



AK-255 CO₂ Controller On-Site Installation Guide

How to Use This Guide

Read this Guide completely as you install and start up your new AK-255 CO₂ Controller.

Scope of document

The intended scope of the 'On-Site Installation Guide' is to provide guidance on how to mount, power and apply initial system settings. The goal of this guide is to ready the AK-255 CO₂ Controller for the commissioning phase, where more detailed documentation is available.

What's Needed for Installation

What you will need to finish the installation:

1. A screwdriver
2. A drill and fasteners appropriate to mounting the controller.
3. A dedicated 120V a.c. or 230V a.c. circuit (the unit is fused internally at 1.0 Amp)
4. OEM installations require a dedicated disconnect

Power and Cable Requirements

AK-255 CO ₂ Controller Power (screen):	~100 to 240V a.c. 50/60Hz (Use approved local wiring codes of practice)
AK-255 CO ₂ Controller (DIN):	5 V d.c.
Communications:	
Ethernet	Approved Cat5 cable
Host	Approved Cat5 Ethernet cable
I/O network	18-22AWG, Beldon or equivalent (Twisted pair stranded wire with shield) for UL approved installations:- UL Listed & rated type CMP (Plenum rated), Single pair shielded Echelon compliant cable. Windy City Wire #106500-S 22 gauge, stranded, blue jacket

A Note about Code Compliance

Danfoss believes that no instruction in this guide violates any national or local electrical code, but the installer is responsible for compliance with any code applicable to the installation site. Use the installation drawing as reference.



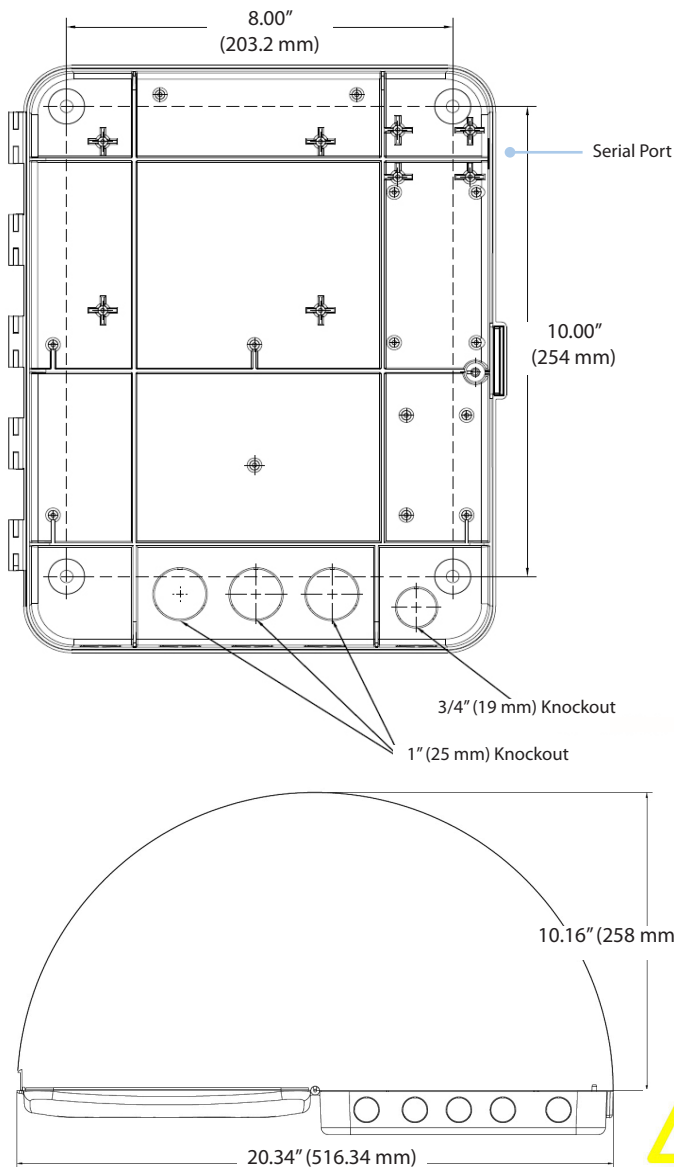
WARNING: To avoid risk of injury from electric shock, ensure correct electrical isolation is made before working within the enclosure.

WARNING - The AK-255 CO₂ Controller contains a 3 V battery (type CR2032) to maintain programmed settings. Do not recharge, disassemble or dispose of in fire. Danger of burn or explosion may occur if mistreated, follow local regulations for correct disposal. Replacement battery is available from typical battery stockists.

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Mounting screw locations, general dimensions



Mounting and Wiring

Mounting (screen version)

The mounting location should be flat, dry and free from major vibrations. The AK-255 CO₂ Controller should be mounted at eye level, with consideration for the following approximate outline dimensions:

- Unit Width 10.5" (266 mm)
- Unit Height 12.5" (317 mm)
- Unit Depth 2.5" (63 mm)

Mounting holes 8.0" (203.2 mm) Width
Mounting holes 10.00" (254 mm) Height

To allow the door to fully open, ensure that there is an area at least 21" (533 mm) x 11" (280 mm) free, leaving room for conduit connections beneath the controller. Mount the controller using appropriate screws through the holes indicated at left, fastening the back of the controller enclosure securely to the flat surface chosen.

Allow approx 3" (76 mm) for side access to local connection port (Danfoss cable part # 080Z0262)

Internal component layout

With the controller door open, the two main sections of the AK-255 CO₂ Controller can be seen, Base board & Connector board.

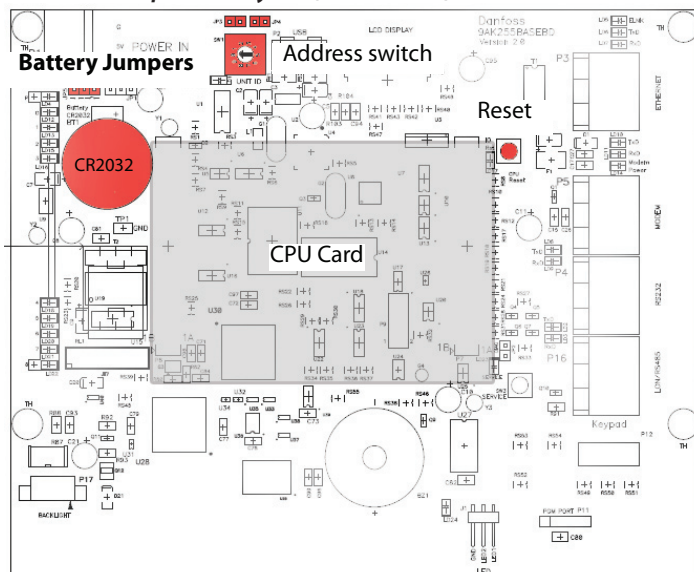
Base board

Mounted on the door frame is the 'Base board' with the main CPU card. The base board contains the following important components that need to be set for correct system operation:

- Battery** (shipped in disabled position)
Type CR2032 with (+) side facing toward the user.

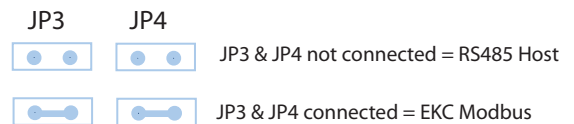
Engage battery circuit to ensure settings are protected after power loss - set Jumper JP5 as follows. JP5

Internal Component layout (Base board)



RS485 Modbus Network

The AK-255 CO₂ Controller system utilizes a selectable RS485 / Modbus port (located on Connector board). The unit comes factory set as Modbus communications.



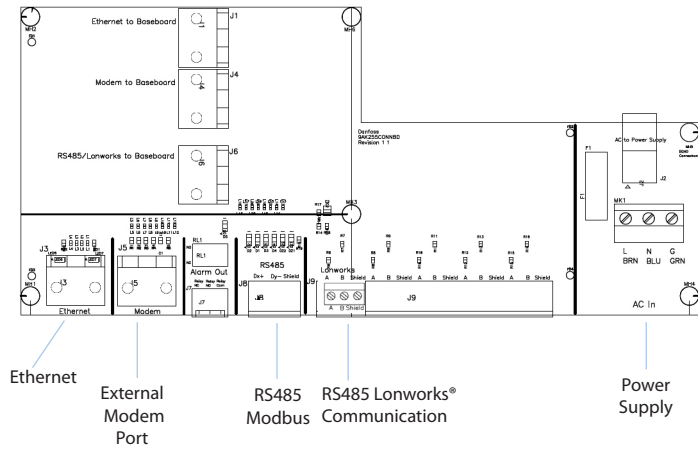
System address switch

Rotary address switch to set AK-255 CO₂ Controller address
Address 0 = Master (1-9 for Slave units)

System Reset

Use the CPU reset button to reset the AK-255 CO₂ Plant controller

Connector Board - User Connections



Internal component layout cont.

Connector board

The Connector board contains the main user connection ports needed for communications, relay output and power supply:

Ethernet

Standard RJ45 Ethernet port, used for TCP/IP remote connection (LAN,WAN), SNMP network support & Host network. Use Ethernet as Host network if 'Virtual Display' functionality is required.

RS485 Modbus

Used for EKC Modbus communication devices.

Host / Modbus network options	JP3 & JP4	Notes
RS485 Host	OFF	Not applicable
EKC Modbus	ON (factory set)	Use for EKC Modbus controllers & displays 120 Ohm terminator to be on last controller only. If host network required use Ethernet network
Ethernet Host	N/A	Use Ethernet port and connect to LAN Configure in 'Communications' section

External Modem

Modem port used in conjunction with Modem Adapter kit 080Z2100

Relay (DIN version only)

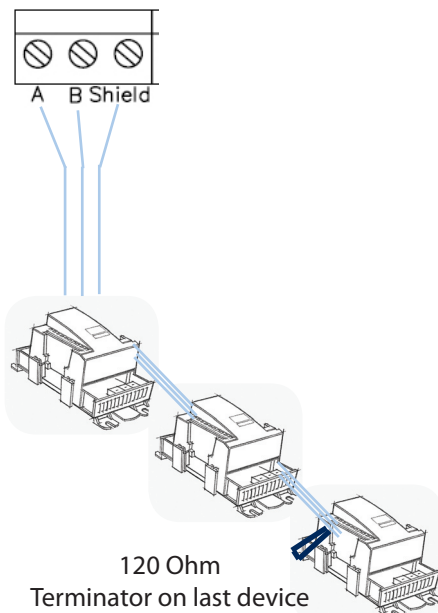
Rated at 30V d.c. 1Amp. Used for external alarm signal.

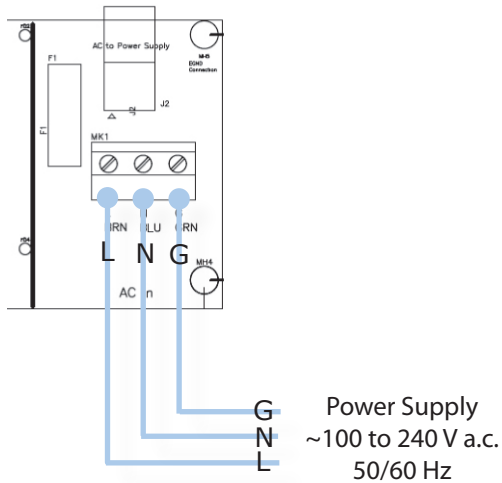
Lonworks® I/O Network

The I/O (Input-Output) network uses a single Echelon® LonTalk® network

Follow network wiring regulations for RS485 network type. For additional information on networks consult Danfoss document entitled 'Data communication between ADAP-KOOL® Refrigeration Controls' (RC8AC302)

Lonworks® I/O Network (RS485)
Connect devices in 'daisy-chain' topology





Making connections to the controller

Conduit entrances are located both on the bottom of the controller and at the back. Five, 7/8" (22 mm) conduit access ports are available at the bottom. Located at the rear, there are three 1 1/8" (28 mm) ports with an additional 7/8" (22 mm) port.

Make sure any I/O network and communication runs are kept separate from the mains power.

Power connection

The AK-255 CO₂ Controller has an auto sensing power supply and is intended for voltage ranges 100 - 240 V a.c. 50/60 Hz. An onboard fuse rated at 1 Amp protects the internal electronics. Ensure the same type / rating fuse is used if required.

The **AK-255 CO₂ Controller** (DIN) mount should be powered with a 5 V d.c. supply (included)

Local connection

A local connection to a PC can be established using either Ethernet or via the RS232 direct connect port (located at the right hand side of the AK-255 Co₂ Controller or the RS232 port on the DIN AK-255 CO₂ Controller model). For local connection via RS232 use Danfoss cable part # 080Z0262.

External connection by dial-up modem

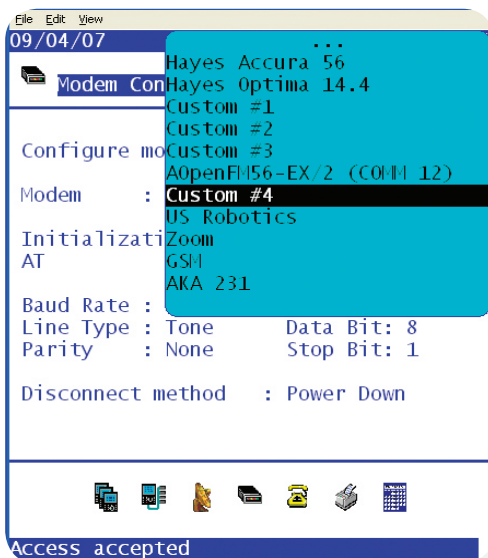
When using a modem to connect / dial out alarms, it is recommended that the modem adapter kit (080Z2100) is used.

From the Main Menu select 'Communications'. Goto '**Modem Config**'. Answer the system question 'yes' to 'Configure modem on this unit:' Next, use the drop down list (see screen shot opposite) to select your modem type.

Ensure all other parameters are set (Baud rate, line type, Data & stop bit and parity). Typically these values can be left as 'factory standard'.

The final setting, 'Disconnect method' refers to the way the modem is disconnected after use. Use the 'Power down' option if a modem adapter is being used. This will toggle the adapter and ensure a clean power re-set.

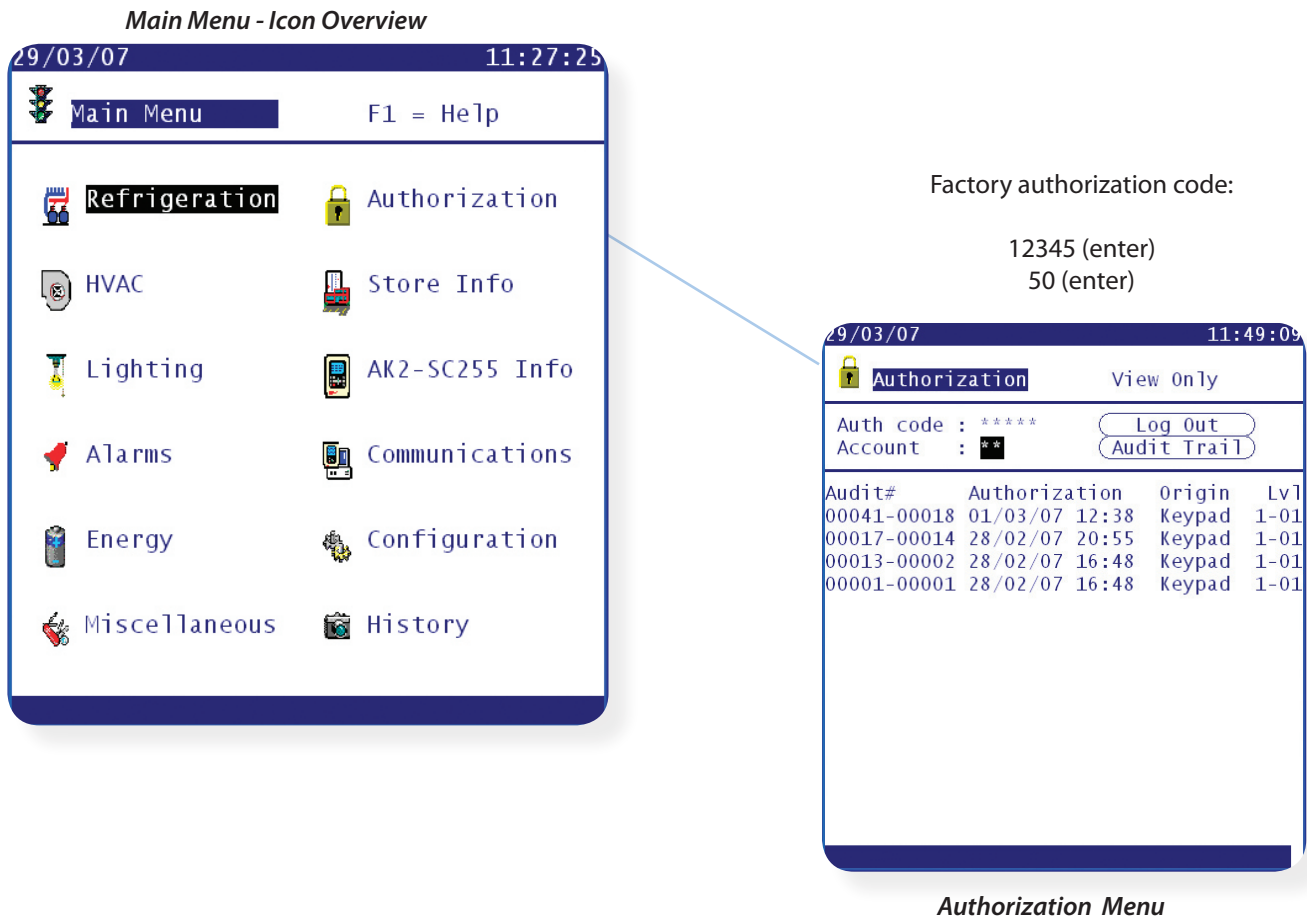
Direct connect (side port) using Danfoss cable 080Z0262



Modem Config page (choose modem type)

Initial AK-255 CO₂ Controller configuration

To get the AK-255 CO₂ Controller ready for full commissioning, a few steps should be implemented. The following section covers the typical settings required for commissioning preparation.



Authorization

After a successful boot up the AK-255 CO₂ Controller will display the 'Main Menu'. Move the cursor, using the arrow keys, to the menu item "Authorization" and press the ENTER KEY.

On the Authorization screen, the cursor is on a field called "Auth." Below that is a field called "Account." Your first operation, each time you use the controller, will be to enter your authorization code and account number. These will be given to you by the system owner. **The default authorization code from the Danfoss factory is 12345, and the default account code is 50.** Once the correct supervisor code has been entered the screen will change and reflect 'supervisor' (assuming the factory code is valid and has not been replaced).

Store Info

The 'Store Info' icon contains various settings that reflect language, preferences, opening hours and other configuration parameters. From the main menu, select 'store info'.

Opening Hours
Used in conjunction with relative lighting
Schedules (00:00 - 00:00 = always on)

	Open	Close
Monday	07:00	00:00
Tuesday	07:00	00:00
Wednesday	07:00	00:00
Thursday	07:00	00:00
Friday	00:00	00:00
Saturday	07:00	00:00
Sunday	07:00	00:00

Store Name: provide name
Store Id1 & Id2: additional identifiers sent to XML alarm receivers (if used)
Store Clock / Time
Sync clocks at midnight: Set to 'yes' if master AK-255 CO2 Controller is to send time to slave AK-255 CO2 Controller units (on host network)
Time Zone: Used to correctly 'time stamp' e-mail alarms

Unit /Language
Set appropriate units & language

Holidays
Configure as required
(up to 8 holidays)
Used in conjunction with schedules

Contact Info
Configure as required

Manager Override
Configure as required

Daylight Savings
Configure to automatically
change AK-255 CO₂ Controller
system clock

Preferences
Set as per user requirements

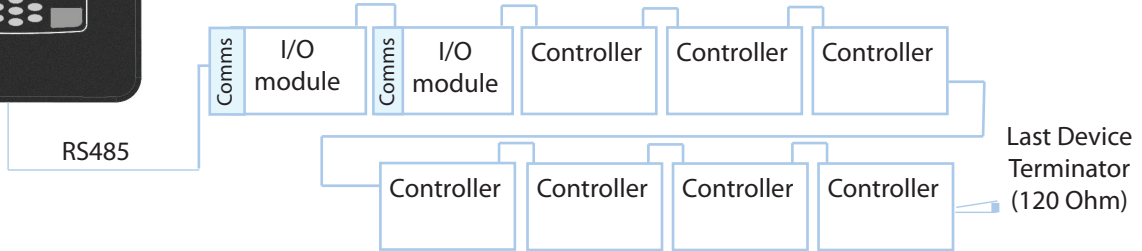
Leak Detector
Configure as required

AK-255 CO₂ Controller RS485 network protocol - Topology Examples



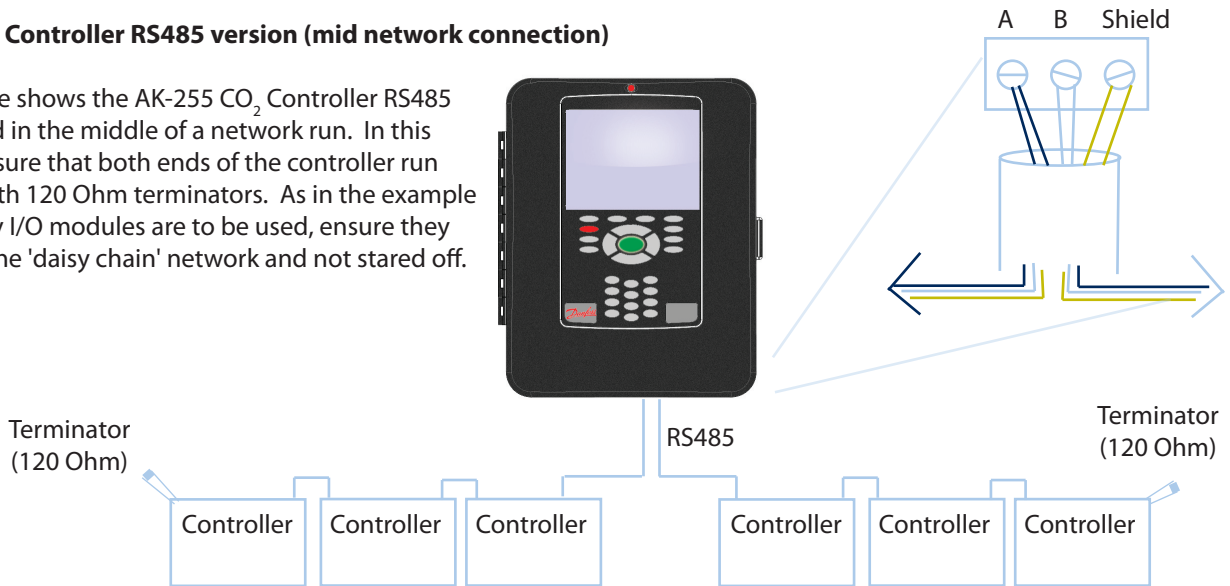
AK-255 CO₂ Controller RS485 version

This example shows the AK-255 CO₂ Controller, with a single RS485 communication port. The RS485 network protocol must be wired in a 'daisy chain' format - recommended that polarity is maintained. If I/O is used in the network, the communications modules must also be wired as part of the 'daisy chain'.

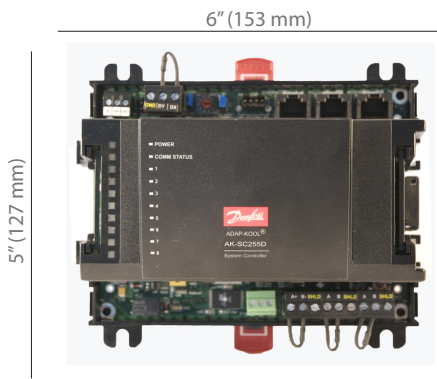


AK-255 CO₂ Controller RS485 version (mid network connection)

This example shows the AK-255 CO₂ Controller RS485 version used in the middle of a network run. In this example ensure that both ends of the controller run are fitted with 120 Ohm terminators. As in the example above, if any I/O modules are to be used, ensure they are part of the 'daisy chain' network and not stered off.



Approvals & Specifications



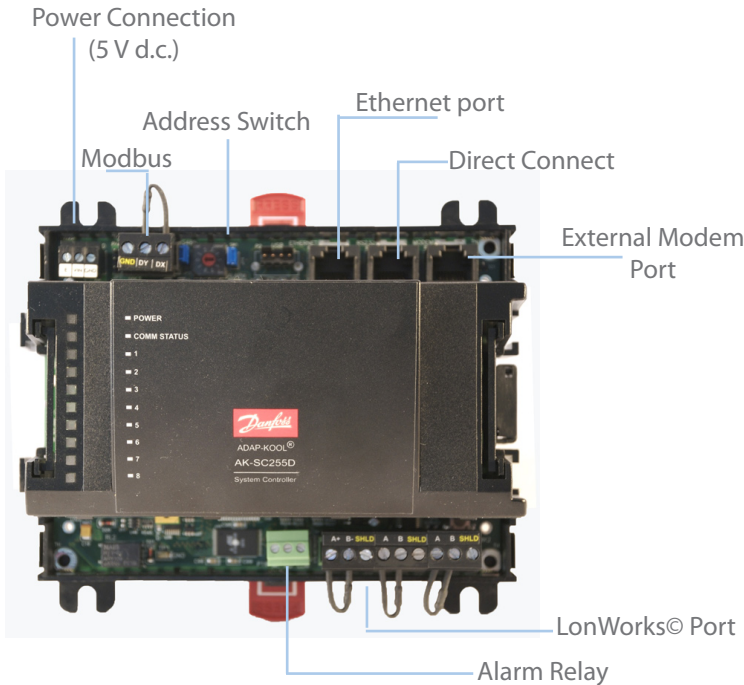
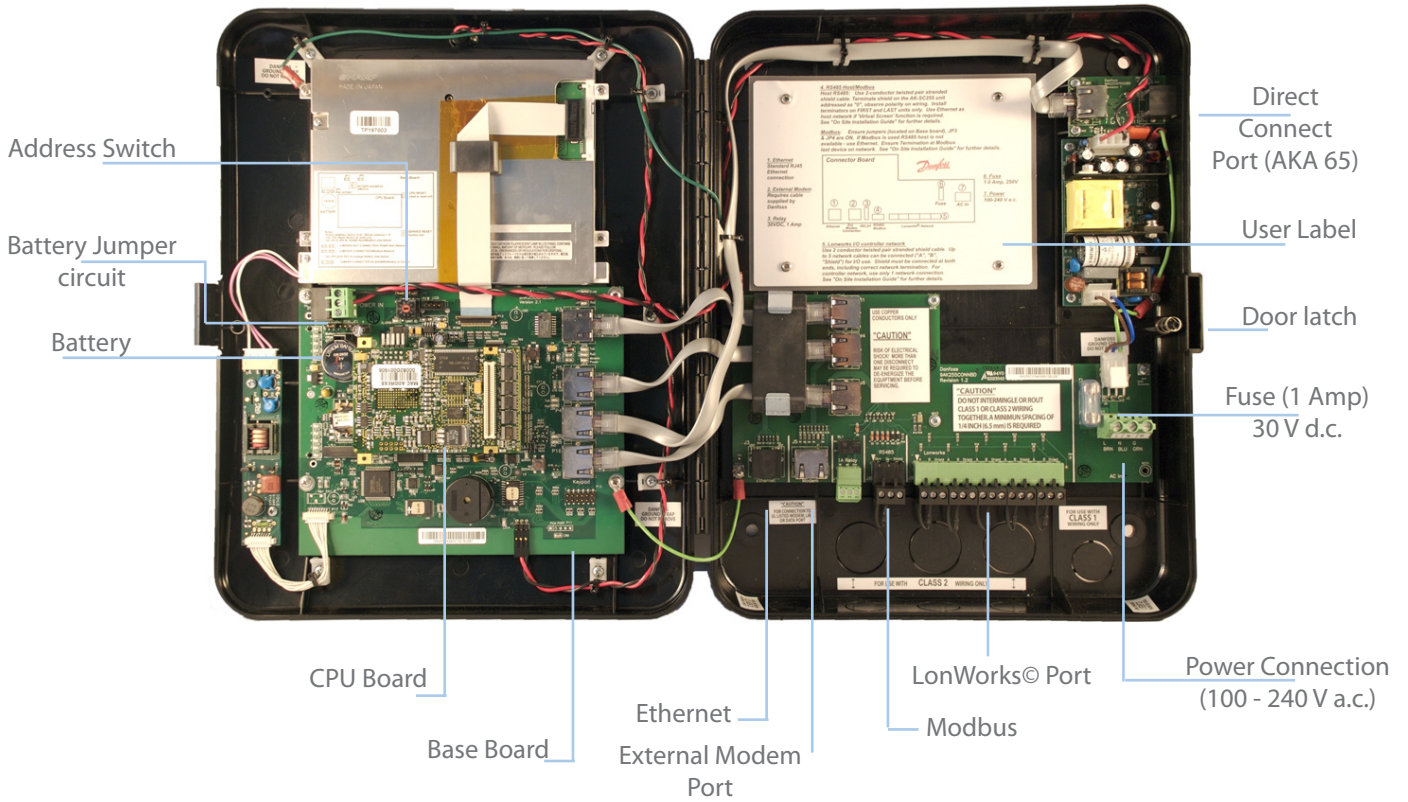
AK-255 CO₂ Controller
DIN Mounted



AK-255 CO₂ Controller



Approvals & specifications



Environmental Range AK-255 CO₂ Controller (screen & DIN versions)

Operating temperature
32 to 104°F (0 to +40°C)
32 to 122°F (0 to +50°C AK-255 CO₂ ControllerD)
@ 90% RH (non condensing)

Electrical range
~ 100 - 240 V a.c. (+ / - 10%) 50 - 60 Hz
5 V d.c. (AK-255 CO₂ Controller DIN version)



UL File # E166834

Code numbers & models

Code Number	Description	Comments
080Z2513	AK-255 CO ₂ Plant Controller (screen)	Pack control via built in software and I/O modules
080Z2584	AK-255 CO ₂ Plant Controller (DIN)	Pack control via built in software and I/O modules
080Z2523	AK-255 CO ₂ Plant Manager (screen)	Pack control via Danfoss pack controllers
080Z2585	AK-255 CO ₂ Plant Manager (DIN)	Pack control via Danfoss pack controllers

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