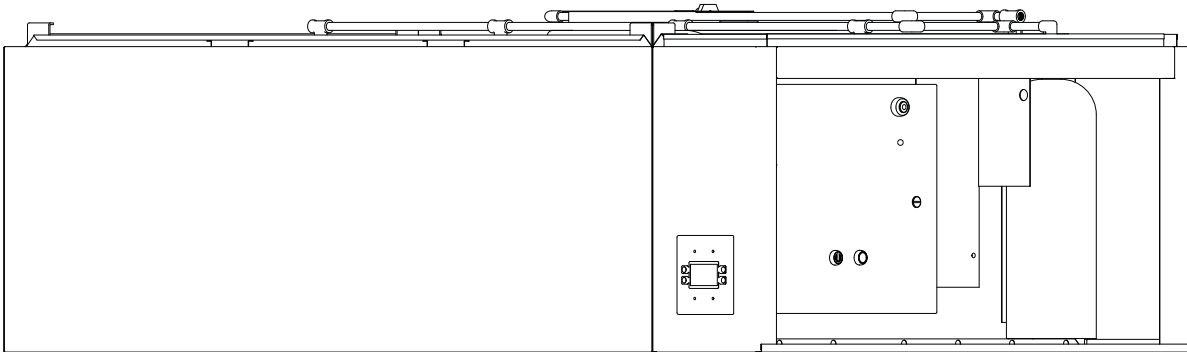


# Electric Wet Chemical Protection Fire System Installation, Operation, and Maintenance Manual

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## **RECEIVING AND INSPECTION**

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Check that all accessory items are accounted for and damage free.

## **WARNING!!**

Installation of this package should only be performed by a qualified Fire System Technician who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. **ALWAYS** disconnect power prior to working on equipment.

**Save these instructions:** This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.



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## WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 2-years from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product.
2. The equipment is not installed in accordance with Federal, State, or Local codes and regulations.
3. The equipment is misused or neglected, or not maintained per the MANUFACTURER'S maintenance instructions.
4. The equipment is not installed and operated within the limitations set forth in this manual.
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization, and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

**NOTE: To receive warranty coverage for this product, copy and print out the "Start-Up and Maintenance Documentation" on page 32. Fill in all details required. Fax the page to 1-919-516-8710 or call 1-866-784-6900 for email information within thirty (30) days of purchase.**

## LISTINGS

The microprocessor-based control board is ETL Listed to UL Standard 864 and CAN/ULC-S527-11.

The fire protection system control package is approved for use in New York City per the Fire Department of New York Certificate Of Approval #6267.

This fire protection system is UL Listed to meet requirements of UL 300; ULC Listed to meet requirements of ULC/ORD-C1254.6; CE Marked; New York City Department of Buildings; Meets requirements of NFPA 96 and NFPA 17A.

## INSTALLATION

It is imperative that this unit is installed and operated within the designed specifications and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at **1-866-784-6900** for warranty and technical support issues.

## Gas Shut-Off Valves

The electric gas valve is held open in the energized state, and closes when de-energized via the output relay of the control panel. The control panel must require manual resetting prior to fuel or power being restored, in accordance with NFPA 17A.

Gas valves are designed to shut off the flow of gas to the kitchen appliances in the event of fire system activation. Electric gas shutoff valves must be installed with an upstream strainer to prevent debris from prohibiting gas valve function. New pipe, properly reamed and cleaned of metal burrs, should be used. Proper care is needed to ensure that the gas flow is in the same direction as indicated on the gas valve and strainer. Do not over-tighten pipe connections. Apply pipe dope to the male threads only. If necessary, install a drip leg in the gas line in accordance with the Authority Having Jurisdiction (AHJ).

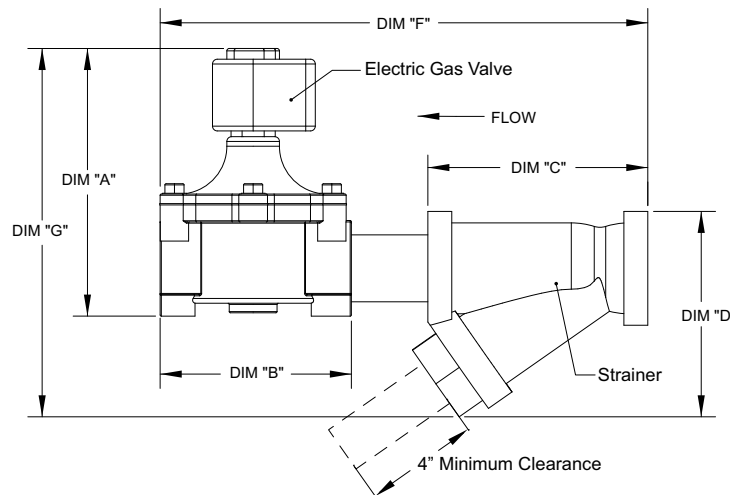
**120V AC** gas valves 3/4" - 2" can be mounted with the solenoid in any position above horizontal.

**120V AC** gas valves 2-1/2" - 3" must be mounted with the solenoid vertical and upright. The pipe must be horizontal.

All **24V DC** gas valves must be mounted with the solenoid vertical and upright. The pipe must be horizontal.

Proper clearance must be provided in order to service the strainers. A minimum of 4" clearance distance must be provided at the base of the strainer.

**Figure 1 - Electric Gas Valve**



**Table 1 - Gas Valve Details**

Gas Valve (ASCO)	Strainer	Size	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "F"	DIM "G"
8214235	4417K64	3/4"	6-15/16"	5-15/16"	4"	4-1/2"	11-15/16"	9-7/8"
8214250	4417K65	1"	6-15/16"	5-15/16"	4-7/8"	5-3/16"	12-13/16"	10-11/16"
8214265	4417K66	1-1/4"	7-5/8"	6-3/8"	5-1/8"	5-15/16"	13-1/2"	12-1/16"
8214275	4417K67	1-1/2"	7-5/8"	6-3/8"	5-3/4"	6-3/16"	14-1/8"	12-5/16"
8214280	4417K68	2"	7-5/8"	6-3/8"	7-1/4"	7-13/16"	15-5/8"	13-15/16"
8214290	4417K69	2-1/2"	10-5/16"	8-1/16"	8-7/8"	9-7/8"	18-15/16"	18-5/8"
8214240	4417K71	3"	10-5/16"	8-1/16"	10"	10-15/16"	20-1/16"	19-11/16"

## ELECTRICAL

### **WARNING!!**

**Disconnect power before installing or servicing control. High voltage electrical input is needed for this equipment. A qualified electrician should perform this work.**

Before connecting power to the control package, read and understand the entire section of this document. As-built wiring diagrams are furnished with each control package from the factory and are either attached to the door of the unit or provided with the paperwork packet.

Electrical wiring and connections must be made in accordance with local ordinances and the National Electric Code, ANSI/NFPA70. Verify the voltage and phase of the power supply, and the wire amperage capacity is in accordance with the unit nameplate.

**ATTENTION: LOW-VOLTAGE DC OR SIGNALING WIRE SHOULD BE ROUTED IN SEPARATE CONDUIT FROM ALL AC VOLTAGE SOURCES.**

1. Always **disconnect power** before working on or near this equipment. Lock and tag the disconnect switch or breaker to prevent accidental power-up.
2. **There are multiple electrical connections** required for this control. **120V AC** should be wired to terminals **H1** and **N1**. If the hood is equipped with a separate light circuit, **120V AC** should power this circuit per the as-built schematic. **H1** and **N1** should not be connected to a shunt trip breaker.
3. Verify that the power source is compatible with the requirements of your equipment. The system wiring schematic identifies the **proper phase and voltage** of the equipment.
4. Before connecting the control package to a power source, verify power source wiring is de-energized.
5. Secure the power cable to prevent contact with sharp objects.
6. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals. Release solenoid cables **must not** come in contact with hood surfaces.
7. If the control package is a **wall-mount system**, a duct mounted temperature sensor will need to be wired. The temperature sensor must be wired to terminal blocks, as indicated on the wiring schematic.
8. If the system contains additional firestats, they must be wired into the supervised loop.
9. If the control is a **wall-mount system**, the hood lights wiring will need to be wired to terminals "B" and "W." Verify connections on wiring schematic.
10. Before powering up the system, make sure that the interior of the control package is free of loose debris or shipping materials.
11. If any of the original internal wire supplied with the system must be replaced, it must be replaced with type THHN wire or equivalent.
12. All field-supplied wire for the optional fire system release solenoid or firestat must be high temp wire rated for **842°F** minimum (#441601C6.FE9 White and #441601C6.FE0 Black).
13. The battery must be plugged into the connector labeled J1 on the electrical board (PCBCORE) after wiring is complete.
14. All gas appliances under the hood must shut down in the event of an AC power loss. All electric appliances will shut down on building power loss.
15. It is recommended to use Belden #6320UL, 18 Gauge, plenum-rated wire for the supervised loop that does not come in contact with the hood. It is recommended to use Belden #88760 for the fire system interlock network and CAT-5 for Modbus communications.
16. All exterior wiring connections to the PCU must be run inside liquid tight conduit. This includes the supervised loop and airflow switch wiring.

**IMPORTANT!: The battery backup for the fire protection system produces output power even when main power is disconnected from system. When performing major electrical service to the control, the battery backup must be disconnected then reconnected before commissioning.**

## Wire Ampacity Rating

The load current rating and the over-current protection for conductor types shall not exceed 15 amperes for 14 AWG, 20 amperes for 12 AWG, and 30 amperes for 10 AWG aluminum and copper-clad aluminum after any correction factors for ambient temperature and number of conductors have been applied.

**Table 2 - Copper Wire Ampacity @ 75°C**

Wire Size AWG	Maximum Amps
14	15
12	20
10	30
8	50
6	65
4	85

## Distance Limitations

Wiring connections to remote fire protection system(s) must use shielded twisted pair wire. The maximum length of this connection is 1000 feet.

Wire size is an important consideration when making the connections between the fire protection system control package and a gas valve. Refer to **Table 3** for maximum wiring distance between the system and remote gas valve.

**Table 3 - Wiring Maximum Distance**

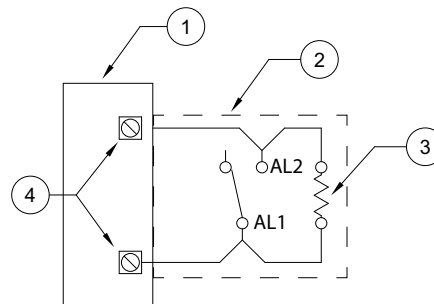
Wire Gauge	Distance (Feet)
12	1049
14	660
16	414
18	260
20	164
22	103
24	64

## Fire Alarm Contacts

The fire protection system is equipped with normally open contacts that can be connected to the premise Fire Alarm Control Panel (FACP) (terminals **AL1** and **AL2**). During a fire condition, the contacts will close and trigger the premise FACP to initiate a general fire alarm.

**Figure 2 - Fire Alarm Reference**

1. Building Fire Alarm
2. Control Panel Fire Alarm Contact
3. End of Line Device
4. Alarm Input



## Fire Group

Fire Groups are for the purpose of using multiple CORE controlled fire systems and grouping specific fire systems together. This will allow the user the ability to assign different zones for independent activation.

In order to set a fire group, you will need to set the CORE board DIP switches to:

**Table 4 - Fire Group DIP Switch Position**

6	7	Fire Group Number
Open	Open	1
Closed	Open	2
Open	Closed	3
Closed	Closed	4

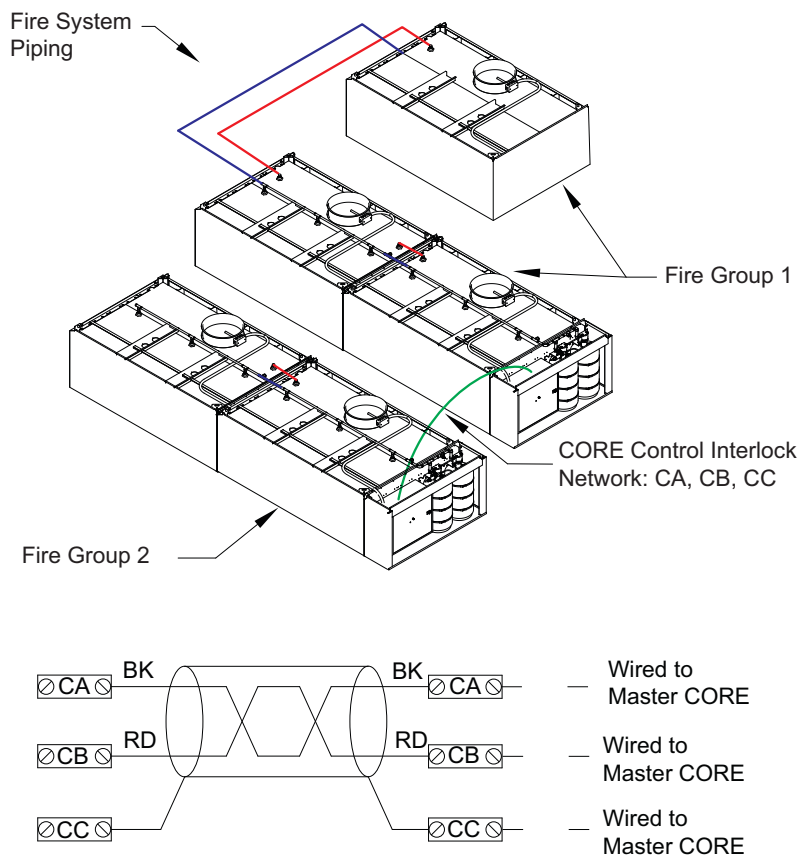
**Note: Every panel with matching fire group settings (DIP switches 6 and 7) will activate simultaneously in a fire condition.**

**Figure 3** shows an example of different zones on separate fire groups, but still connected via the interlock network. In the example, when 2 Fire groups (01 and 02) are assigned on the CORE boards, and if a fire condition exists in any one group, it will NOT activate the other fire group although both are connected to the same interlock network.

- Fire Group 01 CORE board DIP switch setting will be set to: Switch 6 Open and Switch 7 Open.
- Fire Group 02 CORE board DIP switch setting will be set to: Switch 6 Closed and Switch 7 Open.

Refer to **“Typical DIP Switch Arrangement”** on page 13 for setting multiple CORE controlled fire systems.

**Figure 3 - Fire Group Reference**





## Component Description

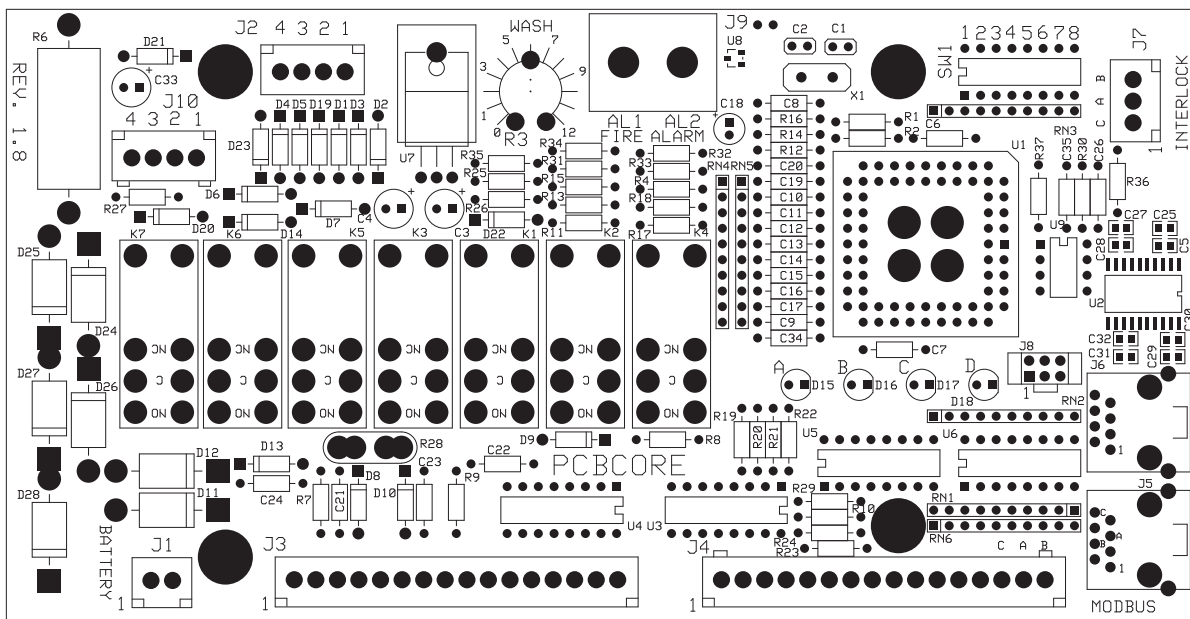
The following section lists the major controls and components used in the Self-Cleaning Hood and the Fire Protection System.

### Fire Protection System Printed Circuit Board

The fire protection system printed circuit board (PCBCORE) is a microprocessor-based controller that provides all the necessary monitoring, timing, and supervision functions required for the reliable operation of the fire system. Under normal conditions, the "Fire System Activated" light is flashing one brief flash every 3 seconds, indicating the system is armed and ready. If a fault is detected anywhere in the system, an audible alarm will periodically sound, and the "Fire System Activated" light will flash a fault code to indicate the fault that was detected. This fault code consists of a series of flashes followed by a pause. Simply count the number of flashes between the pauses and refer to the chart below to find the cause of the fault. Any fault is extremely important and must be corrected and rectified immediately to ensure proper operation of the fire system.

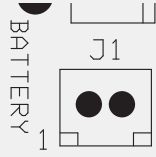
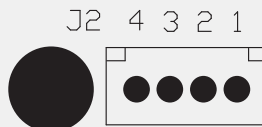
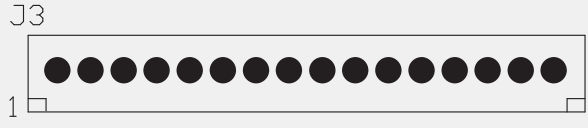
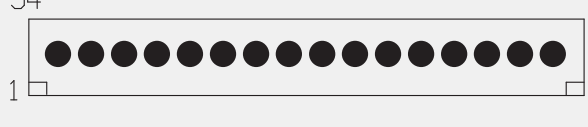
The connections for building fire panels are located at AL1 and AL2 as dry contacts.

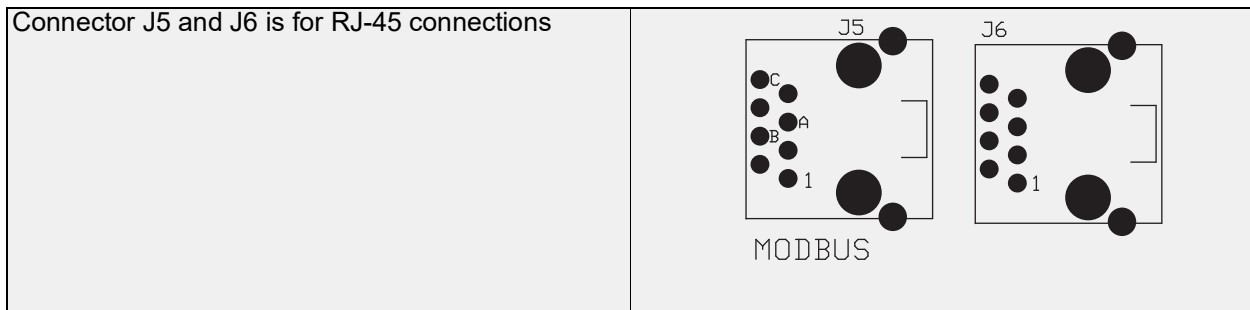
**Figure 4 - Printed Circuit Board**



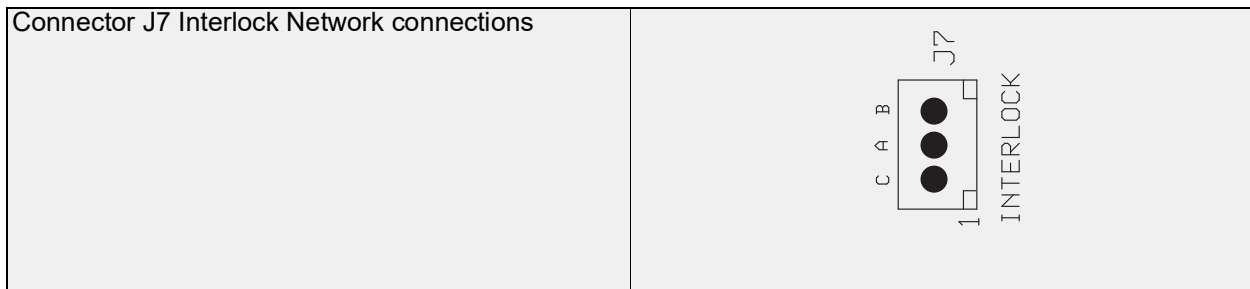
## Connector Descriptions

**Note: Some connections may not be used dependent on system configurations.**

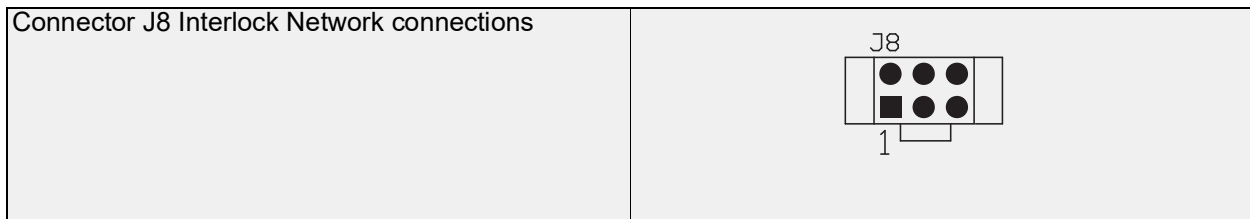
<p>Connector J1 contains battery pack connections for battery charging and monitoring.</p>	
<p>Pin 1 – Battery Positive</p>	<p>Pin 2 – Battery Negative</p>
<p>Connector J2 contains Supervised Sensor Loop connections</p>	
<p>Pin 1 – Start Positive Loop Pin 2 – Start Negative Loop</p>	<p>Pin 3 – Finish Negative Loop Pin 4 – Finish Positive Loop</p>
<p>Connector J3 contains Power Supply and Device connections</p>	
<p>Pin 1 and Pin 2 – Positive Input, Power Supply Pin 3 and Pin 4 – Negative Input, Power Supply Pin 5 – Positive Output, Gas Valve Solenoid Pin 6 – Positive Output, Surfactant Pump Pin 7 – Positive Output, Release Valve Solenoid Pin 8 and Pin 9 – 24V DC Input, Shutoff Valve Supervision</p>	<p>Pin 10 – N/A Pin 11 – Drive Output, Fire Relay Pin 12 – Drive Output, 100% Relay Pin 13 – Drive Output, Trouble Relay Pin 14 – Drive Output, Wash Relay Pin 15 – Drive Output, Spare Relay Pin 16 – Drive Output, Auto-Man Relay</p>
<p>Connector J4 contains Power Supply and Device connections</p>	
<p>Pin 1 – Positive Input, Power Supply Pin 2 – Output, Panel Mounted Audible Alarm Pin 3 – Output, Panel Mounted LED Fire/Fault Indicator Pin 4 – N/A Pin 5 – Drive Output, Cooking Equipment Disable Relay Pin 6 – Negative Input, Power Supply Pin 7 – N/A</p>	<p>Pin 8 – Input, Pump Prime/Reset Push Button Pin 9 – Input, Gas Cartridge/Pressure Switch Pin 10 – Input, Fan Switch Pin 11 – Input, Gas Valve Reset Push Button Pin 12 – Input, Door/Tamper Switch Pin 13 – Input, Test Mode Pin 14 – Modbus Network, Common Signal (C) Pin 15 – Modbus Network, Negative Signal (A) Pin 16 – Modbus Network, Positive Signal (B)</p>



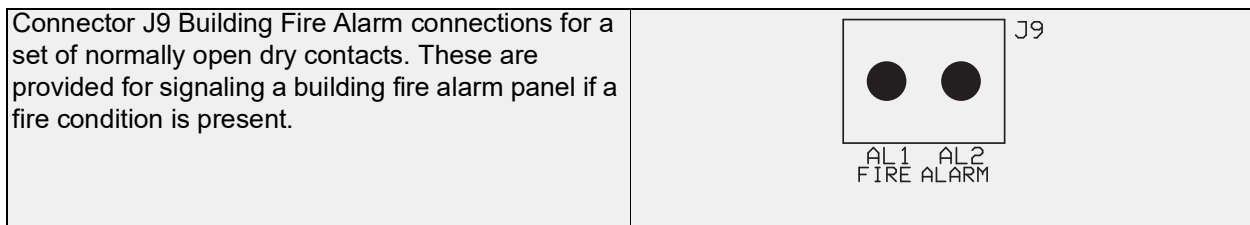
These two connections are for the Modbus Network. This network may be used by non-fire system related equipment to monitor operating conditions of the electrical (PCBCORE) board.



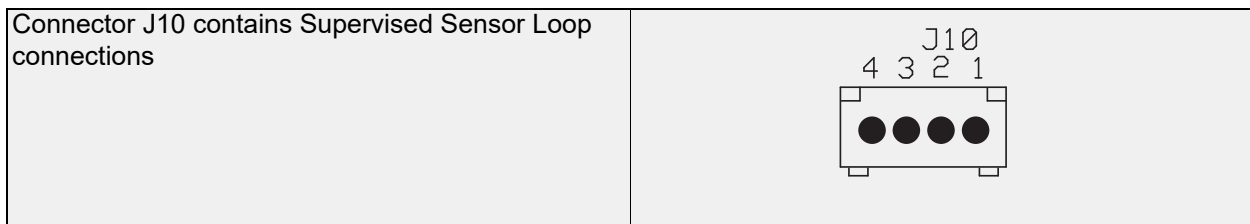
Pin 1 – Interlock Network, Common Signal (C) Pin 2 – Interlock Network, Negative Signal (A)	Pin 3 – Interlock Network, Positive Signal (B)
--	--



Factory Use Only



Pin 1 – Dry Contact Closure	Pin 2 – Dry Contact Closure
-----------------------------	-----------------------------



Pin 1 – Start Positive Loop Pin 2 – Start Negative Loop	Pin 3 – Finish Negative Loop Pin 4 – Finish Positive Loop
--	--

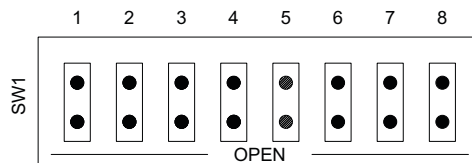
## DIP Switch Settings

When set from the factory, switches 1, 5, and 8 are in the Closed (On) positions. Switch 2, 3, 4, 6, 7 are in the Open (Off) position. These should be considered the default positions and should not be changed.

**Table 5 - DIP Switch Settings**

DIP Switch #	Description				
1 through 4	<b>DIP Switch Position</b>				<b>Interlock Network Address</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
	Closed	Open	Open	Open	1
	Open	Closed	Open	Open	2
	Closed	Closed	Open	Open	3
	Open	Open	Closed	Open	4
	Closed	Open	Closed	Open	5
	Open	Closed	Closed	Open	6
	Closed	Closed	Closed	Open	7
	Open	Open	Open	Closed	8
	Closed	Open	Open	Closed	9
	Open	Closed	Open	Closed	10
	Closed	Closed	Open	Closed	11
	Open	Open	Closed	Closed	12
	Closed	Open	Closed	Closed	13
Open	Closed	Closed	Closed	14	
Closed	Closed	Closed	Closed	15	
	Open	Open	Open	Open	This unit is not part of an interlock network
5	Set this switch to Closed (On) if this unit has the highest address on the interlock network. Otherwise, this switch must be Open (Off)				
6 and 7 Fire Group	<b>6</b>		<b>7</b>		<b>Fire Group Number</b>
	Open		Open		1
	Closed		Open		2
	Open		Closed		3
	Closed		Closed		4
8	Setting switch 8 to its Closed (On) position connects a 120 Ohm terminating resistor to the interlock network. This switch must be Closed if this unit is at either physical end of the interlock network cable. Otherwise, it must be Open (Off).				

**Figure 5 - DIP Switch**



- Each unit has a unique address based on the DIP switch 1-4 settings, 15 units max on a network.
- If address is 0 (all switches off), the unit will not accept or send any network traffic.
- The unit that has switch 5 set to on will be the “master” and will be in charge of polling all the units below it and waiting for a reply. The lack of 3 replies in a row will cause an “interlock network supervision fault.” All units will be polled in a burst every 3 seconds.
- For all non-master units, the lack of being polled for 10 seconds will cause an “interlock network supervision fault.”
- Any unit detecting a fire condition will broadcast the notification once every second for as long as the condition persists.
- When the Fire condition is cleared, 10 notifications will be sent, one every second.
- Any unit detecting a supervisory fault will broadcast the notification every 2 seconds until the condition is cleared.
- When the supervisory fault condition is cleared, 10 notifications will be sent, one every 2 seconds.

## Typical DIP Switch Arrangement

Only One Fire Protection System Panel on the network:

Core Board #	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
#1 (Hood Master)	Closed	Open	Open	Open	Closed	Open	Open	Closed

Two Fire Protection System (or CORE) Panels on the network:

Core Board #	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
#1 (2nd Hood Slave)	Open	Closed	Open	Open	Open	Open	Open	Closed
#2 (Hood Master)	Closed	Open	Open	Open	Closed	Open	Open	Closed

Two Fire Protection System (or CORE) Panels on the network:

Core Board #	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
#1 (PCU Slave)	Open	Closed	Open	Open	Open	Open	Open	Closed
#2 (Hood Master)	Closed	Open	Open	Open	Closed	Open	Open	Closed

Three Fire Protection System (or CORE) Panels on the network:

Core Board #	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
#1 (2nd Hood Slave)	Closed	Open	Open	Open	Open	Open	Open	Closed
#2 (PCU Slave)	Open	Closed	Open	Open	Open	Open	Open	Open
#3 (Hood Master)	Closed	Closed	Open	Open	Closed	Open	Open	Closed

Four Fire Protection System (or CORE) Panels on the network:

Core Board #	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
#1 (2nd Hood Slave)	Closed	Open	Open	Open	Open	Open	Open	Closed
#2 (PCU Slave)	Open	Closed	Open	Open	Open	Open	Open	Open
#3 (2nd PCU Slave)	Closed	Closed	Open	Open	Closed	Open	Open	Open
#4 (Hood Master)	Open	Open	Closed	Open	Closed	Open	Open	Closed

For additional configurations, refer to **Table 5** for the electrical board (PCBCORE) DIP switch settings.

The configurations above are shown with all electrical boards (PCBCORE) in the same Fire Group and may be configured differently, even if the control panels are on the same network. Every panel with matching fire group settings (DIP switches 6 and 7) will activate simultaneously in a fire condition.

## Fire Protection System Supervised Loops

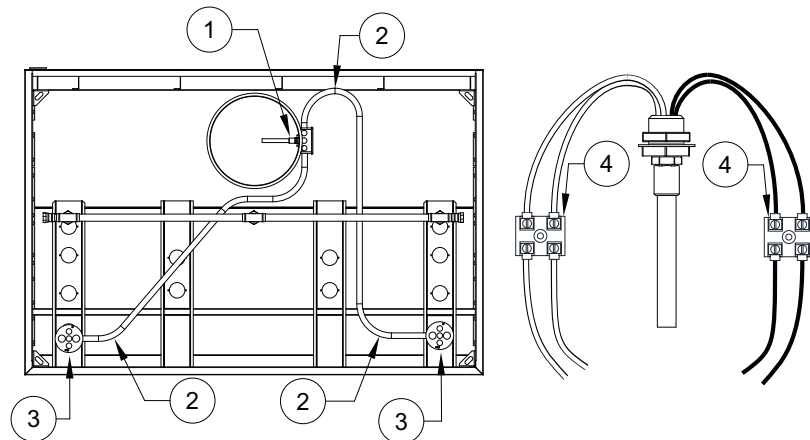
**NOTE: There must be adequate clearance above the hood to access components. Service clearance of 18-inches is recommended.**

The supervised loops are integral to proper operation and activation of the Fire Protection System. All systems have two supervised loops; each loop consists of two conductors, one positive and one negative. One loop is dedicated to all sensors, while the other is dedicated to all manual actuation devices (push/pull stations). The supervised loop connections are located at the front edge of the hoods for accessibility. Connections beyond the hood, like the connections at the manual actuation device, must be made with a plenum-rated wire. It is recommended to use a two-conductor Belden 6320UL, 18 AWG, wire, or similar for these connections. Refer to **Figure 6** for supervised loop details.

- Connections to the firestat will use two terminal blocks. One for an incoming loop and one for an outgoing loop.
- Flexible metallic conduit is used to route the wiring that connects the firestat to the remote loop junction box. Secure conduit to hood hat channel when possible.
- The system contains two circuit ceramic terminal blocks for connecting from one hood to the next.

**Figure 6 - Supervised Loop Connections**

1. Firestat
2. Conduit
3. Junction Box
4. Ceramic Terminal Block



For connections on or above the hood, use Type MG or MGT wiring with High-Temperature Terminal junction blocks. A Supervised Loop Connection kit is available to connect back to back or end to end hoods. This kit will come with the necessary hardware and wire.

**Table 6 - Supervised Loop Components**

Connection Kit Part Number	Length	Location
SLPCON-03	3 Feet	End to End Hoods
SLPCON-05	5 Feet	End to End Hoods
SLPCON-10	10 Feet	End to End and Back to Back Hoods
SLPCON-15	15 Feet	End to End and Back to Back Hoods
SLPCON-20	20 Feet	End to End and Back to Back Hoods

High Temperature Supervised Loop Component	Part Number
Type MG Wire, White, 16 AWG	441601C6.FE9
Type MG Wire, Black, 16 AWG	441601C6.FE0
Two Conductor High Temp Terminal Block	20M4174

## **Fire Protection System Firestat**

**NOTE: There must be adequate clearance above the hood to access components. 18-inches of service clearance is recommended.**

The Firestat is a device installed in the riser of the hood, at the duct connection, that measures temperature. The standard temperature setting is 360°F. Depending on heat produced by appliance, a higher rated temperature Firestat will be required. If a temperature higher than the setpoint is sensed, the Firestat contacts will close and energize the electrical control board. The fire system will activate, the system will run for a minimum of 15 minutes and then recheck the temperature. If the temperature is still higher than the setpoint, the process restarts immediately.

The Firestat has 2 black wires and 2 white wires. These wires must be connected to the supervised loop. Use high-temperature wiring when installing Firestat components. High-temperature wire-nuts or terminal blocks must be used. There must be one sensor installed for every 12 feet of hood length.

Multiple sensors are wired in parallel in the supervised loop. The Firestat may be installed on the opposite side of the quick seal for access in the duct.

### **Non-Solid Fuel Appliances (Rated 450°F)**

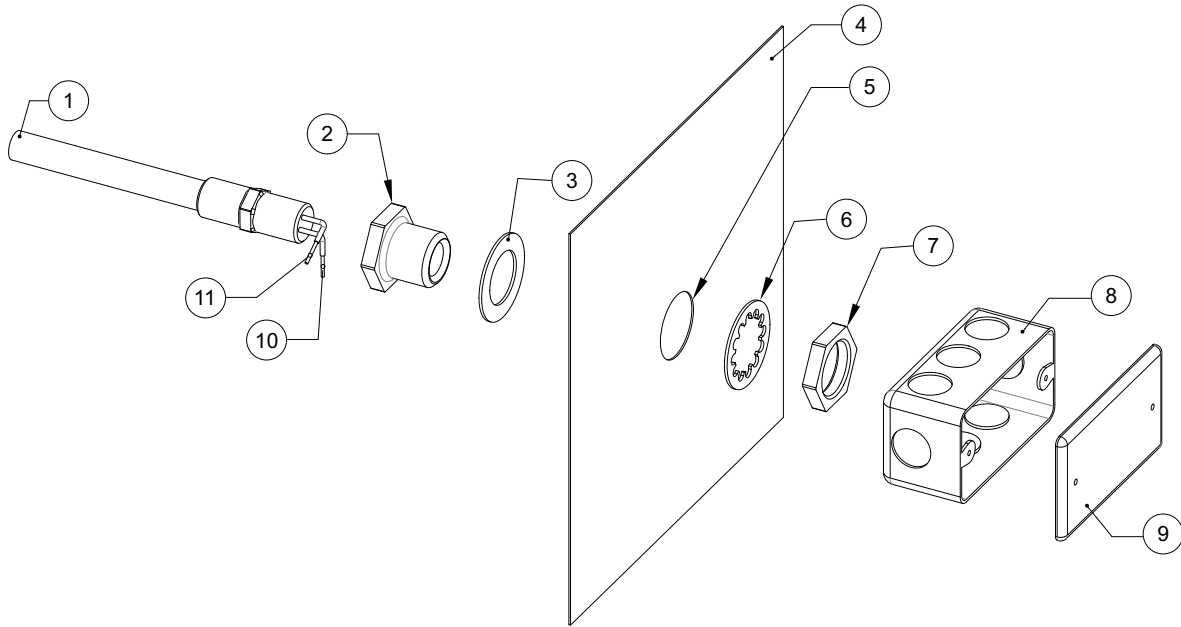
Non-solid fuel appliances rated for 450°F will not require additional firestats, regardless of the configuration and length of ductwork.

### **Non-Solid Fuel Appliances (Rated 600°F)**

Non-solid fuel appliances rated for 600°F will require downstream detection if the duct run contains any horizontal section over 25 feet in length. Downstream detection should be installed at the end of a horizontal section. Duct layouts that include less than 25 feet of horizontal ductwork will not require additional detection.

**NOTE: When additional Firestats are required, install in an accessible location near an access door, hood riser, or fan. The door will provide access to install, clean, and replace the Firestat when needed. If a PCU is equipped with electronic detection, PCU Firestats can serve as downstream detectors, if present. The temperature rating of the Firestat in the duct must always match the temperature rating of the Firestat in the riser.**

**Figure 7 - Firestat**



**Table 7 - Firestat Components**

Item Number	Part Number	Description
1	12-F28021-005360	Normally Open, Close on Rise @ 360°F
	12-H28021-005-OT-600	Normally Open, Close on Rise @ 600°F
2	32-00002	1/2" NPT Quik Seal (Adapter Body)
3	32-00002	1/2" NPT Quik Seal (Gasket)
4	N/A	Hood/Duct (External Surface)
5	N/A	1-1/8" – 1-1/4" Diameter Hole
6	32-00002	1/2" NPT Quik Seal (Lock Washer)
7	32-00002	1/2" NPT Quik Seal (Nut)
8	59361-1/2	Extension Ring
9	100-BW	Extension Ring Cover
10	N/A	2 White Wires
11	N/A	2 Black Wires



## Fire Protection Manual Actuation Device

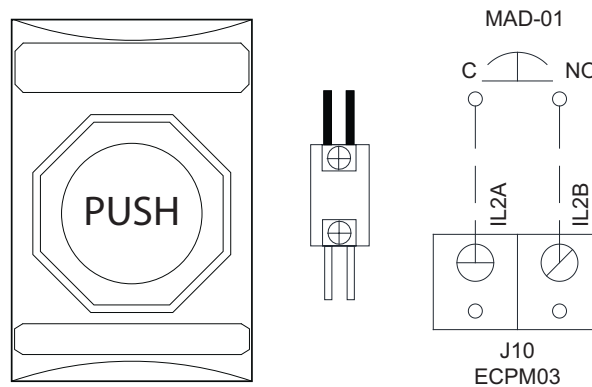
The push/pull station is a remote manual actuation device to activate the fire system. This remote manual actuation device (push/pull station) contains one set of normally open contacts and mounts to any standard single gang junction box. When the front button is pressed, the electrical connection to the fire system is completed, thus activating the fire system.

The remote manual actuation device (push/pull station) should be mounted at a point of egress and positioned at a height determined by the Authority Having Jurisdiction (AHJ). This position is usually 10 to 20 feet from hood and 42 to 48 inches above the floor. Multiple remote manual actuation devices (push/pull stations) are acceptable to use in the fire system and are wired in parallel per the electrical schematic. The remote manual actuation device (push/pull station) is reset by twisting the push-button clockwise until the internal latch is released.

The clear protective cover must be installed to protect the device from accidental activations. This cover is provided as part of the manual actuation device. Below are the part numbers for the devices and replacement parts.

**Note: When connecting the wires to the push/pull station, do not twist the wire ends together. Insert each wire on the opposite side of the screw.**

**Figure 8 - Manual Activation Device**



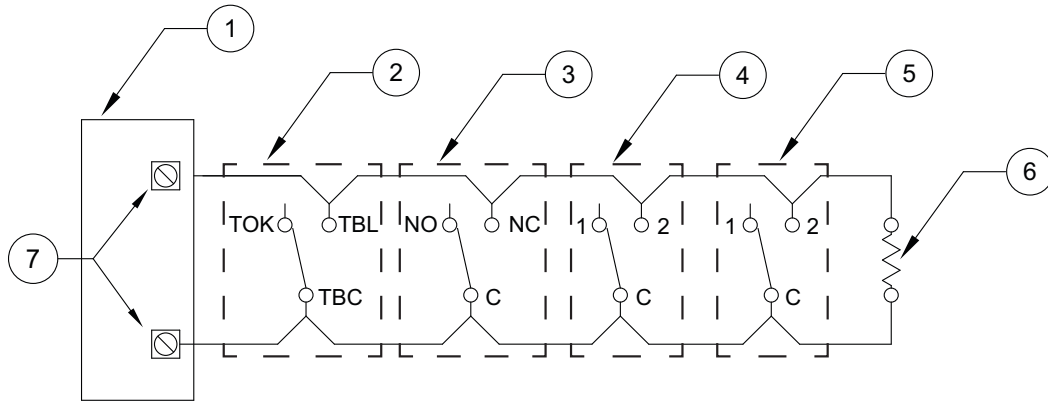
**Table 8 - Activation Device Part Numbers**

Part Description	Part Number
Push-Button with Clear Cover	STI-SS2431
Push-Button with Clear Cover and Horn	STI-SS2441
Replacement Clear Cover	STI-COVER
Blue Extension for Surface Mounted Push Stations	SF-1331
Blue Junction Box with Deep Back	STI-KIT71101AB
Normally Open Contact	STI-10196
Normally Closed Contact	STI-10198
Contact Housing Assembly	SF-10197H

## Trouble Input Wiring

Trouble contacts and supervision switches from each device should be connected to the trouble input of the building fire alarm panel to indicate a trouble condition.

**Figure 9 - Wiring Connection for Trouble Contact**



- |                                       |   |
|---------------------------------------|---|
| 1. Building Fire Alarm                | 5. CORE Water Shut-Off Switch                 |
| 2. CORE Control Panel Trouble Contact | 6. End of Line Device                         |
| 3. PRV Supervision Switch             | 7. Building Fire Alarm - Trouble Input Wiring |
| 4. Waterline Supervision Switch       |   |

## Battery Backup

### **Important!!**

**The battery backup system requires that the batteries be changed every 2 years, from the date of fire system commissioning, maximum. Failure to do this will result in a void in product reliability and may cause severe damage to facility due to loss of fire protection.**

The fire protection system contains a battery backup. During a power loss, the “Fire System Activated” light will flash 11 times between pauses indicating the power loss.

The batteries must be replaced every 2 years, from the date of fire system commissioning. Part number PS-1270-F2, two are required. Although the batteries are hot-swappable, which means they can be replaced while there is input power to the control, **for your safety, all sources of power must be removed from the control before replacing the batteries.** To replace the batteries, unplug the battery cable from the J1 connector on the electrical board (PCBCORE). Then remove the retaining strap holding the batteries in place. Remove the batteries from the cabinet.

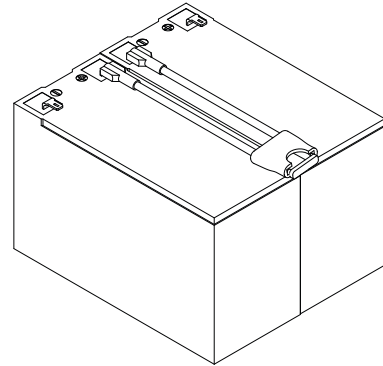
Transfer the fuse and cable set from the old batteries to the new batteries being extremely careful to observe the RED and BLACK lead and terminal colors. Reinstall the batteries in the cabinet and reconnect the battery plug to J1. The batteries are lead-acid type and are recyclable; **please dispose of the old batteries properly.**

During extended periods of inactivity where the fire protection system will be without AC power for more than 2 days, such as a shutdown or natural disaster, it is best to decommission the fire system by disconnecting the batteries. This will prevent any damage to the batteries through complete discharge. When the system becomes active again, commission the system by reconnecting the batteries and allow the batteries to charge for 48 hours.

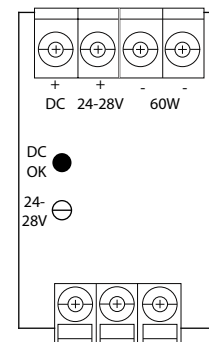
## Power Supply Adjustment

To properly charge the batteries, the power supply must be adjusted to output 27.5V DC. This can be checked with an accurate digital voltmeter placed across Terminals H1D and N1D. To adjust the output voltage, place a small flat-bladed screwdriver into the yellow dial. Turn the dial clockwise, this will increase the voltage.

**Figure 10 - Battery Backup**



**Figure 11 - Power Supply**



## **OPERATION**

Prior to starting up or operating the system, verify all fasteners and electrical connections are secure and tight. Verify that the wiring is installed properly and that all panels are installed.

In the event of a hood fire, the fire protection system is activated. If the hood firestat installed in the riser senses a temperature greater than its internal set-point or if the remote manual actuation device (push/pull station) is pushed, an electric signal is sent to the tank-based fire protection release solenoid.

For mechanical wet chemical systems; when the system is activated, the electric release solenoid is energized. The expellant gas cartridge is punctured, allowing the releasing agent to flow to the hood duct and plenum, and appliance nozzles.

For fire protection systems equipped with a pneumatic Primary Actuator Kit (PAK) and Secondary Valve Actuators (SVA); when the system is activated, the electric solenoid is energized, opening the pneumatic actuators. The actuator's plunger will actuate into the tank valve body, releasing agent to flow to the hood duct, plenum, and appliance nozzles.

Once the fire system is activated, a "Fire System Activated" light is illuminated on the hood control panel and an audible alarm sounds. All gas and electric appliances under the hood must be electrically interlocked to shut off. This is achieved via a gas valve relay and/or a shunt trip breaker.

The fire system is electrically operated and thus requires a battery backup system. In the event of a loss of building electrical power, all gas and electric appliances under the hood must be electrically interlocked to shut off. This is achieved via a gas valve relay and/or a shunt trip breaker. The battery backup will automatically energize upon a loss of power. The battery backup will monitor the fire system circuit for up to 24 hours and be able to operate the fire system circuit. Once power is restored, the battery will automatically recharge.

### **Test Mode Overview**

The fire protection system has an integrated option for testing. This test mode, when active, will disable the release solenoid and prevent the fire extinguishing agent from spraying on the appliances. It will allow activation of the fire system, audible alarm, shunt trip breaker (if applicable), and shut down of appliances via gas valve reset relay.

All additional PCBCORE controlled packages that are attached to the system must be in "Test Mode." This includes additional fire protection systems, Pollution Control Unit with CORE, and other hood-mounted CORE controlled protection systems.

Please note that the appliances must be started before test mode is entered on any PCBCORE protection package for proper demonstration of this function. If the fire protection system is left in "Test Mode" for more than 15 minutes, the appliances will shut down. This is to prevent cooking operations from occurring while the appliances and ventilation system are not protected.

## Reset Overview

There are multiple actions required to reset the fire system. **The following must be completed by a Certified Fire System Technician.**

1. The duct firestat must be cooled below its internal set point.
2. The remote manual actuation device (push/pull station) must be reset by twisting the button clockwise until it resets.
3. The expellant gas cartridge must be removed, if equipped.
4. Press the "Push To Reset Fire System" button.
5. Reset the mechanical release solenoid or pneumatic actuators, per the fire system manufacturer's guidelines.
6. Place new expellant gas cartridge in the system, if equipped.

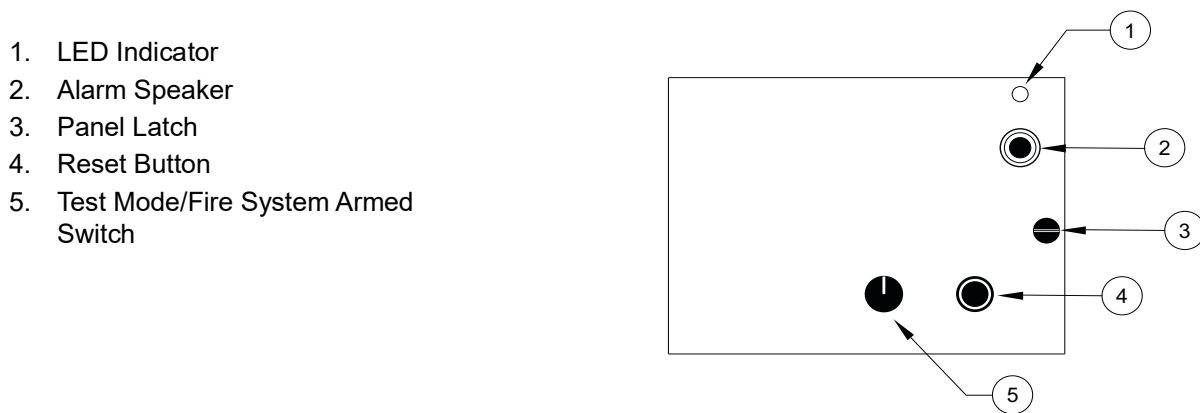
**Note: When the expellant gas cartridge has been punctured, or the pneumatic actuators have been activated, the system will discharge until the agent tanks are empty.**

**Note: The firestat must be cool, and the remote manual actuation device (push/pull station) must be reset for this button to work.**

The fire system must be re-commissioned per the manufacturer's recommendations and guidelines by an authorized fire system distributor and/or authorized service agent.

After a fire, full inspection by a certified professional must be conducted prior to restarting the fire system.

**Figure 12 - Fire System Reset**



## Fire Protection System Start-up

### Special Tools Required

- AC Voltmeter
- Standard Hand Tools
- Hand-held Heat Source
- High-Temperature Wire for Supervised Loop on Hood (Type MG, White Wire Part Number 441601C6.FE9, Black Wire Part Number 441601C6.FE0)
- Supervised Loop Wire for Off Hood Connection (Belden Part Number 6320UL or similar)
- Nitrogen Service Tank, if system is equipped with pneumatic actuators.

### Jobsite Qualifications – Pre-installation of Fire System

1. Verify there is access to the top of the hood.
2. Verify a network connection for CAS-Link.
3. Verify duct location.

### Start-up Procedure – Fire Protection System

1. Verify additional firestats are installed if covering a solid fuel appliance. They must be installed at the exhaust duct discharge if the ductwork is longer than 10 feet or contains horizontal sections.
2. Verify that additional firestats are installed when the duct length exceeds 50 feet.
3. Verify remote manual actuation device (push/pull station) is protected with provided clear cover.
4. Verify that all solenoid wires are secured and not touching hood.
5. Ensure there are no supervision faults being reported by the “Fire System Activated” light and that the light flashes one brief flash every 3 seconds, indicating the fire system is armed and ready.

### Start-up Procedure – Firestat Activation

1. Place fire system unit in “Test Mode”.
2. Place the other fire system panel(s), if present, in “Test Mode” to prevent system activation.
3. Remove hood filter directly below the firestat.
4. Use a portable heat source to apply heat to the duct firestat. Heat should activate the fire system. The use of a torch or flame is strictly prohibited.
5. Replace the filter.
6. Verify that all gas and electric cooking appliances have been disabled.
7. Verify that the “Fire System Activated” light illuminates on the control panel and that the audible alarm is sounding.
8. If all of the above is confirmed, reset the fire system by pressing the button on the face of the electrical control package.
9. Place the other fire system panel(s), if present, in “Armed Mode.”
10. After testing is complete, return the test switch back to “Armed Mode.”

**Note: Activating the fire system will also activate any other PCU or HOOD fire system that is connected to this system. Ensure that all other systems are ready to be tested by placing the control panels in test mode and verifying hood filters and drains are in place.**

#### **IMPORTANT!!**

**The use of a torch or flame to test the Fire Protection System firestats is strictly prohibited.**

### **Start-up Procedure – Remote Manual Actuation Device Activation**

1. Place the CORE system panel (if present) in “Test Mode”.
2. Lift the clear protective cover and depress the push-button until it latches.
3. Reset the remote manual actuation device (push/pull station). Lift the clear protective cover and rotate the push-button clockwise until the push-button is released.
4. Verify that all gas and electric cooking appliances have been disabled.
5. Verify that the “Fire System Activated” light illuminates on the control panel and that the audible alarm is sounding.
6. If all of the above is confirmed, reset the fire system by pressing the button on the face of the electrical control package.
7. Place the CORE system panel (if present) in “Armed Mode.”

### **Start-up Procedure – Battery Backup**

1. Place the CORE system panel (if present) in “Test Mode.”
2. Shut the circuit breaker off at the panel to disconnect the 120V AC circuit to the hood control panel. After a few seconds, the “Fire System Activated” light will flash a power failure supervision fault code (11 flashes followed by a pause).
3. Lift clear the protective cover and depress push-button until it latches.
4. Reset the remote manual actuation device (push/pull station). Lift the clear protective cover and rotate the push-button clockwise until the push-button is released.
5. Verify that all gas appliances have been disabled. In the event of power loss to the building electric appliances will be disabled.
6. If all of the above is confirmed, reset the fire system by pressing the button on the face of the electrical control package.
7. Reset the circuit breaker applying power to the hood panel.
8. Place the CORE system panel (if present) in “Armed Mode”.
9. “Fire System Activated” light will begin flashing one brief flash every 3 seconds, indicating the fire protection system is armed and ready.

### **Start-up Procedure – Final**

1. Verify that the “Fire System Activated” light is flashing one brief flash every 3 seconds, indicating the fire protection system is armed and ready.
2. Verify that remote manual actuation device (push/pull station) is reset.

### **Reset Procedure – Fire Protection System**

1. Fully inspect system to make sure fire is extinguished.
2. If fire is out, firestat should be cool.
3. Reset remote manual actuation device (push/pull station) if tripped.
4. The reset button on the face of the electrical control package can be pressed to reset system.
5. The aqueous-based wet chemical used in extinguishing a fire is not harmful. However, it is recommended that you clean the area immediately after a system discharge. Prolonged exposure of equipment to wet chemical agent can result in localized corrosion due to moisture in the air.
6. Make sure a Certified Fire Protection Technician has serviced the system.
7. Make sure wet chemical tanks, expellant gas cartridges, and/or pneumatic actuators have been serviced and re-commissioned for use.

## Start-up Checklists

### Fire Protection System Start-Up Checklist

Action	Completed (Yes/No)	Result
“Fire System Activated” light flashing ready code (1 short flash every 3 seconds)		
Test Firestat System Activation		
Test Remote Manual Actuation Device (push/pull station) System Activation		
Verify Manual Actuation Device Cover Installed		
Verify Appliance System Activates		
All Gas and Electric Appliances Shut Down		
Fire System Activated Light Illuminates		
Audible Alarm Sounds		
Verify Reset Button Works Correctly		
System Activates on Battery Backup		
Reset Remote Manual Actuation Device (push/pull station)		

### Fire Protection System Reset Checklist

Action	Completed (Yes/No)	Result
Ensure Fire is Extinguished		
Reset Remote Manual Actuation Device (if pushed)		
Press The Reset Button		
Verify Manual Actuation Device Cover Installed		
Inspect All Hood Lights After a Fire		
Inspect All Wiring and Hood Insulation After a Fire		



## TROUBLESHOOTING

**Table 9** lists out causes and corrective actions for possible problems with the system. Review this list prior to consulting manufacturer.

**Table 9 - Fire Protection System Troubleshooting**

<b>Problem</b>	<b>Potential Cause</b>	<b>Corrective Action</b>
Exhaust Fan On and Supply Fan will not Start	Broken supply fan belt	Replace fan belt.
	Fire system not armed	Fire system distributor must arm fire system.
Fire System Activated Light On	Fire system is activated	Verify fire is out and reset fire system.
Audible Alarm is On	Fire system is activated	Verify fire is out and reset fire system.
A fault code is flashing on the "Fire System Activated" light	A fault has been detected in the Fire Protection System	Count the flashes and refer to <b>Table 10</b> .
Fire System will not turn off	Duct sensor is hot	Heat has activated the duct sensor. Remove heat source or let the system extinguish the fire. Once heat source or problem is resolved, press reset button on the face of the electrical control package.
	Remote Manual Actuation Device has been pushed	Reset remote push station once fire is out and press reset button on the face of the electrical control package. Reset remote push station by twisting clockwise until reset.
Gas Valve does not close	Debris on gas valve seal	Fully clean gas valve and strainer.

## Appliance Shutdown in Fault Conditions

The Fire Protection System is equipped to shut down the appliances if a fault condition is present. **Table 10** shows which fault condition affects the appliances' fuel and power sources, alarm muting, and local trouble relay.

**Table 10 - Appliance Fault Conditions**

Number of Flashes	Fault Condition	Gas Valve Shut Down		Shut Down Shunt Trip Breaker and UDS Kill Switch		Mute Local Alarm 4 Hour Reset	Local Trouble Relay
		Local System	Networked System	Local System	Networked System		
<b>Catastrophic Faults</b>							
2	Release Solenoid	X	X	X	X		X
3	Gas Cylinder/ Pressure Switch	X	X	X	X		X
4	Auxiliary Fault	X	X	X	X		X
5	Micro-controller Fault	X	X	X	X		
<b>Critical Faults</b>							
7	Supervised Loop Fault	X	X	X	X		X
<b>Important Faults</b>							
8	Ground Fault					X	
10	Battery Voltage Low					X	X
11	AC Power Failure	X	X	X**	X**		X
12	Door Tamper Switch					X	
13	Test Mode	X	X	X	X		
14	CORE Interlock					X	
15	Fault on Hood In Network					X	
16	Fault on PCU in Network					X	

### Local Alarm Muting

Depressing the fire system reset button can mute the local alarm. This will disable the sounder for 4 hours under specific conditions. **Table 10** shows which errors can be muted. It should be noted that the fault will not clear until the fault condition is corrected.

### Test Mode

Test Mode allows the hood to be tested with operational appliances without discharging the system on the appliances. Once the appliances are started, test mode can be entered without the appliances shutting down for 15 minutes. However, once the fire system is activated, the shunt trip (electric appliances) and the gas valve will be locked out until test mode is deactivated.

\*\*During AC power failure, all gas appliances will be shut down. Electrical appliances will shut down on building power loss.

## Supervised Loop Wiring Troubleshooting

**NOTE: Place the panel in test mode during diagnostic testing.**

Prior to troubleshooting, verify all CORE power supplies are set to 27.5 volts. Check all supervised loop connections. Verify wiring is properly connected and secure. If any of the “Normal Operating Voltages” are out of range, there is an issue with that loop or associated components/wiring.

Normal Operating Voltages	Problem	Potential Cause	Corrective Action
<ul style="list-style-type: none"> <li>Terminal 21 to CORE Power Supply (-) = 26.5V</li> <li>Terminal 21 to Terminal 22 = 26.5V</li> <li>Terminal 24 to Power Supply (-) = 26.5V</li> <li>Terminal 24 to Ground = 1.8V</li> </ul>	Supervised Loop Fault	Open Supervised Loop between Terminals 21 and 24	Locate and repair faulty wiring in the 21-24 supervised loop.
<ul style="list-style-type: none"> <li>Terminal 22 to CORE Power Supply (-) = 0V</li> <li>Terminal 23 to CORE Power Supply (-) = 0V</li> <li>Terminal 23 to Terminal 24 = 26.5V</li> </ul>		Open Supervised Loop between Terminals 22 and 23	Locate and repair faulty wiring in the 22-23 supervised loop.
<ul style="list-style-type: none"> <li>Terminal 101 to CORE Power Supply (-) = 26.5V</li> <li>Terminal 101 to Terminal 102 = 26.5V</li> <li>Terminal 104 to CORE Power Supply (-) = 26.5V</li> <li>Terminal 104 to Ground = 1.8V</li> </ul>		Open Supervised Loop Push-Station (Terminals 101 and 104)	Locate and repair faulty wiring in the 101-104 supervised loop.
<ul style="list-style-type: none"> <li>Terminal 102 to CORE Power Supply (-) = 0V</li> <li>Terminal 103 to CORE Power Supply (-) = 0V</li> <li>Terminal 103 to Terminal 104 = 26.5V</li> </ul>		Open Supervised Loop Push-Station (Terminals 102 and 103)	Locate and repair faulty wiring in the 102-103 supervised loop.
Chassis Ground to CORE Power Supply (-) = 24.4V	Ground Fault	*24V DC CORE Power Supply (-) Wiring or Components	Locate and repair faulty wiring in the 22-23 supervised loop.
Chassis Ground to CORE Power Supply (+) = 2.7V		**24V DC CORE Power Supply (+) Wiring or Components	Locate and repair faulty wiring in the 21-24 supervised loop.

**\* Components that may cause this fault are: Gas Valve, Surfactant Pump, Water Solenoid(s), Release Solenoid(s).**

**\*\* Components that may cause this fault are: 24V Relays, Trouble Relay (when energized), 24V LED Lights.**

**NOTE: If an abnormal reading is present, disconnect potential components/wiring one at a time, while continuing to take readings, to pinpoint the source of the ground fault.**

## MAINTENANCE

Make sure to follow the manufacturer of the wet chemical-based fire protection system's maintenance requirements. In addition to the wet chemical protective system requirements, to guarantee trouble-free operation of this system, the manufacturer suggests following these guidelines. Most problems associated with unit failures are directly related to poor service and maintenance. Record any maintenance or service performed on this equipment in the documentation section located at the end of this manual.

### General Maintenance

1. Hood filters must be maintained on a daily basis to ensure proper airflow and grease extraction.
2. Clean all duct sensors in hood duct connections (if equipped), inspect the hood duct and plenum areas for excess buildup of grease/creosote.

#### **ATTENTION!!**

**When servicing or cleaning ductwork, all Hood, CORE, PCU CORE, and interlocked fire systems must be placed in test mode to prevent accidental discharge.**

### Every 6 Months

1. Clean all duct sensors in hood duct connections (if equipped), inspect the hood duct and plenum areas for excess buildup of grease/creosote.
2. Verify proper system activation via one of the supervised loops, as well as battery backup.
3. Check gas valve operation to ensure gas valve fully shuts during system activation. Also, clean strainer upstream of gas valve.

### Every 2 Years

1. Replace batteries for the Fire Protection System(s). The replacement battery part number is PS-1270-F2; two are required. Once the battery is disconnected, the connected equipment is not protected from power outages. The new battery must be installed immediately. **See "Battery Backup" on page 19.**
2. Inspect condition of all wires; wire insulation must be in good condition.

### Every 12 Years

1. The 12-year maintenance is typically done in conjunction with the semi-annual maintenance. These procedures shall be performed in addition to the tests conducted at semi-annual intervals. Refer to NFPA 17A and NFPA 96 for all 12-year maintenance requirements.
2. Each wet chemical agent tank (cylinder) must be replaced every 12 years.

### Decommissioning

If it should become necessary to disconnect the fire protection system package from AC power for an extended period of time (more than 2 days), the batteries should be disconnected to prevent them from being damaged due to complete discharge.

### After A Fire

1. Inspect all hood lights for proper seals and security.
2. Inspect all wiring and Hood insulation to ensure all are in good condition.

## Fire Protection System Verification

### Hood Information - Electrical

Refer to the start-up procedure in this manual to complete this section.

Name Plate and Unit Information		Field Measured Information	
Hood Model Number		EWC Control Panel Wired	
Serial Number		All Fans are wired into the Control Panel and are properly operating	
Volts		Shunt Trip Breaker wired (if required)	
Hertz		UDS Appliance Kill Switch (if equipped) wired	
Phase		Gas Valve Wired (if 120V required)	
		Control Panel power wired (Wall Mounted Control cabinet only)	
		EWC release solenoid valve wired (Wall Mounted Control cabinet only)	

### Fire System Information (When Supplied)

Refer to the start-up procedure in this manual to complete this section.

Name Plate and Unit Information		Field Measured Information	
Hood Model Number		Gas Valve Wired	
Serial Number		Gas Valve is Functioning Properly	
		Batteries plugged in and light flashes ready	
		Remote Pull Station wired in Supervised Loop	
		Test Remote Push Station System Activation	
		Verify Push Station Cover Installed	
		Test Firestat System Activation	
		Verify Firestats are wired in Supervised Loop	
		Verify all Firestat wiring is high temperature wire	
		Service supervised, assisted or wired all Supervised Loop connections	
		Verify Appliance System Activates	
		All Gas and Electric Appliances Shut Down	
		Fire System Activated Light Illuminates	
		Audible Alarm Sounds	
		Verify Reset Button Works Correctly	
		System Activates on Battery Backup	
		Building Alarm tied-in (where applicable)	
		Trouble Relay tied-in (where applicable)	

Refer to the start-up procedure in this manual to complete this section.

Name Plate and Unit Information		Field Measured Information	
Hood Model Number		Document Electrical Board (PCBCORE) Version, not chip version	
Serial Number		Reset Button works	
		Fire System activates on Battery backup	
		Fire System activate on 120V power	
		Audible Alarm Sounds	
		System reverse interlocked	
		Tamper sticker installed on Manual Actuation Device (Push Station)	
		Comm module connected to the internet	
		CAS-Link Setup	
		Battery Date Code (Date of SDV on batteries)	





# Start-Up and Maintenance Documentation

**START-UP AND MEASUREMENTS SHOULD BE PERFORMED AFTER THE SYSTEM HAS BEEN INSTALLED (Warranty will be void without completion of this form)**

## Job Information

<b>Job Name</b>	
Address	
City	
State	
Zip	
Phone Number	
Fax Number	
Contact	
Purchase Date	
<b>Service Company</b>	
Address	
City	
State	
Zip	
Phone Number	
Fax Number	
Contact	
Start-Up Date	

As a result of our dedication to constant improvements and quality, the MANUFACTURER reserves the right to update specifications without notice. Please refer to MANUFACTURER'S website for up-to-date documentation.

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