



# Duct smoke housing, 2-wire

D340/D340P



**BOSCH**

en Installation manual



# 1 Notices

These instructions cover the installation of the D340 Duct smoke housing and D340P Duct smoke kit in a fire system supervised by a fire alarm control panel (FACP) or a combination Burglary/Fire control panel.

Before installing the module, become familiar with the *Installation and Operation Guide* for the control panel you are using.



## **Warning!**

Follow these instructions to avoid personal injury and damage to equipment.

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Install, test and maintain the module according to these instructions, NFPA codes, local codes, and the authority having jurisdiction (AHJ). Failure to follow these instructions can result in failure of a detector to initiate an alarm event. Bosch Security Systems, Inc. is not responsible for improperly installed, tested or maintained devices.

NFPA 72 requires that you perform a complete system wide functional test following any modifications, repair, upgrades or adjustments made to the system's components, hardware, wiring, programming and software/firmware.

## **Trademarks**

All hardware/software product names used in this document are likely to be registered trademarks and must be treated accordingly.

## 2 Description

### 2.1 Overview

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

Use the housing with the D285DH Duct smoke head (provided separately or with the D340P kit). 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.

Test the system by placing an external magnet on the housing or by turning the D344-RT's key switch to TEST. 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/indicator plate, you can reset the system using the key switch.

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.

### 2.2 Compatibilities

Bosch Security Systems, Inc. (Bosch) makes no claim either written, oral, or implied that the D340 Duct smoke housing with its associated D285DH Duct smoke head works with any control panel other than those listed in the Two-wire Smoke Detectors Technical Service Note that covers the following products:

- D285, D285TH, D285DH, D286, D263, D263TH, D263THC, D263THS smoke detectors
- D603, D604, D605 heat detectors
- D340 Duct smoke detector housing

Two-wire smoke detector compatibility information is available in the documents for this product on our website ([www.boschsecurity.com](http://www.boschsecurity.com)).

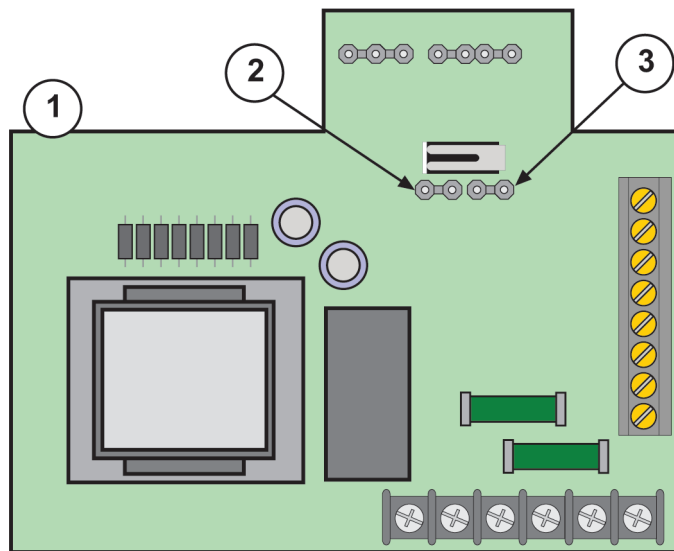
The D340 Duct smoke housing with its associated D285DH Duct smoke head are compatible with the following accessory products:

Accessory products
<b>Active:</b>
D344-1.5 Sample tube, duct 1.5ft/45.7cm
D344-3 Sample tube, duct 3ft/91.4cm
D344-5 Sample tube, duct 5ft/152cm
D344-RL Remote indicator plate

<b>Accessory products</b>
D344-RT Remote test/indicator plate, 24V
D344-TF Duct tube filters, 20pcs
DRA-5 Remote indicator plate, 5V
PAM-4 Relay module, form C, 10A 12/24V
<b>Legacy:*</b>
D306 Remote Indicator Plate
D307 Remote Test and Indicator Plate
SMK-TM Smoke Test Magnet
* Legacy products are not available for purchase.

### 2.3 Setting the jumpers

For the locations of the tamper jumper and reset jumper on the power card, see the following figure.



**Figure 2.1: Jumper locations**

1	Power card	2	Tamper jumper
3	Reset jumper		

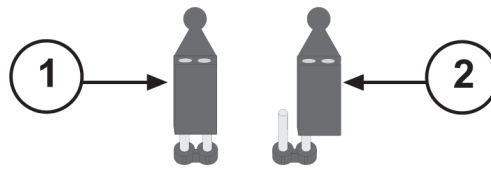
The tamper jumper enables or disables the housing cover tamper switch. When this jumper is enabled, a trouble is indicated if the cover is removed. The reset Jumper enables or disables the remote reset (D344-RT keyswitch). The power off reset from the control panel zone functions normally regardless of the jumper setting.



**Notice!**

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

For enabled and disabled jumper positions, see the following figure.



**Figure 2.2: Jumper settings**

1	Disabled	2	Enabled
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### 3 Mounting

#### 3.1 Preparing the duct

Before installing the duct detector, you must verify the duct air flow and velocity. The detector is designed for use in air handling systems with air velocities between 300 ft/min and 4000 ft/min (1.5 m/s to 20.3 m/s). 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.

#### 3.2 Determining 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 duct housing in the range of six to ten times the width of the duct from any uninterrupted run (see the following figure).

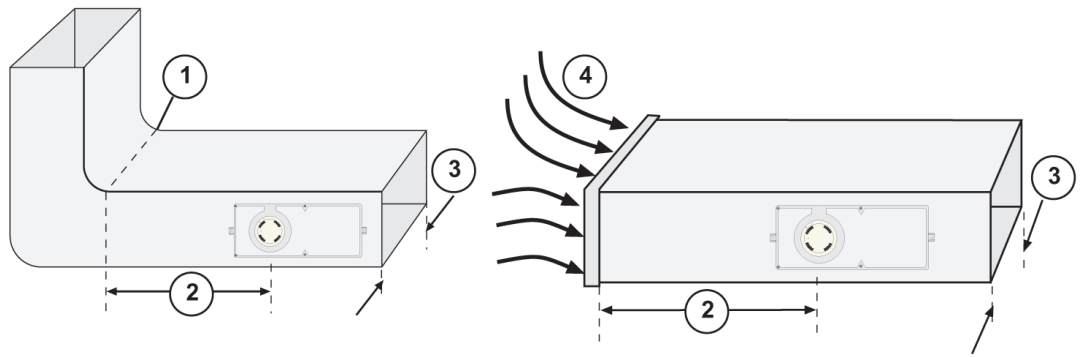


Figure 3.1: Typical duct detector placement

1	Bend or other obstruction	2	6 to 10 times the width of the duct
3	Width of duct	4	Return air inlet

The D340 can be mounted in any direction of 90° increments without regard to the air flow direction (see the following figure).

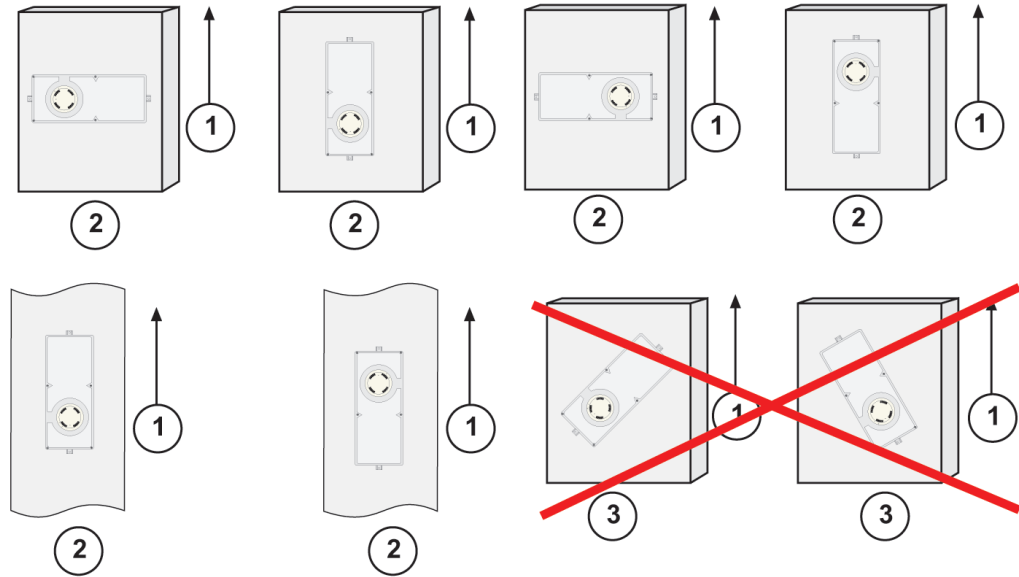


Figure 3.2: Mounting positions

1	Air flow	2	Acceptable mounting positions
3	Unacceptable mounting positions		

### 3.3

### Preparing 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 (see the following figure).

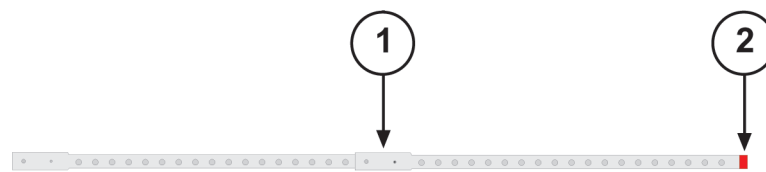


Figure 3.3: Sample tube

1	Set screw	2	End plug
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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 (see the following figure).

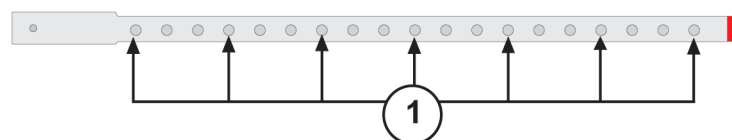


Figure 3.4: Covering sample tube holes



1	Place tape over these sample holes
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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.

**Notice!**

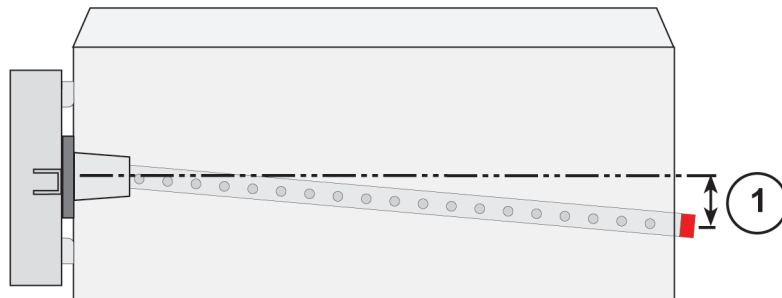
Sample tubes must have at least 12 sample holes within the duct. Do not cut a sample tube to less than 12 sample holes.

**Notice!**

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 (see the figure following step 4 of the following procedure).

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.



**Figure 3.5: Support hole position**

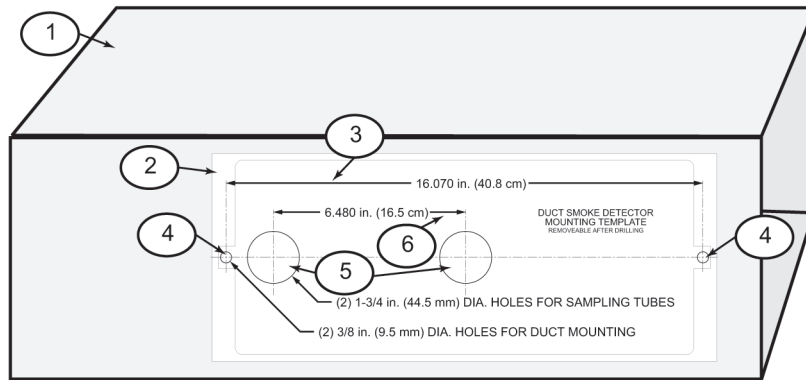
1	1 in. to 2 in. (2.5 cm to 5 cm)
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5. Seal the gap between duct and sample tube. You can remove up to 6 in. (15 cm) from the D344-1.5 for 1 ft (0.3 m) duct installations.

## 3.4

### Mounting the detector

1. Locate the D340 mounting template and remove it from its backing. Place the template over the desired location on the duct (see the following figure).



**Figure 3.6: Mounting template placement**

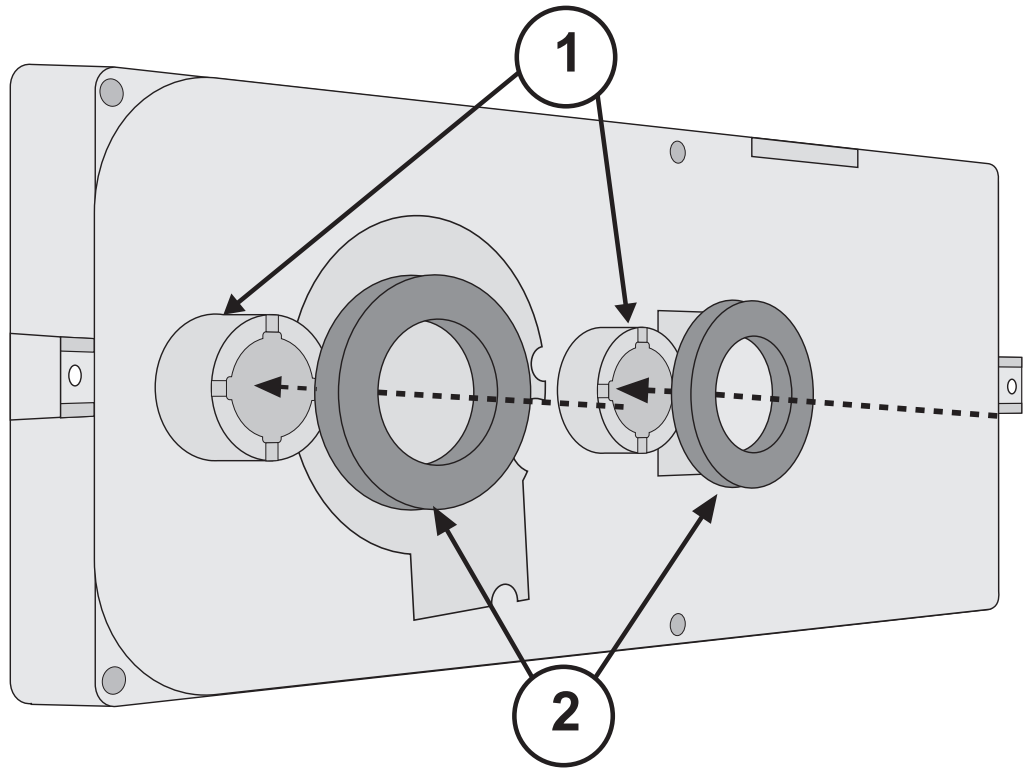
1	Duct	2	Mounting template
3	16.70 in. (40.8 cm)	4	Two 0.375 in. (9.5 mm) holes for mounting the housing to the duct
5	Two 1.75 in. (45 mm) diameter holes for the sample tubes	6	6.5 in. (16.6 cm)

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



**Figure 3.7: Jack nuts**

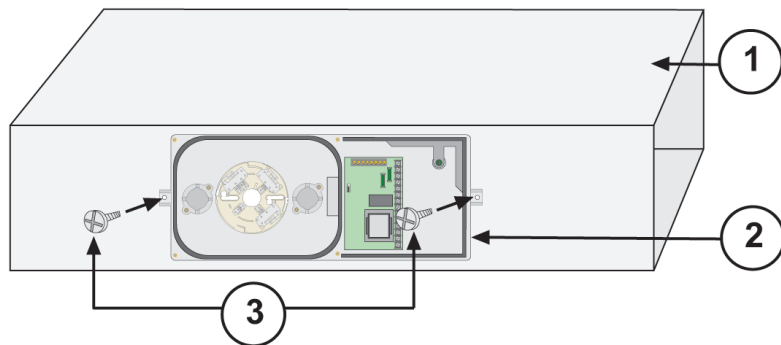
5. Insert the #10-24 x 1 in. machine screws into the jack nuts and firmly tighten. This attaches the jack nuts to the duct. You might have to hold the jack nuts with a installer wrench or a pair of pliers while tightening the screws to stop the jack nut from spinning in the hole. Remove the screws for later use.
6. Place the two foam gaskets over the sample and exhaust ports on the back of the housing (see the following figure).



**Figure 3.8: Foam gaskets**

1	Sample/exhaust tube posts	2	Foam gaskets
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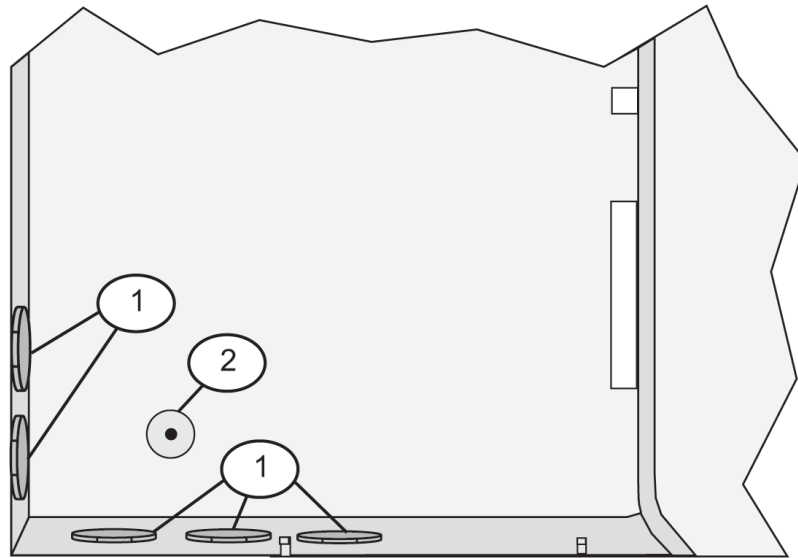
7. Mount the housing to the jack nuts using the supplied machine screws (see the following figure). Remember that over-tightening the screws can cause excessive bowing of the duct.



**Figure 3.9: Mounting the housing**

1	Duct	2	Housing
3	Machine screws (supplied)		

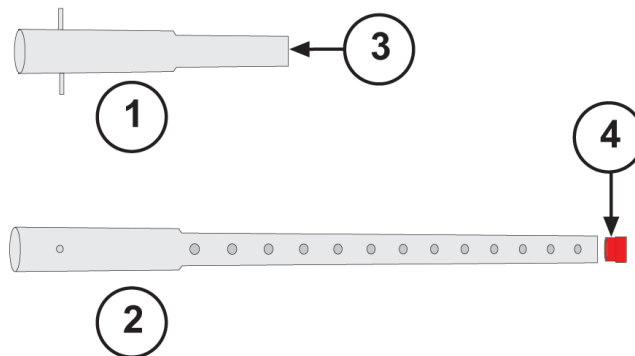
8. Determine and remove the appropriate wire knockouts for power and for any remote indicator wiring (see the following figure).



**Figure 3.10: Wiring knockouts and earth ground**

1	Wiring knockouts	2	Earth ground screw
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9. Locate the sample and exhaust tubes (see the following figure). Ensure the sample tube has a plug installed at the narrow end of the assembly.



**Figure 3.11: Exhaust/sample tubes**

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

10. Note the direction of the airflow in the duct. The sampling holes in the sample tube must face into the air flow (see the first figure below). The exhaust tube must exhaust downwind from the sample tube (see the second figure below).

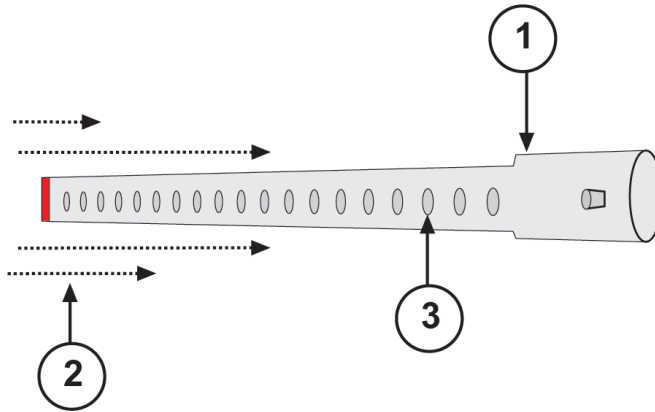


Figure 3.12: Airflow direction

1	Sample tube	2	Airflow direction
3	Sampling holes		

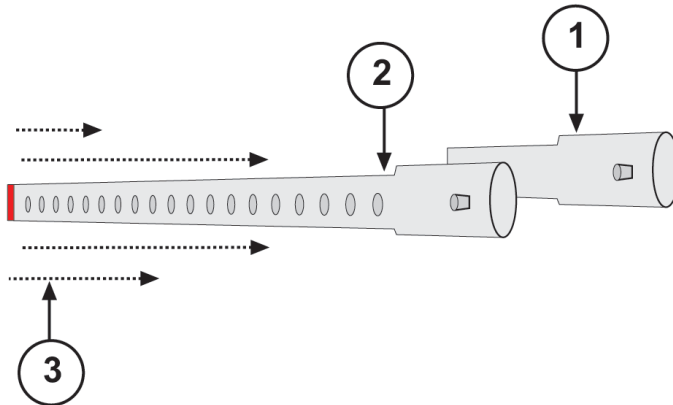


Figure 3.13: Exhaust/sample tube placement

1	Exhaust tube	2	Sample tube
3	Airflow direction		

11. Insert the sample and exhaust tubes into the housing, ensuring the sample tube holes face into the air flow. Ensure the tube alignment point set into the housing.
12. Secure the tubes in place using the tube clamps provided (see the following figure).

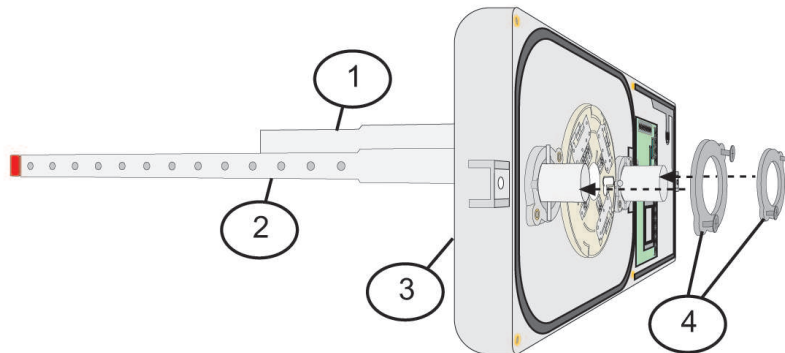
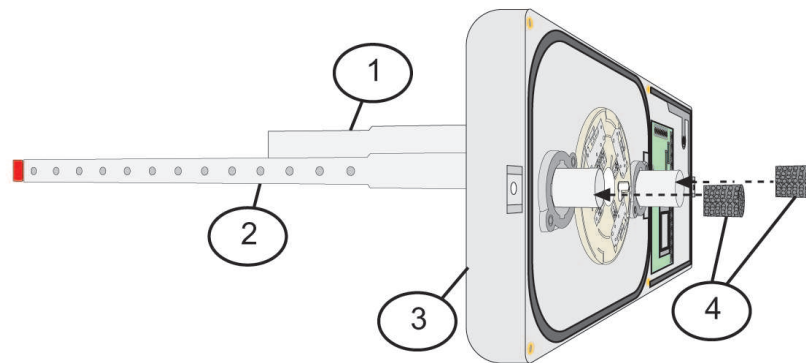


Figure 3.14: Mounting tubes in housing

1	Exhaust tube	2	Sample tube
3	Housing	4	Tube clamps

13. Place the tube filters over the open ends of the sample and exhaust tubes (see the following figure).



**Figure 3.15: Tube filters**

1	Exhaust tube	2	Sample tube
3	Housing	4	Tube filters

## 4 Wiring

The housing/detector is designed for a two-wire loop power ranging from 8.5 VDC to 32 VDC. For use with the D344-RT Remote test/indicator plate or The DRA-5 Remote indicator plate, you must use an external 24 VDC/VAC that can supply a minimum of 170 mA. For terminals for power wiring, see the following figure.

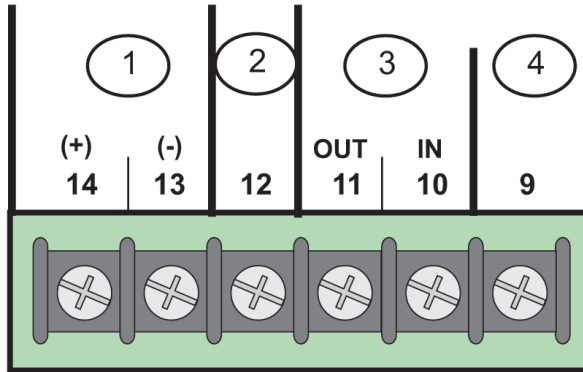


Figure 4.1: D340 terminal wiring

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

### 4.1 Wiring to the D344-RT



**Notice!**

NFPA Requirement

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.



**Notice!**

Do not exceed 500 ft (152 m) between the D344-RT (D307) Remote test/indicator plate and the D340 housing. Use 18 AWG (ISO 0.75 mm<sup>2</sup>) or larger wire.

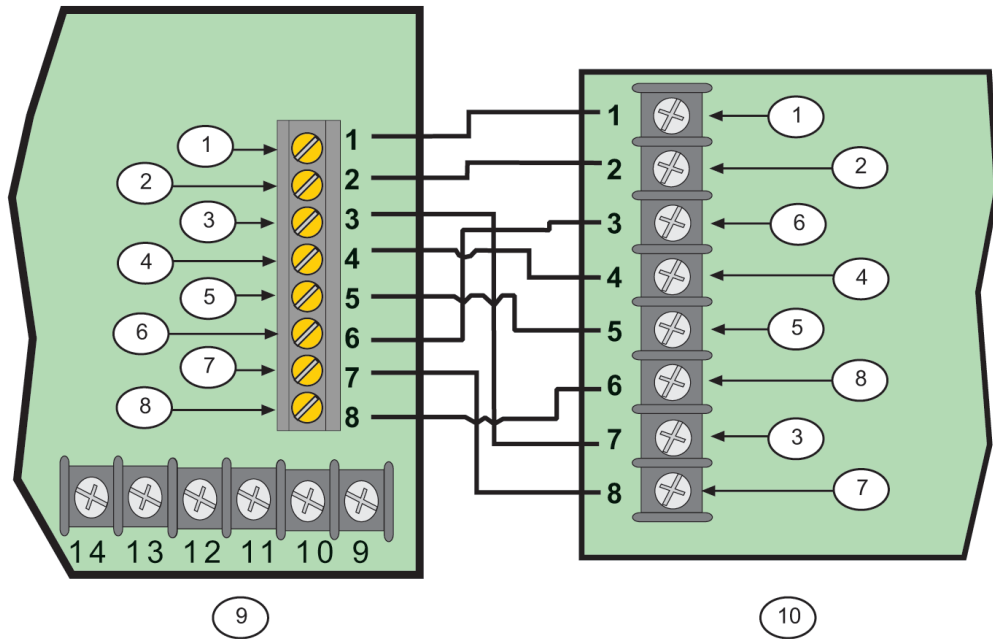


Figure 4.2: D340 to D344-RT wiring

1	Voltage in (+)	2	Voltage out (-)
3	Yellow LED	4	Voltage monitor
5	Ground (-)	6	Remote test
7	Green LED	8	Red LED
9	D340	10	D344-RT (D307)

## 4.2 Wiring to the D344-RL



**Notice!**

Do not exceed a distance of 500 ft (152 m) between the D344-RL (D306) Remote indicator plate and the D340. Use 18 AWG (ISO 0.75 mm<sup>2</sup>) or larger wire.





## 4.4 Wiring to the FACP

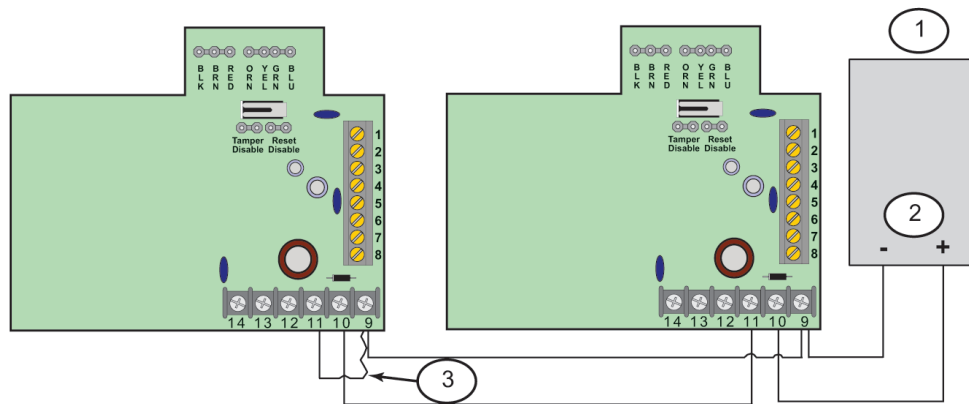


Figure 4.5: D340 to FACP wiring

1	FACP	2	Alarm initiating loop
3	EOL resistor		

## 4.5 Wiring for external power



**Notice!**

Connect the ground wire to the screw on the ground plate when using grounded three-wire AC wiring (see step 8 of the mounting procedure in *Mounting the detector*, page 9).

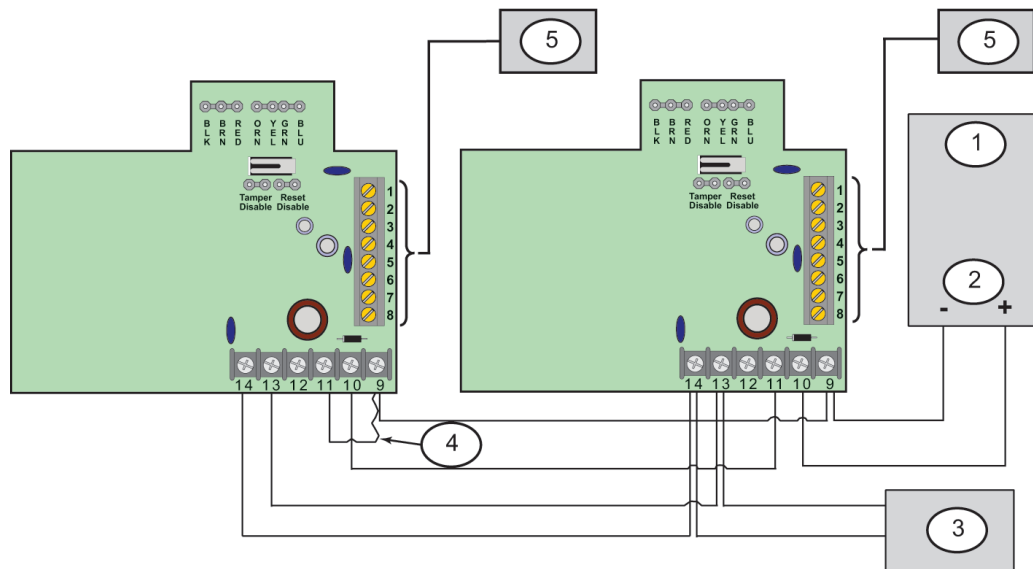


Figure 4.6: Wiring D340 to FACP and external power

1	FACP	2	Alarm initiating loop	
3	External power (24 VAC/VDC)		4	EOL resistor

# 5 Testing and maintenance

## 5.1 Testing the installation

Verify the airflow 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/s to 20 m/s). 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.  
Note which smoke detectors are in alarm (if any) and shut down the system.  
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.

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:  
Place a magnet against the duct housing’s test point notch on the front cover (see the following figure).

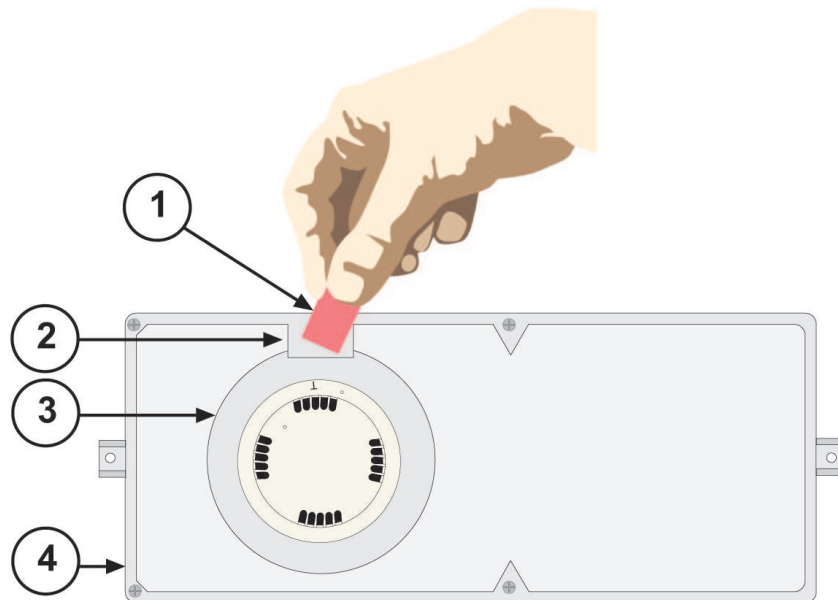


Figure 5.1: Testing the detector

1	Magnet	2	Test point notch
3	Detector	4	Housing

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Switch a signal from a D344-RT (D307) Remote test/indicator plate.

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**Notice!**

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

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6. You can reset the detector by momentarily removing power.
7. For duct detectors with the D344-RT (D307) Remote test/indicator plate installed, reset by moving the keyswitch to the appropriate position and observing the alarm LED.
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.

## 5.2

### Maintenance

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**Notice!**

NFPA Requirement

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.

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**Notice!**

Notify all concerned parties before and after completing maintenance on or testing of the fire alarm system.

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

# 6 Specifications

## Electrical

Current (alarm)	Dependent on the control panel that must limit the alarm current to 100 mA maximum.
Maximum RMS Ripple	25% of DC input
Power-up time	22 sec maximum
Voltage, operating	8.5 VDC to 32 VDC from two-wire loop. Optional 24 VDC/VAC from control panel or external supply.

<b>D340 with D344-RT, D344-RL, and External Power</b>		
	Loop power	External power
	8.5 V to 32 V	24 V
Condition		
- Alarm	Current limit to 100 mA	170 mA in remote test
- Standby	< 0.120 mA	5 mA
- Trouble	< 0.170 mA	0.030 mA

<b>D340 with D344-RT, D344-RL without External Power</b>	
Loop power	8.5 V to 32 V
Condition	
- Alarm	Current limit to 100 mA
- Standby	< 0.140 mA
- Trouble	< 0.170 mA

<b>D340 without D344-RT, D344-RL without External Power</b>	
Loop power	8.5 V to 32 V
Condition	
- Alarm	Current limit to 100 mA
- Standby	< 0.130 mA
- Trouble	< 0.150 mA

## Environmental

Air velocity	300 ft./min to 4000 ft./min (1.5 m/s to 20.3 m/s)
Relative humidity	0% to 95%, non-condensing
Temperature, operating	+32F to +120°F (0°C to +49°C). <i>For UL listed requirements, the operating temperature range is +32°F to +100°F (0°C to +37.8°C).</i>

**Mechanical**

Package Dimensions (LxWxH)	18.9 in. x 7.5 in. X 7.8 in. (48 cm x 19 cm x 19.8 cm)
Product Dimensions (LxWxH)	15.5 in. x 4.3 in. x 6.5 in. (39.5 cm x 11 cm x 16.5 cm)
Material	High-impact fire-retardant polymer plastic
<b>Weight</b>	
Gross	4.23 lb. (1.92 kg)
Net	3.84 lb. (1.74 kg)



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