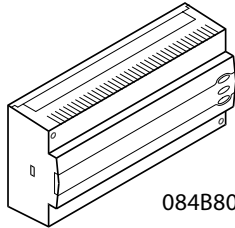**Installation Guide**

# AK-CC 460

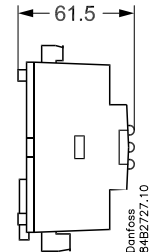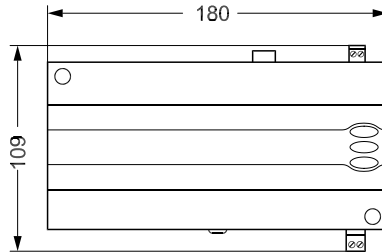084R8052

AN234086440123en-000301
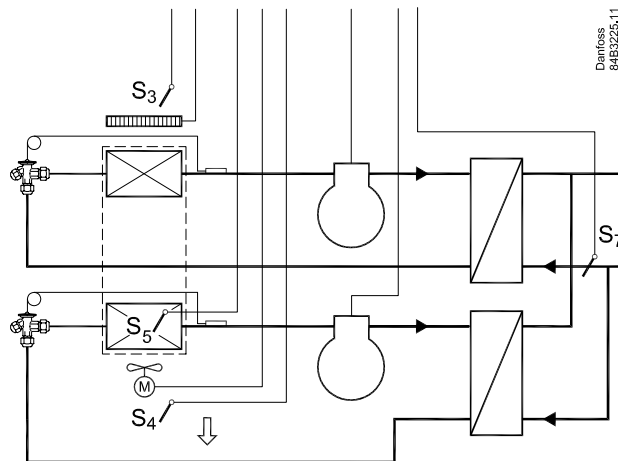
## Identification

084B8016

## Dimensions

CE

180

109

61.5

Danfoss
84B2727.10

## Principle

### Application 1, 3

1: Sequential operation
3: Cyclic operation

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84B3225.11

S₃

S₅

S₄

S₇

### Application 2

Speed control

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84B3227.10

S₃

S₅

S₄

S₇
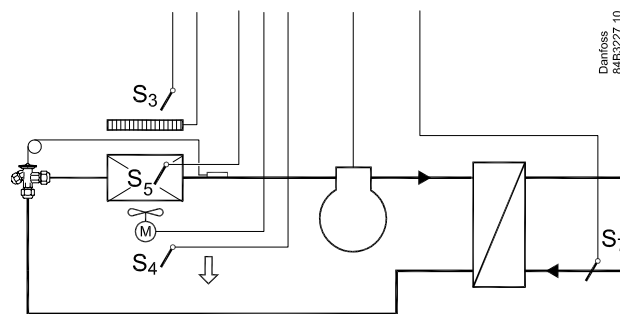
## Connections

### Appplication 1 and 3
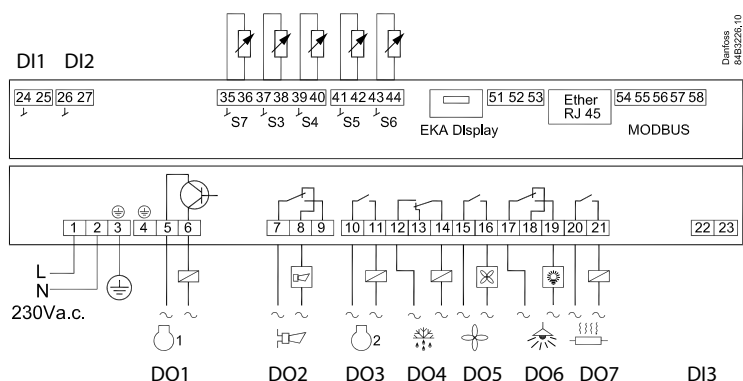


### Appplication 2



| Solid state output | DO1 (for coil) | Max. 240 V AC , Min. 28 V AC<br>Max. 0.5 A<br>Leak < 1 mA<br>Max. 1 pcs. coil |
|---|---|---|
| Relays | | CE<br>(250 V AC)<br>IBExU approved |
| | DO3, DO4 | 4 (3) A |
| | DO2, DO5, DO6, DO7 | 4 (3) A |
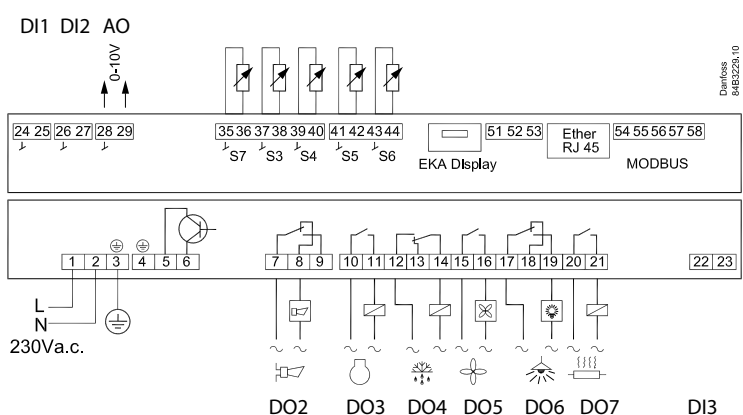
### Overview of outputs and applications

| Application | DO1 | DO2 | DO3 | DO4 | DO5 | DO6 | DO7 | DI1 | DI2 | DI3 | AI1 | AI2 | AI3 | AI4 | AI5 | AI6 | AO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 and 3 | ① | 📢 | ② | ❄ | ✛ | ☀ | ▦ | ● | ● | ● | | S7 | S3 | S4 | S5 | S6 | |
| 2 | | 📢 | ② | ❄ | ✛ | ☀ | ▦ | ● | ● | ● | | S7 | S3 | S4 | S5 | S6 | 0-10V |

### 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.

### AO
Analogue output (only application 2)
0 - 10 V signal for compressor speed control.

### S7, S3, S4, S5, S6
Pt 1000 ohm
*S7, brine sensor, placed in the cold inlet before the heat exchanger*
*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*
*S6, product sensor*

### EKA Display
If there is a need for 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 AC, 50/60 Hz

**DO1**
*Compressor 1  (only application 1 and 3)*
    Connection of relay. The coil must be a 230 V AC coil.

**DO2**
*Alarm*
    There is a connection between terminal 7 and 8 in alarm situations and when the controller is without power.

**DO3**
*Compressor 2*
    There is connection between terminal 10 and 11 when the compressor is on.

**DO4**
*Defrost*
    There is connection between terminal 12 and 14 when defrosting takes place.

**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.

**DO7**
*Rail heat*
    There is connection between terminal 20 and 21 when the rail heat is on.

**DI3**
*Digital input signal*
    Safety circuits compressor 1 and 2
    The signal must have a voltage of 0 / 230 V AC

**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 wil 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.

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Coordinated defrost via cable connections

max. 10



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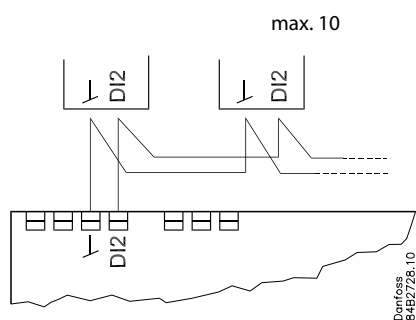
The following controllers can be connected up in this way:
EKC 204A, AK-CC 210, AK-CC 250, AK-CC 450, AK-CC 460, AK-CC 550, AK-CC 55.

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

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Coordinated defrost via data communication

Gateway/
System manager



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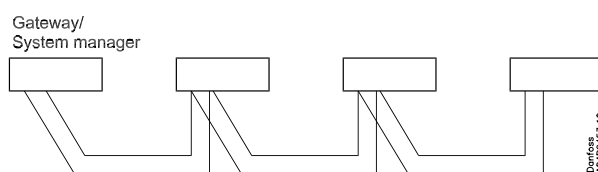
The setting of controllers to coordinate their defrosting takes place in the gateway/system manager.

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

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## Data communication

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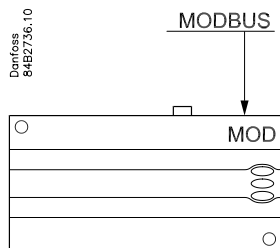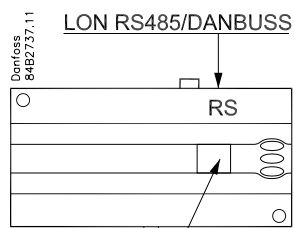


| System manager / Gateway | AK-SM.... | AKA 245 version 6.20$^+$ / AK-SM... | OEM |
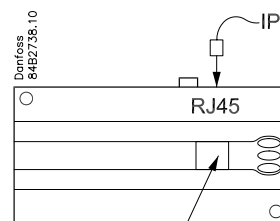
**Display EKA 163 / 164**

**L < 15 m**



**L > 15 m**

## Operation

### Controller/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 °F.



### Light-emitting diodes (LED) on front panel
The LEDs 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/accept the alarm by giving the top button a brief push.

### The buttons
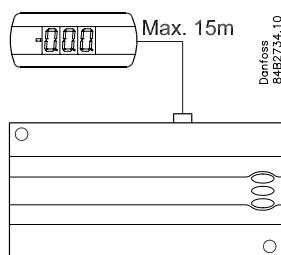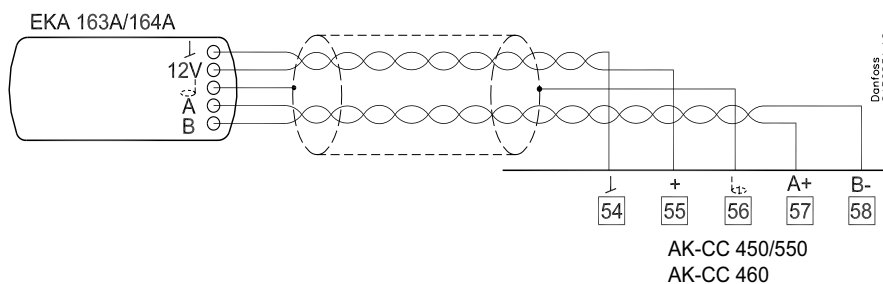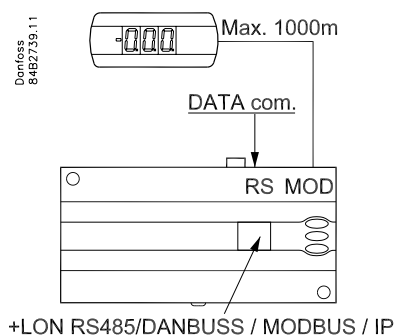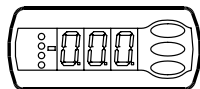When you want to change a setting, the upper and the lower buttons will give you a higher or lower value depending on the button you are pushing. But before you change the value, you must have access to the menu. You obtain this by pushing the upper button for a couple of sec.onds - you will then enter the column with parameter codes. Find the parameter code you want to change and push the middle button 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 the 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 again to set the value.

*Cut-out 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.

*Manual 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.

**3** Open parameter o61 and set the electric connection number.

**4** Open parameter r12 and start the regulation.

**5** Go through the survey of factory settings. Make any necessary changes in the respective parameters.

**6** For network. Set the address in o03.

**7** 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

## Menu survey

| Parameter | | wiring diagram | | Min. value | Max. value | Factory setting | Actual setting |
|---|---|---|---|---|---|---|---|
| Function | Code | 1 & 3 | 2 | | | | |
| **Normal operation** | | | | | | | |
| Temperature (setpoint) | - - - | 1 | 1 | -50 °C | 50 °C | 2 | |
| **Thermostat** | | | | | | | |
| Differential | r01 | 1 | 1 | 0.1 K | 20 K | 2 | |
| Max. limitation of setpoint setting | r02 | 1 | 1 | -49 °C | 50 °C | 50 | |
| Min. limitation of setpoint setting | r03 | 1 | 1 | -50 °C | 49 °C | -50 | |
| Adjustment of temperature indication | r04 | 1 | 1 | -10 | 10 | 0 | |
| Temperature unit ( °C/°F) | r05 | 1 | 1 | 0/ °C | 1/F | 0/ °C | |
| Correction of the signal from S4 | r09 | 1 | 1 | -10 K | 10 K | 0 | |
| Correction of the signal from S3 | r10 | 1 | 1 | -10 K | 10 K | 0 | |
| Manual service, stop regulation, start regulation (-1, 0, 1) | r12 | 1 | 1 | -1 | 1 | 0 | |
| Displacement of reference during night operation | r13 | 1 | 1 | -50 K | 50 K | 0 | |
| Thermostat function (readout) 1= ON/OFF, 2=modulating | r14 | 1 | 1 | — | — | — | |
| Definition and weighting, if applicable, of thermostat sensors - S4% (100%=S4,  0%=S3) | r15 | 1 | 1 | 0 % | 100 % | 100 | |
| Time between melt periods | r16 | 1 | 1 | 0 hrs | 10 hrs | 1 | |
| Duration of melt periods | r17 | 1 | 1 | 0 min. | 30 min. | 5 | |
| Temperature setting for thermostat band 2 . As differential r01 is used | r21 | 1 | 1 | -50 °C | 50 °C | 2 | |
| Correction of the signal from S6 | r59 | 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 | 0 % | 100 % | 100 | |
| S4 min. limit, frost protection. Cooling is stopped. | r98 | 1 | 1 | -50 °C | 20 °C | -50 °C | |
| **Alarm settings** | | | | | | | |
| Delay for temperature alarm | A03 | 1 | 1 | 0 min. | 240 min. | 30 | |
| Delay for door alarm | A04 | 1 | 1 | 0 min. | 240 min. | 60 | |
| Delay for temperature alarm after defrost | A12 | 1 | 1 | 0 min. | 240 min. | 90 | |
| High alarm limit for thermostat 1 | A13 | 1 | 1 | -50 °C | 50 °C | 8 | |
| Low alarm limit for thermostat 1 | A14 | 1 | 1 | -50 °C | 50 °C | -30 | |
| High alarm limit for thermostat 2 | A20 | 1 | 1 | -50 °C | 50 °C | 8 | |
| Low alarm limit for thermostat 2 | A21 | 1 | 1 | -50 °C | 50 °C | -30 | |
| High alarm limit for sensor S6 at thermostat 1 | A22 | 1 | 1 | -50 °C | 50 °C | 8 | |
| Low alarm limit for sensor S6 at thermostat 1 | A23 | 1 | 1 | -50 °C | 50 °C | -30 | |
| High alarm limit for sensor S6 at thermostat 2 | A24 | 1 | 1 | -50 °C | 50 °C | 8 | |
| Low alarm limit for sensor S6 at thermostat 2 | A25 | 1 | 1 | -50 °C | 50 °C | -30 | |
| S6 alarm time delay With setting = 240 the S6 alarm will be omitted | A26 | 1 | 1 | 0 min. | 240 min. | 240 | |
| Alarm time delay or signal on the DI1 input | A27 | 1 | 1 | 0 min. | 240 min. | 30 | |
| Alarm time delay or signal on the DI2 input | A28 | 1 | 1 | 0 min. | 240 min. | 30 | |
| Signal for alarm thermostat. S4% (100%=S4, 0%=S3) | A36 | 1 | 1 | 0 % | 100 % | 100 | |
| Delay for S6 (product sensor alarm) after defrost | A52 | 1 | 1 | 0 min. | 240 min. | 90 | |
| Alarm limit for max. S7 brine temperature | A76 | 1 | 1 | -50 °C | 50 °C | 8 °C | |
| Differential for S7 brine alarm | A77 | 1 | 1 | 0.1 K | 10 K | 3.0 K | |
| **Compressor** | | | | | | | |
| Min. ON-time | c01 | 1 | 1 | 0 min. | 30 min. | 0 | |
| Min. OFF-time | c02 | 1 | 1 | 0 min. | 30 min. | 0 | |
| Time delay for cut-in of comp.2 | c05 | 1 | | 0 sec. | 999 sec. | 5 | |
| Compressor min. speed | c46 | | 1 | 25 Hz | 70 Hz | 30 | |
| Compressor start speed. Must be set higher than "Min. speed" | c47 | | 1 | 30 Hz | 70 Hz | 50 | |
| Compressor max. speed | c48 | | 1 | 50 Hz | 100 Hz | 100 | |
| KP for compressor PI control | c82 | | 1 | 3 | 30 | 20 | |
| Tn for compressor PI control | c83 | | 1 | 30 sec. | 360 sec. | 60 | |

| Continued | Code | wiring diagram | | Min. | Max. | Fac. | Actual |
|---|---|---|---|---|---|---|---|
| Compressor on time when sensor fault | c86 | 1 | | 0 min | 240 min | 15 | |
| Compressor off time when sensor fault | c87 | 1 | | 0 min. | 240 min. | 15 | |
| Compressor speed at sensor error | c93 | | 1 | 25 Hz | 100 Hz | 60 | |
| Max. sloperate (max. allowed change of speed per sec..) | c96 | | 1 | 0.1 Hz/s | 5 Hz/s | 1 | |
| Max Proportional factor Kp for PI control | n95 | | 1 | 5 | 50 | 20 | |
| **Defrost** | | | | | | | |
| Defrost method: 0=none, 1= EL | d01 | 1 | 1 | 0/No | 1/EL | 1/EL | |
| Defrost stop temperature | d02 | 1 | 1 | 0 °C | 50 °C | 6 | |
| Interval between defrost starts | d03 | 1 | 1 | 0 hrs/ Off | 240 hrs | 8 | |
| Max. defrost duration | d04 | 1 | 1 | 0 min. | 360 min. | 45 | |
| Displacement of time on cut-in of defrost at start-up | d05 | 1 | 1 | 0 min. | 240 min. | 0 | |
| Drip off time | d06 | 1 | 1 | 0 min. | 60 min. | 0 | |
| Delay for fan start after defrost | d07 | 1 | 1 | 0 min. | 60 min. | 0 | |
| Fan start temperature | d08 | 1 | 1 | -50 °C | 0 °C | -5 | |
| Fan cut-in during defrost<br>0: stopped<br>1 & 2: Running | d09 | 1 | 1 | 0 | 2 | 1 | |
| Defrost sensor: 0 =Stop on time, 1=S5, 2=S4, 3=S5 and S6 | d10 | 1 | 1 | 0 | 3 | 0 | |
| Pump down delay | d16 | | 1 | 0 min. | 60 min. | 0 | |
| Max. aggregate refrigeration time between two defrosts | d18 | 1 | 1 | 0 hrs | 48 hrs | 0/OFF | |
| Rail heat during defrost<br>0: off<br>1: on<br>2: pulsing | d27 | 1 | 1 | 0 | 2 | 2 | |
| Max. duration of -d- in display | d40 | 1 | 1 | 5 min. | 240 min. | 30 | |
| **Fan** | | | | | | | |
| Fan stop temperature (S5) | F04 | 1 | 1 | -50 °C | 50 °C | 50 | |
| Pulse operation on fans: 0=No pulse operation, 1=At thermostat cut outs only, 2= Only at thermostat cut-outs during night operation | F05 | 1 | 1 | 0 | 2 | 0 | |
| Cycle time for fan pulsation (on-time + off-time) | F06 | 1 | 1 | 1 min. | 30 min. | 5 | |
| On-time in % of cycle time | F07 | 1 | 1 | 0 % | 100 % | 100 | |
| **Real time clock** | | | | | | | |
| Six start times for defrost.<br>Setting of hours.<br>0=OFF | t01 - t06 | 1 | 1 | 0 hrs | 23 hrs | 0 | |
| Six start times for defrost.<br>Setting of minutes.<br>0=OFF | t11 - t16 | 1 | 1 | 0 min. | 59 min. | 0 | |
| Clock - Setting of hours | t07 | 1 | 1 | 0 hrs | 23 hrs | 0 | |
| Clock - Setting of minutes | t08 | 1 | 1 | 0 min. | 59 min. | 0 | |
| Clock - Setting of date | t45 | 1 | 1 | 1 day | 31 days | 1 | |
| Clock - Setting of months | t46 | 1 | 1 | 1 mon. | 12 mon. | 1 | |
| Clock - Setting of years | t47 | 1 | 1 | 0 year | 99 years | 0 | |
| **Miscellaneous** | | | | | | | |
| Delay of output signals after power failure | o01 | 1 | 1 | 0 sec. | 600 sec. | 5 | |
| Input signal on DI1. Function:<br>0=not used. 1=status on DI1. 2=door function with alarm when open.<br>3=door alarm when open. 4=defrost start (pulse signal). 5=ext.main switch. 6=night operation 7=thermostat band changeover (activate r21).<br>8=alarm function when closed. 9=alarm function when open. 10=case cleaning (pulse signal). 12=night cover. 15=appliance shutdown | o02 | 1 | 1 | 0 | 15 | 0 | |
| Network address (0= off) | o03 | 1 | 1 | 0 | 240 | 0 | |
| On/Off switch (Service Pin message)<br>IMPORTANT! o61 **must** be set prior to o04<br>(used at LON 485 only) | o04 | 1 | 1 | 0/Off | 1/On | 0/Off | |

| Continued | | Code | wiring diagram | | Min. | Max. | Fac. | Actual |
|---|---|---|---|---|---|---|---|---|
| Access code 1 (all settings) | | o05 | 1 | 1 | 0 | 100 | 0 | |
| Software Version | | o08 | 1 | 1 | | | | |
| Mains frequency | | o12 | | 1 | 50 Hz | 60 Hz | 50 | |
| Max. hold time after coordinated defrost | | o16 | 1 | 1 | 0 min. | 360 min. | 20 | |
| Select signal for display view. S4% (100%=S4, 0%=S3) | | o17 | 1 | 1 | 0 % | 100 % | 100 | |
| Input signal on DI2. Function:<br>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). 12=night cover, 13=coordinated defrost. 15=appliance shutdown | | o37 | 1 | 1 | 0 | 15 | 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 switches on and night cover will open if the network cuts out for more than 15 minutes. | | o38 | 1 | 1 | 1 | 4 | 1 | |
| Activation of light relay (only if o38=2) On=light | | o39 | 1 | 1 | 0/Off | 1/On | 0/Off | |
| Rail heat On time during day operations | | o41 | 1 | 1 | 0 % | 100 % | 100 | |
| Rail heat On time during night operations | | o42 | 1 | 1 | 0 % | 100 % | 100 | |
| Rail heat cycle time (On time + Off time) | | o43 | 1 | 1 | 6 min. | 60 min. | 10 | |
| Case cleaning. 0=no case cleaning. 1=fans only. 2=all output Off. | *** | o46 | 1 | 1 | 0 | 2 | 0 | |
| Selection of wiring diagram. See overview page 2.<br>1=Two compressors controlled sequentially<br>2= One compressor speed controlled<br>3= Two compressors controlled cyclic | * | o61 | 1 | 1 | 1 | 3 | 1 | |
| Access code 2 (partial access) | *** | o64 | 1 | 1 | 0 | 100 | 0 | |
| Replace the controller's factory settings with the present settings | | o67 | 1 | 1 | 0/Off | 1/On | 0/Off | |
| Rail heat control<br>0=not used, 1=pulse control with timer function (o41 and o42), 2=pulse control with dew point function | | o85 | 1 | 1 | 0 | 2 | 0 | |
| Dew point value where the rail heat is minimum | | o86 | 1 | 1 | -10 °C | 50 °C | 8 | |
| Dew point value where the rail heat is 100% on | | o87 | 1 | 1 | -9 °C | 50 °C | 17 | |
| Lowest permitted rail heat effect in % | | o88 | 1 | 1 | 0 % | 100 % | 30 | |
| Time delay from "open door" refrigeration is started | | o89 | 1 | 1 | 0 min. | 240 min. | 30 | |
| Definition of readings on lower button:<br>1=defrost stop sensor, 2=S6 sensor | | o92 | 1 | 1 | 1 | 2 | 1 | |
| Display of temperature<br>1= u56 air temperature<br>2= u36 product temperature | | o97 | 1 | 1 | 1 | 2 | 1 | |
| Light and night blinds defined:<br>0: Light is switched off and night blind is opened when the main switch is off<br>1: Light and night blind are independent of main switch | | o98 | 1 | 1 | 0 | 1 | 0 | |
| Configuration of alarm relay<br>The alarm relay will be activated upon an alarm signal from the following groups:<br>1 - High temperature alarms<br>2 - Low temperature alarms<br>4 - Sensor error<br>8 - Digital input is activated for alarm<br>16 - Defrost alarms<br>32 - Miscellaneous<br>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 errors).<br>0 = Cancel relay function | | P41 | 1 | 1 | 0 | 63 | 47 | |
| Stop time for fan while night blind rolls down | | P65 | 1 | 1 | 0 min. | 5 min. | 0 min. | |

| Service | | | | |
|---|---|---|---|---|
| Temperature measured with S5 sensor | | u09 | 1 | 1 |
| Status on DI1 input. on/1=closed | | u10 | 1 | 1 |
| Actual defrost time (minutes) | | u11 | 1 | 1 |
| Temperature measured with S3 sensor | | u12 | 1 | 1 |
| Status on night operation (on or off) 1=on | | u13 | 1 | 1 |
| Temperature measured with S4 sensor | | u16 | 1 | 1 |
| Thermostat temperature | | u17 | 1 | 1 |
| Run time of thermostat (cooling time) in minutes | | u18 | 1 | 1 |
| Temperature measured with S6 sensor (product temperature) | | u36 | 1 | 1 |
| Status on DI2 output. on/1=closed | | u37 | 1 | 1 |
| Readout the compressor capacity in % | | U52 | | 1 |
| Display air temperature. Weighted  S3 + S4 (o17) | | u56 | 1 | 1 |
| Measured temperature for alarm thermostat. Weighted S3 + S4 (A36) | | u57 | 1 | 1 |
| Status on relay for compressor 1 | ** | u58 | 1 | |
| Status on relay for fan | ** | u59 | 1 | 1 |
| Status on relay for defrost | ** | u60 | 1 | 1 |
| Status on relay for rail heat | ** | u61 | 1 | 1 |
| Status on relay for alarm | ** | u62 | 1 | 1 |
| Status on relay for light | ** | u63 | 1 | 1 |
| Status on relay for compressor 2 | ** | u67 | 1 | 1 |
| Readout of the actual rail heat effect | | u85 | 1 | 1 |
| 1: Thermostat 1 operating,   2: Thermostat 2 operating | | u86 | 1 | 1 |
| Status on high voltage input DI3 | | u87 | 1 | 1 |
| Readout of thermostat's actual cut-in value | | u90 | 1 | 1 |
| Readout of thermostat's actual cut-out value | | u91 | 1 | 1 |
| Readout of brine temperature S7 | | u98 | 1 | 1 |
| Readout of voltage on AO output | | U44 | | 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

**Forced control**
If you need to force-control an output, you should set r12 to -1 (manual mode). You should then select the relevant relay function, e.g. u58. Go to the function by pressing the middle button. Select On.

**Factory setting**
If you need to return to the factory-set values, it can be done in this way:
- Cut out the supply voltage to the controller.
- Keep upper and lower button depressed at the same time as you reconnect the supply voltage.

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

## Fault message

In an error situation the LEDs 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 |
| 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 | - |
| A97/--- Comp. Safety | Compressor safety. Signal from DI3 input | 8 |
| AA3/---High brine temp. | High brine temperature alarm | 8 |
| E1/--- Ctrl. error | Faults in the controller | 32 |
| E6/--- RTC error | Check clock | 32 |
| 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 |
| E50/--- S7 error | Error on S7 sensor | 4 |
| ---/--- Max Def.Time | Defrost stopped based on time instead of, as wanted, on temperature | 16 |

### 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 AK-SM | Settings from AKM (AKM destination) | Send via Network |
|---|---|---|
| High | 1 | X |
| Middle | 2 | X |
| Low | 3 | X |
| Log only | | |
| Disabled | | |

| 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 |
| 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 |
| Manual control of outputs | S25 | 25 |
| Case cleaning | S29 | 29 |
| Delay on outputs during start-up | S32 | 32 |
| Case shutdown | S45 | 45 |
| *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 cut-in frequency. There are two registered values – one for day operation and one for night operation.

Additional information:
Manual RS8HS...