This user guide is intended to be used by OEMs for the purpose of programming ERC 112. It may also be useful for technicians. However, it is not intended as a user guide for end users.
Introduction

Application
Temperature control for refrigeration appliances.
Front panel mounting.

Advantages
The latest generation CPU, plenty of memory and high-end electronic components allow for a uniquely versatile software. Three separate password-protected user levels can be used to control more than 300 different parameters to fit all individual requirements.

Approvals
R290/R600a end-use applications employing in accordance to EN/IEC 60335-2-24, annex CC and EN/IEC 60335-2-89, annex BB;
Glow wire according to EN/IEC 60335-1;
IEC/EN 60730
UL60730
NSF
CQC
EAC
Ukraine

Password protected
The access level can be set separately for each parameter using KoolProg KoolProg Software.
There are three levels of access 1, 2, 3:
- level 1 is for shop access;
- level 2 for technicians;
- level 3 for OEMs.
The access levels cannot be set using the buttons. Passwords for the different levels can however be altered for the level of access you have, e.g. a level 2 user can change the password for level 1 and level 2 but not level 3.
Typical application

Glass Door Merchandiser
No-frost freezer/sub-zero cooler

Gastro
No-frost freezer/Cooler

ERC 112D
No.: 08065205
Red Display 100V-240V, 50-60Hz (EU) 110-277V, 50-60Hz (US)
Input:
<table>
<thead>
<tr>
<th>N</th>
<th>D01</th>
<th>D02</th>
<th>D03</th>
<th>D04</th>
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<tbody>
<tr>
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</tbody>
</table>
S3, S4 are optional

ERC 112C
No.: 08065206
Red Display 100V-240V, 50-60Hz (EU) 110-277V, 50-60Hz (US)
Input:
<table>
<thead>
<tr>
<th>N</th>
<th>D01</th>
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<th>D03</th>
<th>D04</th>
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<td>4</td>
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</tbody>
</table>
S3, S4 are optional

ERC 112D
No.: 08065215
Red Display 100V-240V, 50-60Hz (EU) 110-277V, 50-60Hz (US)
Input:
<table>
<thead>
<tr>
<th>N</th>
<th>D01</th>
<th>D02</th>
<th>D03</th>
<th>D04</th>
</tr>
</thead>
<tbody>
<tr>
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<td>110,110,110,110</td>
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<td>4</td>
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</tr>
</tbody>
</table>
S3, S4 are optional

ERC 112C
No.: 08065216
Red Display 100V-240V, 50-60Hz (EU) 110-277V, 50-60Hz (US)
Output:
<table>
<thead>
<tr>
<th>N</th>
<th>D01</th>
<th>D02</th>
<th>D03</th>
<th>D04</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>110,110,110,110</td>
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<td>110,110,110,110</td>
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<tr>
<td>2</td>
<td>110,110,110,110</td>
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<td>110,110,110,110</td>
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<tr>
<td>3</td>
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<td>110,110,110,110</td>
<td>110,110,110,110</td>
<td>110,110,110,110</td>
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<tr>
<td>4</td>
<td>110,110,110,110</td>
<td>110,110,110,110</td>
<td>110,110,110,110</td>
<td>110,110,110,110</td>
</tr>
</tbody>
</table>
S2, S3, S4 are optional
The ERC 112 is an electronic refrigeration controller with an LED display especially developed for bottle coolers and commercial fridges and freezers. It is particularly suited for OEM customers where time, easy and reliable installation and high quality need to go hand in hand with flexibility.

The display can be ordered in red or blue. The controller is available with the upper left button as "ECO" or "Defrost". The lower left button can be supplied with "Light", "Stand by" or "Super chill".

Clips

Are used to secure the controller in place in the case of rear mounting. They are not used with front mounting. There are two identical clips, one placed on either side of the controller.

Front frame

The front frame provides a proper finish but can also be used to secure the controller in place when using front mounting. In this case, clamps are not required. Contact Danfoss for details.

"S1"
Temperature sensor for cabinet

"S2"
Temperature sensor for defrost

"S3"
Temperature sensor for condenser, light sensor or Motion sensor

"S4"
Temperature sensor Pt 1000 ohm/0°C or door signal

"di"
Door signal or Motion sensor

The function of an input can be reprogrammed, but the connector can not be moved. The connector is designed to only one location. "S1" to "S1", "S2" to "S2", etc.

Control temperature sensor

There are different lengths.

Defrost temperature sensor

Should be mounted on the evaporator.

Condenser temperature sensor

Should be mounted on the condenser.

Light sensor

Is optional and is used to measure the level of ambient light around the cabinet so that night and day "Economy", "Normal" modes of operation can automatically be set, as well as the brightness of the display.

Motion sensor

Should be mounted on the cabinet front.

Door sensor connector cable

Is optional and is a connector and cable with spade terminals compatible with door contacts used in refrigeration applications.
Quick programming

**Software for PC**

KoolProg

Software from Danfoss for programming the ERC-controller via a PC rather than with the front panel buttons.

[koolprog](https://www.danfoss.com/en/service-and-support/downloads/dcs/koolprog/)

**USB gateway**

USB gateway

The USB Gateway is a laboratory tool, offering fast and easy programming of any ERC controller connected directly to the PC. "KoolProg Software" installation kit is provided for the PC. The gateway is standard inventory for OEM labs.

**USB programming key**

Programming an individual unit in a laboratory

The USB key requires "KoolProg Software" running on a PC. It enables parameters to be set in real time and an array of status information to be read (bidirectional connection). Once the desired settings have been determined, a specific parameter file is saved to the USB key for later mass programming through the docking station.

**Docking station**

Mass programming on an assembly line:

The docking station is used for high volume programming of ERC controllers, for example on an assembly line. The docking station is a write-only device. The USB key, is to be inserted into the docking station. The settings are then loaded into each successive controller in a matter of seconds. "KoolProg Software" is not required for mass programming.
## Technical specs

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>100 - 240 V AC Switch mode power supply. Average 0.7 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose of control</td>
<td>To control commercial Refrigeration Applications</td>
</tr>
<tr>
<td>Construction of Control</td>
<td>Electronic control for incorporation for use in Class I and Class II appliance</td>
</tr>
<tr>
<td>Automatic Action</td>
<td>Micro-disconnection on operation type 1.8</td>
</tr>
<tr>
<td>Input</td>
<td>5 inputs: 4 analogue (digital), 1 digital; user specific assignment; Optional: External button input</td>
</tr>
<tr>
<td></td>
<td>- Cabinet air/Evaporator/Condenser</td>
</tr>
<tr>
<td></td>
<td>- Door sensor: all types, user specific</td>
</tr>
<tr>
<td></td>
<td>- Light sensor: Danfoss ECO light sensor</td>
</tr>
<tr>
<td></td>
<td>- Motion sensor</td>
</tr>
<tr>
<td>Output</td>
<td>UL60730</td>
</tr>
<tr>
<td></td>
<td>“DO1” (Compressor relay)</td>
</tr>
<tr>
<td></td>
<td>120 V AC: 16 A resistive/FLA16/LRA72</td>
</tr>
<tr>
<td></td>
<td>240 V AC: 10 A resistive/FLA10/LRA60</td>
</tr>
<tr>
<td></td>
<td>16(16) A</td>
</tr>
<tr>
<td></td>
<td>“DO4”</td>
</tr>
<tr>
<td></td>
<td>8 A resistive, FLA2/LRA12, TV-1</td>
</tr>
<tr>
<td></td>
<td>8 A resistive, 2(2) A</td>
</tr>
<tr>
<td></td>
<td>“DO5”</td>
</tr>
<tr>
<td></td>
<td>FLA2/LRA12, TV-1</td>
</tr>
<tr>
<td></td>
<td>8 A resistive, 2(2) A</td>
</tr>
<tr>
<td></td>
<td>“DO6”</td>
</tr>
<tr>
<td></td>
<td>FLA2/LRA12, TV-1</td>
</tr>
<tr>
<td></td>
<td>8 A resistive, 2(2) A</td>
</tr>
<tr>
<td></td>
<td>Max 10 A total “DO4-6”</td>
</tr>
<tr>
<td>Probes</td>
<td>Danfoss NTC sensors and Danfoss ECO accessories (Light, Motion and Door sensors)</td>
</tr>
<tr>
<td></td>
<td>Danfoss Pt 1000 ohm/0°C</td>
</tr>
<tr>
<td>Connectors</td>
<td>Modular connector system for OEM customers, with optional output screw terminal adapter; Input connector type: Rast2 5 Edge connectors; output connector type: RAST 5 standard</td>
</tr>
<tr>
<td>Programming</td>
<td>Programming with Danfoss KoolProg PC software, Docking station and Programming key</td>
</tr>
<tr>
<td>Assembly</td>
<td>Front mounting; Brackets</td>
</tr>
<tr>
<td>Display</td>
<td>LED display, 3 digit, decimal point and multi functionality icons; °C/°F scale</td>
</tr>
<tr>
<td>Keypad</td>
<td>4 buttons (integrated IP65 design), 2 left, 2 right; user programmable</td>
</tr>
<tr>
<td>Operating Conditions</td>
<td>0 °C to 55 °C, 93% rH</td>
</tr>
<tr>
<td>Storage Conditions</td>
<td>-40 °C to 85 °C, 93% rH</td>
</tr>
<tr>
<td>Range of Measurement</td>
<td>-40 °C to 85 °C with standard sensors (-40 °C to 200 °C when using NTC 100K sensors)</td>
</tr>
<tr>
<td>Protection</td>
<td>Front: IP65</td>
</tr>
<tr>
<td></td>
<td>Rear: water and dust protection corresponds to IP3, accessibility of connectors limit rear part rating to IP00</td>
</tr>
<tr>
<td>Environmental</td>
<td>Pollution degree II, non-condensing</td>
</tr>
<tr>
<td>Resistance to heat &amp; fire</td>
<td>Category D (UL94-V0)</td>
</tr>
<tr>
<td>EMC category</td>
<td>Category I</td>
</tr>
<tr>
<td>Over Voltage Category</td>
<td>Category II (IEC 60664-1)</td>
</tr>
<tr>
<td>Temperature for Ball Pressure Test</td>
<td>According to EN 60730-1, Annex G</td>
</tr>
<tr>
<td>For SELV Circuits</td>
<td>Input Probes or Digital Input connected to SELV limited energy &gt;15W</td>
</tr>
<tr>
<td>Operating Cycles</td>
<td>Compressor relay: more than 175,000 at full load (16A (16A))</td>
</tr>
<tr>
<td>Approvals</td>
<td>R290/R600a end-use applications employing in accordance to EN/IEC 60335-2-24, annex CC and EN/IEC 60335-2-89, annex BB Glow wire according to EN/IEC 60335-1 IEC/EN 60730 UL60730 NSF CQC EAC Ukraine</td>
</tr>
<tr>
<td></td>
<td>These approvals are only valid when used with recommended Danfoss accessories.</td>
</tr>
</tbody>
</table>

**IMPORTANT NOTE**

The inputs are not galvanic isolated and are connected directly to the mains supply!
For that reason, door-switches, sensors as well as the cables must fulfill the reinforced insulation requirements.

### Dimensions

![Dimensions Diagram](image)
Connections

(inputs and outputs are configurable)

**ERC 112C (3 relays)**

[Diagram of ERC 112C]

**ERC 112D (4 relays)**

[Diagram of ERC 112D]

**100 - 240 Va.c. SMPS**

[Diagram of SMPS]

**Note**

S4 Port can also be used to connect other sensors and Door sensor.
## Code numbers

<table>
<thead>
<tr>
<th>Type</th>
<th>I-Pack</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC 112C, Red LED, without buzzer</td>
<td>080G3202</td>
</tr>
<tr>
<td>ERC 112D, Red LED, without buzzer</td>
<td>080G3203</td>
</tr>
<tr>
<td>ERC 112C, Blue LED, without buzzer</td>
<td>080G3206</td>
</tr>
<tr>
<td>ERC 112D, Blue LED, without buzzer</td>
<td>080G3207</td>
</tr>
<tr>
<td>ERC 112C, Red LED, with buzzer</td>
<td>080G3212</td>
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<tr>
<td>ERC 112D, Red LED, with buzzer</td>
<td>080G3213</td>
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<tr>
<td>ERC 112C, Blue LED, with buzzer</td>
<td>080G3216</td>
</tr>
<tr>
<td>ERC 112D, Blue LED, with buzzer</td>
<td>080G3217</td>
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</table>

### Temperature sensors
-40 – 85 °C, PVC Standard, NTC 5 K
-40 – 120 °C, TPE precision NTC 5 K, Santoprene
-20 – 175 °C, Silicone rubber cable, NTC 100 K
-40 – 85 °C, PVC Standard, NTC 5 K

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Code no.</th>
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<tbody>
<tr>
<td>S1, 470 mm, 3-pole</td>
<td>120</td>
<td>077F8751</td>
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<tr>
<td>S1, 1000 mm, 3-pole</td>
<td>120</td>
<td>077F8757</td>
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<td>S1, 1500 mm, 3-pole</td>
<td>120</td>
<td>077F8761</td>
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<tr>
<td>S1, 2000 mm, 3-pole</td>
<td>120</td>
<td>077F8765</td>
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<tr>
<td>S1, 2200 mm, 3-pole</td>
<td>120</td>
<td>077F8769</td>
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<tr>
<td>S1, 3000 mm, 3-pole</td>
<td>60</td>
<td>077F8723</td>
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<td>S1, 3500 mm, 3-pole</td>
<td>60</td>
<td>077F8766</td>
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<td>S1, 6000 mm, 3-pole</td>
<td>27</td>
<td>080G2019</td>
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<tr>
<td>S1, 550 mm, 3-pole</td>
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<td>S1, 2000 mm, 3-pole</td>
<td>120</td>
<td>077F8727</td>
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<td>S2, 1000 mm, 2-pole</td>
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<td>S3, 2000 mm, 3-pole</td>
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<td>S3, 2500 mm, 3-pole</td>
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<td>S3, 6000 mm, 3-pole</td>
<td>27</td>
<td>080G2039</td>
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</tbody>
</table>

### Light-sensors
-100 – 200 °C, Pt 1000
S4, 1000 mm, 3-pole
S4, 2000 mm, 3-pole
S4, 3000 mm, 3-pole
S3, 1000 mm, 3-pole
S3, 2000 mm, 3-pole
S3, 3000 mm, 3-pole

### Magnetic door sensor
di/S4, 1000 mm, 3-pole
di/S4, 2000 mm, 3-pole
di/S4, 3000 mm, 3-pole
di/S4, 4000 mm, 3-pole

### Cable door sensor
di/S4, 1000 mm, 3-pole
di/S4, 2000 mm, 3-pole
di/S4, 3000 mm, 3-pole
di/S4, 4000 mm, 3-pole

### Motion sensor
S3/di, 3000 mm, 3-pole
S3, 1000 mm, 3-pole
S3, 1500 mm, 3-pole
S3, 2200 mm, 3-pole
S3, 3000 mm, 3-pole

### Clips
Black (2 needed per controller)

### Programming
Docking station for OEM mass production
EKA 183a programming key
Gateway incl USB Cable for R&D

### Power plug *
6-pole with screw

*The connectors are rated for 28 Amps max.

**Note:** For more information about temperature sensor types and connectors, please refer to Danfoss’ technical brochure “NTC type temperature sensors for ETC & ERC controllers.”
Operation

Programming Tools
The controller can be configured in four ways:
Using:
- KoolProg and KoolKey as Gateway
- KoolKey as Copy key
- KoolKey with Docking station
- Buttons on the front panel of the controller.

All these tools are supplied separately.
For technical literature and further information, please contact your local Danfoss representative.

Manual operation with buttons (Direct Access)

1 Press: variable direct function, e.g. “ECO”/“Night mode”
Sub function: back

1 Press: variable direct function, e.g. light
Sub function: “OK”

Examples

Changing the Desired Temperature Set point:
1. The display shows the current temperature.
2. Press “up/down” to access set point.
3. Press “up/down” to adjust set point.
After 30 seconds, the display automatically reverts to showing the current temperature.

Turning ON/OFF the ECO Function:
1. Press “ECO”.
The green “ECO” symbol is lit when in “ECO” mode.

Turn ON/Off the Light:
1. Press the “Light” button.

Acknowledging Alarms:
1. Display Flashing the alarm message.
2. Press any button to acknowledge.

Password protection:
1. Press “^” and “v” together and hold 5 seconds to access the menu.
2. The display shows “PAS” (only if configured for password protection).
3. Press “OK”.
4. Press “^”/”v” to the code.
5. Press “OK”.
Password protection on three levels:
1. Level 1: “shop” (daily use by shop personnel).
2. Level 2: “ser” (service technician).
3. Level 3: “OEM” (OEM programming).

Changing a Parameter
Some parameters may be hidden to you. Your access level will determine which parameters you can view and edit:
1. Press “^” and “v” together and hold 5 seconds to access the menu.
2. First parameter group is shown “tHE”.
3. Press “^” and “v” to find the desired group.
4. Press “OK”.
5. First parameter is shown.
6. Press “^” and “v” to find the desired parameter.
7. Press “OK”.
8. Press “^” and “v” to find the desired setting.
9. Press “OK”.

After 30 seconds, the display automatically reverts to showing the current temperature. Or Press 2 x “Back”.

NOTE:
Incorrect parameter settings can lead to inadequate cooling, excessive energy consumption, unnecessary alarms and in the case of temperature-sensitive food storage, breaches in food hygiene principles and regulations.
Only a trained operator should make changes to parameters.
Menu/functions

<table>
<thead>
<tr>
<th>ERC menu code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;tHE&quot;</td>
<td>Thermostat settings</td>
</tr>
</tbody>
</table>
| **"SEf"** | Set point  
This parameter defines the desired temperature (set point).  
In standard operation the set point is changed by simply pressing the "temperature up/down" buttons on ERC 112; for laboratory and assembly line you may opt for software controlled set point adjustment (speed improvement) |
| Min. -100.0°C | Max. 200.0°C  
Default 2.0°C |
| Current set point adjustment value **dIF** * **SPr** | The default value is set to 0.5 and the parameter is hidden by default.  
"SPr" defines the position of the set point in relation to cut-in and cut-out.  
"SPr=0.5" sets the set point mid between cut-in and cut-out.  
"SPr=0" sets the set point at the cutout.  
"SPr=1" sets the set point at cut-in. |
| Min. 0.0 | Max. 1.0  
Default 0.5 |
| **"dif"** | Thermostat differential  
This defines the difference between the cut-out and the cut-in.  
The desired temperature is determined by "SPr" and "dif". |
| Min. 0.0 K | Max. 20.0 K  
Default 2.0 K |
| **"HSE"** | Upper limit of thermostat set point  
Define the temperature range limit of the controller.  
Once set, the desired temperature (set point) can not go above "HSE" or below "LSE". |
| Min. -100.0°C | Max. 200.0°C  
Default 50.0°C |
| **"LSE"** | Lower limit of thermostat set point  
Define the temperature range limit of the controller.  
Once set, the desired temperature (set point) can not go below "LSE". |
| Min. -100.0°C | Max. 200°C  
Default -35.0°C |
| **"iCi"** | Initial cut in  
Comp relay action when Tair is between cut-in and cut-out at power-up:  
"yes": cut in the compressor.  
"no": cut out the compressor. |
| Min. no | Max. yes  
Default no |
| **"SP2"** | Seasonal offset temperature  
(This parameter is only available from Product version PV03 onwards. Please check product label for Product version of your controller.)  
Offset value for set point and alarms when the seasonal offset button is activated.  
It is an additional offset mode to have separate set points during summer and winter season, which can be activated by long press button after configuring in assignments as "tEc". |
| Min. -25 K | Max. 25 K  
Default 0 K |
| **"df2"** | Seasonal differential  
Temperature differential during seasonal offset mode. Only applicable during normal operation.  
During ECO mode, the controller will be worked to the ECO Differential setting. See ECO management section for more details. |
| Min. 0 K | Max. 20 K  
Default 2 K |
| FAo | Default FAo |
| **"FCT"** | Fan control method  
"FAo": fan always on  
"SEf": fan follow compressor by manual settings. (FoC and FSC needs to be set accordingly)  
"Aut": automatical fan control |
| **"Fod"** | Fan ON Delay/Fod  
Fod defines the fan delay (in seconds) after a compressor cut-in. |
| Min. 0 s | Max. 240 s  
Default 0 s |
| **"FSd"** | Fan Stop Delay/FSd  
"FSd" defines the fan delay after a compressor cut-out. |
| Min. 0 s | Max. 240 s  
Default 0 s |
| **"FoC"** | Fan ON Cycle/FoC  
Fan Stop Cycle/FSC  
When the compressor is OFF, and "FoC" or "FSC" are not zero, the fan runs in cycles according to "FoC" and "FSC". |
| Min. 0 s | Max. 960 s  
Default 0 s |
| **"FSC"** | Fan Stop Cycle/FSC  
Example: "FoC=120" [sec] and "FSC=120" [sec] means that the fan runs for half the time when the compressor is OFF. When the compressor is on, the fan is always ON (according to "FAo" and "Fod"). |
| Min. 0 s | Max. 960 s  
Default 0 s |

Fan settings

<table>
<thead>
<tr>
<th>&quot;FAn&quot;</th>
<th>Fan settings</th>
</tr>
</thead>
</table>
| **"FCT"** | Fan control method  
"FAo": fan always on  
"SEf": fan follow compressor by manual settings. (FoC and FSC needs to be set accordingly)  
"Aut": automatical fan control |
| **"Fod"** | Fan ON Delay/Fod  
Fod defines the fan delay (in seconds) after a compressor cut-in. |
| Min. 0 s | Max. 240 s  
Default 0 s |
| **"FSd"** | Fan Stop Delay/FSd  
"FSd" defines the fan delay after a compressor cut-out. |
| Min. 0 s | Max. 240 s  
Default 0 s |
| **"FoC"** | Fan ON Cycle/FoC  
Fan Stop Cycle/FSC  
When the compressor is OFF, and "FoC" or "FSC" are not zero, the fan runs in cycles according to "FoC" and "FSC". |
| Min. 0 s | Max. 960 s  
Default 0 s |
| **"FSC"** | Fan Stop Cycle/FSC  
Example: "FoC=120" [sec] and "FSC=120" [sec] means that the fan runs for half the time when the compressor is OFF. When the compressor is on, the fan is always ON (according to "FAo" and "Fod"). |
| Min. 0 s | Max. 960 s  
Default 0 s |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FSt</strong></td>
<td>Fan Minimum Stop time&lt;br&gt;Minimum stop time for fan protection.</td>
</tr>
<tr>
<td><strong>FdC</strong></td>
<td>Fan Δt cut in&lt;br&gt;(This parameter is only applicable with Automatic fan control &quot;Aut&quot; mode.)&lt;br&gt;Delta T for fan to cut in which the temperature offset comparing with thermostat cut in temperature.</td>
</tr>
<tr>
<td><strong>Fdt</strong></td>
<td>Fan stop time on door open&lt;br&gt;The delay with which the fan will be stopped after the door has been opened.&lt;br&gt;&quot;0&quot;: fan stop immediately when door open.&lt;br&gt;&quot;1-998&quot;: delay for fan stop after door open.&lt;br&gt;&quot;999&quot;: fan keep running all the time during door open.</td>
</tr>
<tr>
<td><strong>FLt</strong></td>
<td>Fan limit temperature&lt;br&gt;This function prevents the evaporator fan to operate if the temperature is above the fan limit temperature.&lt;br&gt;If the defrost sensor registers a higher temperature than the one set here, the fan will be stopped to avoid the warm air circulation in the cabinet. This parameter is active only when evaporator sensor is connected.</td>
</tr>
<tr>
<td><strong>Fdf</strong></td>
<td>Fan limit Delta temperature&lt;br&gt;This is the evaporator delta temperature for the fan to switch ON after it is switched off due to FLt setting.</td>
</tr>
</tbody>
</table>

### Lig - Light settings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLC</strong></td>
<td>Cabinet Light Source Control&lt;br&gt;This parameter can be set to one of these alternatives to control the light in the cabinet:&lt;br&gt;&quot;on&quot;: always ON.&lt;br&gt;&quot;off&quot;: always OFF.&lt;br&gt;&quot;dor&quot;: door sensor only.</td>
</tr>
<tr>
<td><strong>Lod</strong></td>
<td>Light OFF delay&lt;br&gt;Number of seconds the light will stay ON after the door has been closed.</td>
</tr>
</tbody>
</table>

### Pud - Pull Down settings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pit</strong></td>
<td>Pull Down Initiate Temperature&lt;br&gt;This parameter indicates the temperature which causes a pull down to start. If the temperature measured inside the cabinet exceeds this value for longer than one hour, then pull down will start. The compressor will have already cut-in, so the only effect is to stop defrost cycles until the desired temperature is reached. The period of one hour is fixed and cannot be altered.</td>
</tr>
<tr>
<td><strong>PCy</strong></td>
<td>Pull Down Cycling&lt;br&gt;This is the duration in minutes of the compressor cycling at the reduced setpoint temperature. Once the desired pull down limit temperature &quot;P Lt&quot; has been reached during pull down, the compressor will continue to cycle ON/OFF for the duration of &quot;PCy&quot;. At the end of the period defined by &quot;PCy&quot;, the set point temperature will return to normal and pull down will cease.</td>
</tr>
</tbody>
</table>
# Pull Down Defrost Interval
This is the time between defrost cycles during pull down. It is measured in hours and can be up to 48 hours. During pull down, this setting overrides the defrost interval and defrost time settings (see the defrost section).

<table>
<thead>
<tr>
<th>&quot;Pdi&quot;</th>
<th>Pull Down Defrost Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 0 hour</td>
<td>Max. 48 hour</td>
</tr>
<tr>
<td>Default 15 hour</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>&quot;Pdd&quot;</th>
<th>Pull Down Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 0 hour</td>
<td>Max. 48 hour</td>
</tr>
<tr>
<td>Default 24 hour</td>
<td></td>
</tr>
</tbody>
</table>

# Pull Down Limit Temperature
This parameter sets the minimum allowed temperature during pull-down. In order to protect valuable contents you must always specify the absolute minimum temperature allowed in your application. For glass door merchandisers 0°C/32°F protects bottles from freezing; for commercial fridges you may opt for a slightly higher temperature (e.g. 2°C).

<table>
<thead>
<tr>
<th>&quot;PLt&quot;</th>
<th>Pull Down Limit Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. -55.0°C</td>
<td>Max. 55.0°C</td>
</tr>
<tr>
<td>Default 0.0°C</td>
<td></td>
</tr>
</tbody>
</table>

# Pull Down Reduction Temperature Δt
The controller calculates a lower set point during pull down mode to increase the cooling capacity of your appliance. For each hour the cabinet temperature is above the pull down initiate temperature, the set point is reduced with the value of "Prt".

<table>
<thead>
<tr>
<th>&quot;Prt&quot;</th>
<th>Pull Down Reduction Temperature Δt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 0.0 K</td>
<td>Max. 10.0 K</td>
</tr>
<tr>
<td>Default 0.1 K</td>
<td></td>
</tr>
</tbody>
</table>

# Defrost settings

## Defrost Type
- "no": defrost function is disabled.
- "El": electrical defrost.
- "Hgd": hot gas defrost (contact Danfoss for details).
- "Nat": OFF-cycle defrost (natural defrost).

<table>
<thead>
<tr>
<th>&quot;dft&quot;</th>
<th>Defrost Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default no</td>
<td></td>
</tr>
</tbody>
</table>

## Adaptive defrost
- "no": defrost controlled by time.
- "Yes": automatic defrost control activated.

<table>
<thead>
<tr>
<th>&quot;Add&quot;</th>
<th>Adaptive defrost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. no</td>
<td>Max. yes</td>
</tr>
<tr>
<td>Default no</td>
<td></td>
</tr>
</tbody>
</table>

## Terminate Temperature
This parameter defines at what temperature the defrost cycle will stop. The temperature is given by the evaporator sensor or by the cabinet temperature sensor if no evaporator sensor is used.

<table>
<thead>
<tr>
<th>&quot;dtt&quot;</th>
<th>Terminate Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 0.0°C</td>
<td>Max. 25.0°C</td>
</tr>
<tr>
<td>Default 6.0°C</td>
<td></td>
</tr>
</tbody>
</table>

## Defrost reset temperature
The defrost counter is saved and restored at power-up, but if the temperature sensor, used for defrost, is higher than this value at power-up, it is assumed that the evaporator is free of ice and the defrost counter will be cleared.

<table>
<thead>
<tr>
<th>&quot;drt&quot;</th>
<th>Defrost reset temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 0.0°C</td>
<td>Max. 200.0°C</td>
</tr>
<tr>
<td>Default 0.0°C</td>
<td></td>
</tr>
</tbody>
</table>

## Defrost minimum interval/dii
Defines the minimum time period between the start of two defrost cycles. This parameter is applicable only in Adaptive defrost mode.

<table>
<thead>
<tr>
<th>&quot;dii&quot;</th>
<th>Defrost minimum interval/dii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 1 hour</td>
<td>Max. 96 hour</td>
</tr>
<tr>
<td>Default 6 hour</td>
<td></td>
</tr>
</tbody>
</table>

## Maximum Interval
Defines the maximum time period between the start of two defrost cycles.

<table>
<thead>
<tr>
<th>&quot;dAI&quot;</th>
<th>Maximum Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 1 hour</td>
<td>Max. 96 hour</td>
</tr>
<tr>
<td>Default 7 hour</td>
<td></td>
</tr>
</tbody>
</table>

## Minimum Time
Defines the minimum duration of a defrost cycle. During this period, the controller will not check the temperature. Once the minimum time has expired, the temperature will be checked and if the terminate temperature "dtt" has been reached, the defrost cycle will end. If dtt has not been reached, defrost will continue until either dtt is reached or the maximum time "dAI" reached, whichever occurs first.

<table>
<thead>
<tr>
<th>&quot;dIT&quot;</th>
<th>Minimum Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 0 min</td>
<td>Max. 240 min</td>
</tr>
<tr>
<td>Default 5 min</td>
<td></td>
</tr>
</tbody>
</table>

## Maximum Time
Defines the maximum duration of a defrost cycle. The controller will not allow a maximum time to be entered which is less than the minimum time, or a minimum time which is more than the maximum time.

<table>
<thead>
<tr>
<th>&quot;dAT&quot;</th>
<th>Maximum Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 0 min</td>
<td>Max. 480 min</td>
</tr>
<tr>
<td>Default 30 min</td>
<td></td>
</tr>
</tbody>
</table>
### Drip OFF Time
This parameter can be set to between 0 and 60 minutes and defines how long the delay is between the heater being switched OFF and the compressor starting again.

### Fan Delay after Defrost
Defines how long the delay is between the start of the compressor after defrost and the fan starting again.

### Fan Start Temperature
This only applies if an evaporator temperature sensor is fitted.

This parameter determines at what evaporator temperature the fan will start after a defrost cycle is complete. If the time set in "Fdd" occurs before the temperature set in "Ftd", the fan will start in line with "Fdd". If the temperature set in "Ftd" occurs first, then the fan will start in line with "Ftd". It is therefore a case of whichever parameter's setting is reached first which determines when the fan starts.

### Defrost Fan On
Set to "Y"ES", the fan will constantly run during defrost cycles. Set to "no", the fan will not run during defrost cycles.

### Defrost ON Compressor Time
If Yes: Defrost time based on actual accumulated compressor ON time "doC"
If NO: Defrost Times based on elapsed time.

### Defrost by Comp. running time
Continuous compressor running can cause defrost. "0" = deactived

### Defrost start evaporator temp
Defrost will get triggered at this temperature after expiry of minimum defrost interval "dii" (adaptive defrost only).

### Defrost Δt
Defrost Δt compare with evaporator temperature of first cut out after defrost to trigger defrost start. The defrost start if evaporator temperature has decreased more the "ddt"

### Initial Defrost Interval
The initial defrost interval determines the time for first defrost after power-up. The initial defrost is mainly intended for factory testing of the defrost functionality and can be set to expire after a number compressor cycles according to the setting of parameter "idd". During normal operation, the defrost counter will be saved in memory and restored after power loss, making the initial defrost unnecessary.

### Initial Defrost Duration
The initial defrost duration is the number of compressor cycles before the initial defrost is deactivated. "0": "idd" No initial defrost.
1-998": number of compressor cycles before deactivation.
"999": initial defrost always active.
# Compressor settings

<table>
<thead>
<tr>
<th>CoP</th>
<th>Compressor settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;uPt&quot;</td>
<td><strong>Voltage protection</strong>&lt;br&gt;&quot;no&quot;: no voltage protection.&lt;br&gt;&quot;YEs&quot;: voltage protection activated based on voltage related settings.</td>
</tr>
<tr>
<td>&quot;ULi&quot;</td>
<td><strong>Minimum cut-in voltage/ULi. Minimum cut-out voltage/ULo.</strong>&lt;br&gt;&lt;br&gt;<strong>Maximum voltage/ULHi</strong>&lt;br&gt;These three parameters provide voltage protection to the compressor. Start by setting &quot;ULHi&quot;, followed by &quot;ULo&quot; and &quot;ULi&quot;.&lt;br&gt;&lt;br&gt;&quot;ULi&quot;: when the compressor is due to start, the voltage of the power supply will be checked and the compressor will only be allowed to start if it is at least the value given in this parameter.&lt;br&gt;&lt;br&gt;&quot;ULo&quot;: when the compressor is running, it will be switched OFF if the voltage goes below that given in this parameter.&lt;br&gt;&lt;br&gt;&quot;ULHi&quot;: when the compressor is running, it will be switched OFF if the voltage exceeds that given in this parameter. If the compressor is already stopped, it will remain switched OFF.</td>
</tr>
<tr>
<td>&quot;ULo&quot;</td>
<td><strong>Sensor Error Type</strong>&lt;br&gt;&quot;no&quot;: no sensor error handling.&lt;br&gt;&quot;SEt&quot;: in case of control sensor error, follow error run/stop time.</td>
</tr>
<tr>
<td>&quot;Ert&quot;</td>
<td><strong>Error Run Time</strong>&lt;br&gt;The parameter only become active in the unlikely event of a broken temperature sensor. It is used to run the application in safety mode. At the same time the sensor error will be shown in the display. &quot;Ert&quot; define the duration the compressor will run. Example: &quot;Ert=4&quot; [min] and &quot;EST=16&quot; [min] will provide an average cooling system activity of 20%. Ert and &quot;EST&quot; values are based on OEM experience and are by default inactive.</td>
</tr>
<tr>
<td>&quot;EST&quot;</td>
<td><strong>Error Stop Time</strong>&lt;br&gt;The parameter only become active in the unlikely event of a broken temperature sensor. It is used to run the application in safety mode. At the same time the sensor error will be shown in the display. &quot;EST&quot; define the duration the compressor will be &quot;idle&quot;.</td>
</tr>
<tr>
<td>&quot;CSt&quot;</td>
<td><strong>Minimum Stop Time</strong>&lt;br&gt;It determines the minimum number of minutes the compressor must remain idle before a Temperature cut-in can take effect. For example, if the temperature sensor indicates that the cut-in temperature has been reached, but the number of minutes set in this parameter have not elapsed since the compressor last stopped, then the compressor will stay OFF. It will only start once the duration given by &quot;CSt&quot; has been reached provided the temperature is still high enough. &quot;CSt&quot; thus overrides the cut-in.</td>
</tr>
<tr>
<td>&quot;CRT&quot;</td>
<td><strong>Minimum Run Time</strong>&lt;br&gt;It determines the minimum number of minutes the compressor must run before a Temperature cut-out can take effect. For example, if the temperature sensor indicated that the cut-out temperature has been reached, but the number of minutes set in this parameter have not elapsed since the compressor last started, then the compressor will continue. It will only stop once the duration given by &quot;CRT&quot; has been reached – provided the temperature is still low enough. &quot;CRT&quot; thus overrides the cut-out.</td>
</tr>
<tr>
<td>&quot;COT&quot;</td>
<td><strong>Maximum OFF Time</strong>&lt;br&gt;This is the maximum time in minutes the compressor is allowed to &quot;idle&quot; – up to 480 minutes. Cot is set to zero by default (inactive). If the controller is used on a draft beer (ice bank) application, this parameter can be used to control the ice thickness.</td>
</tr>
</tbody>
</table>
### Condenser Protection settings

**“Cdd”**  
Min. 0 min  
Max. 15 min  
Default 0 min  
Compressor Door Open Delay/Cdd  
This parameter sets the delay in minutes before the compressor stops when the door is opened. If set to zero, the function is disabled.

**“Srf”**  
Min. 0 min  
Max. 60 min  
Default 0 min  
System resume after door open  
Fan and Compressor resume after cut out by door open.

**“Pod”**  
Min. 0 s  
Max. 300 s  
Default 0 s  
Power ON Delay  
This is the delay in seconds between power-on and the compressor being activated.  
Depends on the power ON temperature setting as explained below.

**“Pot”**  
Min. -100.0°C  
Max. 200.0°C  
Default -100.0°C  
Power ON Temperature  
This parameter is used to accelerate the first application test on the OEM assembly line; if the cabinet temperature is higher than this parameter the power ON Delay is overruled and the outputs are activated without delay.

**CAL**  
Min. 0°C  
Max. 200°C  
Default 80°C  
Condenser Alarm Limit/CAL  
This parameter sets the temperature for the condenser at which an alarm will be generated.

**Cbl**  
Min. 0°C  
Max. 200°C  
Default 85°C  
Condenser Block Limit/Cbl  
This parameter sets the temperature which if reached will cause the compressor to switch OFF.

**Col**  
Min. 0°C  
Max. 200°C  
Default 60°C  
Condenser OK Limit/Col  
This parameter sets the temperature at which the compressor is allowed to start again after the temperature set in “Cbl” above has been exceeded and the compressor stopped.

**CLl**  
Min. -100°C  
Max. 20°C  
Default -5°C  
Condenser Low Limit/CLl  
This parameter sets the lowest (condenser) temperature at which the compressor is allowed to start.

### Display settings

**dis**  
Min. no  
Max. yes  
Default no  
Display settings  
NOTE: some display parameters can be set in such as way that they may be illegal in some jurisdictions. Please check local legislation.

**dic**  
Min. no  
Max. yes  
Default no  
Display intensity auto control  
“no”: display intensity use fixed value.

**din**  
Min. 2  
Max. 10  
Default 10  
Display Intensity  
The controller can have its display intensity (brightness) set in one of two ways:  
A) With a Danfoss ambient light sensor attached, the brightness of the display is adjusted automatically according to the ambient light level (see the assignments section).  
B) When no ambient light sensor is attached, the display intensity can be set to a fixed intensity. Both options are on a scale of 1 to 10, where 10 is the brightest.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| **"CFu"** | Display Unit  
This parameter sets the display to Fahrenheit or Celsius. Switching from one to the other will cause all temperature settings to be automatically updated accordingly. |
| **"trS"** | Temp sensor to display  
"SCo": temperature control.  
"EuA": evaporator temperature.  
"Con": condenser temperature (condenser cleaning).  
"AuS": only for showing on display. |
| **"rES"** | Display Resolution  
This parameter can be set to 0.1, 0.5 or 1 and affects the way the temperature is displayed. With the parameter set to 1, the display will only ever show temperatures rounded to the nearest whole degree. At 0.5, it will round the temperature to the nearest half degree for display. For example, 3.3 degrees will be shown in the display as 3.5 degrees and 3.9 as 4.0. With the parameter set to 0.1, no rounding occurs. This parameter does not affect the temperature itself, merely the display. |
| **"rlt"** | Display Range Limit  
In some point of sales applications you may want to show the desired instead of the real temperature. This parameter sets whether the displayed temperature is the actual temperature or whether it is restricted to the cut-in / cut-out limits. Set to "nO" means that the actual temperature will be displayed. The parameter is set to "nO" by default. |
| **"ddl"** | Display Delay  
In order to provide a realistic temperature appearance for an application, a display delay can be set. The parameter sets the time constant \( \tau \) (tau) of the moving average filter for the display. Physically, one time constant represents the time it takes the system's step-response to reach 66% of its final value and five time-constants the time it takes to reach 99% of its final value. |
| **"doF"** | Display Offset  
This parameter is a relative value and allows the temperature displayed to be different to the temperature measured. For instance, at a measured temperature of 7 °C and "doF" set to -2K, the displayed temperature will be 5 °C instead. |
| **"dlt"** | Lock Time After Defrost  
In order not to show a rising temperature during defrosting, the displayed temperature is locked at the temperature shown at the start of the defrost cycle for the number of minutes set in this parameter. "0": no lock. |
| **"SEC"** | Show Economy State  
If set to "yES", this parameter causes the display to show ECO when the system is in ECO mode. If set to "nO", the temperature continues to be displayed. |
| **"SSC"** | Show Pull down state  
If set to "yES", this parameter causes the display to show SC when the system is in pull down mode. If set to "nO", the temperature continues to be displayed. |
| **"SHo"** | Show Holiday  
"nO": display will show temperature or ECO mode during holiday mode. "yES": display will show "HoL" during holiday mode. |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| “Sdf”    | Show Defrost  
If set to "yES", this parameter causes the display to show DEF when the system is in defrost mode. If set to "nO", the temperature continues to be displayed. |
| “SCS”    | Show compressor symbol  
"nO": compressor symbol will not show on display.  
"yES": show compressor symbol on display. |
| “SFS”    | Show Fan symbol  
"nO": san symbol will not show on display.  
"yES": show fan symbol on display. |
| “Sds”    | Show Defrost symbol  
"nO": defrost symbol will not show on display.  
"yES": show defrost symbol on display. |
| “SES”    | Show ECO symbol  
"nO": ECO symbol will not show on display.  
"yES": show ECO symbol on display. |
| “Ld”     | Minimum Display value  
If the probe value is less than minimum display value mentioned in this parameter, it doesn’t show the actual value and instead show this minimum only until the probe starts reading a higher value than minimum display value set here. |
| “Hd”     | Maximum display value  
• Controller will display actual temperature, if the probe value is between Maximum display value and Signaling threshold value and the trend of the probe is increasing (trend is based on past 10 readings)  
• Controller will display Error "Err", if the probe value is more than Signaling threshold value and the trend of the probe is increasing (based on the past 10 readings)  
• Controller will display "---" if the probe value is more than signaling threshold and trend of the probe is decreasing (based on the past 10 readings)  
• Controller will display "---" if the probe value is bigger than Max display value and the trend of the probe is decreasing (based on the past 10 readings) |
| “St”     | Signalling threshold value  
Temperature limit for Maximum display visualization |

### ALA  
Alarm settings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| “HAt”    | High Temp Alarm  
Absolute value.  
By setting "HAt" to the maximum alarms will be deactivated. |
| “LAt”    | Low Temp Alarm  
Absolute value.  
By setting "LAt" to the minimum value, alarms will be deactivated.  
In most situations, the low alarm delay will be set to 0 to warn about too low a temperature immediately. |
| “Htd”    | Alarm delay on high temperature alarm  
The number of minutes to wait before sounding an alarm once the high temperature alarm temperature is reached. |
| “Ltd”    | Alarm delay on low temperature alarm  
The number of minutes to wait before sounding an alarm once the low temperature alarm temperature is reached. |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pdd</td>
<td>Pull down delay</td>
<td>240 min</td>
<td>Min. 0 min, Max. 960 min, Default 240 min</td>
</tr>
<tr>
<td>dod</td>
<td>Door Open delay</td>
<td>2 min</td>
<td>Min. 0 min, Max. 60 min, Default 2 min</td>
</tr>
<tr>
<td>uAL</td>
<td>Voltage alarm</td>
<td>no</td>
<td>Min. no, Max. yes, Default no</td>
</tr>
<tr>
<td>LEA</td>
<td>Leakage alarm</td>
<td>no</td>
<td>Min. 0 hour, Max. 96 hour, Default 0 hour</td>
</tr>
<tr>
<td>Abd</td>
<td>Alarm Buzzer Duration</td>
<td>999 min</td>
<td>Min. 0 min, Max. 999 min, Default 0 min</td>
</tr>
<tr>
<td>ACA</td>
<td>Auto Clear of Alarm/Error/ACA</td>
<td>yes</td>
<td>Min. no, Max. yes, Default yes</td>
</tr>
<tr>
<td>AuH</td>
<td>Automatic Heater Mode Enable</td>
<td>no</td>
<td>Min. no, Max. yes, Default no</td>
</tr>
</tbody>
</table>

**Pull down delay**

Normally, it is not necessary or desirable to sound an alarm during a pull down (the initial phase of reaching the desired temperature). This parameter prevents the high temperature alarm "HAt" sounding during pull down and after a defrost for the number of minutes set for the parameter.

NOTE: it does not apply to the low temperature alarm "LAt".

**Door Open delay**

It is possible to indicate to customers that a door has accidentally been left open. This parameter sets the delay in minutes before the alarm sounds. This is useful in environments where customers/users may hold the door open while making their selection. If the door is closed again before the set number of minutes is reached, the alarm does not sound.

NOTE: a door sensor is required if this parameter is to be activated.

**Voltage alarm**

"no": no voltage alarm.
"yES": voltage alarm activated.

**Leakage alarm**

Leakage detection for compressor protection. If compressor operates for more than the set time, an alarm will be triggered.

**Auto Clear of Alarm/Error/ACA**

If this parameter is set to "nO": The alarm status will not disappear automatically even if the condition which caused the alarm is no longer valid or present.
If set to "yES": As soon as the condition which caused the alarm is no longer valid or present, the alarm status will automatically change back to inactive.

There will be no trace of the alarm having occurred. In general, glass door merchandise applications will be set to "yES" and commercial Fridges and freezers set to "nO".

For example, if the temperature goes too high for a period there may be food safety considerations in a freezer containing food but not in a fridge with cold drinks.

**Automatic Heater settings**

Automatic Heater Control applies reverse cooling mode (heating) to your refrigeration appliance where the ambient temperature can go below the set point.
A) It will use the Defrost output to control the heating function when needed. Defrost operations will operate as normal.
B) Automatic heater will only operate when using Electric Defrost. It is disabled with Natural Defrost or Hot Gas Defrost.

**Automatic Heater Mode Enable**

This setting is normally set to "no".
When set to "yES", parameters "End", "AHS" and "AHD" apply.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| "End"     | Energy Mode Delay  
This is the delay in minutes between the heater and the compressor operation. The heater is not allowed to start until this number of minutes has expired after the compressor has cut out and vice versa. |
| "AHS"     | Auto Heat set point  
Set point of auto heating. |
| "AHd"     | Auto heat differential  
Thermostat differential for auto heating. |
| "ECS"     | ECO strategy  
NOTE: some of these parameters require the installation of the Danfoss Ambient Light Sensor. The Danfoss USB Gateway in combination with "KoolProg Software" allows for real time measurement of the current light intensity. Danfoss recommends testing and adjusting "SLd" and "SLn" values according to customers' specific needs. |
| "ECo"     | ECO ON/OFF  
ECO active or not. If no all other settings are not active. |
| "EdA"     | Door Actions  
Times of door action to trigger exiting ECO |
| "EPA"     | Pir Actions  
Times of "PIR" action to trigger exiting ECO |
| "ECT"     | Action counter time  
It is the duration of time for which the controller will check for number of times of Door action or activity through PIR sensor (mentioned in "EDA" and "EPA" parameters) to exit the ECO mode. |
| "Edd"     | Door delay  
Door delay after door close to trigger entering ECO |
| "Epd"     | Pir delay  
"PIR" delay to trigger entering ECO |
| "SLd"     | Shop Light Day  
These parameters are set as the percentage of the maximum light and determine when the device moves into or out of ECO mode for power-saving purposes. Requires Light Sensor. |
| "SLn"     | Shop Light Night |
| "tto"     | Time to pull down  
Time that ERC must stay in ECO to go into Pulldown upon exiting ECO. E.g: If tto = 2, if the ERC stays in ECO for 2 or more hours, it will go into Pulldown after exiting ECO. If it stays in ECO for less than 2 hours, it will go to Serving Mode upon exiting ECO. |
| "Lsd"     | Light Source delay on ECO  
Time delay for light source to change from serving mode source to ECO mode source. |
### “Eru”

**EWU active on/OFF**

Enable or disable early wake up.

**Min.** no  
**Max.** yes  
**Default.** yes  

### “CLH”

**Shop close hour**

Shop is assumed to be closed when staying in ECO mode longer than shop close hour.

**Min.** 0 hour  
**Max.** 24 hour  
**Default.** 6 hour  

### “ErL”

**Early wake up time offset**

Time of exiting ECO mode for next day=

Time of first activity to exit ECO mode - the early wake-up time.

"0": early wake up function disabled.

**Min.** 0 min  
**Max.** 240 min  
**Default.** 120 min  

### “Hol”

**Holiday Length**

If controller stays for longer than Hol in ECO and no activity is detected, the controller will go into Holiday Mode. Early Wake Up is disabled.

**Min.** 0 hour  
**Max.** 999 hour  
**Default.** 72 hour  

<table>
<thead>
<tr>
<th>ECA</th>
<th>ECO management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Eto”</strong></td>
<td>Eco Temperature Offset</td>
</tr>
</tbody>
</table>
| **Min.** -25.0 K  
**Max.** 25.0 K  
**Default.** 4.0 K  |

This parameter gives a relative temperature in degrees. It is the difference in temperature for ECO mode operation compared to normal mode.  

NOTE: setting a temperature offset may be illegal in some jurisdictions.

| **“Hto”** | Holiday Temperature Offset  |
| **Min.** -25.0 K  
**Max.** 25.0 K  
**Default.** 6.0 K  |

Increase or decrease of temperature with respect to normal mode during holiday mode.

| **“diE”** | ECO Differential  |
| **Min.** 0.0 K  
**Max.** 10.0 K  
**Default.** 2.0 K  |

Thermostat differential for ECO.

| **“FoE”** | ECO Fan on cycle  |
| **Min.** 0 s  
**Max.** 960 s  
**Default.** 0 s  |

On time for fan during compressor OFF period in ECO mode.

| **“FSE”** | ECO Fan stop cycle  |
| **Min.** 0 s  
**Max.** 960 s  
**Default.** 0 s  |

OFF time for fan during compressor OFF period in ECO mode.

| **“ELC”** | ECO Cabinet light control  |
| **Min.** 0 min  
**Max.** 10 min  
**Default.** 5 min  |

“on”: always ON (Button is default to control light for all these options).  
“off”: always OFF.  
“door”: door sensor only.

| **“Eld”** | Eco Light Delay  |
| **Min.** 0 min  
**Max.** 10 min  
**Default.** 5 min  |

This parameter causes a delay to the switch from normal to ECO mode when the shop lights are switched ON or OFF. The ambient light sensor detects the change in light level and causes a switch mode. With this parameter set to zero, the switch OFF mode occurs immediately.  
If not set to zero (max: 10 minutes), then the change will be delayed by the number of minutes set.

### ASi

**Assignments settings**

| **“uSA”** | MODBUS Safety  |
| **Min.** no  
**Max.** yes  
**Default.** no  |

“no”: MODBUS auto detection is enable and serial communication is available for configuration KoolProg Software.  
“yes”: MODBUS communication is deactivated.
### "t1A"

**Air Temperature Adjustment**  
*(applies to non-Danfoss temperature sensors only)*  
This parameter is a relative value and allows adjustment of the control sensor temperature.

For instance, at a measured temperature of 7°C and "tAd" set to -2 K, the input from the control sensor will be 5°C instead.

### "t2A"  

### "t3A"  

### "t4A"

### Inputs and outputs are configurable

There are two steps:

1. Define the type of sensor attached to the input:  
   - **temperature**: light/digital.
2. Define the application for the sensor:
   - **temperature**: control/condenser/evaporator.
   - **light**: ECO/display/both.
   - **motion**: digital: door sensor.

Please contact your local Danfoss representative for information about default settings.

**NOTE:** Coded sensors will impact on the number of possible configurations.

For instance: Danfoss supplies only 2-pole defrost sensors, so input "S3" will most likely be used as a defrost/evaporator temperature sensor input.

### "S1C"

<table>
<thead>
<tr>
<th>Default Stn</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1 Config/S1C</td>
</tr>
<tr>
<td>S2 Config/S2C</td>
</tr>
<tr>
<td>S3 Config/S3C</td>
</tr>
</tbody>
</table>

### "S2C"

<table>
<thead>
<tr>
<th>Default Stn</th>
</tr>
</thead>
<tbody>
<tr>
<td>S4 Config/S4C</td>
</tr>
</tbody>
</table>

### "S3C"

<table>
<thead>
<tr>
<th>Default Stn</th>
</tr>
</thead>
<tbody>
<tr>
<td>S5 Config/S5C</td>
</tr>
</tbody>
</table>

### "S4C"

<table>
<thead>
<tr>
<th>Default Stn</th>
</tr>
</thead>
<tbody>
<tr>
<td>S6 Config/S6C</td>
</tr>
</tbody>
</table>

### "S1A"

<table>
<thead>
<tr>
<th>Default nC</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1 Application/S1A</td>
</tr>
<tr>
<td>S2 Application/S2A</td>
</tr>
<tr>
<td>S3 Application/S3A</td>
</tr>
<tr>
<td>S4 Application/S4A</td>
</tr>
</tbody>
</table>

### "S2A"

<table>
<thead>
<tr>
<th>Default nC</th>
</tr>
</thead>
<tbody>
<tr>
<td>S5 Application/S5A</td>
</tr>
<tr>
<td>S6 Application/S6A</td>
</tr>
</tbody>
</table>

### "S3A"

<table>
<thead>
<tr>
<th>Default nC</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Con&quot;: condenser temperature (Condenser cleaning).</td>
</tr>
<tr>
<td>&quot;AuS&quot;: only for showing temperature on display.</td>
</tr>
<tr>
<td>&quot;Ldr&quot;: light sensor, Luminens.</td>
</tr>
</tbody>
</table>

### "S4A"

<table>
<thead>
<tr>
<th>Default nC</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;ECO&quot;: external input to control ECO mode.</td>
</tr>
<tr>
<td>&quot;doC&quot;: door contact, contact closed when door closed.</td>
</tr>
<tr>
<td>&quot;doo&quot;: door contact, contact open when door closed.</td>
</tr>
<tr>
<td>&quot;Pv&quot;: motion sensor (only &quot;S3&quot;).</td>
</tr>
<tr>
<td>&quot;bt5&quot;: button 5 (only &quot;S4&quot;).</td>
</tr>
</tbody>
</table>
### "diC"

**Default non**

This is the digital input used for a digital sensor or bus communications.

*"non": not used.*

*"doC": door contact, contact closed when door closed.*

*"doo": door contact, contact open when door closed.*

*"ECo": external input to control ECO mode.*

*" Pir": motion sensor. Passive infrared.*

### "o1C"

**Default CoP**

This is the digital input used for a digital sensor or bus communications.

*"CoP": direct compressor control.*

*"PiC": pilot Relay (no zero cross) – if using pilot relay to control a compressor, this option must be used instead of "CoP".*

*"HÉF": heating application, inverse output.*

*"PH": pilot heat relay (no zero cross).*

### "o2C"

**Default CoP**

*"CoP": direct compressor control.*

*"PiC": pilot Relay (no zero cross) – if using pilot relay to control a compressor, this option must be used instead of "CoP".*

*"HÉF": heating application, inverse output.*

*"PH": pilot heat relay (no zero cross).*

### "o3C"

**Default noP**

*"no": not used.*

*"dEF": electric defrost heater/valve for hot gas.*

*"ALAn": alarm output.*

*"Fan": fan control.*

*"Lig": light control.*

### "o4C"

**Default noP**

*"no": not used.*

### "b1C"

**Default noP**

**Button 1 Config (short press)/b1C**

**Button 1 Config (long press)/b1L**

**Short press function**

*"noP": not operating*

*"tP": increase set point*

*"tn": decrease set point*

*"ECo": toggle Eco mode*

*"Lig": toggle light*

*"dEF": toggle defrost*

*"SuP": toggle super-cool/pull down*

*"dIP": increase display intensity*

*"din": decrease display intensity*

*"CFA": toggle °C and °F*

*"PoF": ERC power ON/OFF*

*"HoL": enter holiday mode*

**Long press function (3 s.)**

*"noP": not operating*

*"tP": increase set point*

*"tn": decrease set point*

*"ECo": toggle Eco mode*

*"Lig": toggle light*

*"dEF": toggle defrost*

*"SuP": toggle super-cool/pull down*

*"dIP": increase display intensity*

*"din": decrease display intensity*

*"CFA": toggle °C and °F*

*"PoF": ERC power ON/OFF*

*"HoL": enter holiday mode*

### "b2L"

**Upper right button:**

**Button 3 Config (short press)/b3C**

**Button 3 config (long press)/b3L**

**Short press function**

*"noP": not operating*

*"tP": increase set point*

*"tn": decrease set point*

*"ECo": toggle Eco mode*

*"Lig": toggle light*

*"dEF": toggle defrost*

*"SuP": toggle super-cool/pull down*

*"dIP": increase display intensity*

*"din": decrease display intensity*

*"CFA": toggle °C and °F*

*"PoF": ERC power ON/OFF*

*"HoL": enter holiday mode*

**Long press function (3 s.)**

*"noP": not operating*

*"tP": increase set point*

*"tn": decrease set point*

*"ECo": toggle Eco mode*

*"Lig": toggle light*

*"dEF": toggle defrost*

*"SuP": toggle super-cool/pull down*

*"dIP": increase display intensity*

*"din": decrease display intensity*

*"CFA": toggle °C and °F*

*"PoF": ERC power ON/OFF*

*"HoL": enter holiday mode*

### "b3C"

**Default noP**

**Button 4 Config (short press)/b4C**

**Button 4 config (long press)/b4L**

**Short press function**

*"noP": not operating*

*"tP": increase set point*

*"tn": decrease set point*

*"ECo": toggle Eco mode*

*"Lig": toggle light*

*"dEF": toggle defrost*

*"SuP": toggle super-cool/pull down*

*"dIP": increase display intensity*

*"din": decrease display intensity*

*"CFA": toggle °C and °F*

*"PoF": ERC power ON/OFF*

*"HoL": enter holiday mode*

**Long press function (3 s.)**

*"noP": not operating*

*"tP": increase set point*

*"tn": decrease set point*

*"ECo": toggle Eco mode*

*"Lig": toggle light*

*"dEF": toggle defrost*

*"SuP": toggle super-cool/pull down*

*"dIP": increase display intensity*

*"din": decrease display intensity*

*"CFA": toggle °C and °F*

*"PoF": ERC power ON/OFF*

*"HoL": enter holiday mode*

### "b5C"

**Default noP**

**Button 5 Config (short press) / b5C**

**Button 5 Config (long press) / b5L**

*(Button 5 is an external button option which can be connected and configured through S4 sensor.)*

**Short press function**

*"noP": not operating*

*"ECo": toggle Eco mode*

*"SuP": toggle super-cool/pull down*

*"Lig": toggle light*

*"dEF": toggle defrost*

**Long press function (3 s.)**

*"noP": not operating*

*"ECo": toggle Eco mode*

*"SuP": toggle super-cool/pull down*

*"Lig": toggle light*

*"dEF": toggle defrost*

*"PoF": ERC power ON/OFF*

*"HoL": enter holiday mode*
These assign passwords to the three levels of access. The password is a three-digit number. Access levels are Shop, Service and OEM. You may not therefore have access to change all the passwords. Passwords are entered by using the up and down arrow buttons. Danfoss advises against using passwords which are easy to remember or enter, for example 111, 222, 123 etc.

NOTE: When accessing the controller with 3 wrong password in a sequence ERC will automatically block access for 15 minutes.

NOTE: The only parameters that can be configured are: "oEL", "oEn", "oEH". These parameters allow OEMs to enter their own product code.

The parameters in the following section are READ ONLY and cannot be changed by the user. They provide information for technicians and OEM users.

NOTE: the following parameters are not configured:

ACt Accumulated Comp. run time
AFt Accumulated Fan run time
ALt Accumulated Light run time
AEt Accumulated ERC up time
SDi DI physical DI pin state (ON; OFF).
UA voltage value
Current main power supply voltage.
OU5 DOs status
Current relay open closed status.
"III" = all relay ON (Upper bar for on, Lower bar for OFF).
"II" = DO1 ON, DO2 OFF, DO3 & DO4 NA (no bar if relay not mounted).
"III" = all relay OFF (Upper bar for on, Lower bar for OFF).

RL1 Relay 1 counter
Thousands of cycles of compressor relay since manufacture.

RL2 Relay 2 counter
Thousands of cycles of no. 2 relay since manufacture.

RL3 Relay 3 counter
Thousands of cycles of no. 3 relay since manufacture.

RL4 Relay 4 counter
Thousands of cycles of no. 4 relay since manufacture.

Interval Counter
Compressor run time since last defrost.

Defrost time counter
Duration of last defrost cycle (min).

Door open counter
"ont/100" = number of door openings since last reset.

Serial number
Serial number given at manufacturing.

SW version
Danfoss software version number.
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;HAr&quot;</td>
<td>HW version</td>
<td>Danfoss hardware version number.</td>
</tr>
<tr>
<td>&quot;onL&quot;</td>
<td>OrderNoLow</td>
<td>Danfoss order code number.</td>
</tr>
<tr>
<td>&quot;onH&quot;</td>
<td>OrderNoHigh</td>
<td>Danfoss order code number.</td>
</tr>
<tr>
<td>&quot;oEL&quot;</td>
<td>OEM code Low</td>
<td></td>
</tr>
<tr>
<td>&quot;oEn&quot;</td>
<td>OEM code Middle</td>
<td></td>
</tr>
<tr>
<td>&quot;oEH&quot;</td>
<td>OEM code High</td>
<td></td>
</tr>
<tr>
<td>&quot;PaR&quot;</td>
<td>Parameter version</td>
<td>OEM parameter version number [requires EKA copy key update].</td>
</tr>
<tr>
<td>&quot;Chd&quot;</td>
<td>Manufacturing date</td>
<td>Programme date WWY: week number and year number (2010-19).</td>
</tr>
<tr>
<td>&quot;SFC&quot;</td>
<td>Set as Default</td>
<td>Resets all parameters to last good OEM settings.</td>
</tr>
<tr>
<td>&quot;Ctt&quot;</td>
<td>Condenser Temp</td>
<td>Temperature of the condensor sensor.</td>
</tr>
<tr>
<td>&quot;Et1&quot;</td>
<td>Evaporator1 Temp</td>
<td>Temperature of the evaporator sensor1.</td>
</tr>
<tr>
<td>&quot;Et2&quot;</td>
<td>Evaporator2 Temp</td>
<td>Temperature of the evaporator sensor2.</td>
</tr>
<tr>
<td>&quot;AuS&quot;</td>
<td>AUX Temp</td>
<td>Temperature of the AUX sensor. invisible.</td>
</tr>
<tr>
<td>&quot;LLu&quot;</td>
<td>Light level value</td>
<td>Actual light level value from light sensor.</td>
</tr>
<tr>
<td>&quot;Pir&quot;</td>
<td>Motion sensor state</td>
<td></td>
</tr>
<tr>
<td>&quot;att&quot;</td>
<td>Raw Sair Temp</td>
<td></td>
</tr>
<tr>
<td>&quot;ESS&quot;</td>
<td>External ECO switch state</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Display messages</td>
<td></td>
</tr>
<tr>
<td>&quot;unP&quot;</td>
<td>Device is unprogrammed</td>
<td>(relay output is locked)</td>
</tr>
<tr>
<td>&quot;Prg&quot;</td>
<td>Device has not finished programming</td>
<td>(relay output is locked)</td>
</tr>
<tr>
<td>&quot;Eco&quot;</td>
<td>Device is in Eco mode</td>
<td></td>
</tr>
<tr>
<td>&quot;SC&quot;</td>
<td>Device is in pull-down mode</td>
<td>(super-chill)</td>
</tr>
<tr>
<td>&quot;dEF&quot;</td>
<td>Device is defrosting</td>
<td></td>
</tr>
<tr>
<td>&quot;HoL&quot;</td>
<td>Device is in Holiday mode</td>
<td></td>
</tr>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
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<th>Probable cause</th>
<th>Remedy</th>
</tr>
</thead>
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<tr>
<td>Compressor does not start</td>
<td>Waiting for compressor delay timer</td>
<td>Check CoP -&gt; CSt</td>
</tr>
<tr>
<td></td>
<td>Defrost in progress</td>
<td>Check CoP -&gt; Pot/ Pod</td>
</tr>
<tr>
<td></td>
<td>Line voltage to compressor too low or too high</td>
<td>Check def -&gt; dit, dot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check CoP -&gt; uLi, uLo, uHi</td>
</tr>
<tr>
<td>Fan does not start</td>
<td>Door is open or door contact is defective</td>
<td>Fan stops when door is opened</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check that door contact is ok</td>
</tr>
<tr>
<td>Defrost does not start</td>
<td>Controller in pull down mode</td>
<td>Defrost might be delayed during pull down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check parameter Pud -&gt; Pdi</td>
</tr>
<tr>
<td>Alarm does not sound</td>
<td>Alarm delayed</td>
<td>Check ALA -&gt; Htd, Abd</td>
</tr>
<tr>
<td>Display brightness is weak</td>
<td></td>
<td>Check Pud -&gt; Pdd</td>
</tr>
<tr>
<td>Shift between ECO and normal</td>
<td>Ambient light sensor broken</td>
<td>Replace sensor</td>
</tr>
<tr>
<td>mode does not happen on</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ambient light change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display alternates between</td>
<td>Condenser too hot</td>
<td>Clean condenser</td>
</tr>
<tr>
<td>condenser and temperature</td>
<td></td>
<td>Check Con -&gt; CAL, Cbl</td>
</tr>
<tr>
<td>Display alternates between</td>
<td>Temperature too high</td>
<td></td>
</tr>
<tr>
<td>high and temperature</td>
<td></td>
<td>Check ALA -&gt; HA</td>
</tr>
<tr>
<td>Display alternates between</td>
<td>Temperature too low</td>
<td></td>
</tr>
<tr>
<td>low and temperature</td>
<td></td>
<td>Check ALA -&gt; LAt</td>
</tr>
<tr>
<td>Display shows &quot;def&quot;</td>
<td>Defrost in progress</td>
<td>Check diS -&gt; SdF</td>
</tr>
</tbody>
</table>

### Alarm code

<table>
<thead>
<tr>
<th>Alarm code</th>
<th>Trigger</th>
<th>Automatic clearance</th>
<th>Outputs</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Hi&quot;</td>
<td>Air temperature is higher than &quot;ALA-&gt;Hat&quot; for &quot;ALA-&gt;Htd&quot;</td>
<td>User configured</td>
<td>Blink &quot;Hi&quot; with the highest temperature; if configured: cut in alarm relay, beep the buzzer</td>
<td>High temperature alarm</td>
</tr>
<tr>
<td>&quot;Lo&quot;</td>
<td>Air temperature is lower than &quot;LAT&quot; for &quot;Ld&quot;</td>
<td>User configured</td>
<td>Blink &quot;Lo&quot; with the lowest temperature. If configured: cut in alarm relay, beep the buzzer</td>
<td>Low temperature alarm</td>
</tr>
<tr>
<td>&quot;Con&quot;</td>
<td>Condenser temperature is too high or too low</td>
<td>User configured</td>
<td>Blink &quot;Con&quot;. If configured: cut in alarm relay, beep the buzzer</td>
<td>Condenser alarm</td>
</tr>
<tr>
<td>&quot;dor&quot;</td>
<td>Door open for more than &quot;ALA-&gt;dor&quot;</td>
<td>Always</td>
<td>Blink &quot;dor&quot;. If configured: cut in alarm relay, beep the buzzer</td>
<td>Door open alarm</td>
</tr>
<tr>
<td>&quot;uHi&quot;</td>
<td>Line voltage is higher than &quot;Cop-&gt;uHi&quot;</td>
<td>Always</td>
<td>Blink &quot;uHi&quot;. If configured: cut in alarm relay, beep the buzzer</td>
<td>High voltage alarm</td>
</tr>
<tr>
<td>&quot;uLf&quot;</td>
<td>Line voltage is lower than &quot;Cop-&gt;uLf&quot;</td>
<td>Always</td>
<td>Blink &quot;uLo&quot;. If configured: cut in alarm relay, beep the buzzer.</td>
<td>Low voltage alarm</td>
</tr>
<tr>
<td>&quot;LEA&quot;</td>
<td>Compressor continuous running for more than &quot;ALA-&gt;LEA&quot;</td>
<td>Always</td>
<td>Blink &quot;LEA&quot;. If configured: cut in alarm relay, beep the buzzer</td>
<td>Leakage alarm</td>
</tr>
<tr>
<td>&quot;E01&quot;</td>
<td>&quot;S1&quot; error</td>
<td>Always</td>
<td>Blink &quot;E01&quot;. If configured: cut in alarm relay, beep the buzzer</td>
<td>&quot;S1&quot; sensor failure (short or open)</td>
</tr>
<tr>
<td>&quot;E02&quot;</td>
<td>&quot;S2&quot; error</td>
<td>Always</td>
<td>Blink &quot;E02&quot;. If configured: cut in alarm relay, beep the buzzer</td>
<td>&quot;S2&quot; sensor failure (short or open)</td>
</tr>
<tr>
<td>&quot;E03&quot;</td>
<td>&quot;S3&quot; error</td>
<td>Always</td>
<td>Blink &quot;E03&quot;. If configured: cut in alarm relay, beep the buzzer</td>
<td>&quot;S3&quot; sensor failure (short or open)</td>
</tr>
<tr>
<td>&quot;E04&quot;</td>
<td>&quot;S4&quot; error</td>
<td>Always</td>
<td>Blink &quot;E04&quot;. If configured: cut in alarm relay, beep the buzzer</td>
<td>&quot;S4&quot; sensor failure (short or open)</td>
</tr>
</tbody>
</table>
Typical applications

Glass Door Merchandiser, No-frost freezer/sub-zero cooler

Note: this is a typical (default) wiring diagram since both inputs (AI/DI's) and outputs (DO's) can be assigned differently. Please see "AS", assignment

Temperature Sensor for Cabinet Temperature Control
- PVC Standard Connector type (S1) 3-pole
  - 470 mm: 077F8751
  - 1000 mm: 077F8757
  - 1500 mm: 077F8761
  - 2000 mm: 077F8765
  - 2200 mm: 077F8767
  - 3000 mm: 077F8769
  - 5000 mm: 077F8723

Temperature Sensor for Evaporator Temperature Control
- PVC Standard Connector type (S2) 2-pole
  - 1000 mm: 077F8796
  - 1500 mm: 077F8790
  - 2000 mm: 077F8794
  - 3000 mm: 077F8798
  - 6000 mm: 080G2028

Temperature Sensor for Condenser Temperature Control
- PVC Standard Connector type (S3) 3-pole
  - 1000 mm: 077F8756
  - 1500 mm: 077F8760
  - 2000 mm: 077F8764
  - 3000 mm: 077F8768
  - 5000 mm: 080G2039

Motion detection also connectable to S3
- Door sensor cable: 080G3390
- Magnetic door sensor: 080G3391

Door input
- Door sensor cable: 080G3340
- Magnetic door sensor: 080G3341

Glass Door Merchandiser

Temperature Sensor for Cabinet Temperature Control
- PVC Standard Connector type (S1) 3-pole
  - 470 mm: 077F8751
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Motion detection also connectable to S3
- Door sensor cable: 080G3390
- Magnetic door sensor: 080G3391

Door input
- Door sensor cable: 080G3340
- Magnetic door sensor: 080G3341
## Application Matrix

<table>
<thead>
<tr>
<th>Application</th>
<th>ERC type</th>
<th>Output</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard beverage cooler</td>
<td>ERC 112C</td>
<td>Comp Fan Lamp</td>
<td>Control Defrost Condenser or Ambient Light or Motion detection Door or Motion detection</td>
</tr>
<tr>
<td>Sub-zero beverage cooler</td>
<td>ERC 112D</td>
<td>Comp Heater Fan Lamp</td>
<td>Control Defrost Condenser or Ambient Light or Motion detection Door or Motion detection</td>
</tr>
<tr>
<td>Out-door beverage cooler</td>
<td>ERC 112D</td>
<td>Comp Heater Fan Lamp</td>
<td>Control Condenser Ambient Light or Motion detection Door or Motion detection</td>
</tr>
<tr>
<td>Nofrost freezer w. glassdoor</td>
<td>ERC 112D</td>
<td>Comp Heater Fan Lamp</td>
<td>Control Evaporator Condenser or Ambient Light or Motion detection Door or Motion detection</td>
</tr>
<tr>
<td>CFF refrigerator</td>
<td>ERC 112C</td>
<td>Comp Fan Lamp</td>
<td>Control Defrost Condenser Door</td>
</tr>
<tr>
<td>CFF freezer</td>
<td>ERC 112D</td>
<td>Comp Heater Fan Lamp</td>
<td>Control Defrost Condenser Door</td>
</tr>
</tbody>
</table>

**S: connector position**

**NOTE:**
- Select only one function per input, e.g. condenser sensor or ambient light sensor.
- Make sure that the accessory you select has a matching connector to the input, e.g. a sensor for input "S2" must have "S2" connector.
- Condenser sensor or light sensor are optional and can be omitted.
- Defrost sensor is mandatory when electrical heater is used for defrost. For natural defrost it can be omitted.
Sensor placement

Control sensor

The control sensor must always be connected and is used for controlling the cut-in and cut-out of the compressor according to the set point. The sensor is also used for the displayed temperature.

Vertical coolers with fan
Most common placement is in the return air to the evaporator. The sensor can be placed close to the fan – even when the fan is pulsed during compressor OFF periods: the updating of the temperature is blocked when the fan is stopped and only updated when the fan has been running for a while, so that the heat from the fan does not affect the temperature reading.
For applications sensitive to sub-zero temperatures, sensor placement in the evaporator outlet air can be considered.

Vertical freezers with fan
Placement in the return air or in the freezer compartment.

Coolers without fan
The best results are normally obtained when the sensor is placed at the side-wall, 10 cm from the back and approximately at 1/3 from the bottom or where the evaporator ends.
The control sensor must always be connected and is used for controlling the cut-in and cut-out of the compressor according to the set point. The sensor is also used for the displayed temperature.

Evaporator sensor

The evaporator sensor is only used for de-icing of the evaporator and has no control purpose.

Placement of sensor
Place the sensor where the ice melts last. Please be aware of that sharp fins can damage the cable.
Condenser sensor

The condenser sensor is used to protect the compressor against high pressure when the condenser is blocked or the condenser fan fails.

Condenser sensor

Place the sensor at the liquid side of the condenser. Use a metal bracket or metal tape to ensure good thermal conductivity. Be sure that the cable does not pass hot spots at the compressor or condenser that exceeds 80°C.

Placement of sensor

The sensor must be placed so that the interior light does not affect the sensor. Possible placement could be in the front of the cooler or at the top.

Ambient light sensor

The ambient light sensor is used to detect opening hours of the shop.

Placement of sensor

The sensor must be placed so that the interior light does not affect the sensor. Possible placement could be in the front of the cooler or at the top.

Door sensor

The door sensor is used to detect buying activity and to stop the fan when the door is opened.

Door sensor

Danfoss does not supply the door-switch. Use the door-switch you have and connect it to the cable supplied by Danfoss.