

D340



EN | Installation Guide
Duct Smoke Detector
Housing



BOSCH

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1.0 Overview

The D340 Air Duct Smoke Detector Housing is designed to mount to the ducts of heating, ventilation, and air-conditioning (HVAC) systems to monitor the presence of smoke in the conditioned air.

Use the D340 with the D285DH Photoelectric Smoke Detector (provided separately). The detector is combined with an efficient housing design to sample the air passing through a duct and detect potentially hazardous conditions. When it detects smoke, the detector sends an alarm signal to the control panel. The control panel initiates the necessary action to shut off fans and blowers or to switch to other air handling systems.

The D340 operates on a two-wire loop, and requires a smoke detector head.

Test the system by placing an external magnet on the housing or switching the keyswitch from a Remote Test station. Reset control requires a 24 V supply from the control panel or an external power supply.

You can reset the detector by shutting down zone power. If your system has a D344-RT Remote Test Kit, you can reset the system using the keyswitch.

Install the D340 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®
- IBC: International Building Code
- IFC: International Fire Code
- Any applicable local and state codes
- Local authority having jurisdiction (AHJ)

2.0 D340 Options

Table 1: D340 Options

Options	Description
D285DH	Photoelectric smoke detector head
D344-1.5	1.5 ft (0.5 m) sample tube
D344-3	3 ft (1 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 for sample and exhaust tubes (20 per package)
SMK-TM	Test magnet
DRA-5	Remote alarm indicator
D275	End-of-line (EOL) module

3.0 Assembly

The D340 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 D340P also includes a smoke detector head and 1.5 ft (0.5 m) tube.

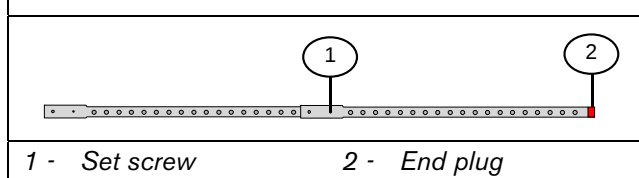
4.0 Sample Tubes

The sample tubes must extend across the width of the duct. The three sizes of sample tubes are:

- 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 of the tube (*Figure 1*).

Figure 1: D344-1.5 Sample Tube



You can combine or cut sample tubes to make different lengths. A sample tube can be a maximum length of 10 ft (3 m) or a minimum length of 1 ft (0.3 m). For example, you can join a 3 ft (1 m) and a 5 ft (1.5 m) to make an 8 ft (2.4 m) sample tube.

To combine sample tubes:

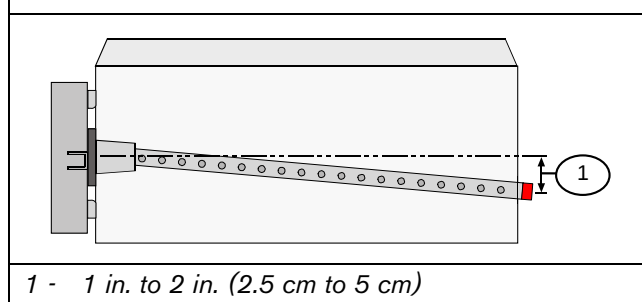
1. Remove the roll pin and set screw from one of the sample tubes.
2. Remove the end plug from the other sample tube.
3. Push the flared end over the sample tube you want to lengthen.
4. Align the holes, insert the set screw, and reinstall the end plug. For example, if you want a 7 ft (2 m) sample tube, combine a 3 ft (1 m) sample tube and a 5 ft (1.5 m) sample tube. Then cut 1 ft (0.3 m) from the narrow end to get the necessary length.



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

Sample tubes over 3 ft (1 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 (*Figure 2*).

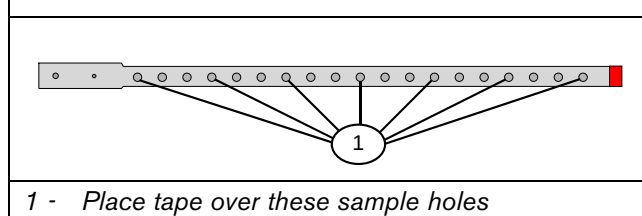
Figure 2: Support Hole Position



5. Seal the gap between duct and sample tube. You can remove up to 6 in. (15 cm) from the D344-1.5 for 1 ft (0.3 m) duct installations.

When using the D344-1.5 in installations where the duct width is between 12 in. (31 cm) and 18 in. (46 cm), cover some of the sample holes. The D344-1.5 has 19 sample holes, but only 12 are required for normal installations. Depending on the length, you might have to cover some of the holes with duct tape. Use even spacing when covering the sample holes to allow an even sample across the width of the duct. Refer to *Figure 3*.

Figure 3: D344-1.5 Sample Tube



5.0 Mounting

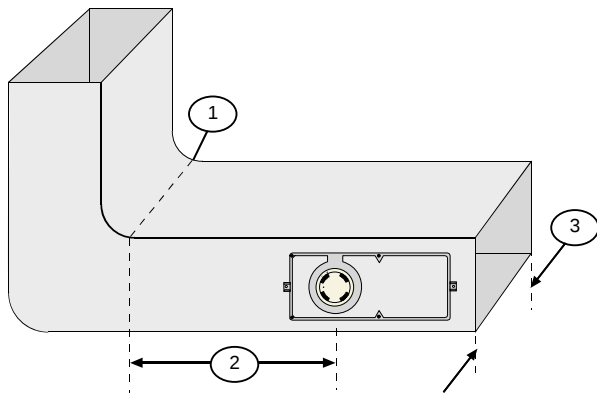
5.1 Preparing the Duct

You must verify the duct air flow and velocity. The D340 is designed for use in air handling systems with air velocities between 300 ft/min and 4000 ft/min (1.5 m/sec to 20.3 m/sec). 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 Determining the Mounting Location

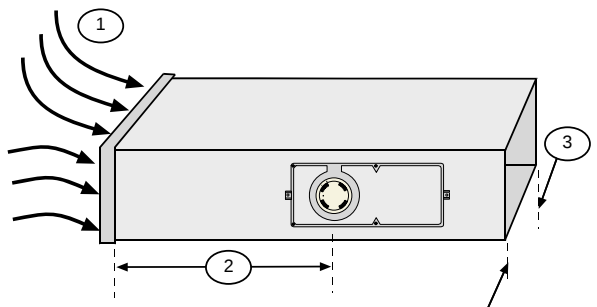
To obtain a representative air sample, avoid stratification and dead air space. These conditions can be caused by return duct openings, sharp turns, connections, or long, uninterrupted runs. For this reason, place the D340 in the range of six to ten times the width of the duct from any uninterrupted run. Refer to *Figure 4* and *Figure 5*.

Figure 4: Typical D340 Placement – Example A



- 1 - Bend or other obstruction
- 2 - Six to ten times the width of the duct
- 3 - Width of duct

Figure 5: Typical D340 Placement – Example B

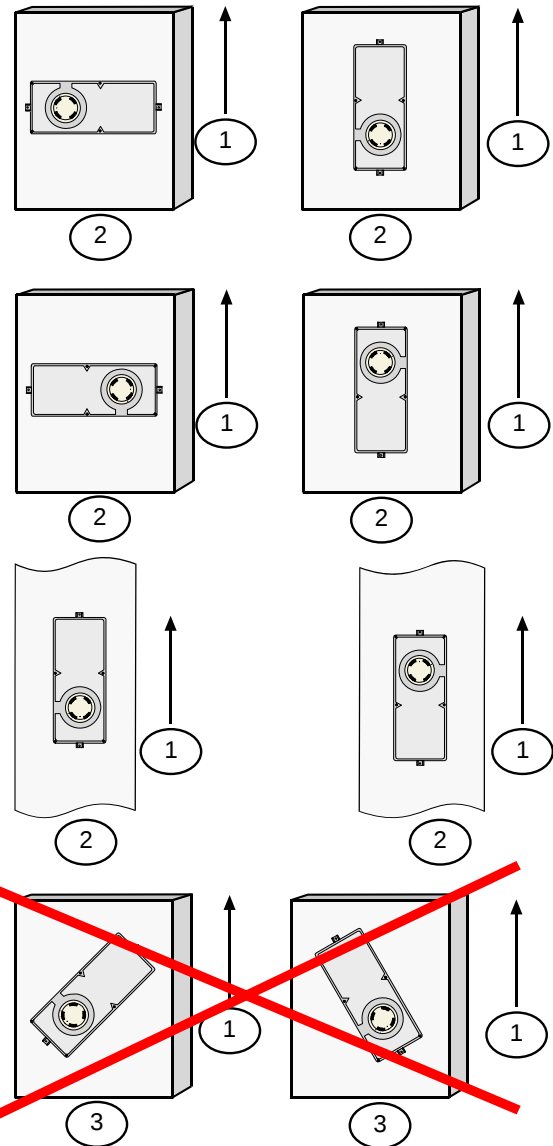


- 1 - Return air inlet
- 2 - Six to ten times the width of the duct
- 3 - Width of duct

5.2 Positioning the D340

The D340 can be mounted in any direction of 90° increments without regard to the air flow direction (*Figure 6*).

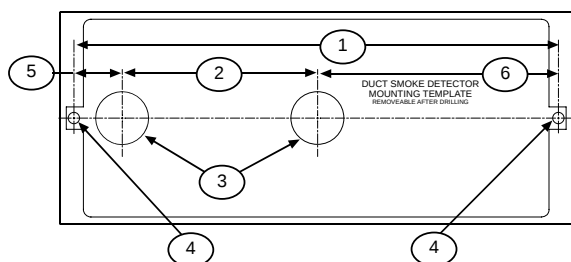
Figure 6: D340 Positions



- 1 - Air flow
- 2 - Correct mounting position
- 3 - Incorrect mounting position

1. Locate the D340 mounting template (*Figure 7*) and remove it from its backing.

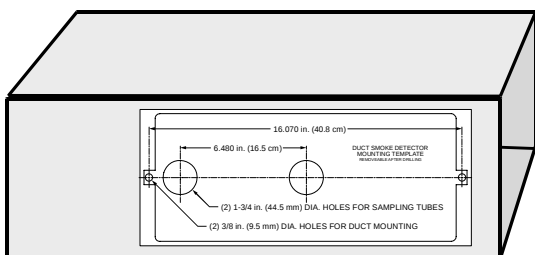
Figure 7: D340 Mounting Template



- 1 - 16 in. (41 cm)
- 2 - 6.5 in. (16.5 cm)
- 3 - Two 1-3/4-in. (45-mm) diameter holes for the sample tubes
- 4 - Two 3/8-in. (9.5-mm) diameter holes for mounting to the duct
- 5 - 1.5 in. (38.1 mm)
- 6 - 8.0 in. (20.5 cm)

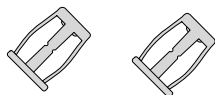
2. Place the template over the desired location on the duct (*Figure 8*).

Figure 8: D340 Template Placement



3. Drill out the required holes and remove any remaining debris.
4. Remove the template.
5. Place a #10-24 jack nut (*Figure 9*) in each of the 3/8 in. (9.5 mm) holes.

Figure 9: Jack Nuts

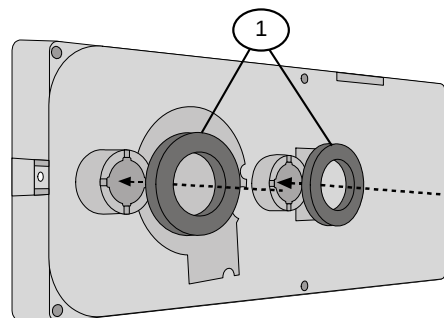


6. Insert the #10-24 x 1 in. machine screws into the jack nuts and firmly tighten.

This attaches the jack nuts to the duct. You might have to hold the jack nuts with a installer wrench or a pair of pliers while tightening the screws to stop the jack nut from spinning in the hole. Remove the screws for later use.

7. Place the two foam gaskets over the sample and exhaust ports on the back of the D340 (*Figure 10*).

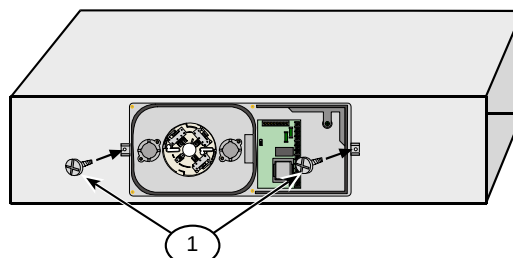
Figure 10: Gasket Placement



- 1 - Foam gasket (2)

8. Mount the D340 to the jack nuts using the supplied 10-24 x 1-in. machine screws (*Figure 11*). Remember that overtightening the screws can cause excessive bowing of duct.

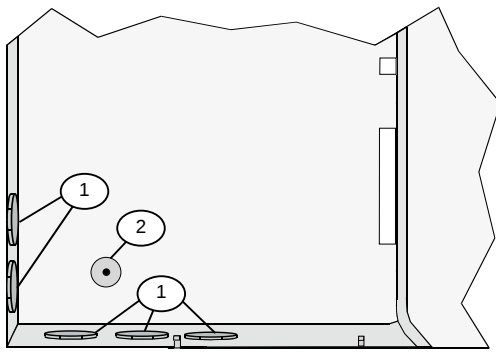
Figure 11: Mounting the D340 to the Jack Nuts



- 1 - Two 10-24 x 1-in. machine screws

9. Locate the wiring knockout holes (*Figure 12*).

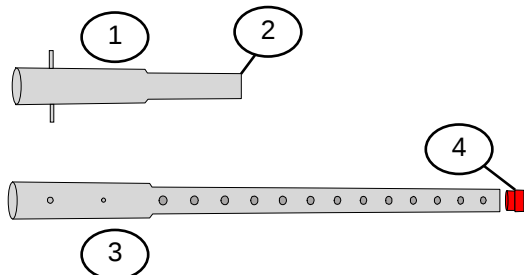
Figure 12: Wiring Knockout Locations



1 - Wiring Knockouts (5) 2 - Earth ground screw

10. Locate the sample and exhaust tubes (*Figure 13*). Ensure the sample tube has a plug installed at the narrow end of the assembly.

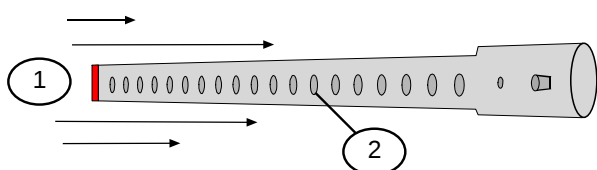
Figure 13: Exhaust and Sample Tubes



- | | |
|--------------------|-----------------|
| 1 - Exhaust tube | 3 - Sample tube |
| 2 - Leave end open | 4 - Insert plug |

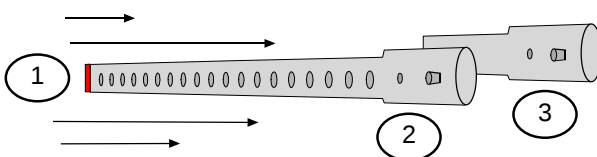
11. Note the direction of the airflow in the duct. The sampling holes in the sample tube must face into the air flow (*Figure 14*). The exhaust tube must be downwind from the sample tube (*Figure 15*).

Figure 14: Duct Air Flow



- | | |
|--------------|------------------|
| 1 - Air flow | 2 - Sample holes |
|--------------|------------------|

Figure 15: Exhaust Tube Position

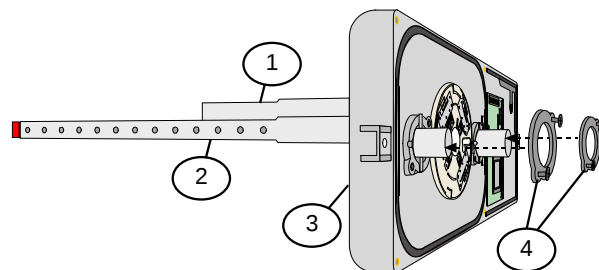


- | |
|---|
| 1 - Air flow |
| 2 - Sample tube |
| 3 - Exhaust tube down stream from sample tube |

12. Insert the sample and exhaust tubes into the D340, ensuring the sample tube holes face into the air flow. Ensure the tube alignment point set into the D340.

13. Secure the tubes in place using the tube clamps provided (*Figure 16*).

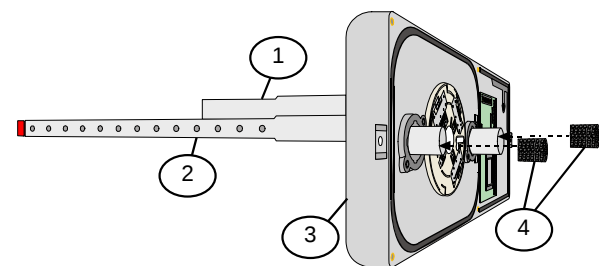
Figure 16: Sample and Exhaust Tubes in D340



- | | |
|------------------|---------------------|
| 1 - Exhaust tube | 3 - D340 |
| 2 - Sample tube | 4 - Tube clamps (2) |

14. Place the tube filters over the open ends of the sample and exhaust tubes (*Figure 17*).

Figure 17: Tube Filters



- | | |
|------------------|----------------------|
| 1 - Exhaust tube | 3 - D340 |
| 2 - Sample tube | 4 - Tube filters (2) |



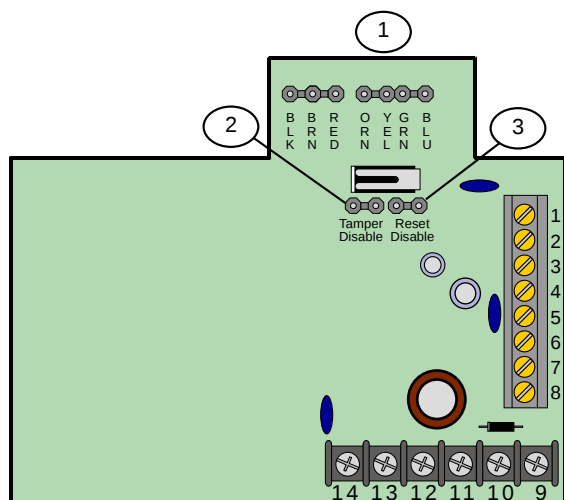
NFPA-72 requires a semi-annual visual inspection of detector housings. Clean or replace the tube filters at this time. If replacement filters are needed, order the D344-TF.

6.0 Selecting the Jumper

6.1 Location

Figure 18 shows the locations of the tamper and reset jumpers on the power card.

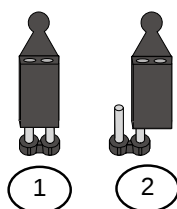
Figure 18: Jumper Locations



- 1 - D340 Power card 3 - Reset jumper
2 - Tamper jumper

The Tamper Jumper (Figure 19) enables or disables the housing cover Tamper Switch. When this jumper is enabled, a trouble is indicated if the cover is removed.

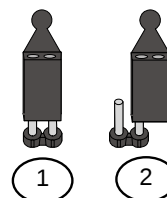
Figure 19: Tamper Jumper



- 1 - Disabled 2 - Enabled

The Reset Jumper (Figure 20) enables or disables the Remote Reset (keyswitch). The Power Off Reset from the control panel zone functions normally regardless of the jumper setting.

Figure 20: Reset Jumper w/Remote Display Units



- 1 - Disabled 2 - Enabled

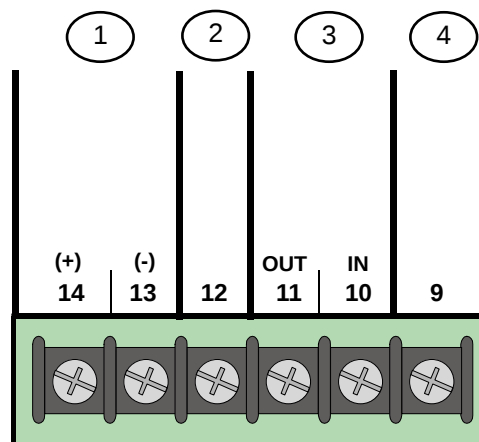


Disable the Reset jumper whenever you are not using the D344-RT (D307).

7.0 Wiring

7.1 Terminals

Figure 21: Terminal Wiring



- 1 - Optional external power (24 VAC/VDC)
2 - Remote LED
3 - Loop (+)
4 - Loop (-)

7.2 Primary Power

The D340 is designed for a two-wire loop power ranging from 8.5 VDC to 32 VDC. For Remote Test or Remote LED, you must use an external 24 VDC/VAC that can supply a minimum of 170 mA.

7.3 D340 Two-Wire D344-RT (D307)

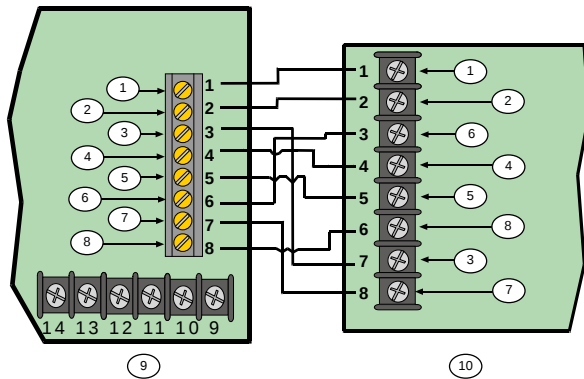


NFPA-72 requires that where in-duct smoke detector housings are installed in concealed locations more than 10 ft (3 m) above the finished floor or in arrangements where the detector's alarm indicator is not visible to responding personnel, the detectors have remote alarm indicators.



Do not exceed 500 ft (152 m) between the D344-RT (D307) Remote Test/Indicator Plate and the D340. Use 18 AWG (1.2 mm) or larger wire.

Figure 22: D340 Two-wire to the D344-RT (D307) Wiring



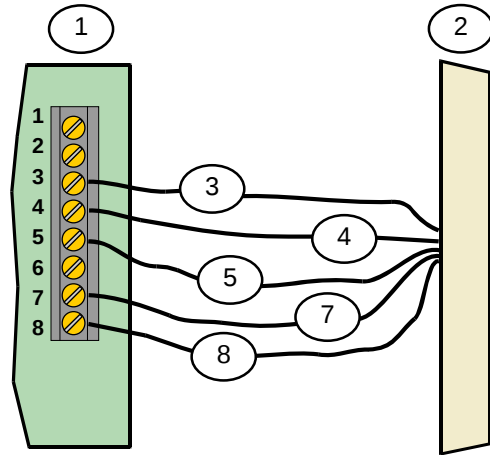
- | | |
|---------------------|-----------------|
| 1 - Voltage in (+) | 6 - Remote test |
| 2 - Voltage out (-) | 7 - Green LED |
| 3 - Yellow LED | 8 - Red LED |
| 4 - Voltage monitor | 9 - D340 |
| 5 - Ground (-) | 10 - D307 |

7.4 D344-RL Remote Indicator Plate



Do not exceed a distance of 500 ft (150 m) between the D344-RL (D306) Remote Indicator Plate and the D340. Use 18 AWG (1.2 mm) or larger wire.

Figure 23: D344-RL (D306) Wiring

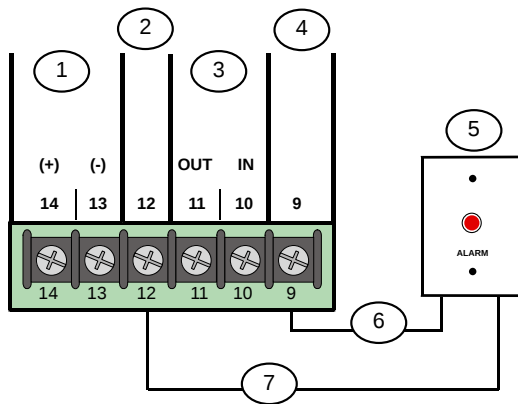


- | | |
|---------------------------------|----------------|
| 1 - D340 Power card | 5 - Black wire |
| 2 - D306 Remote indicator plate | Ground (-) |
| 3 - Yellow wire | 7 - Green wire |
| 4 - Violet wire | 8 - Red wire |

7.5 DRA-5 Remote Alarm LED



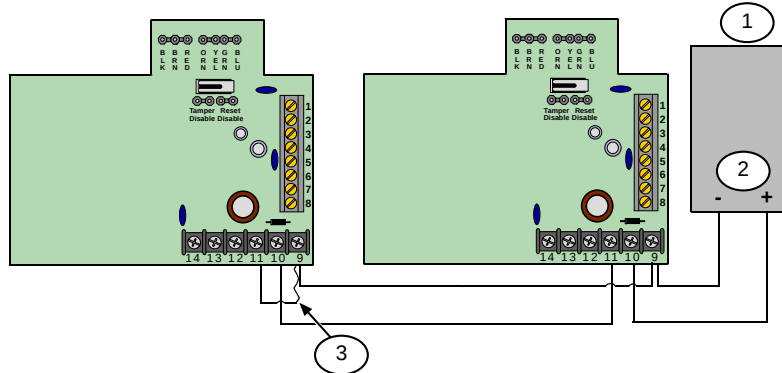
Do not exceed a distance of 500 ft (150 m) between the DRA-5 Remote Alarm Indicator and the D340. Use 18 AWG (1.2 mm) or larger wire.

Figure 24: DRA-5 Wiring

- | | |
|--|----------------|
| 1 - Optional external power (24 VAC/VDC) | 4 - Loop (-) |
| 2 - Remote LED | 5 - DRA-5 |
| 3 - Loop (+) | 6 - White wire |
| | 7 - Red wire |

7.6 D340 to Control Panel

Figure 25: D340 to Control Panel Wiring



1 - Control panel

2 - Alarm Initiating loop

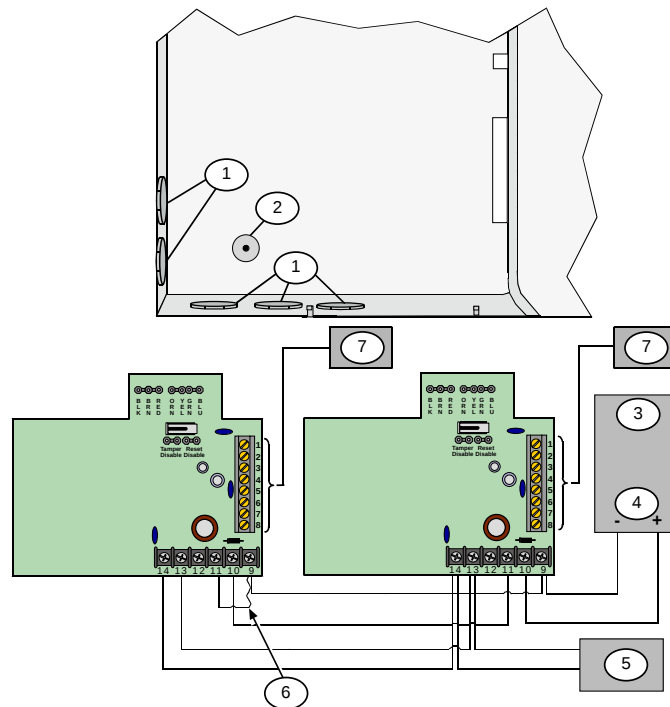
3 - EOL

7.7 D340 to Control Panel and External Power



Connect the ground to the screw on the ground plate when using grounded three-wire AC wiring.

Figure 26: D340 to Control Panel (External Power Required with Remote Test Unit)



1 - Wiring knockouts (5)

2 - Screw for earth ground

3 - Control panel

4 - Alarm initiating loop

5 - External power (24 VAC/VDC)

6 - EOL

7 - Remote test/display units

8.0 Installation Testing

Verify the air flow to ensure the system is properly operating. Use a manometer to verify the correct velocity pressure readings ranging from 300 ft/min to 4000 ft/min (1.5 m/sec to 20 m/sec).

The pressure differential between sampling tubes is a minimum of 0.01 in. (0.25 mm) of water to a maximum of 1.8 in. (45.7 mm) of water.

1. Check the wiring from the control panel to the last duct detector on each run for proper polarity and continuity.
2. Ensure each run terminates with an EOL resistor as specified by the control panel manufacturer.
3. Apply power to the system, and check for alarms.
 - a. Note which smoke detectors are in alarm (if any) and shut down the system.
 - b. 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.
 - c. 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.
4. When the system is free of alarms, check each detector to ensure the red LED indicator flashes approximately every 4 sec for the D285DH. This verifies the detector is receiving power and properly operating.
5. Test each detector to ensure it causes a control panel alarm. Reset the control panel after each test. Test the detectors by doing one of the following:
 - a. Place an SMK-TM magnet against the duct housing's Test Point notch on the front cover (*Figure 27*).
 - b. Switch a signal from a D344-RT (D307) Remote Test Indicator Plate.

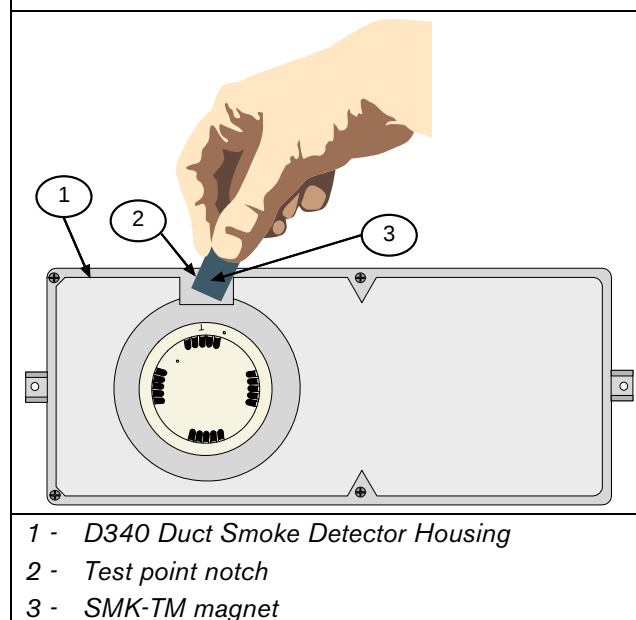


When a detector alarms, the red LED indicator activates and latches to the ON position. Clear the alarm before proceeding to the next detector.

6. You can reset the detector by momentarily removing power.

7. For duct detectors with the D307 Remote Test Indicator installed, reset by moving the keyswitch to the appropriate position and observing the alarm LED.

Figure 27: Detector Testing



8. 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 manufacturer.

9.0 Maintenance



NFPA-72 requires a semi-annual visual inspection of detector housings. Clean or replace the tube filters at this time. If replacement filters are needed, order the D344-TF.



Notify all concerned parties before and after maintaining or testing the fire alarm system.

Clean the detector and base annually using a vacuum or clean and dry compressed air.

10.0 Specifications

Table 2: D340 Specifications			
Option	Description	Option	Description
D275	End-of-line (EOL) module	D344-RL	Remote LED Indicator Kit (D306)
D285DH	Photoelectric smoke detector head	D344-TF	Tube filters for sample and exhaust tubes (20 per package)
D344-1.5	1.5 ft (0.5 m) sample tube	SMK-TM	Test magnet
D344-3	3 ft (1 m) sample tube	DRA-5	Remote alarm indicator
D344-5	5 ft (1.5 m) sample tube		
D344-RT	Remote Test Kit (D307)		
Power Requirements			
Operating Voltage	8.5 VDC to 32 VDC from two-wire loop. Optional 24 VDC/VAC from control panel or external supply		
Maximum RMS Ripple	25% of DC input		
Current Draw	Dependent on the control panel that must limit the alarm current to 100 mA maximum.		
Operating Temperature	+32°F to +120°F (0°C to +49°C). For UL listed requirements, the operating temperature range is +32°F to +100°F (0°C to +37.8°C).		
Humidity	0% to 95% relative humidity		
Air Velocity	300 ft/min to 4000 ft/min (1.5 m/sec to 20.3 m/sec)		
Weight:	3.75 lbs. (1.7 kg)		
Dimensions (H x W x D)	6.5 in. x 15.5 in x 4.3 (16.5 cm x 39.5 cm x 11 cm)		
Power-up Time	22 sec maximum		
D340 with D344-RT, D344-RL, and External Power			
	Loop Power	External Power	
	8.5 V to 32 V	24 V	
Condition			
Standby	< 120 μA	5 mA	
Trouble	< 170 μA	30 μA	
Alarm	Current limit to 100 mA	170 mA in Remote Test	
D340 with D344-RT, D344-RL without External Power			
	Loop Power		
	8.5 V to 32 V		
Condition			
Standby	< 140 μA		
Trouble	< 170 μA		
Alarm	Current limit to 100 mA		
D340 without D344RT, D344RL without External Power			
	Loop Power		
	8.5 V to 32 V		
Condition			
Standby	< 130 μA		
Trouble	< 150 μA		
Alarm	Current limit to 100 mA		

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