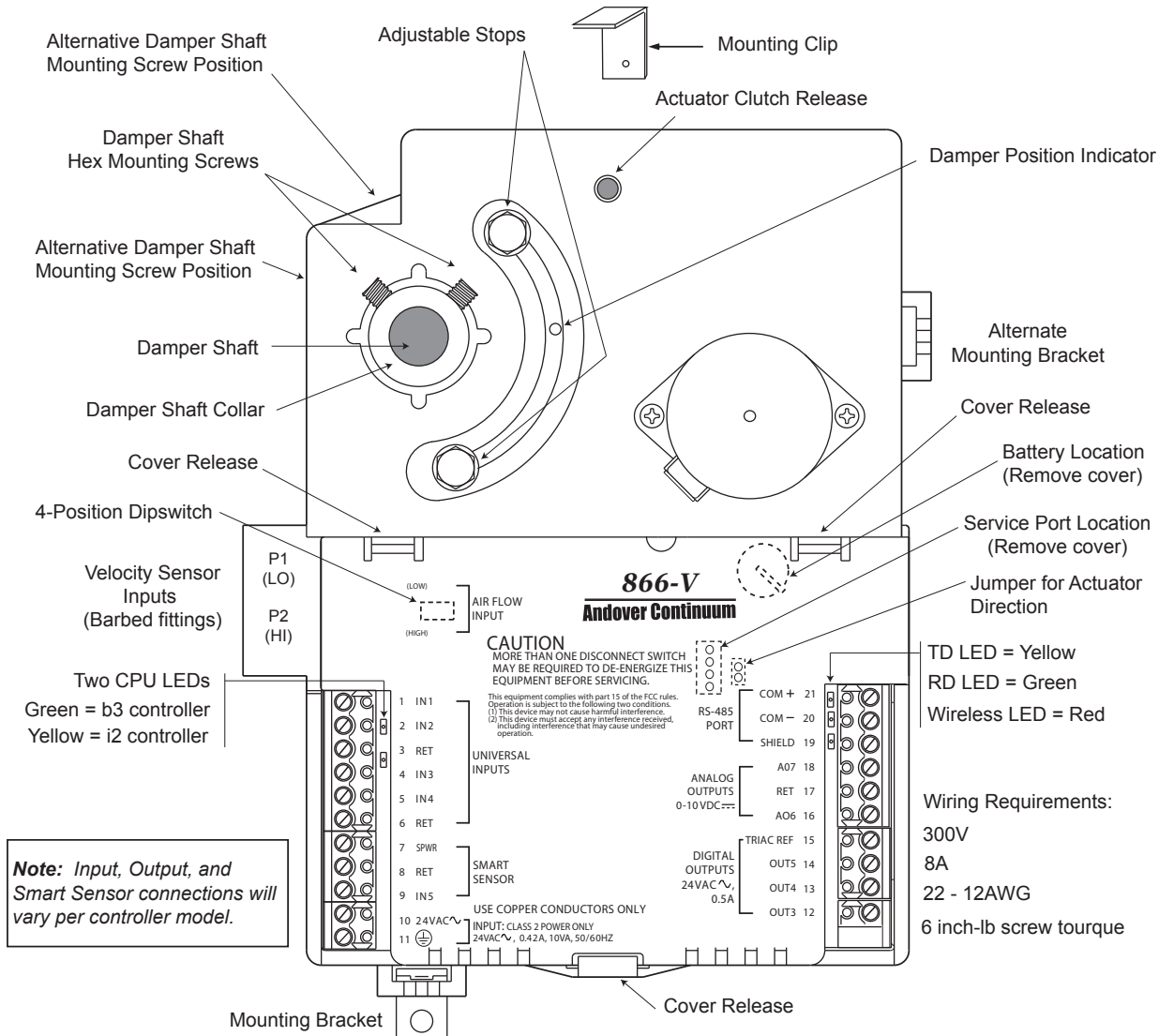


i2/b3 865/866/885-V Controller



i2/b3 865/866/885-V Controller Installation

To install the controller, follow these steps:

1. Check the mounting location for the Andover Continuum i2 or b3 865/866/885-V controller. The unit is typically mounted with the controller extending down or to the right from the damper shaft. However, the controller can be operated in any position within the vertical plane.

Note: Installing the controller to the right (with the barbed fittings pointing down) helps prevent condensate from migrating into the on-board velocity sensor.

With a downward extension, the available area around the damper shaft must measure 6" (160 mm) down from the lower edge of the shaft, 4.5" (120 mm) to the right, 1.5" (40 mm) to the left and 1.75" (45 mm) above the shaft. Ensure the location allows enough clearance for servicing.

2. The actuator is designed to mount over a 1/2" (12.7 mm) diameter shaft with a minimum of 2.5" (63.5 mm) of exposed shaft. If the damper shaft diameter is less than 1/2" (12.7 mm) an adapter is required. An adapter (p/n AM-135) is available from Schneider Electric to allow mounting on 3/8" (9.5 mm) damper shaft. The 865/866/885-V controller will not work with larger damper shaft diameters.
3. If the exposed damper shaft is less than 2" (51 mm) but at least 1" (25.4 mm) long, move the two damper shaft mounting screws to the alternate lower damper shaft positions.
4. Select the mounting bracket location that provides the most stability for the operation of the actuator. Position the mounting clip in the desired mounting bracket. Do not insert the clip more than half-way into the bracket. This allows the clip and the back of the actuator to properly align with the VAV box.

i2/b3 865/866/885-V Controller Installation (continued)

- Press and hold the green actuator clutch release and rotate the VAV damper shaft by hand to the fully closed position. Note whether the damper is rotated clockwise (CW) or counter-clockwise (CCW) to close.
- Slip the controller over the damper shaft. Position the actuator and, using a self tapping sheet metal screw, secure the mounting clip to the VAV box.
- Next, press the actuator toward the box until the actuator comes into contact with the VAV box, the mounting clip snaps into the bracket, or the back of the actuator comes into contact with the VAV box.
- Press and hold the green actuator clutch release (see Figure on cover page) and rotate the actuator collar to a nearly closed position, the 5° index mark, if the damper shaft was rotated counter-clockwise to close (Step 5). Rotate the actuator collar to the 85° index mark if the damper shaft was rotated clockwise to close (Step 5).
- Tighten the two damper hex mounting screws using a $\frac{1}{8}$ " hex Allen wrench. The minimum torque required to secure the controller to the damper shaft depends on the shaft material. The maximum torque for the socket screws is 30 inch-pounds (3.4 Nm).

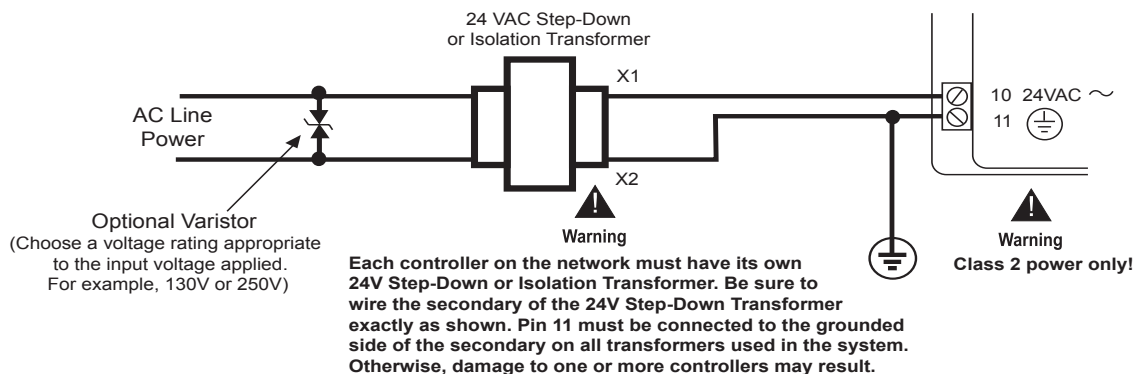
Note: The damper should rotate freely when the clutch is released. If it does not, the actuator may not be properly aligned with the damper shaft – it may be necessary to repeat Steps 4 through 9 using a new orientation.

- If the damper does not provide a mechanical stop in the open direction, or it is not desirable to use the damper's open stop, set the adjustable stops on the 865/866/885-V controller to the desired position. Use a $\frac{1}{4}$ " hex driver to adjust the screw stop on the controller.

Note: For the 866-V model only, you must calibrate the damper position feedback reporting option before using. You calibrate damper position feedback reporting by changing the damper's output attribute, LCDState, from DISABLED to ENABLED. The attribute, OverrideValue, indicates the damper position as a fractional value from 0 (at the closed stop) to 1 (at the open stop).

Whenever the Actuator Clutch Release button is pressed and the Actuator is moved manually, you need to recalibrate damper position feedback reporting. During damper calibration, the damper output will rotate from one end-stop to the other and then return to its original position. It is also recommended that you periodically recalibrate damper position feedback reporting using a Plain English (PE) program.

AC Power Connection



Note: Use care when attaching power wiring to these connectors. They are not to be used as a strain relief. The connectors cannot withstand excessive bending or flexing. Failing to install this transformer on remote controllers can damage it and other controllers on the network.

Wiring Rules

These modules are intended for installation within the enclosure of another product.

Do not remotely ground any part of the input sensor wiring.

Remote grounds connected to the return terminal could make the system operate incorrectly or damage the equipment.

The signal return is not true earth ground. It is an electronic reference point necessary to interpret the sensor properly.

For reliable input operation, follow these input wiring guidelines:

- Never lay wires across the surface of a printed circuit board.
- Wires should never be within 1" or 25 mm of any component on a printed circuit board.
- Use shielded input wire.
- Terminate the shield of the input wires at one end of the run only — preferably at the end where your I/O module is located.

- When stripping wire, be careful not to drop small pieces of wire inside the cabinet.
- Don't run your input wiring in the same conduit with AC power.
- Don't run your input wiring in the same conduit with your output wiring.

Grounding the Controller

To insure proper operation of the controller, it must be connected to a good earth ground. The connection must be made as close to the module as possible.

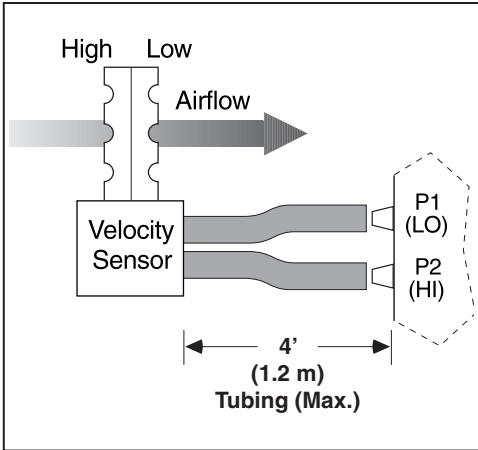
Caution: Earth ground (⊕) must be connected to avoid module damage.



Removing the Plastic Battery Tab

Before operating the controller, open the cover and remove the protective plastic battery tab. The battery location is shown in the illustration on the cover page.

Connecting the Air Velocity Sensor

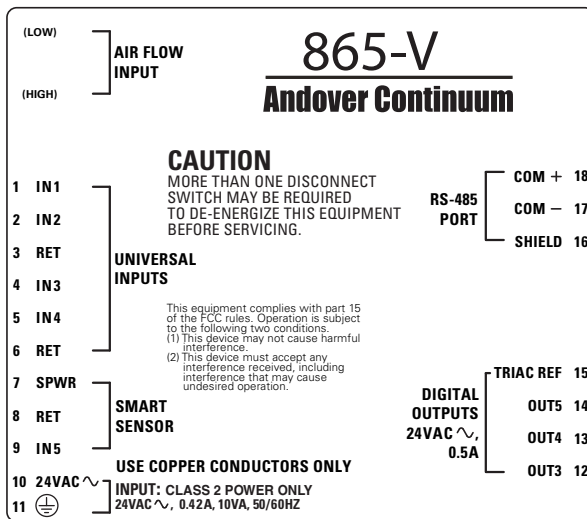


1. Connect the low pressure side of the velocity sensor to the barbed fitting labeled P1 (LO) on the controller.
2. Connect the high pressure side of the velocity sensor to the fitting labeled P2 (HI) on the controller.

Notes: Use a recommended maximum length of 4' (1.2 m) FRPE polyethylene tubing or 0.25" (6.34 mm) O.D. and 0.125" (3.175 mm) I.D. Tygon tubing.

Do not expose the velocity sensor to moisture. If moisture condensation is a potential problem, orient the tubing and controller so that the barbed fittings are above the lowest part of the tubing to create a moisture trap.

Connections for i2/b3 865-V Controller



Airflow Input
One Low and one High connection

Universal Inputs
Four input and two return connections — terminals 1-6

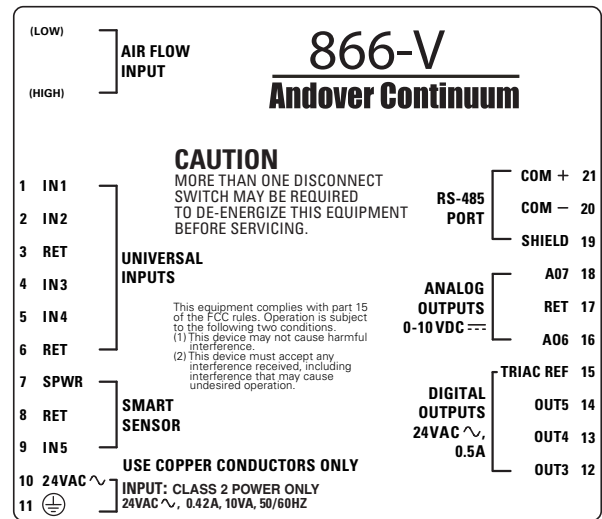
Smart Sensor Bus Interface
One Smart Sensor connection — terminals 7-9

Power Connection
One 24 VAC connection and ground — terminals 10-11

Digital Outputs
Three output connections and one triac reference — terminals 12-15

RS-485 Port
One port for a BACnet MS/TP or Infinet connection — terminals 16-18

Connections for i2/b3 866-V Controller



Airflow Input
One Low and one High connection

Universal Inputs
Four input and two return connections — terminals 1-6

Smart Sensor Bus Interface
One Smart Sensor connection — terminals 7-9

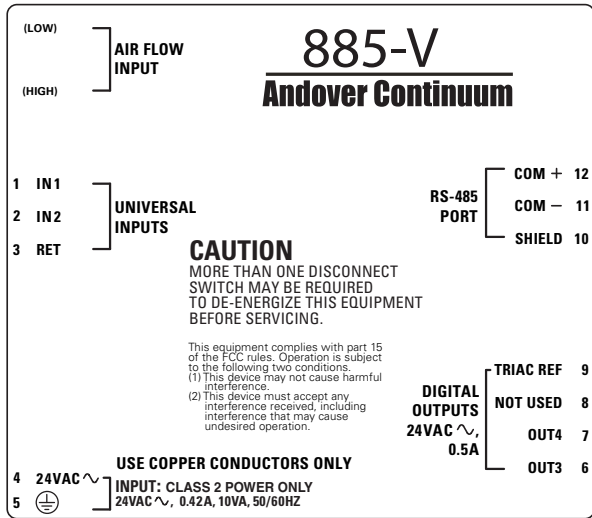
Power Connection
One 24 VAC connection and ground — terminals 10-11

Digital Outputs
Three output connections and one triac reference — terminals 12-15

Analog Outputs
Two analog outputs and one return connection — terminals 16-18

RS-485 Port
One port for a BACnet MS/TP or Infinet connection — terminals 19-21

Connections for i2/b3 885-V Controller



Airflow Input
One Low and one High connection

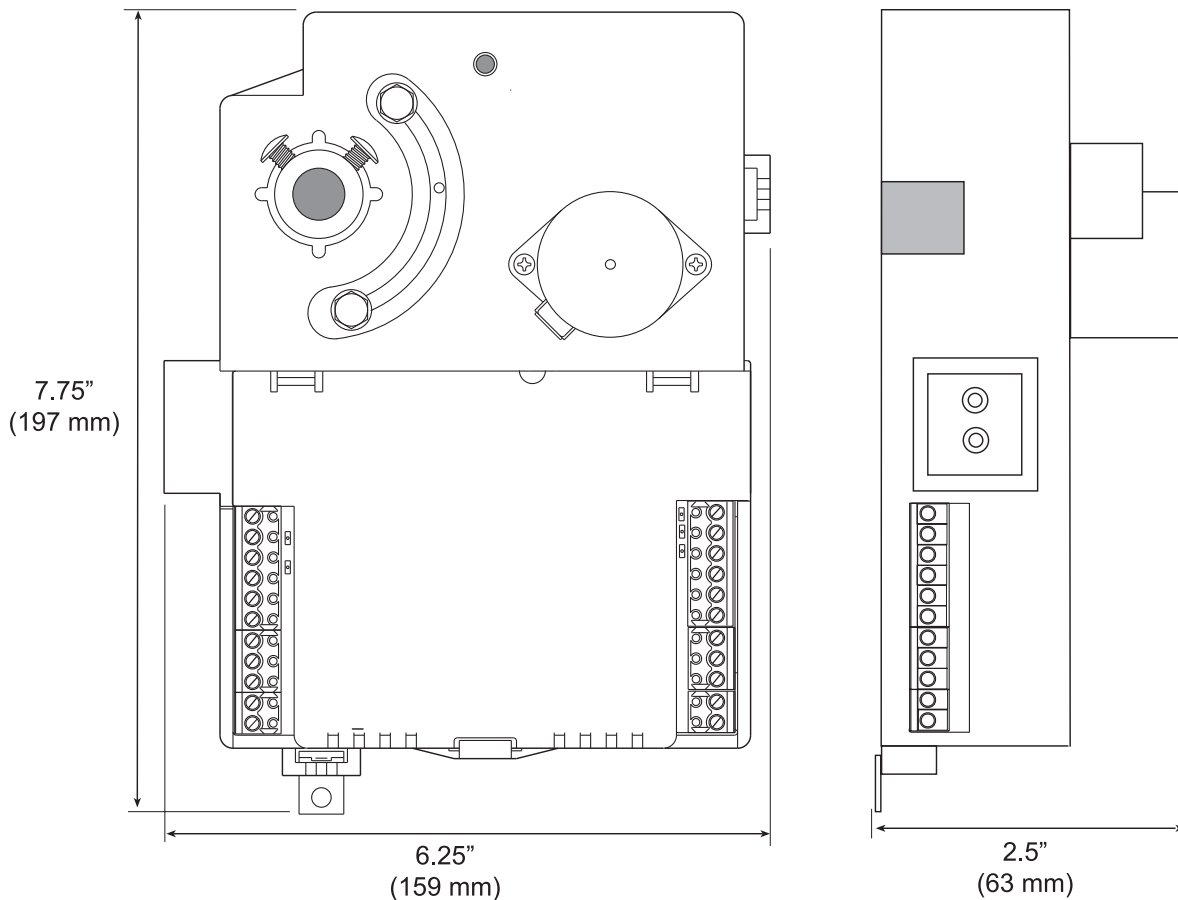
Universal Inputs
Two input and one return connection — terminals 1-3

Power Connection
One 24 VAC connection and ground — terminals 4-5

Digital Outputs
Two output connections and one triac reference — terminals 6-9

RS-485 Port
One port for a BACnet MS/TP or Infinet connection — terminals 10-12

Physical Dimensions

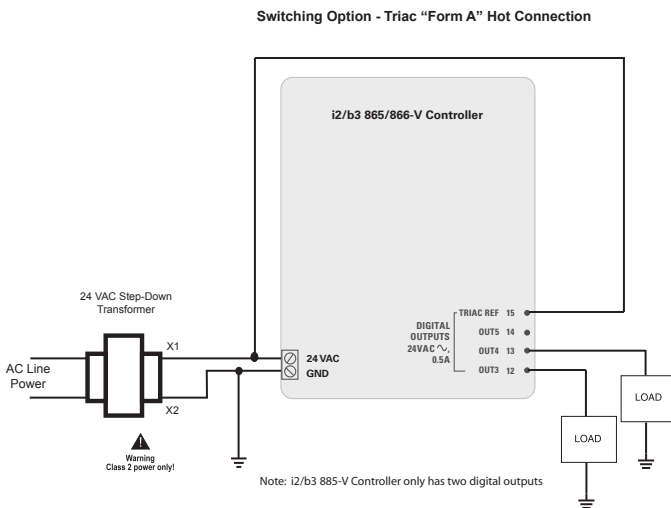


Wiring Digital Outputs

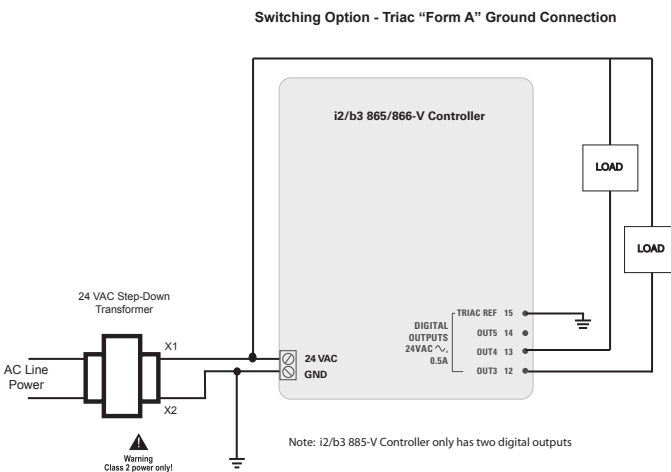
Form A Triac Outputs

The new i2/b3 865/866-V controllers use three Form A triac output terminals with a single triac reference. This configuration gives you the flexibility to wire the single triac reference as either a hot or ground connection. On these new controllers, all three outputs must be wired the same, as either hot or ground switch applications.

To make a hot switch connection, connect one of the output terminals (OUTX, where X = 3, 4, or 5) to a load, and connect the Triac Reference to the incoming 24 VAC power.



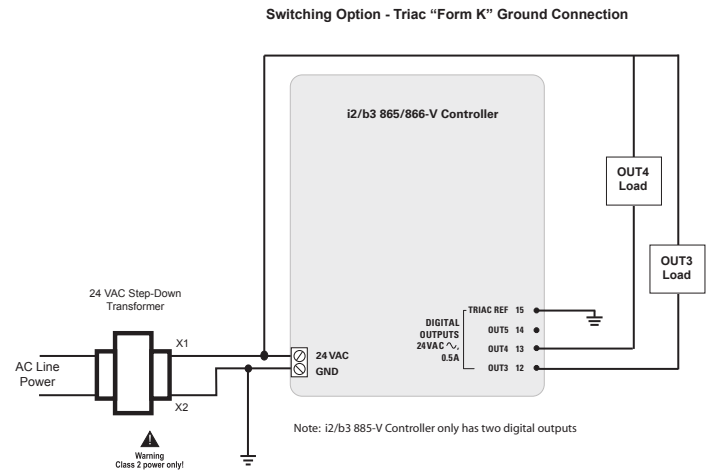
To make a ground switch connection, connect one of the output terminals (OUTX, where X = 3, 4, or 5) to a load in series with the 24 VAC incoming power, and connect the Triac Reference to ground.



The new i2/b3 885-V controller, which only has two output terminal connections, works the same, allowing for either two hot or ground switch applications

Form K Triac Outputs

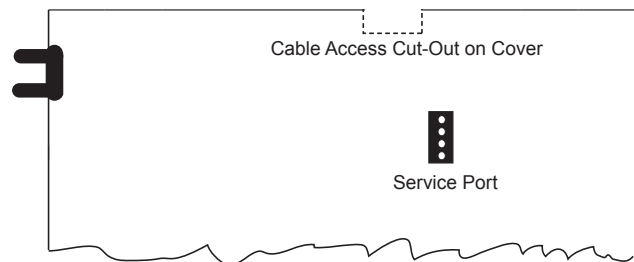
To create a Form K triac connection on the new i2/b3 865/866-V controllers, make the individual connections from terminals 12 and 13 (OUT3 and OUT4), or use terminals 13 and 14 (OUT4 and OUT5), with a common ground reference to terminal 15 (TRIAC REF).*



To maintain Form K triac connections on the new i2/b3 885-V controller, make the individual connections from terminals 6 and 7 (OUT3 and OUT4) with a common ground reference to terminal 9 (TRIAC REF).**

Notes: * Use Andover Continuum CyberStation is set the lower numbered digital output terminal to "tristate".
** Terminal 8 is not used on the 885-V controller.

Wireless Network Operation



To connect the controller to a Wireless Adapter, remove the cover and connect the Andover Continuum Wireless Adapter cable to the Service Port and run the cable through the cable access opening (cut-out) on the cover.

You must set two Continuum CyberStation software attributes for wireless operation:

- The comm port must have the Default Mode set to "Wireless".
- The software must "Learn" (discover) all the controllers on the Continuum network.

These attributes are set using the CommPort Editor in CyberStation. You need configuration privileges to configure a controller or comm port.

Specifications

Dimensions

7.75" W x 6.25" L x 2.5" H (197 x 159 x 63.5 mm)

Operating Environment

Temperature: 32° to 122° F (0° to 50° C)

Humidity: 10 to 90% RH, non-condensing

Power Requirement

Power: 24 VAC, +10% -15%, 50/60 Hz, Class 2 Limited Power

Power Consumption: Less than 10VA

Overload Protection: Fused, MOV protected

Airflow Input

Range: 0 to 1" W.C. (0-250 Pa)

Resolution: 0.0013" W.C. (0.33 Pa) @ 73° F (23° C)

Accuracy: +/- 0.05" W.C. (12.50 Pa) @ 73° F (23° C)

Communications

RS-485 port for implementing BACnet MS/TP or Infinet connections, including:

- Three-position removable screw terminal
- Standard service port, four-position shrouded connector
- Support for wireless adapter
- LEDs:
 - TD = Transmit Enable
 - RD = Received Data
 - Wired/Wireless Field Bus

CPU LEDs

- Green = b3 software model (BACnet)
- Yellow = i2 software model (Infinet)

Damper Shaft Mounting Screws

Torque Minimum: Varies according to shaft material

Torque Maximum: 30 inch-pounds (3.4 Nm)

Hex screws: 10-32 (with supplied hex wrench)

Damper Actuator (Motor)

Shaft Diameter: 1/2" (3/8" with AM-135 adapter)

Shaft Torque: 53 inch-pounds

Damper Speed: 180 sec. @ 60 Hz and 216 sec. @ 50 Hz; for 90°

Adjustable end limits with two set screws

Motor:

- Type = 24 VAC synchronous
- Motor Protection: Mechanical clutch
- Manual clutch override with a push-button release
- Hardware position feedback (model 866-V only)

Actuator Jumper Settings (Tri-State for directional control)

Jumper Connected

- + (On) = Clockwise (CW)
- - (-On) = Counter Clockwise (CCW)
- Off

Jumper Disconnected

- + (On) = Counter Clockwise (CCW)
- - (-On) = Clockwise (CW)
- Off

Terminal Contact Ratings

- 300V
- 8A
- 22 - 12AWG
- 6 inch-lb screw torque

Universal Inputs

Connections:

- Model 865 — Four inputs and two returns
- Model 866 — Four inputs and two returns
- Model 885 — Two inputs and one return

Input Voltage Range: 0-5.115 VDC

Input Impedance: 10K to 5.120 V

Input Voltage Resolution: 5.0 mV

Digital Resolution: 10 bits

Input Voltage Accuracy: +/- 15 mV

Temperature Range: -30° to 230° F (-34° to 110° C)

Temperature Accuracy: +/- 1° F from -10° to +150° F
(+/- 0.56° C from -23° to +66° C)

Counter Frequency: 4 Hz @ 50% duty cycle

Input Protection: +/- 1000V transients

Input Filter: 16 Hz with a one pole RC filter

Connector: Removable, 5 mm screw terminal

4-Position Dipswitch (Model 865 and Model 866):

- One switch per input
- Four universal inputs
- Enables/Disables input pullup resistors

Smart Sensor Interface

Connections:

- Model 865 — One input, SPWR, and return
- Model 866 — One input, SPWR, and return
- Model 885 — Not Available

Digital Outputs

Connections:

- Model 865 — Three triac output and one reference
- Model 866 — Three triac output and one reference
- Model 885 — Two triac output and one reference

SPST Accuracy: 0.1 second for pulse width modulation

Contact Ratings: 0.5A Maximum, 24VAC

Connector: Removable, 5 mm screw terminal

Analog Outputs

Connections:

- Model 865 — Not Available
- Model 866 — Two analog output and one return
- Model 885 — Not Available

Analog Output Channels Required: Two, Voltage only

Voltage Output Range: 0-10V

Output Source Current: 5 mA Maximum

Voltage Output Load: 2K Minimum Impedance

Voltage Output Resolution: 50 mV

Digital Resolution: 8 bits

Output Voltage Accuracy: 100 mV

Connector: Removable, 5 mm screw terminal

Regulatory Notices

Federal Communications Commission

FCC Rules and Regulations CFR 47, Part 15, Class A

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Caution: The user that changes or makes modifications not expressly approved by Schneider Electric for compliance could void the user's authority to operate the equipment.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.



CE - Compliance to European Union (EU)

2014/30/EU Electromagnetic Compatibility Directive

2014/35/EU Low Voltage Directive

2011/65/EU Restriction of Hazardous Substances (RoHS) Directive

This equipment This equipment complies with the rules, of the Official Journal of the European Union, for governing the Self Declaration of the CE Marking for the European Union, as specified in the above directive(s) per the provisions of the following standards: EN 60730-1, EN 60730-2-11, and EN 50491-3 Safety Standards.



Regulatory Compliance Mark (RCM)- Australian Communications and Media Authority (ACMA)

This equipment complies with the requirements of the relevant ACMA standards made under the Radiocommunications Act 1992 and the Telecommunications Act 1997. These standards are referenced in notices made under section 182 of the Radiocommunications Act and 407 of the Telecommunications Act.



WEEE - Directive of the European Union (EU)

This equipment and its packaging carry the waste of electrical and electronic equipment (WEEE) label, in compliance with (EU) Directive 2012/19/EU, governing the disposal and recycling of electrical and electronic equipment in the European community.




and UL listed product for the United States and Canada, Open Energy Management

Related Documentation


Document	Document Number
i2/b3 865/866/885-V Controller Retrofit Guide	30-3001-988
i2 Controller Technical Reference	30-3001-861
b3 and b4920 Controller Technical Reference	30-3001-862
b3xxx PICS statements — contact Schneider Electric Technical Support	

California Proposition 65

 WARNING: This product can expose you to chemicals including lead which is known to the State of California to cause cancer and which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov

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