FIRE-COMM

FIRE & COMMUNICATIONS SYSTEMS

DESCRIPTIVE LITERATURE LIST

FOR THE REPAIR OR REPLACEMENT OF THE

FIRE ALARM SYSTEM

GUAM PUBLIC SCHOOL SYSTEM

May 26, 2009

FACS Inc. dba FIRE-COMM

GENERAL TERMS AND CONDITIONS OF SALE

No terms conditions, deletions, modification, or other understandings, oral or written, in any way purporting to vary these terms and conditions, whether contained in Purchasers forms or elsewhere, shall be binding upon Fire & Communications Systems (FACS Inc. dba FIRE-COMM), unless approved in writing and signed at its offices in Dededo, Guam.

ANY TERMS INCONSISTENT WITH THOSE HEREIN WHICH APPEAR ON BUYERS FORMAL PURCHASE WILL NOT BIND ON SELLER.

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1. **VALIDITY PERIOD**: This Quotation is valid for 30 days, but cancelable in the event of causes beyond the control of FIRE-COMM.

2. **LIMITATION OF WARRANTY AND REMEDIES**: Subject to the limitations below, the manufacturer and FIRE-COMM warrants all products to be free from defects in materials and workmanship for a period of one year from the date of the first beneficial use of all or any part of the system or after equipment shipment as determined by FIRE-COMM provided, however that FIRE-COMM's liability under said warranty shall be limited to the replacement, at its option, of any product, or parts thereof, which FIRE-COMM determines to be defective. FIRE-COMM's warranty repair service is limited to one year after the date of sale subject to the limitations below. **THIS WARRANTY DOES NOT APPLY TO ANY PRODUCT WHICH HAVE BEEN SUBJECTED TO ABUSE, MISHANDLING, OR IMPROPER USE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

   FIRE-COMM SHALL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL, ECONOMIC, OR CONSEQUENTIAL LOSS OR DAMAGE TO THE PURCHASER OR USER OF THIS EQUPIMENT ARISING OUT OF THE FAILURE OF THE EQUIPMENT TO OPERATE.

   WARRANTY SERVICE REQUESTED TO BE PERFORMED AT OTHER THAN DURING FIRE-COMM' NORMAL WORK HOURS 8:00 AM TO 5:00 PM LOCAL TIME, MONDAY THROUGH FRIDAY EXCLUSIVE OF FIRE-COMM's RECOGNIZED HOLIDAYS SHALL BE CHARGEABLE AT FIRE-COMM' STANDARD OVERTIME RATE IN EFFECT AT THE TIME.

3. **INDEMNITY:** The purchaser agrees to indemnify and hold FIRE-COMM harmless for any expense or loss arising out of or resulting from construction site damage or the faulty or negligent installation of the equipment by the Purchaser or Installer.

4. **LIABILITY:** FIRE-COMM shall not be liable for loss or damage of any kind resulting from delay or inability to deliver on account of fire, typhoon, labor problems, accidents, acts of civil or military authorities, or from any causes beyond FIRE-COMM's control.

5. **GENERAL:** Any provision of a contract resulting from this quotation prohibited by the law of any state shall, as to such state, be ineffective to the extent of such prohibition without invalidating the remaining provisions of the contract. FIRE-COMM shall nor be bound by statements or promises made by any representative of FIRE-COMM which are not stated in and made a part of this quotation. Any contract resulting from this quotation shall be construed under the law of the Government of Guam.

7. **TAXES, LICENSES AND PERMITS:** The Purchaser is responsible for obtaining all licenses and permits.

7. **Shipment:** All equipment is shipped FOB Factory unless otherwise noted on quotation.

8. **CANCELLATION**: In the event that the Purchaser cancels any order resulting from this quotation without just cause he shall be liable to FIRE-COMM for an amount equal to twenty five percent (25%) of the value of the order. This amount shall be construed as **LIQUIDATED DAMAGES** representing an approximation of all administrative, engineering, and other costs incurred by FIRE-COMM in reliance upon the order; not as penalty. FIRE-COMM's rights under this clause shall be in addition to all other rights and remedies available to it in law or equity and shall not be construed as to limit FIRE-COMM's damages in any way recoverable as a result of Purchaser's breach.

9. **ALTERATIONS BY PURCHASER:** All repairs or adjustments that are or may become necessary under the warranty provisions of this quotation shall be performed only by an authorized representative of FIRE-COMM. Any repairs, adjustments, or interconnections performed by the Purchaser or at the purchaser's request by anyone other than an authorized representative of FIRE-COMM shall **VOID ALL WARRANTIES** contained herein.

10. **DRAWINGS:** All drawing and wiring diagrams provided by FIRE-COMM in connection with the quoted project are:

    A. Protected under the United States Copyright Laws.

    B. Prepared in accordance with what FIRE-COMM judges to be good design practice.

    C. Intended solely for the use of the installing contractor as a guide for the fabrication and installation of the system.

11. **INSTALLATION:** The installation of the proposed equipment is **NOT** included unless specifically stated on this quotation.

12. **FIRE-COMM TECHNICAL INSTALLER SUPPORT (TIS)** includes the following activities by a trained technician when determined by FIRE-COMM to be appropriate.

    - Preconstruction review of submits and drawings.
    - Technical advise during initial start up of control panels before installer wiring is connected.
    - Review of panel connections and preparation of a list of items to be corrected by the installer.
    - Program editing to correct minor errors and omissions.
    - Assistance with one functional test of the system.
    - One training session for the owner's representatives.

13. **PAYMENT TERMS**: Payment Terms as noted on facing page or net 30 days from date of invoice where satisfactory open account credit is established FIRE-COMM reserves the right to revoke or modify any credit at its sole discretion. Purchaser agrees to pay each invoice when due. In the event that Purchaser defaults on its obligation to pay each invoice when due, then in addition to all other rights and remedies available to it, FIRE-COMM shall have the option to withhold any further shipments of material and/or the provision of any services, including TIS, until Purchaser's account is fully paid. Further, in the event payment is not received according to terms, FIRE-COMM may at its discretion, assess interest at the rate of 1-1/2% per month or the maximum rate allowed by law, whichever is lower. Purchaser also agrees to pay reasonable legal fees or agency commissions sustained by FIRE-COMM in pursuit of payment which is past due.

SILENT KNIGHT

Fire Systems Group
Honeywell
7550 Meridian Circle
Maple Grove, MN 55369-4927

763-493-6400
Fax 763-493-6475

Effective May 11, 2006

Limited Warranty

SILENT KNIGHT warrants products manufactured by it to be free from defects in materials and workmanship for eighteen (18) months from the date of manufacture, under normal use and service. Products are date stamped at time of manufacture. The sole and exclusive obligation of SILENT KNIGHT is to repair or replace, at its option, free of charge for parts and labor, any part that is defective in materials or workmanship under normal use and service. **All returns for credit are subject to inspection and testing at the factory before actual determination is made to allow credit**. SILENT KNIGHT does not warrant products not manufactured by it, but assigns to the purchaser any warranty extended by the manufacturer of such products. This warranty is void if the product is altered or repaired by anyone other than SILENT KNIGHT or as expressly authorized by SILENT KNIGHT in writing, or is serviced by anyone other than SILENT KNIGHT or its authorized distributors. This warranty is also void if there is a failure to maintain the products and systems in which they operate in a proper and workable manner. In case of defect, secure a Return Material Authorization form from our Return Authorization Department.

This writing constitutes the only warranty made by SILENT KNIGHT, with respect to its products. SILENT KNIGHT , does not represent that its products will prevent any loss by fire or otherwise, or that its products will in all cases provide the protection for which they are installed or intended. Buyer acknowledges that SILENT KNIGHT, is not an insurer and assumes no risk for loss or damages or the cost of any inconvenience, transportation damage, misuse, abuse, accident or similar incident.

SILENT KNIGHT GIVES NO WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR OTHERWISE WHICH EXTENDS BEYOND THE DESCRIPTION ON THE FACE HEREOF. UNDER NO CIRCUMSTANCES SHALL SILENT KNIGHT BE LIABLE FOR ANY LOSS OF OR DAMAGE TO PROPERTY, DIRECT, INCIDENTAL OR CONSEQUENTIAL, ARISING OUT OF THE USE OF, OR INABILITY TO USE SILENT KNIGHT ALARM'S PRODUCTS. FURTHERMORE, SILENT KNIGHT SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY OR DEATH WHICH MAY ARISE IN THE COURSE OF, OR AS A RESULT OF, PERSONAL, COMMERCIAL OR INDUSTRIAL USE OF ITS PRODUCTS.

This warranty replaces all previous warranties and is the only warranty made by SILENT KNIGHT. No increase or alteration, written or verbal, of the obligation of this warranty is authorized.

May 11, 2006

ANY MATERIAL EXTRAPOLATED FROM THIS DOCUMENT OR FROM WHEELOCK MANUALS OR OTHER DOCUMENTS DESCRIBING THE PRODUCT FOR USE IN PROMOTIONAL OR ADVERTISING CLAIMS, OR FOR ANY OTHER USE, INCLUDING DESCRIPTION OF THE PRODUCT'S APPLICATION, OPERATION, INSTALLATION AND TESTING IS USED AT THE SOLE RISK OF THE USER AND WHEELOCK WILL NOT HAVE ANY LIABILITY FOR SUCH USE.

Limited Warranty

Wheelock products must be used within their published specifications and must be PROPERLY specified, applied, installed, operated, maintained and operationally tested in accordance with these instructions at the time of installation and at least twice a year or more often and in accordance with local, state and federal codes, regulations and laws. Specification, application, installation, operation, maintenance and testing must be performed by qualified personnel for proper operation in accordance with all of the latest National Fire Protection Association (NFPA), Underwriters' Laboratories (UL), Underwriters' Laboratories of Canada (ULC), National Electrical Code (NEC), Occupational Safety and Health Administration (OSHA), local, state, county, province, district, federal and other applicable building and fire standards, guidelines, regulations, laws and codes including, but not limited to, all appendices and amendments and the requirements of the local authority having jurisdiction (AHJ). Wheelock products when properly specified, applied, installed, operated, maintained and operationally tested as provided above are warranted against mechanical and electrical defects for a period of three years from date of manufacture (as determined by date code). Correction of defects by repair or replacement shall be at Wheelock's sole discretion and shall constitute fulfillment of all obligations under this warranty. THE FOREGOING LIMITED WARRANTY SHALL IMMEDIATELY TERMINATE IN THE EVENT ANY PART NOT FURNISHED BY WHEELOCK IS INSTALLED IN THE PRODUCT. THE FOREGOING LIMITED WARRANTY SPECIFICALLY EXCLUDES ANY SOFTWARE REQUIRED FOR THE OPERATION OF OR INCLUDED IN A PRODUCT. WHEELOCK MAKES NO REPRESENTATION OR WARRANTY OF ANY OTHER KIND, EXPRESS, IMPLIED OR STATUTORY WHETHER AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER MATTER.

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IN NO CASE WILL WHEELOCK'S LIABILITY EXCEED THE PURCHASE PRICE PAID FOR A PRODUCT.

Limitation of Liability

WHEELOCK'S LIABILITY ON ANY CLAIM OF ANY KIND, INCLUDING NEGLIGENCE AND BREACH OF WARRANTY, FOR ANY LOSS OR DAMAGE RESULTING FROM, ARISING OUT OF, OR CONNECTED WITH THIS CONTRACT, OR FROM THE MANUFACTURE, SALE, DELIVERY, RESALE, REPAIR OR USE OF ANY PRODUCT COVERED BY THIS ORDER SHALL BE LIMITED TO THE PRICE APPLICABLE TO THE PRODUCT OR PART THEREOF WHICH GIVES RISE TO THE CLAIM. WHEELOCK'S LIABILITY ON ANY CLAIM OF ANY KIND SHALL CEASE IMMEDIATELY UPON THE INSTALLATION IN THE PRODUCT OF ANY PART NOT FURNISHED BY WHEELOCK. IN NO EVENT SHALL WHEELOCK BE LIABLE FOR ANY CLAIM OF ANY KIND UNLESS IT IS PROVEN THAT OUR PRODUCT WAS A DIRECT CAUSE OF SUCH CLAIM. FURTHER, IN NO EVENT, INCLUDING IN THE CASE OF A CLAIM OF NEGLIGENCE, SHALL WHEELOCK BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE PRECEDING LIMITATION MAY NOT APPLY TO ALL PURCHASERS.

4/01

FIRE-COMM

FIRE & COMMUNICATIONS SYSTEMS

GUAM PUBLIC SCHOOL SYSTEM

ITEM	*QTY*	*MAKER*	*MODEL*	*DESCRIPTION*
1.		Honeywell Farenhyt / Silent Knight	IFP-1000	Analog-Addressable Fire Alarm Panel Max 1016 Points
2.		" " "	IFP-100	Analog-Addressable Fire Alarm Panel Max 127 Points
3.		" " "	5815XL	Signal Line Circuit Expander, 127 Points
4.		" " "	5896	NAC Booster Panel
5.		" " "	RA-100	Remote LCD Annunciator

PERIPHERAL DEVICES

ITEM	*QTY*	*MAKER*	*MODEL*	*DESCRIPTION*
6.	6	Honeywell Farenhyt / Silent Knight	IDP-PULL	Addressable Pull Station, Single Action
7a.		" " "	IDP-6AB	Addressable Detector Base 6"
7b.		" " "	IDP-PHOTO	Analog / Addressable Smoke Detector Head, Photoelectric
7c.		" " "	IDP-HEAT	Analog / Addressable Heat Detector Head
8.		" " "	IDP-PDUCT	Addressable Duct Detector Housing
9.		" " "	IDP-NINIMON	Addressable Monitor Module
10.		" " "	IDP-RELAY	Addressable Relay Module
11.		" " "	IDP-ZONE	Addressable Zone Module, Monitors One IDC Circuit
12.		" " "	IDP-ZONE-6	Addressable Zone Module, Monitors Six IDC Circuits
13.		" " "	IDP-CONTROL	Addressable Control Module, Notification Circuit Expander
14.		" " "	SS2W-B	Conventional Smoke Detector, Photoelectric with Base
15.		" " "	SS5603	Conventional Heat Detector Fixed Temp. 135 Degrees
16.		Cooper - Wheelock	ZRS-24MCW-FR	Visual Only Strobe, 24vdc, Multi-Candela, Wall Mt, Red
17.		Cooper - Wheelock	NS-24MCW.FR	Audio-Visual Horn Strobe, 24vdc, Multi-CD, Wall Mt, Red
18		Cooper - Wheelock	ASWP-2475W-FR	Audio-Visual Horn Strobe, 24vdc, Weatherproof, Wall Mt, Red

Farenhyt

IFP-1000/IFP-1000HV

Analog/Addressable Fire Alarm Control System

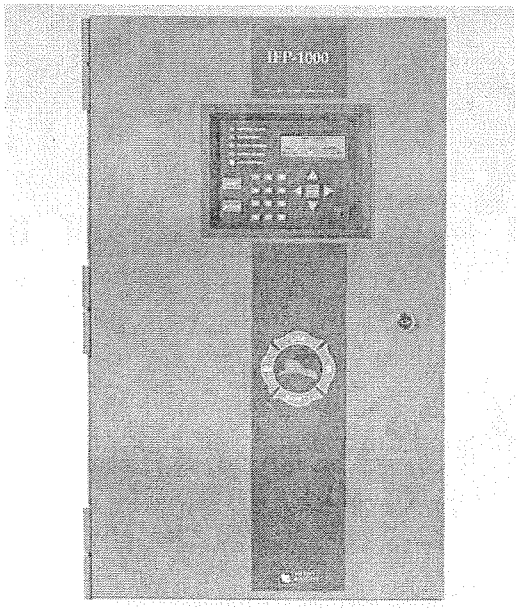
The IFP-1000 and IFP-1000HV are intelligent analog/addressable fire alarm control panels (FACPs). The basic IFP-1000 system has one signal line circuit (SLC) loop that supports up to seven 5815XL signal line circuit expanders.The IFP-1000HV offers the same functionality and features as the IFP-1000 but is configured for 240 VAC operation.

IFP-1000/HV has six on-board Flexput™ circuits that can be configured for auxiliary power, notification outputs, or for conventional smoke detector inputs (Class A or Class B). The FACP also has a built-in, dual-line digital fire communicator, Form C trouble relay, and two programmable Form C relays. The firmware has powerful features such as detector sensitivity, day/night thresholds, drift compensation, pre-trouble maintenance alert, and calibration trouble alert.

IFP-1000/HV supports a variety of devices, including RA-1000 remote annunciator, 5824 serial/parallel printer interface module (for printing system reports), RPS-1000 intelligent power module, and Hochiki or Intelligent Device Protocol (IDP) devices.

FM APPROVED

MEA 429-92-E Vol. VI



IFP-1000

Features

- Built-in support for up to 127 Hochiki devices or 99 IDP detectors and 99 IDP modules, expandable to 1016 Hochiki devices or 792 IDP detectors and 792 IDP modules
- Uses standard wire—no shielded or twisted pair required
- Built-in UL listed digital communicator for remote reporting of system activity and system programming
- Central station reporting by point or by zone
- Supports Class B (Style 4) and Class A (Style 6 or Style 7) configuration for SLC, and SBUS
- Distributed, intelligent power
- Sensor sensitivity settings, day/night sensitivity setting and automatic drift compensation
- Flexput™ I/O circuits configurable for auxiliary power, notification outputs, or conventional smoke detector inputs. Notification circuits can be configured as Class A (Style Z) or Class B (Style Y). 2- and 4-wire smoke detectors can be configured as Class A (Style D) or Class B (Style B)
- Built-in annunciator with a backlit 80-character LCD display
- RS-485 bus provides communication to system accessories
- Built-in RS-232 and USB interface for programming
- Upload or download programming, event history, or detector status onsite or from a remote location using a PC and 5650/5651 Silent Knight Software Suite (SKSS)
- Improvements in SKSS delivers five times faster upload/downloads
- Built-in Form C trouble relay rated at 2.5 amps at 27.4 VDC
- Two built-in Form C programmable relays rated at 2.5 amps at 27.4 VDC
- Individual addressable devices can be tested
- SLC device locator can locate a single or multiple devices on a SLC loop
- System automatically tests addressable devices
- 13 preset notification cadence patterns (including ANSI 3.41) and four user programmable patterns
- Programmable to automatically display initial event first or display tally of system events
- Built-in synchronization for appliances from AMSECO, Gentex®, Faraday, System Sensor®, and Wheelock®
- Acknowledge function allows operator to keep track of event status
- Jumpstart® auto-programming
- Modular design
- Nonvolatile event history stores up to 1000 events
- 125 software zones and 250 output groups
- 6 amp power supply and maximum charging capacity of 35 amp hours (An additional cabinet enclosure is required for batteries in excess of 18 amp hours)
- Programmable date setting for Daylight Saving Time
- Plex-1 door option combines a dead front cabinet door with a clear window, limiting access to the panel while providing single button operation of the reset and silence functions

SILENT KNIGHT by Honeywell

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P/N 350093 Rev H 04/21/06

Installation

The IFP-1000/HV can be surface or flush mounted.

Compatibility

The IFP-1000/HV SLC supports multiple device types of the *same* protocol:

- Hochiki
- IDP

You cannot mix Hochiki and IDP devices on a FACP. However, any combination of addressable devices of the same protocol can be used on the IFP-1000/HV.

Specifications

Physical

Flush Mount Dimensions: 14.5"W x 24.75"H x 3.9"D (36.8 W x 62.9 H x 9.8 D cm)

Overall Dimensions: 16.2"W x 26.4"H x 4.2"D (40.6 W x 67 H x 11.8 D cm)

Weight: 28 lbs. (12.8 kg)

Color: Red

Environmental

Operating Temperature: 32°F – 120°F (0°C – 49°C)

Humidity: 10% – 93% non-condensing

Electrical

IFP-1000 Primary AC: 120 VRMS @ 50/60 Hz, 2.7A
IFP-1000HV Primary AC: 240 VRMS @ 50/60 Hz, 1.4A

Total Accessory Load: 6A @ 27.4 VDC power-limited

Standby Current: 140 mA

Alarm Current: 260 mA

Battery Charging Capacity: 7 to 35 AH

Battery Size: 18 AH max. allowed in control panel cabinet. Larger capacity batteries can be housed in RBB accessory cabinet.

Flexput Circuits

Six circuits that can be programmed individually as:
Notification Circuits: 3A per circuit @ 27.4 VDC, power-limited
Auxiliary Power Circuits: 3A per circuit @ 27.4 VDC, power-limited
Initiation Circuit: 100 mA per circuit @ 27.4 VDC, power-limited

Indicator Lights

General Alarm (Red): Flashes when in alarm; solid when alarm silenced

Supervisory (Yellow): Flashes when a supervisory condition exists; solid when supervisory silenced

System Troubles (Yellow): Flashes when a trouble condition exists; solid when trouble silenced

System Silenced (Yellow): On when an alarm, trouble or supervisory condition has been silenced but not yet cleared

System Power (Green): Flashes for AC failure; solid when power systems are normal

Telephone

Requirements: FCC Part 15 & Part 68 approved

Jack: RJ31X (two required)

Approvals

NFPA 13, NFPA 15, NFPA 16, NFPA 70, &
NFPA 72: Central Station; Remote Signalling; Local Protective Signalling Systems; Auxiliary Protected Premises Unit; & Water Deluge Releasing Service. Suitable for automatic, manual, waterflow, sprinkler supervisory (DACT non-coded) signalling services.

Other Approvals: UL Listed; CSFM 7170-0559: 135; MEA 429-92-E Vol. VI; FM Approved

Ordering Information

IFP-1000	Intelligent Fire Alarm Control Panel.
IFP-1000HV	Intelligent Fire Alarm Control Panel. High voltage (240 VAC).

SBUS Accessories

RA-100	Remote Annunciator. Similar in operation and appearance to FACP annunciator. Gray.
RA-100R	Remote Annunciator. Similar in appearance and operation to FACP annunciator. Red.
RA-1000	Remote Annunciator. Four line LCD annunciator with 20 characters per line.
5815XL	Signal Line Circuit (SLC) Expander.
RPS-1000	Intelligent Power Module.
5496	Intelligent Power Module.
5824	Serial/Parallel Printer Interface Module.
5880	LED I/O Module.
5865-3 & 5865-4	LED Fire Annunciators.
5883	Relay Interface Board.

Hochiki and IDP Devices

See the specification sheets listed below for a complete listing of the Hochiki and IDP devices.

350360	Hochiki Devices Specification Sheet
350361	Intelligent Device Protocol Devices Specification Sheet

Miscellaneous Accessories

5650/5651	Silent Knight Software Suite. Provides programming, upload/download, and event reporting.
5670	Silent Knight Software Suite. Provides facility monitoring.
Plex-1	Door Accessory. Dead front cabinet door with clear window to limit access to panel.
RBB	Remote Battery Box Accessory Cabinet. Use if backup batteries are too large to fit into FACP cabinet. Dimensions: 16" W x 10" H x 6" D (406 mm W x 254 mm H x 152 mm D)

SILENT KNIGHT
by Honeywell

For more information, contact Silent Knight 7550 Meridian Circle Suite 100, Maple Grove, Mn 55369-4927. Phone: (800) 328-0103, Fax: (763) 493-6475.

Made in the U.S.A.

Farenhyt

Single Loop Analog/Addressable Fire Alarm Control System

MEA
429-92-E Vol. XIV

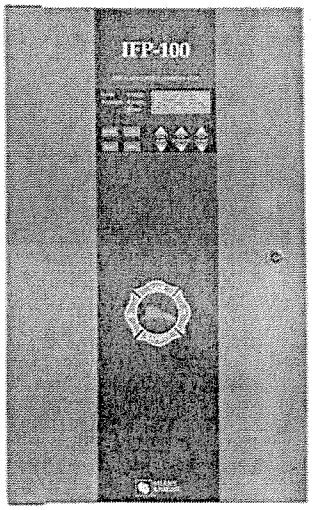
IFP-100

IFP-100 is an intelligent analog/addressable fire control panel. The basic IFP-100 system has a single SLC loop and four notification appliance circuits that can be programmed for notification outputs or auxiliary power. IFP-100 also has a built-in dual line digital fire communicator, Form C trouble relay, and two programmable Form C relays. The firmware has powerful features, such as detector sensitivity, day/night thresholds, drift compensation and pre-trouble maintenance alert.

IFP-100 supports a variety of other devices that can be added to the system such as RA-100 remote annunciator, 5824 serial/parallel printer interface module (for printing system reports), and 5496 intelligent power module, and Hochiki or Intelligent Device Protocol (IDP) devices.

Features

- Built-in support for up to127 Hochiki devices or 99 IDP detectors and 99 IDP modules
- Uses standard wire—no shielded or twisted pair required
- Built-in digital communicator for remote reporting of system activity and system programming
- Central station reporting by point or by zone
- Jumpstart® auto-programming
- Supports Class B (Style 4) and Class A (Style 6 or Style 7) configuration for SLC
- Distributed, intelligent power
- Built-in synchronization for AMSECO, Gentex®, Faraday, System Sensor®, and Wheelock® appliances
- Sensor sensitivity settings and day/night sensitivity setting
- Automatic drift compensation
- Notification circuits configurable as 2 Class A (Style Z), 4 Class B (Style Y), or auxiliary power for resettable, constant, or door holder power
- Built-in annunciator with a backlit 80-character LCD display
- RS-485 bus provides communication to system accessories
- Built-in Form C trouble relay rated at 2.5 amps at 27.4 VDC
- Two built-in Form C programmable relays rated at 2.5 amps at 27.4 VDC
- SLC device locator can be used to locate a single or multiple devices on a SLC loop
- System automatically performs detector sensitivity test
- 13 preset notification cadence patterns (including ANSI 3.41) and four user programmable patterns
- Built-in RS-232 and USB interface for programming
- Upload or download programming, event history, or detector status onsite or from a remote location using a PC and 5650/5651 Silent Knight Software Suite (SKSS)
- Improvements in SKSS deliver five times faster upload/downloads
- Non volatile event history stores up to 1000 events
- 125 Software zones and 125 output groups



IFP-100

- 6 amp power supply and maximum charging capacity of 35 amp hours (An additional cabinet enclosure is required for batteries in excess of 18 amp hours)
- Integrated dead front panel protects operator from exposure to electrical components
- The FACP enclosure features a Plexiglass® viewing window to protect annunciator
- Programmable to automatically display oldest event first or display tally of system events
- Acknowledge function allows operator to keep track of event status
- Programmable date setting for Daylight Saving Time

Installation

The IFP-100 can be surface or flush mounted.

SILENT KNIGHT
by Honeywell

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P/N 350388 Rev E 04/21/06

Compatibility

The IFP-100 SLC supports multiple device types of the *same* protocol:

- Hochiki
- IDP

You cannot mix Hochiki and IDP devices on a FACP. However, any combination of addressable devices of the same protocol can be used on the IFP-100.

See Hochiki Devices specification sheet (PN 350360) and IDP Device Protocol Devices specfication sheet (PN 350361) for more information.

Specifications

Physical

Flush Mount Dimensions: 14.5"W x 24.75"H x 3.5"D (36.8 W x 62.9 H x 8.73 D cm)

Overall Dimensions: 16"W x 26.4"H x 4.65"D (40.6 W x 67 H x 11.8 D cm)

Weight: 28 lbs. (12.8 kg)

Color: Red

Environmental

Operating Temperature: 32°F – 120°F (0°C – 49°C)

Humidity: 10% – 93% non-condensing

Electrical

Primary AC: 120 VRMS @ 50/60 Hz, 2.5A

Total Accessory Load: 6A @ 27.4 VDC power-limited

Standby Current: 170 mA

Alarm Current: 325 mA

Battery Charging Capacity: 7 to 35 AH

Battery Size: 18 AH max. allowed in control panel cabinet. Larger capacity batteries can be housed in RBB accessory cabinet.

Notification Appliance Circuits

Four circuits that can be programmed individually as:
Notification Circuits: 3A per circuit @ 27.4 VDC, power-limited
Auxiliary Power Circuits: 3A per circuit @ 27.4 VDC, power-limited

Indicator Lights

Alarm (Red): Flashes when in alarm; solid when alarm silenced

Supervisory (Yellow): Flashes when a supervisory condition exists; solid when supervisory silenced

Trouble (Yellow): Flashes when a trouble condition exists; solid when trouble silenced

Silenced (Yellow): Solid when an alarm, trouble or supervisory condition has been silenced but not yet cleared

Power (Green): Flashes for AC failure; solid when power systems are normal

Telephone

Requirements: FCC Part 15 & Part 68 approved

Jack: RJ31X (two required)

Approvals

NFPA 13, NFPA 15, NFPA 16, NFPA 70, &
NFPA 72: Central Station; Remote Signalling; Local Protective Signalling Systems; Auxiliary Protected Premises Unit; & Water Deluge Releasing Service. Suitable for automatic, manual, waterflow, sprinkler supervisory (DACT non-coded) signalling services.

Other Approvals: UL Listed; CSFM 7170-0559: 142;
MEA 429-92-E Vol. XIV

Ordering Information

IFP-100	Intelligent Fire Alarm Control Panel.

SBUS Accessories

RA-100	Remote Annunciator. Same operation and similar appearance to FACP annunciator.
RA-1000R	Remote Annunciator. Four line LCD annunciator with 20 characters per line. Red.
RA-1000	Remote Annunciator. Four line LCD annunciator with 20 characters per line. Gray.
RPS-1000	Intelligent Power Module.
5496	Intelligent Power Module.
5824	Serial/Parallel Printer Interface Module.
5880	LED I/O Module.
5865-3 & 5865-4	LED Fire Annunciators.
5883	Relay Interface Board.

Hochiki and IDP Devices

See the specification sheets listed below for a complete listing of the Hochiki and IDP devices.

350360	Hochiki Devices Specification Sheet.
350361	Intelligent Device Protocol Devices Specification Sheet.

Miscellaneous Accessories

5650/5651	Silent Knight Software Suite. Provides programming, upload/download, and event reporting.
5670	Silent Knight Software Suite. Provides facility monitoring.
RBB	Remote Battery Box Accessory Cabinet. Use if backup batteries are too large to fit into FACP cabinet. Dimensions: 16" W x 10" H x 6" D (406 mm W x 254 mm H x 152 mm D)

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Made in the U.S.A.

Farenhyt

5815XL

Signaling Line Circuit Expander

MEA

429-92-E
Vol. V

Description

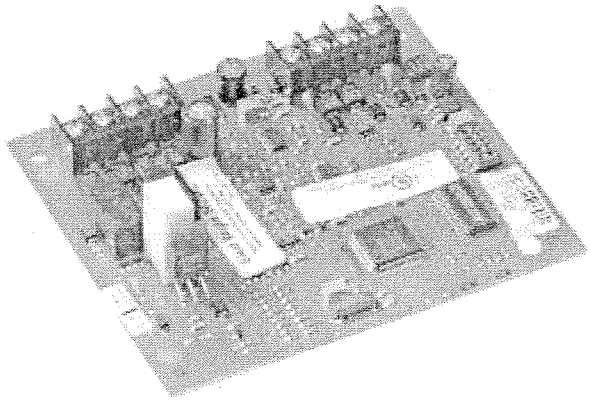
The 5815XL is a signaling line circuit (SLC) expander for use with the Farenhyt IFP-1000 and IFP-2000 analog/addressable fire alarm control panels (FACP). Use the 5815XL to add more SLC devices of the same SLC protocol to an IFP-1000 or IFP-2000 control panel.

The 5815XL supports the same number of devices and SLC device types that are supported by the control panel. A maximum of seven 5815XLs can be used with the IFP-1000. A maximum of 63 5815XLs can be used on an IFP-2000 panel, but the total SLC device count is limited to 636.

The 5815XL communicates with the FACP via an RS 485 system bus. A green LED on the 5815XL board blinks to indicate good communication. If an addressable device on a 5815XL fails, the loop communicates the failure to the FACP and continues to operate normally.

Features

- Adds support for up to 159 IDP detectors and 159 IDP modules or 127 Hochiki devices per 5815XL
- Install up to seven 5815XLs per IFP-1000 system, 63 5815s per IFP-2000 system
- The SLCs on the 5815XL offer the same functionality as the built-in SLCs of the IFP-1000 and IFP-2000, including Style 6 and 7 (Class A) wiring configuration
- Communicates with the FACP via RS 485 system bus
- LED indicates good communication
- House up to two 5815XLs in the IFP-1000 cabinet, IFP-2000 cabinet, RPS-1000 cabinet, or one 5815XL in the 5815RMK remote mounting kit.
- SLC wiring uses standard wire. Twisted pair or shield cable is not required.
- UL 864 listed, complies with NFPA 72 and 101
- CSFM approved
- MEA
- FM approved



5815XL

Installation

The 5815XL can be mounted on standoffs located in the IFP-1000, IFP-2000, or RPS-1000 cabinet or in the 5815RMK remote mounting kit. All control panel mounting options allow you to install two 5815XLs per cabinet.

Compatibility

The 5815XL is compatible with the IFP-1000 and IFP-2000 FACP. The 5815XL supports multiple device types of the same protocol, either Hochiki or IDP. You cannot mix Hochiki and IDP devices on a 5815XL.

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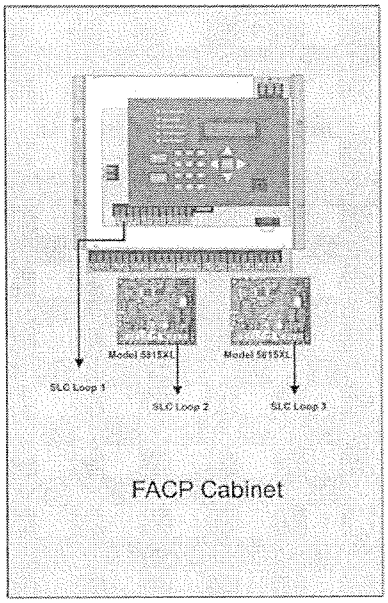
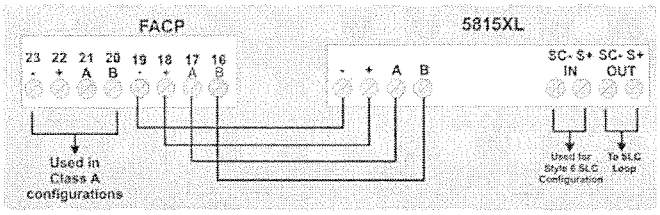
350211 Rev E



FACP Cabinet



Specifications

5815XL Physical

Height: 4.2" (10.7 cm)
Width: 4.8" (12.2 cm)
Shipping Weight: 5.6 oz. (159 g)

RPS-1000 Physical (Optional Accessory)

Height: 26" (66 cm)
Width: 16" (40 cm)
Depth: 4.7" (11.8 cm)
Shipping Weight: 28.8 lbs (13.1 kg)

5815RMK Physical (Optional Accessory)

Height: 10.2" (25.9 cm)
Width: 10.4" (26.4 cm)
Depth: 3" (7.6 cm)
Shipping Weight: 1.2 oz. (37 g)

System Capacity

IFP-1000 FACP supports seven 5815XLs
IFP-2000 supports 63 5815XLs (but with a maximum of 636 SLC devices per system)
5815XL Capacity:
127 Hochiki addressable devices
159 IDP detectors and 159 IDP modules

Electrical

Standby & Alarm Current: 55 mA max – 125 mA (with maximum number of devices installed on 5815XL)

Environmental

Operating Temperature 32° – 120°F (0°C – 49°C)
Humidity: 10% – 93% non-condensing

Approvals

NFPA 13, NFPA 15, NFPA 16, NFPA 70, & NFPA 72: Central Station; Remote Signalling; Local Protective Signalling Systems; Auxiliary Protected Premises Unit; & Water Deluge Releasing Service. Suitable for automatic, manual, waterflow, sprinkler supervisory (DACT non-coded) signalling services.
Other Approvals: UL Listed; CSFM 7170-0559: 135; MEA 429-92-E Vol. VI; FM Approved

Ordering Information

5815XL	Signaling Line Circuit Expander

Accessories

RPS-1000	Intelligent Power Module. Cabinet holds two 5815XLs.
5815RMK	Remote Mounting Kit. Cabinet holds two 5815XLs
VIP-5815RMK	Mounting Kit. Mounting kit installs VIP-series cabinet and holds two 5815XLs

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Made in USA

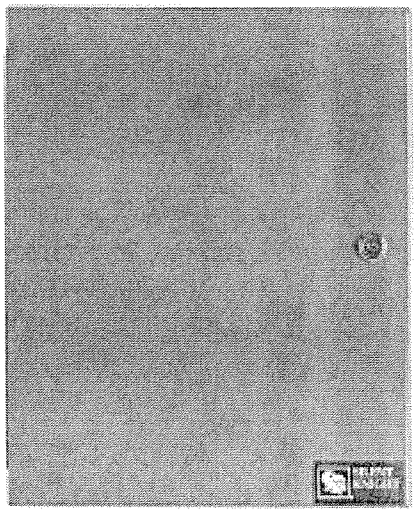
Farenhyt

Intelligent Power Module

5496

The 5496 intelligent power module by Silent Knight is the most cost-effective power supply available today. It delivers 6 amps of notification appliance circuit power and built-in synchronization for appliances from Gentex®, Faraday, AMSECO, System Sensor®, and Wheelock®. The 5496's advanced microprocessor design is years ahead of the competition. Its switch mode power supply design is up to 50% more efficient than competitive linear mode power supplies.

The 5496 is a 6 amp notification power expander that provides its own AC power connection, battery charging circuit, and backup battery for use with Silent Knight IFP-Series fire alarm control panels (FACPs). The 5496 is the cost-effective solution for powering notification appliances required by the Americans with Disabilities Act (ADA). The 5496 has built-in ANSI cadence pattern. The output circuits can be programmed as notification appliance circuits, or as auxiliary power (configurable for constant, resettable, or door holder power).



5496 Intelligent Power Module

Features

- UL Listed for 6 amps of notification power
- Power supply's advanced switch mode design reduces damaging heat and manages power up to 50% more efficiently than other systems
- Built-in synchronization for appliances from Gentex, Faraday, AMSECO, System Sensor, and Wheelock
- 24 VDC filtered output voltage
- Four power-limited notification outputs; 2 Class A or 4 Class B, or 1 Class A and 2 Class B
- NACs are programmable as notification appliance circuits, or as auxiliary power to be used as constant, resettable, or door holder power
- 3 amps per output circuit
- Ground fault detector
- Communicates to the FACP via 4-wire SBUS (wire runs up to 6000 ft)
- AC loss delay option shuts off power to non-essential high-current accessories like magnetic door holders
- Lightweight design adds to ease of installation and reduces shipping costs
- ANSI Cadence pattern output capability built-in
- UL 864 & 1481 listed
- CSFM approved
- MEA approved

Installation

The 5496 cabinet is surface mounted.

Compatibility

The 5496 is compatible with the following FACPs:

- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

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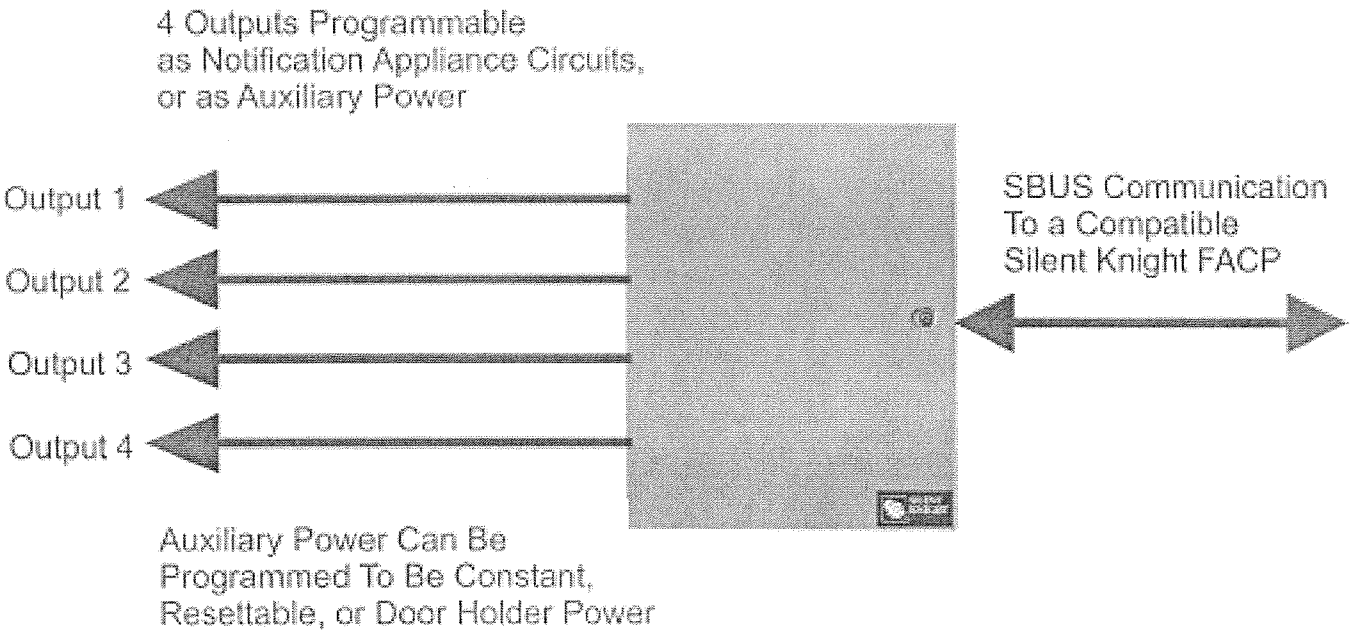
P/N 350302 Rev B 9/07



Specifications

Physical

Height: 16" (40.6 cm)

Width: 12.25" (30.9 cm)

Depth: 3" (7.6 kg)

Shipping Weight: 8.7 lbs. (3.9 kg)

Electrical

AC Input: 120 VAC at 2.7A

Output: 24 VDC at 6A

Alarm Current: 160 mA

Standby Current: 40 mA

Notification/Aux. Power Circuits: 4

Output Configuration:
- 2 Class A (Style Z)
- 4 Class B (Style Y)
- 1 Class A & 2 Class B

Amps Per Output Circuit: 3.0 (6.0 amps total)

Notification Circuit Output: 20.4 – 27.3 VDC @ 3.0A each

End-of-Line Resistance: 4.7k Ω EOL resistor required on each Class B circuit

Battery Charging Capacity: 7.0 – 35.0 AH

Environmental

Operating Temperature: 32°F to 120°F (0°C to 49°C)

Humidity: 10% – 93% non-condensing

Ordering Information

5496	Intelligent Power Module
RBB	Remote Battery Box

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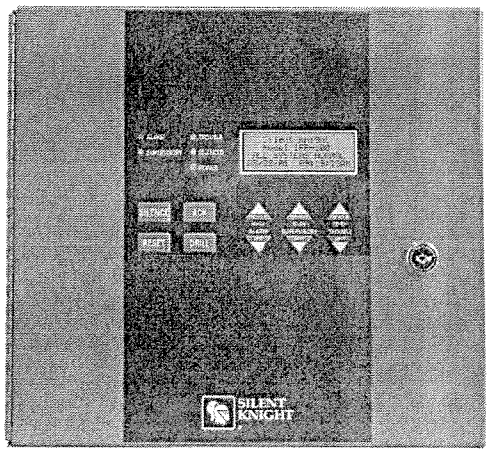
Farenhyt

RA-100 Remote Annunciator

The RA-100 Remote Annunciator can be used to operate and program the IFP-100 or IFP-1000 Fire Control Panels. The RA-100's keypad and display match the built-in annunciator of the IFP-100 control panel. The remote annunciator connects to the control panel via the RS-485 system bus. When the system is in normal operation and has AC power, the Power LED is lit and all other LEDs are off. The other LEDs turn on as alarms, supervisories, troubles, system silenced and AC power losses occur.

For remote annunciation



Features

- 80-character backlit LCD display (4 lines with 20 characters each)
- Tactile/audible feedback
- Larger keypad buttons for system Reset and Silence
- RS-485 interface to panel
- Can be flush- or surface mounted. Trim ring available for surface mounting.
- Operation and appearance is identical to IFP-100 built-in annunciator
- Initiate and end fire drills with a single key press
- View event history by alarms, supervisories, or troubles
- Supports simultaneous use by multiple users from up to 8 separate RA-100s
- on-board piezo sounder audibly indicates alarms, troubles, and supervisories
- Five Status LEDs for; alarms, supervisory, trouble, silence and AC power indications.
- UL listed, complies with NFPA 72
- Wiring lengths up to 6000 ft. from the control panel

Specifications

Operating Voltage:	24 VDC
Standby Current:	20 mA
Alarm Current:	25 mA
Maximum Per System:	8
Operating Temperature:	32° F to 120° F (0° C to 49° C)
Mounting:	Surface or Flush
Wiring Distance:	Up to 6,000 feet from control panel (depending on wiring method)

Dimension

Flush Mount:

Outside wall:	12.25"W x 11.5"H x 7/8"D (31.1W x 29.2H x 2.2D cm)
Inside wall:	9-3/8"W x 8-3/8"H x 2"D (23.8W x 21.3H x 5.1D cm)

Surface Mount:

Including Trim Ring:	12.25"W x 11.5"H x 3"D (31.1W x 29.2H x 2.2D cm)

Optional Accessories

RA-100TR	Surface Mount Trim Ring

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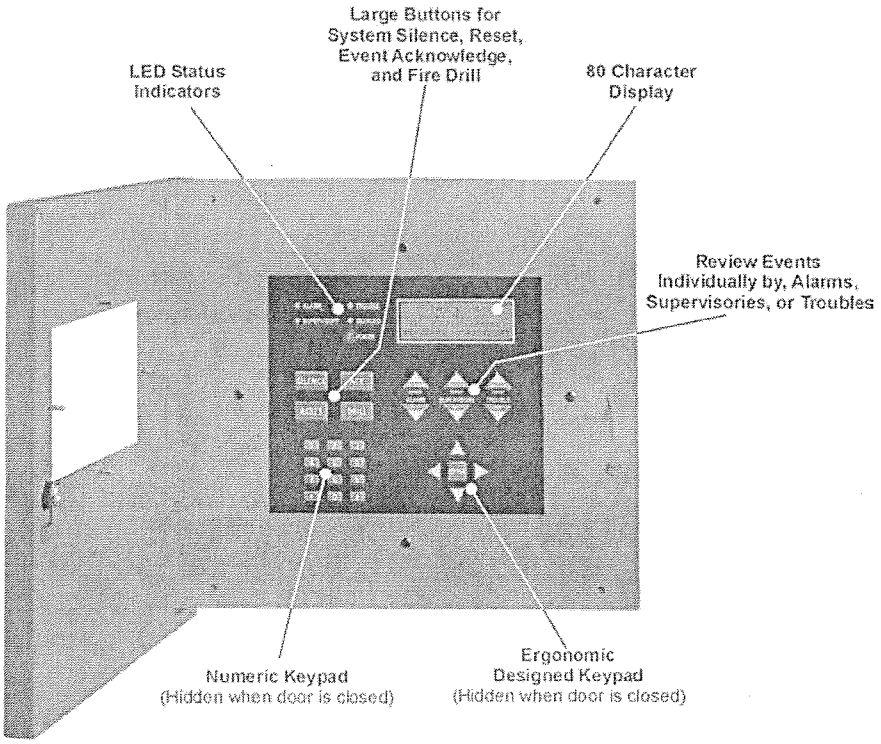
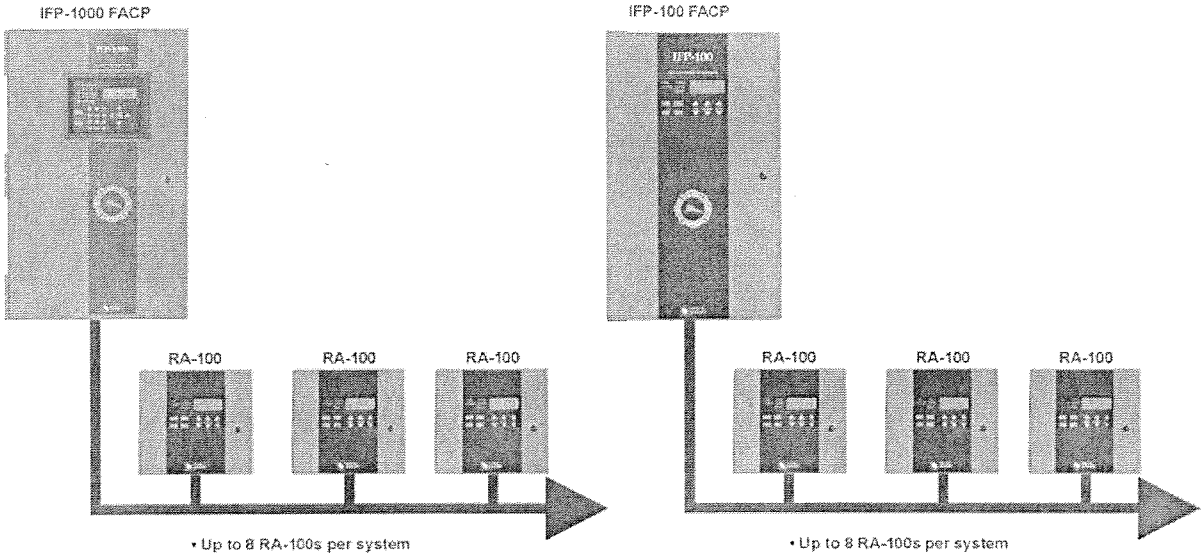


RA-100 Features



- Up to 8 RA-100s per system
- 80-character backlit LCD display (4 lines with 20 characters each)
- Wiring lengths up to 6000 ft. from the control panel

- Up to 8 RA-100s per system
- 80-character backlit LCD display (4 lines with 20 characters each)
- Wiring lengths up to 6000 ft. from the control panel

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Farenhyt

Addressable Single Action and Dual Action Pull Stations

For IDP-Pull-DA

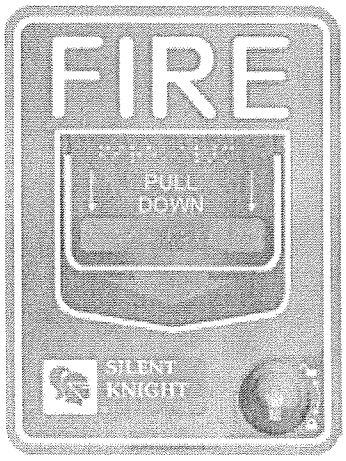
MEA 67-02-E Vol. IX For IDP-Pull-DA

IDP-Pull-SA & IDP-Pull-DA

The IDP-Pull-SA is a single action pull station requiring only one motion to activate the station. The IDP-Pull-DA is a dual action pull station requiring two motions to active the station. Both pull stations are designed to work with Silent Knight IFP-series fire alarm control panels (FACPs).

Features

- Installer can open station without causing an alarm condition
- Dual-color LED is visible through handle of station blinks green to indicate normal operation and remains steady red in an alarm condition
- Key operated test and reset lock using lock plate actuator
- Key matches compatible FACP locks
- Meets the Americans with Disabilities Act Accessibility Guidelines (ADAAG) controls and operating mechanisms guidelines (Section 4.1.3[13])
- Meets ADA requirement for 5 lbs maximum pull force to active
- Shell, door, and handle molded from durable LEXAN®
- Reliable analog communications for trouble-free operation
- Braille text on station handle
- Handle latches in down position and the word *Activated* appears, clearly indicating the station has been pulled
- Rotary address switches for fast installation
- UL Listed, including UL 38, Standard of Manually Actuated Signaling System



IDP-Pull-SA

IDP-Pull-DA

Installation

The IDP-Pull-SA and IDP-Pull-DA can be surface mounted to an SB-I/O surface back box or semi-flush mounted on a standard single-gang with a minimum depth of 2.13"(5.40 cm) or double-gang or 4" (10.61 cm) square electrical box. You can also use the optional SSBG-TR (System Sensor® PN BG-TR) trim ring if the station is being semi-flush mounted.

Compatibility

The IDP-Pull-SA and IDP-Pull-DA are compatible with the following FACPs:

- IFP-2000/RPS-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

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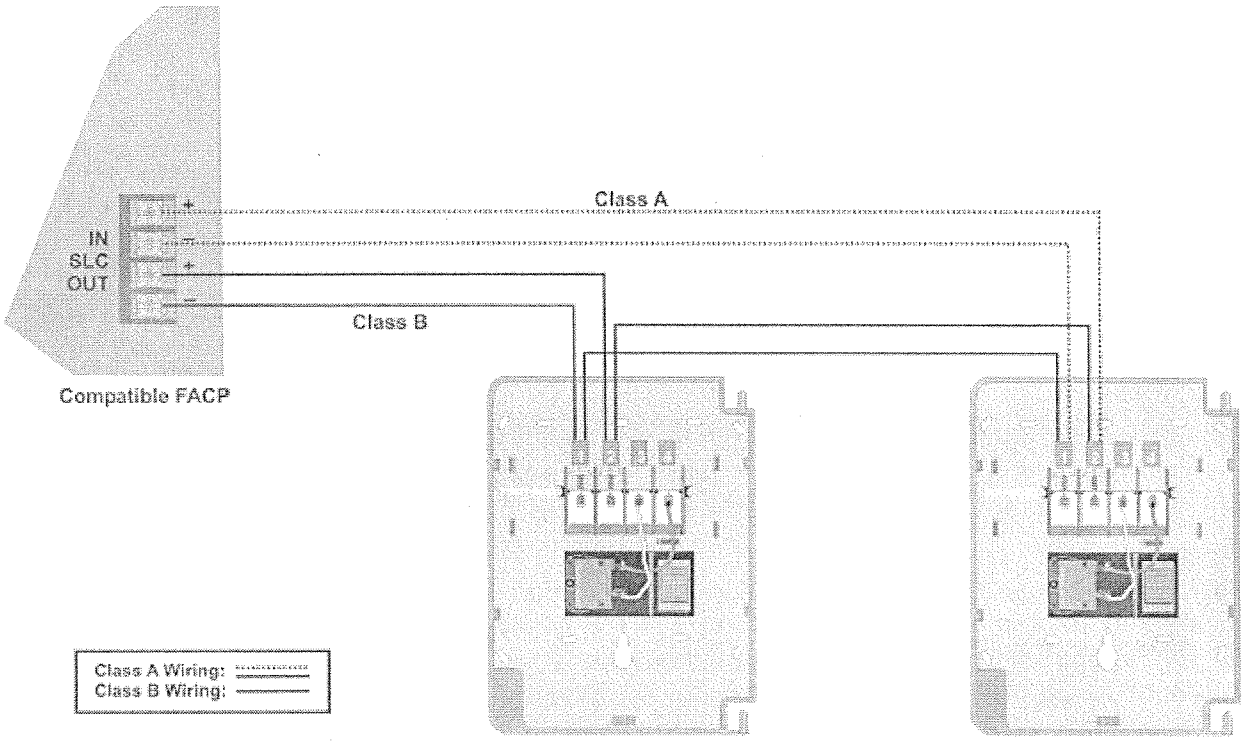
P/N 350286 Rev D



Wiring IDP-Pull-SA & IDP-Pull-DA Pull Stations

Specifications*

Physical

Height: 5.5" (14 cm)

Width: 4" (10.2 cm)

Depth: 5.4 oz. (3.7 cm)

Housing Material: LEXAN polycarbonate resin

Bi-Colored LED:
Blinking Green: Normal

Steady Red: Alarm

Switch: Single pole, single throw (SPST) normally open (N/O) switch which closes upon activation of the pull station

Electrical

Operating Voltage: 15–32 VDC

Operating Current (LED flashing): 300 µA

Wire Gauge: Up to 12 AWG (3.1 mm^2)

Environmental

Operating Temperature 32° – 120°F (0°C – 49°C)

Humidity: 10% – 93% non-condensing

Ordering Information

IDP-Pull-SA	Single Action Pull Station
IDP-Pull-DA	Dual Action Pull Station

Accessories

SSBG-TR†	Optional trim ring.
SB-I/O	Surface backbox, indoor/outdoor.

* Unless otherwise noted, specifications apply to IDP-Pull-SA and IDP-Pull-DA.

† For ordering purposes, an SS has been added to the System Sensor part numbers. Example–System Sensor PN for SSB501 is B501.

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Farenhyt

Addressable Detector Bases

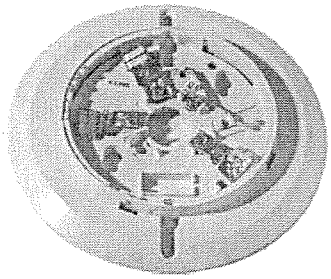
IDP-6AB & SSB501

MEA
205-94-E Vol IX

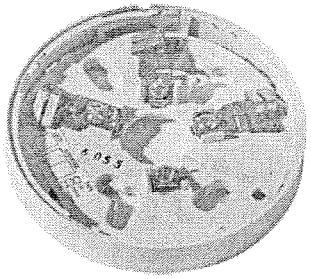
The IDP-6AB 6" Mounting Base and the SSB501 4" Mounting Base are plug in detector bases for IDP style detectors intended for use with Silent Knight IFP-series fire alarm control panels (FACPs). The IDP-6AB and SSB501 have screw terminals for power (+) and (-) and remote annunciator connections. Communication takes place over the power (+) and (-) lines.

Features

- Plug-in mounting provides ease of installation
- Tamper-proof feature prevents removal of the detector without the use of a tool
- Range of mounting options to meet any application
- SSB501 allows for aesthetically pleasing installation with Recessed Mounting Kit (PN SSRMK400)
- Rotary address switches for fast installation
- Optional remote LED annunciator (PN SSRA400Z)
- SEMS screws, 12–22 AWG
- UL Listed



IDP-6AB Base



SSB501 Base

Installation

The IDP-6AB and SSB501 can be mounted on a variety of junction boxes as shown in the tables below.

U.S. Junction Box Selection Guide*

Model	Single Gang	3.5" Oct	4" Oct	4" Sq
IDP-6AB	Yes	Yes	Yes	Yes
SSB501	No	Yes	No	No

Metric Junction Box Selection Guide*

Model	50 mm	60 mm	70 mm	75 mm
IDP-6AB	No	No	No	No
SSB501	Yes	Yes	Yes	No

*Box depth is contingent on base and wire size. Refer to the National Electric Code or applicable local codes for appropriate recommendations.

Compatibility

The IDP-6AB and SSB501 are compatible with the following IDP-series detectors:

- IDP-Photo Photoelectric Smoke Detector
- IDP-Photo-T Photoelectric Smoke Detector with Thermal
- IDP-Acclimate Multi Criteria Photoelectric Smoke Detector
- IDP-Ion Ionization Smoke Detector
- IDP-Heat Fixed Temperature Thermal Detector
- IDP-Heat-ROR Rate-of-Rise Detector with Thermal
- IDP-Heat-HT Fixed High Temperature Thermal Detector

The IDP-6AB and SSB501 are compatible with the following FACPs:

- IFP-2000/RPS-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

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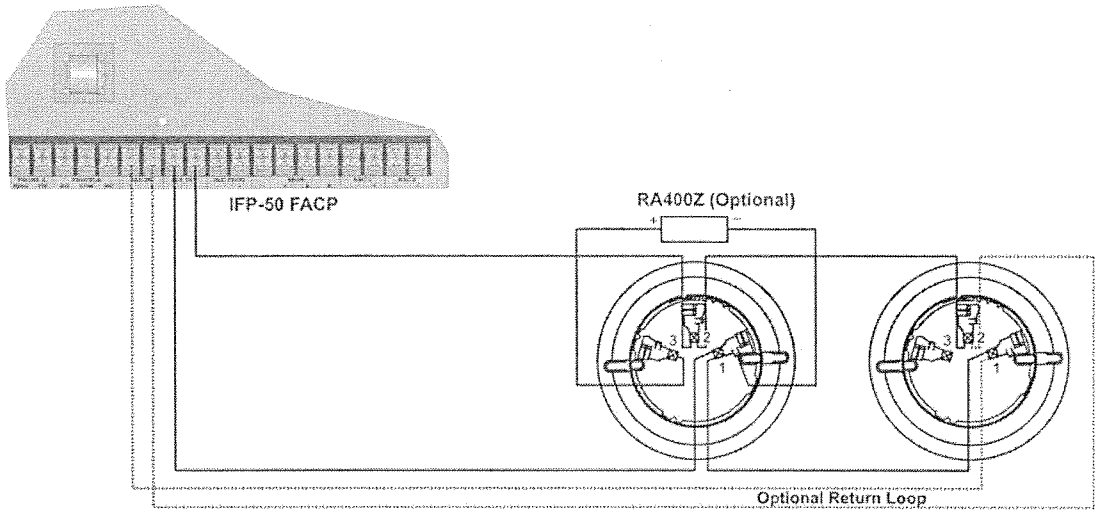


IDP6AB and B501 Mounting Bases

Specifications

Physical

IDP-6AB Diameter: 6.1" (155 mm)
SSB501 Diameter: 4.1" (104 mm)

Electrical

Wire Gauge: 18–12
Terminals:
- Terminal 1: Power (–) and Optional RA400Z
- Terminal 2: Power (+)
- Terminal 3: Optional RA400Z Remote Annunciator

Environmental

Operating Temperature: 32°F – 150°F (0°C – 66°C)
Humidity: 10% – 93% non-condensing

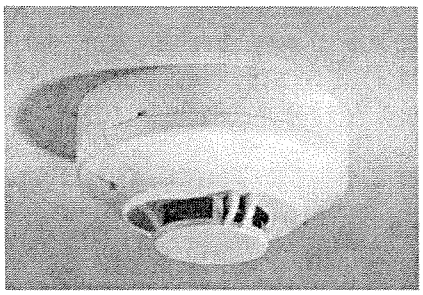
Ordering Information

IDP-6AB	6" Mounting Base
SSB501	4" Mounting Base

Accessories

SSRA400Z	Remote LED Annunciator.
SSRMK400	Recessed Mounting Kit. Provides low profile for use with SSB501.
SSXR2B	Detector Removal Tool. A removal and replacement tool for IDP plug-in detectors. Includes the T55-127-000.
SSM02-04-01	Detector Test Magnet.
SSM02-09-00	Test Magnet with Telescoping Handle.
SSXP-4	Extension Pole for XR2B. Extends from 5 – 15 ft.
SST55-127-000	Detector Removal Head.
SSBCK-200B	Black Detector Kit. For IDP-series detectors.


IDP-6AB Base Installed with Detector


SSB501 Base Installed with Detector

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Addressable Photoelectric Smoke Detector & Photoelectric Smoke with Thermal

IDP-Photo & IDP-Photo-T

MEA

225-02-E Vol. V

Description

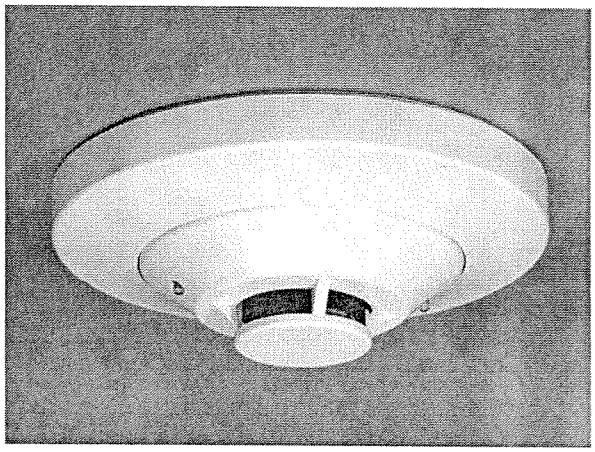
The IDP-Photo is a photoelectric smoke detector and the IDP-Photo-T is a photoelectric smoke detector with thermal. These plug in smoke detectors, with integral communication, provide features that surpass conventional detectors and are for use with Silent Knight IFP-series fire alarm control panels (FACPs).

Detector sensitivity can be programmed from the FACP software. Sensitivity is continuously monitored and reported to the FACP. Point ID capability allows each detector's address to be set with rotary address switches, providing exact detector locations for selective maintenance when chamber contamination reaches unacceptable levels.

IDP-Photo and IDP-Photo-T have a unique optical sensing chamber that is engineered to sense smoke produced by a wide range of combustion sources. In the IDP-Photo-T, dual electronic thermistors add 135°F (57°C) thermal technology to maximize detection.

Features

- Sleek, low-profile design
- Reliable analog communications for trouble-free operation
- Age resistant polymer housing
- Dual electronic thermistor design on the IDP-Photo-T
- Superior EMI resistance for reliability
- Simple field cleaning for code compliance
- Variety of mounting options to meet any application
- Dual LED indicators for 360° visibility
- Detector transmits signal to indicate maintenance is required
- Optional remote LED annunciator (PN SSRA400Z; System Sensor® PN RA400Z)
- Plug-in mounting provides ease of installation
- Tamper-proof feature available on mounting bases
- Listed for use in duct applications



IDP-Photo (Base Not Included)

- Rotary address switches for fast installation
- UL Listed

Installation

The IDP-Photo and IDP-Photo-T plug into a compatible IDP-series detector base.

Compatibility

The IDP-Photo and IDP-Photo-T are compatible with the following IDP-series detector bases:

- IDP-6AB 6" Mounting Base
- SSB501 4" Mounting Base*
- SSB224BI 6" Isolator Base*
- SSB224RB 6" Relay Base*
- SSB501BHT-2 6" Temporal Sounder Base*

The IDP-Photo and IDP-Photo-T is compatible with the following FACPs:

- IFP-2000/RPS-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

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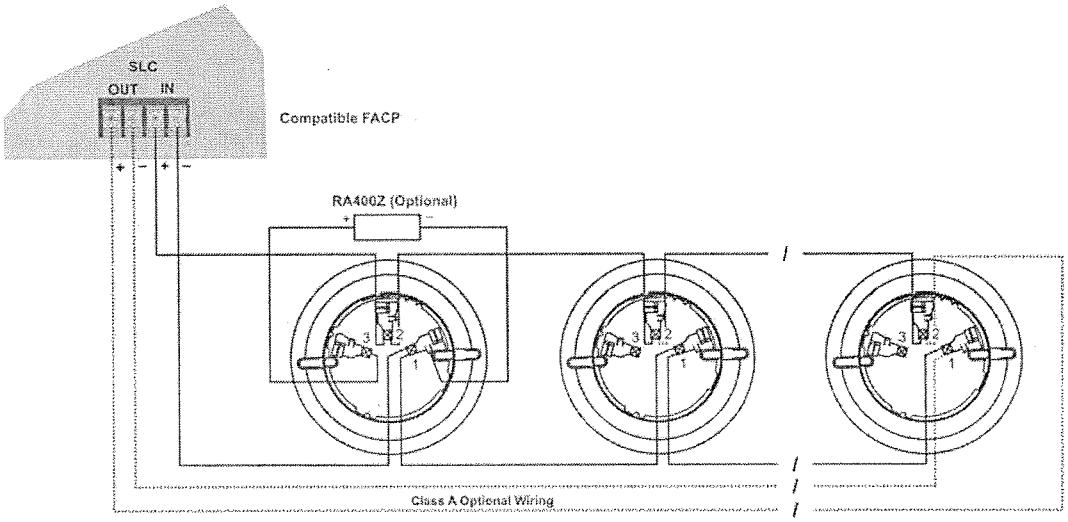
Fax: 763-493-6475
www.farenhyt.com

350280 Rev D



Wiring IDP-Series Detector Mounting Bases

Specifications*

Physical

Height: 2.0" (5.0 cm)
Diameter: 4.1" (10.4 cm)
Shipping Weight: 5.2 oz. (147 g)

Electrical

Operating Voltage: 15–32 VDC
Standby Current:
250 µA @ 24 VDC (no communication; LED off)
300 µA @ 24 VDC (one communication every 5 sec with
LED enabled)
Alarm Current: 6.5 mA @ 24 VDC max (with LED on)

Environmental

Operating Temperature
IDP-Photo: 32° – 120°F (0°C – 49°C)
IDP-Photo-T: 32° – 100°F (0°C – 38°C)

Humidity: 10% – 93% non-condensing

Other Ratings

IDP-Photo-T Thermal: Fixed temperature setpoint 135°F (57°C)
Velocity: 0 – 4000 fpm (0 – 20 m/sec)
IDP-Photo Insect Screen Hole Size: 0.016" (0.41 mm) nominal

Ordering Information

IDP-Photo	Photoelectric Smoke Detector
IDP-Photo-T	Photoelectric Smoke Detector with Thermal (135°F)

Accessories†

SSRA400Z	Remote LED Annunciator.
SSRMK400	Recessed Mounting Kit. Provides low profile for use with SSB501.
SSXR2B	Detector Removal Tool. A removal and replacement tool for IDP plug-in detectors. Includes the SST55-127-000.
SSM02-04-01	Detector Test Magnet.
SSM02-09-00	Test Magnet with Telescoping Handle.
SSXP-4	Extension Pole for SSXR2B. Extends from 5 – 15 ft.
SST55-127-000	Detector Removal Head.
SSBCK-200B	Black Detector Kit. For IDP-series detectors.

** Unless otherwise noted, specifications apply to IDP-Photo and IDP-Photo-T.*
† For ordering purposes, an SS has been added to the System Sensor part numbers. Example–System Sensor PN for SSB501 is B501.

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by Honeywell

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Made in the USA

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Addressable Thermal and Rate-of-Rise Thermal Detectors

MEA
383-02-E Vol. VI

IDP-Heat, IDP-Heat-HT, & IDP-Heat-ROR

The IDP-Heat, IDP-Heat-HT, and IDP-Heat-ROR are plug in thermal detectors, with integral communication, that provide features that surpass conventional detectors. These thermal detectors are for use with Silent Knight IFP-series fire alarm control panels (FACPs).

Detector sensitivity can be programmed from the FACP software. Sensitivity is continuously monitored and reported to the FACP. Point ID capability allows each detector's address to be set with rotary address switches, providing exact detector locations for selective maintenance when chamber contamination reaches unacceptable levels.

IDP-Heat is a fixed temperature thermal detector that uses a thermistor sensing circuit to produce 135°F (57°C) fixed thermal detection.

IDP-Heat-HT is a variable high temperature detector that provides high temperature detection at 135°F – 190°F (57°C – 88°C).

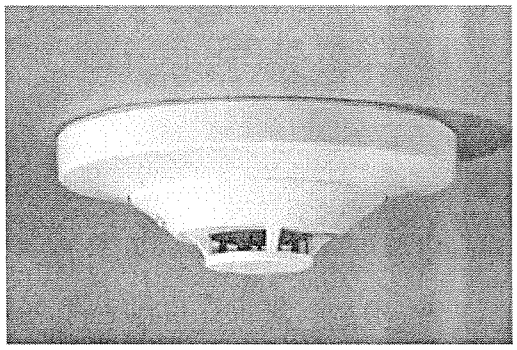
IDP-Heat-ROR is a fixed temperature and rate-of-rise thermal detector that uses a thermistor sensing circuit to produce 135°F (57°C) thermal protection.

Features

- Sleek, low-profile design
- Reliable analog communications for trouble-free operation
- Age resistant polymer housing
- Innovative thermistor sensing circuit
- Superior EMI resistance for reliability
- Variety of mounting options to meet any application
- Dual LED indicators for 360° visibility
- Detector transmits signal to indicate maintenance is required
- Plug-in mounting provides ease of installation
- Optional remote LED annunciator (PN SSRA400Z; System Sensor® PN RA400Z)
- Tamper-proof feature available on mounting bases
- Rotary address switches for fast installation
- UL Listed

Installation

The IDP thermal detectors plug into a compatible IDP-series detector base.



IDP-Heat Installed in the IDP-6AB Mounting Base (Base Not Included)

Compatibility

The IDP-Heat, IDP-Heat-HT, and IDP-Heat-ROR are compatible with the following IDP-series detector bases:

- IDP-6AB 6" Mounting Base
- SSB501 4" Mounting Base*
- SSB224BI 6" Isolator Base*
- SSB224RB 6" Relay Base*
- SSB501BHT-2 6" Temporal Sounder Base*

The IDP-Heat, IDP-Heat-HT, and IDP-Heat-ROR are compatible with the following FACPs:

- IFP-2000/RPS-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

* For ordering purposes, an SS has been added to the System Sensor part numbers. Example–System Sensor PN for SSB501 is B501.

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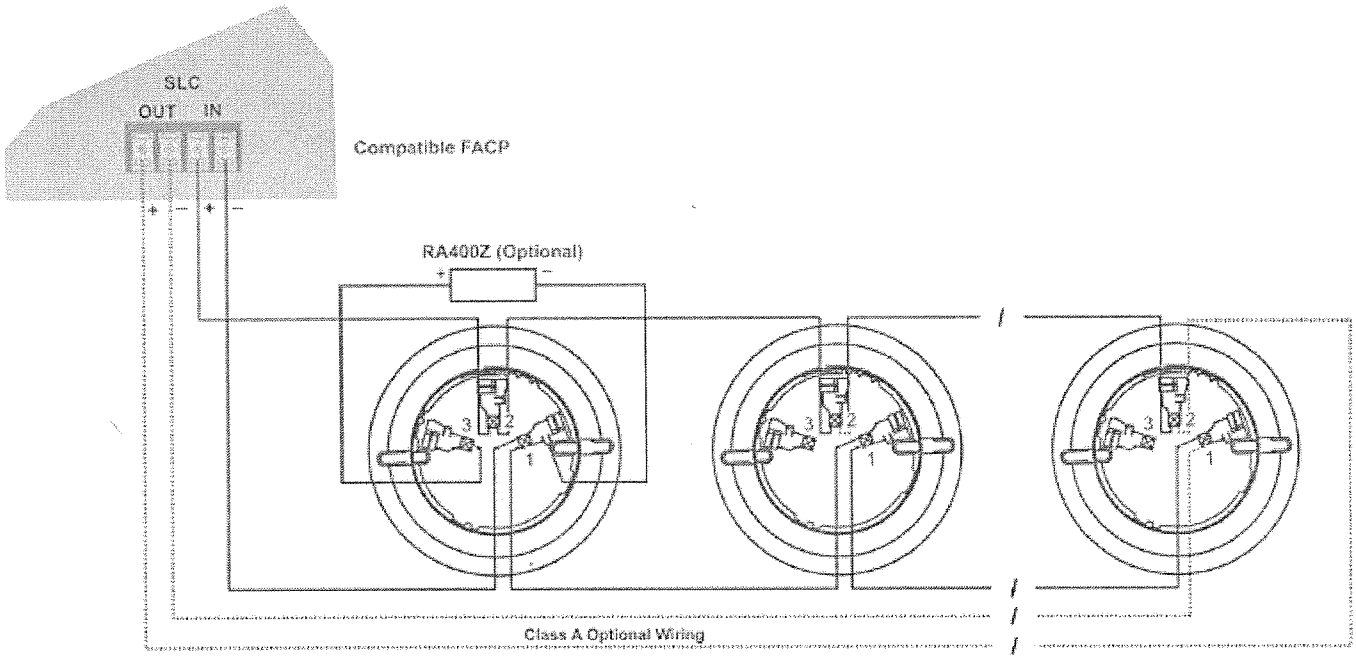
P/N 350285 Rev D



Wiring IDP-Series Detector Mounting Bases

Specifications*

Physical

Height: 2.0" (5.0 cm)

Diameter: 4.1" (10.4 cm)

Shipping Weight: 4.8 oz (136 g)

Electrical

Operating Voltage: 15 – 32 VDC

Standby Current

IDP-Heat:
200 µA @ 24 VDC (no communication; LED off)
300 µA @ 24 VDC (one communication every 5 sec with LED enabled)

IDP-Heat-HT & IDP-Heat-ROR:
150 µA @ 24 VDC (no communication; LED off)
200 µA @ 24 VDC (one communication every 5 sec with LED enabled)

Alarm Current: 6.5 mA @ 24 VDC max (with LED on)

Environmental

Operating Temperature

IDP-Heat & IDP-Heat-ROR: -4° – 100°F (20°C – 38°C)
IDP-Heat-HT: -4° – 150°F (20°C – 66°C)

Humidity: 10% – 93% non-condensing

Thermal Ratings

IDP-Heat: Fixed temperature setpoint 135°F (57°C)
IDP-Heat-HT: High temperature heat 135°F – 190°F (57°C – 88°C)
IDP-Heat-ROR: Rate-of-rise detection 15°F/min (9°C/min)

Ordering Information

IDP-Heat	Fixed Temperature Thermal Detector
IDP-Heat-HT	Fixed High Temperature Thermal Detector
IDP-Heat-ROR	Fixed Temperature and Rate-of-Rise Thermal Detector

Accessories†

SSRA400Z	Remote LED Annunciator.
SSRMK400	Recessed Mounting Kit. Provides low profile for use with B501.
SSXR2B	Detector Removal Tool. A removal and replacement tool for IDP plug-in detectors. Includes the T55-127-000.
SSM02-04-00	Replacement Test Magnet.
SSM02-09-00	Test Magnet with Telescoping Handle.
SSXP-4	Extension Pole for XR2B. Extends from 5 – 15 ft.
SST55-127-000	Detector Removal Head.
SSBCK-200B	Black Detector Kit. For IDP-series detectors.

* Unless otherwise noted, specifications apply to all IDP thermal detectors.

† For ordering purposes, an SS has been added to the System Sensor part numbers. Example–System Sensor PN for SSB501 is B501.

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IDP-Pduct/IDP-Pduct-R

The IDP-Pduct and IDP-Pduct-R are addressable photoelectric air duct smoke detectors for use with Silent Knight IFP-series fire alarm control panels (FACPs).

The IDP-Pduct and IDP-Pduct-R feature low-flow technology that enables duct smoke detection throughout a broad range of airflow environments. Many difficult to solve HVAC applications occur in low airflow duct applications where reliable smoke detection is critical. These duct detectors can detect smoke at air speed velocities of 100 feet per minute or greater, while continuing the same reliable performance to 4000 feet per minute.

By sampling air currents passing through a duct and giving dependable performance for shutdown of fans, blowers, and air conditioning systems, the IDP-Pduct and IDP-Pduct-R prevent the spread of toxic smoke and fire gases through the protected area.

These intelligent duct detectors communicate and are continuously monitored through the FACP signaling line circuit (SLC) loop. Detector sensitivity changes caused by dirt, temperature, or humidity are reported to the FACP, allowing compensation algorithms to maintain the detector's set sensitivity. An advanced indication at the panel identifies the detector address, allowing for selected maintenance to be performed as needed.

The IDP-Pduct and IDP-Pduct-R are designed for simplified installation and easy maintenance. The modular construction allows for easy cleaning and uncomplicated field replacement of the UL recognized power and sensor boards.

Features

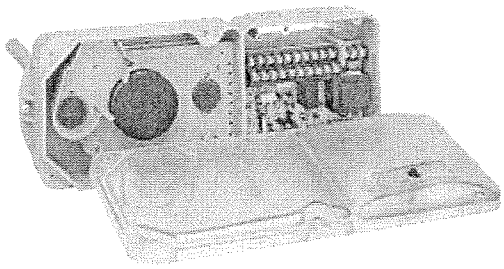
- Air velocity rating from 100 to 4000 feet per minute (0.5 to 20.32 meters per second)
- Support for Class B or Class A wiring
- Patented telescopic sampling tube
- Outside mounting tabs
- Easy and quick mounting to round or rectangular ducts from 1 foot to 12 feet (0.3 to 3.7 meters)
- Easy to clean
- Rotary address switches for fast installation
- UL recognized field replaceable power and sensor boards
- Transparent cover for convenient visual inspection
- UL 268A listed
- 3-year warranty

IDP-Pduct Features

- Outputs for remote LED display and remote test
- Incorporates zener diodes to conserve power for communication to other devices
- Requires communication line power only

Addressable Photoelectric
Duct Smoke Detectors

MEA
384-02-E Vol. IV



IDP-Pduct-R

IDP-Pduct-R Features

- Powered outputs for remote LED, remote test, and remote sounder
- Configure as relay version or jumper to mimic the non-relay IDP-Pduct
- Patented cover tamper trouble signal
- Requires both communication line power and one of the following: 24 VAC/VDC or 120/220 VAC for operation
- Easy and quick mounting to round or rectangular ducts from 1 foot to 12 feet (0.3 to 3.7 meters)

Installation

The IDP-Pduct and IDP-Pduct-R are designed for use in air handling systems that have air velocities or 100 to 4000 feet per minute (0.5 – 20.3 m/s).

Compatibility

The IDP-Pduct and IDP-Pduct-R are compatible with the following FACPs:

- IFP-2000/RPS-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fre Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

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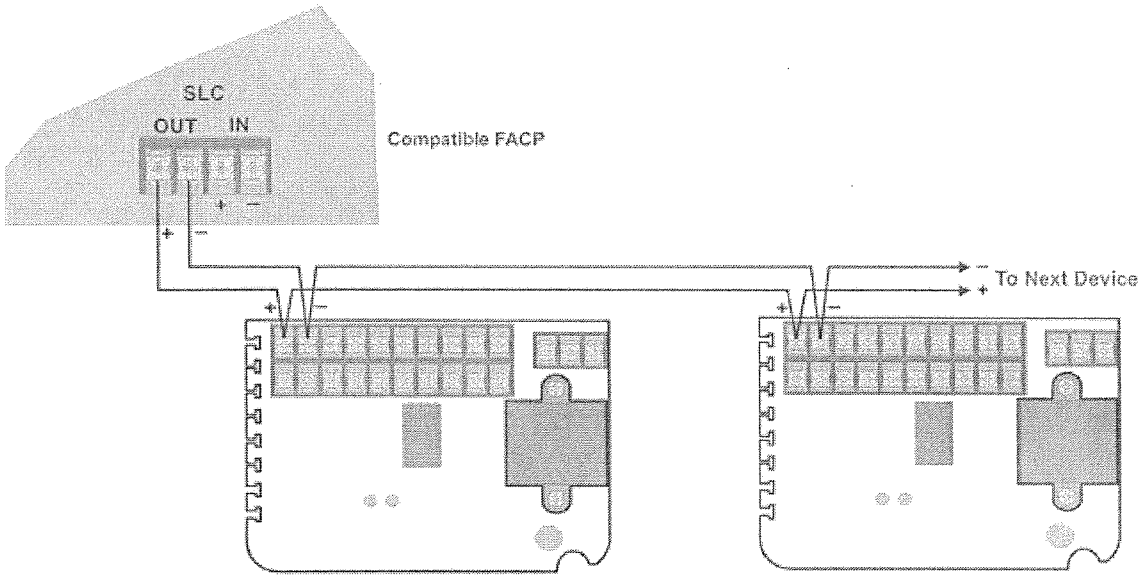
P/N 350284 Rev D



Wiring IDP-Pduct-R Duct Detectors

Specifications*

Physical

Height: 5.5" (14 cm)

Width: 14.4" (37 cm)

Depth: 2.8" (7 cm)

Shipping Weight:
IDP-Pduct: 3.4 lbs (1.5 kg); IDP-Pduct-R: 3.9 lbs (1.8 kg)

Environmental

Operating Temperature: 32°F – 120°F (0°C – 49°C)

Humidity: 10% – 93% non-condensing

Air Velocity

100 to 4000 ft/min (0.5 – 20.3 m/s)

Electrical

Alarm Current: 87 mA @ 20 – 30 VDC; 182 mA RMS @ 24 VAC; 52 mA RMS @ 120 VAC; 30 mA RMS @ 220/240 VAC

P-duct Electrical

Operating Voltage: 15 – 32 VDC

Standby Current: 300 µA @ 24 VDC

P-duct-R Electrical

Alarm Aux Contacts – DPDT: 10 @ 30 VDC; 10 @ 277 VAC (0.75 power factor); 240 VA @ 249 VAC (0.4 power factor); 1/8 HP @120 VAC; 1/4 HP @ 240 VAC

Supervisory Contacts – SPST: 2.0A @ 30 VDC (resistive)

Power Supply Voltage: 20–30 VDC; 24 VAC 50–60 Hz; 120 VAC 50–60 Hz; 220/240 VAC 50–60 Hz

Standby Current: 26 mA @ 20–30 VAC; 65 mA RMS @ 24 VAC; 44 mA RMS @ 120 VAC; 25 mA RMS @ 220/240 VAC

Alarm Response Time: 3 – 10 sec

Power Up Time: 2 sec

Ordering Information

IDP-Pduct	Duct Smoke Detector
IDP-Pduct-R	Duct Smoke Detector with Relay

Accessories†

SSST-1.5	Metal Sampling Tube Duct Widths 1' – 2'
SSST-3	Metal Sampling Tube Duct Widths 2' – 4'
SSST-5	Metal Sampling Tube Duct Widths 4' – 8'
SSST-10	Metal Sampling Tube Duct Widths 8' – 12'
SSA5053SK	Replacement Photoelectric Sensor Board
SSA5067	Replacement Power Board for IDP-Pduct (without relay)
SSRA400Z	Remote LED Annunciator
SSA5060	Replacement Power Board for IDP-Pduct-R (with relay)
SSRTS451	Magnetic Remote Test
SSRTS451KEY	Key-Activated Remote Test
SSF36-09-11	Replacement Filters
SSM02-04-00	Replacement Test Magnet
SSM02-09-00	Test Magnet with Telescoping Handle
SSS08-39-01	Replacement Photo Insect Screen
SSP48-61-00	Replacement End Cap for Plastic Sampling Tube
SSP48-21-00	Replacement End Cap for Metal Sampling Tube

* Unless otherwise noted, specifications apply to IDP-Pduct and IDP-Pduct-R.

† For ordering purposes, an SS has been added to the System Sensor® part numbers. Example–System Sensor PN for SSB501 is B501.

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by Honeywell

For more information, contact Silent Knight 7550 Meridian Circle Suite 100, Maple Grove, Mn 55369-4927. Phone: (800) 328-0103, Fax: (763) 493-6475.

Made in the U.S.A.

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IDP-Minimon

Addressable Monitor Module

MEA
457-99-E
Vol. V

Description

The IDP-Minimon is a compact and light weight addressable monitor module for use with Silent Knight IFP-series fire alarm control panels (FACPs). The IDP-Minimon acts as an interface to contact devices, such as waterflow switches and pull stations.

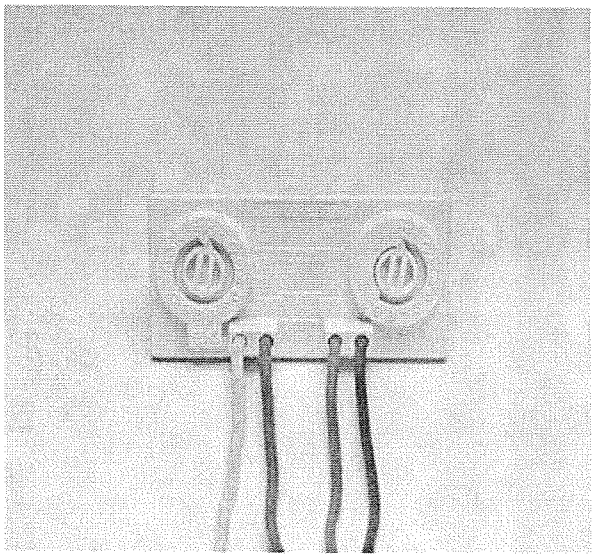
The IDP-Minimon supports Class B supervised wiring to the load device. Conventional 4-wire smoke detectors can be monitored for alarm and trouble conditions.

Features

- Single contact monitor
- Small and lightweight size allows for flexible mounting options
- Support for Class B wiring
- Fully supervised
- Rotary address switches for fast installation
- Analog communications
- UL Listed

Installation

The IDP-Minimon can be mounted in a single gang junction box directly behind the monitored device. Its small size and light weight allow it to be installed without rigid mounting requirements.



IDP-Minimon

Compatibility

The IDP-Minimon is compatible with the following FACPs:

- IFP-2000/RPS-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

Ordering Information

IDP-Minimon Miniature Monitoring Module

SILENT KNIGHT
by Honeywell

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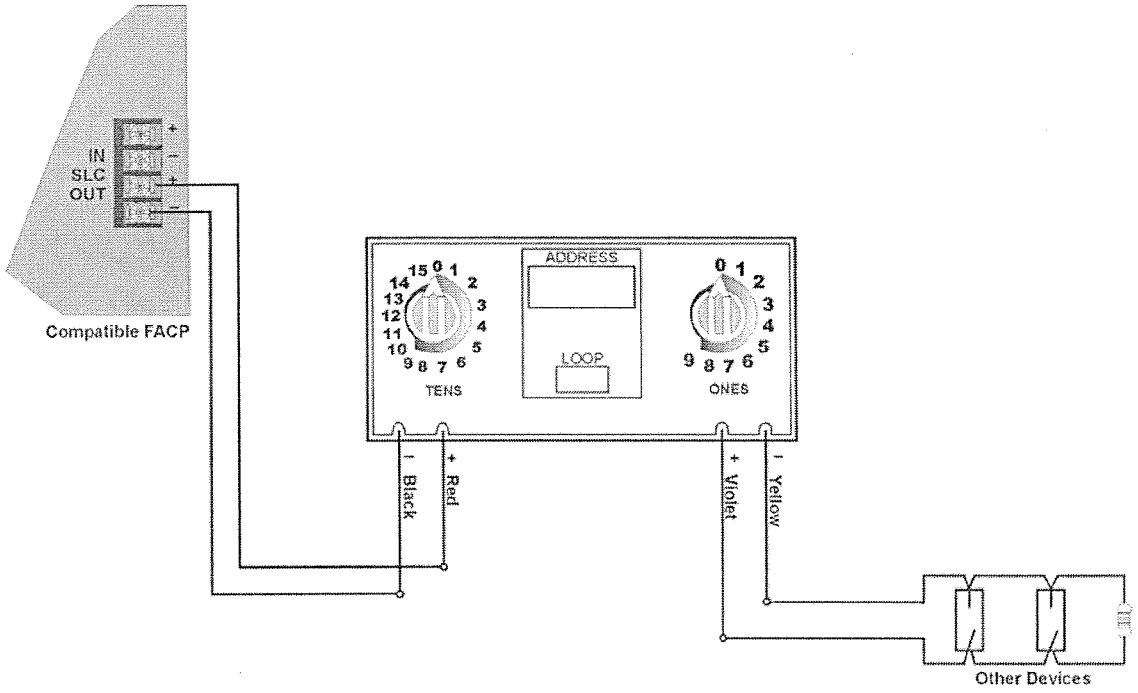
P/N 350279 Rev D



Wiring the IDP-Minimon

Specifications

Physical

Height: 1.3" (3.3 cm)

Width: 2.8" (7 cm)

Depth: 0.5" (1.3 cm)

Shipping Weight: 1.2 oz (37 g)

Electrical

Operating Voltage: 15 – 32 VDC

Standby Current: 300 µA

End-of-Line Resistance: 47K ½

Initiating Device Circuit Wiring Resistance: 1,500½ max

SLC Loop Resistance: 40½ max.

Wire Length: 6" min.

Environmental

Operating Temperature: 32°F – 120°F(0°C –9°C)

Humidity: 10% – 93% non-condensing

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www.Farenhyt.com

Made in the USA

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Addressable Relay Module

IDP-Relay

MEA
457-99-E Vol. V

Description

The IDP-Relay is an addressable relay module for use with Silent Knight IFP-series fire alarm control panels (FACPs). The IDP-Relay allows a Silent Knight FACP to switch discrete contacts by code command. The relay contains two isolated sets of Form C contacts, which operate as a DPDT switch. No supervision is provided for the notification appliance circuit.

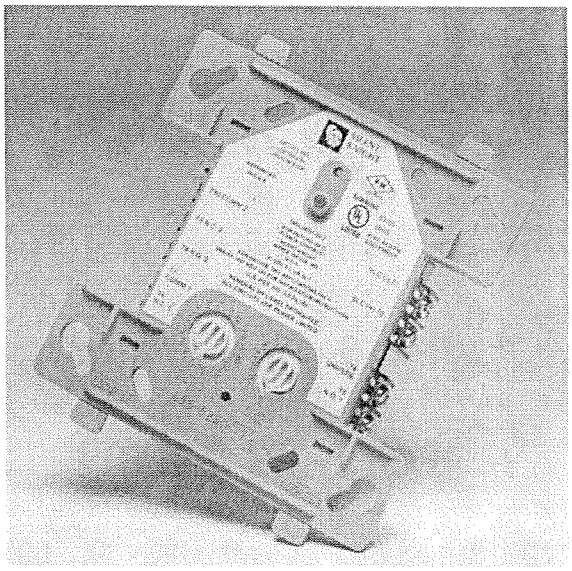
The IDP-Relay contacts can be used for virtually any normally open or normally closed application. Each IDP-Relay is programmed with a unique signaling line circuit (SLC) loop address. When an event occurs that controls the IDP-Relay, the relay is triggered by the FACP

Features

- Two sets of Form C contacts
- Contacts are rated for a variety of amps (see Specifications)
- Panel controlled status LED that flashes green in normal state and is solid red in alarm
- Relay programming is completely flexible–can be mapped to zone conditions
- Polling LED visible through the cover plate
- Attractive ivory cover plate
- Rotary address switches for fast installation
- SEMS screws for easy wiring
- UL Listed

Installation

The IDP-Relay mounts directly into a 4" square electrical box. The box must have a minimum depth of 2-1/8". A surface mount electrical box (PN SSSMB500; System Sensor® PN SMB500) is available from Silent Knight.



IDP-Relay

Compatibility

The IDP-Relay is compatible with the following FACPs:

- IFP-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

Ordering Information

IDP-Relay Relay Module

Accessories*

SSSMB500 4" Square Surface Mount Electrical Box

SSCB500 Module Barrier

** For ordering purposes, an SS has been added to the System Sensor part numbers. (example-System Sensor PN for SSB501 is B501).*

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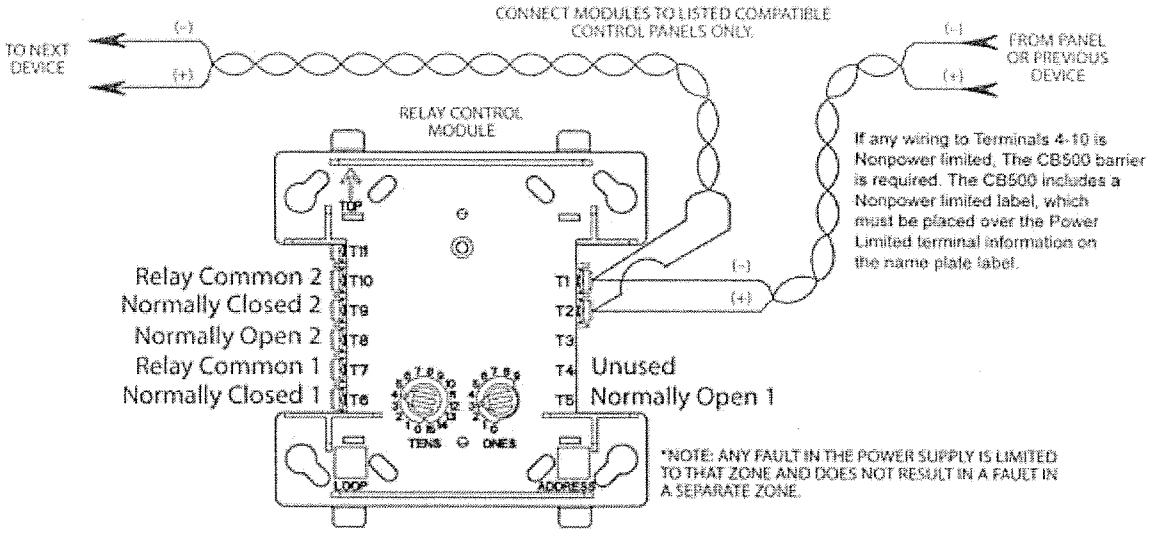
P/N 350290 Rev D



Wiring the IDP-Relay Module

Specifications

Physical

Height: 4.5" (11.4 cm)
Width: 4" (10.2 cm)
Depth: 1.3" (3 cm)
Shipping Weight: 6.3 oz (196 g)

Environmental

Operating Temperature: 32°F – 120°F (0°C – 49°C)
Humidity: 10% – 93% non-condensing

Electrical

Operating Voltage: 15 – 32 VDC
Current Draw: 6.5 mA max (LED on)
Operating Current:
230 µA (LED flashing) direct poll
255 µA (LED flashing) group poll
End-of-Line Resistance: Not used
Standby Current:
300 µA max @ 24 VDC (one communication every 5 sec with LED enabled)
LED Current: 5.5 mA (with LED latched on)
SLC Loop Resistance: 40Ω maX

Relay Contact Ratings

Current Rating	Max Voltage	Load Description	Application
3 A	30 VDC	Resistive	Noncoded
2 A	30 VDC	Resistive	Coded
.9 A	110 VDC	Resistive	Noncoded
.9 A	125 VAC	Resistive	Noncoded
.5 A	30 VDC	Inductive (L/R = 5 ms)	Coded
1 A	30 VDC	Inductive (L/R = 2 ms)	Coded
.3 A	125 VAC	Inductive (PF = .35)	Noncoded
1.5 A	25 VAC	Inductive (PF=.35)	Noncoded
.7 A	70.7 VAC	Inductive (PF = .35)	Noncoded
2 A	25 VAC	Inductive (PF = .35)	Noncoded

Farenhyt

IDP-Zone

Addressable Two-Wire Interface Module

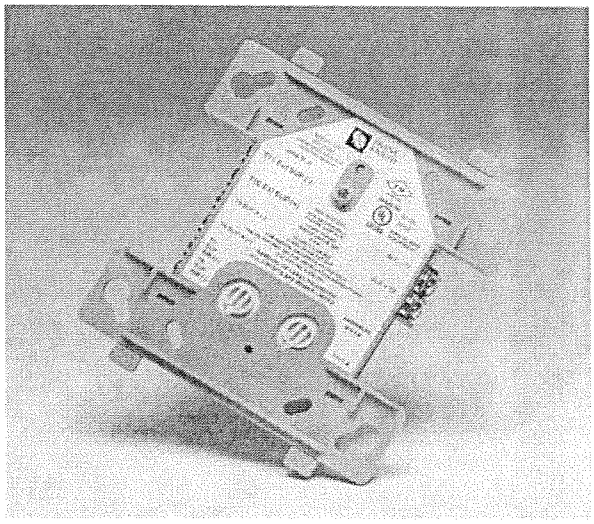
MEA
457-99-E
Vol. V

Description

The IDP-Zone is an addressable two-wire interface module for use with Silent Knight IFP-series fire alarm control panels (FACPs). The IDP-Zone allows a Silent Knight FACP to interface and monitor two wire conventional smoke detectors. This means you can retrofit an existing building and use existing conventional devices.

The IDP-Zone is addressed through the signaling line circuit loop of the FACP. It transmits the status of one full zone of two-wire detectors to the FACP. Status conditions are reported as normal, open, or alarm. The IDP-Zone supervises the zone of detectors and the connection of the external power supply.

All two-wire detectors being monitored must be UL compatible with the IDP-Zone.



IDP-Zone

Features

- Converts a conventional two-wire loop to an SLC loop
- Fully supervised
- Support for Style B and Style D wiring
- Panel controlled status LED that flashes green in normal state and is solid red in alarm
- Attractive ivory cover plate
- Rotary address switches for fast installation
- SEMS screws for easy wiring
- UL Listed

Installation

The IDP-Zone mounts directly into a 4" square electrical box. The box must have a minimum depth of 2-1/8". A surface mount electrical box (part number SMB500) is available from Silent Knight.

Compatibility

The IDP-Zone is compatible with the following FACPs:

- IFP-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

Ordering Information

IDP-Zone Two-Wire Interface Module

Accessories

SSSMB500* 4" Square Surface Mount Electrical Box

** For ordering purposes, an SS has been added to the System Sensor part number. Example - System Sensor PN for SSB501 is B501*

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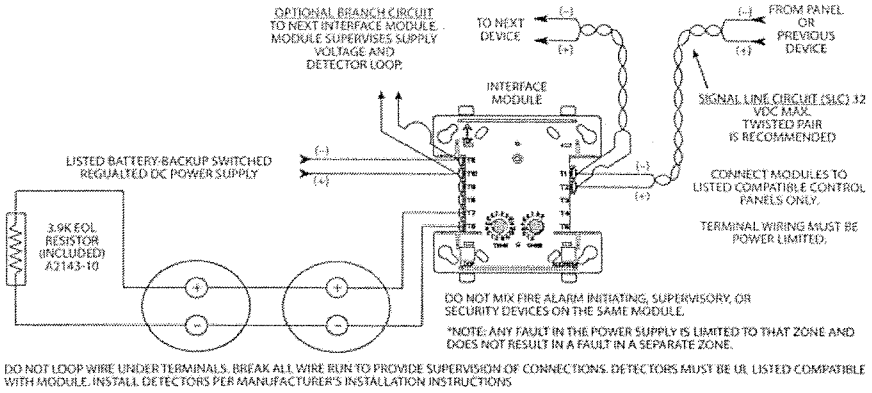
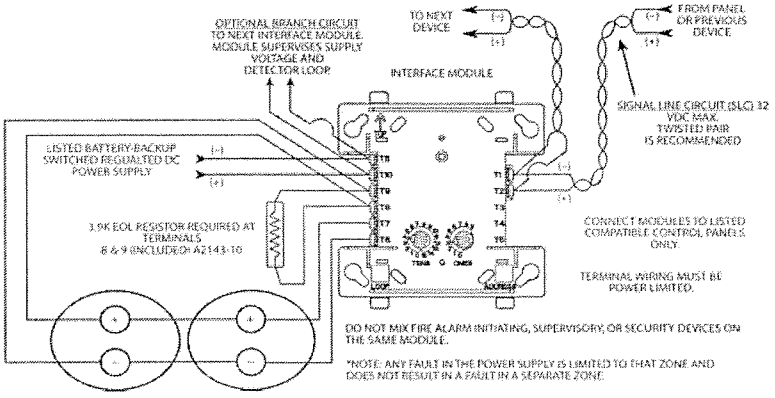
P/N 350292 Rev D

Interface two-wire conventional detectors, NFPA Style B



Interface two-wire conventioanl detectors, NFPA Style D



Specifications

Physical

Height: 4.5" (11.4 cm)

Width: 4" (10.2 cm)

Depth: 1.3" (3.2 cm)

Shipping Weight: 6.3 oz (196 g)

Environmental

Operating Temperature: 32°F – 120°F (0°C – 49°C)

Humidity: 10% – 93% non-condensing

Electrical

Normal Operating Voltage: 15 – 32 VDC

Maximum Current Draw: 5.1 mA (LED on)

Operating Current: 300 µA average (LED flashing)

EOL Resistence: 3.9K Ohms

Maximum IDC wiring Resistence: 25 Ohms

External Power Supply

Voltage: 18 – 28 VDC power limited
(19 – 28 VDC when used with intrinsically safe applications

Ripple Voltage: 0.1V RMS max

Current: 90 mA per module

Farenhyt

Addressable Two-Wire Interface Module

IDP-Zone-6

The IDP-Zone-6 is an addressable zone interface module for use with Silent Knight IFP-series fire alarm control panels (FACPs). The IDP-Zone-6 provides six zone inputs that allow a Silent Knight FACP to interface and monitor two-wire conventional smoke detectors. This means you can retrofit an existing building and use existing conventional devices.

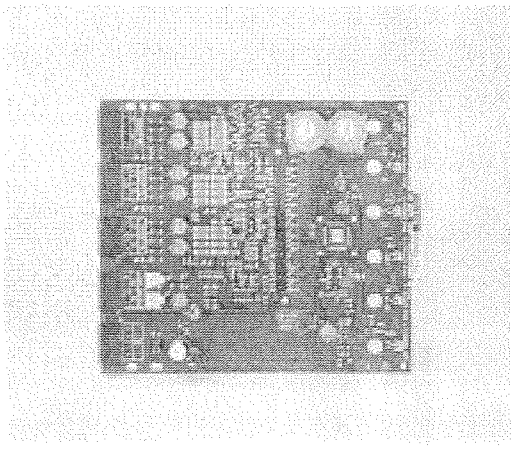
The inputs on the IDP-Zone-6 share a common FACP signaling line circuit (SLC) input, and the initiating device circuits share a common external power supply. Otherwise, each input on the module operates independently from the others. If needed, you can disable a maximum of two unused inputs on the IDP-Zone-6 board.

It transmits the status of a zone of two-wire detectors to the FACP. Status conditions are reported as normal, open, or alarm. The IDP-Zone-6 supervises the zone of detectors and the connection of the external power supply.

All two-wire detectors being monitored must be UL compatible with the IDP-Zone-6.

Features

- Converts a conventional two-wire loop to an SLC loop
- Six zone inputs
- Fully supervised
- Support for Class B and Class A wiring
- Removable 12 to 18 AWG plug-in terminal blocks
- Individual LED for each relay contact
- Two module mounting in the IDP-ACB cabinet
- Up to two unused modules can be disabled
- Rotary address switches for fast installation
- Mounting hardware included
- UL Listed



IDP-Zone-6

Installation

The IDP-Zone-6 mounts in the Silent Knight IDP-ACB cabinet (PN IDP-ACB). The IDP-ACB has a built-in chassis that will accommodate one or two IDP-Zone-6 modules.

Compatibility

The IDP-Zone-6 is compatible with the following FACPs:

- IFP-2000/RPS-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

For a list of detectors compatible with the IDP-Zone-6, see the IDP-Zone-6 Installation Instructions (PN K200-16-00).

SILENT KNIGHT
by Honeywell

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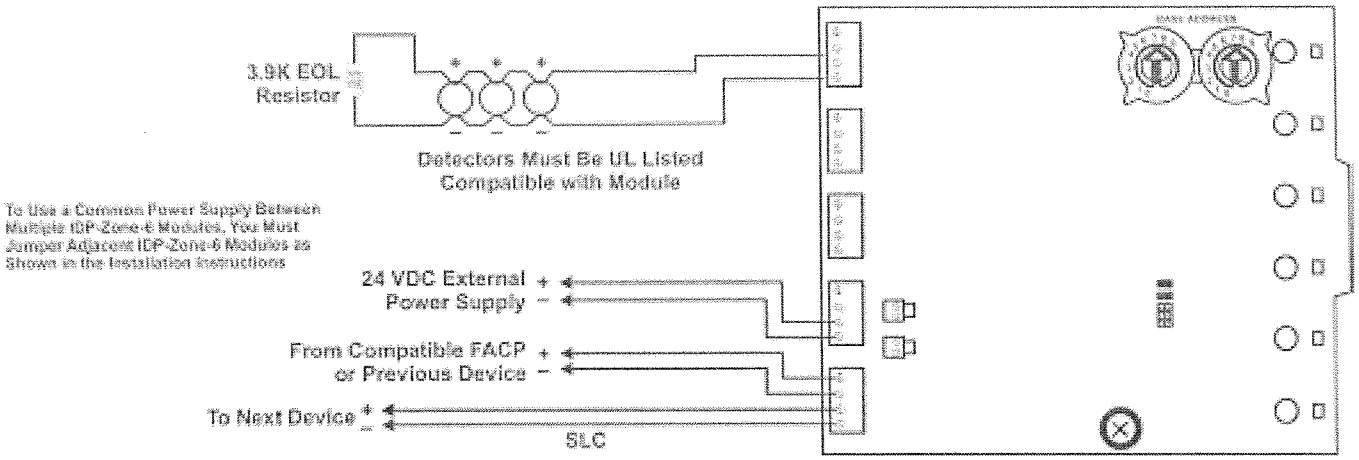
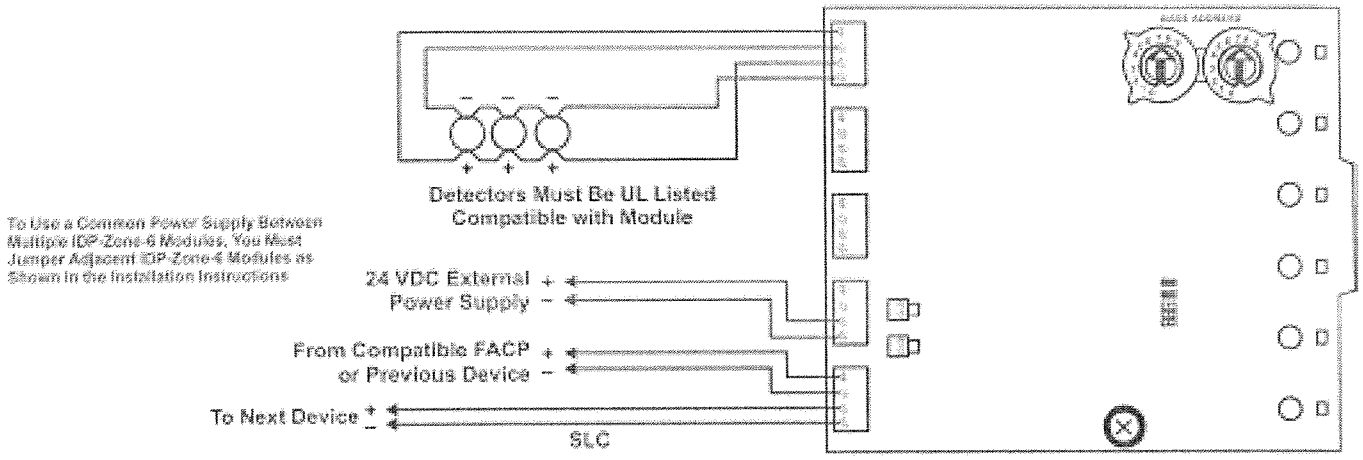
Maple Grove, Mn 55369-4927
763-493-6455 or -800-328-0103
Fax: 763-493-6475
www.farenhyt.com

P/N 350297 Rev C



Wiring the IDP-Zone-6 Two-Wire Interface Module and Two-Wire Conventional Detectors for Class B, Style B



Wiring the IDP-Zone-6 Two-Wire Interface Module and Two-Wire Conventional Detectors for Class A, Style D

Specifications

Physical

IDP-Zone-6	IDP-ACB
Height: 6.8" (17.3 cm)	15.25" (38.7 cm)
Width: 5.8" (14.7 cm)	12.5" (31.8 cm)
Depth: 1.0" (2.5 cm)	3" (7.6 cm)
Shipping Weight: 6.3 oz (196 g)	6.5 lbs (2.8 kg)

Environmental

Operating Temperature: 32°F – 120°F (0°C – 49°C)

Humidity: 10% – 93% non-condensing

Electrical

Wire Gauge: 12 – 18 AWG

Operating Voltage: 15 – 32 VDC

Alarm Current: 40 mA max (assumes all six LEDs solid on)

Standby Current: 2 mA max

SLC Loop Impedance: 40 max

Initiating Device Circuit: Supervised, power-limited

Initiating Device Circuit Wiring Resistance: 25 max

External Power Supply
Voltage: 18 – 28 VDC power limited;
Ripple Voltage: 0.1V RMS max;
Current: 90 mA per module

Ordering Information

IDP-Zone-6	Six Zone Two-Wire Interface Module

Accessories

IDP-ACB	IDP Module Cabinet. Cabinet holds two IDP-Zone-6s.

SILENT KNIGHT
by Honeywell

For more information, contact Silent Knight 7550 Meridian Circle Suite 100, Maple Grove, Mn 55369-4927. Phone: (800) 328-0103, Fax: (763) 493-6475.

Made in the U.S.A.

Farenhyt

IDP-Control

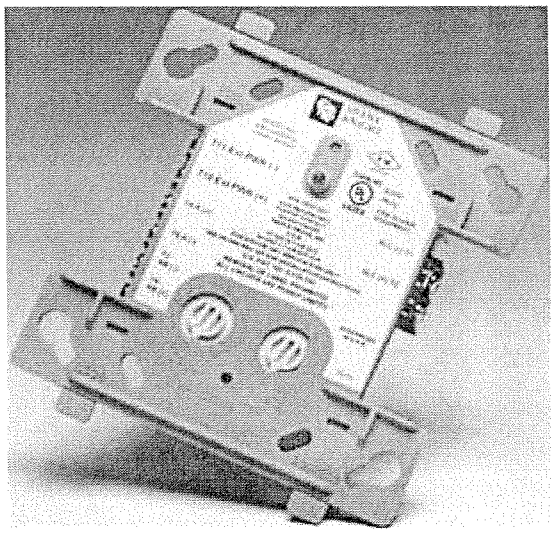
Addressable Notification Module

Description

The IDP-Control is an addressable notification module for use with Silent Knight IFP-series fire alarm control panels (FACPs). The IDP-Control gives you the flexibility to add notification circuits wherever they are needed on an IFP FACP signaling line circuit (SLC) loop.

The IDP-Control provides supervised monitoring of wiring to load devices that require an external power supply to operate, such as bells, horns, and strobes. It is capable of Class B (Styles Y) and Class A (Style Z) supervision.

Upon command from the FACP, the IDP-Control will disconnect the supervision and connect the external power supply across the load device. The disconnection of the supervision provides a positive indication to the panel that the control relay actually turned on. The external power supply is always relay isolated from the SLC loop, so that a trouble condition on the power supply will never interfere with the rest of the system.



IDP-Control

Features

- Flexible solution for adding notification circuits where needed
- Support for Class B (style Y) or Class A (style Z) wiring
- Panel controlled status LED that flashes green in normal state and is solid red in alarm
- Polling LED visible through the cover plate
- Attractive ivory cover plate
- Rotary address switches for fast installation
- SEMS screws for easy wiring
- UL Listed

Installation

The IDP-Control mounts directly into a 4" square electrical box. The box must have a minimum depth of 2-1/8". A surface mount electrical box (part number SMB500) is available from Silent Knight.

Compatibility

The IDP-Control is compatible with the following FACPs:

- IFP-2000 Intelligent Fire Panel
- IFP-1000 Intelligent Fire Panel
- IFP-100 Intelligent Fire Panel
- IFP-50 Intelligent Fire Panel

Ordering Information

IDP-Control	Notification Module

Accessories

SSSMB500	4" Square Surface Mount Electrical Box
SSCB500	Module Barrier

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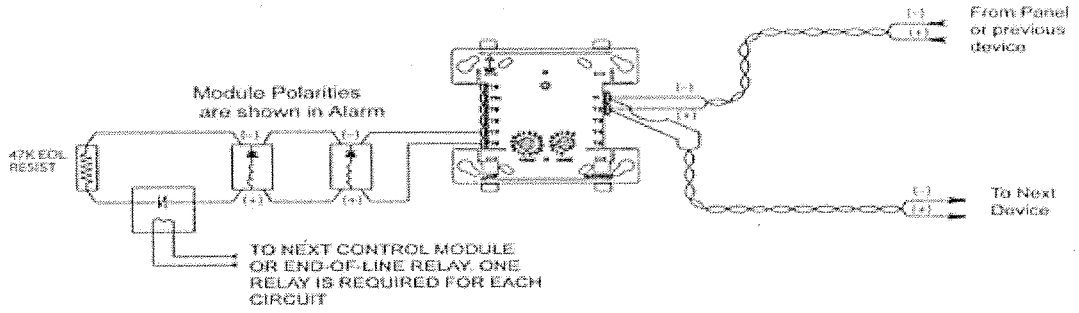
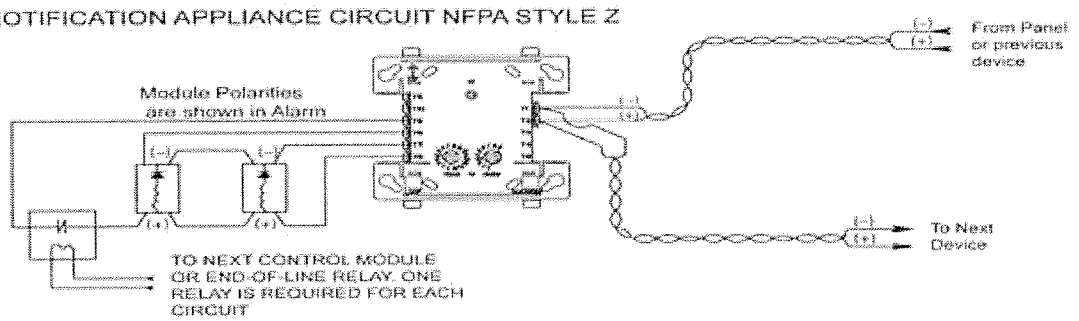
P/N 350293 Rev D

NOTIFICATION APPLIANCE CIRCUIT NFPA STYLE Y



NOTIFICATION APPLIANCE CIRCUIT NFPA STYLE Z



Specifications

Physical

Height: 4.5" (11.4 cm)
Width: 4" (10.2 cm)
Depth: 1.3" (3.2 cm)
Shipping Weight: 6.3 oz (196 g)

Environmental

Operating Temperature: 32°F – 120°F (0°C – 49°C)
Humidity: 10% – 93% non-condensing

Electrical

Operating Voltage: 15 – 32 VDC
Current Draw: 6.5 mA max (LED on)
Operating Current: 375 µA average (LED flashing)
Drain on External Power Supply: 1.7 mA max (using internal EOL relay)
End-of-Line Resistance: 47K Ω
Standby Current:

- 400 µA max @ 24 VDC (one communication every 5 sec with 47K EOL)
- 550 µA max @ 24 VDC (one communication every 5 sec with EOL <1K)

LED Current: 5.5 mA (with LED latched on)
SLC Loop Resistance: 40Ω maX

Relay Contact Ratings

Current Rating	Max Voltage	Load Description	Application
3A	30 VDC	Resistive	Noncoded
2A	30 VDC	Resistive	Coded
0.9A	30 VDC	Resistive	Noncoded
0.9A	30 VDC	Resistive	Noncoded
0.5A	30 VDC	Inductive (L/R = 5ms)	Coded
1A	30 VDC	Inductive (L/R = 2ms)	Coded
0.5A	125 VDC	Inductive (PF=0.35)	Noncoded
0.7A	75 VDC	Inductive (PF=0.35)	Noncoded
2A	25 VDC	Inductive (PF=1)	Noncoded

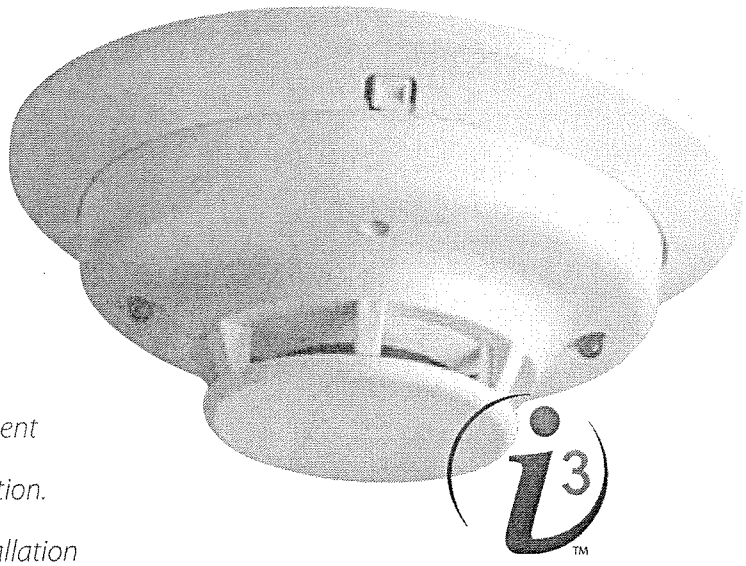
SILENT KNIGHT by Honeywell

For more information contact Silent Knight 7550 Meridian Circle, Suite 100, Maple Grove, MN 55369-4927 Phone: (800) 328-0103, fax (763) 493-6475
www.Farenhyt.com

Made in the USA

SYSTEM SENSOR®

Photoelectric Smoke Detectors



System Sensor's i³™ series smoke detectors represent significant advancement in conventional detection. The i³ family is founded on three principles: installation ease, intelligence, and instant inspection.

Features

- Plug-in detector line, mounting base included
- Large wire entry port
- In-line terminals with SEMS screws
- Mounts to octagonal and single-gang backboxes, 4-square backboxes, or direct to ceiling
- Stop-Drop 'N Lock attachment to base
- Removable detector cover and chamber
- Built-in remote maintenance signaling
- Drift compensation and smoothing algorithms
- Simplified sensitivity measurement
- Wide angle, dual color LED indication
- Loop testing via EZ Walk feature
- Built-in test switch

Installation ease. The i³ line redefines installation ease with its plug-in design. This allows an installer to pre-wire the bases included with the heads. The large wire entry port and in-line terminals provide ample room for neatly routing the wiring inside the base. The base accommodates a variety of back box mounting methods, as well as direct mounting with drywall anchors. To complete the installation, i³ heads plug in to the base with a simple Stop-Drop 'N Lock™ action.

Intelligence. i³ detectors offer a number of intelligent features to simplify testing and maintenance. Drift compensation and smoothing algorithms are standard with the i³ line to minimize nuisance alarms. Two-wire i³ detectors needing cleaning can generate a remote maintenance signal, when connected to the 2W-MOD2 loop test/maintenance module, or to a panel equipped with the i³ protocol. This signal is indicated by LEDs located at the module and the panel. The SENS-RDR, a wireless device, displays the sensitivityof i³ detectors in terms of percent per-foot-obscuration.

Instant inspection. The i³ series provides wide-angle red and green LED indicators for instant inspection of the detector's condition: normal standby, out-of-sensitivity, alarm, or freeze trouble. When connected to the 2W-MOD2 loop test/maintenance module or a panel with the i³ protocol, the EZ Walk loop test feature is available on two-wire i³ detectors. This feature verifies the initiating loop wiring by providing LED status indication at each detector.

Agency Listings

UL LISTED S911 | FM APPROVED 3011446 | 7272-1209:210 | MEA approved 290-01-E | MSFM approved 2093

i³ Smoke Detector Specifications

Architectural/Engineering Specifications

Smoke detector shall be a System Sensor i³ Series model number_____, listed to Underwriters Laboratories UL 268 for Fire Protection Signaling Systems. The detector shall be a photoelectric type (Model 2W-B, 4W-B) or a combination photoelectric/thermal (Model 2WT-B, 4WT-B) with thermal sensor rated at 135°F (57.2°C). The detector shall include a mounting base for mounting to 3½-inch and 4-inch octagonal, single gang, and 4-inch square back boxes with a plaster ring, or direct mount to the ceiling using drywall anchors. Wiring connections shall be made by means of SEMS screws. The detector shall allow pre-wiring of the base and the head shall be a plug-in type. The detector shall have a nominal sensitivity of 2.5 percent-per-foot nominal as measured in the UL smoke box. The detector shall be capable of automatically adjusting its sensitivity by means of drift compensation and smoothing algorithms. The detector shall provide dual color LED indication which blinks to indicate power up, normal standby, out of sensitivity, alarm, and freeze trouble (Model 2WT-B, 4WT-B) conditions. When used in conjunction with the 2W-MOD2 module, 2-wire models shall include a maintenance signal to indicate the need for maintenance at the alarm control panel, and shall provide a loop testing capability to verify the circuit without testing each detector individually.

Electrical Specifications

Operating Voltage	Nominal: 12/24V non-polarized Minimum: 8.5V Maximum: 35V
Maximum Ripple Voltage	30% peak to peak of applied voltage
Standby Current	2-wire: 50 μA maximum average; 4-wire: 50 μA maximum average
Maximum Alarm Current	2-wire: 130 mA limited by control panel; 4-wire: 20 mA @12V, 23mA @ 24V
Peak Standby Current	2-wire: 100 μA; 4-wire: n/a
Alarm Contact Ratings	2-wire: n/a; 4-wire: 0.5 A @ 30V AC/DC

Physical Specifications

Dimensions (including base)	5.3 inches (127 mm) diameter; 2.0 inches (51 mm) height
Weight	6.3 oz. (178 grams)
Operating Temperature Range	2W-B and 4W-B: 32°F–120°F (0°C–49°C); 2WT-B and 4WT-B: 32°F–100°F (0°C–37.8°C)
Operating Humidity Range	0 to 95% RH non-condensing
Thermal Sensor	135°F (57.2°C) fixed
Freeze Trouble	2WT-B and 4WT-B only: 41°F (5°C)
Sensitivity	2.5%/ft. nominal
Input Terminals	14–22 AWG
Mounting	3½-inch octagonal back box 4-inch octagonal back box Single gang back box 4-inch square back box with a plaster ring Direct mount to ceiling

LED Modes / Power Up Sequence for LED Indication

LED Mode	Green LED	Red LED	Condition	Duration
Power up	Blink every 10 seconds	Blink every 10 seconds	Initial LED status indication	80 seconds
Normal (standby)	Blink every 5 seconds	off		
Out of sensitivity	off	Blink every 5 seconds		
Freeze trouble	off	Blink every 10 seconds		
Alarm	off	Solid		

Ordering Information

Model	Thermal	Wiring	Alarm Current
2W-B	No	2-wire	130 mA max. limited by control panel
2WT-B	Yes	2-wire	130 mA max. limited by control panel
4W-B	No	4-wire	20 mA @ 12V, 23mA @ 24V
4WT-B	Yes	4-wire	20 mA @ 12V, 23mA @ 24V

Accessories			
2W-MOD2	2-wire loop test / maintenance module	RT	Removal / replacement tool
SENS-RDR	Sensitivity reader	A77-AB2	Retrofit adapter bracket, 6.5 in. (16.76cm) diameter

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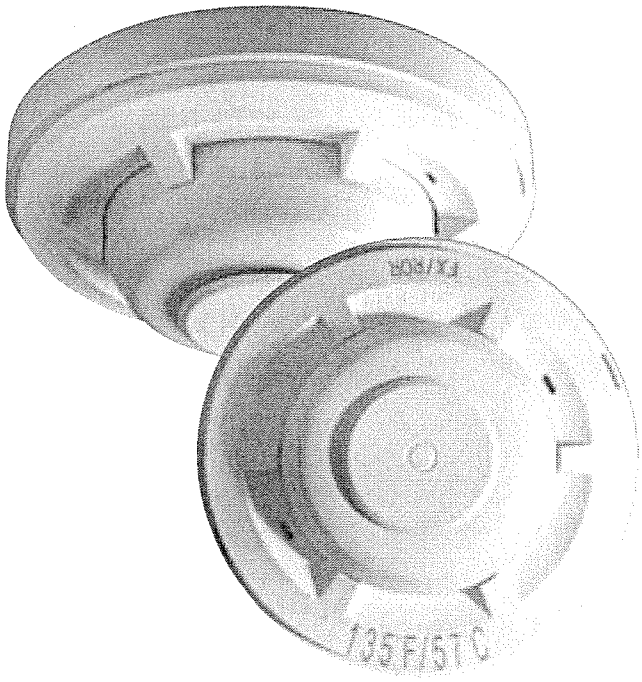
SYSTEM SENSOR®

5600 Series Mechanical Heat Detectors



System Sensor's 5600 series mechanical heat detectors offer a low-cost means for property protection against fire, and for non-life-safety installations where smoke detectors are inappropriate.

Features

- Multiple configurations for installations:
  - Single- and dual-circuit models
  - Fixed temp and combination fixed- temp/rate-of-rise 135°F or 194°F ratings.
- Plain housing for residential installations (Model 5601P)
- Easy-to-use terminal screws
- A broad range of back box mounting options:
  - Single gang
  - 3.5″ and 4″ Octagonal
  - 4″ square with square to round plaster ring
- Reversible mounting bracket

Multiple configurations. The 5600 series offers a full-line of configurations to accommodate a broad range of applications. Both single- and dual-circuit models are available for low- and high-temperature ratings with either fixed temperature or combination fixed temperature/rate-of-rise (ROR) activation. The ROR element of the fixed/ROR models is restorable to accommodate field-testing.

Installation flexibility. To satisfy a variety of installation needs, the 5600 series easily mounts to single-gang and octagonal back boxes. And these models accommodate four-square back boxes, when used with a square to round plaster ring. The reversible mounting bracket permits both flush- and surface-mount back box installations.

Visual identification. The 5600 series provides clear markings on the exterior of the unit to ensure that the proper detector is being used. Alphanumeric characters identify the activation method, as well as the temperature rating, in Fahrenheit and Celsius degrees. Fixed temperature models are identified FX, while combination fixed/rate-of-rise units are marked FX/ROR. The 5600 series also provides a post-activation indicator in the form of a collector. When the detector is activated, the collector drops from the unit, making it easy to identify the unit in alarm.

Agency Listings

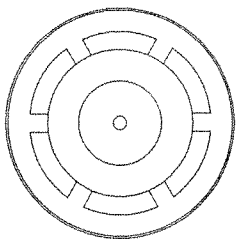
UL LISTED 52101 · FM APPROVED 3016008 · MEA approved 199-03-E · 7270-1209:227

Specifications

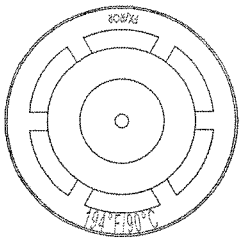
Architectural/Engineering Specifications

Mechanical heat detector shall be a System Sensor 5600 series model number _____, listed to Underwriters Laboratories UL 521 for Heat Detectors for Fire Protective Signaling Systems. The detector shall be either a single-circuit or a dual-circuit type, normally open. The detector shall be rated for activation at either 135°F (57°C) or 194°F (90°C), and shall activate by means of a fixed temperature thermal sensor, or a combination fixed temperature/rate-of-rise thermal sensor. The rate-of-rise element shall be activated by a rapid rise in temperature, approximately 15°F (8.3°C) per minute. The detector shall include a reversible mounting bracket for mounting to 3½-inch and 4-inch octagonal, single gang, and 4-inch square back boxes with a square to round plaster ring. Wiring connections shall be made by means of SEMS screws that shall accommodate 14–22AWG wire. The detector shall contain alphanumeric markings on the exterior of the housing to identify its temperature rating and activation method. The rate-of-rise element of combination fixed temperature/rate-of-rise models shall be restorable, to allow for field-testing. The detectors shall include an external collector that shall drop upon activation to identify the unit in alarm.

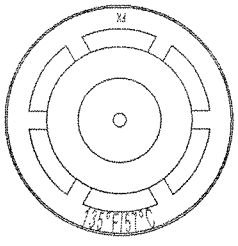
Physical/Operating Specifications	
Maximum Installation Temperature	5601P, 5603, 5621, and 5623: 100°F (38°C) 5602, 5604, 5622, and 5624: 150°F (65.6°C)
Operating Humidity Range	5 to 95% RH non-condensing
Dimensions with mounting bracket	Diameter: 4.57 inches (11.6cm) Height: 1.69 inches (4.3cm)
Alarm Temperature	5601P, 5603, 5621, and 5623: 135°F (57°C) 5602, 5604, 5622, and 5624: 194°F (90°C)
Weight	6 oz. (170 grams)
Rate-of-Rise Threshold	15°F (8.3°C) rise per minute (models 5601P, 5602, 5621, and 5622 only)
Mounting	3½-inch octagonal back box 4-inch octagonal back box Single gang back box 4-inch square back box with a square to round plaster ring
Electrical Specifications	
Operating Voltage / Contact Ratings	6–125VAC / 3A 6–28VDC / 1A 125VDC / 0.3A 250VDC / 0.1A
Input Terminals	14–22 AWG



5601P



5602, 5622



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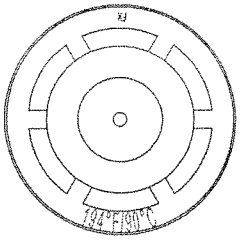

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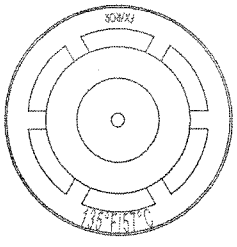

5621

Ordering Information

Model	Circuit	Identification Method on Exterior	Temperature Rating	Activation	UL Protected Spacing – 10 Foot Ceiling*
5601P	Single	None	135°F (57°C)	Fixed Temperature / Rate-of-Rise	50 feet × 50 feet (15.24m × 15.2m)
5602	Single	Lettering	194°F (90°C)	Fixed Temperature / Rate-of-Rise	50 feet × 50 feet (15.24m × 15.2m)
5603	Single	Lettering	135°F (57°C)	Fixed Temperature	25 feet × 25 feet (7.62m × 7.62m)
5604	Single	Lettering	194°F (90°C)	Fixed Temperature	25 feet × 25 feet (7.62m × 7.62m)
5621	Dual	Lettering	135°F (57°C)	Fixed Temperature / Rate-of-Rise	50 feet × 50 feet (15.24m × 15.2m)
5622	Dual	Lettering	194°F (90°C)	Fixed Temperature / Rate-of-Rise	50 feet × 50 feet (15.24m × 15.2m)
5623	Dual	Lettering	135°F (57°C)	Fixed Temperature	25 feet × 25 feet (7.62m × 7.62m)
5624	Dual	Lettering	194°F (90°C)	Fixed Temperature	25 feet × 25 feet (7.62m × 7.62m)

*NOTE: Refer to NFPA72 guidelines for spacing reductions when ceiling heights exceed 10 feet.

SYSTEM SENSOR®

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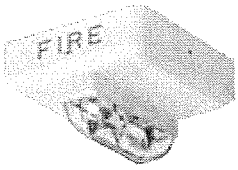
COOPER Notification

Series ZRS Strobes, ZNS Horn Strobes and Series ZNH Horns

SNAP

Series ZNS

Series ZNH



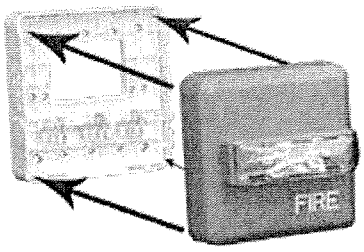
Series ZRS

Series ZRS

Description:

The Wheelock Series Z notification appliances feature an easy snap on base that is designed to simplify the installation and testing of horns, strobes, and horn/strobes. The separate Series Z snap on base can be pre-wired so circuit wiring can be fully tested before the appliance is installed and before the walls are covered. Once all surrounding work is complete, the appliance can be simply installed by snaping it on the base. Shorting contacts in the base, which provide continuity for circuit testing, are permanently opened when the appliance is installed so any subsequent removal of the appliance will indicate a trouble condition on that circuit at the control panel when circuit supervision is enabled. The same base is used for all Series Z horns, strobes and horn/strobes to provide consistent installation and easy replacement of appliances if required. A locking screw is also included for the appliance to provide extra secure installation.

The Wheelock Series Z appliances incorporate the same dependable circuitry and high efficiency optics that are used in Wheelock RSS strobes, NS horn/strobes and NH horns and have the same high performance ratings. The Series Z appliances are compatible with all UL listed "Regulated" panels and all panels that are compatibility listed with Wheelock RSS, NS and NH appliances.



ZNS, ZNH and ZRS appliances go onto the base plate in a SNAP.

Features:

- Approvals include: UL Standard 1971, UL Standard 464, New York City (MEA), California State Fire Marshal (CSFM), Factory Mutual (FM) and Chicago (BFP). See approvals by model number in Specifications and Ordering Information
- ADA/NFPA/UFC/ANSI and OSHA 29, Part 1910, 165 compliant
- EZ Mount SNAP design, with separate base plate, provides ability to pre-wire the base and test the circuit wiring before the walls are covered
- The base plate is protected by a disposable cover and the appliances can quickly snap onto the base after the walls are painted.
- Patented EZ Mount Universal Mounting Plate (ZBASE) – uses single plate for ceiling and wall mount installations
- Wall Mount models feature field selectable candela settings of 15/30/75/110cd and 135/185cd
- Ceiling Mount models feature field selectable candela settings of 15/30/75/95cd and 115/177cd
- Synchronize using the Wheelock Sync Modules or panels with built-in Wheelock Patented Sync Protocol
- 12 and 24 VDC models with UL "Regulated Voltage" using filtered DC or unfiltered VRMS input voltage
- Strobes produce 1 flash per second over the "Regulated Voltage" range (ZNS, ZRS models)
- Selectable Continuous Horn or Temporal (Code-3) Tones with selectable 90 or 95 dBA setting (ZNH, ZNS models)
- Selectable 12 or 24VDC in 1 appliance (ZNH model)

UL THE CITY OF NEW YORK DEPARTMENT OF BUILDINGS MEA FM APPROVED

NOTE: All CAUTIONS and WARNINGS are identified by the symbol ⚠. All warnings are printed in bold capital letters.

⚠ WARNING: PLEASE READ THESE SPECIFICATIONS AND ASSOCIATED INSTALLATION INSTRUCTIONS CAREFULLY BEFORE USING, SPECIFYING OR APPLYING THIS PRODUCT. VISIT WWW.COOPERWHEELOCK.COM OR CONTACT COOPER WHEELOCK FOR THE CURRENT INSTALLATION INSTRUCTIONS. FAILURE TO COMPLY WITH ANY OF THESE INSTRUCTIONS, CAUTIONS OR WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.

General Notes:

- Strobes are designed to flash at 1 flash per second minimum over their "Regulated Voltage Range".
- All candela ratings represent minimum effective strobe intensity based on UL Standard 1971.
- Series ZNS Strobe products are listed under UL Standards 1971 and 464 for indoor use with a temperature range of 32°F to 120°F (0°C to 49°C) and maximum humidity of 93% (± 2%).
- Series ZNH horns are listed under UL Standard 464 for audible signal appliances (Indoor use only).
- "Regulated Voltage Range" is the newest terminology used by UL to identify the voltage range. Prior to this change UL used the terminology "Listed Voltage Range".

Table 1: Series ZNS Ratings Per UL Standard 1971

Model	Input Voltage VDC	Regulated Voltage Range VDC/FWR	Strobe Candela (CD)
ZNS-MCW	24	16.0 - 33.0	15/30/75/110
ZNS-MCWH	24	16.0 - 33.0	135/185
ZNS-MCC	24	16.0 - 33.0	15/30/75/95
ZNS-MCCH	24	16.0 - 33.0	115/177

Table 2: Series ZNS/ZNH Horn dBA Ratings

Description	Volume	Reverberant dBA @ 10ft per UL 464		Anechoic dBA @ 10 ft	
		12 VDC	24 VDC	12 VDC	24 VDC
Continuous Horn	High	83	87	89	95
	Low	76	81	84	90
Code 3 Horn	High	79	82	89	95
	Low	72	76	84	90

Table 3: Series ZNS UL Max. Current*

Series ZNS/ZNH 24 VDC		Audible	Wall Mount Strobe Models						Ceiling Mount Strobe Models					
		ZNH-12/24	ZNS-MCW				ZNS-MCWH		ZNS-MCC				ZNS-MCCH	
			15cd	30cd	75cd	110cd	135cd	185cd	15cd	30cd	75cd	95cd	115cd	177cd
High (95) dBA	16-33 VDC	0.044	0.074	0.107	0.184	0.244	0.350	0.477	0.082	0.124	0.209	0.275	0.350	0.477
Low (90) dBA		0.018	0.066	0.101	0.177	0.232	0.306	0.429	0.071	0.114	0.201	0.261	0.306	0.429

Series ZNS/ZNH 12VDC		Audible
		ZNH-12/24
High (89) dBA	8-17.5 VDC	0.021
Low (84) dBA		0.012

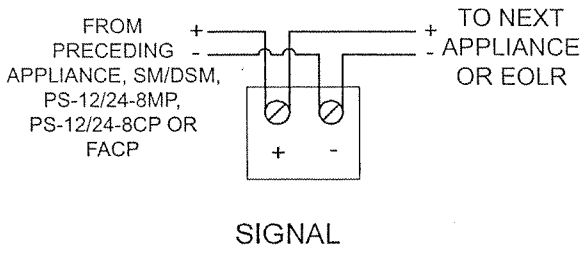
Table 4: Series ZRS UL Max. Current*

ZRS 24VDC Models	ZRS - Wall Mount						ZRS - Ceiling Mount					
	MCW				MCWH		MCC				MCCH	
	15cd	30cd	75cd	110cd	135cd	185cd	15cd	30cd	75cd	95cd	115cd	177cd
16-33 vdc	0.060	0.092	0.165	0.220	0.300	0.420	0.065	0.105	0.189	0.249	0.300	0.420

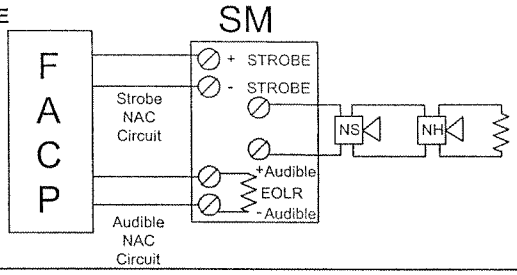
* UL max current rating is the maximum RMS current within the listed voltage range (16-33v for 24v units). For strobes the UL max current is usually at the minimum listed voltage (16v for 24v units). For audibles the max current is usually at the maximum listed voltage (33v for 24v units). For unfiltered FWR ratings, see installation instructions.

Wiring Diagrams#

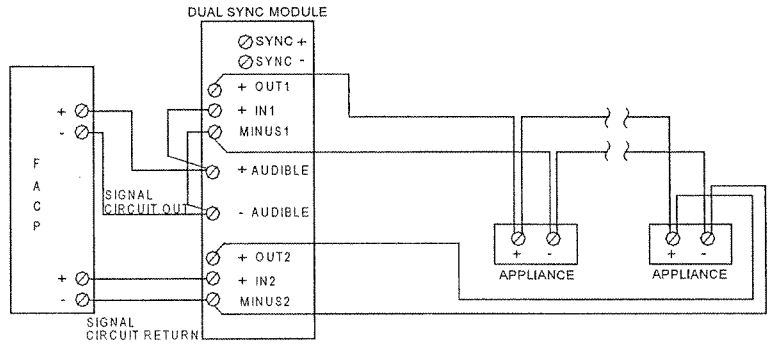
ZNS/ZNH APPLIANCE



ZNS AND ZNH APPLIANCES SYNCHRONIZED WITH SM MODULE SINGLE CLASS "B" NAC CIRCUIT WITH AUDIBLE SILENCE FEATURE



ZNS AND ZNH APPLIANCES SYNCHRONIZED WITH DSM MODULE DUAL CLASS "A" NAC CIRCUIT WITH NO AUDIBLE SILENCE FEATURE



NOTE: ZNS/ZNH must be set on Code-3 horn tone to achieve synchronized temporal (Code-3) tone. Refer to installation instruction (P83983, P83600 respectively).

For detail using SM or DSM Sync Module refer to Data Sheet S3000 or Installation Instructions P83123 for SM and P83177 for DSM. For wiring information on the power supplies refer to Installation Instructions P84662 for PS-24-8MC.

SPECIFICATION & ORDERING INFORMATION

Model Number	Order Code	Strobe Candela	Sync w/ SM, DSM or PS-24-8MC	24 VDC	12 VDC	Mounting Options#	Agency Approvals				
							UL	MEA	CSFM	FM	BFP
ZNS-MCW-FR	0304	15/30/75/110	X	X	-	B, D, E, F	X	*	X	*	*
ZNS-MCW-FW	0305	15/30/75/110	X	X	-	B, D, E, F	X	*	X	*	*
ZNS-MCWH-FR	0306	135/185	X	X	-	B, D, E, F	X	*	X	*	*
ZNS-MCWH-FW	0307	135/185	X	X	-	B, D, E, F	X	*	X	*	*
ZNH-R	0300	-	X	X	X	B, D, E, F	X	*	X	*	*
ZNH-W	0301	-	X	X	X	B, D, E, F	X	*	X	*	*
ZNS-MCC-FR	0310	15/30/75/95	X	X	-	B, D, E, F	X	*	X	*	*
ZNS-MCC-FW	0311	15/30/75/95	X	X	-	B, D, E, F	X	*	X	*	*
ZNS-MCCH-FR	0312	115/177	X	X	-	B, D, E, F	X	*	X	*	*
ZNS-MCCH-FW	0313	115/177	X	X	-	B, D, E, F	X	*	X	*	*
ZRS-MCW-FR	4085	15/30/75/110	X	X	-	B, D, E, F	X	*	X	*	*
ZRS-MCW-FW	0302	15/30/75/110	X	X	-	B, D, E, F	X	*	X	*	*
ZRS-MCWH-FR	5242	135/185	X	X	-	B, D, E, F	X	*	X	*	*
ZRS-MCWH-FW	0303	135/185	X	X	-	B, D, E, F	X	*	X	*	*
ZRS-MCC-FW	0309	15/30/75/95	X	X	-	B, D, E, F	X	*	X	*	*
ZRS-MCC-FR	0308	15/30/75/95	X	X	-	B, D, E, F	X	*	X	*	*
ZRS-MCCH-FR	5240	115/177	X	X	-	B, D, E, F	X	*	X	*	*
ZRS-MCCH-FW	0314	115/177	X	X	-	B, D, E, F	X	*	X	*	*
ZBASE	5268	Accessory - Includes base, dust cover, mounting screws and installation sheet									
ZBB-R	6036	Backbox for indoor suface mounting of all SNAP models									
ZBB-W	6045	Backbox for indoor suface mounting of all SNAP models									

*Pending

#The ZRS, ZNS and ZNH will mount to single-gang, double-gang, 4" octal, 4" square and 3-1/2" octal back boxes.

NOTE: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Wheelock Inc. standard terms and conditions.

ARCHITECTS AND ENGINEERS SPECIFICATIONS

General

Audible/visual notification appliances shall be listed for indoor use and shall meet the requirements of FCC Part 15 Class B. These appliances shall be listed under UL Standard 1971, (Standard for Safety Signaling Devices for Hearing Impaired) and UL Standard 464 (Fire Protective Signaling). The appliances shall use a Patented Universal EZMount backplate that shall allow mounting to a single-gang, double-gang, 4-inch square, 4" octal, or a 3-1/2" octal backbox. Two wire appliance wiring shall be capable of directly connecting to the mounting back plate. Continuity checking of the entire NAC circuit prior to attaching any audible/visual notification appliances shall be allowed. A dust cover shall fit and protect the mounting plate. The dust cover shall be easily removed when the appliance is installed over the backplate. Removal of an appliance shall result in an alarm condition by the Fire Alarm Control Panel (FACP).

Strobes

Strobe appliances shall produce a minimum flash rate of 60 flashes per minute (1 flash per second) over the Regulated Voltage Range of 16 to 33 VDC and shall incorporate a Xenon flashtube enclosed in a rugged Lexan lens. The strobes shall be available with two or four field selectable settings in one unit and shall be rated, per UL 1971, for up to 185 cd for wall mounting and 177 cd for ceiling mounting. The strobes shall operate over an extended temperature range of 32°F to 120°F (0°C to 49°C) and be listed for maximum humidity of 95% RH. Strobe inputs shall be polarized for compatibility with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP).

Audibles and Audible/Strobe Combinations

Horns and horn/strobes shall be listed for Indoor use under UL Standard 464. The horns shall be able to produce a continuous output or a temporal code-3 output that can be synchronized. The horns shall have at least 2 sound level settings of 90 and 95 dBA.

Synchronization Modules

When synchronization of strobes or temporal Code-3 audibles is required, the appliances shall be compatible with the Wheelock Series SM, DSM Sync Modules Wheelock Power Supplies or other manufacturers panels with built-in Wheelock Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. Audibles and strobes shall be able to be synchronized on a 2-wire circuit with the capability to silence the audible if required. If the sync module or power supply fails to operate (i.e., contacts remain closed), the strobes shall revert to a non-synchronized flashrate

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3 YEAR WARRANTY

Z1000 ZNS/ZNH ZRS 12/07

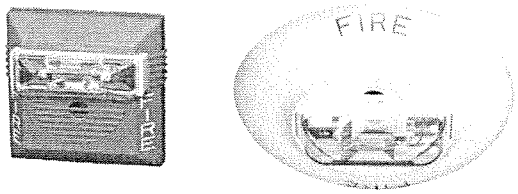
NJ Location
273 Branchport Ave.
Long Branch, NJ 07740
P: 800-631-2148
F: 732-222-8707
www.coopernotification.com

FL Location
7565 Commerce Ct.
Sarasota, FL 34243
P: 941-487-2300
F: 941-487-2389

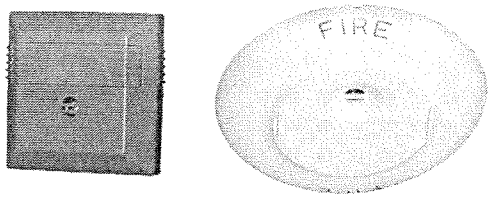
VA Location
P: 877-459-7726
F: 703-294-6560

COOPER Notification

Series NS Horn Strobes and Series NH Horns



Series NS



Series NH

Description:

The Series NS Horn Strobe Appliances are designed for indoor, wall and ceiling mount applications.

The Series NH Horn and the horn portion of the Series NS include a selectable continuous horn tone or temporal pattern (Code 3) with selectable dBA settings of 90 or 95 dBA.

Strobe options include 1575cd or the Wheelock patented Multi-Candela strobe with field selectable candela settings of 15/30/75/110cd for wall mount and 15/30/75/95cd and 115/177cd for ceiling mount.

These versatile Horn Strobe Appliances can be synchronized using the Wheelock SM, DSM Sync Modules, Wheelock Power Supplies or other manufacturers panels incorporating the Wheelock Patented Sync Protocol. Additionally, the audible may be silenced while maintaining strobe activation.

All models of the Series NS and NH are designed for maximum performance, reliability and cost-effectiveness while meeting or exceeding the latest requirements of NFPA 72/ANSI 117.1/UFC and UL Standards 1971 and 464 as well as meeting ADA requirements concerning photosensitive epilepsy.

The Wheelock patented 2-Wire Series NS Horn Strobes and Series NH Horns offer more features with lower current draw than competitors.

Features:

- Approvals include: UL Standard 1971, UL Standard 464, New York City (MEA), California State Fire Marshal (CSFM), Factory Mutual (FM) and Chicago (BFP). See approvals by model number in Specifications and Ordering Information
- ADA/NFPA/UFC/ANSI compliant
- Complies with OSHA 29, Part 1910.165
- Wall mount model Field Selectable Candela Setting 15/30/75/110cd (24 VDC Multi-Candela models) or 1575cd in 12 or 24 VDC
- Ceiling mount model Field Selectable Candela Setting 15/30/75/95cd and 115/177cd (24 VDC Multi-Candela models)
- Selectable Continuous Horn or Temporal (Code 3)
- 2 Selectable dBA settings of 90 and 95 dBA in both tones
- Patented Universal Mounting Plate
- 12 and 24 VDC models with UL "Regulated Voltage" using filtered DC or unfiltered VRMS input voltage
- Wall and Ceiling Mount
- Ceiling models with same look as Wheelock round ceiling strobes and speakers
- NH horn is selectable 12 or 24 VDC in 1 appliance
- Synchronize using Wheelock Sync Modules or panels with built-in Wheelock Patented Sync Protocol
- Fast installation with IN/OUT screw terminals using #12 to #18 AWG wires

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General Notes:

- Strobes are designed to flash at 1 flash per second minimum over their "Regulated Voltage Range". Note that NFPA-72 specifies a flash rate of 1 to 2 flashes per second and ADA Guidelines specify a flash rate of 1 to 3 flashes per second.
- All candela ratings represent minimum effective Strobe intensity based on UL Standard 1971.
- Series NS Strobe products are listed under UL Standard 1971 for indoor use with a temperature range of 32°F to 120°F (0°C to 49°C) and maximum humidity of 93% (± 2%).
- Series NH horns are listed under UL Standard 464 for audible signal appliances (Indoor use only).
- **"Regulated Voltage Range" is the newest terminology used by UL to identify the voltage range. Prior to this change UL used the terminology "Listed Voltage Range".**

Table 1: Ratings Per UL Standard 1971

Model	Input Voltage VDC	Regulated Voltage Range VDC/FWR	Strobe Candela (CD)
NS-24MCW	24	16.0 - 33.0	15/30/75/110
NS-241575W	24	16.0 - 33.0	15 (75 on Axis)
NS-121575W	12	8.0 - 17.5	15 (75 on Axis)
NS-24MCC	24	16.0 - 33.0	15/30/75/95
NS-24MCCH	24	16.0 - 33.0	115/177

Table 2: dBA Ratings for Series NS/NH Horn

Description	Volume	Reverberant dBA @ 10ft per UL 464		Anechoic dBA @ 10 ft	
		12 VDC	24 VDC	12 VDC	24 VDC
Continuous Horn	High	83	87	89	95
	Low	76	81	84	90
Code 3 Horn	High	79	82	89	95
	Low	72	76	84	90

Table 3: UL Max Current*

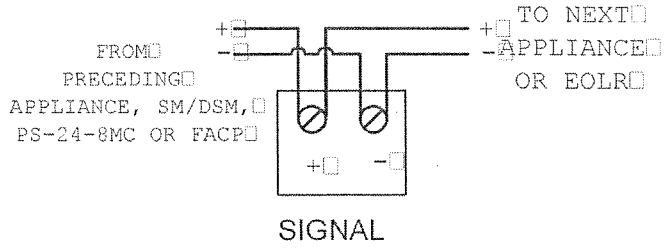
Series NS/NH 24 VDC		Audible	Wall Mount Strobe Models					Ceiling Mount Strobe Models					
		NH-12/24	NS-241575W	NS-24MCW				NS-24MCC				NS-24MCCH	
		@24VDC	15/75cd	15cd	30cd	75cd	110cd	15cd	30cd	75cd	95cd	115cd	177cd
High (95) dBA	24VDC	0.044	0.104	0.074	0.107	0.184	0.244	0.082	0.124	0.209	0.275	0.350	0.477
Low (90) dBA	24VDC	0.018	0.096	0.066	0.101	0.177	0.232	0.071	0.114	0.201	0.261	0.306	0.429

Series NS/NH 12VDC		Audible	Wall Mount
		NH-12/24	Aud/Strobe
		@12V	NS-121575W
High (89) dBA	12 VDC	0.021	0.220
Low (84) dBA	12VDC	0.012	0.210

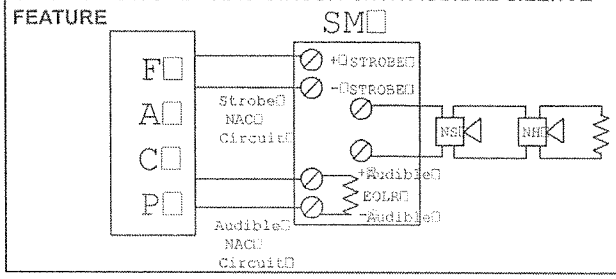
* RMS current ratings are per UL average RMS method. UL max current rating is the maximum RMS current within the listed voltage range (16-33v for 24v units). For strobes the UL max current is usually at the minimum listed voltage (16v for 24v units). For audibles the max current is usually at the maximum listed voltage (33v for 24v units). For unfiltered FWR ratings, see installation instructions.

Wiring Diagrams#

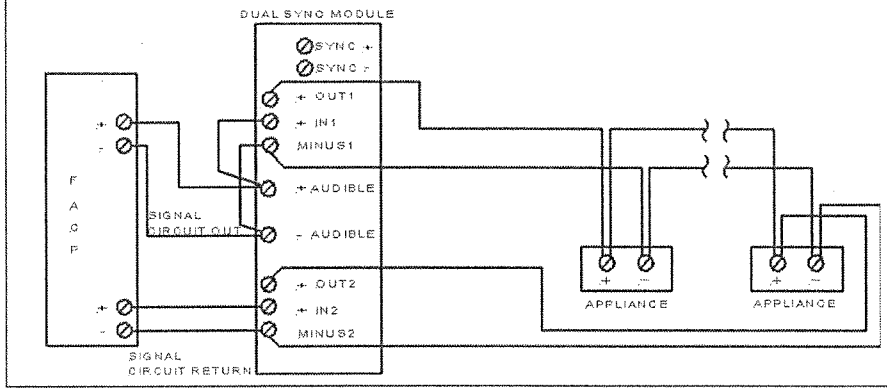
NS/NH APPLIANCE



NS AND NH APPLIANCES SYNCHRONIZED WITH SM MODULE SINGLE CLASS "B" NAC CIRCUIT WITH AUDIBLE SILENCE FEATURE



NS AND NH APPLIANCES SYNCHRONIZED WITH DSM MODULE DUAL CLASS "A" NAC CIRCUIT WITH NO AUDIBLE SILENCE FEATURE



NOTE: NS/NH must be set on Code 3 horn tone to achieve synchronized temporal (Code 3) tone. Refer to installation instruction (P83983, P83600 respectively).

For detail using SM or DSM Sync Module refer to Data Sheet S3000 or Installation Instructions P83123 for SM and P83177 for DSM. For wiring information on the power supplies refer to Installation Instructions P84662 for PS-24-8MC.

SPECIFICATION & ORDERING INFORMATION

Model Number	Order Code	Strobe Candela	Sync w/ SM, DSM or PS-24-8MC	24 VDC	12 VDC	Mounting Options#	Agency Approvals				
							UL	MEA	CSFM	FM	BFP
NS-24MCW-FR	9404	15/30/75/110	X	X	-	B,D,E,F,G,H,J,N,O,R,X	X	X	X	X	X
NS-24MCW-FW	9405	15/30/75/110	X	X	-	B,D,E,F,G,H,J,N,O,R,X	X	X	X	X	X
NS-241575W-FR	7806	15 (75 on Axis)	X	X	-	B,D,E,F,G,H,J,N,O,R,X	X	X	X	X	X
NS-241575W-FW	7811	15 (75 on Axis)	X	X	-	B,D,E,F,G,H,J,N,O,R,X	X	X	X	X	X
NS-121575W-FR	7816	15 (75 on Axis)	X	--	X	B,D,E,F,G,H,J,N,O,R,X	X	X	X	X	X
NS-121575W-FW	7818	15 (75 on Axis)	X	-	X	B,D,E,F,G,H,J,N,O,R,X	X	X	X	X	X
NH-12/24-R	7449	-	X	X	X	B,D,E,F,G,H,J,N,O,R,X	X	X	X	X	X
NH-12/24-W	7500	-	X	X	X	B,D,E,F,G,H,J,N,O,R,X	X	X	X	X	X
NS-24MCC-FR	3754	15/30/75/95	X	X	-	E	X	*	X	X	*
NS-24MCC-FW	3753	15/30/75/95	X	X	-	E	X	*	X	X	*
NS-24MCCH-FR	3756	115/177	X	X	-	E	X	*	X	X	*
NS-24MCCH-FW	3755	115/177	X	X	-	E	X	*	X	X	*
NH-12/24R-R	3752	-	X	X	X	D & E	X	*	X	X	*
NH-12/24R-W	3751	-	X	X	X	D & E	X	*	X	X	*

*Pending

Note: Models are available in Red or White. Contact Customer Service for Order Code and Delivery.
#Refer to Data Sheet S7000 for Mounting Options

NOTE: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Wheelock Inc. standard terms and conditions.

ARCHITECTS AND ENGINEERS SPECIFICATIONS

The audible/visual notification appliances shall be Wheelock Series NS Horn Strobe appliances and Series NH Horn appliances or approved equals. The Series NS appliances shall meet and be listed for UL Standard 1971(Emergency Devices for the Hearing-Impaired for Indoor Fire Protection Service). The Series NH Horn shall be UL Listed under Standard 464 (Fire Protective Signaling). The horn strobe shall be listed for indoor use and shall meet the requirements of FCC Part 15 Class B. All inputs shall be compatible with standard reverse polarity supervision of circuit wiring by the Fire Alarm Control Panel (FACP).

The audible portion of the appliance shall have a minimum of two (2) field selectable settings for dBA levels (90 and 95 dBA) and shall have a choice of continuous or temporal (Code 3) audible outputs.

The strobe portion of the appliance shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range and shall incorporate a Xenon flashtube enclosed in a rugged Lexan lens. The Series NS shall be of low current design. Where wall mount, Multi-Candela appliances are specified, the strobe intensity shall have field selectable settings and shall be rated per UL Standard 1971 for 15/30/75/110 candela. Where ceiling mount, Multi-Candela appliances are specified, the strobe intensity shall have field selectable settings and shall be rated per UL Standard 1971 for 15/30/75/95 candela or 115/177 candela. The selector switch for selecting the candela setting shall be tamper resistant. The 1575 candela strobe shall be specified when 15 candela UL Standard 1971 Listing with 75 candela on-axis is required (e.g. ADA compliance).

When synchronization is required, the appliance shall be compatible with the Wheelock SM, DSM Sync Modules, Wheelock Power Supplies or other manufacturers panels with built-in Wheelock Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync module or Power Supply fails to operate, (i.e., contacts remain closed), the strobes shall revert to a non-synchronized flash-rate. The appliance shall also be designed so that the audible signal may be silenced while maintaining strobe activation.

The Series NS Horn Strobes and NH horn shall incorporate a Patented Universal Mounting Plate that shall allow mounting to a single-gang, double-gang, 4-inch square, 100mm European type backboxes, or the SHBB Surface Backbox. If required, an NATP (Notification Appliance Trimplate) shall be provided.

All notification appliances shall be backward compatible.

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3 YEAR WARRANTY
Made in USA

S2100 NS/NH 2/08

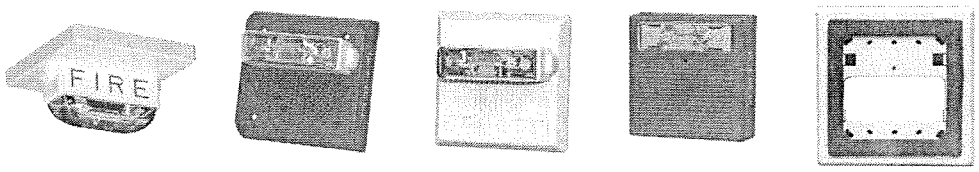
NJ Location
273 Branchport Ave.
Long Branch, NJ 07740
P: 800-631-2148
F: 732-222-8707
www.coopernotification.com

FL Location
7565 Commerce Ct.
Sarasota, FL 34243
P: 941-487-2300
F: 941-487-2389

VA Location
2009 North 14th St., Ste. 510
Arlington, VA 22201
P: 877-459-7726
F: 703-294-6560

COOPER Notification

Weatherproof Appliances - Series AH Audibles, AS Audible Strobes, MT Multitone Strobes, RSS Strobes and ET70 Speaker Strobes and Weatherproof Mounting Accessories



Description:

Designed for life safety, performance and reliability, Cooper Wheelock's cost effective weatherpoof notification appliances include:

Weatherproof Appliances	Series
Strobes	RSSWP
Horn Strobes	ASWP
Horns	AH-24WP, AH-12WP
Multitone Horn Strobes	MTWP
Multitone Horns	MT
Speaker Strobes	ET70WP
Speakers	ET-1010

All strobe models are UL dual listed - meeting both UL1638 and UL1971 requirements. As dual listed appliances, these weatherproof strobes, horn strobes and speaker strobes are listed for outdoor applications under UL 1638 as well as under UL 1971, the Standard for Safety Signaling Devices for Hearing Impaired. With an extended temperature range of –31°F to 150°F (-40°C to 66°C), Wheelock weatherproof appliances meet or exceed UL outdoor test requirements for rain, humidity and corrosion resistance while providing multiple strobe intensity options, including the highest strobe ratings available for area coverage per NFPA 72 strobe spacing tables (up to 185 candela for wall mounting and 177 candela for ceiling mounting).

To enable weatherproof mounting, Cooper-Wheelock provides the industry's widest choice of mounting options for surface or unique semi-flush installation. Models are available for surface mounting to Wheelock weatherproof backboxes on walls or ceilings. The optional WP-KIT allows the weatherproof backboxes (IOB, WPBB or WPSBB) to be mounted to a recessed electrical box for concealed conduit installation. For semi-flush installation, the WPA and WFPA kits allow a customer to mount the weatherproof appliances to a recessed electrical box without the need for an external weatherproof backbox. See the Backboxes, Plates and Gaskets Table on page three of this document for a summarization of these mounting options and the required accessories.

All models may be synchronized using the Wheelock SM, DSM Sync Modules, Wheelock Power Supplies or other manufacturers panels incorporating the Wheelock Patented Sync Protocol. The horn output of horn strobes can be independently controlled on 2-wire circuits using the Wheelock patented sync protocol. MTWP horn strobe models are 4-wire appliances; the strobes can be synchronized while the audible can be connected to a coded fire alarm system or can be set to produce any of eight selectable tones.

Features:

- Approvals include: UL Standards 1971, 1638, 464 and 1480 California State Fire Marshal (CSFM) and New York City (MEA), Factory Mutual (FM) and Chicago (BFP) . See agency approvals by model number on page two of this document
- Compliance with the following requirements: NFPA, UFC, ANSI 117.1, OSHA Part 29, 1910.165, ADA
- Weatherproof with extended temperature range of –40°F to 150°F (-40°C to 66°C)*
- Dual Listed strobe models (UL 1638 and UL 1971)
- Industry's highest strobe candela options
- Synchronize using the Wheelock Sync Modules or panels with built-in Wheelock Patented Sync Protocol
- Models with field selectable tone, dBA and candela settings
- Wall or ceiling mounting options
- Surface of semi-flush mounting
- IN/OUT wiring termination accepting two #12-18 AWG wires at each terminal

*The series RSSWP, ASWP, MTWP and ET70WP have UL approval down to -40°F. The AH-24WP, MT-12/24 and the ET-1010 have been ULC tested and approved to -40°F, but not submitted to UL. The AH-12WP has UL/ULC approval to -31°F.

E5946
S5391
S2652

151-92-E

7125-0785:131 (ASWP)
7125-0785:146 (ET70WP)
7125-0785:156 (MTWP)
7300-0785:154 (RSSWP)

FM APPROVED

NOTE: All CAUTIONS and WARNINGS are identified by the symbol ⚠. All warnings are printed in bold capital letters.

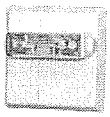
⚠ **WARNING: PLEASE READ THESE SPECIFICATIONS AND ASSOCIATED INSTALLATION INSTRUCTIONS CAREFULLY BEFORE USING, SPECIFYING OR APPLYING THIS PRODUCT. VISIT WWW.COOPERWHEELOCK.COM OR CONTACT COOPER WHEELOCK FOR THE CURRENT INSTALLATION INSTRUCTIONS. FAILURE TO COMPLY WITH ANY OF THESE INSTRUCTIONS, CAUTIONS OR WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

General Notes:

- Strobes are designed to flash at 1 flash per second minimum over their UL Listed Regulated Voltage Range.
- All candela ratings represent minimum effective Strobe intensity based on UL Standards 1971 and 1638 as indicated in candela ratings table.

Wall Mount

RSSWP


MTWP

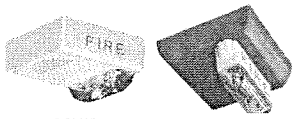

ASWP


ET70WP

Strobe		Order Code
RSSWP-2475W-FR	Red	9013
RSSWP-2475W-FW	White	3034
RSSWP-24MCWH-FR	Red	5161
RSSWP-24MCWH-FW	White	5165
Audible Strobe		
ASWP-2475W-FR	Red	9012
ASWP-24MCHH-FR	Red	5137
ASWP-24MCWH-FW	White	5140
Multi-tone Strobe		
MTWP-2475W-FR	Red	8420
MTWP-2475W-FW	White	3112
MTWP-24MCWH-FR	Red	5132
MTWP-24MCWH-FW	White	5134
Speaker Strobe		
ET70WP-2475W-FR	Red	9077
ET70WP-2475W-FW	White	3179
ET70WP-24185W-FR	Red	4885
ET70WP-24185W-FW	White	4891
ET70WP-24135W-FR	Red	4872
ET70WP-24135W-FW	White	4875

Ceiling Mount

RSSWP MTWP



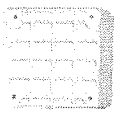
ASWP ET70WP

Strobe		Order Code
RSSWP-2475C-FR	Red	4338
RSSWP-2475C-FW	White	4446
RSSWP-24MCCH-FR	Red	5167
RSSWP-24MCCH-FW	White	5187
Audible Strobe		
ASWP-2475C-FR	Red	4251
ASWP-2475C-FW	White	4502
ASWP-24MCCH-FR	Red	5149
ASWP-24MCCH-FW	White	5157
Multi-tone Strobe		
MTWP-2475C-FR	Red	4457
MTWP-2475C-FW	White	4478
MTWP-24MCCH-FR	Red	5102
MTWP-24MCCH-FW	White	5122
Speaker Strobe		
ET70WP-2475C-FR	Red	4452
ET70WP-2475C-FW	White	4454
ET70WP-24177C-FR	Red	4845
ET70WP-24177C-FW	White	4859
ET70WP-24115C-FR	Red	4550
ET70WP-24115C-FW	White	4732

Wall or Ceiling Mount


MT


AH


ET-1010

Audible		Order Code
AH-24WP-R	Red	7416
AH-12WP-R	Red	7415
Horn		
MT-12/24-R	Red	5023
Speaker		
ET-1010-R	Red	3135
ET-1010-W	White	3137

UL Max. Current	AH	
	24 VDC	12 VDC
High (99) dBA	0.080	0.192
Med (95) dBA	0.043	0.108
Low (90) dBA	0.021	0.058

UL Reverberant dBA @ 10 Feet							
Watts	1/8	1/4	1/2	1	2	4	8
ET-1010	77	80	83	86	87	92	94
ET70WP	78	81	84	87	90	93	95

	Candela Ratings						
Series	UL 1971	UL 1638 @ 77°F	UL 1638 @ -40°F	RSS, ET70WP and MTWP UL Max Current (Strobe Only)	ASWP		
					High	Med	Low
2475	30**	180	115	0.138	0.168	0.155	0.150
MCWH	135	135	56	0.300	0.355	0.340	0.335
	185	185	77	0.420	0.480	0.465	0.460
MCCH	115	115	47	0.300	0.355	0.340	0.335
	177	177	73	0.420	0.480	0.465	0.460
24185	185	185	77	0.420			
24177	177	177	73	0.420			

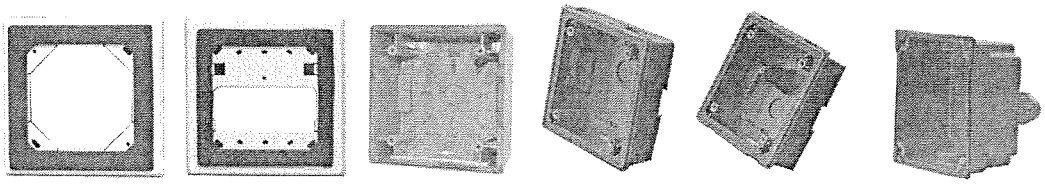
**Wall mount rating only

UL Max. Current (Audible)	MTWP/MT 24 VDC		MT 12 VDC	
dBA	HI	STD	HI	STD
Horn	0.108	0.044	0.177	0.034
Bell	0.053	0.024	0.095	0.020
March Time	0.104	0.038	0.142	0.034
Code 3 Horn	0.091	0.035	0.142	0.034
Code 3 Tone	0.075	0.035	0.105	0.021
Slow Whoop	0.098	0.037	0.142	0.035
Siren	0.104	0.036	0.152	0.030
Hi/Lo	0.057	0.025	0.114	0.026

Model Number	Agency Approvals				
Strobe	**UL**	**MEA**	**CSFM**	**FM**	**BFP**
RSSWP-2475	X	X	X	X	*
RSSWP-24MCWH	X	*	X	*	*
RSSWP-24MCCH	X	*	X	*	*
Audible Strobe					
ASWP-2475	X	X	X	X	X
ASWP-MCWH	X	*	X	*	*
ASWP-MCCH	X	*	X	*	*
Multitone Strobe					
MTWP-2475	X	X	X	X	*
MTWP-MCWH	X	*	X	*	*
MTWP-MCCH	X	*	X	*	*
Horns/Audibles					
AH-24WP	X	X	X	-	X
AH-12WP	X	X	X	-	X
MT-12/24	X	X	X	X	X
Speaker Strobe					
ET70WP-2475	X	X	X	*	*
ET70WP-185	X	*	X	*	*
ET70WP-177	X	*	X	*	*
ET70WP-115	X	*	X	*	*
ET70WP-135	X	*	X	*	*

*Pending

Mounting Accessories



WFP WFPA IOB WPSBB WPBB WBB

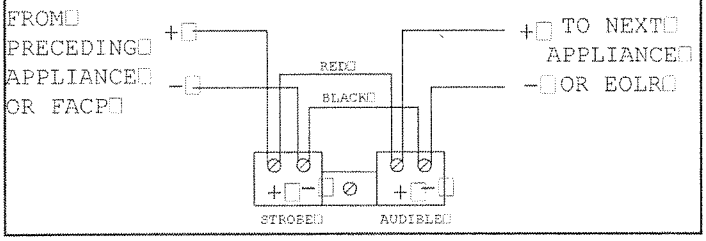
Gasket Kit		Order Code
WP-KIT		4486
Flush Plates		
WFPA-R	Red	4698
WFPA-W	White	4701
WFP-R	Red	4696
WFP-W	White	4697
Backboxes		
IOB-R	Red	5046
IOB-W	White	5047
WPSBB-R	Red	9751
WPSBB-W	White	3033
WPBB-R	Red	9014
WPBB-W	White	4692
WBB-R	Red	2959
WBB-W	White	2960

Mounting Options:

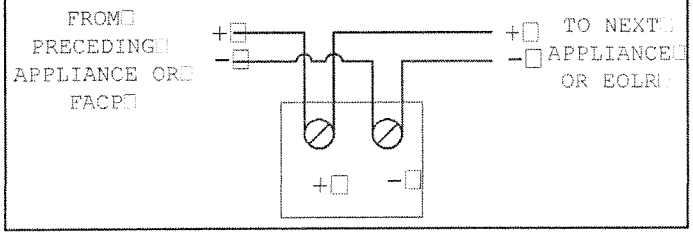
	Backboxes, Plates, Gasket Kits		
	Surface Mount		Flush Mount
	Exposed Conduit	Concealed Conduit	
RSSWP Strobes	WPSBB	WPSBB + WP-KIT	WFP
ET70WP Speaker Strobes	IOB	IOB + WP-KIT	WFP
ASWP Horn Strobes	WPBB	WPBB + WP-KIT	WFPA
AHWP Horns	WBB	-	WFP
ET-1010 Speakers	WBB	-	WFP
MTWP Multitone Horn Strobes	IOB	IOB + WP-KIT	WFP
Multitone Horn	IOB	IOB + WP-KIT	WFP

Wiring Diagrams

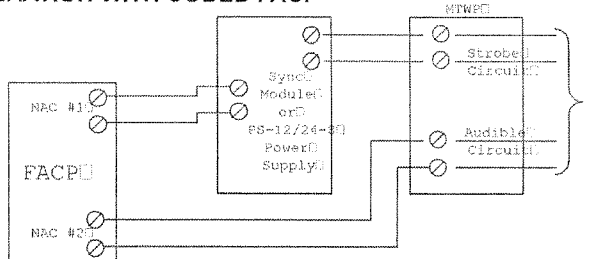
SERIES MTWP AUDIBLE APPLIANCE AND STROBE OPERATE IN UNISON. RED AND BLACK SHUNT-WIRES ARE SUPPLIED.



SERIES RSSWP, ASWP, AHWP, MTWP AND MT-12/24 APPLIANCES

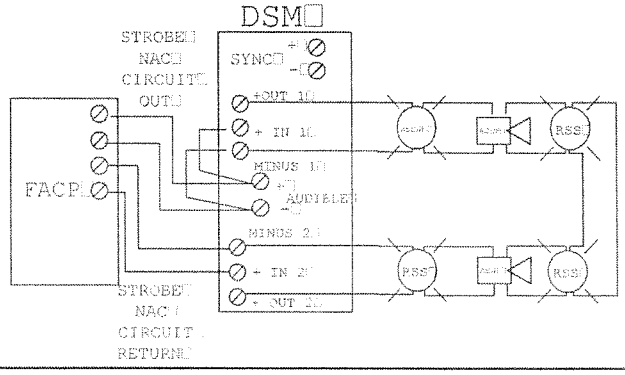


SERIES MTWP APPLIANCES SYNCHRONIZED STROBE OPERATION WITH CODED FACP



Note: Strobe circuit requires constant voltage.

SERIES RSSWP/ASWP APPLIANCES SYNCHRONIZED W/ DSM MODULE SINGLE CLASS "A" NAC CIRCUIT



Note: Models are available in Red or White. Contact Customer Service for Order Code and Delivery.
#Refer to Data Sheet S7000 for Mounting Options

NOTE: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Wheelock Inc. standard terms and conditions.

ARCHITECTS AND ENGINEERS SPECIFICATIONS

General
Weatherproof notification appliances shall be UL listed for outdoor use. Weatherproof Strobe appliances shall be listed under UL Standard 1638 (Standard for Visual Signaling Appliances) for Indoor/Outdoor use and UL Standard 1971 (Standard for Safety Signaling Devices for Hearing Impaired). The appliances shall be available for optional wall mounting or ceiling mounting to weatherproof backboxes using either exposed conduit or concealed conduit, or semi-flush mounting to a recessed electrical box in walls or ceilings using Wheelock mounting accessories.

Weatherproof Strobes
Weatherproof Strobe appliances shall produce a minimum flash rate of 60 flashes per minute over the UL Regulated Voltage Range of 16 to 33 VDC and shall incorporate a Xenon flashtube. The weatherproof strobes shall be available with UL 1971 candela ratings up to 185 cd for wall mounting and 177 cd for ceiling mounting. UL 1638 candela ratings up to 180 cd at 77°F shall be available. The strobes shall operate over an extended temperature range of –40°F to 150°F (-40°C to 66°C) and be listed for maximum humidity of 95% RH. Strobe inputs shall be polarized for compatibility with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP).

Weatherproof Audibles and Audible/Strobe Combinations Weatherproof horns and multitone audibles shall be listed for Indoor/Outdoor use under UL Standard 464. The horns shall be able to produce a continuous output or a temporal code-3 output that can be synchronized. The horns shall have at least 3 sound level settings. Horn/Strobe combinations shall be able to be synchronized on a single NAC.

Multitone audibles shall be able to produce 8 distinct tones selectable by dip switch and shall have at least 2 sound level settings. Multitone Audible/Strobe combinations shall have independent inputs for the audible and strobe. The strobes shall be able to be synchronized. The audibles shall be able to be coded when operated on a separate NAC.

Weatherproof Speakers and Speaker/Strobes
Weatherproof speakers and speaker/strobes shall be listed for Indoor/Outdoor use under UL Standard 1480. All speakers shall provide field selectable taps for 1/8W to 8W operation for either 25 VRMS or 70 VRMS audio systems and shall incorporate a sealed back construction for extra protection and improved audibility. Speakers without strobes shall be Wheelock Series ET-1010. They shall be listed to produce up to 94 dBA and shall incorporate a vandal resistant grille design. Speaker with strobes shall be Wheelock Series ET70WP. They shall be available for surface or semi-flush mounting to walls or ceilings and shall be listed to produce up to 93 dBA.

Synchronization Modules
When synchronization of strobes or temporal code-3 audibles is required, the appliances shall be compatible with the Wheelock Series SM, DSM Sync Modules, Wheelock Power Supplies or other manufacturers panels with built-in Wheelock Patented Sync Protocol. The strobes and audibles shall not drift out of synchronization at any time during operation.

Series ASWP audibles and strobes shall be able to be synchronized on a 2-wire circuit with the ability to silence the audible if required. The strobes on Series MT multitone audible/strobe appliances shall be able to be synchronized and shall be able to be operated on a separate circuit from the audibles while the audible circuit is connected to a coded or continuous NAC.

Weatherproof Mounting Accessories
Weatherproof mounting options shall include surface mounting or semi-flush mounting to walls or ceilings. Surface mounted appliances shall mount to Wheelock IOB, WBB, WPBB or WPSBB weatherproof backboxes using either exposed conduit or concealed conduit. For concealed conduit the weatherproof backbox shall be mounted to a recessed electrical box with Wheelock's WP-KIT to provide a weatherproof seal for the electrical box. Semi-flush mounted appliances shall mount to a recessed electrical box using Wheelock WFP or WFPA flush plates to provide a weatherproof seal between the electrical box and the appliance.

NEMA Member

WE ENCOURAGE AND SUPPORT NICET CERTIFICATION
3 YEAR WARRANTY
Made in USA
S9004 WP 05/08

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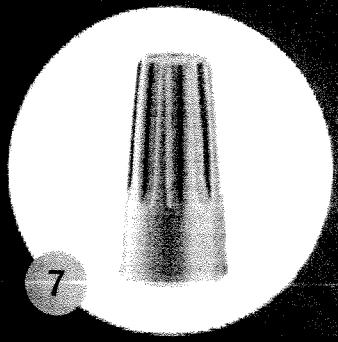
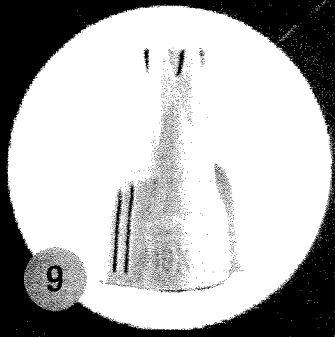
F: 732-222-8707
www.coopernotification.com

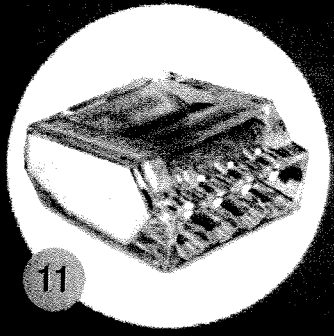
FL Location
7565 Commerce Ct.
Sarasota, FL 34243
P: 941-487-2300
F: 941-487-2389

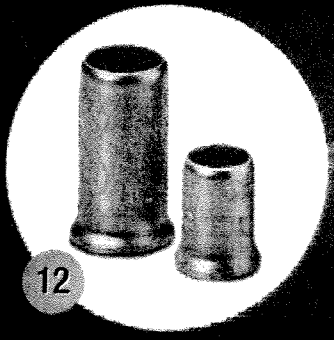
VA Location
P: 877-459-7726
F: 703-294-6560

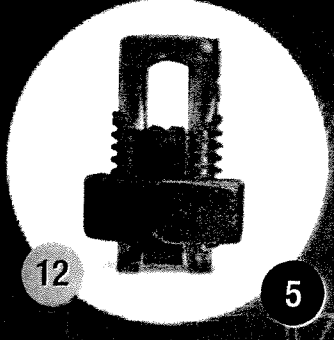
WIRE CONNECTORS



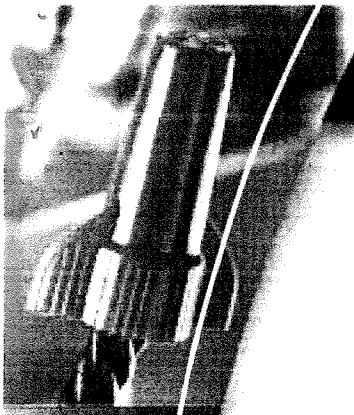




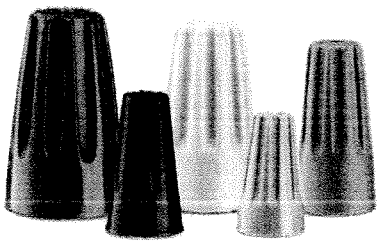




Made of top-quality materials, Gardner Bender wire connectors are engineered to exceed the expectations of professional electricians.



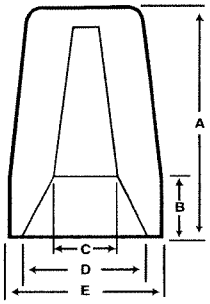
WireGard™ Color-Coded Screw-On Wire Connectors



The industry standard twist-on connector with top quality, performance and durability.

- Color-coded for easy size selection.
- Tight, square-wire spring makes quick, secure connections for positive continuity.
- Tough, thermoplastic shell shields against environmental extremes.
- Resists chemical action from hydrocarbons, diluted acid or alkaline solutions.
- Flame-retardant properties resist heat distortion up to 105 °C (221 °F).
- High-dielectric shell features deep skirt design to prevent exposure of bare wire.
- Copper-to-copper connections only.

Color	Part #	Pkg Qty	Wire Range	Min	Max
GB-1 (71B)	10-001	100/box	#22 - #16 AWG *(connections rated at 300 V Max.)*	1 #20 w/1 #22	2 #16
	12-001	25,000/bulk keg			
	12-001BU	150,000/bulk barrel			
	16-001	150/jar			
	19-001	14/card			
	25-001	25/resealable bag			
GB-2 (72B)	10-002	100/box	#22 - #16 AWG *(connections rated at 300 V Max.)*	3 #22	3 #16
	12-002	10,000/bulk keg			
	12-002BU	96,000/bulk barrel			
	16-002	150/jar			
	19-002	14/card			
	25-002	25/resealable bag			
GB-3 (73B)	10-003	100/box	#22 - #14 AWG *(connections rated at 300 V Max. and 600 V Max.)* [2]	3 #20	4 #16 w/1 #20
	12-003BU	53,000/bulk barrel			
	13-003	500/bag			
	16-003	100/jar			
	16-003M	300/jar			
	17-003	50/bag			
	19-003	12/card			
	25-003	25/resealable bag			
GB-4 (74B)	10-004	100/box	#18 - #10 AWG *(connections rated at 300 V Max. and 600 V Max.)* [2]	1 #14 w/1 #18	4 #14
	12-004BU	32,400/bulk barrel			
	13-004	500/bag			
	16-004	200/jar			
	17-004	50/bag			
	19-004	9/card			
	25-004	25/resealable bag			
GB-6 (76B)	10-006	100/box	#18 - #10 AWG *(connections rated at 300 V Max. and 600 V Max.)* [2]	2 #14	2 #10 w/2 #12
	12-006BU	21,000/bulk barrel			
	13-006	250/bag			
	16-006	125/jar			
	17-006	50/bag			
	19-006	6/card			
	25-006	25/resealable bag			



Dimensions

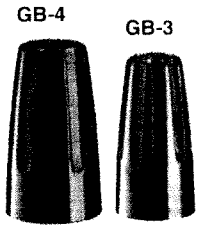
	A	B	C	D	E
GB-1	37/64"	11/64"	1/8"	1/4"	21/64"
GB-2	45/64"	11/64"	3/16"	5/16"	25/64"
GB-3	27/32"	21/64"	13/64"	11/32"	7/16"
GB-4	15/16"	17/64"	15/64"	7/16"	35/64"
GB-6	1 1/16"	17/64"	21/64"	17/32"	21/32"

[2] *Note: Connection rated at 600 V Max. for building wiring and rated at 1000 V Max. in lighting fixtures/luminaries and signs. See carton for detailed wire combination ratings.*

Assortments

Part #	Pkg Qty	Description
19-AWC	9/card	2 gray, 2 orange, 3 yellow, 3 red
25-AWC	25/resealable bag	3 gray, 4 blue, 6 orange, 6 yellow, 6 red

Hi-Temp Black Connectors for Tough Environments



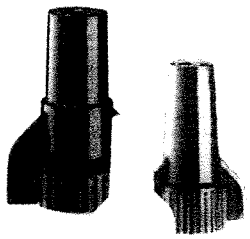
Connectors manufactured with high-temperature-rated plastic to withstand extreme temperatures.

- Temperature-rated to 150 °C (302 °F).
- Available in two standard models.
- Copper-to-copper connections only.

Model	(Size)	Part #	Pkg Qty	Wire Range	Min	Max
GB-3	(73B)	10-003HT	100/box	#22 - #14 AWG[1]	3 #20	4 #16 w/1 #20
		27-003	10,000/bulk keg			
GB-4	(74B)	10-004HT	100/box	#18 - #10 AWG[1]	1 #14 w/1 #18	4 #14
		27-004	10,000/bulk keg			

[1] *Connections rated at 300 V Max. and 600 V Max.*
Note: Connection rated at 600 V Max. for building wiring and rated at 1000 V Max. in lighting fixtures/luminaries and signs. See carton for detailed wire combination ratings.

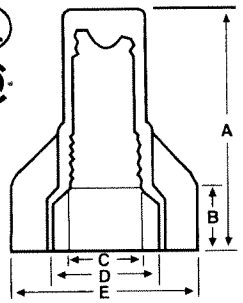
WingGard™ Color-Coded Twist-On Wire Connectors



Unsurpassed quality and durability in a high-leverage, easy-on wing-type design.

- Wings are knurled for a sure grip and offset from centerline for greater twisting leverage.
- Square-wire plated spring instantly adjusts to the shape and size of the splice.
- Flame-retardant properties resist heat distortion up to 105 °C (221 °F).
- High-dielectric shell features deep skirt design to prevent exposure of bare wire.
- Copper-to-copper connections only.

Color	Part #	Pkg Qty	Wire Range	Min	Max
#84™	10-084	100/box	#22 - #10 AWG *(connections rated at 300 V Max. and 600 V Max.)*	2 #22	3 #12
	12-084BU	42,000/bulk barrel			
	13-084	500/bag			
	16-084	100/jar			
	16-084M	225/jar			
	17-084	50/bag			
	19-084	6/card			
	25-084	25/resealable bag			
#86™ 	10-086	100/box	#22 - #6 AWG *(connections rated at 300 V Max. and 600 V Max.)*	2 #20	4 #10
	12-086BU	22,500/bulk barrel			
	13-086	500/bag			
	16-086	125/jar			
	16-086L	325/jar			
	17-086	50/bag			
	19-086	6/card			
	25-086	25/resealable bag			
#89™ 	10-089	50/box	#14 - #6 AWG *(connections rated at 300 V Max. and 600 V Max.)*	1 #10 w/1 #12	1 #6 Str w/2 #8 Str
	13-089	100/bag			
	19-089	2/card			
	25-089	10/resealable bag			



Dimensions

	A	B	C	D	E
#84™	1 1/32"	5/16"	7/32"	1/4"	23/32"
#86™	1 1/4"	5/16"	9/32"	7/16"	29/32"
#89™	1 1/2"	7/16"	3/8"	3/4"	1 1/4"

Note: Connection rated at 600 V Max. for building wiring and rated at 1000 V Max. in lighting fixtures/luminaries and signs. See carton for detailed wire combination ratings.

Assortments

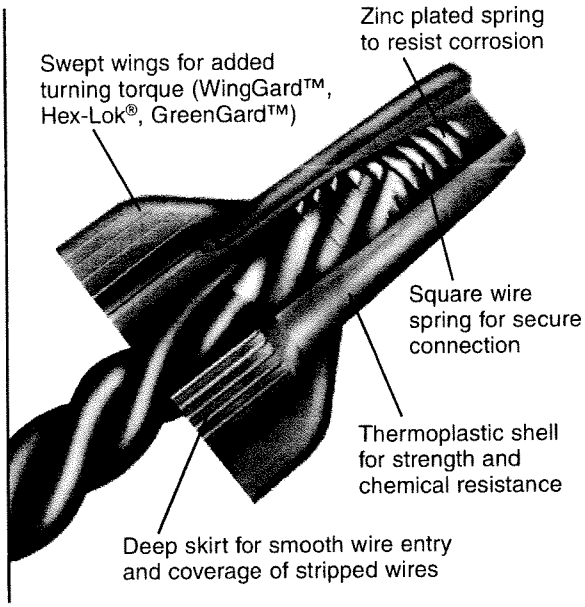
Part #	Pkg Qty	Description
16-8486	100/jar	50 red, 50 yellow
16-8486M	160/jar	80 red, 80 yellow
19-AWW	5/card	2 yellow, 2 red, 1 large gray
25-AWW	25/resealable bag	8 yellow, 8 red, 7 tan, 2 blue

Gardner Bender Twist-On Wire Connectors

Engineered to exceed the expectations of professional electricians.

All GB Twist-On Wire Connectors:

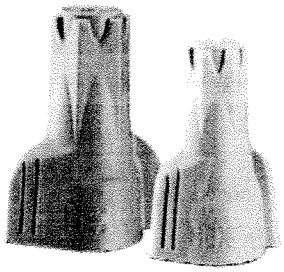
- *Are designed to make wiring jobs fast, easy, safe and reliable.*
- *Provide maximum application flexibility by offering contractors myriad packaging options, ergonomic designs and wire ranges.*
- *Exceed UL standards for dielectric strength, wire pullout force and static heat resistance.*
- *Are manufactured of top-quality materials.*
- *Meet the requirements of nearly all budgets.*
- *Are continually evaluated for improvements and enhancements.*

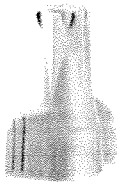


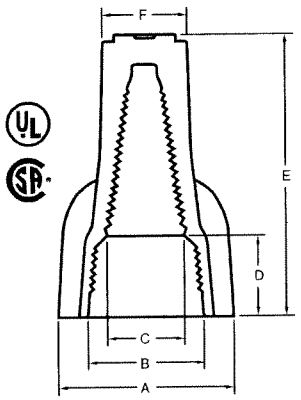
Hex-Lok® Multi-Range Wire Connectors

Multi-range, hex-head copper-to-copper connector covers 95% of everyday applications.

- Streamlined design for compact installations.
- Square-wire spring grabs and holds wires for secure connections.
- Long skirt covers stripped wires.
- Rated at 600 V Max. in building wire and at 1000 V Max. in lighting fixtures/luminaries and signs.
- Copper-to-copper connections only.



Color	Part #	Pkg Qty	Wire Range	Min	Max
H1 	10-1H1	100/box	#22 - #8 AWG	3 #22	3 #10
	12-1H1BU	28,000/bulk barrel			
	13-1H1	500/bag			
	16-1H1	175/jar			
	16-1H1L	400/jar			
	17-1H1	50/bag			
	19-1H1	6/card			
	25-1H1	25/resealable bag			
H2 	10-2H2	50/box	#14 - #6 AWG	3 #14	1 #6 w/1 #8
	12-2H2BU	16,000/bulk barrel			
	13-2H2	250/bag			
	19-2H2	6/card			
	25-2H2	25/resealable bag			



Dimensions

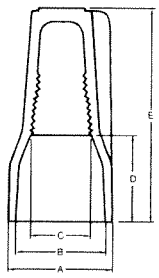
	A	B	C	D	E	F
H1	47/64"	9/16"	5/16"	21/64"	1 5/32"	5/16"
H2	1"	15/32"	25/64"	13/32"	1 21/64"	7/16"

Uni-Lok™ Universal Wire Connectors

Versatile and cost-effective, Uni-Lok™ connectors are designed to accept a wide range of wire combinations.

- Swept mini-wings provide additional torque.
- Square-wire spring grabs and holds wires for secure connections.
- Long skirt covers stripped wires.
- Rated at 600 V Max. in building wire and at 1000 V Max. in lighting fixtures/luminaries and signs.
- Copper-to-copper connections only.

Color	Part #	Pkg Qty	Wire Range	Min	Max
G1	10-1G1	100/box	#22 - #12 AWG	4 #22	3 #12
	12-1G1BU	40,000/bulk barrel			
	13-1G1	500/bag			
	19-1G1	6/card			
	25-1G1	25/resealable bag			
G2 	10-2G2	100/box	#22 - #10 AWG	3 #20	5 #12
	12-2G2BU	24,000/bulk barrel			
	13-2G2	500/bag			
	19-2G2	6/card			
	25-2G2	25/resealable bag			



Dimensions

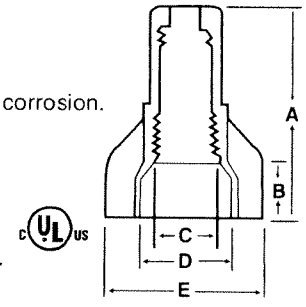
	A	B	C	D	E
G1	31/64"	27/64"	9/32"	13/32"	63/64"
G2	37/64"	33/64"	23/64"	27/64"	1 11/64"

GreenGard™ Grounding Wire Connectors

Specifically designed for making positive ground connections, GreenGard™ connectors feature the same live-action as GB WingGard™ connectors with the added plating protection for corrosion resistance in grounding applications.

- Easier to use — New design enables torque-up with improved grip.
- Contoured, offset wings enable firm ground connections.
- Flame retardant, thermoplastic shell resists punctures, cuts, abrasion and corrosion.
- Connectors have a hole in the tip for ground wire.
- Solid copper-to-copper connections only.

Color	Part #	Pkg Qty	Wire Range	Min	Max
#95™ 	10-095	100/box	#14 - #10 AWG *(connections rated at 600 V Max.)*	2 #14	4 #12
	13-095	500/bag			
	16-095	125/jar			
	19-095	6/card			
	25-095	25/resealable bag			

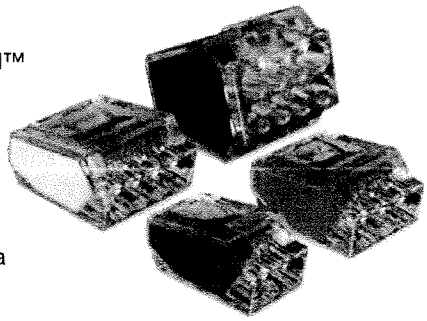


Dimensions

	A	B	C	D	E
#95™	1 1/4"	5/16"	9/32"	7/16"	29/32"

GB Gardner Bender **INNOVATION**

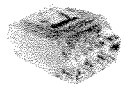
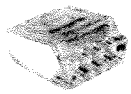
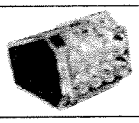
PushGard™ Push-in Wire Connectors



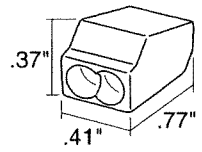
Easy and fast to use, just strip and push conductors into PushGard™ connectors to make reliable, secure connections.

- Simplified insertion and compact size helps in tight locations.
- Clear polycarbonate housings have color-coded side panels for connection verification and identification.
- With corrosion-resistant stainless steel springs, PushGard™ connectors restrict wire pullout, yet corrections are possible with a simple left-right twist and pull.
- Continuity test point for easy voltage checks.
- Available in 2-,3-,4 and 8-port configurations.
- Rated at 600 V Max. in building wire and at 1000 V Max. in lighting fixtures/luminaries.
- Copper-to-copper connections only.

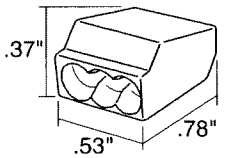
c UL us

	Color	Ports	Part #	Pkg Qty	Wire Range
PC2		2	10-PC2 19-PC2	100/box 10/clam	#22 - #12 AWG Solid *(connections rated at 600 V Max.)*
PC3		3	10-PC3 19-PC3	100/box 10/clam	#22 - #12 AWG Solid *(connections rated at 600 V Max.)*
PC4		4	10-PC4 19-PC4	100/box 10/clam	#22 - #12 AWG Solid *(connections rated at 600 V Max.)*
PC8		8	10-PC8 19-PC8	50/box 10/clam	#22 - #12 AWG Solid *(connections rated at 600 V Max.)*

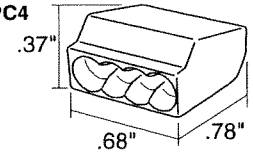
PC2



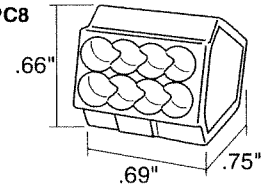
PC3



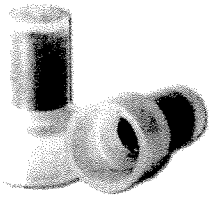
PC4



PC8



Nylon Pigtail Connectors



Closed-end crimp connector designed for use with solid or stranded wire.

- Two sizes available.
- Vibration resistant.
- Tin-plated seamless copper.
- Corrosion and chemical resistant.

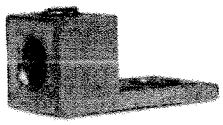
c UL us

SP

Part #	Pkg Qty	Wire Range	Min	Max
20-089	10/clam	#22 - #14 AWG	2 #22	1 #14 w/1 #18
20-090	10/clam	#22 - #12 AWG	3 #18	1 #10 w/1 #20

Aluminum Mechanical Lugs

- Feature high-strength, low-resistance aluminum construction.
- Accepts conductors from 14 AWG - 2/0 AWG.
- For 3/8" stud.
- Use GB OX-GARD™ anti-oxidant treatment on Al-Al and Al-Cu to prevent corrosion and permit cooler connections.



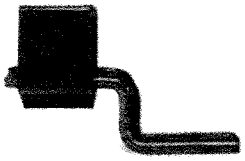
1 Conductor

Part #	Pkg Qty	Wire Gauge
GTA-2	2/clam	#14 - #10 AWG Stranded, #14 - #2 AWG Solid
GTA-2/0	2/clam	#14 - #10 AWG Stranded, #14 - #00 AWG Solid

Copper Mechanical Lugs

Provide maximum mechanical strength and minimum resistance.

- All-copper alloy construction features a compact design that is reusable.
- Accept a wide range of solid and stranded conductors from 14 AWG – 0 AWG.
- For 3/8" stud.



Part #	Pkg Qty	Wire Gauge
GSLU-25	2/clam	#14 - #10 AWG Stranded
GSLU-35	2/clam	#14 - #10 AWG Stranded, #14 - #6 AWG Solid

Part #	Pkg Qty	Wire Gauge
GSLU-70	2/clam	#8 - #2 AWG Solid
GSLU-125	2/clam	#6 - #0 AWG Solid

Aluminum Splicer-Reducers

Designed to splice similar-gauge conductors or reduce the gauge from a larger wire diameter to a smaller one.

- Galvanic corrosion is limited by an internal wire stop, preventing direct contact of dissimilar metals inside.
- Use GB OX-GARD™ anti-oxidant treatment on Al-Al and Al-Cu to prevent corrosion and permit cooler connections.

Part #	Pkg Qty	Wire Gauge
GSPA-2	2/clam	#14 - #10 AWG Stranded, #14 - #2 AWG Solid
GSPA-0	1/clam	#14 - #10 AWG Stranded, #14 - #0 AWG Solid
GSPA-4/0	1/clam	#6 - #0000 AWG Solid

SEE PG 14 FOR MORE INFO ON Ox-Gard™

GB Xtreme™ Lugs

GB XTREME™ For Harsh Environments

Heavy-duty lugs made from pure copper for maximum current flow.

- Tinned for corrosion resistance.
- Seamless barrel for maximum strength.
- Closed ends seal out moisture.

Part #	Pkg Qty	Wire Gauge	Stud Size
AML-200	2/clam	#6 AWG	1/4"
AML-201	2/clam	#6 AWG	5/16"
AML-202	2/clam	#6 AWG	3/8"
AML-203	2/clam	#4 AWG	5/16"
AML-204	2/clam	#4 AWG	3/8"

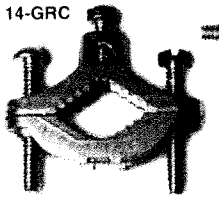
Part #	Pkg Qty	Wire Gauge	Stud Size
AML-205	2/clam	#2 AWG	5/16"
AML-206	2/clam	#2 AWG	3/8"
AML-207	2/clam	#1/0 AWG	3/8"
AML-208	2/clam	#2/0 AWG	3/8"

Grounding Accessories

Convenient grounding accessories include products suitable for most job requirements.

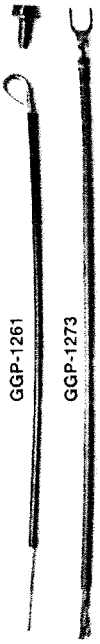
- Zinc-plated grounding clips provide positive grounding to switch, outlet or junction boxes for #10, 12, 14 AWG copper grounding wire.
- Hex-head grounding screws secure ground wires to circuit box.
- Grounding clamps listed for direct burial and connection of ground wire to ground rod.

14-GRC



GGC-1014C

GGS-1032HC



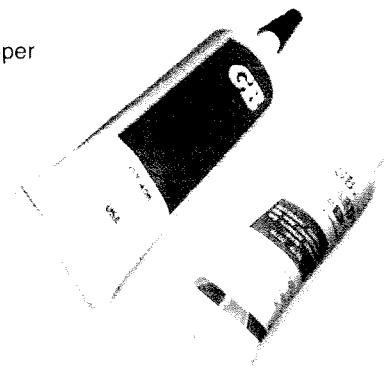
GGP-1261 GGP-1273

SEE PG 10 FOR MORE INFO ON Grounding Wire Connector

Part #	Pkg Qty	Description	Length	Ends
GGP-1261	25/bag	Grounding Pigtail; #12 AWG Solid	6½"	Captured screw/stripped
GGP-1273	25/bag	Grounding Pigtail; #12 AWG Str	7"	Stripped/bare fork terminal
GGP-1282	25/bag	Grounding Pigtail; #12 AWG Str	8"	Captured screw/bare fork terminal
GGP-1461	25/bag	Grounding Pigtail; #14 AWG Solid	6½"	Captured screw/stripped
GGP-1502	2/card	Grounding Pigtail; #12 AWG Solid	8"	Captured screw/bare fork terminal
14-GRC	1/card	Grounding Clamp for ½" - 1" pipe		
GGC-1014C	50/clam	Grounding Clip for #10, #12 or #14 AWG		
GGC-1508	8/card	Grounding Clip for Aluminum or Copper; Grounding wire; Zinc plated		
GGS-1032HC	100/clam	Hex-Head Ground Screw		
GGS-1512R	12/card	Green Round Washer Head Screw for Switch and Outlet Boxes		

Ox-Gard™ Anti-Oxidant Compound

The perfect safeguard for aluminum-to-aluminum, aluminum-to-copper wire connections and aluminum conduit joints.



- Guards against oxidation.
- Improves conductivity; penetrates aluminum oxide to maintain inter-strand and inter-conductor current paths.
- Produces a cooler connection.

Part #	Pkg Qty	Description
OX-100	1/tube	1 oz Squeeze Tube
OX-100B	1/tube	1 oz Squeeze Tube (blister pack)
OX-400	1/tube	4 oz Squeeze Tube
OX-800	1/tube	8 oz Squeeze Tube

Wheatland Tube Company

1 Council Avenue P.O. Box 608
Wheatland, PA 16161-0608
800.257.8182

www.wheatland.com

Rigid Metal Conduit - Aluminum

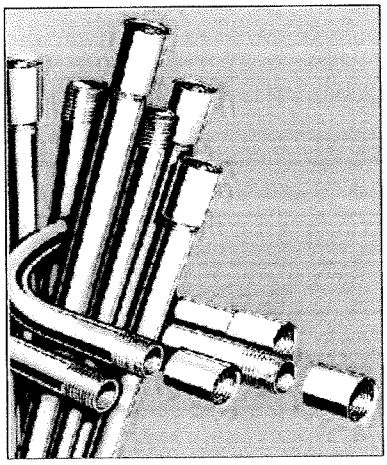
Features

Corrosion Resistance
Aluminum conduit resists most corrosive atmospheres and industrial environments that usually attack other types of metallic conduit. In these applications, aluminum requires no painting or replacement, resulting in considerable savings in maintenance costs.

Attractive Appearance
Aluminum won't rust or leave discoloring streaks and stains.

Non-sparking
Aluminum is non-sparking, eliminating a hazard in explosive atmospheres.

Nonmagnetic
Nonmagnetic aluminum conduit reduces power loss due to voltage drop, resulting in power savings throughout the life of installation.



Ease of Installation
Aluminum conduit can be readily cut, bent or threaded on the job, and it requires no special tools or installation equipment. In installations using large size conduit, ease of field fabrication is of special significance.

Thread Protectors
Rigid Aluminum Conduit is shipped with a coupling on one end and a color-coded thread protector on the other end. See Rigid Aluminum Conduit packaging table for the trade size end cap color relationship.

Installation
The conventional tools and practices used on steel conduit can be utilized on Rigid Aluminum Conduit.

Applicable Rigid Aluminum Conduit Material Standards

Though the National Electrical Code® deals primarily with proper field application, it presumes that the tubing meets the standards necessary to perform properly under approved conditions.

Wheatland Rigid Aluminum Conduit is made to provide all the characteristics required for proper installation as specified in the Code.

Wheatland Rigid Aluminum Conduit is made from 6063 aluminum alloy, T-1 temper (formerly designated T-42), and manufactured in conformance to standards established by the American National Standards Institute, the Underwriters Laboratories and the Federal Specification.

Management Systems Registered to: ISO 9001:2000

QMI REGISTERED

Certificate Numbers:
Wheatland, PA 007172
Chicago, IL 008952

In preparing bids, it may be stated that Wheatland Rigid Aluminum Conduit conforms or Listed to:

Underwriters Laboratories Standard For Electrical Rigid Metal Conduit - Aluminum, Bronze, and Stainless steel, UL 6A

American National Standard Institute C80.5

Federal Specification WW-C-540c

NEC® 2008 Section 250.118(2) recognizes Rigid Metal Conduit as an equipment grounding conductor.

Wheatland Tube Company

1 Council Avenue P.O. Box 608
Wheatland, PA 16161-0608
800.257.8182

www.wheatland.com

Rigid Metal Conduit - Aluminum

WEIGHTS AND DIMENSIONS

Trade Size	Metric Designator	Threads Per Inch	Acceptable Length of Finished Conduit Without Coupling			Approx. Weight 10 Unit Lengths with Couplings		Outside Diameter		Inside Diameter*		Wall Thickness*	
			ft.	in. (+/- ¼ in.)	mm (+/- 6 mm)	lb	kg	in.	mm	in.	mm	in.	mm
½	16	14	9	11¼	3030	28.1	12.75	0.840	21.34	0.632	16.05	.104	2.64
¾	21	14	9	11¼	3030	37.4	16.96	1.050	26.67	0.836	21.23	.107	2.72
1	27	11½	9	11	3025	54.5	24.72	1.315	33.40	1.063	27.00	.126	3.20
1¼	35	11½	9	11	3025	71.6	32.48	1.660	42.16	1.394	35.41	.133	3.38
1½	41	11½	9	11	3025	88.7	40.23	1.900	48.26	1.624	41.25	.138	3.51
2	53	11½	9	11	3025	118.5	53.75	2.375	60.33	2.083	52.91	.146	3.71
2½	63	8	9	10½	3010	187.5	85.05	2.875	73.03	2.489	63.22	.193	4.90
3	78	8	9	10½	3010	246.3	111.72	3.500	88.90	3.090	78.49	.205	5.21
3½	91	8	9	10¼	3005	295.6	134.08	4.000	101.60	3.570	90.68	.215	5.46
4	103	8	9	10¼	3005	350.2	158.85	4.500	114.30	4.050	102.87	.225	5.72
5	129	8	9	10	2995	478.9	217.23	5.563	141.30	5.073	128.85	.245	6.22
6	155	8	9	10	2995	630.4	285.95	6.625	168.28	6.093	154.76	.266	6.76

*For information only, not a Standards requirement

PACKAGING

Trade Size	Metric Designator	Thread Protectors Color	Quantity Per Bundle		Quantity Per Lift				Weight Per Lift		Volume Per Lift	
			Feet	Meters	Pieces	Bundles	Feet	Meters	Pounds	Kilograms	Cu. Ft.	Cu. m
½	16	Black	100	30.5	—	25	2500	762	703	319	18.7	0.53
¾	21	Red	100	30.5	—	25	2500	762	935	424	27.1	0.77
1	27	Blue	100	30.5	—	20	2000	610	1090	494	31.3	0.88
1¼	35	Red	50	15.2	—	20	1000	305	716	325	27.5	0.78
1½	41	Black	50	15.2	—	20	1000	305	887	402	34.3	0.97
2	53	Blue	50	15.2	—	9	450	137	533	242	26.4	0.75
2½	63	Black	—	—	30	—	300	91	563	255	22.9	0.65
3	78	Blue	—	—	20	—	200	61	493	223	22.9	0.65
3½	91	Black	—	—	20	—	200	61	591	268	27.5	0.78
4	103	Blue	—	—	20	—	200	61	700	318	35.4	1.00
5	129	Blue	—	—	8	—	80	24	383	174	24.4	0.69
6	155	Blue	—	—	6	—	60	18	378	172	26.7	0.76

Wheatland Tube Company
A DIVISION OF JOHN MANEELY COMPANY

1 Council Avenue P.O. Box 608
Wheatland, PA 16161-0608
800.257.8182

www.wheatland.com

Wheatland Galvanized Electrical Metallic Tubing (EMT) -Steel

General

Steel Electrical Metallic Tubing is manufactured from mild steel tube. It has an accurate circular cross section, a uniform wall thickness, a defect free interior surface, and continuously welded seams. The exterior surface is thoroughly and evenly coated with zinc using an inline galvanizing process, so that metal-to-metal contact and galvanic protection against corrosion are provided. Additionally, the exterior is protected by a clear zinc chromate coating. The interior surface is coated with organic lubricating coating to reduce friction during wire insertion and retard corrosion.

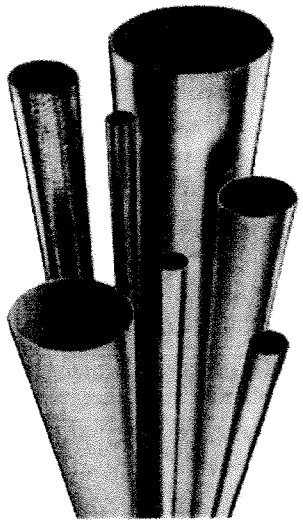
Wheatland's EMT and its associated tubular fittings are produced in nominal trade sizes from 1/2 to 4. EMT is produced in standard lengths of 10 feet (3.05 m).

Bundles of finished EMT are wrapped with color coded special light weight filament tape. Black tape identifies trade sizes 1/2 and 1 1/2, Red tape identifies 3/4 and 1 1/4, and Blue tape 1. Trade sizes 2 and larger are not bundled.

Wheatland EMT is a UL Listed product. Each length of tubing has a label affixed containing UL Listing information and a bar code. Each length is identified with Wheatland's name, Logo, the letters "EMT" clearly and durably marked once per 10 foot (3.05 m) length, a U.L. listing number and the words, "Consult manufacturer for installation instructions". On July 25, 2001 the past UL requirement to embed the letters "EMT" into the surface of the tube was changed to require only durably marking the tube with the letters "EMT" at a minimum of 1/8 inch (3 mm) high.

Applications

Wheatland Galvanized Steel Electrical Metallic Tubing, National Electrical Code® (NEC®) 2008 Article 358, can be installed indoors or outdoors, in dry or wet locations, exposed or concealed, in all kinds of atmospheric conditions, and in hazardous locations, when in accordance with the NEC® and providing it will not be subject to severe physical damage during and after installation and is properly protected against corrosion.
Also, it provides mechanical protection for the conductors while reducing Electro-Magnetic Field (EMF) exposure and shielding against Electro-Magnetic Interference (EMI).



Galvanized Steel Electrical Metallic Tubing is an approved equipment grounding conductor under the 2008 NEC® Section 250.118(4). The NEC® establishes the minimum requirements for a safe electrical installation. Because of the varied environments in which electrical equipment is installed, local amendments are often added. **Always consult local codes prior to any installation.**

Specifications

Wheatland Galvanized Steel Electrical Metallic Tubing is manufactured in accordance with the latest edition of the following:

American National Standards Institute - American National Standard for Steel Electrical Metallic Tubing (EMT), ANSI® C80.3

Underwriters Laboratories Standard for Electrical Metallic Tubing - Steel, UL 797

National Electrical Code® 2008 - Article 358

Federal Specification - WW-C-563

The above Federal specification may still be referenced, however the federal government has canceled it and adopted the UL 797 and ANSI C80.3 standard and will no longer maintain a separate standard. Electrical Metallic Tubing was covered under WW-C-563.

Additional information on the titles and designations of standards or requirements that have been used for the investigation of products in a specific category can be found in the Underwriters Laboratories Inc.®, *General Information for Electrical Equipment Directory.* The UL product category for EMT is FJMX.

Made in U.S.A.

Certificate Numbers:
Wheatland, PA 007172
Chicago, IL 008952

Wheatland Tube Company
A DIVISION OF JOHN MANEELY COMPANY

1 Council Avenue P.O. Box 608
Wheatland, PA 16161-0608
800.257.8182

www.wheatland.com

Electrical Metallic Tubing - Steel

WEIGHTS AND DIMENSIONS

Trade Size	Metric Designator	Weight 10 Unit Lengths		Outside Diameter(1)		Inside Diameter(2)		Wall Thickness(2)	
		lb	kg	in.	mm	in.	mm	in.	mm
1/2	16	30	13.6	0.706	17.93	0.622	15.80	.042	1.07
3/4	21	46	20.9	0.922	23.42	0.824	20.93	.049	1.25
1	27	67	30.4	1.163	29.54	1.049	26.64	.057	1.45
1 1/4	35	101	45.8	1.510	38.35	1.380	35.05	.065	1.65
1 1/2	41	116	52.6	1.740	44.20	1.610	40.89	.065	1.65
2	53	148	67.1	2.197	55.80	2.067	52.50	.065	1.65
2 1/2	63	216	98.0	2.875	73.03	2.731	69.37	.072	1.83
3	78	263	119.3	3.500	88.90	3.356	85.24	.072	1.83
3 1/2	91	349	158.3	4.000	101.60	3.834	97.38	.083	2.11
4	103	393	178.3	4.500	114.30	4.334	110.08	.083	2.11

Notes : Applicable tolerances Length: 10 Ft. (3.05 m) +/- 1/4 in. (+/- 6.35 mm)
(1) Outside Diameter: 1/2 - 2 +/- 0.005 in. (16 - 53 +/- 0.13mm), 2-1/2 +/- 0.010 in. (63 +/- 0.25 mm).
3 +/- 0.015 in. (78 +/- 0.38 mm) , 3-1/2 - 4 +/- 0.020 in. (91 - 103 +/- 0.51 mm).
(2) For information only, not a UL 797 requirement.

PACKAGING

Trade Size	Metric Designator	Bundle Tape Color	Quantity Per Bundle		Quantity Per Lift				Weight Per Lift		Volume Per Lift	
			Feet	Meters	Pieces	Bundles	Feet	Meters	Pounds	Kilograms	Cu. Ft.	Cu. m
1/2	16	Black	100	30.5	---	70	7000	2134	2100	952.6	31.7	0.9
3/4	21	Red	100	30.5	---	50	5000	1524	2300	1043.3	36.1	1.0
1	27	Blue	100	30.5	---	30	3000	914	2010	911.7	36.5	1.0
1 1/4	35	Red	50	15.2	---	40	2000	610	2020	916.3	38.2	1.1
1 1/2	41	Black	50	15.2	---	30	1500	457	1740	789.3	37.9	1.1
2	53	---	---	---	120	---	1200	366	1776	805.6	46.7	1.3
2 1/2	63	---	---	---	61	---	610	186	1318	597.7	41.5	1.2
3	78	---	---	---	51	---	510	155	1341	608.4	48.9	1.4
3 1/2	91	---	---	---	37	---	370	113	1291	585.7	48.6	1.4
4	103	---	---	---	30	---	300	91	1179	534.8	50.0	1.4

The quantity per Lift conforms to the National Electrical Manufacturers Association Standards Publication RN-2 Packaging of Master Bundles for Steel Rigid Conduit, Intermediate Metal Conduit (IMC), and Electrical Metallic Tubing.

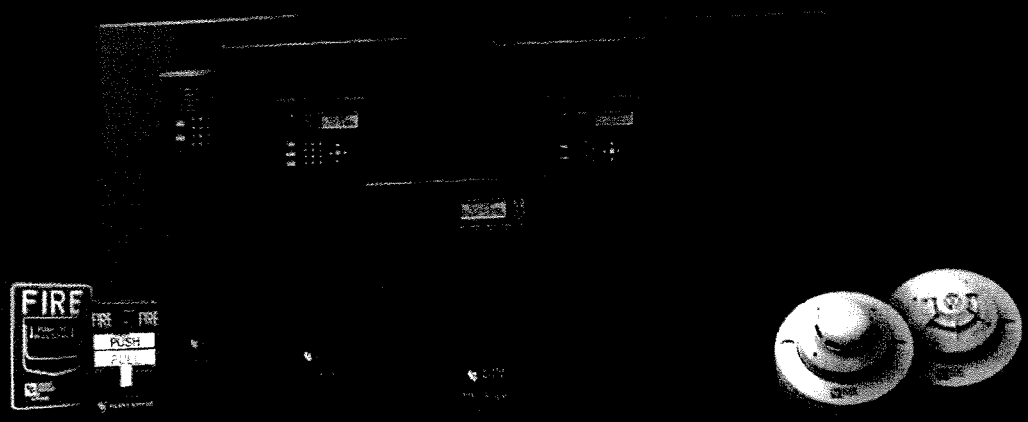
SILENT KNIGHT
by Honeywell

The Legacy of The Knight

Honor.

Commitment.

Respect.



Silent Knight. A Flexible Line of Fire Control Systems with Integrity.

CONVENTIONAL FIRE ALARM CONTROL PANELS

SK-Conventional Series

2- to 30-Zone Fire Alarm Control Panels (FACPs)

Whether your installation calls for 2 zones or 30 zones, we've got you covered. Our entire SK-Conventional Series boasts power and features you won't find in panels that cost twice as much. So now you'll have access to more of the jobs you want—new or retrofit. The SK-5208, compatible with both 2- and 4-wire smoke detectors, is an all-in-one control panel and digital communicator, and also has a built-in LCD display. With full English readouts, your programming and maintenance become a snap. Of course, as with all of our conventional panels, you'll appreciate how fast and easy it is to install, program and maintain. Our built-in power supplies handle power-hungry peripherals with ease. Put any of one these panels to the test. You'll find they really do defy convention.

SK-5208 10- to 30-Zone FACP

Features

- Built-in UL listed digital communicator
- Built-in LCD display provides English readouts
- 10 zones — 10 Class B Style B or 8 Class B Style B and 2 Class A Style D
- 4 notification appliance circuits (Class B Style Y)
- Programmable from built-in touchpad

SK-5208 Accessories

5217 10-Zone Expander
5235 Remote LCD Annunciator
5280 Status Display Module
5660 Silent Knight Software Suite (SKSS)
7181 Fire Zone Converter Module
5824 Serial/Parallel Module

SK-4

Features

- Form C Alarm, Supervisory and Trouble relays
- Optional module that converts all 4 IDCs and 2 NACs to Class A
- 240 VAC primary (SK-4E only)

SK-4 and SK4E Accessories

SK-DP2/4 Dress Panel
SK-4RB Repair Board
SK-CAC4 Class A Converter
SK-4XTM Transmitter Module
SK-4XLM LED Interface Module
SK-XRM24 110 Volt Transformer 3-6A
SK-XRM24E 240 Volt Transformer 3-6A
SK-RA4 Remote Annunciator
SK-4XZM Zone Relay Module
TR-1-R Semiflush Mount Trim Ring

SK-2

Features

- Form C Alarm and Trouble relays
- 240 VAC primary (SK-2E only)

SK-2 and SK-2E Accessories

SK-DP2/4 Dress Panel
SK-2RB Repair Board
SK-4XTM Transmitter Module
RBB Remote Battery Box Accessory Cabinet
TR-1-R Semiflush Mount Trim Ring

Features	SK-5208	SK-4	SK-2
Number of Class B Zones	10 (exp. to 30)	4	2
Notification Appliance Circuits	4	2	1
Power Supply (24VDC)	6A	2.5A or 5.0A	2.5A
Alarm Verification	•	•	•
ANSI 3.41 (Temporal) Cadence	•	•	•
Up/Downloadable	•		
Communicator	•	optional	optional
Built-In Relay Outputs	4	3	2
Remote Annunciator	LCD	LED	
Auxiliary Power	1 amp	.5 amp	.5 amp

CONVENTIONAL MANUAL PULL STATIONS

Manual Pull Stations

PS-SATK Single Action Metal
PS-DATK Dual Action Metal
PS-SA Single Action Lexan
PS-DA Dual Action Lexan
PS-DASP Dual Action Spanish Language Lexan

Features

- Weatherproof model approved for outdoor use (PS-SATK and PS-DATK)
- Surface mount back boxes available
- Reset with the same keys as SK enclosures

The Legacy of The Knight

Honor.

Commitment.

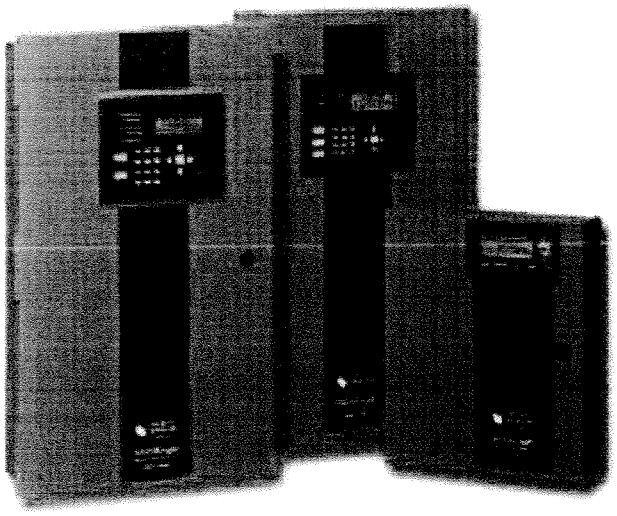
Respect.

SILENT KNIGHT: THE LEGACY CONTINUES

At Silent Knight, we continually engineer best-of-class products that respond to your ever-changing needs. Our track record of innovation included the invention of the first digital fire communicator, and the first dedicated power supply. It continued with the rollout of our IntelliKnight Fire Alarm Control Panel, featuring the first addressable integrated control communicator in distribution. Our dedication to innovation is still strong, as we continue to deliver even more affordable addressable solutions.

Today, Silent Knight offers the widest range of addressable products on the market. With our IntelliKnight panels and accessories, you can spec affordable addressable technology on virtually every job you bid. Large or small. New or retrofit. When you choose Silent Knight, you're assured of an end-to-end solution that provides unprecedented levels of power and control. You can expect more accurate information about your facilities. You can expect easy installation, programming and maintenance. And, you can expect Silent Knight products to help impact your bottom line. When you combine all this with our rock solid support and unending commitment to innovation, you'll have more than a system that simply does the job.

ADDRESSABLE FIRE ALARM CONTROL PANELS



IntelliKnight® Series

Whether you're doing a large commercial installation or a smaller job, the IntelliKnight Series has the right addressable panel for your needs. IntelliKnight makes set-up simple by automatically initializing detectors. Plus, it continuously monitors their operation, provides drift compensation, controls detector sensitivity, and performs an NFPA 72-compliant sensitivity check. Our IntelliKnight Series is perfect for retrofits because it requires no special wiring, which allows you to take advantage of a building's existing wiring. All three offer built-in synchronization for System Sensor,® Wheelock, Gentex,® Faraday, and AMSECO. The world's most advanced built-in digital communicator and an arsenal of accessories round out IntelliKnight's powerful options. Silent Knight gives you the capability to design an affordable, addressable system for any facility. Managing your facilities has never been easier!

IntelliKnight 5820XL

- Up to 508 addressable points of protection
- Supports Class B (Style 4) and Class A (Style 6 or 7) configuration for SLC
- Distributed, intelligent power
- Three Form C relays; One is trouble, and two are programmable rated at 2.5 amps at 24 VDC
- Flexput™ Input/Output circuits
- Class A support for SBUS and Flexput circuits
- Compatible with Flex-1 Door Accessory

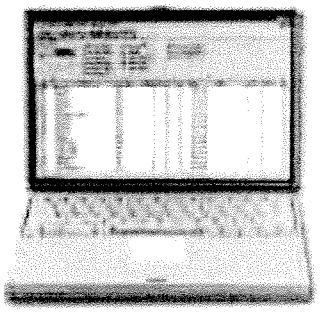
IntelliKnight 5808

- Up to 127 addressable points of protection
- Supports Class B (Style 4) and Class A (Style 6 or 7) configuration for SLC
- Distributed, intelligent power
- Three Form C relays; One is trouble, and two are programmable rated at 2.5 amps at 24 VDC
- Class A support for SBUS
- Compatible with Flex-2 Door Accessory

IntelliKnight 5700

- Up to 50 addressable points of protection
- Supports Class B (Style 4) and Class A (Style 6 or 7) configuration for SLC
- Distributed, intelligent power
- Three Form C relays; One is trouble, and two are programmable rated at 2.5 amps at 24 VDC
- 13 pre-programmed output cadences (including ANSI-3.41/temporal), and 4 programmable outputs
- Notification circuits can be configured as 1 Class A (Style Z) or 2 Class B (Style Y), or auxiliary power for resettable, constant, or door holder power
- Compatible with DF-50 Dead Front Panel

Features	5820XL	5808	5700
Addressable Points (maximum)	508	127	50
Notification Appliance Circuits	6 (exp. to 56)	4 (exp. to 36)	2 (exp. to 34)
Power Supply	6A	6A	2.5A
Smoke Verification	•	•	•
ANSI 3.41 (Temporal) Cadence	•	•	•
Up/Downloadable	•	•	•
Built-In Digital Communicator	•	•	•
Built-In Relay Outputs	3	3	3
Remote Annunciator	LCD, LED	LCD, LED	LCD, LED
Built-In 80-Character LCD	•	•	•
Alarm Reporting by Point or Zone	•	•	•
RS-485 Accessory Comm Bus	•	•	•
Built-In Serial Interface to Program via PC	•	•	•
USB Programming Connector	•	•	
Non-Volatile, 1000-Event History Buffer	•	•	•
Customizable Text Labels for Device & Modules	•	•	•
Water Deluge Releasing Service	•	•	•



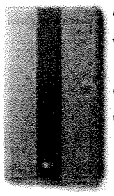
Our user-friendly 5660 Silent Knight Software Suite can be used with our entire line of IntelliKnight products to provide users with access to programming, up/downloading, event history, detector status, test reports and more.

ADDRESSABLE FIRE ALARM ACCESSORIES

Power Supplies, Detectors, Modules, Annunciators, Bases and More

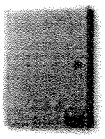
Our IntelliKnight Series boasts a complete line-up of accessories that lets you bring unparalleled functionality and control to any type of job. IntelliKnight's addressable power supplies, bases, detectors, modules and pull stations are all specifically engineered to ensure your installs and maintenance remain simple and economical. Combine these accessories with the IntelliKnight's built-in digital communicator for the most powerful and easy-to-use addressable solution in the industry. All of our accessories are compatible with all three of our addressable fire alarm control panels.

5895XL Intelligent Power Module



- Six amps of output power
- Six programmable Flexput™ I/O circuits
- Two Form C relay circuits
- Built-in synchronization for System Sensor,® Wheelock, Gentex,® Faraday and AMSECO

5496 Addressable Power Supply



- Six amps of output power
- Four programmable output circuits
- Built-in synchronization for System Sensor,® Wheelock, Gentex® Faraday and AMSECO

5883 Relay Interface Board

- 10 programmable Form C relays

5865-3/5865-4 Remote LED Annunciator

- 30 programmable LEDs
- Fits standard 3-or 4-gang electrical box
- Up to eight annunciators per panel

SD505-AHS Addressable Heat Detector

- Programmable temperature range
- Low-profile

SD505-AIS Addressable Ionization Type Smoke Detector

- Low-profile
- Supervised
- Provides drift compensation and detector sensitivity test

SD505-APS Addressable Photoelectric Type Smoke Detector

- Low-profile
- Supervised
- Provides drift compensation and detector sensitivity test

5860/5860R Remote LCD Annunciator

- 80-character backlit annunciator
- Available in gray or red
- Surface or flush-mount

SD505-6SB 6" Addressable Sounder Base

- Adds audible output function
- Single station or multi-station applications

SD505-6RB 6" Addressable Relay Base

- Provides relay output function
- Normally open or closed relay
- Compatible with our photoelectric, ionization and heat detectors

SD505-6IB 6" Isolator Base

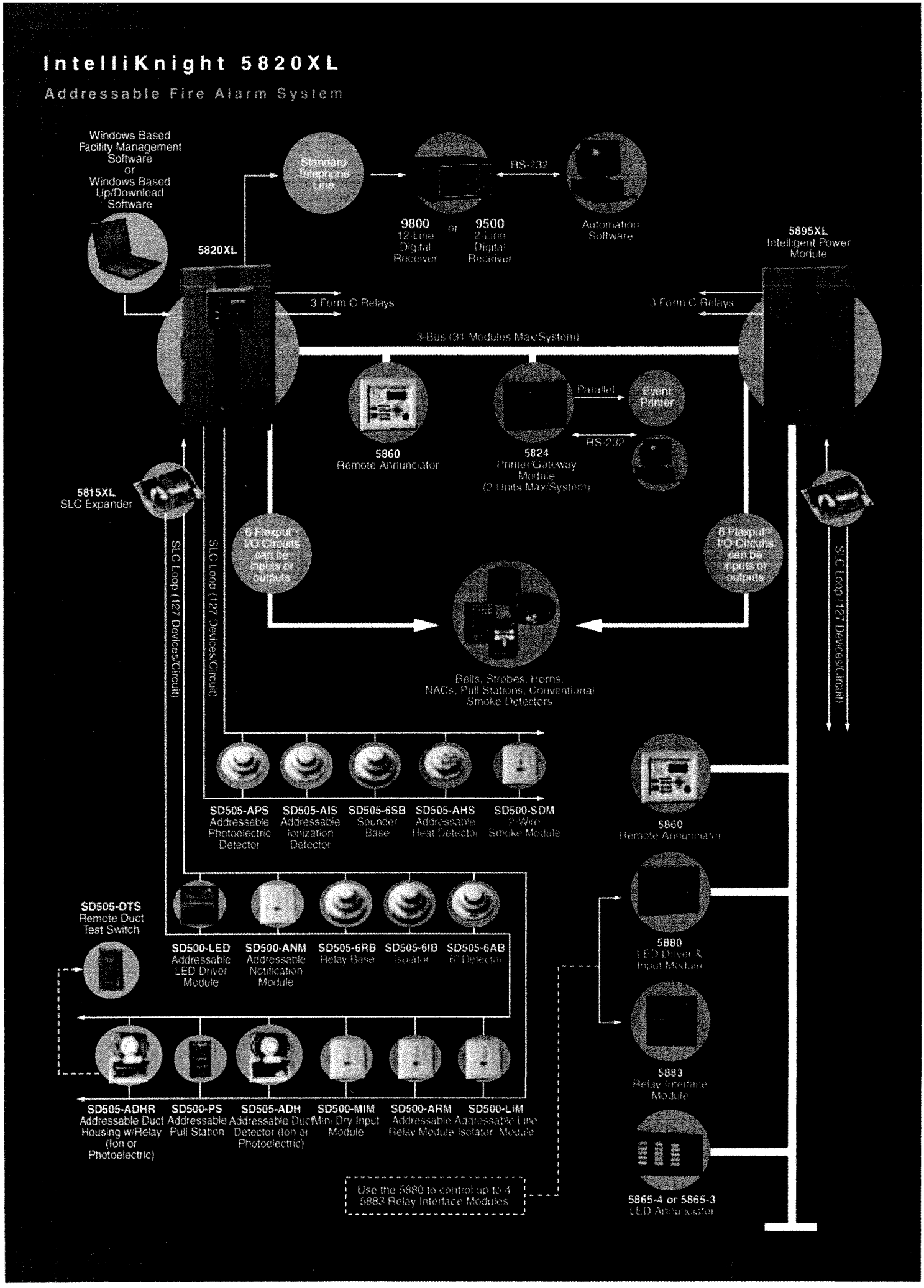
- Isolates short circuited wiring on an SLC loop without shutting down the entire loop

ADDITIONAL ADDRESSABLE DEVICES

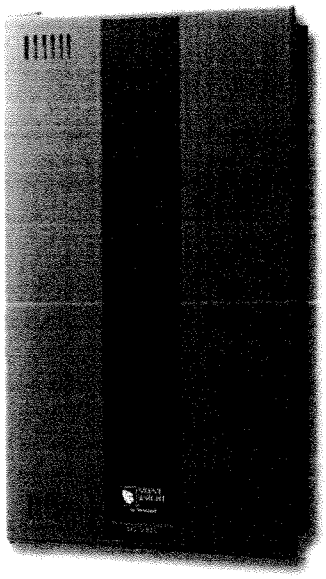
	5820XL	5808	5700
SD500-AIM Addressable Input Module	•	•	•
SD500-ANM Addressable Notification Module	•	•	•
SD500-ARM Addressable Relay Module	•	•	•
SD500-LED SLC Annunciator Driver Module	•	•	•
SD500-LIM Loop Isolation Module	•	•	•
SD500-MIM Mini-Input Module	•	•	•
SD500-PS/PSDA Single or Dual Action Addressable Pull Station	•	•	•
SD500-SDM Smoke Detector Module	•	•	•
SD505-4AB/SD505-6AB Four/Six-Inch Detector Base	•	•	•
SD505-ADH Addressable Duct Housing	•	•	•
SD505-ADHR Addressable Duct Detector with Built-In Relay	•	•	•
SD505-DTS Addressable Duct Detector Test Switch	•	•	•
5815XL Signal Line Circuit Expander	•		
5824 Serial/Parallel Module	•	•	•
5880 LED Input/Output Module	•	•	•

IntelliKnight 5820XL

Addressable Fire Alarm System



VOICE EVACUATION SYSTEM



SKE-450 Voice Evacuation System

Silent Knight's SKE-450 helps you meet compliance needs for areas of assembly where voice evacuation is required. The signature of the SKE-450 is its best-in-class 50-watt amplifier. It's just the edge you need to be even more competitive in your bids When it comes to value, the SKE-450 speaks volumes. Our free downloadable voice prompts give you unprecedented access to evacuation instruction messages. Simply download these professionally-recorded messages from our website and upload them to your system. No additional chips to buy! Plus, our SKE-450 works with any fire system, so compatibility is never an issue. A built-in digital message repeater, microphone, and power supply with battery charger round out this solid voice evac solution.

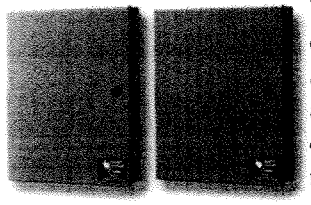
SKE-450

Features

- Speaker circuits are fully supervised, short-circuit and overload protected
- Speaker circuits are power limited
- Delivers clear voice messages even in noisy environments
- Easy dip switch programming
- Simple to install, program and operate
- 50-Watt Amplifier
- Built-In Digital Message Repeater
- Built-In Power Supply /Batt Charger
- Built-In Microphone
- Downloadable Voice Prompts

POWER SUPPLIES

5499 and 5495 Distributed Power Supplies



This dynamic duo of NAC expanders packs quite a punch. Available with a whopping 9 or 6 amps of power, you can meet the needs of even the most power-hungry notification appliances. They also deliver built-in synchronization for appliances from System Sensor,® Wheelock, Gentex,® Faraday, and AMSECO. Their switch-mode design is up to 50% more efficient than competitive linear mode power supplies, and set-up is simple with easy dip-switch programming. ADA retrofits are easier and less expensive, because these power supplies integrate into current systems without costly new components.

Features	5499	5495
Power Output	9A/24VDC	6A/24VDC
Number of Outputs	4 + Aux	4 + Aux
Maximum Output per CKT	3A	3A
Auxiliary Power Output	3A	3A
Ground Fault Detection	•	•
Trouble Relay	•	•
Standalone Operation	•	•
ANSI 3.41 (Temporal) Cadence	•	•
Activation -->> Reverse Polarity/Contact	•	•
Class A or B Operation	•	•

DIGITAL FIRE COMMUNICATORS

5104 Digital Fire Communicator

We know digital communication. And, with hundreds of thousands of our communicators worldwide, it shows. The popular six-channel 5104 provides fast, reliable communication as a stand-alone, or as an adjunct to another FACP. The 5104 is fully supervised. Its microprocessor constantly runs programs to monitor AC, stand-by battery, channel inputs and telephone line connections. The 5104 programs easily from a 5230 remote touchpad or with the downloading package.

5104 Digital Fire Communicator

Features

- Use stand-alone or as adjunct communicator (Universal Digital Alarm Communicator Transmitter)
- Supervised notification circuit rated at .35A (not for evacuation purposes)
- Dual phone line interface
- Automatic self test every 24 hours with report sent to central station
- Reports in SIA and most major communications formats
- 6 supervised Input Channels
- Supervised Waterflow Bell Output
- Supports up to 3 remote annunciators
- 60 hours of stand-by power

5104 Accessories

5230 Remote Alphanumeric Annunciator
5561 Downloading Software Package

Silent Knight
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Maple Grove, MN 55369-4927

800.446.6444 763.493.6400
800.328.0103 fast-fax info

www.silentknight.com

SILENT KNIGHT
by Honeywell

Part # 350920 2/07

HARVEL

PVC Industrial Pipe: Schedule 40

Application:

Corrosion resistant pressure pipe, IPS sizes 1/8" through 24", for use at temperatures up to and including 140° F. Pressure rating (120 psi to 810 psi) varies with schedule, pipe size, and temperature as stated in Harvel Plastics, Inc. engineering bulletin (Product Bulletin 112/401). Pipe is also suitable for PVC plastic drain, waste, and vent (DWV) applications. Generally resistant to most acids, bases, salts, aliphatic solutions, oxidants, and halogens. Chemical resistance data is available and should be referenced for proper material selection. Pipe exhibits excellent physical properties and flammability characteristics (independently tested flame and smoke characteristics-ULC). Typical applications include: chemical processing, plating, high purity applications, potable water systems, water and wastewater treatment, drainage, irrigation, agricultural, and other applications involving corrosive fluid transfer.

Scope:

This specification outlines minimum manufacturing requirements for Polyvinyl Chloride (PVC) Schedule 40 iron pipe size (IPS) pressure pipe. This pipe is intended for use in applications where the fluid conveyed does not exceed 140° F. This pipe meets and or exceeds the industry standards and requirements as set forth by the American Society for Testing and Materials (ASTM D1785 & D2665) and the National Sanitation Foundation (NSF International STD 61 & Std 14).

PVC Materials:

The material used in the manufacture of the pipe shall be domestically produced rigid polyvinyl chloride (PVC) compound, Type I Grade I, with a Cell Classification of 12454 as defined in ASTM D1784, trade name designation H707 PVC. This compound shall be white or gray in color as specified, and shall be approved by NSF International for use with potable water (NSF Std 61).

Dimensions:

All sizes of PVC Schedule 40 pipe shall be manufactured in strict accordance to the requirements of ASTM D1785 for physical dimensions and tolerances. PVC Sch 40 pipe sizes 1¼" through 24" diameters shall also meet the requirements of ASTM D2665 Standard Specification for PVC plastic drain, waste and vent (DWV) pipe and shall be dual marked as such. Each production run of pipe manufactured in compliance to the standard, shall also meet or exceed the test requirements for materials, workmanship, burst pressure, flattening, and extrusion quality defined in ASTM D1785 and ASTM D2665 as applicable. All belled-end pipe shall have tapered sockets to create an interference-type fit, which meet or exceed the dimensional requirements and the minimum socket length for pressure-type sockets as defined in ASTM D2672. All PVC Schedule 40 pipe must also meet the requirements of NSF Standard 14 and CSA Standard B137.3 rigid PVC pipe for pressure applications, and shall bear the mark of these Listing agencies. This pipe shall have a flame spread rating of 0-25 when tested for surface burning characteristics in accordance with CAN/ULC-S102-2-M88 or equivalent.

Marking:

Product marking shall meet the requirements of ASTM D1785 and ASTM D2665 as applicable and shall include: the manufacturer's name (or the manufacturer's trademark when privately labeled); the nominal pipe size; the material designation code; the pipe schedule and pressure rating in psi for water @ 73° F; the ASTM designation D1785; the ASTM designation D2665 (when dual marked); the independent laboratory's seal of approval for potable water usage; and the date and time of manufacture.

Sample Specification:

All PVC Schedule 40 pipe shall be manufactured from a Type I, Grade I Polyvinyl Chloride (PVC) compound with a Cell Classification of 12454 per ASTM D1784. The pipe shall be manufactured in strict compliance to ASTM D1785 and D2665 (where applicable), consistently meeting and/or exceeding the Quality Assurance test requirements of these standards with regard to material, workmanship, burst pressure, flattening, and extrusion quality. The pipe shall be manufactured in the USA, using domestic materials, by an ISO 9001 certified manufacturer. Standard lengths of pipe sizes 6" and larger shall be beveled each end by the pipe manufacturer. All pipe shall be stored indoors after production at the manufacturing site until shipped from factory. This pipe shall carry the National Sanitation Foundation (NSF) seal of approval for potable water applications. All pipe shall be manufactured by HARVEL® PLASTICS, INC.

PVC Industrial Pipe: Schedule 40

Schedule 40 Dimensions

	Nom. Pipe Size (in.)	O.D.	Average I.D.	Min. Wall	Nom. Wt./Ft.	Max. W.P.
	1/8	0.405	0.249	0.068	0.051	810
	1/4	0.540	0.344	0.088	0.086	780
	3/8	0.675	0.473	0.091	0.115	620
	1/2	0.840	0.602	0.109	0.170	600
	3/4	1.050	0.804	0.113	0.226	480
	1	1.315	1.029	0.133	0.333	450
*	1-1/4	1.660	1.360	0.140	0.450	370
*	1-1/2	1.900	1.590	0.145	0.537	330
*	2	2.375	2.047	0.154	0.720	280
	2-1/2	2.875	2.445	0.203	1.136	300
*	3	3.500	3.042	0.216	1.488	260
	3-1/2	4.000	3.521	0.226	1.789	240
*	4	4.500	3.998	0.237	2.118	220
	5	5.563	5.016	0.258	2.874	190
*	6	6.625	6.031	0.280	3.733	180
*	8	8.625	7.942	0.322	5.619	160
*	10	10.750	9.976	0.365	7.966	140
*	12	12.750	11.889	0.406	10.534	130
*	14	14.000	13.073	0.437	12.462	130
*	16	16.000	14.940	0.500	16.286	130
*	18	18.000	16.809	0.562	20.587	130
*	20	20.000	18.743	0.593	24.183	120
*	24	24.000	22.544	0.687	33.652	120

* Denotes these sizes are dual marked as being in compliance with both ASTM D1785 (pressure pipe) and ASTM D2665 (drain, waste & vent pipe- DWV).

The pressure ratings given are for water, non-shock, @ 73°F. The following temperature de-rating factors are to be applied to the working pressure ratings (WP) listed when operating at elevated temperatures.

Multiply the working pressure rating of the selected pipe at 73°F, by the appropriate de-rating factor to determine the maximum working pressure rating of the pipe at the elevated temperature chosen.

EX:
10" PVC SCH 40 @ 120°F = ?
140 psi x 0.40 = 56 psi max.
@ 120°F

De-Rating Factor

Operating Temp (°F)	De-Rating Factor
73	1.00
80	0.88
90	0.75
100	0.62
110	0.51
120	0.40
130	0.31
140	0.22

THE MAXIMUM SERVICE TEMPERATURE FOR PVC IS 140°F.

Solvent-cemented joints should be utilized when working at or near maximum temperatures. Harvel Plastics does not recommend the use of PVC for threaded connections at temperatures above 110°F; use flanged joints, unions, or roll grooved couplings where disassembly is necessary at elevated temperatures.

Threading of Schedule 40 PVC pipe is not a recommended practice due to insufficient wall thickness. Thread only Schedule 80 or heavier walls. *Threading requires a 50% reduction in pressure rating stated for plain end pipe @ 73°F.*

Chemical resistance data should be referenced for proper material selection and possible de-rating when working with fluids other than water. Refer to Harvel Plastics 112/401 Product Bulletin for chemical resistance, installation data, and additional information.

ASTM STANDARD D1784 MATERIAL EQUIVALENTS:

Cell Classification 12454 = PVC Type I Grade I = PVC1120

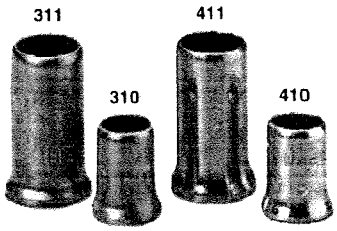
Pipe sizes shown are manufactured in strict compliance with ASTM D1785 and ASTM D2665 where applicable.

Crimp Connectors

Use GB crimp connectors for strong, vibration-resistant permanent connections in branch circuit and fixture wiring.

- Two styles and sizes available.
- Copper or zinc-plated steel.

SEE PG 121 FOR MORE INFO ON GCP-3400 Crimp Tool

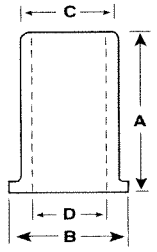


Copper

Part #	Model	Pkg Qty	Wire Range	Min	Max
10-310	310	100/box	#18 - #10 AWG	2 #16	2 #10 w/1 #12
10-310C	310	100/clam			
10-311	311	50/box	#14 - #8 AWG	3 #12	4 #10
10-311C	311	50/clam			

Zinc-plated Steel

Part #	Model	Pkg Qty	Wire Range	Min	Max
10-410	410	100/box	#18 - #10 AWG	2 #16	2 #10 w/1 #12
10-410C	410	100/clam			
13-410	410	500/bag			
20-410	410	12/clam			
10-411	411	50/box	#14 - #8 AWG	3 #12	4 #10
10-411C	411	50/clam			
20-411	411	8/clam			



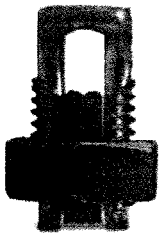
Dimensions

Model	A	B	C	D
310/410	3/8"	19/64"	1/4"	13/64"
311/411	5/8"	23/64"	21/64"	17/64"

Copper Split Bolt Connectors

All-copper alloy construction for high mechanical strength, maximum conductivity and low resistance.

- Accept a wide range of solid and stranded conductors from 16 AWG – 3/0 AWG.
- Can be torqued with standard wrenches.



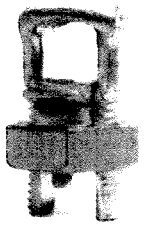
Part #	Pkg Qty	Wire Gauge
GSBC-8	2/clam	#16 - #10 AWG Stranded, #16 - #8 AWG Solid
GSBC-6	2/clam	#10 AWG Stranded, #10 - #8 AWG Solid
GSBC-4	2/clam	#8 - #4 AWG Solid
GSBC-2	2/clam	#6 - #2 AWG Solid

Part #	Pkg Qty	Wire Gauge
GSBC-1/0	1/clam	#4 - #0 AWG Solid
GSBC-2/0	1/clam	#2 - #00 AWG Solid
GSBC-3/0	1/clam	#2 - #000 AWG Solid

Aluminum Split Bolt Connectors

Constructed of high-strength aluminum with oxide-displacing jaws to prevent galvanic corrosion.

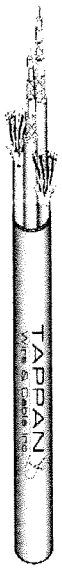
- Accept conductors from 10 AWG – 4/0 AWG.
- Use GB OX-GARD™ anti-oxidant treatment on Al-Al and Al-Cu to prevent corrosion and permit cooler connections.



Part #	Pkg Qty	Wire Gauge
GAK-2	1/clam	#8 - #2 AWG Solid
GAK-1/0	1/clam	#8 - #0 AWG Solid
GAK-2/0	1/clam	#10 AWG Stranded, #10 - #00 AWG Solid
GAK-4/0	1/clam	#6 - #0000 AWG Solid

ARTICLE 725

MULTIMEDIA CABLE
UL Rated



APPLICATIONS: RESIDENTIAL VOICE, VIDEO, AND DATA CABLING

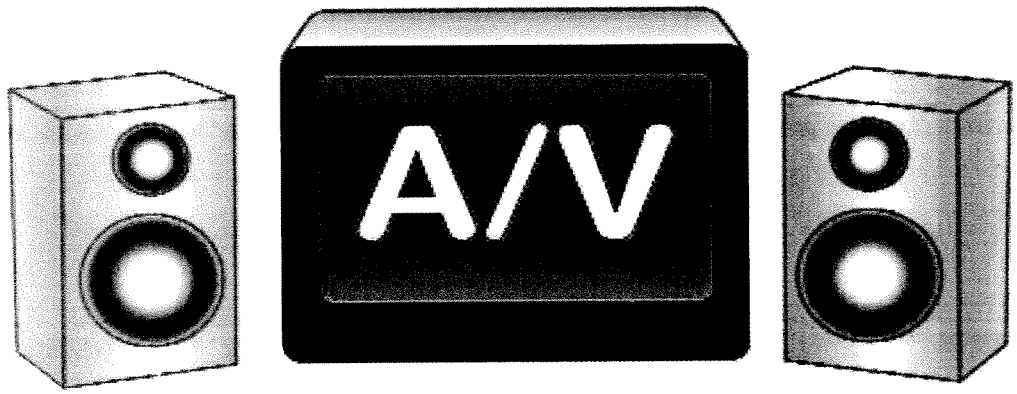
CODE RESTRICTIONS: FOR USE WITH POWER-LIMITED CIRCUITS EXCEPT THOSE IN RISERS OR PLENUMS

FEATURES: AVAILABLE ON 500 FT OR 1000 FT SPOOLS, SEQUENTIAL FOOTAGE MARKINGS

CONSTRUCTION: SOLID OR FOAMED DIELECTRIC CORE OVER SOLID COPPER CENTER CONDUCTOR, FLEXIBLE PVC JACKET

Multimedia Cable UL Rated

CONSTRUCTION			NOM. O.D.	COLOR	AVG. LBS. PER MFT	SPEC #
CAT CABLE		COAX				
2 CAT 5e	+	2 RG6 QUAD	0.650	BLUE	115	H90122
1 CAT 5e	+	1 RG6 QUAD	0.628	PURPLE	58	H91063
1 CAT 5e	+	2 RG6 QUAD	0.595	YELLOW	88	H91064
2 CAT 5e	+	1 RG6 QUAD	0.602	GREEN	78	H90357
1 CAT 5e	+	16/4	0.503	WHITE	75	H91065
1 CAT 5e	+	RG59 (CCTV) + 1PR 18	0.488	YELLOW	80	H90948
1 PR 22 SHIELDED	+	1 PR 18	0.381	TEAL	35	H91066



ARTICLE 725

HOME THEATER CABLES

APPLICATIONS: HIGH-END AUDIO TRANSMISSION, THEATER, PRO AUDIO, STEREO SYSTEM
CODE RESTRICTIONS: FOR USE WITH POWER LIMITED CIRCUITS EXCEPT FOR THOSE IN RISERS AND PLENUMS
FEATURES: HIGHLY FLEXIBLE
CONSTRUCTION: HIGH-STRAND-COUNT OXYGEN FREE COPPER CONDUCTOR, COLOR CODE CHART 17

Home Theater Cables

AWG	# / COND.	STR / SOL	NOM O.D.	NOM. CAP. PF/FT	# STR OXYGEN FREE BC	JACKET COLOR	UL LISTINGS	AVG. WT. PER MFT	SPEC #
16	2	STR	0.230	30.55	65	WHITE	CM/CL3	34	A50312
16	4	STR	0.264	26.52	65	WHITE	CM/CL3	56	A50313
14	2	STR	0.268	31.52	41	BLUE	CM/CL3	49	A60146
14	4	STR	0.310	27.4	41	BLUE	CM/CL3	83	A60147

DIRECT BURIAL / OUTDOOR AUDIO

APPLICATIONS: HIGH-END AUDIO TRANSMISSION, STEREO, PROFESSIONAL SOUND, AND STUDIO REQUIREMENTS WHERE CRUSH RESISTANCE IS REQUIRED. DIRECT BURIAL SUNLIGHT RESISTANT
CODE RESTRICTIONS: INTENDED FOR OUTDOOR OR UNDERGROUND USE
FEATURES: AVAILABLE ON 500FT SPOOLS, SEQUENTIAL FOOTAGE MARKINGS
CONSTRUCTION: HIGH-STRAND OXYGEN FREE COPPER CONDUCTORS. BLACK HIGH MOLECULAR WEIGHT POLYOLEFIN JACKET. COLOR CODE CHART 17

Direct Burial / Outdoor Audio

AWG	# CONDUCTORS (STRAND COUNT)	AVG. LBS. PER MFT	SPEC #
16	2 (65 STR BC) OXYGEN FREE	26	SU5011
16	4 (65 STR BC) OXYGEN FREE	46	SU5012
14	2 (41 STR BC) OXYGEN FREE	40	SU6026
14	4 (41 STR BC) OXYGEN FREE	71	SU6027

ARTICLE 725

MINI-RGB COMPONENT VIDEO CABLES

APPLICATIONS:

COMPONENT VIDEO CABLES ARE A KEY ELEMENT OF ANY HOME THEATER SYSTEM. THESE 75 OHM CABLES CARRY VIDEO SIGNALS FROM A SOURCE (ie. DVD PLAYER) TO A LOAD (ie. TV MONITOR)

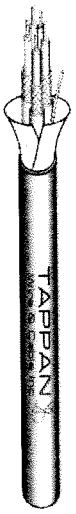
FEATURES:

100% FOIL SHIELD, 95% TINNED COPPER BRAID SHIELD, GAS INJECTED DIELECTRIC, 81% VP, SUPER FLEXIBLE EASY STRIP OUTER JACKET, RIPCORD FOR JACKET REMOVAL, LOW LOSS SOLID BARE COPPER CENTER CONDUCTOR, SWEEP TESTED TO 2 GHz

Mini-RGB Component Video Cables

STYLE	COAXIAL JACKET COLORS	SHIELD	NOM IMP.	NOM O.D.	UL LISTING	SPEC #
3 X MINI-COAX	RED, GREEN & BLUE	95% TC & 100% FOIL	75 OHMS	.370	CM/CL2	H91089
5 X MINI-COAX	RED, GREEN, BLUE, YELLOW & WHITE	95% TC & 100% FOIL	75OHMS	.429	CM/CL2	H91088
6 X MINI-COAX	RED, GREEN, BLUE, YELLOW, WHITE & GRAY	95% TC & 100% FOIL	75 OHMS	.466	CM/CL2	H91082

MINI-RGB COMPONENT VIDEO CABLES
Plenum Rated



APPLICATIONS:

COMPONENT VIDEO CABLES ARE A KEY ELEMENT OF ANY HOME THEATER SYSTEM. THESE 75 OHM CABLES CARRY VIDEO SIGNALS FROM A SOURCE (ie. DVD PLAYER) TO A LOAD (ie. TV MONITOR)

FEATURES:

100% FOIL SHIELD, 95% TINNED COPPER BRAID SHIELD, GAS INJECTED DIELECTRIC, 81% VP, SUPER FLEXIBLE EASY STRIP OUTER JACKET, RIPCORD FOR JACKET REMOVAL, LOW LOSS SOLID BARE COPPER CENTER CONDUCTOR, SWEEP TESTED TO 2 GHz

Mini-RGB Component Video Cables, Plenum

STYLE	COAXIAL JACKET COLORS	SHIELD	NOM IMP.	NOM O.D.	UL LISTING	SPEC #
3 X MINI-COAX	RED, GREEN & BLUE	95% TC & 100% FOIL	75 OHMS	.348	CMP/CL2P	H91080
5 X MINI-COAX	RED, GREEN, BLUE, YELLOW & WHITE	95% TC & 100% FOIL	75 OHMS	.411	CMP/CL2P	H91079
6 X MINI-COAX	RED, GREEN, BLUE, YELLOW, WHITE & GRAY	95% TC & 100% FOIL	75 OHMS	.448	CMP/CL2P	H91078

ARTICLE 760

ARTICLE 760 NEC
Wiring and equipment for fire alarm systems, power circuits for fire alarms

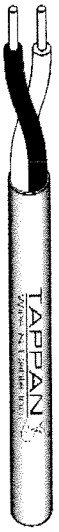
Power Limited Circuits: Type FPL, FPLR, FPLP

Article 760 provides the requirements for the installation of wiring and equipment for fire alarm systems, including control and power circuits. Fire alarm systems include fire detection, alarm notification and voice communications. NFPA 72-National Fire Alarm Code provides other fire alarm system requirements.

ARTICLE 760

FIRE ALARM MID CAP

Multi-Conductor, Unshielded



APPLICATIONS: MID-CAPACITANCE ADDRESSABLE FIRE-PROTECTIVE SIGNALING CIRCUITS, SUNLIGHT RESISTANT

CODE RESTRICTIONS: FOR USE WITH ALL POWER-LIMITED CIRCUITS EXCEPT THOSE IN RISERS AND PLENUMS

FEATURES: AVAILABLE IN 500 FT. OR 1000 FT. BOXES OR REELS, SEQUENTIAL FOOTAGE MARKINGS

CONSTRUCTION: SOLID BARE COPPER CONDUCTORS, POLYOLEFIN INSULATION, PVC JACKET, RIPCORD
JACKET COLOR: RED, COLOR CODE CHART 17

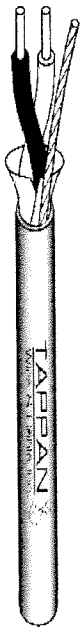
Fire Alarm Mid Cap Unshielded

AWG	#/COND.	STR/SOL	NOM. O.D.	NOM. CAP. PF/FT	UL LISTINGS	AVG. LBS. PER MFT	SPEC #
18	2	SOL.	.181	16.7	FPL/CM	19	SM4007
16	2	SOL.	.202	18.5	FPL/CM	26	SM5014
14	2	SOL.	.228	20.7	FPL/CL3	37	SM6005

* Available in various jacket colors. Consult factory for a list of colors.

FIRE ALARM MID CAP SHIELDED

Multi-Conductor, Overall Shield



APPLICATIONS: MID-CAPACITANCE ADDRESSABLE FIRE-PROTECTIVE SIGNALING CIRCUITS, SUNLIGHT RESISTANT

CODE RESTRICTIONS: FOR USE WITH ALL POWER-LIMITED CIRCUITS EXCEPT THOSE IN RISERS AND PLENUMS

FEATURES: AVAILABLE IN 500 FT. OR 1000 FT. BOXES OR REELS, SEQUENTIAL FOOTAGE MARKINGS

CONSTRUCTION: SOLID BARE COPPER CONDUCTORS, POLYOLEFIN INSULATION, ALUMINUM/POLYESTER FOIL SHIELD WITH TINNED COPPER DRAIN WIRE, PVC JACKET, RIPCORD
JACKET COLOR: RED, COLOR CODE CHART 17

Fire Alarm Mid Cap Shielded (Overall Shield)

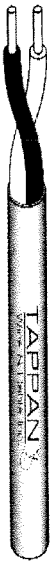
AWG	#/COND.	STR/SOL	NOM. O.D.	NOM. CAP. PF/FT	LISTINGS	AVG. LBS. PER MFT	SPEC #
18	2	SOL.	.181	25.4	FPL/CM	20	J40026
16	2	SOL.	.202	29.0	FPL/CM	27	SM5015
14	2	SOL.	.228	33.1	FPL/CL3	38	SM6007

* Available in various jacket colors. Consult factory for a list of colors.

ARTICLE 760

FIRE ALARM, RISER RATED

Multi-Conductor, Unshielded



APPLICATIONS: FIRE-PROTECTIVE SIGNALING CIRCUITS, SUNLIGHT RESISTANT

CODE RESTRICTIONS: FOR USE WITH ALL POWER-LIMITED CIRCUITS EXCEPT THOSE IN PLENUMS

FEATURES: AVAILABLE IN 500 FT. OR 1000 FT. BOXES OR REELS, SEQUENTIAL FOOTAGE MARKINGS

CONSTRUCTION: SOLID BARE COPPER CONDUCTORS, PVC INSULATION, PVC JACKET, RIPCORD
JACKET COLOR: RED, COLOR CODE CHART 17

Fire Alarm, Unshielded, Riser Rated

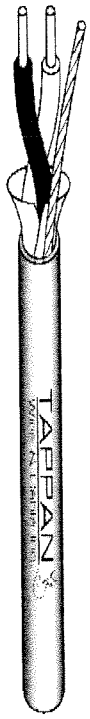
AWG	#/COND.	STR/SOL	NOM. O.D.	NOM. CAP. PF/FT	UL LISTINGS	AVG. LBS. PER MFT	SPEC #
22	4	SOL.	.140	22.3	FPLR/CMR	14	F20004
22	6	SOL.	.156	22.3	FPLR/CMR	20	F20009
22	8	SOL.	.178	22.3	FPLR/CMR	26	F20002
22	10	SOL.	.190	22.3	FPLR/CMR	32	F20012
22	12	SOL.	.204	22.3	FPLR/CMR	37	F20014
18	2	SOL.	.157	30.6	FPLR/CMR	17	F40021
18	4	SOL.	.181	26.5	FPLR/CMR	30	F40003
18	6	SOL.	.204	26.5	FPLR/CMR	42	F40025
18	8	SOL.	.235	26.5	FPLR/CMR	55	F40026
18	10	SOL.	.252	26.5	FPLR/CMR	67	F40027
16	2	SOL.	.182	32.4	FPLR/CMR	25	F50004
16	4	SOL.	.211	28.2	FPLR/CMR	44	F50011
14	2	SOL.	.216	33.2	FPLR/CL3R	37	F60001
14	4	SOL.	.253	28.9	FPLR/CL3R	66	F60112
12	2	SOL.	.258	34.5	FPLR/CL3R	55	F70004

* Available in various jacket colors. Consult factory for a list of colors.

ARTICLE 760

FIRE ALARM, RISER RATED

Multi-Conductor, Overall Shield



APPLICATIONS: FIRE-PROTECTIVE SIGNALING CIRCUITS, SUNLIGHT RESISTANT

CODE RESTRICTIONS: FOR USE WITH ALL POWER-LIMITED CIRCUITS EXCEPT THOSE IN PLENUMS

FEATURES: AVAILABLE IN 500 FT. OR 1000 FT. BOXES OR REELS, SEQUENTIAL FOOTAGE MARKINGS

CONSTRUCTION: SOLID BARE COPPER CONDUCTORS, ALUMINUM/POLYESTER FOIL SHIELD, PVC INSULATION, PVC JACKET, RIPCORD, JACKET COLOR: RED, COLOR CODE CHART 17

Fire Alarm, Overall Shielded, Riser Rated

AWG	#/COND.	STR/SOL	NOM. O.D.	NOM. CAP. PF/FT	UL LISTINGS	AVG. LBS. PER MFT	SPEC #
22	4	SOL.	.140	40.5	FPLR/CMR	16	F20017
18	2	SOL.	.157	49.3	FPLR/CMR	19	F40131
18	4	SOL.	.181	49.3	FPLR/CMR	31	F40030
18	6	SOL.	.204	49.3	FPLR/CMR	44	F40032
18	8	SOL.	.235	49.3	FPLR/CMR	56	F40033
16	2	SOL.	.182	52.8	FPLR/CMR	26	F50010
16	4	SOL.	.211	52.8	FPLR/CMR	45	F50030
14	2	SOL.	.216	54.3	FPLR/CL3R	38	F60030
14	4	SOL.	.253	54.3	FPLR/CL3R	68	F60111
12	2	SOL.	.258	56.6	FPLR/CL3R	56	F70015

* Available in various jacket colors. Consult factory for a list of colors.

FPN to (4) and (5): Examples of utilities may include those entities that are typically designated or recognized by governmental law or regulation by public service/utility commissions and that install, operate, and maintain electric supply (such as generation, transmission, or distribution systems) or communication systems (such as telephone, CATV, Internet, satellite, or data services). Utilities may be subject to compliance with codes and standards covering their regulated activities as adopted under governmental law or regulation. Additional information can be found through consultation with the appropriate governmental bodies, such as state regulatory commissions, the Federal Energy Regulatory Commission, and the Federal Communications Commission.

Section 90.2(B)(5) is not intended to exclude the *NEC* as an installation regulatory document. After all, the *NEC* is fully capable of being utilized for electrical installations in most cases, and 90.2(B)(5) does not pertain to areas where portions of the *NEC* could not be used. Rather, 90.2(B)(5) lists specific areas where the nature of the installation requires specialized rules or where other installation rules, standards, and guidelines have been developed for specific uses and industries. For example, the electric utility industry uses the *NESC* as its primary requirement in the generation, transmission, distribution, and metering of electric energy. See Exhibit 90.1 for examples of electric utility facilities that may or may not be covered by the *Code*.

(C) Special Permission. The authority having jurisdiction for enforcing this *Code* may grant exception for the installation of conductors and equipment that are not under the exclusive control of the electric utilities and are used to connect the electric utility supply system to the service-entrance conductors of the premises served, provided such installations are outside a building or terminate immediately inside a building wall.

90.3 Code Arrangement

This *Code* is divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally; Chapters 5, 6, and 7 apply to special occupancies, special equipment, or other special conditions. These latter chapters supplement or modify the general rules. Chapters 1 through 4 apply except as amended by Chapters 5, 6, and 7 for the particular conditions.

Chapter 8 covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8.

Chapter 9 consists of tables that are applicable as referenced.

Annexes are not part of the requirements of this *Code* but are included for informational purposes only.

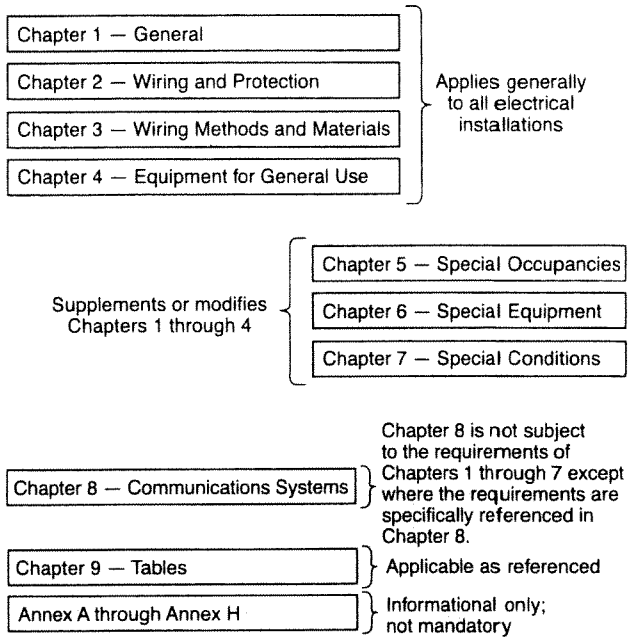


Figure 90.3 Code Arrangement.

The reference to "the introduction" in 90.3 is intended to include Article 90 in the application of the *Code*. Chapters 1 through 4 apply generally, except as amended or specifically referenced in Chapters 5, 6, and 7 (Articles 500 through 770). For example, 300.22 (Chapter 3) is modified by 725.3(C) and 760.3(B) and is specifically referenced in 800.133(C) and 830.3(B). Figure 90.3 is a graphic explanation of the *NEC* arrangement.

90.4 Enforcement

This *Code* is intended to be suitable for mandatory application by governmental bodies that exercise legal jurisdiction over electrical installations, including signaling and communications systems, and for use by insurance inspectors. The authority having jurisdiction for enforcement of the *Code* has the responsibility for making interpretations of the rules, for deciding on the approval of equipment and materials, and for granting the special permission contemplated in a number of the rules.

Some localities do not adopt the *NEC*, but even in those localities, installations that comply with the current *Code* are prima facie evidence that the electrical installation is safe.

Section 90.4 advises that all materials and equipment used under the requirements of the *Code* are subject to the approval of the authority having jurisdiction. The text of 90.7, 110.2, and 110.3, along with the definitions of the terms

approved, identified (as applied to equipment), labeled, and *listed,* is intended to provide a basis for the authority having jurisdiction to make the judgments that fall within that particular area of responsibility.

The phrase "including signaling and communication systems" emphasizes that, indeed, these systems are also subject to enforcement.

By special permission, the authority having jurisdiction may waive specific requirements in this *Code* or permit alternative methods where it is assured that equivalent objectives can be achieved by establishing and maintaining effective safety.

The authority having jurisdiction is responsible for interpreting the specific rules of the *Code.* This paragraph empowers the authority having jurisdiction, using special permission (written consent), to permit alternative methods where specific rules are not established in the *Code.* For example, the authority having jurisdiction may waive specific requirements in industrial occupancies, research and testing laboratories, and other occupancies where the specific type of installation is not covered in the *Code.*

This *Code* may require new products, constructions, or materials that may not yet be available at the time the *Code* is adopted. In such event, the authority having jurisdiction may permit the use of the products, constructions, or materials that comply with the most recent previous edition of this *Code* adopted by the jurisdiction.

This final paragraph of 90.4 permits the authority having jurisdiction to waive a new *Code* requirement during the interim period between acceptance of a new edition of the *NEC* and the availability of a new product, construction, or material redesigned to comply with the increased safety required by the latest edition. Establishing a viable future effective date in each section of the *NEC* is difficult because the time needed to change existing products and standards, as well as to develop new materials and test methods, usually is not known at the time the latest edition of the *Code* is adopted.

90.5 Mandatory Rules, Permissive Rules, and Explanatory Material

(A) Mandatory Rules. Mandatory rules of this *Code* are those that identify actions that are specifically required or prohibited and are characterized by the use of the terms *shall* or *shall not.*

The *Code* uses two distinctive types of rules: mandatory rules and permissive rules. Mandatory rules, characterized by the terms *shall* and *shall not,* are covered in 90.5(A).

(B) Permissive Rules. Permissive rules of this *Code* are those that identify actions that are allowed but not required, are normally used to describe options or alternative methods, and are characterized by the use of the terms *shall be permitted* or *shall not be required.*

Permissive rules are simply options or alternative methods of achieving equivalent safety — they are not requirements. A close reading of permissive terms is important because permissive rules are often misinterpreted. For example, the frequently used permissive term *shall be permitted* can be mistaken for a requirement. Substituting "the inspector must allow [item A or method A]" for "[item A or method A] shall be permitted" generally clarifies the interpretation.

(C) Explanatory Material. Explanatory material, such as references to other standards, references to related sections of this *Code,* or information related to a *Code* rule, is included in this *Code* in the form of fine print notes (FPNs). Fine print notes are informational only and are not enforceable as requirements of this *Code.*

Brackets containing section references to another NFPA document are for informational purposes only and are provided as a guide to indicate the source of the extracted text. These bracketed references immediately follow the extracted text.

A number of requirements in the *NEC* have been extracted from other NFPA codes and standards. Therefore, the second paragraph of 90.5(C) is intended to prevent any misunderstanding about the purpose of bracketed references to other NFPA codes and standards — they are provided only to indicate the section of the NFPA document from which the material in the *NEC* was extracted. Although *NEC* requirements based on extracted material are under the jurisdiction of the technical committee responsible for the particular document in which the extracted material resides, this revision to 90.5(C) makes it clear that the *NEC* requirements stand on their own and that extracted material with bracketed references does not indicate that other NFPA documents are adopted through reference.

Fine print notes (FPNs) do not contain requirements, statements of intent, or recommendations. They present additional supplementary material that aids in the application of the requirement that they follow. In addition to explanatory material being in fine print (small type), the material is further identified in the *Code* by the abbreviation *FPN*

ITC-ER shall be permitted to be installed exposed. The cable shall be continuously supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be secured at intervals not exceeding 1.8 m (6 ft).

(6) As aerial cable on a messenger.

(7) Direct buried where identified for the use.

(8) Under raised floors in rooms containing industrial process control equipment and rack rooms where arranged to prevent damage to the cable.

(9) Under raised floors in information technology equipment rooms in accordance with 645.5(D)(5)(c).

727.5 Uses Not Permitted

Type ITC cable shall not be installed on circuits operating at more than 150 volts or more than 5 amperes.

Installation of Type ITC cable with other cables shall be subject to the stated provisions of the specific articles for the other cables. Where the governing articles do not contain stated provisions for installation with Type ITC cable, the installation of Type ITC cable with the other cables shall not be permitted.

Type ITC cable shall not be installed with power, lighting, Class 1 circuits that are not power limited, or non–power-limited circuits.

Exception No. 1: Where terminated within equipment or junction boxes and separations are maintained by insulating barriers or other means.

Exception No. 2: Where a metallic sheath or armor is applied over the nonmetallic sheath of the Type ITC cable.

727.6 Construction

The insulated conductors of Type ITC cable shall be in sizes 22 AWG through 12 AWG. The conductor material shall be copper or thermocouple alloy. Insulation on the conductors shall be rated for 300 volts. Shielding shall be permitted.

The cable shall be listed as being resistant to the spread of fire. The outer jacket shall be sunlight and moisture resistant.

Where a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor is applied over the nonmetallic sheath, an overall nonmetallic jacket shall not be required.

FPN: One method of defining *resistant to the spread of fire* is that the cables do not spread fire to the top of the tray in the "UL Flame Exposure, Vertical Tray Flame Test" in UL 1685-2000, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test method are not applicable.

Another method of defining *resistant to the spread of fire* is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA "Vertical Flame Test — Cables in Cable Trays," as described in CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables*.

727.7 Marking

The cable shall be marked in accordance with 310.11(A)(2), (A)(3), (A)(4), and (A)(5). Voltage ratings shall not be marked on the cable.

727.8 Allowable Ampacity

The allowable ampacity of the conductors shall be 5 amperes, except for 22 AWG conductors, which shall have an allowable ampacity of 3 amperes.

727.9 Overcurrent Protection

Overcurrent protection shall not exceed 5 amperes for 20 AWG and larger conductors, and 3 amperes for 22 AWG conductors.

727.10 Bends

Bends in Type ITC cables shall be made so as not to damage the cable.

ARTICLE 760
Fire Alarm Systems

Summary of Changes

- **760.3(G):** Added requirement for fire alarm system conductors to comply with 300.8.
- **760.24:** Added cable ties as a supporting means.
- **760.25:** Relocated requirement on removing accessible portions of abandoned cables, and added requirement on the durability of tags used to identify cable(s) intended for future use.
- **760.30:** Revised to specify the intended objective of identifying fire alarm circuits at terminal and junction locations.
- **760.41 & 760.121:** Added requirement for NPLFA and PLFA power sources to be supplied by an individual branch circuit.
- **760.130(B):** Added 300.7 to compliance requirements for installation of PLFA cables and conductors.
- **760.139:** Revised to include cable trays.
- **760.176:** Added requirement that NPLFA cables used in wet locations be listed for use in wet locations or have a moisture-impervious metal sheath.
- **760.179:** Added requirement for PLFA cables used in wet locations be listed for use in wet locations or have a moisture-impervious metal sheath.

760.179 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors
- (A) Conductor Materials
- (B) Conductor Size
- (C) Ratings
- (D) Type FPLP
- (E) Type FPLR
- (F) Type FPL
- (G) Fire Alarm Circuit Integrity (CI) Cable or Electrical Circuit Protective System
- (H) Coaxial Cables
- (I) Cable Marking
- (J) Insulated Continuous Line-Type Fire Detectors

I. General

760.1 Scope

This article covers the installation of wiring and equipment of fire alarm systems including all circuits controlled and powered by the fire alarm system.

FPN No. 1: Fire alarm systems include fire detection and alarm notification, guard's tour, sprinkler waterflow, and sprinkler supervisory systems. Circuits controlled and powered by the fire alarm system include circuits for the control of building systems safety functions, elevator capture, elevator shutdown, door release, smoke doors and damper control, fire doors and damper control and fan shutdown, but only where these circuits are powered by and controlled by the fire alarm system. For further information on the installation and monitoring for integrity requirements for fire alarm systems, refer to the *NFPA 72®-2007, National Fire Alarm Code®*.

FPN No. 2: Class 1, 2, and 3 circuits are defined in Article 725.

Article 760 covers only those circuits that are powered and controlled by the fire alarm system, including fire safety functions such as smoke door control, damper control, fan shutdown, and elevator recall. Circuits powered and controlled by other building systems such as heating, ventilating, air conditioning (HVAC); security; lighting controls; sound recording are covered by Article 725.

Article 760 covers the wiring between the devices and equipment required by *NFPA 72, National Fire Alarm Code*. *NFPA 72* provides the requirements for the selection, installation, performance, use, and testing and maintenance of fire alarm system components. The provision for whether an occupancy is required to have a fire alarm system is found in *NFPA 101, Life Safety Code*, or other local codes.

Examples of fire alarm equipment and devices are shown in Exhibits 760.1 and 760.2. The installation of these system components is covered by *NFPA 72*, but the circuit

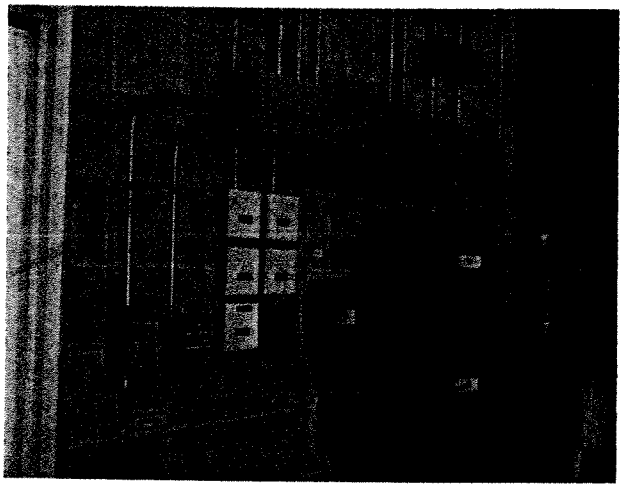


Exhibit 760.1 Typical fire alarm control unit. (Courtesy of the International Association of Electrical Inspectors)

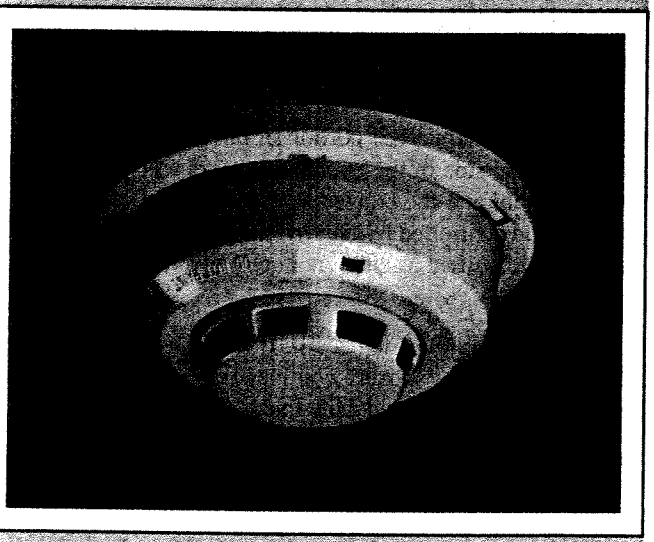


Exhibit 760.2 Typical spot-type smoke detector.

wiring associated with these components must be installed in accordance with the requirements of Article 760. Single- and multiple-station smoke alarms, such as those commonly installed in dwelling units, are supplied through 120-volt branch circuits rather than through a non–power-limited or power-limited fire alarm signaling circuit that is powered and controlled by a fire alarm control panel. Branch circuits supplying power to single- and multiple-station smoke alarms are not subject to the requirements of Article 760.

NFPA 72 requires that all wiring, cable, and equipment be in accordance with NFPA 70, *National Electrical Code*, and specifically with Article 760. Additionally, *NFPA 72* requires all equipment to be listed for its intended purpose.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*,

covers the installation, maintenance, and use of all public fire service communications facilities. These facilities include public reporting, dispatching, telephone, and two-way and microwave radio systems, all of which fulfill two principal functions: the receipt of fire alarms or other emergency calls from the public and the retransmission of these alarms and emergency calls to fire companies and other appropriate agencies.

760.2 Definitions

Abandoned Fire Alarm Cable. Installed fire alarm cable that is not terminated at equipment other than a connector and not identified for future use with a tag.

This definition is for use with 760.25, which requires removal of accessible abandoned fire alarm cable. Abandoned cable increases fire loading unnecessarily, and, where installed in plenums, it can affect airflow. Similar requirements can be found in Articles 640, 645, 725, 770, 800, 820, and 830.

Fire Alarm Circuit. The portion of the wiring system between the load side of the overcurrent device or the power-limited supply and the connected equipment of all circuits powered and controlled by the fire alarm system. Fire alarm circuits are classified as either non–power-limited or power-limited.

Fire Alarm Circuit Integrity (CI) Cable. Cable used in fire alarm systems to ensure continued operation of critical circuits during a specified time under fire conditions.

Non–Power-Limited Fire Alarm Circuit (NPLFA). A fire alarm circuit powered by a source that complies with 760.41 and 760.43.

Power-Limited Fire Alarm Circuit (PLFA). A fire alarm circuit powered by a source that complies with 760.121.

760.3 Other Articles

Circuits and equipment shall comply with 760.3(A) through (G). Only those sections of Article 300 referenced in this article shall apply to fire alarm systems.

(A) Spread of Fire or Products of Combustion. Section 300.21. The accessible portion of abandoned fire alarm cables shall be removed.

(B) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22, where installed in ducts or plenums or other spaces used for environmental air.

Exception: As permitted in 760.53(B)(1) and (B)(2) and 760.154(A).

See the commentary following 300.22(B) and (C) for information on wiring installed in ducts, plenums, and spaces used for environmental air.

(C) Hazardous (Classified) Locations. Articles 500 through 516 and Article 517, Part IV, where installed in hazardous (classified) locations.

(D) Corrosive, Damp, or Wet Locations. Sections 110.11, 300.6, and 310.9, where installed in corrosive, damp, or wet locations.

Section 760.3(D) requires cables and equipment used in wet or damp locations, high ambient temperature areas, or corrosive locations to be identified as suitable for the particular use. Underground installations are considered wet locations.

(E) Building Control Circuits. Article 725, where building control circuits (e.g., elevator capture, fan shutdown) are associated with the fire alarm system.

(F) Optical Fiber Cables. Where optical fiber cables are utilized for fire alarm circuits, the cables shall be installed in accordance with Article 770.

(G) Installation of Conductors with Other Systems. Installations shall comply with 300.8.

760.21 Access to Electrical Equipment Behind Panels Designed to Allow Access

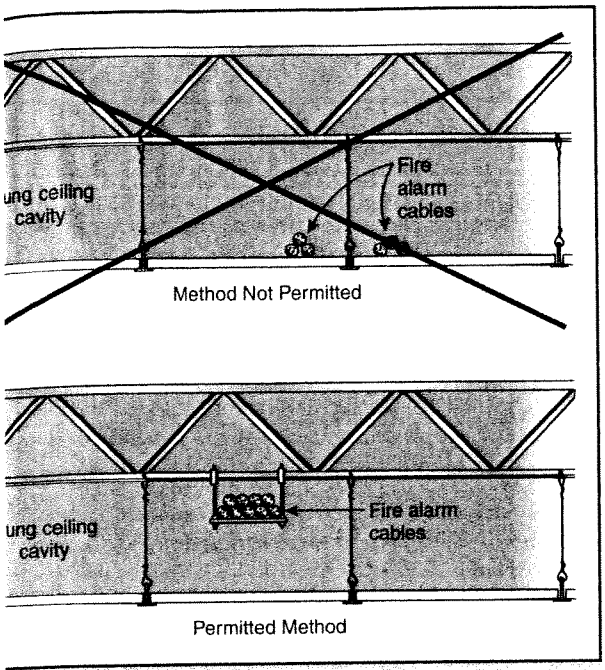
Access to electrical equipment shall not be denied by an accumulation of conductors and cables that prevents removal of panels, including suspended ceiling panels.

An excess accumulation of wires and cables can limit access to equipment by preventing the removal of access panels. See Exhibit 760.3.

760.24 Mechanical Execution of Work

Fire alarm circuits shall be installed in a neat workmanlike manner. Cables and conductors installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be supported by straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with 300.4(D).

Section 760.24 provides definitive requirements for workmanship. Cable must be attached to or supported by the structure by cable ties, straps, clamps, hangers, and the like.



bit 760.3 Incorrect installation of conductors and cables er diagram), which can prevent access to equipment or ca- Correct method is shown in lower diagram.

installation method must not damage the cable. In addi- the location of the cable should be carefully evaluated nsure that activities and processes within the building ot cause damage to the cable.

The reference to 300.4(D) calls attention to the hazards hich cables are exposed where they are installed on ing members. Such cables are required to be installed nanner that protects them from nail or screw penetration. section permits attachment to baseboards and non–load- ing walls, which are not structural components.

.25 Abandoned Cables

accessible portion of abandoned fire alarm cables shall emoved. Where cables are identified for future use with g, the tag shall be of sufficient durability to withstand environment involved.

.30 Fire Alarm Circuit Identification

alarm circuits shall be identified at terminal and junction tions in a manner that helps to prevent unintentional als on fire alarm system circuit(s) during testing and icing of other systems.

.32 Fire Alarm Circuits Extending ond One Building

er-limited fire alarm circuits that extend beyond one ding and run outdoors either shall meet the installation requirements of Parts II, III, and IV of Article 800 or shall meet the installation requirements of Part I of Article 300. Non–power-limited fire alarm circuits that extend beyond one building and run outdoors shall meet the installation requirements of Part I of Article 300 and the applicable sections of Part I of Article 225.

760.35 Fire Alarm Circuit Requirements

Fire alarm circuits shall comply with 760.35(A) and (B).

(A) Non–Power-Limited Fire Alarm (NPLFA) Circuits. See Parts I and II.

(B) Power-Limited Fire Alarm (PLFA) Circuits. See Parts I and III.

Exact power source limitations for power-limited fire alarm circuits used by testing laboratories are found in Chapter 9, Tables 12(A) and 12(B). Table 12(A) covers alternating-current source limitations, and Table 12(B) covers direct-current source limitations.

II. Non–Power-Limited Fire Alarm (NPLFA) Circuits

760.41 NPLFA Circuit Power Source Requirements

(A) Power Source. The power source of non–power-limited fire alarm circuits shall comply with Chapters 1 through 4, and the output voltage shall be not more than 600 volts, nominal.

(B) Branch Circuit. An individual branch circuit shall be required for the supply of the power source. This branch circuit shall not be supplied through ground-fault circuit interrupters or arc-fault circuit interrupters.

> FPN: See 210.8(A)(5), Exception, for receptacles in dwelling-unit unfinished basements that supply power for fire alarm systems.

Section 760.41 prohibits supplying a non–power-limited fire alarm circuit through a ground-fault circuit interrupter or an arc-fault circuit interrupter. Power must be supplied though an individual branch circuit. The intent is to supply a fire alarm system through a source that is not subject to interruption. This requirement does not apply to single- or multiple-station smoke alarms. Single- and multiple-station smoke alarms are supplied by a branch circuit covered by the requirements of Article 210, not through a non–power-limited fire alarm circuit powered by the fire alarm control panel. In new construction, single- and multiple-station smoke alarms are required by *NFPA 72, National Fire Alarm Code*,

to have a backup battery that will supply power in the event that the branch circuit power is interrupted due to the operation of a GFCI or AFCI device.

760.43 NPLFA Circuit Overcurrent Protection

Overcurrent protection for conductors 14 AWG and larger shall be provided in accordance with the conductor ampacity without applying the derating factors of 310.15 to the ampacity calculation. Overcurrent protection shall not exceed 7 amperes for 18 AWG conductors and 10 amperes for 16 AWG conductors.

Exception: Where other articles of this Code permit or require other overcurrent protection.

760.45 NPLFA Circuit Overcurrent Device Location

Overcurrent devices shall be located at the point where the conductor to be protected receives its supply.

Exception No. 1: Where the overcurrent device protecting the larger conductor also protects the smaller conductor.

Exception No. 2: Transformer secondary conductors. Non–power-limited fire alarm circuit conductors supplied by the secondary of a single-phase transformer that has only a 2-wire (single-voltage) secondary shall be permitted to be protected by overcurrent protection provided by the primary (supply) side of the transformer, provided the protection is in accordance with 450.3 and does not exceed the value determined by multiplying the secondary conductor ampacity by the secondary-to-primary transformer voltage ratio. Transformer secondary conductors other than 2-wire shall not be considered to be protected by the primary overcurrent protection.

Exception No. 3: Electronic power source output conductors. Non–power-limited circuit conductors supplied by the output of a single-phase, listed electronic power source, other than a transformer, having only a 2-wire (single-voltage) output for connection to non–power-limited circuits shall be permitted to be protected by overcurrent protection provided on the input side of the electronic power source, provided this protection does not exceed the value determined by multiplying the non–power-limited circuit conductor ampacity by the output-to-input voltage ratio. Electronic power source outputs, other than 2-wire (single voltage), connected to non–power-limited circuits shall not be considered to be protected by overcurrent protection on the input of the electronic power source.

FPN: A single-phase, listed electronic power supply whose output supplies a 2-wire (single-voltage) circuit is an example of a non–power-limited power source that meets the requirements of 760.41.

Non–power-limited electronic power supplies that do not supply energy directly through the use of transformers are covered by Exception No. 3 to 760.45, which permits overcurrent protection for the non–power-limited circuit conductors to be installed on the input side of the electronic power source rather than on the output side for 2-wire circuits only.

760.46 NPLFA Circuit Wiring

Installation of non–power-limited fire alarm circuits shall be in accordance with 110.3(B), 300.7, 300.11, 300.15, 300.17, and other appropriate articles of Chapter 3.

Exception No. 1: As provided in 760.48 through 760.53.

Exception No. 2: Where other articles of this Code require other methods.

Section 760.46 requires that the appropriate wiring methods in Chapter 3 be used for non–power-limited circuits. However, 760.46, Exception No. 1, permits special non–power-limited cable types to be used in place of Chapter 3 wiring methods.

Section 760.46 requires that devices be mounted in accordance with Chapter 3. Section 300.11(A) requires devices and equipment to be securely mounted. Section 300.15(E) is referenced to require non–power-limited circuit terminations to be made in a box or conduit body. However, 300.15(E) permits devices with integral terminal enclosures and mounting brackets to be used without a box. Devices must be mounted on a box or conduit body where the instructions or listing require the use of a box. Fire alarm system components such as manual fire alarm boxes are frequently tested. Therefore, secure mounting of the back box is necessary to ensure that the manual fire alarm device will remain in place. (See Exhibit 760.4.)

760.48 Conductors of Different Circuits in Same Cable, Enclosure, or Raceway

(A) Class 1 with NPLFA Circuits. Class 1 and non–power-limited fire alarm circuits shall be permitted to occupy the same cable, enclosure, or raceway without regard to whether the individual circuits are alternating current or direct current, provided all conductors are insulated for the maximum voltage of any conductor in the enclosure or raceway.

(B) Fire Alarm with Power-Supply Circuits. Power-supply and fire alarm circuit conductors shall be permitted in the same cable, enclosure, or raceway only where connected to the same equipment.

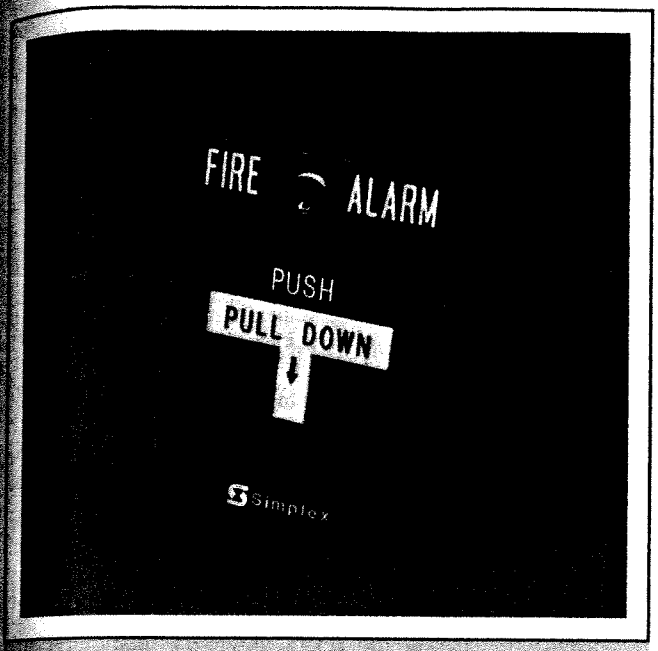


Exhibit 760.4 Typical manual fire alarm box.

760.49 NPLFA Circuit Conductors

(A) Sizes and Use. Only copper conductors shall be permitted to be used for fire alarm systems. Size 18 AWG and 16 AWG conductors shall be permitted to be used, provided they supply loads that do not exceed the ampacities given in Table 402.5 and are installed in a raceway, an approved enclosure, or a listed cable. Conductors larger than 16 AWG shall not supply loads greater than the ampacities given in 310.15, as applicable.

The minimum size of conductors permitted to be used on non-power-limited fire protective signaling circuits is 18 AWG. The load must not exceed the conductor ampacities specified in Table 402.5.

NFPA 72, National Fire Alarm Code, requires fire alarm device and appliance voltages to be between 85 and 110 percent of nominal rated voltage. Calculations should be made to ensure that all devices or appliances will be operating within these limits at full circuit load. Where future circuit extensions are anticipated, larger conductors should be considered. Some manufacturers specify maximum circuit loop resistances. The equipment specifications should be consulted to ensure that maximum allowable loop resistances are not exceeded.

(B) Insulation. Insulation on conductors shall be suitable for 600 volts. Conductors larger than 16 AWG shall comply with Article 310. Conductors 18 AWG and 16 AWG shall be Type KF-2, KFF-2, PAFF, PTFF, PF, PFF, PGF, PGFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, or ZFF. Conductors with other types and thickness of insulation shall be permitted if listed for non–power-limited fire alarm circuit use.

FPN: For application provisions, see Table 402.3.

(C) Conductor Materials. Conductors shall be solid or stranded copper.

Exception to (B) and (C): Wire Types PAF and PTF shall be permitted only for high-temperature applications between 90°C (194°F) and 250°C (482°F).

760.51 Number of Conductors in Cable Trays and Raceways, and Derating

(A) NPLFA Circuits and Class 1 Circuits. Where only non–power-limited fire alarm circuit and Class 1 circuit conductors are in a raceway, the number of conductors shall be determined in accordance with 300.17. The derating factors given in 310.15(B)(2)(a) shall apply if such conductors carry continuous load in excess of 10 percent of the ampacity of each conductor.

(B) Power-Supply Conductors and Fire Alarm Circuit Conductors. Where power-supply conductors and fire alarm circuit conductors are permitted in a raceway in accordance with 760.48, the number of conductors shall be determined in accordance with 300.17. The derating factors given in 310.15(B)(2)(a) shall apply as follows:

(1) To all conductors where the fire alarm circuit conductors carry continuous loads in excess of 10 percent of the ampacity of each conductor and where the total number of conductors is more than three
(2) To the power-supply conductors only, where the fire alarm circuit conductors do not carry continuous loads in excess of 10 percent of the ampacity of each conductor and where the number of power-supply conductors is more than three

(C) Cable Trays. Where fire alarm circuit conductors are installed in cable trays, they shall comply with 392.9 through 392.11.

760.53 Multiconductor NPLFA Cables

Multiconductor non–power-limited fire alarm cables that meet the requirements of 760.176 shall be permitted to be used on fire alarm circuits operating at 150 volts or less and shall be installed in accordance with 760.53(A) and (B).

(A) NPLFA Wiring Method. Multiconductor non–power-limited fire alarm circuit cables shall be installed in accordance with 760.53(A)(1), (A)(2), and (A)(3).

(1) Exposed or Fished in Concealed Spaces. In raceway or exposed on surface of ceiling and sidewalls or fished in

concealed spaces. Cable splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

(2) Passing Through a Floor or Wall. In metal raceway or rigid nonmetallic conduit where passing through a floor or wall to a height of 2.1 m (7 ft) above the floor unless adequate protection can be afforded by building construction such as detailed in 760.53(A)(1) or unless an equivalent solid guard is provided.

(3) In Hoistways. In rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or electrical metallic tubing where installed in hoistways.

Exception: As provided for in 620.21 for elevators and similar equipment.

(B) Applications of Listed NPLFA Cables. The use of non–power-limited fire alarm circuit cables shall comply with 760.53(B)(1) through (B)(4).

(1) Ducts and Plenums. Multiconductor non–power-limited fire alarm circuit cables, Types NPLFP, NPLFR, and NPLF, shall not be installed exposed in ducts or plenums.

Wiring methods for non–power-limited circuits in ducts and plenums must be in accordance with the Chapter 3 wiring methods covered by 300.22(B). It is important to note that cables marked NPLFP may not be installed in plenums. Although the "P" designation was used for consistency, the higher possible voltages and currents of non–power-limited fire alarm circuits preclude the use of the listed cables inside plenums.

FPN: See 300.22(B).

(2) Other Spaces Used for Environmental Air. Cables installed in other spaces used for environmental air shall be Type NPLFP.

Exception No. 1: Types NPLFR and NPLF cables installed in compliance with 300.22(C).

Exception No. 2: Other wiring methods in accordance with 300.22(C) and conductors in compliance with 760.49(C).

Other spaces used for environmental air are covered by 300.22(C) and the related fine print note. Spaces over suspended ceilings used as an environmental air-handling return are considered by the *Code* as "other spaces used for environmental air." Non–power-limited cables used in other spaces used for environmental air must, however, be marked NPLFP. [See 760.176(C).]

Exception No. 3: Type NPLFP-CI cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.

(3) Riser. Cables installed in vertical runs and penetrating more than one floor or cables installed in vertical runs in a shaft shall be Type NPLFR. Floor penetrations requiring Type NPLFR shall contain only cables suitable for riser or plenum use.

Exception No. 1: Type NPLF or other cables that are specified in Chapter 3 and are in compliance with 760.49(C) and encased in metal raceway.

Exception No. 2: Type NPLF cables located in a fireproof shaft having firestops at each floor.

FPN: See 300.21 for firestop requirements for floor penetrations.

Exception No. 3: Type NPLF-CI cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.

(4) Other Wiring Within Buildings. Cables installed in building locations other than the locations covered in 760.53(B)(1), (B)(2), and (B)(3) shall be Type NPLF.

Exception No. 1: Chapter 3 wiring methods with conductors in compliance with 760.49(C).

Exception No. 2: Type NPLFP or Type NPLFR cables shall be permitted.

Exception No. 3: Type NPLFR-CI cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.

III. Power-Limited Fire Alarm (PLFA) Circuits

760.121 Power Sources for PLFA Circuits

(A) Power Source. The power source for a power-limited fire alarm circuit shall be as specified in 760.121(A)(1), (A)(2), or (A)(3).

FPN No. 1: Tables 12(A) and 12(B) in Chapter 9 provide the listing requirements for power-limited fire alarm circuit sources.

FPN No. 2: See 210.8(A)(5), Exception, for receptacles in dwelling-unit unfinished basements that supply power for fire alarm systems.

(1) A listed PLFA or Class 3 transformer.
(2) A listed PLFA or Class 3 power supply.
(3) Listed equipment marked to identify the PLFA power source.

FPN: Examples of listed equipment are a fire alarm control panel with integral power source; a circuit card listed for use as a PLFA source, where used as part of a listed assembly; a current-limiting impedance, listed for the purpose or part of a listed product, used in conjunction with a non–power-limited transformer or a stored energy source, for example, storage battery, to limit the output current.

(B) Branch Circuit. An individual branch circuit shall be required for the supply of the power source. This branch circuit shall not be supplied through ground-fault circuit interrupters or arc-fault circuit interrupters.

760.124 Circuit Marking

The equipment supplying PLFA circuits shall be durably marked where plainly visible to indicate each circuit that is a power-limited fire alarm circuit.

FPN: See 760.130(A), Exception No. 3, where a power-limited circuit is to be reclassified as a non–power-limited circuit.

760.127 Wiring Methods on Supply Side of the PLFA Power Source

Conductors and equipment on the supply side of the power source shall be installed in accordance with the appropriate requirements of Part II and Chapters 1 through 4. Transformers or other devices supplied from power-supply conductors shall be protected by an overcurrent device rated not over 20 amperes.

Exception: The input leads of a transformer or other power source supplying power-limited fire alarm circuits shall be permitted to be smaller than 14 AWG, but not smaller than 18 AWG, if they are not over 300 mm (12 in.) long and if they have insulation that complies with 760.49(B).

760.130 Wiring Methods and Materials on Load Side of the PLFA Power Source

Fire alarm circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with 760.130(A), (B), or a combination of (A) and (B).

Section 760.130 permits individual power-limited circuits to be installed using Chapter 3 wiring methods, non–power-limited fire alarm circuit wiring methods, power-limited circuit wiring methods, or a combination. If it is desirable to run power-limited circuits in the same cable or raceway with non–power-limited circuits, the power-limited circuits may be reclassified as permitted by 760.130(A), Exception No. 3. Also note the information contained in the fine print note that follows 760.130, Exception No. 3, regarding circuit classification.

(A) NPLFA Wiring Methods and Materials. Installation shall be in accordance with 760.46, and conductors shall be solid or stranded copper.

Exception No. 1: The derating factors given in 310.15(B)(2)(a) shall not apply.

Exception No. 2: Conductors and multiconductor cables described in and installed in accordance with 760.49 and 760.53 shall be permitted.

Exception No. 3: Power-limited circuits shall be permitted to be reclassified and installed as non–power-limited circuits if the power-limited fire alarm circuit markings required by 760.124 are eliminated and the entire circuit is installed using the wiring methods and materials in accordance with Part II, Non–Power-Limited Fire Alarm Circuits.

FPN: Power-limited circuits reclassified and installed as non–power-limited circuits are no longer power-limited circuits, regardless of the continued connection to a power-limited source.

Section 760.130(A) permits any of the wiring methods in Chapter 3 to be used for power-limited circuits. In addition, 760.130(A), Exception No. 3, allows power-limited circuits to be reclassified and installed in accordance with the requirements for non–power-limited circuits. Where installed as non–power-limited circuits, the power-limited marking must be removed from equipment, overcurrent protection must be provided in accordance with 760.43, and reclassified circuits must maintain separation from power-limited circuits, in accordance with 760.48 and 760.133.

(B) PLFA Wiring Methods and Materials. Power-limited fire alarm conductors and cables described in 760.179 shall be installed as detailed in 760.130(B)(1), (B)(2), or (B)(3) of this section and 300.7. Devices shall be installed in accordance with 110.3(B), 300.11(A), and 300.15.

Section 760.130(B) requires mechanical protection at splices and termination points. Because failure of a circuit often occurs at splices or termination points, this requirement offers more protection and strain relief for these cable connections.

(1) Exposed or Fished in Concealed Spaces. In raceway or exposed on the surface of ceiling and sidewalls or fished

in concealed spaces. Cable splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

(2) Passing Through a Floor or Wall. In metal raceways or rigid nonmetallic conduit where passing through a floor or wall to a height of 2.1 m (7 ft) above the floor, unless adequate protection can be afforded by building construction such as detailed in 760.130(B)(1) or unless an equivalent solid guard is provided.

(3) In Hoistways. In rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, or electrical metallic tubing where installed in hoistways.

Exception: As provided for in 620.21 for elevators and similar equipment.

760.133 Installation of Conductors and Equipment in Cables, Compartments, Cable Trays, Enclosures, Manholes, Outlet Boxes, Device Boxes, and Raceways for Power-Limited Circuits

Conductors and equipment for power-limited fire alarm circuits shall be installed in accordance with 760.136 through 760.143.

760.136 Separation from Electric Light, Power, Class 1, NPLFA, and Medium-Power Network-Powered Broadband Communications Circuit Conductors

(A) General. Power-limited fire alarm circuit cables and conductors shall not be placed in any cable, cable tray, compartment, enclosure, manhole, outlet box, device box, raceway, or similar fitting with conductors of electric light, power, Class 1, non–power-limited fire alarm circuits, and medium-power network-powered broadband communications circuits unless permitted by 760.136(B) through (G).

Jackets of listed power-limited fire alarm cables do not have sufficient construction specifications to permit them to be installed with electric light, power, Class 1, non–power-limited fire alarm circuits, and medium-power network-powered broadband communications cables. Failure of the cable insulation due to a fault could lead to hazardous voltages being imposed on the power-limited fire alarm circuit conductors.

(B) Separated by Barriers. Power-limited fire alarm circuit cables shall be permitted to be installed together with Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are separated by a barrier.

(C) Raceways Within Enclosures. In enclosures, power-limited fire alarm circuits shall be permitted to be installed in a raceway within the enclosure to separate them from Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits.

(D) Associated Systems Within Enclosures. Power-limited fire alarm conductors in compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non–power-limited fire alarm, and medium power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to power-limited fire alarm circuits, and comply with either of the following conditions:

(1) The electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are routed to maintain a minimum of 6 mm (0.25 in.) separation from the conductors and cables of power-limited fire alarm circuits.
(2) The circuit conductors operate at 150 volts or less to ground and also comply with one of the following:
   a. The fire alarm power-limited circuits are installed using Type FPL, FPLR, FPLP, or permitted substitute cables, provided these power-limited cable conductors extending beyond the jacket are separated by a minimum of 6 mm (0.25 in.) or by a nonconductive sleeve or nonconductive barrier from all other conductors.
   b. The power-limited fire alarm circuit conductors are installed as non–power-limited circuits in accordance with 760.46.

(E) Enclosures with Single Opening. Power-limited fire alarm circuit conductors entering compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to power-limited fire alarm circuits or to other circuits controlled by the fire alarm system to which the other conductors in the enclosure are connected. Where power-limited fire alarm circuit conductors must enter an enclosure that is provided with a single opening, they shall be permitted to enter through a single fitting (such as a tee), provided the conductors are separated from the conductors of the other

circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.

(F) In Hoistways. In hoistways, power-limited fire alarm circuit conductors shall be installed in rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or electrical metallic tubing. For elevators or similar equipment, these conductors shall be permitted to be installed as provided in 620.21.

(G) Other Applications. For other applications, power-limited fire alarm circuit conductors shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non–power-limited fire alarm, or medium-power network-powered broadband communications circuits unless one of the following conditions is met:

(1) Either (a) all of the electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors or (b) all of the power-limited fire alarm circuit conductors are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, or Type UF cables.
(2) All of the electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are permanently separated from all of the power-limited fire alarm circuit conductors by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the conductors.

760.139 Installation of Conductors of Different PLFA Circuits, Class 2, Class 3, and Communications Circuits in the Same Cable, Enclosure, Cable Tray, or Raceway

(A) Two or More PLFA Circuits. Cable and conductors of two or more power-limited fire alarm circuits, communications circuits, or Class 3 circuits shall be permitted within the same cable, enclosure, cable tray, or raceway.

(B) Class 2 Circuits with PLFA Circuits. Conductors of one or more Class 2 circuits shall be permitted within the same cable, enclosure, cable tray, or raceway with conductors of power-limited fire alarm circuits, provided that the insulation of the Class 2 circuit conductors in the cable, enclosure, or raceway is at least that required by the power-limited fire alarm circuits.

(C) Low-Power Network-Powered Broadband Communications Cables and PLFA Cables. Low-power network-powered broadband communications circuits shall be permitted in the same enclosure, cable tray, or raceway with PLFA cables.

(D) Audio System Circuits and PLFA Circuits. Audio system circuits described in 640.9(C) and installed using Class 2 or Class 3 wiring methods in compliance with 725.133 and 725.154 shall not be permitted to be installed in the same cable, cable tray, or raceway with power-limited conductors or cables.

Section 760.139(D) prohibits audio circuits that are installed as Class 2 or Class 3 circuits from being installed in the same cable or raceway with power-limited fire alarm wiring. A fault between audio amplifier circuits and power-limited fire alarm circuits has the potential to impair the fire alarm system.

760.142 Conductor Size

Conductors of 26 AWG shall be permitted only where spliced with a connector listed as suitable for 26 AWG to 24 AWG or larger conductors that are terminated on equipment or where the 26 AWG conductors are terminated on equipment listed as suitable for 26 AWG conductors. Single conductors shall not be smaller than 18 AWG.

See the commentary following 760.24.

760.143 Support of Conductors

Power-limited fire alarm circuit conductors shall not be strapped, taped, or attached by any means to the exterior of any conduit or other raceway as a means of support.

Due to a signaling method called *multiplexing* used with digitally addressable fire alarm systems, power-limited fire alarm cable may contain circuit conductors as small as 26 AWG. In the past, these small conductors were typically reserved for communications circuits, but due to recent technological advances, they now have application within the fire alarm industry. Of course, these small circuit conductors are permitted to be used only as specified in 760.143 and as permitted by the listing or installation instructions of specific fire alarm equipment.

760.145 Current-Carrying Continuous Line-Type Fire Detectors

(A) Application. Listed continuous line-type fire detectors, including insulated copper tubing of pneumatically operated detectors, employed for both detection and carrying signaling currents shall be permitted to be used in power-limited circuits.

(B) Installation. Continuous line-type fire detectors shall be installed in accordance with 760.124 through 760.130 and 760.133.

760.154 Applications of Listed PLFA Cables

PLFA cables shall comply with the requirements described in either 760.154(A), (B), or (C) or where cable substitutions are made as shown in 760.154(D).

Note that 760.25 requires the removal of accessible abandoned fire alarm cable. Abandoned cable increases fire loading unnecessarily, and, where installed in plenums, it can affect airflow. Similar requirements can be found in Articles 640, 645, 725, 770, 800, 820, and 830. See the definition of *abandoned fire alarm cable* in 760.2.

(A) Plenum. Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type FPLP. Types FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted. Type FPLP-CI cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.

(B) Riser. Cables installed in risers shall be as described in either (1), (2), or (3):

(1) Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type FPLR. Floor penetrations requiring Type FPLR shall contain only cables suitable for riser or plenum use. Type FPLR-CI cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.
(2) Other cables shall be installed in metal raceways or located in a fireproof shaft having firestops at each floor.
(3) Type FPL cable shall be permitted in one- and two-family dwellings.

FPN: See 300.21 for firestop requirements for floor penetrations.

(C) Other Wiring Within Buildings. Cables installed in building locations other than those covered in 760.154(A) or (B) shall be as described in either (C)(1), (C)(2), (C)(3), or (C)(4). Type FPL-CI cable shall be permitted to be installed as described in either (C)(1), (C)(2), (C)(3), or (C)(4) to provide a 2-hour circuit integrity rated cable.

Section 760.154(C) permits the use of circuit integrity cable for applications where survivability of fire alarm circuits is needed during a fire. Such circuits could be essential to communicating evacuation or relocation instructions to building occupants under fire or other emergency conditions.

(1) General. Type FPL shall be permitted.

(2) In Raceways. Cables shall be permitted to be installed in raceways.

(3) Nonconcealed Spaces. Cables specified in Chapter 3 and meeting the requirements of 760.179(A) and (B) shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed 3 m (10 ft).

(4) Portable Fire Alarm System. A portable fire alarm system provided to protect a stage or set when not in use shall be permitted to use wiring methods in accordance with 530.12.

(D) Fire Alarm Cable Substitutions. The substitutions for fire alarm cables listed in Table 760.154(D) and illustrated in Figure 760.154(D) shall be permitted. Where substitute cables are installed, the wiring requirements of Article 760, Parts I and III, shall apply.

FPN: For information on communications cables (CMP, CMR, CMG, CM), see 800.179.

Table 760.154(D) Cable Substitutions

Cable Type	References	Permitted Substitutions
FPLP	760.154(A)	CMP
FPLR	760.154(B)	CMP, FPLP, CMR
FPL	760.154(C)	CMP, FPLP, CMR, FPLR, CMG, CM

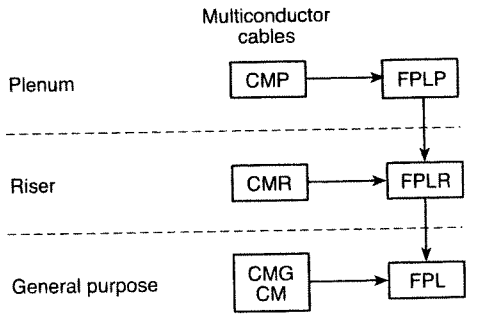


Figure 760.154(D) Cable Substitution Hierarchy.

IV. Listing Requirements

760.176 Listing and Marking of NPLFA Cables

Non–power-limited fire alarm cables installed as wiring within buildings shall be listed in accordance with 760.176(A) and (B) and as being resistant to the spread of fire in accordance with 760.176(C) through (F), and shall be marked in accordance with 760.176(G). Cable used in a

ocation shall be listed for use in wet locations or have isture-impervious metal sheath.

NPLFA Conductor Materials. Conductors shall be 18 ; or larger solid or stranded copper.

Insulated Conductors. Insulated conductors shall be ble for 600 volts. Insulated conductors 14 AWG and r shall be one of the types listed in Table 310.13(A) or hat is identified for this use. Insulated conductors 18 ; and 16 AWG shall be in accordance with 760.49.

Type NPLFP. Type NPLFP non–power-limited fire n cable for use in other space used for environmental hall be listed as being suitable for use in other space for environmental air as described in 300.22(C) and also be listed as having adequate fire-resistant and low ce-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-2007, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

further information on the fire test method for Type FP cables, see the commentary following 725.179(A), . Also see the commentary following 760.53(B)(2), Exion No. 2, which discusses spaces used for environmenir.

Type NPLFR. Type NPLFR non–power-limited fire n riser cable shall be listed as being suitable for use in rtical run in a shaft or from floor to floor and shall also isted as having fire-resistant characteristics capable of enting the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass ANSI/UL 1666-2002, *Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts.*

further information on the fire test method for Type FR cables, see the commentary following 725.179(B), .

Type NPLF. Type NPLF non–power-limited fire alarm e shall be listed as being suitable for general-purpose alarm use, with the exception of risers, ducts, plenums, and other space used for environmental air, and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining *resistant to the spread of fire* is that the cables do not spread fire to the top of the tray in the "UL Flame Exposure, Vertical Tray Flame Test" in UL 1685-2000, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables.* The smoke measurements in the test method are not applicable.

Another method of defining *resistant to the spread of fire* is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA "Vertical Flame Test — Cables in Cable Trays," as described in CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables.*

For further information on the fire test method for Type NPLF cables used as other wiring within buildings, see the commentary following 725.179(C), FPN.

(F) Fire Alarm Circuit Integrity (CI) Cable or Electrical Circuit Protective System. Cables used for survivability of critical circuits shall be listed as circuit integrity (CI) cable. Cables specified in 760.176(C), (D), and (E), and used for circuit integrity shall have the additional classification using the suffix "-CI." Cables that are part of a listed electrical circuit protective system shall be considered to meet the requirements of survivability.

FPN No. 1: Fire alarm circuit integrity (CI) cable and electrical circuit protective systems may be used for fire alarm circuits to comply with the survivability requirements of *NFPA 72®-2007, National Fire Alarm Code®*, 6.9.4.3 and 6.9.4.6, that the circuit maintain its electrical function during fire conditions for a defined period of time.

FPN No. 2: One method of defining circuit integrity (CI) cable is by establishing a minimum 2-hour fire resistance rating for the cable when tested in accordance with UL 2196-1995, *Standard for Tests of Fire Resistive Cables.*

Circuit integrity (CI) cable is intended to meet the performance requirements for survivability required by *NFPA 72, National Fire Alarm Code*. This type of cable is designed to retain vital electrical performance during and immediately after fire exposure. Circuit integrity cable, which carries the CI suffix, is considered a 2-hour-rated cable assembly and is an alternative to fire-rated mineral-insulated cable (Type MI).

(G) NPLFA Cable Markings. Multiconductor non–power-limited fire alarm cables shall be marked in accordance with Table 760.176(G). Non–power-limited fire alarm circuit cables shall be permitted to be marked with a maximum usage voltage rating of 150 volts. Cables that are listed

Table 760.176(G) NPLFA Cable Markings

Cable Marking	Type	Reference
NPLFP	Non–power-limited fire alarm circuit cable for use in "other space used for environmental air"	760.176(C) and (G)
NPLFR	Non–power-limited fire alarm circuit riser cable	760.176(D) and (G)
NPLF	Non–power-limited fire alarm circuit cable	760.176(E) and (G)

Note: Cables identified in 760.176(C), (D), and (E) and meeting the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, NPLFP-CI, NPLFR-CI, and NPLF-CI).

for circuit integrity shall be identified with the suffix "CI" as defined in 760.176(F).

FPN: Cable types are listed in descending order of fire resistance rating.

760.179 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors

Type FPL cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 760.179(A) through (H) and shall be marked in accordance with 760.179(I). Insulated continuous line-type fire detectors shall be listed in accordance with 760.179(J). Cable used in a wet location shall be listed for use in wet locations or have a moisture-impervious metal sheath.

(A) Conductor Materials. Conductors shall be solid or stranded copper.

Some line-type fire detectors may not be made exclusively of copper but are listed for the application nevertheless.

(B) Conductor Size. The size of conductors in a multiconductor cable shall not be smaller than 26 AWG. Single conductors shall not be smaller than 18 AWG.

(C) Ratings. The cable shall have a voltage rating of not less than 300 volts.

(D) Type FPLP. Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-2007, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

For further information on the fire test method for Type FPLP cables, see the commentary following 725.179(A), FPN.

(E) Type FPLR. Type FPLR power-limited fire alarm riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-2002, *Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts*.

For further information on the fire test method for Type FPLR cables, see the commentary following 725.179(B), FPN.

(F) Type FPL. Type FPL power-limited fire alarm cable shall be listed as being suitable for general-purpose fire alarm use, with the exception of risers, ducts, plenums, and other spaces used for environmental air, and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining *resistant to the spread of fire* is that the cables do not spread fire to the top of the tray in the "UL Flame Exposure, Vertical Tray Flame Test" in UL 1685-2000, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test method are not applicable.

Another method of defining *resistant to the spread of fire* is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA "Vertical Flame Test — Cables in Cable Trays," as described in CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables*.

For further information on the fire test method for Type FPL cables used as other wiring within buildings, see the commentary following 725.179(C), FPN.

(G) Fire Alarm Circuit Integrity (CI) Cable or Electrical Circuit Protective System. Cables used for survivability

Loyal Pacific Corp.

P. O. Box 7981
Tamuning, Guam 96931
Telephone: 1-671-482-8949

Appendix III

1. Protest letter, June 22, 2009.
2. Request for reconsideration letter, July 09, 2009.
3. Supporting documents for a follow up of Protest, dated July 09, 2009 and July 28, 2009 from LPC's fire alarm system supplier and consultant, FIRECOMM.

Loyal Pacific Corp.

P. O. Box 7981
Tamuning, Guam 96931
Telephone: 1-671-482-8949

Guam Public School System
Office of Supply Management
Administration Building, 2nd Floor, Suite B-202
Hagatna, Guam 96932

June 22, 2009

PROCUREMENT SECTION RECEIVED 3:10 TIME: INITIAL: DEPARTMENT OF EDUCATION

Attention: Al Garcia
Buyer Supervisor II
Administrator, Supply/Procurement

Re: Bid for Fire Alarm System Maintenance and Repair
Reference No. IFB 014-2009

Dear Mr. Al Garcia:

We acknowledged in receipt of your facsimile at 6:54 PM on June 19, 2009 that was dated on June 18, 2009 regarding the referenced Bid Status.

We hereby protest this bid because your authority had awarded to only one bidder, G4S Security Systems (Guam), Inc., which is not correspondent with: "***BID AWARD: This Bid will be awarded on a multiple award basis***," as indicated in the paragraph II, Page No. 23, Special Provisions. We want to have your explanation as to why your authority awarded only one bidder.

Please contact us if you have any additional information on this matter.

JACQUES G. BRONZE, PC
DATE: JUN 23 2009
TIME: 11:52 am
RECEIVED: JB

Sincerely yours,

Christopher Bo Heon Lee
President

RECEIVED FINANCIAL JUN GUAM PUB

CC: Salvatore G. T. Sgambelluri
Deputy Superintendent of Finance and Administrative Services

Jacques G. Bronze
Attorney-At-Law

GUAM PUBLIC SCHOOL SYSTEM
OFFICE OF SUPPLY MANAGEMENT
SPECIAL PROVISIONS

FBE 014-2009

Fire Alarm System Repair and Maintenance Services for Thirty Six Public Schools

I **INTENT:** The intent of this formal solicitation is to repair and make fully operational existing Fire Alarm Systems throughout the thirty-six (36) public schools and provide a maintenance & repair service contract.

The repairs shall consist of;
A. Replacing all defective and Damage components of Main Control Panel
B. System interfaces
C. Connection of all components
D. Replacement or Repair of Pull Stations
E. Installation of Cable Supports
F. Replacement or Repair of Audio and Visual Alarms
G. Tying in of forty seven ~~(47)~~ 45 new buildings (~~117~~ 114 classrooms). **(Reference Appendix 1. On Page ~~32~~ 31)**

The Maintenance and Repair Service contract shall consist of;
A. Quarterly Routine maintenance and Testing **(Reference Appendix II on Page ~~33~~ 32)**
B. On-call repair/trouble shooting
C. Minor and Major Repairs. Note: Minor and major repairs shall be submitted detailing the extent of repairs and costs prior to commencing repairs.

II **Bid Award:** This Bid will be awarded on a multiple award basis.

III **Contract Period:** The initial term of this service shall be effective upon issuance of a Purchase Order or Contract between the Guam Public School System and the selected Company and shall end within a 180 calendar days. For the purpose of clarification the awarded company shall provide as part of their submittal, a maintenance service cost for a period of five (5) years. The term of this service will be based on the first year with an option to renew for an additional four (4)) years, provided it is determined that the renewal option is in the best interest of the Department and, further provided that the fixed price remains the same over the years. Each renewal year shall be subject to the availability of funds and can be terminated as a whole when the Department deems it is in the best interest of the Government.

IV **Rights Reserved:** The Guam Public School System reserves the right to accept or reject technical proposals in whole or in part if it is determined to be in the best interest of the Department.

V **Late Bid, Late Withdraws and Late Modifications:** Any bid received after the time and date set for receipt of Technical Proposals is late and shall be rejected.

VI **Additional Information or Clarification:** Any BIDDER requiring additional information regarding this Multi Step Bid should submit or fax the request attention to:

Office of Supply Management
Attn: Administrator, Supply Management
Ref: FBE-014-2009
Room B202 Second Floor
Manuel F.L. Guerrero Building
Hagatna, Guam 96910
Fax no: 472-5001

Deadline for submission for additional information or clarifications shall be no later than 5:00pm Tuesday, April 28, 2009 in order to allow sufficient time for research and response.

VII **Technical Proposal:**

The Technical Proposal will include:

1. **Required Bid Forms/License**
   a. Special Reminder to Prospective Bidders (form enclosed)
   b. Current certificate of Authority issued by the Insurance Commissioner
   c. Affidavit Disclosing Ownership and Commissions (form included)
   d. Copy of Business License
   e. Copy of Specialty License: **C-19, C-20**
   f. Local Procurement Preference Application (form included)
   g. Terms, Conditions and other related documents relative to the warranty of labor and materials offered.

2. **Statement of Bidder Qualifications** - The Bidder must provide an overview of the company and specifically states its experience in providing the type of service requested. The company overview should not be more than 4 single space pages.

3. **Vendor Profile:**
   All prospective Bidders shall provide a >Company profile=. As a minimum, all prospective Bidders shall include as part of their technical proposal the following:

   1. Company Name
   2. Business Address
   3. Company Profile
   4. Number of Employees
   5. Company Net Worth
   6. Number of Years in related business
   7. Areas of Specialty

LOYAL PACIFIC CORP.
P.O. Box 7981
TAMUNING, GUAM 96931
TELEPHONE: 1-671-482-8949

July 9, 2009

Guam Public School System
Office of Supply Management
Administration Building – 2nd Floor, Suite B-202
Hagåtña, Guam 96932

Attn: Salvatore G.T. Sgambelluri
Deputy Superintendent of Finance and Administrative Services

Re: Bid for Fire Alarm System Maintenance and Repair
Reference No. IFB 014-2009

Dear Mr. Sgambelluri:

We acknowledged in receipt of your facsimile at 12:12 p.m., on June 26, 2009, that was dated on June 24, 2009, regarding the referenced Bid Status that our offer was "above the Government ceiling," therefore, it was rejected. Pursuant to GPSS Procurement Regulation, section 9.2.8, we are requesting that GPSS reconsider its decision, on two grounds:

a. Section II of the Special Provisions of the IFB provides that "this bid will be awarded on a multiple award basis," however, the bid was awarded as a single award to a single bidder.

b. Moreover, section 1 and 2 of the Special Provisions section titled "Scope and Location of Work," provides in part:

> The Fire Alarm Systems will meet the requirements of all local, state and federal fire codes. The Contractor is responsible for the complete alarm system and submission to the appropriate governmental agency(s) for approval per applicable codes. All fire alarm devices and components required by the governing authority shall be furnished and installed by the contractor,

The general rule is that an invitation for bids must set forth the requirements and criteria which will be used to determine the lowest responsible and responsive bidder and shall be evaluated based on the requirements set forth in the invitation for bids. 5 G.C.A. §5211(e) and 2 G.A.R., Div. 4, Chap. 3, §3109(n)(1).

The existing Fire Alarm Systems are technically beyond repair if we are to comply with the requirements of the sections 760.35 Fire Alarm Circuit Requirement according to the National Fire Alarm Code, and the section 4.4.4.4 Wiring according to National Fire Alarm Code. Our bid was based on the following: 1) 70% of all existing wires and conduits are to be replaced with new ones as per the sections 760.35 Fire Alarm Code Requirement, and 30% of remaining wires and conduits are to be repaired. 2) 100% of the panels, devices, accessories are to be replaced with new ones according to the assessment done by FIRE-COMM whose company is our consultant and supplier. All documents supporting this argument are attached as Exhibit "A," and incorporated by reference.

Please contact us if you have any additional information on this matter.

Sincerely Yours,

Christopher Bo Heon Lee
President

cc: Jacques G. Bronze, Esq.

Exhibit "A"

CHAPTER 67
THE BUILDING CODE

ARTICLE 1
GENERAL STANDARDS

§ 67101. Uniform Building Code Adopted.

(a) Section 303, Parts II through XII and appendices of the latest edition of the Uniform Building Code (hereinafter referred to as UBC) promulgated and published by the International Conference of Building Officials, are enacted and added to Division 2 of Title 21, Guam Code Annotated. The UBC shall be recognized as the standard for the furtherance of the intent of Chapter 66 of this Title. The Codifier shall number the sections of the UBC appropriately to correlate with provisions of this Title not repealed by this Act.

(b) All seismic Zone 3 references to Guam in the Uniform Building Code and any updated version thereof shall be changed to seismic Zone 4 as it pertains to any standard on Guam for the furtherance of the intent of Chapter 66 of this Title.

SOURCE: P.L. 23-88 renumbered § 67101 as subsection (a) and added a new subsection (b).

NOTE: Enacted as uncodified Section 1 of P.L. 14-112. Amended by uncodified §4 of P.L. 17-76 to refer, wherever found, to "the latest edition" of the UBC, rather than to any specific edition. Because of the size and scope of the UBC, it is impractical for the Compiler to incorporate the UBC into this Code. Therefore, only Guam sections will be found here, and the UBC may be had from any appropriate commercial source.

NOTE: As part of the adoption of the UBC by P.L. 14-112, §8 of that law repealed "Sections 31011(a), 31058, 31100 through 35802, 36405 and 36408 of the Government Code".

§ 67102. Mechanical Standard.

The latest edition of the Uniform Mechanical Code of the International Association of Plumbing and Mechanical Officials (IAPMO) and the International Conference of Building Officials (ICBO) shall be accepted as the generally recognized standard of design and construction of cooling and refrigeration systems.

SOURCE: GC §35800. Repealed by P.L. 14-122. Enacted again in this form by P.L. 17-76:3. The only change from the former section was to refer to the "latest" edition of the UMC.

One-Stop Gov. Guam

§ 67103. Electrical Installations.

The current edition of the National Electrical Code of the National Fire Protection Association, 60 Battermarch Street, Boston, Massachusetts, shall be accepted as the generally recognized standard for the design and construction of electrical installations.

SOURCE: GC §36100; amended by P.L. 11-177 (10/10/72).

§ 67104. Plumbing Installations.

The current edition of the Uniform Plumbing Code of the International Association of Plumbing and Mechanical Officials, 5032 Alhambra Avenue, Los Angeles, California, shall be accepted as the generally recognized standard for the design and construction of plumbing installations.

SOURCE: GC §36200; amended by P.L. 11-177 (10/10/72).

§ 67105. Concrete/Masonry Standards.

The latest editions of the Guam Building Code, the American Concrete Institute's Standard ACI-318 (Building Code Requirements for Structural Concrete) and the Uniform Building Code shall be accepted as the generally recognized standards for the design and construction of Fully Concrete Dwellings. When the provisions of the most recent editions of the recognized standards conflict, the more restrictive provisions shall govern the design. A Fully Concrete Dwelling's plans, specifications and calculations shall be certified by a licensed Guam engineer or architect.

SOURCE: Added by P.L. 23-128:IV:28 (a). Repealed and reenacted by P.L. 24-59:IV:3.

ARTICLE 10 — FIRE-PROTECTION SYSTEMS AND EQUIPMENT

SECTION 1001 — GENERAL

1001.1 Scope. Fire-protection systems and equipment shall be in accordance with Article 10. See also Appendix II-C.

Fire-protection equipment and systems shall be installed and maintained in buildings under construction in accordance with Article 87.

1001.2 Definitions. For definitions of ALARM CONTROL UNIT, ALARM-INITIATING DEVICE, ALARM SIGNAL, ALARM-SIGNALING DEVICE, ALARM SYSTEM, ALARM ZONE, ANNUNCIATOR, AUTOMATIC FIRE-EXTINGUISHING SYSTEM, FACILITY, FIRE DEPARTMENT INLET CONNECTION, SMOKE DETECTOR and STANDPIPE SYSTEM, see Article 2.

1001.3 Plans. Complete plans and specifications for fire alarm systems; fire-extinguishing systems, including automatic sprinklers and wet dry standpipes; halon systems and other special types of automatic fire-extinguishing systems; basement pipe inlets; and other fire-protection systems and appurtenances thereto shall be submitted to the fire department for review and approval prior to system installation. Plans and specifications for fire alarm systems shall include, but not be limited to, a floor plan; location of all alarm-initiating and alarm-signaling devices; alarm control- and trouble-signaling equipment; annunciation; power connection; battery calculations; conductor type and sizes; voltage drop calculations; and manufacturer, model numbers and listing information for all equipment, devices and materials.

1001.4 Installation Acceptance Testing. Fire alarm systems; fire hydrant systems; fire-extinguishing systems, standpipes, and other fire-protection systems and appurtenances thereto shall meet the approval of the fire department as to installation and location and shall be subject to such acceptance tests as required by the chief.

Condition of acceptance of halon and clean agent systems shall be satisfactory passage of a test conducted in accordance with nationally recognized standards prior to final acceptance of the system.

Fire alarm and detection systems shall be tested in accordance with UFC Standard 10-2 and nationally recognized standards.

See Section 9003, Standard n.2.5. → one-stop

1001.5 Maintenance, Inspection, Testing and Systems Out of Service.

1001.5.1 Maintenance. Fire sprinkler systems, fire hydrant systems, standpipe systems, fire alarm systems, portable fire extinguishers, smoke and heat ventilators, smoke-removal systems, and other fire protective or extinguishing systems or appliances shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective.

Fire-protection or fire-extinguishing systems coverage and spacing shall be maintained according to original installation standards. Such systems shall be extended, altered or augmented as necessary to maintain and continue protection whenever any building so equipped is altered, remodeled or added to. Additions, repairs, alterations and servicing shall be in accordance with recognized standards.

1001.5.2 Inspection and testing. The chief is authorized to require periodic inspection and testing for fire sprinkler systems, fire hydrant systems, standpipe systems, fire alarm systems, portable fire extinguishers, smoke and heat ventilators, smoke-removal systems and other fire-protection or fire-extinguishing systems or appliances.

Automatic fire-extinguishing systems shall be inspected and tested at least annually. See Appendix III-C. Fire alarm systems shall be inspected and tested at least at frequencies specified in UFC Standard 10-2. Standpipe systems shall be inspected and tested at least every five years.

EXCEPTIONS: 1. Automatic fire-extinguishing equipment associated with commercial cooking operations when in compliance with Section 1006.

2. Systems in high rise buildings when in compliance with Section 1001.5.4.

Reports of inspections and tests shall be maintained on the premises and made available to the chief when requested.

1001.5.3 Systems out of service. The chief shall be notified when any required fire-protection system is out of service and on restoration of service.

1001.5.3.1 Problematic systems and systems out of service. In the event of a failure of a fire-protection system or an excessive number of accidental activations, the chief is authorized to require the building owner or occupant to provide firewatch personnel until the system is repaired.

Such individuals shall be provided with at least one approved means for notification of the fire department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

1001.5.4 Systems in high-rise buildings. The owner of a high-rise building shall be responsible for assuring that the fire- and life-safety systems required by the Building Code are maintained in an operable condition at all times. Unless otherwise required by the chief, quarterly tests of such systems shall be conducted by approved persons. A written record shall be maintained and shall be made available to the inspection authority. (See UBC Section 403.)

1001.5.5 Smoke-control systems. Mechanical smoke-control systems, such as those in high-rise buildings, buildings containing atria, covered mall buildings and mechanical ventilation systems utilized in smokeproof enclosures and for smoke-removal systems utilized in high-piled combustible storage occupancies, shall be maintained in an operable condition at all times. Unless otherwise required by the chief, quarterly tests of such systems shall be conducted by approved persons. A written record shall be maintained and shall be made available to the inspection authority.

1001.6 Tampering with Fire-protection Equipment. Barriers, Security Devices, Signs and Seals.

1001.6.1 Fire department property. Apparatus, equipment and appurtenances belonging to or under the supervision and control of the fire department shall not be molested, tampered with, damaged or otherwise disturbed unless authorized by the chief.

1001.6.2 Fire hydrants and fire appliances. Fire hydrants and fire appliances required by this code to be installed or maintained shall not be removed, tampered with or otherwise disturbed except for the purpose of extinguishing fire, training, recharging or making necessary repairs, or when allowed by the fire department.

Cables and conductors installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be supported by straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with 300.4(D).

760.25 Abandoned Cables. The accessible portion of abandoned fire alarm cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

760.30 Fire Alarm Circuit Identification. Fire alarm circuits shall be identified at terminal and junction locations in a manner that helps to prevent unintentional signals on fire alarm system circuit(s) during testing and servicing of other systems.

760.32 Fire Alarm Circuits Extending Beyond One Building. Power-limited fire alarm circuits that extend beyond one building and run outdoors either shall meet the installation requirements of Parts II, III, and IV of Article 800 or shall meet the installation requirements of Part I of Article 300. Non–power-limited fire alarm circuits that extend beyond one building and run outdoors shall meet the installation requirements of Part I of Article 300 and the applicable sections of Part I of Article 225.

Present : Electric Wire 12 GA.

760.35 Fire Alarm Circuit Requirements. Fire alarm circuits shall comply with 760.35(A) and (B).

(1) **(A) Non–Power-Limited Fire Alarm (NPLFA) Circuits.** See Parts I and II.

(2) **(B) Power-Limited Fire Alarm (PLFA) Circuits.** See Parts I and III.

New Code : 3 Wires (2) + Cable

II. Non–Power-Limited Fire Alarm (NPLFA) Circuits

760.41 NPLFA Circuit Power Source Requirements.

(A) Power Source. The power source of non–power-limited fire alarm circuits shall comply with Chapters 1 through 4, and the output voltage shall be not more than 600 volts, nominal.

(B) Branch Circuit. An individual branch circuit shall be required for the supply of the power source. This branch circuit shall not be supplied through ground-fault circuit interrupters or arc-fault circuit interrupters.

FPN: See 210.8(A)(5), Exception, for receptacles in dwelling-unit unfinished basements that supply power for fire alarm systems.

760.43 NPLFA Circuit Overcurrent Protectio
rent protection for conductors 14 AWG and larg
provided in accordance with the conductor ampac
applying the derating factors of 310.15 to the amp
lation. Overcurrent protection shall not exceed 7 a
18 AWG conductors and 10 amperes for 16 AWG

Exception: Where other articles of this Code pe
quire other overcurrent protection.

760.45 NPLFA Circuit Overcurrent Device
Overcurrent devices shall be located at the point
conductor to be protected receives its supply.

Exception No. 1: Where the overcurrent device
the larger conductor also protects the smaller c

Exception No. 2: Transformer secondary conduc
power-limited fire alarm circuit conductors supp
secondary of a single-phase transformer that h
2-wire (single-voltage) secondary shall be perm
protected by overcurrent protection provided b
mary (supply) side of the transformer, provided t
tion is in accordance with 450.3 and does not
value determined by multiplying the secondary
ampacity by the secondary-to-primary transform
ratio. Transformer secondary conductors other th
shall not be considered to be protected by th
overcurrent protection.

Exception No. 3: Electronic power source outpu
tors. Non–power-limited circuit conductors supp
output of a single-phase, listed electronic pow
other than a transformer, having only a 2-wi
voltage) output for connection to non–power-l
cuits shall be permitted to be protected by overc
tection provided on the input side of the electr
source, provided this protection does not exceed
determined by multiplying the non–power-limi
conductor ampacity by the output-to-input vol
Electronic power source outputs, other than 2-w
voltage), connected to non–power-limited circui
be considered to be protected by overcurrent pr
the input of the electronic power source.

FPN: A single-phase, listed electronic power supp
output supplies a 2-wire (single-voltage) circuit
ample of a non–power-limited power source that
requirements of 760.41.

760.46 NPLFA Circuit Wiring. Installation
power-limited fire alarm circuits shall be in
with 110.3(B), 300.7, 300.11, 300.15, 300.17,
appropriate articles of Chapter 3.

Exception No. 1: As provided in 760.48 throug

Exception No. 2: Where other articles of this C
other methods.

one or more complete paragraphs have been deleted, the deletion is indicated by a bullet (•) between the paragraphs that remain.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex G. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex G.

Chapter 1 Administration

1.1 Scope.

1.1.1 *NFPA 72* covers the application, installation, location, performance, inspection, testing, and maintenance of fire alarm systems, fire warning equipment and emergency warning equipment, and their components.

1.1.2 The provisions of this chapter apply throughout the Code unless otherwise noted.

1.2* Purpose.

1.2.1 The purpose of this Code is to define the means of signal initiation, transmission, notification, and annunciation; the levels of performance; and the reliability of the various types of fire alarm systems.

1.2.2 This Code defines the features associated with these systems and also provides information necessary to modify or upgrade an existing system to meet the requirements of a particular system classification.

1.2.3 This Code establishes minimum required levels of performance, extent of redundancy, and quality of installation but does not establish the only methods by which these requirements are to be achieved.

1.3.3 The intent and meaning of the terms used in this Code shall be, unless otherwise defined herein, the same as those of NFPA 70, *National Electrical Code®*.

1.4 Retroactivity.

1.4.1 Unless otherwise noted, it is not intended that the provisions of this document be applied to facilities, equipment, structures, or installations that were existing or approved for construction or installation prior to the effective date of the document.

1.4.2 In those cases where it is determined by the authority having jurisdiction that the existing situation involves a distinct hazard to life or property, retroactive application of the provisions of this document shall be permitted.

1.5 Equivalency.

1.5.1 Nothing in this Code shall prevent the use of systems, methods, devices, or appliances of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this Code.

1.5.2 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.3 The systems, methods, devices, or appliances that are found equivalent shall be approved.

1.6 Units and Formulas.

1.6.1 The units of measure in this Code are presented in the International System (SI) of units. Where presented, U.S. customary units (inch-pound units) follow the SI units in parentheses.

1.6.2 Where both systems of units are presented, either system shall be acceptable for satisfying the requirements in this Code.

1.6.3 Where both systems of units are presented, users of this Code shall apply one set of units consistently and shall not alternate between units.

1.6.4* The values presented for measurements in this Code are expressed with a degree of precision appropriate for practical application and enforcement. It is not intended that the application or enforcement of these values be more precise than the precision expressed.

4.4.3.8.2 The means shall transfer the supervisory indication to a lamp or other visible indicator, and subsequent supervisory signals in other zones shall cause the supervisory notification appliance(s) to resound.

4.4.3.8.3 A means that is left in the "silence" position where there is no supervisory off-normal signal shall operate a visible signal silence indicator and cause the trouble signal to sound until the silencing means is restored to normal position.

4.4.4 Performance and Limitations.

4.4.4.1 Voltage, Temperature, and Humidity Variation. Equipment shall be designed so that it is capable of performing its intended functions under the following conditions:

(1) At 85 percent and at 110 percent of the nameplate primary (main) and secondary (standby) input voltage(s)
(2) At ambient temperatures of 0°C (32°F) and 49°C (120°F)
(3) At a relative humidity of 85 percent and an ambient temperature of 30°C (86°F)

4.4.4.2 Installation and Design.

4.4.4.2.1* All systems shall be installed in accordance with the specifications and standards approved by the authority having jurisdiction.

4.4.4.2.2 Devices and appliances shall be located and mounted so that accidental operation or failure is not caused by vibration or jarring.

4.4.4.2.3 All apparatus requiring rewinding or resetting to maintain normal operation shall be restored to normal as promptly as possible after each alarm and kept in normal condition for operation.

4.4.4.2.4 Equipment shall be installed in locations where conditions do not exceed the voltage, temperature, and humidity limits specified in 4.4.4.1.

Exception: Equipment specifically listed for use in locations where conditions can exceed the upper and lower limits specified in 4.4.4.1 shall be permitted.

4.4.4.3 Transient Protection. To reduce the possibility of damage by induced transients, circuits and equipment shall be properly protected in accordance with the requirements of NFPA 70, *National Electrical Code*, Article 800.

continuous occupancy, automatic smoke detection shall be provided at the location of each fire alarm control unit(s), notification appliance circuit power extenders, and supervising station transmitting equipment to provide notification of fire at that location.

Exception No. 1: Where ambient conditions prohibit installation of automatic smoke detection, automatic heat detection shall be permitted.

Exception No. 2: Fully sprinklered buildings shall not require protection in accordance with 4.4.5.

4.4.6 Annunciation and Annunciation Zoning.

4.4.6.1 Alarm Annunciation. Where required, the location of an operated initiating device shall be annunciated by visible means. Visible annunciation shall be by an indicator lamp, alphanumeric display, printout, or other approved means. The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances.

4.4.6.2 Supervisory and Trouble Annunciation. Where required, supervisory and/or trouble annunciation shall be annunciated by visible means. Visible annunciation shall be by an indicator lamp, alphanumeric display, printout, or other means. The visible annunciation of supervisory and/or trouble conditions shall not be canceled by the means used to deactivate supervisory or trouble notification appliances.

4.4.6.3* Annunciator Access and Location. All required annunciation means shall be readily accessible to responding personnel and shall be located as required by the authority having jurisdiction to facilitate an efficient response to the fire situation.

4.4.6.4 Alarm Annunciation Display. Visible annunciators shall be capable of displaying all zones in alarm. If all zones in alarm are not displayed simultaneously, the zone of origin shall be displayed and there shall be an indication that other zones are in alarm.

4.4.6.5 Fire Command Center. Annunciation at the fire command center shall be by means of audible and visible indicators.

4.4.6.6* Annunciation Zoning.

4.4.6.6.1 For the purpose of alarm annunciation, each floor of the building shall be considered as a separate zone. If a

4.4.3.7.5 Subsequent actuation of initiating devices on other initiating device circuits or subsequent actuation of addressable initiating devices on signaling line circuits shall cause the notification appliances to reactivate.

Exception: If permitted by the authority having jurisdiction, subsequent actuation of another alarm-capable initiating device of the same type in the same room or space shall not be required to cause the notification appliance(s) to reactivate.

4.4.3.7.6 A means that is left in the "off" position when there is no alarm shall operate an audible trouble signal until the means is restored to normal.

4.4.3.8 Supervisory Signal Silencing. A means for silencing a supervisory signal notification appliance(s) shall be permitted only if it complies with 4.4.3.8.1 through 4.4.3.8.3.

4.4.3.8.1 The means shall be key-operated, located within a locked enclosure, or arranged to provide equivalent protection against unauthorized use.

4.4.3.8.2 The means shall transfer the supervisory indication to a lamp or other visible indicator, and subsequent supervisory signals in other zones shall cause the supervisory notification appliance(s) to resound.

4.4.3.8.3 A means that is left in the "silence" position where there is no supervisory off-normal signal shall operate a visible signal silence indicator and cause the trouble signal to sound until the silencing means is restored to normal position.

4.4.4 Performance and Limitations.

4.4.4.1 Voltage, Temperature, and Humidity Variation. Equipment shall be designed so that it is capable of performing its intended functions under the following conditions:

(1)* At 85 percent and at 110 percent of the nameplate primary (main) and secondary (standby) input voltage(s)
(2) At ambient temperatures of 0°C (32°F) and 49°C (120°F)
(3) At a relative humidity of 85 percent and an ambient temperature of 29°C (86°F)

4.4.4.2 Installation and Design.

4.4.4.2.1* All systems shall be installed in accordance with the specifications and standards approved by the authority having jurisdiction.

4.4.4.4* **Wiring.** The installation of all wiring, cable, and equipment shall be in accordance with NFPA 70, *National Electrical Code*, and specifically with Articles 760, 770, and 800, where applicable. Optical fiber cables shall be protected against mechanical injury in accordance with Article 760.

4.4.4.5 **Grounding.** All systems shall test free of grounds.

Exception: Parts of circuits or equipment that are intentionally and permanently grounded to provide ground-fault detection, noise suppression, emergency ground signaling, and circuit protection grounding shall be permitted.

4.4.4.6 Initiating Devices.

4.4.4.6.1 Initiating devices of the manual or automatic type shall be selected and installed so as to minimize nuisance alarms.

4.4.4.6.2 Fire alarm boxes of the manually operated type shall comply with Section 5.13 and 6.8.5.2.1.

4.4.5* Protection of Fire Alarm System. In areas that are not continuously occupied, automatic smoke detection shall be provided at the location of each fire alarm control unit(s), notification appliance circuit power extenders, and supervising station transmitting equipment to provide notification of fire at that location.

Exception No. 1: Where ambient conditions prohibit installation of automatic smoke detection, automatic heat detection shall be permitted.

Exception No. 2: Fully sprinklered buildings shall not require protection in accordance with 4.4.5.

4.4.6 Annunciation and Annunciation Zoning.

4.4.6.1 Alarm Annunciation. Where required, the location of an operated initiating device shall be annunciated by visible means. Visible annunciation shall be by an indicator lamp, alphanumeric display, printout, or other approved means. The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances.

4.4.6.2 Supervisory and Trouble Annunciation. Where required, supervisory and/or trouble annunciation shall be annunciated by visible means. Visible annunciation shall be by an indicator lamp, alphanumeric display, printout, or other means. The visible annunciation of supervisory and/or trouble conditions shall not be canceled by the means used to deactivate supervisory or

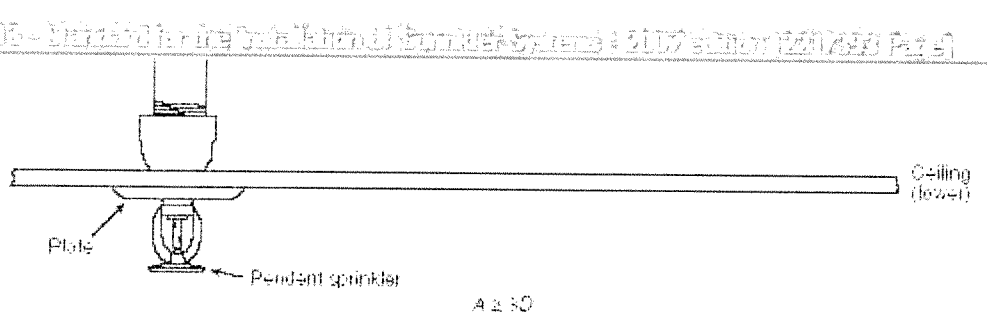


FIGURE 22.5.2.3(c) Arrangement of Branch Lines Supplying Sprinklers Above, in Between, and Below Ceilings.

Table 22.5.2.4 Number of Sprinklers Above and Below a Ceiling

Steel		Copper	
1 in.	2 sprinklers	1 in.	2 sprinklers
1¼ in.	4 sprinklers	1¼ in.	4 sprinklers
1½ in.	7 sprinklers	1½ in.	7 sprinklers
2 in.	15 sprinklers	2 in.	18 sprinklers
2½ in..	50 sprinklers	2½ in.	65 sprinklers

For SI units, 1 in. = 25.4 mm.

22.5.2.5 Branch lines and cross mains supplying sprinklers installed entirely above or entirely below ceilings shall be sized in accordance with Table 22.5.2.2.1.

22.5.2.6* Where the total number of sprinklers above and below a ceiling exceeds the number specified in Table 22.5.2.2.1 for 2½ in. (64 mm) pipe, the pipe supplying such sprinklers shall be increased to 3 in. (76 mm) and sized thereafter according to the schedule shown in Table 22.5.2.2.1 for the number of sprinklers above or below a ceiling, whichever is larger.

22.5.3 Schedule for Ordinary Hazard Occupancies.

22.5.3.1 Unless permitted by 22.5.3.2 or 22.5.3.3, branch lines shall not exceed eight sprinklers on either side of a cross main.

22.5.3.2 Where more than eight sprinklers on a branch line are necessary, lines shall be permitted to be increased to nine sprinklers by making the two end lengths 1 in. (25.4 mm) and 1¼ in. (33 mm), respectively, and the sizes thereafter standard.

22.5.3.3 Ten sprinklers shall be permitted to be placed on a branch line, making the two end lengths 1 in. (25.4 mm) and 1¼ in. (33 mm), respectively, and feeding the tenth sprinkler by a 2½ in. (64 mm) pipe.

22.5.3.4 Pipe sizes shall be in accordance with Table 22.5.3.4.

Table 22.5.3.4 Ordinary Hazard Pipe Schedule

Steel		Copper	
1 in.	2 sprinklers	1 in.	2 sprinklers
1¼ in.	3 sprinklers	1¼ in.	3 sprinklers
1½ in.	5 sprinklers	1½ in.	5 sprinklers
2 in.	10 sprinklers	2 in.	12 sprinklers
2½ in..	20 sprinklers	2½ in.	25 sprinklers
3 in.	40 sprinklers	3 in.	45 sprinklers
3½ in.	65 sprinklers	3½ in.	75 sprinklers
4 in.	100 sprinklers	4 in.	115 sprinklers
5 in.	160 sprinklers	5 in.	180 sprinklers
6 in.	275 sprinklers	6 in.	300 sprinklers
8 in.	See Section 8.2	8 in.	See Section 8.2

For SI units, 1 in. = 25.4 mm.

NFPA 72®

National Fire Alarm Code®

2007 Edition

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet (•) between the paragraphs that remain.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex G. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex G.

Chapter 1 Administration

1.1 Scope.

1.1.1 *NFPA 72* covers the application, installation, location, performance, inspection, testing, and maintenance of fire

1.2.4 This Code shall not be interpreted to require a level of fire protection that is greater than that which would otherwise be required by the applicable building or fire code.

1.3 Application.

1.3.1 Fire alarm systems shall be classified as follows:

(1) Household fire alarm systems
(2) Protected premises (local) fire alarm systems
(3) Supervising station fire alarm systems
  (a) Central station (service) fire alarm systems
  (b) Remote supervising station fire alarm systems
  (c) Proprietary supervising station fire alarm systems
(4) Public fire alarm reporting systems
  (a) Auxiliary fire alarm systems — local energy type
  (b) Auxiliary fire alarm systems — shunt type

1.3.2 Any reference or implied reference to a particular type of hardware shall be for the purpose of clarity and shall not be interpreted as an endorsement.

1.3.3 The intent and meaning of the terms used in this Code shall be, unless otherwise defined herein, the same as those of NFPA 70, *National Electrical Code®*.

1.4 Retroactivity.

1.4.1 Unless otherwise noted, it is not intended that the provisions of this document be applied to facilities, equipment, structures, or installations that were existing or approved for construction or installation prior to the effective date of the document.

1.4.2 In those cases where it is determined by the authority having jurisdiction that the existing situation involves a distinct hazard to life or property, retroactive application of the provisions of this document shall be permitted.

1.5 Equivalency.

1.5.1 Nothing in this Code shall prevent the use of systems, methods, devices, or appliances of equivalent quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this Code.

1.5.2 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.3 The systems, methods, devices, or appliances

data services). Utilities may be subject to compliance with codes and standards covering their regulated activities as adopted under governmental law or regulation. Additional information can be found through consultation with the appropriate governmental bodies, such as state regulatory commissions, the Federal Energy Regulatory Commission, and the Federal Communications Commission.

(C) Special Permission. The authority having jurisdiction for enforcing this *Code* may grant exception for the installation of conductors and equipment that are not under the exclusive control of the electric utilities and are used to connect the electric utility supply system to the service-entrance conductors of the premises served, provided such installations are outside a building or terminate immediately inside a building wall.

90.3 Code Arrangement. This *Code* is divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally; Chapters 5, 6, and 7 apply to special occupancies, special equipment, or other special conditions. These latter chapters supplement or modify the general rules. Chapters 1 through 4 apply except as amended by Chapters 5, 6, and 7 for the particular conditions.

Chapter 8 covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8.

Chapter 9 consists of tables that are applicable as referenced.

Annexes are not part of the requirements of this *Code* but are included for informational purposes only.

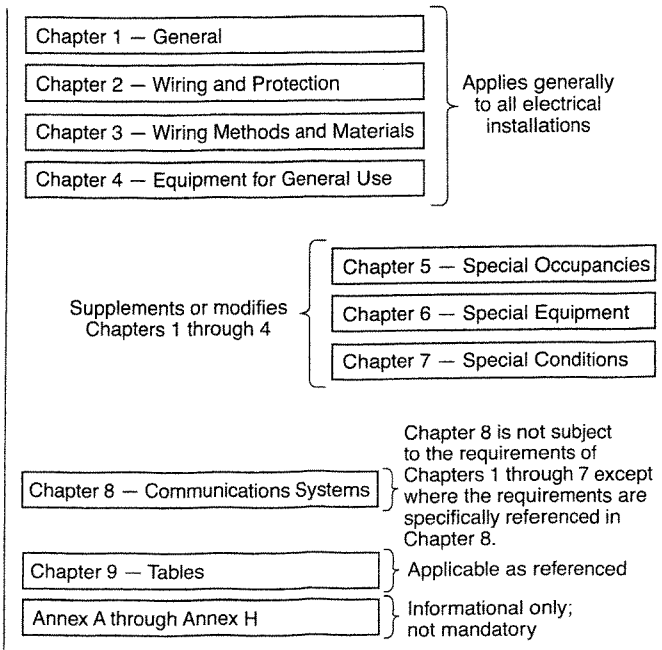

Figure 90.3 Code Arrangement.

90.4 Enforcement. This *Code* is intended to be suitable for mandatory application by governmental bodies that exercise legal jurisdiction over electrical installations, including signaling and communications systems, and for use by insurance inspectors. The authority having jurisdiction for enforcement of the *Code* has the responsibility for making interpretations of the rules, for deciding on the approval of equipment and materials, and for granting the special permission contemplated in a number of the rules.

By special permission, the authority having jurisdiction may waive specific requirements in this *Code* or permit alternative methods where it is assured that equivalent objectives can be achieved by establishing and maintaining effective safety.

This *Code* may require new products, constructions, or materials that may not yet be available at the time the *Code* is adopted. In such event, the authority having jurisdiction may permit the use of the products, constructions, or materials that comply with the most recent previous edition of this *Code* adopted by the jurisdiction.

90.5 Mandatory Rules, Permissive Rules, and Explanatory Material.

(A) Mandatory Rules. Mandatory rules of this *Code* are those that identify actions that are specifically required or prohibited and are characterized by the use of the terms *shall* or *shall not*.

(B) Permissive Rules. Permissive rules of this *Code* are those that identify actions that are allowed but not required, are normally used to describe options or alternative methods, and are characterized by the use of the terms *shall be permitted* or *shall not be required*.

(C) Explanatory Material. Explanatory material, such as references to other standards, references to related sections of this *Code*, or information related to a *Code* rule, is included in this *Code* in the form of fine print notes (FPNs). Fine print notes are informational only and are not enforceable as requirements of this *Code*.

Brackets containing section references to another NFPA document are for informational purposes only and are provided as a guide to indicate the source of the extracted text. These bracketed references immediately follow the extracted text.

FPN: The format and language used in this *Code* follows guidelines established by NFPA and published in the *NEC Style Manual*. Copies of this manual can be obtained from NFPA.

90.6 Formal Interpretations. To promote uniformity of interpretation and application of the provisions of this

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Joe Dela Cruz
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July 9, 2009

Mr. Christopher Bo Heon Lee
President
Loyal Pacific Corporation

Dear Mr. Lee,

The following information is based on site inspections and assessments on installed Fire Alarm equipment conducted in April of 2009. We asked for and used each school's Evacuation Plan drawings since As-Built Drawings were not made available.

Attached is the list of all the schools with their installed Fire Alarm Panels. The list of equipment is not all inclusive given the number of school sites, time constraint and access issues. Our site assessment team found a total of forty-three (43) Fire Alarm Panels and most likely a few more were overlooked. Thirty-six (36) of the panels are considered Main Panels and the other seven (7) in the same campus were added later as the fast-track classrooms were built. According to the bid document information, apparently they are not connected to the Main System Panels.

FIRE-COMM's quotation for the equipment is based on the criteria as outlined in bid document GPSS IFB 014-2009, specifically the SCOPE AND LOCATION OF WORK, 1. General Scope, 2. Fire Alarm System, and 3. Testing and Operational Instructions.

Section 1. a). 3. Requires that contractor must "Insure the system meets local, state, and federal code. "

Guam's Fire Alarm requirement is currently defined as UFC 1997 / NFPA 72 – 1993. Repairing all the fire alarm systems would meet minimum code requirements, if parts and equipment are available.

There are several reasons why we opted to replace most of the system panels and devices. The primary reason is to prepare for the Maintenance of the systems. It would be simpler to repair if the brand and models are the same thereby minimizing inventory cost. MTTR (Mean Time To Repair) would decrease since parts would be readily available and inventory would be minimized.

Below are other reasons we feel that it would benefit the School System to change out as many of the panels as possible.

1. FCI – Fire Control Instruments:

   We found a total of twenty-six (26) Fire alarm panels manufactured by FCI – Fire Control Instruments. FCI was purchased by Pittway Corporation in 1997and when Honeywell purchased Pittway in 2000, FCI was merged with Gamewell Fire Systems to form Gamewell-FCI in 2005.

   Fire Control Instrument's Fire Alarm Panels are no longer being manufactured. Parts are difficult to obtain. The Fire Alarm Panel equipment also do not meet UL864 ninth edition requirements and therefore there is no incentive for the manufacture to continue assembling the parts.

We opted to replace all existing installed FCI fire alarm equipment with new Analog / Addressable equipment manufactured by Honeywell, specifically their Silent Knight / Farenhyt products.

2. EST – Edwards Systems:

   Total of thirteen (13) Systems, most of the systems are installed in the fast track classrooms and are conventional panels. An alarm condition in a building will not annunciate its location if all the devices are connected in the same zone. The Emergency First Responder would have to see smoke coming out of a classroom to determine the source of the fire.

   Changing out these panels to an Analog / Addressable panel would eliminate this problem. Changing out the devices to that of the new Main Panel would further reduce cost since a separate panel will not be necessary. Maintenance cost also would be reduced.

3. Simplex:

   There are a total of four (4) Simplex panels, FIRE-COMM is not only a Honeywell dealer but we are also Simplex Distributors.

   The Simon Sanchez panel seems to be a large system with 78 classrooms and a total of 211 field devices. This model is an older discontinued system and we will change it out.

   The other three panels are fairly small systems and we can repair them or change them out slowly as panel and parts deteriorate. We would check these systems out first to determine functionality and make the decision then. We will change the systems out if 50% of the devices are not functional. Base on our assessment this seems very likely.

4. Notifier system at Upi Elementary School: If the panel is functioning we will conduct a 100% test on all devices. We will determine our plan of action after we obtain the results.

5. Fire-Lite System at Jose Rios Elementary: Seems to be an Evacuation system and we would also conduct testing prior to determining a plan of action.

As you can see the bulk of the equipment would be replaced instead of repaired. As required in the bid document, General Scope, section 1.k) "In the event the fire alarm systems are found to be beyond repair or repairs are too extensive and not cost effective, the Contractor must provide a detailed report showcasing the findings and proposed cost." We would adhere to this requirement prior to changing out any of the systems.

We hope this explains our plan of action and look forward to your reply. If you have any questions to the above, please feel free to call my office at any time.

Regards,

Joe Dela Cruz
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attachments: 1

FIRE-COMM DEVICE COUNT SHEET

DATE:	*23-Apr-09*
PROJECT:	*GPSS FIRE ALARM ASSESMENT*
CONTRACTER:	*LOYAL PACIFIC*
JOB TYPE:	*COUNT*
INFORMATION:	*DEVICE COUNT AS PER EVACUATION PLANS*

SCHOOL	LOCATION	NO. OF CL RMS	BRAND	FIRE ALARM SYSTEM MODEL	FIRE ALARM PANEL STATUS	PULL STA	SMK DET	HT DET	AV	VO	Aud Only	Totals
DISTRICT 1												
ASTUMBO ELEMENTARY SCHOOL	YIGO	36	SIMPLEX	4005	REPAIRABLE	51	114	9	25	80	0	279
DANIEL L PEREZ ELEMENTARY SCHOOL	YIGO	61	FCI	FCI 7100	NON-REPAIRABLE	18	20	0	18	15	0	71
JUAN M. GUERRERO ELEMENTARY SCHOOL	HARMON LOOP	49	FCI	FCI D	NON-REPAIRABLE	23	9	0	18	19		69
FINEGAYAN ELEMENTARY SCHOOL	NCS, DEDEDO	70	EST / FCI	LSS3 / FCI 7100	EST - REPAIRABLE / FCI NON-REPAIRABLE	26	16	0	27	38	0	107
WETTENGEL ELEMENTARY SCHOOL	DEDEDO	48	EST	LSS1	REPAIRABLE	21	16	0	18	*	*	55
FBLG MIDDLE SCHOOL	YIGO	70	FCI / EST	FCI 7200 / FIRE SHIELD / LSS1	EST - REPAIRABLE / FCI NON-REPAIRABLE	36	36	10	36			118
MARIA A. ULLOA ELEMENTARY SCHOOL	DEDEDO	60	FCI / EST	FCI 72 / FCI 7100 / EST LSS1	EST - REPAIRABLE / FCI NON-REPAIRABLE	18	93	0	16	11	17	155
MACHANANAO ELEMENTARY SCHOOL	YIGO	24	FCI	FCI 7200	NON-REPAIRABLE	42	74	3	17	34		170
UPI ELEMENTARY SCHOOL	YIGO	47	NOTIFIER	NOTIFIER 5000	REPAIRABLE	28*	33	0	15*	4*		33
VICENTE S.A. BENAVENTE MIDDLE SCHOOL	DEDEDO	91	EST	EST LSS1	REPAIRABLE	36	67	0	36	0	0	139
SIMON SANCHEZ HIGH SCHOOL	YIGO	78	SIMPLEX	4001	NON-REPAIRABLE	18	162	*	19	12		211
DISTRICT 2												
C.L. TAITANO ELEMENTARY SCHOOL	SINAJANA	33	EST	EST PANEL	REPAIRABLE	20	71	0	17	11		119
AGANA HEIGHTS ELEMENTARY SCHOOL	AGANA	27	FCI	FCI 7100	NON-REPAIRABLE	8	59	0	6	17		90
CHIEF BRODIE MEMORIAL ELEMENTARY SCHOOL	TAMUNING	41	FCI	FCI 7100	NON-REPAIRABLE	9	89	0	9	14		121
TAMUNING ELEMENTARY SCHOOL	TAMUNING	46	FCI	FCI 7200	NON-REPAIRABLE	13	115	6	6	13		153
L.B. JOHNSON MIDDLE SCHOOL	TAMUNING		EST	ESTL551	REPAIRABLE							0
JOSE RIOS MIDDLE SCHOOL	PITI	48	FCI / Fire-Lite	FCI 7200 / MS-9200	FL - REPAIRABLE / FCI NON-REPAIRABLE	25	121	0	32	8		186
DISTRICT 3												
ORDOT CHALANPAGO ELEMENTARY SCHOOL	CHALAN PAGO	30	SIMPLEX	4005	REPAIRABLE	31	79	3	15	9		137
J.Q. SAN MIGUEL ELEMENTARY SCHOOL	TOTO	39	FCI	FCID	NON-REPAIRABLE	23	60	13	21	46		163
B.P. CARBULLIDO ELEMENTARY SCHOOL	BARRIGADA	31	FCI / EST	FCID/EST FIRE SHIELD	EST - REPAIRABLE / FCI NON-REPAIRABLE	16	84	0	9	39		148
PEDRO C. LUJAN ELEMENTARY SCHOOL	RADIO BARR.	41	FCI / EST	FCID/EST FIRE SHIELD	EST - REPAIRABLE / FCI NON-REPAIRABLE	35	89	0	19	18		161
AGUEDA I. JOHNSON MIDDLE SCHOOL	ORDOT	82	EST	EST 2/EST FIRE SHIELD	EST REPAIRABLE	20	148	0	15	13		196
CAPTAIN H.B. PRICE ELEMENTARY	MANGILAO	51	FIC / EST	FCID / EST FIRE SHIELD	EST - REPAIRABLE / FCI NON-REPAIRABLE	8	113	0	7	34		162
LUIS P. UNTALAN MIDDLE SCHOOL	BARRIGADA	65	FCI	FCID	NON-REPAIRABLE	25	70	0	25	51		171
GEORGE WASHINGTON HIGH SCHOOL	MANGILAO	72	FCI	FCI 7100	NON-REPAIRABLE	31	?	11	28	12		82
DISTRICT 4												
HARRY S. TRUMAN ELEMENTARY SCHOOL	SANTA RITA	37	FCI	FCI 7100	NON-REPAIRABLE	10	14	0	11	12		47
M.U. LUJAN ELEMENTARY SCHOOL	YONA	46	FCI	FCID	NON-REPAIRABLE	20	12	0	17	45		94
INARAJAN ELEMENTARY SCHOOL	INARAJAN	30	FCI	FCI 72	NON-REPAIRABLE	14	42	0	14	10		80
MARCIAL A. SABLAN ELEMENTARY SCHOOL	AGAT	51	FCI	FCID	NON-REPAIRABLE	19	56	0	13	59		147
J.P. TORRES ALTERNATIVE SCHOOL	SANTA RITA	22	FCI	FCI 7100	NON-REPAIRABLE	4	27	0	4	4		39
MERIZO MARTYRS MEMORIAL SCHOOL	MERIZO	23	FCI	FCID	NON-REPAIRABLE	14	33	0	13	6		66
OCEANVIEW MIDDLE SCHOOL	AGAT	52	FCI	FCID	NON-REPAIRABLE	25	56	0	23	17		121
INARAJAN MIDDLE SCHOOL	INARAJAN	44	FCI	FCID	NON-REPAIRABLE	35	49	0	29	29		142
TALAFOFO ELEMENTARY SCHOOL	TALAFOFO	29	FCI	FCID	NON-REPAIRABLE	10	37	0	7	9		63
F.Q. SANCHEZ ELEMENTARY SCHOOL	UMATAC	8	SIMPLEX	SIMPLEX 4004	REPAIRABLE	6	1	0	8	9		24
SOUTHERN HIGH SCHOOL	AGAT	94	EST	EST IRC3	EST REPAIRABLE	86	138	0	69	42		335
		1676				796	2203	55	647	736	17	

FCI	26
EST	11
SIMPLEX	4
NOTIFIER	1

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Joe Dela Cruz
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July 28, 2009

Mr. Christopher Bo Heon Lee
President
Loyal Pacific Corporation

Dear Mr. Lee,

We received the copy you sent of the letter regarding the GPSS IFB 014-2009 bid rejecting the request for reconsideration of our bid submission.

The letter states that the basis of the rejection of our bid proposal is that we exceeded the ceiling amount allocated for the purchase of the repair work.

Question that comes to mind is what is the project's allocated ceiling amount? What is the government estimate and how was the price computed?

Another question is what are the other bid amounts from the other companies that put in a bid and how does it compare with our price?

Our price reflects our strategy of giving the best value by replacing most of the existing Fire Alarm System in each school. To do less is to offer another band aid solution to a critical component required for the Life-Safety of our children while in the care of the public school system. Replacing the system panels to one brand make and model would also be conducive to maintenance since components would be the same throughout the school systems. This would minimize the amount of spare components required to be kept on-island to minimize repair time since parts would be readily available and this would therefore decrease maintenance cost.

Our bid price is about 2.7 Million; the winning bid price is 22% of our price, **$ 588,736.38** (average of $16,353.79 per school). This LOW price may be sufficient if the intent is to only repair the systems but if this is a **Firm, Fixed-Price Contract** we doubt if the amount allocated in the winning bid would be able to complete the work as required in the SPECIAL PROVISIONS FBE 014-2009 as stated in page 23 of Bid no. IFB 014-2009.

"Section I .... INTENT: The intent of this formal solicitation is to repair and make fully operational existing Fire Alarm Systems throughout the thirty-six (36) public schools and provide a maintenance & repair service contract.

The repairs shall consist of;
A. Replacing all defective and damaged components of Main Control Panel.
B. System Interfaces
C. Connection of all components
D. Replacement or Repair of Pull Stations
E. Installation of Cable Supports
F. Replacement or Repair of Audio and Visual Alarms
G. Tying in of forty-five (45) new buildings (114 classrooms). (Reference Appendix 1 on Page 31)

The Maintenance and Repair Service contract shall consist of;
A. Quarterly Routine maintenance and Testing (Reference Appendix II on Page 32)
B. On-call repair / troubleshooting
C. Minor and Major Repairs. Note: Minor and major repairs shall be submitted detailing the extent of repairs and costs prior to commencing repairs."

The only way this low bid price would be able to accomplish all the above is if the contractor is allowed to ask for **change orders** as the project commences. This may drive up the overall cost above that of what we quoted. If this is the intent of this bid then this should have been stated simply and succinctly in the bid requirements.

The rest of this letter would explain our premise that our bid is a fair and accurate price. That our proposal would meet the intent of the requirements as stated in the bid documents.

We based our price on the site inspection and assessment we conducted at all 36 schools with your electrician in April of this year. FIRE-COMM shall furnish the Fire Alarm Equipment and certify each system's correct operation. Your company, Loyal Pacific will run new conduits, wires and install all fire alarm components.

As stated in a previous letter to you, during the on-site visits we asked for the Emergency Evacuation Plans at each school to map the existing device locations during the assessments. Given the lack of drawings, the time constraints and accessibility issues, our device counts based on visual inspections are probably about 75% - 85% accurate.

Also in order to meet the requirements in the General Scope located in the SCOPE AND LOCATION OF WORK on page 25, specifically to "Ensure the system meets local, state and federal code." We added smoke detectors in all classrooms that now lack these devices. All of the 114 New Fast-Track Classrooms listed in Appendix I on page 31 have one or more detectors in each room. The new schools Liguan, Okkudo, Adacao, etc. designed by the local engineering company EMCE and just completed also have detectors in each classroom.

We completed a similar Fire Alarm Systems repair / replacement project in fourteen (14) schools in the CNMI (Saipan, Tinian and Rota) in 2007; Smoke Detectors were also required in each classroom. The systems were designed by Engineering Partners Inc., Guam and approved by Local and Federal Inspectors.

Based on the above prevailing practices we recommend installing detectors in each existing classroom. Most of the other 1,560 public school classrooms we surveyed do not have smoke detectors installed.

Below is a brief synopsis of the DOE Fire Alarm Systems as found during our site inspections.

There are thirty-six (36) schools with different Main Fire Alarm Panels and system components installed. The majority of the systems were impacted by Super Typhoon Pongsona in 2002 and were never repaired. Most of the fire alarm devices installed outside the buildings are damaged and are no longer functioning. Conduits, wires and connections in boxes need extensive repair work or replacement given the nature of salt-laden rain that usually accompany typhoon force winds here in the Pacific Islands. And of course there is the never-ending problem of vandalism in our schools.

Twenty-five (25) schools have Main panels manufactured by FCI (Fire Control Instruments). Out of the 25 FCI panels Seventeen (17) of the panels are OBSOLETE and are no longer being manufactured. Because the fire alarm panels do not meet the new UL 864 Ninth Edition requirements the replacement panel boards and components are no longer available. They may be found and purchased maybe through e-Bay or other surplus outlets but they are difficult to find and most components would not be new further negating the intent of the bid.

Twelve of these OBSOLETE Fire Alarm Control Panels (FACP) are Addressable units with Addressable field devices that are exclusively manufactured for this brand. These 12 panels with their addressable devices have to be replaced; repair is not an option because of incompatibility issues with other systems.

The other Eleven (11) Main FACPs manufactured by EST, Simplex and Notifier are in varying degrees of disrepair, victims of lack of maintenance. These Fire Alarm Panels also have to adhere to the UL864 Ninth Edition standard and some are considered obsolete since components are no longer available to repair them. We know that the FACP in Simon Sanchez is a Simplex panel that is definitely OBSOLETE and need to be replaced.

In conclusion, to meet the INTENT of the bid requirements "... **to repair and make fully operational the existing Fire Alarm Systems throughout the thirty-six (36) and provide a maintenance & repair service contract. .... Repairs shall consist of;"**

"A. Replacing all defective and damaged components of Main Control Panel."
As mentioned above at least half to the total thirty-six (36) FACPs, Eighteen (18) Main Control Panels require replacement and because of UL Compatibility issues, devices must also be replaced. Most of the other FACPs and field devices most likely are uneconomical to repair and require replacement or extensive repair.

"C. Connection of all components"

Connections as per NEC (National Electrical Code) require Fire Control Wire. It would be easier to install and run new conduits and wire than waste time trying to repair / rerun existing damaged wires in imbedded conduit. Without the as-built drawings troubleshooting and repairing wiring errors become a nightmare.

"D. Replacement or Repair of Pull Stations"

"F. Replacement or Repair of Audio and Visual Alarms"

Most of the damaged devices are located outside exposed to the weather and need replacement since they are not repairable. NFPA / NEC require weatherproof devices and weatherproof backboxes therefore increasing cost. These devices are not waterproof but they are less susceptible to UV damage from the sun and last longer than standard indoor units now installed increasing reliability.

"L. Tying in of forty-five (45) new buildings (114 classrooms). (Reference Appendix 1 on Page 31)"

These buildings are located in eighteen (18) different schools. Tying in the Fire Alarm components to the Main FACP for the campus would require digging and trenching. Trench work requires heavy equipment and additional labor.

As you can see doing a "Band-Aid" Repair job on the existing Fire Alarm Systems would not meet the intent of the bid requirements as stated on page 23 of the document and copied above. Repairing obsolete equipment is a waste of taxpayer money. The best course of action is to REPLACE the equipment and then have them Maintained by a responsible company able to do the work consistently.

$ 16,000.00 per school to replace obsolete FACPs, install, add new components, test, certify, interface / trench and tie-in all the components within the campus to meet local and federal fire code requirements would be very difficult. We can see multiple change order requests forthcoming. Will the DOE approve the Change Order Requests? Would this ploy be considered as "Lowballing" and is this an illegal bidding procedure? Please ask your lawyer for his opinion.

Which leads me to the second component of the bid, the Maintenance of the systems. FIRE-COMM has been installing and maintaining Fire Alarm Equipment since 1993. We have personnel that are factory trained on the equipment we sell and service.

" The Maintenance and Repair Service contract shall consist of;

A. Quarterly Routine maintenance and Testing (Reference Appendix II on Page 32)

B. On-call repair / troubleshooting

C. Minor and Major Repairs. Note: Minor and major repairs shall be submitted detailing the extent of repairs and costs prior to commencing repairs."

We have extensive experience in maintaining systems, we have had contractual or on-call agreements in place with the Guam International Airport, the Hilton Resort and Spa, the Hyatt Hotel, the Micronesian Mall, Agana Shopping Center, Guam Community College, the Bank of Hawaii (all branches) and other buildings too numerous to mention. Unfortunately one of the first expenditures to be cut during hard economic times is the maintenance of the systems.

Maintenance is not inexpensive but just as in having a Car, Health or Life Insurance, the time when it is needed is sometimes when it is least expected. The sad results of neglect are a compromised Life-Safety system that is unreliable and may fail when you need it the most, during an actual fire emergency.

Compromising and cutting corners on a Life-Safety Fire Alarm System may have dire future results.

We hope this explains adequately our intent when we calculated our bid price. If you have any questions to the above, please feel free to call my office at any time.

Regards,

Joe Dela Cruz
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Joe Dela Cruz
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July 28, 2009

Mr. Christopher Bo Heon Lee
President
Loyal Pacific Corporation

Dear Mr. Lee,

We received the copy you sent of the letter regarding the GPSS IFB 014-2009 bid rejecting the request for reconsideration of our bid submission.

The letter states that the basis of the rejection of our bid proposal is that we exceeded the ceiling amount allocated for the purchase of the repair work.

Question that comes to mind is what is the project's allocated ceiling amount? What is the government estimate and how was the price computed?

Another question is what are the other bid amounts from the other companies that put in a bid and how does it compare with our price?

Our price reflects our strategy of giving the best value by replacing most of the existing Fire Alarm System in each school. To do less is to offer another band aid solution to a critical component required for the Life-Safety of our children while in the care of the public school system. Replacing the system panels to one brand make and model would also be conducive to maintenance since components would be the same throughout the school systems. This would minimize the amount of spare components required to be kept on-island to minimize repair time since parts would be readily available and this would therefore decrease maintenance cost.

Our bid price is about 2.7 Million; the winning bid price is 22% of our price, **$ 588,736.38** (average of $16,353.79 per school). This LOW price may be sufficient if the intent is to only repair the systems but if this is a **Firm, Fixed-Price Contract** we doubt if the amount allocated in the winning bid would be able to complete the work as required in the SPECIAL PROVISIONS FBE 014-2009 as stated in page 23 of Bid no. IFB 014-2009.

"Section I .... INTENT: The intent of this formal solicitation is to repair and make fully operational existing Fire Alarm Systems throughout the thirty-six (36) public schools and provide a maintenance & repair service contract.

The repairs shall consist of;
A. Replacing all defective and damaged components of Main Control Panel.
B. System Interfaces
C. Connection of all components
D. Replacement or Repair of Pull Stations
E. Installation of Cable Supports
F. Replacement or Repair of Audio and Visual Alarms
G. Tying in of forty-five (45) new buildings (114 classrooms). (Reference Appendix 1 on Page 31)

The Maintenance and Repair Service contract shall consist of;
A. Quarterly Routine maintenance and Testing (Reference Appendix II on Page 32)
B. On-call repair / troubleshooting
C. Minor and Major Repairs. Note: Minor and major repairs shall be submitted detailing the extent of repairs and costs prior to commencing repairs."

The only way this low bid price would be able to accomplish all the above is if the contractor is allowed to ask for **change orders** as the project commences. This may drive up the overall cost above that of what we quoted. If this is the intent of this bid then this should have been stated simply and succinctly in the bid requirements.

The rest of this letter would explain our premise that our bid is a fair and accurate price. That our proposal would meet the intent of the requirements as stated in the bid documents.

We based our price on the site inspection and assessment we conducted at all 36 schools with your electrician in April of this year. FIRE-COMM shall furnish the Fire Alarm Equipment and certify each system's correct operation. Your company, Loyal Pacific will run new conduits, wires and install all fire alarm components.

As stated in a previous letter to you, during the on-site visits we asked for the Emergency Evacuation Plans at each school to map the existing device locations during the assessments. Given the lack of drawings, the time constraints and accessibility issues, our device counts based on visual inspections are probably about 75% - 85% accurate.

Also in order to meet the requirements in the General Scope located in the SCOPE AND LOCATION OF WORK on page 25, specifically to "Ensure the system meets local, state and federal code." We added smoke detectors in all classrooms that now lack these devices. All of the 114 New Fast-Track Classrooms listed in Appendix I on page 31 have one or more detectors in each room. The new schools Liguan, Okkudo, Adacao, etc. designed by the local engineering company EMCE and just completed also have detectors in each classroom.

We completed a similar Fire Alarm Systems repair / replacement project in fourteen (14) schools in the CNMI (Saipan, Tinian and Rota) in 2007; Smoke Detectors were also required in each classroom. The systems were designed by Engineering Partners Inc., Guam and approved by Local and Federal Inspectors.

Based on the above prevailing practices we recommend installing detectors in each existing classroom. Most of the other 1,560 public school classrooms we surveyed do not have smoke detectors installed.

Below is a brief synopsis of the DOE Fire Alarm Systems as found during our site inspections.

There are thirty-six (36) schools with different Main Fire Alarm Panels and system components installed. The majority of the systems were impacted by Super Typhoon Pongsona in 2002 and were never repaired. Most of the fire alarm devices installed outside the buildings are damaged and are no longer functioning. Conduits, wires and connections in boxes need extensive repair work or replacement given the nature of salt-laden rain that usually accompany typhoon force winds here in the Pacific Islands. And of course there is the never-ending problem of vandalism in our schools.

Twenty-five (25) schools have Main panels manufactured by FCI (Fire Control Instruments). Out of the 25 FCI panels Seventeen (17) of the panels are OBSOLETE and are no longer being manufactured. Because the fire alarm panels do not meet the new UL 864 Ninth Edition requirements the replacement panel boards and components are no longer available. They may be found and purchased maybe through e-Bay or other surplus outlets but they are difficult to find and most components would not be new further negating the intent of the bid.

Twelve of these OBSOLETE Fire Alarm Control Panels (FACP) are Addressable units with Addressable field devices that are exclusively manufactured for this brand. These 12 panels with their addressable devices have to be replaced; repair is not an option because of incompatibility issues with other systems.

The other Eleven (11) Main FACPs manufactured by EST, Simplex and Notifier are in varying degrees of disrepair, victims of lack of maintenance. These Fire Alarm Panels also have to adhere to the UL864 Ninth Edition standard and some are considered obsolete since components are no longer available to repair them. We know that the FACP in Simon Sanchez is a Simplex panel that is definitely OBSOLETE and need to be replaced.

In conclusion, to meet the INTENT of the bid requirements "... **to repair and make fully operational the existing Fire Alarm Systems throughout the thirty-six (36) and provide a maintenance & repair service contract. .... Repairs shall consist of;"**

"A. Replacing all defective and damaged components of Main Control Panel."
As mentioned above at least half to the total thirty-six (36) FACPs, Eighteen (18) Main Control Panels require replacement and because of UL Compatibility issues, devices must also be replaced. Most of the other FACPs and field devices most likely are uneconomical to repair and require replacement or extensive repair.

"C. Connection of all components"

Connections as per NEC (National Electrical Code) require Fire Control Wire. It would be easier to install and run new conduits and wire than waste time trying to repair / rerun existing damaged wires in imbedded conduit. Without the as-built drawings troubleshooting and repairing wiring errors become a nightmare.

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