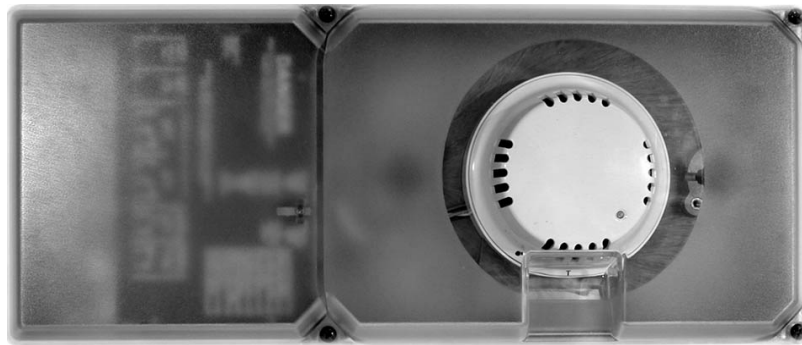


D341/D342



EN | Installation Instructions  
Air Duct Smoke Detector  
Housing



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## Trademarks

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## 1.0 Overview

The D341/D342 Air Duct Smoke Detector Housings are designed to mount to heating, ventilation, and air conditioning (HVAC) system ducts to monitor the presence of smoke in the conditioned air. These housings work with D285DH Photoelectric Detectors and D286 Ionization Smoke Detectors (provided separately) for general property protection.

The D341/D342 combines with an efficient housing design that samples the air passing through a duct and allows the detection of a potentially hazardous condition. When smoke is detected, the detector sends an alarm signal to the control panel that initiates the necessary action to shut off fans and blowers or to change over to other air handling systems.

The D341/D342 operates on 24 VDC, 24 VAC, 120 VAC, 220 VAC, or 240 VAC. Alarm and trouble relay contacts are provided for the control panel interface. In addition, two auxiliary Form “C” alarm relay contacts are available for other functions such as fan shutdown.

Test the system by placing an external magnet on the detector housing or switching a signal from a remote test or indicator plate.

Reset the system by shutting down power and placing a magnet on the detector housing, or by sending a signal from the remote test or indicator plate.



Install the D341/D342 according to NFPA 90A: Standard for the Installation of Air Conditioning and Ventilating Systems, NFPA 72: National Fire Alarm Code®, NFPA 101: Life Safety Code®, any applicable local and state codes, and your local authority having jurisdiction (AHJ).

## 2.0 Description

**Table 1: Product Description**

Table 1: Product Description	
<b>Types</b>	D341: Air Duct Smoke Detector Housing for 24 VDC, 24 VAC, or 120 VAC operation. This housing requires a detector head. D342: Air Duct Smoke Detector Housing for 24 VDC, 24 VAC, or 220 VAC, or 240 VAC operation. This housing requires a detector head.
<b>Optional Equipment:</b>	D285DH: Photoelectric smoke detection head D286: Ionization smoke detection Head D344-1.5: 1.5 ft (0.46 m) sample tube D344-3: 3 ft (0.9 m) sample tube D344-5: 5 ft (1.5 m) sample tube D344-RT: Remote test kit (D307) D344-RL: Remote LED indicator kit (D306) D344-TF: Tube filters (20 per package) for sample and exhaust tubes SMK-TM: Test magnet DRA-5: Remote alarm indicator EOL200: End-of-line (EOL) Module

### 3.0 Assembly

The D341/D342 includes:

- One housing, power card, and cover assembly
- Two #10-24 x 1 in. machine screws for mounting
- Two #10-24 jack nuts
- One exhaust tube
- Two tube clamps with four screws
- Two foam gaskets
- Two air filters
- One drilling template
- One cover gasket

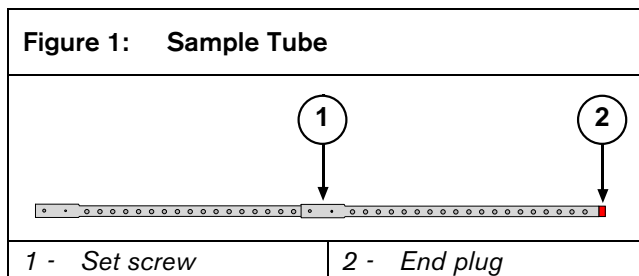
The D341I/P and D342I/P also include a head and 1.5 ft (0.46 m) sample tube.

### 4.0 Sample Tubes

Sample tubes must extend across the width of the duct. These tubes are available in three sizes:

- D344-1.5 (1.5 ft [0.46 m])
- D344-3 (3 ft [0.91 m])
- D344-5 (5 ft [1.52 m])

Sample tubes include an end plug that must be installed in the narrow end (refer to *Figure 1*).



A sample tube's maximum length is 10 ft (3.05 m); its minimum length is 1 ft (30.48 cm). You can join or cut sample tubes to make different lengths.



Sample tubes must have at least 12 sample holes within the duct. Do not cut sample tubes to less than 12 sample holes.

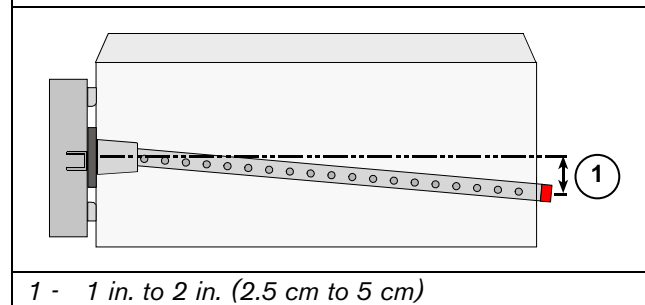
To create a new sample tubes by combining two tubes:

1. Remove the roll pin and set screw from one tube.
2. Remove the end plug from the other tube.
3. Push the flared end over the tube you want to lengthen.
4. Align the air holes and insert the set screw.
5. Reinstall the end plug.

For example, you need a 7 ft (2.13 m) sample tube. Combine a 3 ft (0.91 m) sample tube and a 5 ft (1.52 m) sample tube. Cut 1 ft (30.48 cm) from the narrow end.

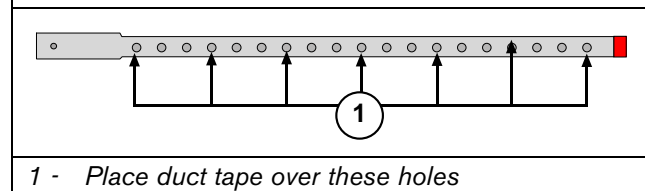
Sample tubes that are more than 3 ft (0.91 m) must be supported at the end opposite the duct detector. The support hole should be 1 in. to 2 in. (2.5 cm to 5 cm) below the entry hole to allow for possible moisture drainage (refer to *Figure 2*). Seal the gap between duct and sample tube.

**Figure 2: Sample Tube Support Hole**



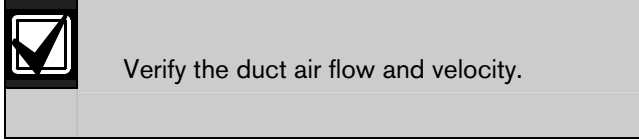
You can remove a maximum of 6 in. (15 cm) from the D344-1.5 for 1 ft (0.30 m) duct installations. If using the D344-1.5 in installations where the duct width is between 12 in. (30.5 cm) and 18 in. (45.7 cm), cover some of the sample holes. There are 19 sample holes in the D344-1.5, but only 12 of them are needed for normal installation. Depending on the length, you might need to cover some of the holes with duct tape. Use even spacing when you cover sample holes. This allows for an even sample across the width of the duct (refer to *Figure 3*).

**Figure 3: Covering Sample Tube Holes**



## 5.0 Mounting

### 5.1 Preparing the Duct



Verify the duct air flow and velocity.

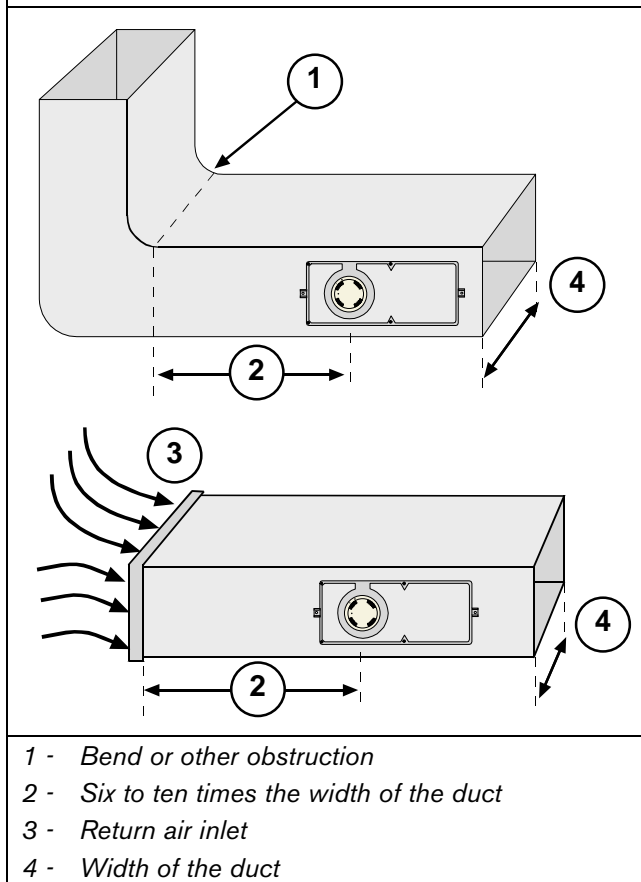
The D341/D342 is designed for use in air handling systems that have air velocities between 300 ft/min and 4000 ft/min (1.52 m/c to 20.3 m/c). Check the HVAC engineering specifications to ensure the air velocity in the duct falls within these parameters. If necessary, use a velocity meter to check the air velocity in the duct.

### 5.1 Selecting a Mounting Location

Avoid stratification and dead air space when taking a representative air sample. These conditions can be caused by return duct openings, sharp turns, connections, and long uninterrupted runs.

Place the duct smoke detectors in a range of six to ten times the width of the duct from any uninterrupted run. Refer to *Figure 4* for a typical duct detector placement.

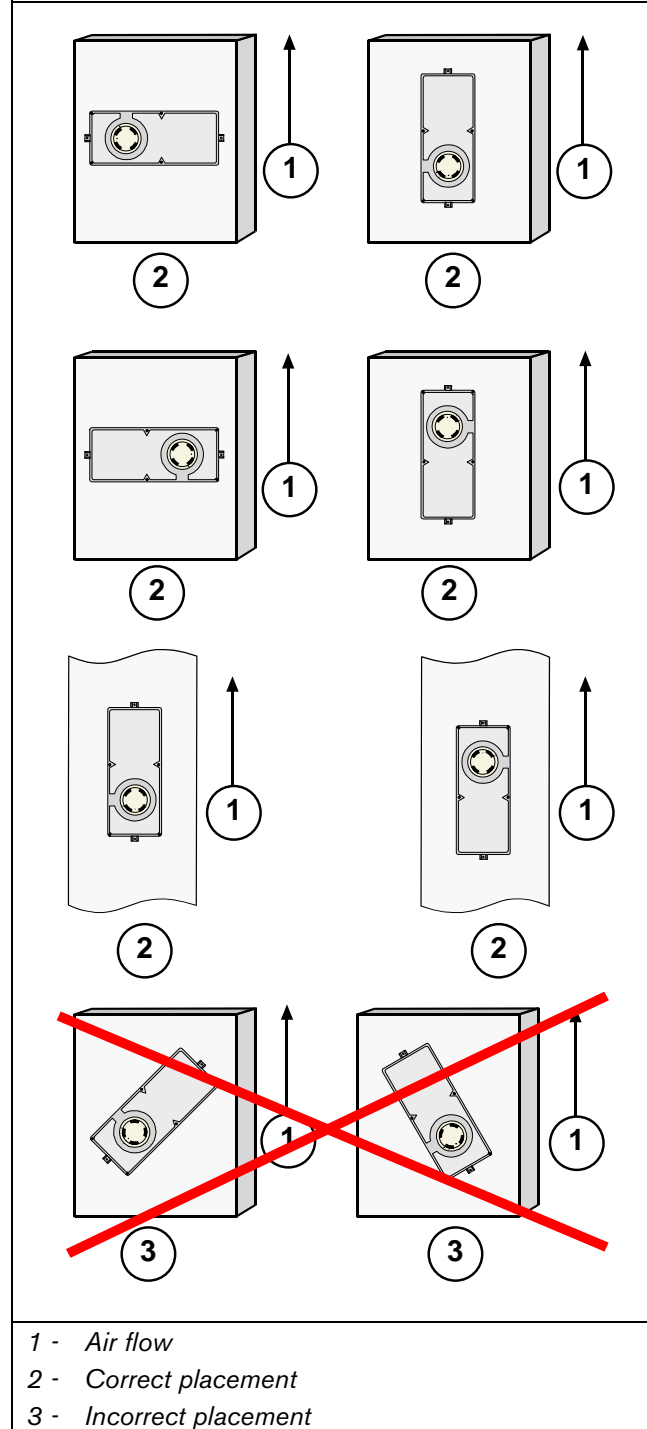
**Figure 4: Typical Duct Detector Placement**



### 5.2 Placing the Housing

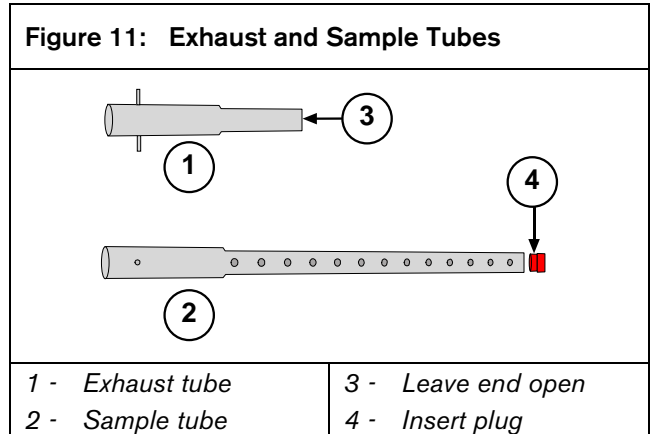
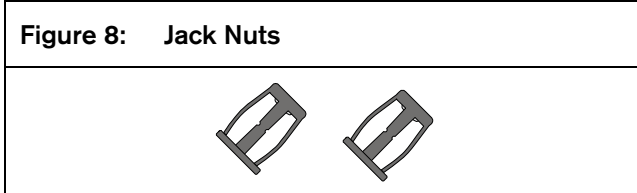
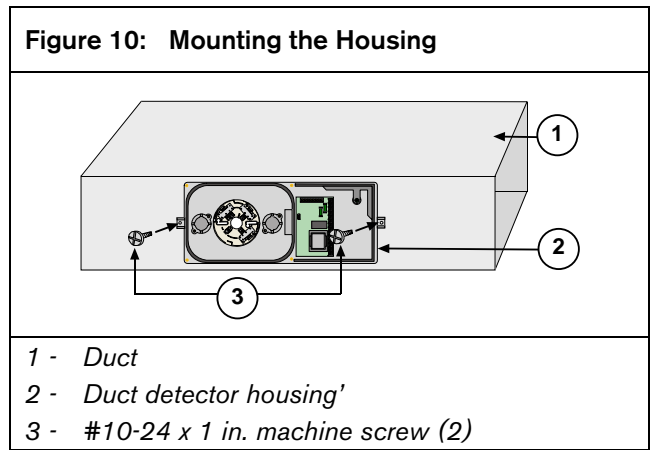
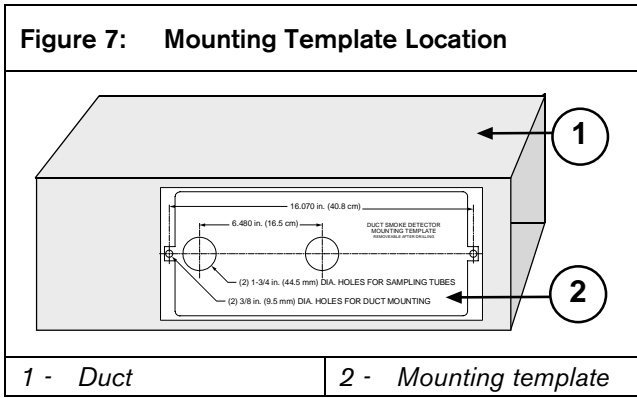
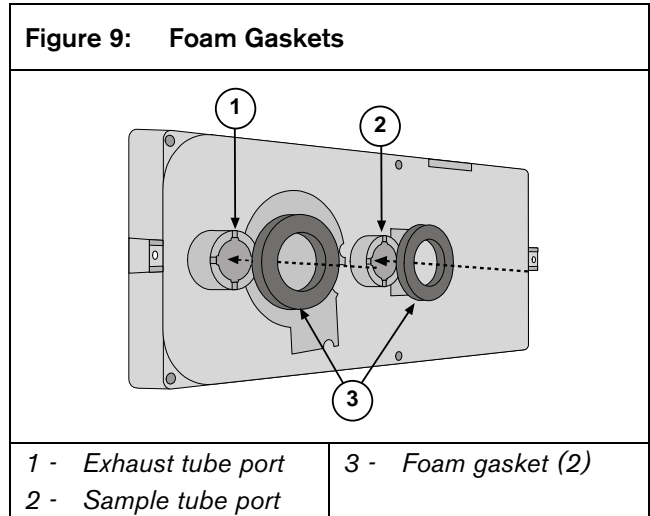
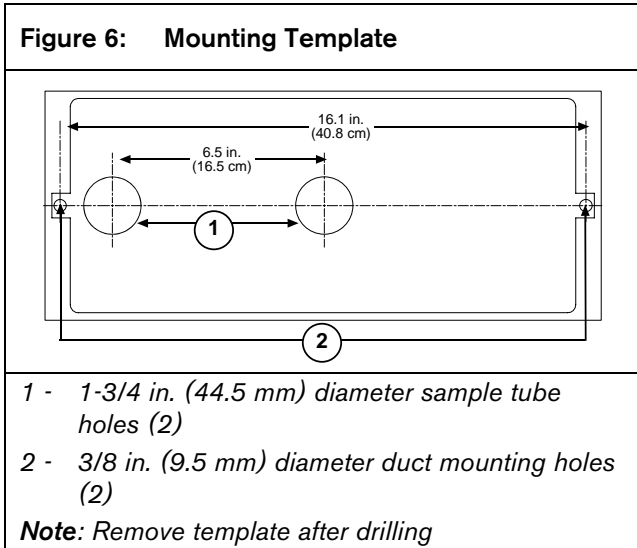
The D341/D342 can be mounted in any direction in 90° increments without regard to air flow direction (refer to *Figure 5*).

**Figure 5: D341/D342 Placement**

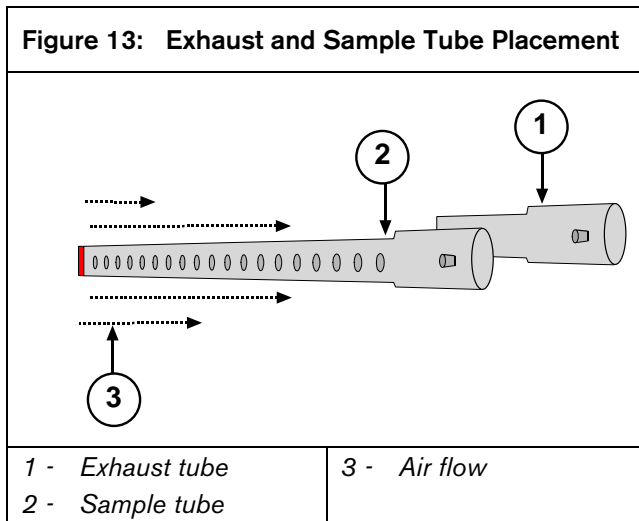
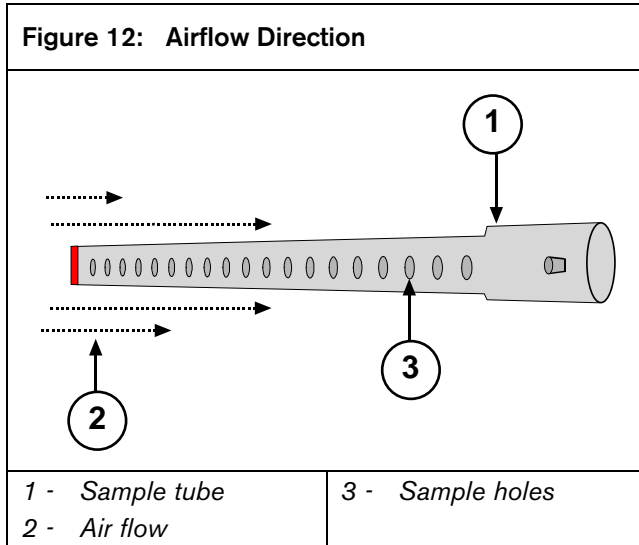


1. Locate the mounting template and remove it from its backing (refer to *Figure 6*).
2. Place the mounting template over the desired location on the duct (refer to *Figure 7*).
3. Drill out the required holes (two) and remove any remaining debris.
4. Remove the template after the drilling is complete.
5. Place a #10-24 jack nut in each of the two 3/8 in. (9.5 mm) holes (refer to *Figure 8*).
6. Insert the #10-24 x 1 in. machine screws into the jack nuts and tighten the screws firmly. This attaches the jack nuts to the duct. You might need to hold the jack nuts with an installer wrench or a pair of pliers while tightening the screws. This stops the jack nut from spinning in the hole. Remove the screws and set them aside for later use.

7. Place the two foam gaskets over the sample and exhaust ports located on the back of the D341/D342 (refer to *Figure 9*).
8. Mount the D341/D342 to the jack nuts in the duct using the #10-24 x 1 in. screws. Do not over tighten the screws. Over tightening can cause excessive bowing of the duct (refer to *Figure 10*).
9. Locate the sample and exhaust tubes. Ensure the sample tube has a plug installed at the narrow end of the assembly (refer to *Figure 11*).

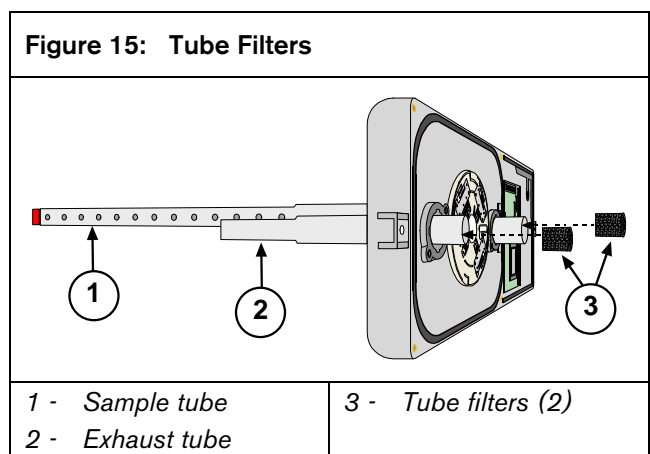
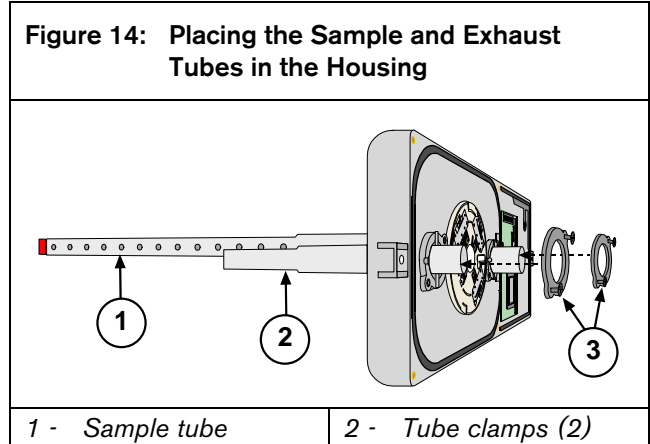


10. Note the direction of the airflow in the duct. Place the sample tube so the sampling holes face into the air flow (refer to *Figure 12*).
11. Ensure the exhaust tube is downwind from the sample tube (refer to *Figure 13*).



12. Insert the sample and exhaust tubes into the housing. The sample tube holes must face into the air flow. The alignment pins on the tubes must seat into the housing. Secure the tubes in place using the tube clamps provided (refer to *Figure 14*).
13. Place the tube filters over the open ends of the sample and exhaust tubes (refer to *Figure 15*).
14. Visually inspect the duct smoke detectors.

NFPA-72 requires a semi-annual visual inspection. Clean or replace the tube filters during this inspection. Order part D344-TF for replacements as needed.



## 6.0 Jumpers

The power card contains two jumpers:

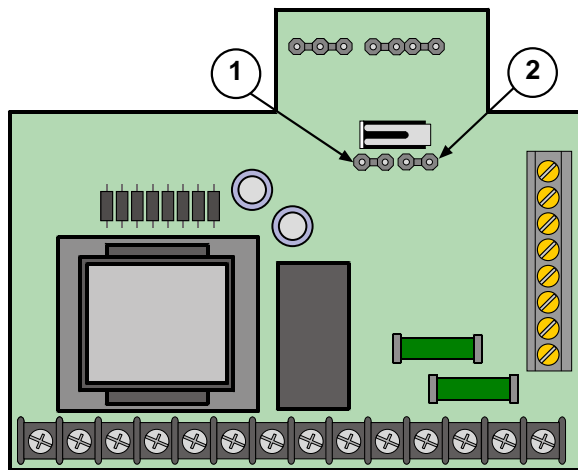
- Tamper jumper that enables or disables the housing cover tamper switch.
- Reset jumper that enables or disables the remote keyswitch reset function. The power off reset functions normally regardless of the jumper setting.

Figure 16 shows the location of the two jumpers on the power card.

Figure 17 shows the enable and disable settings for the tamper and reset jumpers.

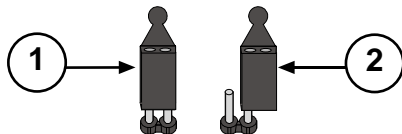


Figure 16: Power Card



- 1 - Tamper jumper
- 2 - Reset jumper

Figure 17: Tamper and Reset Jumper Settings



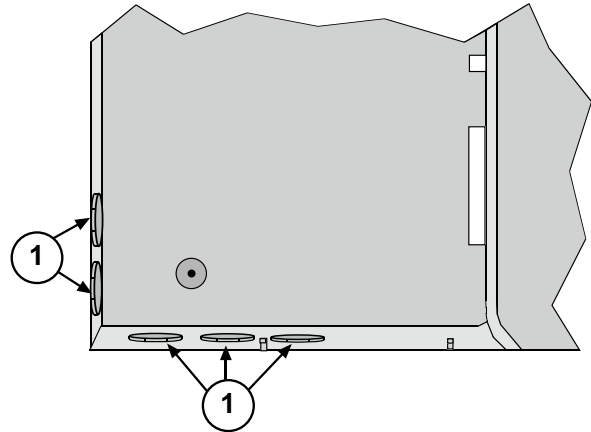
- 1 - Disabled
- 2 - Enabled

## 7.0 Wiring

Figure 18 shows the wiring knockout holes in the smoke detector duct.

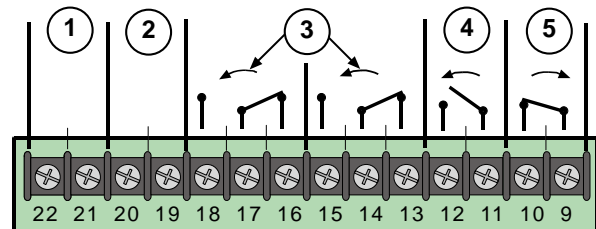
Refer to Figure 19 for the wiring terminals.

Figure 18: Wiring Knockout Holes



- 1 - Duct detector housing
- 2 - Wiring knockout holes

Figure 19: Wiring Terminals



- 1 - Power input (120 VAC and 230 VAC)
- 2 - Power input (24 VDC)
- 3 - Alarm relay auxiliary contacts
- 4 - Alarm contacts
- 5 - Trouble contacts

### 7.1 Primary Power

The D341 is designed for a primary power of 24 VAC, 120 VAC, or 24 VDC.

The D342 is designed for a primary power of 220 VAC, 240 VAC, 24 VDC, or 24 VAC.

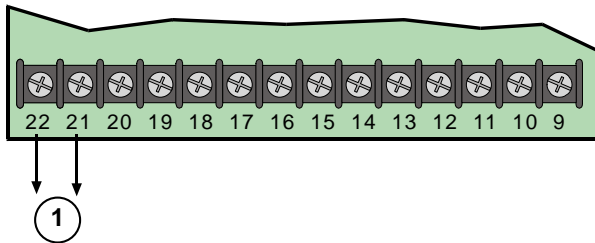


The D341/D342 is designed for one power source only. Do not connect a high-voltage AC source and a low-voltage AC/DC source to the same detector.

Refer to *Figure 20* for 120 VAC, 220 VAC, or 240 VAC wiring.

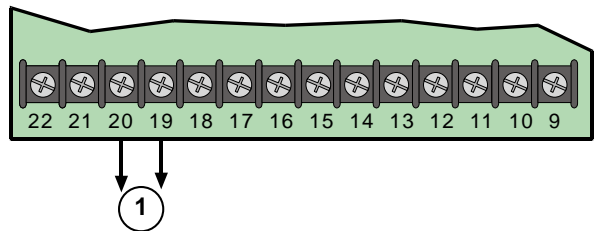
Refer to *Figure 21* for 24 VAC or 24 VDC wiring.

**Figure 20: 120 VAC, 220VAC, or 240 VAC Wiring**



1 - 120 VAC for the D341  
220 VAC or 240 VAC for the D342

**Figure 21: 24 VAC or 24 VDC Wiring**



1 - 24 VAC or 24 VDC

### 7.2 D344-RT Remote Test/Indicator

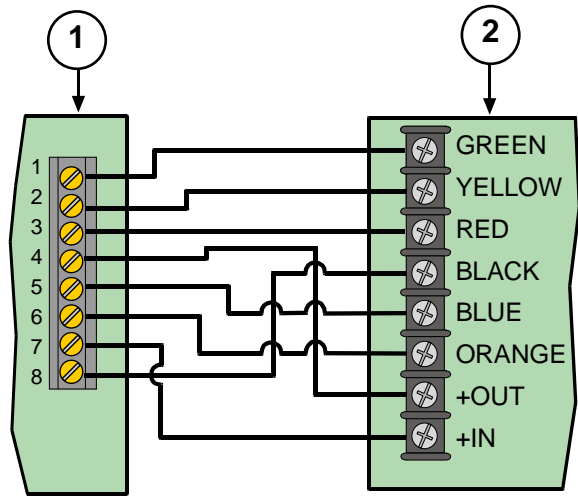
NFPA-72 requires detectors have remote alarm indicators where induct smoke detectors are installed in concealed locations that are more than 10 ft (3 m) above the finished floor. Remote alarm indicators are also required in arrangements where the detector's alarm indicator is not visible to responding personnel.



Do not exceed a distance of 500 ft (152 m) between the D307 and the D341/D342. Use #18 AWG (1.2 mm) wire or larger.

Refer to *Figure 22* for the D344-RT wiring.

**Figure 22: D344-RT Wiring**



1 - D341/D342 power card    2 - D307

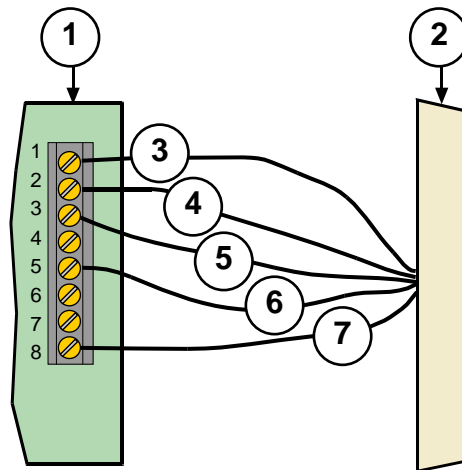
### 7.3 D344-RL Remote Indicator



Do not exceed a distance of 500 ft (152 m) between the D306 and the D341/D342. Use #18 AWG (1.2 mm) wire or larger.

Refer to *Figure 23* for the D344-RL wiring.

**Figure 23: D344-RL Wiring**



1 - D341/D342 power card    5 - RED WIRE  
2 - D306    6 - Violet wire  
3 - Green wire    7 - Black wire  
4 - Yellow wire



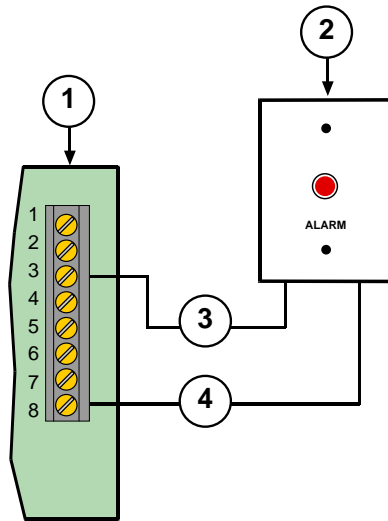
### 7.4 DRA-5 Remote Alarm Indicator



Do not exceed a distance of 500 ft (152 m) between the DRA-5 and the D341/D342. Use #18 AWG (1.2 mm) wire or larger

Refer to *Figure 24* for the DRA-5 wiring.

**Figure 24: DRA-5 Wiring**

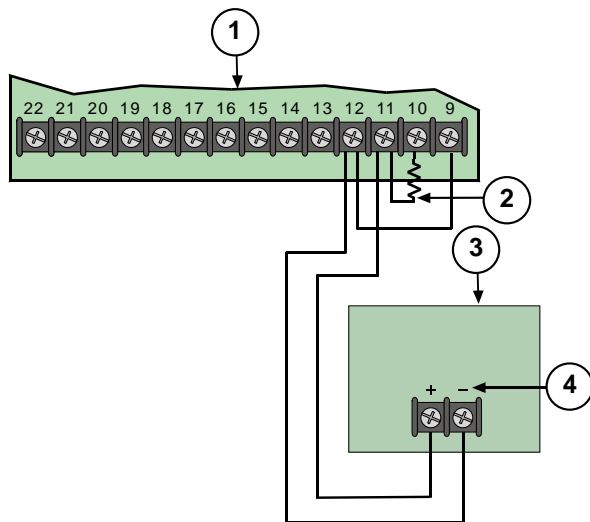


- |                          |                |
|--------------------------|----------------|
| 1 - D341/D342 power card | 3 - Red wire   |
| 2 - DRA-5                | 4 - White wire |

### 7.5 D341/D342 to Control Panel

Refer to *Figure 25* for the D341/D342 to control panel wiring.

**Figure 25: D341/D342 to Control Panel Wiring**

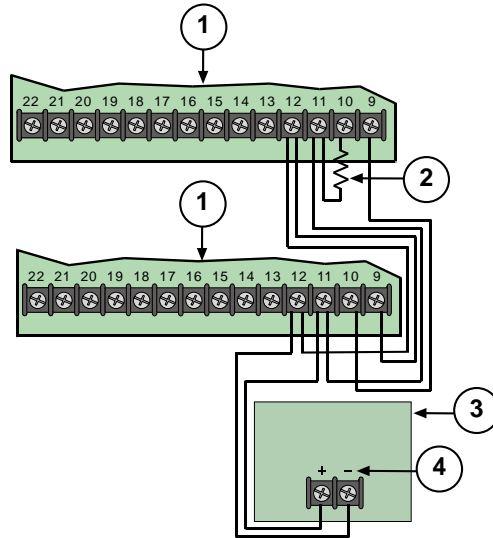


- |                  |                   |
|------------------|-------------------|
| 1 - D341/D342    | 3 - Control panel |
| 2 - EOL resistor | 4 - Alarm loop    |

### 7.6 Multiple D341/D342s to Control Panel

Refer to *Figure 26* for multiple D341/D342 to control panel wiring.

**Figure 26: Multiple D341/D342s to Control Panel Wiring**

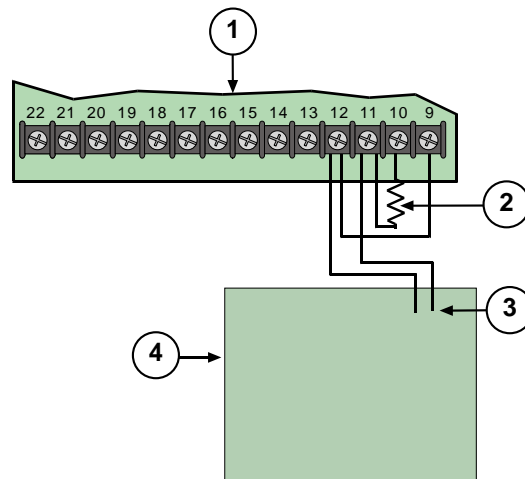


- |                  |                   |
|------------------|-------------------|
| 1 - D341/D342    | 3 - Control panel |
| 2 - EOL resistor | 4 - Alarm loop    |

### 7.7 D341/D342 to Mux Point Module

Mount the small mux point modules inside the D341/D342 on the power card side. Refer to *Figure 27* for the D341/D342 to mux point module wiring.

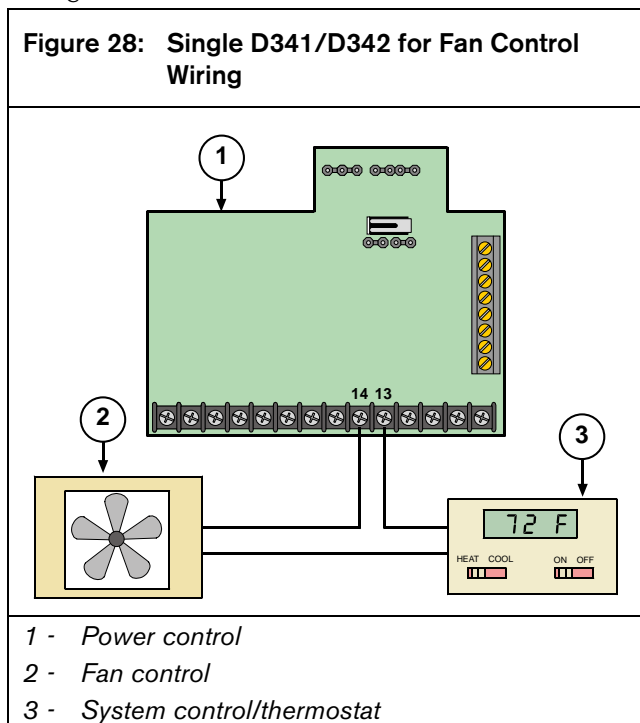
**Figure 27: D341/D342 to Mux Point Module Wiring**



- |                  |                              |
|------------------|------------------------------|
| 1 - D341/D342    | 3 - Zone                     |
| 2 - EOL resistor | 4 - FACP or mux point module |

## 7.8 Single D341/D342 for Fan Control

Refer to *Figure 28* for single D341/D342 to fan control wiring.



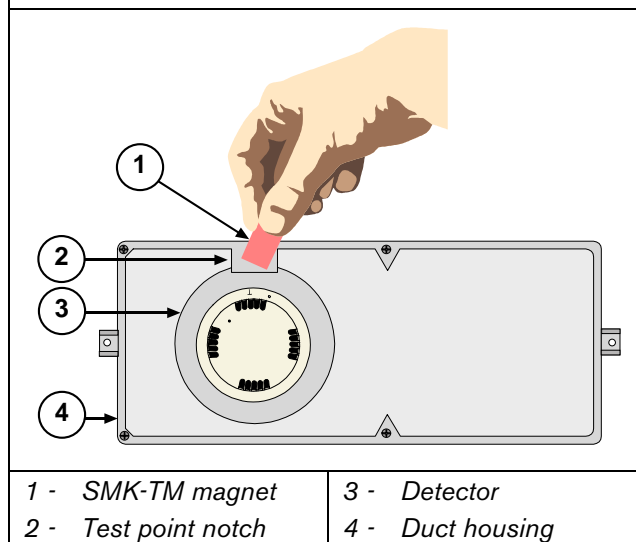
## 8.0 Testing

Verify air flow to ensure the system is operating properly. Use a manometer to verify the correct velocity pressure readings ranging 300 ft/min to 4000 ft/min (1.52 m/s to 20.3 m/s). Ensure the water pressure differential between the sampling tubes ranges from 0.01 in. (0.25 mm) to 1.8 in. (4.57 cm).

- Check the wiring from the control panel to the last D341/D342 on each run for proper polarity and continuity. Ensure each run terminates with an EOL resistor as specified by the control panel's manufacturer.
- Apply power to the system and check for alarms.
  - Note which smoke detectors are in alarm, if any, and shut down the system down.
  - Remove these detectors from their duct housing and recheck the duct housing for proper wiring. If the problems persist, replace the affected smoke detectors or swap them with known good units. This determines if the problem is caused by the detector or the duct housing.
  - If there is a system alarm with no detector alarms present, remove all smoke detectors and check the wiring at each duct housing. Pay close attention to the wiring of each EOL resistor.

- When the system is free of alarms, check each detector to ensure the red LED indicator is flashing approximately every 4 sec for the D285DH and every 11 sec for the D286. This verifies the detector is receiving power and operating properly.
- Test each detector to ensure it will cause a control panel alarm. Reset the control panel after each test.
- Test the detectors by doing one of the following:
  - Place a SMK-TM magnet against the duct housing's test point notch located on the front cover (refer to *Figure 29*).

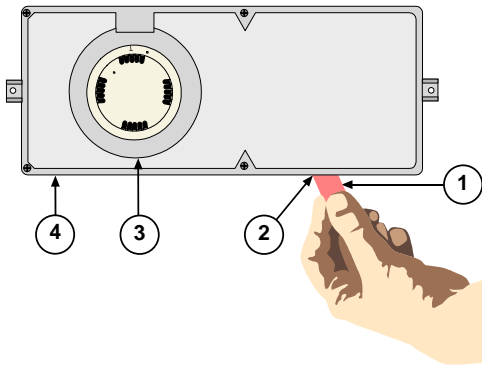
**Figure 29: Testing the Detector**



When a detector alarms, the red LED indicator activates and latches in the ON position. Ensure you clear the alarm before proceeding to the next detector.

- Reset the detector by momentarily removing power or by placing a magnet in the reset notch located near the rear of the housing (refer to *Figure 30* on page 11).
  - Test and reset duct detectors with the D344-RT installed by moving the keyswitch to the appropriate position and observing the Alarm LED.
- Check the overall loading of the alarm loop by measuring the voltage across each EOL resistor. This voltage should equal or exceed the minimum specified by the control panel's manufacturer.

**Figure 30: Resetting the Detector**



- |                      |                  |
|----------------------|------------------|
| 1 - SMK-TM magnet    | 3 - Detector     |
| 2 - Test point notch | 4 - Duct housing |

## 9.0 Maintenance

- NFPA-72 requires a semi-annual visual inspection of the duct smoke detectors. Clean or replace the tube filters during this inspection. Order part DS294-TF for replacements as needed.
- Notify all concerned parties before and after performing maintenance or testing on the fire alarm system.

At least once a year, clean the detector and base using a vacuum or clean/dry compressed air.

## 10.0 Specifications

Refer to *Table 2* for the D341/D342 specifications.

**Table 2: Specifications**

Duct Detector Housing Power Requirements					
Operating Voltage:	D341:	20 VDC to 29 VDC and 24 VAC or 120VAC			
	D342:	20 VDC to 29 VDC and 24 VAC or 120 VAC			
Maximum RMS Ripple:		25 percent of DC input			
Current Draw:		Nominal Primary Voltage (D341/D342)			
	Condition	24 VDC	24 VAC	120 VAC	230 VAC
	Standby	15 mA	85 mA	100 mA	25 mA
	Trouble	15 mA	85 mA	100 mA	25 mA
	Alarm	65 mA	200 mA	110 mA	30 mA
		D341/D342 when connected to the D344-RL/D344-RT Remote Indicator			
	Condition	24 VDC	24 VAC	120 VAC	230 VAC
	Standby	10 mA	0 mA	0 mA	0 mA
	Trouble	10 mA	0 mA	0 mA	0 mA
	Alarm	15 mA	0 mA	0 mA	0 mA
	Alarm and Remote Coil (ON)	150 mA	150 mA	25 mA	20 mA
Alarm Output:	Form "A" Normally Open (NO and C) contacts 0.5 A at 24 VDC and 24 VAC, 0.1 A at 120 VAC				
Trouble Output:	Form "A" Normally Open (NO/C) contacts 0.5 A at 24 VDC/24 VAC, 0.1 A at 120 VAC				
Auxiliary Output:	Two Form "C" Normally Open and Normally Closed (NO and C and NC) contacts 10 A at 24 VDC, 24 VAC, 120 VAC, or 240 VAC				
Operating Temperature:	+32°F to +120°F (0°C to +49°C). For UL Listed requirements, the operating temperature is +32°F to +100°F (0°C to +37.8°C).				
Humidity:	0 to 95% RH				
Air Velocity:	300 ft/min to 4000 ft/min (1.52 m/s to 20.3 m/s)				
Weight:	3.75 lb (1.7 kg)				
Dimensions (H x W x D):	6.5 in. x 15.5 in. x 4.25 in. (16.5 cm x 39.5 cm x 11 cm)				
Powerup Time:	22 sec maximum				

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