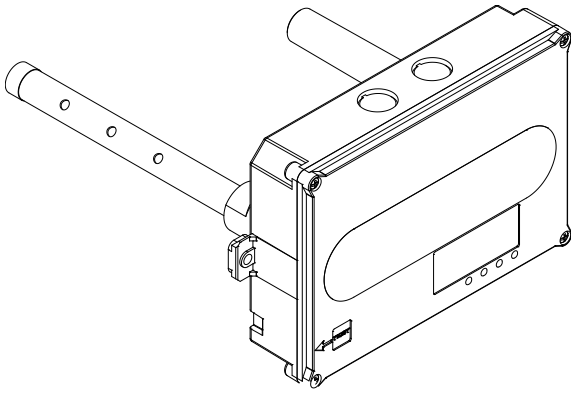
FX-PDD Duct Smoke Detector Installation Sheet



Description

The FX-PDD Duct Smoke Detector is designed for use in duct applications where temperatures can exceed standard detector capabilities.

The device address is set using the two rotary switches located on the front of the unit. One device address is required.

In installations where the controls and indicators are hidden from view, a remote test station or an LED indicator can be connected to the detector to provide these functions.

Jumper settings

The following jumper settings determine the operation of the detector. See Figure 6 for proper jumper location.

Table 1: JP3 jumper settings

Setting	Description
Alarm	Configures the detector for alarm latching operation.
Supervisory	Configures the detector for supervisory operation. This is the factory default setting.

LED operation

Two LEDs, visible from the front of the detector, show its status.

Table 2: LEDs

LED	Description
Power LED	Off when the detector is in the alarm state. Flashes intermittently when the detector is in the normal state.
Alarm/active LED	Indicates the detector is in the alarm/active state.

Installation

WARNINGS

- The duct smoke detector is not intended as a substitute for open area protection.
- This detector does not operate without electrical power. As fires frequently cause power interruption, discuss further safeguards with the local fire protection specialist.
- The duct smoke detector does not operate as designed outside of the listed electrical and environmental specifications.
- The duct smoke detector does not sense smoke unless the ventilation system is operating and the sensor's cover is properly installed.
- The duct smoke detector may not operate as designed unless installed in accordance with these instructions and all applicable national and local codes as determined by the local authority having jurisdiction.

Note: Read these instructions thoroughly before installing. Refer to Application Bulletin P/N 3101107 for additional information regarding installation instructions.

Installation guidelines

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

- Install the duct smoke detector on a flat section of HVAC duct between six and ten duct widths from any bends or obstructions.
- Install supply-side detectors at a point downstream from the supply fan and after the air filter.
- Install return-side detectors at a point before the return air stream is diluted by outside air.

Verifying the duct air velocity

In order to verify the airflow direction and velocity, air must be moving through the HVAC system.

To verify the duct air velocity:

1. Drill a small hole at the point where the duct smoke detector is being installed.
2. Using the SD-VTK Air Velocity Test Kit and a suitable air velocity meter, verify that the air velocity in the HVAC duct falls within the specified operating range of the detector and note which direction the air flows.
3. If the air velocity does not fall within the specified range, relocate the detector and seal the hole in the HVAC duct. Refer to Application Bulletin P/N 3101107 for additional information pertaining to installation locations.

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Selecting an appropriate sampling tube:

- Select a sampling tube that extends at least two-thirds across the width of the duct. Refer to Table 3 below.
- For duct widths greater than 36 inches, use a sampling tube that is longer than the width of the duct.
- Sampling tubes are available in the following lengths:

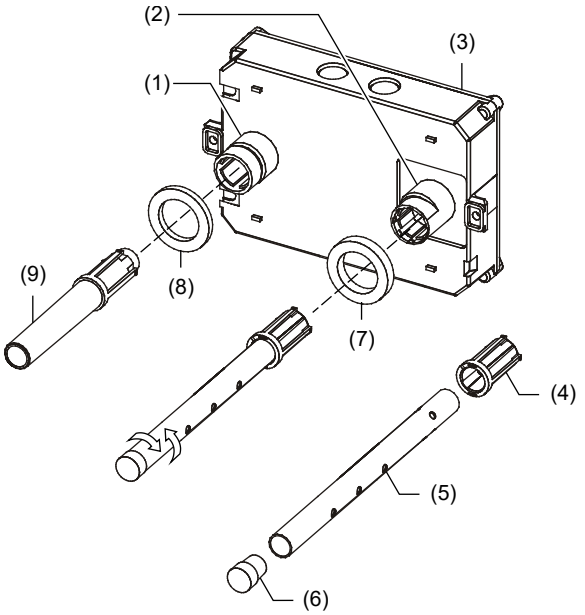
Table 3: Sampling tubes

Model	Length (in.)	Model	Length (in.)
SD-T8	8	SD-T42	42
SD-T18	18	SD-T60	60
SD-T24	24	SD-T78	78
SD-T36	36	SD-T120	120

To assemble the detector:

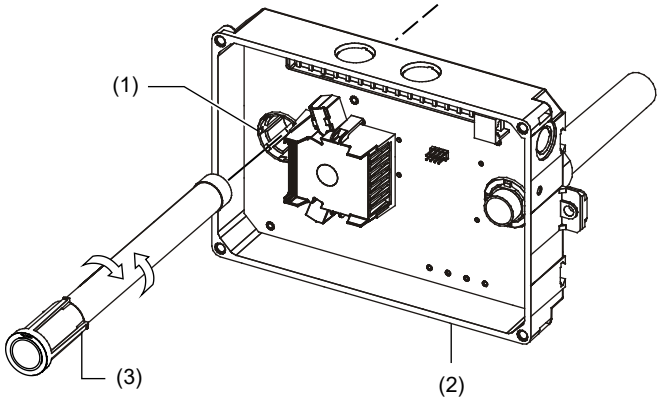
1. Assemble the duct smoke detector as shown in Figure 1.
2. Rotate the air sampling tube so the inlet holes face the direction of airflow.
3. The sampling tube is normally installed from the rear, but it can also be installed from the front of the detector as shown in Figure 2. This method requires that you remove the detector cover.

Figure 1: Duct detector assembly



(1) Exhaust tube socket
(2) Sampling tube socket
(3) Detector
(4) Coupling
(5) Sampling tube
(6) Plug
(7) Thick gasket
(8) Thin gasket
(9) Exhaust tube

Figure 2: Sampling tube installation



(1) Sampling tube socket
(2) Detector
(3) Sampling tube (fully assembled)

To install the detector:

1. Attach the drill template to the HVAC duct at the desired mounting location.
2. Drill (or punch) the mounting holes where indicated.
3. Remove any rough edges from the holes.
4. When using an air sampling tube that is longer than the width of the duct:
   - Drill a 3/4 in. hole on the opposite side of the duct for the tube to pass through.
   - Cut the tube so that approximately one inch of the tube extends through the duct. Seal the opening around the tube with an approved duct sealant as shown in Figure 3.

   Note: Support sampling tubes longer than 36 inches at both ends of the duct. See Figure 3.
5. Mount the duct smoke detector on the HVAC duct and secure it using the two sheet metal screws provided. See Figure 4.
7. Verify that all field wiring is free of opens, shorts, and ground faults.
8. Make all wiring connections as shown in Figure 6.
9. Set the module address as follows:
   - Use a screwdriver to adjust the two rotary switches on the front of the module. See Figure 5.
   - Set the TENS rotary switch (0 through 12) for the 10s and 100s digit.
   - Set the ONES rotary switch for the 0 through 9 digit.

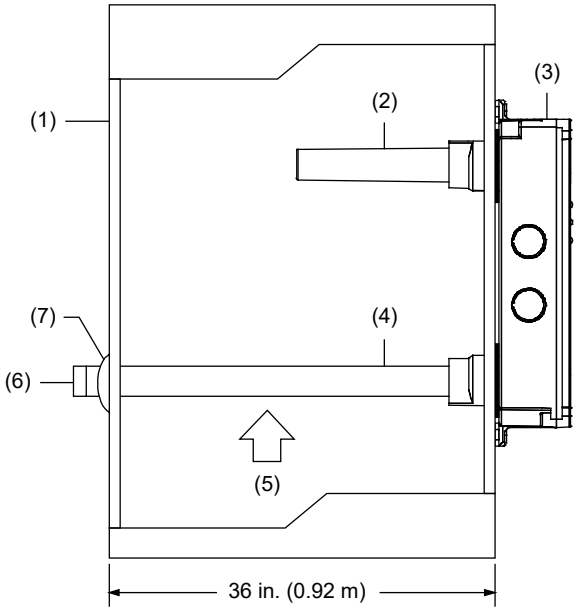
   For example: for device address 21, set the TENS rotary switch to 2, and then set the ONES rotary switch to 1.

   For a list of detector addresses, see Table 4 on page 3.
10. Set jumper JP3 to the appropriate position. See Table 1 and Figure 6.
11. Verify that the air pressure differential value falls within the specified operating range of the detector in accordance with procedures specified in “Verifying the air pressure differential” on page 4.
12. After completing the installation of the duct smoke detector, test the detector in accordance with procedures specified in “Testing the duct smoke detector” on page 5 to ensure it is operating correctly.

Table 4: Detector address

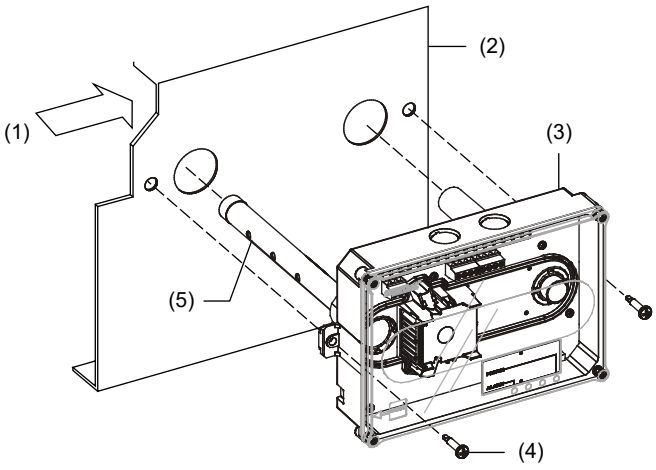
Address	Panel
01 to 64	64 point control panel
01 to 127	127 point control panel

Figure 3: Sampling tube support



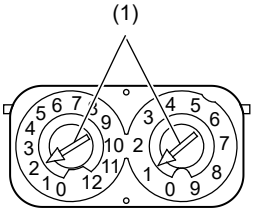
(1) HVAC duct
(2) Exhaust tube
(3) Detector
(4) Sampling tube
(5) Airflow
(6) Plug
(7) Sealant

Figure 4: Duct detector installation



(1) Airflow
(2) HVAC duct
(3) Detector
(4) #10 sheet metal screws (2X)
(5) Sampling tube

Figure 5: Address switches

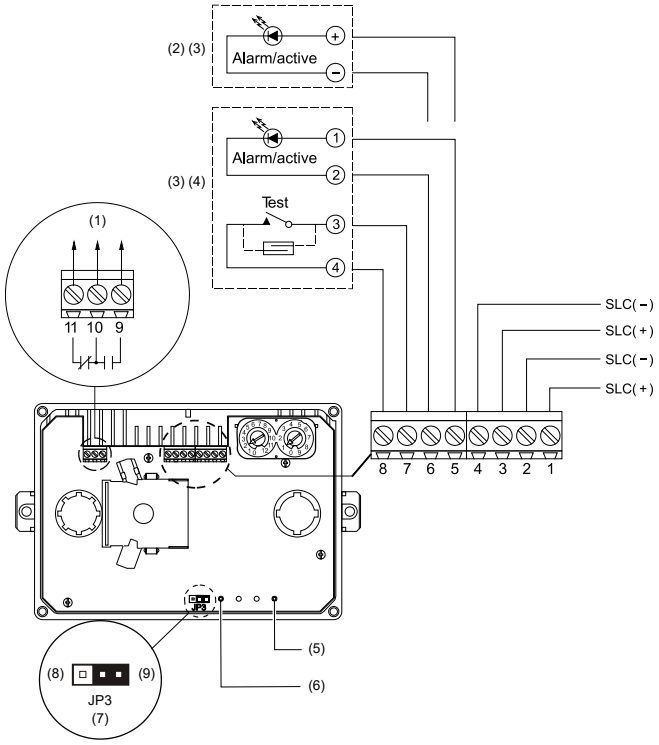


(1) Insert screwdriver here

Wiring

Wire in accordance with NFPA 72 and CAN/ULC-S524. Be sure to observe the polarity of the terminals on the terminal block as shown in Figure 6.

Figure 6: Duct detector wiring



(1) Auxiliary equipment. Power-limited unless connected to a nonpower-limited source. If the source is nonpower-limited, eliminate the power-limited mark and maintain a minimum of 0.25 in. (6.4 mm) space from power-limited wiring. For other mounting methods, see enclosure and bracket installation sheets to maintain separation of power-limited and nonpower-limited wiring. The wire size must be capable of handling fault current from the nonpower-limited source.
— or —
Use type FPL, FPLR, FPLP, or permitted substitute cables, ensuring that the power-limited cable conductors extending beyond the jacket are separated by a minimum of 0.25 in. (6.4 mm) space or by a nonconductive sleeve or nonconductive barrier from all other conductors. The wire size must be capable of handling fault current from the nonpower-limited source. Refer to NFPA 70 for more details.

(2) Remote alarm/active indicator. See “Specifications” on page 5 for a list of available model numbers.
(3) Connect only one remote test station or LED indicator to the detector. Wiring is unsupervised. Maximum wire resistance is 10 Ω per wire.
(4) Remote test station. See “Specifications” on page 5 for a list of available model numbers.
(5) Power indicator.
(6) Alarm Indicator.
(7) JP3 (shown in the factory default position, for supervisory mode).
(8) Alarm position.
(9) Supervisory position.

Testing

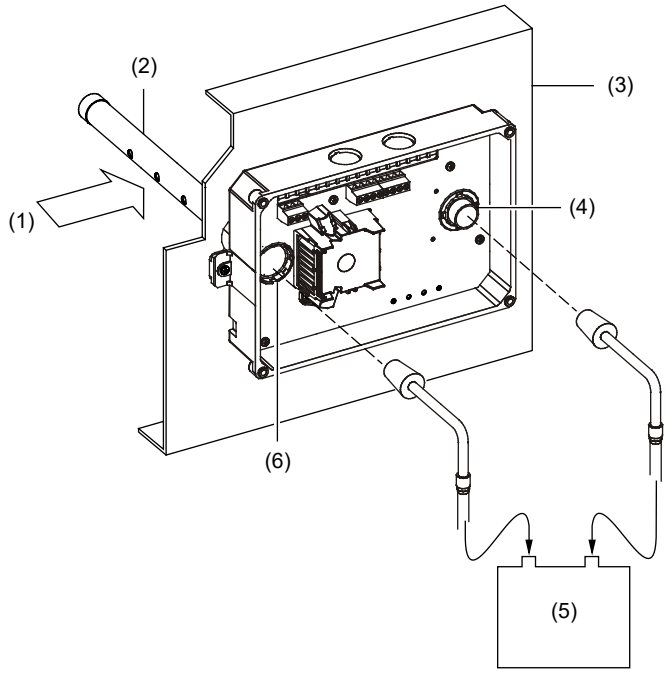
Verifying the air pressure differential

In order to verify air pressure differential, air must be moving through the HVAC system.

To verify the air pressure differential:

1. Connect a suitable air pressure differential meter to the sampling tube and exhaust tube openings as shown in Figure 7.
2. Verify that the air pressure differential reading falls within the specified operating range of the detector. See “Specifications” on page 5.
3. If the air pressure differential measured does not fall within the specified operating range of the detector, make sure the sampling tube air holes are not obstructed and are facing the HVAC system airflow.

Figure 7: Air pressure differential



(1) Airflow
(2) Sampling tube
(3) HVAC duct
(4) Exhaust tube opening
(5) Air pressure differential meter
(6) Sampling tube opening

Testing the duct smoke detector

After completing installation of the duct smoke detector, test the detector to ensure it is operating correctly prior to leaving the site. For details, refer to Application Bulletin P/N 3101107.

Maintenance

Replacement parts

The following table lists the replacement parts for the duct smoke detector.

Table 5: Replacement parts

Model	Description
FX-SDPCB	PCB replacement kit for duct smoke detector

Cleaning the duct smoke detector

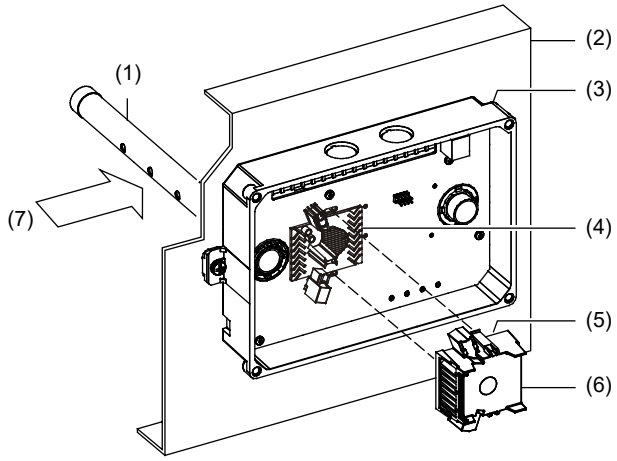
Clean the duct smoke detector when it becomes 80% to 99% dirty or sooner if conditions warrant.

Caution: Before cleaning the duct smoke detector, notify the proper authorities that the fire alarm system is undergoing maintenance and take steps to prevent the control panel from responding to a false alarm.

To clean the duct smoke detector:

1. Disable the detector or zone to prevent false alarms.
2. Remove the detector's cover, and then power down the detector by disconnecting the SLC wiring. See Figure 6.
3. Using a vacuum cleaner, clean compressed air, or a soft bristle brush, remove loose dirt and debris from inside the detector housing and cover.
4. Remove dirt and other contaminants from the gasket on the detector's cover using isopropyl alcohol and a lint-free cloth.
5. Squeeze the retainer clips on both sides of the optic housing then lift the housing away from the printed circuit board. See Figure 8.
6. Gently remove dirt and debris from around the optic plate and inside the optic housing.
7. Replace the optic housing and the detector cover, and then connect the SLC wiring.
8. Test the detector and verify its sensitivity. For details, refer to Application Bulletin P/N 3101107.

Figure 8: Duct detector cleaning



(1) Sampling tube
(2) HVAC duct
(3) Detector housing
(4) Optic plate
(5) Retainer clip
(6) Optic housing
(7) Airflow

Specifications

Communication line voltage	20 Vp-p max.
Operating current	
Normal	45 µA
Alarm	45 µA
Inrush	1 mA
Common alarm relay/auxiliary equipment	Unsupervised and power-limited
Quantity	1
Type	Form C
Rating	2.0 A at 30 VDC (resistive)
Air velocity	100 to 4,000 ft./min
Air pressure differential	0.005 to 1.00 in. of water
Smoke sensitivity range	0.79 to 2.46%/ft. obscuration
Smoke detection method	Photoelectric (light scattering principle)
Alarm test response time	5 seconds
Dimensions	8.70 × 5.45 × 1.90 in.
Wire size	14 to 22 AWG wire
Operating environment	
Temperature	32 to 122°F (0 to 50°C)
Relative humidity	0 to 93%, noncondensing
Accessories	
SD-TRM	Remote test-reset station, magnetic
SD-TRK	Remote test-reset station, keyed
SD-MAG	Test magnet kit
SD-VTK	Air velocity test kit
R-LED	Remote LED alarm indicator

Regulatory information

North American standards	UL 268A, CAN/ULC S529-02

Contact information

For contact information, see www.kidde-esfire.com.