

MMF-300 Monitor Module Installation Instructions

Specifications

Normal Operating Voltage:	15 to 32 VDC
EOL Resistance:	47K Ohms
Maximum IDC Resistance:	1,500 Ohms
Temperature Range:	32°F to 120°F (0°C to 49°C)
Humidity:	10% to 93% Noncondensing
Dimensions:	4 1/2" H x 4" W x 1 1/4" D (Mounts to a 4" square by 2 1/8" deep box.)
Accessories:	SMB500 Electrical Box

Before Installing

This information is included as a quick reference installation guide. Refer to the control panel installation manual for detailed system information. If the modules will be installed in an existing operational system, inform the operator and local authority that the system will be temporarily out of service. Disconnect power to the control panel before installing the modules.

NOTICE: This manual should be left with the owner/user of this equipment.

General Description

The MMF-300 Monitor Module is intended for use in addressable, two-wire systems, where the individual address of each module is selected using the built-in rotary switches. It provides either a 2-wire or 4-wire fault tolerant Initiating Device Circuit (IDC) for normally open contact fire alarm or supervisory devices. The module has a panel controlled LED indicator. The MMF-300 can be used to replace an M300 module in existing systems.

Compatibility Requirements

To ensure proper operation, these modules shall be connected to listed compatible system control panels only.

Mounting

The MMF-300 mounts directly to 4" square electrical boxes (see Figure 2). The box must have a minimum depth of 2 1/8". Surface mounted electrical boxes (SMB500) are available.

Wiring

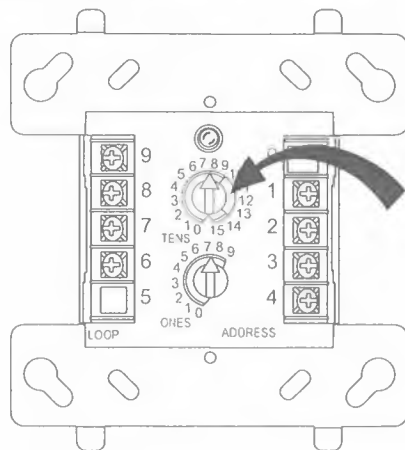
NOTE: All wiring must conform to applicable local codes, ordinances, and regulations. This module is intended for power limited wiring only.

1. Install module wiring in accordance with the job drawings and appropriate wiring diagrams.
2. Set the address on the module per job drawings.

NOTE: Some panels support extended addressing. In order to set the module above address 99 on Fire-Lite compatible systems, carefully remove the stop on the upper rotary switch with thumb in the direction shown in Figure 1.

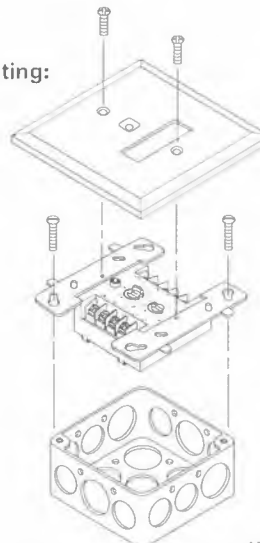
3. Secure module to electrical box (supplied by installer), as shown in Figure 2.

Figure 1. Controls and indicators:



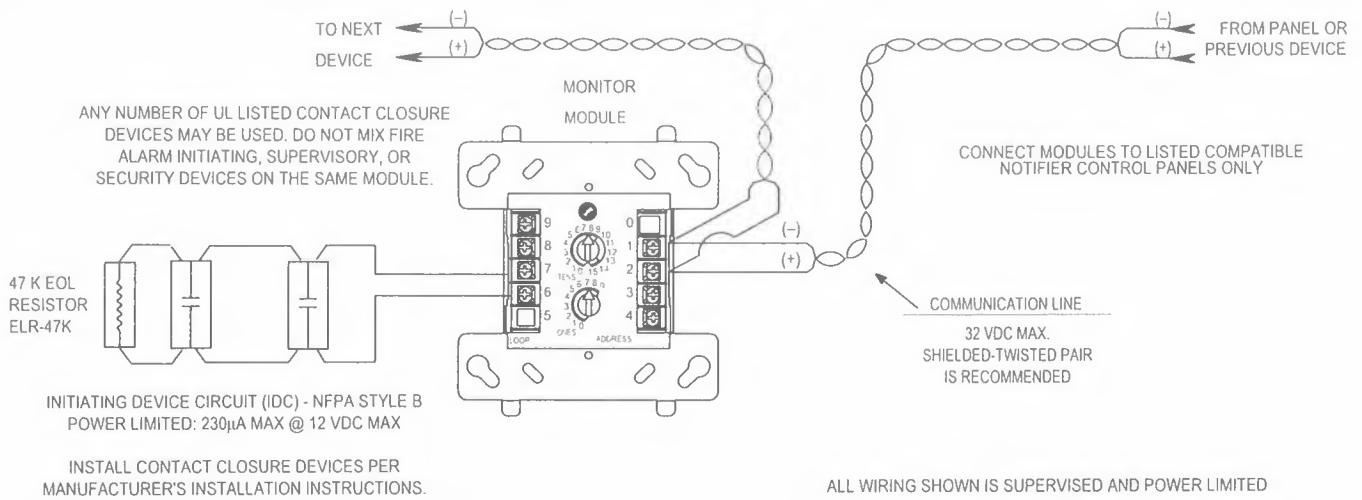
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Figure 2.
Module mounting:



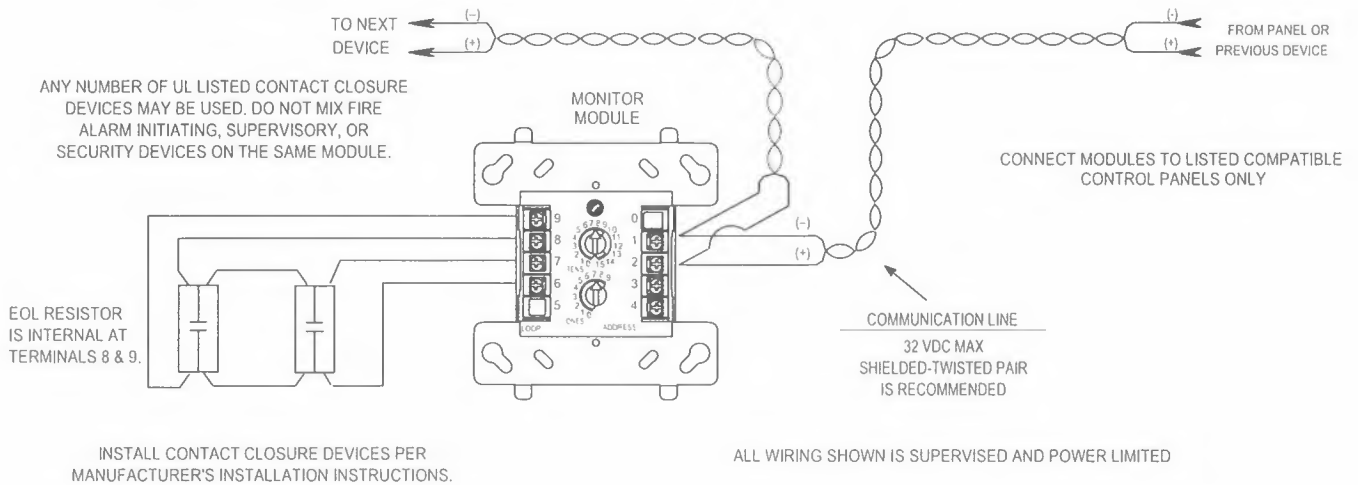
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Figure 3. Typical 2-wire Initiating Device Circuit (IDC) configuration, NFPA Style B (Class B):



A78-2280-15

Figure 4. Typical 4-wire fault tolerant Initiating Device Circuit (IDC) configuration, NFPA Style D (Class A):



A78-2281-62

INSTALLATION INSTRUCTIONS FOR M301 AND M301A MONITOR MODULES

GENERAL

M301 and M301A Monitor Modules provide two-wire, Styles A and B initiating circuits for normally open contact fire alarm and supervisory devices.

The M301 and M301A are small enough to fit inside a single gang junction box behind the monitored device. The small size and light weight allow them to be installed without rigid mounting (see Figure 1).

COMPATIBILITY REQUIREMENTS

To insure proper operation, these modules must be connected to compatible addressable Fire-Lite control panels only.

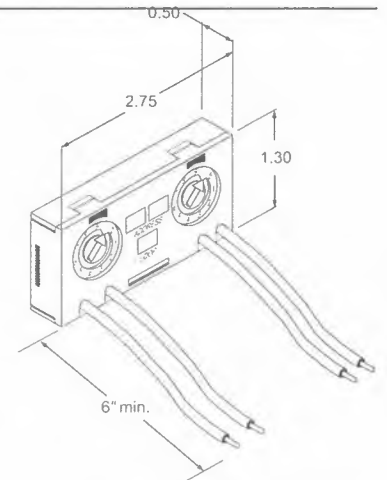
INSTALLATION

CAUTION

Do not connect circuit wiring to control unit or modules, or apply power to any portion of the system until after the circuit test has been performed.

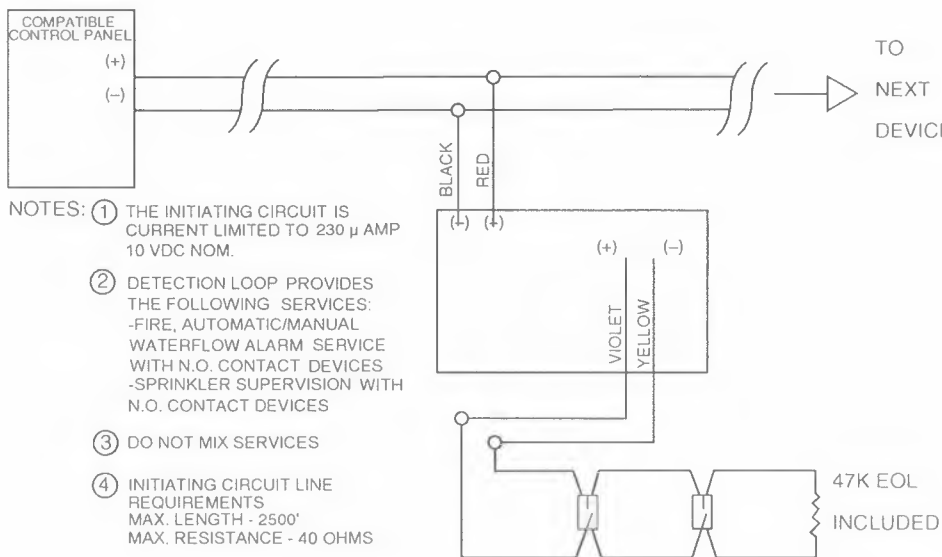
Note: All wiring must conform to applicable local codes, ordinances and regulations.

1. Install module wiring in accordance with the job drawings and wiring diagram as appropriate (Figure 2).
2. Set the desired address on the module per job drawings.
3. Record the address and loop on the front of the module if desired.



A78-2426-00

Figure 1



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Figure 2

Typical 2-wire Styles A and B Initiating Circuit Configuration
of a M301 or M301A Monitor Module



CRF-300 Relay Control Module Installation Instructions

Specifications

Normal Operating Voltage:	15 to 32 VDC
EOL Resistance:	Not used
Temperature Range:	32°F to 120°F (0°C to 49°C)
Humidity:	10% to 93% Noncondensing
Dimensions:	4½" H x 4" W x 1¼" D (Mounts to a 4" square by 2⅛" deep box.)
Accessories:	SMB500 Electrical Box; CB500 Barrier

Before Installing

This information is included as a quick reference installation guide. Refer to the control panel installation manual for detailed system information. If the modules will be installed in an existing operational system, inform the operator and local authority that the system will be temporarily out of service. Disconnect power to the control panel before installing the modules.

NOTICE: This manual should be left with the owner/user of this equipment.

General Description

The CRF-300 Relay Control Module is intended for use in addressable, two-wire systems, where the individual address of each module is selected using the built-in rotary switches. It allows a compatible control panel to switch discrete contacts by code command. The relay contains two isolated sets of Form-C contacts, which operate as a DPDT switch and are rated in accordance with the table in the manual. Circuit connections to the relay contacts are not supervised by the module. The module also has a panel controlled LED indicator. This module can be used to replace an C304 module that has been configured for Form-C operation.

Compatibility Requirements

To ensure proper operation, these modules shall be connected to listed compatible system control panels only.

Mounting

The CRF-300 mounts directly to 4" square electrical boxes (see Figure 2A). The box must have a minimum depth of 2⅛". Surface mounted electrical boxes (SMB500) are available.

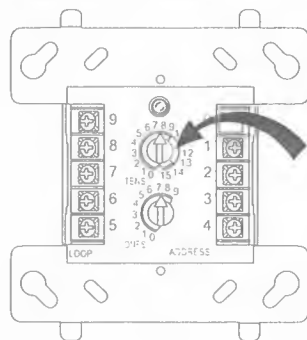
NOTE: All wiring must conform to applicable local codes, ordinances, and regulations. When using control modules in nonpower limited applications, the CB500 Module Barrier must be used to meet UL requirements for the separation of power-limited and nonpower-limited terminals and wiring. The barrier must be inserted into a 4"x4"x2⅛" junction box, and the control module must be placed into the barrier and attached to the junction box (Figure 2A). The power-limited wiring must be placed into the isolated quadrant of the module barrier (Figure 2B).

1. Install module wiring in accordance with the job drawings and appropriate wiring diagrams.
2. Set the address on the module per job drawings.

NOTE: Some panels support extended addressing. In order to set the module above address 99 on compatible systems, carefully remove the stop on the upper rotary switch with thumb in the direction shown in Figure 1.

3. Secure module to electrical box (supplied by installer), as shown in Figure 2A.

Figure 1. Controls and indicators:



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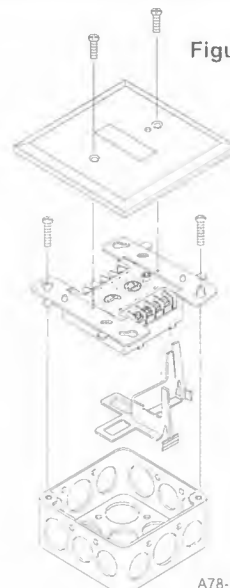
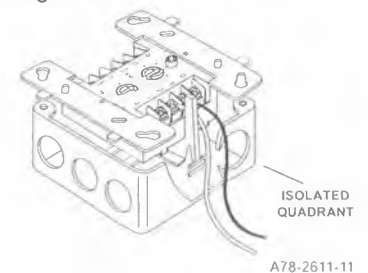


Figure 2A. Module mounting with barrier:

Figure 2B:



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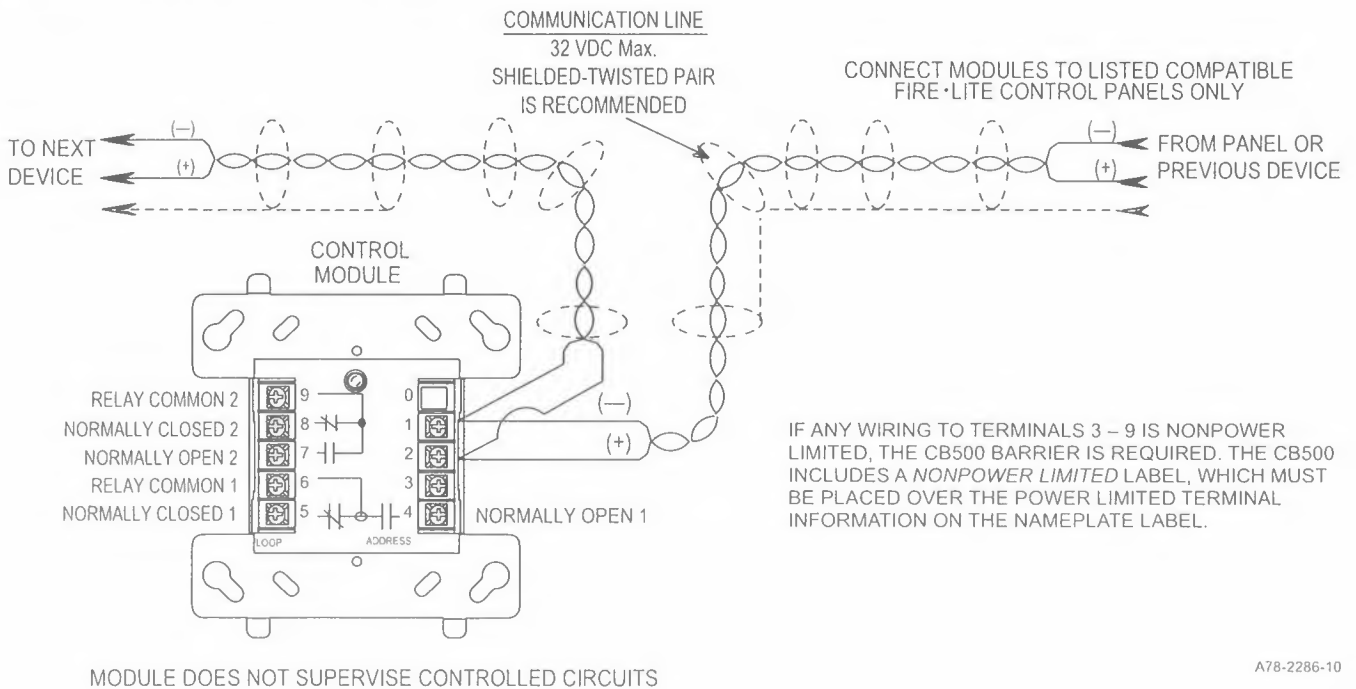
Relay Contact Ratings:

CURRENT RATING	MAXIMUM VOLTAGE	LOAD DESCRIPTION	APPLICATION
3 A	30 VDC	Resistive	Non Coded
2 A	30 VDC	Resistive	Coded
.9 A	110 VDC	Resistive	Non Coded
.9 A	125 VAC	Resistive	Non Coded
.5 A	30 VDC	Inductive (L/R=5ms)	Coded
1 A	30 VDC	Inductive (L/R=2ms)	Coded
.5 A	125 VAC	Inductive (PF=.35)	Non Coded
.7 A	75 VAC	Inductive (PF=.35)	Non Coded

WARNING

All relay switch contacts are shipped as shown in Figure 3, but may have transferred during shipping. To ensure that the switch contacts are in their correct state, modules must be made to communicate with the panel before connecting circuits controlled by the module.

Figure 3. Relay module wiring diagram:



A78-2286-10

BG-12 Series

Manual Fire Alarm Pull Stations

 **Fire-Lite Alarms**
by Honeywell

Conventional Initiating Devices

General

The Fire-Lite **BG-12 Series** is a cost-effective, feature-packed series of non-coded manual fire alarm pull stations. It was designed to meet multiple applications with the installer and end-user in mind. The BG-12 Series features a variety of models including single- and dual-action versions.

The BG-12 Series provides Fire-Lite Alarm Control Panels (FACPs), as well as other manufacturers' controls, with a manual alarm initiating input signal. Its innovative design, durable construction, and multiple mounting options make the BG-12 Series simple to install, maintain, and operate.

Features

- Aesthetically pleasing, highly visible design and color.
- Attractive contoured shape and light textured finish.
- Meets ADA 5 lb. maximum pull-force.
- Meets UL 38, Standard for Manually Actuated Signaling Boxes.
- Easily operated (single- or dual-action), yet designed to prevent false alarms when bumped, shaken, or jarred.
- PUSH IN/PULL DOWN handle latches in the down position to clearly indicate the station has been operated.
- The word "ACTIVATED" appears on top of the handle in bright yellow, further indicating operation of the station.
- Operation handle features white arrows showing basic operation direction for non-English-speaking persons.
- Braille text included on finger-hold area of operation handle and across top of handle.
- Multiple hex- and key-lock models available.
- U.S. patented hex-lock needs only a quarter-turn to lock/unlock.
- Station can be opened for inspection and maintenance without initiating an alarm.
- Product ID label viewable by simply opening the cover; label is made of a durable long-life material.
- The words "NORMAL" and "ACTIVATED" are molded into the plastic adjacent to the alarm switch (located inside).
- Four-position terminal strip molded into backplate.
- Terminal strip includes Phillips combination-head captive 8/32 screws for easy connection to Initiating Device Circuit (IDC).
- Terminal screws backed-out at factory and shipped ready to accept field wiring (up to 12 AWG/3.1 mm²).
- Terminal numbers are molded into the backplate, eliminating the need for labels.
- Switch contacts are normally open.
- Can be surface-mounted (with **SB-10** or **SB-I/O**) or semi-flush mounted. Semi-flush mount to a standard single-gang, double-gang, or 4" (10.16 cm) square electrical box.
- Backplate is large enough to overlap a single-gang backbox cutout by 1/2" (1.27 cm).
- Optional trim ring (**BG12TR**).
- Spanish versions (*FUEGO*) available (**BG-12LSP**, **BG-12LPSP**).
- Designed to replace the Fire-Lite legacy **BG-10** Series.
- Models packaged in attractive, clear plastic (PVC), clam-shell-style, Point-of-Purchase packages. Packaging includes a cutaway dust/paint cover in shape of pull station.



Construction

- Cover, backplate and operation handle are all molded of durable polycarbonate material.
- Cover features white lettering and trim.
- Red color matches System Sensor's popular SpectrAlert® Advance horn/strobe series.

Operation

The BG-12 manual pull stations provide a textured finger-hold area that includes Braille text. In addition to PUSH IN and PULL DOWN text, there are arrows indicating how to operate the station, provided for non-English-speaking people.

Pushing in and then pulling down on the handle activates the normally-open alarm switch. Once latched in the down position, the word "ACTIVATED" appears at the top in bright yellow, with a portion of the handle protruding at the bottom as a visible flag. Resetting the station is simple: insert the key, twist one quarter-turn, then open the station's front cover, causing the spring-loaded operation handle to return to its original position. The alarm switch can then be reset to its normal (non-alarm) position manually (by hand) or by closing the station's front cover, which automatically resets the switch.

Specifications

PHYSICAL SPECIFICATIONS:

	pull station	SB-I/O	SB-10
Height	5.5 inches (13.97 cm)	5.601 inches (14.23 cm)	5.5 inches (13.97 cm)
Width	4.121 inches (10.47 cm)	4.222 inches (10.72 cm)	4.121 inches (10.47 cm)
Depth	1.39 inches (3.53 cm)	1.439 inches (3.66 cm)	1.375 inches (3.49 cm)

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ELECTRICAL SPECIFICATIONS:

Switch contact ratings: gold-plated; rating 0.25 A @ 30 VAC or VDC.

ENGINEERING/ARCHITECTURAL SPECIFICATIONS

Manual Fire Alarm Stations shall be non-code, with a key- or hex-operated reset lock in order that they may be tested, and so designed that after actual Emergency Operation, they cannot be restored to normal except by use of a key or hex. An operated station shall automatically condition itself so as to be visually detected as activated. Manual stations shall be constructed of red colored LEXAN (or polycarbonate equivalent) with clearly visible operating instructions provided on the cover. The word **FIRE** shall appear on the front of the stations in white letters, 1.00 inches (2.54 cm) or larger. Stations shall be suitable for surface mounting on matching backbox SB-10 or SB-I/O; or semi-flush mounting on a standard single-gang, double-gang, or 4" (10.16 cm) square electrical box, and shall be installed within the limits defined by the Americans with Disabilities Act (ADA) or per national/local requirements. Manual Stations shall be Underwriters Laboratories listed.

NOTE: *The words "FIRE/FUEGO" on the BG-12LSP shall appear on the front of the station in white letters, approximately 3/4" (1.905 cm) high.



Agency Listings and Approvals

The listings and approvals below apply to the BG-12 Series pull stations. In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **C(UL)US:** S711
- **FM Approved**
- **CSFM:** 7150-0075:184
- **MEA:** 67-02-E
- **Patented:** U.S. Patent No. D428,351; 6,380,846; 6,314,772; 6,632,108.

Product Line Information

BG-12S: Single-action pull station with pigtail connections, hex lock.

BG-12SL: Same as BG-12 with key lock.

BG-12: Dual-action pull station with SPST N/O switch, screw terminal connections, **hex lock**.

BG-12L: Same as BG-12 with key lock.

BG-12LSP: Same as BG-12L with English/Spanish (**FIRE/FUEGO**) labeling.

BG-12LOB: Same as BG-12L with "outdoor use" listing. Includes outdoor listed backbox, and sealing gasket.

BG-12LO: Same as BG-12L with "outdoor use" listing. Does not include backbox.

BG-12LA: Same as BG-12L with auxiliary contacts.

BG-12LPS: Dual-action pull station with pre-signal option.

BG-12LPSP: Same as BG-12LPS with English/Spanish (**FIRE/FUEGO**) labeling.

SB-10: Surface-mount backbox, metal.

SB-I/O: Surface-mount backbox, plastic. (Included with BG-12LOB.)

BG12TR: Optional trim ring for semi-flush mounting.

17003: Keys, set of two. (Included with key-lock pull stations.)

17007: Hex lock, 9/64". (Included with hex-lock pull stations.)

NOTE: For addressable BG-12LX models, see data sheet DF-52013.

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This document is not intended to be used for installation purposes.
We try to keep our product information up-to-date and accurate.
We cannot cover all specific applications or anticipate all requirements.
All specifications are subject to change without notice.



For more information, contact Fire•Lite Alarms. Phone: (800) 627-3473, FAX: (877) 699-4105.
www.firelite.com

SD365 and SD365-IV Intelligent Photoelectric Smoke Sensors

One FireLite Place
Northford, CT 06472
Phone: 203.484.7161

SPECIFICATIONS

Operating Voltage Range:	15 to 32 VDC
Operating Current @ 24 VDC:	200 uA (one communication every 5 seconds with green LED blink on communication)
Maximum Alarm Current:	2 mA @ 24 VDC (one communication every 5 seconds with red LED solid on)
Maximum Current:	4.5 mA @ 24 VDC (one communication every 5 seconds with amber LED solid on)
Operating Humidity Range:	10% to 93% Relative Humidity, Non-condensing
Operating Temperature Range:	32°F to 122°F (0°C to 50°C)
Air Velocity:	0 to 4000 ft./min. (0 to 1219.2 m/min.)
Height:	2.0" (51 mm) installed in B300-6 Base
Diameter:	6.2" (156 mm) installed in B300-6 Base; 4.1" (104 mm) installed in B501 Base
Weight:	3.4 oz. (95 g)
Isolator Load Rating:	0.0063*

*Please refer to your isolator base/module manual for isolator calculation instructions.

UL 268 listed for Open Air Protection.

UL268A listed for Duct Applications.

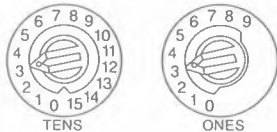
This sensor must be installed in compliance with the control panel system installation manual. The installation must meet the requirements of the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when installed in compliance with the National Fire Protection Association (NFPA); see NFPA 72.

GENERAL DESCRIPTION

Models SD365 and SD365-IV are plug-in type smoke sensors that combine a photoelectronic sensing chamber with addressable-analog communications.

The sensors transmit an analog representation of smoke density over a communication line to a control panel. Rotary dial switches are provided for setting the sensor's address. (See Figure 1.)

FIGURE 1. ROTARY ADDRESS SWITCHES:



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Two LEDs on the sensor are controlled by the panel to indicate sensor status. An output is provided for connection to an optional remote LED annunciator (P/N RA100Z).

Fire-Lite panels offer different features sets across different models. As a result, certain features of the photoelectric sensors may be available on some control panels, but not on others. SD365 will support only LiteSpeed® protocol mode. SD365-IV will support either LiteSpeed or CLIP (Classic Loop Interface Protocol) mode. The possible features available if supported by the control panel are:

1. The sensor's LEDs can operate in three ways—on, off, and blinking—and they can be set to red, green, or amber. This is controlled by the panel.
2. The remote output may be synchronized to the LED operation or controlled independent of the LEDs.
3. Devices are point addressable up to 159 addresses.

Please refer to the operation manual for the UL listed control panel for specific operation. The photoelectric sensors require compatible addressable communications to function properly. Connect these sensors to listed-compatible control panels only.

SPACING

Fire-Lite recommends spacing sensors in compliance with NFPA 72. In low air flow applications with smooth ceilings, space sensors 30 feet apart (9.1 m). For specific information regarding sensor spacing, placement, and special applications, refer to NFPA 72 or the System Smoke Detector Application Guide, available from Fire-Lite.

Duct Applications: SD365 and SD365-IV are listed for use in ducts. See Duct Smoke Detectors Applications Guide HVAG53 for details on pendant mount applications. **NOTE:** Intelligent photoelectric smoke sensors are also listed for use inside DNR(W) duct smoke detectors.

WIRING GUIDE

All wiring must be installed in compliance with the National Electrical Code, applicable local codes, and any special requirements of the Authority Having Jurisdiction. Proper wire gauges should be used. The installation wires should be color-coded to limit wiring mistakes and ease system troubleshooting. Improper connections will prevent a system from responding properly in the event of a fire.

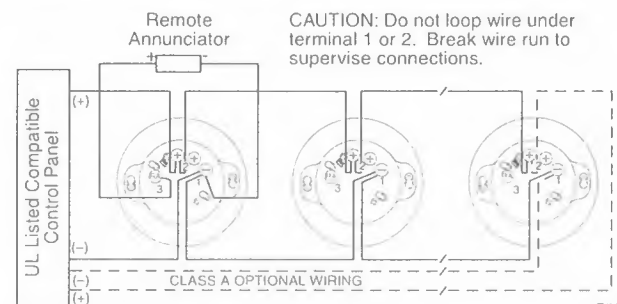
Remove power from the communication line before installing sensors.

1. Wire the sensor base (supplied separately) as shown in the wiring diagram. (See Figure 2.)
2. Set the desired address on the sensor address switches. (See Figure 1.)
3. Install the sensor into the sensor base. Push the sensor into the base while turning it clockwise to secure it in place.
4. After all sensors have been installed, apply power to the control panel and activate the communication line.
5. Test the sensor(s) as described in the TESTING section of this manual.

CAUTION

Dust covers provide limited protection against airborne dust particles during shipping. Dust covers must be removed before the sensors can sense smoke. Remove sensors prior to heavy remodeling or construction.

FIGURE 2. WIRING DIAGRAM:



C0129-10

TAMPER-RESISTANCE

Intelligent photoelectric smoke sensors include a tamper-resistant capability that prevents their removal from the base without the use of a tool. Refer to the base manual for details on making use of this capability.

TESTING

Before testing, notify the proper authorities that the system is undergoing maintenance, and will temporarily be out of service. Disable the system to prevent unwanted alarms.

All sensors must be tested after installation and periodically thereafter. Testing methods must satisfy the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when tested and maintained in compliance with NFPA 72.

The sensor can be tested in the following ways:

A. Functional: Magnet Test (P/N M02-04-01 or M02-09-00)

This sensor can be functionally tested with a test magnet. The test magnet electronically simulates smoke in the sensing chamber, testing the sensor electronics and connections to the control panel.

1. Hold the test magnet in the magnet test area as shown in Figure 3.
2. The sensor should alarm the panel.

Two LEDs on the sensor are controlled by the panel to indicate sensor status. Coded signals, transmitted from the panel, can cause the LEDs to blink, latch on, or latch off. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.

B. Smoke Entry

Sensitivity readings are available through the FACP. Refer to the manufacturer's published instructions for proper use.

Additionally, canned aerosol simulated smoke (canned smoke agent) may be used for smoke entry testing of the smoke detector. Tested and approved aerosol smoke products are:

Manufacturer	Model
HSI Fire & Safety	25S, 30S (PURCHECK)
SDi	SMOKE CENTURIAN, SOLOA4, SMOKESABRE, TRUTEST
No Climb	TESTIFIRE 2000

When used properly, the canned smoke agent will cause the smoke detector to go into alarm. Refer to the manufacturer's published instructions for proper use of the canned smoke agent.



Canned aerosol simulated smoke (canned smoke agent) formulas will vary by manufacturer. Misuse or overuse of these products may have long term adverse effects on the smoke detector. Consult the canned smoke agent manufacturer's published instructions for any further warnings or caution statements.

A sensor that fails any of these tests may need to be cleaned as described under CLEANING, and retested.

When testing is complete, restore the system to normal operation and notify the proper authorities that the system is back in operation.

CLEANING

Before removing the detector, notify the proper authorities that the smoke detector system is undergoing maintenance and will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

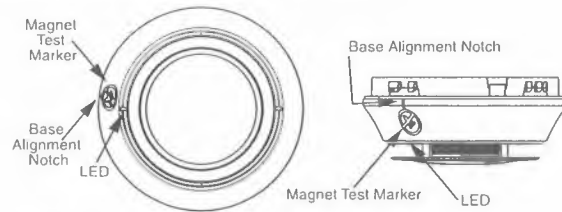
1. Remove the sensor to be cleaned from the system.
2. Remove the sensor cover by pressing firmly on each of the four removal tabs that hold the cover in place. (See Figure 4.)
3. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 4, otherwise skip to Step 7.

4. Remove the chamber cover/screen assembly by pulling it straight out.
5. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing chamber.
6. Reinstall the chamber cover/screen assembly by sliding the edge over the sensing chamber. Turn until it is firmly in place.
7. Replace the cover using the LEDs to align the cover and then gently pushing it until it locks into place.
8. Reinstall the detector.
9. Test the detector as described in TESTING.
10. Reconnect disabled circuits.
11. Notify the proper authorities that the system is back on line.

SPECIAL NOTE REGARDING SMOKE DETECTOR GUARDS

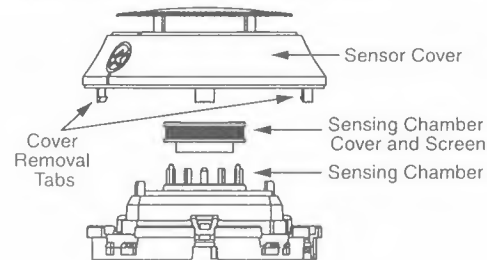
Smoke detectors are not to be used with detector guards unless the combination has been evaluated and found suitable for that purpose.

FIGURE 3: FEATURES OF THE PHOTO DETECTOR



C2021-00

FIGURE 4: CLEANING THE PHOTO DETECTOR



C2022-00

Please refer to insert for the Limitations of Fire Alarm Systems

FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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SD365R and SD365R-IV Intelligent Photoelectric Smoke Sensor with Remote Test Capability in Duct Applications

One FireLite Place
Northford, CT 06472
Phone: 203.484.7161

SPECIFICATIONS

Operating Voltage Range:	15 to 32 VDC
Operating Current @ 24 VDC:	200 uA (one communication every 5 seconds with green LED blink on communication)
Maximum Alarm Current:	2 mA @ 24 VDC (one communication every 5 seconds with red LED solid on)
Maximum Current:	4.5 mA @ 24 VDC (one communication every 5 seconds with amber LED solid on)
Operating Humidity Range:	10% to 93% Relative Humidity, Non-condensing
Operating Temperature Range:	32°F to 122°F (0°C to 50°C), -4°F to 158°F (-20°C to 70°C) in duct applications
Air Velocity:	0 to 4000 ft./min. (0 to 1219.2 m/min.)
Height:	2.0" (51 mm) installed in B300-6 Base
Diameter:	6.2" (156 mm) installed in B300-6 Base; 4.1" (104 mm) installed in B501 Base
Weight:	3.4 oz. (95 g)
Isolator Load Rating:	0.0063*

*Please refer to your isolator base/module manual for isolator calculation instructions.

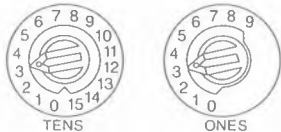
UL268A listed for Duct Applications

This sensor must be installed in compliance with the control panel system installation manual. The installation must meet the requirements of the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when installed in compliance with the National Fire Protection Association (NFPA); see NFPA 72.

GENERAL DESCRIPTION

Models SD365R and SD365R-IV are plug-in type smoke sensors that combines a photoelectronic sensing chamber with addressable-analog communications. When used in duct applications with a DNR(W), testing can be done remotely using approved System Sensor test accessories, eliminating the need for a test coil. The sensors transmit an analog representation of smoke density over a communication line to a control panel. Rotary dial switches are provided for setting the sensor's address.

FIGURE 1. ROTARY ADDRESS SWITCHES:



CO162-00

Two LEDs on the sensor are controlled by the panel to indicate sensor status. An output is provided for connection to an optional remote LED annunciator (P/N RA100Z).

Note: Only System Sensor approved accessories may be used with the SD365R and SD365R-IV.

Fire-Lite panels offer different features sets across different models. As a result, certain features of the photoelectric sensors may be available on some control panels, but not on others. SD365R will support only LiteSpeed® protocol mode. SD365R-IV will support either LiteSpeed or CLIP (Classic Loop Interface Protocol) mode. The possible features available in the SD365R and SD365R-IV, if supported by the control panel are:

1. The sensor's LEDs can operate in three ways—on, off, and blinking—and they can be set to red, green, or amber. This is controlled by the panel.
2. The remote output may be synchronized to the LED operation or controlled independent of the LEDs.
3. Devices are point addressable up to 159 addresses.

Please refer to the operation manual for the UL listed control panel for specific operation. The SD365R and SD365R-IV require compatible addressable communications to function properly. Connect these sensors to listed-compatible control panels only.

SPACING

Fire-Lite recommends spacing sensors in compliance with NFPA 72. In low air flow applications with smooth ceilings, space sensors 30 feet apart (9.1 m). For specific information regarding sensor spacing, placement, and special applications, refer to NFPA 72 or the System Smoke Detector Application Guide, available from Fire-Lite.

Duct Applications: SD365R and SD365R-IV are listed for use in ducts. See Duct Smoke Detectors Applications Guide HIVAG53 for details on pendant mount applications. **NOTE:** SD365R and SD365R-IV are also listed for use inside DNR(W) duct smoke detectors.

WIRING GUIDE

All wiring must be installed in compliance with the National Electrical Code, applicable local codes, and any special requirements of the Authority Having Jurisdiction. Proper wire gauges should be used. The installation wires should be color-coded to limit wiring mistakes and ease system troubleshooting. Improper connections will prevent a system from responding properly in the event of a fire.

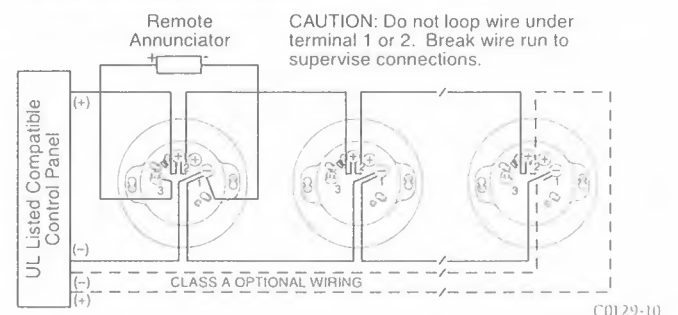
Remove power from the communication line before installing sensors.

1. Wire the sensor base (supplied separately) per the wiring diagram, Figure 2.
2. Set the desired address on the sensor address switches, see Figure 1.
3. Install the sensor into the sensor base. Push the sensor into the base while turning it clockwise to secure it in place.
4. After all sensors have been installed, apply power to the control panel and activate the communication line.
5. Test the sensor(s) as described in the TESTING section of this manual.

CAUTION

Dust covers provide limited protection against airborne dust particles during shipping. Dust covers must be removed before the sensors can sense smoke. Remove sensors prior to heavy remodeling or construction.

FIGURE 2. WIRING DIAGRAM:



CO129-10

TAMPER-RESISTANCE

Models SD365R and SD365R-IV include a tamper-resistant capability that prevents their removal from the base without the use of a tool. Refer to the base manual for details on making use of this capability.

TESTING

Before testing, notify the proper authorities that the system is undergoing maintenance, and will temporarily be out of service. Disable the system to prevent unwanted alarms.

All sensors must be tested after installation and periodically thereafter. Testing methods must satisfy the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when tested and maintained in compliance with NFPA 72.

The sensor can be tested in the following ways:

A. Functional: Magnet Test (P/N M02-04-01 or M02-09-00)

This sensor can be functionally tested with a test magnet. The test magnet electronically simulates smoke in the sensing chamber, testing the sensor electronics and connections to the control panel.

1. Hold the test magnet in the magnet test area as shown in Figure 3.
2. The sensor should alarm the panel.

Two LEDs on the sensor are controlled by the panel to indicate sensor status. Coded signals, transmitted from the panel, can cause the LEDs to blink, latch on, or latch off. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.

B. Smoke Entry

Sensitivity readings are available through the FACP. Refer to the manufacturer's published instructions for proper use.

Additionally, canned aerosol simulated smoke (canned smoke agent) may be used for smoke entry testing of the smoke detector. Tested and approved aerosol smoke products are:

Manufacturer	Model
HSI Fire & Safety	25S, 30S (PURCHECK)
SDi	SMOKE CENTURIAN, SOLOA4, SMOKESABRE, TRUTEST
No Climb	TESTIFIRE 2000

When used properly, the canned smoke agent will cause the smoke detector to go into alarm. Refer to the manufacturer's published instructions for proper use of the canned smoke agent.

CAUTION

Canned aerosol simulated smoke (canned smoke agent) formulas will vary by manufacturer. Misuse or overuse of these products may have long term adverse effects on the smoke detector. Consult the canned smoke agent manufacturer's published instructions for any further warnings or caution statements.

C. Remote Test.

SD365R and SD365R-IV can be remotely tested using the RTS151 or RTS151KEY test accessories. Refer to the DNR(W) manual for wiring diagrams. Maximum test response time may be up to two communications from the panel.

A sensor that fails any of these tests may need to be cleaned as described under CLEANING, and retested. When testing is complete, restore the system to normal operation and notify the proper authorities that the system is back in operation.

CLEANING

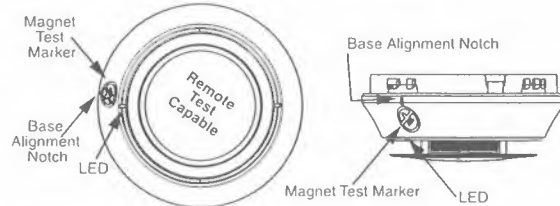
Before removing the detector, notify the proper authorities that the smoke detector system is undergoing maintenance and will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

1. Remove the sensor to be cleaned from the system.
2. Remove the sensor cover by pressing firmly on each of the four removal tabs that hold the cover in place.
3. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 4, otherwise skip to Step 7.
4. Remove the chamber cover/screen assembly by pulling it straight out.
5. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing chamber.
6. Reinstall the chamber cover/screen assembly by sliding the edge over the sensing chamber. Turn until it is firmly in place.
7. Replace the cover using the LEDs to align the cover and then gently pushing it until it locks into place.
8. Reinstall the detector.
9. Test the detector as described in TESTING.
10. Reconnect disabled circuits.
11. Notify the proper authorities that the system is back on line.

SPECIAL NOTE REGARDING SMOKE DETECTOR GUARDS

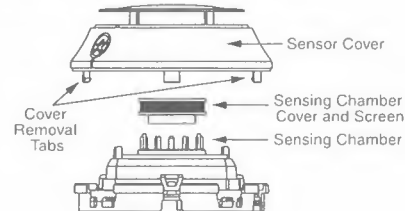
Smoke detectors are not to be used with detector guards unless the combination has been evaluated and found suitable for that purpose.

FIGURE 3: FEATURES OF THE PHOTO DETECTOR



C2021-01

FIGURE 4: CLEANING THE PHOTO DETECTOR



C2022-00

Please refer to insert for the Limitations of Fire Alarm Systems

FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

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SD365T and SD365T-IV

Intelligent Photoelectric and Temperature Sensors

One FireLite Place
Northford, CT 06472
Phone: 203.484.7161

SPECIFICATIONS

Operating Voltage Range:	15 to 32 VDC
Operating Current @ 24 VDC:	200 uA (one communication every 5 seconds with green LED blink on communication)
Maximum Alarm Current:	2 mA @ 24 VDC (one communication every 5 seconds with red LED solid on)
Maximum Current:	4.5 mA @ 24 VDC (one communication every 5 seconds with amber LED solid on)
Operating Humidity Range:	10% to 93% Relative Humidity, Non-condensing
Operating Temperature Range:	32°F to 100°F (0°C to 38°C)
Air Velocity:	0 to 4000 ft./min. (0 to 1219.2 m/min.)
Height:	2.0" (51 mm) installed in B300-6 Base
Diameter:	6.2" (156 mm) installed in B300-6 Base; 4.1" (104 mm) installed in B501 Base
Weight:	3.4 oz. (95 g)
Isolator Load Rating:	0.0063*

*Please refer to your isolator base/module manual for isolator calculation instructions.

UL 268 listed for Open Air Protection
UL 521 listed for Heat Detectors

This sensor must be installed in compliance with the control panel system installation manual. The installation must meet the requirements of the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when installed in compliance with the National Fire Protection Association (NFPA); see NFPA 72.

GENERAL DESCRIPTION

Models SD365T and SD365T-IV are plug-in type multi-sensor smoke sensors that combine a photoelectric sensing chamber and 135°F (57.2°C) fixed temperature heat detector across addressable-analog communications. The sensors transmit an analog representation of smoke density over a communication line to a control panel. Rotary dial switches are provided for setting the sensor's address. (See Figure 1.) The intelligent photoelectric and temperature sensors also transmit an alarm signal due to heat at 135°F (57.2°C) per UL 521.

FIGURE 1. ROTARY ADDRESS SWITCHES:



C0162-00

Two LEDs on the sensor are controlled by the panel to indicate sensor status. An output is provided for connection to an optional remote LED annunciator (P/N RA100Z).

Fire-Lite panels offer different features sets across different models. As a result, certain features of the photoelectric and temperature sensors may be available on some control panels, but not on others. SD365T will support only LiteSpeed® protocol mode. SD365T-IV will support either LiteSpeed or CLIP (Classic Loop Interface Protocol) mode. The possible features available if supported by the control panel are:

1. The sensor's LEDs can operate in three ways—on, off, and blinking—and they can be set to red, green, or amber. This is controlled by the panel.
2. The remote output may be synchronized to the LED operation or controlled independent of the LEDs.
3. Devices are point addressable up to 159 addresses.

Please refer to the operation manual for the UL listed control panel for specific operation. The photoelectric and temperature sensors require compatible addressable communications to function properly. Connect these sensors to listed-compatible control panels only.

SPACING

Fire-Lite recommends spacing sensors in compliance with NFPA 72. In low air flow applications with smooth ceilings, space sensors 30 feet apart (9.1 m). When using the photoelectric and temperature sensors as a heat detector in FM3210 compliant applications, space sensors 20 feet apart (6 m). For specific information regarding sensor spacing, placement, and special applications,

refer to NFPA 72 or the System Smoke Detector Application Guide, available from Fire-Lite.

WIRING GUIDE

All wiring must be installed in compliance with the National Electrical Code, applicable local codes, and any special requirements of the Authority Having Jurisdiction. Proper wire gauges should be used. The installation wires should be color-coded to limit wiring mistakes and ease system troubleshooting. Improper connections will prevent a system from responding properly in the event of a fire.

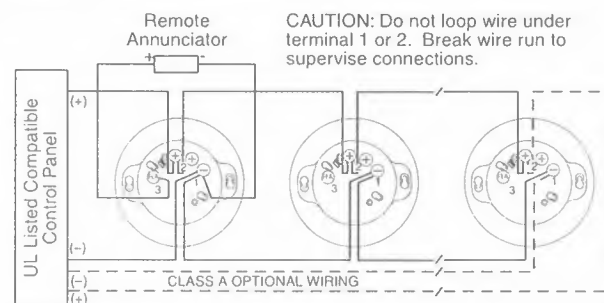
Remove power from the communication line before installing sensors.

1. Wire the sensor base (supplied separately) per the wiring diagram, Figure 2.
2. Set the desired address on the sensor address switches, see Figure 1.
3. Install the sensor into the sensor base. Push the sensor into the base while turning it clockwise to secure it in place.
4. After all sensors have been installed, apply power to the control panel and activate the communication line.
5. Test the sensor(s) as described in the TESTING section of this manual.



Dust covers provide limited protection against airborne dust particles during shipping. Dust covers must be removed before the sensors can sense smoke. Remove sensors prior to heavy remodeling or construction.

FIGURE 2. WIRING DIAGRAM:



C0129-10

TAMPER-RESISTANCE

Photoelectric and temperature sensors include a tamper-resistant capability that prevents their removal from the base without the use of a tool. Refer to the base manual for details on making use of this capability.

TESTING

Before testing, notify the proper authorities that the system is undergoing maintenance, and will temporarily be out of service. Disable the system to prevent unwanted alarms.

All sensors must be tested after installation and periodically thereafter. Testing methods must satisfy the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when tested and maintained in compliance with NFPA 72.

The sensor can be tested in the following ways:

A. Functional: Magnet Test (P/N M02-04-01 or M02-09-00)

This sensor can be functionally tested with a test magnet. The test magnet electronically simulates smoke in the sensing chamber, testing the sensor electronics and connections to the control panel.

1. Hold the test magnet in the magnet test area as shown in Figure 3.
2. The sensor should alarm the panel.

Two LEDs on the sensor are controlled by the panel to indicate sensor status. Coded signals, transmitted from the panel, can cause the LEDs to blink, latch on, or latch off. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.

B. Smoke Entry

Sensitivity readings are available through the FACP. Refer to the manufacturer's published instructions for proper use.

Additionally, canned aerosol simulated smoke (canned smoke agent) may be used for smoke entry testing of the smoke detector. Tested and approved aerosol smoke products are:

Manufacturer	Model
HSI Fire & Safety	25S, 30S (PURCHECK)
SDi	SMOKE CENTURIAN, SOLOA4, SMOKESABRE, TRUTEST
No Climb	TESTIFIRE 2000

When used properly, the canned smoke agent will cause the smoke detector to go into alarm. Refer to the manufacturer's published instructions for proper use of the canned smoke agent.



Canned aerosol simulated smoke (canned smoke agent) formulas will vary by manufacturer. Misuse or overuse of these products may have long term adverse effects on the smoke detector. Consult the canned smoke agent manufacturer's published instructions for any further warnings or caution statements.

C. Direct Heat Method (Hair dryer of 1000-1500 watts).

A hair dryer of 1000-1500 watts should be used to test the thermistors. Direct the heat toward either of the two thermistors, holding the heat source approximately 12 inches (30 cm) from the detector in order to avoid damaging the plastic housing. The detector will reset only after it has had sufficient time to cool. Make sure both thermistors are tested individually.

D. Multi-Criteria Method.

A Testifire® by SDi provides testing of the smoke and heat sensors. Consult the manufacturer's published instructions for complete instructions.

A sensor that fails any of these tests may need to be cleaned as described under CLEANING, and retested.

When testing is complete, restore the system to normal operation and notify the proper authorities that the system is back in operation.

CLEANING

Before removing the detector, notify the proper authorities that the smoke detector system is undergoing maintenance and will be temporarily out of

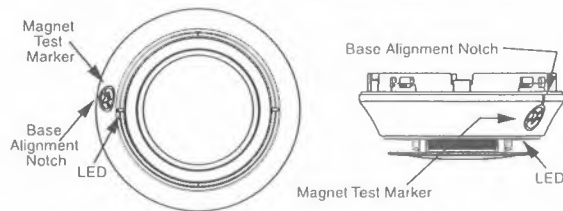
service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

1. Remove the sensor to be cleaned from the system.
2. Remove the sensor cover by pressing firmly on each of the four removal tabs that hold the cover in place.
3. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 4, otherwise skip to Step 7.
4. Remove the chamber cover/screen assembly by pulling it straight out.
5. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing chamber.
6. Reinstall the chamber cover/screen assembly by sliding the edge over the sensing chamber. Turn until it is firmly in place.
7. Replace the cover using the LEDs to align the cover and then gently pushing it until it locks into place. Make sure that the thermistors do not become bent under the cover.
8. Reinstall the detector.
9. Test the detector as described in TESTING.
10. Reconnect disabled circuits.
11. Notify the proper authorities that the system is back on line.

SPECIAL NOTE REGARDING SMOKE DETECTOR GUARDS

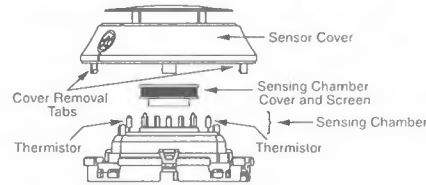
Smoke detectors are not to be used with detector guards unless the combination has been evaluated and found suitable for that purpose.

FIGURE 3: FEATURES OF THE PHOTO/HEAT DETECTOR



C2023-00

FIGURE 4: CLEANING THE PHOTO/HEAT DETECTOR



C2024-00

Please refer to insert for the Limitations of Fire Alarm Systems

FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

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ANN-80

80-Character Serial LCD Annunciator



Annunciators

General

The ANN-80 annunciator is a compact, backlit, 80-character LCD fire annunciator that mimics the Fire Alarm Control Panel (FACP) display. It provides system status indicators for AC Power, Alarm, Trouble, Supervisory, and Alarm Silenced conditions. The ANN-80 and the FACP communicate over a two-wire serial interface employing the ANN-Bus communication format. Connected devices are powered, via two additional wires, by either the host FACP or a remote UL-listed, filtered power supply. The ANN-80 is red; for white, order ANN-80-W.

The ANN-80 displays English-language text of system point information including device type, zone, independent point alarm, trouble or supervisory status, as well as any custom alpha labels programmed into the control panel. It includes control switches for remote control of critical system functions. (A keyswitch prevents unauthorized operation of the control switches.)

Up to eight ANN-80s may be connected to the ANN-Bus of each FACP. No programming is required, which saves time during system commissioning.



Features

- Listed to UL Standard 864, 9th Edition
- Backlit 80-character LCD display (20 characters x 4 lines)
- Mimics all display information from the host panel
- Control switches for System Acknowledge, Signal Silence, Drill, and Reset
- Control switches can be independently enabled or disabled at the FACP
- Keyswitch enables/disables control switches and mechanically locks annunciator enclosure
- Keyswitch can be enabled or disabled at the FACP
- Enclosure supervised for tamper
- System status LEDs for AC Power, Alarm, Trouble, Supervisory, and Alarm Silence
- Local sounder can be enabled or disabled at the FACP
- ANN-80 connects to the ANN-Bus terminal on the FACP and requires minimal panel programming
- Displays device type identifiers, individual point alarm, trouble, supervisory, zone, and custom alpha labels
- Time-and date display field
- Surface mount directly to wall or to single, double, or 4" square electrical box
- Semi-flush mount to single, double, or 4" square electrical box. Use ANN-SB80KIT for angled view mounting
- Can be remotely located up to 6,000 feet (1,800 m) from the panel
- Backlight turns off during AC loss to conserve battery power but will turn back on if an alarm condition occurs
- May be powered by 24 VDC from the host FACP or by remote power supply (requires 24 VDC)
- Up to eight ANN-80s can be connected on the ANN-Bus

Controls and Indicators

- AC Power
- Alarm
- Trouble

- Supervisory
- Alarm Silenced

Specifications

- **Operating voltage range:** 18 VDC to 28 VDC
- **Current consumption @ 24 VDC nominal** (filtered and non-resettable): 40 mA maximum
- **Ambient temperature:** 32°F to 120°F (0°C to 49°C)
- **Relative humidity:** 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F)
- 5.375" (13.65 cm.) high x 6.875" (17.46 cm.) wide x 1.375" (3.49 cm.) deep
- For use indoors in a dry location
- All connections are power-limited and supervised

The ANN-Bus

POWERING THE DEVICES ON THE ANN-BUS FROM AUXILIARY POWER SUPPLY

The ANN-Bus can be powered by an auxiliary power supply when the maximum number of ANN-Bus devices exceeds the ANN-Bus power requirements. See the FACP manual for more information.

ANN-BUS DEVICE ADDRESSING

Each ANN-Bus device requires a unique address (ID Number) in order to communicate with the FACP. A maximum of 8 devices can be connected to the FACP ANN-Bus communication circuit. See the FACP manual for more information.

WIRE REQUIREMENTS: COMMUNICATIONS CIRCUIT

The ANN-80 connects to the FACP ANN-Bus communications circuit. To determine the type of wire and the maximum wiring distance that can be used with FACP ANN-Bus accessory modules, it is necessary to calculate the total worst case current draw for all modules on a single 4-conductor bus. The total worst case current draw is calculated by adding the individual worst case currents for each module.

NOTE: For total worst case current draw on a single ANN-Bus refer to appropriate FACP manual.

WIRE REQUIREMENTS: POWER CIRCUIT

- 14 to 18 AWG (0.75 - 2.08 mm²) wire for 24 VDC power circuit is acceptable. Power wire distance limitation is set by 1.2 volt maximum line drop from source to end of circuit.
- All connections are power-limited and supervised.
- A maximum of eight ANN-80 modules may be connected to this circuit.

Ordering Options

ANN-80: Red 80 character LCD Annunciator.

ANN-80-W: White, 80 character LCD Annunciator.

ANN-SB80KIT-R: Red surface mount backbox with angled wedge.

ANN-SB80KIT-W: White surface mount backbox with angled wedge.

Agency Listings and Approvals

The listings and approvals below apply to the ANN-80. In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL:** S2424
- **FM approved**
- **CSFM:** 7120-0075:0211
- **MEA:** 442-06-E

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This document is not intended to be used for installation purposes.
We try to keep our product information up-to-date and accurate.
We cannot cover all specific applications or anticipate all requirements.
All specifications are subject to change without notice.

For more information, contact Fire-Lite Alarms. Phone: (800) 627-3473, FAX: (877) 699-4105.
www.firelite.com



Country of Origin: USA

INSTALLATION AND MAINTENANCE INSTRUCTIONS



**D4120 Duct Smoke Detector
D4S Sensor Component
D4P120 Power Board Component**



3825 Ohio Avenue, St. Charles, Illinois 60174
1-800-SENSOR2, FAX: 630-377-6495
www.systemsensor.com

156-2967-008R

NOTE: The D4120 duct detector consists of D4P120 Power Board component and the D4S Sensor component.

SPECIFICATIONS

Operating Temperature:	D4120 & D4S: -4° to 158° F (-20° to 70° C)	D4P120: -40° to 158° F (-40° to 70° C)
Storage Temperature:	D4120 & D4S: -22° to 158° F (-30° to 70° C)	D4P120: -40° to 158° F (-40° to 70° C)
Humidity:	0% to 95% Relative Humidity Non-condensing	
Air Velocity:	100 to 4000 ft./min. (0.5 to 20.3 m/sec.)	
D4120 Footprint Dimensions:	Rectangular - 14.38 in L x 5 in W x 2.5 in D (37cm L x 12.7cm W x 6.36cm D) Square - 7.75 in L x 9 in W x 2.5 in D (19.7cm L x 22.9cm W x 6.35cm D)	
D4S/D4P120 Footprint Dimensions:	7.75 in L x 5 in W x 2.5 in D (19.7cm L x 12.7cm W x 6.35cm D)	
D4120 Weight:	2.5 pounds; 1.14 kg	

Electrical

Power supply voltage:	20-29 VDC	24 VAC 50-60-Hz	120 VAC 50-60 Hz
Input capacitance:	270 µF max.	270 µF max.	N/A
Reset Voltage:	3.0 VDC min.	2.0 VAC min.	10 VAC min.
Reset Time (with RTS451/RTS151):	.03 to 0.3 sec.	.03 to 0.3 sec.	.03 to 0.3 sec.
Reset Time (by power down):	0.6 sec. max.	0.6 sec. max.	0.6 sec. max.
Power Up Time:	35 sec. max.	35 sec. max.	35 sec. max.
Alarm response time:	15 sec.	15 sec.	15 sec.
Sensitivity Test:	See detector label	See detector label	See detector label

Current Requirements (Using No Accessories)

Max. standby current	21 mA @ 24 VDC	65 mA RMS @ 24VAC 60Hz	20 mA RMS @ 120 VAC 60 Hz
Max. alarm current	65 mA @ 24 VDC	135 mA RMS @ 24 VAC 60 Hz	35 mA RMS @ 120 VAC 60 Hz

CONTACT RATINGS

Alarm initiation contacts (SPST)	2.0A @ 30 VDC (resistive)
Alarm auxiliary contacts (DPDT)	10A @30 VDC (resistive) 10A @250 VAC (resistive) 1/2 HP @240 VAC 1/4 HP @120 VAC
NOTE: Alarm auxiliary contacts shall not be connected to initiating circuits of control panels. Use the alarm initiation contact for this purpose.	
Supervisory Contacts (SPDT)	2.0A @ 30 VDC (resistive) 2.0A @ 125 VAC (resistive)

ACCESSORY CURRENT LOADS AT 24 VDC

DEVICE	STANDBY	TROUBLE	ALARM
APA151/APA451	12.5mA	n/a	30mA Max.
MHR/MHW	0mA	n/a	29mA Max.
RA400Z/RA100Z	0mA	n/a	12mA Max.
RTS451/RTS151	0mA	n/a	12mA Max.
RTS451KEY/RTS151KEY	12mA	n/a	12mA Max.
RTS2	3mA Max.	16mA Max.	30mA Max.
RTS2-AOS	3mA	16mA Max.	55mA Max.

NOTE: Any combination of accessories may be used such that the given accessory loads are: 110mA or less at the Aux output, and 50mA or less at the Alarm output.

IMPORTANT: This detector must be tested and maintained regularly following NFPA 72 requirements. The detector must be tested and maintained regularly following NFPA 72 requirements. According to NFPA, the detector should be visually inspected semiannually and functionally tested at least once a year. This may need to be more frequent depending on the air quality of the duct supply air.

[1] LIMITATIONS OF DUCT SMOKE DETECTORS



The National Fire Protection Association has established that DUCT DETECTORS 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.

System Sensor supports this position and strongly recommends that the user read NFPA Standards 90A, 72, and 101. The D4120 Air Duct Smoke Detectors are listed per UL 268A.

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.

This device will not sense smoke unless the ventilation system is operating and the cover is installed.

For this detector to function properly, it MUST be installed according to the instructions in this manual. Furthermore, the detector MUST be 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.

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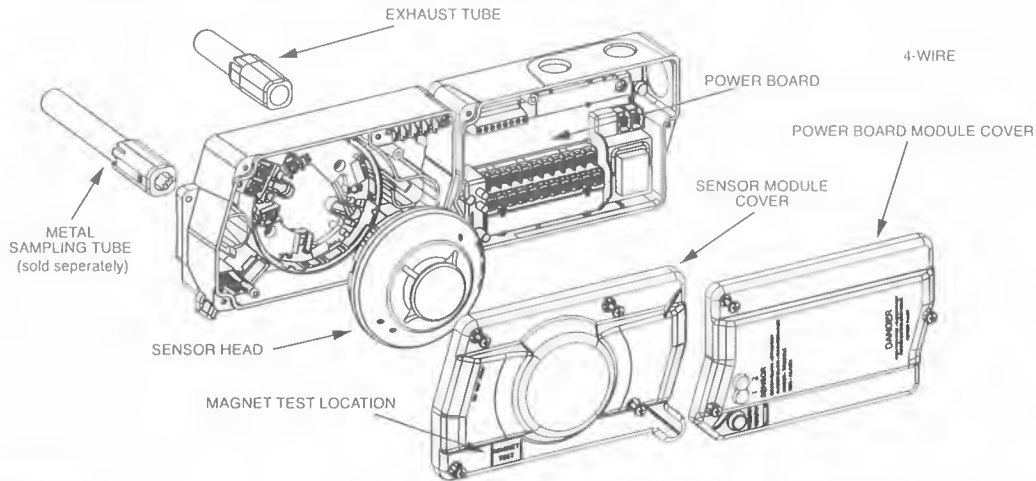
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BEFORE INSTALLING

Read System Sensor's *Applications Guide for Duct Smoke Detectors* (HVAG53), which provides information on detector spacing, placement, zoning, wiring, and special applications. This manual is available online at www.systemsensor.com. NFPA Standards 72 and 90A should also be referenced for detailed information.

NOTICE: This manual shall be left with the owner/user of this equipment.

[2] FIGURE 1. EXPLODED VIEW OF DUCT SMOKE DETECTOR COMPONENTS:



H10549-06

[3] GENERAL DESCRIPTION

Smoke introduced into an air duct system will be distributed throughout the entire building. Smoke detectors designed for use in air duct systems are used to sense the presence of smoke in the duct.

Model D4120 and D4S Duct Smoke Detectors utilize 4-wire photoelectric technology for the detection of smoke. This detection method, when combined with an efficient housing, samples air passing through the duct allowing detection of a developing hazardous condition. When sufficient smoke is sensed, an alarm signal is initiated and appropriate action can be taken to shut off fans, blowers, change over air handling systems, etc. These actions can facilitate the management of toxic smoke and fire gases throughout the areas served by the duct system.

The D4120 and D4P120 detectors are designed to operate on 24 VDC/VAC or 120 VAC. Alarm and supervisory relay contacts are available for control panel interface (alarm initiation), HVAC control, and other auxiliary functions. Auxiliary relays are provided for fan shut down. Detector interconnection provides signaling of up to 50 other detectors in the loop for multiple fan shut down. These detectors are not designed for 2-wire applications.

[3.1] DETECTOR FEATURE SET

- Utilizes 2D51 plug-in head
- 2 sensors to 1 power board capability
- Cover missing signal
- Sampling tubes install from front or rear of detector
- Compatible with existing accessories

[4] CONTENTS OF THE DUCT SMOKE DETECTOR KIT

1. Sensor/power board assembly and cover(s)
2. Three #10 sheet metal screws for mounting
3. Drilling template
4. One sampling tube end cap
5. One plastic exhaust tube

NOTE: A sampling tube must be ordered to complete the installation. It must be the correct length for the width of the duct where it will be installed. See Table 1 on page 3 to determine the inlet tube required for different duct widths.

[5] DETECTOR INSTALLATION

[5.1] VERIFY AIR FLOW DIRECTION AND VELOCITY

Model D4120 detectors are designed to be used in air handling systems with air velocities of 100 to 4000 feet per minute. Duct widths from 6 inches to 12 feet can be accommodated. Be sure to check engineering specifications to ensure that the air velocity in the duct falls within these parameters. If necessary, use a velocity meter (anemometer) to check the air velocity in the duct.

[5.2] DETERMINE MOUNTING LOCATION AND CONFIGURATION

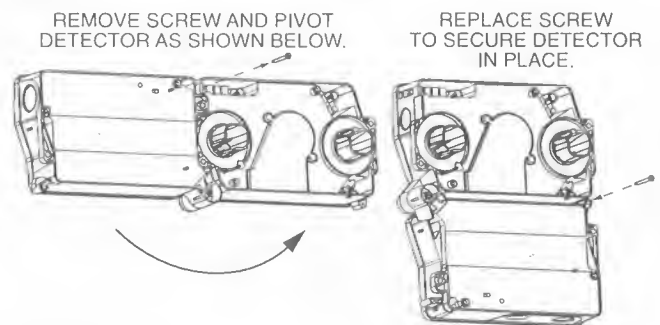
On ducts wider than 18 inches it is recommended that the detector be mounted downstream of a bend, obstruction in the duct, or the supply or return air inlet.

Exception: Installation of duct detectors can be on or within a commercial

packaged rooftop heating and air-conditioning system, fire/smoke dampers and economizers. They may be mounted in either the supply and/or return air section as determined by local code.

Once a suitable location is selected, determine if the detector is to be mounted in a side-by-side "rectangular" configuration or a top-over-bottom "square" configuration as shown in Figure 2. If mounting in the square configuration, remove the rear attachment screw, rotate the unit at the hinge, and replace the screw into the new attachment hole as shown in Figure 2. Do NOT remove the hinge screw during this process. Final installation approval shall be based upon passing section 7.2.2 and/or 8.2.4 tests.

FIGURE 2:



H10550-00

[5.3] DRILL THE MOUNTING HOLES

Remove the paper backing from the mounting template supplied. Affix the template to the duct at the desired mounting location. Make sure the template lies flat and smooth on the duct.

[5.3.1] FOR RECTANGULAR SIDE-BY-SIDE MOUNTING CONFIGURATION:

Center punch at (4) target centers: (2) "A" for sampling tubes and (2) "B" for the rectangular configuration mounting tabs as shown on mounting template. Drill pilot holes at target "A" centers and cut two 1.375 inch diameter holes using a 1 3/8 inch hole saw or punch. Drill .156 inch diameter holes using a 5/32 inch drill at target "B" centers.

[5.3.2] FOR SQUARE TOP-OVER-BOTTOM MOUNTING CONFIGURATION OR D4S SENSOR COMPONENT MOUNTING:

Center punch at (4) target centers: (2) "A" for sampling tubes and (2) "C" for the square configuration mounting tabs as shown on mounting template. Drill pilot holes at target "A" centers and cut two 1.375 inch diameter holes using a 1 3/8 inch hole saw or punch. Drill .156 inch diameter holes using a 5/32 inch drill at target "C" centers. If desired, drill an additional .156 inch hole at the location of one of the mounting tabs on the lower housing.

[5.4] SECURE THE DUCT DETECTOR TO THE DUCT

Use two (rectangular configuration) or three (square configuration) of the provided sheet metal screws to screw the duct detector to the duct.

CAUTION: Do not overtighten the screws.

[6] SAMPLING TUBE INSTALLATION

[6.1] SAMPLING TUBE SELECTION

The sampling tube must be purchased separately. Order the correct length, as specified in Table 1, for width of the duct where it will be installed. It is recommended that the sampling tube length extend at least $\frac{2}{3}$ across the duct width for optimal performance.

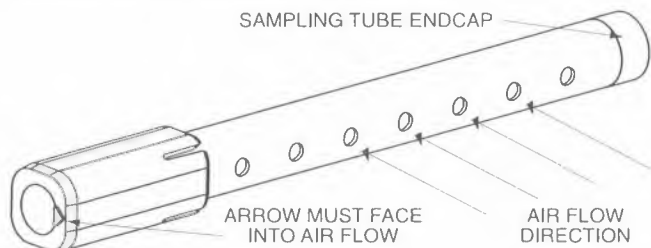
TABLE 1. SAMPLING TUBES RECOMMENDED FOR DIFFERENT DUCT WIDTHS:

Outside Duct Width	Sampling Tube Recommended*
Up to 1 ft.	DST1
1 to 2 ft.	DST1.5
2 to 4 ft.	DST3
4 to 8 ft.	DST5
8 to 12 ft.	DST10 (2-piece)

*Must extend a minimum of $\frac{2}{3}$ the duct width. These sampling tubes can only be used with new InnovairFlex duct smoke detectors.

The sampling tube is always installed with the air inlet holes facing into the air flow. To assist proper installation, the tube's connector is marked with an arrow. Make sure the sampling tube is mounted so that the arrow points into the airflow as shown in Figure 3. Mounting the detector housing in a vertical orientation is acceptable provided that the air flows directly into the sampling tube holes as indicated in Figure 3. The sampling tube and exhaust tube can be mounted in either housing connection as long as the exhaust tube is mounted downstream from the sampling tube.

FIGURE 3. AIR DUCT DETECTOR SAMPLING TUBE:



H0551-00

CAUTION: The sampling tube end cap, included with the detector, is critical to proper operation of the duct smoke detector. The end cap is needed to create the proper air flow to the sensor of the duct smoke detector. Once any sampling tube length adjustments are made, plug the end of the sampling tube with the provided end cap.

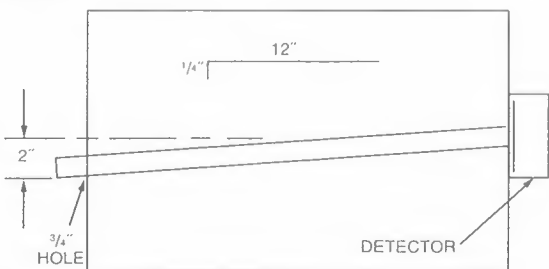
A plastic exhaust tube is included with the unit to be installed if needed. Install into the housing connection that is downstream from the sampling tube connection. The exhaust tube can be installed from the front or back of the detector. A longer 1 foot exhaust tube, model ETX, is available as an accessory in cases where the molded exhaust tube does not extend at least 2 inches into the duct.

[6.2] SAMPLING TUBE INSTALLATION

- For tubes shorter than the width of the duct, slide the sampling tube, with installed end cap, into the housing connection that meets the airflow first. Position the tube so the arrow points into the airflow as shown in Figure 3. Per NFPA sampling tubes over 3 feet long should be supported at the end opposite the duct detector. In ducts wider than 8 feet, work must be performed inside the duct to couple the other section of the sampling tube to the section already installed using the $\frac{1}{2}$ inch conduit fitting. Make sure that the holes on both sections of the air inlet sampling tube are lined up and facing into the airflow.
- For tubes longer than the width of the duct, the tube should extend out of the opposite side of the duct. Drill a $\frac{3}{4}$ inch hole in the duct opposite the hole already cut for the sampling tube. Ensure that the sampling tube is angled downward from the duct smoke detector to allow for moisture drainage away from the detector. The sampling tube should be angled at least $\frac{1}{4}$ inch downward for every 12 inches of duct width per Figure 4. There should be 10 to 12 holes spaced as evenly as possible across the width of the duct. If there are more than 2 holes in the section of the tube extend-

ing out of the duct, select a shorter tube using Table 1. Otherwise, trim the tube to leave approximately 1 to 2 inches extending outside the duct. Plug the end with the end cap and tape closed any holes in the protruding section of tube. Be sure to seal the duct where the tube protrudes.

FIGURE 4.



H0215-00

NOTE: Air currents inside the duct may cause excessive vibration, especially when the longer sampling tubes are used. In these cases, a 3 inch floor flange (available at most plumbing supply stores) may be used to fasten the sampling tube to the other side of the duct. When using the flange/connector mounting technique, drill a 1 to $1\frac{1}{4}$ inch hole where the flange will be used.

[6.3] MODIFICATIONS OF SAMPLING TUBES

There may be applications where duct widths are not what is specified for the installation. In such cases, it is permissible to modify a sampling tube that is longer than necessary to span the duct width.

Use a 0.193 inch diameter (#10) drill and add the appropriate number of holes so that the total number of holes exposed to the air flow in the duct is 10 to 12. Space the additional holes as evenly as possible over the length of the tube.

NOTE: This procedure should only be used as a temporary fix and is not intended as a substitute for ordering the correct length tubes.

[6.4] REMOTE SAMPLING TUBE INSTALLATION

The detector arrangement can also incorporate remote mounting of the sampling tube and/or exhaust tube. In this case both the detector, sampling tube and exhaust tube (if included) should be rigidly mounted to withstand the pressure and vibrations caused by the air velocity. The location of the detector's sampling tube should be such that there is uniform airflow in the cross section area.

The pressure differential across the sampling and exhaust ports in the detector housing shall be verified to be between 0.01 and 1.11 inches of water. Do so by measuring the pressure difference between the inlet and outlet ports on the detector housing using a manometer as described in Section 7.1.

[7] MEASUREMENT TESTS

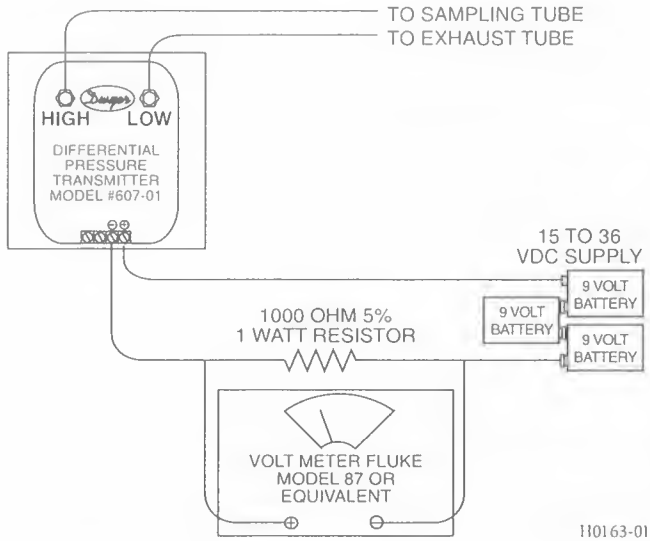
[7.1] AIR FLOW

The D4120 is designed to operate over an extended air speed range of 100 to 4000 FPM. To verify sufficient sampling of ducted air, turn the air handler on and use a manometer to measure the differential pressure between the two sampling tubes. The differential pressure should measure at least 0.01 inches of water and no more than 1.11 inches of water. Because most commercially available manometers cannot accurately measure very low pressure differentials, applications with less than 500 FPM of air speed may require one of the following: 1) the use of a current-sourcing pressure transmitter (Dwyer Series 607) per Section 7.2, or 2) the use of aerosol smoke per section 12.5.3.

[7.2] LOW FLOW AIR FLOW TEST USING DWYER SERIES 607 DIFFERENTIAL PRESSURE TRANSMITTER

Verify the air speed of the duct using an anemometer. Air speed must be at least 100 FPM. Wire the Dwyer transmitter as shown in Figure 5. Connect the leads of the meter to either side of the 1000Ω resistor. Allow unit to warm up for 15 seconds. With both HIGH and LOW pressure ports open to ambient air, measure and record the voltage drop across the 1000Ω resistor (measurement 1), 4.00 volts is typical. Using flexible tubing and rubber stoppers, connect the HIGH side of the transmitter to the sampling tube of the duct smoke detector housing, and the LOW side of the transmitter to the exhaust tube of the duct smoke detector housing. Measure and record the voltage drop across the 1000Ω resistor (measurement 2). Subtract the voltage recorded in measurement 1 from the voltage recorded in measurement 2. If the difference is greater than 0.15 volts, there is enough air flow through the duct smoke detector for proper operation.

FIGURE 5. PROCEDURE FOR VERIFYING AIR FLOW LESS THAN 500 FPM:



H0163-01

[8] FIELD WIRING INSTALLATION GUIDELINES

All wiring must be installed in compliance with the National Electrical Code and the local codes having jurisdiction. Proper wire gauges should be used. The conductors used to connect smoke detectors to control panels and accessory devices should be color-coded to prevent wiring mistakes. Improper connections can prevent a system from responding properly in the event of a fire.

For signal wiring, (wiring between interconnected detectors or from detectors to auxiliary devices), it is recommended that single conductor wire be no smaller than 18 gauge.

Smoke detectors and alarm system control panels have specifications for allowable loop resistance. Consult the control panel manufacturer's specifications for the total loop resistance allowed for the particular control panel being used before wiring the detector loop

[8.1] WIRING INSTRUCTIONS

The D4120 and D4P120 detectors are designed for easy wiring. The housing provides a terminal strip with clamping plates. The D4S housing provides 4 wiring terminals with clamping plates. Wiring connections are made by sliding the bare end of the wire under the plate, and tightening the clamping plate screw. See Figure 7 on page 5 for system wiring.

[8.2] SENSOR 2 INSTALLATION/WIRING

The power board is capable of controlling a second housed sensor. The second sensor, model D4S, can be wired to the power board per the following:

1. Connect wires to the four wire terminals in the corner of the D4S sensor housing designated as Tamper (Y,Y), +R, and -B. Route wires through the conduit openings in the sensor housing and D4120 power board housing.
2. Connect the opposing ends of the wires to the terminal connections marked "Sensor 2" on the Power Board. See Figure 6 for reference. Ensure that wires are connected to the appropriate terminal locations. A No. 0 or 1 phillips screwdriver should be used for terminal connection. The tamper terminals are not polarity sensitive.
3. Adjust the middle dip switch on the power board to indicate (2) sensors as shown in Figure 6.
4. The D4S can only be used with new InnovairFlex models and is not compatible with previously sold detectors.[9] Unit Configuration:

[9] UNIT CONFIGURATION

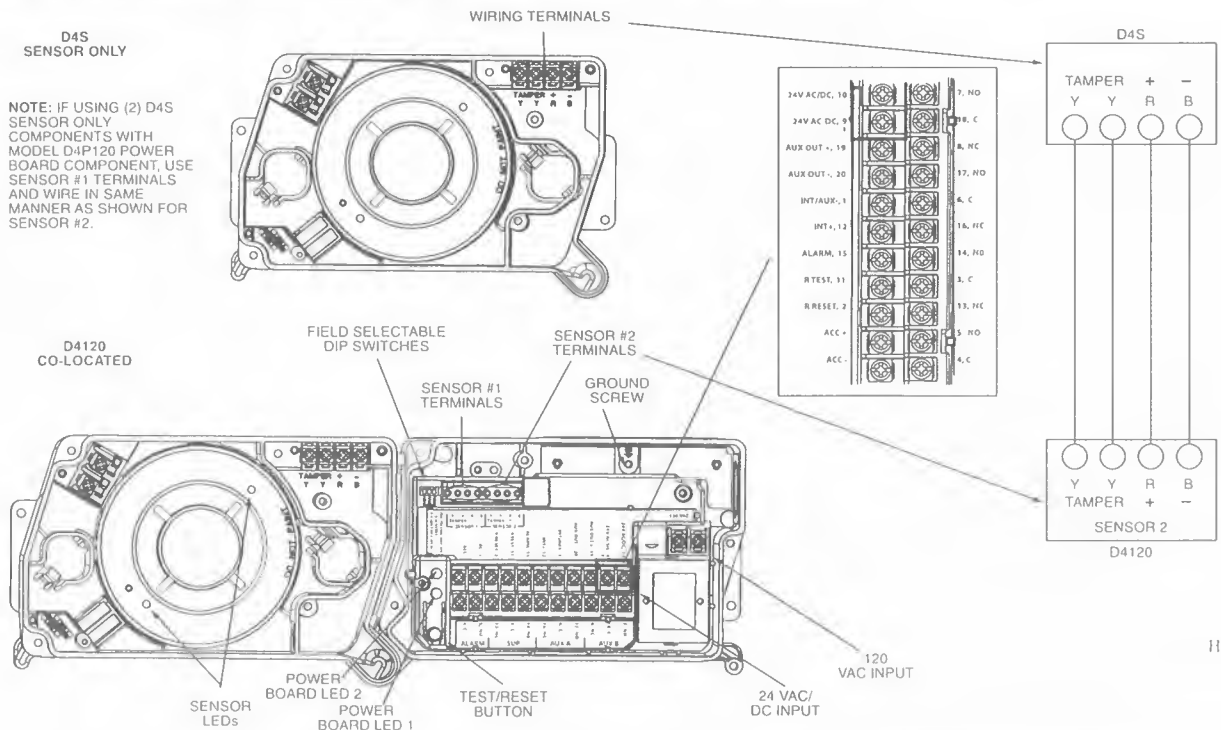
A three position Dip Switch is included only on the D4P120 in order to configure the setup of the unit. One switch is used to determine if there are one or two sensors connected to the Power Board. The second switch selects an instantaneous or 7-minute tamper Delay. A tamper Condition indicates that the cover of the sensor Housing has been removed or has not been secured properly. The third switch is used to turn the Shutdown On Trouble feature on or off. With this feature turned On, the Aux relay will switch states when a Trouble Condition occurs.

*Trouble is indicated when the Supervisory Relay, switches state-Terminals 3 and 14 are open in a Trouble Condition

Causes of a Trouble Condition may be:

- Unit loses Power
- Cover Tamper Feature times out
- Wiring Problems between the Sensor and the Power Board
- Mismatch between number of sensors connected to the Power Board and the Dipswitch setting

FIGURE 6. OPTIONAL SENSOR 2 CONFIGURATION AND WIRING:

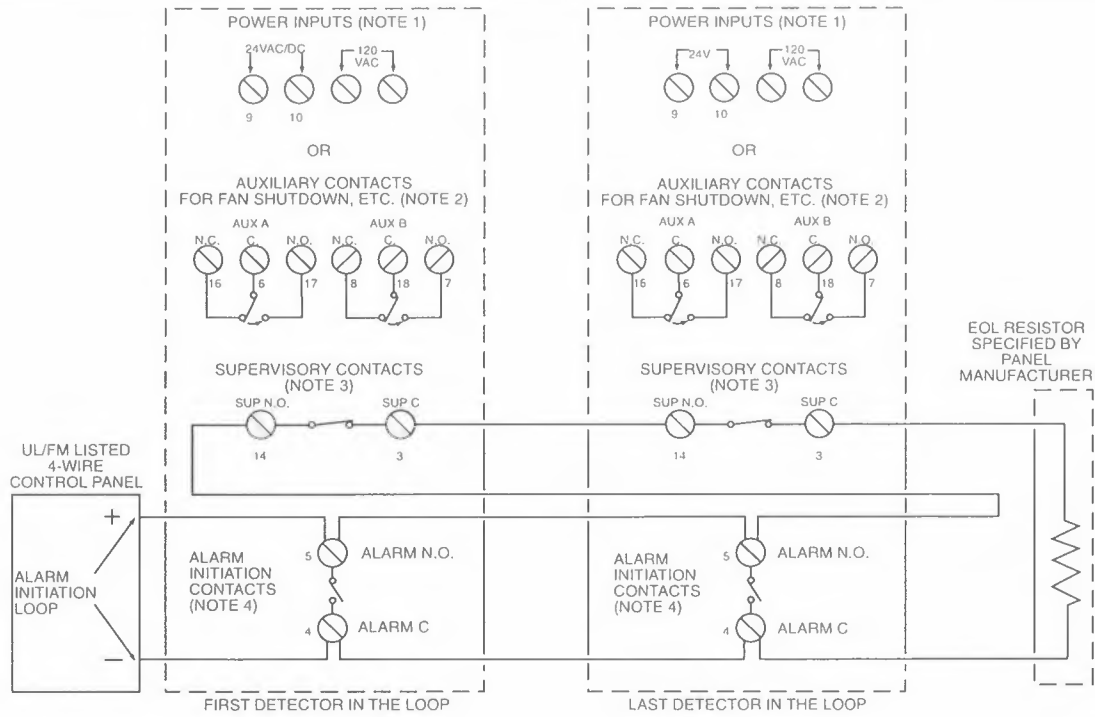


H0557-14

FIGURE 7. SYSTEM WIRING DIAGRAM FOR 4-WIRE DUCT SMOKE DETECTORS:

CAUTION

Do not loop wire under terminals when wiring detectors. Break wire runs to provide system supervision of connections.



NOTE 1: 24V Power Inputs accept a non-polarized 24VDC or 24VAC 50-60Hz. 120VAC Power Inputs accept only 120VAC 50-60Hz. Connect power source to appropriate terminals of each detector. See specifications for additional power supply information.

NOTE 2: Auxiliary contacts shown in standby position. Contacts switch during alarm as indicated by arrows. Auxiliary contacts are not to be used for connection to the control panel. See specifications for contact ratings.

NOTE 3: Supervisory contacts shown in standby position. Open contacts indicate a trouble condition to the panel. See specifications for contact ratings.

NOTE 4: Alarm Initiation contacts shown in standby position. Closed contacts indicate an alarm condition to the panel. See specifications for contact ratings.

[10] DETECTOR STATUS INDICATION

Detector Status is indicated by the LED sensor, and the corresponding LED on the power board. The power board has two separate LED's to indicate the status of each sensor connected to it. Refer to Table 3 on page 8 for more details.

[11] INTERCONNECTION (MULTIPLE FAN SHUT DOWN)

When using the interconnect feature, an alarm from an initiating device will switch the Aux Relays on the other devices interconnected.

TABLE 2. DIP SWITCH SETTINGS:

Designation	Default	Selection	Features
TRBL SHUTDN	OFF	OFF	Aux relay does not switch states with a Trouble condition
		ON	Aux relay switches states with a Trouble condition
SENSORS	1	1	Only one sensor is connected the Power Board
		2	Two sensors are connected to the Power Board
MIN TMPR DELAY	7	7	Provides a Trouble condition (terminals 3 and 14 open) when Sensor Housing cover has been removed or has been secured improperly for more than 7 minutes
		0	Provides an instantaneous Trouble condition(terminals 3 and 14 open) upon cover removal

FIGURE 8. MULTIPLE FAN SHUTDOWN (INTERCONNECTION OF D4120'S):

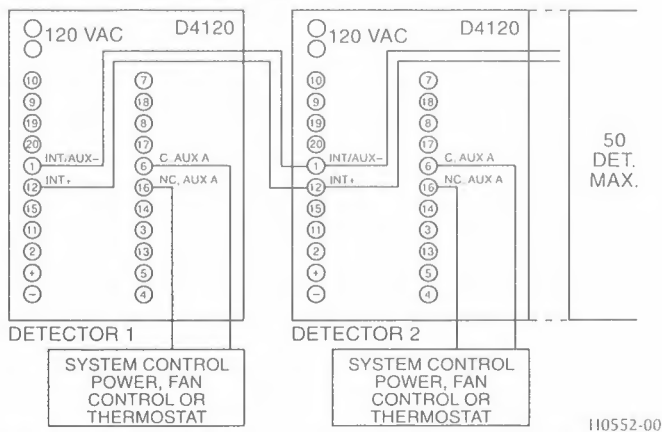
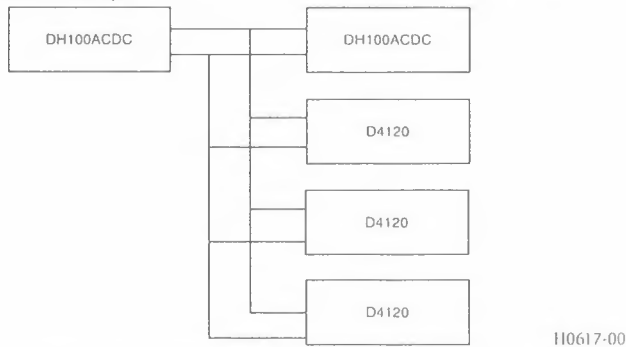


FIGURE 9. MULTIPLE FAN SHUTDOWN (INTERCONNECTION OF D4120 TO DH100ACDC):



[11.1] IMPORTANT INTERCONNECTION NOTES:

- When using the interconnect feature, all interconnected units must be powered using the same independent supply.
- Polarity must be maintained throughout the interconnect wiring. Connect the INT + terminal on unit 1 to the INT + terminal on unit 2 and so on. Similarly, connect the INT/AUX- terminal on unit 1 to the INT/AUX- terminal on unit 2 and so on.
- Up to 50 D4120 units may be interconnected.
- Up to 10 DH100ACDC units may be interconnected. Please note that each of the 9 DH100ACDC units interconnected can be substituted by three D4120 units. Therefore, when using the interconnect feature a single DH100ACDC can drive either 9 DH100ACDC's or 27 D4120 units.

NOTE: Alarm can be reset only at the initiating device and not at the devices interconnected.

[12] VERIFICATION OF OPERATION

[12.1] FIELD SELECTABLE SETTINGS

Verify dip switch settings as per Table 2 on Page 5.

[12.2] POWERING THE UNIT

Apply 24 VDC power to 9 and 10 terminals on the D4P120 or apply 120 VAC on terminals named 120VAC. See Figure 7 and electrical specifications for details.

[12.3] PERFORM DETECTOR CHECK

VERIFY STANDBY AND TROUBLE TEST per Table 3 on page 8. The use of a remote accessory for visible indication of power and alarm is recommended.

NOTE: If an instantaneous tamper delay is selected a trouble may be indicated with the cover installed.

[12.4] SENSITIVITY VERIFICATION

The sensitivity of the sensor is confirmed to be operating within its allowable range each time the sensor and power board LEDs blink green every 5 seconds. Note in a maintenance condition the sensor LEDs will blink red every 5 seconds and power board will blink amber as depicted in Table 3 on page 8. The maintenance condition indicates that the sensor is operating outside its original factory preset sensitivity and shall be cleaned or replaced. See Section 9 for reference. This is a valid UL test.

[12.5] DETECTOR CLEANING PROCEDURES

Notify the proper authorities that the smoke detector system is undergoing maintenance, and that the system will temporarily be out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms and possible dispatch of the fire department.

[12.5.1] ALARM TESTS

- 1a. Test/Reset Button - Press and hold the test button located on the power board cover for at least 2 seconds.
OR
 - 1b. M02-04-00 Magnet Test (Magnet sold separately) - Place the painted surface of the magnet onto the MAGNET TEST location on the sensor cover of unit (Figure 1).
OR
 - 1c. Remote Test Accessory - See list on page 1.
The red alarm LED on the sensor and the power board should latch on, as should any accessories (i.e. RA400Z/RA100Z, RTS451/RTS151). Verify system control panel alarm status and control panel execution of all intended auxiliary functions (i.e fan shutdown, damper control, etc.).
2. The detector must be reset by the system control panel, front cover Test/Reset button, or remote accessory.
 3. To reset using the Test/Reset button on the power board cover simply Press and release.
 4. Verify airflow test per Section 7 has been performed.

[12.5.2] SMOKE RESPONSE TESTS

To determine if smoke is capable of entering the sensing chamber, visually identify any obstructions. Plug the exhaust and sampling tube holes to prevent ducted air from carrying smoke away from the detector head, then blow smoke such as cigarette, cotton wick, or punk directly at the head to cause an alarm. REMEMBER TO REMOVE THE PLUGS AFTER THIS TEST, OR THE DETECTOR WILL NOT FUNCTION PROPERLY.

[12.5.3] SMOKE ENTRY USING AEROSOL SMOKE

This test is intended for low-flow systems (100-500 FPM). If the air speed is greater than 500 FPM, use a conventional manometer to measure differential pressure between the sampling tubes, as described in Section 7.1.

Drill a 1/4 inch hole 3 feet upstream from the duct smoke detector. With the air handler on, measure the air velocity with an anemometer. Air speed must be at least 100 FPM. Spray aerosol smoke* into the duct through the 1/4 inch hole for five seconds. Wait two minutes for the duct smoke detector to alarm. If the duct smoke detector alarms, air is flowing through the detector. Remove the duct smoke detector cover and blow out the residual aerosol smoke from the chamber and reset the duct smoke detector. Use duct tape to seal the aerosol smoke entry hole.

*Aerosol smoke can be purchased from Home Safeguard Industries at home-safeguard.com, model 25S Smoke Detector Tester, and Chekkit Smoke Detector Tester model CHEK02 and CHEK06 available from SDI. When used properly, the canned smoke agent will cause the smoke detector to go into alarm. Refer to the manufacturer's published instructions for proper use of the canned smoke agent.



Canned aerosol simulated smoke (canned smoke agent) formulas will vary by manufacturer. Misuse or overuse to these products may have long term adverse effects on the smoke detector. Consult the canned smoke agent manufacturer's published instructions for any further warnings or caution statements.

[12.6] INSTALL THE COVER

Install the covers making sure that the cover fits into the base groove. Tighten the seven screws that are captured in the covers.

[13] DETECTOR CLEANING PROCEDURES

Notify the proper authorities that the smoke detector system is undergoing maintenance, and that the system will temporarily be out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms and possible dispatch of the fire department.

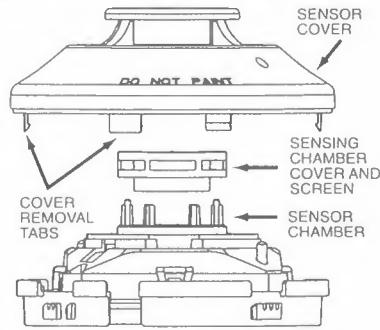
[13.1] DETECTOR SENSOR

1. Remove the sensor to be cleaned from the system.
2. Remove the sensor cover by pulling outward on each of the four removal tabs that hold the cover in place. See Figure 10.
3. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 4, otherwise skip to Step 7.
4. Remove the chamber cover/screen assembly by pulling it straight out.
5. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing chamber.
6. Reinstall the chamber cover/screen assembly by sliding the edge over the sensing chamber. Turn until it is firmly in place.
7. Replace the cover using the holes for the LEDs for alignment and then gently pushing it until it locks into place.
8. Reinstall the detector.

[13.2] REINSTALLATION

1. Reinstall the detector in its housing.
2. Restore system power.
3. Perform Detector Check, Section 12.3.
4. Notify the proper authorities testing has been completed and the smoke detector system is back in operation.

FIGURE 10. DETECTOR SENSOR EXPLODED VIEW:



C1009-00

NOTICE: If any unitary packaged air conditioning units are run during the drywall installation phase of any building under construction to accelerate the drying of joint compound, the subsequent sanding of those drywall joints and resulting dust may compromise the sensor heads in duct smoke detectors. To avoid this condition it is recommended that the sensor heads be removed during the construction phase.

For additional information visit www.systemsensor.com for a detailed technical bulletin.

[14] SENSOR REPLACEMENT (PART NO. 2D51)

1. Remove the sensor head by rotating counterclockwise.
2. Pull gently to remove it.
3. To replace the sensor head, align the mounting features and rotate clockwise into place.

[15] OPTIONAL ACCESSORIES

[15.1] RTS451/RTS151/RTS451KEY/RTS151KEY REMOTE TEST STATION

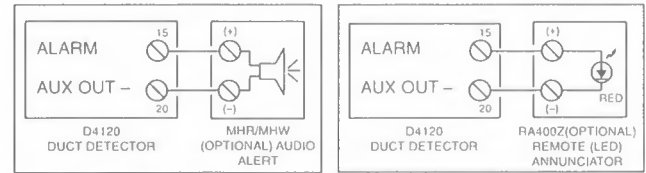
The RTS451/RTS151/RTS451KEY/RTS151KEY Remote Test Station facilitates test of the alarm capability of the duct smoke detector as indicated in the RTS451/RTS151/RTS451KEY/RTS151KEY manual. The D4120 duct smoke detector can be reset by the RTS451/RTS151/RTS451KEY/RTS151KEY. To install the RTS451/RTS151/RTS451KEY/RTS151KEY, connect the device as shown in Figure 13; wire runs must be limited to 25 ohms or less per interconnecting wire. If a system control panel is used, the panel itself may require testing.

[15.2] RTS2/RTS2-AOS MULTI-SIGNALING ACCESSORY

The RTS2 and RTS2-AOS multi-signaling accessories are designed for use with InnovairFlex 4-wire conventional duct smoke detectors only. The accessory has two bicolored LEDs that indicate the sensor status of up to two connected duct smoke detectors. The key switch on the unit can be used to select a connected duct detector sensor (either sensor 1 or sensor 2), and the selected sensor can be tested or both sensors can be reset simultaneously using the test/reset button. LED status indications include: Standby (green blink), Trouble (amber), Maintenance (amber blink) and Alarm (red).

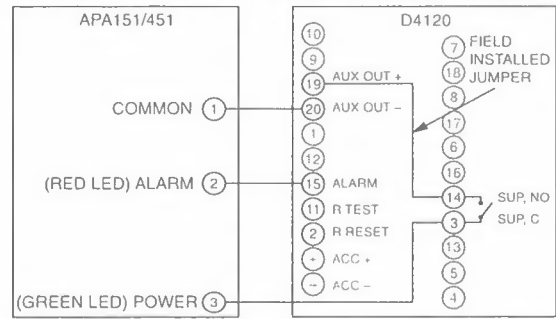
With the key switch selected, there is also the capability of obtaining a sensitivity measurement of the selected sensor using the SENS-RDR sensitivity reader (sold separately).

FIGURE 11. WIRING DIAGRAMS FOR OPTIONAL ACCESSORIES:



H0554-00

FIGURE 12. WIRING DIAGRAM FOR D4120 TO APA151 OR APA451:

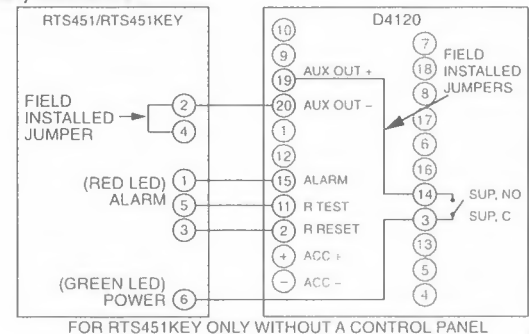


NOTE: WIRING DIAGRAM SHOWN IS FOR D4120 4-WIRE DUCT SMOKE DETECTOR SYSTEM EQUIPPED WITHOUT A CONTROL PANEL.

NOTE: A TROUBLE CONDITION IS INDICATED BY LOSS OF GREEN LED

H10584-02

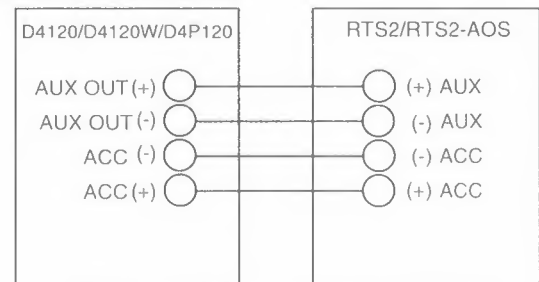
FIGURE 13. WIRING DIAGRAM FOR D4120 TO RTS451/RTS151/RTS-451KEY/RTS151KEY:



FOR RTS451KEY ONLY WITHOUT A CONTROL PANEL

H10582-17

FIGURE 14. WIRING DIAGRAM:



NOTE: If polarity of Acc. (+) and Acc. (-) are reversed, an Amber LED on sensor 2 of the duct smoke detector power board will exist indicating a trouble condition.

H10626-01

TABLE 3. DETECTOR STATUS INDICATION

NOTE: There are two LED's on the Power board D4P120, each indicating the Status of the two sensors connected. When there is only one sensor connected, LED2 will remain off.

Status	Description	LED Status		Status of Relays
		Sensor D4S	Power Board D4P120	
Sensor Initialization	At power-up or reset at the panel, the sensor will take approx 35 seconds to initialize. Also occurs if the sensor has been removed and restored in the base in the sensor housing.	RED Blink every 5 seconds	Alternating Green/amber every 1 second	Supervisory relay: Terminals 3 and 14 are closed. Alarm Relay: Terminals 4 and 5 are open. Aux Relay does not switch states:Terminals 6 and 16 are closed,Terminals 8 and 18 are closed
	Sensor is missing during the seven minute tamper Delay, if selected.	Off	Alternating Green/amber every 1 second	Supervisory relay: Terminals 3 and 14 are closed Alarm Relay: Terminals 4 and 5 are open. Aux Relay does not switch states:Terminals 6 and 16 are closed,Terminals 8 and 18 are closed
Maintenance	Sensor D4S is outside it's UL approved sensitivity limits and needs to be cleaned or replaced.	RED Blink every 5 seconds	Amber Blink every 5 seconds	Supervisory relay: Terminals 3 and 14 are closed. Alarm Relay: Terminals 4 and 5 are open Aux Relay does not switch states:Terminals 6 and 16 are closed,Terminals 8 and 18 are closed
Trouble	.Unit loses Power	Off	Off	Supervisory relay: Terminals 3 and 14 are open. Alarm Relay: Terminals 4 and 5 are open. Aux Relay does not switch states with no shutdown on Trouble selected: Terminals 6 and 16 are closed. Terminals 8 and 18 are closed. Aux Relay Switches states with shutdown on Trouble selected: Terminals 6 and 16 are open, Terminals 8 and 18 are open
	.Cover Tamper Delay times out	Green Blink every 5 seconds	Amber solid	
	.Wiring Problems between the Sensor and the Power Board	Off	Amber solid	
	.Mismatch between the number of sensors connected and the Dip Switch setting			
	1 sensor connected,2 selected	Green blink every 5 seconds on first sensor. No second sensor.	LED1 Green blink every 5 seconds LED2 Amber solid	
2 sensors connected,1 selected	Green blink every 5 seconds on first sensor. LED's off on second sensor	LED1 Green blink every 5 seconds LED2 Amber solid		
Alarm	Unit detects smoke	Solid Red	Solid Red	Supervisory relay: Terminals 3 and 14 are closed Alarm Relay: Terminals 4 and 5 are closed. Aux Relay switches states: Terminals 6 and 16 are open, Terminals 8 and 18 are open
Standby	Unit has Power and it is not in initialization, Trouble, Maintenance or Alarm.	Green Blink every 5 seconds	Green Blink every 5 seconds	Supervisory relay: Terminals 3 and 14 are closed Alarm Relay: Terminals 4 and 5 are open. Aux Relay does not switch states: Terminals 6 and 16 are closed, Terminals 8 and 18 are closed

NOTE: If any other visual indication is noted contact System Sensor technical support at 1-800-SENSOR2.

Please refer to insert for the Limitations of Fire Alarm Systems

THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for the enclosed product. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: Honeywell, 12220 Roias Drive, Suite 700, El Paso

TX 79936, USA. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



Indoor Selectable-Output Horns, Strobes, and Horn Strobes for Wall Applications

System Sensor L-Series audible visible notification products are rich with features guaranteed to cut installation times and maximize profits with lower current draw and modern aesthetics.

Features

- Updated Modern Aesthetics
- Small profile devices for Horns and Horn Strobes
- Plug-in design with minimal intrusion into the back box
- Tamper-resistant construction
- Automatic selection of 12- or 24-volt operation at 15 and 30 candela
- Field-selectable candela settings on wall units: 15, 30, 75, 95, 110, 135, and 185
- Horn rated at 88+ dBA at 16 volts
- Rotary switch for horn tone and two volume selections
- Mounting plate for all standard and all compact wall units
- Mounting plate shorting spring checks wiring continuity before device installation
- Electrically compatible with legacy SpectrAlert and SpectrAlert Advance devices
- Compatible with MDL3 sync module
- Strobes and Horn Strobes listed for wall mounting only
- Horns listed for wall or ceiling use

Agency Listings



The System Sensor L-Series offers the most versatile and easy-to-use line of horns, strobes, and horn strobes in the industry with lower current draws and modern aesthetics. With white and red plastic housings, standard and compact devices, and plain, FIRE, and FUEGO-printed devices, System Sensor L-Series can meet virtually any application requirement.

The L-Series line of wall-mount horns, strobes, and horn strobes include a variety of features that increase their application versatility while simplifying installation. All devices feature plug-in designs with minimal intrusion into the back box, making installations fast and foolproof while virtually eliminating costly and time-consuming ground faults.

To further simplify installation and protect devices from construction damage, the L-Series utilizes a universal mounting plate for all models with an onboard shorting spring, so installers can test wiring continuity before the device is installed.

Installers can also easily adapt devices to suit a wide range of application requirements using field-selectable candela settings, automatic selection of 12- or 24-volt operation, and a rotary switch for horn tones with two volume selections.

L-Series Specifications

Architect/Engineer Specifications

General

L-Series standard horns, strobes, and horn strobes shall mount to a standard 2 x 4 x 1⁷/₈-inch back box, 4 x 4 x 1¹/₂-inch back box, 4-inch octagon back box, or double-gang back box. L-Series compact products shall mount to a single-gang 2 x 4 x 1⁷/₈-inch back box. A universal mounting plate shall be used for mounting ceiling and wall products for all standard models and a separate universal mounting plate shall be used for mounting wall compact models. The notification appliance circuit wiring shall terminate at the universal mounting plate. Also, L-Series products, when used with the Sync•Circuit™ Module accessory, shall be powered from a non-coded notification appliance circuit output and shall operate on a nominal 12 or 24 volts. When used with the Sync•Circuit Module, 12-volt-rated notification appliance circuit outputs shall operate between 8.5 and 17.5 volts; 24-volt-rated notification appliance circuit outputs shall operate between 16.5 and 33 volts. Indoor L-Series products shall operate between 32 and 120 degrees Fahrenheit from a regulated DC or full-wave rectified unfiltered power supply. Strobes and horn strobes shall have field-selectable candela settings including 15, 30, 75, 95, 110, 135, and 185.

Strobe

The strobe shall be a System Sensor L-Series Model _____ listed to UL 1971 and shall be approved for fire protective service. The strobe shall be wired as a primary-signaling notification appliance and comply with the Americans with Disabilities Act requirements for visible signaling appliances, flashing at 1 Hz over the strobe's entire operating voltage range. The strobe light shall consist of a xenon flash tube and associated lens/reflector system.

Horn Strobe Combination

The horn strobe shall be a System Sensor L-Series Model _____ listed to UL 1971 and UL 464 and shall be approved for fire protective service. The horn strobe shall be wired as a primary-signaling notification appliance and comply with the Americans with Disabilities Act requirements for visible signaling appliances, flashing at 1 Hz over the strobe's entire operating voltage range. The strobe light shall consist of a xenon flash tube and associated lens/reflector system. The horn shall have two audibility options and an option to switch between a temporal three pattern and a non-temporal (continuous) pattern. These options are set by a multiple position switch. The horn on horn strobe models shall operate on a coded or non-coded power supply.

Synchronization Module

The module shall be a System Sensor Sync•Circuit model MDL3 listed to UL 464 and shall be approved for fire protective service. The module shall synchronize Strobes at 1 Hz and horns at temporal three. Also, while operating the strobes, the module shall silence the horns on horn strobe models over a single pair of wires. The module shall mount to a 4¹/₁₆ x 4¹/₁₆ x 2¹/₈-inch back box. The module shall also control two Style Y (class B) circuits or one Style Z (class A) circuit. The module shall synchronize multiple zones. Daisy chaining two or more synchronization modules together will synchronize all the zones they control. The module shall not operate on a coded power supply.

Physical/Electrical Specifications

Standard Operating Temperature	32°F to 120°F (0°C to 49°C)
Humidity Range	10 to 93% non-condensing
Strobe Flash Rate	1 flash per second
Nominal Voltage	Regulated 12 DC or regulated 24 DC/FWR ¹
Operating Voltage Range ²	8 to 17.5 V (12 V nominal) or 16 to 33 V (24 V nominal)
Operating Voltage Range MDL3 Sync Module	8.5 to 17.5 V (12 V nominal) or 16.5 to 33 V (24 V nominal)
Input Terminal Wire Gauge	12 to 18 AWG
Wall-Mount Dimensions (including lens)	5.6" L x 4.7" W x 1.91" D (143 mm L x 119 mm W x 49 mm D)
Compact Wall-Mount Dimensions (including lens)	5.26" L x 3.46" W x 1.91" D (133 mm L x 88 mm W x 49 mm D)
Horn Dimensions	5.6" L x 4.7" W x 1.25" D (143 mm L x 119 mm W x 32 mm D)
Compact Horn Dimensions	5.25" L x 3.45" W x 1.25" D (133 mm L x 88 mm W x 32 mm D)

1. Full Wave Rectified (FWR) voltage is a non-regulated, time-varying power source that is used on some power supply and panel outputs.
2. Strobe products will operate at 12 V nominal only for 15 cd and 30 cd.

UL Current Draw Data

UL Max. Strobe Current Draw (mA RMS)				
Candela Range	Candela	8–17.5 Volts		
		DC	DC	FWR
Candela Range	15	88	43	60
	30	143	63	83
	75	N/A	107	136
	95	N/A	121	155
	110	N/A	148	179
	135	N/A	172	209
	185	N/A	222	257

UL Max. Horn Current Draw (mA RMS)				
Sound Pattern	dB	8–17.5 Volts		
		DC	DC	FWR
Temporal	High	39	44	54
Temporal	Low	28	32	54
Non-Temporal	High	43	47	54
Non-Temporal	Low	29	32	54
3.1 KHz Temporal	High	39	41	54
3.1 KHz Temporal	Low	29	32	54
3.1 KHz Non-Temporal	High	42	43	54
3.1 KHz Non-Temporal	Low	28	29	54
Coded	High	43	47	54
3.1 KHz Coded	High	42	43	54

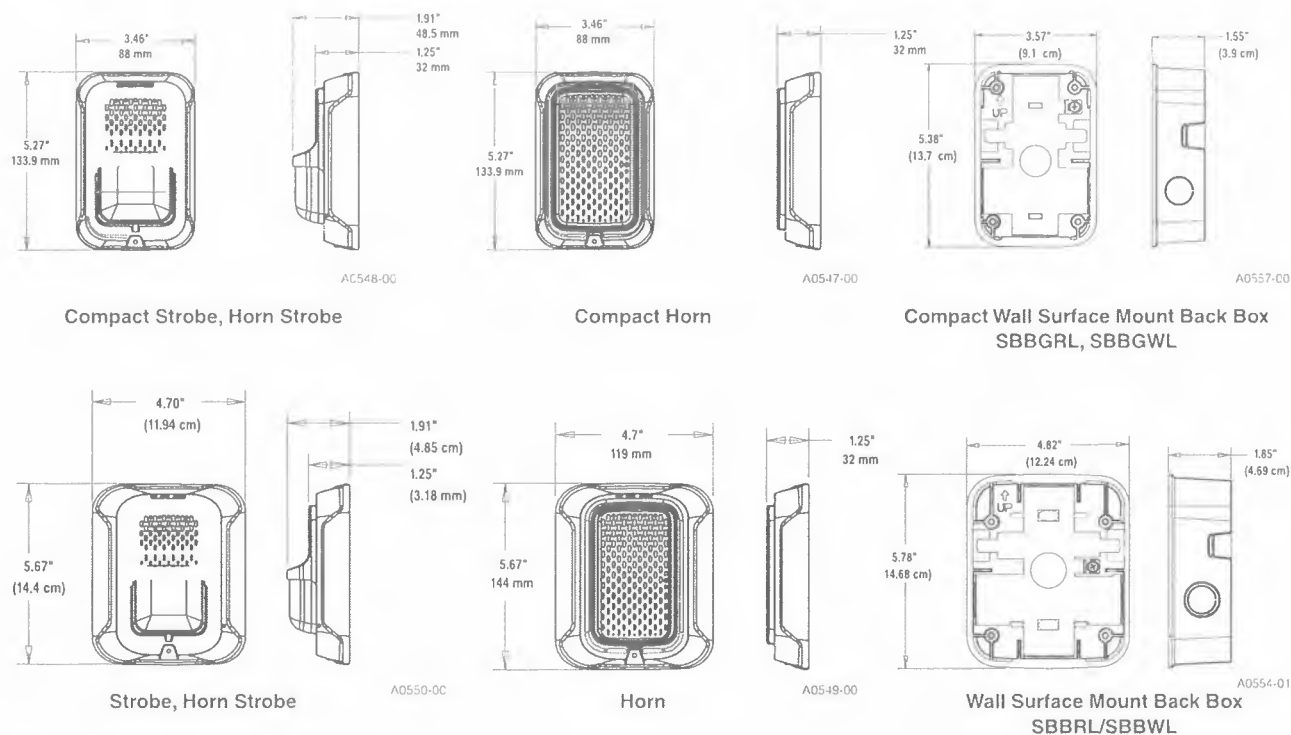
UL Max. Current Draw (mA RMS), Wall Horn Strobe, Candela Range (15–185 cd)									
DC Input	8–17.5 Volts			16–33 Volts					
	15cd	30cd	15cd	30cd	75cd	95cd	110cd	135cd	185cd
Temporal High	98	158	54	74	121	142	162	196	245
Temporal Low	93	154	44	65	111	133	157	184	235
Non-Temporal High	106	166	73	94	139	160	182	211	262
Non-Temporal Low	93	156	51	71	119	139	162	190	239
3.1K Temporal High	93	156	53	73	119	140	164	190	242
3.1K Temporal Low	91	154	45	66	112	133	160	185	235
3.1K Non-Temporal High	99	162	69	90	135	157	175	208	261
3.1K Non-Temporal Low	93	156	52	72	119	138	162	192	242
FWR Input	16–33 Volts								
	15cd	30cd	75cd	95cd	110cd	135cd	185cd		
Temporal High	83	107	156	177	198	234	287		
Temporal Low	68	91	145	165	185	223	271		
Non-Temporal High	111	135	185	207	230	264	316		
Non-Temporal Low	79	104	157	175	197	235	283		
3.1K Temporal High	81	105	155	177	196	234	284		
3.1K Temporal Low	68	90	145	166	186	222	276		
3.1K Non-Temporal High	104	131	177	204	230	264	326		
3.1K Non-Temporal Low	77	102	156	177	199	234	291		

Horn Tones and Sound Output Data

Horn and Horn Strobe Output (dBA)					
Switch Position	Sound Pattern	dB	8–17.5	16–33	
			Volts	Volts	FWR
1	Temporal	High	84	89	89
2	Temporal	Low	75	83	83
3	Non-Temporal	High	85	90	90
4	Non-Temporal	Low	76	84	84
5	3.1 KHz Temporal	High	83	88	88
6	3.1 KHz Temporal	Low	76	82	82
7	3.1 KHz Non-Temporal	High	84	89	89
8	3.1 KHz Non-Temporal	Low	77	83	83
9*	Coded	High	85	90	90
10*	3.1 KHz Coded	High	84	89	89

* Settings 9 and 10 are not available on 2-wire horn strobes. Temporal coding must be provided by the NAC. If the NAC voltage is held constant, the horn output remains constantly on.

L-Series Dimensions



L-Series Ordering Information

Model	Description
Wall Horn Strobes	
P2RL	2-Wire, Horn Strobe, Red
P2WL	2-Wire, Horn Strobe, White
P2GRL	2-Wire, Compact Horn Strobe, Red
P2GWL	2-Wire, Comp 2 fils act Horn Strobe, White
P2RL-P	2-Wire, Horn Strobe, Red, Plain
P2WL-P	2-Wire, Horn Strobe, White, Plain
P2RL-SP	2-Wire, Horn Strobe, Red, FUEGO
P2WL-SP	2-Wire, Horn Strobe, White, FUEGO
P4RL	4-Wire, Horn Strobe, Red
P4WL	4-Wire, Horn Strobe, White
Wall Strobes	
SRL	Strobe, Red
SWL	Strobe, White
SGRL	Compact Strobe, Red
SGWL	Compact Strobe, White
SRL-P	Strobe, Red, Plain
SWL-P	Strobe, White, Plain
SRL-SP	Strobe, Red, FUEGO
SWL-CLR-ALERT	Strobe, White, ALERT

Model	Description
Horns*	
HRL*	Horn, Red
HWL*	Horn, White
HGRL*	Compact Horn, Red
HGWL*	Compact Horn, White
Accessories	
TR-2	Universal Wall Trim Ring Red
TR-2W	Universal Wall Trim Ring White
SBBRL	Wall Surface Mount Back Box, Red
SBBWL	Wall Surface Mount Back Box, White
SBBGRL	Compact Wall Surface Mount Back Box, Red
SBBGWL	Compact Wall Surface Mount Back Box, White

Notes:

All -P models have a plain housing (no "FIRE" marking on cover).
 All -SP models have "FUEGO" marking on cover.
 All -ALERT models have "ALERT" marking on cover.
 *Horn-only models are listed for wall or ceiling use.



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