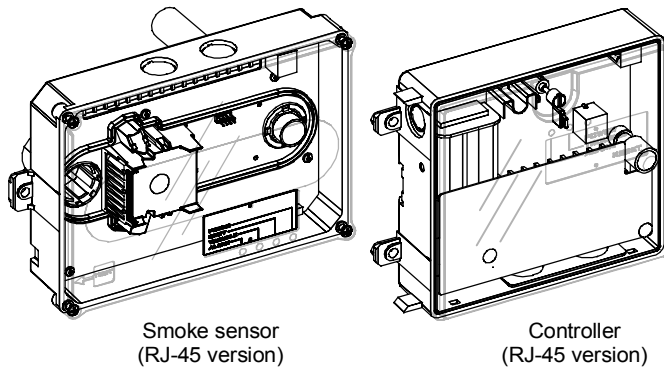
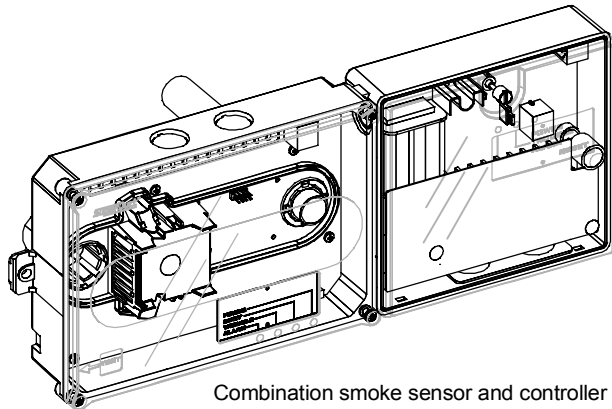


SuperDuct Four-Wire Duct Smoke Detector

P/N 3100685 • Rev 2.0 • 18AUG05



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Introduction

This document provides technical information for the following SuperDuct four-wire duct smoke detector controllers and sensors:

Model	Description
TSD-CJ, TSD-CJ24, ESD-CJ, SD-CJ	Four-wire controller with RJ-45 modular connectors
TSD-SJ, ESD-SJ, SD-SJ	Four-wire smoke sensor with RJ-45 modular connector
TSD-4WJ, TSD-4WJ24, ESD-4WJ, SD-4WJ	Combination four-wire controller and sensor with RJ-45 modular connectors
TSD-CJG	Four-wire controller with RJ-45 modular connectors and cover gasket
TSD-SJG	Four-wire smoke sensor with RJ-45 modular connector and cover gasket
TSD-CT, TSD-CT24, ESD-CT, SD-CT,	Four-wire controller with terminal block connectors
TSD-ST, ESD-ST, SD-ST	Four-wire smoke sensor with terminal block connector
TSD-SJCO2	Four-wire sensor with RJ-45 modular connector and TSD-CO2 sensor module
TSD-STCO2	Four-wire sensor with terminal block connector and TSD-CO2 sensor module

Note: The TSD-CO2 module has not been performance evaluated to UL 2075 or approved by ULC.

Related documents

In addition to this document, important information regarding the proper installation and maintenance of SuperDuct duct smoke detectors is provided in the following standards:

- NFPA 70 *National Electrical Code*
- NFPA 72 *National Fire Alarm Code*
- NFPA 90A *Installation of Air Conditioning and Ventilating Systems*
- UL 268A *Smoke Detectors for Duct Applications*
- ULC 529 *Smoke Detectors for Fire Alarm Systems*
- NEMA *Guide for Proper Use of Smoke Detectors in Duct Applications*

Duct smoke detector limitations

SuperDuct duct smoke detectors will not operate without electrical power.

SuperDuct duct smoke detectors will not operate as designed outside of the listed electrical and environmental specifications.

SuperDuct duct smoke detectors will not sense smoke unless the ventilation system is operating and the sensor's cover is properly installed.

SuperDuct duct smoke detectors may not operate as designed unless the duct detector is installed in accordance with these instructions and all applicable national and local codes as determined by the local authority having jurisdiction.

Product description

Overview

SuperDuct four-wire duct smoke detectors are used to detect smoke under extended temperature ranges in self-contained commercial HVAC units, such as those typically found on building rooftops. In self-contained commercial HVAC units, the HVAC equipment is enclosed in a single package to protect the internal components (compressor, condensing unit, heating coils, etc.) from adverse environmental conditions. Hinged or removable service panels provide access to the equipment.

WARNING: SuperDuct duct smoke detectors are not intended as a substitute for open area protection.

The SuperDuct duct smoke detector (see Figure 1) comprises a controller and one or two sensors. Its primary function is to provide early warning of an impending fire and shut down the

HVAC unit in order to prevent smoke from circulating throughout the building. It is typically used to detect smoke in the supply side of the HVAC system but can provide supervision of the return side as well.

Note: Install supply-side sensors at a point downstream from the supply fan and air filters and return-side sensors at a point before the return air is diluted by outside air.

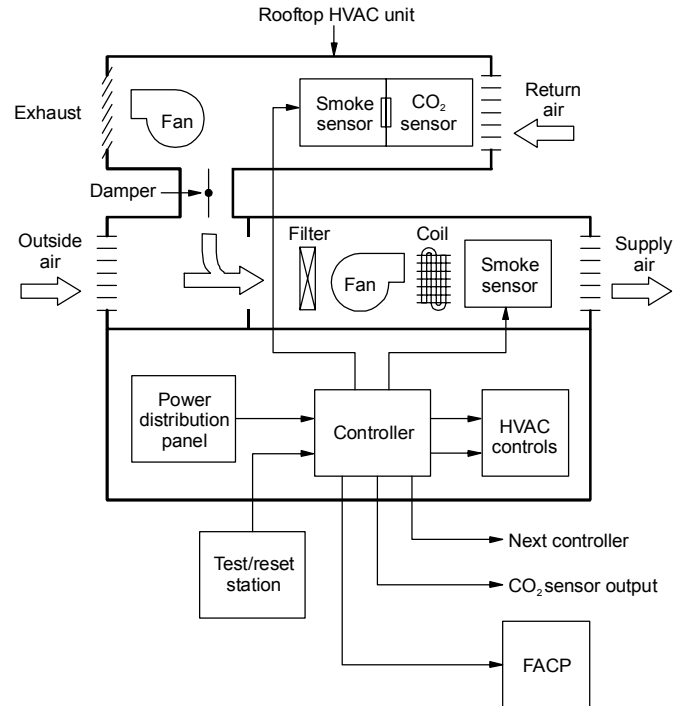


Figure 1: Duct smoke detector application diagram

The controller is designed for multiple operating voltages and provides relay contacts for connection to fire alarm systems, HVAC controls, and other auxiliary functions. It can be attached to a sensor and installed as a single unit or it can be installed separate from the sensor. In installations where the duct smoke detector's controls and indicators are hidden from view, a remote test/reset station can be connected to the controller to provide these functions.

Note: In installations using two sensors, the duct smoke detector does not differentiate which sensor signals an alarm or trouble condition.

The sensor uses a process called differential sensing to prevent gradual environmental changes from triggering false alarms. A rapid change in environmental conditions, such as smoke from a fire, causes the sensor to signal an alarm state but dust and debris accumulated over time does not. When the sensor's ability to compensate for environmental changes has reached its limit (100% dirty), the sensor signals a trouble condition.

Air is introduced to the duct smoke detector's sensing chamber through a sampling tube that extends into the HVAC

duct and is directed back into the ventilation system through an exhaust tube. The difference in air pressure between the two tubes pulls the sampled air through the sensing chamber. When a sufficient amount of smoke is detected in the sensing chamber, the sensor signals an alarm state and the controller automatically takes the appropriate action to shut down fans and blowers, change over air handling systems, notify the fire alarm control panel, etc.

Caution: Excess temperature differentials between the ambient air and the sampled air can produce unwanted condensation inside the sensor, which may cause the sensor to function improperly. Precautions should be taken to limit the temperature range and the amount of condensation to which the sensor is exposed.

Sensor description

The sensor (see Figure 2) comprises a plastic housing, a printed circuit board, a clear plastic cover, an exhaust tube, and a sampling tube. The exhaust tube and sampling tube are attached during installation. The sampling tube is ordered separately and varies in length depending on the size of the HVAC duct.

The clear plastic cover permits visual inspections without having to disassemble the sensor. The cover attaches to the sensor housing using four captive screws and forms an airtight chamber around the sensing electronics.

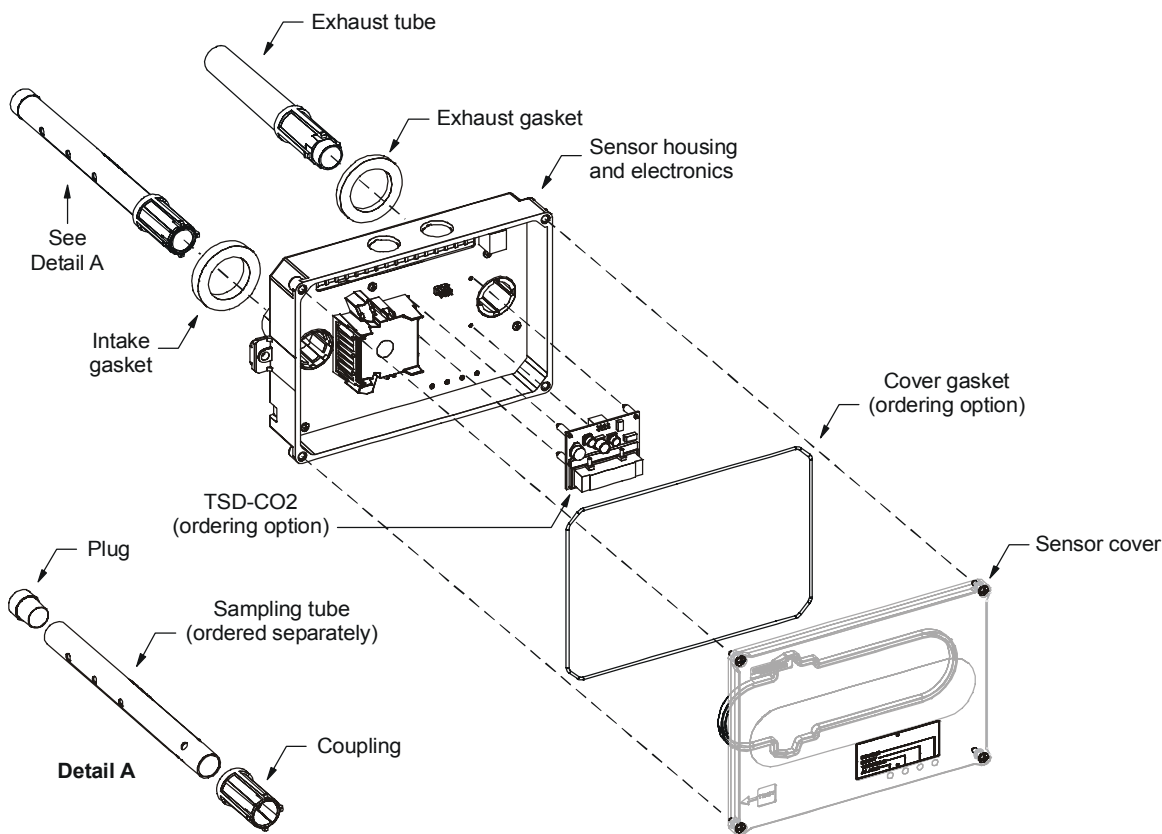


Figure 2: Four-wire smoke sensor exploded view (RJ-45 version)

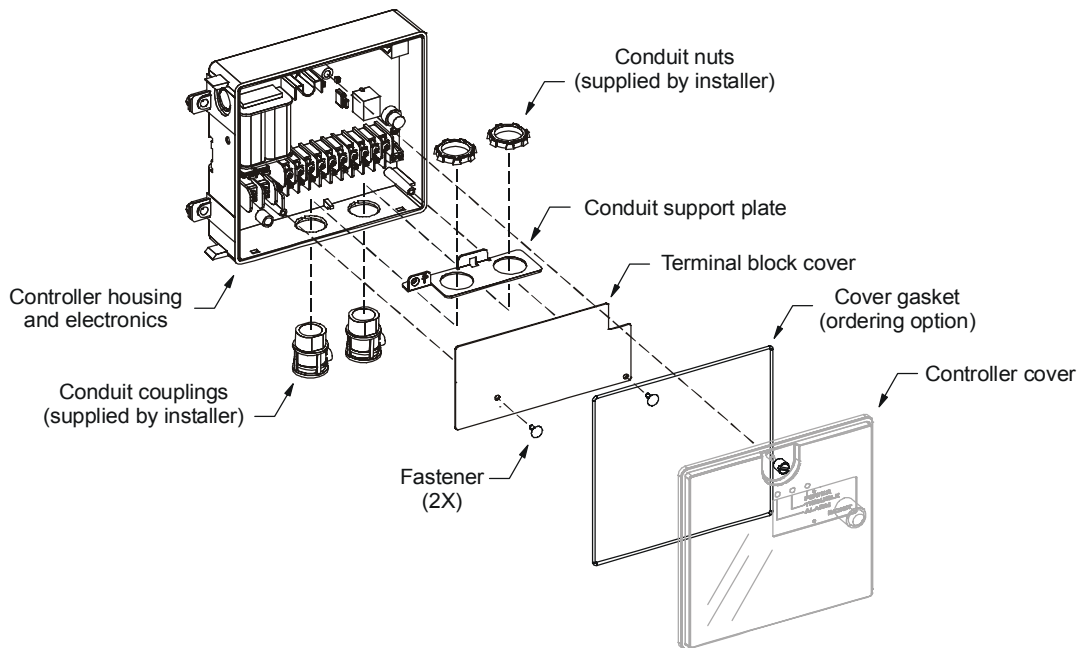


Figure 3: Four-wire controller exploded view (RJ-45 version)

Controller description

The controller (see Figure 3) comprises a plastic housing, a printed circuit board, and a clear plastic cover. The controller can be connected to one or two compatible duct smoke sensors. Depending on the model, connections are made using terminal blocks or RJ-45 cables.

The clear plastic cover is secured to the housing with a single captive screw for easy access to the wiring terminals. Knockouts are provided to route wires into the controller housing.

Features

The duct smoke detector incorporates the following features:

- Environmental compensation with differential sensing for reliable, stable, and drift-free sensitivity
- Magnet-activated test/reset switch on sensors
- PCB mounted photoelectric sensor with onboard intelligence
- Cover tamper switch for added security
- Sampling tube can be installed with or without the cover in place and can be rotated in 45-degree increments to ensure proper alignment with duct airflow
- Alarm, Trouble, Dirty, and Power status LEDs
- Standard sampling tube spacing and field connections for easy drop-in migration from other duct detectors
- Extended temperature and air velocity ranges

- Sensor and controller may be installed as a single unit or separately
- Uses one or two sensors
- Uses multiple operating voltages
- No tools required to access field connection terminals
- Recessed momentary switch for testing and resetting the duct detector
- One set of normally open alarm initiation contacts for connection to an initiating device circuit on a fire alarm control panel
- Two Form C auxiliary alarm relays for controlling ancillary equipment (e.g., HVAC controls)
- One Form C supervision (trouble) relay to control the operation of the Trouble LED on a remote test/reset station
- Can be wired to up to 14 other duct smoke detectors for multiple fan shutdown applications

Specifications

Dimensions

Controller: 6.75 x 5.45 x 1.90 inches

Sensor: 8.70 x 5.45 x 1.90 inches

Controller with sensor: 14.51 x 5.45 x 1.90 inches

Wire size

High voltage terminals: 12 to 22 AWG

All others: 14 to 22 AWG

Smoke detection method: Photoelectric

Air velocity rating: 100 to 4,000 ft/min

Air pressure differential: 0.005 to 1.00 inches of water

Sensitivity: 0.67 to 2.46 %obscuration/ft
 Reset time: 2 seconds, max.
 Power up time: 8 seconds, max.
 Alarm test response time: 5 to 7 seconds
 Controller LED indicators: Alarm (red), Trouble (yellow), Power (green)
 Sensor LED indicators: Alarm (red), Trouble (yellow), Dirty (yellow), Power (green)
 Alarm initiation relay
 Quantity: 1
 Style: Normally open
 Ratings: 2.0 A at 30 Vdc (resistive)
 Auxiliary relay
 Quantity: 2
 Style: Form C
 Ratings: 10 A at 30 Vdc, 10 A at 250 Vac (contacts must switch a minimum of 100 mA at 5 Vdc)
 Supervision (trouble) relay
 Quantity: 1
 Style: Form C
 Ratings: 2.0 A at 30 Vdc (resistive)
 Auxiliary output: 18 Vdc, nom., 30 mA, max.
 TSD-CO2 module output: 0 to 10 Vdc (0 to 2,000 ppm)
 Operating environment
 Temperature: -20 to 70 °C (-4 to 158 °F)
 Temperature with TSD-CO2 module installed: 0 to 55 °C (32 to 131 °F)
 Humidity: 10 to 93%, RH noncondensing at 68 to 72 °C (154.4 to 161.6°F)
 Operating voltages: 20 to 29 Vdc (-15 to 10%), 24 V (-15 to 10%) at 50/60 Hz, 120 V (-15 to 10%) at 50/60 Hz, 220/240 V (-15 to 10%) at 50/60 Hz
 Operating currents: See table below

Supply voltage	Standby current	Alarm current
24 Vdc	77.9 mA	124.3 mA
24 V at 50 Hz	215.3 mA	307.0 mA
24 V at 60 Hz	220.0 mA	316.5 mA
120 V at 50 Hz	91.0 mA	89.0 mA
120 V at 60 Hz	79.0 mA	74.0 mA
220/240 V at 50 Hz	44.9 mA	44.0 mA
220/240 V at 60 Hz	34.0 mA	32.0 mA

Note: The TSD-CO2 module has not been performance evaluated to UL 2075 or approved by ULC.

Accessories

The accessories that you can use with the duct smoke detector are listed in the table below.

Model	Description
SD-T8	8-inch sampling tube

Model	Description
SD-T18	18-inch sampling tube
SD-T24	24-inch sampling tube
SD-T36	36-inch sampling tube
SD-T42	42-inch sampling tube
SD-T60	60-inch sampling tube
SD-T78	78-inch sampling tube
SD-T120	120-inch sampling tube
SD-RJ5	RJ-45 wiring harness kit, 5.0 ft
SD-RJ10	RJ-45 wiring harness kit, 10.0 ft
SD-RJ15	RJ-45 wiring harness kit, 15.0 ft
SD-RJ20	RJ-45 wiring harness kit, 20.0 ft.
SD-TRM4	Remote test-reset station, magnetic
SD-TRK4	Remote test-reset station, keyed
SD-MAG	Test magnet kit
SD-TMP	Sampling tube mounting plate
SD-VTK	Air velocity test kit
SD-GSK	Cover gasket kit
TSD-CO2	Carbon dioxide (CO ₂) sensor module

Note: The TSD-CO2 module has not been performance evaluated to UL 2075 or approved by ULC.

Operation

Controller controls and indicators

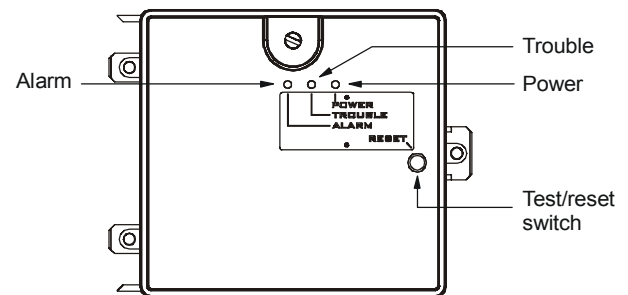


Figure 4: Controller controls and indicators

The controls and indicators on the four-wire controller (see Figure 4) are described in the table below.

Control or indicator	Description
Reset switch	Resets the sensor when it is in the alarm or trouble state. Activates or tests the sensor when it is in the normal state.
Alarm LED	Indicates one or both sensors are in the alarm state
Trouble LED	Indicates one or both sensors are in the trouble state (flashing = dirty fault, steady = internal or wiring fault)
Power LED	Indicates the controller is energized

Sensor controls and indicators

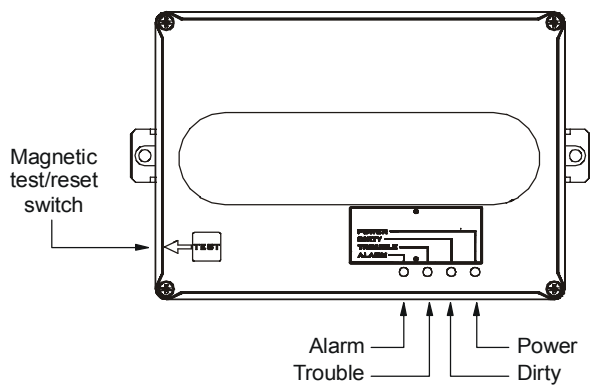


Figure 5: Sensor controls and indicators

The controls and indicators on the four-wire smoke sensor (see Figure 5) are described in the table below.

Control or indicator	Description
Magnetic test/reset switch	Resets the sensor when it is in the alarm or trouble state. Activates or tests the sensor when it is in the normal state.
Alarm LED	Indicates the sensor is in the alarm state
Trouble LED	Indicates the sensor is in the trouble state
Dirty LED	Indicates the amount of environmental compensation used by the sensor (flashing continuously = 100%)
Power LED	Indicates the sensor is energized

Normal state

The SuperDuct duct smoke detector operates in the normal state in the absence of any trouble conditions and when its

sensing chamber is free of smoke. In the normal state, the Power LED on both the sensor and the controller are on and all other LEDs are off.

Alarm state

The SuperDuct duct smoke detector enters the alarm state when the amount of smoke in the sensor's sensing chamber exceeds the alarm threshold value. Upon entering the alarm state:

- The sensor's Alarm LED and the controller's Alarm LED turn on
- The contacts on the controller's two auxiliary relays change over
- The controller's alarm initiation relay closes
- The controller's remote alarm LED output is activated (turned on)
- The controller's high impedance multiple fan shutdown control line is pulled to ground

Trouble state

The SuperDuct duct smoke detector enters the trouble state under the following conditions:

- A sensor's cover is removed and 20 minutes pass before it is properly secured
- A sensor's environmental compensation limit is reached (100% dirty)
- A wiring fault between a sensor and the controller is detected
- An internal sensor fault is detected

Upon entering the trouble state:

- The contacts on the controller's supervisory relay change over
- If a sensor trouble, the sensor's Trouble LED and the controller's Trouble LED turn on
- If 100% dirty, the sensor's Dirty LED turns on and the controller's Trouble LED flashes continuously
- If a wiring fault between a sensor and the controller, the controller's Trouble LED turns on but not the sensor's

Note: All troubles are latched by the duct smoke detector. You must clear the trouble condition then reset the duct smoke detector in order to restore it to the normal state.

Multiple duct detector operation

The interconnect feature of the SuperDuct duct smoke detector lets you connect up to 15 SuperDuct duct smoke detectors to each other, typically for multiple fan shutdown applications.

When one of the duct smoke detectors goes into alarm, it operates as previously described. On the remaining duct smoke detectors not in alarm, only the following occurs:

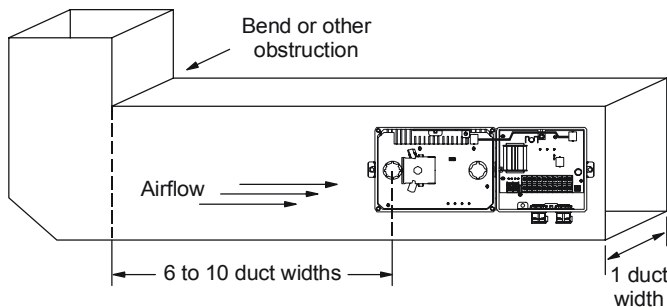
- The auxiliary relay contacts change over
- The remote LED output is activated (turned on)

Duct detector installation

Installation guidelines

To ensure correct operation, install the SuperDuct duct smoke detector using the following guidelines:

- Locate the sensor so its sampling tube is positioned in a straight length of square duct between six and ten duct widths from any bends or obstructions as shown in the diagram below. See Figure 12 for sensor and controller dimensions.



- For detection of smoke in the supply air system, install a duct smoke detector in the supply air duct at a point downstream from the supply fan and air filters
- For detection of smoke in the return air system, install a duct smoke detector in the return air duct at a point before the return air stream is diluted by outside air
- Extend sampling tubes at least two-thirds across the width of the HVAC duct with the air inlet holes pointed into the direction of airflow
- Support sampling tubes longer than 3 feet at the end farthest from the sensor to avoid excessive vibration
- Upon installation perform an air pressure differential test to ensure the sensor is capable of sampling the air stream

Wiring guidelines

- Do not loop wiring under screw terminals. Always break wire runs to ensure proper connection supervision.
- Run all field wiring to the controller through the knockouts located at the bottom of the controller housing. Maintain a 1/4-inch separation between power-limited and nonpower-limited wiring at all times.

Installation sequence

The steps required to install the SuperDuct duct smoke detector are described below. The order in which these steps are performed may vary depending on installation requirements.

1. Verify the duct airflow direction and velocity.
2. Drill the mounting holes.
3. Assemble the detector.
4. Mount the detector on the HVAC duct.
5. Verify the detector pressure differential.

You can install the SuperDuct duct smoke detector in any position on a flat surface, as a single unit or with the sensor and controller separated.

Changing sensor dirty test operation

By default, sensor dirty test results are indicated as follows:

- The sensor's Dirty LED flashes
- The controller's Trouble LED flashes
- The controller's supervision relay contacts toggle

You can change the operation of a sensor's dirty test so that the controller's supervision relay is not used to indicate test results. When two detectors are connected to a controller, sensor dirty test operation on both sensors must be configured to operate in the same manner.

Caution: Changing the sensor dirty test operation will put the duct detector into the alarm state and activate all automatic alarm responses. Before changing sensor dirty test operation, disconnect all auxiliary equipment from the controller and notify the proper authorities if connected to a fire alarm system.

To configure dirty test operation:

1. Hold the test magnet where indicated on the side of the sensor housing until the sensor's Alarm LED turns on and its Dirty LED flashes twice (approximately 60 seconds).
2. Reset the sensor by removing the test magnet then holding it against the sensor housing again until the sensor's Alarm LED turns off (approximately 2 seconds).

Use the above procedure to change sensor dirty test back to its default operation.

Attaching a controller to a sensor in the field

If there are space constraints, you can attach the controller to the sensor as shown in Figure 6 then mount them at the same time.

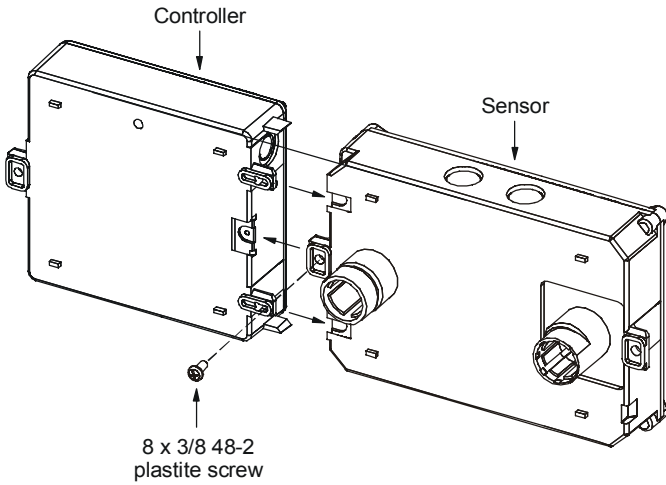


Figure 6: Attaching the controller to a detector

Sampling tubes

Before installing the duct detector, determine how the sampling tube is going to be installed. Sampling tubes can be installed from the front or back of the sensor. To make installation easier, align the arrows on the coupling with the air inlet holes on the sampling tube.

To avoid excessive vibration, support sampling tubes longer than 3 feet at the end opposite the duct detector. For optimal performance, sampling tubes must extend at least two-thirds across the width of the HVAC duct.

Note: Sampling tubes are ordered separately.

Installing the sampling tube from the front of the detector

The sampling tube can also be installed from the front of the detector as shown in Figure 7. This method requires that you remove the detector cover.

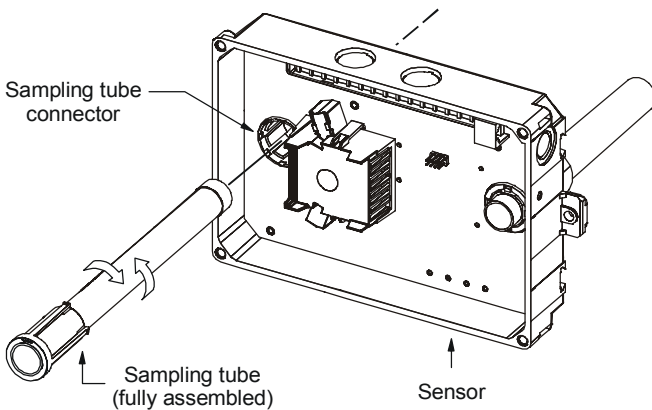


Figure 7: Sampling tube installed from the front

Support for 36-inch or longer sampling tubes

NFPA requirements state that sampling tubes must extend at least two-thirds of the way into the duct and those that are 36 inches long or greater must be supported at both ends. To meet this requirement, drill a 3/4-inch hole on the opposite side of the duct. Locate the hole so the sampling tube angles slightly downward when installed. Extend the sampling tube through the hole as shown in Figure 8. Cut off the excess sampling tube and seal all openings outside the duct with an approved sealant.

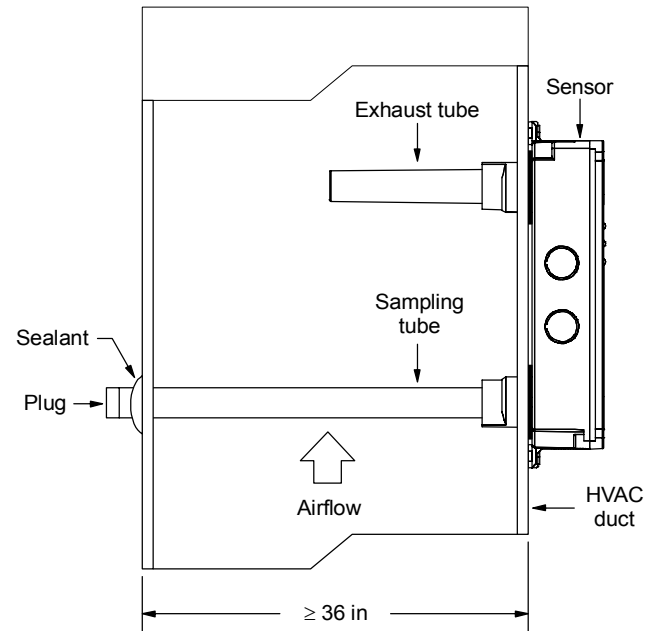


Figure 8: Installation with sampling tubes longer than the width of the duct

Note: For ducts 36 inches wide or more, use the next longest sampling tube available.

Wiring

Separating power-limited and nonpower-limited wiring

Maintain a 1/4-inch separation between power-limited and nonpower-limited wiring at all times. To do this, keep all power-limited wiring in the shaded area and all nonpower-limited wiring in the area that is not shaded. See Figure 9.

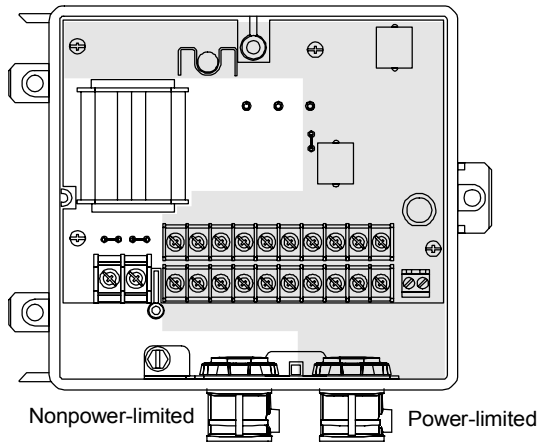


Figure 9: Power-limited and nonpower-limited wiring areas

Field wiring terminals

The field wiring terminals are located at the bottom of the controller underneath a terminal block cover as shown in Figure 10. The markings on the terminal block cover identify each terminal block connection.

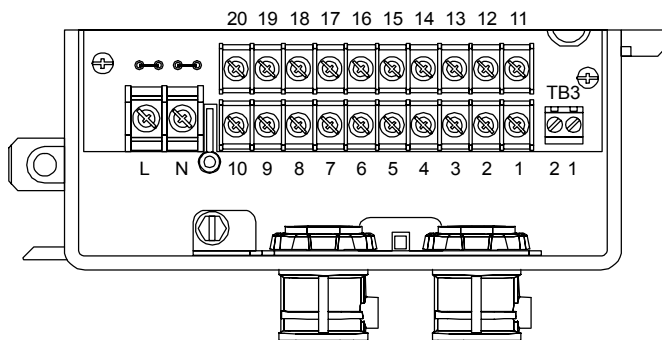


Figure 10: Field wiring terminal block connections

No.	Name	No.	Name
1	AUX (-)	11	Not used
2	Reset	12	Mult-shutdown
3	SUPV Contact COM	13	SUPV Contact NO
4	Alarm Contact COM	14	SUPV Contact NC
5	Alarm Contact NO	15	Rem Alarm LED Out (+)
6	AUX 1 Contact COM	16	AUX 1 Contact NC
7	AUX 2 Contact NO	17	AUX 1 Contact NO
8	AUX 2 Contact NC	18	AUX 2 Contact COM
9	24V AC/DC In (+)	19	18 Vdc Output (+)
10	24V AC/DC In (-)	20	18 Vdc Output (-)
N	AC neutral	TB3-1	CO2 Output (-)
L	AC line	TB3-2	CO2 Output (+)

No.	Name	No.	Name
Note: High voltage terminals L and N are not included on 24-volt controller models.			

Wiring diagram

Figure 13 and Figure 14 show how to wire the SuperDuct duct smoke detector and accessories.

Maintenance and service

Recommended service schedule

- Visually inspect each sensor connected to the controller upon installation and once every six months thereafter
- Perform a sensor alarm test on each sensor connected to the controller upon installation and once every twelve months thereafter
- Perform a sensor dirty test upon installation and once every six months thereafter or more frequently as conditions warrant

Sensor alarm test

The sensor alarm test checks a sensor's ability to signal an alarm state. This test requires that you use an SD-MAG test magnet.

Caution: This test places the duct detector into the alarm state. Unless part of the test, disconnect all auxiliary equipment from the controller before performing the test. If the duct detector is connected to a fire alarm system, notify the proper authorities before performing the test.

To perform a sensor alarm test:

1. Hold the test magnet where indicated on the side of the sensor housing for seven seconds. Verify that the sensor's Alarm LED turns on.

After performing a sensor alarm test, reset the sensor by holding the test magnet against the sensor housing for two seconds. Verify that the sensor's Alarm LED turns off.

Sensor dirty test

The sensor dirty test provides an indication of the sensor's ability to compensate for gradual environmental changes. A sensor that can no longer compensate for environmental changes is considered 100% dirty and requires cleaning or replacing. You must use an SD-MAG test magnet to initiate a sensor dirty test.

The sensor's Dirty LED indicates the results of the dirty test as shown below.

Flashes	Description
1	0 to 25% dirty. This is typical on a newly installed duct detector.
2	26 to 50% dirty
3	51 to 75% dirty
4	76 to 99% dirty

Caution: Holding the test magnet against the sensor housing for longer than seven seconds will put the duct detector into the alarm state and activate all automatic alarm responses.

To perform a sensor dirty test:

1. Hold the test magnet where indicated on the side of the sensor housing for two seconds. Verify that the sensor's Dirty LED flashes.

Controller alarm test

The controller alarm test checks the controller's ability to initiate and indicate an alarm state.

Caution: This test places the duct detector into the alarm state. Unless part of the test, disconnect all auxiliary equipment from the controller before performing the test. If the duct detector is connected to a fire alarm system, notify the proper authorities before performing the test.

To perform a controller alarm test:

1. Press the controller's test/reset switch for seven seconds. Verify that the controller's Alarm LED turns on.

After performing a controller alarm test, reset the sensor by pressing the test/reset switch for two seconds. Verify that the controller's Alarm LED turns off.

Controller dirty test

The controller dirty test checks the controller's ability to initiate a sensor dirty test and indicate its results.

Caution: Pressing the controller's test/reset switch for longer than seven seconds will put the duct detector into the alarm state and activate all automatic alarm responses.

To perform a controller dirty test:

1. Press the controller's test/reset switch for two seconds. Verify that the controller's Trouble LED flashes.

Test/reset station alarm test

The test/reset station alarm test checks a test/reset station's ability to initiate and indicate an alarm state.

Caution: This test places the duct detector into the alarm state. Unless part of the test, disconnect all auxiliary equipment from the controller before performing the test. If the duct detector is connected to a fire alarm system, notify the proper authorities before performing the test.

To perform the alarm test using an SD-TRK4:

1. Turn the key switch to the RESET/TEST position for seven seconds. Verify that the test/reset station's Alarm LED turns on.

After performing an alarm test using an SD-TRK4, reset the sensor by turning the key switch to the RESET/TEST position for two seconds. Verify that the test/reset station's Alarm LED turns off.

To perform the alarm test using an SD-TRM4:

1. Hold the test magnet to the target area for seven seconds. Verify that the test/reset station's Alarm LED turns on.

After performing an alarm test using an SD-TRM4, reset the sensor by holding the test magnet to the target area for two seconds. Verify that the test/reset station's Alarm LED turns off.

Test/reset station sensor dirty test

The test/reset station dirty test checks the test/reset station's ability to initiate a sensor dirty test and indicate the results. For the test/reset station to indicate the results of the sensor dirty test, it must be wired to the controller as shown in Figure 13 and the sensor dirty test must be configured to operate the controller's supervision relay. For more information, see "Changing sensor dirty test operation."

Caution: Leaving the test/reset station's key switch in the RESET/TEST position or holding the test magnet to the target area for longer than seven seconds will put the duct detector into the alarm state and activate all automatic alarm responses.

To perform the dirty test using an SD-TRK4:

1. Turn the key switch to the RESET/TEST position for two seconds. Verify that the test/reset station's Trouble LED flashes.

To perform the dirty test using an SD-TRM4:

1. Hold the test magnet to the target area for two seconds. Verify that the test/reset station's Trouble LED flashes.

Troubleshooting

Controller's Trouble LED is on

1. Check the Trouble LED on each sensor connected to the controller. If a sensor's Trouble LED is on, determine the cause and make the necessary repairs.
2. Check the wiring between the sensor and the controller. If wiring is loose or missing, repair or replace as required.

Controller's Trouble LED is flashing

1. One or both of the sensors is 100% dirty. Determine which one's Dirty LED is flashing then clean that sensor assembly as described in this documentation.

Sensor's Trouble LED is on

1. Check the sensor's Dirty LED. If it is flashing, the sensor is dirty and must be cleaned.
2. Check the sensor's cover. If it is loose or missing, secure the cover to the sensor housing.
3. Replace sensor assembly.

Sensor's Power LED is off

1. Check the controller's Power LED. If it is off, determine why the controller does not have power and make the necessary repairs
2. Check the wiring between the sensor and the controller. If wiring is loose or missing, repair or replace as required.

Controller's Power LED is off

1. Make sure the circuit supplying power to the controller is operational. If not, make sure JP2 and JP3 are set correctly on the controller before applying power.
2. Verify that power is applied to the controller's supply input terminals. If power is not present, replace or repair wiring as required.

Remote test/reset station's Trouble LED does not flash when performing a dirty test but the controller's Trouble LED does

1. Verify that the remote test/station is wired as shown in Figure 13. Repair or replace loose or missing wiring.
2. Configure the sensor dirty test to activate the controller's supervision relay. See "Changing sensor dirty test operation."

Sensor's Trouble LED is on but the controller's Trouble LED is off

1. Remove JP1 on the controller.

Cleaning the sensor

Clean the sensor when the Dirty LED is flashing continuously or sooner if conditions warrant.

Caution: If the duct smoke detector is connected to a fire alarm system, first notify the proper authorities that the detector is undergoing maintenance then disable the relevant circuit to avoid generating a false alarm.

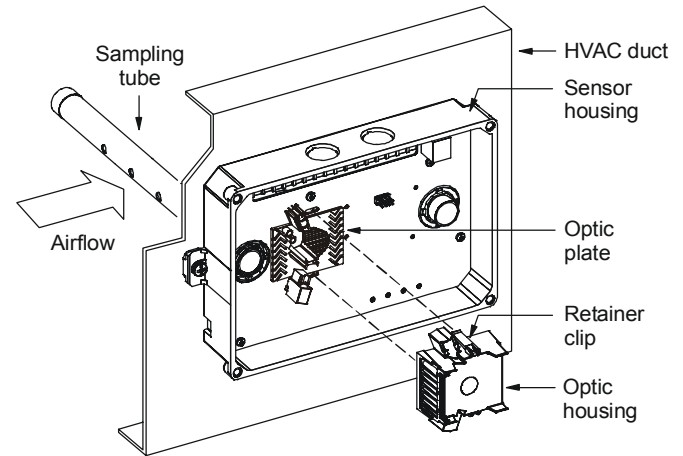


Figure 11: Sensor cleaning diagram

To clean the sensor:

1. Disconnect power from the duct detector then remove the sensor's cover.
2. Using a vacuum cleaner, clean compressed air, or a soft bristle brush, remove loose dirt and debris from inside the sensor housing and cover.
Use isopropyl alcohol and a lint-free cloth to remove dirt and other contaminants from the gasket on the sensor's cover
3. Squeeze the retainer clips on both sides of the optic housing then lift the housing away from the printed circuit board.
4. Gently remove dirt and debris from around the optic plate and inside the optic housing.
5. Replace the optic housing and sensor cover.
6. Connect power to the duct detector then perform a sensor alarm test.

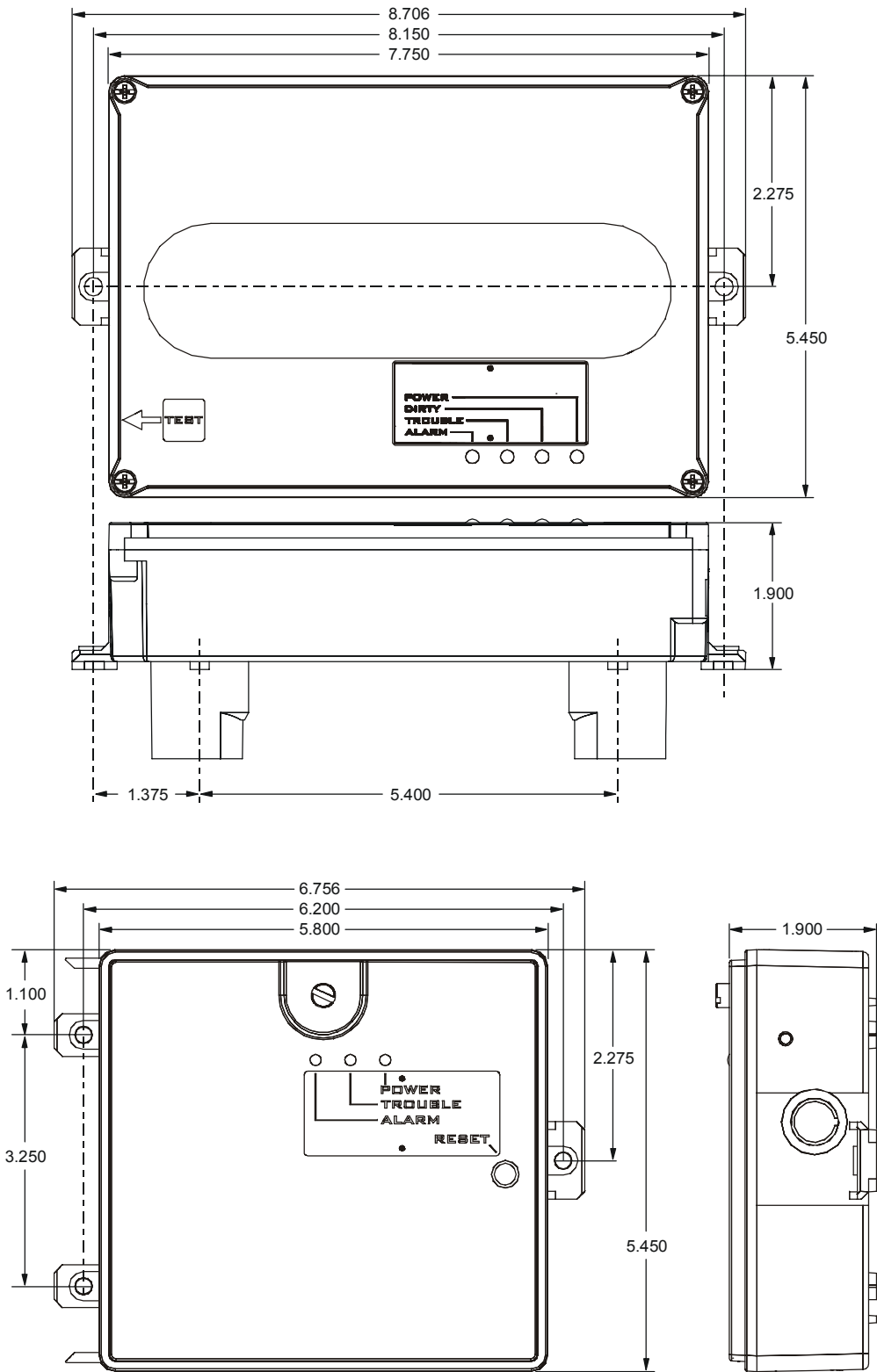


Figure 12: Mechanical dimensions

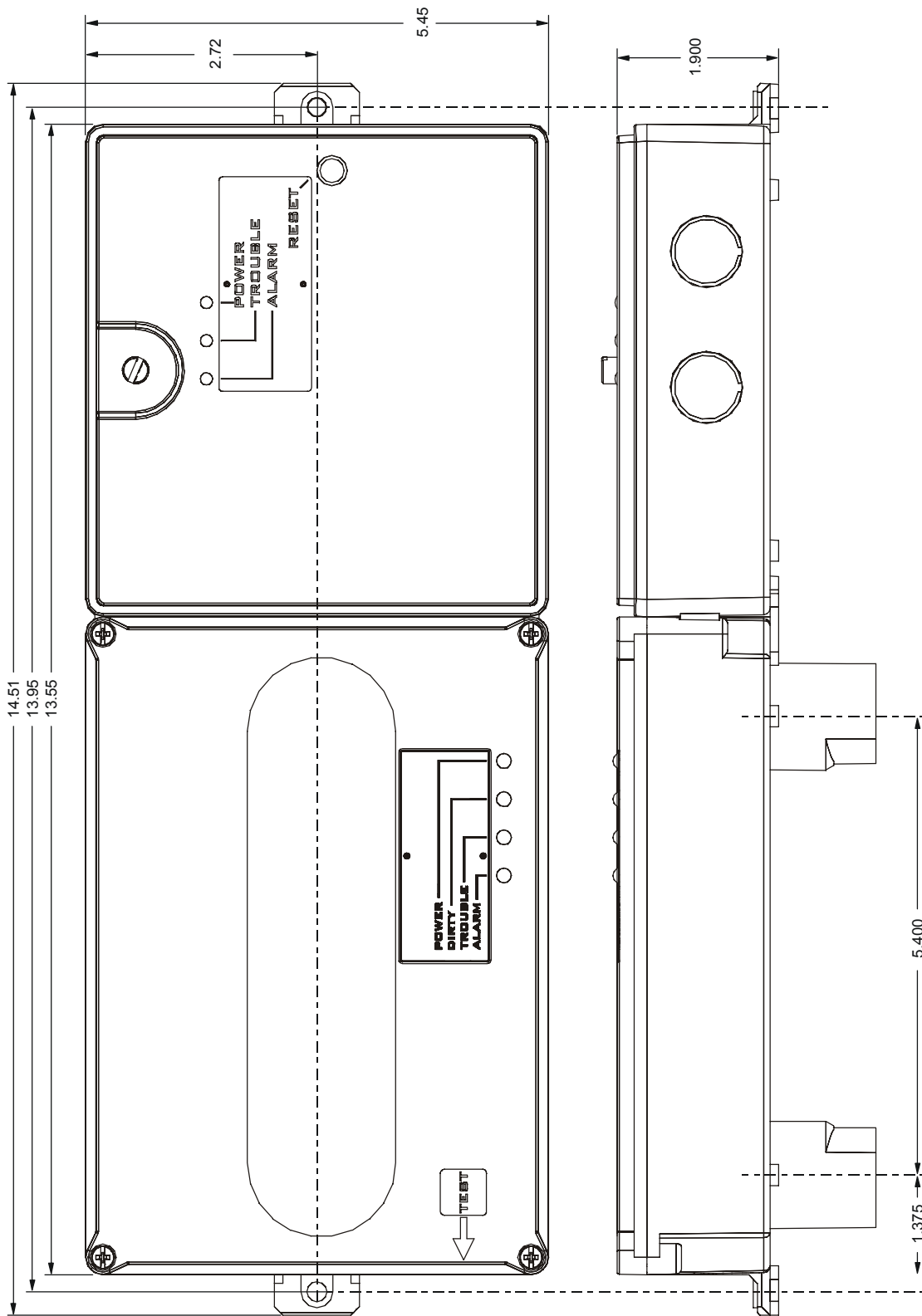


Figure 12: Mechanical dimensions (continued)

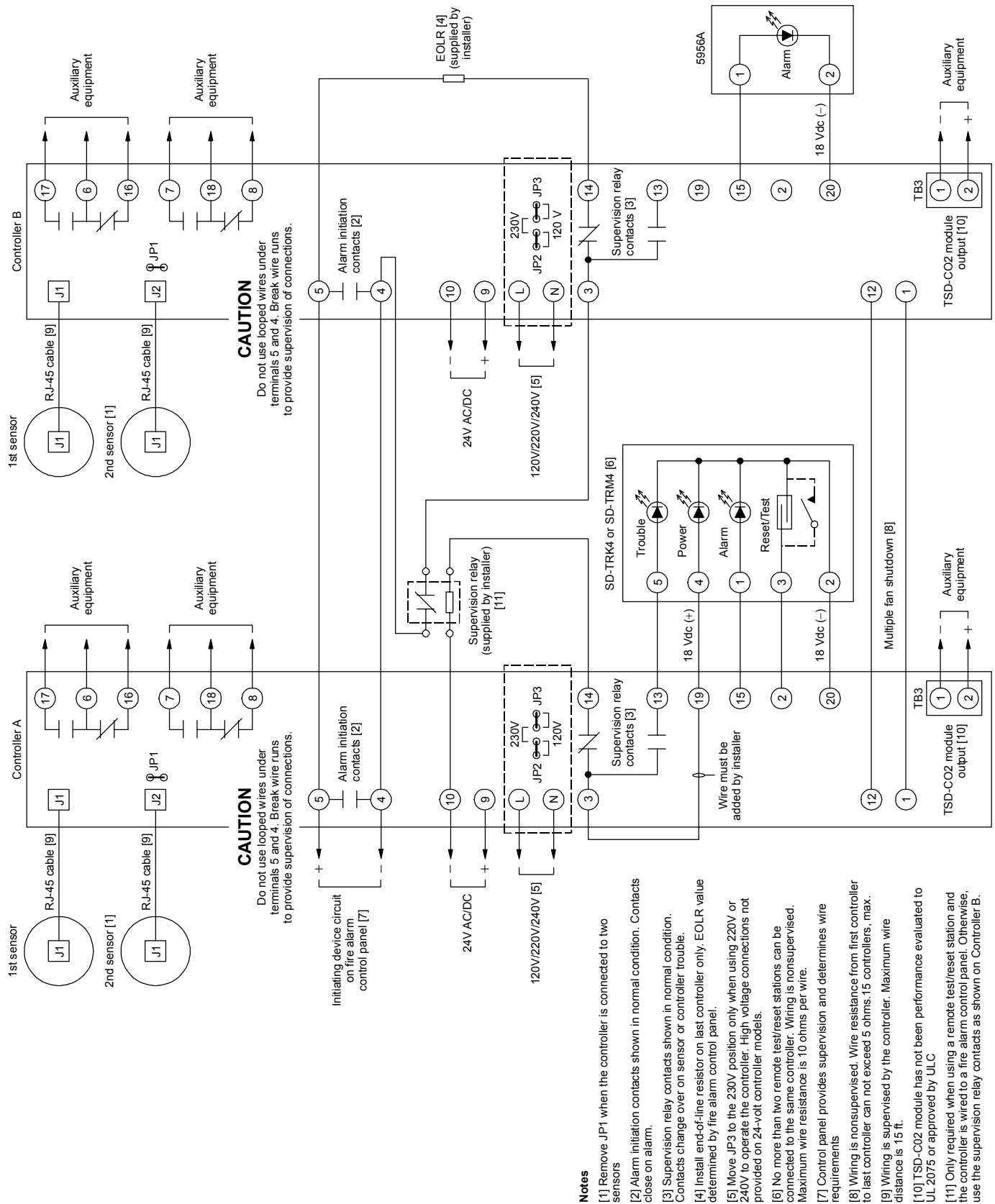


Figure 13: Duct smoke detector wiring diagram (RJ-45 version models)

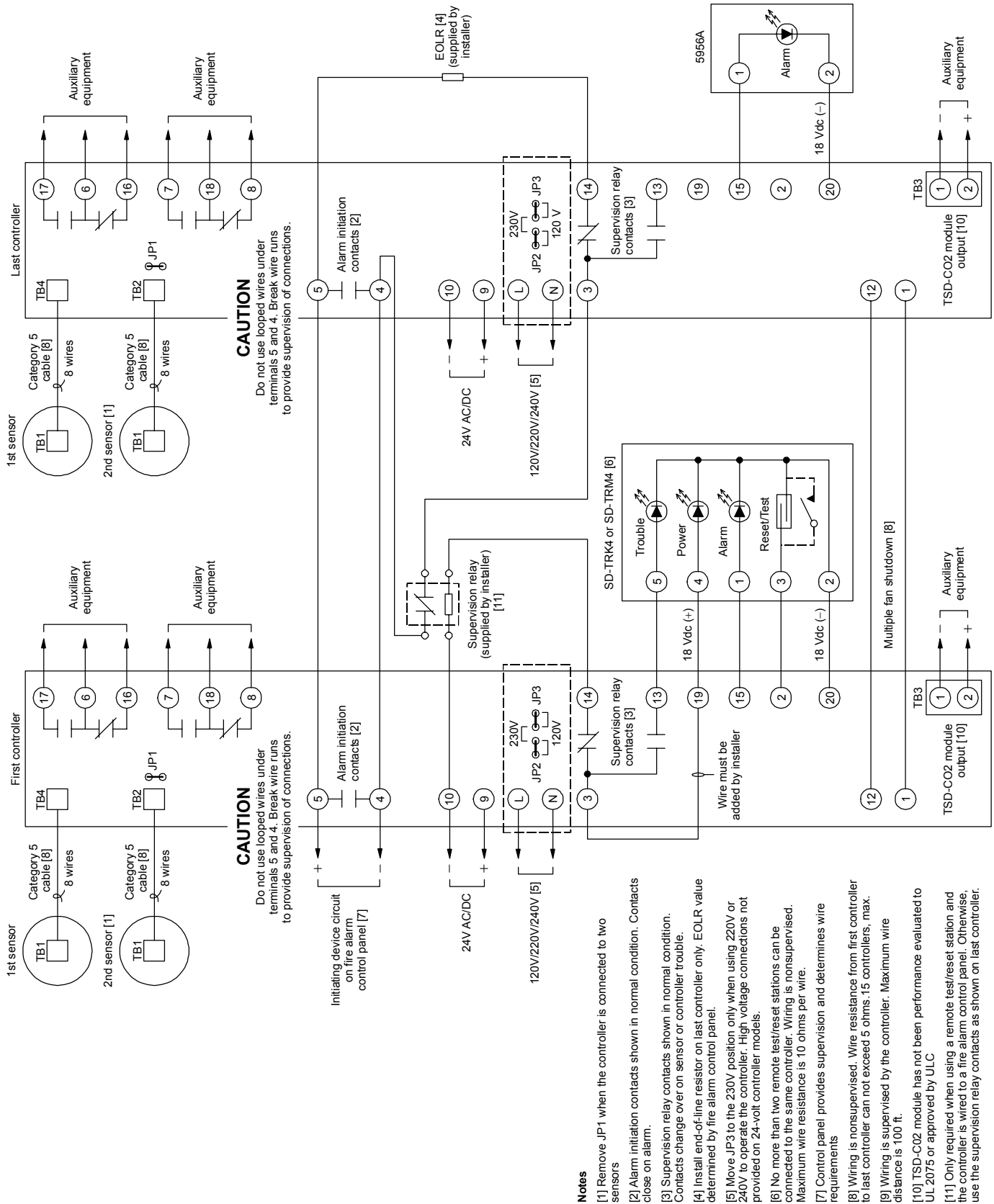


Figure 14: Duct smoke detector wiring diagram (TB version models)

