

ENGINEERING
TOMORROW

Danfoss

Solutions catalog for CO₂ installations
Food Retail, Commercial and Industrial Refrigeration

Discover CO₂ system solutions and **dedicated products**

SAVE UP TO
20%

on energy by replacing
HFCs with CO₂
in warmer climates.

danfoss.com/co2

Why choose CO₂ transcritical refrigeration?

With the implementation of refrigerant regulations like the Kigali amendment to the Montreal Protocol (Global) and F-gas regulative (Europe), the quest for alternative solutions is accelerating. CO₂ is now recognized as the most viable and efficient solution among natural refrigerants in food retail.

Today, CO₂ refrigeration has matured and is widely used in all types of stores from hyper and supermarkets to convenience stores and discounters. Every day, progress is being made to invent components and configurations for sustainable and viable CO₂ refrigeration; not only in cold climates where heat reclaim has proved to be an excellent business case, but also in warmer climates, where technology like ejectors constantly improve the energy efficiency of CO₂ systems.

Danfoss leads the development of solutions and components for CO₂ refrigeration and offers a wide range of products specifically designed for CO₂ transcritical systems. Furthermore, Danfoss provides training, design tools and consulting services to promote the use of CO₂ and to support the development of forward thinking solutions in all parts of the value chain.

Facts about CO₂

- Environmentally friendly with up to 4,000 times lower GWP than traditionally used synthetic refrigerants, non-toxic and non-flammable
- Superior thermo-physical properties and high volumetric efficiency
- High heat transfer efficiency

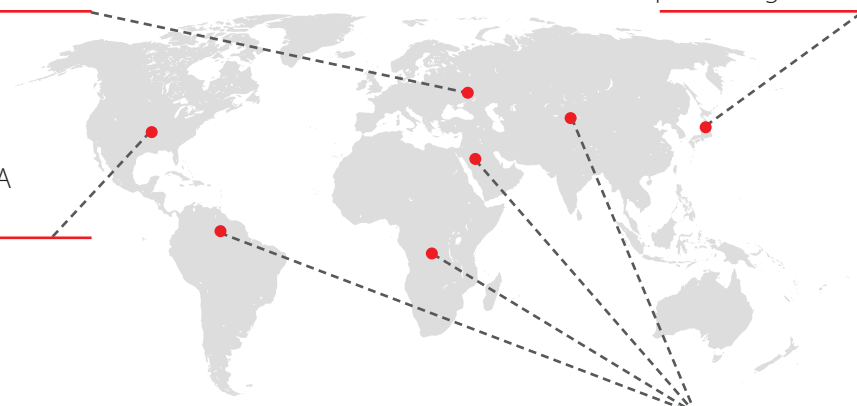
Historical agreement

In 2016, negotiators from 197 countries reached a historic agreement to reduce emissions of HFCs that contribute to global warming. The Kigali pact represents a major expansion of the 1987 Montreal Protocol, which curbed the use of ozone-depleting CFC gases. With European F-gas and American SNAP regulation already in place, the Kigali agreement will further push the development of alternative refrigerants, where CO₂ already holds a strong position in several cooling applications that are safe for the climate as well as for the ozone layer.

HFC phase down starting in 2015 ending with 79% cut down in 2030

Extended new framework law promoting low GWP refrigerants

SNAP delisting of several HFC refrigerants like R404A starting in 2016



Worldwide:

- Global HFC phase down under the Montreal Protocol from 2019 ending with 85 % cut down in 2047
- National tax schemes on HFC
- National incentives and subsidies

Multilateral Fund supports low GWP projects

Global

CO₂ – one solution across all climates
With heat reclaim, parallel compression and ejector technology, CO₂ has become highly efficient in all climates.

Sustainable

CO₂ – lowest possible Global Warming Potential (GWP)
Zero ozone depletion and lowest possible GWP (equal to one).

Energy Efficient

CO₂ – smart solutions for high efficiency
With the latest technology, transcritical booster systems outperform traditional HFC systems on energy efficiency in all climates.

Proven

Danfoss has provided controls to more than 10,000 transcritical CO₂ systems worldwide
Danfoss commercialized the first transcritical controls 10+ years ago and uses the experience to continue to bring robust and innovative solutions to the market.



Why CO₂ is the natural refrigerant of tomorrow

Since 1850, CO₂ has proven to be one of the most reliable, efficient, and environmentally friendly refrigerants. Now, CO₂ is being used worldwide to provide a sustainable and cost-effective refrigerant solution – one that is compliant with the increased environmental requirements of today – and tomorrow.

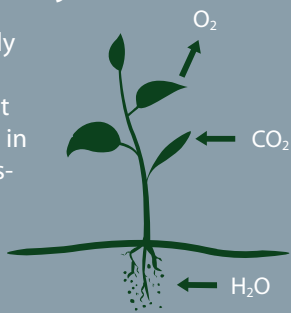
More than

30%

reduction of carbon footprint on store level

A wonder of natural efficiency

Environmentally friendly and sustainable, CO₂ is a natural substance that plays an important role in many natural and industrial processes.



Supermarket systems can easily leak up to **20%** of their refrigerant. Replacing HFCs with CO₂ reduces refrigeration cost and accelerates a positive climate impact.

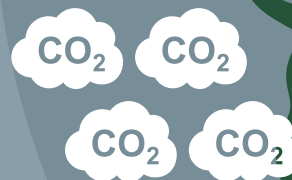


CO₂ provides the lowest cost of ownership for end-users because of high volumetric efficiency, low power consumption, and refrigerant charge reduction.

CO₂ HAS

0 impact

on global warming



Superior thermodynamic properties



EXPERIENCE HIGH VOLUMETRIC COOLING CAPACITY

- Small volume – high capacity
- Up to 5 times greater than R404A
- Possible to use smaller pipes and compressors



HIGH PRESSURE REFRIGERANT

- +30°C - 71 bar
- Very low pipe pressure drop effect



HIGH DENSITY GAS

- Increases heat exchanger efficiency
- Greater capacities with smaller surfaces



A refrigerant accompanied by cool cash



SAVE UP TO

20%

on energy by replacing HFCs with CO₂ in warmer climates.

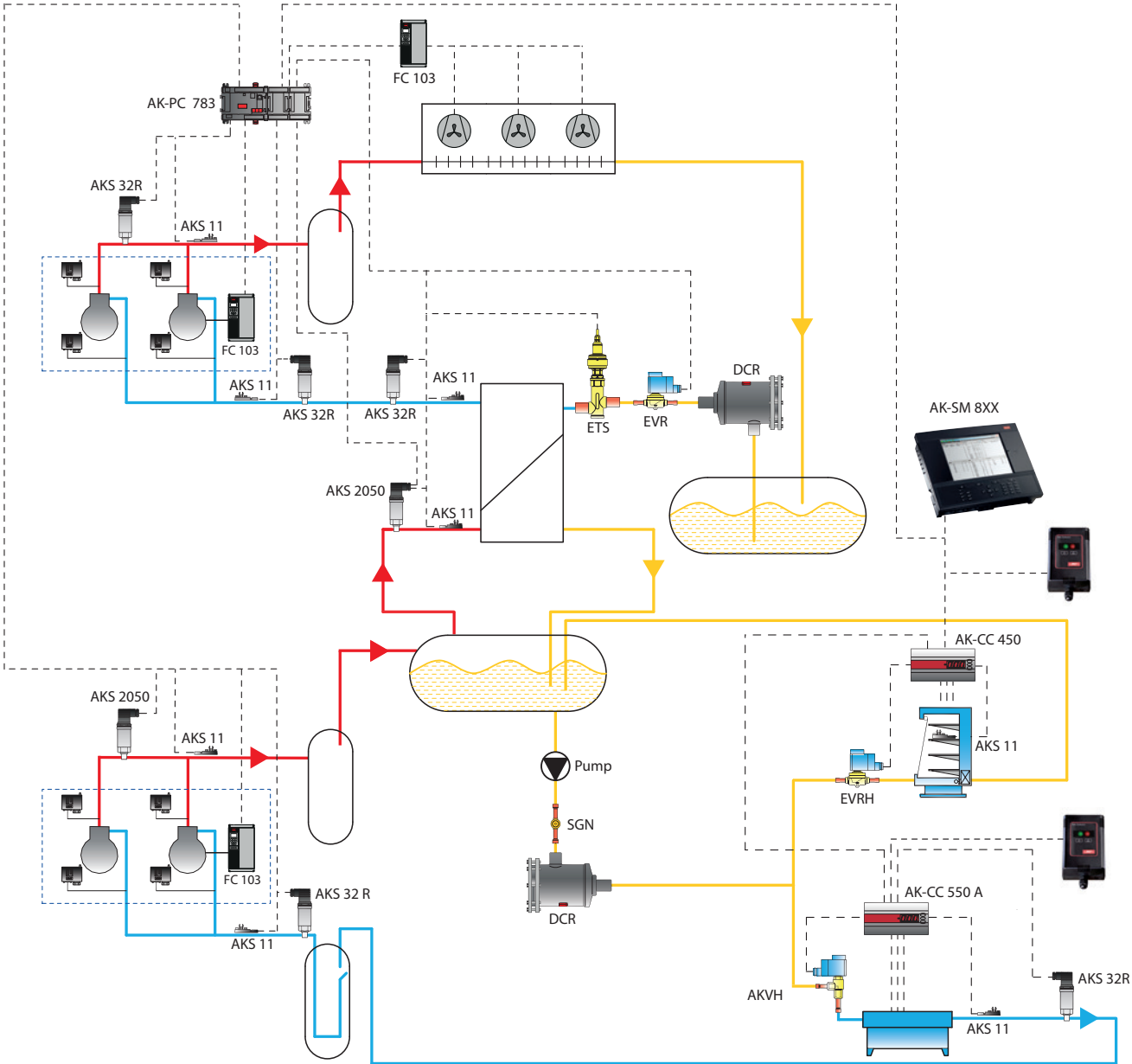


Transcritical systems provide an efficient, simple, and cost-effective solution **in all climates.**

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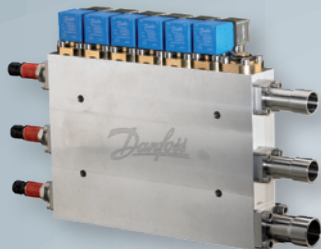
Food retail cascade HC/HFC- CO₂ System

CO₂ cascade systems are highly efficient in hot climates, use a relatively small amount of refrigerant, experience a low temperature change in the heat exchanger, and can use HC, HFC, or ammonia as the high side refrigerant. Cascade system controls can be divided into five groups: condenser capacity control, compressor capacity control, cascade injection control, MT evaporator CO₂ flow control, and LT evaporator injection control.



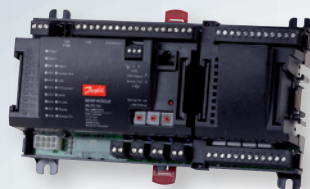
- HP vapour refrigerant
- HP Liquid refrigerant
- LP vapour refrigerant

Full product portfolio for CO₂ refrigeration



Multi Ejector

The Danfoss Multi Ejector is the latest edition to the Danfoss portfolio and ensures that transcritical CO₂ applications for retailers become energy efficient in any climate.



AK-PC 782A

A multi suction group transcritical pack controller, offering supreme system performance and integrity by combining many years of experience in transcritical control with market leading innovative control features.



AKVH

AKVH together with the AK-CC 550A evaporator controller is the most used solution in commercial CO₂ refrigeration systems. Fail safe and filter build in.



CCMT

A high pressure regulating valve fitting transcritical CO₂ systems offering unmatched regulating and benefits through full serviceability, including both a filter and a pressure transmitter.



ICMTS

The most used transcritical CO₂ control valve. Featuring full serviceability and offering hand held magnet control.



CTR

The 3 way heat reclaim valve for CO₂ applications enables energy savings by reclaiming heat in e.g. supermarket applications. This valve provides the tightest seal on the market, while at the same time ensuring the most accurate control and even the possibility for modulation between two heat exchangers.

Our pledge to low-GWP refrigerants

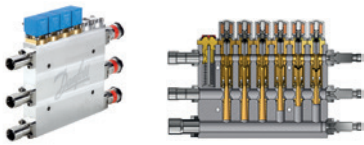
Danfoss actively pursues development and use of low-GWP refrigerants to help slow the process of global warming while helping to ensure continued global well-being, economic development and future viability of our industry. We will enable our customers to achieve their low-GWP goals while continuing to enhance the energy efficiency of refrigeration and HVAC systems in food retail.



Find out more about products and scan the QR code

Transcritical Booster System with parallel compression and Multi Ejectors

The latest generation of systems combines parallel compression and ejector technology to make transcritical CO₂ an efficient choice globally.



Danfoss Multi Ejector Solution™

- Consists of a CTM High Pressure valve and an AK-PC 782A controller
- Solution makes CO₂ refrigeration system economically competitive with the HFC systems at all ambient temperatures by improving COP in comparison to standard parallel compressor systems
- Enabling integration of air conditioning and heat reclaim



AK-PC 782A – Pack controller

- Complete regulating unit for capacity control of compressors and gas cooler in CO₂ booster systems with parallel compressors and ejectors
- Includes CO₂ gas cooler pressure control via motor expansion valves and gas ejectors
- Receiver pressure control
- Two stage heat recovery functions
- Capacity control of up to 8 compressors distributed on MT and IT
- Capacity control of up to 4 compressors on LT



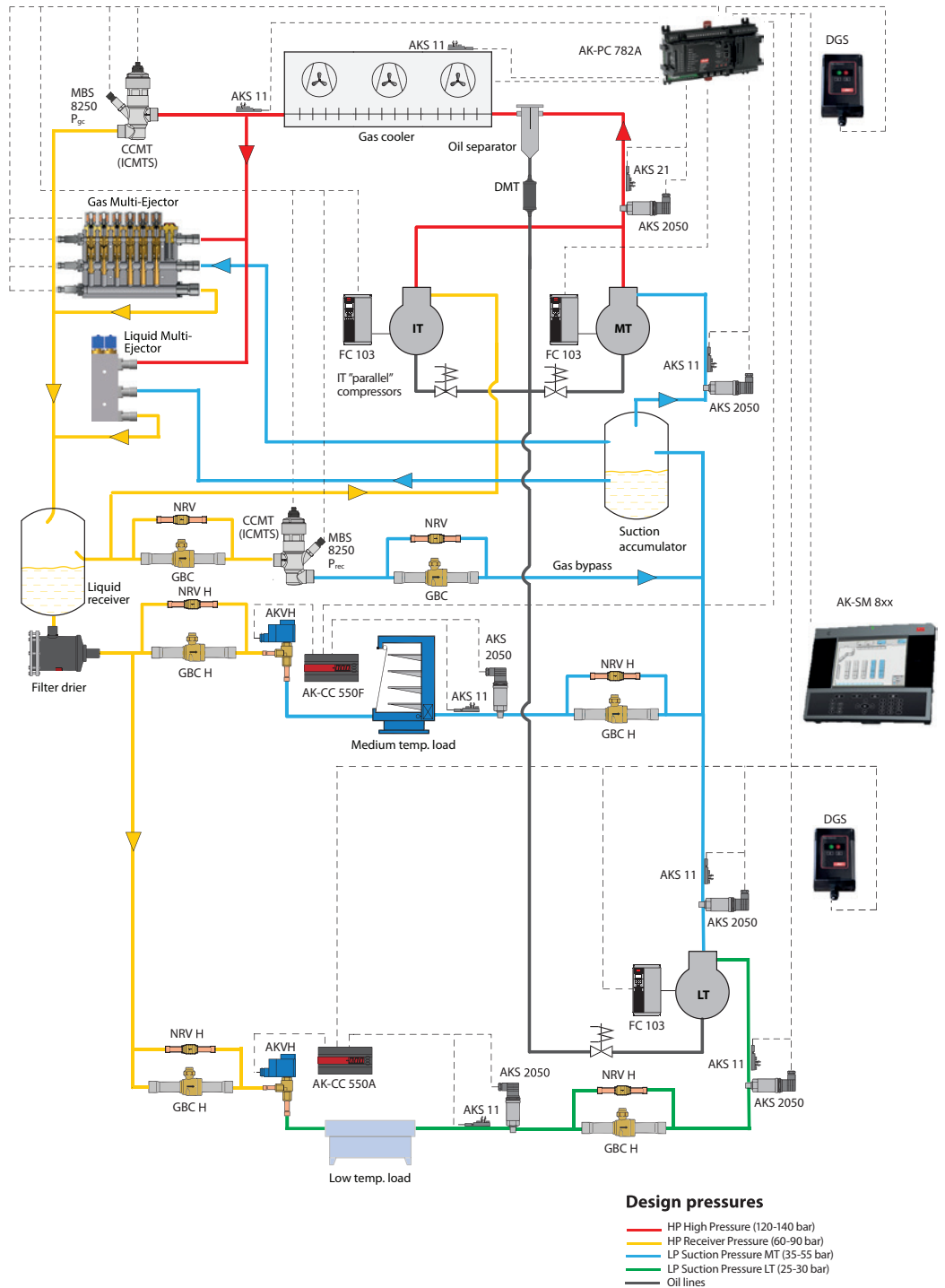
AK-CC 550F – Pack controller

- AK-CC 550F is based on the AK-CC 550A and holds all the functionality of the A version in addition to software for flooded evaporator control and is needed to use in combination with Liquid ejectors
- Switching between dry expansion and flooded evaporator control depending on system conditions
- With flooded evaporator controls the suction pressure can typical be increased 2-3 K compared to standard dry expansion resulting in 4-9% energy saving



VLT Refrigeration Drive

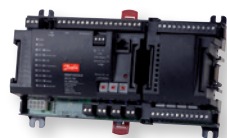
- Reduced energy consumption and maintenance requirements
- Optimum system efficiency is achieved by taking advantage of the drive's software features
- The need for external cooling or oversizing is avoided as the drive operates efficiently in a maximum ambient temperature of 50°C without derating



Solutions catalog for CO₂ installations

AK2 Modular platform for Packs and Evaporator controllers

AK-PC Pack Controllers for CO₂ Transcritical Booster



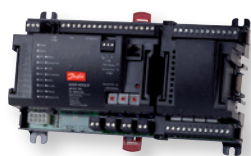
- AK-PC 7xxA is complete regulating units for capacity control of compressors in MT and LT system, high pressure and receiver pressure control in CO₂ refrigeration systems.
- CO₂ gas cooler control and receiver control. Floating reference with regard to outside temperature.
 - Parallel compression IT on transcritical CO₂ system
 - CO₂ Ejectors control
 - MT/LT - coordination between controllers
 - Heat recovery function
 - Start/stop of liquid injection in cascade heat exchanger cascade (781A)

Type	Code No	Function	No. of Compressors (max)	AI (analog inputs)	DO (relay outputs)
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Integrated LON RS485 communication

AK-PC 782A	080Z0192	Medium-large transcritical (MT-LT-IT suction)	12 8 x (MT+IT) ; 4 x LT	11	8
AK-PC 772	080Z0200	Small transcritical (MT-LT-IT suction)	5	11	8
AK-PC 772A*	080Z0201		3 x (MT+IT) ; 2 x LT	11	8
AK-PC 781	080Z0186	Medium-large transcritical (single suction)	8	11	8
AK-PC 781A*	080Z0191		10	11	8

AK-PC Pack Controller for Cascade HFC/HC/NH₃-CO₂ System



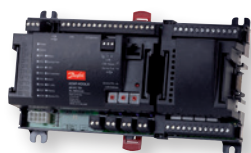
- AK-PC 783A is complete regulating unit for capacity control of compressors and condensers in refrigeration plants with cascade function.
- The controller controls the high-pressure circuit, low-pressure circuit and cascade circuit. The controller is with oil management, simple heat recovery function and coordination between the high-pressure control and low-pressure control.
- Capacity control of up to 12 compressors (Max. 6 on each circuits or 7 MT + 5 LT or 8 MT + 4 LT)
 - Up to 3 unloaders for each compressor / Up to 3 screw compressors / Digital scroll compressor
 - Control of two cascade circuits in parallel
 - Control of CO₂ pump system

Type	Code No	Function	No. of Compressors (max)	AI (analog inputs)	DO (relay outputs)
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Integrated LON RS485 communication

AK-PC 783	080Z0196	Capacity control of MT compressors, condensers, LT compressors and cascade heat exchangers	8 5/4xMT; 3/4xLT	11	8
AK-PC 783A*	080Z0193		12 8/7/6xMT; 4/5/6xLT	11	8

AK-CC 750 Cabinet/Cold Room Controllers



- AK-CC 750 is a case/room controller for control up to 4 evaporators in a case line-up or a cold room. The fully flexible in- and output definition of the controller makes it adaptable to almost any application including CO₂ plants.
- Covers all typical case/cold room control functions plus advanced energy optimization functionality support directly AKV/AKVH pulse operation and ETS/CCMT stepper motor electronic expansion valves via extension module.

Type	Code No	Function	No. of Compressors (max)	AI (analog inputs)	DO (relay outputs)
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Integrated LON RS485 communication

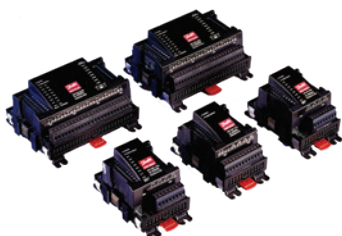
AK-CC 750	080Z0125	Multiple evaporator controller	4	11	8
AK-CC 750A*	080Z0140		4	11	8

* will be released in 2018, please consult local Danfoss company

Solutions catalog for CO₂ installations

Extension modules

Variety of AK-XM modules allow to extend the number of inputs and outputs and add extra functionality to the main controller (AK-PC or AK-CC) according to application needs.



Type	Code No	AI	DO	DI max. 80V	DI max. 260V	AO 0-10Vdc	Stepper outputs	Override switches
AK-XM 101A	080Z0007	8						
AK-XM 102A	080Z0008			8				
AK-XM 102B	080Z0013				8			
AK-XM 103A	080Z0032	4				4		
AK-XM 204A	080Z0011		8					
AK-XM 204B	080Z0018		8					X
AK-XM 205A	080Z0010	8	8					
AK-XM 205B	080Z0017	8	8					X
AK-XM 208C	080Z0023	8					4	
AK-OB 110*	080Z0251					2		

* Extension module can be placed on the PC board in the controller module.

AK operation and accessories



Type	Code No	Description
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Communication module for controllers where modules cannot be connected continuously

AK-CM 102	080Z0064	Communication module for external extension modules
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Power supply module 230 V / 115 V to 24 V d.c.

AK-PS 075	080Z0053	18 VA; Supply for controller
AK-PS 150	080Z0054	36 VA; Supply for controller
AK-PS 250	080Z0055	60 VA; Supply for controller

External display that can be connected to the controller module

AK-MMI	080G0311	Graphic display with operation buttons for AK-PC 7xx platform
MMIGRS2	080G0294	Graphic display with operation buttons for new AK-PC 7xx A platform
Cable	080G0075	1,5 m ; Cable between graphic display type MMIGRS2 and controller (RJ11 plug)
Cable	080G0076	3,0 m ; Cable between graphic display type MMIGRS2 and controller (RJ11 plug)
EKA 163B	084B8574	Display
EKA 164B	084B8575	Display with operation buttons
Cable	084B7298	2,0 m ; Cable between EKA display and controller
Cable	084B7299	6,0 m ; Cable between EKA display and controller

Operation

AK-ST 500	080Z0161	Software for operation of AK controllers
AK - USB	080Z0264	Cable between PC (USB converter) and AK controller with RS 232

Evaporator controllers for CO₂ direct expansion evaporators

AK-CC 550x Cabinet/Cold Room Controllers



ADAP-KOOL® evaporator controls enable optimal functionality of refrigeration system, and, at the same time, save energy and keep food quality in display cases and cold rooms thanks to features like defrost function, adaptive superheat control with electronically operated expansion valve such as AKVH/AKV.

AK-CC 550A

Complete refrigeration controller with great flexibility to adapt to all types of refrigeration appliances and cold storage rooms. Covers all typical appliance/cold room control functions plus advanced energy optimization functionality and AKV/AKVH electronic expansion valves support. EEV control based on advanced MSS (Minimum Stable Superheat) algorithm. Optimized for CO₂ but can be used for variety of other refrigerants as well. Can control 1 AKV and is typically used for 1 cooling section but it can control (with some limitations) a specific appliance type with 2 sections too.

AK-CC 550B

Same as AK-CC 550A but with 1 more temperature sensor input which allows full control of specific appliance type with 2 cooling sections (however still 1 AKV is controlled as with AK-CC 550A).

AK-CC 550F

Same as AK-CC 550A but with additional functionality to control flooded evaporators. There are 2 operating modes of the controller available (dry expansion and flooded evaporator) selected by a signal on DI input.

Type	Code No	Function	No. of Evaporators	Comm. option	Integrated MODBUS
AK-CC 550A	084B8030	Evap. controller for one AKV	1	LON / Modbus	x
AK-CC 550B	084B8032	Evap. controller for one AKV, 2 evaporators	2	LON / Modbus	x
AK-CC 550F	084B8073	Evap. controller for one AKV, Flooded CO ₂ system	1	LON / Modbus	x

AK-CC accessories



Type	Code No	Description
EKA 175	084B8579	Data communication module LON RS 485
EKA 178B	084B8571	Data communication module MODBUS
EKA 163B	084B8574	External display with plug for direct connection
EKA 164B	084B8575	External display with operation buttons and plug for direct connections
Cable	084B7298	2,0 m ; Cable between EKA display and controller
Cable	084B7299	6,0 m ; Cable between EKA display and controller

Solutions catalog for CO₂ installations

Evaporator controllers for CO₂ pump recirculation evaporators

Controls for regulating refrigeration appliances. The controls are capable of regulating one or more evaporators, depending on the type of controls. The controls have functions for regulating temperature, defrosting, door frame heating and fan operation.

EKC 202, AK-CC Cabinet/ Cold Room Controllers for panel mounting



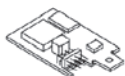
Type	Code No	Function	DO	DI	AI	Integrated MODBUS
EKC 202A	084B8521	Evaporator controllers for panel mounting	2	1	2	
EKC 202B	084B8522		3	1	2	
EKC 202C	084B8523		4	1	2	
EKC 202C-MS	084B8543		4	1	2	
EKC 202D	084B8536		4	2	3	
AK-CC 210	084B8520		4	2	3	
AK-CC 250A	084B8528		4	2	3	x
EKA 179A	084B8565	Data communication module LON RS 485				
EKA 178A	084B8564	Data communication module MODBUS				

EKC 302, AK-CC Cabinet/ Cold Room Controllers for DIN rail mounting



Type	Code No	Function	DO	DI	AI	Integrated MODBUS
EKC 302D	084B4164	Evaporator controllers for panel mounting	4	2	3	x
AK-CC 350	084B4165		4	2	3	x
AK-CC 450	084B8022		6	3	6	x
EKA 175	084B8579	Data communication module LON RS 485				
EKA 178B	084B8571	Data communication module MODBUS				

Common accessories for EKC 200/300, AK-CC 200/300/400/500 controllers



Type	Code No	Function
EKA 163A	084B8562	External display with screw terminals
EKA 164A	084B8563	External display with operation buttons and screw terminals
EKA 183A	084B8582	Programming key EKC/PC/EKC

AK-RC 101 Cold Room Controller IP65 protection mounting on panel outside the room



The AK-RC 101 OPTYMA™ Control single-phase is a new control panel for cold rooms with a single-phase compressor up to 2 HP (or for EVR solenoid valve control in central systems), specially designed for safety, protection, control and ease of installation. It allows the user to control all the components on a refrigeration system: compressor/EVR, evaporator fans, defrosting elements and room light.

Type	Code No	Function	DO	DI	AI	Integrated MODBUS
AK-RC 101	080Z3200	OPTYMATM Control single-phase (2 HP) including two sensors	5	2	2	x
Sensor	084N3210	Sensor EKS 221 (spare part)				

Stepper motor valves drivers and Superheat controllers

Drivers can be used where there are requirements to accurate control of superheat.

The main advantages of this controller are:

- The evaporator is charged optimally – even when there are great variations of load and suction pressure.
- Energy savings – the adaptive regulation of the refrigerant injection ensures optimum utilisation of the evaporator and hence a high suction pressure.
- The superheating is regulated to the lowest possible value



Type	Code No	Description
EKD 316 C	084B8045	ETS and ETS Colibri driver / superheat controller (with terminals)
EKA 164A	084B8563	External display (with MODBUS communication)
AKA 211	084B2238	Cable filter

Controller for Cascade heat exchanger HFC/HC/NH₃ – CO₂ System

EKC 313 is a controller for use in systems with cascade regulating and CO₂ as refrigerant on the low temperature circuit.

It can regulate the cooling of the heat exchanger in one of two ways: Optimize superheat, or regulate the condensation pressure at the low temperature circuit while ensuring that the superheat does not become too low. As the same functionality is already present in AK-PC 783 the EKC 313 can be used in cascade systems where AK-PC 783 has not been applied or as an extra safety back-up unit.



Type	Code No	Description
EKC 313	084B7253	Cascade controller
EKA 174	084B7124	Data communication module, LON RS 485 with galvanic separation

Solutions catalog for CO₂ installations

Pulse Electronic Expansion Valves

Pulse Electronic Expansion Valves for HFC, AKV



Type	Code No [in]		Code No [mm]		MWP [bar]	Flow rate Kv [m ³ /h]	Rated capacity [kW]	
							R134a	R404A
AKV 10-1	068F1161	3/8 x 1/2	068F1162	10 x 12	52	0.010	0.9	0.8
AKV 10-2	068F1164	3/8 x 1/2	068F1165	10 x 12	52	0.017	1.4	1.3
AKV 10-3	068F1167	3/8 x 1/2	068F1168	10 x 12	52	0.025	2.1	2
AKV 10-4	068F1170	3/8 x 1/2	068F1171	10 x 12	52	0.046	3.4	3.1
AKV 10-5	068F1173	3/8 x 1/2	068F1174	10 x 12	52	0.064	5.3	4.9
AKV 10-6	068F1176	3/8 x 1/2	068F1177	10 x 12	52	0.114	8.5	7.8
AKV 10-7	068F1179	1/2 x 5/8	068F1180	12 x 16	42	0.209	13.5	12.5
AKV 15-1	068F5000	3/4 x 3/4	068F5001	18 x 18	42	0.250	21.2	19.6
AKV 15-2	068F5005	3/4 x 3/4	068F5006	18 x 18	42	0.400	33.8	31.4
AKV 15-3	068F5010	7/8 x 7/8	068F5010	22 x 22	42	0.630	53.3	49.4
AKV 15-4	068F5015	1 1/8 x 1 1/8	068F5016	28 x 28	28	1.000	84.6	78.3

Electromagnetic coils



Type	Code No	Description	Valve type		
			AKV 10-1 / 10-6	AKV 10-7	AKV 15
Coil	018F6701	Coil with terminal box; 230 V AC, 50 Hz, 10 W	+	-	+
	018F6905	Coil with terminal box; 230 V AC, 50 Hz, 20 W	+	+	+
	018F6702	Coil with terminal box; 240 V AC, 50 Hz, 10 W	+	-	+
	018F6802	Coil with terminal box; 240 V AC, 50 Hz, 12 W	+	+	+

Pulse Electronic Expansion Valves for R744 (CO₂) / 90 bar, AKVH



The AKVH is a pulse modulating electrically operated expansion valve designed for CO₂ refrigeration applications. It features a replaceable coil, quiet operation, energy efficient operation and long valve life, and the ability to operate as both an expansion and solenoid valve. AKVH valves should be paired with high MOPD EEC coil.

Type	Code No [in]		Code No [mm]		MWP [bar]	Flow rate Kv [m ³ /h]	Rated capacity [kW]	
							Chłodnie	Mroźnie
AKVH 10-0	068F4078	3/8 x 1/2	068F4088	10 x 12	90	0.003	0.4	0.8
AKVH 10-1	068F4079	3/8 x 1/2	068F4089	10 x 12		0.010	1.1	2.2
AKVH 10-2	068F4080	3/8 x 1/2	068F4090	10 x 12		0.017	1.7	3.5
AKVH 10-3	068F4081	3/8 x 1/2	068F4091	10 x 12		0.025	2.6	5.4
AKVH 10-4	068F4082	3/8 x 1/2	068F4092	10 x 12		0.046	4.3	8.7
AKVH 10-5	068F4083	3/8 x 1/2	068F4093	10 x 12		0.064	6.7	13.6
AKVH 10-6	068F4084	3/8 x 1/2	068F4094	12 x 16		0.114	10.7	21.7

Electromagnetic coils



Type	Code No	Description
Coil EEC	018F6783	Coil with electronic coil controller; 208 – 240 V AC, 50/60Hz, 4 W

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High pressure Electronic Expansion Valves for R744 (CO₂)/ 140 bar

Electronic Expansion Valves / 140 bar

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. Additional features include: compatibility with PAG, POE and PVE oils; combined butt weld and solder connections; and a light weight and compact design. The CTR is an electrically operated 3-way valve designed specifically for operation in CO₂ systems with heat reclaim. 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.

CCMT valves (High pressure expansion / Gas by-pass / Direct expansion evaporator)



Type	Code No	Connections	Flow rate Kv [m ³ /h]	Integrated MBS 8250
CCMT 2	027H7200	Weld ½ x ½ in; Solder ODF 5/8 x 5/8 in	0.17	
CCMT 4	027H7201		0.45	
CCMT 8	027H7202		0.8	
CCMT 16	027H7231	Weld 1 x 1 in; Solder ODF 1 1/8 x 1 1/8 in	1.6	X
CCMT 24	027H7232		2.4	X
CCMT 30	027H7233		3.0	X
CCMT 42	027H7234		4.2	X

CTR Commercial Transcritical Heat Reclaim 3-way Valve



Type	Code No	Connections	Flow rate Kv [m ³ /h]
CTR 20	027H7244	Weld 1 x 1 in; Solder ODF 1 1/8 x 1 1/8 in	20

CCMT / CTR valves accessories

Type	Code No	Connections	Packing format
Kabel PVC	034G7073	2 m ; Cable with M12 connector	1
Kabel PVC	034G7074	8 m ; Cable with M12 connector	1
Cable Packard	064G0950	10 m ; Cable for MBS 8250 pressure transmitter	1
AST-G	034G0013	Service Driver; used to manually open or close valve	

ICMTS valves (High pressure expansion / Gas by-pass / Direct expansion evaporator)

Type	Code No	Connections	Flow rate Kv [m ³ /h]
ICMTS 20-A33	027H1084	DIN butt weld DN 25 / 1in	0.19
ICMTS 20-A	027H1085		0.59
ICMTS 20-B66	027H1093		1.6
ICMTS 20-B	027H1086		2.4
ICMTS 20-C	027H1087		4.6

ICMTS valves accessories & Spare parts

Type	Code No	Description
ICAD 600A-TS	027H9078	Actuator with cables
	027H0181	Mutli-function tool for manual operation
UPS	027H0182	Fail safe supply Battery / UPS 19 V d.c.

Solutions catalog for CO₂ installations

CO₂ Multi Ejectors



Fully integrated solution not requiring any additional components like check valves or motorized ball valves.

- Fully serviceable - wide range of spare parts and accessories.
- Easily accessible strainer / filter for fast maintenance.
- 3 x MBS 8250 pressure transmitters integrated.
- Brings first cost savings.
- High pressure valve becomes redundant
- Enables 15 - 35 % savings on compressor swept volume, compared to booster systems.

Type	Code No	Description	Capacity kg/h	Block
HP 1875	032F5673	High pressure lift Gas CO ₂ ejector	1,875	CTM 6
HP 3875	032F5674		3,875	CTM 6
LP 935	032F5678	Low pressure lift Gas CO ₂ ejector	935	CTM 6
LP 1935	032F5679		1,935	CTM 6
LE 200	032F5683	Liquid CO ₂ ejector	200	CTM 1
LE 400	032F5684		400	CTM 1
LE 600	032F5685		600	CTM 2

Coils electromagnetic and accessories



Type	Code No	Description
AS230CS	042N7601	Coil 230V / 50Hz / 8W with DIN plug
DIN plug (LED)	042N0265	
DIN plug	042N0156	

Motor Electronic Expansion Valves for HFC

ETS are electronic stepper motor valves. The valves have been designed for precise liquid injection into evaporators for air conditioning and refrigeration applications. **The valves are not intended to be used with CO₂.**

ETS valves



Type	Code No		Connection ODF x ODF		Rated capacity ¹⁾			
	Straight way	Angle way	[in]	[mm]	R134a	R407C	R404A	R410A
ETS 12.5	034G4209	034G4213	1/2 x 1/2	-	45	63	43	70
	034G4208	034G4212	-	12 x 12				
	034G4210	034G4214	5/8 x 5/8	16 x 16				
	034G4211	034G4215	7/8 x 7/8	22 x 22				
ETS 25	034G4201	034G4205	1/2 x 1/2	-	93	129	88	144
	034G4200	034G4204	-	12 x 12				
	034G4202	034G4206	5/8 x 5/8	16 x 16				
	034G4203	034G4207	7/8 x 7/8	22 x 22				

With sight glass



ETS 50	034G1708		7/8 x 7/8	22 x 22	170	240,5	161,4	262,3
	034G1705		7/8 x 1 1/8	22 x 28				
	034G1706		1 1/8 x 1 1/8	28 x 28				
	034G1704		1 1/8 x 1 3/8	28 x 35				
ETS 100	034G0507		1 1/8 x 1 1/8	28 x 28	316,5	447,8	300,5	488,4
	034G0501		1 1/8 x 1 3/8	28 x 35				
	034G0508		1 3/8 x 1 3/8	35 x 35				
	034G0505		1 5/8 x 1 5/8	-				
ETS 250	034G2600		1 1/8 x 1 1/8	28 x 28	874	1212	828	-
	034G2601		1 3/8 x 1 3/8	35 x 35				
	034G2602		1 5/8 x 1 5/8	-				
	034G2611			42 x 42				
ETS 400	034G3500		1 5/8 x 1 5/8	-	1394	1933	1320	-
	034G3501		2 1/8 x 2 1/8	54 x 54				

¹⁾ The above estimated capacities, are based on the following conditions: Evaporating temperature t_e: 5 °C, Liquid temperature t_l: 28 °C, Condensing temperature t_c: 32 °C.

Solutions catalog for CO₂ installations

Motor Electronic Expansion Valves for HC / HFC

ETS Colibri® are electronic stepper motor valves. The valves have been designed for precise liquid injection into evaporators for air conditioning and refrigeration applications. **The valves are not intended to be used with CO₂.**

ETS Colibri



Type	Code No	Connection ODF x ODF		Flow rate Kv [m ³ /h]	Rated capacity ¹⁾			
					R134a	R290	R1234ze	R410A
					[kW]	[kW]	[kW]	[kW]
Without sight glass								
ETS 12C	034G7500	1/2 x 1/2	-	0.6	68	91	53.6	105
	034G7501	5/8 x 5/8	16 x 16					
	034G7502	7/8 x 7/8	22 x 22					
ETS 24C	034G7900	1/2 x 1/2	-	1.2	111	149	87.3	170
	034G7901	5/8 x 5/8	16 x 16					
	034G7902	7/8 x 7/8	22 x 22					



With sight glass								
ETS 25C	034G7602	7/8 x 7/8	22 x 22	1.2	111	149	87.3	170
ETS 50C	034G7700	7/8 x 7/8	22 x 22	2,5	210	282	166	323
	034G7701	7/8 x 1 1/8	22 x 28					
	034G7702	1 1/8 x 1 1/8	28 x 28					
	034G7703	1 1/8 x 1 3/8	28 x 35					
ETS 100C	034G7800	1 1/8 x 1 1/8	28 x 28	5,0	413	554	325	635
	034G7801	1 1/8 x 1 3/8	28 x 35					
	034G7802	1 3/8 x 1 3/8	35 x 35					
	034G7803	1 5/8 x 1 5/8	-					

¹⁾ The above estimated capacities, are based on the following conditions:
Evaporating temperature te : 5 °C, Liquid temperature tl : 28 °C, Condensing temperature tc : 32 °C.

ETS valves accessories & Spare parts



Type	Code No	Description	Packing format
Cable PVC	034G7073	2 m ; Cable with M12 connector	1
Cable PVC	034G7074	8 m ; Cable with M12 connector	1
AST-G	034G0013	Service Driver; used to manually open or close valve	
UPS	027H0182	Fail safe supply Battery / UPS 19 V d.c.	

Solenoid Valves for R744 (CO₂) / 90 bar

EVUL solenoid valves are designed to fit into compact refrigeration systems and can be applied in liquid, suction lines.

EVUL solenoid valves can be used in many different refrigeration systems and are specially designed for commercial refrigeration systems, refrigeration appliances, liquid coolers, ice cube machines, mobile refrigeration systems, heat pump systems and air conditioning units.

EVUL valves



Typ	Code No; Multi Pack	Connection		MWP [bar]	Flow rate Kv [m ³ /h]	MOPD Min [bar]	MOPD Max [bar]
		[in]	[mm]				
EVUL 1	032F9506	1/4	-	90	0,1	0,02	36
	032F9508	-	6				
EVUL 2	032F9510	1/4	-		0,2		
	032F9516	-	6				
EVUL 3	032F9511	1/4	-		0,3		
	032F9517	-	6				
EVUL 4	032F9512	1/4	-		0,5		
	032F9518	-	6				
EVUL 5	032F9513	3/8	-		0,65		
	032F9519	-	10				
EVUL 6	032F9514	1/2	-		0,75		
	032F9521	-	12				
EVUL 8	032F9515	1/2	-	0,9			
	032F9522	-	12				

Solutions catalog for CO₂ installations

Solenoid Valves for R744 (CO₂) / 70 bar

EVU valves



Typ	Code No; Multi Pack	Connection		MWP	Flow rate Kv	MOPD Min	MOPD Max
		[in]	[mm]				
EVU 1	032F9524	1/4	-	70	0,1	0	24
EVU 2	032F9529	-	6		0,2		
EVU 3	032F9525	1/4	-		0,3		
	032F9530	-	6		0,5		
EVU 4	032F9531	-	10		0,65		
EVU 5	032F9526	3/8	-		0,8	0,02	36
	032F9532	-	10				
EVU 6	032F9527	3/8	-		1,0		
	032F9528	1/2	-				
EVU 8	Only version I-pack	-	12				

Coils for EVUL and EVU valves and accessories



Type	Code No	Description
AS230CS	042N7601	Coil 230V / 50Hz / 8W with DIN plug
AS240CS	042N7602	Coil 240V / 50Hz / 6,5W with DIN plug
DIN plug (LED)	042N0265	
DIN plug	042N0156	
AU230CS	042N7651	Coil 230V / 50Hz / 7W with 1 m cable
O-ring	032F6115	O-ring for sealing the coil. Industrial pack (50 pcs.)

Note: Valve body supplied with O-ring

Solutions catalog for CO₂ installations

AK-SM System Manager

System Manager AK-SM 8xx network unit specifically designed for Convenience Store market, Medium and Hyper Supermarkets but also Cold Room storage plants

- Simple user interface for fast and easy access to your information
- Refrigeration, HVAC, Lighting, Energy control, Gas detectors via built in control logic
- Support for Danfoss controllers
- Full functional web server built in
- VGA color screen
- Blind and Screen models available
- Built in Modbus, Ethernet, Lonworks® RS485
- XML compatible, allowing interface for remote access applications



Type	Code No	Function	Controllers	Refrigeration	HVAC	Communication
AK-SM 810	080Z4006	System manager; C-store; Blind	32	X	X	Modbus / LON
AK-SM 820	080Z4004	System manager; C-Store; Screen version	32	X	X	Modbus / LON
AK-SM 850	080Z4001	System manager; Refrigeration; Screen version	120	X	-	Modbus / LON
AK-SM 880	080Z4008	System manager; Full Store; Screen version	120	X	X	Modbus / LON
AK-SM 800 AL	080Z4014	Alarm module for AK-SM800 platform	-	-	-	IP

AK-EM Enterprise Management

The AK-EM 800 is an Enterprise Management solution from Danfoss for the food retail industry. The AK-EM 800 is a multi-user, multi-site server PC application which provides alarm management and automatic data collection, together with reporting features.



Type	Code No	Function	Sites
AK-EM 800	080Z4106	Alarm Management and HACCP reporting	1
	080Z4100		50
	080Z4101		250
	080Z4102		500

Solutions catalog for CO₂ installations

AK-SM System Manager

Extension modules



Type	Code No	AI	DO	DI max. 80V	DI max. 260V	AO 0-10V DC	Stepper outputs	Override switches
AK-XM 101A	080Z0007	8						
AK-XM 102A	080Z0008			8				
AK-XM 102B	080Z0013				8			
AK-XM 103A	080Z0032	4				4		
AK-XM 204A	080Z0011		8					
AK-XM 204B	080Z0018		8					X
AK-XM 205A	080Z0010	8	8					
AK-XM 205B	080Z0017	8	8					X
AK-XM 208C	080Z0023	8					4	
AK-XM 107A	080Z0020	Pulse counting module; 4 inputs						

Additional modules

AK-CM 101C	080Z0063	RS485 Communication Module
AK-PI 200	080Z8521	Intermediary link between AK-SM and controllers with DANBUSS comm.

Power supply module 230 V / 115 V do 24 V DC

AK-PS 075	080Z0053	18 VA; Supply for controller
AK-PS 150	080Z0054	36 VA; Supply for controller
AK-PS 250	080Z0055	60 VA; Supply for controller

Network amplifiers (with power supply transformer)

AKA 223	084B2241	LON RS485 repeater
AKA 222	084B2240	Modbus / Danbuss repeater

Solutions catalog for CO₂ installations

Danfoss DGS Gas Detector (Modbus)

Utilizing either Semi-Conductor (SC) or Infrared (IR) technologies, 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 & Safety requirements on new or existing systems.

Type	Code No	Refrigerant	IP	Temperature range [°C]	Note
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Integrated MODBUS communication



DGS-SC	080Z2998	R404A, R507	41	-20 do +50°C	
	080Z2942	R134a	41		
	080Z2943	R407A	41		
	080Z2956	R407F	41		
	080Z2988	R410A	41		
	080Z2945	R448A	41		
	080Z2947	R449A	41		
DGS-IR	080Z2995	R744 (CO ₂)	41		
DGS-IR Failsafe	080Z2994	R744 (CO ₂)	41		



DGS-SC	080Z2999	R404A, R507	66	-40 do +50°C	
	080Z2989	R134a	66		
	080Z2944	R407A	66		
	080Z2957	R407F	66		
	080Z2987	R410A	66		
	080Z2949	R422D	66		
	080Z2946	R448A	66		
080Z2948	R449A	66			
080Z2986	R1234ze	66			
DGS-IR	080Z2996	R744 (CO ₂)	66		
DGS-IR Failsafe	080Z2993	R744 (CO ₂)	66		



DGS-IR	080Z2997	R744 (CO ₂)	66	-40 do +50°C	Remote sensor
DGS-IR Failsafe	080Z2992	R744 (CO ₂)	66		Remote sensor
DGS-IR	080Z2958	R744 (CO ₂)	66	-40 do +50°C	Duct mounted sensor

Solutions catalog for CO₂ installations

Miscellaneous sensors



Type	Code No	Description
PHOTO-OD-1	080Z2172	Outdoor photocell with AKS21 sensor for outside temperature
EMHS-3-1	080Z2171	Inside Humidistat (combined temperature & humidity)

Power meters (Modbus)



Type	Code No	Description
Meter		
Wattnode	080Z2146	Power meter 400V / 50Hz ; MODBUS
Split cores		
ACT-0750-150	CTS0750150	SPLIT CORE CT 0.75 IN I.D. 150A
ACT-0750-250	CTS0750250	SPLIT CORE CT 0.75 IN I.D. 250A

Power meters (Modbus)

It is possible to connect also specified energy meters using following settings for Modbus RS 485 RTU:

- 38400 baud
- 8 data bit,
- EVEN parity and 1 stop bit

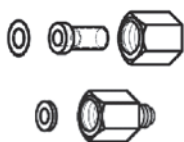
Carlo Gavazzi®	
Smart Modular Power Analyzer	WM30-96 AV5 3 H R2 A2 S1
Energy Analyzer	EM210 72D AV5 3 X O S
<i>Products from outside Danfoss offer. Recommended for use in Danfoss systems.</i>	

Solutions catalog for CO₂ installations

Pressure transmitters

AKS 2050 ratiometric pressure transmitters convert measured pressure to a linear output and are designed specifically for CO₂ pressure ranges.

MBS 8250 with integrated pulse-snobber is designed for use in hydraulic applications with severe media influences like cavitation, liquid hammer or pressure peaks, and offers a reliable pressure measurement, even under harsh environmental conditions.



Type	Operating range [bar]	MWP [bar]	Compensated temperature range [°C]	G3/8A	1/4" in flare	3/8" solder	1/4" in female flare
AKS 32R	-1 to +12	33	-30 to +40 °C	060G1038	060G1036	060G3551	060G6323
AKS 32R	-1 to +34	55	0 to + 80 °C		060G0090	060G3552	060G6341
AKS 2050	-1 to +59	100	-30 to +40 °C	060G5750			
AKS 2050	-1 to +99	150	-30 to +40 °C	060G5751			
AKS 2050	-1 to +159	250	0 to + 80 °C	060G5752			
	060G1034	5m ; Connecting plug with cable (mounted on pressure transmitter obtains IP67)					
	060G0008	Plug Pg 9					
	017-436866	Connector with nipple; G 3/8 connector, nipple and washer (10 mm o.d. x 6.5 mm i.d.) for brazing					
	017-422966	Connector with nipple; G 3/8 connector, nipple and washer (10 mm o.d. x 6.5 mm i.d.) for welding					
	017-420566	Reducer; G 3/8 x 7/16 – 20 UNF (1/4 flare) reduction with washer					

Slim-line pressure transmitters with pulse-snobber

MBS 8250	-1 do +159	960	-20 do 100 °C	064G1136	UNF - 7/16-20 Male	
Packard cable	064G0950	10 m; Cable for MBS 8250 pressure transmitter				
Packard cable	064G0910	10 m; Cable for MBS 8250 pressure transmitter; Ind. Package 14 pcs				

Temperature sensors Pt1000

AKS PT1000 temperature sensors utilize a platinum element to ensure optimal accuracy.



Type	Code No	Purpose	Sensor range [°C]	Length [m]	Pack Qty.	Pack Format
AKS 11	084N0003	Superheat and air sensor for control & monitoring	-50 do +100	3.5	70	M-Pack
	084N0005			5.5	60	
	084N0008			8.5	50	
	084N0027			3.5	110	
	084N0028			5.5	70	
AKS 12	084N0029	Air temperature sensor for monitoring	-40 do +100	8.5	50	I-Pack
	084N0036			1.5	50	
	084N0046			5.5	30	
	084N0035			1.5	30	
	084N0039			3.5	30	
084N0038	5.5	30				
AKS 21M	084N2003	Multipurpose sensor	-70 do +180	2.5	72	M-Pack
AK-HS 1000	084N1007	HACCP ambient sensor	-50 do +50	5.5	20	M-Pack

Solutions catalog for CO₂ installations

Temperature sensors NTC 10K for EKE, MCX, AK-RC

EKS 221 is an NTC cable sensor with nominal resistance 10.000 ohm at 25°C.



Type	Code No	Purpose	Sensor range [°C]	Length [m]	Pack Qty.	Pack Format
EKS 221	084N3210	Temperature sensor NTC 10k, Thermo plastic rubber	-50 do 120	3.5	20	M-Pack
	084N3209			8.5	20	
	084N3206			3.5	150	I-Pack
	084N3207			5.5	80	
	084N3208			8.5	50	
EKS 221	084N0036	Temperature sensor NTC 10k, Steel AISI 304	-50 do 110	1.5	150	I-Pack

Temperature sensors NTC 5K for EKC

EKS 211 is an NTC cable sensor with nominal resistance 5.000 ohm at 25°C.



Type	Code No	Purpose	Sensor range [°C]	Length [m]	Pack Qty.	Pack Format
EKS 211	084N1220	Temperature sensor NTC 5K PBT (Thermo-Plastic Polyester)	-40 do 80	1.5	20	M-Pack
	084N1221			3.5	20	
	084B4403			1.5	150	I-Pack
	084B4404			3.5	75	

Temperature sensors PTC for EKC

EKS 111 is a PTC cable sensor with nominal resistance 1.000 ohm at 25°C.



Type	Code No	Purpose	Sensor range [°C]	Length [m]	Pack Qty.	Pack Format
EKS 111	084N1220	Temperature sensor PTC PVC	-55 do 100	1.5	20	M-Pack
	084N1221			3.5	20	
	084B4403			6	20	
	084B4404			1.5	150	I-Pack
	084B4403			3.5	150	
	084B4404			6	80	
	084B4403			8.5	60	

Solutions catalog for CO₂ installations

Liquid level sensors

The AKS 4100 / AKS 4100U liquid level sensor is designed specifically to measure refrigerant liquid levels in a wide range of refrigeration applications. The coaxial version is designed for use with R744 (CO₂). Can be connected directly to AK-PC 7xx pack controller and used for liquid refrigerant level measurement (for example for flooded evaporator control system).

AKS 4100 - Coaxial D14



Type	Code No	Code No	Code No	Probe length [mm]	Bottom Dead Zone [mm]
	With HMI English (default) German French Spanish	With HMI English (default) Japanese Chinese Russian	Code number Without HMI		
AKS 4100	084H4510	084H4560	084H4503	500	170
	084H4511	084H4561	084H4504	800	
	084H4512	084H4562	084H4505	1000	
	084H4513	084H4563	084H4506	1200	
	084H4514	084H4564	084H4507	1500	
	084H4515	084H4565	084H4508	1700	
	084H4516	084H4566	084H4509	2200	

Accessories





Type	Code No	Code No	Description
	With HMI English (default) German French Spanish	With HMI English (default) Japanese Chinese Russian	
Panel	084H4540	084H4590	AKS 4100/4100U HMI Service/Display unit with rear cover and mounting bracket
Display	084H4548	084H4598	AKS 4100/4100U HMI Display (usually spare part)

Solutions catalog for CO₂ installations

Shut-off ball valve GBCH for R744 (CO₂) / 90 bar

GBC H ball valves have been designed and tested to meet the high pressure requirements of CO₂. These manually operated shut-off valves are suitable for bi-directional flow and 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, and sealing materials developed specifically for CO₂.

Type	Code No	Type	Code No	Connection ODF x ODF		Flow rate Kv [m ³ /h]	MWP [bar]
				[in]	[mm]		
GBC H without access port		GBC H with access port					
							
GBC 6s H	009L7415	GBC 6s H	009L7581	1/4	-	1.78	90
	009L7395		009L7580	-	6		
GBC 10s H	009L7416	GBC 10s H	009L7582	3/8	-	6.31	
	009L7396		009L7583	-	10		
GBC 12s H	009L7417	GBC 12s H	009L7585	1/2	-	12.87	
	009L7397		009L7584	-	12		
GBC 16s H	009L7418	GBC 16s H	009L7586	5/8	16	11.77	
GBC 18s H	009L7419	GBC 18s H	009L7588	3/4	-	31.07	
	009L7399		009L7587	-	18		
GBC 22s H	009L7420	GBC 22s H	009L7589	7/8	22	24.47	

GBC without access port, butt weld, Stainless steel connections

GBC 28s H	009L7406			-	28	96.72	90
GBC 35s H	009L7410			-	35	106.95	75
GBC 42s H	009L7411			-	42	150.98	75



Check valve for high pressure NRV 10s H for R744 (CO₂)

NRV 10s H check valves for R744 (CO₂) can work as an internal relief valve when installed in parallel with GBC Ball Valves or service shut off valves, at the inlet and outlet of components to be serviced. The NRV 10s H can also be used in hot gas defrosting lines.

Type	Code No	Connection ODF x ODF		Flow rate Kv [m ³ /h]	MWP [bar]	Diff pressure to start opening	Pressure drop across valve
		[in]	[mm]				
NRV 10s H	020-4000	3/8	-	0.9	90	0,4 bar	1 bar
	020-4300	-	10				



Pressure switches PED 97/23/EC approved; EN 12263

KP pressure switch can be used as a protection in suction line of LT compressor in CO₂ systems (booster & cascade)

Type	Code No	High pressure (HP) [bar]		Reset	Contact system	Connection	MWP [bar]
		Regulating range	Differential				
KP 6W	060-519066	8 – 42	4 – 10	Auto	SPDT	1/4 in. 6 mm flare	46.5
KP 6B	060-519166	8 – 42	4	Man (Max)			



Engineering Tomorrow's Food Retail Solutions



Solutions catalog for CO₂ installations

Stainless steel line components

Shut-off valve - SVA-S/L SS



Conne- tion size [mm]	Conne- tion size [in]	Neck type	Cap or wheel	DIN Butt- weld (EN 10220)	MWP [bar]	Tempera- ture range	Angleway	Straightway
15	1/4	S - Short	Cap	Yes	52	-60/150°C	148B5290	148B5292
20	3/4						148B5378	148B5380
25	1						148B5487	148B5489
32	1 1/2						148B5567	148B5569
40	1 1/2						148B5647	148B5649
50	2						148B5754	148B5756
65	2 1/2				148B5848		148B5850	
80	3				-		148B5928	
100	4				-		148B6032	
125	5				-		148B6126	

15	1/4	S - Short	Wheel	Yes	52	-60/150°C	148B5289	148B5291
20	3/4						148B5377	148B5379
25	1						148B5486	148B5488
32	1 1/2						148B5566	148B5568
40	1 1/2						148B5646	148B5648
50	2						148B5753	148B5755
65	2 1/2						148B5847	148B5849

15	1/4	L - Long	Cap	Yes	52	-60/150°C	148B6547	148B6549
20	3/4						148B6551	148B6553
25	1						148B6555	148B6557
32	1 1/2						148B6559	148B6561
40	1 1/2						148B6563	148B6565

15	1/4	L - Long	Wheel	Yes	52	-60/150°C	148B6546	148B6548
20	3/4						148B6550	148B6552
25	1						148B6554	148B6556
32	1 1/2						148B6558	148B6560
40	1 1/2						148B6562	148B6564

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Stop & check valve - SCA-X SS



Connection size [mm]	Connection size [in]	DIN Butt-weld (EN 10220)	MWP [bar]	Temperature range	Angleway	Straightway
15	1/4	Yes	52	-60/150°C	148B5293	
20	3/4				148B5381	
25	1				148B5490	
32	1 1/2				148B5585	
40	1 1/2				148B5664	

Check valve - CHV-X SS



Connection size [mm]	Connection size [in]	DIN Butt-weld (EN 10220)	MWP [bar]	Temperature range	Angleway	Straightway
15	1/4	Yes	52	-60/150°C	148B5294	148B5678
20	3/4				148B5382	148B5679
25	1				148B5491	148B5680
32	1 1/2				148B5586	148B6544
40	1 1/2				148B5665	148B6566

Regulating valve - REG-SA/SB SS



Connection size [mm]	Connection size [in]	Cone type	Flow area [mm ²]	DIN Butt-weld (EN 10220)	MWP [bar]	Temperature range	Angleway	Straightway
15	1/4	A	36.5	Yes	52	-60/150°C	148B5297	148B5298
20	3/4		36.5				148B5385	148B5386
25	1		178				148B5494	148B5495
32	1 1/2		178				148B5589	148B5590
40	1 1/2		178				148B5674	148B5675
15	1/4	B	115	Yes	52	-60/150°C	148B5387	148B5388
20	3/4		115				148B5389	148B5390
25	1		531				148B5496	148B5497
32	1 1/2		531				148B5591	148B5592
40	1 1/2		531				148B5676	148B5677

Solutions catalog for CO₂ installations

Strainer without strainer insert - FIA SS



Connection size [mm]	Connection size [in]	DIN Butt-weld (EN 10220)	MWP [bar]	Temperature range	Angleway	Straightway
15	1/4	Yes	52	-60/150°C	148B5295	148B5296
20	3/4				148B5383	148B5384
25	1				148B5492	148B5493
32	1 1/2				148B5587	148B5588
40	1 1/2				148B5666	148B5667
50	2				148B5757	148B5758
65	2 1/2				148B5851	148B5852

FIA strainer insert



Connection size [mm]	Connection size [in]	100µ (150 mesh)	150µ (100 mesh)	250µ (72 mesh)	5000µ (38 mesh)	Pleated 100µ (150 mesh)	Pleated 250µ (72 mesh)	Pleated 500µ (38 mesh)
15	1/4							
20	3/4	148H3122	148H3124	148H3126	148H3128	148H3303	148H3303	-
25	1							
32	1 1/2	148H3123	148H3125	148H3127	148H3129	148H3304	148H3304	-
40	1 1/2							
50	2	148H3157	148H3130	148H3138	148H3144	148H3179	148H3179	148H3189
65	2 1/2	-	148H3131	148H3139	148H3145	148H3180	148H3180	148H3190

Accessories for FIA SS

Connection size [mm]	Connection size [in]	Filter element µ150 + µ50	Filter bag	Blind nut with gasket
15	1/4	148H3301		
20	3/4			
25	1	148H3302	-	-
32	1 1/2			
40	1 1/2			
50	2	-	148H3150	148H3450
65	2 1/2		148H3151	



CO₂ refrigeration is part of Danfoss Smart Store

Danfoss is committed to supporting food retailers working to achieve climate-friendly and energy efficient solutions. As a market leader with more than 50,000 food retail installations worldwide, Danfoss leads the development of food retail solutions. Our CO₂ technologies are part of the Danfoss Smart Store concepts developed based on 30 years of close cooperation with the global community of food retailers.

Danfoss continuously develops its portfolio of components, controllers and advanced algorithms with the long-term ambition to create net-zero stores or even stores that give more energy than they take. Together with forward-thinking retailers around the world, we take sustainable solutions to the next level through constant development of sustainable technologies and service concepts.

Visit Danfoss Smart Store at:
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Read more about trending CO₂ technologies for food retail refrigerants: danfoss.com/co2