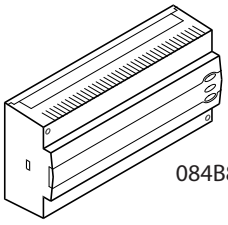
REFRIGERATION AND
AIR CONDITIONING

Instructions
AK-CC 550B

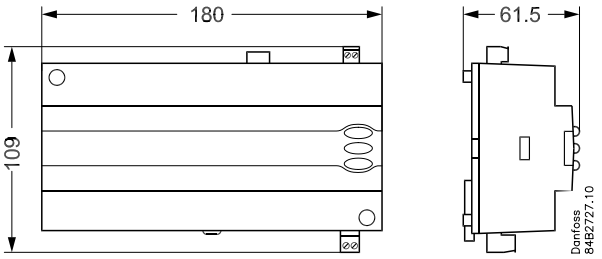
084R8041

RI8PT202

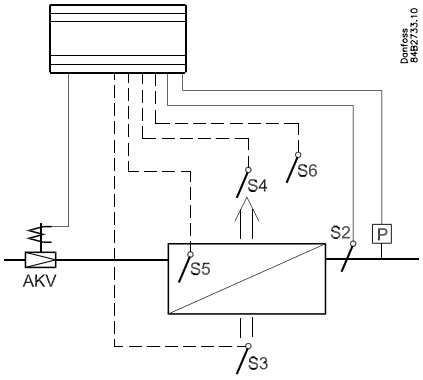
Identification



Dimensions

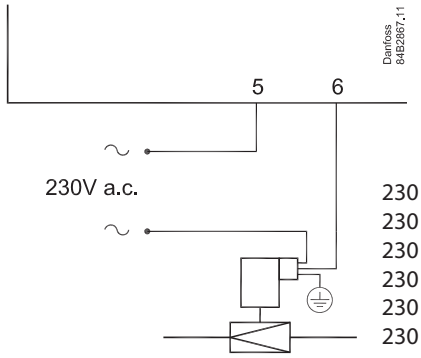


Principle



S2:
Insulate sensor
Fühler isolieren
Capteur isolés
Isolér føleren
Sensores aislados

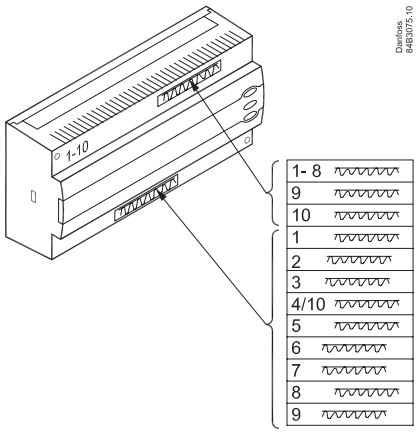
AKV info !!



230 V a.c. spole
230 V a.c. coil
230 V a.c. Spule
230 V c.a. Bobine
230 V c.a. Bobina
230 V c.a. Bobine

AK-CC 550B

Additional information:	English Manual	RS8GL...	www.danfoss.com
Weitere Information:	Deutsches Manual		
Renseignements supplémentarires:	Manuel en français		
Yderligere information:	Dansk Manual		
Información adicional:	Manual español		
Informazioni aggiuntive!	Manuale in italiano		
Ytterligare information:	Svenska Handbok		
Aanvullende informatie:	Dutch Handleiding		

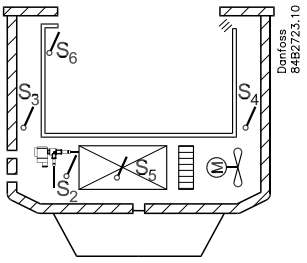


The controller is provided with signs from the factory indicating application 1.
If you employ another use, signs are provided so that you can mount the relevant one.

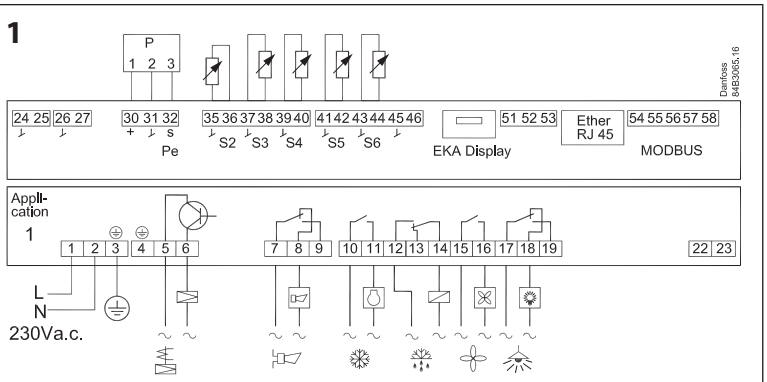
Werkseitig wird der Regler mit Schildern geliefert, die Anwendung 1 angeben.
Wenn Sie eine andere Anwendung verwenden, so montieren Sie bitte das entsprechende der mitgelieferten Schilder.

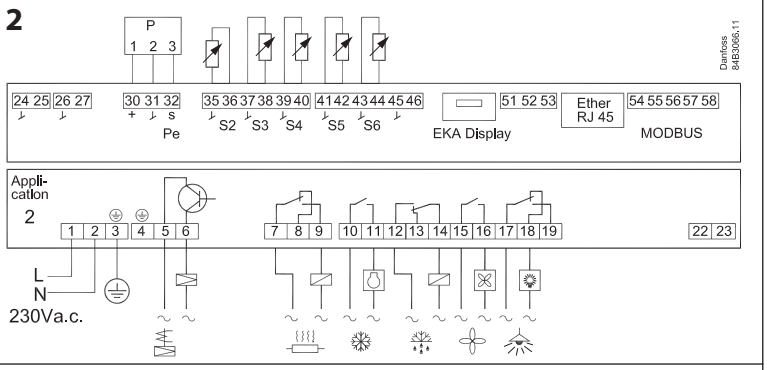
Les régulateurs sortis d'usine sont livrés avec une étiquette indiquant l'utilisation 1.
Si vous optez pour une autre utilisation, des plaques sont jointes pour vous permettre de monter la plaque adéquate.

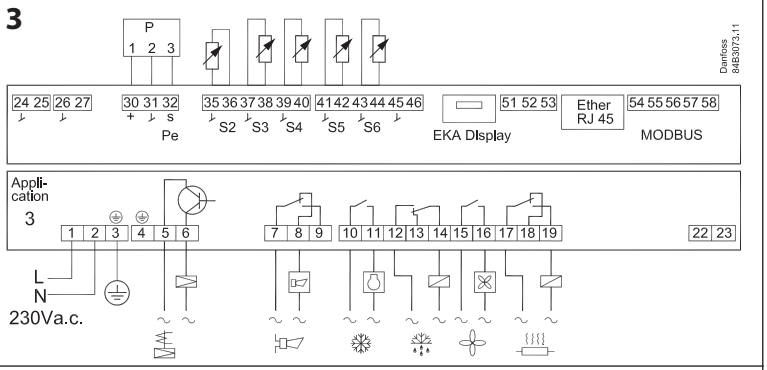
Fra fabrikken er regulatoren leveret med skilte, der angiver anvendelse 1.
Hvis du benytter en anden anvendelse, er der medleveret skilte, så du kan montere det aktuelle.

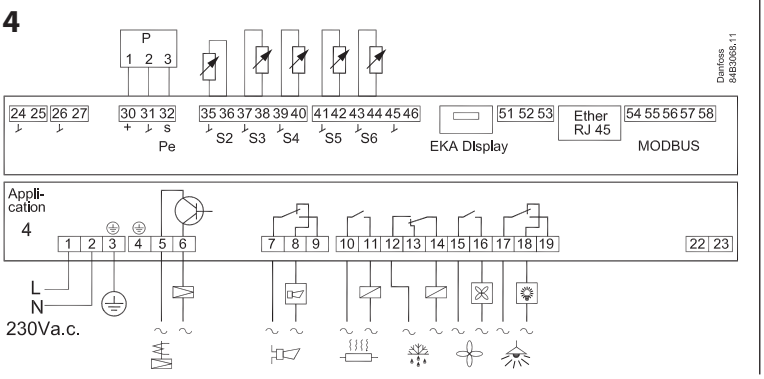


1 - 8









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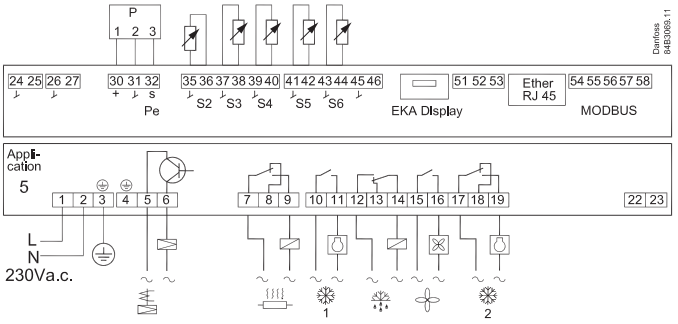
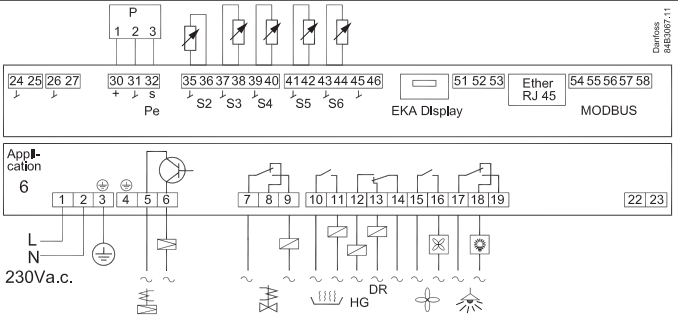
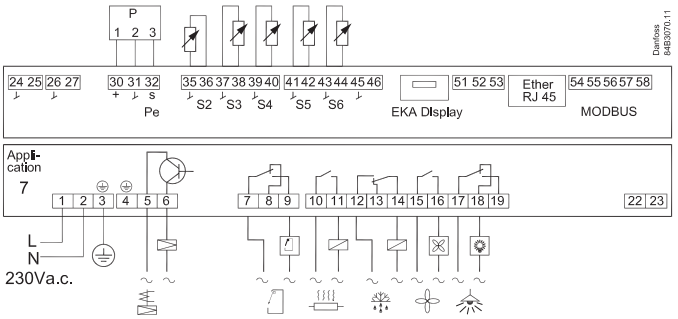

P
1 2 3
24 25 26 27
30 31 32
+ s
Pe
35 36 37 38 39 40 41 42 43 44 45 46
S2 S3 S4 S5 S6
51 52 53
EKA Display
Ether RJ 45
54 55 56 57 58
MODBUS
Appli-cation 5
1 2 3 4 5 6
7 8 9
10 11 12 13 14 15 16 17 18 19
22 23
L
N
230Va.c.
1
2
Danfoss 84B3093.11

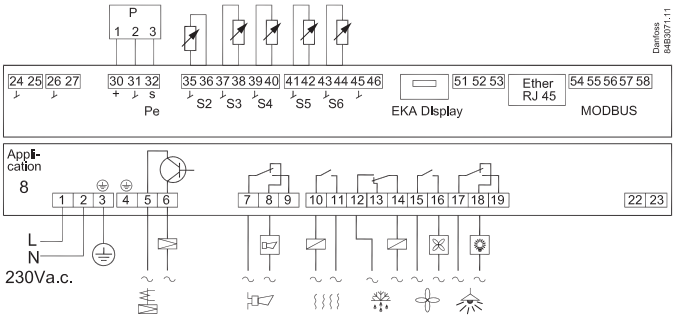
6


P
1 2 3
24 25 26 27
30 31 32
+ s
Pe
35 36 37 38 39 40 41 42 43 44 45 46
S2 S3 S4 S5 S6
51 52 53
EKA Display
Ether RJ 45
54 55 56 57 58
MODBUS
Appli-cation 6
1 2 3 4 5 6
7 8 9
10 11 12 13 14 15 16 17 18 19
22 23
L
N
230Va.c.
DR
HG
Danfoss 84B3067.11

7


P
1 2 3
24 25 26 27
30 31 32
+ s
Pe
35 36 37 38 39 40 41 42 43 44 45 46
S2 S3 S4 S5 S6
51 52 53
EKA Display
Ether RJ 45
54 55 56 57 58
MODBUS
Appli-cation 7
1 2 3 4 5 6
7 8 9
10 11 12 13 14 15 16 17 18 19
22 23
L
N
230Va.c.
Danfoss 84B3070.11

8


P
1 2 3
24 25 26 27
30 31 32
+ s
Pe
35 36 37 38 39 40 41 42 43 44 45 46
S2 S3 S4 S5 S6
51 52 53
EKA Display
Ether RJ 45
54 55 56 57 58
MODBUS
Appli-cation 8
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7 8 9
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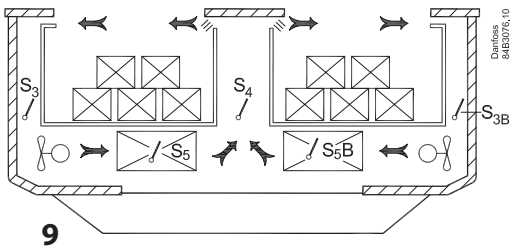
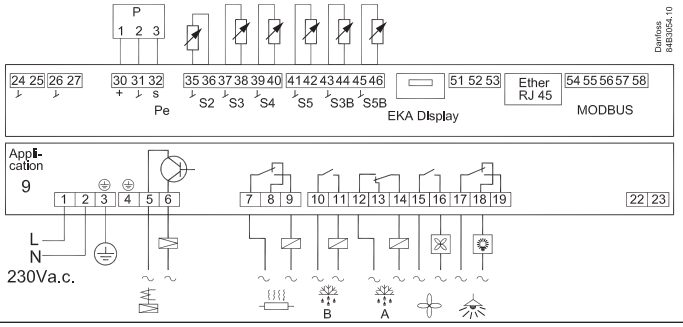
22 23
L
N
230Va.c.
Danfoss 84B3071.11


S3
S4
S3B
S5
S5B
Danfoss 84B3076.10

9


P
1 2 3
24 25 26 27
30 31 32
+ s
Pe
35 36 37 38 39 40 41 42 43 44 45 46
S2 S3 S4 S5 S3B S5B
51 52 53
EKA Display
Ether RJ 45
54 55 56 57 58
MODBUS
Appli-cation 9
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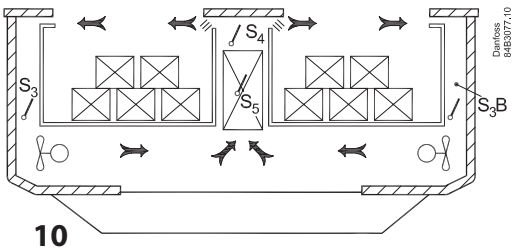
7 8 9
10 11 12 13 14 15 16 17 18 19
22 23
L
N
230Va.c.
B
A
Danfoss 84B3054.10


S4
S3
S5
S3B
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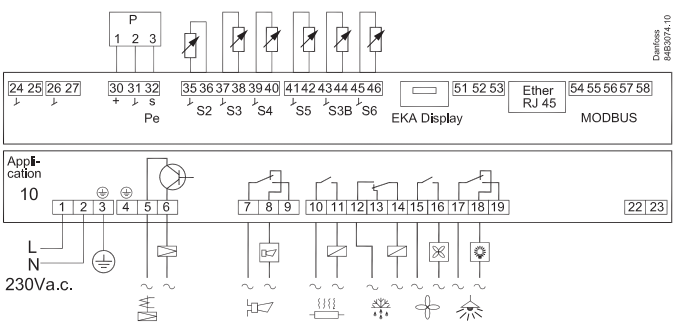
10


P
1 2 3
24 25 26 27
30 31 32
+ s
Pe
35 36 37 38 39 40 41 42 43 44 45 46
S2 S3 S4 S5 S3B S6
51 52 53
EKA Display
Ether RJ 45
54 55 56 57 58
MODBUS
Appli-cation 10
1 2 3 4 5 6
7 8 9
10 11 12 13 14 15 16 17 18 19
22 23
L
N
230Va.c.
Danfoss 84B3074.10

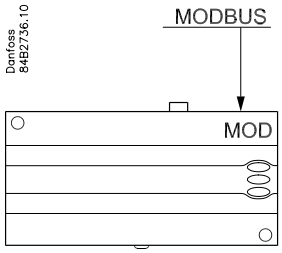
Data communication
Datenkommunikation
Transmission de données
Datakommunikation

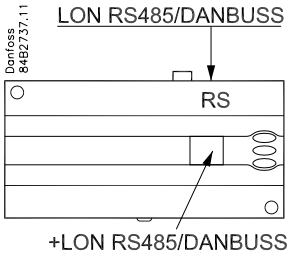
Important All connections to the data communication MODBUS, DANBUSS and RS 485 must comply with the requirements for data communication cables. See literature: RC8AC.

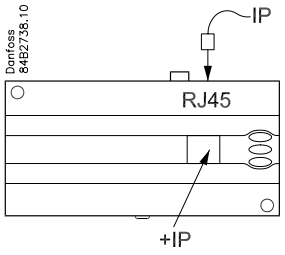
Wichtig Alle Anschlüsse an die Datenkommunikation MODBUS, DANBUSS und RS 485 müssen die Anforderungen erfüllen, die an Datenkommunikationskabel gestellt werden. Siehe Literatur: RC8AC

Important Tout raccordement au système de données MODBUS, DANBUSS et à RS 485 doit satisfaire à la norme applicable pour les câbles de transmission de données. Voir documentation : RC8AC

Vigtigt Alle tilslutninger til datakommunikationen MODBUS, DANBUSS og RS 485, skal overholde de krav, der stilles til datakommunikationskabler. Se litteratur: RC8AC



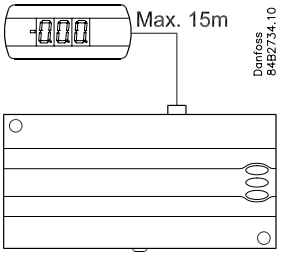




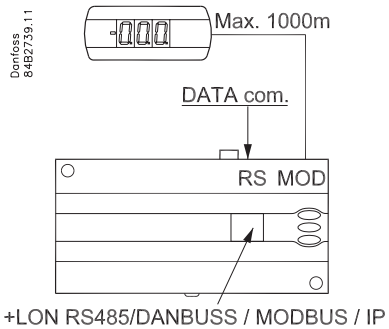
System manager / Gateway	AK-SM....	AKA 245 version 6.20^{+} / AK-SM...	OEM

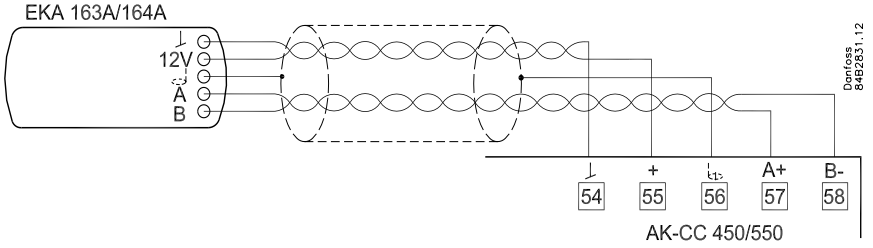
Display EKA 163 / 164

L < 15 m

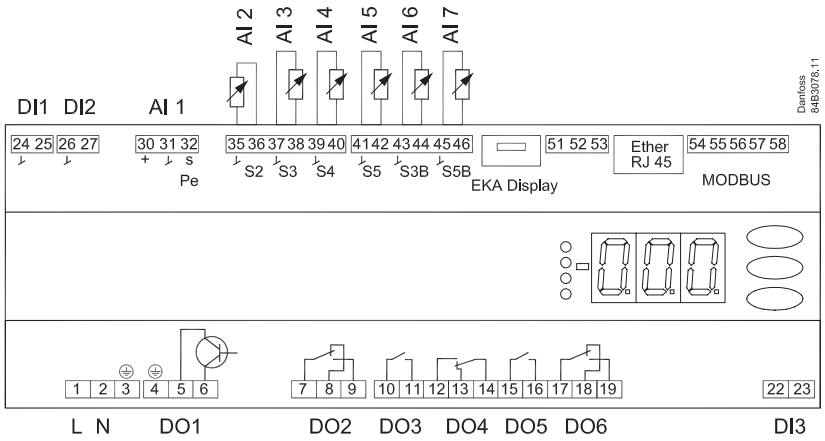


L > 15 m





Connections



Overview of outputs and applications.

See also electrical diagrams earlier in the instruction

Application	DO1	DO2	DO3	DO4	DO5	DO6	DI1	DI2	DI3	AI1	AI2	AI3	AI4	AI5	AI6	AI7
1							●	●	●	P0	S2	S3	S4	S5	S6	
2							●	●	●	P0	S2	S3	S4	S5	S6	
3							●	●	●	P0	S2	S3	S4	S5	S6	
4							●	●	●	P0	S2	S3	S4	S5	S6	
5							●	●	●	P0	S2	S3	S4	S5	S6	
6		suction		hotgas			●	●	●	P0	S2	S3	S4	S5	S6	
7		Blinds					●	●	●	P0	S2	S3	S4	S5	S6	
8			heat				●	●	●	P0	S2	S3	S4	S5	S6	
9			2	1			●	●	●	P0	S2	S3	S4	S5	S3B	S5B
10							●	●	●	P0	S2	S3	S4	S5	S3B	S6

DI1
Digital input signal.
The defined function is active when the input is short-circuited/ opened. The function is defined in o02.

DI2
Digital input signal.
The defined function is active when the input is short-circuited/ opened. The function is defined in o37.

Pressure transmitter
AKS 32R
Connect to terminal 30, 31 and 32.
(Used cable 060G1034: Black=30, Blue=31, Brown=32)
The signal from one pressure transmitter can be received by up to 10 controllers. But only if there are no significant pressure decreases between the evaporators to be controlled. See drawing page 36.

S2, S6
Pt 1000 ohm sensor
S6, product sensor

S3, S4, S5
Pt 1000 ohm sensor or PTC 1000 ohm sensor. All have to be of the same type.
S3, air sensor, placed in the warm air before the evaporator
S4, air sensor, placed in the cold air after the evaporator
(the need for either S3 or S4 can be deselected in the configuration)
S5, defrost sensor, placed on the evaporator

EKA Display
If there is be external reading/operation of the controller, display type EKA 163B or EKA 164B can be connected.

RS485 (terminal 51, 52, 53)
For data communication, but only if a data communication module is inserted in the controller. The module can be a LON RS485, DANBUSS or a MODBUS.
Terminal 51 = screen
Terminal 52 = A (A+)
Terminal 53 = B (B-)
(For LON RS485 and gateway type AKA 245 the gateway must be version 6.20 or higher.)

RJ45
For data communication, but only if a TCP/IP module is inserted in the controller. (OEM)

MODBUS
For data communication.
Terminal 56 = screen
Terminal 57 = A+
Terminal 58 = B-
(Alternatively the terminals can be connected to an external display type EKA 163A or 164A, but then they cannot be used for data communication. Any data communication must then be carried out by one of the other methods.)

Supply voltage
230 V a.c., 50/60 Hz

DO1
Connection of expansion valve type AKV or AKVA. The coil must be a 230 V a.c. coil.

DO2

Alarm

There is a connection between terminal 7 and 8 in alarm situations and when the controller is without power.

Rail heat and heating element in drip tray

There is connection between terminal 7 and 9 when heating takes place.

Night blind

There is connection between terminal 7 and 9 when the night blind is up.

Suction line valve

There is connection between terminal 7 and 9 when the suction line must be open.

DO3

Refrigeration, Rail heat, Heat function, Defrost 2

There is connection between terminal 10 and 11 when the function must be active.

Heating element in drip tray

There is connection between terminal 10 and 11 when heating takes place.

DO4

Defrost

There is connection between terminal 12 and 14 when defrosting takes place.

Hot gas / drain valve

There is connection between terminal 13 and 14 during normal operation.

There is connection between terminal 12 and 14 when the hot gas valves must open.

DO5

Fan

There is connection between terminal 15 and 16 when the fan is on.

DO6

Light relay

There is connection between terminal 17 and 18 when the light must be on.

Rail heat, Compressor 2

There is connection between terminal 17 and 19 when the function must be active.

DI3

Digital input signal.
The signal must have a voltage of 0 / 230 V AC.
The function is defined in o84.

Data communication

If data communication is used, it is important that the installation of the data communication cable is performed correctly.
See separate literature No. RC8AC…

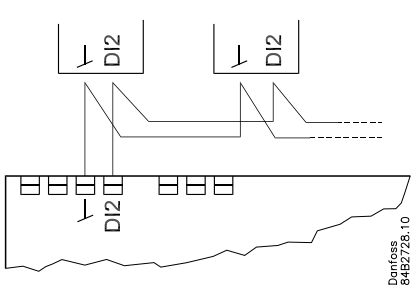
Electric noise

Cables for sensors, DI inputs and data communication **must** be kept separate from other electric cables:
- Use separate cable trays
- Keep a distance between cables of at least 10 cm
- Long cables at the DI input should be avoided

Installation considerations

Accidental damage, poor installation, or site conditions, can give rise to malfunctions of the control system, and ultimately lead to a plant breakdown.
Every possible safeguard is incorporated into our products to prevent this. However, a wrong installation, for example, could still present problems. Electronic controls are no substitute for normal, good engineering practice.
Danfoss will not be responsible for any goods, or plant components, damaged as a result of the above defects. It is the installer's responsibility to check the installation thoroughly, and to fit the necessary safety devices.
Special reference is made to the necessity of signals to the controller when the compressor is stopped and to the need of liquid receivers before the compressors.
Your local Danfoss agent will be pleased to assist with further advice, etc.

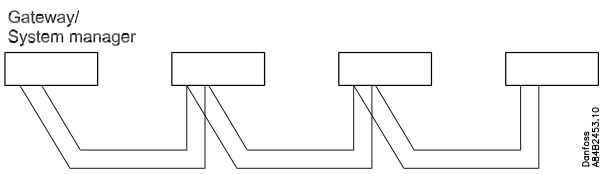
Coordinated defrost via cable connections



The following controllers can be connected up in this way:
EKC 204A, AK-CC 210, AK-CC 250, AK-CC 450, AK-CC 550A,

Refrigeration is resumed when all controllers have "released" the signal for defrost.

Coordinated defrost via data communication

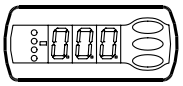


The setting of controllers to coordinate their defrosting takes place in the gateway/system manager.

Refrigeration is resumed when all controllers have "released" the signal for defrost.

Operation

Display
The values will be shown with three digits, and with a setting you can determine whether the temperature is to be shown in °C or in °F.



Light-emitting diodes (LED) on front panel
The LED's on the front panel will light up when the relevant relay is activated.
= Refrigeration
= Defrost
= Fan running

The light-emitting diodes will flash when there is an alarm.
In this situation you can download the error code to the display and cancel/sign for the alarm by giving the top button a brief push.

The buttons
When you want to change a setting, the upper and the lower buttons will give you a higher or lower value depending on the button you are pushing. But before you change the value, you must have access to the menu. You obtain this by pushing the upper button for a couple of seconds - you will then enter the column with parameter codes. Find the parameter code you want to change and push the middle buttons until value for the parameter is shown. When you have changed the value, save the new value by once more pushing the middle button.

Examples

Set menu
1. Push the upper button until a parameter r01 is shown
2. Push the upper or the lower button and find that parameter you want to change
3. Push the middle button until the parameter value is shown
4. Push the upper or the lower button and select the new value
5. Push the middle button againt to freeze the value.

Cutout alarm relay / receipt alarm/see alarm code
• A short press of the upper button
If there are several alarm codes they are found in a rolling stack. Push the uppermost or lowermost button to scan the rolling stack.

Set temperature
1. Push the middle button until the temperature value is shown
2. Push the upper or the lower button and select the new value
3. Push the middle button again to conclude the setting.

Reading the temperature at defrost sensor (Or product sensor, if selected in o92.)
• A short press of the lower button

Manuel start or stop of a defrost
• Push the lower button for four seconds.

Get a good start

With the following procedure you can start regulation very quickly:

1 Open parameter r12 and stop the regulation (in a new and not previously set unit, r12 will already be set to 0 which means stopped regulation.)

2 Select electrical connection based on the drawings on page 2 and 3

3 Open parameter o61 and set the electric connection number in it

4 Now select one of the preset settings from the table

Auxiliary schedule for settings (quick-setup)	**Case**			**Room**		
	Defrost stop on			Defrost stop on		
	time	S5		time	S5	
Preset settings (o62)	1	2	3	4	5	6
Temperature (SP)	2°C	-2°C	-28°C	4°C	0°C	-22°C
Max. temp. setting (r02)	6°C	4°C	-22°C	8°C	5°C	-20°C
Min. temp. setting (r03)	0°C	-4°C	-30°C	0°C	-2°C	-24°C
Sensor signal for thermo-stat. S4% (r15)	100%			0%		
Alarm limit high (A13)	8°C	6°C	-15°C	10°C	8°C	-15°C
Alarm limit low (A14)	-5°C	-5°C	-30°C	0°C	0°C	-30°C
Sensor signal for alarm funct.S4% (A36)	0%		100%	0%		
Interval between defrost (d03)	6 h	6h	12h	8h	8h	6h
Defrost sensor: 0=time, 1=S5, 2=S4 (d10)	0	1	1	0	1	1
DI1 config. (o02)	Case cleaning (=10)			Door function (=2)		
Sensor signal for display view S4% (017)	0%					

5 Open parameter o62 and set the number for the array of presettings. The few selected settings will now be transferred to the menu.

6 Select refrigerant via parameter o30

7 Open parameter r12 and start the regulation

8 Go through the survey of factory settings. The values in the grey cells are changed according to your choice of settings. Make any necessary changes in the respective parameters.

9 For network. Set the address in o03

10 Send address to system unit:
• MODBUS: Activate scan function in system unit
• If another data communication card is used in the controller:
- LON RS485: Activate the function o04
- DANBUSS: Activate scan function in system unit
- Ethernet: Use the MAC Address

Menu survey

SW = 2.0x

Parameter			EL-diagram page 2 and 3										Min.-value	Max.-value	Factory setting	Actual setting
Function		Code	1	2	3	4	5	6	7	8	9	10				
Normal operation																
Temperature (setpoint)		- - -	1	1	1	1	1	1	1	1	1	1	-50°C	50°C	2	
Thermostat																
Differential		r01	1	1	1	1	1	1	1	1	1	1	0.1 K	20 K	2	
Max. limitation of setpoint setting		r02	1	1	1	1	1	1	1	1	1	1	-49°C	50°C	50	
Min. limitation of setpoint setting		r03	1	1	1	1	1	1	1	1	1	1	-50°C	49°C	-50	
Adjustment of temperature indication		r04	1	1	1	1	1	1	1	1	1	1	-10	10	0	
Temperature unit (°C/°F)		r05	1	1	1	1	1	1	1	1	1	1	0/°C	1/F	0/°C	
Correction of the signal from S4		r09	1	1	1	1	1	1	1	1	1	1	-10 K	10 K	0	
Correction of the signal from S3 and S3B		r10	1	1	1	1	1	1	1	1	1	1	-10 K	10 K	0	
Manual service, stop regulation, start regulation (-1, 0, 1)		r12	1	1	1	1	1	1	1	1	1	1	-1	1	0	
Displacement of reference during night operation		r13	1	1	1	1	1	1	1	1	1	1	-50 K	50 K	0	
Define thermostat function 1=ON/OFF, 2=Modulating		r14	1	1	1	1	1	1	1	1	1	1	1	2	1	
Definition and weighting, if applicable, of thermostat sensors - S4% (100%=S4, 0%=S3)		r15	1	1	1	1	1	1	1	1	1	1	0 %	100 %	100	
Time between melt periods		r16	1	1	1	1	1	1	1	1	1	1	0 hrs	10 hrs	1	
Duration of melt periods		r17	1	1	1	1	1	1	1	1	1	1	0 min.	30 min.	5	
Temperature setting for thermostat band 2 . As differential use r01		r21	1	1	1	1	1	1	1	1	1	1	-50°C	50°C	2	
Correction of the signal from S6		r59	1	1	1	1	1	1	1	1		1	-10 K	10 K	0	
Definition and weighting, if applicable, of thermostat sensors when night cover is on. (100%=S4, 0%=S3)		r61	1	1	1	1	1	1	1	1	1	1	0 %	100 %	100	
Heat function Neutral zone between refrigeration and heat function		r62								1			0 K	50 K	2	
Time delay at switch between refrigeration and heat function		r63								1			0 min.	240 min.	0	
Alarms																
Delay for temperature alarm		A03	1	1	1	1	1	1	1	1	1	1	0 min.	240 min.	30	
Delay for door alarm		A04	1	1	1	1	1	1	1	1	1	1	0 min.	240 min.	60	
Delay for temperature alarm after defrost		A12	1	1	1	1	1	1	1	1	1	1	0 min.	240 min.	90	
High alarm limit for thermostat 1		A13	1	1	1	1	1	1	1	1	1	1	-50°C	50°C	8	
Low alarm limit for thermostat 1		A14	1	1	1	1	1	1	1	1	1	1	-50°C	50°C	-30	
High alarm limit for thermostat 2		A20	1	1	1	1	1	1	1	1	1	1	-50°C	50°C	8	
Low alarm limit for thermostat 2		A21	1	1	1	1	1	1	1	1	1	1	-50°C	50°C	-30	
High alarm limit for sensor S6 at thermostat 1		A22	1	1	1	1	1	1	1	1		1	-50°C	50°C	8	
Low alarm limit for sensor S6 at thermostat 1		A23	1	1	1	1	1	1	1	1		1	-50°C	50°C	-30	
High alarm limit for sensor S6 at thermostat 2		A24	1	1	1	1	1	1	1	1		1	-50°C	50°C	8	
Low alarm limit for sensor S6 at thermostat 2		A25	1	1	1	1	1	1	1	1		1	-50°C	50°C	-30	
S6 alarm time delay With setting = 240 the S6 alarm will be omitted		A26	1	1	1	1	1	1	1	1		1	0 min.	240 min.	240	
Alarm time delay or signal on the DI1 input		A27	1	1	1	1	1	1	1	1	1	1	0 min.	240 min.	30	
Alarm time delay or signal on the DI2 input		A28	1	1	1	1	1	1	1	1	1	1	0 min.	240 min.	30	
Signal for alarm thermostat. S4% (100%=S4, 0%=S3)		A36	1	1	1	1	1	1	1	1	1	1	0 %	100 %	100	
Delay for S6 (product sensor alarm) after defrost		A52	1	1	1	1	1	1	1	1		1	0 min.	240 min.	90	
Delay for temperature alarm S3B		A53									1	1	0 min.	240 min.	90	
Compressor																
Min. ON-time		c01	1	1	1		1						0 min.	30 min.	0	
Min. OFF-time		c02	1	1	1		1						0 min.	30 min.	0	
Time delay for cutin of comp.2		c05					1						0 sec	999 sec	5	
Defrost																
Defrost method: 0=Off, 1= EL, 2= Gas		d01	1	1	1	1	1	1	1	1	1	1	0/Off	2/gAs	1/EL	
Defrost stop temperature		d02	1	1	1	1	1	1	1	1	1	1	0°C	50°C	6	
Interval between defrost starts		d03	1	1	1	1	1	1	1	1	1	1	0 hrs/Off	240 hrs	8	
Max. defrost duration		d04	1	1	1	1	1	1	1	1	1	1	0 min.	360 min.	45	
Displacement of time on cutin of defrost at start-up		d05	1	1	1	1	1	1	1	1	1	1	0 min.	240 min.	0	
Drip off time		d06	1	1	1	1	1	1	1	1	1	1	0 min.	60 min.	0	
Delay for fan start after defrost		d07	1	1	1	1	1	1	1	1	1	1	0 min.	60 min.	0	
Fan start temperature		d08	1	1	1	1	1	1	1	1	1	1	-50 °C	0 °C	-5	
Fan cutin during defrost 0: Stopped 1: Running 2: Running during pump down and defrost 3: Running but stop at d41		d09	1	1	1	1	1	1	1	1	1	1	0	2	1	

Continued		Code	1	2	3	4	5	6	7	8	9	10	Min.	Max.	Fac.	Actual
Defrost sensor: 0 =Stop on time, 1=S5, 2=S4, 3=Sx (Application 1-8 and 10: both S5 and S6. Application 9: S5 and S5B)		d10	1	1	1	1	1	1	1	1	1	1	0	3	0	
Pump down delay		d16	1	1	1	1	1	1	1	1	1	1	0 min.	60 min.	0	
Drain delay (used at hot gas defrost only)		d17						1					0 min.	60 min.	0	
Max. aggregate refrigeration time between two defrosts		d18	1	1	1	1	1	1	1	1	1	1	0 hrs	48 hrs	0/OFF	
Heat in drip tray. Time from defrosting stops to heating in the drip tray is switched off		d20						1					0 min.	240 min.	30	
Adaptive defrost: 0=not active, 1=monitoring only, 2=skip allowed day, 3=skip allowed both day and night, 4=own assessment + all schedules		d21	1	1	1	1	1	1	1	1	1	1	0	4	0	
Time delay before opening of hot gas valve		d23						1					0 min	60 min	0	
Rail heat during defrost 0=off. 1=on. 2=Pulsating		d27		1	1	1	1		1		1	1	0	2	2	
Max. duration of -d- in display		d40	1	1	1	1	1	1	1	1	1	1	5 min.	240 min.	30 min.	
Temperature limit for Fan stop during defrost when d09 set to 3		d41	1	1	1	1	1	1	1	1	1	1	-20°C	20°C	0°C	
Injection control function																
Max. value of superheat reference (dry expansion)		n09	1	1	1	1	1	1	1	1	1	1	2°C	20°C	12	
Min. value of superheat reference (dry expansion)		n10	1	1	1	1	1	1	1	1	1	1	2°C	20°C	3	
MOP temperature. Off if MOP temp. = 15.0 °C		n11	1	1	1	1	1	1	1	1	1	1	-50°C	15°C	15	
Period time of AKV pulsation Only for trained personnel		n13	1	1	1	1	1	1	1	1	1	1	3 sec	6 sec	6	
Max limitation of superheat reference when Flooding activated		P86	1	1	1	1	1	1	1	1	1	1	1°C	20°C	3	
Min limitation of superheat reference when Flooding activated		P87	1	1	1	1	1	1	1	1	1	1	0°C	20°C	1	
Fan																
Fan stop temperature (S5)		F04	1	1	1	1	1	1	1	1	1	1	-50°C	50°C	50	
Pulse operation on fans: 0=No pulse operation, 1=At thermostat cuts out only, 2= Only at thermostat cut outs during night operation		F05	1	1	1	1	1	1	1	1	1	1	0	2	0	
Period time for fan pulsation (on-time + off-time)		F06	1	1	1	1	1	1	1	1	1	1	1 min.	30 min.	5	
On-time in % of period time		F07	1	1	1	1	1	1	1	1	1	1	0 %	100 %	100	
Real time clock																
Six start times for defrost. Setting of hours. 0=OFF		t01 - t06	1	1	1	1	1	1	1	1	1	1	0 hrs	23 hrs	0	
Six start times for defrost. Setting of minutes. 0=OFF		t11 - t16	1	1	1	1	1	1	1	1	1	1	0 min.	59 min.	0	
Clock - Setting of hours		t07	1	1	1	1	1	1	1	1	1	1	0 hrs	23 hrs	0	
Clock - Setting of minute		t08	1	1	1	1	1	1	1	1	1	1	0 min.	59 min.	0	
Clock - Setting of date		t45	1	1	1	1	1	1	1	1	1	1	1 day	31 day	1	
Clock - Setting of month		t46	1	1	1	1	1	1	1	1	1	1	1 mon.	12 mon.	1	
Clock - Setting of year		t47	1	1	1	1	1	1	1	1	1	1	0 year	99 year	0	
Miscellaneous																
Delay of output signals after power failure		o01	1	1	1	1	1	1	1	1	1	1	0 sec	600 sec	5	
Input signal on DI1. Function: 0=not used. 1=status on DI1. 2=door function with alarm when open. 3=door alarm when open. 4=defrost start (pulse-signal). 5=ext.main switch. 6=night operation 7=thermostat band changeover (activate r21). 8=alarm function when closed. 9=alarm function when open. 10=case cleaning (pulse signal). 11=forced cooling at hot gas defrost, 12=night cover. 15=appliance shutdown. 20=refrigerant leak alarm. 21=activate flooding.		o02	1	1	1	1	1	1	1	1	1	1	0	21	0	
Network address		o03	1	1	1	1	1	1	1	1	1	1	0	240	0	
On/Off switch (Service Pin message) IMPORTANT! o61 **must** be set prior to o04 (used at LON 485 only)		o04	1	1	1	1	1	1	1	1	1	1	0/Off	1/On	0/Off	
Access code 1 (all settings)		o05	1	1	1	1	1	1	1	1	1	1	0	100	0	
Used sensor type : 0=Pt1000, 1=Ptc1000,		o06	1	1	1	1	1	1	1	1	1	1	0/Pt	1/Ptc	0/Pt	
Max hold time after coordinated defrost		o16	1	1	1	1	1	1	1	1	1	1	0 min.	360 min.	20	
Select signal for display view. S4% (100%=S4, 0%=S3)		o17	1	1	1	1	1	1	1	1	1	1	0 %	100 %	100	
Pressure transmitter working range – min. value		o20	1	1	1	1	1	1	1	1	1	1	-1 bar	5 bar	-1	
Pressure transmitter working range – max. value		o21	1	1	1	1	1	1	1	1	1	1	6 bar	200 bar	12	

Continued		Code	1	2	3	4	5	6	7	8	9	10	Min.	Max.	Fac.	Actual
Refrigerant setting: 1=R12. 2=R22. 3=R134a. 4=R502. 5=R717. 6=R13. 7=R13b1. 8=R23. 9=R500. 10=R503. 11=R114. 12=R142b. 13=User defined. 14=R32. 15=R227. 16=R401A. 17=R507. 18=R402A. 19=R404A. 20=R407C. 21=R407A. 22=R407B. 23=R410A. 24=R170. 25=R290. 26=R600. 27=R600a. 28=R744. 29=R1270. 30=R417A. 31=R422A. 32=R413A. 33=R422D. 34=R427A. 35=R438A. 36=R513A. 37=R407F. 38=R1234ze. 39=R1234yf. 40=R448A. 41=R449A. 42=R452A		o30	1	1	1	1	1	1	1	1	1	1	0	42	0	
Input signal on DI2. Function: (0=not used. 1=status on DI2. 2=door function with alarm when open. 3=door alarm when open. 4=defrost start (pulse-signal). 5=ext. main switch 6=night operation 7=thermostat band changeover (activate r21). 8=alarm function when closed. 9=alarm function when open. 10=case cleaning (pulse signal). 11=forced cooling at hot gas defrost.). 12=night cover, 13=coordinated defrost). 15=appliance shutdown. 20=refrigerant leak alarm. 21=activate flooding.		o37	1	1	1	1	1	1	1	1	1	1	0	21	0	
Configuration of light function: 1=Light follows day /night operation, 2=Light control via data communication via 'o39', 3=Light control with a DI-input, 4=As "2", but light switch on and night cover will open if the network cut out for more than 15 minutes.		o38	1	1		1		1	1	1	1	1	1	4	1	
Activation of light relay (only if o38=2) On=light		o39	1	1		1		1	1	1	1	1	0/Off	1/On	0/Off	
Rail heat On time during day operations		o41		1	1	1	1		1		1	1	0 %	100 %	100	
Rail heat On time during night operations		o42		1	1	1	1		1		1	1	0 %	100 %	100	
Rail heat period time (On time + Off time)		o43		1	1	1	1		1		1	1	6 min.	60 min.	10	
Case cleaning. 0=no case cleaning. 1=Fans only. 2=All output Off.	***	o46	1	1	1	1	1	1	1	1	1	1	0	2	0	
Selection of EL diagram. See overview page 12 and 13	*	o61	1	1	1	1	1	1	1	1	1	1	1	10	1	
Download a set of predetermined settings. See overview page 27.	*	o62	1	1	1	1	1	1	1	1	1	1	0	6	0	
Access code 2 (partial access)	***	o64	1	1	1	1	1	1	1	1	1	1	0	100	0	
Replace the controllers factory settings with the present settings		o67	1	1	1	1	1	1	1	1	1	1	0/Off	1/On	0/Off	
Input signal on DI3. Function: (high voltage input) (0=not used. 1=status on DI2. 2=door function with alarm when open. 3=door alarm when open. 4=defrost start (pulse-signal). 5=ext. main switch 6=night operation, 7=thermostat band changeover (activate r21). 8=Not used. 9=Not used. 10=case cleaning (pulse signal). 11=forced cooling at hot gas defrost, 12=night cover. 13=Not used. 14=Refrigeration stopped (forced closing)). 15=appliance shutdown. 21=activate flooding.		o84	1	1	1	1	1	1	1	1	1	1	0	21	0	
Rail heat control 0=not used, 1=pulse control with timer function (o41 and o42), 2=pulse control with dew point function		o85		1	1	1	1		1		1	1	0	2	0	
Dew point value where the rail heat is minimum		o86		1	1	1	1		1		1	1	-10°C	50°C	8	
Dew point value where the rail heat is 100% on		o87		1	1	1	1		1		1	1	-9°C	50°C	17	
Lowest permitted rail heat effect in %		o88		1	1	1	1		1		1	1	0 %	100 %	30	
Time delay from "open door" refrigeration is started		o89	1	1	1	1	1	1	1	1	1	1	0 min.	240 min.	30	
Fan operation on stopped refrigeration (forced closing): 0 = Stopped (defrosting permitted) 1 = Running (defrosting permitted) 2 = Stopped (defrosting not permitted) 3 = Running (defrosting not permitted)		o90	1	1	1	1	1	1	1	1	1	1	0	3	1	
Definition of readings on lower button: 1=defrost stop temperature, 2=S6 temperature, 3=S3 temperature , 4=S4 temperature		o92	1	1	1	1	1	1	1	1	1	1	1	3	1	
Display of temperature 1= u56 Air temperature (set automtically to 1 at application 9) 2= u36 product temperature		o97	1	1	1	1	1	1	1	1	1	1	1	2	1	
Light and night blinds defined 0: Light is switch off and night blind is open when the main switch is off 1: Light and night blind is independent of main switch		o98	1	1	1	1	1	1	1	1	1	1	0	1	0	

Continued		Code	1	2	3	4	5	6	7	8	9	10	Min.	Max.	Fac.	Actual
Configuration of alarm relay The alarm relay will be activated upon an alarm signal from the following groups: 0 - Alarm relay not used 1 - High temperature alarms 2 - Low temperature alarms 4 - Sensor error 8 - Digital input enabled for alarm 16 - Defrosting alarms 32 - Miscellaneous 64 - Injection alarms The groups that are to activate the alarm relay must be set by using a numerical value which is the sum of the groups that must be activated. (E.g.: a value of 5 will activate all high temperature alarms and all sensor error.		P41	1		1	1				1		1	0	127	111	
Service																
Temperature measured with S5 sensor		u09	1	1	1	1	1	1	1	1	1	1				
Status on DI1 input. on/1=closed		u10	1	1	1	1	1	1	1	1	1	1				
Actual defrost time (minutes)		u11	1	1	1	1	1	1	1	1	1	1				
Temperature measured with S3 sensor		u12	1	1	1	1	1	1	1	1	1	1				
Status on night operation (on or off) 1=on		u13	1	1	1	1	1	1	1	1	1	1				
Temperature measured with S4 sensor		u16	1	1	1	1	1	1	1	1	1	1				
Thermostat temperature		u17	1	1	1	1	1	1	1	1						
Run time of thermostat (cooling time) in minutes		u18	1	1	1	1	1	1	1	1	1	1				
Temperature of evaporator outlet temp.		u20	1	1	1	1	1	1	1	1	1	1				
Superheat across evaporator		u21	1	1	1	1	1	1	1	1	1	1				
Reference of superheat control		u22	1	1	1	1	1	1	1	1	1	1				
Opening degree of AKV valve	**	u23	1	1	1	1	1	1	1	1	1	1				
Evaporating pressure Po (relative)		u25	1	1	1	1	1	1	1	1	1	1				
Evaporator temperature To (Calculated)		u26	1	1	1	1	1	1	1	1	1	1				
Temperature measured with S6 sensor (product temperature)		u36	1	1	1	1	1	1	1	1		1				
Status on DI2 output. on/1=closed		u37	1	1	1	1	1	1	1	1	1	1				
Air temperature . Weighted S3 and S4		u56	1	1	1	1	1	1	1	1	1	1				
Measured temperature for alarm thermostat		u57	1	1	1	1	1	1	1	1	1	1				
Status on relay for cooling	**	u58	1	1	1		1									
Status on relay for fan	**	u59	1	1	1	1	1	1	1	1	1	1				
Status on relay for defrost	**	u60	1	1	1	1	1		1	1	1	1				
Status on relay for railheat	**	u61		1	1	1	1		1		1	1				
Status on relay for alarm	**	u62	1		1	1				1		1				
Status on relay for light	**	u63	1	1		1		1	1	1	1	1				
Status on relay for valve in suction line	**	u64						1								
Status on relay for compressor 2	**	u67					1									
Temperature measured with S5B sensor		u75									1					
Temperature measured with S3B sensor		u76									1	1				
Status on relay for hot gas- / drain valve	**	u80						1								
Status on relay for heating element in drip tray	**	u81						1								
Status on relay for night blinds	**	u82							1							
Status on relay for defrost B	**	u83									1					
Status on relay for heat function	**	u84								1						
Readout of the actual rail heat effect		u85		1	1	1	1		1		1	1				
1: Thermostat 1 operating, 2: Thermostat 2 operating		u86	1	1	1	1	1	1	1	1	1	1				
Status on high voltage input DI3		u87	1	1	1	1	1	1	1	1	1	1				
Readout of thermostats actual cut in value		u90	1	1	1	1	1	1	1	1	1	1				
Readout of thermostats actual cut out value		u91	1	1	1	1	1	1	1	1	1	1				
Readout of status on the adaptive defrost 0: Off. Function is not activated and are zero set 1: Sensor error or S3/S4 are reversed. 2: Tuning is in progress 3: Normal 4: Light build-up of ice 5: Medium build-up of ice 6: Heavy build-up of ice		U01	1	1	1	1	1	1	1	1	1	1				
Number of defrosts carried out since the initial power up or since the resetting of the function		U10	1	1	1	1	1	1	1	1	1	1				
Number of defrosts skipped since the initial power up or since the resetting of the function		U11	1	1	1	1	1	1	1	1	1	1				
Measured temperature for alarm thermostat in section B		U34									1	1				
Air temperature in section B		U35									1	1				

*) Can only be set when regulation is stopped (r12=0)
**) Can be controlled manually, but only when r12=-1
***) With access code 2 the access to these menus will be limited

Factory settings are indicated for standard units. Other code numbers have customized settings.

Fault message		
In an error situation the LED's on the front will flash and the alarm relay will be activated. If you push the top button in this situation you can see the alarm report in the display. There are two kinds of error reports - it can either be an alarm occurring during the daily operation, or there may be a defect in the installation. A-alarms will not become visible until the set time delay has expired. E-alarms, on the other hand, will become visible the moment the error occurs. (An A alarm will not be visible as long as there is an active E alarm). Here are the messages that may appear:		
Code / Alarm text via data communication	**Description**	**Alarm relay groups (P41)**
A1/--- High t.alarm	High temperature alarm	1
A2/--- Low t. alarm	Low temperature alarm	2
A4/--- Door alarm	Door alarm	8
A5/--- Max hold time	The "o16" function is activated during a coordinated defrost	16
A10/--- Inject prob.	Control problem	64
A11/--- No Rfg. sel.	No refrigerant selected	64
A13/--- High temp S6	Temperature alarm. High S6	1
A14/--- Low temp S6	Temperature alarm. Low S6	2
A15/--- DI1 alarm	DI1 alarm	8
A16/--- DI2 alarm	DI2 alarm	8
A45/--- Standby mode	Standby position (stopped refrigeration via r12 or DI input)	-
A59/--- Case clean	Case cleaning. Signal from DI input	-
A70/--- High temp S3B	High temperature alarm, B section	1
A71/--- Low temp S3B	Low temperature alarm, B section	2
AA2/--- Refg. leak	Refrigerant leak alarm	8
AA3/--- CO2 alarm	CO2 leak alarm	8
--- AD fault	Error in the adaptive defrost function	16
--- AD Iced	Evaporator is iced up. Reduction of air flow	16
--- AD not defr.	Defrost of evaporator is not satisfactory	16
--- AD flashgas.	Flash gas is formed at the valve	16
E1/--- Ctrl. error	Faults in the controller	32
E6/--- RTC error	Check clock	32
E20/--- Pe error	Error on pressure transmitter Pe	64
E24/--- S2 error	Error on S2 sensor	4
E25/--- S3 error	Error on S3 sensor	4
E26/--- S4 error	Error on S4 sensor	4
E27/--- S5 error	Error on S5 sensor	4
E28/--- S6 error	Error on S6 sensor	4
E34/--- S3 error B	Error on S3B sensor	4
E37/--- S5 error B	Error on S5B sensor	4
---/--- Max Def.Time	Defrost stopped based on time instead of, as wanted, on temperature	16

Operating status		(Measurement)
The controller goes through some regulating situations where it is just waiting for the next point of the regulation. To make these "why is nothing happening" situations visible, you can see an operating status on the display. Push briefly (1s) the upper button. If there is a status code, it will be shown on the display. The individual status codes have the following meanings:		Ctrl. state: (Shown in all menu displays)
Normal regulation	S0	0
Waiting for end of the coordinated defrost	S1	1
When the compressor is operating it must run for at least x minutes.	S2	2
When the compressor is stopped, it must remain stopped for at least x minutes.	S3	3
The evaporator drips off and waits for the time to run out	S4	4
Refrigeration stopped by main switch. Either with r12 or a DI-input	S10	10
Refrigeration stopped by thermostat	S11	11
Defrost sequence. Defrost in progress	S14	14
Defrost sequence. Fan delay — water attaches to the evaporator	S15	15
Refrigeration stopped due to open ON input or stopped regulation	S16	16
Door is open. DI input is open	S17	17
Melt function in progress. Refrigeration is interrupted	S18	18
Modulating thermostat control	S19	19
Emergency cooling due to sensor error *)	S20	20
Regulation problem in the injections function	S21	21
Start-up phase 2. Evaporator being charged	S22	22
Adaptive control	S23	23
Start-up phase 1. Signal reliability from sensors is controlled	S24	24
Manual control of outputs	S25	25
No refrigerant selected	S26	26
Case cleaning	S29	29
Forced cooling	S30	30
Delay on outputs during start-up	S32	32
Heat function r36 is active	S33	33
Appliance shutdown	S45	45
Flood evap. function is active	S48	48
Other displays:		
The defrost temperature cannot be displayed. There is stop based on time	non	
Defrost in progress / First cooling after defrost	-d-	
Password required. Set password	PS	
Regulation is stopped via main switch	OFF	

*) Emergency cooling will take effect when there is lack of signal from a defined S3 or S4 sensor. The regulation will continue with a registered average cutin frequency. There are two registered values – one for day operation and one for night operation.

Data communication

The importance of individual alarms can be defined with a setting. The setting must be carried out in the group "Alarm destinations"

Settings from System manager	Settings from AKM (AKM destination)	Log	Alarm relay			Send via Network
			Non	High	Low-High	
High	1	X		X	X	X
Middle	2	X			X	X
Low	3	X			X	X
Log only		X				
Disabled						

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