

Factory Installed Smoke Detector Specification Sheet

For Factory Installed smoke detectors on 2-20 ton Commercial Rooftop Units

APPLICABLE UNITS: 4R50FG, PM, PD 03-28
4B50TC 04-30, 4B50HC 04-28,
50TCO 04-24, 50HCO 04-12
4B50HE, 50HEO 003-003
4B50HJ, TM, TF 004-014
50HJO, TFO 004-012

GENERAL DATA

Type: TeMAre SuperDuct, 4-wire Photoelectric Sensing detector and control module
The Carrier factory installed smoke detector system comprises a four-wire controller and one or two sensors (Return Air and/or Supply Air). Its primary function is to shut down the rooftop unit in order to prevent smoke from circulating throughout the building. It is not to be used as a life saving device. Factory installed smoke detectors require no additional sampling tubes to be field installed.

SYSTEM DESCRIPTION

Controller - The controller includes a controller housing, a printed circuit board, and an easily removable clear plastic cover for access to the multiple terminal connections and relay contacts for connection to fire alarm systems, HVAC controls, and other auxiliary functions. A remote test/reset alarm station can be connected to the controller.

Detectors - The detector includes a plastic housing, a printed circuit board, a clear plastic cover, an exhaust tube, and a sampling tube. The exhaust tube and sampling tube are attached during factory installation. The sampling tube varies in length depending on the size of the rooftop unit. The clear plastic cover permits visual inspection without having to disassemble the sensor. The cover forms an airtight chamber around the sensing electronics.

For installations using two detectors, the controller does not differentiate which detector signals an alarm or trouble condition. A rapid change in environmental conditions, such as smoke, causes the sensor to signal an alarm state but dust and debris accumulated over time does not. When the sensor's ability to compensate for environmental changes has reached its limit (100% dirty), the sensor signals a trouble condition. Air is introduced to the dust strobe detector's sensing chamber through a sampling tube that extends into the HVAC duct and is directed back into the ventilation system through an exhaust tube. The difference in air pressure between the two tubes pulls the sampled air through the sensing chamber. When a sufficient amount of smoke is detected in the sensing chamber, the sensor signals an alarm state and the controller automatically takes the appropriate action to shut down the unit via the factory installed wiring connections. Additional functions such as integration with a Building Alarm System, additional fans and blowers, notify the fire alarm control panel, etc. require field wiring and configuration.

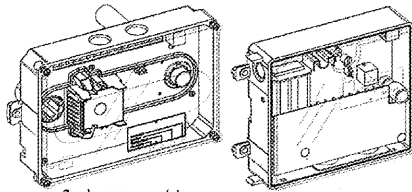


Fig. 1 - Controller and Detector (Sensor) Modules

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GUIDE SPECIFICATIONS

System Specifications:

- System Type:
 - Separate controller and detector modules
 - Four Wire Controller and Detector
 - Photoelectric Sensing
 - Environmental compensation with differential venting for reliable, stable, and drift-free sensitivity
- Operating environment:
 - Temperature: -20° to 135°F (-2° to 70° C)
 - Humidity: 10% to 93% RH, non-condensing
 - Magnet-activated test/reset sensor switches
 - Tool-less connection terminal access
 - Reset/retest momentary switch for testing and resetting the detector

Controller specifications:

- Controller shall include:
 - One set of normally open alarm initiation contacts for connection to an initiating device circuit on a fire alarm control panel
 - Two Form C auxiliary alarm relays for interface with rooftop unit or other equipment
 - One Form-C supervision (trouble) relay to control the operation of the Trouble LED on a remote test/reset station
 - Capable of direct connection to two individual detector modules.
 - Can be wired to up to 14 other duct smoke detectors for multiple fan shutdown applications

Wire Size:
High voltage terminals: 12-22 AWG
14-22 AWG
20-20 VAC, 50/60 Hz
120 VAC, 50/60 Hz
220/240 VAC:

Operating current:
24VDC: 175 mA
24VAC: 500 mA at 50/60 Hz
120VAC: 100 mA, 50 Hz
75 mA at 60 Hz
50 mA at 50 Hz
40 mA at 60 Hz
120VAC: 10 A at 250 VAC

LED indicators:
Alarm (red)
Yellow (Trouble)
Green (Power)

Relays
Alarm initiation relay:
Quantity: 1
Style: Minimally open
Ratings: 2.0A at 30 VDC (resistive)

Auxiliary relays:
Quantity: 2
Style: Form C
Ratings: 10 A at 250 VAC
10A at 30 VDC

Supervision (trouble) relay:
Quantity: 1
Style: Form C
Ratings: 2.0A at 30 VDC (resistive)

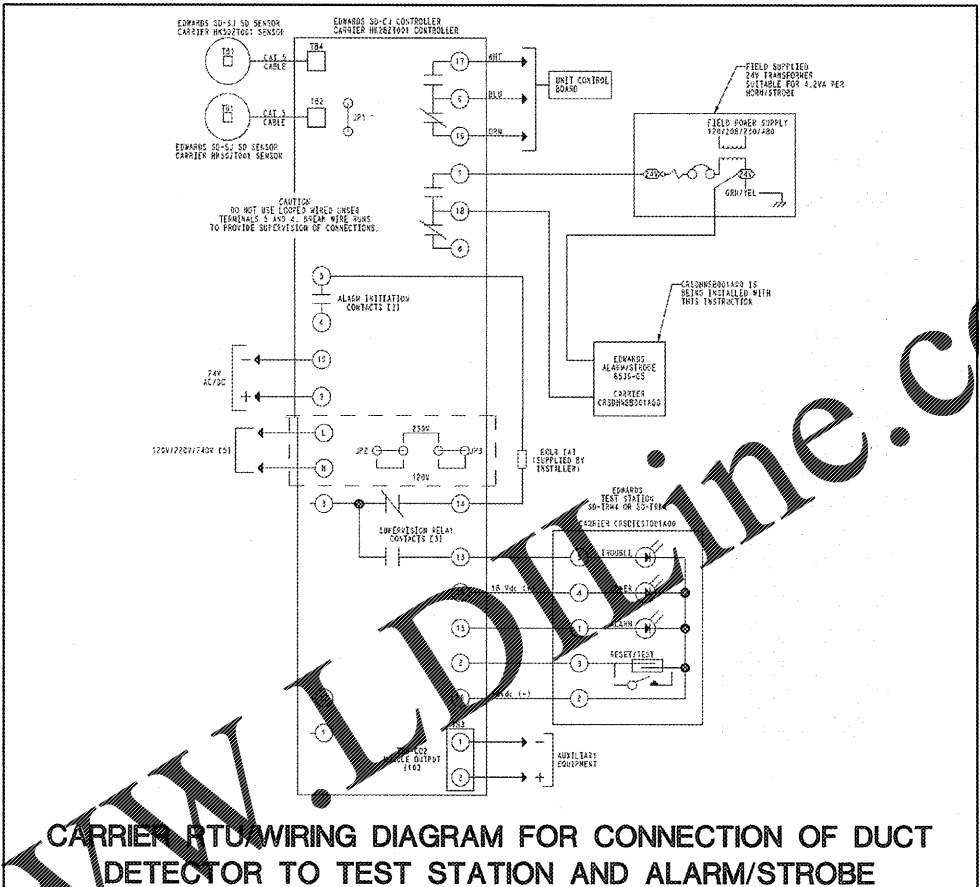
Detector specifications:
Sensor:
Smoke detection method: 8.70x5.40x1.50 in.
Photoelectric
Air velocity min-max: 100 - 4,000 ft/min
Pressure differential (min-max): 0.005 - 1.00 in
Sensitivity: 0.57 to 2.49 %/absorptivity
Wire size: 14 to 22 AWG
Reset time: 2 second maximum
Power up time: 8 seconds max
Alarm test response time: 5 to 7 seconds
LED indicators:
Red (Alarm)
Yellow (Trouble)
Yellow (Dirty)
Green (Power)

Table 1 - Controller Terminal Connections

Terminal Number	Name
1	AUX (+)
2	Reset
3	SUPV Contact COM
4	Alarm Contact COM
5	Alarm Contact NO
6	AUX2 Contact COM
7	AUX2 Contact NO
8	AUX2 Contact NC
9	24V AC/DC In (+)
10	24V AC/DC In (-)
11	Not Used
12	Multi-Shutdown
13	SUPV Contact NO
14	SUPV Contact NC
15	REM Alarm-LED Out
16	AUX1 Contact NO
17	AUX1 Contact NC
18	AUX1 Contact COM
19	RS VDC Output (+)
20	RS VDC Output (-)
TR1-1	Not Used
TR1-2	Not Used
TR	AC Neutral
L	AC Line

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CARRIER RTU WIRING DIAGRAM FOR CONNECTION OF DUCT DETECTOR TO TEST STATION AND ALARM/STROBE

CRSDTEST001A00 REMOTE TEST/RESET STATION SD-TRM4 FOR SMOKE DETECTORS COMMERCIAL ROOFTOP UNITS 3-27.5 TONS

Installation Instructions

IMPORTANT: Read these instructions completely before attempting to install the accessory Remote Magnetic Test/Reset Station.

SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified personnel should install, repair, or service this equipment.

Untrained personnel can perform basic maintenance functions such as cleaning and replacing air filters. All other operations must be performed by trained service personnel. When working on air conditioning equipment, observe precautions in the literature, on tags, and on labels attached to or shipped with the unit and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use opening cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes, the current editions of the National Electrical Code (NEC), NFPA 70, in Canada refer to the current editions of the Canadian Electrical Code (CEC) CSA C22.1.

Recognize safety information. This is the safety-alert symbol. When you see this symbol on the unit and its instructions or warnings, be alert to the potential for personal injury. Understand these signal words: DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbols. DANGER identifies hazards which will result in serious personal injury or death. WARNING identifies hazards which could result in personal injury or death. CAUTION is used to identify unsafe practices which may result in minor personal injury or product and property damage. NOTICE is used to highlight suggestions which will result in improved installation, reliability, or operation.

WARNING
ELECTRICAL SHOCK HAZARD
Failure to follow this warning could result in personal injury or death.
Before installing or servicing systems, always turn off main power to system and install lockout tag. There may be more than one disconnect switch. Turn off accessory heater power unless it is applicable.

CAUTION
CUT HAZARD
Failure to follow this caution may result in personal injury.
Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate clothing.

WARNING
PERSONAL INJURY AND ENVIRONMENTAL HAZARD
Failure to follow system instructions could result in personal injury or death.
Do not touch electrical components. Do not touch refrigerant lines. Do not touch electrical devices, including solenoid valves.
Federal regulations require that you do not vent refrigerant into the atmosphere. Recover during system repair or final unit disposal.

GENERAL

The SD-TRM4 Remote Test/Reset Station is used with the SuperDuct™ four-wire duct smoke detector. Each remote test/reset station provides a green LED to indicate power, a red LED to indicate alarm, and a yellow LED to indicate trouble and detector dirty levels. The SD-TRM4 requires a magnetic to activate test and reset functions. (See Fig. 1.)

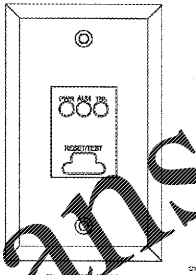


Fig. 1 - SD-TRM4

SPECIFICATIONS

Compatible Electrical Boxes	North American 1-gang box Standard 4-in square box, 1-1/2-in deep with 1-gang cover
LED Indicators	Alarm (red) Trouble (yellow) Power (green)
LED Type	Clear lens
Wire Size	14 to 22 AWG
Resistance Per Wire	10 Ω max
Current Requirements	Included in controller specification
Compatible Detectors	SuperDuct™ Four-Wire Smoke Detectors
Operating Environment	
Temperature	-20° to 135°F (-2° to 55°C)
Humidity	83% RH, non-condensing
Storage Temperature	-20° to 60°C (-4° to 140°F)

REMOTE TEST/RESET STATION TESTS

Test/reset station alarm test using the "Direct" Four-Wire Smoke Detector

The test/reset station alarm test checks the detector's ability to initiate and indicate an alarm state.

CAUTION
ALARM SYSTEM ACTIVATION HAZARD
Failure to follow this caution may result in unnecessary fire system activation and property loss.
Do not reset the detector into the alarm state unless you are certain that the fire alarm system has been properly reset before performing the test.

- To perform the alarm test using an SD-TRM4:
1. Hold the test magnet to the larger area for seven seconds.
 2. Verify that the test/reset station's Alarm LED turns on.
 3. After performing on alarm test using an SD-TRM4, reset the sensor by holding the test magnet to the larger area for two seconds.
 4. Verify that the test/reset station's Alarm LED turns off.

INSTALLATION

Mount the remote test/reset station on a single gang box as shown in Fig. 2.

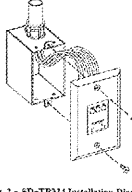


Fig. 2 - SD-TRM4 Installation Diagram

WIRING

Wire the remote test/reset station to the four-wire controller as shown in Fig. 3.

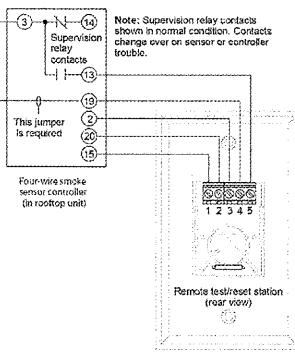


Fig. 3 - Wiring Diagram

EDWARDS SIGNALING PRODUCTS

Installation Instructions for the 6536-G5 Horn/Strobe

Description

The 6536-G5 is an audible/visual signal UL Listed for general purpose signaling applications.

Installation

A qualified electrician familiar with National Electrical Code and local code requirements must install this product. Failure to follow the safety precautions in this instruction sheet could result in product or property damage, severe personal injury or death.

Maintenance

Perform regularly scheduled testing at least twice a year or more often as dictated by local authorities having jurisdiction.

WARNING

To reduce the risk of shock, do not remove lens or tamper with unit when the circuit is energized. Do not connect AC power until installation is complete. Stored energy will dissipate before starting work or disassembly. High energy could be stored in the strobe circuit once it is energized.

Install an appropriate electrical box using suitable hardware.

2. Connect the horn/strobe wire leads and terminals (Figure 2). The horn and strobe are connected together at the factory. **NOTE:** To connect the horn and strobe to different circuits, join the terminals, remove the two wires and cap off with the nuts.

3. Mount the horn/strobe onto the electrical box. Secure it using two screws (supplied).

4. Perform an operational test.

WARNING

To reduce the risk of shock, do not remove lens or tamper with unit when the circuit is energized. Do not connect AC power until installation is complete. Stored energy will dissipate before starting work or disassembly. High energy could be stored in the strobe circuit once it is energized.

Perform regularly scheduled testing at least twice a year or more often as dictated by local authorities having jurisdiction.

Table 1. Specifications

Operating Voltage	24V 50/60 Hz	24V DC
Alarm Current	175 mA	125 mA

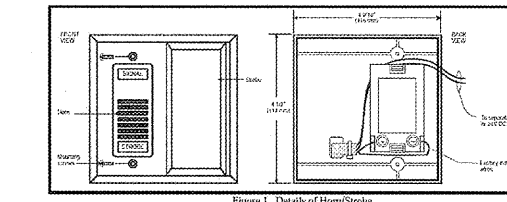


Figure 1 - Details of Horn/Strobe

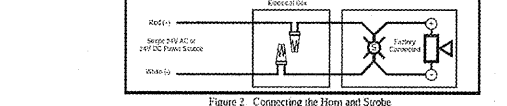


Figure 2 - Connecting the Horn and Strobe

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DUCT DETECTOR - TEST STATION - ALARM/STROBE