

INSTALLATION, OPERATION AND INSTRUCTION MANUAL

PFC 2000RC FIRE CONTROL PANEL



ALL SPECIFICATIONS SUBJECT TO REVISION



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MANUAL #5403521 - REV N
3/03



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Contents

GENERAL DESCRIPTION	5
SYSTEM FEATURES	5
ORDERING INFORMATION	5
SPECIFICATIONS	6
HOUSING	6
VISUAL INDICATORS	6
LCD	6
PANEL VISUAL DISPLAY DRAWING	6
CONTROL SWITCHES	7
SILENCE SWITCH	7
RESET SWITCH	7
TEST SWITCH	7
ZONE DISABLE SWITCHES	7
AUTO RESET SWITCH	7
RELEASING CIRCUIT DISABLE SWITCH	7
ALARM INITIATING DEVICE CIRCUITS	8
MANUAL INITIATING DEVICE CIRCUITS	8
SUPERVISORY INITIATING DEVICE CIRCUIT	8
INDICATING APPLIANCE CIRCUITS	8
RELEASING CIRCUIT	9
ABORT CIRCUIT	9
PRE-DISCHARGE TIMER	9
DISCHARGE TIMER	9
POWER REQUIREMENTS	10
AUXILIARY POWER OUTPUT	10
AUDIBLE INDICATOR	10
ELECTRONIC OUTPUTS	10
AUXILIARY CONTACT OUTPUTS	10
MAIN CIRCUIT BOARD MODULE	10
TERMINATION	10
OPERATING TEMPERATURE RANGE	10
APPROVALS AND LISTINGS	11
SERVICE USE	11
BASIC CIRCUIT OPERATION	11
DESCRIPTION OF SEQUENTIAL MODE	11
DESCRIPTION OF CROSS-ZONING MODE	11
ALARM CONDITION	11
TROUBLE CONDITION	11
INITIATING DEVICE CIRCUITS RESPONSE	11
ABORT CIRCUIT RESPONSE	12
INDICATING APPLIANCE AND RELEASING CIRCUITS RESPONSE	12
SUPERVISORY CONDITION	12
ABORT CONDITION	12

GROUND FAULT 12

LOSS OR REDUCTION OF AC POWER 13

AC CIRCUIT BREAKER OPERATION 13

HIGH OR LOW BATTERY VOLTAGE 13

BATTERY CIRCUIT BREAKER OPERATION 13

AUXILIARY POWER FAILURE 13

DISCHARGE CIRCUIT DISABLED 13

AUTO RESET SWITCH 13

COMMON TROUBLE OUTPUTS 13

SILENCING AN ALARM OR TROUBLE CONDITION 14

RESETTING AN ALARM CONDITION 14

RESETTING A TROUBLE CONDITION 14

SELECTING PANEL OPERATING CHARACTERISTICS 14

SELECTING THE PRE-DISCHARGE TIME 14

SELECTING INITIATING DEVICE ZONE STYLE D OR B (CLASS A OR B) 14

SELECTING INDICATING APPLIANCE CIRCUIT MODE 15

SELECTING THE PRE-DISCHARGE TIMER ACTIVATION MODE 15

ACTIVATION FROM MANUAL CIRCUIT 15

SELECTING ABORT CIRCUIT OPERATING MODE 16

SELECTING DISCHARGE TIME 16

INSTALLATION INSTRUCTIONS 16

 PROCEDURE FOR THE REMOVAL OF THE MAIN BOARD MODULE 16

 LOCATION 16

 MOUNTING THE BEZEL 17

 INSTALLATION OF BEZEL FOR SEMI-FLUSH INSTALLATIONS DRAWING 17

 WIRING HOOKUP 17

TEST PROCEDURES 17

OPERATING INSTRUCTIONS 18

BATTERY SIZE REQUIREMENTS 18

TABLE 1, CURRENT REQUIREMENTS 19

TABLE 2, SECONDARY POWER SUPPLY REQUIREMENTS 19

CALCULATION TABLE 19

INACTIVE CIRCUITS 19

PFC 2000RC MAIN BOARD CONNECTION DRAWING 20

APPLICATION NOTES 21

TYPICAL 2-WIRE DETECTOR CONNECTION DRAWINGS 22

TYPICAL 4-WIRE DETECTOR CONNECTION DRAWING 23

CONNECTION DRAWING POWER SUPPLY MODULE 23

CONNECTION DRAWING FOR CENTRAL STATION & PROPRIETARY OPERATION 24

PFC 2000RC INNER PANEL DRAWING 25

2-WIRE SMOKE DETECTOR COMPATIBILITY DATA 26

AUTOMATIC WATER CONTROL VALVES COMPATIBILITY DATA 27

EXTINGUISHING AGENT CONTROL VALVE COMPATIBILITY DATA 27

ALARM INDICATING APPLIANCE COMPATIBILITY DATA 27

WIRE ROUTING FOR POTTER MODEL PFC 2000RC 28

GENERAL DESCRIPTION

This microprocessor-based fire detection and releasing control panel meets the requirements of Underwriter Laboratories Standard 864 and is in compliance with the National Fire Protection Association (NFPA) Standards for service usage as follows: NFPA 12- Carbon Dioxide Systems, NFPA 12A - Halon 1301 Fire Systems, NFPA 12B - Halon 1211 Systems, NFPA 13 - Sprinkler Systems, NFPA 17 - Dry Chemical Extinguishing Systems, NFPA 72 - National Fire Alarm Code (Local and Proprietary Fire Alarm Systems).

SYSTEM FEATURES

- 1) Two Style D (Class A) or Style B (Class B) detection zones for smoke and/or heat detectors.
- 2) One Style D (Class A) or Style B (Class B) manual zone.
- 3) One Style B (Class B) supervisory initiating device circuit.
- 4) Two Style Y (Class B) indicating appliance circuits.
- 5) One (Class B) abort circuit.
- 6) One (Class B) releasing circuit.
- 7) Pre-discharge timer selectable from 0 to 60 seconds with 4 modes of activation for the smoke/heat detector circuits. The pre-discharge time is also switch selectable to be 0 or 30 seconds upon activation of the manual circuit.
 - Mode 1 - Single zone activation
 - Mode 2 - Cross zone activation
 - Mode 3 - Sequential activation
 - Mode 4 - Cross zone or Sequential activation
 Note: Mode 3 or 4 requires the use of Hochiki detectors with HSB-221 or YBA-M21 bases.
- 8) Discharge Timer selectable for two minutes or continuous.
- 9) 32 character alpha-numeric display with backlight indicating all alarm, trouble and supervisory conditions in an English format.
- 10) One man test feature
- 11) Compatible with 2 and 4-wire detectors.
- 12) Power limited circuits
- 13) Single alarm/trouble silence switch.
- 14) Semi-flush mounting option.
- 15) 24 or 90 hour battery standby available.
- 16) Main board is removable without disconnecting field wiring.

ORDERING INFORMATION

Model No.	Description	Stock No.
PFC 2000RC	Fire Control/Releasing Panel	3005800 (wht.), 3005802 (red)
PFC-TR	Semi-Flush Mounting Trim (white)	5090107
PFC-TW	Semi-Flush Mounting Trim (red)	5090114
BT-40	Battery, 12 Volt, 4.0 AH, 24 hr. Standby (2 required)	5130092
BT-80	Battery, 12 Volt, 8.0 AH, 60 hr. Standby (2 required)	5130084
BT-120	Battery, 12 Volt, 12.0 AH, 90 hr. Standby (2 required)	5130090
ARM-1	Optional 4PDT Relay Assembly	3004726
ARM-2	Optional DPDT Relay Assembly	3004725
Spare or Replacements Parts:		
	EOL Resistor	5080600
	EOL Resistor and Diode Assembly for releasing circuit	3005012
	Main Circuit Board Module	3005810
	Power Supply Module	3004520
	Transformer Assembly	3001172

WARNING: This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, this product may cause interference to radio communications. This product has been designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

SPECIFICATIONS

HOUSING:

Type: General purpose, indoor, steel enclosure with hinged removable cover and key lock.

Size: 18 1/2" X 14 1/4" X 4 3/4"

Finish: Baked enamel, off-white with grey trim and red logo. Available in other colors and private labeling as required by users (consult factory).

Knockouts: 8 combination 1/2" - 3/4" knockouts. 2 on each side, top and back.

Option: Bezel for semi-flush mounting in a 4" wall.

VISUAL INDICATORS (With door closed):

AC ON: Green LED comes on when AC voltage reaches 102 Volts, goes off when AC voltage drops below 96 Volts.

Alarm: Red LED comes on when a zone is in alarm condition.

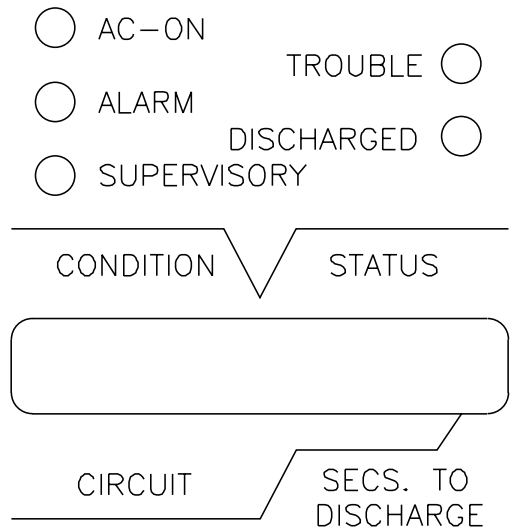
Discharged: Red LED comes on when releasing circuit is activated.

Supervisory: Yellow LED comes on for supervisory condition.

System Trouble: Yellow LED comes on for any trouble condition. Possible conditions are Ground Fault, Initiation Device Circuit Trouble, Supervisory Zone Activation, Supervisory Circuit Trouble, Indicating Appliance Circuit Trouble, Abort, Abort Circuit Trouble, Battery Trouble, Zone Disable switch operated, Auto Reset switch operated, AC Voltage Trouble, Releasing Circuit disabled.

LCD: A two line, 32 character alpha-numeric liquid crystal display displays the condition, status and circuit for all Alarm, Trouble and Supervisory conditions as illustrated. The time to discharge is shown when the pre-discharge timer has been activated.

PANEL VISUAL DISPLAY



DWG. #3521-3

<u>CONDITION</u>	<u>STATUS</u>	<u>CIRCUIT</u>	<u>SECSTODISCHARGE</u>
Alarm	Low	1	0 - 60
Trouble	Silenced	2	
Supv.	Aborted	Manual	
	Ground	Supervisory	
	Disabled	Abort	
	Discharge	Signaling	
	AC	Discharge	
	Battery		
	Aux. Power		

- NOTES: 1) All zones that are in alarm will be displayed simultaneously in the “circuit” area of the display.
 Example: “1 2 Manual” would be displayed if all were in alarm.
- 2) If an alarm condition exists it will remain on the display. If more than one condition exists other than an alarm condition, the display will be scrolled every 2 seconds.
- 3) The backlight on the LCD display is off when the AC power is off except when an alarm condition exists. If the TEST SWITCH is operated during the absence of AC power, the backlight illuminates.

CONTROL SWITCHES

- SILENCE SWITCH:** Momentary switch silences built in buzzer and devices connected to the indicating appliance circuit. This will not disable any visual or other alarm outputs such as the electronic outputs or the auxiliary contacts. Any additional trouble or alarm conditions will reactivate the appropriate circuits.
- RESET SWITCH:** Momentary switch resets all alarm circuits if the condition has been corrected. Removes power from the alarm initiating device circuit and also from the auxiliary power circuit if this mode has been selected. The reset switch must be held for a minimum of 3 seconds. This is to avoid accidental reset.
- TEST SWITCH:** Momentary switch activates all indicators, trouble, and alarm outputs. These all return to normal when the switch is released. If the TEST SWITCH is operated during the absence of AC power, the backlight illuminates.
- ZONE DISABLE SWITCHES:** Supervised switches which disable the associated zone, inhibiting trouble and alarm outputs for the specified zone (Zone 1 or Zone 2). Operating either of these switches will generate a system trouble and a zone trouble. When the panel is operated in “cross zone” mode, disable either Zone 1 or Zone 2 to effectively disable both zones for an alarm condition.
- AUTO RESET SWITCH:** A supervised switch which disables the latching feature of the alarm initiating device circuits for test purposes. Operation of this switch will generate a system trouble.
- RELEASING CIRCUIT DISABLE SWITCH:** A supervised switch which disables the releasing circuit. Operation of this switch generates a system

trouble.

ALARM INITIATING DEVICE CIRCUITS

Two circuits for smoke and/or heat detectors, maximum detector load 2.5mA
Circuits are switch selectable for Style D or B (Class A or B)
Circuits are latching and power limited
Maximum line resistance is 25 ohms
Maximum short circuit loop current is 80 mA
Maximum open circuit loop voltage is 26.4 Volts with 132 Volts AC input
Minimum voltage at end of line resistor is 16 Volts with 20.4 Volts DC input
Minimum loop current required for alarm is 15 mA
Normal standby loop current is 5 mA
Maximum impedance on loop for alarm is 1500 ohms
Maximum impedance on loop for 2nd alarm (when a sequential mode is selected) 560 ohms
End of line resistor is 5.1k ohms
Minimum time to reset is 3 seconds

MANUAL INITIATING DEVICE CIRCUIT

One circuit for manual stations, switch selectable Style D or B (Class A or B)
Circuit is latching and power limited
Maximum loop resistance is 100 ohms
Maximum short circuit loop current is 8 mA
Minimum line current required for alarm is 5 mA
Normal standby loop current is 3 mA
End of line resistor is 5.1k ohms
Minimum time to reset is 3 seconds

SUPERVISORY INITIATING DEVICE CIRCUIT

One Class B circuit
Circuit is non-latching and power limited
Maximum line resistance is 100 ohms
Maximum short circuit loop current is 8 mA
Normal standby loop current is 3 mA
End of line resistor is 5.1k ohms
Current increase causes a supervisory signal and system trouble
Current decrease causes a supervisory trouble and system trouble

INDICATING APPLIANCE CIRCUITS

Two Style Y (Class B) circuits that reverse polarity on alarm
Circuits are power limited
Each circuit rated 24 Volt DC 1 Amp maximum
Normal standby loop current is 3 mA
End of line resistor is 5.1k ohms
Three switch selectable modes of operation:
Mode 1 - Steady on first alarm, pulsing upon activation of predischarge timer.
Mode 2 - Pulsing on first alarm, steady upon activation of predischarge timer.
Mode 3 - One circuit activated on first alarm. Second circuit activated upon activation of predischarge timer.
Note: If the predischarge timer is set to 0 the change in operation described above will occur at the time of release of the extinguishing agent.

RELEASING CIRCUIT

One Class B circuit

Circuit is power limited

Circuit is rated 24VDC at 1 Amp continuous, 3 Amps intermittent

Reverses polarity to release extinguishing agent

Operates at the end of the pre-discharge timer period (or upon actuation of a manual alarm if this mode is selected for the manual alarm circuit.)

Minimum battery voltage that will maintain 85 - 100% of solenoid voltage = 22.5 Volts

Maximum allowable line resistance = $2 \div \text{CURRENT (IN RELEASE MODE)}$

Maximum short circuit loop current is 8 mA (in standby condition)

Normal standby loop current is 3 mA

End-Of-Line resistor is 5.1k ohms

ABORT CIRCUIT

One Class B switch circuit

Circuit is power limited

Maximum loop resistance is 100 ohms

Maximum short circuit loop current is 8 mA

Normal standby loop current is 3 mA.

End-Of-Line resistor is 5.1k ohms

Two switch selectable modes of operation:

Mode 1 - The release of the extinguishing agent is delayed as long as the abort switch is activated. Deactivation of the abort switch will result in the release of the extinguishing agent within 10 seconds if the 60 second delay period has elapsed.

Mode 2 - (IRI Mode) If the abort switch is actuated prior to the actuation of a second alarm, the pre-discharge timer will not start. If the abort switch is restored after the second alarm, subsequent actuation of the abort switch will not interrupt the operation of the pre-discharge timer. Actuation of the abort switch after a second alarm will not interrupt operation of the pre-discharge timer.

PRE-DISCHARGE TIMER

Switch selectable from 0 to 60 seconds in 10 second increments, with 4 switch selectable modes of operation for the smoke/heat detector circuits (the predischARGE circuit, also switch selectable, to be 0 or 30 seconds upon activation of the manual circuit):

Mode 1 Single Zone - Actuation of one or more detectors will create an alarm condition and start the pre-discharge timer (this mode is usually used with heat detectors).

Mode 2 Cross Zone - Actuation of one or more detectors in any one zone will create an alarm condition. Actuation of one or more detectors in both zones, in addition to creating an alarm condition will start the pre-discharge timer (this mode is usually used with smoke detectors).

Mode 3 Sequential - Actuation of one detector in any one zone will create an alarm condition. Actuation of a second detector in the same zone will start the pre-discharge timer (this mode is usually used with smoke detectors).

Mode 4 Sequential or Cross Zone - Actuation of one detector in any zone will create an alarm condition. Actuation of two detectors in the same zone, or one detector in each zone will start the pre-discharge timer (this mode is usually used with smoke detectors).

Manual Circuit Activation - Activation of one or more devices on the Manual Device Circuit will create an alarm condition. The output of this circuit is switch selectable to start a 30 second pre-discharge timer or to immediately activate the releasing circuit. Activation of this circuit overrides abort.

DISCHARGE TIMER

Switch selectable periods of 2 minutes or continuous.

POWER REQUIREMENTS

Input: 117VAC single phase, 60 Hertz, 100V Amps maximum

Standby: 24VDC, 85mA

Standby Batteries: Gel cell sealed lead-acid batteries

Must be sized to provide the required standby period. 24 or 90 hours depending on the service required.

Alarm: 24 Volts - 240mA for first 2 mins. max., then 200mA.

AUXILIARY POWER OUTPUT

Regulated 24VDC, 500mA max.

Three terminal connections: one common negative, one positive that is interrupted on reset (for use with 4-wire detectors), and one positive that is constant.

AUDIBLE INDICATOR

Built in buzzer operates on trouble conditions.

ELECTRONIC OUTPUTS

24VDC, 25mA with current limiting to 45mA for each of the following:

Alarm per zone (3)

System Trouble

Releasing Circuit activated

System Alarm

Supervisory

Output for optional 4 pole relay (see below)

AUXILIARY CONTACT OUTPUTS

} Use power limited and/or Class 2 source only

System Alarm: 1 set SPDT (Form C)

System Trouble: 1 set SPDT (Form C)

Contacts rated 30 Volts, 2 Amps Resistive

Option: System Alarm output - 4PDT (4 pole double-throw)

Contacts rated 30VDC/120VAC, 5 Amps Resistive

MAIN CIRCUIT BOARD MODULE

The Main Circuit Board Module is removable without disconnecting the field wiring.

TERMINATION

AC power input terminals and grounding terminal are capable of handling #12 AWG conductors. All other terminals are capable of handling #14 AWG conductors.

OPERATING TEMPERATURE RANGE

32 to 120 degrees Fahrenheit

0 to 49 degrees Celsius

APPROVALS AND LISTINGS

UL and CSFM listed, FM approved, NYMEA accepted.

SERVICE USE

NFPA 12 - Carbon Dioxide Extinguishing Systems
 NFPA 12A - Halon 1301 Fire Extinguishing Systems
 NFPA 12B - Halon 1211 Fire Extinguishing Systems
 NFPA 13 - Installation of Sprinkler Systems
 NFPA 17 - Dry Chemical Extinguishing Systems
 NFPA 72 - Local, Central Station (PPU), Proprietary (PPU), NFAC

BASIC CIRCUIT OPERATION**DESCRIPTION OF SEQUENTIAL MODE:**

Actuation of one detector in any one zone will create an alarm condition. Actuation of a second detector in the same zone will start the pre-discharge timer (this mode is usually used with smoke detectors).

DESCRIPTION OF CROSS-ZONING MODE:

Actuation of one or more detectors in any one zone will create an alarm condition. Actuation of one or more detectors in both zones, in addition to creating an alarm condition will start the pre-discharge timer. This mode is usually used with smoke detectors.

ALARM CONDITION:

Provided all associated switches are in their normal condition an increase of current on any alarm initiating device circuit to approximately 15mA or greater will result in the following:

- 1) The zone or zones that have been activated will be displayed along with the word "ALARM" on the alpha-numeric display.
- 2) Operation of the red alarm LED.
- 3) Operation of the auxiliary alarm contacts.
- 4) Positive 24 VDC will appear on the associated zone electronic output terminal.
- 5) Operation of one or both of the indicating appliance circuits depending on how they are programmed.

TROUBLE CONDITIONS:

Microprocessor failure: The yellow "System Trouble" indicator will be on; the "Trouble" buzzer will be pulsating and you will be unable to silence the buzzer by operating the trouble silence switch. To silence the buzzer, disconnect the battery and turn off the AC power. After 30 seconds reapply power. If the trouble still exists, call the factory. The supervision of the microprocessor is a safeguard feature that is built into the panel.

Other System Trouble: System trouble conditions will result in the following common trouble indications.

- 1) Operation of the system trouble LED.
- 2) Operation of the built-in trouble buzzer.
- 3) Operation of the auxiliary trouble contacts.

INITIATING DEVICE CIRCUITS RESPONSE:

A decrease in current to approximately 3 mA or operation of the zone disable switch to the disable position on any initiating device zone will result in the following:

- 1) The zone or zones that are affected will be displayed along with the word "TROUBLE" on the alpha-numeric display. If more than one trouble condition exists the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see "Common Trouble Outputs").

ABORT CIRCUIT RESPONSE:

A decrease of current to approximately 1.5mA in the abort circuit will result in the following:

- 1) The words “ABORT” and “TROUBLE” will be displayed on the alpha-numeric display. If more than one trouble condition exists, the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see “Common Trouble Outputs”).

INDICATING APPLIANCE AND RELEASING CIRCUITS RESPONSE:

An increase of current to approximately 8 mA or a decrease of the current to approximately 1.5 mA in either the indicating appliance circuit or the releasing circuit, or connecting an indicating appliance backward will result in the following:

- 1) The zone or zones that are affected will be displayed along with the word “TROUBLE” on the alpha-numeric display. If more than one trouble condition exists the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see “Common Trouble Outputs”).

NOTE: A current in excess of 1.5 Amps on a indicating appliance circuit when the panel is in the alarm condition will result in an indicating appliance circuit trouble as described above. Manual operation of the reset switch is required to correct the trouble condition.

CAUTION: A problem in a device that is connected into the indicating appliance circuit may not be apparent when the panel is in the normal condition. If the indicating appliance circuit indicates a trouble condition when the panel is in an alarm condition the problem must be located and corrected.

SUPERVISORY CONDITION:

An increase in current to approximately 4.5 mA or greater in the supervisory circuit will result in the following:

- 1) The words “SUPV” and “SUPERVISORY” will be displayed on the alpha-numeric display. If more than one trouble condition exists, the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see “Common Trouble Outputs”).
- 3) The yellow supervisory LED will be lit.
- 4) Positive 24 Volts DC will appear on the associated electronic output terminal.

ABORT CONDITION:

An increase in current to approximately 4.5mA or greater in the abort circuit will result in the following:

- 1) The words “ABORT” and “ABORTED” will be displayed on the alpha-numeric display. If more than one trouble condition exists, the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see “Common Trouble Outputs”).
- 3) If the abort circuit is in “Mode 1” the release of the extinguishing agent will be delayed as long as this circuit is activated.
- 4) If the abort circuit is in “Mode 2” (IRI mode) and this circuit is activated before a second alarm occurs the pre-discharge timer will not start. If this circuit is activated after a second alarm has occurred, it will not interrupt operation of the pre-discharge timer.

GROUND FAULT:

A Ground Fault on any circuit that is powered by the control panel will result in the following:

- 1) The words “TROUBLE” and “GROUND” will be displayed on the alpha-numeric display. If more than one trouble condition exists, the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see “Common Trouble Outputs”).

LOSS OR REDUCTION OF AC POWER:

A loss or reduction in AC input voltage will result in the following:

- 1) The words “TROUBLE”, “LOW”, and “AC” will be displayed on the alpha-numeric display. If more than one trouble condition exists, the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see “Common Trouble Outputs”).
- 3) The green AC-ON LED will be extinguished.

AC CIRCUIT BREAKER OPERATION:

Operation of the AC circuit breaker will result in the same indication as a loss or reduction of AC power condition. The LED adjacent to the circuit breaker, located on the power supply board, will be illuminated.

HIGH OR LOW BATTERY VOLTAGE:

A loss of battery voltage, a reduction of battery voltage to 23 V or less, or an increase of battery voltage to 29 V or more will result in the following:

- 1) The words “TROUBLE” and “BATTERY” will be displayed on the alpha-numeric display. If more than one trouble condition exists, the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see “Common Trouble Outputs”).

BATTERY CIRCUIT BREAKER OPERATION:

Operation of the Battery circuit breaker will result in the same indication as a high or low battery voltage condition. In addition, the LED adjacent to the circuit breaker, located on the power supply board, will be illuminated.

AUXILIARY POWER FAILURE:

Failure of the auxiliary power supply will result in the following:

- 1) The words “TROUBLE” and “AUX. POWER” will be displayed on the alpha-numeric display. If more than one trouble condition exists, the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see “Common Trouble Outputs”).

DISCHARGE CIRCUIT DISABLED:

Operating the discharge circuit disable switch to the “disabled” position will result in the following:

- 1) The words “DISCHARGE” and “DISABLED” will be displayed on the alpha-numeric display. If more than one trouble condition exists, the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs (see “Common Trouble Outputs”).

AUTO RESET SWITCH:

Operating the Auto Reset Switch to the “AUTO RESET” position will result in the following:

- 1) The words “AUTO RESET” will be displayed on the alpha-numeric display. If more than one trouble condition exists, the conditions will be alternately scrolled every 2 seconds.
- 2) Operation of all of the common trouble outputs except the buzzer (see “Common Trouble Outputs”).

COMMON TROUBLE OUTPUTS:

The common trouble outputs respond with any of the trouble conditions in a manner as follows:

- 1) Operation of the built-in trouble buzzer.
- 2) Transfer of the auxiliary trouble contacts.
- 3) Positive 24 VDC will appear on the associated electronic output terminal.
- 4) Illumination of the yellow trouble LED.

SILENCING AN ALARM OR TROUBLE CONDITION:

Operate the momentary type Silence switch.

CAUTION: Where audible and/or visual indicators are being used as an evacuation signal, do not silence an alarm condition without investigating and determining that an emergency condition does not exist.

RESETTING AN ALARM CONDITION:

- 1) Determine the cause of the alarm condition and if necessary remove the cause.
- 2) Operate the momentary type Reset switch and hold for approximately 3 seconds. This delay is to prevent accidental resetting of the alarm condition.

RESETTING A TROUBLE CONDITION:

- 1) Determine the cause of the trouble condition and if necessary remove the cause.
- 2) Trouble conditions are self-restoring when the panel is operating in its normal mode. When all trouble conditions are removed all indications will return to normal.

Exceptions:

- 1) When an initiating device zone is operated in a Style D (Class A) mode, any trouble condition on those zones will require manual operation of the Reset switch to restore the panel to normal after the fault has been corrected.
- 2) A trouble condition of a indicating appliance circuit that is the result of a current in excess of 1.5 Amps when the panel is in the alarm condition requires manual operation of the Reset switch.

SELECTING PANEL OPERATING CHARACTERISTICS:

Operating characteristics are selected by setting the two 8PST (8 Pole Single Throw) dip-switches that are located in the lower right-hand corner of the main circuit board module. Switches are turned on by pressing them down on the right-hand side of the switch.

SELECTING THE PRE-DISCHARGE TIME:

The time delay length of the pre-discharge timer is selectable from 0 to 60 seconds in 10 second increments. This time is set by the top three dip-switch positions (with 1 being at the top) of the upper dip-switch as shown below.

<u>Switch No.</u>	<u>Time in Seconds</u>						
	<u>0</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>50</u>	<u>60</u>
1	OFF	ON	OFF	ON	OFF	ON	ON
2	OFF	OFF	ON	ON	OFF	OFF	ON
3	OFF	OFF	OFF	OFF	ON	ON	ON

SELECTING INITIATING DEVICE ZONE STYLE D OR B (CLASS A OR B):

Zones 1, 2 and the manual initiating device circuit can be selected to operate in either a Style D (Class A) or Style B (Class B) mode. To place a circuit in a Style D mode turn the switch associated with that circuit “on” by pressing down on the right-hand side of the switch.

<u>Mode</u>	<u>Circuit</u>	<u>Switch No.</u>	<u>Position</u>
Style D (Class A)	Zone 1	4	ON
Style D (Class A)	Zone 2	5	ON

Style D (Class A) Manual Ckt. 6 ON

SELECTING INDICATING APPLIANCE CIRCUIT MODE:

There are 3 modes of operation for the indicating appliance circuit. Select the desired mode by setting switches 7 and 8 as shown in the following:

<u>Mode</u>	<u>Operation</u>	<u>Switch No.</u>	<u>Position</u>
1	Steady on first alarm, pulsating on second alarm or upon activation of manual circuit.	7	ON
		8	OFF
2	Pulsing on first alarm, steady on second alarm or upon activation of manual circuit.	7	OFF
		8	ON
3	No. 1 circuit activated on first alarm, No. 2 circuit activated on second alarm or upon activation of manual circuit.	7	ON
		8	ON

Note: Pulse time period is approximately 1/2 second.

SELECTING THE PRE-DISCHARGE TIMER ACTIVATION MODE:

There are 4 modes of starting the pre-discharge timer from zones 1 and/or 2. Select the desired mode by setting switches 9 and 10 as shown in the following:

<u>Mode</u>	<u>Operation</u>	<u>Switch No.</u>	<u>Position</u>
1	Single zone activation	9	ON
		10	OFF
2	Cross zone activation	9	OFF
		10	ON
3	Sequential activation	9	ON
		10	ON
4	Sequential or cross zone (any 2 detectors)	9	OFF
		10	OFF

NOTE: Mode 3 or 4 requires the use of Hochiki detectors and HSB-21 or YBA-M21 bases.

ACTIVATION FROM MANUAL CIRCUIT:

In addition to the above activation modes, there are two modes of activation from the manual device circuit. Select the desired mode by setting switch 11 as shown in the following:

<u>Mode</u>	<u>Operation</u>	<u>Switch No.</u>	<u>Position</u>
1	Immediate discharge upon activation of the manual circuit.	11	OFF
2	30 second delay of discharge after activation of the manual circuit.	11	ON

SELECTING ABORT CIRCUIT OPERATING MODE:

There are two modes of operation for the abort circuit. Select the desired mode by setting switch 12 as shown in the following:

<u>Mode</u>	<u>Operation</u>	<u>Switch No.</u>	<u>Position</u>
1	Releasing circuit is delayed as long as the abort circuit is activated.	12	OFF
2	(IRI applications) Pre-discharge timer will not start if abort circuit is activated before second alarm occurs.	12	ON

SELECTING DISCHARGE TIME:

There are two modes of operation for the releasing circuit. Select the desired mode by setting switch 13 as shown in the following:

<u>Mode</u>	<u>Operation</u>	<u>Switch No.</u>	<u>Position</u>
1	Releasing circuit operating time 2 minutes	13	OFF
2	Releasing circuit operating time continuous	13	ON

NOTE: For use in sprinkler systems installed in accordance with the requirements of NFPA 13, either (a) switch 13 must be programmed “on” to provide continuous operation of the releasing device circuit or (b) the alarm trip valve must be of the latching type, such that water will continue to flow through the sprinkler system if power is removed.

INSTALLATION INSTRUCTIONS

NOTE: Please read the entire manual before attempting to install this panel.

Use wire routing drawing on page on page 28.

CAUTION: This panel, associated wiring and devices should be installed and maintained in accordance with Section 760, Fire Protection Signaling Systems, and all other applicable Sections of the National Electrical Code, NFPA 72 - National Fire Alarm Code (Central Station, Proprietary and Local), all local codes and the authority having jurisdiction.

Review the circuit parameters listed in the “Specifications” section of this manual before installing the panel.

CAUTION: Do not install the diode/resistor assembly across terminals 5 and 6. For testing install a 5.1K resistor only. Install diode/resistor assembly at solenoid location.

PROCEDURE FOR THE REMOVAL OF THE MAIN BOARD MODULE:

- 1) **If the module is being removed for replacement, disconnect the AC and battery power by pulling out the black pins on the two circuit breakers that are located at the upper right hand corner of the power supply board.**
- 2) Disconnect the power cable, accessible at the cutout on the left side of the main panel.
- 3) Remove the 16 point terminal from the top left hand side of the panel by pulling upward.
- 4) Pull out the two top corner locks or remove the screws.
- 5) Hold the top of the panel out approximately 1/2".
- 6) Insert a screwdriver between the ends of the terminal strip and the panel at the points indicated by the arrows.
- 7) Pry the panel toward the top of the housing. Hold onto the Main Board Module tightly. The Main Board Module should become free of the terminal strip at which time it may be removed from the panel.

LOCATION:

This unit should be installed in a dry location where it will not be exposed to temperature extremes. This unit should be mounted in a convenient location approximately 5 feet from the floor where it will be accessible for testing and servicing.

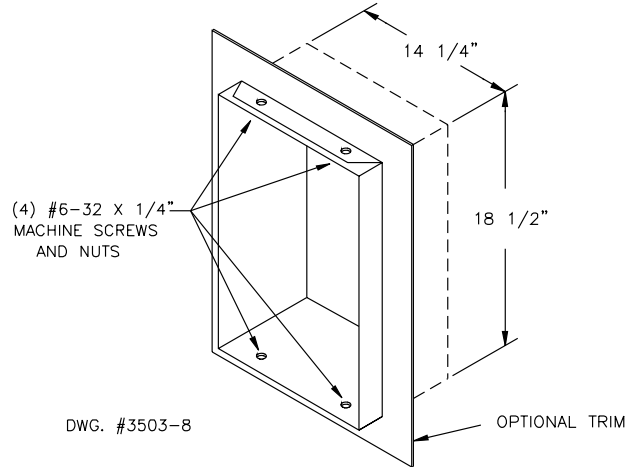
NOTE: Mounting the unit too high will make the alpha-numerical display difficult to read. The display is most visible when

viewed at eye level. The viewing angle can be adjusted slightly by the adjustment located just below the display.

MOUNTING THE BEZEL:

- 1) This unit may be surface mounted or semi-flush mounted by using the optional trim bezel. For semi-flush installations mount the housing so that the front edge protrudes 1" from the finished wall surface.
- 2) The main panel should be removed before attempting to mount the cabinet. For instructions on removal of the Main Board Module, refer to "Procedure for the Removal of the Main Board Module".
- 3) Install all required conduits, external wiring and devices making all connections that are external to the panel.
- 4) If this is a semi-flush mount installation, after the wall surface is finished, slide the trim bezel in place and fasten with four #6-32 screws as shown below.

INSTALLATION OF BEZEL FOR SEMI-FLUSH INSTALLATIONS



WIRINGHOOKUP:

- 1) With the AC power turned off at the circuit breaker panel, connect the 120VAC HOT, NEUTRAL and GROUND wire to the terminal block as shown on the power supply connection drawing. Verify that the transformer cable is securely connected.
- 2) Connect all the other wiring to the terminals as shown in the main board connection drawings. Plug the main board into the card edge connection portion of the terminal strip. Plug the power cable into the main board. Turn the AC power on. Observing proper polarity, connect the standby batteries with the cable provided.
- 3) The operation of the complete system should be verified as outlined in the test procedure section.

TEST PROCEDURES

CAUTION: The system should be inspected and tested in compliance with NFPA-72 National Fire Alarm Code or the authority having jurisdiction.

- 1) Notify the fire department or other receiving station of alarm, supervisory, and/or trouble signals that will be transmitted.
- 2) Notify the proper building personnel so that audible and/or visual, signals can be disregarded during testing.
- 3) Remove the two wires from the releasing circuit, reverse and reconnect them. The panel should go to a trouble condition and remain there (if the panel restores to a normal condition when the leads are reversed it indicates that the diode in the end of the line assembly is open and the solenoid valve can not operate until the entire EOL assembly, part #3005012, is replaced). Disconnect and restore the leads to their correct position. The panel should restore to a normal condition.
- 4) Operate the Releasing Circuit Switch to the disable position. This will cause a trouble condition.
- 5) Momentarily operate the Test/Reset switch to the Test position. This will cause all audible and visual indicators to activate. Releasing the Test switch will restore the panel to the condition it was in prior to operation of this switch.
- 6) Operate each zone switch to the disable position. This should result in a trouble condition and operate all indicators as described in the sections on "Trouble Conditions" and "Initiating Device Circuits Response". Restoring the switch to the enable position should restore all indicators to normal.
- 7) Momentarily open each of the following circuits:
 - A) Each initiating device zone. There is a brief delay when these circuits are in the Style D (Class A) mode.
 - B) Supervisory circuit.

- 7) Momentarily open each of the following circuits:
 - A) Each initiating device zone. There is a brief delay when these circuits are in the Style D (Class A) mode.
 - B) Supervisory circuit.
 - C) Indicating Appliance circuits.
 - D) Abort Circuit.

Verify that this results in a trouble condition and all indicators operated as described in the appropriate preceding section for the particular circuit that is faulted.
- 8) Turn off AC power at the circuit breaker panel. The green "AC ON" LED will be extinguished. Verify that all the trouble indicators described in the section on "Loss or Reduction of AC Power" occur. Operated the Reset/Test switch to the Test position. All audible and visual indicators should operate. Restore the switch to normal. Restore the AC power.
- 9) Operate the Auto Reset switch to the on position.
- 10) Operated each alarm imitating device on all zones. All audible and visual devices should operated. These devices will cease to operate after period of approximately 3 seconds. Power will automatically be removed from the initiating device circuit for approximately 15 seconds. No alarm can be initiated during this period. If the imitating device has not been restore the panel will go back into the alarm condition.
- 11) Operate each initiating device on the supervisory circuit. Verify that all the indications described in the section on "Supervisory Conditions" occur.
- 12) Restore the Releasing Circuit Switch.
- 13) Return the Auto Reset switch to the off position. All the LED's on the panel except the green "AC ON" LED should be off. All audible and visual indicators connected to the indicating appliance circuit should be off.
- 14) Notify all building personnel that the test has been concluded.
- 15) Notify the fire department or other receiving station that the test has been concluded.

OPERATING INSTRUCTIONS

Fill in the name, address and telephone number of the servicing agency on the instruction sheet provided and post in a prominent place. There are two Operating Instruction sheets provided, one if abort mode 1 is used and the other if abort mode 2 is used.

BATTERY SIZE REQUIREMENTS

These panels require a 24 Volt gel-cell battery for proper operation. 24 hours of standby power is required for NFPA 722-Central Station Systems, Local Systems and Proprietary Systems.

The chart below will assist you in selecting the proper size battery:

Battery Size	Hours of Standby	Maximum Auxiliary Current Load
4.0 AH	24	.100
8.0 AH	24	.175
8.0 AH	90	0
12.0 AH	24	.250
12.0 AH	90	.075

Note: Batteries rated above 10AH require a separate battery cabinet.

Alternate method of calculating battery size using the "Calculation Table" on page 19.

- 1) List in column #1 all devices used in the system, include all modules, bells, horns, door holders and smoke detectors (see Table #1 or manufacturers specifications).
- 2) List in column #2 the quantity of each device.
- 3) List in column #3 the standby current of each device (exclude all indicating appliance devices).
- 4) List in column #5 the alarm current of each device.
- 5) For each line, multiply the figure in column #2 by the figure in column #3 and enter the product in column #4. Then multiply the figure in column #2 by the figure in column #5 and enter the product in column #6.
- 6) Add the figures in column #3 and #6, then enter the sums in the appropriate Total mA box.
- 7) Convert these figures from milliamperes to amperes by multiplying by .001, enter the product in the appropriate Total A box.
- 8) Multiply the standby total amperes by required time in hours from Table 2.
- 9) Divide the alarm total amperes by 12 for 5 min. or by 6 for 10 min. (see Table 2).
- 10) Add the standby AH and the alarm AH and divide this sum by .85 (Efficiency Factor). Select a battery that has an AH rating above this figure but not less than 6.5 AH.

TABLE 1 CURRENT REQUIREMENTS

Module/Device	Standby mA	Alarm mA
PFC2000RC	85	240*

*Includes one zone short circuit current.

TABLE 2 SECONDARY POWER SUPPLY REQUIREMENTS

NFPA Standard	Standby Time	Alarm Time
NFPA-72 National Fire Alarm Code		
• Central Station Systems	24 hrs.	5 mins.
• Local Systems	24 hrs.	5 mins.
• Proprietary Systems	24 hrs.	5 mins.
FMRC 1011 & 1012, Deluge & Pre-action Systems	90 hrs.	10 mins.

CALCULATION TABLE

1	2	3	4	5	6
Module/Device	Quantity	Standby mA Per Unit	Total Standby Current	Alarm mA Per Unit	Total Alarm Current
		Total mA		Total mA	
		Convert to A	x .001	Convert to A	x .001
		Total A		Total A	
		Multiply by hours from Table 2	x _____	5 min/12 or 10 min/6	÷ _____
		Total Standby AH		Total Alarm AH	
			+ Total Standby AH		
			Total AH		
			Efficiency Factor		÷ .85
			Required AH		

Use a battery with a higher AH rating than Required AH

INACTIVE CIRCUITS

All inactive alarm and supervisory initiating device circuits and indicating appliance circuits must have the end-of-line resistor installed on the panel terminals. On circuits that have four terminals, this resistor must be on the outside two terminals.

APPLICATIONNOTES

NOTE 1:

When the releasing circuit is used to activate releasing solenoids for compressed gas suppression systems such as carbon dioxide (NFPA-12) , halon (NFPA-12A & 12B) and dry chemical (NFPA-17), some means of indicating that the compressed gas extinguishing agent cylinder has been discharged must be provided as part of the system installation. This may be accomplished with a listed supervisory initiating device intended specifically for this purpose or by the use of one or more listed alarm pressure switches installed to monitor the pressure present in the suppression system, the normally open contacts of which are connected to the supervisory circuit of the PFC 2000RC (terminals 13 and 14).

NOTE 2:

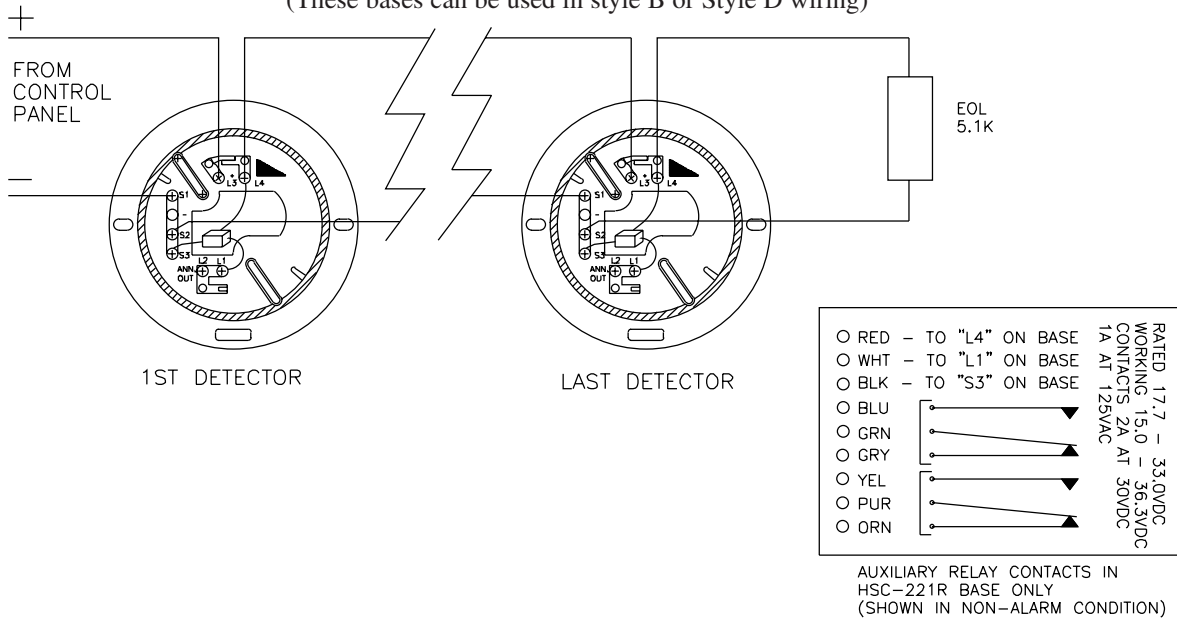
For use in sprinkler systems installed in accordance with the requirements of NFPA-13, either (a) switch 13 must be programmed “on” to provide continuous operation of the releasing device circuit or (b) the alarm trip valve must be of the latching type, such that water will continue to flow through the sprinkler system if power is removed.

TYPICAL 2-WIRE DETECTOR CONNECTION DRAWINGS

Base wiring for Hochiki models SIH-24F Ionization Detectors and SLK-24FH Photoelectric Detectors. See page 15 for instructions on selecting the Zone Style and Pre-Discharge Timer Activation Mode.

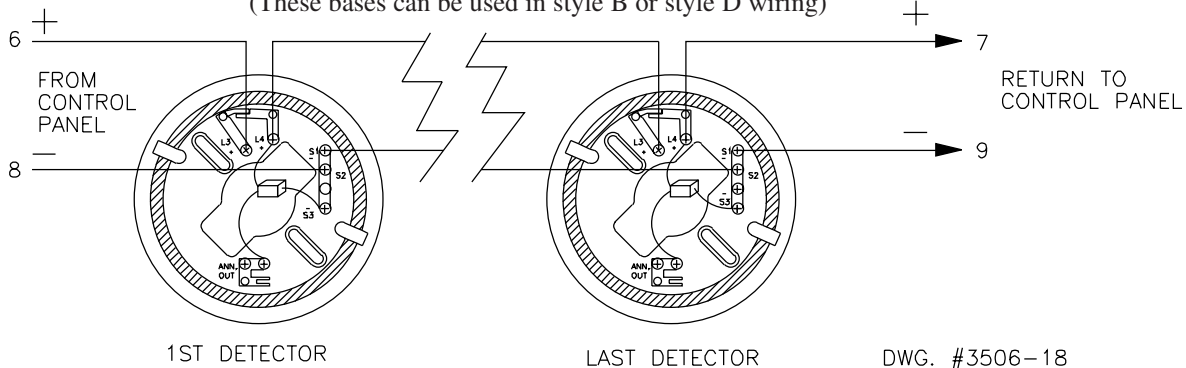
TYPICAL STYLE B (CLASS B) WIRING USING HSB-21, HSB-221 OR HSC-221R BASES

(These bases can be used in style B or Style D wiring)



TYPICAL STYLE D (CLASS A) WIRING USING YBA-M21 OR YBA-M221 BASES

(These bases can be used in style B or style D wiring)



Predischarge Timer

Activation Mode Selected
1 or 2 (single or cross zone)

6" Dia. Base
HSB-221N
HSC-221R

4" Dia. Base
YBA-M221

Relay

Impedance
390 ohms
390 ohms

Contact
no
yes

3 or 4 (sequential or cross sequential)

HSB-221

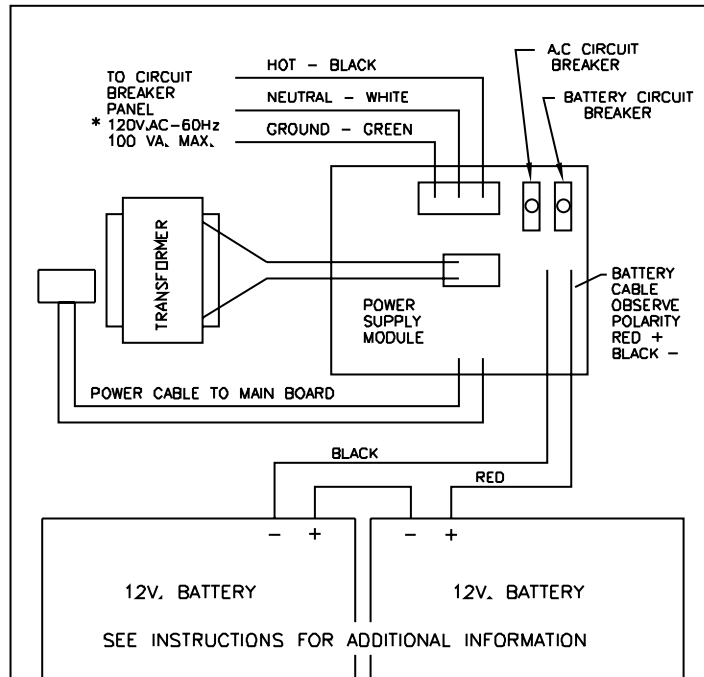
YBA-M21

750 ohms

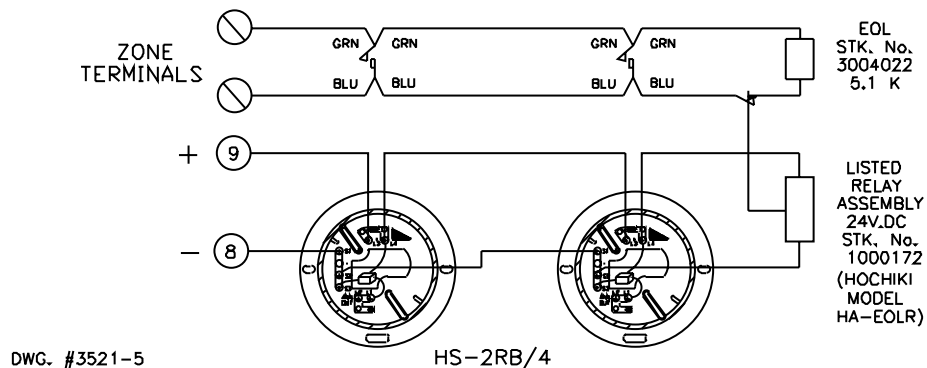
no

- NOTES:
- 1) Only bases with 750 ohms of impedance can be used when sequential or cross-sequential timer activation is selected. The 4" diameter bases will mount on a 3" octagon box. The 6" diameter bases will mount on a 3" or 4" octagon box or a 4" square box.
 - 2) When used in the sequential or cross-sequential mode, if an annunciator is to be connected to the smoke detectors a 3.6K ohm resistor should be installed in series with the annunciator output. The LED should be capable of illuminating at 2mA or less.

CONNECTION DRAWING POWER SUPPLY MODULE



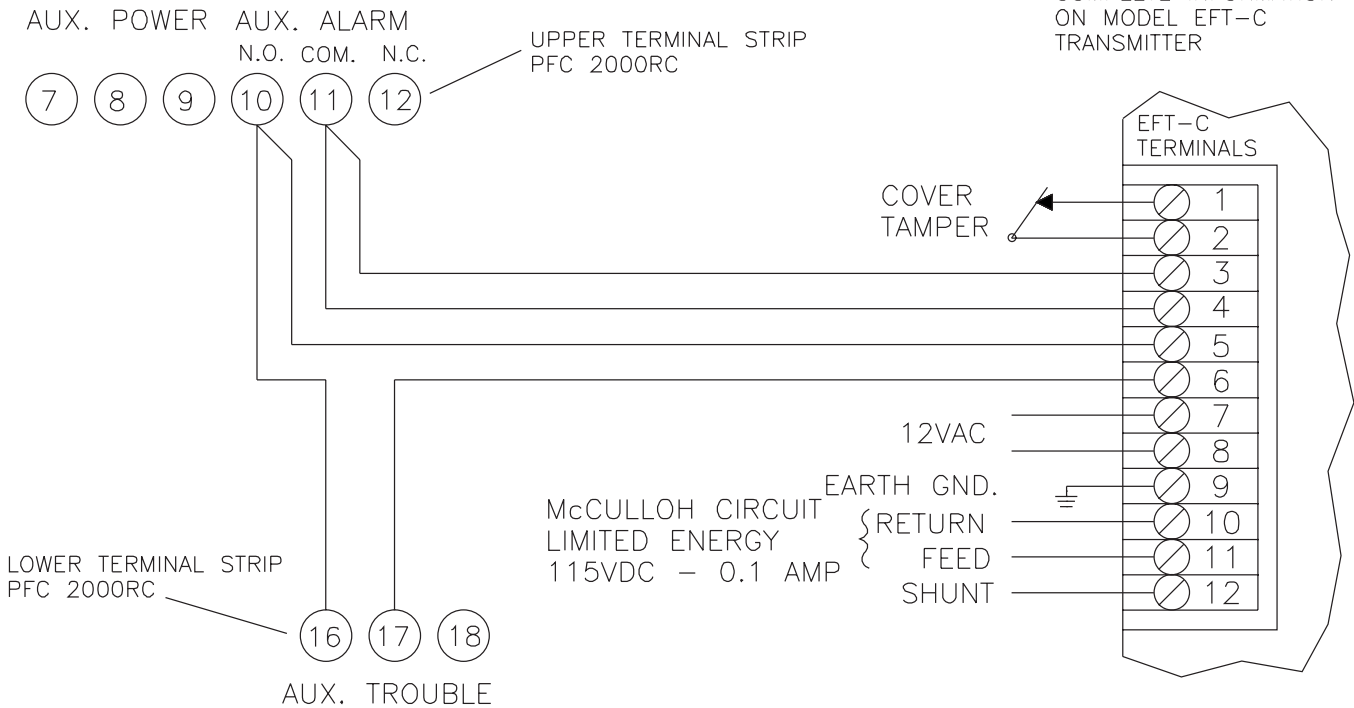
TYPICAL 4-WIRE DETECTOR CONNECTION DRAWING (CLASS B CKT. SHOWN)



CONNECTION DRAWING FOR CENTRAL STATION & PROPRIETARY OPERATION

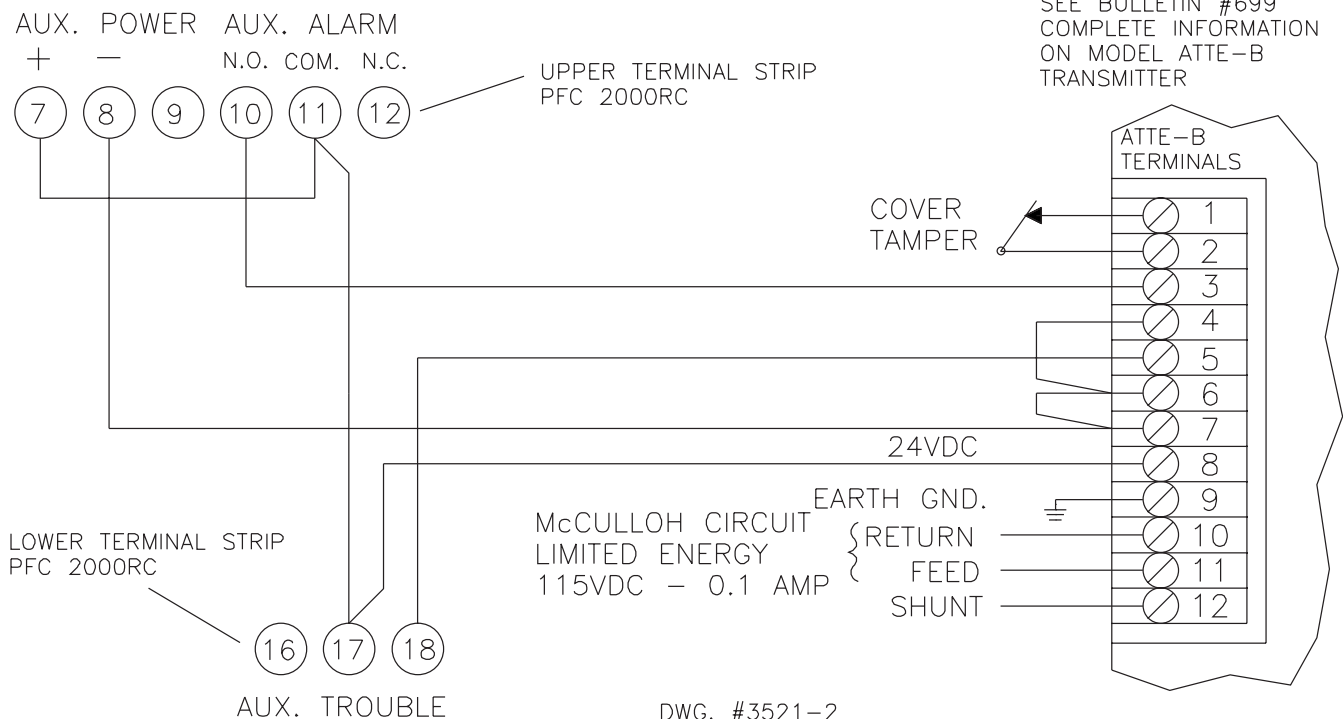
PFC/EFT-C INTERCONNECTION DRAWING

SEE BULLETIN #748 FOR COMPLETE INFORMATION ON MODEL EFT-C TRANSMITTER



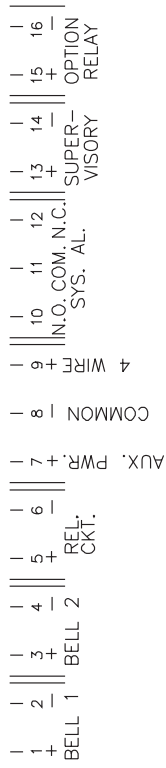
PFC/ATTE-B INTERCONNECTION DRAWING

SEE BULLETIN #699 COMPLETE INFORMATION ON MODEL ATTE-B TRANSMITTER



DWG. #3521-2

PFC 2000RC INNER PANEL DRAWING



HOLD THREE SECONDS
RESET

SILENCE

DISABLE ZONE 1

DISABLE ZONE 2

DISABLE MANUAL

DISABLE REL. CKT.

AUTO RESET



AC-ON TROUBLE
ALARM DISCHARGED
SUPERVISORY STATUS

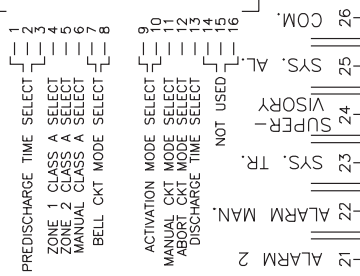
AUXILIARY
CKT. BREAKER

PS1
POWER
SUPPLY
CONNECTOR
CAUTION
DO NOT
DISCONNECT
WHILE AC
OR BATTERY
POWER IS ON

CIRCUIT SECS. TO DISCHARGE

VIEWING ANGLE

PANEL REMOVAL:
REMOVE AC AND BATTERY POWER
DISCONNECT POWER CONNECTOR PS1
REMOVE THE TWO TOP CORNER SCREWS
HOLD TOP OF PANEL OUT APPROX. 1/2".
INSERT SCREW DRIVER BETWEEN ENDS
OF TERMINAL AND PANEL AT ARROWS
PRY PANEL TOWARD TOP OF HOUSING.



**2-WIRE SMOKE DETECTOR COMPATIBILITY DATA
SYSTEM SENSOR (BRK) (MAX. NO. OF DETECTORS PER ZONE IS 20)**

DET. MODEL	IDENTIFIER	BASE MODEL	IDENTIFIER
1400	A	N/A	N/A
1451	A	B401B	A
2400	A	N/A	N/A
2400TH	A	N/A	N/A
2451	A	B401B	A
2451TH	A	B401B	A

DETECTION SYSTEMS (MAX. NO. OF DETECTORS PER ZONE IS 25)

DET. MODEL	IDENTIFIER	BASE MODEL	IDENTIFIER
DS200	A	MB200-2W	A
DS200HD	A	MB200-2W	A

ESL (MAX. NO. OF DETECTORS PER ZONE IS 25)

DET. MODEL	IDENTIFIER	BASE MODEL	IDENTIFIER
611U	S10	601U	S00
611UD	S10	601U	S00
611UT	S10	601U	S00
612U	S10	601U	S00
612UD	S10	601U	S00
613U5	S10	601U	S00
611UD	S10	609U10	S00
612UD	S10	609U10	S00
420C	S10	N/A	N/A
420CT	S10	N/A	N/A
425C	S10	N/A	N/A
425CT	S10	N/A	N/A

HOCHIKI (MAX. NO. OF DETECTORS PER ZONE IS 25)

FOR SEQUENTIAL DETECTION USE ONLY HOCHIKI DETECTORS WITH YBA-M21 BASE

DET. MODEL	IDENTIFIER	BASE MODEL	IDENTIFIER
SLR-24	HD-3	HSB-221N	HB-54
		HSB-221	HB-54
		HSC-221R	HB-71
		NS6-221	
SLR-24H	HD-3	NS4-221	
		HSB-221N	HB-54
		HSB-221	HB-54
		HSC-221R	HB-71
SIJ-24	HD-3	NS6-221	
		NS4-221	
		HSB-221N	HB-54
		HSB-221	HB-54
		HSC-221R	HB-71
		NS6-221	
		NS4-221	

FENWAL (MAX. NO. OF DETECTORS PER ZONE IS 35)

DET. MODEL	IDENTIFIER	BASE MODEL	IDENTIFIER
CPD-7051	I51FE1	2-WIRE	FE51A
PSD-7155	P55FE1	2WRLT	FE52A
PSD-7156	P56FE1	2WRB	FE55A

All of the above Fenwal detectors and bases can be used in any combination

Retrofit Base Adaptor 70-501000-003, Identifier MAFE1 (for series 70-201000 Bases, Models -001, -002, -003 and -005).
Duct Housing with Detector Base DH-51, Identifier DH22FE5 (for CPD-7051 and PSD-7155 detectors only).

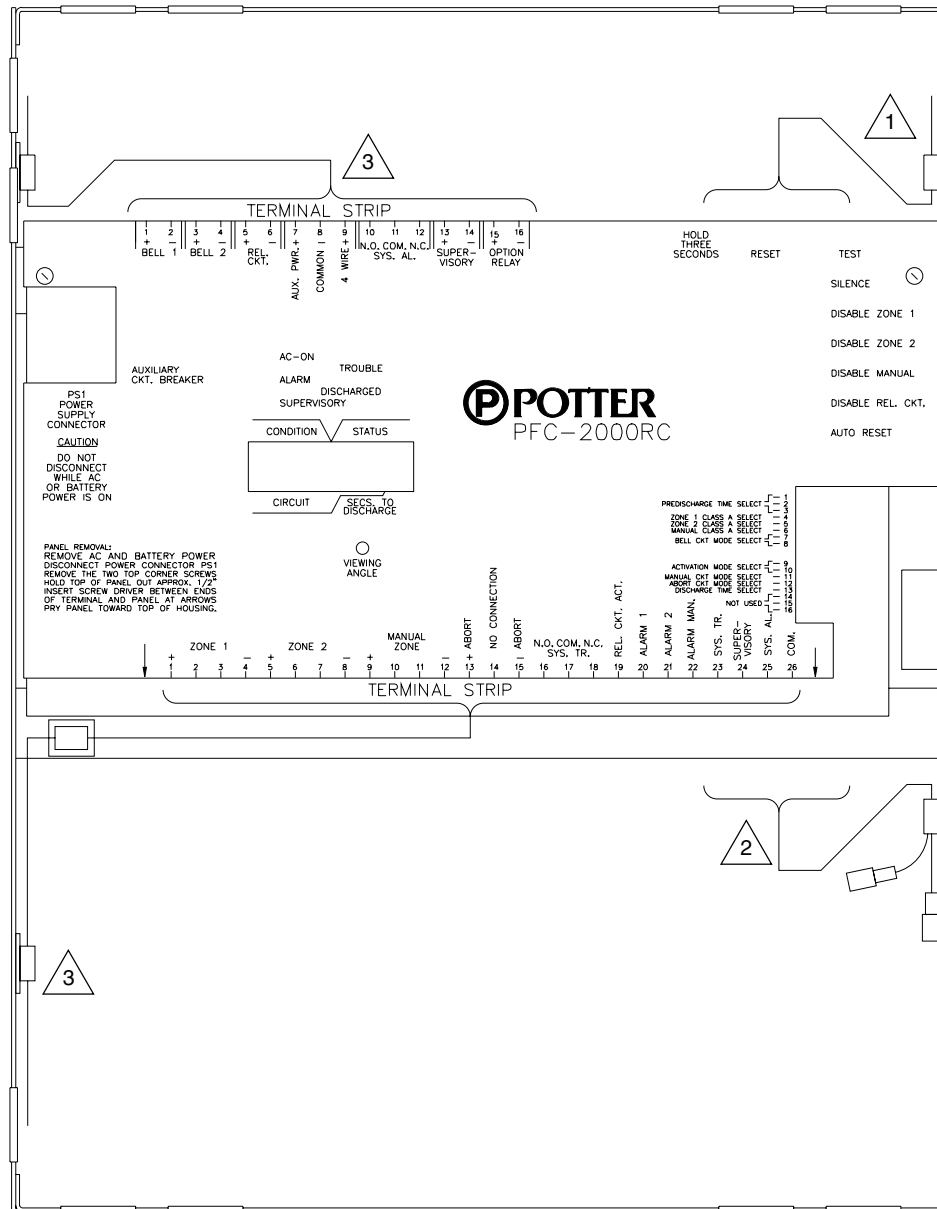
POTTER (MAX. NO. OF DETECTORS PER ZONE IS 25)

DET. MODEL	IDENTIFIER	BASE MODEL	IDENTIFIER
PS-24	HD-3(HOCHIKI)	SB-46	HB-71(HOCHIKI)
PS-24H	HD-3(HOCHIKI)	SB-46	HB-54(HOCHIKI)
			HB-71(HOCHIKI)
IS-24	HD-3(HOCHIKI)	SB-46	HB-54(HOCHIKI)
			HB-71(HOCHIKI)
			HB-54(HOCHIKI)




NOTE: IF SYSTEM SENSOR DETECTORS ARE MIXED WITH OTHER MANUFACTURERS DETECTORS, DO NOT EXCEED 20 PER ZONE. ONLY ONE DETECTOR CAN BE SUPPORTED IN ALARM PER ZONE EXCEPT TWO CAN BE SUPPORTED IN SEQUENTIAL OR CROSS-SEQUENTIAL.

AUTOMATIC WATER CONTROL VALVES COMPATIBILITY DATA			
USING THE FOLLOWING SOLENOIDS	WATER VALVE MANUFACTURER	WATER VALVE DESIGNATION	SIZE NPS
ASCO Solenoid Valves Model T8210A107, Model R8210A107, Model 8210A107, 24VDC	Figgie Fire Protection Systems (Formally ASCOA)	Models D and F	2 1/2", 4", 6"
SKINNER Solenoid Valve Model 73218BN4UNLVNOC111C2, 24VDC	Grinnell Corp.	Grinnell or Gem Model A-4 Grinnell or Gem Model B Grinnell or Gem Model F445 Grinnell or Gem Model F470	4", 6" 2" 2 1/2" 4", 6"
SKINNER Solenoid Valve Model 73218BN4UNLVNOC111C2, 24VDC	Central Sprinkler	Model A	6"
	Reliable Automatic Sprinkler Co. Inc.	Model A Models B and BX	2 1/2" 4", 6", 100mm,150mm
	Globe Fire Sprinkler Corp.	Model F	2 1/2", 4", 6"
	Star Sprinkler Corp.	Model A Model D Model G	3",6" 3",6" 3",6"
ASCO Solenoid Valves Model T8210A107, Model R8210A107, Model 8210A107, 24VDC	The Viking Corp.	Model E-1	1 1/2", 2", 3", 4", 6"
FIXED EXTINGUISHING SYSTEMS CARBON DIOXIDE SYSTEMS COMPATIBILITY DATA			
MANUFACTURER		CO2 SOLENOID ACTUATOR	VOLTAGE
Fike Protection Systems Division of Fike, Inc.		C85-102	24VDC
ALARM INDICATING APPLIANCE COMPATIBILITY DATA			
All Alarm Indicating Appliances must be UL listed, 24VDC devices			

WIRE ROUTING FOR POTTER MODEL PFC 2000RC



DWG #3521-6

-  1 Power Inputs
-  2 Battery Leads
-  3 Using the cable clamps provided, route all other wiring (power limited) away from power input wiring (battery leads and any other non-power limited conductors).

NOTE:

All field installed wiring connected to this panel must maintain a spacing of 1/4 inch between all power limited fire protective signaling conductors and all electric light, power, Class 1 or non-power limited fire protective signaling conductors.