

## Electronic controls – overview

Type		Code Nr.	Relay / temperature sensor	Defrost heating	Cooling or heating function	Rail heat	Fan	Alarm / light / misc. (choosable)	2nd compressor	DI / DO / AI / AO	Batterie for clock (optional)	HACCP via system / HACCP integrated	Application modul	Definition and waiting of thermostat sensors	Defrost / defrost on demand/ defrost on demand via bus	Voltage 230 V	Voltage 115 V	Voltage 24 V
<b>Case controller</b>																		
EKC 102A		084B8500	1/1	x						-/-/-					x			
EKC 102A		084B8503	1/1	x						-/-/-					x			
EKC 102B		084B8501	2/2			x/-/-	x	-/-/-							x/-/-	x		
EKC 102C		084B8502	2/2	x		x/-/-		-/-/-							x/-/-	x		
EKC 102C		084B8505	2/2	x		x/-/-		-/-/-							x/-/-	x		
EKC 102D		084B8506	3/2	x		x	x/-/-		x/x/-/-						x			
EKC 202A		084B8521	3/2	x		x/-/-		x/x/-/-	x	x/-/-					x/-/x	x		
EKC 202B		084B8522	4/2	x		x	x/-/-		x/x/-/-	x	x/-/-				x/-/x	x		
EKC 202C		084B8523	4/2	x		x	x/x/-		x/x/-/-	x	x/-/-				x/-/x	x		
EKC 202C-MS		084B8543	4/2	x		x	x/x/-		x/x/-/-	x	-/-				x/-/x	x		
EKC 302A		084B4162	2/2		x/-/-				x/x/-/-						x/-/x	x		
EKC 302B		084B4163	3/2	x		x			x/x/-/-		x/-/-				x/-/x	x		
EKC 302D		084B4164	4/3	x	x	x	x/x/x		x/x/-/-	x/-/-	x				x/-/x	x		
AK-CC 210		084B8520	4/3	x	x	x	x/x/x	x	x/x/-/-	x	x/x	x	x		x/x/x	x		
AK-CC 250A		084B8528	4/3	x	x	x	x/x/x	x	x/x/-/-	x	x/x	x	x		x/x/x	x		
AK-CC 250B		084B8529	4/3	x	x	x	x/x/x	x	x/x/-/-	x	-/-	x	x		x/x/x	x		
AK-CC 350		084B4165	4/3	x	x	x	x/x/x	x	x/x/-/-		x/x	x	x		x/x/x	x		
AK-CC 450		084B8022	6/5	x	x	x	x/x/x		x/x/-/-		x/x	x	x		x/x/x	x		
AK-CC 550A		084B8030	6/5	x	x	x	x/x/x		x/x/-/-		x/-	x	x		x/x/x	x		
AK-CC 750		080Z0121	9/5	x	x	x	x/x/x		x/x/x/x		x/-	x	x		x/x/x	x		x
AK-CC 750		080Z0122	9/5	x	x	x	x/x/x		x/x/x/x		x/-	x	x		x/x/x	x		x
AK-CC 750		080Z0125	9/5	x	x	x	x/x/x		x/x/x/x		x/-	x	x		x/x/x	x		x
<b>Superheat Controller</b>																		
EKC 315A		084B7086	2/2			x/-/-										x		
EKC 312		084B7250	1/2			x/-/-									x			
EKC 316A		084B7088	2/2			x/-/-									x			
EKD 316		084B8040	1/2			x/-/-									x			
<b>Temperature Controller</b>																		
EKC 368		084B7079	4/2	x		x	x	x/-/-										
<b>Liquid level Controller</b>																		
EKC 347		084B7067																
<b>Capacity Controller</b>																		
EKC 331T		084B7105	5/2			x/-/-	2x	x/x/-/-							x			
AK-PC 530		084B8007	10/2			4x	x/-/-	2x	x/x/-/-						x			
AK-PC 781		080Z0186	8/11			8x			x/x/x/x						x			
		080Z0187	8/11			8x			x/x/x/x						x			
		080Z0188	8/11			8x			x/x/x/x						x			
<b>Condensing unit Controller</b>																		
AK-RC 101		080Z3200																
AK-RC 103		080Z3201																
		080Z3202																
		080Z3206																
		080Z3207																

			With screw terminals	With plug connection	Valve control	Room thermostat	UPS connection	Pressure controls	0-10 V / 4-20 mA Input	0-10 V / 4-20 mA Output	Superheat regulation	Reference displacement	External display	Data communication opt./ on board	Note / Language	
<b>Case controller</b>																
EKC 102A		084B8500	TEV	x												
EKC 102A		084B8503	TEV	x												
EKC 102B		084B8501	TEV	x							x					
EKC 102C		084B8502	TEV	x						x						
EKC 102C		084B8505	TEV	x						x						
EKC 102D		084B8506	TEV	x						x						
EKC 202A		084B8521	TEV	x					x		x/-					
EKC 202B		084B8522	TEV	x					x		x/-					
EKC 202C		084B8523	TEV	x					x		x/-					
EKC 202C-MS		084B8543	TEV	x					x		x/-	NTC				
EKC 302A		084B4162	x	TEV	x						x/+					
EKC 302B		084B4163	x	TEV	x						x/+					
EKC 302D		084B4164	x	TEV	x						x/+					
AK-CC 210		084B8520		TEV	x				x		x/-					
AK-CC 250A		084B8528		TEV	x				x		-/x					
AK-CC 250B		084B8529		TEV	x				x		-/x	NTC				
AK-CC 350		084B4165	x	TEV	x				x		+/-					
AK-CC 450		084B8022	x		TEV	x					x	+/-				
AK-CC 550A		084B8030	x		AKV	x			x		x	+/-				
AK-CC 750		080Z0121	x	4x AKV	x				x		x	-/x	EN, DE, FR, IT, NL			
AK-CC 750		080Z0122	x	4x AKV	x				x		x	-/x	EN, ES, PT			
AK-CC 750		080Z0125	x	4x AKV	x				x		x	-/x	EN, DK, SW, FI			
<b>Superheat Controller</b>																
EKC 315A		084B7086	x		AKV/ICM	x	x	x	-/x	-/x	x	x	x/-			
EKC 312		084B7250	x		ETS		x	-/-	-/-	x			x/-			
EKC 316A		084B7088	x		ETS	x	x	x	-/x	-/x	x	x	x/-			
EKD 316		084B8040	x		ETS		x	x	x/x	-/-	x		x/-			
<b>Temperature Controller</b>																
EKC 368		084B7079	x		KVS		x		x/-		x		x/-			
<b>Liquid level Controller</b>																
EKC 347		084B7067	x										x/-			
<b>Capacity Controller</b>																
EKC 331T		084B7105	x				x	x/x	x/x		x		x/-			
AK-PC 530		084B8007	x				x	x/x	x/x		x	x	x/-			
AK-PC 781		080Z0186	x										EN, DE, FR, IT, NL			
		080Z0187	x										EN, ES, PT			
		080Z0188	x										EN, DK, FI			
<b>Condensing unit Controller</b>																
AK-RC 101		080Z3200		Single-phase												
AK-RC 103		080Z3201		Three-phase (3 kW), 4.5-6.3 A												
		080Z3202		Three-phase (3 kW), 7-10 A												
		080Z3206		Three-phase (5 kW), 11-16 A												
		080Z3207		Three-phase (5 kW), 14-20 A												



## EKC 102 – Temperature controller

EKC 102 controllers for panel mounting are used for temperature and defrost control via pump-down or start/stop of compressor.



Functions	Advantages
<p><b>Thermostat</b></p> <ul style="list-style-type: none"><li>ON/OFF thermostat</li><li>Sensors: Danfoss Pt1000, PTC1000 or NTC5000</li><li>Calibration of sensors</li><li>Day/night control</li><li>Alarm thermostat with delays</li></ul> <p><b>Defrost</b></p> <ul style="list-style-type: none"><li>Electrical or natural defrost</li><li>Start via DI input, time interval or display</li><li>Defrost on demand</li><li>Stop on time or temperature</li></ul> <p><b>Compressor</b></p> <ul style="list-style-type: none"><li>Anti cycle timers for optimum compressor protection</li><li>High-effect 16A relays for connection of compressors without use of intermediate relay</li><li>Control of 2 compressors (version 102B)</li></ul> <p><b>Multipurpose DI input</b></p> <ul style="list-style-type: none"><li>Multipurpose DI input for defrost start, day/night control, dooralarm or main switch</li></ul> <p><b>Other functions</b></p> <ul style="list-style-type: none"><li>The S5 sensor can be used for monitoring of condenser temperature or as product sensor (version 102B+102D)</li><li>Door function with alarm monitoring</li><li>Manual control of outputs</li><li>Delay of outputs at power up</li></ul> <p><b>Display &amp; Programming</b></p> <ul style="list-style-type: none"><li>High-efficient LED display with icons for indication of operational status. Parameter settings/readouts and alarm conditions can be read on the display.</li><li>"Copy key" programming key with room for 25 different controller setups</li></ul> <p><b>Fan (102D only)</b></p> <ul style="list-style-type: none"><li>Fan delay during defrost</li><li>Fan stop when compressor cuts out</li><li>Fan stop at high S5 temperature</li></ul>	<ul style="list-style-type: none"><li>Integrated refrigeration-technical functions</li><li>Defrost on demand in 1:1 systems</li><li>Buttons and seal imbedded in the front</li><li>IP65 density from the front panel</li><li>Can control two compressors</li><li>Digital input for either:<ul style="list-style-type: none"><li>- Door alarm</li><li>- Defrost start</li><li>- Start/stop of regulation</li><li>- Night operation</li><li>- Change-over between two temperature reference</li><li>- Case cleaning function</li></ul></li><li>Instant programming via programming key</li><li>HACCP</li></ul> <p>Factory calibration that will guarantee a better measuring accuracy than stated in the standard EN 441-13 without subsequent calibration (Pt 1000 ohm sensor)</p>

# Technical data and ordering

## Technical data

<b>Supply voltage</b>	230 V a.c.(115 V) +10/-15 %. 1.5 VA		
<b>Sensors</b>	Pt 1000 or PTC (1000 ohm/25 °C) or NTC-M2020 (5000 ohm/25 °C)		
<b>Accuracy</b>	Measuring range	-60 to +99 °C	
	Controller	±1 K below -35 °C ±0.5 K between -35 to +25 °C ±1 K above +25 °C	
	Pt 1000 sensor	±0.3 K at 0 °C ±0.005 K per grad	
<b>Display</b>	LED, 3 digits		
<b>Digital inputs</b>	Signal from contact functions Requirements to contacts: Gold plating Cable length must be max. 15 m Use auxiliary relays when the cable is longer		
<b>Electrical connection cable</b>	Max.1.5 mm <sup>2</sup> multi-core cable on supply and relays. Max. 1 mm <sup>2</sup> on sensors - and DI inputs. Terminals are mounted on the circuit board		
<b>Relays*</b>	CE (250 V a.c.)		UL ** (240 V a.c.)
	DO1. Refrigeration	10 (6) A	10 A Resistive 5FLA, 30LRA
	DO2. Alarm/ Defrost/ Refrigeration	10 (6) A	10 A Resistive 5FLA, 30LRA
	DO3. Fan	6 (3) A	6 A Resistive 3FLA, 18LRA 131 VA Pilot duty
<b>Environments</b>	0 to +55 °C, During operations -40 to +70 °C, During transport 20 - 80% Rh, not condensed No shock influence/vibrations		
<b>Enclosure</b>	IP65 from front. Buttons and packing are imbedded in the front.		
<b>Approvals</b>	EU Low Voltage Directive and EMC demands re CE-marking complied with LVD tested acc. EN 60730-1 og EN 60730-2-9, A1, A2 EMC tested acc. EN50082-1 og EN 60730-2-9, A2		

\* DO1 and DO2 are 16 A relays. DO3 is a 8 A relay. Max. load must be kept.

\*\* UL-approval based on 30000 couplings

## Ordering

Type	Description	Supply	Code no.
<b>EKC 102A</b>	Temperature controller	230 V a.c.	084B8500
		115 V a.c.	084B8503
<b>EKC 102B</b>	Temperature controller with alarm function	230 V a.c.	084B8501
		230 V a.c.	084B8502
<b>EKC 102D</b>	Temperature controller for electric defrost	230 V a.c.	084B8505
<b>EKC 102D</b>	Controller for refrigeration with fan function	230 V a.c.	084B8506
<b>Accessories</b>			
<b>EKA 182A</b>	Copy key EKC - EKC		084B8567
<b>AKS 12</b>	Pt 1000 Sensor	1.5 m	084N0036
<b>EKS 111</b>	PTC 1000 Sensor	1.5 m	084N1178
<b>EKS 211</b>	NTC 5000 Sensor	1.5 m	084N1220



## EKC 202 – Refrigeration controller

The series of EKC 202 controllers can be used for a wide range of different refrigeration applications – from control of air temperatures and defrost to more advanced applications, including control of light and fans.



Functions	Advantages
<p><b>Thermostat</b></p> <ul style="list-style-type: none"><li>ON/OFF heating or cooling thermostat</li><li>Sensors: Danfoss Pt1000, PTC1000 or NTC</li><li>Day/night control</li><li>Thermostat band</li><li>Alarm thermostat with delay</li></ul> <p><b>Defrost</b></p> <ul style="list-style-type: none"><li>Electrical, natural or hot gas defrost</li><li>Start via DI input, time interval or schedule (RTC)</li><li>Defrost on demand</li><li>Stop on time or temperature</li><li>Coordinated defrost</li></ul> <p><b>Compressor</b></p> <ul style="list-style-type: none"><li>Anti cycle timers for optimum protection</li><li>High-effect 16A relays for connection of compressors without use of intermediate relays</li></ul> <p><b>DI input</b></p> <ul style="list-style-type: none"><li>Multi purpose DI input for defrost start, door function, night setback, main switch, appliance cleaning, general alarm, defrost coordination and thermostat band.</li></ul> <p><b>Fan</b></p> <ul style="list-style-type: none"><li>Fan delay during defrost</li><li>Fan stop when compressor cuts out</li><li>Fan stop at high S5 temperature</li></ul> <p><b>Light control</b></p> <ul style="list-style-type: none"><li>Light control of day/night, door, or via network</li></ul>	<ul style="list-style-type: none"><li>Integrated refrigeration-technical functions</li><li>Defrost on demand in 1:1 systems</li><li>Buttons and seal imbedded in the front</li><li>IP65 density from the front panel</li><li>Digital input for either:<ul style="list-style-type: none"><li>- Door contact function with alarm</li><li>- Defrost start</li><li>- Start/stop of regulation</li><li>- Night operation</li><li>- Change-over between two temperature reference</li><li>- Case cleaning function</li></ul></li><li>Instant programming via programming key</li><li>HACCP</li></ul> <p>Factory calibration that will guarantee a better measuring accuracy than stated in the standard EN 441-13 without subsequent calibration (Pt 1000 ohm sensor)</p>

# Technical data and ordering

## Technical data

<b>Supply voltage</b>	230 V a.c. +10/-15 %. 1.5 VA		
<b>Sensors for EKC 202A, 202B, 202C</b>	Pt 1000 ohm (0 °C) PTC 1000 ohm (25 °C) or NTC 5000 ohm (25 °C) M 2020		
<b>Sensors for EKC 202C-MS</b>	NTC 2000 ohm (25 °C) NTC 2500 ohm (0 °C) NTC 3000 ohm (25 °C) NTC 5000 ohm (25 °C) M 2020 NTC 10000 ohm (25 °C) NTC 10000 ohm (25 °C) Beta 3435		
<b>Accuracy</b>	Measuring range -60 to +99 °C Controller ±1 K below -35 °C ±0,5 K between -35 to +25 °C ±1 K above +25 °C		
	Pt 1000 sensor ±0,3 K at 0 °C ±0,005 K per grad		
<b>Display</b>	LED, 3 digits		
<b>Digital inputs</b>	Signal from contact functions Requirements to contacts: Gold plating Cable length must be max. 15 m Use auxiliary relays when the cable is longer		
<b>Electrical connection cable</b>	Max. 1,5 mm <sup>2</sup> multi-core cable on supply and relays. Power current terminals are mounted on the circuit board. Max. 1 mm <sup>2</sup> on sensors - and DI inputs.		
		CE (250 V a.c.)	UL *** (240 V a.c.)
<b>Relays*</b>	DO1. Refrigeration	10 (6) A	10 A Resistive 5FLA, 30LRA
	DO2. Defrost	10 (6) A	10 A Resistive 5FLA, 30LRA
	DO3. Fan	6 (3) A	6 A Resistive 3FLA, 18LRA 131 VA Pilot duty
	DO4. Alarm or light	4 (1) A Min. 100 mA**	4 A Resistive 131 VA Pilot duty
<b>Environments</b>	0 to +55 °C, During operations -40 to +70 °C, During transport 20 - 80% Rh, not condensed No shock influence/vibrations		
<b>Enclosure</b>	IP65 front from front. Buttons and packing are imbedded in the front.		
<b>Escapement reserve for the clock</b>	4 hours		
<b>Approvals</b>	EU Low Voltage Directive and EMC demands re CE-marking complied with LVD tested acc. EN 60730-1 og EN 60730-2-9, A1, A2 EMC tested acc. EN50082-1 og EN 60730-2-9, A2		

\* DO1 and DO2 are 16 A relays. DO3 and DO4 are 8 A relays. Max. load must be kept.

\*\* Gold plating ensures make function with small contact loads

\*\*\* UL-approval based on 30000 couplings

## Ordering

Type	Description	Code no.
EKC 202A	Refrigeration controller	084B8521
EKC 202B	Refrigeration controller with fan function	084B8522
EKC 202C	Refrigeration controller for electric defrost	084B8523
EKC 202C-MS	Refrigeration controller multi sensor (only NTC)	084B8543
<b>Accessories</b>		
EKA 178A	Data communication module MODBUS	084B8564
EKA 179A	RS485 LON	084B8565
EKA 181A	Battery & Buzzer	084B8566
EKA 181C	Battery module that will protect the clock in case of lengthy power failure	084B8577
EKA 182A	Copy key EKC - EKC	084B8567
EKA 183A	Programming key EKC	084B8582
AKS 12	Pt 1000 Sensor 1.5 m	084N0036
EKS 111	PTC 1000 Sensor 1.5 m	084N1178
EKS 211	NTC 5000 Sensor 1.5 m	084N1220
EKS 221	NTC 10000 Beta 3435 Sensor 3.5 m	084N3206