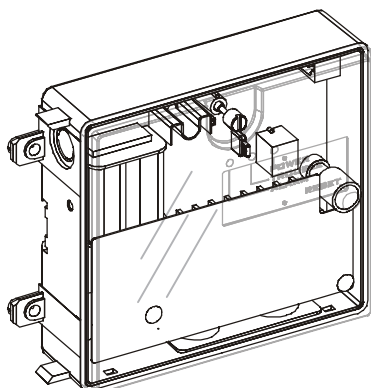


SuperDuct Four-Wire Controller (RJ-45 version)

Product description



The SuperDuct four-wire controller coupled with a compatible sensor make up a SuperDuct four-wire duct smoke detector. The sensor sends an alarm signal to the controller when smoke is detected in the HVAC system. Upon receipt of the alarm signal, the controller takes the appropriate actions to provide early warning of the impending fire and prevent smoke from circulating throughout the building. The controller can be configured for a range of operating voltages and supports one or two compatible sensors.

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

The controller comprises a plastic housing, a printed circuit board, and a clear plastic cover. 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.

The controller contains no user serviceable parts.

This document provides installation instructions for the following SuperDuct four-wire controllers:

Model	Description
TSD-CJ, ESD-CJ, SD-CJ	Four-wire controller with RJ-45 modular connectors
TSD-CJG	Four-wire controller with RJ-45 modular connectors and cover gasket
TSD-4WJ, ESD-4WJ, SD-4WJ	Combination four-wire controller and sensor with RJ-45 modular connectors

This product will not operate without at least one compatible sensor. The table below lists the compatible four-wire smoke sensors that you can use with the controllers listed above.

Controller	Compatible sensor
TSD-CJ, TSD-CJG, TSD-4WJ	TSD-SJ, TSD-SJG, TSD-SJCO2
ESD-CJ, ESD-4WJ	ESD-SJ
SD-CJ, SD-4WJ	SD-SJ

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

Related documents

In addition to this document, information about sensor installation and duct smoke detector testing and maintenance can be found in the following:

- *SuperDuct Four-Wire Smoke Sensor (RJ-45 version) Installation Sheet* (P/N 3100686)
- *SuperDuct Four-Wire Duct Smoke Detector Technical Bulletin* (P/N 3100685)

Specifications

Dimensions

Controller: 6.75 x 5.45 x 1.90 inches
Controller with detector: 14.51 x 5.45 x 1.90 inches

Wire size

High voltage terminals: 12 to 22 AWG
All others: 14 to 22 AWG

LED indicators: Alarm (red), Trouble (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%), 24V (-15 to 10%) at 50/60 Hz, 120V (-15 to 10%) at 50/60 Hz, 220/240V (-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	34.5 mA	32.0 mA

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

Installation guidelines

Install in accordance with all applicable national and local codes as determined by the local authority having jurisdiction.

Do not install a controller more than 15 feet away from a sensor.

Run all field wiring through the knockouts located on the bottom of the controller housing. Maintain a 1/4-inch separation between power-limited and nonpower-limited wiring at all times.

Installation instructions

Please read these instructions thoroughly before installing. In addition to this document, important information can be found in Technical Bulletin P/N 3100685.

Step 1: Mount the controller

Mount the controller on a flat section of HVAC duct or sheet metal as shown in Figure 1 using the sheet metal screws provided in the hardware kit. The controller does not have to be mounted next to the sensor.

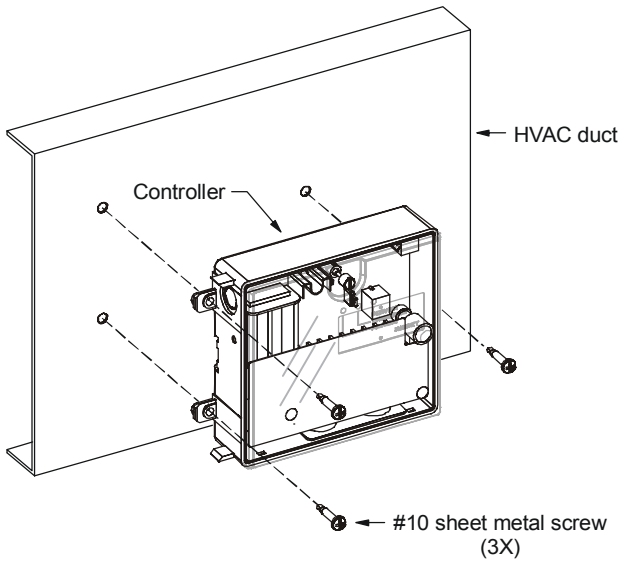


Figure 1: Controller mounting diagram

If you are installing a controller combined with a sensor, mount both on a flat section of HVAC duct as shown in Figure 2.

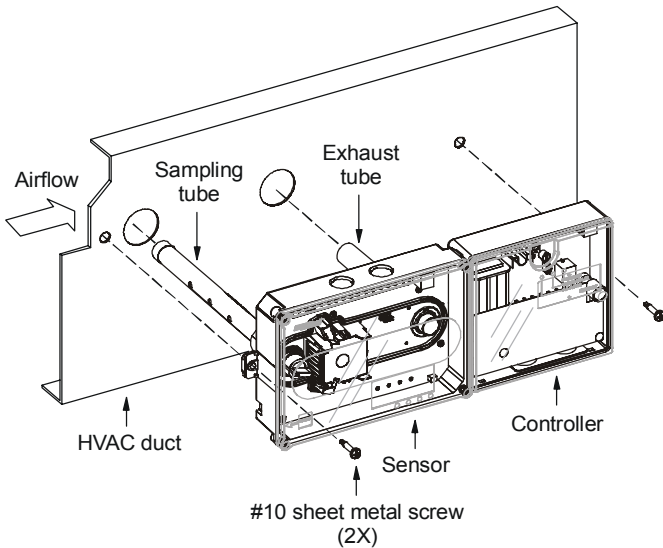


Figure 2: Mounting a controller combined with a sensor

Step 2: Attach the conduit support plate

Open the controller and remove the terminal block cover. Attach the conduit support plate as shown in Figure 3.

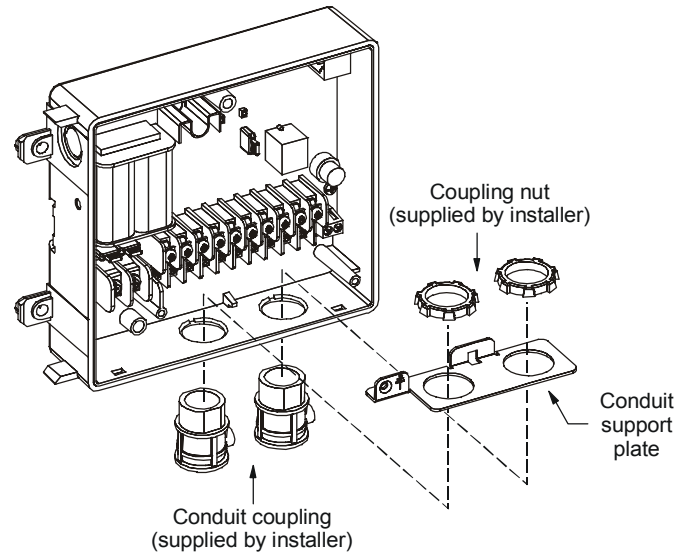


Figure 3: Conduit support plate installation

Jumper configuration

Set the controller configuration jumpers as described below.

Note: Failure to remove JP1 prevents the controller from indicating a trouble condition with the sensor connected to J2. It does not prevent the controller from responding to an alarm signal.

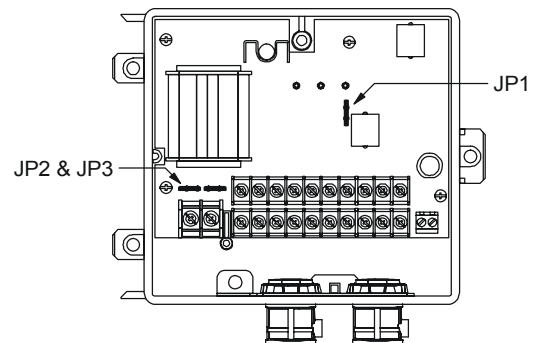
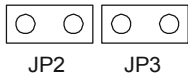
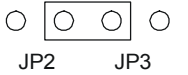


Figure 4: Controller jumper locations

JP1 jumper settings

Position	Description
IN	Controller connected to one sensor (factory setting)
OUT	Controller connected to two sensors

JP2, JP3 jumper settings

Position	Description
 JP2 JP3	Controller connected to 24 Vdc, 24 Vac, or 120 Vac (factory setting)
 JP2 JP3	Controller connected to 220/240 Vac

Controller to sensor wiring

Connect the controller to the sensor as shown in Figure 5. Make sure the cable grommets are seated securely into their respective openings.

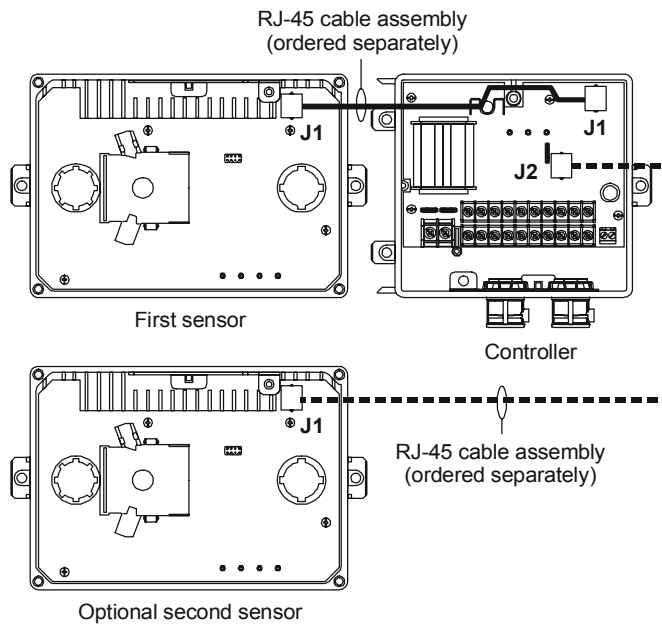


Figure 5: Controller to sensor wiring diagram

RJ-45 cable assemblies are available in the lengths listed below.

Model	Description
SD-RJ5	RJ-45 wiring harness kit (5 ft)
SD-RJ10	RJ-45 wiring harness kit (10 ft)
SD-RJ15	RJ-45 wiring harness kit (15 ft)

Notes

- If strain relief is required, secure the cable using the cable clamps provided with the cable kit
- If you are connecting the controller to two sensors, remove JP1

Field wiring

Bring all field wiring into the controller through the knockouts on the bottom of the housing as shown in Figure 6. Keep all power-limited wiring in the shaded area and all nonpower-limited wiring in the area that is not shaded.

Remove the terminal block cover and connect the field wiring as shown in Figure 8. Replace the terminal block cover when finished.

Note: Maintain a 1/4-inch separation between power-limited and nonpower-limited wiring at all times.

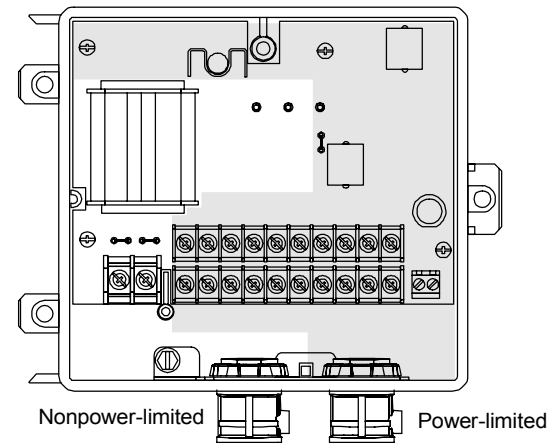


Figure 6: Power-limited and nonpower-limited wiring areas

Figure 7 shows the terminal block cover that is installed on the controller. The markings identify the function and number of the screw terminals found underneath.

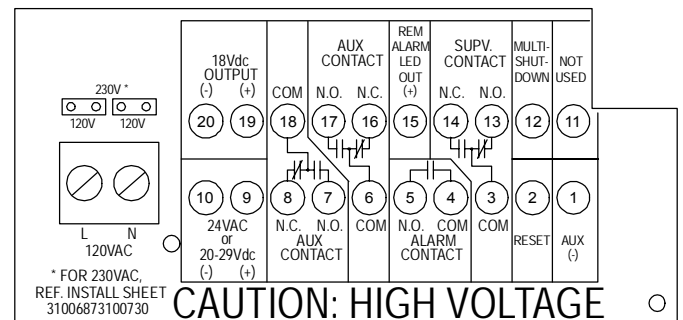
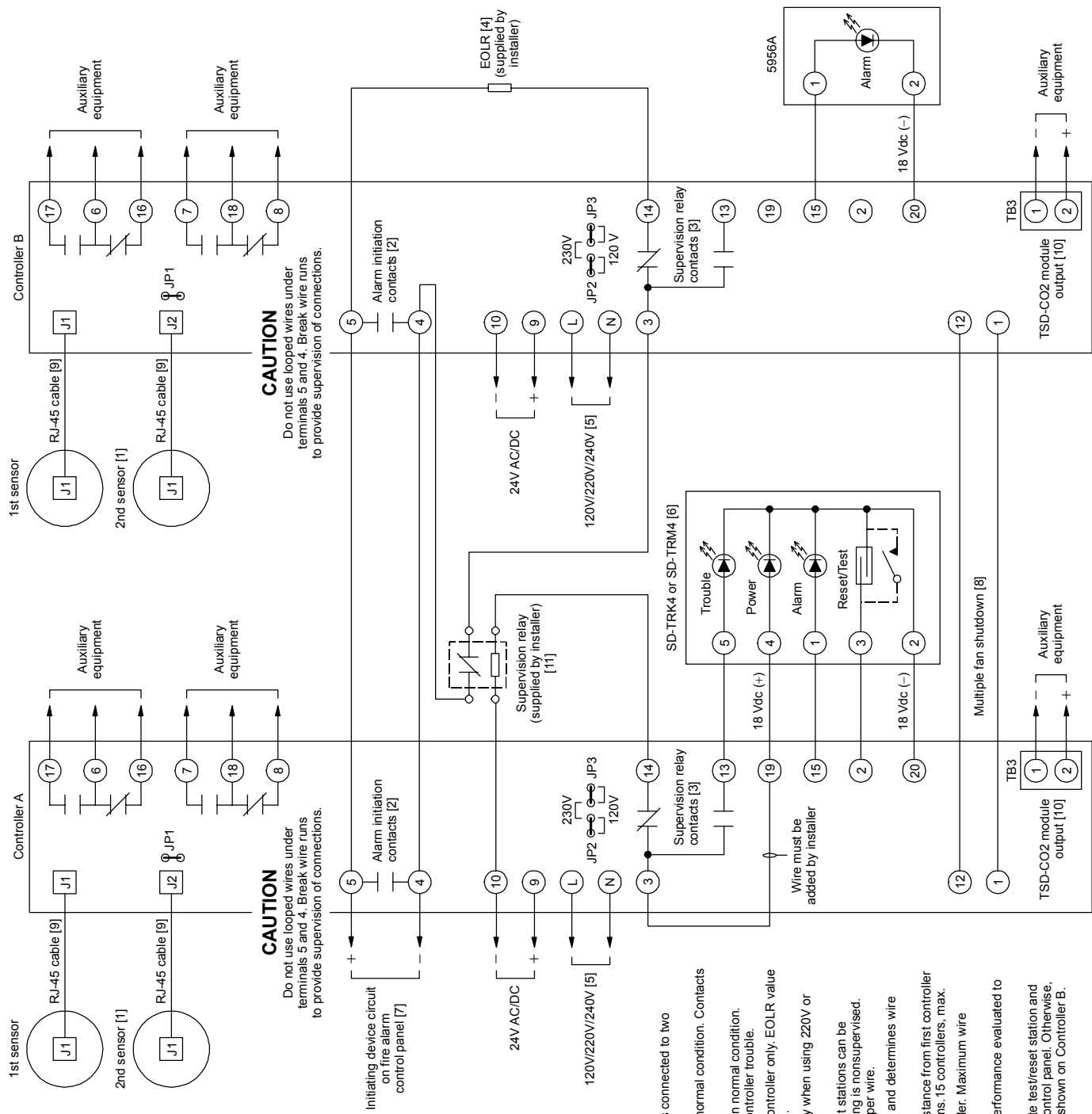


Figure 7: Terminal block cover

Testing

After completing the installation, test the controller to ensure that it is operating correctly before leaving the site. For details, refer to Technical Bulletin P/N 3100685.



CAUTION
Do not use looped wires under terminals 5 and 4. Break wire runs to provide supervision of connections.

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Notes

- [1] Remove JP1 when the controller is connected to two sensors
- [2] Alarm initiation contacts shown in normal condition. Contacts close on alarm.
- [3] Supervision relay contacts shown in normal condition. Contacts change over on sensor or controller trouble.
- [4] Install end-of-line resistor on last controller only. EOLR value determined by fire alarm control panel.
- [5] Move JP3 to the 230V position only when using 220V or 240V to operate the controller
- [6] No more than two remote test/reset stations can be connected to the same controller. Wiring is non-supervised. Maximum wire resistance is 10 ohms per wire.
- [7] Control panel provides supervision and determines wire requirements
- [8] Wiring is non-supervised. Wire resistance from first controller to last controller can not exceed 5 ohms, 15 controllers, max.
- [9] Wiring is supervised by the controller. Maximum wire distance is 15 ft.
- [10] TSD-CO2 module has not been performance evaluated to UL 2075 or approved by ULC
- [11] Only required when using a remote test/reset station and the controller is wired to a fire alarm control panel. Otherwise, use the supervision relay contacts as shown on Controller B.

Figure 8: Controller wiring diagram