	4.60	4.60	4.20	0.80	0.50	0.90	0.80	023Z8255
DCL 032s	¼ solder	667	8.50	8.00	9.10	8.70	8.60	8.00	7.80	7.20	1.90	1.42	2.12	2.11	023Z5013 ¹
DCL 032	¼ flare	667	8.50	8.00	9.10	8.70	8.60	8.00	7.80	7.20	1.90	1.42	2.12	2.11	023Z5000 ¹
DCL 052s	¼ solder	667	13.60	12.80	14.60	13.80	13.80	12.70	12.40	11.40	2.18	1.60	2.40	2.37	023Z5018
DCL 052	¼ flare	667	13.60	12.80	14.60	13.80	13.80	12.70	12.40	11.40	2.18	1.60	2.40	2.37	023Z5002
DCL 053s	⅜ solder	667	13.60	12.80	14.60	13.80	13.80	12.70	12.40	11.40	3.66	2.79	4.10	4.15	023Z5019
DCL 053	⅜ flare	667	13.60	12.80	14.60	13.80	13.80	12.70	12.40	11.40	3.66	2.79	4.10	4.15	023Z5003
DCL 082s	¼ solder	667	21.70	20.50	23.30	22.10	22.00	20.30	19.80	18.20	2.18	1.55	2.37	2.28	023Z5022
DCL 082	¼ flare	667	21.70	20.50	23.30	22.10	22.00	20.30	19.80	18.20	2.18	1.55	2.37	2.28	023Z5004
DCL 083s	⅜ solder	667	21.70	20.50	23.30	22.10	22.00	20.30	19.80	18.20	4.03	3.12	4.56	4.65	023Z5023
DCL 084s	½ solder	667	21.70	20.50	23.30	22.10	22.00	20.30	19.80	18.20	8.14	6.07	9.03	8.99	023Z5026
DCL 084	½ flare	667	21.70	20.50	23.30	22.10	22.00	20.30	19.80	18.20	8.14	6.07	9.03	8.99	023Z5006
DCL 162	¼ flare	667	47.70	45.10	51.30	48.60	48.30	44.70	43.50	40.10	2.18	1.54	2.36	2.28	023Z5007
DCL 163s	⅜ solder	667	47.70	45.10	51.30	48.60	48.30	44.70	43.50	40.10	4.64	3.18	4.95	4.67	023Z5029
DCL 163	⅜ flare	667	47.70	45.10	51.30	48.60	48.30	44.70	43.50	40.10	4.64	3.18	4.95	4.67	023Z5008
DCL 164s	½ solder	667	47.70	45.10	51.30	48.60	48.30	44.70	43.50	40.10	9.15	6.69	10.07	9.90	023Z5032
DCL 165s	⅝ solder	667	47.70	45.10	51.30	48.60	48.30	44.70	43.50	40.10	12.69	10.41	14.74	15.59	023Z5033
DCL 165	⅝ flare	667	47.70	45.10	51.30	48.60	48.30	44.70	43.50	40.10	12.69	10.41	14.74	15.59	023Z5010
DCL 303s	⅜ solder	667	100.50	95.00	108.00	102.40	101.80	94.10	91.60	84.40	4.46	3.00	4.72	4.40	023Z0030
DCL 303	⅜ flare	667	100.50	95.00	108.00	102.40	101.80	94.10	91.60	84.40	4.46	3.00	4.72	4.40	023Z0012
DCL 304s	½ solder	667	100.50	95.00	108.00	102.40	101.80	94.10	91.60	84.40	9.24	7.11	10.41	10.58	023Z0031
DCL 304	½ flare	667	100.50	95.00	108.00	102.40	101.80	94.10	91.60	84.40	9.24	7.11	10.41	10.58	023Z0013
DCL 305s	⅝ solder	667	100.50	95.00	108.00	102.40	101.80	94.10	91.60	84.40	13.00	10.51	14.99	15.72	023Z0032
DCL 305	⅝ flare	667	100.50	95.00	108.00	102.40	101.80	94.10	91.60	84.40	13.00	10.51	14.99	15.72	023Z0014
DCL 307s	⅞ solder	667	100.50	95.00	108.00	102.40	101.80	94.10	91.60	84.40	18.27	15.34	21.44	23.05	023Z0034
DCL 415s	⅝ solder	667	139.50	131.90	150.00	142.20	141.30	130.70	127.30	117.30	15.78	11.9	17.61	17.66	023Z0105
DCL 417s	⅞ solder	500	139.50	131.90	150.00	142.20	141.30	130.70	127.30	117.30	18.98	16.01	22.32	24.08	023Z0106
DCL 607s	⅞ solder	667	200.90	189.90	216.00	204.80	203.50	188.20	183.30	168.90	19.93	19.94	25.16	30.71	023Z0036
DCB 083s	⅜ solder	667	15.60	14.70	16.70	15.80	15.60	14.50	14.10	13.00	2.10	1.50	2.30	2.30	023Z1433
DCB 163s	⅜ solder	667	29.30	27.70	31.50	29.90	29.70	27.50	26.80	24.60	5.10	3.70	5.70	5.70	023Z1437
DCB 164s	½ solder	667	29.30	27.70	31.50	29.90	29.70	27.50	26.80	24.60	8.00	5.70	9.10	9.10	023Z1436
DCB 165s	⅝ solder	667	29.30	27.70	31.50	29.90	29.70	27.50	26.80	24.60	10.60	8.30	11.40	11.40	023Z1435

¹ Wire mesh in filter drier outlet.

DAS Filter Driers

Danfoss Type	Connection in.	Max. working pressure (psig)	Rated capacity (tons)			Acid capacity (oz.)	Danfoss Code No.
			R-134a	R-404A	R-22 R-410A		
DAS 164SVV	½ solder	500	1.7	2.4	6.3	0.3	023Z1009
DAS 165SVV	⅝ solder		2.7	3.7	4.3	0.3	023Z1010
DAS 166SVV	¾ solder		3.4	4.9	5.7	0.3	023Z1011
DAS 167SVV	⅞ solder		3.9	5.4	6.3	0.3	023Z1012
DAS 306SVV	¾ solder		4	5.4	6.3	0.64	023Z1014
DAS 307SVV	⅞ solder		4.6	6.3	7.4	0.64	023Z1015
DAS 309SVV	1½ solder		5.7	7.7	8.9	0.64	023Z1016
DAS 419SVV	1½ solder		6.3	8.6	10	0.86	023Z1018

DMT Filter Driers for CO₂

Danfoss Type	Connection in.	Max. working pressure (psig)	Drying capacity						Liquid capacity Tons	Danfoss Code No.
			20 °F			75 °F				
			Water (g)	Ref. (Kg)	Water (drops)	Water (g)	Ref. (Kg)	Water (drops)		
DMT 083s	¾ solder	2030	7.2	7.2	143	5.7	5.8	114	3	023Z8416

DCR Cores and Gaskets

Danfoss Type	Material	Danfoss Code No.
48-DM	100% molecular sieve	023U1392
48-F	strainer	023U1921
48-DC	80% molecular sieve/20% activated alumina	023U4381
48-DA	solid core	023U5381
DCR gasket kit	various	023U0058

DCR Drier Housing

Danfoss Type	Connection (in.)	Connection Type	Weight	Max. Pressure (psig)	Temperature Range (°F)	Danfoss Code No.
DCR 0489	1	butt weld/solder, ODF	10 lbs. 6 oz.	667	-40 to +160	023U7453
DCR 0969	1	butt weld/solder, ODF	13 lbs. 12 oz.			023U7459
DCR 09617	2 ½	butt weld/solder, ODF	14 lbs. 9 oz.			023U7464

NRV—Check Valves



NRV check valves can be used in liquid, suction, and hot gas lines in refrigeration and air conditioning applications, ensuring that refrigerant flows in the correct direction. A built-in dampening piston makes the valve suitable for installation in lines where pulsation can occur, such as in the discharge line from the compressor. The NRV 10s H is specifically designed with a high maximum working pressure to permit use in CO₂ applications.

Danfoss Type	Design/conn. type	Conn. size	Pressure drop across valve (psi) ²	Cv value (gal/min) ³	MWP (psi)	Danfoss Code No.	Danfoss Type	Design/conn. type	Conn. size	Cv value (gal/min)	MWP (psi)	Danfoss Code No.
NRV 6s	straight-way/ solder	¼	1.01	0.65	667	020-1010	NRV 10s H	straight-way/ solder	¾	1040	1305	020-4000
NRV 10s		⅜	1.01	1.39		020-1011						
NRV 10s ¹		½	1.01	1.39		020-1058						
NRV 12s		½	0.72	2.37		020-1012						
NRV 16s		⅝	0.72	4.16		020-1018						
NRV 19s		¾	0.72	6.36		020-1019						
NRV 19s ¹		⅞	0.72	6.36		020-1054						

¹ Oversize connections

² Δp = the minimum pressure at which the valve is completely open

³ The Cv value is the flow of water in (gal/min) at a pressure drop across valve of 14.5 psig. ρ = 2205 lbs./G

KPU—Temperature Switches



These temperature controls are specifically designed for the North American aftermarket and function as easy and direct replacements for most controls on the market. The KPU 60/70 temperature controls feature snap-action switches, highly visible contrast scales, fingertip tests, and are easily adjustable using a standard refrigeration wrench. The KPU 19 temperature controls are designed for easy installation and service with bottom and rear knockouts, differential adjustment dial, a tamper-resistant design, and a robust thermoplastic housing.

KPU 19 Series

KPU series	Bulb type	Range (°F)	Contact/reset	Capillary tube length (in.)	Differential at lowest temp. setting	Max. bulb temperature (°F)	Competitor part no.	Danfoss Code No.
KPU 9	Remote bulb	-30 to 80	SPDT/Auto	120	3.6 to 12.6	140	A19ABC-24C, A19ABC-37C, A19ABC-74C, A19AAC-4C, A19AAF-20C	060L5201
KPU 19			SPST/Auto	80			A19AAD-5C, A19ABA-40C, A19AAD-12C	060L5206
KPU 19	Room sensor		SPDT/Auto	Room sensor			A19BBC-2C, A19BAB-3C, A19BAC-1C, A198AF-1C	060L5208

Contact load	Resistive load		0.5~16A/120V AC, 0.5~8A/240V AC
	Inductive load	Full load	0.5~16A/120V AC, 0.5~8A/240V AC
		Locked load	96A/120V AC, 48A/240V AC
	Pilot duty		125VA/240V DC

KPU 60/70 Series

KPU Type	Bulb type	Range (°F)	Contact/reset	Capillary tube length (in.)	Low temperature differential	High pressure differential	Max. bulb temperature (°F)	Competitor part no.	Danfoss Code No.
KPU 61	Straight capillary tube ¹	-20 to 60	SPDT/Auto	80	10 to 40	2.5 to 13	250	O10-1416, O10-1010, O16-111, O10-1419	060L5201
KPU 61	Remote air coil ¹	-20 to 60	SPDT/Auto	80	8 to 40	2.5 to 13	250	O10-1408, O10-1409, O10-1473, O16-104, O10-1410	060L5203
KPU 62	Room sensor ¹	-20 to 60	SPDT/Auto	Room sensor	10 to 40	2.5 to 13	250	O10-1072, O10-1418, O16-594, O60-101	060L5206
KPU 68	Room sensor ¹	25 to 95	SPDT/Auto	Room sensor	8 to 45	3 to 13	250	O10-1802, O16-595, O10-301, O16-165	060L5215
KPU 73	Remote bulb ²	-15 to 60	SPDT/Auto	80	6.5 to 32	5 to 50	175	O60-100, O60-120	060L5208
KPU 71	Remote bulb ²	25 to 70	SPDT/Auto	80	5.5 to 18	4 to 16	175		060L5218
KPU 77	Remote bulb ²	60 to 140	SPDT/Auto	80	6 to 18	6.3 to 18	265	O60-200, A19AAF-12C, A19AAB-4C, A19ABB-2C, A19ABB-7C	060L5223

¹Bulb must be installed in colder position than thermostat housing and capillary tube.

²Temperature variations in excess of 70 °F between sensing bulb, housing, and capillary tube will influence scale accuracy.

Contact load	Resistive load		24A/120V AC, 24A/240V AC
	Inductive load	Full load	24A/120V AC, 24A/240V AC
		Locked load	144A/120V AC, 144A/240V AC
	Pilot duty		12W/120V DC

KPU—Pressure Switches



KPU pressure switches are designed to be contractor friendly and used in refrigeration and air conditioning systems to protect the systems from excessively low suction or too high discharge pressure. They can also be applied to start and stop compressors and the fans of air-cooled condensers. KPU pressure switches, in single and dual versions, cover a comprehensive range of applications and are designed for use with fluorinated and non-aggressive refrigerants. Most KPU pressure controls can be used with R-410A systems.

KPU Pressure Switches

Danfoss Type	Pressure	Reset type	Contract system	Range (in. Hg/psig)	Differential (psig)	Max. working pressure (psig)	Competitor part no.	Danfoss Code No.	
								¼ in. M flare	36 in. capillary tubes with ¼ in. flare nuts
KPU 1	Low	Automatic	SPDT	6 to 108	10.2 to 58	250	O10-1483	060-5231	060-5233
KPU 2	Low	Automatic	SPST (NO)	6 to 73	6 to 30	250	O10-1402	060-5237	060-5235
KPU 2	Low	Automatic	SPDT	6 to 73	6 to 30	250		060-5239	060-5240
KPU 1B	Low	Manual	SPDT	28 to 100	10.2	250	P70AB12, P70AB2	060-5232	060-5234
KPU 5	Fan cycling	Automatic	SPST (NO)	100 to 465	26.1 to 87	510	O10-2054, P70AA118	060-5241	060-5242
KPU 6W	High	Automatic	SPDT	100 to 600	58 to 145	675	O16-108	060-5243	060-5245
KPU 6B	High	Manual	SPDT	100 to 600	60	675		060-5244	060-5246

KPU Dual Pressure Switches

Danfoss Type	Low pressure side		High pressure side		Rest		Contact system (LP/HP)	Max. working pressure (low/high side) (psig)	Competitor part no.	Danfoss Code No.	
	Range (in. Hg/psig)	Differential (psig)	Range (psig)	Differential (psig)	Low pressure side	High pressure side				¼ in. M flare	36 in. capillary tubes with ¼ in. flare nuts
KPU 15	6 to 108	10 to 60	100 to 465	60	Automatic	Automatic	SPST (NO/NC)	250/510	012-1549	060-5247	060-5248
KPU 15B	6 to 108	10 to 60	100 to 465		Automatic	Manual	SPST (NO/NC)	250/510	P170LB1, P70LB1, P70MA1	060-5249	060-5250
KPU 16B	6 to 108	10 to 60	100 to 600		Convertible	Convertible	SPDT/SPST (NO)	250/675	O12-4834	060-5253	060-5254

¹Competitor part no. equipped with capillary tube for all but P170LB1 which has flare connections.

²KPU 6 and the high pressure side of KPU 16 are designed with fail-safe double bellows.

³Convertible reset controls can be adjusted for either automatic or manual reset.

All controls are supplied with universal mounting bracket and mounting screws.

Ambient temperature: -40 °F to +122 °F (175 °F for maximum 2 hours).

KPU 1, 2, 6, 16 suitable for all HFC refrigerants, including R-410A.

	120/240 VAC
Alternating Current	
Motor Full Load Amps (FLA)	24
Locked Rotor Amps (LRA)	144
Direct Current	240 V DC: 12W pilot duty

KVS—Electronic Evaporator Regulators



KVS electrically operation evaporator pressure regulator valves modulate refrigerant flow in the evaporator. These valves must be paired with a current or voltage driver. The balanced design provides bi-flow operation as well as solenoid shut-off function in both flow directions. KVS is compatible with R-410A, R-407C, R-134a, R-507, R-22, and other refrigerants.

KVS Regulators

Danfoss Type	Rated capacity (tons)			Connection (in.)	Max. working pressure (psig)	Danfoss Code No.
	R-22	R-134a	R-404A R-507A			
KVS 15	1.3	0.9	1	5/8	660	034G4252
KVS 42	11.4	8.3	10	1 1/8	493	034G2850
KVS 42	11.4	8.3	10	1 3/8	493	034G2851
KVS 42	11.4	8.3	10	1 5/8	493	034G2852
KVS 42	11.4	8.3	10	7/8	493	034G2858

KVS Spare Parts and Accessories

Description	Danfoss Code No.
AST-G Service Driver; used to manually open or close valve	034G0013
M12 cable, 26 ft.	034G2323
M12 cable, 6 ft.	034G2330
Cable filter for long wire runs (in excess of 32 ft.). Permits wire runs of up to 328 ft.	084B2238

CCM—Gas Bypass Valves



The CCM is an electrically operated valve designed for operation in CO₂ systems and is capable of functioning both as an expansion valve and as a gas bypass with back pressure regulation in subcritical applications. Additional features include: precise positioning for optimal control of intermediate pressure in transcritical CO₂ systems or liquid injection in heat exchangers, combined stainless steel butt weld and solder connections for installation in copper piped systems, and a standard M12 connector for simple and flexible connection to the motor driver.

CCM Valves

Danfoss Type	Conn. Standard	Solder conn. size (in.)	Weld conn. size (in.)	Cv valve (gpm)	MWP (psig)	Danfoss Code No.
CCM 10	EN10220	5/8	1/2	0.81	1305	027H7188
CCM 20	EN10220	7/8	3/4	2.14		027H7187
CCM 30	EN10220	1 1/8	1	3.22		027H7186
CCM 40	EN10220	1 1/8	1	5.55		027H7185

CCM Spare Parts and Accessories

Description	Danfoss Code No.
Actuator for CCM CO ₂ valve	027H7184
AST-G Service Driver; used to manually open or close valve	034G0013
M12 cable, 26 ft.	034G2323
M12 cable, 6 ft.	034G2330
Cable filter for long wire runs (in excess of 32 ft.). Permits wire runs of up to 328 ft.	084B2238

CCMT—Gas Cooler Expansion Valves



The CCMT is an electronically operated valve designed specifically for CO₂ systems and can function either as an expansion valve, a pressure regulator for the gas cooler, or a gas bypass valve with back pressure regulation in transcritical applications. Large sizes (16-42) feature integrated serviceable strainer and integrated pressure transducer. Additional features include: compatibility with PAG, POE, and PVE oils; combined butt weld and solder connections; and a light weight and compact design.

CCMT Valves

Danfoss Type	Temp. range (°F)	Conn. Standard	Solder conn. size (in.)	Weld conn. size (in.)	Cv valve (gpm)	Diff. Range (psi)	Max. working pressure (psig)	Danfoss Code No.
CCMT 2	-40 to 40	EN10220	5/8	1/2	0.19	1305	2030	027H7200
CCMT 4			5/8	1/2	0.52			027H7201
CCMT 8			5/8	1/2	0.92			027H7202
CCMT 16			1 1/8	1	1.85			027H7231
CCMT 24			1 1/8	1	2.77			027H7232
CCMT 30			1 1/8	1	3.70			027H7233
CCMT 42			1 1/8	1	5.32			027H7234

CCMT Spare Parts and Accessories

Description	Danfoss Code No.
AST-G Service Driver; used to manually open or close valve	034G0013
M12 cable, 26 ft.	034G2323
MBS 8250 pressure transducer	064G4032
Cable filter for long wire runs (in excess of 32 ft.). Permits wire runs of up to 328 ft.	084B2238
EKD 316—valve driver or superheat controller	084B8040
EKA 164A—display and control buttons for EKD 316	084B8563

ICMTS—Large Capacity Gas Cooler Expansion Valves



The ICMTS is a direct operated motorized valve designed to regulate the flow of transcritical gas or subcritical liquid from the gas cooler in a transcritical CO₂ system. The ICMTS is driven by actuator type ICAD 600A-TS. ICMTS valves may be manually operated using the multi-function tool.

ICMTS Valves

Danfoss Type	Conn. Standard	Inlet type	Inlet size (in.)	Outlet type	Outlet size (in.)	Cv valve (gpm)	Diff. range (psi)	Max. working pressure (psig)	Danfoss Code No.
ICMTS 20-A33	EN10220	butt weld	1	butt weld	1	0.23	1305	2030	027H1084
ICMTS 20-A						0.69			027H1085
ICMTS 20-B						2.78			027H1086
ICMTS 20-C						5.32			027H1087

ICAD 600TS Actuator

Danfoss Type	Cable length	Supply voltage DC (V)	Supply voltage load (A)	Analog input voltage options (V) DC	Analog input current options (mA)	Analog output options (mA)	Dig. Output/ext. supply voltage DC (V)	Danfoss Code No.
ICD 600A-TS	4 ft. 11 in.	24	1.2	0-10/ 2-10	0-20/ 4-20	0-20/ 4-20	5-24	027H9078
ICD 600A-TS	—							027H9123

ICMTS Spare Parts and Accessories

Description	Danfoss Code No.
Mutli-function tool for manual operation	027H0181
ICMT/S 20-A33 top part w/cone & orifice	027H1088
ICMT/S 20-A top part w/cone & orifice	027H1080
ICMT/S 20-B66 top part w/cone & orifice	027H1094
ICMT/S 20-B top part w/cone & orifice	027H1081
ICMT/S 20-C top part w/cone & orifice	027H1082

ADAP KOOL (AK) Electronic Controllers and Accessories



The AK family of supermarket and commercial refrigerator controllers and system managers are ideal for both new installations and as replacement controllers. Danfoss electronic controls use the latest technology to provide the maximum benefit to end users, both in terms of energy savings, control options, and full web user access.

AK-SM System Manager



The key component of an ADAP-KOOL® refrigeration system controller is the system unit. This unit coordinates data communication to and from the individual refrigeration controllers, acquires temperature data for logging, receives alarms, and forwards alarms to defined recipients. The web enabled AK-SM 800 series is Danfoss' newest system unit and features "case to cloud" connectivity for enterprise level data sharing. Remote connection is possible with web browser, Danfoss software and smartphone app. These replace legacy controllers such as Com-Trol, ECI, and previous Danfoss system controllers.

AK-SM Controllers

Danfoss Type	License	Frequency (Hz)	Communication types	Danfoss Code No.
AK-SM 850	refrigeration	50/60	LON RS485, Modbus	080Z4001
AK-SM 820	refrigeration & HVAC (convenience store version)		LON RS485, Modbus	080Z4004
AK-SM 880	refrigeration & HVAC		LON RS485, Modbus	080Z4008
AK-SM 880	refrigeration & HVAC		LON TP78, Modbus	080Z4009

AK2 SC-255 Spare Parts and Accessories

Description	Notes	Danfoss Code No.
Modem power adapter	Includes modem power adapter, cables	080Z2100
COMM255 modem kit	Includes modem, modem power adapter, modem power supply, cables	080Z2102
PC direct connect cable	Can be used to connect PC to SC 255 using AKA 65 software and PC to AK-PC 700 series and AK-CC 700 series controller	080Z0262
Serial USB adapter kit for PC direct connect cable	Approved USB 2.0 to DB 9 pin M connector	080Z0267

Anti-sweat Controllers



These energy efficient anti-sweat controllers eliminate condensation in glass door freezers by pulsing heaters based on sensed humidity levels.

Description	Notes	Danfoss Code No.
No sweat unit; 16 circuit	16 amps/circuit	C20125416

Input/Output Communication and Extension Modules

Input/Output (I/O) expansion modules are used in applications requiring more connections than featured on a control. I/O modules require a communication module to communicate with front end system manager. Up to nine extension modules may communicate through each communication module.



AK-CM Communication Modules

Danfoss Type	Description	Danfoss Code No.
AK-CM 101A	Communication Module (LON TP-78)	080Z0061
AK-CM 101C	Communication Module (LON RS485)	080Z0063



AK-XM Extension Modules

Danfoss Type	Analog inputs	On/off outputs		On/off supply voltage (DI signal)		Analog outputs	Stepper outputs	Module with switches	Uses	Danfoss Code No.
	For sensors, pressure transmitters, etc.	Relay (SPDT)	Solid state	Low voltage (80 V max.)	High voltage (260 V max.)	0-10 V DC	For valves with step control	For overriding relay outputs		With screw terminals
AK-XM 101A	8								Sensors, pressure transmitters, contact signals	080Z0007
AK-XM 102A				8					On/off voltage signals, low voltage (24 V)	080Z0008
AK-XM 102B					8				On/off voltage signals, high voltage (230 V)	080Z0013
AK-XM 103A	4					4			Sensors, pressure transmitters, contact signal, analog outputs (0-10 V DC)	080Z0032
AK-XM 107A pulse module									Pulse measuring	080Z0020
AK-XM 204A		8							On/off relay outputs	080Z0011
AK-XM 204B		8							On/off relay outputs with overriding function	080Z0018
AK-XM 205A	8	8							Sensors, pressure transmitters, and on/off outputs	080Z0010
AK-XM 205B	8	8		x					Sensors, pressure transmitters, and on/off output with overriding function	080Z0017
AK-XM 208B							4		Stepper output	080Z0022

I/O Spare Parts and Accessories

Description	Notes	Danfoss Code No.
DIN Rail for AK2 module mounting	1 Meter	080Z0290
AK2 light ballast dimmer driver board	Boosts signal from a variable output (such as AK-XM 103A) board to drive multiple ballasts	080Z0270
Temperature offset adjustment	Designed for RTC board to permit temperature setting adjustment	TEMPADJ2
RTC to AK2 board conversion kit	Converts obsolete RTC board to AK2 IO modules; includes documentation, power supply, and wire	080Z2117
CO ₂ indoor sensor	For measuring indoor CO ₂ levels	LDC02
Air flow switch	For proofing RTU airflow	CAFS-1

Input/Output Communication and Extension Modules *(continued)*

Power Supplies for AK series controls

Danfoss Type	Input Voltage	Output		Mount	Note	Danfoss Code No.
		Voltage	Capacity			
IOPS	115/230	12/24V AC	56 VA	Chassis	Use for 12VAC or special application only; replaced by 080Z0055 for AK2 applications	080Z0052
AK-PS 250	100–240	24V AC	60 VA	Din Rail	Replaces 080Z0052	080Z0055
AK-PS 75	100–240	24V AC	18 VA	Din Rail	Can power one com module and combo board	080Z0053

Repeaters, Bridges, and Gateways

Gateways permit communication from manufacturer's equipment to another. Repeaters boosts signal to overcome issues resulting from excess wire length and poor installation. Bridges converts communication signal from one protocol to another.

Danfoss Type	Description	Applicable protocols	Notes	Danfoss Code No.
TP78-01	Repeater	LON TP 78	Requires 12V AC, old part no. TP78-01	084B2251
TP78-02	Bridge	LON TP 78 to LON FTT-10	Requires 12V AC, old part no. TP78-02	084B2252
TP78-04	Bridge	LON TP 78 to LON RS485	Old part no. TP78-04	084B2254
AKA 222	Repeater	Modbus		084B2240
AKA 223	Repeater	LON RS485		084B2241
TP78-05	Bridge	LON FTT-10 to LON RS485	Old part no. TP78-05	084B2255
	Gateway	AK-SC 255 ECI Serial Adapter Kit Permits communication between AK-SC 255 and ECI serial IO modules		080Z2110
	Accessory	8-port MOXA Ethernet Switch Kit Allows customer to connect multiple front end controllers (includes 24VDC power supply, DIN Rail, 8-port unmanaged switch)		080Z0276

I/O Enclosures

Enclosures for input/output boards

Description	Notes	Danfoss Code No.
AK2 enclosure for 1 row of 4 full size modules	Includes power supply and 1 AK2 comm. Module 13 × 30 × 5	AK2IO8
AK2 enclosure for 2 row of 4 full size modules	Includes power supply and 1 AK2 comm. Module 25 × 30 × 5	AK2IO16
AK2 comm. mod. + AK2 XM 205B in RTC box filtered; power input	24VAC only; no power supply included 12 in. × 12 in.	AK2RTCB
AK2 comm. mod. RTC filtered power V.2	contains 080Z0061, 080Z0017, 080Z0053	AK2RTCB-2
12 in. × 24 in. enclosure	080Z0055, with comm. Module, combo board	080Z2165
Lighting control panel/8 relay output		080Z2164

AKS—Pressure Sensors and Accessories



AKS 32 and AKS 33 are pressure transmitters that measure a pressure and convert the measured value to a standard signal (1 to 5 V d.c. for AKS 32 and 4 to 20 mA for AKS 33). AKS 32R and AKS 2050 are ratiometric pressure transmitters that convert the measured pressure to a linear output signal. The minimum value of the output signal is 10% of the actual supply voltage. The maximum value is 90% of the actual supply voltage. AKS 2050 are designed specifically for CO₂ pressure ranges.

Danfoss Type	Pressure range (psig)	Electrical connection	System connection (in.)	Notes	Danfoss Code No.
AKS 32	0 to 200	26 ft. cable	1/8 NPT	For Danfoss rack controllers	060G3990
AKS 32	0 to 500	26 ft. cable	1/8 NPT	For Danfoss rack controllers	060G3991
AKS 32	0 to 100	26 ft. cable	1/8 NPT	For ECI rack controllers	060G1889
AKS 32	0 to 500	26 ft. cable	1/8 NPT	For ECI rack controllers	060G1890
AKS 33	-14.5 to 174	DIN plug	1/4 NPT	Use with EKC 316	060G2101
AKS 32R	-14.5 to 174	DIN plug	1/4 NPT	Use with AK CC controllers	060G1037
AKS 2050	-14.5 to 855	DIN plug	1/4 NPT	Designed for CO ₂	060G6342
AKS 2050	-14.5 to 2306	DIN plug	1/4 NPT	Designed for CO ₂	060G6344
MBS 8250	14.5 to 2320	Packard 3 pin male	7/16 UNF 20	Used as integrated pressure transducer in CCMT valves	064G4032

AKS Spare Parts and Accessories

Description	Notes	Danfoss Code No.
DIN plug for AKS transducer	Fits AKS 32, 32R, 33, and 2050	060G000812
Cable with end plug for AKS transducer	16 ft., fits AKS 32, 32R, 33, and 2050	060G1034

Temperature Sensors

Danfoss Type	Sensor type	Sensor temp. range (°F)	Wire length (ft.)	Description	Danfoss Code No.
AKS 21W	PT1000	-94 to 356	1	Boiler temp. probe; fits well with ½ NPT	084N2032
AKS 11	PT1000	-60 to 212	11.5	Single packed 084N0027	084N0003
AKS 11	PT1000	-60 to 212	18	Single packed 084N0028	084N0005
AKS 11	PT1000	-60 to 212	27.5	Single packed 084N0029	084N0008
AKS 12	PT1000	-40 to 176	5	Single packed 084N0035	084N0036
AKS 12	PT1000	-40 to 176	18		084N0038
AKS 21	PT1000	-94 to 356	8	Used for high temp. pipe applications	084N2003
AKS 21	PT1000	-94 to 356	16	Used for high temp. pipe applications	084N2008
MBT 153	NTC	-40 to 158	18	General purpose sensor—replace Com-Trol and ECI TP 2L	084N3016
Air supply/duct probe		-94 to 356	8	Old part no. ASTP2	084Z2186
Box temp. probe assembly		-13 to 221		Probe length 18 in.	080Z2185
Product temp. sensor		-22 to 122	18	PT1000; calibration certificate included	084N1007
Zone temp. sensor		-40 to 122		PT1000; temp. sensor on cover plate for HVAC room temp; old part no. ZTP2	080Z2187
Condenser air probe		-40 to 122		PT1000; temp. sensor for measuring air temp. under condenser	AKCOTC

Temperature Sensor Resistors (Permit use of non-Danfoss sensors on AK2 input boards)

Description	Notes	Danfoss Code No.
Com-Trol, CPC, and Altech Temp. Sensor Resistor Kit	Kit contains 2 resistors	CTPKIT
AK-2 Pullup kit for ECI TP-1 Probe	Kit contains 4 resistors	TP1KIT

Humidity Sensors and Light Level Sensors

Description	Notes	Danfoss Code No.
Outdoor Photo Cell/Humidity Sensor/Temp Sensor	Mounts on ½ in. conduit knockout; box not included	AKCOTHP
Outdoor humidity sensor	Mounts in ½ in. conduit knock out; replaces EMHS-4	080Z2167
Humidity sensor w/indoor temp. sensor	Old part no. EMHS3-1	080Z2171
Outdoor photo cell with temp. sensor	Old part no. PHOTO-OD-1	080Z2172
Skylight Photocell 0-5000 FC with resistor	Old part no. PHOTO-MAS	080Z2169

Door Monitors, Current Transducer

Description	Notes	Danfoss Code No.
Magnetic Door Monitor Assembly	Door contacts; typically used for walk in coolers and freezers	DRMON-1
Current transducer 0-5/100/200 A	Connects to inboards for current monitoring. Frequently used for compressor, fan motor or other loads requiring current monitoring.	080Z2251
Current sensing relay	Provides contact closure when current is detected.	49-100

Miscellaneous Relays and Transformers

Description	Notes	Danfoss Code No.
Relay	24V coil 2 pole Form C relay	41-062
Transformer	24V 150 VA wall mount control transformer	55-168
Power supply	5Vdc Din rail mounted power supply	68-102

Alarm Devices

Description	Notes	Danfoss Code No.
24V horn/strobe; red	For indoor use	AKAHS01
24V horn/strobe; blue	For outdoor use	AKAHS02
Strobe alarm light; amber		99-242
Strobe alarm light; blue		99-272
Office alarm box PC board w/audio, LED signal & reset	Requires 12V AC	OAB-1

AK-CC—Case Controllers



All of the controls below control anti-sweat heaters, fan operation, lighting door alarms, case cleaning, dual temperature control, and provide alarm notification.

Danfoss Type	AK-CC 210	AK-CC 550A	AK-CC 750
Overview	Single evaporator on/off (typically solenoid valve) control. May be used on self-contained cases or rack systems. May be stand alone or tied into front end controller.	550A Single evaporator control which controls Danfoss AKV based on superheat. May be stand alone or tied into front end controller.	750 Multi-evaporator control (up to 4) which controls Danfoss AKV based on superheat or temperature.
No. of evaporators	Single	Single	Multiple
Valve Control	On/off—Typically solenoid valve with TXV	EEV	AKV or Solenoid
Mounting	Panel mount	DIN rail or wall	DIN rail or wall
Display	On front	On front	Connection for 1–4 displays
Temp. control	Yes	Yes	Yes
Defrost	Yes with connections	Yes, adaptive with skip and coordination	Yes, adaptive with skip and coordination
No. of compressors	1 or 2	1 or 2	1
No. of outputs	4	5 × AKV	8, max. 4 AKV
No. sensors	3	6	11
No. DI	2	3	11
Communication	Opt. LON RS 485 or MODBUS	MODBUS + opt. LON RS 485	LON RS 485 or LON TP 78

Danfoss Type	Supply Voltage (V)	Notes	Danfoss Code No.
AK-CC 210	115		084B8534
AK-CC 210	220		084B8520
AK-CC 550A	115		084B8036
AK-CC 550A	230		084B8030
AK-CC 750	24 AC/DC	LON TP78	080Z0130
AK-CC 750	24 AC/DC	LON RS485	080Z0139

Displays and Display Accessories for AK2 Sis

Danfoss Type	Description	Notes	Danfoss Code No.
EKA 163A	Display unit	Screw terminals	084B8562
EKA 163B		With plug connector	084B8574
EKA 164A	Display unit with operation buttons	Screw terminals	084B8563
EKA 164B		With plug connector	084B8575
EKC 202D2	Walmart temperature Display	EKA Remote Display (Green Display)	084B8670
EKC 202D2	Walmart temperature controller	Stand Alone Display Unit 110V (Green Display) & LON 485 communication card	084B8693
	Cable with plugs for display unit	6.5 ft.	084B7298
	Cable with plugs for display unit	19.5 ft.	084B7299

Other Accessories for AK2 Case/Rack Controllers

Danfoss Type	Description	Applicable Product	Danfoss Code No.
EKA 173	LON FTT10 card	EKC 316	084B7092
EKA 175	LON RS485 card	Top of form EKC 3XX, AK-CC 450/550/550A	084B8579
EKA 178	AK-CC 210 MODBUS card	Top of form EKC 202/210 Bottom of form	084B8564
EKA 179	AK-CC 210 LON RS485 card	Top of form EKC 202/210 Bottom of form	084B8565
EKA 183A	Progammig Key	EKC 102, 202, 204, 3XX (excl. EKC 301), 4XX and 5XX, AK-CC 210 and 550, AK-CT, ERC 211, 213 and 214	084B8582
	EKA mounting flange kit	EKA 163, 164	084B8584
	Metal EKC Bracket	Any standard 71mm × 29mm panel mount display or controller	60-274

AK-PC—Pack Controllers



The AK-PC 700 series of controllers offers rack-level control for various designs including standard HFC systems, transcritical CO₂ systems, and cascade designs.

Danfoss Type	Function	Supply Voltage (V)	Communication Types	No. of compressors (max.)	Danfoss Code No.
AK-PC 781	medium-large transcritical (single suction)	24	LON RS485	8	080Z0186
AK-PC 781A	medium-large transcritical (single suction)			10	080Z0191
AK-PC 782A	medium-large transcritical (triple suction)			8	080Z0192
AK-PC 783	cascade system (dual suction)			4 × 4	080Z0196
AK-PC 772	small transcritical			3 × 2	080Z0200

When installing or modifying Danfoss AK-SM/CC/CM/PC or other controllers, it is critical to follow the wiring specifications as outlined in the installation guide; failure to do so may result in communication errors or failures

EKC/EKD—Industrial Superheat Controllers



Evaporator controllers designed to control superheat in specialized applications.

Danfoss type	Controller type	Danfoss Code No.
EKC 316A	Controller 24V AC (requires 2 AKS 11 sensors & 1 AKS 33 pressure transducer)	084B7088
EKD 316A	Superheat controller/valve driver, no display; typically controls a KVS valve	084B8040
EKC 326A	CO ₂ gas cooler controller	084B7252

KW Transducers and CTS for energy metering

Description	Danfoss Code No.
Split Core Buss Bar Style CT W3.5 × L3.5 600A Wattnode CT	CTB0600
Split Core Buss Bar Style CT W3.5 × L3.5 800A Wattnode CT	CTB0800
Split Core Buss Bar Style CT W3.5 × L3.5 1200A Wattnode CT	CTB1200
Split Core Buss Bar Style CT W3.5 × L3.5 2000A Wattnode CT	CTB2000
WATTNODE PLUS 120/208–240V kWh, kW, PF, V, A, KVA meter—requires 3 wattnode CTs (LON communication)	WATTNODEP1
WATTNODE PLUS 480V kWh, kW, PF, V, A, KVA meter—requires 3 wattnode CTs (LON communication)	WATTNODEP3
Wattnode Modbus meter 208V. Requires 3 wattnode CTs	080Z2144
Wattnode Modbus meter 400V. Requires 3 wattnode CTs	080Z2146
Veris kWh Power Transducer 100 amp 3 amp Phase incl. 3 CTs w/embedded transducer (requires pulse module)	C20106600
Veris kWh Power Transducer 300 amp 3 amp Phase incl. 3 CTs w/embedded transducer (requires pulse module); for balanced loads	080Z2142

DGS—Refrigerant Leak Detectors



Utilizing either semi-conductor (SC) or infrared (IR), DGS leak detectors give a rapid response when detecting a wide range of different refrigerants, including CO₂. The DGS sensors can be used in stand-alone or integrated systems where continuous, real-time, automatic monitoring is required. The DGS complies with environmental regulations and health and safety requirements on new or existing systems.

Danfoss Type	Enclosure	Temperature range (°F)	Calibrated for	Alarm set point (ppm)	Notes	Danfoss Code No.	
#N/A	Non-refrigerated space (IP41)	-4 to 120	R-404A	R-507A	500		080Z2098
DGS-SC			R-134a		500		080Z2092
DGS-SC			R-407A		500		080Z2093
DGS-SC			R-407F		500		080Z2076
DGS-SC			R-410A		500		080Z2088
DGS-SC			R-22		500		080Z2090
DGS-IR-CO2			R-744 (CO ₂)		5000		080Z2095
DGS-SC			Refrigerated space (IP 66)	-4 to 120	R-404A	R-507A	500
DGS-SC	-4 to 120	R-134a		500		080Z2089	
DGS-SC	-40 to 120	R-407A		500		080Z2094	
DGS-SC	-4 to 120	R-407F		500		080Z2077	
DGS-SC	-40 to 120	R-410A		500		080Z2087	
DGS-SC	-40 to 120	R-22		500		080Z2091	
DGS-IR-CO2	-4 to 120	R-744 (CO ₂)		5000		080Z2096	
DGS-IR-CO2	-40 to 120	R-744 (CO ₂)		5000	Remote 3m	080Z2097	
HGM-MZ	Compressor room	32 to 122	All common refrigerants		User defined	8 zones	080Z2151
HGM-MZ						16 zones	080Z2153

DGS Spare Parts and Accessories

Description	Notes	Danfoss Code No.
HGM-MZ air sample line coupler	For joining 2 sample tubes	080Z2195
HGM-MZ 2-way splitter kit-model	Permits sensing of 2 zones from 1 tube	080Z2196
HGM-MZ connection kit for SM controllers and HGM-MZ	Permits communication between Danfoss AKSC/SM controllers and HGM-MZ	080Z2154

MCX—Programmable Controller



Easy-to-program using the C programming language, the MCX controller provides unique versatility and freedom compared to proprietary systems. All units are delivered with a low level operating system including hardware drivers, services, as well as a virtual machine. Connections to peripheral equipment take place via open standard protocols that enable easy integration with electromechanical components and building management systems. Open programming standards allow you to take full control of your applications such as chillers, rooftop units, air-handling units, close control, shelter units, and heat pumps.

Danfoss Type	Communication type	Supply voltage (AC)	Danfoss Code No.
MCX08M	CANBUS, MODBUS, RS485	110 to 230 V	080G0029
MCX152V	CANBUS, ETHERNET, MODBUS, RS485	110 to 230 V	080G0285

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