

## FEATURES

- Controls-in-a-Box™ is based on an open protocol microprocessor and designed to control a variety of HVAC applications.
- It has a feature rich network interface.
- All controller features are adjustable by a freely-available plug-in software tool.
- Its devices can operate stand-alone or as a networked solution.
- When monitored by Controls-in-a-Box™ software, web-based control and monitoring is enabled; along with available trend scheduling and alarm storage.
- The hardware can be expanded with a variety of add-on features.
- Open protocol guidelines are strictly observed. Controls-in-a-Box™ is interoperable with other open protocol controllers and devices.
- The hardware is built to the highest quality standards and is backed by a one-year warranty.
- All hardware is built in the USA using eco-friendly, lead-free technology and is RoHS compliant.

# Controls-in-a-Box™ Controller Specification

Model 2.4.5.2 Roof Top Heat Pump



## UL916

Made in USA

### HARDWARE

Processor: 8 bits, 80MHz

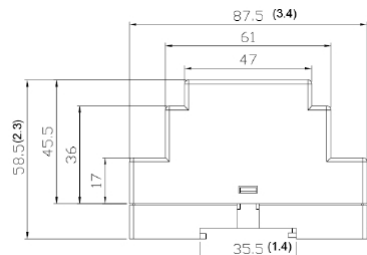
Memory: 48k application memory

Transceiver: FTT-10; 78kbps free topology, polarity free

Indicator light: Multi-color LED, power, status, service

Communication jack: RJ11; power, hand-held

The hardware has been certified to the UL916 Energy Management Equipment standard and CSA C22.2#205 Issue 1983/06/01 (R2009) Signal Equipment standard



### Inputs

- 2 resistive sensor inputs.
- 4 universal inputs.
- Input resolution is 20 bits.
- Universal inputs (UI) are software configurable.

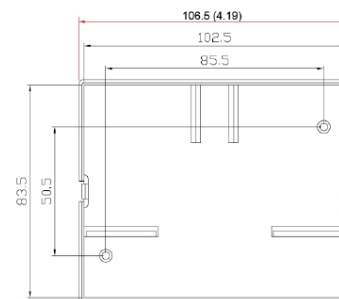
Voltage is 0-10VDC

Current is 0-20mA

Digital is a dry contact

Resistive sensors

- a) Thermistor 10kΩ Type 2 (recommended), Type 3
- b) Thermistor custom translation table on each UI
- c) Potentiometer with custom translation table on each UI



### Outputs

- 5 triac digital outputs
- 2 analog outputs.
- Triac outputs can source 24AC or route external AC power depending on power jumper setting.
- Digital Triac rated for 1A at 24VAC with external power supply
- Analog Universal 0-10VDC adjustable, linear 0 or 12VDC digital, 20 mA max at 30° C, and 16 bit resolution

### LED Color Codes

- Green = Powered on and configured
- Red = Flashing, powered on and unaddressed
- OFF, no color = No power

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## APPLICATION

Model 2.4.5.2 is designed for roof top heat pump equipment. The software profile has reversing valve control, variable speed fan control, economizer, and CO<sub>2</sub> control.

## SOFTWARE

The programming plug-in provides a graphical user interface for configuration and monitoring, I/O customization, communication parameters and control sequences. The plug-in is to be executed within the network management tool for Windows.

User interface features:

- Administrative User Levels
- Alarming and email notification
- Device Monitoring
- Trending
- Scheduling

Changeable network variable types:

- Ten (10) PID loops
- Input, output properties and network update throttling

Optional Software Points:

- 1) Room Temperature
- 2) Discharge Air Temperature
- 3) Supply Fan Status
- 4) Supply Fan Start/Stop
- 5) Up to two (2) Cooling stages
- 6) Up to two (2) Heating stages

## ENVIRONMENTAL

Operating Temperature	0 to 70° C (32 to 158° F)
Operating Humidity	0 to 90% non-condensing
Storage Temperature	-20 to 70° C (-4 to -158° F)

## POWER

Consumption:	6VA plus peripherals
Max Consumption:	30VA
Supply Voltage:	24VAC; 50/60Hz; Class II
Fuse:	1.85A auto-reset fuse

## ENCLOSURE

Installation:	Mounts on 35mm DIN-rail
Color:	Black
Material:	ABS
Connectors:	Pluggable, 10 position

## NETWORK

Controls-in-a-Box™ is built to operate on network channels connected with 22/2 flexible, twisted pair wire. Network update throttling is incorporated and can be adjusted by the plug-in. Networks can be built using IP backbones and routers