



Danfoss CO2 Module Controller Universal Gateway User Guide

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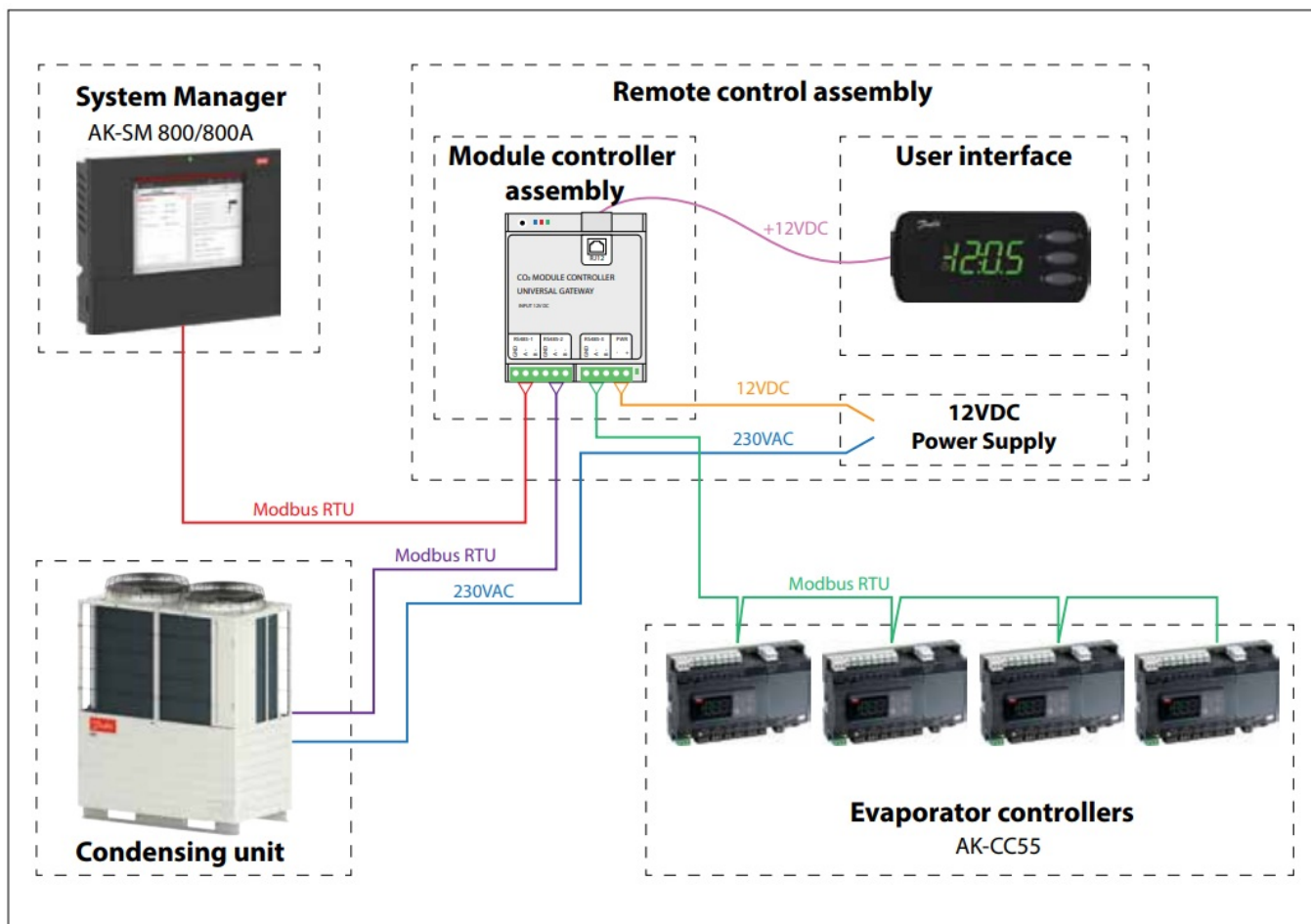


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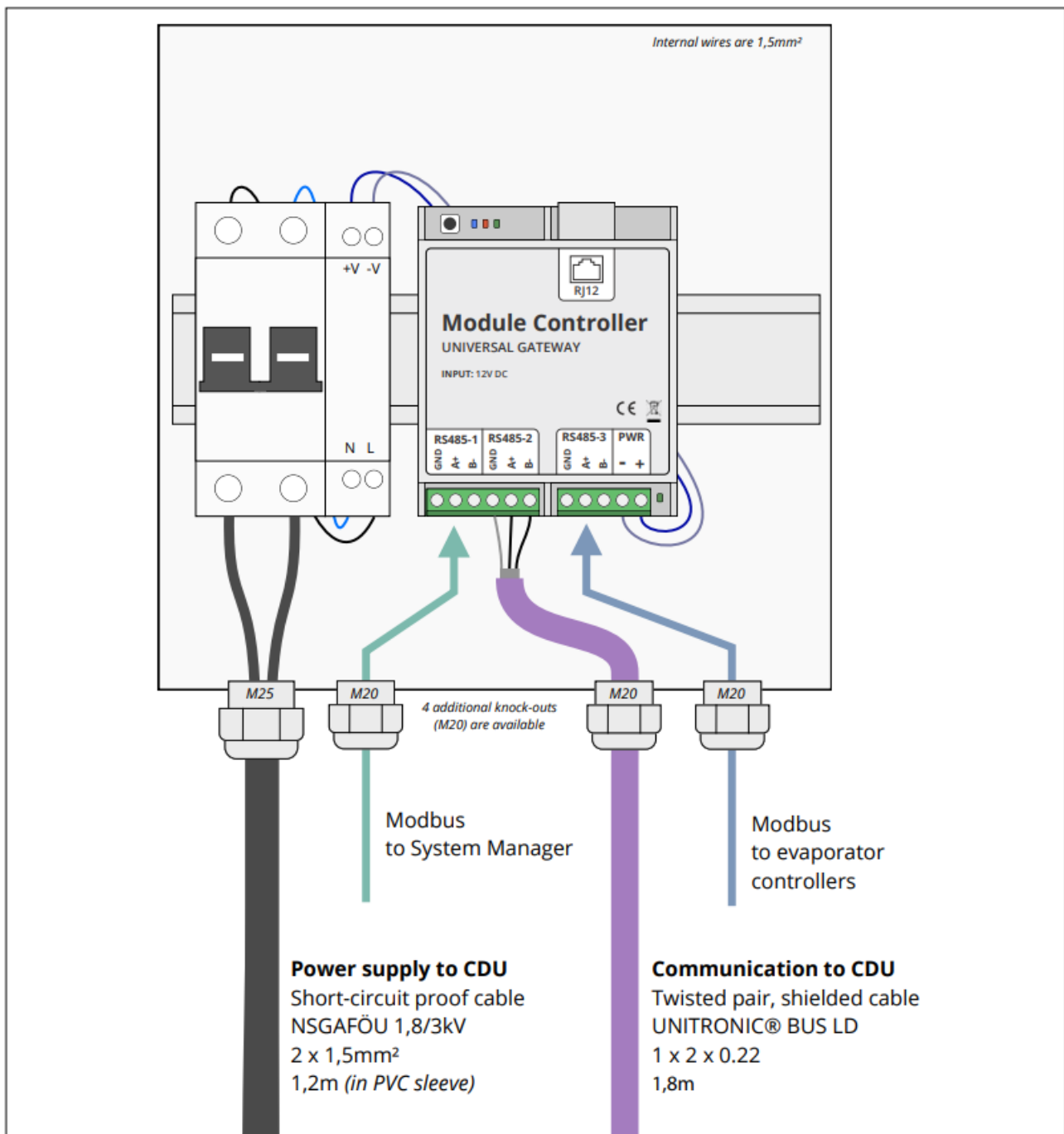
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Electric Installation

Below is an illustration of the external connections that can be made in the remote control assembly.



Power supply to CDU
230V AC 1,2m cable for this is included.



Connect Module controller power supply cable to L1 (left terminal) and N (right terminal) of the condensing unit control panel – power supply terminal block

Caution: If the cable needs to be replaced, it must either be short-circuit proof or it must be protected by a fuse on the other end.



RS485-1

Modbus interface for connection to the System Manager

RS485-2

Modbus interface for connection to the CDU.

1,8 m cable for this is included.

Connect this RS485-2 Modbus cable to terminal A and B of the condensing unit control panel – Modbus interface terminal block. Do not connect insulated shield to ground



RS485-3

Modbus interface for connection to the evaporator controllers

3x LED Function explanation

- Blue led is ON when the CDU is connected and polled operation is complete
- Red led is flashing when there is a communication fault with an evaporator controller
- Green led is flashing during communication with an evaporator controller The green LED next to the 12V power supply terminals indicates "Power OK".

Electric noise

Cables for data communication must be kept separate from other electric cables:

- Use separate cable trays
- Keep a distance between cables of at least 10 cm.

Mechanical Installation

1. Installation in the backside of the unit / backside of e-panel with provided rivets or screws (3 mounting holes provided)

Procedure:

- Remove CDU panel



- Mount the bracket with provided screws or rivets
- Fix the e-Box to the bracket (4 screws provided)
- Route and connect the provided Modbus and power supply cables to the CDU control panel
- Route and connect the evaporator controller Modbus cable to the Module controller
- Option: Route and connect the System Manager Modbus cable to the Module controller

Optional installation on the frontside (only for 10HP unit, just beside the CDU control panel, holes to be drilled)

Procedure:

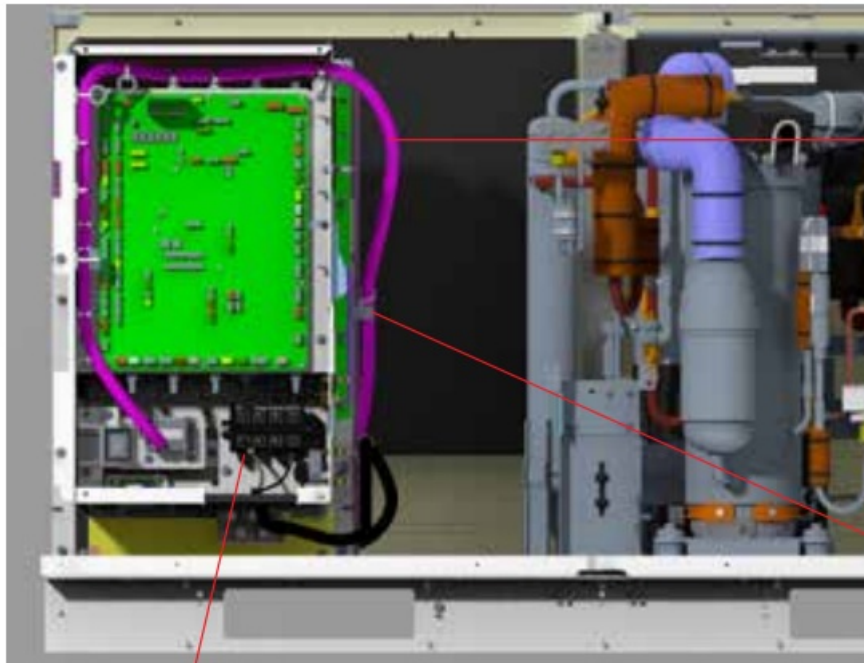
- Remove CDU panel



- Mount the bracket with provided screws or rivets
- Fix the e-Box to the bracket (4 screws provided)
- Route and connect the provided Modbus and power supply cables to the CDU control panel
- Route and connect the evaporator controller Modbus cable to the Module controller
- **Option:** Route and connect the System Manager Modbus cable to the Module controller

Module Controller wiring

Please wire the communication cable from the top of the control board to the left side. The cable comes along with the module controller.

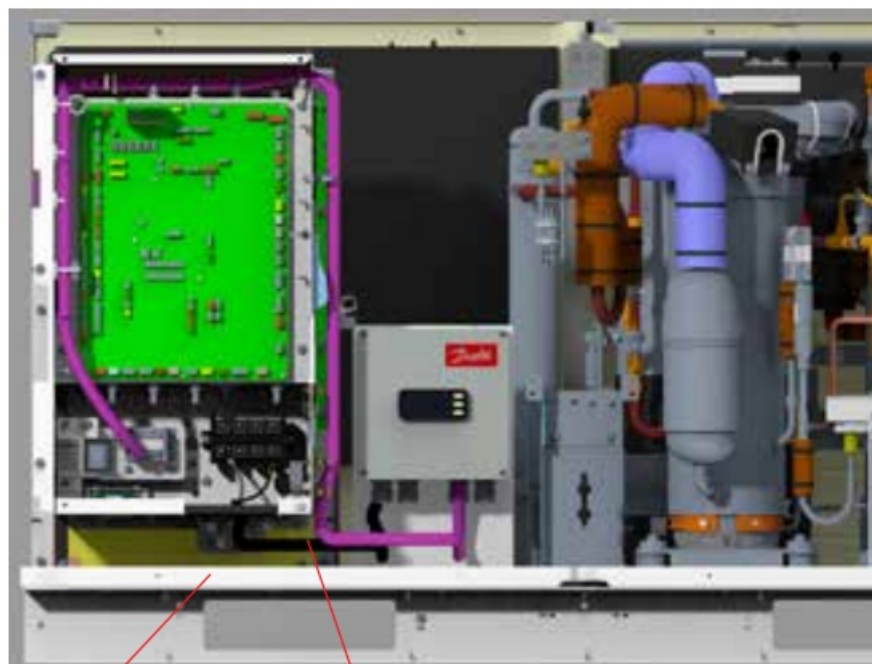


Communication cable

Cable tie

Module controller wiring need to be connected to the L1 and N -Terminals

Please pass the power cable through the insulation at the bottom of the control box.



The communication cable and the power cable should not touch the baseplate

Power cable

Note:

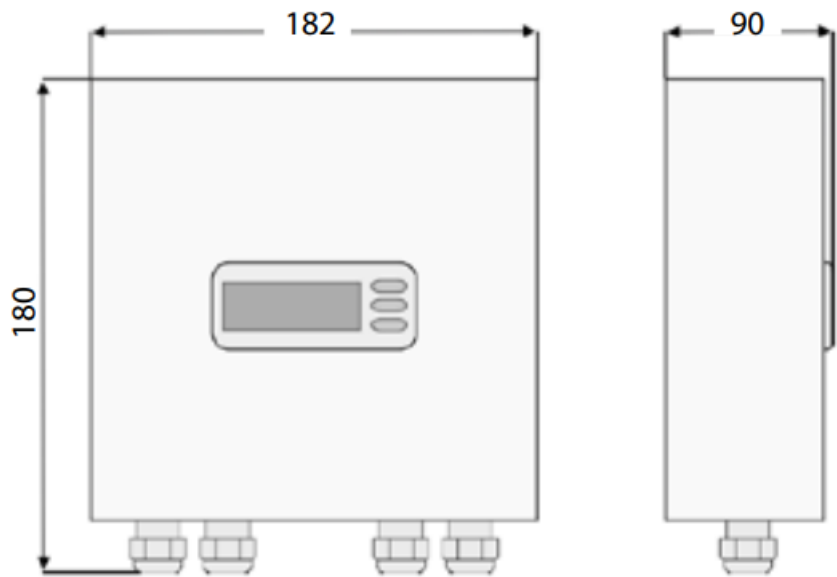
The cables should be fixed with the cable ties and should not touch the baseplate to avoid water ingress.

Technical data

Supply voltage	110-240 V AC. 5 VA, 50 / 60 Hz
Display	LED
Electrical connection	Power supply: Max.2.5 mm2 Communication: Max 1.5 mm2
	-25 — 55 °C, During operations -40 — 70 °C, During transport
	20 – 80% RH, not condensed
	No shock influence
Protection	IP65
Mounting	Wall or with included bracket
Weight	TBD
Included in the package	1 x Remote control assembly 1 x Mounting bracket 4 x M4 screws 5 x Inox rivets 5 x Sheet metal screws
Approvals	EC Low Voltage Directive (2014/35/EU) – EN 60335-1 EMC (2014/30/EU) – EN 61000-6-2 and 6-3

Dimensions

Units in mm



Spare parts

		Danfoss Requirements					
Parts Name	Parts No	Gross weight	Unit Dimension (mm)			Packing Style	Remarks
		Kg	Length	Width	Height		

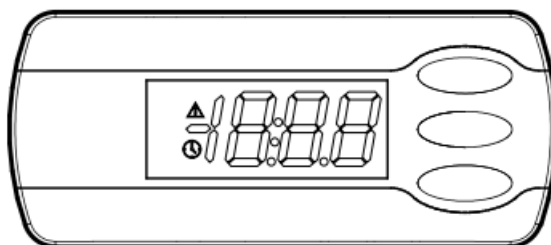
CO2 MODULE CONTROLLER UNIVERSAL GATEWAY



MODULE CONTROLLER	118U5498	TBD	182	90	180	Carton box
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Operation

Display

The values will be shown with three digits.



 	Active alarm (red triangle)
	Scan for Evap. controller is in progress (yellow clock)

When you want to change a setting, the upper and the lower button will give you a higher or lower value depending on the button you are pushing. But before you change the value, you must have access to the menu. You obtain this by pushing the upper button for a couple of seconds – you will then enter the column with parameter codes. Find the parameter code you want to change and push the middle buttons until value for the parameter is shown. When you have changed the value, save the new value by once more pushing the middle button. (If not operated for 10 seconds, the display will change back to showing the suction pressure in temperature).

Examples:

Set menu

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

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 point

1. Push upper button until display shows parameter menu code r01
2. Select and change par. r28 to 1, which defines the MMILDS UI as the reference set device
3. Select and change par. r01 to the required lower pressure setpoint target in bar(g)
4. Select and change par. r02 to the required upper pressure setpoint target in bar(g)

Remark: The arithmetic middle of r01 and r02 is the target suction pressure.

Get a good start

With the following procedure you can start regulation as soon as possible.

1. Connect the modbus communication to CDU.
2. Connect the modbus communication to evaporator controllers.
3. Configure the address in each evaporator controller.
4. Perform a network scan in the module controller (n01).
5. Verify that all evap. controllers have been found (lo01-lo08).
6. Open parameter r12 and start the regulation.
7. For connection to a Danfoss System Manager
 - Connect the modbus communication
 - Set the address with parameter o03
 - Perform a scan in the System Manager.

Survey of functions

Function	Parameter	Remarks
Normal display		
The display shows the suction pressure in temperature.		
Regulation		
Min. Pressure The lower setpoint for suction pressure. See instructions for CDU.	r01	
Max. Pressure The upper set point for suction pressure. See instructions for CDU.	r02	
Demand Operation Limits the compressor speed of the CDU. See instructions for CDU.	r03	
Silent Mode Enable/disable silent mode. Operating noise is suppressed by limiting the speed of the outdoor fan and compressor.	r04	

<p>Snow Protection</p> <p>Enable/disable snow protection functionality.</p> <p>To prevent snow from building up on the outdoor fan during winter shutdown, the outdoor fan is operated at regular intervals to blow off the snow.</p>	r05	
<p>Main Switch Start/stop the CDU</p>	r12	
<p>Reference source</p> <p>The CDU can either use a reference that is configured with rotary switches in the CDU, or it can use the reference as defined by parameter r01 and r02. This parameter configures which reference to use.</p>	r28	
<p>For Danfoss Only</p>		
<p>SH Guard ALC</p> <p>Cut-out limit for ALC control (oil recovery)</p>	r20	
<p>SH Start ALC</p> <p>Cut-in limit for ALC control (oil recovery)</p>	r21	
<p>011 ALC setpol M LBP (AK-CCSS parameter P87,P86)</p>	r22	
<p>SH Close</p> <p>(AK-CC55 parameter —)</p>	r23	
<p>SH Setpoint</p> <p>(AK-CCSS parameter n10, n09)</p>	r24	
<p>EEV force low OD after oil recovery (AK-CCSS AFidentForce =1.0)</p>	r25	
<p>011 ALC setpol M MBP (AK-CCSS parameter P87,P86)</p>	r26	
<p>011 ALC setpoint HBP (AK-CC55 parameter P87,P86)</p>	r27	
<p>Miscellaneous</p>		
<p>If the controller is built into a network with data communication, it must have an address, and the system unit of the data communication must then know this address.</p>		
<p>The address is set between 0 and 240, depending on the system unit and the selected data communication.</p>	3	
<p>Evaporator controller addressing</p>		
<p>Node 1 Address</p> <p>Address of the first evaporator controller</p> <p>Will only be shown if a controller has been found during scan.</p>	lo01	
<p>Node 2 Address See parameter lo01</p>	1002	

Node 3 Address See parameter lo01	lo03	
Node 4 Address See parameter lo01	1004	
Node 5 Address See parameter 1001	1005	
Node 6 Address See parameter lo01	1006	
Node 7 Address See parameter 1001	1007	
Node 8 Address See parameter lo01 lon		
Node 9 Address See parameter 1001	1009	

Function	Parameter	Remarks
Node 10 Address See parameter lo01	1010	
Node 11 Address See parameter lo01	lo1	
Node 12 Address See parameter 1001	1012	
Node 13 Address See parameter 1001	1013	
Node 14 Address See parameter lo01	1014	
Node 15 Address See parameter 1001	lo15	
Node 16 Address See parameter 1001	1016	
Scan Network Initiates a scan for evaporator controllers	n01	
Clear Network List Clears the list of evaporator controllers, may be used when one or several controllers are removed, proceed with a new network scan (n01) after this.	n02	
Service		
Read discharge pressure	u01	Pc
Read gascooler outlet temp.	U05	Sgc
Read receiver pressure	U08	Prec
Read receiver pressure in temperature	U09	Trec
Read discharge pressure in temperature	U22	Tc
Read suction pressure	U23	Po
Read suction pressure in temperature	U24	To
Read discharge temperature	U26	Sd
Read suction temperature	U27	Ss
Read controller software version	u99	

Operating status		(Measurement)
Push briefly (Is) the upper button. A status code will be shown on the display. The individual status codes have the following meanings:		Ctrl. state
CDU not operational	SO	0
CDU operational	Si	1
Other displays		
Oil recovery	Oil	
No communication with CDU	—	

Fault message

In an error situation an alarm symbol will flash..

If you push the top button in this situation you can see the alarm report in the display.

Here are the messages that may appear:

Code/Alarm text via data communication	Description	Action
E01 / COD offline	Communication lost with CV	Check CDU connection and configuration (SW1-2)
E02 / CDU communication error	Bad response from CDU	Check CDU configuration (SW3-4)
AI7 /CDU alarm	An alarm has occurred in the CDU	See instructions for CDU
A01 / Evap. controller 1 offline	Communication lost with evap. controller 1	Check Evap. controller controller and connection
A02 / Evap. controller 2 offline	Communication lost with evap. controller 2	See A01
A03 / Evap. controller 3 offline	Communication lost with evap. controller 3	See A01
A04 / Evap. controller 4 offline	Communication lost with evap. controller 4	See A01
A05 / Evap. controller 5 offline	Communication lost with evap. controller 5	See A01
A06/ Evap. controller 6 offline	Communication lost with evap. controller 6	See A01
A07 / Evap. controller 7 offline	Communication lost with evap. controller 7	See A01
A08/ Evap. controller 8 offline	Communication lost with evap. controller 8	See A01
A09/ Evap. controller 9 offline	Communication lost with evap. controller 9	See A01
A10 / Evap. controller 10 offline	Communication lost with evap. controller 10	See A01
AI1 / Evap. controller 11 offline	Communication lost with evap. controller 11	See A01
AI2 / Evap. controller 12 offline	Communication lost with evap. controller 12	See A01
A13 /Evap. controller 13 offline	Communication lost with evap. controller 13	See A01
A14 /Evap. controller 14 offline	Communication lost with evap. controller 14	See A01
A15 /Evapt controller 15 offline	Communication lost with evap. controller 15	See A01
A16 / Evapt controller 16 offline	Communication lost with evap. controller 16	See A01

Menu survey

Function	Code	Min	Max	Factory	User-Setting
Regulation					
Min. Pressure	r01	0 bar	126 bar	CDU	
Max. Pressure	r02	0 bar	126 bar	CDU	
Demand Operation	r03	0	3	0	
Silent Mode	r04	0	4	0	
Snow Protection	r05	0 (OFF)	1 (ON)	0 (OFF)	
Main Switch Start/stop the CDU	r12	0 (OFF)	1 (ON)	0 (OFF)	
Reference source	r28	0	1	1	
For Da nfoss Only					
SH Guard ALC	r20	1.0K	10.0K	2.0K	
SH Start ALC	r21	2.0K	15.0K	4.0 K	
011 ALC setpoint LBP	r22	-6.0K	6.0 K	-2.0 K	
SH Close	r23	0.0K	5.0 K	25 K	
SH Setpoint	r24	4.0K	14.0K	6.0 K	
EEV force low OD after oil recovery	r25	0 min	60 min	20 min	
Oil ALC setpoint MBP	r26	-6.0K	6.0 K	0.0 K	
011 ALC setpoint HBP	r27	-6.0K	6.0K	3.0K	
Miscellaneous					
CDU Address	o03	0	240	0	
Evap. controller Addressing					
Node 1 Address	lo01	0	240	0	
Node 2 Address	lo02	0	240	0	
Node 3 Address	lo03	0	240	0	
Node 4 Address	lo04	0	240	0	
Node 5 Address	lo05	0	240	0	
Node 6 Address	106	0	240	0	
Node 7 Address	lo07	0	240	0	

Node 8 Address	lo08	0	240	0	
Node 9 Address	lo08	0	240	0	
Node 10 Address	lo10	0	240	0	
Node 11 Address	lo11	0	240	0	
Node 12 Address	lo12	0	240	0	
Node 13 Address	lo13	0	240	0	
Node 14 Address	lo14	0	240	0	
Node 15 Address	lo15	0	240	0	
Node 16 Address	lo16	0	240	0	
Scan Network Initiates a scan for evaporator controllers	n01	0 OFF	1 ON	0 (OFF)	
Clear Network List Clears the list of evaporator controllers, may be used when one or several controllers are removed, proceed with a new network scan (n01) after this.	n02	0 (OFF)	1 (ON)	0 (OFF)	
Service					
Read discharge pressure	u01	bar			
Read gascooler outlet temp.	U05	°C			
Read receiver pressure	U08	bar			
Read receiver pressure in temperature	U09	°C			
Read discharge pressure in temperature	1122	°C			
Read suction pressure	1123	bar			
Read suction pressure in temperature	U24	°C			
Read discharge temperature	U26	°C			
Read suction temperature	U27	°C			
Read controller software version	u99				

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Documents / Resources

 The image shows a white, rectangular Danfoss CO2 Module Controller Universal Gateway. It has a small display screen and several ports on the front. A black cable is plugged into one of the ports. The device is shown against a light blue background.	<p>Danfoss CO2 Module Controller Universal Gateway [pdf] User Guide CO2 Module Controller Universal Gateway, CO2, Module Controller Universal Gateway, Module Controller, Controller, Universal Gateway, Gateway</p>
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