



Installation and Maintenance Manual

IM 1037-3

Group: **Controls**

Part Number: **IM 1037**

Date: **January 2018**

Supersedes: **IM 1037-2**

Daikin VAV Controller Model 250802400

Installation Procedures



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Revision History

Publication	Date	Release Notes
IM 1037-3	January 2018	Updated VAV part number, cover image, application numbers, parts ordering information and minor formatting
IM 1037-2	January 2017	Updated for actuator with new AO connection
IM 1037	March 2010	Initial Release

Reference Documents

Publication	Company	Title	Source
ED 19098	Daikin Applied	Daikin VAV Controller Technical Specifications	www.DaikinApplied.com
IM 1038	Daikin Applied	Room Temperature Sensor for Daikin VAV Controller	
IM 1261	Daikin Applied	Room Temperature Sensor with CO ₂ Sensor for Daikin VAV Controller	
OM 1063	Daikin Applied	Daikin VAV Controller Owners Manual	

Limited Warranty

Consult your local Daikin representative for warranty details. To find your local Daikin representative, go to www.DaikinApplied.com.

Notice

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General Information

This manual contains the information you need to install the Daikin VAV Controller on a Daikin VAV box.

Hazard Identification Messages

CAUTION

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

WARNING

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

DANGER

Dangers indicate a hazardous situation which will result in death or serious injury if not avoided.

NOTICE

Notices give important information concerning a process, procedure, special handling or equipment attributes.

DANGER

Electric shock hazard. Can cause personal injury or equipment damage.

This equipment must be properly grounded. Connections and service to the Daikin VAV Controller must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

CAUTION

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

NOTICE

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense. **Daikin Applied disclaims any liability resulting from any interference or for the correction thereof.**

Description

These instructions describe direct-coupled mounting of the Daikin VAV Controller (i.e. controller) and Daikin's non-spring return rotary electronic damper actuator.

Application

The controller can be used in application numbers 6630 - 6637. For a full description of application specifics please refer to the Daikin VAV Controller Owner's Manual, OM 1063 (www.DaikinApplied.com).

Component Data

Figure 1 identifies the important features of the controller. Table 1 lists the parts that ship with the controller (Items A-F) and that are required for installation. These items are also shown in Figure 2. A dimensional drawing of the controller is shown in Figure 3.

Table 1: Parts List (see Figure 2)

Item	Description
A	Controller with pre-terminated tubing
B	Damper position indicator
C	Mounting bracket
D	Self-tapping mounting screws
E	4 mm hex key
F	3/8-inch shaft adapter (8 to 10 mm shafts)

Figure 1: Important Features

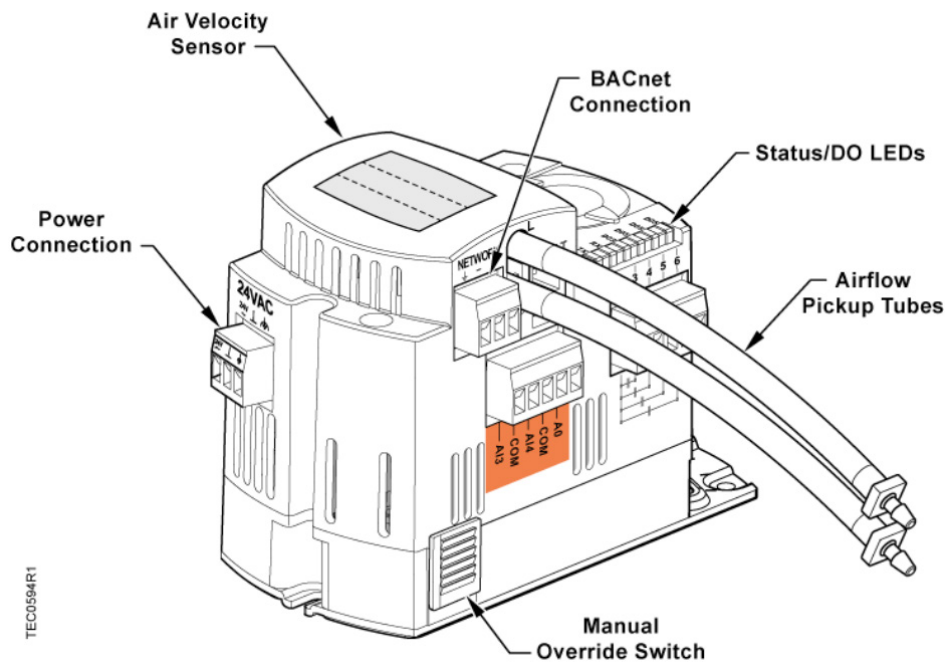


Figure 2: Parts and Accessories

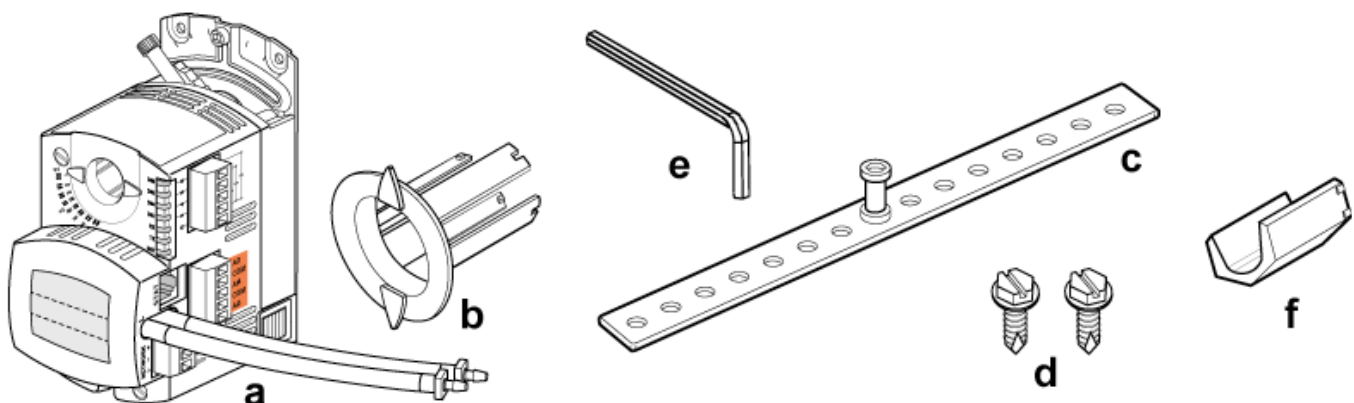
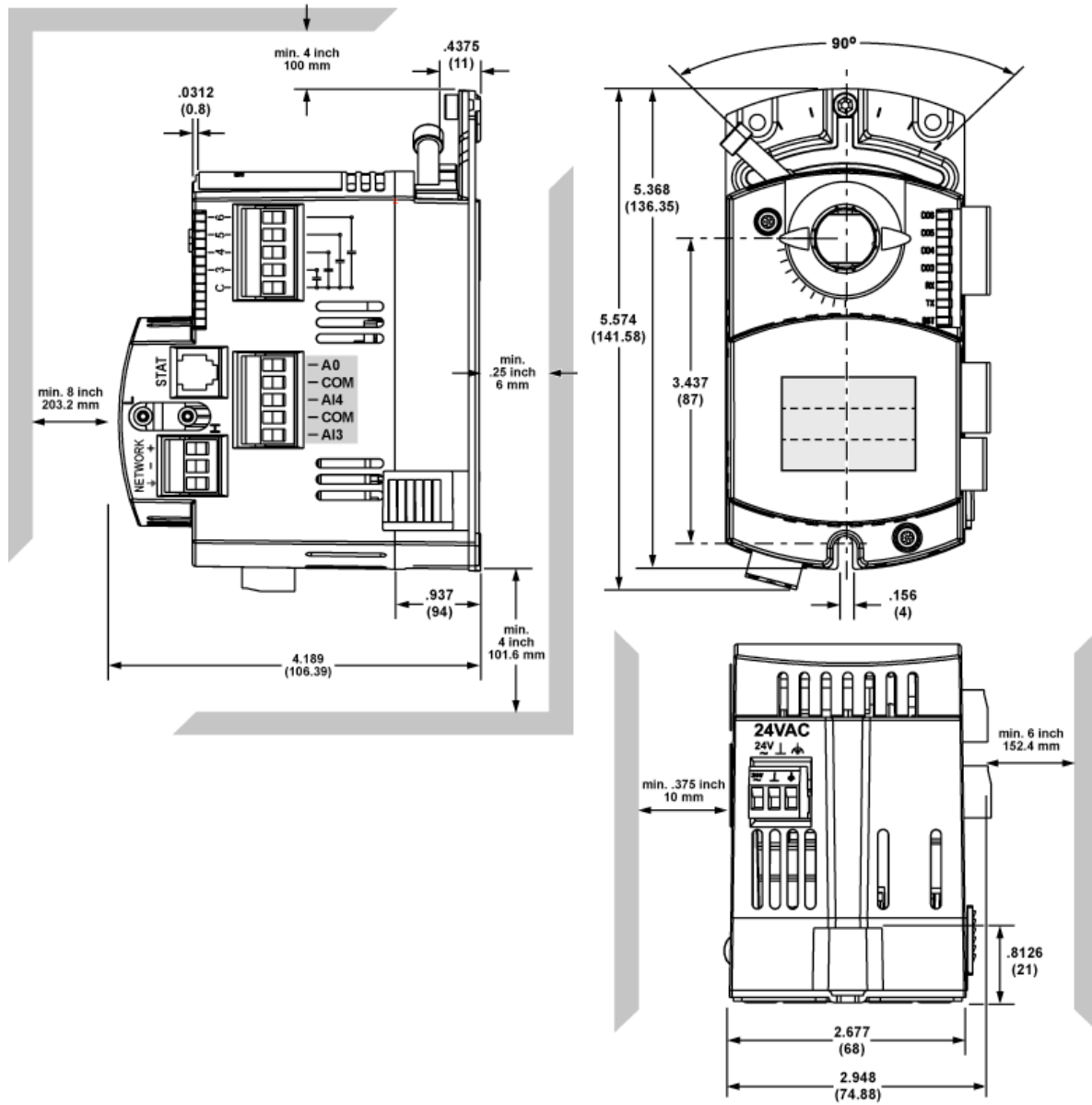


Figure 3: Dimensions in Inches (Millimeters)



The following section describes how to field install a new or replace an existing Daikin VAV Controller on a Daikin VAV box

CAUTION

Electrostatic discharge hazard. Can cause equipment damage.

This equipment contains sensitive electronic components that may be damaged by electrostatic discharge from your hands. Before you handle a communications module, you need to touch a grounded object, such as the metal enclosure, in order to discharge the electrostatic potential in your body.

WARNING

Electric shock hazard. Can cause personal injury or equipment damage.

This equipment must be properly grounded. Only personnel knowledgeable in the operation of the equipment being controlled must perform connections and service to the Daikin VAV Controller.

Required Tools and Materials

- 4 mm hex wrench
- Small, flat-blade screwdriver
- 1/4-inch Hex drill/driver set
- Marker or pencil
- Torque Wrench

Prerequisites

- Wiring conforms to NEC and local codes and regulations
- Room temperature sensor installed (optional)
- 24 Vac Class 2 power available
- Supply power to the unit is OFF
- Any application specific hardware or devices installed
- Air velocity sensors installed in ducts

Installing the Controller

Follow these steps to install the controller on a Daikin VAV box.

To Install the Controller

1. Determine the size of the damper shaft.

- A. If the damper shaft is 1/2-inch, proceed to Step 2.

NOTE: The actuator on the controller comes with a factory-installed 1/2-inch damper shaft guide.

- B. If the damper shaft is 5/8-inch:

- a. Remove the 1/2-inch shaft guide, [Figure 4](#).
- b. Proceed to Step 2.

- C. If the damper shaft is 3/8-inch:

- a. Remove the 1/2-inch shaft guide, [Figure 4](#).
- b. Use the 3/8-inch adapter, provided in the actuator packaging, [Figure 4](#) and [Figure 5](#). Hold the shaft insert so that the raised tabs are inserted last when placing the insert into the back of the actuator on the controller.
- c. Proceed to Step 2.

2. Determine the damper blade rotation, clockwise or counterclockwise to open, [Figure 6](#).

- A. The actuator on the controller is designed to move slowly with high torque. In order to move the damper manually, push the switch down on the right side of the controller to disengage the gearing inside the actuator. To return the actuator back to its gearing, release the manual override switch. An audible click may be heard when the gearing reengages with the shaft. If it is not, lightly push the adjustment lever to make sure it is locked in place. Refer to [Figure 7](#).

- a. If the damper blades rotate clockwise, hold the manual override switch and move the adjustment lever to the left. Once at the desired location, release the switch.
- b. If the damper blades rotate counterclockwise, hold the manual override switch and move the adjustment lever to the right. Once at the desired location, release the switch.

3. Close the damper blades as seen in [Figure 9](#).

4. Mark the end of the damper shaft that the controller will be connected to with a pencil or marker, as seen in [Figure 9](#).

5. Tighten the set screw on the adjustment lever until the first thread can be seen in the shaft hole. The shaft hole has the position indicator inserted into it.

6. Mount the controller on the damper shaft. Again, refer to [Figure 9](#).

7. Install the position indicator into the shaft hole as seen in [Figure 10](#).

8. Tighten the adjustment lever to the proper torque listed below:
 - A. 70 +/- 5 inch-pounds for solid metal shafts
 - B. 37 +/- 2 inch-pounds for plastic graphite composite (hollow metal shafts require an insert to prevent shaft damage).
 9. Attach and center the mounting bracket as seen in Figure 11.
- NOTE:** When installing the mounting bracket directly on the ductwork, be sure to position the bracket so that the screws do not obstruct the damper blade movement inside the box.
10. Connect the airflow tubing for the Differential Pressure Sensor on the side of the controller.
 - A. RED connects to HIGH.
 - B. BLUE connects to LOW.

Figure 4: Removing the 1/2-inch Shaft Guide from Actuator

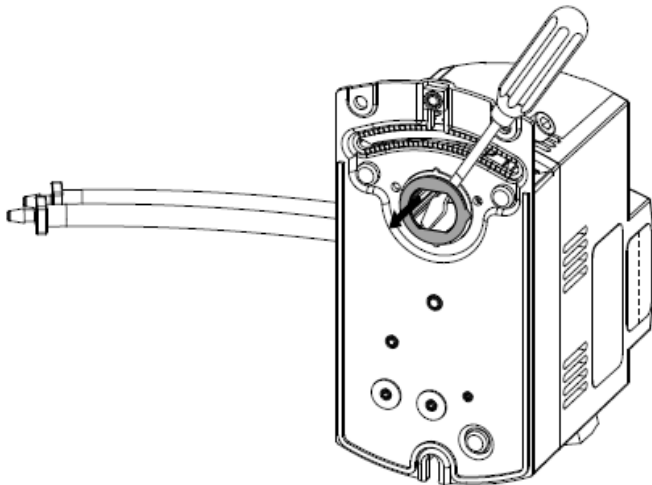


Figure 5: Installing the 3/8-inch Shaft Adapter

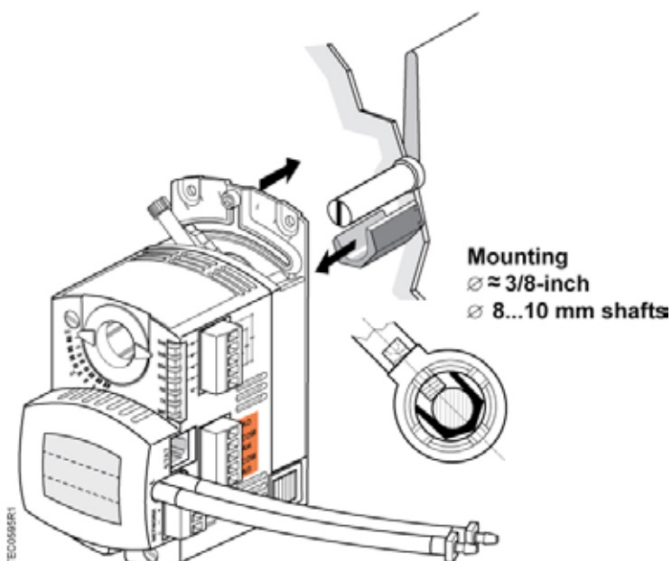


Figure 6: Damper Rotation

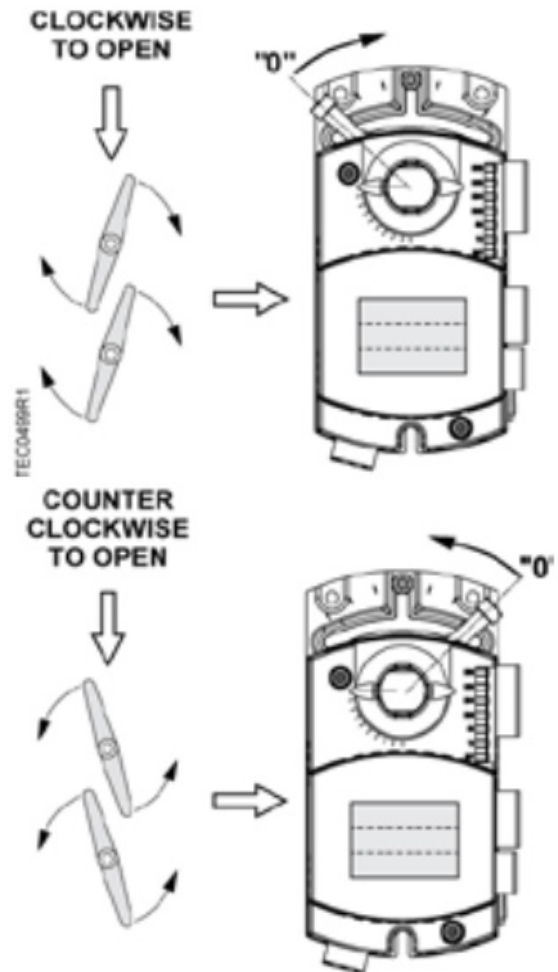


Figure 7: Moving the Adjustment Lever using the Manual Override Switch.

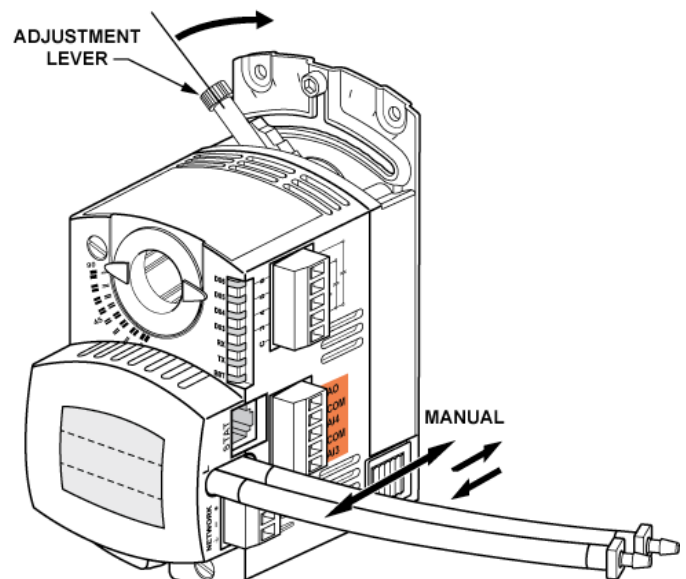


Figure 8: Closed Damper Blades.

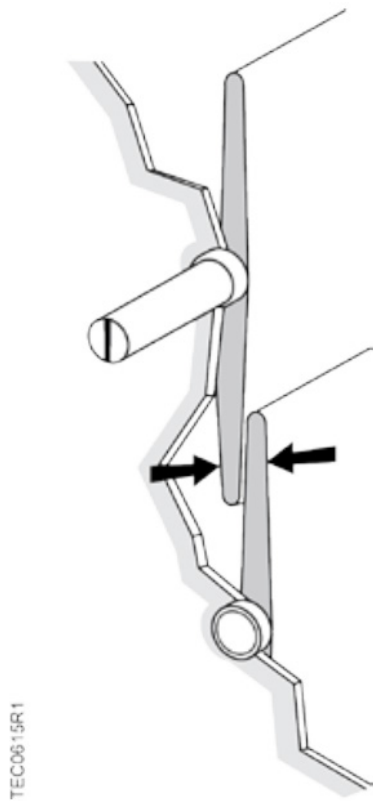


Figure 10: Position Indicator and Adjustment Lever

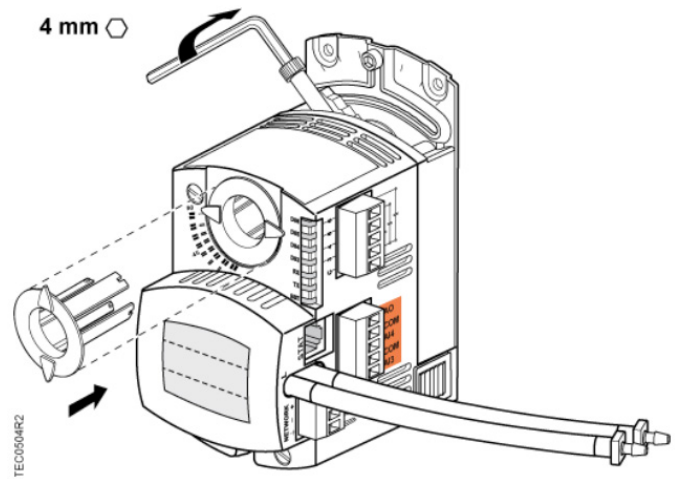


Figure 9: Mounting the Controller

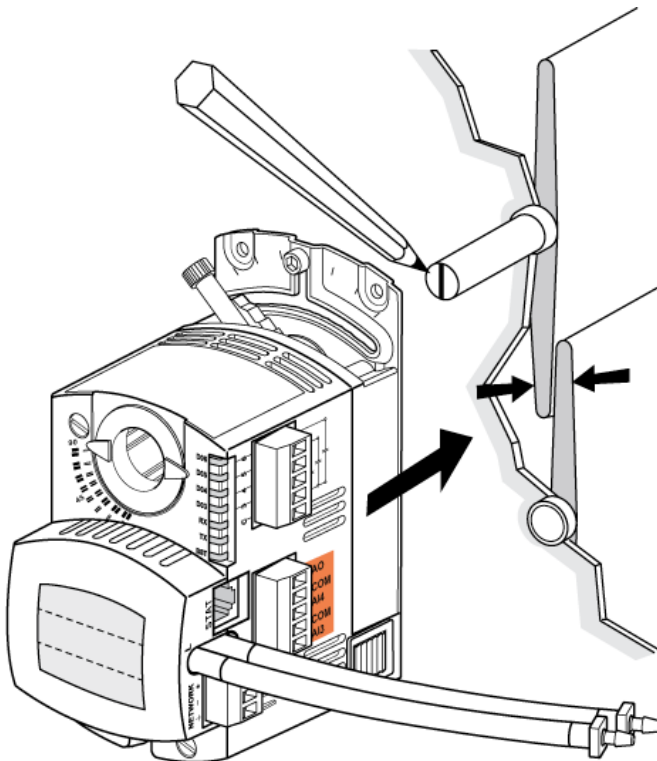
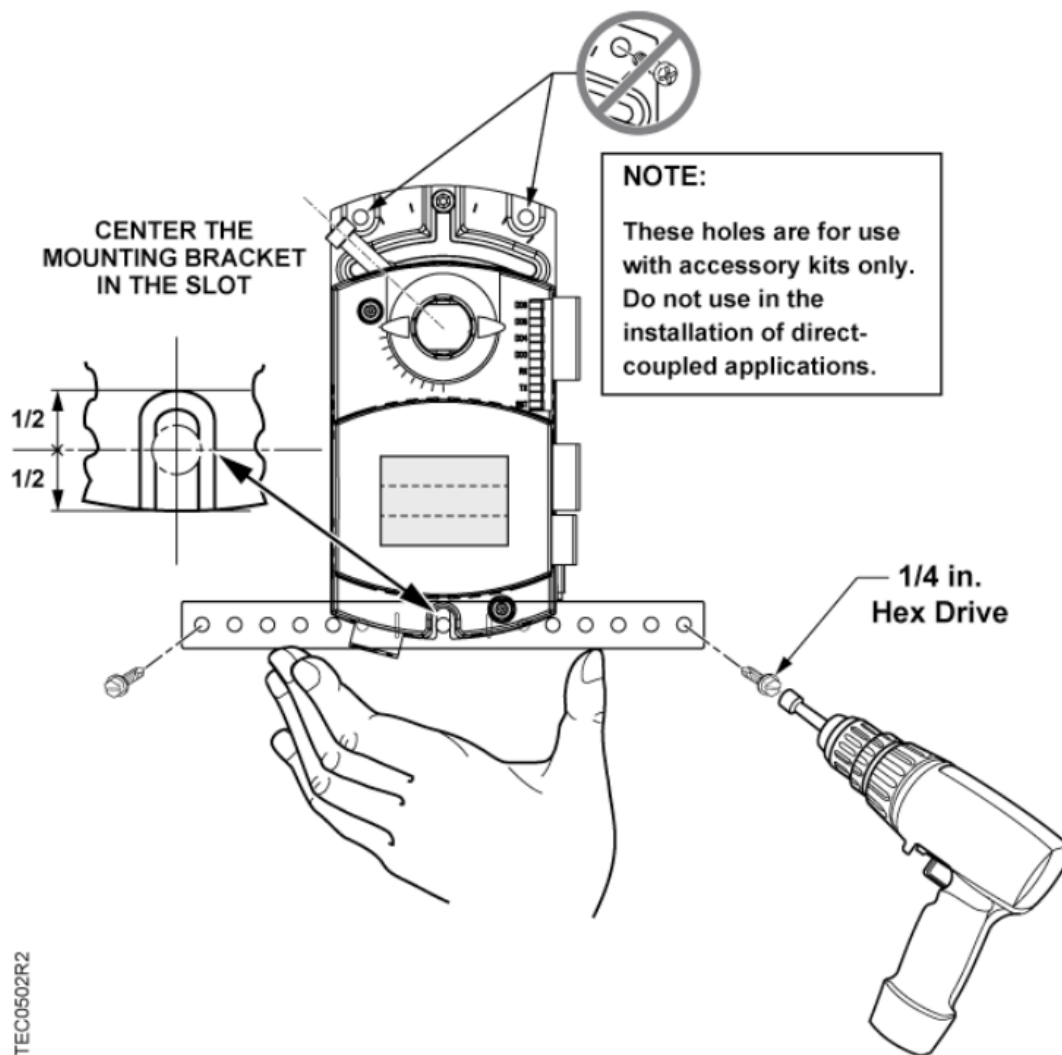


Figure 11: Installing the Mounting Bracket



Wiring the Controller



WARNING

Electric shock hazard. Can cause personal injury or equipment damage.

This equipment must be properly grounded. Only personnel knowledgeable in the operation of the equipment being controlled must perform connections and service to the Daikin VAV Controller.



WARNING

Installations requiring CE Conformance

- All wiring for CE rated actuators must be Separated Extra Low Voltage (SELV) or Protective Extra Low Voltage (PELV) per HD384-4-41.
- Use safety-isolating transformers (Class III transformer) per EN 61558. They must be rated for 100% duty cycle.
- Over current protection for supply lines is maximum 4A.

Wiring Instructions

1. Verify power supply.

NOTE: This controller is designed to work with 2-wire AC power (Neutral and Phase (hot) at 24 Vac +/-20%. Use of the ground terminal is optional. Refer to [Figure 13](#) for a visual aid in wiring and plugging in the connector.

2. Connect the twisted pair wire to the positive (+) and negative (-) terminals to enable communication with a field panel (such as an Intelligent Equipment gateway, system controller, or other network device) via BACnet MS/TP as shown in [Figure 12](#).
 - Applications using a Temperature/CO₂/Relative Humidity Sensor (PNs 250803700 and 250803800) require the power module for that sensor to be wired in parallel off of the 24 Vac connector.
 - Applications using a Temperature-Only Sensor (PNs 2508031 and 2508032) do *not* require the power module.

For more detailed information, refer to the Room Temperature Sensor with CO₂ Sensor for Daikin VAV Controller, IM 1261 (www.DaikinApplied.com).

For sensors and power module part numbers, refer to the [Parts and Accessories](#) section at the end of this manual.

Figure 12: BACnet MS/TP Communication Wiring

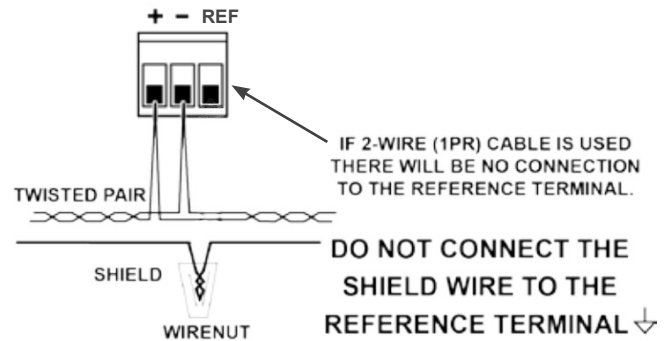
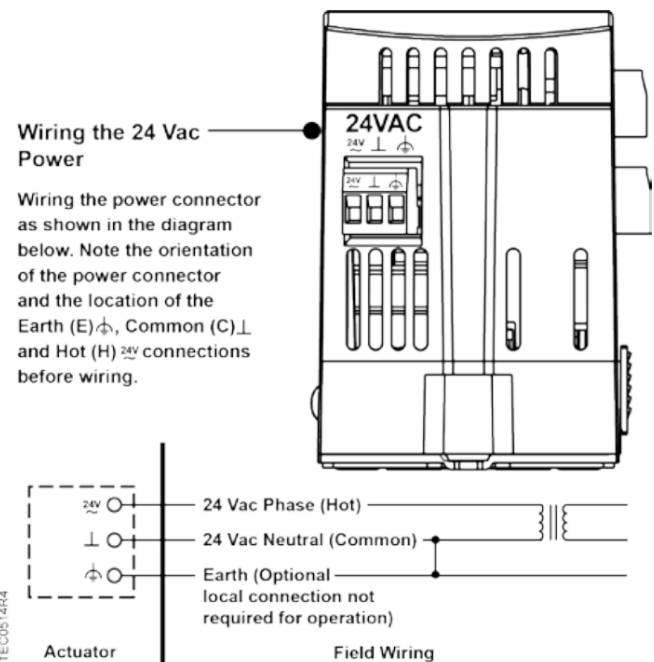


Figure 13: Power Wiring



Digital Outputs (DO)

The Digital Outputs on the controller are dry output Triac type outputs. 24 Vac must be applied to the "C" pin of the DO connector. The side view of the controller shows output pin details.

By providing dry output Triac DOs, the application can switch either Phase or Neutral depending on application needs. In a 24 Vac circuit, neutral is determined by which side of the transformer is earth grounded. If neither side is earth grounded (at the transformer) then the 24 Vac is considered a floating (isolated) source. See Figure 14 and Figure 15 for examples of DO wiring.

Wiring DI Common (pin 4) to 10K Thermistor - 8Vdc (pin 2) incorrectly will cause the actuator to shut down. No damage will occur. When the wiring is corrected the controller will resume operation. Refer to Figure 16 for DI wiring examples.

Figure 14: Daikin VAV Controller with Electric Heat and Fan

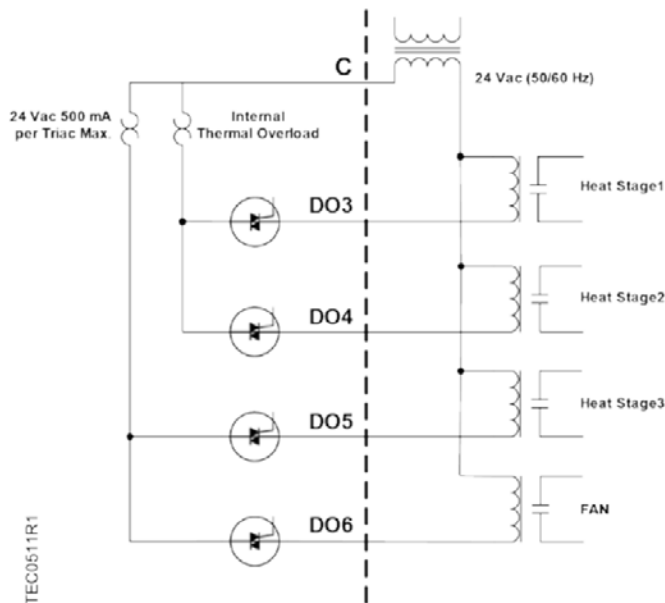


Figure 15: Daikin VAV Controller with Hot Water Reheat, Fan and Spare DO

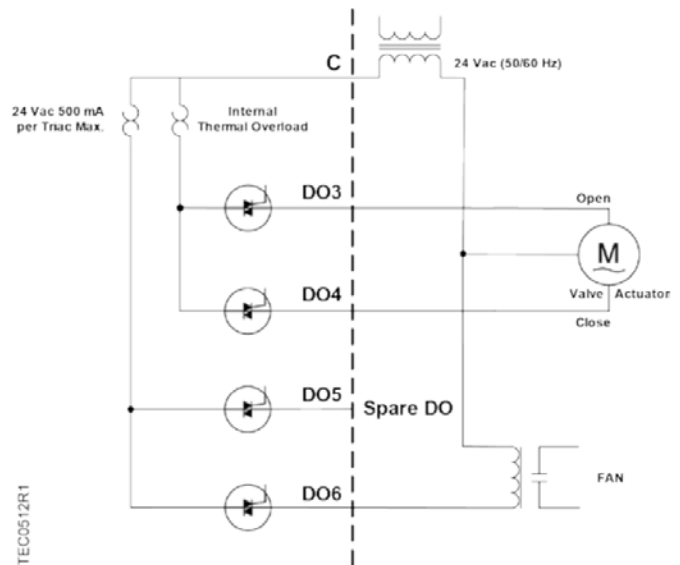
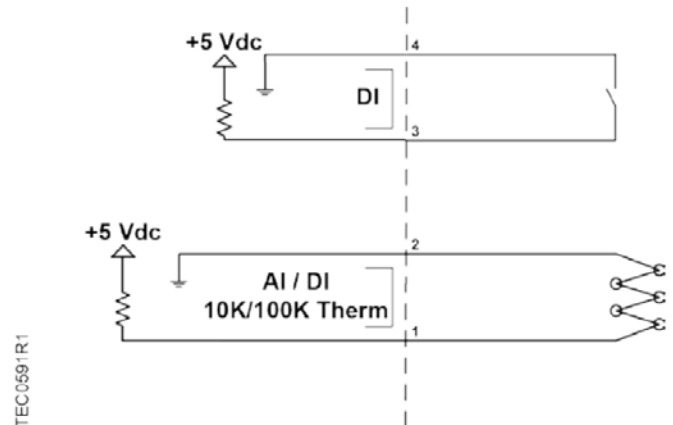


Figure 16: Wiring for D12/A13



DO/DI Wiring Diagrams

NOTE: The controller DO is capable of handling 24 Vac loads only. The maximum rating is 12 Va for each DO. An external interposing relay is required for any of the following:

- Va requirements higher than the maximum
- 110 or 220 Vac requirements
- DC power requirements
- Separate transformers used to power the load

Figure 17 - Figure 24 are specific to the VAV application being used. Verify the desired wiring configuration matches the VAV application.

NOTE: The application versions shown in Figure 17 - Figure 24 are supported by the current controller model. Temperature/CO₂/RH sensors are not available in the previous controller model. Refer to the [Product Support](#) section for details about the sensors that are compatible with the older controller. For reference, the "current" controller model has an analog output, which is not available on the previous controller.

Figure 17: Application 6630 VAV Cooling-Only Wiring Diagram

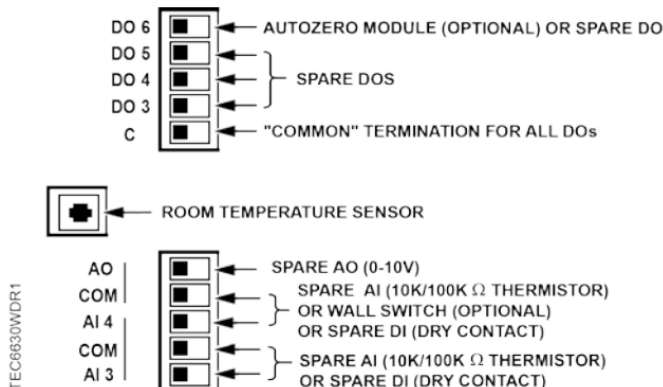


Figure 18: Application 6631 VAV Cooling and Heating Wiring Diagram

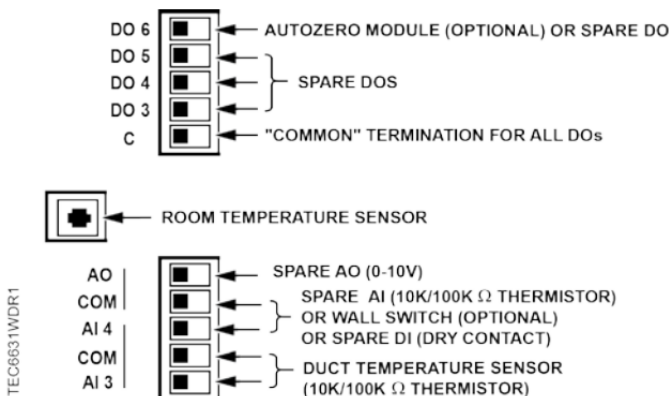


Figure 19: Application 6632 VAV with Electric Heat Wiring Diagram

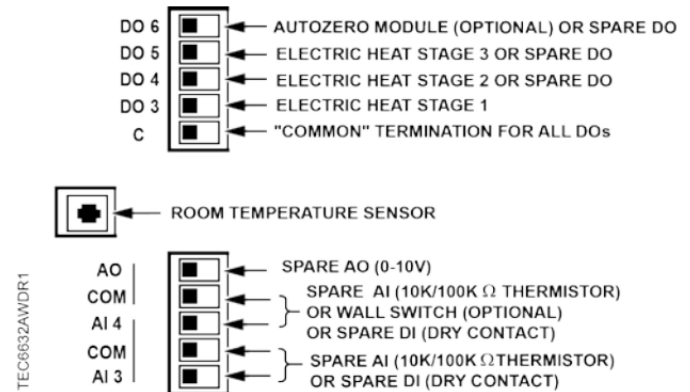


Figure 20: Application 6632 VAV with Baseboard Radiation Wiring Diagram

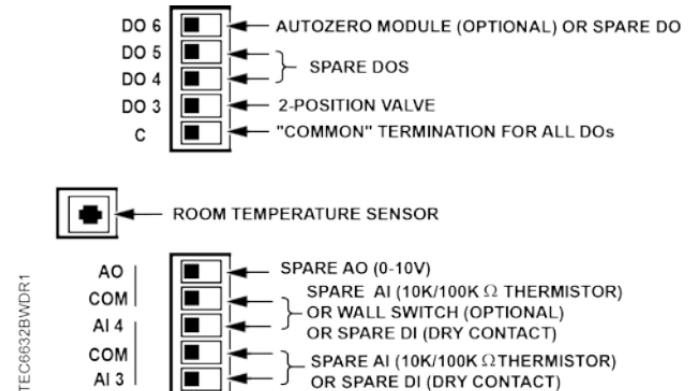


Figure 21: Application 6633 VAV with One Hot Water Valve Wiring Diagram

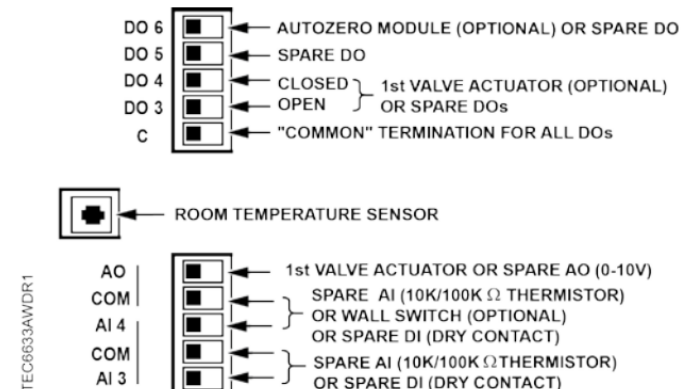


Figure 22: Application 6633 VAV with Two Hot Water Valves Wiring Diagram

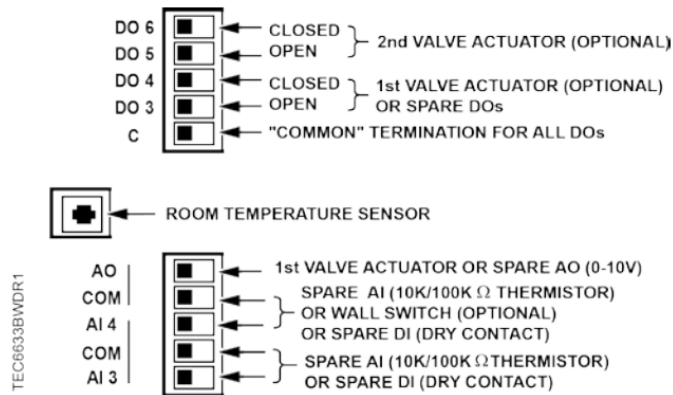


Figure 24: Application 6635/6637 VAV Series Fan or Parallel Fan and Hot Water Heat Wiring Diagram

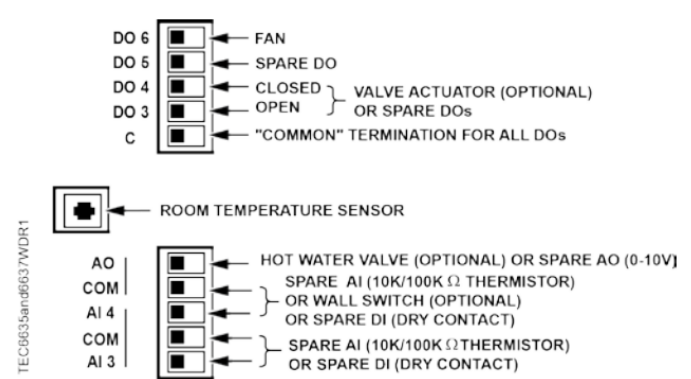
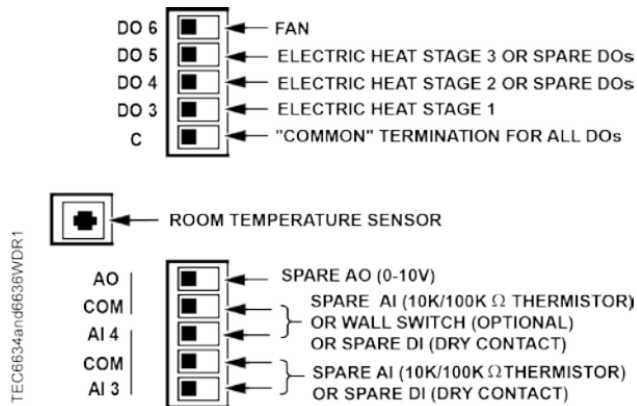


Figure 23: Application 6634/6636 VAV Series Fan or Parallel Fan and Electric Heat Wiring Diagram



Parts and Accessories

There are two different versions of the controller. The newer (current) controller model has an analog output, which is not available on the older (legacy) model. It also has a different part number.

The parts and accessories supported by the current controller are shown in [Table 2](#).

NOTE: Temperature/CO₂/RH sensors listed in [Table 2](#) are used only with the newer controller. These sensors are not compatible with the legacy controller.

[Table 3](#) shows the parts and accessories available with the older controller. The room temperature sensors listed in this table are not compatible with the newer controller.

To order Daikin VAV controller parts and accessories, contact Daikin Applied Parts customer service at 763-383-4500 or partsid@daikinapplied.com.

Technical Support

Contact the Daikin Applied Controls Customer Support group at 866-462-7829 for installation and troubleshooting assistance.

Table 2: Current Controller Parts and Accessories

Description	Part Number
Daikin VAV Controller	250802400
Room Temperature Sensor (blank front)	2508031
Room Temperature Sensor (includes display, setpoint adjust, and tenant override)	2508032
Temperature/CO ₂ /Relative Humidity Sensor (blank front)	250803700
Temperature/CO ₂ /Relative Humidity Sensor (includes display, setpoint adjust, and tenant override)	250803800
Temperature/CO ₂ /Relative Humidity Power Module	250803900
Duct Static Pressure Sensor	250803301
25-foot (7.6 m) cable	2508041
50-foot (15.2 m) cable	2508042
100-foot (30.5 m) cable	2508043

NOTE: Cables include connections

Table 3: Legacy Controller Parts and Accessories

Description	Part Number
Daikin VAV Controller	2508021
Room Temperature Sensor	2508031
Room Temperature Sensor	2508032
25-foot (7.6 m) cable	2508041
Duct Static Pressure Sensor	250803301
50-foot (15.2 m) cable	2508042
100-foot (30.5 m) cable	2508043

NOTE: Cables include connections



Daikin Applied Training and Development

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Warranty

All Daikin equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local Daikin Applied representative for warranty details. To find your local Daikin Applied representative, go to www.DaikinApplied.com.

Aftermarket Services

To find your local parts office, visit www.DaikinApplied.com or call 800-37PARTS (800-377-2787). To find your local service office, visit www.DaikinApplied.com or call 800-432-1342.

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