

INSTALLATION & SUBMITTAL DATA

air duct smoke detector

gas direct and indirect fired duct furnace/make-up air units

model series: “D”, “H”, “M”, “I”, “O”, & “Q”

⚠ **WARNING**

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All units must be wired strictly in accordance with wiring diagram furnished with the unit. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. All wiring must be done with a wiring material having a temperature rating of at least 105°C.

IMPORTANT

The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of these units must be performed by a qualified installation and service agency. Modine manuals may contain excerpts from component supplier literature adapted for Modine products. Any accompanying component supplier literature is for general information.

Application

System Sensor® DH100ACDCP Air Duct Smoke Detector is designed to detect the presence of smoke in the duct. Once the smoke is sensed, the smoke detector will de-energize the unit. To reset the unit, the manual reset button on the detector must be pressed.

⚠ **WARNING**

1. The National Fire Protection Association (NFPA) has established that duct detector must not be used as a substitute for open area detector protection as a means of providing life safety. Nor are they a substitute for early warning in a building's regular fire detection system.
2. It is recommended that the user read NFPA Standards 90A, 72, and 101. The DH100ACDCP Air Duct Smoke Detectors are listed per UL 268A.
3. This device will not operate without electrical power. Fire situations may cause an interruption of power. The system safeguards should be discussed with your local fire protection specialist.

Figure 1.1
Air Duct Smoke Detector

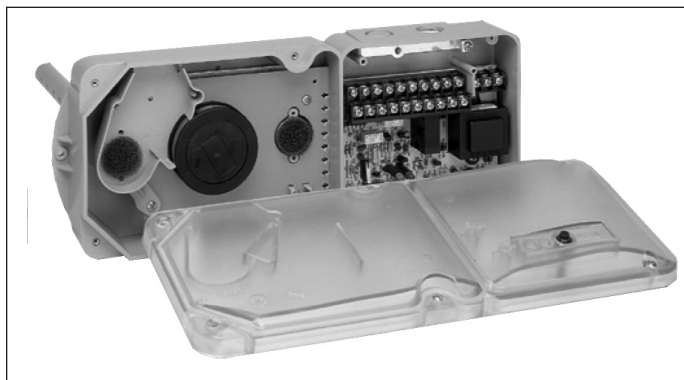


Table 1.1
Unit Specification

Temperature	23° to 131°F
Humidity	10% to 93% R. H. non condensing
Air velocity	500 to 4,000 ft./min.
Dimension	14.4" L x 5.7" W x 2.4" D
Weight	3.75 lbs.
Power supply voltage	24 VAC or 115 VAC 60 Hz
Input capacitance	270µF max.
Reset voltage	2.0 VAC min.
Reset	0.6 sec. max.
Power up time	34 sec. max.
Alarm response time	2 - 17 sec.

Contents

1. One duct detector housing
2. One duct detector cover
3. One drilling template
4. Two sampling tube filters
5. Two foam gaskets
6. One telescoping tube with end-plug
7. One test magnet
8. One end-plug for additional telescopic tube
9. Four #6 self-tapping mounting screws for the telescoping tube and additional telescopic tube
10. Two #10 sheet metal mounting screws
11. One #8 self-tapping screw for telescoping tube
12. Two jack nuts

Figure 2.1
Exploded view of duct detector components

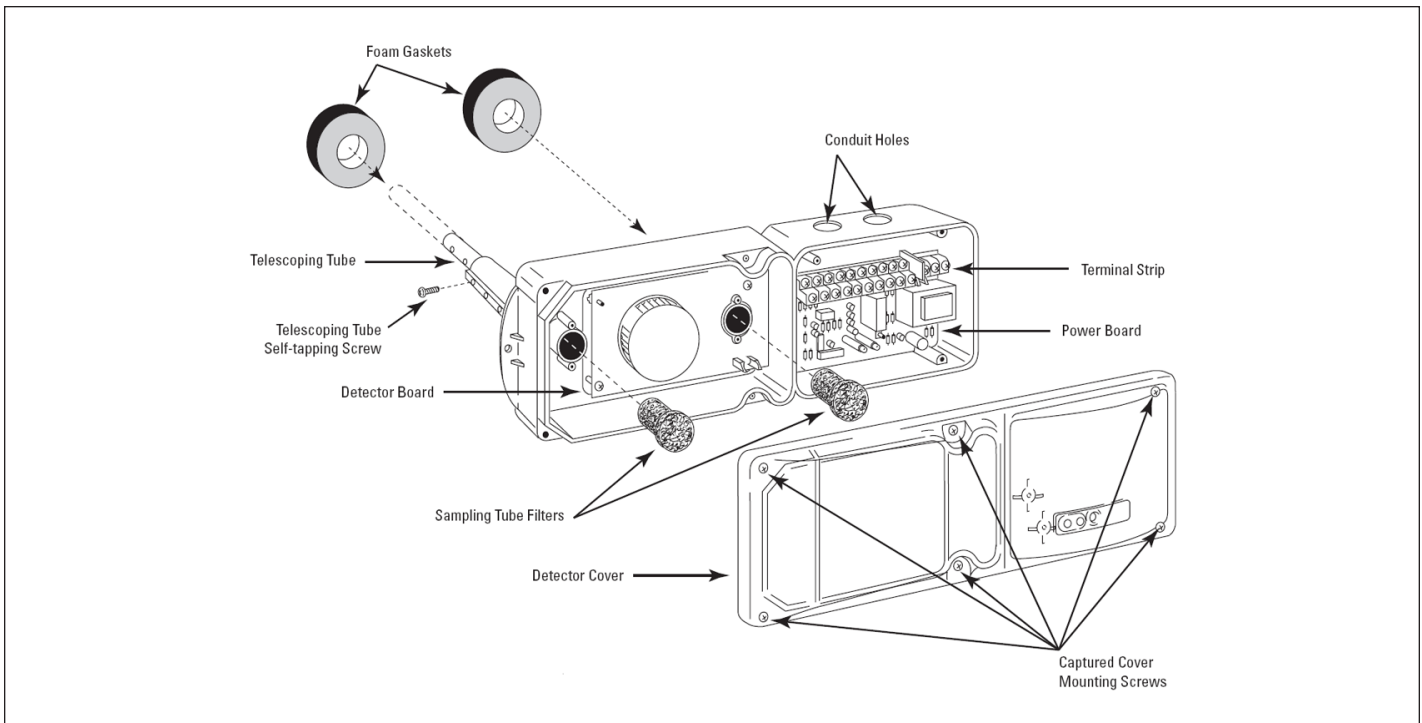
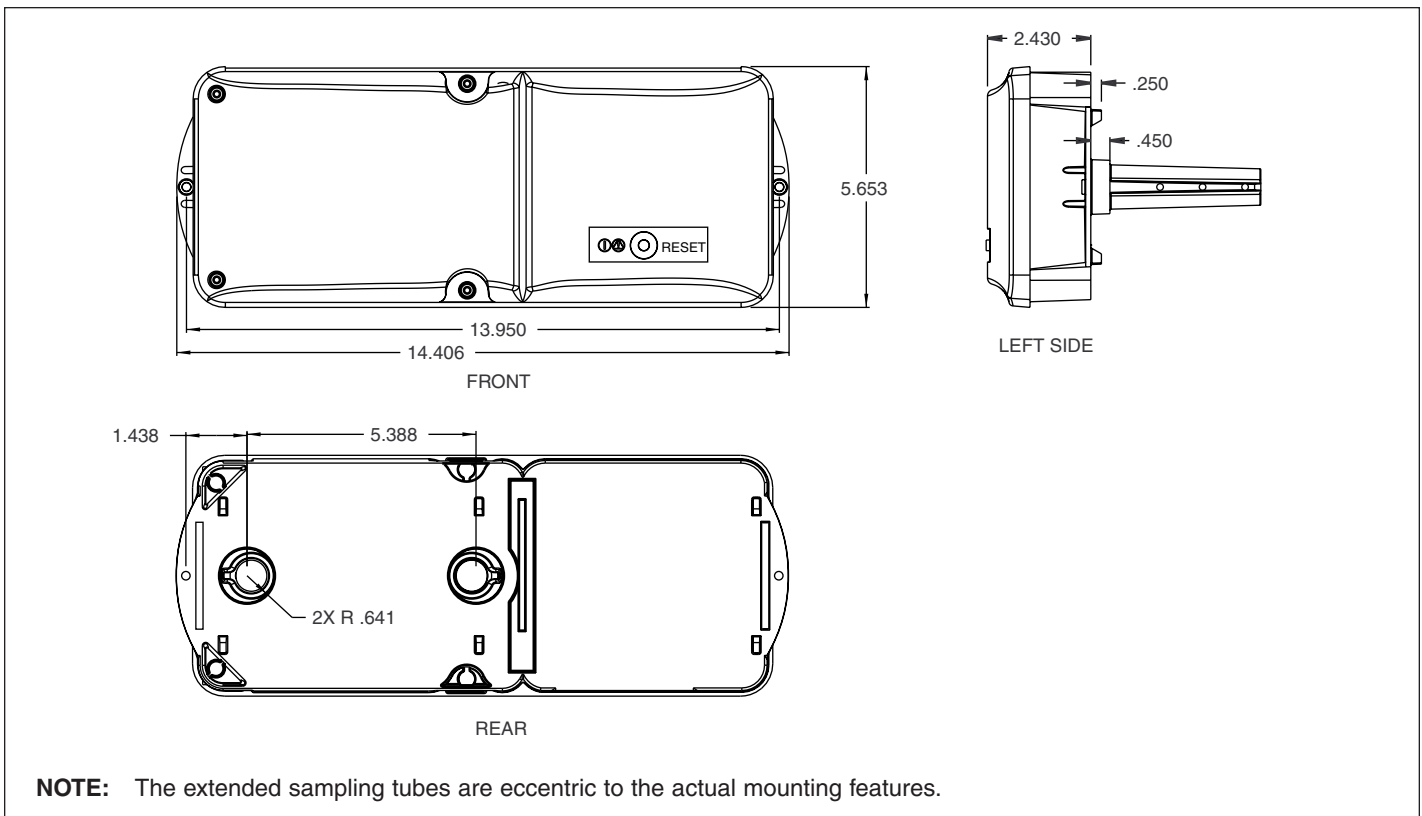


Figure 2.2
Dimension of Air Duct Smoke Detector



Installation

⚠ WARNING

For this detector to function properly, it **MUST** be installed according to the instructions in this manual. Furthermore, the detector **MUST** be protected from the elements and operated within ALL electrical and environmental specifications listed in this manual. Failure to comply with these requirements may prevent the detector from activating when smoke is present in the air duct.

The smoke detector only operates when air velocity inside the duct is between 500 and 4,000 feet per minute. The air velocity in the duct must be calculated before installing the smoke detector. The ductwork may need to be reduced from the discharge dimension of the heat exchanger to achieve the required air velocity.

Mounting-hole preparation

Use the paper template that comes with the unit as a guidance when drilling holes for mounting the smoke detector in a duct.

1. Affix the template flat and smooth to the desired location on the duct.
2. At "A", drill holes using 25/64 drill. At "B", drill holes using 1-3/8" hole saw or punch.
3. Insert the jack-nut receptacles.
4. Drive screw into jacket to flare the retainer.
5. Back out the screw to use for detector mounting.

Sampling-tube installation for a duct less than 1.5 feet wide

1. Remove the duct detector's cover and slide the telescoping tube into the sampling tube (see Figure 3.2 for tube mounting configuration with varying the air flow direction).
2. Align the holes in the telescoping tube with the holes in the sampling tube. The number of exposed holes on the sampling and telescoping tube should match the number as listed in Table 3.1.
3. Use data in Table 3.1 to determine the setscrew setting for the telescoping tube. Secure the telescoping tube with the #8 self-tapping screw into the bottom of the sampling tube.

Table 3.1.
Tube Installation Chart

Tube Holes	Duct Width
3	7.5" - 9"
4	9" - 11"
5	11" - 14"
6	14" - 16"
7	16" - 18"

Securing the duct detector housing to the duct

1. Slide the foam gasket over the telescoping and sampling tubes, as shown in Figure 2.1.
2. Insert the jack-nuts into the drilled end holes of the duct.
3. Use two #10 sheet-metal screws to screw the detector housing to the duct.

Sampling tube installation for duct wider than 1.5 feet and less than 8 feet.

⚠ WARNING

In no case should more than 2 air inlet holes be cut off the tube. There must be a minimum of 10 holes in the tube exposed to the air stream.

An additional telescoping tube must be ordered separately for ducts wider than 1.5 feet.

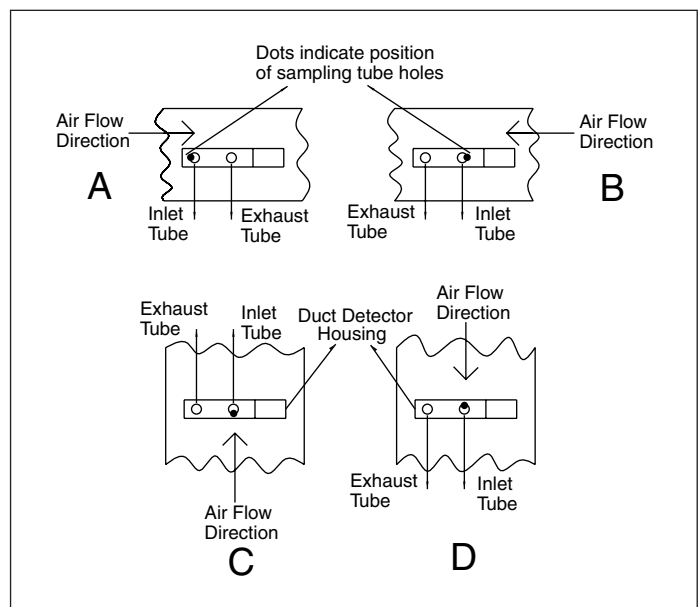
Table 3.2
Additional telescoping tube

Outside Duct Width	Modine Item Code
1 to 2 ft.	33257
2 to 4 ft.	33258
4 to 8 ft.	33259

If the telescoping tube is longer than the width of the air duct:

1. Drill 3/4" holes in the duct opposite the holes that are already cut for the sampling tubes. These holes should be located 1" to 2" below the inlet holes on the opposite side of the duct to allow moisture to drain away from the detector.
2. Slide the metal telescoping tube into the sampling tube. Position the metal telescoping tube so that the arrow points toward the airflow (See Figure 3.1). Secure it with two #6 self-tapping screws.
3. The metal tube should extend out of the opposite side of the duct. If there are more than two holes in the metal tube exposed, select a different length using data in Table 1.2. Otherwise, trim the end of the tube protruding through the duct so that 1" to 2" of the tube extends outside the duct.
4. Plug this end with the end-plug and tape closed any holes in the protruding section of the tube. Be sure to seal the duct where the tube protrudes.

Figure 3.1
Tube Mounting Configurations with Varying Air Flow Direction



If the telescoping tube is shorter than the width of the air duct :

1. Place the end-plug into the end of the metal telescoping tube. If the metal tube is over 3' long, the metal tube must be supported at opposite end of the duct detector.
2. Slide the metal tube into the sampling tube. Position the metal tube so that the arrows point into the airflow (See Figure 3.2). Secure it with two #6 self-tapping screws.

IMPORTANT

Air flow inside the duct may cause excessive vibration, especially when the longer metal telescoping tube is used. Therefore, a 3" floor flange may be used to fasten the telescoping tube to the other side of the duct. When using the flange/connector mounting technique, drill a 1" to 1-1/4" hole where the flange will be used.

Sampling tube filter installation

Push the filters into the sampling and exhaust tube hole as shown in Figure 2.1. When the metal telescoping tube is used, install the filters over the tube ends.

IMPORTANT

Filters require periodic cleaning and replacement at least quarterly and more often if required. Additional filter can be ordered from supplier.

Wiring

Installation of wiring must conform with local building codes, or in the absence of local codes, of the National Electric Code ANSI/NFPA 70 - Latest Edition. Unit must be electrically grounded in conformance to this code. In Canada, wiring must comply with CSA C22.1, Part 1, Electrical Code.

WARNING

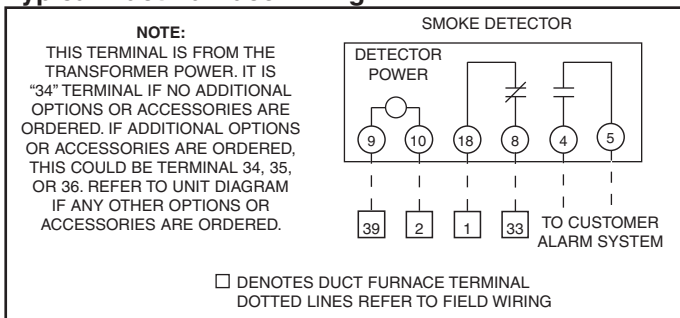
This device will not operate without electrical power. Fire situations may cause an interruption of power. The system safeguards should be discussed with your local fire protection specialist.

Wiring Diagram Selection

- For model series "D", "H", "I", & "O" duct furnaces (non-factory supplied blower) refer to the following figures for wiring.
- For model series "M" & "Q" direct fired make-up air units, refer to the job specific unit wiring diagram provided with the unit.
- For model series "D", "H", "I", & "O" system units (factory supplied blower) refer to the job specific unit-wiring diagram provided with the unit.
- For deviations to these wiring diagrams or the job specific wiring diagrams: consult the factory.

Figure 4.1

Typical Duct Furnace Wiring



Commercial HVAC&R Division • Modine Manufacturing Company • 1500 DeKoven Avenue • Racine, Wisconsin 53403-2552
"D", "H", and "M" Model Series - Phone: 1.800.828.4328 (HEAT) • Fax: 1.800.204.6011
"I", "O", and "Q" Model Series - Phone: 1.866.823.1631 (Toll Free) • Fax: 1.800.204.6011

Installation Check

Initial testing of the duct detector is recommended according to NFPA 72. The tests contained in this manual were devised to assist the installer in verification of proper detector operation.

WARNING

1. This device will not sense smoke unless the ventilation system is operating and the cover is installed.
2. Before the test, notify the proper authorities that the smoke detection system will be temporarily out of service.

Air Flow Test

When the unit is running, use a manometer to measure the differential pressure created from air flow across the sampling tube. For testing, the manometer tubes should be inserted into the inlet and exhaust tube openings, seal the manometer tube in the opening to prevent the manometer from reading atmospheric pressure. The pressure should be greater than 0.01" w.c. and less than 1.2" w.c.

Smoke Response

1. Plug the holes in the inlet and exhaust tubes.
2. Blow smoke, such as cigarette, cotton wick, or punk, directly at the head to cause an alarm.

WARNING

Remove the plug after the smoke response test, otherwise the detector will not function properly.

Standby Mode

The green LED in the housing should flash every 10 seconds to indicate that the unit is in standby mode. If the green LED is not flashing:

- * The detector is lacking power, thus check wiring, panel, or power supply.
- * The head is missing, thus replace the head.
- * The unit is defective, thus return to supplier for repair.

If the cover is removed for longer than 20 minutes, a trouble signal is generated to indicate the missing cover. The trouble signal can be created intentionally, to verify the correct operation of the system, by removing the detector head to cause a trouble condition locally and at the system control panel.

Alarm Test

1. Place the painted surface of the magnet onto the "Test" locator on the bottom of the housing.
2. The red-alarm LED on the detector should turn on and actuate a latch. Verify the system control panel alarm status and control panel execution of all intended auxiliaries function (i.e. fan shutdown, damper control, etc.)
3. Reset the detector by using the front cover reset button or system control panel.

Maintenance

Please refer to the supplier literature for maintenance instructions.