## Factory Installed Smoke Detector Specification Sheet

Carrier — Turn to the Experts

For Factory Installed smoke detectors on 2-28 ton Commercial Rooftop Units

**APPLICABLE UNITS:** 48/50PG, PM, PD 03-26
48/50TC 04-30, 48/50HC 04-28,
50TCQ 04-24, 50HCQ 04-12
48/50HE, 50HEQ 003-008
48/50HJ, TM, TF 004-014
50HJQ, TFQ 004-012

### GENERAL DATA

Type: Trellex 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/local 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 inspections 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 duct smoke 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 configurations.

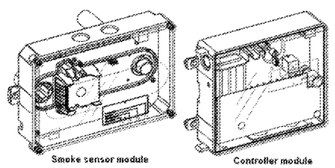


Fig. 1 – Controller and Detector (Sensor) Modules



## GUIDE SPECIFICATIONS

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**System Specifications:**

- Systems Type:
  Separate controller and detector modules
  Four Wire Controller and Detector
  Photoelectric Sensing
  Environmental compensation with differential sensing for reliable, stable, and drift-free sensitivity
- Operating environment:
  Temperature: -20° to 158°F (-29° to 70° C)
  Humidity: 10% to 93% R.H. non-condensing
- Magnet-activated test/reset sensor switches
- Tool-less connection terminal access
- Recessed momentary controls for testing and resetting the detector

**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 | AUX 1 Contact COM |
| 7 | AUX 2 Contact NO |
| 8 | AUX 2 Contact NC |
| 9 | 24V AC/DC In (+) |
| 10 | 24V AC/DC In (-) |
| 11 | Not used |
| 12 | Multi-Stationsin |
| 13 | SUPV Contact NO |
| 14 | SUPV Contact NC |
| 15 | RSM Alarm LED Out |
| 16 | AUX 1 Contact NC |
| 17 | AUX 1 Contact NO |
| 18 | AUX 2 Contact COM |
| 19 | 16 VDC Output (+) |
| 20 | 16VDC Output (-) |
| TB3-1 | Not Used |
| TB3-2 | Not Used |
| N | AC Neutral |
| L | AC Line |

**Controller specifications:**
Controller shall include:

- One set of normally open alarm initiation contacts for connection to an existing 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

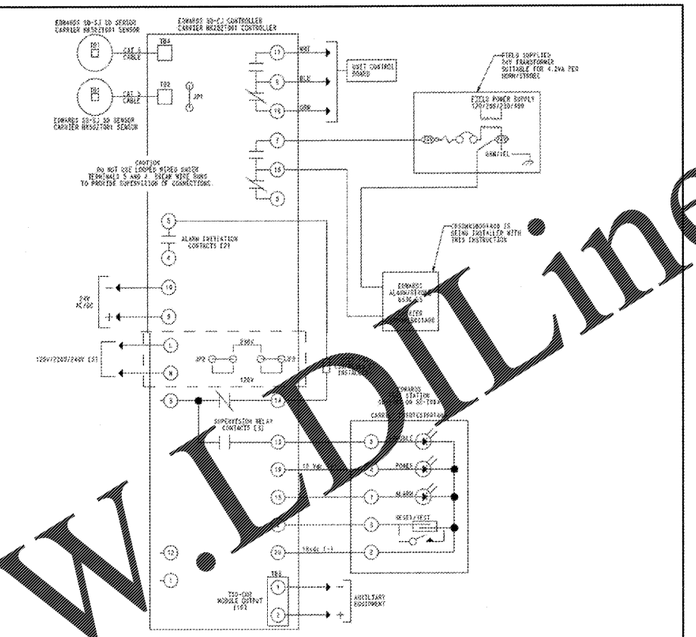
Wire Size:
High voltage terminals: 12-22 AGW
All others: 14-22 AGW
Operating voltages: 20-29 VAC, 50/60 Hz
120 VAC, 50/60 Hz
220/240 VAC, 50/60 Hz

Operating current:
20-29VDC: 175 mA
24VAC: 800 mA at 50/60 Hz
120VAC: 150 mA, 50 Hz
75 mA at 60 Hz
220/240 VAC: 53 mA at 50 Hz
40 mA at 60 Hz
LED indications: Red (Alarm)
Yellow (Trouble)
Green (power)

Relays:
Alarm initiation relay:
Quantity: 1
Style: Normally open
Ratings: 2.0A at 30 VDC (resistive)
Auxiliary relays:
Quantity: 2
Style: Form C
Ratings: 10A at 30 VDC,
10 A at 250 VAC
Supervision (trouble) relay:
Quantity: 1
Style: Form C
Ratings: 2.0A at 30 VDC (resistive)

**Detector specifications:**
Sensor: 8.72x5.4x5x1.90 in
Smoke detection method: Photoelectric
Air velocity (min-max): 100 - 4,000 fpm
Pressure differential (min-max): 0.005 - 1.00 in
Sensitivity: 0.67 to 2.46 %obscuration/ft
Wire size: 14 to 22 AGW
Reset time: 2 seconds minimum
Power up time: 8 seconds max
Alarm test response time: 5 to 7 seconds
LED indications: Red (alarm)
Yellow (Trouble)
Yellow (Dirty)
Green (Power)






## 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 UNIT 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 quenching 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 CSA C22.1.

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

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

**⚠ WARNING**
**PERSONAL INJURY AND ENVIRONMENTAL HAZARD**
Failure to relieve system pressure could result in personal injury and/or death.
Release pressure and recover all refrigerant before servicing existing equipment, and before final unit disposal. Use all service ports and open all flow-control devices, including solenoid valves.
2. 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 alarms, and a yellow LED to indicate trouble and detector dirty needs. 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<br>Standard 4-in square box, 1-1/2-in deep with 1-gang cover |
| LED Indications | Alarm (red)<br>Trouble (yellow)<br>Power (green) |
| LED Type | Clear lens |
| Wire Size | 14 to 22 AWG |
| Resistance Per Wire | 50 Ω max |
| Current Requirements | Included in controller specification |
| Compatible Detectors | SuperDuct™ Four-Wire Smoke Detectors |
| Operating Environment | |
| Temperature | 32° - 131 °F (0° - 55°C) |
| Humidity | 93% RH, non-condensing |
| Storage Temperature | -20° to 60°C (-4° to 140°F) |

### REMOTE TEST/RESET STATION TEST

**Test/reset station alarm test using a SuperDuct™ Four-Wire Smoke Detector**

The test/reset station alarm test initiates test/reset station switch to initiate and indicate an alarm state.

**⚠ CAUTION**
**ALARM SYSTEM ACTIVATION HAZARD**
Failure to follow this caution may result in unnecessary alarm system activation and possible fines.
Test detectors in the duct detector into the alarm state, then start of alarm test. Disconnect all auxiliary equipment from the controller before performing the test. If the duct detector is connected to a fire alarm system, notify the proper authorities before performing the test.

Perform the alarm test using an SD-TRM4:

1. Hold the test magnet to the target area for several seconds.
2. Verify that the test/reset station's Alarm LED turns on.
3. After performing an alarm test using an SD-TRM4, reset the sensor by holding the test magnet to the target 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.

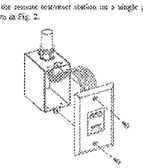



Fig. 2 - SD-TRM4 Installation Diagram

### WIRING

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

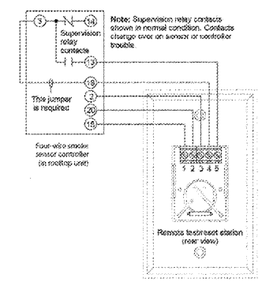



Fig. 3 - Wiring Diagram

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## DUCT DETECTOR - TEST STATION - ALARM/STROBE

**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 installation sheet could result in product or property damage, severe personal injury or death.*

**⚠ 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.

The 6536-G5 horn/strobe (Figure 1) can be mounted on any single gang 2" x 4" (51 mm x 102 mm) electrical box, double gang 4" x 4" (102 mm x 102 mm) electrical box, or standard 4" x 4" (102 mm x 102 mm) junction box with a plaster ring.

1. 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: Remove the terminals, remove the two wires and cap off with wire nuts.*

3. Mount the horn/strobe onto the electrical box. Secure it using two screws (supplied).
4. Perform an operational test.

**Maintenance**

**⚠ WARNING**
To reduce the risk of shock, do not remove lens or tamper with unit when the circuit is energized. Disconnect power and allow five (5) minutes for stored energy to 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

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

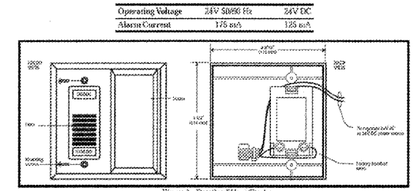


Figure 1. Details of Horn/Strobe

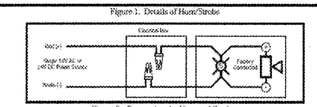


Figure 2. Connecting the Horn and Strobe

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