

*SINGLE HAZARD PANEL*  
**SHP**  
*PRO*



P/N 10-063

## Product Manual

**Conventional Fire Alarm/Suppression System**



Manual P/N: 06-297  
Rev. 4, 03/2010





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**TABLE OF CONTENTS**


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Section	Page
<b>1.0 Preface</b> .....	1
1.1 About This Manual .....	1
1.2 Product Support .....	1
1.3 Revision History .....	1
1.4 Terms Used in this Manual .....	2-3
1.5 Symbols Used in this Manual.....	4
1.6 Safety Notices .....	5
<b>2.0 Product Overview</b> .....	7
2.1 Product Description .....	7
2.2 Listings and Approvals .....	7
2.3 Agency Compliance and Standards.....	8
2.4 Related Documentation.....	8
2.5 SHP PRO Features.....	9
<b>3.0 Equipment/Products</b> .....	11
3.1 Main Panel Hardware.....	11-13
3.2 Input Devices .....	14-18
3.3 Output Devices.....	18
3.4 Ancillary Devices .....	19-20
3.5 Spare Parts .....	21
3.6 Specifications .....	22-28
3.7 Enclosure Specifications .....	29-31
<b>4.0 Installation</b> .....	32
4.1 Enclosure Installation .....	32
4.2 Power and Field .....	33-34
4.3 Wiring Verification .....	35
4.4 System Module Installation .....	36-37
4.5 Initial Power-Up.....	38
4.6 Complete Field Wiring / Wiring Diagrams .....	38-42
4.7 System Configuration.....	43-49
4.8 Checkout System .....	50
4.9 Releasing Hardware.....	50
<b>5.0 Operations</b> .....	51
5.1 User Switch Interaction .....	51
5.2 Silencing Rules .....	51
5.3 Supervisory and Trouble Status LED's .....	51
5.4 Latching versus Non-Latching Troubles .....	52
5.5 Supervision Response Times .....	52
5.6 Low Power Conditions .....	52
5.7 Diagnostic LED Code Designators .....	53
5.8 Typical Alarm Operation.....	54
5.9 Supervisory Operation .....	54
5.10 Trouble Operation .....	54
5.11 SHP PRO Input / Output Matrix .....	55-56

**6.0 Servicing**..... 57

    6.1 Checkout..... 57

    6.2 Maintenance ..... 57

    6.3 Troubleshooting..... 57-59

**Appendix 1**..... 61

    Battery Calculations..... 61-63

**Appendix 2**..... 64

    System Operation Posting..... 65

**Index**..... 67

## 1.0 PREFACE

### 1.1 ABOUT THIS MANUAL

This manual is intended to be a complete reference for the installation, operation, and service of the Fike Single Hazard Panel Professional (SHP Pro) Fire Alarm/Suppression Control System. The information contained in this manual must be utilized by the factory trained Fike distributor in order to properly install, test and service the SHP Pro. This manual can also be used by the end user as an Operations Manual for the SHP Pro.

Before you refer to any section in this manual, and before you attempt to install or use the SHP Pro, be sure to read the important safety notices in section 1.6.

This manual is divided into sections for easy reference. The first-time installer and/or user should thoroughly read and understand the instructions contained within this manual before using this device. These instructions must be followed to avoid possible damage to the SHP Pro itself or adverse operating conditions caused by improper installation and programming.

### 1.2 PRODUCT SUPPORT

If you have a question or encounter a problem not covered in this manual, you should first try to contact the distributor that installed the protection system. Fike has a worldwide distribution network. Each distributor sells, installs, and services Fike equipment. Look on the inside of the door, left side, there should be a sticker with an indication of the distributor who sold the system. If you can not locate the distributor, please call Fike Customer Service for locating your nearest distributor, or go to our web-site at [www.fike.com](http://www.fike.com). If you are unable to contact your installing distributor or you simply do not know who installed the system you can contact Fike Product Support at (800) 979-FIKE (3453), Monday through Friday, 8:00 a.m. to 4:30 p.m. CST.

### 1.3 REVISION HISTORY

**Document Title:** SHP Pro Conventional Fire Alarm/Suppression System Product Manual

**Document Reorder Number:** 06-297

Revision	Section	Date	Reason for Change
0	All Sections	10/2003	Initial Release
1	All Sections	07/2006	UL 9 <sup>th</sup> Edition Revision
2	All Sections	04/2008	UL 9 <sup>th</sup> Edition Revision
3	Sections 3, 4 & 6	08/2008	Changed Agent Release circuit EOL value to 2.4K
4	Sections 2, 3, 4, 5 & 6	03/2010	Added IRM as a compatible releasing device

## 1.4 TERMS USED IN THIS MANUAL

The following are various terms used in this manual with a brief description of each:

### $\Omega$

Symbol for “ohm”. Unit of resistance.

### AC Normal State

(“AC Normal” Green LED ON) The system is in the AC Normal state when appropriate AC power is being applied to the system.

### Abort

An input to a suppression system to prevent an unwanted discharge of fire suppressant agent. The SHP Pro has several different abort types.

### Alarm State

(“Alarm” Red LED ON, Piezo pulsing) The alarm occurs when an input circuit configured for alarm operation has been activated. Activation typically initiated by a detector or contact device. The system leaves the alarm state upon entry into the pre-discharge or release state.

### Class A wiring

Input circuits capable of transmitting an alarm signal during a single open or a non-simultaneous single ground fault on a circuit conductor shall be designated as Style D or Class A. Similarly, output circuits capable of activating during a single open or a non-simultaneous ground fault on a circuit conductor shall be designated as Style Z or Class A. Commonly referred to as redundant or 4-wire connection; this manual refers to 4-wire connections as Class A wiring.

### Class B wiring

Input circuits incapable of transmitting and alarm signal beyond the location of the fault condition (listed for Class A wiring above) shall be designated as Style B or Class B. Similarly, output circuits incapable of operating beyond the location of the fault condition shall be designated as Style Y or Class B. This manual refers to 2-wire connections as Class B wiring

### Initiating Device

A system component that originates transmission of a change-of-state condition, such as in a smoke detector, manual fire alarm box, or supervisory switch. This manual interchanges the terms initiating device and input device.

### Initiating Device Circuit

A circuit to which automatic or manual initiating devices are connected where the signal received does not identify the individual device operated. This manual interchanges the terms initiating device circuit and input circuit.

### Normal State

(“Trouble” Yellow LED OFF) The system is in the normal state when the power supply and all circuits are configured properly, connected, and responding properly. The system remains in normal state until a trouble condition occurs.

### Cross-zone Detection

A detection scheme where two detectors must activate before the system enters into the pre-discharge state: at least one detector from each detection initiating circuit must be active.

### Notification Appliance

A fire alarm system component such as a bell, horn, speaker, light, or textual display that provides audible, tactile, or visible output, or any combination thereof. The device notifies building occupants of system status. This manual interchanges the terms notification and audible appliance.

### Notification Appliance Circuit

A circuit or path directly connected to a notification appliance(s). This manual interchanges the terms notification appliance circuit and audible circuit.

### Non Power-Limited

A circuit designation given for wiring purposes. The amount of current flowing through the circuit is unlimited vs. being limited, or power-limited. AC power and Battery wiring is Non Power-limited.



**Power-Limited**

A circuit designation given for wiring purposes. The amount of current flowing through the circuit is limited (typically by fuse) vs. being unlimited, or non-power-limited. The SHP Pro input and output circuits are power-limited. The circuit has a maximum power that flows through it or it current limits and opens the circuit.

**Pre-discharge Delay**

The time (in seconds) that the system will delay entering the release state after the zone's detection type has been satisfied. Activation of an abort switch will have an effect on this value, depending upon the abort type selected.

**Pre-discharge State**

("Alarm" Red LED ON, Piezo chirping) The pre-discharge state occurs when the zone's detection type input conditions are satisfied (Cross-zone Detection, Sequential Alarm Detection, or Single Detector Release). Upon time delay countdown completion (unless delayed by a pertinent activated abort input), the system leaves the pre-discharge state and enters the release state.

**Release State**

("Alarm" Red LED ON, Piezo chirping) The release state occurs upon completion of the pre-discharge state or upon activation of a manual release input. At the start of the release state, output circuits configured for releasing shall operate

**Sequential Detection**

A detection scheme where the sum total of active detectors on the detection initiating circuits must be two or more before the system will enter the pre-discharge state.

**Single Detector Release Detection**

A detection scheme where activation of one detector causes the system to enter the pre-discharge state. SDR (Single Detector Release) detector(s) are installed on initiating circuits setup for sequential detection.

**Solenoid On Time**

The time (in minutes) that the solenoid is activated upon entering the release state. Reset of the system overrides this value.

**Supervisory State**

("Supervisory" Yellow LED ON, Piezo Warble) The supervisory state occurs upon activation of a supervisory input circuit. The supervisory state is non-latching and will follow the status of the supervisory input contact.

**Trouble State**

("Trouble" Yellow LED ON, Piezo Constant) The trouble state occurs upon any detectable condition which could impair system operation including connection problems, ground faults, hardware problems, power problems, configuration problems, or prematurely activated abort inputs. Certain trouble conditions are latching; others allow the system to reset upon trouble condition removal. Depending upon the type of trouble condition, the system may or may not remain operational. When the system is in trouble state, it is not in the normal state.

## 1.5 SYMBOLS USED IN THIS MANUAL

The following cautions and warnings appear in this manual. Be certain to read all of the following warning and cautions before attempting to install or use this device. Personal injury or accidental release of the suppression system may result if these warnings and cautions are not followed!



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**Warning Symbol** – This symbol is used in this manual to warn of possible injury or death from improper use or application of the product under noted conditions.

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**Caution Symbol** – This symbol warns of possible personal injury or equipment damage under noted conditions. Follow all safety standards of professional practice and the recommendations in this manual. Using equipment in ways other than described in this manual can present serious safety hazards or cause equipment damage.

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**Notes** – This symbol indicates the message is important, but is not of a Warning or Caution category. These notes can be of great benefit to the user and should be read.

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**Tips** – Tips provide advice that may save time during a procedure, or help to clarify an issue. Tips may include additional reference.

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## 1.6 SAFETY NOTICES

Be certain to read all the following warnings and cautions before installing or using this device. Accidental damage to the device could result if these warnings and cautions are not heeded!



**CAUTION:** The SHP Pro contains static sensitive components. Handle the electronics by the edges only and avoid touching the integrated components. Keep the electronics in the protective static bags it was shipped in until time for installation. Always ground yourself with a proper wrist strap before handling the module(s). If the installer is properly grounded at all times, damage due to static discharge will not occur. If the module requires repair or return to Fike, it must be shipped in an anti-static bag.



**CAUTION:** To ensure proper system operation after installation of the SHP Pro, this device must be tested in accordance with NFPA 72. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.



**WARNING:** Failure to disconnect power to the releasing circuit(s) and completely disarm the solenoid(s) or any other "critical operation" contacts prior to system testing may cause accidental activation of the system.

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**2.0 PRODUCT OVERVIEW**

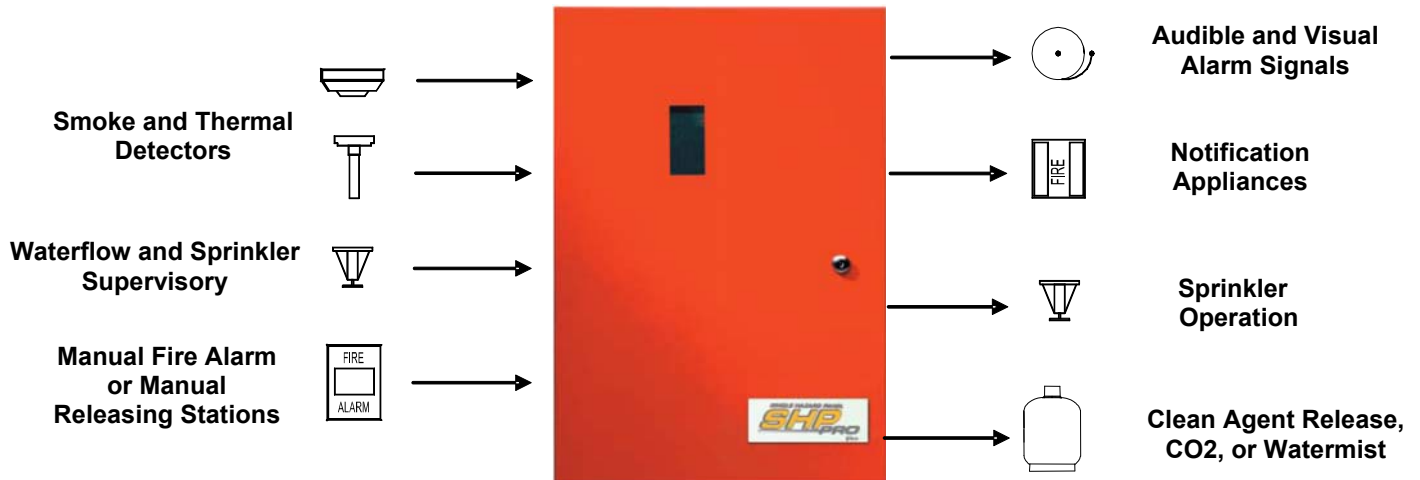
**2.1 PRODUCT DESCRIPTION**

The Fike SHP Pro (P/N 10-063 Series) is a compact, cost-effective, conventional fire alarm and suppression releasing panel. The SHP Pro is designed for use with Fike Clean Agent Fire Suppressant, CO<sub>2</sub>, sprinkler (pre-action/deluge), or other industrial solenoid-based suppression systems. The SHP Pro controller is shipped from the factory pre-configured for Clean Agent suppression operation.

The main controller contains all electronics required for a complete detection and control system suitable for most applications. Optional modules, which plug into the main circuit board, are available to add increased functionality to the system.

**2.2 LISTINGS AND APPROVALS**

<u>Approval Agency</u>	<u>File Number</u>
Underwriters Laboratories	S2203
Type:	Local, Remote Station, Central Station PPU
Service Type:	A-Automatic Fire Alarm, M-Manual Fire Alarm WF-Water-flow Alarm, SS-Sprinkler Supervisory, Releasing, DACT
Type Signaling:	Non-coded
Factory Mutual (FM)	3017159
California State Fire Marshall	7165-0900:135
City of New York (MEA)	461-04-E
Hong Kong	206/0877 VII



## 2.3 AGENCY COMPLIANCE AND STANDARDS

### 2.3.1 This Fire Alarm Control Panel Complies With the Following NFPA and UL Standards

- NFPA 72 – National Fire Alarm Code
- UL 864 – Control Units and Accessories for Fire Alarm Systems

### 2.3.2 Related Fire Alarm Standards

The installer should also be familiar with the following standards.

#### **National Fire Protection Association (NFPA) Codes:**

- NFPA 12 – Carbon Dioxide Extinguishing Systems (High Pressure Only)
- NFPA 12A – Halon 1301 Extinguishing Systems
- NFPA 13 – Sprinkler Systems
- NFPA 15 – Water Spray Fixed Systems
- NFPA 16 – Deluge, Foam-water and Foam-water Spray Systems
- NFPA 70 – National Electrical Code (NEC)
- NFPA 70, Article 300 – Wiring Methods
- NFPA 70, Article 760 – Fire Protective Signaling Systems
- NFPA 72 – National Fire Alarm Code
- NFPA 101 – Life Safety Code
- NFPA 110 – Emergency Standby Power Systems
- NFPA 2001 – Clean Agent Fire Extinguishing Systems

#### **Underwriters Laboratories (UL) Standards:**

- UL 38 – Manually Actuated Signaling Boxes
- UL 217 – Smoke Detectors, Single and Multiple Station
- UL 228 – Door Closers – Holders for Fire Protective Signaling Systems
- UL 268 – Smoke Detectors for Fire Protective Signaling Systems
- UL 268A – Smoke Detectors for Duct Applications
- UL 346 – Waterflow Indicators for Fire Protective Signaling Systems
- UL 464 – Audible Signaling Appliances
- UL 521 – Heat Detectors for Fire Protective Signaling Systems
- UL 1481 – Power Supplies for Fire Protective Signaling Systems
- UL 1638 – Visual Signaling Appliances
- UL 1971 – Visual Signaling Appliances

#### **Factory Mutual (FM) Standards:**

- FMRC 1011 and 1012 – Deluge and Pre-action Sprinkler Systems
- FMRC 3820 – Electrical Utilization Equipment

Applicable Local and State Building Codes  
Requirements of the Local Authority Having Jurisdiction

## 2.4 RELATED DOCUMENTATION

To obtain a complete understanding of the specific features of the SHP Pro or to become familiar with related functions in general, refer to the documentation listed below. Please reference the most current version or the version noted on the label located on the product.

Document Title	Part Number
Agent Release Module (ARM III) Manual	06-106
Compatible Notification Appliances and Releasing Devices	06-186
The DACT/Fire Communicator Addendum	06-159
The DACT/Fire Communicator Manual	06-160
System Operation Posting, SHP PRO	02-11060
Impulse Releasing Module Product Manual	06-552

## 2.5 SHP PRO FEATURES

- **General**
  - ❑ Microprocessor-controlled
  - ❑ Power-limited on all circuits except power connections (P1)
  - ❑ Four operational modes:
    1. Clean agent release (10-2452-1)
    2. Clean agent release with sprinkler operation (10-2452-1)
    3. Sprinkler operation (10-2452-1, 10-2452-2)
    4. Industrial releasing (10-2452-1)
  - ❑ Ten system status LEDs to provide positive indication of system status
  - ❑ Seven segment diagnostic LED for trouble and event occurrences
  - ❑ System configuration via dip-switches
  - ❑ Local piezo with distinct event tones
  - ❑ Reset switch
  - ❑ Audible silence switch
  - ❑ Disable Mode for audible and release circuits, and relays
  - ❑ Alarm and trouble resound
- **Power**
  - ❑ Integral power supply at 24VDC nominal; 1.0 Amp total normal standby 4.0 Amp alarm
  - ❑ Selection of 120, or 240VAC power input at 50 or 60 hertz
  - ❑ Re-settable and non-re-settable special application power output
  - ❑ Battery/Earth fault supervision
  - ❑ 7 AH to 40 AH battery options, up to 90 hours (Factory Mutual) standby
- **Enclosure**
  - ❑ Steel enclosure 21" high by 14.35" wide by 4" deep (Back-box dimensions)
  - ❑ Enclosure is equipped with a .50" wide lip to facilitate flush mounting
  - ❑ Removable door for easy installation
  - ❑ Enclosure is available in Red or Gray
- **Initiating Device Circuits**
  - ❑ Up to two Style B initiating device circuits capable of sequential alarm, cross-zone, or single detector release operation with an overall system capacity of 50 detectors maximum
  - ❑ Three Style B initiating device circuits capable of monitoring closed contact devices
  - ❑ Optional Class A module that converts all five initiating device circuits to Style D wiring and operation
- **Notification Appliance Circuits**
  - ❑ Three Style Y notification appliance circuits rated at 2.0 amps each
  - ❑ Optional Class A module that converts all five output circuits to Style Z (3 NAC, 2 releasing)
- **Releasing Circuits**
  - ❑ One Agent Release circuit with maximum of 6 ARM's or IRM's (any combination)
  - ❑ One Solenoid release circuit which can activate one 24V or two 12V solenoids
  - ❑ Model 10-063-1 provides option to use *both* releasing circuits simultaneously
- **Relays**
  - ❑ General Alarm, Supervisory and Trouble relays
  - ❑ Two Optional CRM4 modules to add eight more SPDT dry relay contact outputs
- **Sprinkler Monitoring Points**
  - ❑ Waterflow input
  - ❑ Supervisory input

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### 3.0 EQUIPMENT/PRODUCTS

#### 3.1 MAIN PANEL HARDWARE

The 10-063 SHP Pro control panel consists of a red (or gray) metal enclosure with removable door for ease of mounting flush or surface. The back-box is 21" high x 14.35" wide x 4" deep. It also includes a 0.5" lip around the back box to facilitate flush mounting.

Refer to Section 3.7 for a complete detail of the back-box dimensions.

The basic part numbers for the components covered in further detail in this section are as follows:

Part Number	Description
10-063-m-c-p	SHP Pro Control System m: 1 = all modes 2 = sprinkler mode only c: R = red, G = gray p: 1 = 120VAC, 2 = 240VAC
10-2452 - m	SHP Pro Controller Printed Circuit Board m: 1 = all modes 2 = sprinkler mode only Compatibility Identifier for this product is "SHP PRO"
10-2450	Class A Input Module
10-2448	Class A Output Module
10-2204	CRM4 Relay Module
10-2190-b	Battery Assembly AH selection b: 1 = 7 AH, 2 = 18 AH
02-3468	Battery, 12VDC, 33 AH
10-2154-C	Battery Enclosure, 33 AH, where C= R for Red; G for Gray
A02-0252	Battery, 12 VDC, 40 AH (requires 66AH enclosure)
10-2236-C	Battery Enclosure, 66 AH, where C= R for Red; G for Gray

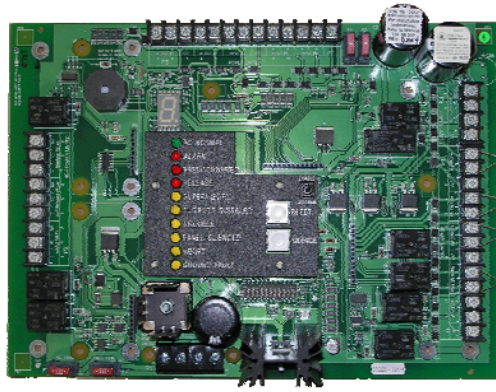
- **10-063 SHP PRO Control System**

Includes the main controller, transformer, and steel enclosure (red or gray). The enclosure door is equipped with a standard Fike keylock and a viewing window covered with clear Lexan. The enclosure includes space for installing batteries (up to 18 AH – ordered separately).



- **10-2452 Series SHP PRO Controller**

The controller is the heart of the SHP Pro control panel. It contains the system's central processing unit, power supply, and other primary components. It also includes the electronics required to support the optional Class A modules and CRM4 Relay modules.



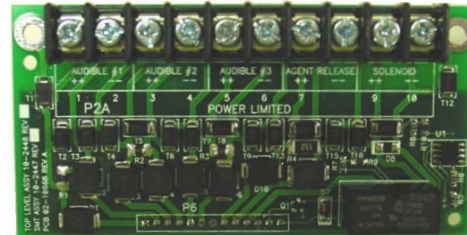
- **10-2450 CLASS A INPUT MODULE**

The optional Class A Input Module allows all of the five initiating device circuits to be wired Class A (Style D) versus the standard Class B (Style B). The Class A module mounts directly onto the SHP Pro Controller at P6 utilizing two standoffs supplied with the module.



- **10-2448 CLASS A OUTPUT MODULE**

The optional Class A Output Module allows all of the three notification appliance and both releasing circuits to be wired Class A (Style Z) versus the standard Class B (Style Y). The Class A module mounts directly onto the SHP Pro Controller at P7 utilizing two standoffs supplied with the module.



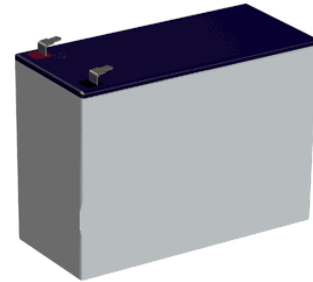
- **10-2204 CRM4 RELAY MODULE**

The optional CRM4 Relay Module provides four SPDT dry contact relays, which activate upon selected events per the configuration switches. The CRM4 Relay modules mount directly onto the SHP Pro Controller at P8 or P9 utilizing four stand-offs supplied with the module.



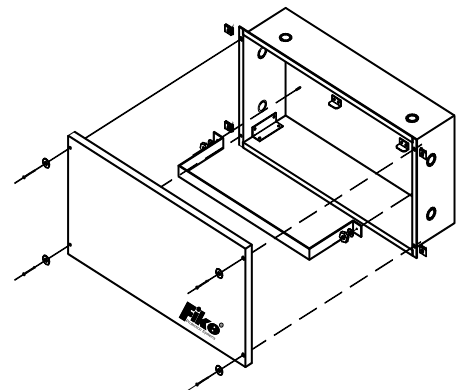
- **10-2190-B Battery Assembly,**
- **02-3468 33 AH Battery,**
- **A02-0252 40 AH Battery**

Batteries are required for alarm systems for maintaining emergency back-up power. Two each 12V batteries are required and are to be wired in series for maintaining a 24VDC back-up. Most systems require at least a 24 hour standby current with 5 minutes alarm current for determining minimum battery size. Refer to Appendix 1 for Battery Calculation form for determining required battery size for system. The 10-2190-1 consists of 2 each 7A-H, 12VDC batteries with a wiring harness. The 10-2190-2 consists of 2 each 18 A-H, 12VDC batteries with the same wiring harness. The 02-3468 and A02-0252 are a single battery part number, a pair would be required for a single SHP Pro system.



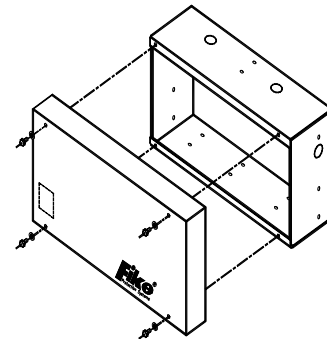
- **10-2154-C Battery Enclosure, 33 AH**  
where C = R for Red  
and G for Gray

The 33 AH Enclosure is a heavy gauge metal enclosure (21" w x 11" h x 5" d) and is large enough to house two each 33 AH batteries. Conduit knockouts are provided to provide entry of battery wiring. The box lid is installed onto the back-box using the 4 mounting screws provided.



- **10-2236-C Battery Enclosure, 66 AH**  
where C = R for Red  
and G for Gray

The 66 AH Enclosure is a heavy gauge metal enclosure (26 1/4" w x 14" h x 7" d) and is large enough to house two each 40 AH batteries. Conduit knockouts are provided to provide entry of battery wiring. The box lid is installed onto the back-box using the 4 mounting screws provided.



### 3.2 INPUT DEVICES

The SHP Pro is required to list compatibility with specific conventional detectors. The following items have been approved for use with the SHP Pro. Refer to the Detection Input Compatibility portion of Section 3.6, Specifications, for selecting the appropriate detector base and head.

Other devices such as contact closure input devices, contact closure detectors, notification appliances, and Solenoids are listed in the Fike Compatibility Document, P/N 06-186.

Mfg	Old Part Number	Part Number	Mfg Model Number	Description
System Sensor		63-1015	2451	Photoelectric ( <b>Discontinued</b> )
		63-1017	2451TH	Photo/heat
		67-1025	1451	Ionization
		60-1027	5451	135° Thermal
		63-1014	2151	Photoelectric (Low Profile)
		67-1040	1151	Ionization (Low Profile) ( <b>Discontinued</b> )
		67-1023	1151	Ionization ( <b>Discontinued</b> )
		67-1026	B401BR470	470 Ω, 6"
		67-1029	B110RLP	470 Ω, 6" , Low Profile
		67-1031	B401B	0 Ω, 6"
Hochiki		63-1024	SLR-24	Photoelectric Detector
		67-1033	SIJ-24	Ionization Detector
		63-1025	SLR-24H	Photo/Thermal Detector
		60-1020	DFE-135	135° F Fixed Temperature Heat Detector
		60-1022	DFE-190	190° F Fixed Temperature Heat Detector
		60-1029	DCD-135	135° F Fixed, Rate of Rise Heat Detector
		60-1030	DCD-190	190° F Fixed, Rate of Rise Heat Detector
		67-1034	NS6-224	430 Ω, 6" Base
		67-1036	NS4-224	430 Ω, 4" Base
		67-1035	NS6-220	220 Ω, 6" Base (SDR or Cross-zone Only)
		67-1037	NS4-220	220 Ω, 4" Base (SDR or Cross-zone Only)
	67-1027	See note below	HSB-224	430 Ω, 6" Base
	67-1028	See note below	YBA-M224	430 Ω, 4" Base ( <b>Discontinued</b> )
	67-1010	See note below	HSB-220	220 Ω, 6" Base (SDR or Cross-zone Only)
	67-1017	See note below	YBA-M220	220 Ω, 4" Base (SDR or Cross-zone Only) ( <b>Discontinued</b> )



**NOTE:** If using LED graphic, it is required to use the older type bases. Please note on the order, "Using conventional graphic with panel, do not substitute bases".

## System Sensor 400 Series Smoke Detectors

- **63-1015 Photoelectric Detector (2451)**

(Discontinued) The 400 Series photoelectric smoke detector contains an optical sensing chamber designed to sense the presence of smoke particles produced by a wide range of combustion sources. A custom integrated circuit incorporates signal processing to reduce false alarms.



- **63-1017 Photo/Heat Detector (2451TH)**

Same as 63-1015 (2451) above, but with a 135° F (57.2 C) fixed temperature, restorable, bi-metallic heat sensor. The alarm contact will transfer if either of the detection types sense the fire.



- **67-1025 Ionization Detector (1451)**

The 400 Series ionization smoke detector includes a specially designed dual source, dual unipolar detection chamber design which will sense the presence of smoke particles produced by fast combustion as well as slow smoldering fires. This chamber exhibits increased stability, significantly reduces nuisance alarms, and provides better performance at higher velocities.



- **60-1027 135° Thermal (5451)**

The 400 Series thermal rate-of-rise with fixed heat detector contains a unique dual thermistor heat sensing circuit to provide maximum performance and solid state reliability. It is designed to initiate an alarm at 135° F and respond to a temperature increase in excess of 15° per minute. This enables the heat detector to communicate an alarm to the central control panel prior to reaching the static set point for these high rates of rise, providing a timely response to both rapid and slow temperature increases. This model should be used in applications where rapid response is desired and where rapid temperature increases would only be caused by a fire emergency.



**Warning: Heat detectors are for property protection only, not life safety!**

## System Sensor 100 Series, Low Profile , Smoke Detectors

- **63-1014 Photoelectric Detector, Low Profile (2151)**

The 100 Series photoelectric smoke detector contains a unique optical sensing chamber designed to sense particles produced by a wide range of combustion sources. A custom integrated circuit incorporates signal processing to reduce false alarms. 1.6" deep profile. Built-in test switch. Two LED's blink in standby and constant in alarm. Field sensitivity metering using optional test module.



- **67-1040 Ionization Detector, Low Profile (1151)**

**(Discontinued)** The 100 Series ionization smoke detector includes a single source, dual chamber design that senses smoke particles. This chamber exhibits excellent stability, significantly reducing nuisance alarms, and provides good performance at higher air velocities. 1.6" deep profile. Built-in test switch. Two LED's blink in standby and constant in alarm. Field sensitivity metering using optional test module.

## System Sensor Bases

- **67-1026 470  $\Omega$  Base, 6" (B401BR470)**

A 6" conventional detection base for use with the **400 Series System Sensor Smoke detectors**. It contains a 470  $\Omega$  current limiting resistor to provide the ability to provide sequential detection.

- **67-1029 470  $\Omega$  Base, 6" Low Profile (B110RLP)**

A 6" conventional detection base for use with the **100 Series System Sensor Smoke detectors**. It contains a 470  $\Omega$  current limiting resistor to provide the ability to provide sequential detection.

- **67-1031 0  $\Omega$  Base, 6" (B401B)**

A 6" conventional detection base for use with the **400 Series System Sensor Smoke detectors**. It contains NO current limiting resistor, so it provides either a single detector release or cross-zoned detection if utilizing both detection circuits.

## Fike private labeled Hochiki detectors

- **63-1024 Photoelectric Detector**

The photoelectric smoke detector is well suited for fires ranging from smoldering to flaming. It utilizes two bi-colored LED's for indication of status. In a normal standby condition the LED's flash Green every 3 seconds. When the detector senses that it's sensitivity has drifted outside the UL listed sensitivity window the LED's will flash Red every 3 seconds. When the detector senses smoke and goes into alarm the status LED's will latch ON Red.



- **67-1033 Ionization Detector**

The Ion Detector can be used in areas where early warning of superheated or flaming combustibles is expected. It utilizes two bi-colored LED's for status indication purposes. In a normal standby condition the LED's flash Green approximately once each second. When the detector senses smoke and goes into alarm the status LED's will latch ON Red.



- **60-1020 Heat Detector 135°F / Fixed Temp**

- **60-1022 Heat Detector 190°F / Fixed Temp**

The heat detector is suited for installation where high heat output fires are expected or in areas where ambient conditions would not allow use of other detection methods. Each detector is fixed temperature rated for 135°F (60-1020) where ambient temperatures do not exceed 120°F or 190°F (60-1022) where ambient temperatures exceed 120°F but not 160°F. Features mechanically operated contact closures. **Contact is not latching.**



- **60-1029 Heat Detector 135°F / Rate-of-Rise**

- **60-1030 Heat Detector 190°F / Rate-of-Rise**

The fixed temperature / rate-of-rise heat detector features electronic circuitry to close normally open contacts when the fixed temperature is reached or when the rate-of-rise is greater than 12°F / minute.



**Warning: Heat detectors are for property protection only, not life safety!**

**Fike private labeled Hochiki bases**

- **67-1034 6" Base**

Electronics-free 6" base with plastic tamper-lock lug. Contains a 430 $\Omega$  resistor. Can be used for Sequential or Cross-zone detection.



- **67-1036 4" Base**

4" version of the 67-1034



- **67-1035 6" Base**

Electronics-free base with plastic tamper-lock lug. Contains a 220 $\Omega$  resistor. Can be used with Cross-zone or Single Detector Release detection.



- **67-1037 4" Base**

4" version of the 67-1035



### 3.3 OUTPUT DEVICES

Refer to FIKE Notification Appliance and Releasing Compatibility Document (06-186).



**3.4 ANCILLARY DEVICES**

The following table lists several ancillary devices that can be used in conjunction with the SHP Pro panel to provide increased system flexibility and performance.

For detailed wiring instructions for each of these devices refer to the appropriate product manual.

P/N	Manual P/N	Description	Function
10-2256	06-159	Digital Alarm Communicator Transmitter (DACT)	Complies with NFPA 72-Supervising Station Fire Alarm System
10-2476		5 Zone Digital Alarm Communicator Transmitter (DACT)	Complies with NFPA 72-Supervising Station Fire Alarm System
10-1832	06-106	ARM-III (Agent Release Module)	Provides a releasing means for Fike's Clean Agent suppression systems with GCA valves
		Conventional Graphic Annunciator	Provides graphic point annunciation for detectors
10-2748	06-552	Impulse Releasing Module	Provides a releasing means for Fike's Clean Agent suppression systems with Impulse valves

• **10-2256 Digital Alarm Communicator Transmitter (DACT)**

The SHP Pro panel is capable of communicating to a Central Station via the DACT (optional). The DACT monitors the relay outputs of the SHP Pro. This model provides 4 channel inputs; 3 standard inputs with one programmable selection. It is necessary to program the DACT with the 10-2257 programmer and 10-2258 cable or 10-2259 modem and 06-151 software.



• **10-2476 5 Zone Digital Alarm Communicator Transmitter (DACT)**

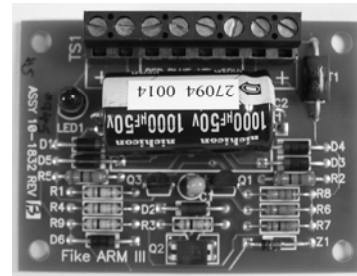
The 5 zone DACT contains inputs configurable for one of the seven types of conditions: Fire Alarm, Waterflow Alarm, Supervisory, Monitor Alarm, System Fault, AC Failure, and Low Battery. It is programmable using the 10-2477 programmer.



- **10-1832 Agent Release Module (ARM III)**

The SHP Pro panel is capable of supporting up to 6 ARM's on the single Agent Release Output Circuit. The ARM is required for each Clean Agent Suppressant Container equipped with a GCA valve.

Refer to the ARM manual, 06-106 for detailed instructions on the ARM.

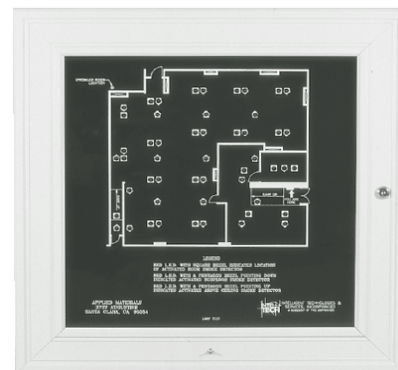


- **Conventional Graphic Annunciator**

Fike Graphic Annunciators provide a graphic display of the protected area using LED's to indicate the location of the smoke detectors. The LED will illuminate when the detector is in alarm. If using the Hochiki smoke detectors with the graphic, it is necessary to use the older model bases.



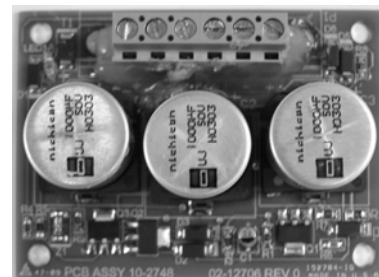
Requires 67-1027 or 67-1010 sensor bases.



- **10-2748 Impulse Releasing Module (IRM)**

The SHP Pro panel is capable of supporting up to 6 IRM's on the single Agent Release Output Circuit. The IRM is required for each Clean Agent Suppressant Container equipped with an Impulse valve.

Refer to the IRM manual, 06-552 for detailed instructions on the IRM.



## 3.5 SPARE PARTS

Description	Part Number
Keylock with cam	02-1606
Panel Key Only (without cam)	02-4983
Battery, 7 Amp-Hour	02-2018
Battery, 18 Amp-Hour	02-2820
Battery, 33 Amp-Hour	02-3468
Battery, 40 Amp-Hour	A02-0252
Wire Assembly, 7/18 AH Batteries	10-2192
Standoff and lock washer/hex nut kit (30 each)	02-4035
Transformer, 110VAC	02-10881
Transformer, 240 VAC	02-10882
Releasing circuit EOL assembly, 2.4K, 1W 5%	02-12281
Switch circuit 3,4 & 5 EOL assembly, 20K	10-2461
Detection circuit 1 & 2 circuit EOL assembly, 4.3K	10-2318
Audible output circuit EOL assembly, 1.2K	10-2570
Fuse, 10 Amp, Mini Auto, Fast Acting (For F1 & F2)	02-4173
Fuse, 4 Amp, Mini Auto, Fast Acting (For F3 & F4)	02-11412
Flashbulb (for testing ARM III release) 12/box	02-3799
End Of Line Relay - Hochiki	02-4667
End Of Line Relay – System Sensor	02-4981
<b>Touch-Up Paint (Not available from Fike)</b>	
Sherwin Williams, Signal Red, RAL 3001 per RAL 840-HR (matt finish)	
Sherwin Williams, Light Gray, RAL 7035 per RAL 840-HR	

3.6 SPECIFICATIONS

Environmental:

All electronics are rated 32° - 120°F (0° - 49°C)  
93% relative humidity

Primary Input AC Power:

120 VAC, 50/60 Hertz, 2.6 Amps, 250 VA  
240 VAC, 50/60 Hertz, 1.5 Amps 250 VA  
System AC line power must originate from a dedicated circuit at the main building power distribution center. The circuit breaker shall be equipped with a lockout mechanism and be clearly labeled as a “**Fire Protection Control Circuit.**”

10-2452-m Controller Board:

The controller’s internal power supply provides 4.135 amps of 24VDC power. Power consumption of the controller itself is 0.135 amps at 24VDC in the normal standby mode. 8 “ high x 11” wide x 3” deep; (1.2 lbs).

• P1 - Power Supply Input:

TERMINAL	DESCRIPTION	NOMINAL RANGE	SPECIFICATION DETAILS
<b>24 VAC</b> Term. 1 & 2	Transformer secondary	20.5-28.1VAC non-power-limited Supervised	<b>Fused by F1</b> <b>(10 Amp field replaceable fuse.)</b> <b>P/N 02-4173</b>
<b>BATTERY</b> Term. 3 & 4 + -	Standby Battery	24VDC nominal non-power-limited  Supervised	Sealed lead-acid batteries only. 40 amp-hour maximum. Maximum supply current: 8 amps/ 27VDC Maximum charge current: 1.5 amps/ 27Vdc Batteries larger than 18 AH shall be mounted in external enclosure and the following qualifications apply: Wire Gauge shall be 14 AWG minimum. Maximum wire length shall not exceed 10 feet.

• P2 – Relays:

	TERMINAL	DESCRIPTION	WIRING	SPECIFICATION DETAILS
<b>ALARM</b>	Term. 1 C	Common	Non Power-limited	SPDT Form C relay contact DC operation: 2 amps @30VDC (pf=.35) AC operation: .5 amps @250VAC (pf=.35) Common (Non Programmable)
	Term. 2 NC	Normally Closed		
	Term. 3 NO	Normally Open		
<b>SUPER-VISORY</b>	Term. 4 C	Common	Non Power-limited	SPDT Form C relay contact DC operation: 2 amps @30VDC (pf=.35) AC operation: .5 amps @250VAC (pf=.35) Common (Non Programmable)
	Term. 5 NC	Normally Closed		
	Term. 6 NO	Normally Open		
<b>TROUBLE</b>	Term. 7 C	Common	Non Power-limited	SPDT Form C relay contact DC operation: 2 amps @30VDC (pf=.35) AC operation: .5 amps @250VAC (pf=.35) Common (Non Programmable)
	Term. 8 NO	Normally Open		
	Term. 9 NC	Normally Closed		



**NOTE:** May be connected to power-limited or non power-limited sources. All connections to terminal block shall be either power-limited or non-power-limited, not both.

• P3 – Input Circuits:

TERMINAL	DESCRIPTION	WIRING	SPECIFICATION DETAILS
<b>DETECT # 1</b> <b>Term. 1 &amp; 2</b> - +  <b>DETECT # 2</b> <b>Term. 4 &amp; 5</b> - +	Detection inputs	Power-limited Class B (Class A with optional 10-2450 module)  4.3K Ω EOL resistor (yellow, orange, red)	Used for conventional detectors listed with this panel (see next section) or contact closure type detectors listed for fire alarm use, or linear heat detection cabling.  19.9 – 27.5 VDC  360 mA max  <u>Max. Wiring Resistance</u>  Compatible Detectors = 20 Ω Linear Heat Detection = 440 Ω Contact Closure = 440 Ω
<b>INPUT #3</b> <b>Term. 6 &amp; 7</b> - +  <b>INPUT # 4</b> <b>Term. 9 &amp; 10</b> - +  <b>INPUT # 5</b> <b>Term. 11 &amp; 12</b> - +	Contact closure inputs	Power-limited Class B (Class A with optional 10-2450 module)  20K Ω EOL resistor (red, black, orange)	Used for contact closure inputs such as Manual Release, Abort, Waterflow and Supervisory listed for fire alarm use, or linear heat detection cabling.  5 VDC max.  0.5 mA max.  100 Ω maximum wire resistance

DETECTION BASE COMPATIBILITY

Fike P/N	Size	Char. Ω	Manufacturer	Mfg. P/N	Manufacturer Compatibility ID	Maximum Bases per Circuit		
						Sequential	Cross-zone	Single Detector Release
67-1034	6"	430	Hochiki	NS6-224	HB-53	25	25	N/A
67-1036	4"	430	Hochiki	NS4-224	HB-5	25	25	N/A
C02-1164	6"	390	Hochiki	HS-221D	HB-4	N/A	25	N/A
67-1035	6"	220	Hochiki	NS6-220	HB-56	N/A	25	25
67-1037	4"	220	Hochiki	NS4-220	HB-3	N/A	25	25
67-1026	6"	470	System Sensor	B401BR470	61-093-02A	25	25	N/A
67-1029	6"	470	System Sensor	B110RLP	61-093-02A	25	25	N/A
67-1031	6"	0	System Sensor	B401B	61-093-02A	N/A	N/A	N/A



**NOTE:** If using LED graphic, it is required to use the older type bases as listed in Section 3.2. Please note on the order, "**Using conventional graphic with panel, do not substitute bases**".



**NOTE:** Detectors of different models/manufacturers shall not be mixed on the system.

## DETECTOR COMPATIBILITY



**NOTE:** Use Hochiki detectors with Hochiki bases and System Sensor detectors with System Sensor bases. **ALSO:** Detectors of different models/manufacturers shall not be mixed on the system.

## HOCHIKI

Fike P/N	Type	Mfg. P/N	Mfg Compatibility ID
63-1024	Photoelectric	SLR-24	HD-3
63-1025	Photo/Heat	SLR-24H	HD-3
67-1033	Ionization	SIJ-24	HD-3
60-1029	Thermal, 135 w/Rate of Rise	DCD-135	
60-1030	Thermal, 190 w/Rate of Rise	DCD-190	
63-032	Photoelectric, Baseless	SLR-835B-2	
60-1020	Thermal, 135 Fixed Temp	AL-DFE-135	
60-1022	Thermal, 190 Fixed Temp	AL-DFE-190	

## SYSTEM SENSOR

Fike P/N	Type	Mfg. P/N	Mfg Compatibility ID
63-1015	Photoelectric	2451	A
63-1017	Photo/Heat	2451TH	A
67-1025	Ionization	1451	A
60-1027	135 Thermal	5451	A
63-1014	Photoelectric	2151	A
67-1023	Ionization	1151	A

LINEAR HEAT DETECTION  
CABLING

UL approved to 8800 feet\*  
FM approved to 10000 feet\*

Fike P/N	Type	Mfg. P/N	Spool Length
63-1067	155 degF, 0.05Ω/ft	TC155	500 feet
63-1107	155 degF, 0.05Ω/ft	TC155	1500 feet
63-1108	155 degF, 0.05Ω/ft	TC155	3000 feet
63-1068	172 degF, 0.05Ω/ft	TC172	500 feet
63-1109	172 degF, 0.05Ω/ft	TC172	1500 feet
63-1110	172 degF, 0.05Ω/ft	TC172	3000 feet
63-1065	190 degF, 0.05Ω/ft	TC190	500 feet
63-1111	190 degF, 0.05Ω/ft	TC190	1500 feet
63-1112	190 degF, 0.05Ω/ft	TC190	3000 feet
63-1066	220 degF, 0.05Ω/ft	TC220	500 feet
63-1113	220 degF, 0.05Ω/ft	TC220	1500 feet
63-1114	220 degF, 0.05Ω/ft	TC220	3000 feet



\*Applies to Detect inputs only

- **P4 – Auxiliary Output Circuits:**



**NOTE:** Total current for system modules, notification appliances circuits, releasing devices, and regulated power circuits MUST NOT exceed the 4.0 Amps supplied by the SHP Pro controller .

TERMINAL	DESCRIPTION	WIRING	SPECIFICATION DETAILS
<b>RES AUX OUTPUT Term. 1 &amp; 2 + -</b>	Resettable Auxiliary Output Power	Power-limited Supervised	Used for 4-wire type detectors or others requiring power to drop out temporarily upon reset of the control panel. 24VDC nominal (Range = 19.8 VDC to 27.3 VDC) 2.0 Amp maximum, Special Application Fused by F3 (4 Amp – p/n 02-11412)
<b>AUX OUTPUT Term. 2 &amp; 3 - +</b>	Auxiliary Output Power	Power-limited Supervised	Used for devices requiring constant 24VDC. 24 VDC nominal (Range = 19.8 VDC to 27.3 VDC) 2.0 Amp maximum, Special Application Fused by F4 (4 Amp – p/n 02-11412)



**NOTE:** Resettable and non-resettable auxiliary power output share the same negative output terminal (#2).

#### Compatible Devices with Auxiliary Output Circuits:

<i>Innovair™ Series Duct Detectors</i>		Manufacturer	MFG p/n
63-033	Duct Detector Unit, Photo-Electric	System Sensor	DH100ACDCLP
67-031	Duct Detector Unit, Ionization	System Sensor	DH100ACDCLI

<i>Switches with Countdown Timers</i>		Manufacturer	MFG p/n
20-040	Digital Countdown Timer w/ Abort Switch	Fike	
20-046	Countdown Timer / Abort Switch / Manual Pull	Fike	

<i>DACT</i>		Manufacturer	MFG p/n
10-2256	DACT	Fike	
10-2476	DACT, 5 Zone Digital Alarm Communicator	Bosch	D9602

• **P5 – Notification Appliance and Releasing Circuits:**

TERMINAL	DESCRIPTION	WIRING	SPECIFICATION DETAILS
<b>AUDIBLE #1</b> <b>Term. 1 &amp; 2</b> + -  <b>AUDIBLE #2</b> <b>Term. 4 &amp; 5</b> + -  <b>AUDIBLE #3</b> <b>Term. 6 &amp; 7</b> + -	Notification outputs	Power-limited Class B (Style Y) or Class A with optional module, 10-2448  Maximum wire resistance limited by the chart following  1.2K $\Omega$ EOL Resistor (Brown, Red, Red)	24VDC nominal, 27.9VDC maximum (16-33 maximum RMS voltage range limits)  2.0 Amps maximum, Regulated  Fike tested indicating appliances compatible with the SHP Pro are detailed in the Fike compatibility document, P/N 06-186
<b>AGENT</b> <b>RELEASE</b> <b>Term. 9 &amp; 10</b> + - <i>polarity shown in                      normal state</i>	Suppressant Agent Release output	Power-limited Class B (Style Y) or Class A with optional module, 10-2448  2.4K $\Omega$ EOL Resistor (Red, Yellow, Red)	24 VDC nominal, Special Application  2 Amps maximum  Compatible with Fike's ARM III, P/N 10-1832 or IRM, P/N 10-2748  6 ARM III's or IRM's maximum (any combination)  Maximum wire resistance: 35 $\Omega$
<b>SOLENOID</b> <b>Term. 11 &amp; 12</b> + -	Sprinkler, Foam Micromist, Inert Gas, and CO <sub>2</sub> Solenoid Release output	Power-limited Class B (Style Y) or Class A with optional module, 10-2448  Maximum wire resistance limited by the chart following	24 VDC nominal, Special Application  2 Amps Maximum  Fike tested and UL/FM approved valves, 0.100 – 1.4 amp valve (18-240 $\Omega$ ) detailed in the Fike compatibility document. P/N 06-186 (FM Group 2 panel)  The solenoid circuit does not require an EOL. It supervises through the coil for wiring integrity.  <i><b>*For testing purposes only*To simulate the                      proper solenoid resistance, a 200 <math>\Omega</math>, 5 watt                      resistor can be used (P/N 02-2686).</b></i>

**FIELD WIRING LIMITATIONS FOR AUDIBLE AND SOLENOID OUTPUTS**

Max Current (Amps)	0.1	0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.5	2.0
Audibles 1-3 (Max $\Omega$ s)	24	12	8	6	4.8	4.0	3.0	2.4	1.6	1.2
Agent Release (Max $\Omega$ s)	35	35	35	35	35	35	35	35	35	35
Solenoid (Max $\Omega$ s)	12	6	4	3	2.4	2.0	1.5	1.2	0.8	0.6



• P6 – Optional Class A Input Module (P/N 10-2450):

TERMINAL	DESCRIPTION	WIRING	SPECIFICATION DETAILS
<b>DETECT # 1</b> <b>Term. 1 &amp; 2</b> -- ++  <b>DETECT # 2</b> <b>Term. 3 &amp; 4</b> -- ++	Detection inputs	Power-limited Class A	Used for conventional detectors listed with this panel (see next section) or contact closure type detectors listed for fire alarm use.  19.9 – 27.5VDC 360 mA max  <u>Max. Wiring Resistance</u>  Compatible Detectors = 20 Ω Linear Heat Detection = 440 Ω Contact Closure = 440 Ω
<b>INPUT # 3</b> <b>Term. 5 &amp; 6</b> -- ++  <b>INPUT # 4</b> <b>Term. 7 &amp; 8</b> -- ++  <b>INPUT # 5</b> <b>Term. 9 &amp; 10</b> -- ++	Contact closure inputs	Power-limited Class A	Used for contact closure inputs such as Manual Release, Abort, Waterflow and Supervisory listed for fire alarm use.  5 VDC max.  0.5 mA max.  100 Ω maximum wire resistance



**NOTE:** If used, all five input circuits must be wired as Class A, rather than Class B.

• **P7 – Optional Class A Output Module (P/N 10-2448):**

TERMINAL	DESCRIPTION	WIRING	SPECIFICATION DETAILS
<b>AUDIBLE #1</b> Term. 1 & 2 ++ --  <b>AUDIBLE #2</b> Term. 3 & 4 ++ --  <b>AUDIBLE #3</b> Term. 5 & 6 ++ --	Notification outputs	Power-limited Class A  Maximum wire resistance limited by the chart on previous page	24VDC nominal  2.0 Amps maximum, Regulated  Fike tested indicating appliances compatible with the SHP Pro are detailed in the Fike compatibility document, P/N 06-186
<b>AGENT RELEASE</b> Term. 7 & 8 ++ -- <i>polarity shown in normal state</i>	Suppressant Agent Release output	Power-limited Class A	24 VDC nominal, Special Application  2 Amps maximum  Compatible with Fike's ARM III, P/N 10-1832 or IRM, P/N 10-2748  6 ARM III's or IRM's maximum (any combination)  Maximum wire resistance: 35 Ω
<b>SOLENOID</b> Term. 9 & 10 ++ --	Sprinkler, Foam Micromist, Inert Gas, and CO <sub>2</sub> Solenoid Release output	Power-limited Class A  Maximum wire resistance limited by the chart on previous page	24 VDC nominal, Special Application  2 Amps Maximum  Fike tested and UL/FM approved valves, 0.100 – 1.4 amp valve (18-240 Ω) detailed in the Fike compatibility document. P/N 06-186 (FM Group 2 panel)  The solenoid circuit does not require an EOL, it supervises through the coil for wiring integrity.  <i>*For testing purposes only*To simulate the proper solenoid resistance, a 200 Ω, 5 watt resistor can be used (P/N 02-2686).</i>

• **P8 – Optional CRM4 Relays (P/N 10-2204):**

	TERMINAL	DESCRIPTION	WIRING	SPECIFICATION DETAILS
<b>RELAY 1-4</b>	Term. 1 C	Common	Non Power-limited	SPDT Form C relay contact DC operation: 2 amps @30VDC (pf=.35) AC operation: .5 amps @120VAC (pf=.35) (Function defined by application)
	Term. 2 NC	Normally Closed		
	Term. 3 NO	Normally Open		



**NOTE:** May be connected to power-limited or non power-limited sources. All connections to terminal block shall be either power-limited or non-power-limited, not both

• **P9 – Optional CRM4 Relays (P/N 10-2204):**

	TERMINAL	DESCRIPTION	WIRING	SPECIFICATION DETAILS
<b>RELAY 1-4</b>	Term. 1 C	Common	Non Power-limited	SPDT Form C relay contact DC operation: 2 amps @ 30VDC (pf=.35) AC operation: .5 amps @120VAC (pf=.35) (Function defined by application)
	Term. 2 NC	Normally Closed		
	Term. 3 NO	Normally Open		



**NOTE:** May be connected to power-limited or non power-limited sources. All connections to terminal block shall be either power-limited or non-power-limited, not both

### 3.7 ENCLOSURE SPECIFICATIONS

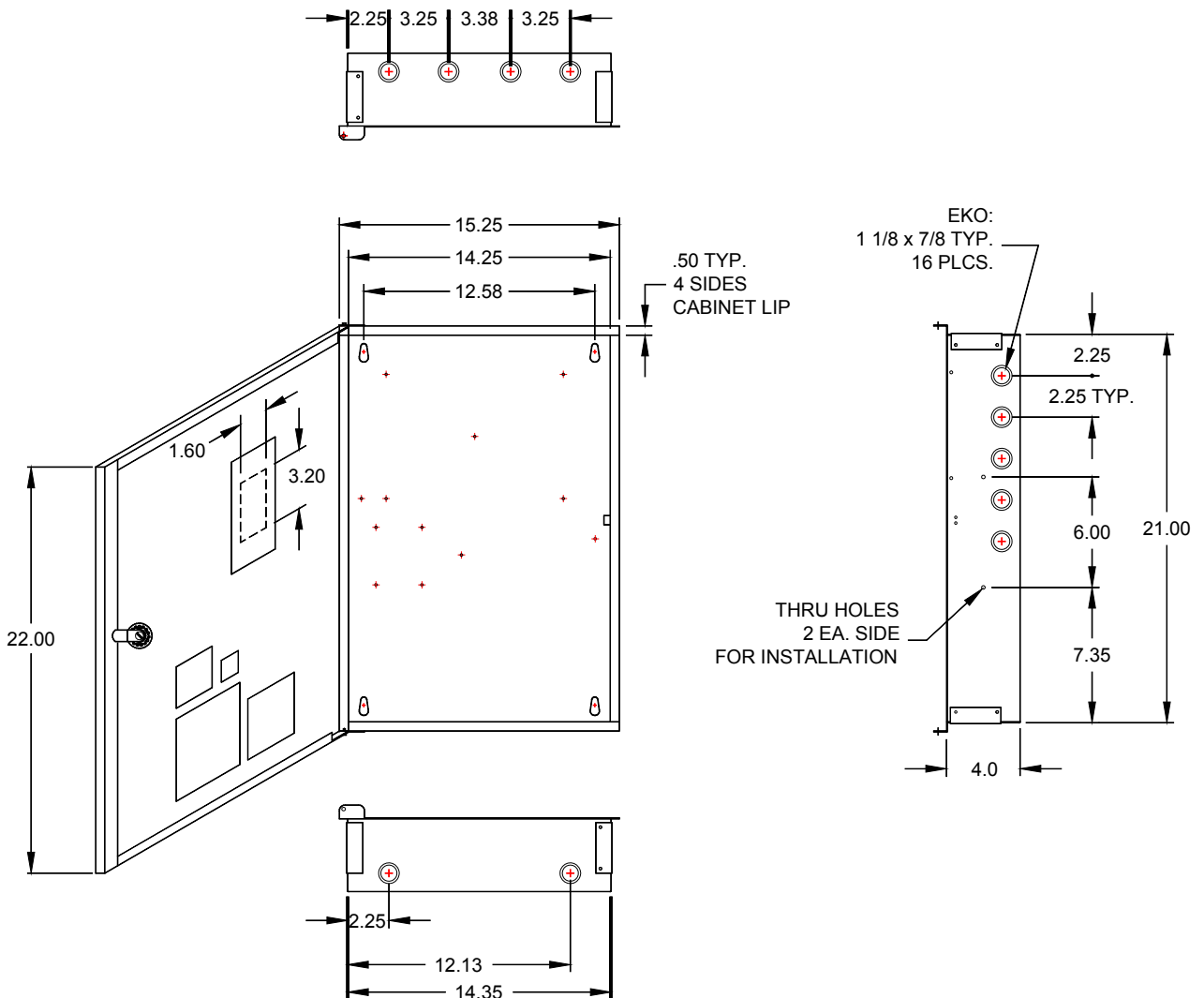
- Mounting Methods:

Surface: Use tear-drop openings in back of back-box

Flush: Use tear-drop openings in back of back-box and 3/16 dia. thru holes, 2 each side for secure installation. This method provides a 1/2 " lip around back-box and removable door with full swing.

- Weight: 15 lbs. empty
- Dimension: 22" High x 15.25" Wide x 4.5" Deep with attached door.  
See below for precise dimensions

The SHP Pro enclosure includes the back-box, door, and power transformer assembly. The enclosure is available in red or gray color options. Optional modules are shipped separately and must be installed in the field.

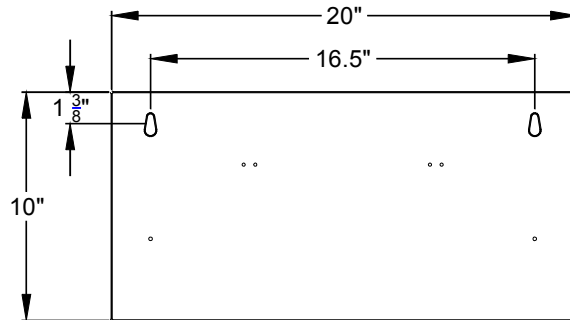
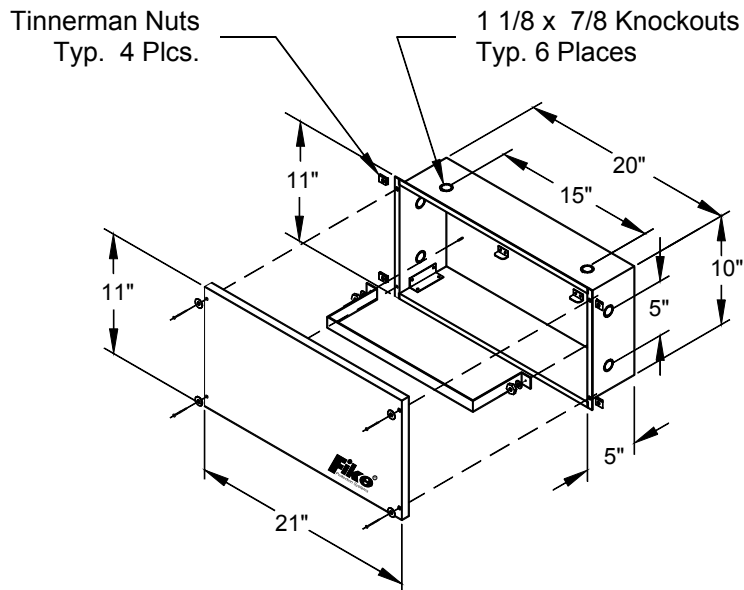


**33 AH Battery Enclosure**

**P/N: 10-2154-C** (C = color)  
 R = Red  
 G = Grey

Mounting Methods:

- Surface: Use tear-drop openings in back of back-box
- Flush: Use tear-drop openings in back of back-box and 3/16 dia. thru holes, 2 each side for secure installation. This method provides a 1/2 " lip around back-box and removable door with full swing.
- Weight: 18 lbs. empty
- Dimension: 11" High x 21" Wide x 5" Deep with attached door.  
See below for precise dimensions



Back View  
 Tear Drop location for Mounting

### 66 AH Battery Enclosure

- P/N: 10-2236-C (C = color)  
 R = Red  
 G = Grey

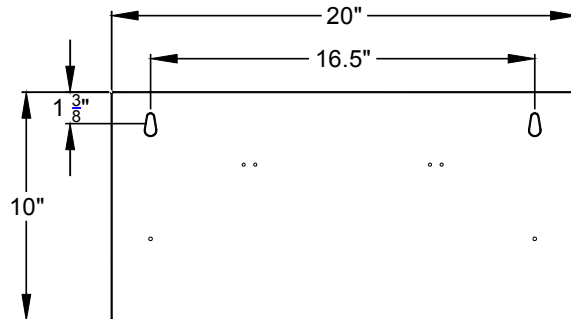
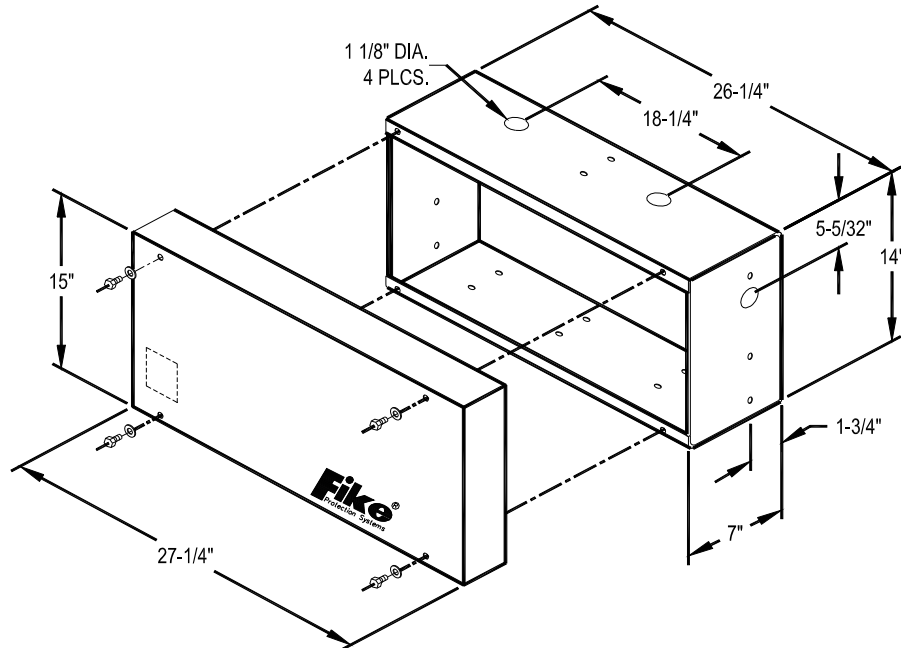
Mounting Methods:

Surface: Use 1/2" diameter thru holes, 4 each in back of enclosure

Flush: Use 1/2" diameter thru holes, 4 each in back of enclosure and recess into wall for secure installation.

Weight: 47 lbs. empty

- Dimension: 14" High x 26 1/4" Wide x 7" Deep with attached door.  
 See below for precise dimensions



Back View  
 Tear Drop location for Mounting

**4.0 INSTALLATION**

<b>NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES</b>			
This product incorporates field-programmable firmware. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all as indicted below.			
<b>Program feature or option</b>	<b>Permitted in UL 864?(Y/N)</b>	<b>Possible settings</b>	<b>Settings permitted in UL</b>
Abort Types 1 - 4	Yes	Types 1-4	Use types 2-3
Micromist Operation	No	Use or Don't use	Don't use

90.23 (UL 864)

**INSTALLATION OVERVIEW**

System installation is independent of whether the modules were ordered separately or as part of a complete SHP Pro system. For optional modules not used, skip the instructions detailing their installation. Proper system installation requires following steps 4.1 – 4.9 in order.



**CAUTION:** The SHP Pro Control System contains static sensitive components. Handle the module by the edges only and avoid touching the integrated components. Keep the module in the protective static bags it was shipped in until time for installation. Always ground yourself with a proper wrist strap before handling the module(s). If the installer is properly grounded at all times, damage due to static discharge will not occur. If the module requires repair or return to Fike, it must be shipped in an anti-static bag.

**4.1 ENCLOSURE INSTALLATION**

The mounting location for the control panel enclosure is very important. Vibration, dust, moisture, electromagnetic interference, and radio frequency interference are all types of problems that could adversely affect the successful operation of the equipment. Choose a mounting location that is free from environmental problems. Refer to Section 3.6, Specifications, for the exact temperature ratings of the equipment. Do not install in an environment that exceeds these temperature ranges. The SHP Pro Control System enclosure is not fire rated.

Determine the maximum number of conductors needed from the design. Wire is to be routed to the control panel through back-box via knock-out openings (Reference Section 3.7). Conduit knock-outs are provided for two distinct conduit sizes. Removing just the inside hole creates a one-half inch (1/2”) opening. Removing the entire opening provides a three-quarter inch (3/4”) opening.



**CAUTION:** Do not install the electronic assemblies into the back-box until the environment is free from construction dust.



**CAUTION:** Do not install on or in a Fire Rated Wall.

The control panel should be installed so the viewing window is approximately 60” above the floor. The back-box can be surface or flush mounted as desired. For surface mounting, utilize the four ‘tear-drop’ openings in the back of the box. For flush mounting, cut the opening in the wall to fit the 21” high by 14.35” wide back-box. Reference Section 3.7, Enclosure Specifications, for enclosure dimensions.

Unless otherwise detailed in this manual, or in other documents relating to this control panel, the technician shall utilize published standards and references such as NFPA 70 National Electrical Code, NFPA 72 National Fire Alarm Code, NFPA 2001 Standard for Clean Agent Fire Extinguishing Systems, and others, which may be relevant to the Local Authority Having Jurisdiction.

## 4.2 POWER AND FIELD WIRING

### Field Wiring / Power-limited Requirements:

Route all field wiring through the appropriate conduit knockouts. Provide adequate wire length for strain relief. SHP Pro terminal blocks (including CRM4 and Class-A modules) accept single wire from 14 to 30 AWG.

**Non Power-limited** - SHP Pro bottom side (P1) connections including AC Power, and Battery power are non-power-limited and shall be routed only in the enclosure's left side.

**Power-limited** - SHP Pro top (P3) and right side (P4 & P5) connections are power-limited and shall not be routed within 2" of the enclosure's left side to ensure segregation from the non-power-limited wiring.



**NOTE:** SHP Pro left side (P2) connections including Alarm, Supervisory, and Trouble relays may be connected to power-limited or non power-limited sources. All connections to terminal block shall be either power-limited or non-power-limited, not both. Also, if connected to power-limited sources, that wiring **MUST** always be segregated for non power-limited wiring feeding transformer and P1 bottom side connections by a minimum of 2 inches.

When planning the type of wire to be used, refer to National Electrical Code, NFPA 70. This information was derived from the 2005 edition.

AWG	Stranding	Nominal Diameter	Uncoated Copper ( $\Omega$ s /1000')	Coated Copper ( $\Omega$ s /1000')
18	solid	0.040"	7.77	8.08
18	7	0.046"	7.95	8.45
16	solid	0.051"	4.89	5.08
16	7	0.058"	4.99	5.29
14	solid	0.064"	3.07	3.19
14	7	0.073"	3.14	3.26

### Abort Switch Wiring Criteria:

Abort input circuits are to be wired only with momentary contact switches so they cannot be left activated without human interaction.

### AC Power & Chassis Wiring

AC power must originate from a dedicated 10 - 20 amp circuit at the main building power distribution center. The circuit breaker must be equipped with a lockout mechanism and be clearly labeled as a

**"Fire Protection Control Circuit."**

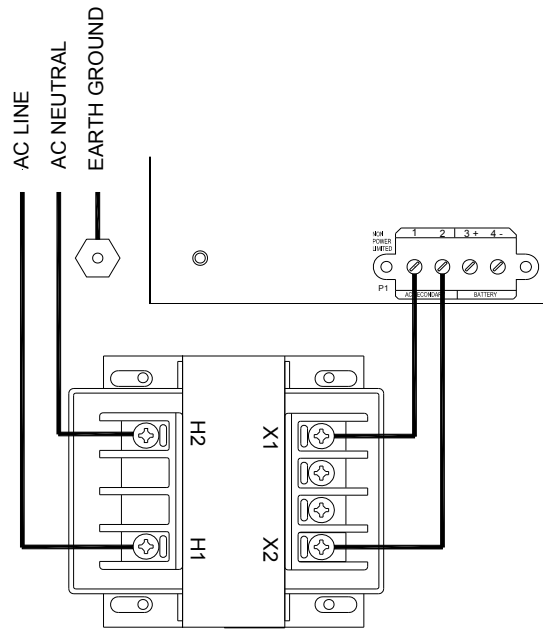


**NOTE:** Complete wiring with AC power off and locked-out. Likewise, remove F2 fuse from the controller board to ensure the batteries cannot provide system power until wiring is completed and system is ready for checkout. **Do not attach gas cartridge actuators or other non-restorable electrical devices until the system has been proven to be fully operational.**

(Also see Section 4.5 and 4.6)

**Transformer:**

The transformer mounts to the four press studs. Align on the studs and attach with four 6-32 nuts and washers. Ensure the power to be used is compatible with the transformer assembly (120VAC or 240VAC). For 120VAC or 240VAC operation, connect the AC hot (line) and neutral directly to the transformer. Connect ground to the chassis standoff. When completed, verify continuity from chassis (green wire) to enclosure and to conduit.





**4.3 WIRING VERIFICATION**

After pulling the wire into the enclosure, verify wire for ground-fault absence and acceptable impedances prior to connecting the initiating and indicating circuits.



**CAUTION:** Field devices shall not be connected if using meggar or any means that applies voltages in excess of device ratings (to prevent damage to the devices).



**NOTE:** To test for ground fault use a resistor or jumper valued at 0 Ω.

**Input Circuits:**

1. Verify no stray voltages exist on any field wiring prior to device installation.
2. Verify each conductor is free from shorts between all other conductors and chassis.
3. Measure wire resistance with a short across the circuit at a point furthest from circuit start. This is typically across EOL for Class B and at the panel for Class A. Verify per these limits:

Detector Circuits Input1, Input2:  
Less than: 20 Ωs/10 per leg

Contact Monitor Circuits Input3, Input4 and Input 5  
Less than: 100 Ωs/50per leg

4. If using contact closure type devices on Detection input #1 or #2, clip the respective “0 ohm resistor” to limit the current flowing through the circuit (shown near the top of the board on the wiring diagram in section 4.6.2).
5. If using linear heat detection cable on Input 1 or Input 2 circuits, do NOT clip the “0 Ω jumper”.

**Output Circuits:**

1. Verify no stray voltages exist on any field wiring prior to device installation.
2. Verify each conductor is free from shorts between all other conductors and chassis.
3. Measure circuit impedance with a short across loop at point furthest from circuit start. This is typically across the EOL or Solenoid for class B and at the panel for Class A.

Verify per these limits:

Max Current (Amps)	0.1	0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.5	2.0
Audibles 1-3 (Max Ωs)	24	12	8	6	4.8	4.0	3.0	2.4	1.6	1.2
Agent Release (Max Ωs)	35	35	35	35	35	35	35	35	35	35
Solenoid (Max Ωs)	12	6	4	3	2.4	2.0	1.5	1.2	0.8	0.6

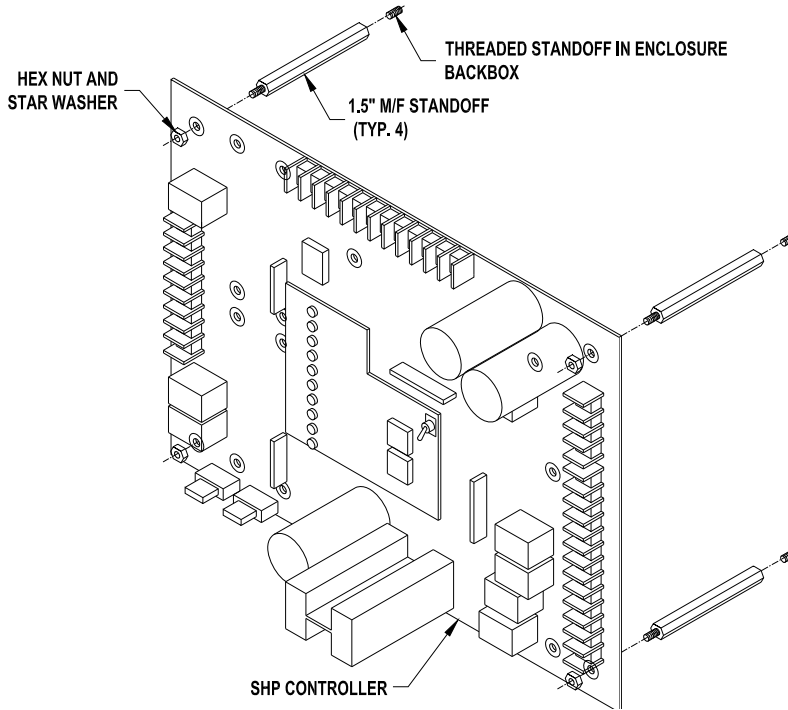
4.4 SYSTEM MODULE INSTALLATION

- Install system modules after the enclosure has been installed and cleaned of all dust and debris. Modules include the appropriate mounting hardware. Prior to handling or installing any modules, appropriate anti-static procedures must be followed per Section 1.6.

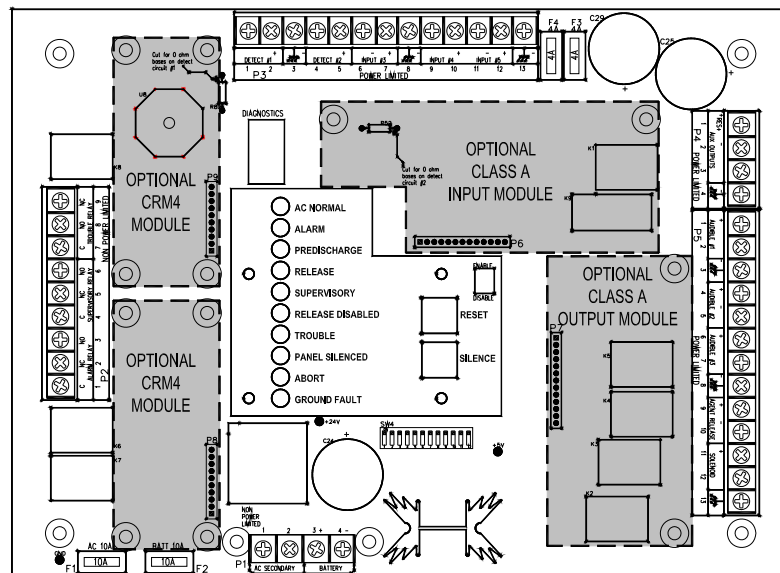
SHP Pro Controller:

The SHP Pro Controller mounts on the five standoffs in the upper half of the enclosure. Secure using the four 6-32 nuts & four lock washers provided.

**NOTE:** Optional modules should be mounted to controller prior to mounting controller into enclosure.

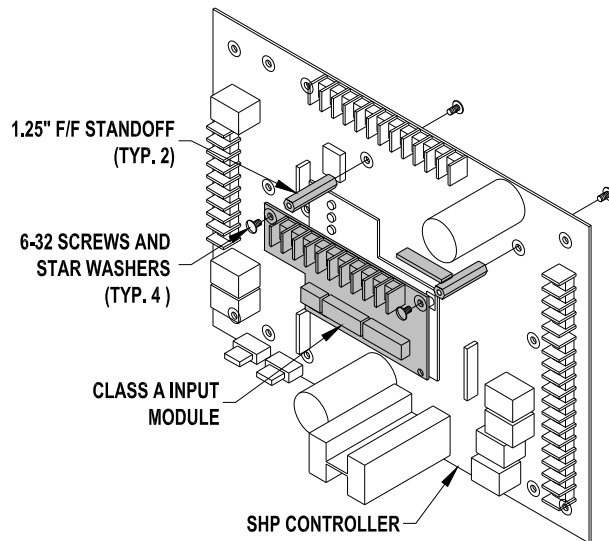


Optional Modules (4 places as shown below)



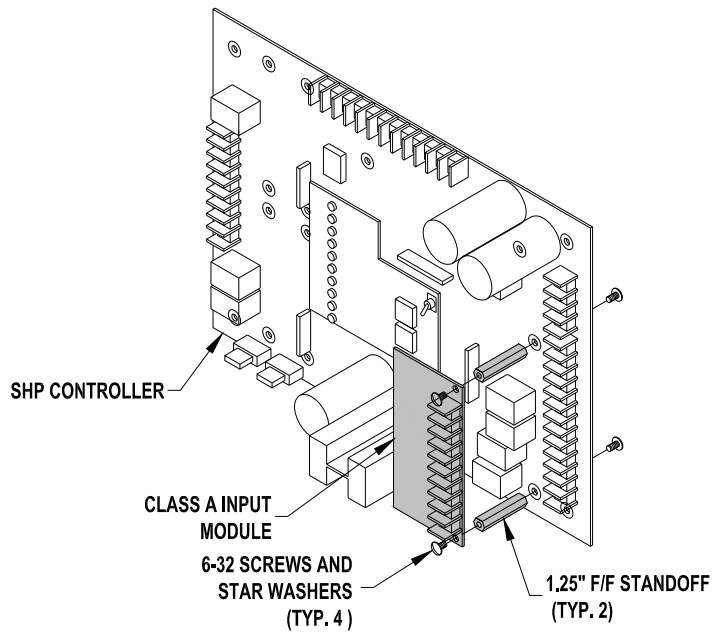
**Class A Input Module:**

Install the two standoffs onto the main control board as shown. The optional Class-A input module connects to header P6. Align using standoffs, and secure into place.



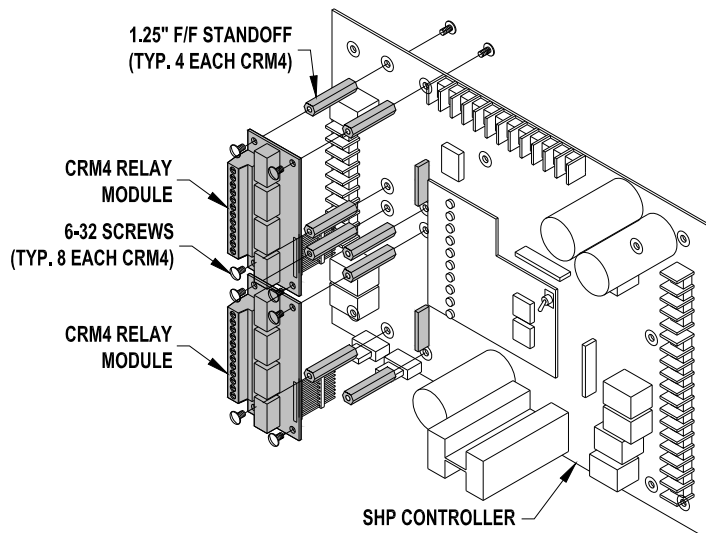
**Class A Output Module:**

Install the two standoffs onto the main control boards as shown. The optional Class A output module connects to header P7. Align using standoffs, and secure into place.



**CRM4:**

The optional CRM4's mount on four standoffs on the SHP Pro's left side P8 and P9 headers. Align using standoffs, press and secure into place.




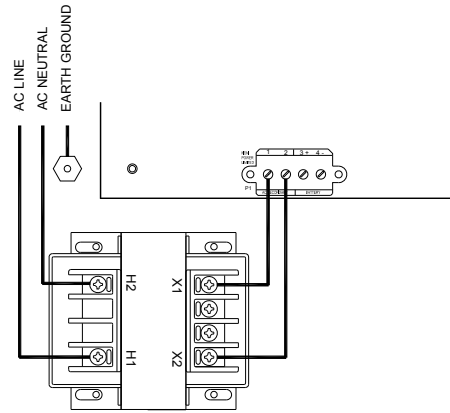
**4.5 INITIAL POWER-UP**

Prior to power-up, interconnect the transformer secondary winding to SHP Pro P1-1 & P1-2 per the wiring diagram. Ensure AC power is wired per the wiring diagram.

With other EOL's still connected, power the system up and validate AC Normal state (green LED). Upon Power-up (or reset) all LED's and piezo are on for 2-4 seconds. Only the following troubles should be annunciated (within 30 seconds).

- \*Trouble LED (yellow) should be illuminated
- \*Diagnostic LED (E) since batteries are not connected.

 **NOTE:** Do not proceed until system is free of troubles except these.



**4.6 COMPLETE FIELD WIRING**

Power the system down by removing and locking out the AC power. Determine the installation application from one of the four applications shown in this section and complete all field wiring per the wiring diagrams in this section. Do not connect any releasing hardware (such as initiators or GCA's) at this time.

**4.6.1 CIRCUIT CONFIGURATION**

Common specifications to all applications:

- Three notification appliance circuits. Each NAC is capable of annunciating a continuous, slow, fast, or synchronized audible/visual output. Modes of operation are described in the Audible Options Table in Section 4.7.1.
- Audible circuits are synced together (if the sync option is selected for the Audible Circuits.)
- Three dedicated relays outputs configured for Alarm, Trouble, and Supervisory. Contact ratings 2A, 30VDC.
- One each, resettable and continuous 2.0A auxiliary outputs.
- Expansion slots compatible with optional Class A input module, Class A output module, and two each CRM4 modules
- 7 segment display for panel condition indication


- Primary indicator LEDs
 


AC Normal	Outputs Disabled
Alarm	Trouble
Pre-discharge	Panel Silenced
Release	Abort
Supervisory	Ground Fault

- Integral power supply capable of 4.0 amps output with 40AH battery charging capability.
- Five initiating device circuits – compatible with Class A module

**Input 1:** Compatible with either 2 wire smoke detectors or Linear Heat Detection cable as Sequential, Cross-zone (with input 2), or Single Detector Release

**Input 2:** Compatible with either 2 wire smoke detectors or Linear Heat Detection cable as Sequential, Cross-zone (with input 1), or Single Detector Release

 **NOTE:** If using 0 Ω detector bases or contact closure devices on Input 1 or Input 2 circuits, clip the pertinent “0 Ω jumper”. Clipping this jumper limits the current to 100 mA for the associated circuit.

 **NOTE:** If using linear heat detection cable on Input 1 or Input 2 circuits, do NOT clip the “0 Ω jumper”.

Hochiki 430 Ω, 220 Ω  
 System Sensor 470 Ω  
 Compatible with contact closure alarm devices

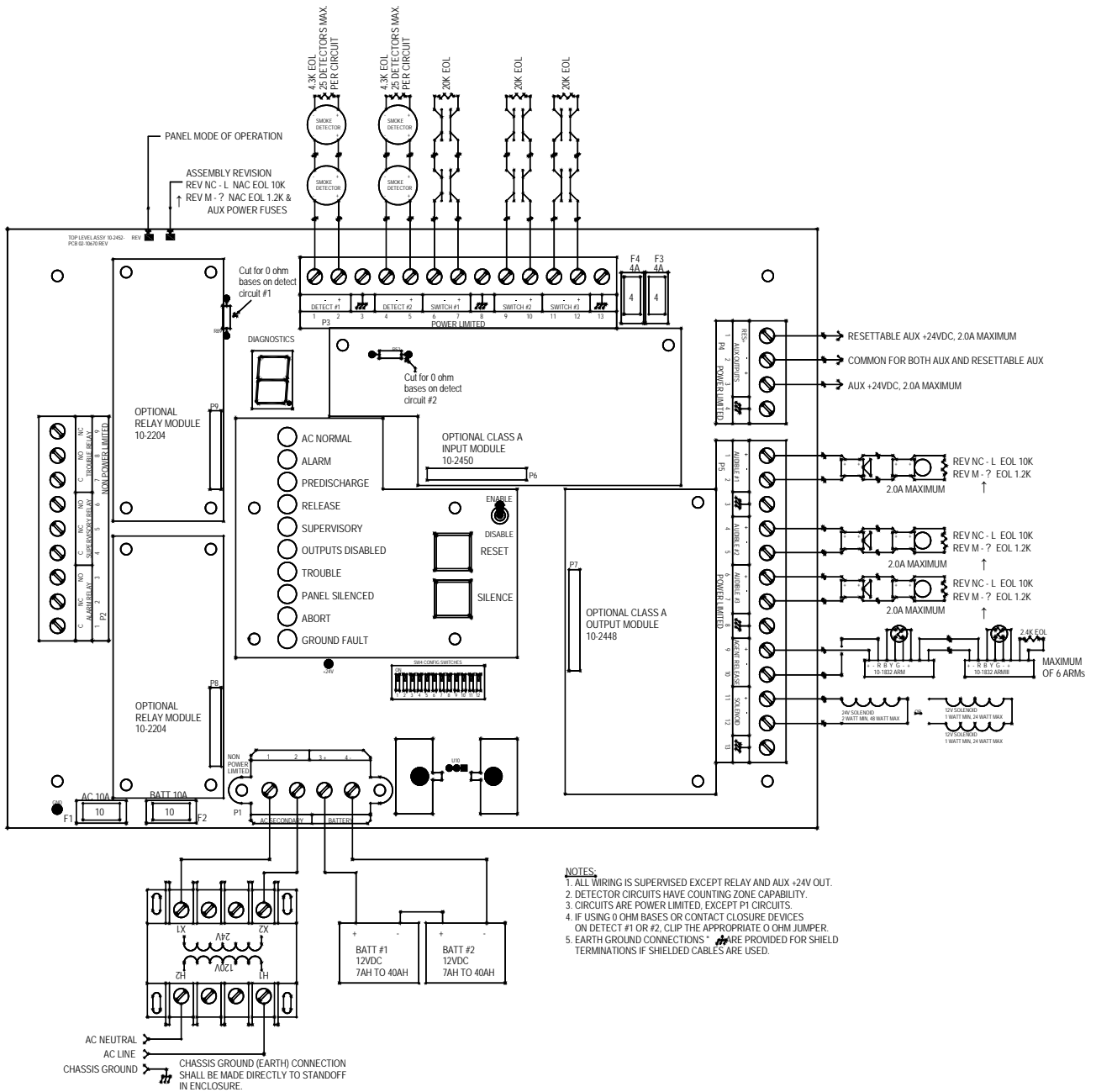
**Input 3:** Compatible with contact closure devices

**Input 4:** Compatible with contact closure devices

**Input 5:** Compatible with contact closure devices

4.6.2 WIRING DIAGRAMS

SHP PRO CONTROLLER

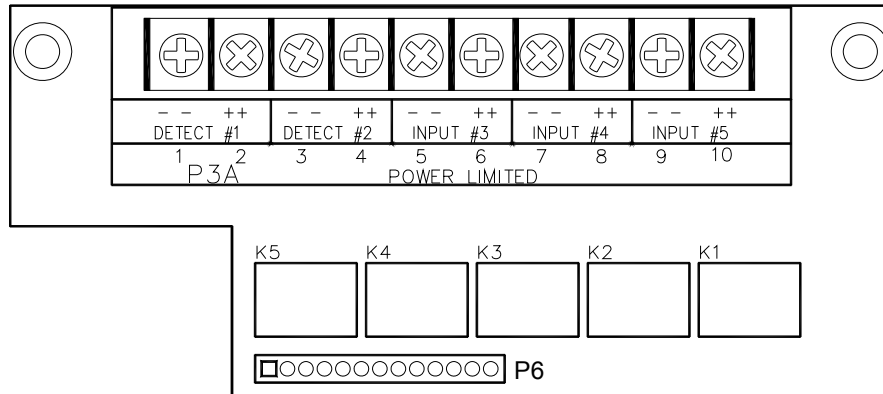


**CLASS A INPUT MODULE, 10-2450**

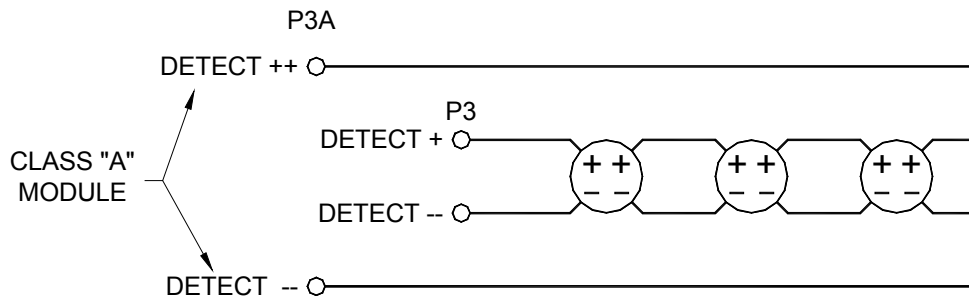
This optional module allows "Class A" wiring of all of the five initiating circuits versus the standard Class B wiring. It mounts directly onto the SHP Pro header P6. If used, all of the five circuits must be wired as Class A rather than Class B.

Dimensions: 4 7/8" long by 2 1/8" tall by 2" deep

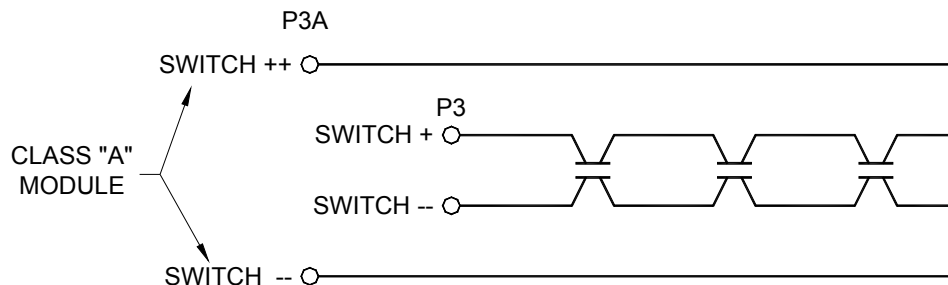
Shipping Weight: 0.10 lbs.



**Detection Inputs 1 and 2:**



**Contact Closure Inputs 3 and 4:**

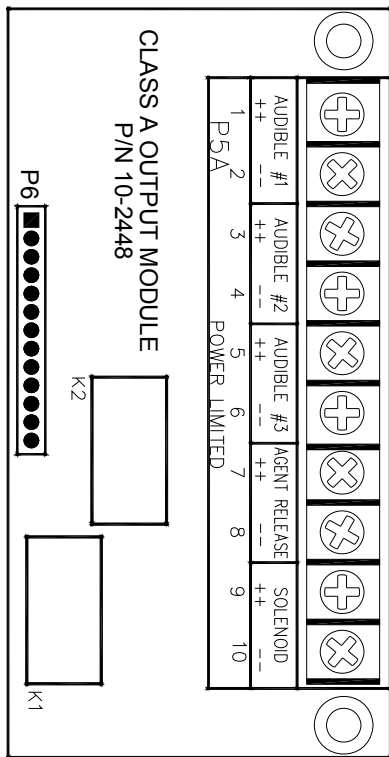


**CLASS A INDICATING APPLIANCE & RELEASE CIRCUITS MODULE, 10-2448**

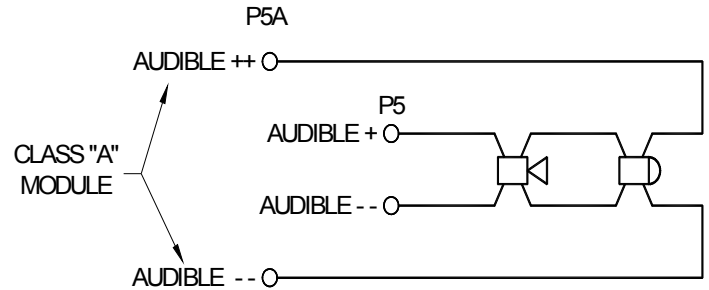
This optional module allows “Class A” wiring of the three notification appliance, agent release and solenoid output circuits versus the standard Class B wiring. It mounts directly onto the SHP Pro header P7. If used, all of the circuits must be wired as Class A rather than Class B.

Dimensions: 4” long by 2” tall by 2” deep

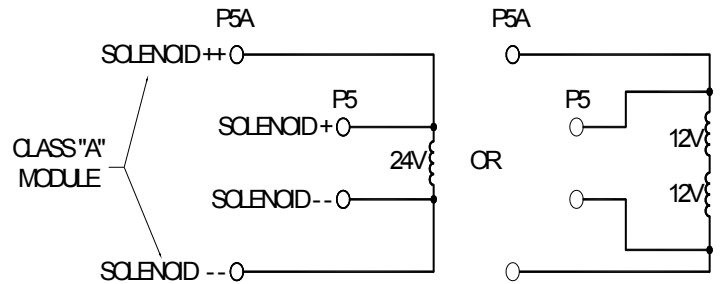
Shipping Weight: 0.10 lbs.



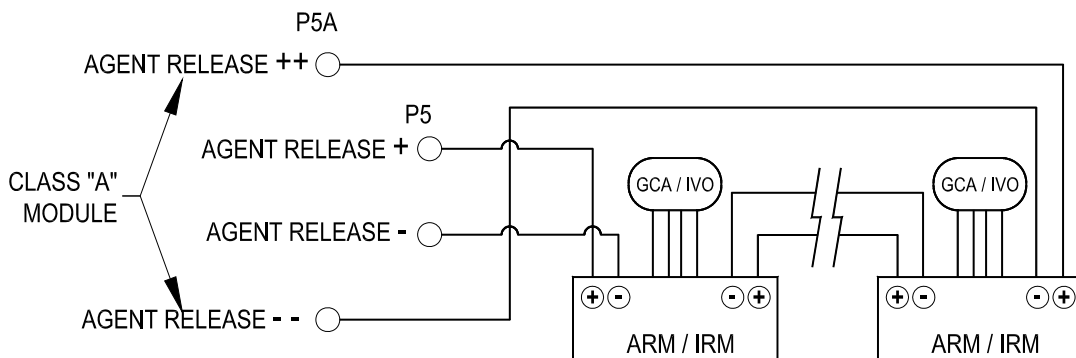
**Audible Outputs 1 thru 3:**



**Solenoid Output:**



**Clean Agent Release Output:**



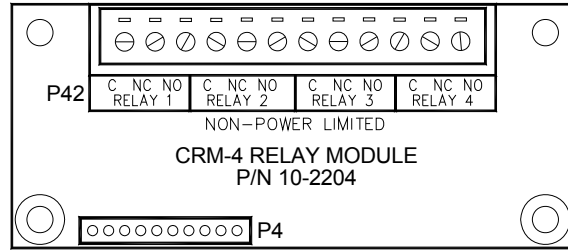
**NOTE:** ARMs and IRMs can be intermixed on the same agent release output (any combination, six maximum).

**CRM4, 10-2204 RELAY MODULE**

The optional Relay Module provides 4 additional dry relay contacts. The relay module is mounted to the SHP Pro main controller at header P8 and/or P9 and is mechanically secured using the (4)-supplied standoffs and screws.

Dimensions: 3 1/2" long by 1 1/2" tall by 2" deep

Shipping Weight: 0.10 lbs.





**4.7 SYSTEM CONFIGURATION (SW4 Settings)**

Set the configuration dipswitch, SW4 to provide the appropriate operation for the installation application:

10-063-2 This Application Only

SW4 Position	Function	0 = Off 1 = On	Clean Agent Application 1	Clean Agent & Preaction Application 2	Preaction Application 3	Industrial Application 4
S1 / S2	Application	0/0	Clean Agent			
		0/1		Clean Agent & Preaction		
		1/0			Preaction	
		1/1				Industrial Solenoid Releasing
S3	Trouble Relay	0		No Delay		
		1		AC Delay ( 2 hours )		
S4 / S5	Audible Operation	0/0		Audible Option 1		
		0/1		Audible Option 2		
		1/0		Audible Option 3		
		1/1		Audible Option 4		
S6	Aud. Sync	0		Gentex Sync		
		1		System Sensor Sync		
S7 / S8	Pre-discharge Delay	0/0		0 seconds	Not Applicable	N / A
		0/1		15 seconds		15 seconds
		1/0		30 seconds		30 seconds
		1/1		60 seconds		60 seconds
S9 / S10	Abort Type or SOL ON time	0/0		Abort - Type 1	Det1 activates SOL	Solenoid ON continuous
		0/1		Abort - Type 2	Det2 activates SOL	Solenoid ON 5 minutes
		1/0		Abort - Type 3	Det1 <b>OR</b> 2 activates SOL	Solenoid ON 10 minutes
		1/1		Abort - Type 4	Det1 <b>AND</b> 2 activates SOL	Solenoid ON 15 minutes
S11	Activation Control	0	Agent Release	0/0 Det1 activates SOL	WF activates SOL	Solenoid ON 20 minutes
		1	24VDC Solenoid	0/1 WF activates SOL	WF <b>does not</b> activate SOL	Solenoid ON 30 minutes
				1/0 Det1 <b>OR</b> WF activates SOL		Micromist - Machinery Spc.
				1/1 Det1 <b>AND</b> WF activates SOL		Micromist - Turbine Gen.
S12	Detection Type	0	Sequential / SDR	↑ S11/S12	Sequential / SDR	
		1	Cross Zone		Cross Zone	



**NOTE: (Audible Options Table in Section 4.7.1)**

4.7.1 Audible Options

Audible Options				
Option #	SW4/SW5	Audible 1	Audible 2	Non-silenceable Audible 3 (on until reset)
<b>Option 1</b> 0/0				
Alarm		ON (continuous)		
Pre-discharge			ON (continuous)	
Release			ON (continuous)	ON (continuous)
<b>Option 2</b> 0/1				
Alarm		ON (continuous)	ON (continuous)	
Pre-discharge			ON (continuous)	
Release			ON (continuous)	ON (continuous)
<b>Option 3</b> 1/0				
Alarm		ON (slow)	ON (continuous)	
Pre-discharge		ON (Fast)	ON (continuous)	
Release		ON (continuous)	ON (continuous)	ON (continuous)
<b>Option 4</b> 1/1				
Alarm		ON (slow)	ON (sync-continuous)	
Pre-discharge		ON (fast)	ON (sync-continuous)	
Release		ON (continuous)	ON (sync-continuous)	ON (sync-continuous)
<b>NOTE:</b>	<b><i>Option 4, Audible 2 - When using this option with compatible combination horn/strobes, and the panel is silenced, the horn will turn off but the strobe will remain on until reset.</i></b>			



**NOTE:** When using more than one Audible circuit for audible device operation (horn or bell), the installation shall not allow two circuits to provide different audible indication during the same state in the same area of protection. For example, using Audible Option 3 with horns attached to circuits 1 and 2 would provide different annunciation during the Alarm state (slow on Audible 1, continuous on Audible 2).

### 4.7.2 ABORT TYPES:

These abort types are programmable via SW4 configuration switches S9-S10. Countdown starts when the system enters the pre-discharge state.



**NOTE:** The ABORT switch delays releases initiated by automatic detection schemes. Releases initiated by activated Manual Release input circuits **override** the Abort Switch.

#### TYPE 1:

The abort is effective only if active upon entry into pre-discharge state. Countdown continues during abort activation. Upon abort deactivation (during pre-discharge), the release cannot again be aborted, so release occurs upon countdown completion. Conforms to Industrial Risk Insurers (IRI) requirements. *(Not UL approved)*

#### TYPE 2:

Countdown continues during abort activation. Release occurs when both the countdown is completed and the abort is deactivated.

#### TYPE 3:

If the abort is active during pre-discharge, release occurs upon abort deactivation.

#### TYPE 4:

Upon abort deactivation, countdown occurs from the full programmed countdown time. Prior to countdown completion, abort activation extends the countdown time to the programmed length. Does not conform to UL requirements, but is allowed by some Local Authority having Jurisdiction. Type 4 with "0" countdown also provides "NYC mode" as described in the note below. *(Not UL approved)*



**NOTE:** *For Abort = 4 with countdown = 00, system operates in "NYC mode" with a 90 second verification delay, then a 30 second countdown after each abort input deactivation. During the 90 second verification delay, the system emulates continuous abort activation. After the 90 second delay, the system starts a 30 second pre-discharge delay.*

4.7.3 Application #1 Detail - Clean Agent Release Only


**Circuit Configurations**


Input 1	Detection
Input 2	Detection
Input 3	Manual Release
Input 4	Abort
Input 5	Supervisory
Audible 1	Refer to Audible Option table
Audible 2	Refer to Audible Option table
Audible 3	Refer to Audible Option table
Agent Release	Clean Agent
Solenoid	Clean Agent
Relay 1 (main)	Alarm
Relay 2 (main)	Supervisory
Relay 3 (main)	Trouble
<b>P8</b> Relay 1 (CRM4-1)	Alarm
Relay 2 (CRM4-1)	Pre-discharge
Relay 3 (CRM4-1)	Release
Relay 4 (CRM4-1)	Abort
<b>P9</b> Relay 1 (CRM4-2)	Alarm
Relay 2 (CRM4-2)	Release
Relay 3 (CRM4-2)	Supervisory
Relay 4 (CRM4-2)	Trouble

**Configuration Selections**

Switch Position	0 = OFF 1 = ON	Operational Characteristics
S1/S2	0/0	Mode 1 Select
S3	0	Trouble Relay - No Delay
	1	Trouble Relay - AC Power Failure Delay (2 hours)
S4/S5	0/0	Audible Option 1
	0/1	Audible Option 2
	1/0	Audible Option 3
	1/1	Audible Option 4
S6	0	Sync Protocol - Gentex*
	1	Sync Protocol - System Sensor*
S7/S8	0/0	Pre-discharge Delay - 0 seconds
	0/1	Pre-discharge Delay - 15 seconds
	1/0	Pre-discharge Delay - 30 seconds
	1/1	Pre-discharge Delay - 60 seconds
S9/S10	0/0	Abort Type - 1
	0/1	Abort Type - 2
	1/0	Abort Type - 3
	1/1	Abort Type - 4
S11	0	Agent Release
	1	24 VDC Solenoid
S12	0	Sequential or Single Detector Release**
	1	Cross-Zone

 \*Requires Audible Option 4

 \*\*Sequential Detection shall be accomplished using 430 Ω bases.

 \*\*Single Detetector Release shall be accomplished using 220 Ω bases.

4.7.4 Application #2 Detail – Clean Agent AND Sprinkler Preaction

**Circuit Configurations**

Input 1	Detection**
Input 2	Waterflow***
Input 3	Manual Release
Input 4	Abort
Input 5	Supervisory
Audible 1	Refer to Audible Option table
Audible 2	Refer to Audible Option table
Audible 3	Refer to Audible Option table
Agent Release	Clean Agent
Solenoid	24 V
Relay 1 (main)	Alarm
Relay 2 (main)	Supervisory
Relay 3 (main)	Trouble
<b>P8</b> Relay 1 (CRM4-1)	Alarm
Relay 2 (CRM4-1)	Pre-discharge
Relay 3 (CRM4-1)	Release
Relay 4 (CRM4-1)	Abort
<b>P9</b> Relay 1 (CRM4-2)	Alarm
Relay 2 (CRM4-2)	Waterflow
Relay 3 (CRM4-2)	Supervisory
Relay 4 (CRM4-2)	Trouble

**Configuration Selections**

Switch Position	0 = OFF 1 = ON	Operational Characteristics
S1/S2	0/1	Mode 2 Select
S3	0	Trouble Relay - No Delay
	1	Trouble Relay - AC Power Failure Delay (2 hours)
S4/S5	0/0	Audible Option 1
	0/1	Audible Option 2
	1/0	Audible Option 3
	1/1	Audible Option 4
S6	0	Sync Protocol - Gentex*
	1	Sync Protocol - System Sensor*
S7/S8	0/0	Pre-discharge Delay - 0 seconds
	0/1	Pre-discharge Delay - 15 seconds
	1/0	Pre-discharge Delay - 30 seconds
	1/1	Pre-discharge Delay - 60 seconds
S9/S10	0/0	Abort Type - 1
	0/1	Abort Type - 2 for Agent Release Output
	1/0	Abort Type - 3 only (not Solenoid)
	1/1	Abort Type - 4
S11/S12	0/0	Detect 1 activates solenoid**
	0/1	Waterflow activates solenoid
	1/0	Detect 1 <b>OR</b> Waterflow activates solenoid
	1/1	Detect 1 <b>AND</b> Waterflow activate solenoid



\*Requires Audible Option 4



\*\*Sequential Detection shall be accomplished using 430 Ω bases.

\*\*Single Detector Release shall be accomplished using 220 Ω bases.



\*\*\*Waterflow input does not effect (completely independent from) clean agent releasing activities.

4.7.5 Application #3 Detail - Preaction Sprinkler, Deluge (10-063-2 this detail only)

**Circuit Configurations**

Input 1	Detection
Input 2	Detection
Input 3	Manual Release
Input 4	Waterflow
Input 5	Supervisory
Audible 1	Refer to Audible Option table
Audible 2	Refer to Audible Option table
Audible 3	Refer to Audible Option table
Agent Release	N/A
Solenoid	24 V
Relay 1 (main)	Alarm
Relay 2 (main)	Supervisory
Relay 3 (main)	Trouble
<b>P8</b> Relay 1 (CRM4-1)	Alarm
Relay 2 (CRM4-1)	Waterflow
Relay 3 (CRM4-1)	Supervisory
Relay 4 (CRM4-1)	Trouble
<b>P9</b> Relay 1 (CRM4-2)	Alarm
Relay 2 (CRM4-2)	Waterflow
Relay 3 (CRM4-2)	Supervisory
Relay 4 (CRM4-2)	Trouble

**Configuration Selections**

Switch Position	0 = OFF 1 = ON	Operational Characteristics
S1/S2	1/0	Mode 3 Select
S3	0	Trouble Relay - No Delay
	1	Trouble Relay - AC Power Failure Delay (2 hours)
S4/S5	0/0	Audible Option 1
	0/1	Audible Option 2
	1/0	Audible Option 3
	1/1	Audible Option 4
S6	0	Sync Protocol - Gentex*
	1	Sync Protocol - System Sensor*
S7	x	Not Used
S8	x	Not Used
S9/S10	0/0	Input 1 activates solenoid
	0/1	Input 2 activates solenoid
	1/0	Input 1 <b>OR</b> Input 2 activates solenoid
	1/1	Input 1 <b>AND</b> Input 2 activates solenoid
S11	0	Waterflow activates solenoid
	1	Waterflow <b>does not</b> activate solenoid
S12	0	Sequential or Single Detector Release**
	1	Cross-Zone
	<b>S9 &amp; S10 operation is void when cross-zone operation is selected</b>	



\*Requires Audible Option 4

\*\*Sequential Detection shall be accomplished using 430 Ω bases.

\*\*Single Detetector Release shall be accomplished using 220 Ω bases.

4.7.6 Application #4 Detail – Industrial Solenoid (CO2, Watermist, Foam, Deluge)


**Circuit Configurations**

Input 1	Detection
Input 2	Detection
Input 3	Manual Release
Input 4	Abort ( <b>hardcoded to Type 4</b> )
Input 5	Supervisory
Audible 1	Refer to Audible Option table
Audible 2	Refer to Audible Option table
Audible 3	Refer to Audible Option table
Agent Release	N/A
Solenoid	24 V
Relay 1 (main)	Alarm
Relay 2 (main)	Supervisory
Relay 3 (main)	Trouble
<b>P8</b> Relay 1 (CRM4-1)	Alarm
Relay 2 (CRM4-1)	Pre-discharge
Relay 3 (CRM4-1)	Release
Relay 4 (CRM4-1)	Abort
<b>P9</b> Relay 1 (CRM4-2)	Alarm
Relay 2 (CRM4-2)	Release
Relay 3 (CRM4-2)	Supervisory
Relay 4 (CRM4-2)	Trouble


**Configuration Selections**

Switch Position	0 = OFF 1 = ON	Operational Characteristics
S1/S2	1/1	Mode 4 Select
S3	0	Trouble Relay - No Delay
	1	Trouble Relay - AC Power Failure Delay (2 hours)
S4/S5	0/0	Audible Option 1
	0/1	Audible Option 2
	1/0	Audible Option 3
	1/1	Audible Option 4
S6	0	Sync Protocol - Gentex*
	1	Sync Protocol - System Sensor*
S7/S8	0/0	<b>N/A</b> - See 2 <sup>nd</sup> note in section 4.7.2
	0/1	Pre-discharge Delay - 15 seconds
	1/0	Pre-discharge Delay - 30 seconds
	1/1	Pre-discharge Delay - 60 seconds
S9/S10/S11	0/0/0	Solenoid on continuous
	0/0/1	Solenoid on 5 minutes
	0/1/0	Solenoid on 10 minutes
	0/1/1	Solenoid on 15 minutes
	1/0/0	Solenoid on 20 minutes
	1/0/1	Solenoid on 30 minutes
	1/1/0	Micromist - Machinery Space***
1/1/1	Micromist - Turbine Generator***	
S12	0	Sequential or Single Detector Release**
	1	Cross-Zone

 \*Requires Audible Option 4

 \*\*Sequential Detection shall be accomplished using 430 Ω bases.

 \*\*Single Detetector Release shall be accomplished using 220 Ω bases.

 \*\*\*Micromist operation not UL 864 9<sup>th</sup> Edition approved.

## 4.8 CHECKOUT SYSTEM

Power the system up and again verify no troubles except for missing batteries. Connect the batteries per the Wiring diagram. After pressing reset switch, verify trouble LED does not illuminate. Perform system check-out per Chapter 6.



**NOTE:** Enable/Disable switch (SW3) should be in the “disable position” upon power-up and power-down to protect against accidental release.

## 4.9 RELEASING HARDWARE

After complete system check-out, connect the releasing hardware according to the appropriate documentation, and enable the Releasing Circuits via SW3.



## 5.0 OPERATIONS

### 5.1 USER SWITCH INTERACTION

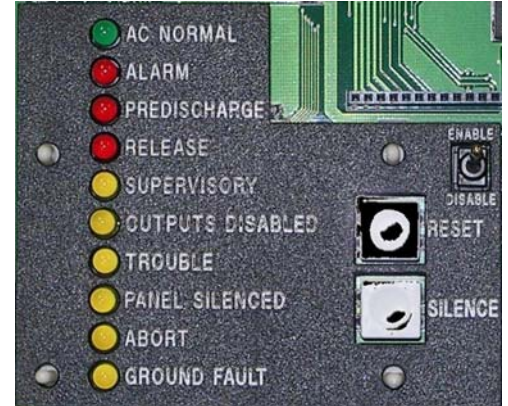
The user switches provide these capabilities:

**Silence Switch:** Silences audibles & piezo. Changes flashing LED's to steady. If held for 3 seconds it will toggle the panel between current history, last 20 events, and A/D conversion (Fike development use only).

**Reset Switch:** Resets system including turning off outputs, interrupting resettable power. Momentarily activates piezo, all LED's, and trouble relay. **Displays panel application number.** Restores system to normal state.

**Enable/Disable:** Disables the agent release and solenoid circuit.

Disables audible circuits and all relay outputs excluding supervisory and trouble.



When an ARM or IRM releasing mechanism is used, do NOT flip the ENABLE/DISABLE switch to the DISABLE position when a ground fault is present on the system. Depending on the source of the ground fault, disabling the release circuit could inadvertently activate the ARM or IRM.

### 5.2 SILENCING RULES

- The Silence switch silences audibles #1 and 2 (but does not effect Relays).
- After silencing, entry into new states only sounds that state's audibles (except entry into release state resounds pre-discharge audibles).
- Alarm, Waterflow, Supervisory, Pre-discharge, Release, and Trouble LED's stay on steady after silencing to acknowledge operator action.
- If the panel is left silenced for a period of approximately 18 hours, the panel will automatically resound.

### 5.3 SUPERVISORY AND TROUBLE STATUS LED'S

Event	LED	Piezo
Upon supervision alarm or trouble	Flashes (2 second rep)	On
Upon silence acknowledge	Steady	Off
Upon event clear	Off	Off
Upon event recurrence	Flashes (2 second rep)	On

Flashes occur for one second every 2 seconds.

Piezo operation is: {Alarm Events: Chirp} {Supervisory: Warble} {Trouble: On steady}

Piezo priority is in same order; alarm events over supervisory events over trouble events.

## 5.4 LATCHING VERSUS NON-LATCHING TROUBLES

### LATCHING TROUBLES

Input circuit open (Codes 1, 2, 3, 4, and 5)  
Agent Release Open (Code 9)  
Solenoid Open (Code 11)  
IntelliFET failure (Code H).

All other troubles are non-latching (upon restoration to a normal condition). If all troubles are non-latching and all have cleared, system clears to normal. Upon clearing of non-latching troubles (including AC power loss) the diagnostic code will clear, the trouble relay will return to normal, and the LED will extinguish.



**NOTE:** Press and hold the SILENCE button for 3 seconds to display the history of the last 20 events on the diagnostics display. If pressed and held another 3 seconds, it will display A/D information. (Contact Fike Technical Support for use of this feature.)

## 5.5 SUPERVISION RESPONSE TIMES

Supervision of circuits is designed to be within 90 seconds on all circuits.

Supervision is delayed up to 15 seconds immediately after a reset or power-up for detection input only.



**NOTE:** Audible circuits are not supervised during any active alarm condition.

## 5.6 LOW POWER CONDITIONS

### 5.6.1 AC POWER

The system is designed to suspend detector operation if AC power is missing and system battery power falls below 20.4V ("F" trouble) since detector operation is not guaranteed at these voltages. System field design and maintenance should be such to prevent this occurrence. After occurrence, restarting the system requires return of AC power in conjunction with a manual system reset.

System will register brown-out trouble if AC voltage is less than approximately 85% of rating. Both AC power and battery power are enabled at all times, allowing each to supplement the other. Partial fall-out of one power source permits the other to provide most of the needed power.

### 5.6.2 BATTERY POWER

The system is designed to monitor the battery charging circuit. (*Older panels used to monitor voltage only instead of current.*) If the batteries do not monitor enough current being drawn by the batteries, the panel will produce a battery failure trouble.



**NOTE:** During any active alarm or supervisory event, the panel does **NOT** supervise for loss of battery charging current.

## 5.7 DIAGNOSTIC LED CODE DESIGNATORS

The current events, history events and Analog to Digital conversion can be viewed by pressing the silence switch for 3 seconds. This will toggle the panel segment diagnostic LED.

The seven segment diagnostic LED cycles through display of these codes (with or without a period) for the events that have occurred since the last reset. For example, if input circuit #3 is activated, the LED displays "3."



**NOTE:** The period portion of the display is often overlooked. When viewing the diagnostic codes, do not overlook the period.



**NOTE:** The letter "b" is often misinterpreted as the number 6.

Circuit/Mode	Code	Condition	Code with Period	Condition
DETECT #1	1	Open*	1.	Activated*
DETECT #2	2	Open*	2.	Activated*
INPUT #3	3	Open*	3.	Activated*
INPUT #4	4	Open*	4.	Activated**
INPUT #5	5	Open*	5.	Activated
AUDIBLE #1	6	Open	6.	Shorted
AUDIBLE #2	7	Open	7.	Shorted
AUDIBLE #3	8	Open	8.	Shorted
AGENT RELEASE	9	Open*	9.	Shorted
SOLENOID	11	Open*	11.	Shorted
Abort Input	A	Valid Abort		
Invalid Abort	b	Abort, premature	b.	Abort, late
2nd Alarm Active	C	Input Circuit 1*	C.	Input Circuit 2*
DISABLED (toggle switch)	d			
Battery Failure	E	Missing Battery		
System Voltage	F	Low Voltage (<19 VDC)		
Microcontroller	H	Intelli-FET (FAILED)*	H.	5V ref./ADC failure
Ground Fault	Q			
Reset	P			
Power Failure	-	AC Brown-out (<85%)		
Auxiliary Output	α	AUX Output #1 Open	α.	AUX Output #2 Open

\*Latching Condition, requires Reset to clear.

\*\*Latching only for Application 3

## 5.8 TYPICAL ALARM OPERATION

Upon alarm of a first detector, system enters alarm state. Typical response includes:

Piezo:	Chirp (On & Off pattern) until silenced.
Alarm LED:	Flash. After silencing, illuminate steady.
Alarm Relay:	Activate.
Alarm Audibles:	Activate until silenced.

Upon alarm of a second detector meeting the cross-zone or sequential alarm detection criteria (or alarm of the first SDR detector), system enters pre-discharge state. Typical response changes to:

Piezo:	Chirp (On & Off pattern) until silenced.
Pre-discharge LED:	Flash. After silencing, illuminate steady.
Pre-discharge Relay:	Activate. Alarm relay also remains active.
Alarm Audibles:	Activate until silenced.
Pre-discharge Audibles:	Activate until silenced.

Upon completion of pre-discharge countdown (or activation of a manual release), system enters release state. Typical response changes to:

Piezo:	Chirp (On & Off pattern) until silenced.
Release LED:	Flash. After silencing, illuminate steady.
Release Relay:	Activate. Alarm & Pre-discharge relays also remain active.
Alarm Audible:	Activate until silenced.
Pre-discharge LED:	OFF
Pre-discharge Audibles:	Activate. (Unsilence if silenced)
Release Audibles:	Activate until silenced.
Release Circuits:	Activate AgtRel or solenoid circuit.

Upon activation of the Abort Switch, system responds with a trouble condition if it is not a valid abort time.

While activated during a valid abort time, typical system response includes:

Piezo:	Chirp (On & Off pattern) until silenced.
Abort LED:	Flash while Abort is active. Steady after silencing.
Abort Relay:	Activated while Abort is held.
Count-down timer:	Modified (or paused) per abort type description.
Pre-discharge Audibles:	Unsilenced upon deactivation of abort switch, if pertinent.

**NOTE:** During activation of multiple events, piezo priority is alarm over supervisory over trouble.

Alarm events are latching and require the operator to reset the panel to clear the event.

## 5.9 SUPERVISORY OPERATION

Upon activation of a supervisory input, system enters supervisory state. Typical response includes:

Piezo:	Warble (On & Off pattern) until silenced.
Supervisory LED:	Flash. After silencing, illuminate steady.
Supervisory Relay:	Activate.

A supervisory input is non-latching and the panel will follow the status of the input.

## 5.10 TROUBLE OPERATION

Upon occurrence of a trouble condition, system enters trouble state. Typical response includes:

Piezo:	Steady on until silenced.
Trouble LED:	Flash. After silencing, illuminate steady.
Trouble Relay:	Activate.
Diagnostic LED:	Displays code or codes corresponding to trouble conditions.

Many trouble events are non-latching (see section 5.4). If the trouble is non-latching and it clears, the panel will return to normal. If the trouble is latching, the operator will be required to press the RESET switch to clear the trouble event.

5.11 SHP PRO INPUT / OUTPUT MATRIX

Panel Application 1 Agent		Clean	Audible 1	Audible 2	Audible 3	Agent Release	Solenoid (2-12V or 1-24V)	P2 Alarm Relay	P2 Supervisory Relay	P2 Trouble Relay	P8 Relay 1 - Alarm	P8 Relay 2 - Predischarge	P8 Relay 3 - Release	P8 Relay 4 - Abort	P9 Relay 1 - Alarm	P9 Relay 2 - Release	P9 Relay 3 - Supervisory	P9 Relay 4 - Trouble		
Alarm			See audible options table					ON			ON				ON					
Pre-discharge										ON			ON	ON			ON			
Valid Abort																ON				
Release	S11 = 0 S11 = 1								ON	ON			ON	ON	ON		ON	ON		
Invalid Abort*									ON *					ON				ON *		
Supervisory								ON									ON			
SW3 Disable		Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON		
Trouble										ON								ON		

\*A trouble condition will be created if the Abort is initiated with no alarm present.

See next page for Application #2 - Clean Agent Release AND Sprinkler Preaction

Panel Application 3 Preaction		Audible 1	Audible 2	Audible 3	Agent Release	Solenoid (2-12V or 1-24V)	P2 Alarm Relay	P2 Supervisory Relay	P2 Trouble Relay	P8 Relay 1 - Alarm	P8 Relay 2 - Waterflow	P8 Relay 3 - Supervisory	P8 Relay 4 - Trouble	P9 Relay 1 - Alarm	P9 Relay 2 - Waterflow	P9 Relay 3 - Supervisory	P9 Relay 4 - Trouble		
Alarm			See audible options table				ON			ON				ON					
Pre-discharge								ON	ON			ON				ON			
Release								ON	ON			ON				ON	ON		
Waterflow (alarm)								ON **	ON			ON	ON			ON	ON		
Supervisory							ON					ON				ON			
SW3 Disable		Disabled	Disabled	Disabled		Disabled	Disabled	ON	ON	Disabled	Disabled	ON	ON	Disabled	Disabled	ON	ON		
Trouble									ON								ON		

\*A trouble condition will be created if the Abort is initiated with no alarm present.

\*\*Switch 11 determines the operation of the Solenoid with the Waterflow input (SW11 = OFF, Solenoid will activate with Waterflow input active)

Panel Application 4 Industrial Solenoid Releasing		Audible 1	Audible 2	Audible 3	Agent Release	Solenoid (2-12V or 1-24V)	P2 Alarm Relay	P2 Supervisory Relay	P2 Trouble Relay	P8 Relay 1 - Alarm	P8 Relay 2 - Predischarge	P8 Relay 3 - Release	P8 Relay 4 - Abort	P9 Relay 1 - Alarm	P9 Relay 2 - Release	P9 Relay 3 - Supervisory	P9 Relay 4 - Trouble		
Alarm			See audible options table				ON			ON				ON					
Pre-discharge								ON				ON	ON			ON			
Valid Abort																ON			
Release								ON	ON			ON	ON	ON		ON	ON		
Invalid Abort*									ON *				ON				ON *		
Supervisory							ON									ON			
SW3 Disable		Disabled	Disabled	Disabled		Disabled	Disabled	ON	ON	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON		
Trouble									ON								ON		

\*A trouble condition will be created if the Abort is initiated with no alarm present.



**NOTE: Audible Options Table is Section 4.7.1**

Panel Application 2 Detector 1 Operates Solenoid		Audible 1	Audible 2	Audible 3	Agent Release	Solenoid (2-12V or 1-24V)	P2 Alarm Relay	P2 Supervisory Relay	P2 Trouble Relay	P8 Relay 1 - Alarm	P8 Relay 2 - Predischarge	P8 Relay 3 - Release	P8 Relay 4 - Abort	P9 Relay 1 - Alarm	P9 Relay 2 - Release	P9 Relay 3 - Supervisory	P9 Relay 4 - Trouble
Alarm	See audible options table						ON			ON				ON			
Pre-discharge						ON	ON			ON	ON			ON			
Release					ON	ON	ON			ON	ON	ON		ON			
Manual Release					ON	ON	ON			ON	ON	ON		ON			
Waterflow							ON			ON				ON	ON		
Abort									ON *				ON				ON *
Supervisory								ON								ON	
SW3 Disable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON
Trouble									ON								ON

Panel Application 2 Waterflow Operates Solenoid		Audible 1	Audible 2	Audible 3	Agent Release	Solenoid (2-12V or 1-24V)	P2 Alarm Relay	P2 Supervisory Relay	P2 Trouble Relay	P8 Relay 1 - Alarm	P8 Relay 2 - Predischarge	P8 Relay 3 - Release	P8 Relay 4 - Abort	P9 Relay 1 - Alarm	P9 Relay 2 - Release	P9 Relay 3 - Supervisory	P9 Relay 4 - Trouble
Alarm	See audible options table						ON			ON				ON			
Pre-discharge							ON			ON	ON			ON			
Release					ON		ON			ON	ON	ON		ON			
Manual Release					ON		ON			ON	ON	ON		ON			
Waterflow					ON	ON				ON				ON	ON		
Abort									ON *				ON				ON *
Supervisory								ON								ON	
SW3 Disable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON
Trouble									ON								ON

Panel Application 2 Detector 1 OR Waterflow Operates Solenoid		Audible 1	Audible 2	Audible 3	Agent Release	Solenoid (2-12V or 1-24V)	P2 Alarm Relay	P2 Supervisory Relay	P2 Trouble Relay	P8 Relay 1 - Alarm	P8 Relay 2 - Predischarge	P8 Relay 3 - Release	P8 Relay 4 - Abort	P9 Relay 1 - Alarm	P9 Relay 2 - Release	P9 Relay 3 - Supervisory	P9 Relay 4 - Trouble
Alarm	See audible options table						ON			ON				ON			
Pre-discharge						ON	ON			ON	ON			ON			
Release					ON	ON	ON			ON	ON	ON		ON			
Manual Release					ON	ON	ON			ON	ON	ON		ON			
Waterflow					ON	ON				ON				ON	ON		
Abort									ON *				ON				ON *
Supervisory								ON								ON	
SW3 Disable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON
Trouble									ON								ON

Panel Application 2 Detector 1 AND Waterflow Operates Solenoid		Audible 1	Audible 2	Audible 3	Agent Release	Solenoid (2-12V or 1-24V)	P2 Alarm Relay	P2 Supervisory Relay	P2 Trouble Relay	P8 Relay 1 - Alarm	P8 Relay 2 - Predischarge	P8 Relay 3 - Release	P8 Relay 4 - Abort	P9 Relay 1 - Alarm	P9 Relay 2 - Release	P9 Relay 3 - Supervisory	P9 Relay 4 - Trouble
Alarm	See audible options table						ON			ON				ON			
Pre-discharge						ON	ON			ON	ON			ON			
Release					ON	ON	ON			ON	ON	ON		ON			
Manual Release					ON	ON	ON			ON	ON	ON		ON			
Waterflow					ON	ON				ON				ON	ON		
Abort									ON *				ON				ON *
Supervisory								ON								ON	
SW3 Disable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	ON	ON
Trouble									ON								ON



**NOTE: Audible Options Table is Section 4.7.1**

## 6.0 SERVICING

Qualified individuals shall perform Inspection, Testing, and Maintenance. Fike provides a training class on the SHP Pro for Factory Authorized Distributors. The training class provides Certification for Installation, Service and Maintenance of the SHP Pro. The certified individual performing the service must have also read this entire manual and understand the basics of Fire Alarm Systems, codes, and standards. Before proceeding with any testing, notify all building occupants and any parties monitoring the Fire Control System. Notification must also be performed at the conclusion of the testing.

### 6.1 CHECKOUT

After system installation per previous chapters, verify system operation to the satisfaction of the authority having jurisdiction. As required, the **Record of Completion** in Chapter 1 of NFPA 72 must be completed.

For systems utilizing an ARM or IRM module to release a suppression system, properly disconnect the releasing mechanism (i.e., initiator, GCA, IVO) prior to testing the integrity of the releasing circuit. After testing is complete, check the system for the presence of ground faults. **Do not** re-connect the releasing device if any ground faults are present on the system. This could cause inadvertent activation of the suppression system.

Refer to Fike document 06-106, "Agent Release Module (ARM-III) manual" for installation and testing instructions.

Refer to Fike document 06-552, "Impulse Releasing Module (IRM) manual" for installation and testing instructions.



**When an ARM or IRM releasing mechanism is used, do NOT flip the ENABLE/DISABLE switch to the DISABLE position when a ground fault is present on the system. Depending on the source of the ground fault, disabling the release circuit could inadvertently activate the ARM.**



**NOTE:** Use the Arm/Disable Switch (SW3) to disable the Agent Release and Solenoid circuits during system checkout and maintenance. As a minimum, place SW3 in the "disable" position upon system power-up and power-down. After power-down, allow the ARM/IRM module ten minutes to self-discharge prior to maintenance to prevent accidental firing of the system.

### 6.2 MAINTENANCE

Periodic maintenance, replacement and testing shall be, as a minimum, performed per NFPA 72. Maintenance shall be performed by a trained or authorized Fike representative. Certain components of the SHP Pro require replacement, even though no obvious sign of failure is present.

- Batteries (Lead Acid)  
Replace every 3 years according to date of manufacture
- Gas Cartridge Actuator (GCA)  
Replace every 10 years according to date of manufacture
- Initiator  
Replace every 5 years according to date of installation

### 6.3 TROUBLESHOOTING

System troubles and events are displayed via the diagnostic LED codes defined in Section 5.7. Additional troubleshooting aids are provided in Section 6.3.1.

## 6.3.1 EVENT DESCRIPTION / POSSIBLE RESOLUTION

Diagnostic Display Code	Description	Tips For Resolution
1 2	Detection Circuit 1 open Detection Circuit 2 open	<ul style="list-style-type: none"> <li>◆ Verify correct value EOL resistor (4.3K <math>\Omega</math> - Yellow, Orange, Red)</li> <li>◆ Measure field wiring resistance = 20 <math>\Omega</math> or less.</li> <li>◆ Verify all devices are installed properly (smoke detector heads installed on bases).</li> <li>◆ Remove field wiring and install a 4.3K <math>\Omega</math> resistor at the panel to verify the SHP Pro Control Board is functioning properly.</li> <li>◆ Latching, requires Reset to clear</li> </ul>
3 4 5	Input Circuit 3 open Input Circuit 4 open Input Circuit 5 open	<ul style="list-style-type: none"> <li>◆ Verify correct value EOL resistor (20K <math>\Omega</math> - Red, Black, Orange)</li> <li>◆ Measure field wiring resistance = 100 <math>\Omega</math> or less.</li> <li>◆ Verify all field devices are installed properly.</li> <li>◆ Remove field wiring and install a 20K <math>\Omega</math> resistor at the panel to verify the SHP Pro Control Board is functioning properly.</li> <li>◆ Latching, requires Reset to clear</li> </ul>
1. 2. 3. 4. 5.	Detection Circuit 1 activated Detection Circuit 2 activated Input Circuit 3 activated Input Circuit 4 activated Input Circuit 5 activated	<ul style="list-style-type: none"> <li>◆ If device was not the cause of the activation, check field wiring for shorts, or a faulty device.</li> <li>◆ Verify correct value EOL resistor</li> <li>◆ Input 1, 2, &amp; 3 latching, requires Reset to clear</li> <li>◆ If Application 3, input 4 latching, requires Reset to clear</li> </ul>
6 7 8	Audible Circuit 1 open Audible Circuit 2 open Audible Circuit 3 open	<ul style="list-style-type: none"> <li>◆ Verify correct value EOL resistor (1.2K <math>\Omega</math> - Red, Violet, Red)</li> <li>◆ Measure field wiring resistance = reference section 4.2.</li> <li>◆ Verify all field devices are installed properly.</li> <li>◆ Remove field wiring and install a 1.2K <math>\Omega</math> resistor at the panel to verify the SHP Pro Control Board is functioning properly.</li> </ul>
9	Agent Release Circuit open	<ul style="list-style-type: none"> <li>◆ Verify correct value EOL resistor (2.4K <math>\Omega</math> - Red, Yellow, Red)</li> <li>◆ Measure field wiring resistance = reference section 4.2.</li> <li>◆ Verify all field devices are installed properly.</li> <li>◆ Is Agent Disconnect Switch in DISCONNECTED mode?</li> <li>◆ Remove field wiring and install a 2.4K <math>\Omega</math> resistor at the panel to verify the SHP Pro Control Board is functioning properly.</li> <li>◆ Latching, requires Reset to clear</li> </ul>
11	Solenoid Circuit open	<ul style="list-style-type: none"> <li>◆ Measure field wiring resistance = reference section 4.2.</li> <li>◆ Verify all field devices are installed properly.</li> <li>◆ Remove field wiring and install a 200 <math>\Omega</math>, 5 watt resistor (p/n 02-2686) at the panel to simulate the solenoid and verify the SHP Pro Control Board is functioning properly.</li> <li>◆ Latching, requires Reset to clear</li> </ul>



Diagnostic Display Code	Description	Tips For Resolution
6.	Audible Circuit 1 shorted	♦ Check field wiring for short circuit or a faulty device
7.	Audible Circuit 2 shorted	♦ If panel has released agent, replace GCA.
8.	Audible Circuit 3 shorted	♦ Verify EOL resistor value is correct.
9.	Agent Release Circuit shorted <b>OR</b>	
11.	Actuator Circuit is Open Solenoid Circuit shorted	
A	Valid abort	♦ Normal Operation. No resolution required.
b	Abort premature	♦ Normal Operation. No resolution required.
<b>NOTE:</b> The letter "b" is often confused with the number 6.		
b.	Abort late	♦ Normal Operation. No resolution required.
C	2nd Alarm active on input 1 if using 430 Ω bases. Only one 430 Ω base active Always activates on first alarm if using 220 Ω or 0 Ω bases.	♦ Input Circuit 1 active. Verify cause from input device and not a short. ♦ Check base wiring - Hochiki bases use terminals 3 & 4 for negative wiring. ♦ Latching, requires Reset to clear
C.	2nd Alarm active on input 2 if using 430 Ω bases. Only one 430 Ω base active Always activates on first alarm if using 220 Ω or 0 Ω bases.	♦ Input Circuit 2 active. Verify cause from input device and not a short. ♦ Check base wiring - Hochiki bases use terminals 3 & 4 for negative wiring. ♦ Latching, requires Reset to clear
d	Outputs disabled	♦ Check Switch 3 (Enable/Disable) to see if it is in the Disable position
E	Missing battery	♦ Verify batteries are installed properly ♦ Verify each battery has approximately the same voltage ♦ Remove battery wiring harness and replace with a 4.3K Ω, 1/4 watt resistor (same as detection EOL, 10-2318) and verify charger voltage
F	Low Voltage (<19 VDC)	♦ Reference Section 5.6, Low Power Conditions ♦ Check AC and DC power input
H	Intelli-FET lost	♦ Reset panel, if trouble does not clear, replace SHP Pro Control Board ♦ Latching, requires Reset to clear
H.	5V Reference / ADC failure	♦ Reset panel, if trouble does not clear, replace SHP Pro Control Board
Q	Ground Fault	♦ Remove field wiring from terminal strips to isolate the wire with the ground fault. When panel clears, troubleshoot wire.
o	Resettable AUX power missing	♦ Remove field wiring from Resettable AUX circuit and check fuse F3. If fuse is blown, replace fuse and check field wiring for short.
o.	Continuous AUX power missing	♦ Remove field wiring from Continuous AUX circuit and check fuse F4. If fuse is blown, replace fuse and check field wiring for short.
P	Reset	♦ Normal Operation. No resolution required.
-	AC Brown-out (<85% AC)	♦ Measure primary voltage to transformer and secondary voltage off transformer.

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**APPENDIX 1 BATTERY CALCULATIONS**

The SHP Pro is designed for use with batteries up to 40 AH in capacity. Each battery pack contains two 12V batteries which can be installed in the SHP Pro enclosure. Battery back-up duration must be extended for sprinkler supervisory systems. Minimum battery capacity must exceed (by more than 10%) normal operation power followed by alarm operation power for these durations:

<u>Operation Type</u>	<u>Normal Operation</u>	<u>Alarm Operation</u>
Local & Sprinkler Supervisory	90 hours (FM only)	5 minutes
Remote Station	60 hours	5 minutes
Local Operation Only	24 hours	5 minutes

Each battery pack's maximum current consumption for normal operation is:

---Max Normal Operation Current---

<u>Battery Pack</u>	<u>Description</u>	<u>24 hour back-up</u>	<u>90 hour back-up (FM Only)</u>
10-2190-1	7 Amp-Hour Battery Pack	0.260 A	Not applicable
10-2190-2	18 Amp-Hour Battery Pack	0.590 A	0.171 A
<u>Battery</u>			
02-3468*	12V, 33 Amp-Hour Battery	1.106 A	0.295 A
A02-0252*	12V, 40 Amp-Hour Battery	1.346 A	0.359 A



**NOTE:** SHP Pro requires 2 12V batteries for operation.

“Total normal current” and “total alarm current” can each be calculated as the sum of:

- A.) SHP Pro controller current
- B.) CRM4 current for relays activated while in alarm
- C.) Output current to activated indicating devices.
- D.) Auxiliary current from Aux Power Out circuit.

<u>Module Type:</u>	<u>Module Current Consumption</u>
10-2452 Controller	0.135 Amps
10-2450 Class-A Module	0.000 Amps
10-2448 Class-A Module	0.000 Amps
10-2204 CRM4 Module	0.000 Amps (0.010A each relay while active)

Normal operation power (in Amp-Hours) = (total normal current) X [24, 60, or 90 hours (FM Only)].  
 Alarm operation power = (total alarm current) X (0.0833 hours).

The selected battery capacity must exceed the sum of the Normal and Alarm power plus a 20% battery power derating safety margin to ensure adequate system voltages are maintained. If using an uninterruptable power supply that supplies power in excess of the above time durations; NFPA 72 allows lesser amounts of system internal battery capacity.



**NOTE:** The SHP Pro 0.135 Amp current includes power to activate the normally energized trouble relay and power for the maximum number of two wire detectors. The CRM4's 0.010 Amps alarm current per relay is for the activated relays.

A battery calculation form that illustrates a typical battery calculation example is shown in following pages.

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**SHP Pro Battery Calculation Form**

Back-up Hours required: [24, 60 or 90 hours (FM Only)]

**Normal Operation:**

Controller Current 0.135 A  
 Auxiliary Output Current: \_\_\_\_\_ A

\*Total Normal Standby Current = \_\_\_\_\_ X \_\_\_\_\_ hours = \_\_\_\_\_ A-H

**Alarm Operation:**

Controller Current 0.135 A  
 CRM4 Current (0.010 for each relay used, else 0.0) \_\_\_\_\_ A  
 Output Device Current: \_\_\_\_\_ A  
 Auxiliary Output Current: \_\_\_\_\_ A

\*\*Total Alarm Current = \_\_\_\_\_ X 0.083 hours = \_\_\_\_\_ A-H

Total A-H used = \_\_\_\_\_ A-H

(X1.2 factor)

Total Power Required → \_\_\_\_\_ A-H

**Power Supplied:**

Controller Supplied Current: 4.135 Amps  
 Auxiliary In current: \_\_\_\_\_ Amps  
 Total Current Supplied = \_\_\_\_\_ Amps

Must exceed

Must exceed

Total Battery Pack A-H available (7 or 18 A-H): \_\_\_\_\_ A-H

\* - Total normal standby current shall not exceed 1.000 amp.

\*\* - Total alarm current shall not exceed 4.135 amps.

**SHP Pro Battery Calculation Form**

**Example**

Back-up Hours required: [24 or 90 hours (FM Only)]

**Normal Operation:**

Controller Current 0.135 A  
 Auxiliary Output Current: 0.100 A

Total Normal Current = 0.235 X 24 hours = 5.64 A-H

**Alarm Operation:**

Controller Current 0.135 A  
 CRM4 Current (0.010 for each relay used, else 0.0) 0.040 A  
 Output Device Current: 1.000 A  
 Auxiliary Output Current: 0.100 A

Total Alarm Current = 1.335 X 0.083 hours = 0.111 A-H

Total A-H used = 5.75 A-H

(X1.2 factor)

Total Power Required → 6.90 A-H

**Power Supplied:**

Controller Supplied Current: 4.135 Amps  
 Auxiliary In current: 0.000 Amps  
 Total Current Supplied = 4.135 Amps

Must exceed

Must exceed

Total Battery Pack A-H available (7 or 18 A-H): 7.0 A-H

“System Operation Posting” on the next page is offered without headers or footers so distributor may make copies to post adjacent to control equipment.

# "System Operation Posting"

P/N 02-11060 REV 2

OPERATING INSTRUCTIONS

FIKE

10-063 SHP PRO CONTROL SYSTEM

## OPERATIONAL CONDITIONS

<u>SYSTEM STATUS</u>	<u>LED's ON</u>	<u>AUDIBLE STATUS</u>
Normal Standby:	AC Normal Green LED	All audibles off
System Trouble:	Trouble Yellow LED	Local piezo on, Trouble audible(s) on
System Alarm:	Alarm Red LED	Local piezo pulses, Alarm audible(s) on
Pre-discharge:	Alarm Red LED	Local piezo pulses, Pre-discharge audible(s) on In sprinkler mode, Alarm audible(s) also on
Release:	Alarm Red LED	Local piezo pulses, Release audible(s) on In sprinkler mode, pre-discharge and alarm audibles are on in place of release audible.
Abort:	Abort Yellow LED	Local piezo on, Trouble audible(s) on Delays release initiated by detection scheme.
<b>To Silence Panel:</b>	Press SILENCE button	Silences audibles & piezo. Changes flashing LED's to steady. If held for 3 seconds it will toggle the panel between current history, last 20 events, and A/D conversion.
<b>To Reset Panel:</b>	Press RESET button	Resets system including turning off outputs, interrupting resettable power. Momentarily activates piezo, all LED's, and trouble relay. Displays panel option number. Restores system to normal state.

### To Disable Releasing and Audible Circuits:

Flip Enable/Disable Switch (SW3) Panel still operates normally. Audibles and releasing or solenoid circuits will not activate in this state.

CAUTION: Remove AC and battery power before servicing equipment.



**NOTE:** The ABORT switch delays releases initiated by automatic detection schemes. Releases initiated by activation of the Manual Release input circuit OVERRIDES the abort switch. See Operation Manual for functionality of different abort types.

Refer to System Service Label attached to inside of door for listing of Diagnostic Codes.

IN CASE OF TROUBLE CONTACT:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Phone # \_\_\_\_\_

OR

Customer Service Department  
Fike Corporation  
+1.816.229.3405

Refer to Fike Installation, Operation and Maintenance Manual #06-297

Frame this sheet and place adjacent to control equipment.

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## INDEX

- O**
- 0 ohm jumper..... 38
- A**
- Abort..... 2, 3, 23, 25, 27, 32, 33, 38, 45, 54, 65  
 Alarm...1, 3, 1, 2, 3, 7, 8, 9, 13, 15, 16, 17, 19, 20, 22, 23, 25,  
 27, 28, 32, 33, 38, 44, 51, 52, 54, 57, 61, 63, 65  
 ARM III..... 8, 9, 19, 20, 21, 26, 28, 57
- B**
- Battery ...4, 2, 9, 11, 13, 19, 21, 22, 30, 31, 33, 38, 52, 61, 63,  
 65  
 Battery Calculations..... 4
- C**
- Class A..... 2, 9, 11, 12, 23, 26, 27, 28, 35, 37, 38, 40, 41  
 Class B..... 2, 12, 23, 26, 28, 35, 40, 41  
 CRM4 ..... 9, 11, 12, 28, 33, 37, 38, 42, 61, 63  
 Cross-Zone..... 2, 3, 9, 14, 16, 18, 23, 38, 54
- D**
- DACT .....7, 8, 19, 25  
 Detection2, 3, 7, 14, 15, 16, 17, 18, 21, 23, 24, 27, 35, 40, 45,  
 52, 54, 65  
 Diagnostics Codes .....53, 65
- E**
- Enclosures.. 3, 9, 11, 13, 22, 29, 30, 31, 32, 33, 34, 35, 36, 61
- F**
- Fuse .....3, 21, 22, 25, 33
- G**
- GCA.....33, 38, 57  
 Graphic ..... 14, 19, 20, 23
- I**
- Installation 3, 1, 5, 9, 17, 29, 30, 31, 32, 35, 38, 43, 44, 57, 65
- L**
- LED ...3, 2, 3, 9, 14, 16, 17, 20, 23, 38, 50, 51, 52, 53, 54, 57,  
 65  
 Linear Heat Detection.....23, 24, 27
- M**
- Maintenance ..... 4, 52, 57, 65
- N**
- NAC .....2, 9, 38  
 Non Power-Limited ..... 2, 22, 28, 33
- P**
- Piezo..... 2, 3, 9, 38, 51, 54, 65  
 Power Calculations..... 63  
 Power Limited .....33  
 Power-Limited..... 2, 3, 9, 22, 23, 25, 26, 27, 28, 33  
 Pre-Action ..... 7, 8, 9, 47, 48  
 Pre-Discharge ..... 2, 3, 38, 45, 51, 54, 65
- R**
- Relays 9, 11, 12, 19, 21, 22, 28, 33, 38, 42, 51, 52, 54, 61, 63,  
 65  
 Release ..1, 2, 3, 4, 8, 9, 16, 18, 19, 20, 21, 23, 26, 27, 28, 35,  
 38, 41, 45, 46, 50, 51, 54, 57, 65  
 Reset.....3, 9, 25, 38, 50, 51, 52, 53, 54, 65  
 Reset Switch .....51
- S**
- Sequential ..... 3, 9, 16, 18, 23, 38, 54  
 Silence ..... 9, 51, 52, 53, 65  
 Silencing .....51, 54  
 Solenoid...3, 5, 7, 9, 26, 27, 28, 35, 41, 49, 51, 52, 54, 57, 65  
 Specifications ..... i, 3, 14, 22, 29, 32, 38  
 Sprinkler..... 7, 8, 9, 11, 26, 28, 47, 48, 61, 65  
 Supervisory .....3, 2, 3, 7, 9, 19, 23, 27, 33, 38, 51, 52, 54, 61  
 System Check Out .....57
- T**
- Transformer ..... 11, 21, 22, 29, 33, 34, 38  
 Trouble .....3, 2, 3, 9, 22, 33, 38, 50, 51, 52, 54, 61, 65  
 Trouble Codes ..... 53
- W**
- Waterflow..... 8, 9, 19, 23, 27, 51  
 Wiring ...3, 2, 3, 5, 8, 9, 13, 19, 22, 23, 25, 26, 27, 28, 33, 35,  
 38, 39, 40, 41, 50, 57  
 Chassis .....33  
 Class A.....40  
 Field .....33  
 Initiators .....33  
 Resistance Chart..... 33, 35

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