

# 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. Also check that all accessory items are accounted for and are damage free.

## **WARNING!!**

Installation of this module should only be performed by a qualified professional 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 module.

**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 12 months 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 and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
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 12-month 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.

# INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow 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.

## Mechanical

### System Nomenclature

**WARNING: APPLY THE APPROPRIATE WATER PRESSURE AND TEMPERATURE TO ALL FITTINGS TO PREVENT LEAKAGE AND COMPONENT FAILURE**

System	Water Connection
WC with CORE	1 Hot, 1 Dedicated Water

**ATTENTION: SYSTEM MUST BE INSTALLED IN CONDITIONED SPACE BETWEEN 32°F AND 130°F**

Ensure there is 36 inches of service clearance to the front of the panel.

### Plumbing Connections for CORE Total Flood Protection

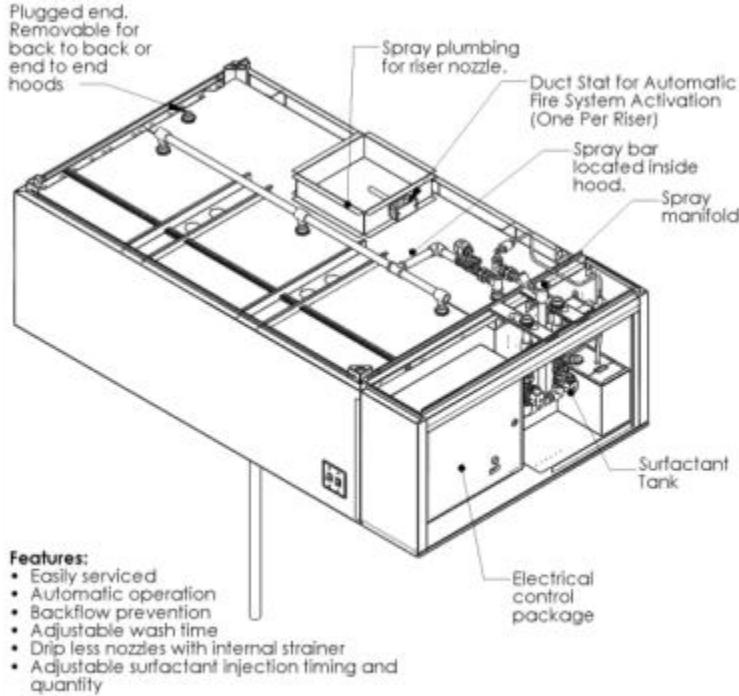
Several field plumbing connections are required for proper Self Cleaning with CORE Total Flood Protection fire system hood operation. It is recommended that all plumbing connections be sealed with Teflon tape or pipe dope. Use care not to contaminate the interior surfaces of the water lines when plumbing the unit, as small particulate can clog the orifices of the spray nozzles.

1. All incoming plumbing connections are connected via 3/4" quickseals at the top of the utility cabinet. See Figures 1 and 2 for details.
2. Self Cleaning hoods with the **WC** option (Hot Water Wash) require a hot water connection at 140°F to 170°F and 30 to 70 PSI operating pressure. If the operating pressure is greater than 70 PSI, a water regulator must be connected. Max water static pressure is 125 PSI. Typical water flow rate is 0.7 GPM per foot of hood. The spray lasts for a factory setting of 3 minutes every time the fans are switched off.
3. A dedicated water supply must be connected to the CORE connection. This requires an unheated water connection at 30 to 70 PSI operating pressure. Water pressure may not drop below 30 PSI while the hood is spraying. Pressure may not rise above 70 PSI when the hood is spraying. If the operating pressure is greater than 70 PSI, a water regulator must be connected. Max water static pressure is 90 PSI. Typical water flow rate is 1.5 GPM per foot of hood. The water connection must be 3/4" pipe and must be dedicated to the hood. This must be connected to a water supply line immediately downstream from the building main shut-off valve or a fire sprinkler system. This main valve must be continuously supervised. See **Table 1** for hood length and pressure requirements.
4. If multiple hoods are arranged in an end-to-end or back-to-back arrangement, plumbing connecting the hoods must be piped in the field. The plugged end of the Appliance and Plenum spray bars is used to do this. Remove the plugs on the main hood and the adjacent hood and simply pipe the Appliance spray bars together and Plenum spray bars together. It is important to not cross connect the spray bars. The highest part of the connecting pipe must not exceed the height of the vacuum breaker in the main utility cabinet. See **Figure 1** for illustration.
5. If a remote mounted manifold is used with CORE Total Flood Protection, the appliance solenoid will be shipped loose for field installation. This valve must be installed between the manifold package and the hood appliance coverage spray bar as shown in the install drawing.
6. There is also a non-pressurized 1-1/2 inch drain connection that must be piped. This allows water to drain from the hood grease trough. It must be connected to the building grease trap. 30 inch tall hoods will have 2 drains and hoods 10 feet and longer will also have 2 drains. See Figure 2 for details.
7. Once all supply and drain lines are connected, remove one of the nozzles and flush the lines.

### Warning

**All drain lines, field connections between hoods, and incoming CORE Protection lines must be run with Steel, Stainless Steel, or Copper pipe. Plastic pipe cannot be used for drains, field connections between hoods, or CORE Protection supply lines as it could fail and become hazardous.**

## Self Cleaning with CORE Protection Fire System Overview



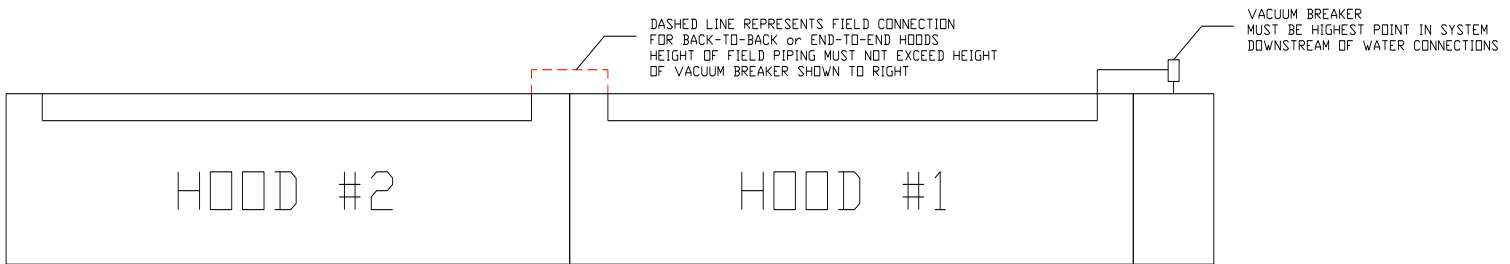
**Note:**  
Filters must be installed for proper system operation. Filters can be removed once the system is off.

The Fully Integrated Self Cleaning System has the following options.

- Hot Water Fully Integrated Self Cleaning System (W1).**  
The hot water fully integrated self cleaning system uses the basic manifold with the addition of a detergent pump and timers to control the system. When the fan power switch is turned off, the system sprays and injects surfactant into the plenum for cleaning. The length of the wash cycle and surfactant injection are adjustable. It is recommended that the wash time be 3 minutes and detergent injection is 1 second every 1 minute.  
Water Pressure = 30 to 50 PSI Operating (120V)  
Water Pressure = 30 to 70 PSI Operating (24V)  
Water Pressure = 125 PSI Maximum Static  
Water Temp = 140° to 170° F
- CORE PROTECTION**  
Primary Water Sprinkler Fire Protection for Commercial Kitchen Hoods. Duct and Plenum Fire System protection is provided by this option per UL300. Appliance protection by others. Duct mounted sensor electrically activates the water spray system to extinguish duct and plenum fires. The appliance protection system is also electrically activated by the same duct sensor.  
Operating Water Pressure:  
30 to 70 PSI (24V CORE)\*\*  
\*\*Water pressure may not drop below 30 PSI while water is spraying. Pressure may not raise above 70 PSI (24V) when water is spraying. Max water static pressure is 90 psi (24V).

**IMPORTANT!!**

**CORE Protection water connection requires a dedicated supply line. This must be connected immediately downstream from the building main shut-off valve or building sprinkler system. The main shut-off valve must be supervised. A minimum water operating pressure of 30 psi (while the hood is spraying) must be achieved at the hood.**



**Figure 1**

### Piping Loss Calculation for Wall Mount CORE Total Flood Protection Fire Systems

To ensure proper operation of the CORE Protection Fire System, a minimum of 30 PSI water operating pressure during spraying must be achieved at the hood nozzles. For this to occur, proper sizing of the water line is required. Use the following steps to calculate the piping minimum size.

1. Use the **Minimum Pressure Requirements for Lengths of Hood** chart and find the CORE minimum PSI required at the hood inlet. Subtract this value from the available PSI at the panel pressure gauge. Maximum panel operating pressure is 70 PSI. This will be your maximum allowable pressure drop for field installed pipes between the panel and the hood.
2. Most fittings add an equivalent pipe length to the total run. Use the chart below to calculate the equivalent pipe length for installed fittings. If you have multiple fittings of one type, simply multiply the number below by the total number of the fitting and add to the total run length.

**Equivalent Pipe Length For Various Pipe Fittings**

Pipe Size Inches	45° Elbow	90° Elbow	Tee Thru Run	Tee Thru Branch
3/4"	1.03	2.21	1.23	4.41
1"	1.31	2.81	1.56	5.62
1 1/2"	2.15	4.31	2.4	8.63

3. To calculate the total flowing pressure drop between the panel and the hood, take the total equivalent length found in step 2 and add the total linear field installed pipe length. Multiply this number by the value found in the table below, Pressure Drop (PSI) per Equivalent Foot of Waterline. (Gallons per minute is calculated by multiplying the length of the hood by 1.5 gpm) This will be the friction pressure drop between the hood and the panel.

**Pressure Drop (PSI) per Equivalent Foot of Waterline - Pipe Size**

Gallons per Minute	Waterline Pipe Size (PSI per foot of pipe)		
	3/4"	1"	1 1/2"
10	0.102	0.029	0.004
20	0.368	0.105	0.014
30	0.779	0.222	0.030
40	1.327	0.379	0.052
50	2.005	0.573	0.078
60	2.809	0.803	0.109
70	3.735	1.068	0.146
80	4.782	1.367	0.186
90	5.947	1.700	0.232
100	7.223	2.066	0.282

4. Add in the pressure drop due to gravity. This must be evaluated to overcome any rise in pipe elevation between the panel and the hood. There is .43 PSI/ft of vertical rise of pressure drop.
5. Now, compare the maximum allowable pressure drop from step 1 to the calculated pressure drop from step 3. If the calculated pressure drop exceeds the maximum allowable pressure drop, increase the pipe size and recalculate steps 2 and 3. Continue this step until the calculated pressure drop is below the maximum allowable.

**Field Pipe Pressure Drop Calculation Example:**

Wall mount panel installed with 30 feet of 3/4" linear pipe between panel and hood. (4) 90 degree elbows are installed in the pipe run and the pipe run has a vertical rise of 5 feet. Length of end-to-end hood system is 32 feet.

Hood System = 32 feet. Flow rate = 32 feet \* 1.5 gpm = 48 gpm  
Pressure required at hood = 44 psi.  
Pressure at panel gauge = 50 psi.  
Allowable pressure drop between panel and hoods: 50 psi – 44 psi = **6 psi**

Equivalent length of pipe = 30 + 4 \* 2.21 = 38.84 feet  
Friction Pressure Drop through pipe = 38.84 \* 2.005 = 77.87 psi  
Gravitational Pressure = 0.43 psi/ft \* 5 feet = 2.15 psi  
Total Pressure Drop in Field Pipe between panel and hood = 77.87 psi + 2.15 psi = **80.02 psi**  
Allowable pressure drop = 6 psi

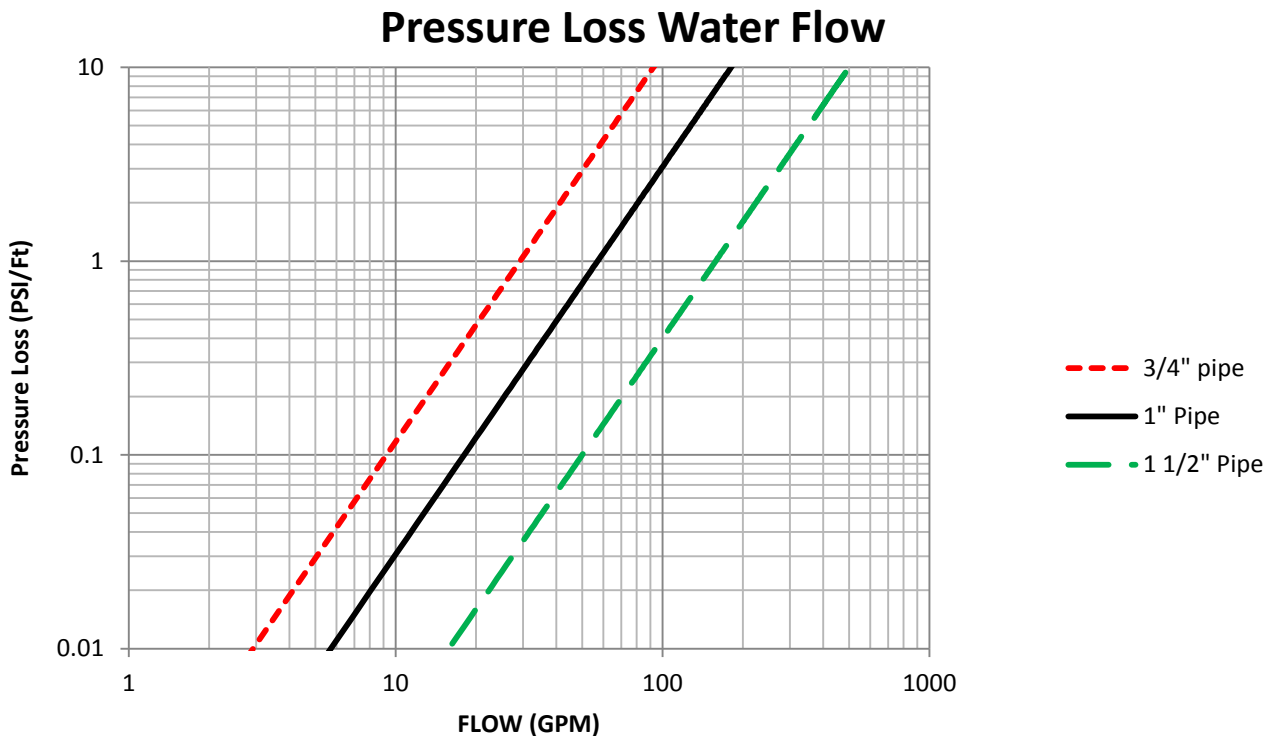
**This system will not work correctly because calculated pressure drop is greater than allowable pressure drop. Pipe size will need to be change to 1-1/2 inch diameter.**

**Re-calculate with 1-1/2 inch pipe instead of 3/4" pipe:**

Equivalent length of pipe = 30 + 4 \* 4.31 = 47.24 feet  
Friction Pressure Drop through pipe = 47.24 \* 0.078 = 3.68 psi  
Gravitational Pressure = 0.43 psi/ft \* 5 feet = 2.15 psi  
Total Pressure Drop in Field Pipe between panel and hood = 3.68 psi + 2.15 psi = **5.83 psi**  
Allowable pressure drop = 6 psi

**This system will work correctly because calculated pressure drop is less than allowable pressure drop.**

**Pressure Loss Through Typical Water Pipe Chart**



**Minimum Pressure Requirements for Lengths of Hood**

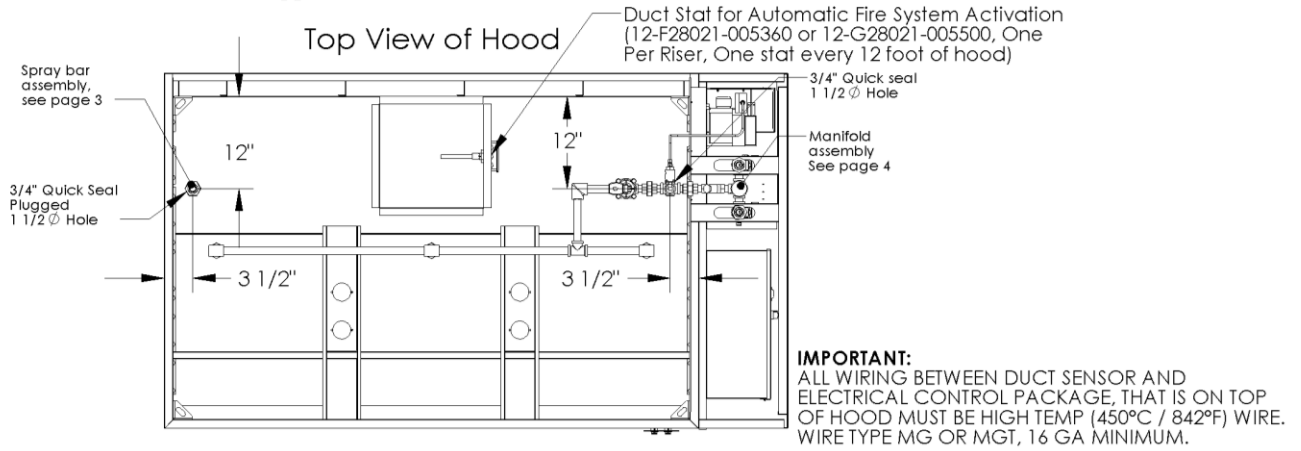
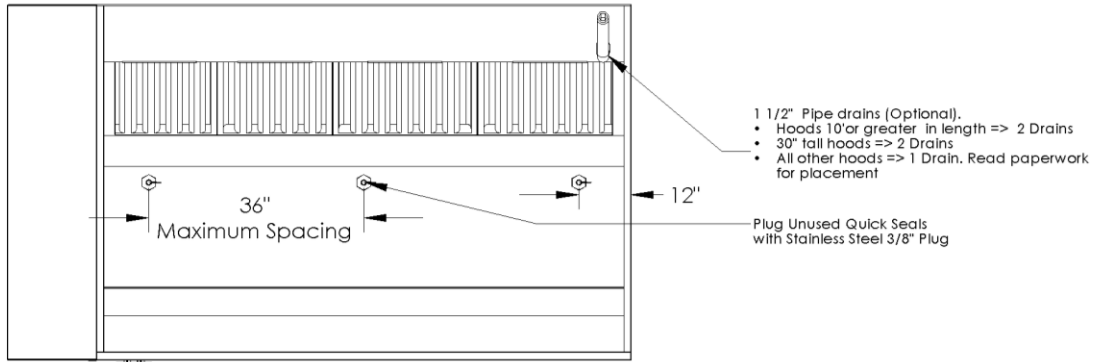
<b>Length of Hood (Ft)</b>	<b>Minimum Inlet Water Pressure for Self Cleaning(PSI)</b>	<b>Minimum Inlet Water Pressure for CORE Protection</b>
<b>0</b>	<b>30</b>	<b>30</b>
<b>4</b>	<b>30</b>	<b>30</b>
<b>8</b>	<b>30</b>	<b>30</b>
<b>12</b>	<b>30</b>	<b>30</b>
<b>16</b>	<b>30</b>	<b>30</b>
<b>20</b>	<b>31</b>	<b>33</b>
<b>24</b>	<b>32</b>	<b>36</b>
<b>28</b>	<b>34</b>	<b>39</b>
<b>32</b>	<b>37</b>	<b>44</b>
<b>36</b>	<b>39</b>	<b>49</b>
<b>40</b>	<b>42</b>	<b>56</b>
<b>44</b>	<b>46</b>	<b>63</b>
<b>48</b>	<b>50</b>	<b>70</b>

**Table 1**

**Note: Water pressure may not drop below 30 PSI while the hood is spraying hot water or for CORE. Pressure may not rise above 70 PSI when the hood is spraying. If the operating pressure is greater than 70 PSI, a water regulator must be connected.**

**The chart above is for continuous back to back and/or end to end hood installations. If the pipe connecting any hood contains excessive elbows or complicated paths, additional pressure may be required to overcome this pressure loss. Contact engineering for clarification in these circumstances.**

## CORE Hood Top and Bottom View



### Drain Assembly

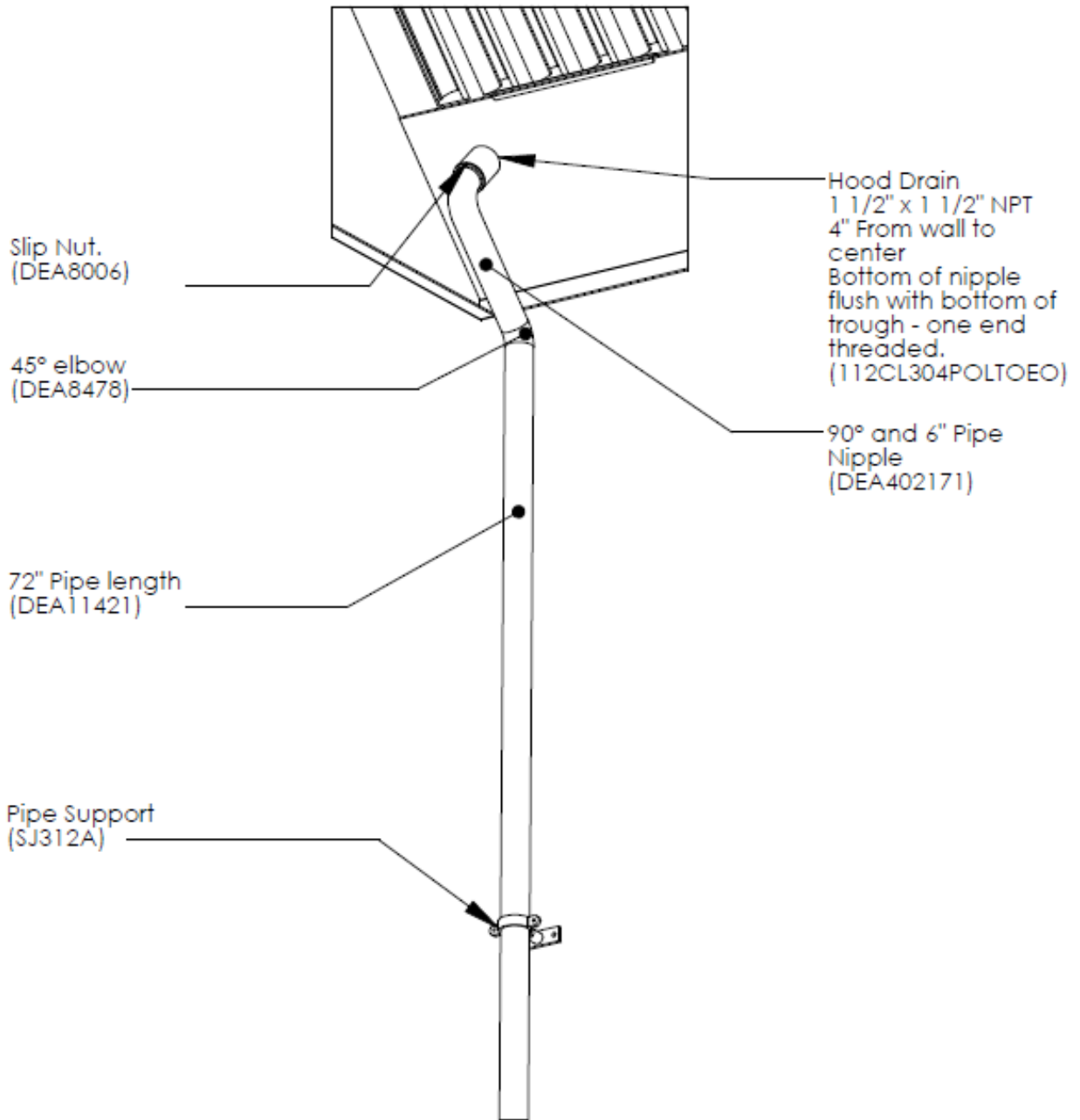


Figure 2

## Electrical

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

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

### **WARNING!!**

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

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. **120VAC** should be wired to terminals **H1** and **N1**. If the hood is equipped with a separate light circuit, 120VAC should power it per the as-built schematic. Fan wiring connections should be made per the schematic. H1 and N1 should not be connected to a shunt trip breaker.
3. Make certain 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 control to power source, verify power line 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.
7. If the control is a **wall-mount system**, duct mounted temperature sensor will need to be wired. The temperature sensor should be wired to terminal blocks as indicated on the wiring schematic. The hood lights wiring will also need to be wired to terminals "B" and "W". Verify connections on wiring schematic.
8. If the system contains a Remote Manifold, then the appliance solenoid will need to be wired. Once the valve is plumbed in place, connect the Black and White wires to WC2 and N1D respectively, and connect the solenoid ground to the package ground.
9. Before powering up the system, make sure that the interior of the control is free of loose debris or shipping materials.
10. **If 3 phase motors are spinning in the incorrect direction, switch any two wires on the output of the motor starter. Rewire single phase motors per the motor schematic to change direction.**
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 CORE Protection fire system solenoid or Firestat must be high temp wire rated for 842°F minimum.
13. The battery must be plugged into the connector labeled J1 on the CORE printed circuit board after wiring is complete.
14. All appliances under the hood must shut down in the event of a power loss. This can be done by connecting the reset relay and shunt breakers to the control panel per the schematic.
15. It is recommended to use Belden #6320UL, 18 Gauge, plenum rated wire for the supervised loop.

### Copper Wire Ampacity

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

### **IMPORTANT!!**

**CORE Protection battery backup 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.**

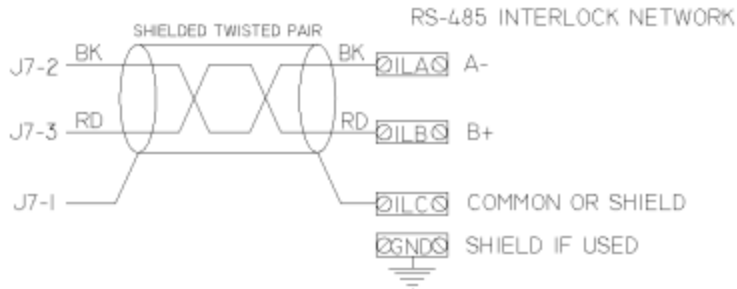
### Wiring Distance Limitations

Wire size is an important consideration when making the connections between the CORE Protection Fire System and a gas valve. The chart to the right should be consulted to verify wire gauge.

Wiring connections to remote CORE Protection Fire Systems must be done using shielded twisted pair wire. The maximum length of this connection is 1000 feet.

**Maximum Distance Between CORE System and Remote Gas Valve**

Wire Gauge	Distance in feet
12	1049
14	660
16	414
18	260
20	164
22	103
24	64



## CORE Total Flood Coverage

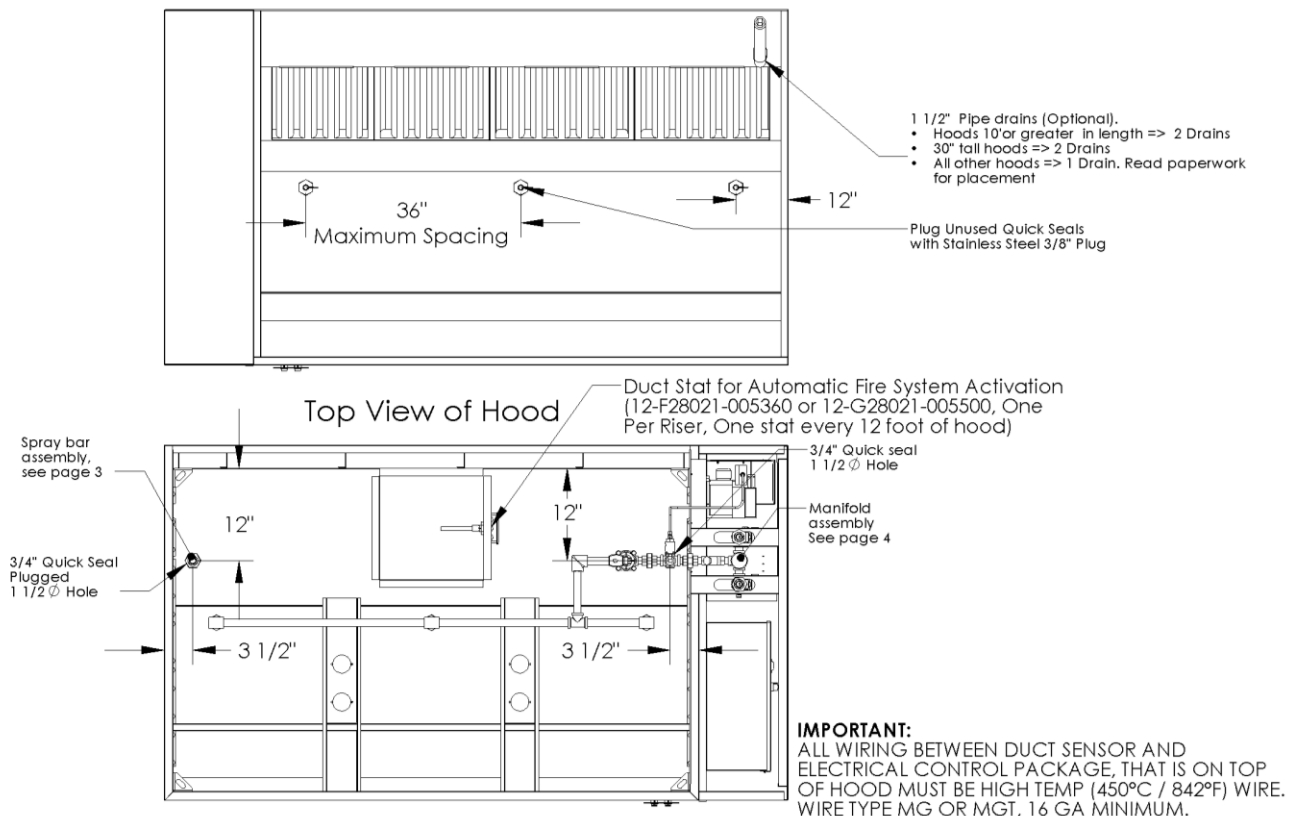
The CORE Protection System for appliances depends on proper placement of the fire suppression nozzles. The fire system can be tailored to suit the individual needs of the appliances. It is important to remember that the nozzles will need an unobstructed path to the cooking surface for proper fire suppression. The overall cooking surfaces of the appliances under the hood are called the hazard zone and will determine the fire protection system.

### Hazard Zone and Nozzle Placement

The Hazard Zone consists of the cooking surface of each appliance underneath each hood. All appliances outlined in UL300 and on the chart on the following page are suitable to be covered with the CORE total flood system. There are specific branch appliance drop requirements for upright charbroilers and salamanders. The lowest and highest cooking surface will determine the height of the fire suppression nozzles. This nozzle height can range between 30 and 55 inches. For applications where the appliance is vertical, such as an upright char broiler, the nozzle setup will need to be adjusted. The sections below contain more detailed information about the Total Flood system.

Proper placement of the appliance hazard zone will maximize the performance of the fire system. There are several factors which need to be accounted for when placing the appliances under the fire system, such as the front and side overhang measurements of the hoods with respect to the hazard zone, and the appliance clearances to combustibles. The common line placement will depend on where the appliance hazard zone is installed under the hood. The common line is a 3/4" NPT line typically installed 24" off the back of the hood and will supply the nozzles. This line can be extended to additional CORE Protection hoods to continue the coverage of the hazard zone to a maximum of 48 feet.

The nozzles must be positioned along the hood length to allow Total Flood of each appliance in the hazard zone. The nozzles must be no more than 12" away from the end of the hazard zone and the nozzles cannot be spaced further than 36" from each other. The nozzle must be no more than 18" away from the front or back of the hazard zone. The pipe for the nozzle drops cannot be sleeved in stainless steel, but can be made from polished stainless steel or polished chrome plated black iron.



### Appliance Coverage Details

The chart below illustrates the maximum permitted cooking surface depth and area to be covered by CORE Protection for each individual appliance. Multiple appliances may be covered under the CORE Total Flood system. The maximum length of the hazard zone is 48 feet. Remember that the cooking surface is different than the appliance size.

Appliance	Fuel Source	Maximum Depth of Cooking Surface	Maximum Length of Cooking Surface	Maximum Height of Fuel
<b>Deep Fat Fryer (with or without dripboard)</b> <sup>(2)</sup>	Gas or Electric	26.75 inches	26.75 inches	N/A
<b>Multi Vat Fryer (with or without dripboard)</b> <sup>(2)</sup>	Gas or Electric	28 inches	41 inches	N/A
<b>Split Vat Fryer (with or without dripboard)</b> <sup>(2)</sup>	Gas or Electric	21 inches	14 inches	N/A
<b>Griddle</b>	Gas or Electric	24 inches	Unlimited	N/A
<b>Char-Broiler (Radiant or Standard)</b>	Gas or Electric	36 inches	Unlimited	N/A
<b>Up-Right Char-Broiler (Upright, Salamander, Chain)</b>	Gas or Electric	25 inches	Unlimited	N/A
<b>Cook Range (with or without back shelf)</b> <sup>(3)</sup>	Gas or Electric	25 inches	Unlimited	N/A
<b>Natural Charcoal Broiler</b> <sup>(4)</sup>	Charcoal	24 inches	Unlimited	8 inches
<b>Solid Fuel Char-Broiler</b> <sup>(4)</sup>	Mesquite or Hardwood	24 inches	Unlimited	8 inches
<b>Lava Rock Char-Broiler</b> <sup>(4)</sup>	Gas or Electric	24 inches	Unlimited	8 inches
<b>Wok</b>	Gas or Electric	11 inch to 20 inch diameter	11 inch to 20 inch diameter	5.25 inches

Notes:

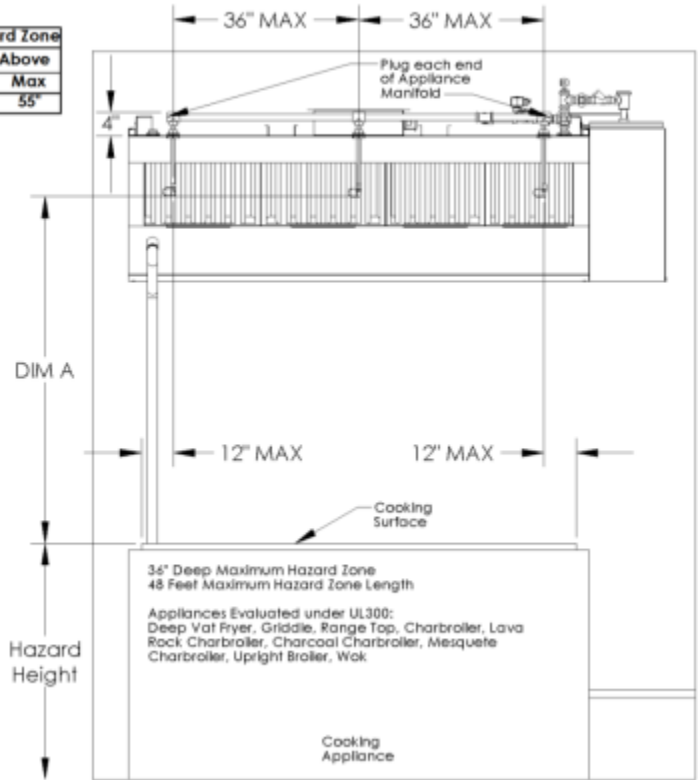
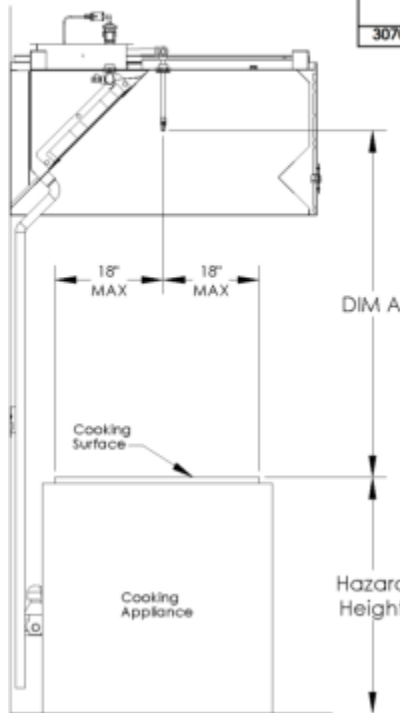
1. All dimensions and areas above are referencing the cooking surface of the appliance, which is typically smaller than the outside dimensions of the appliance itself.
2. Deep fat fryers, multi vat fryers, and split vat fryers are permitted to have a dripboard.
3. The Cook Range may have an integral back shelf that protrudes no more than 12 inches from the back of the appliance. The shelf is to be at least 18 inches above the cooking surface. The cooking surface of the range is defined as the raised portion of the appliance grating encompassing the burners as identified on the range detail on the following pages. The grating dimension may extend beyond this.
4. Dimensions above for the Natural Charcoal Broiler, Solid Fuel Char-Broiler and Lava Rock Char-Broiler are referencing the metal housing containing the fuel source.

The drawings below illustrate the placement of the nozzles for CORE Total Flood. The dimension A, shown below, can range between 30 inches to a maximum of 55 inches above the cooking surface.

Notes:

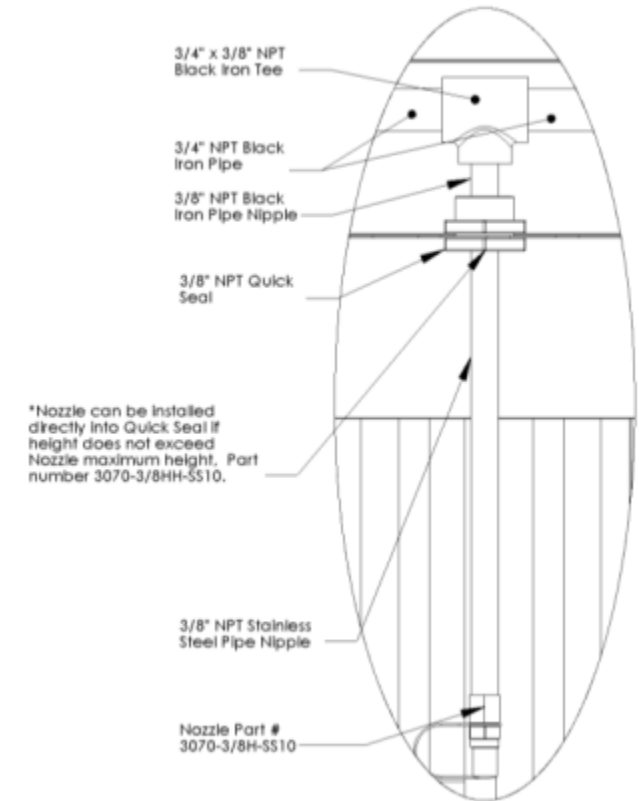
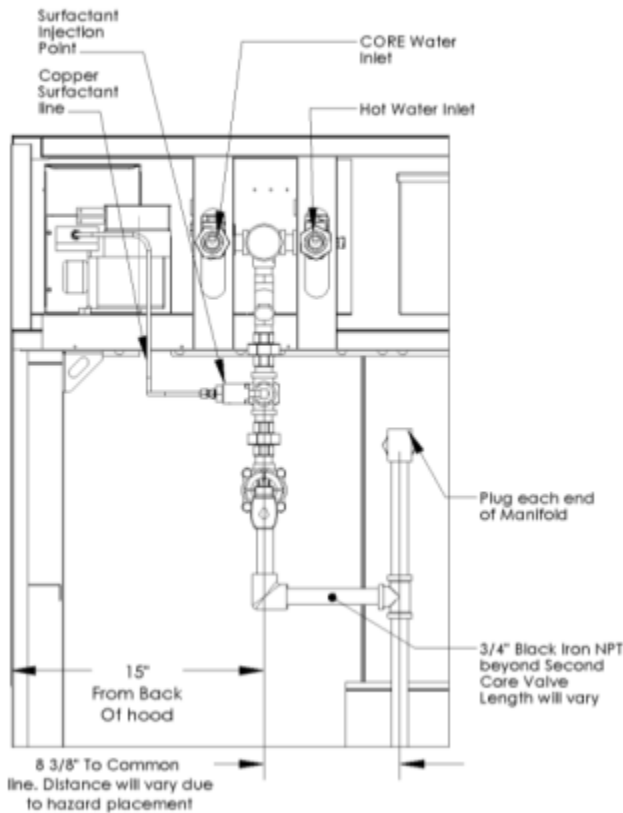
1. Pipe and fittings above the hood, after the second CORE solenoid, will be 3/4" NPT Black Iron. Pipe and fittings inside the hood capture volume will be 3/8" NPT Stainless Steel. No Sleeving Permitted.
2. Nozzle heights must follow table below.

Nozzle Part Number	Nozzle Above	
	Min	Max
3070-3/8H-SS10	30"	55"



Notes:

1. Pipe and fittings above the hood, after the second CORE solenoid, will be 3/4" NPT Black Iron. Pipe and fittings inside the hood capture volume will be 3/8" NPT Stainless Steel. No Sleeving Permitted.



\*Nozzle can be installed directly into Quick Seal if height does not exceed Nozzle maximum height. Part number 3070-3/8H-SS10.

DETAIL K  
SCALE 1 : 3

## Upright Broiler Protection

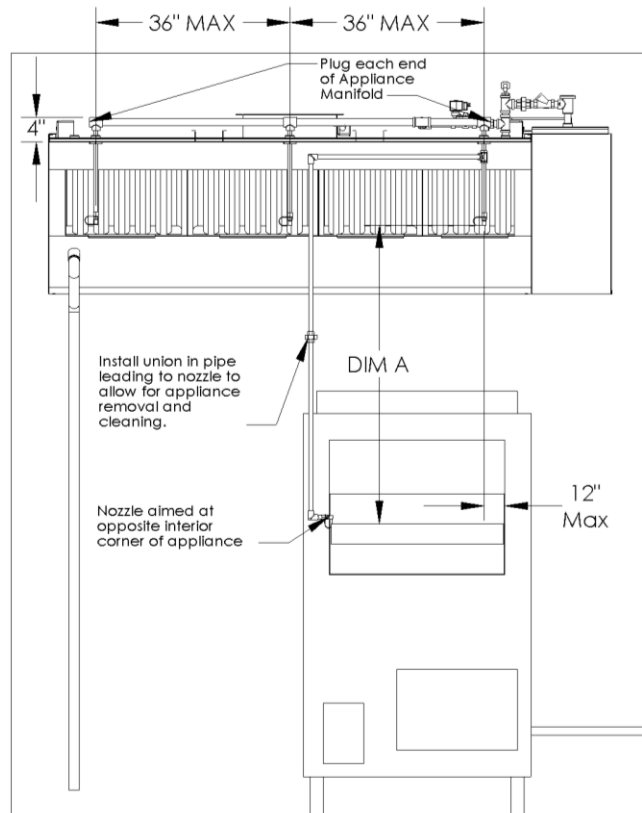
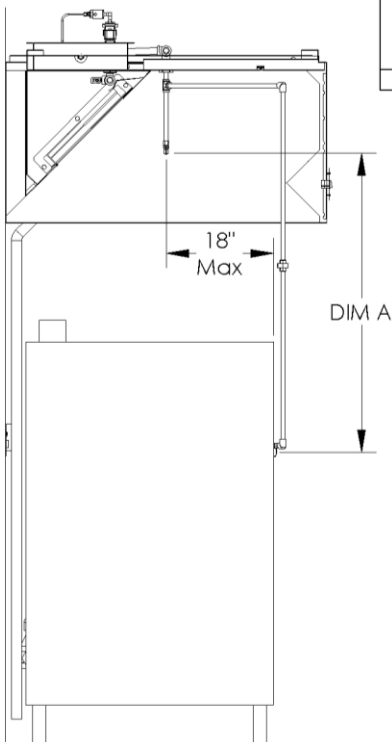
Upright broilers, salamanders, chain broilers, and cheesemelters have specific coverage requirements. Unlike appliances with an exposed flat cooking surface, these appliances have an internal cooking surface and only have a small opening in the face or end of the appliance.

To cover the internal hazard posed by these appliances, a nozzle must be placed at the opening and aimed to the opposite rear corner of the appliance. This nozzle must be branched off one of the nozzle drops and piped to the appliance opening. The drawing below illustrates how this should be accomplished.

**Notes:**

1. Pipe and fittings above the hood, after the second CORE solenoid, will be 3/4" NPT Black Iron. Pipe and fittings inside the hood capture volume will be 3/8" NPT Stainless Steel or Chrome Plated Black Iron. No Sleeving Permitted.
2. Nozzle heights must follow table below.

Nozzle Part Number	Nozzle Above Hazard (DIM A)	
	Min	Max
3070-3/8H-SS10	30"	55"



## Range Top Protection

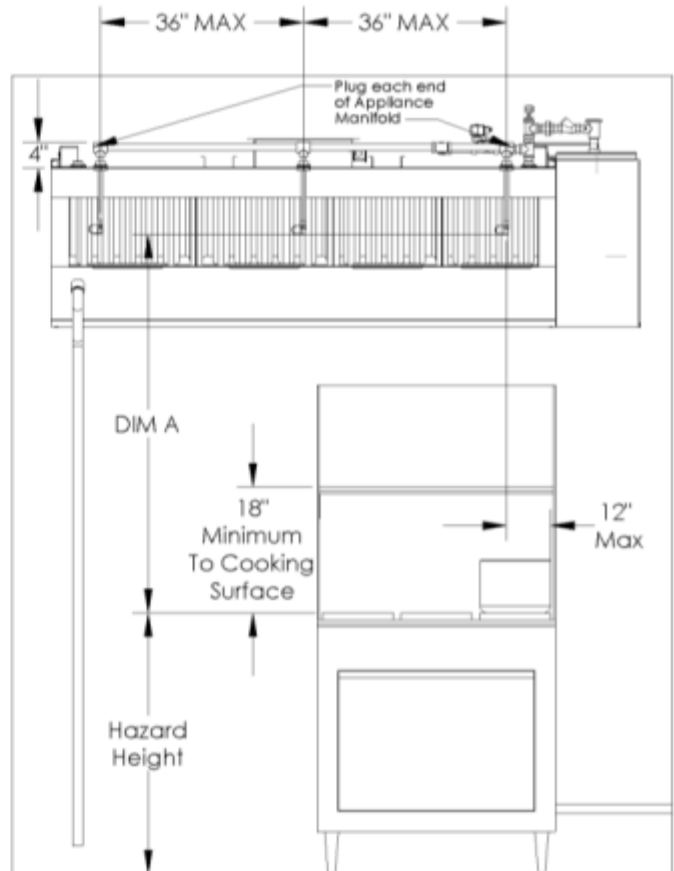
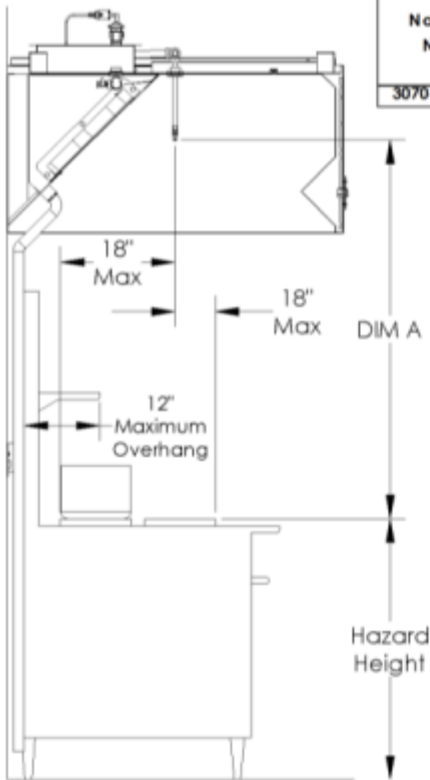
Range top cooking appliances are available with multiple burner assemblies. Some ranges are equipped with shelving behind the appliance for additional storage. For CORE Total Flood protection, this shelf cannot overhang the appliance more than 12" from the back of the appliance.

Below is an illustration showing the position of the hood in relation to the CORE Total Flood Protection system.

**Notes:**

1. Pipe and fittings above the hood, after the second CORE solenoid, will be 3/4" NPT Black Iron. Pipe and fittings inside the hood capture volume will be 3/8" NPT Stainless Steel.
2. Nozzle heights must follow table below.

Nozzle Heights Above Hazard Zone		
Nozzle Part Number	Nozzle Above Hazard (DIM A)	
	Min	Max
3070-3/8H-SS10	30"	55"



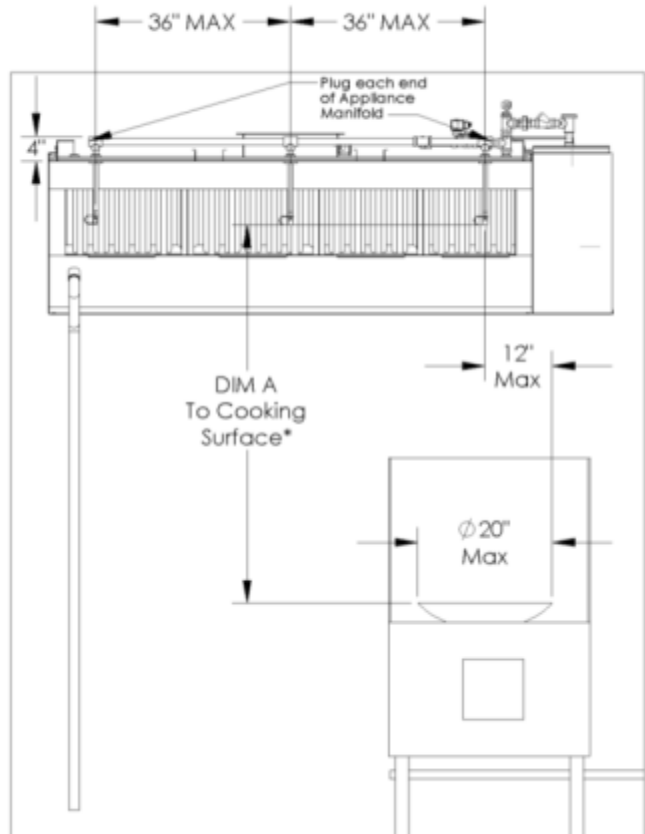
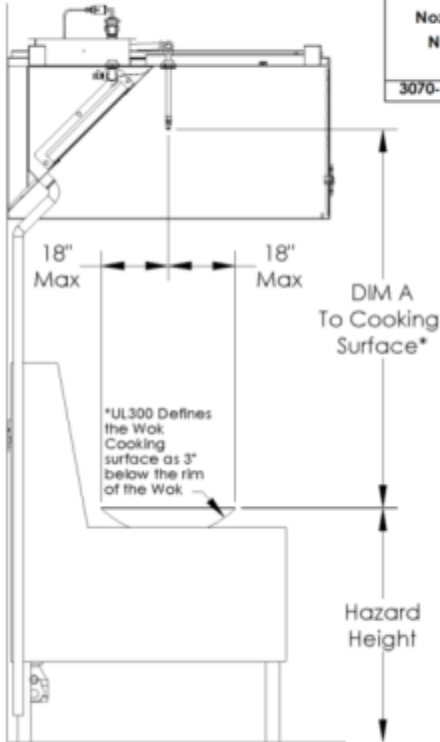
## Wok Protection

Nozzle for Wok protection must be located within 12" from the left or right of the Wok and 18" from the front or back of the Wok. The Wok diameter range for CORE protection is 11" to 20" diameter.

**Notes:**

1. Pipe and fittings above the hood, after the second CORE solenoid, will be 3/4" NPT Black Iron. Pipe and fittings inside the hood capture volume will be 3/8" NPT Stainless Steel. No Steeving Permitted.
2. Nozzle heights must follow table below.

Nozzle Part Number	Nozzle Above Hazard (DIM A)	
	Min	Max
3070-3/8H-5510	30"	55"



## OPERATION

Prior to starting up or operating the system, check all fasteners for tightness. Ensure that the wiring is installed properly and that all nozzles and panels are installed.

### Self Cleaning Hood

The Self Cleaning hood is designed to use hot water to wash the hood plenum and immediate duct section every time the fan switch is switched from the “ON” position on the main control panel. When the switching action occurs, hot water sprays along the entire length of the hood and towards the back of the hood for a factory setting of 3 minutes. During this time, surfactant is injected into the water stream for duration of 1 second for each minute of wash time. Once the wash cycle is complete, water stops spraying and the hood filters are to be removed and cleaned.

If the hood is ordered with a cold water mist option, cold water sprays continuously during the cooking process. Cold water stops spraying when the fan switch is switch from the “ON” position.

### Self Cleaning Hood Start Up

#### Special Tools Required

- AC Voltage Meter
- Standard Hand Tools
- Hand-held Propane Torch
- Surfactant (Part Number WWDETER for 4 Gallons, WWDETER-1G for 1 Gallon)
- High Temperature Wire for Supervised Loop (Type MG, Tan Part Number CW04427, Black Part Number CW04427B)
- Supervised Loop Wire (Belden Part Number 6320UL or similar)

#### Start Up Procedure – Self Cleaning Hood

1. Check all nozzles to make sure they are installed and tight.
2. Install all hood filters per the filter installation configuration chart below. There are drip blanks secured to the filters to prevent water from exiting the hood between the filters.
3. Open all water valves to the hood.
4. Fill surfactant tank with surfactant. The “Add Surfactant” light should not be on. Prime the surfactant pump with the push-button on the face of the electrical control package.
5. There are 2 timers that control the water wash spray and the surfactant injection. The wash timer, which is controlled by R3 on the CORE printed circuit board, is set to 3 minutes from the factory. The surfactant timer that is fixed and factory set for 1 second of injection during each minute of wash time. The injection occurs at the start of each minute. The Wash timer setting should be verified. (See section “Self Cleaning Water Wash Timers for information)
6. Turn the hood fan switch to the “ON” position. Fans should operate. If they do not, check wiring. If the hood has the cold water mist option, cold water should begin to spray.
7. To operate the wash cycle, simply turn the fan switch off. The wash cycle energizes automatically and will remain on for the duration of the wash timer setting.
8. Verify that surfactant is being injected properly into the water stream.
9. Verify the pressure and temperature of the water via the pressure/temperature gauge. See Figure 3 for a picture of the gauge. Self Cleaning pressure should be between 30 and 70 PSI operating pressure.
10. Check all manifold pipe connections to ensure there are no water leaks.
11. Check all filters to make sure that no water is leaking back through the filters.
12. Verify that the hood grease trough is draining properly and there are no clogs in the drain.



Figure 3

### Filter Installation Configuration

The hood filters have drip blanks attached to them to prevent water leakage through the filters. The chart below shows the location of the drip blanks and the last filter to be installed into the hood. See Figure 4 below for details.

\*NOTE: BLUE FILTERS DESIGNATE THE LAST FILTER THAT IS INSTALLED IN THE HOOD.

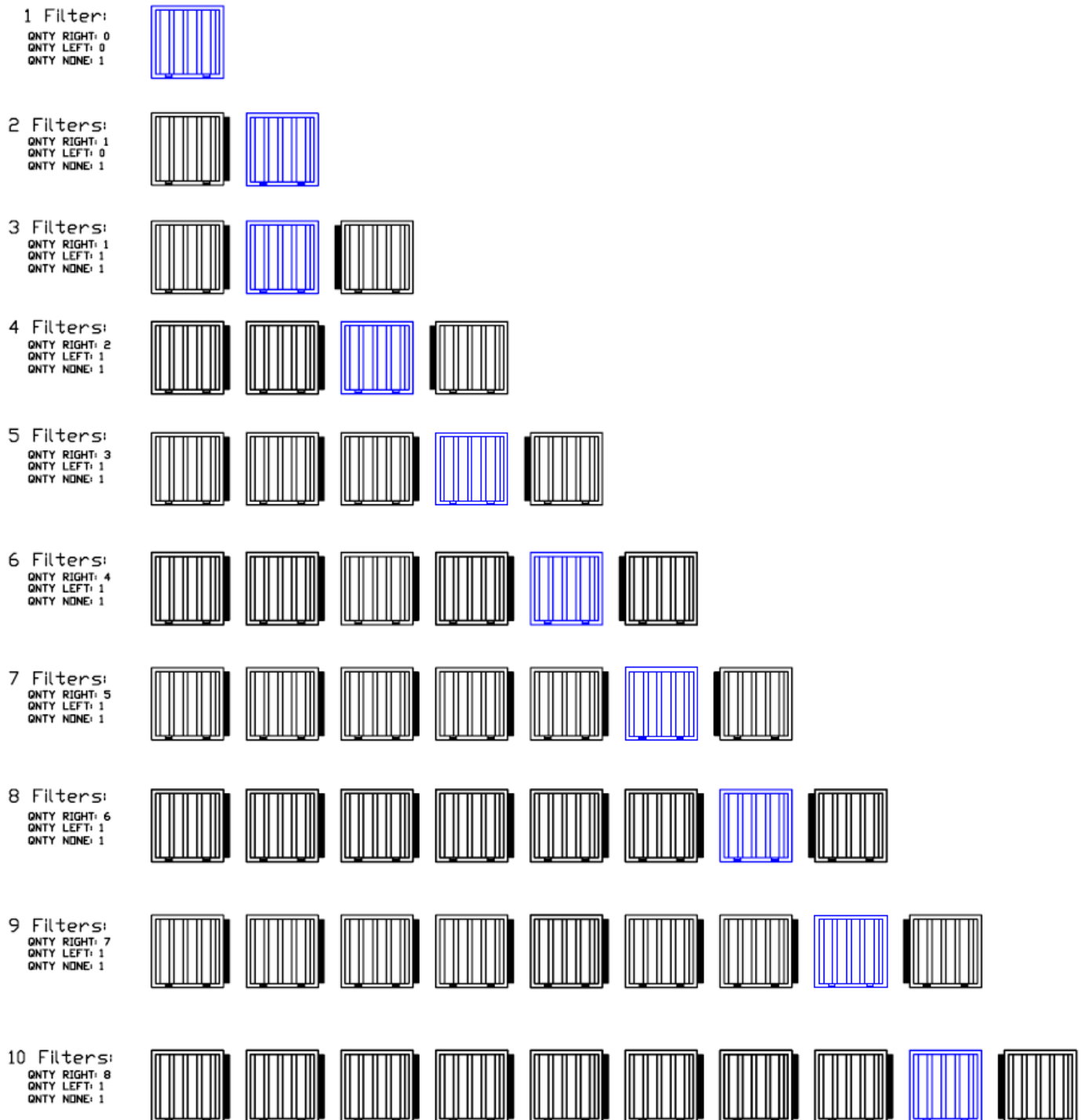


Figure 4

## **CORE Protection Fire System**

The Self Cleaning hood is required to be installed to achieve CORE Protection. The daily basic operation of the CORE Protection system is identical to the Self Cleaning hood. In the event of a hood fire, CORE Protection is activated.

If the hood Firestat installed in the riser senses a temperature hotter than its internal setpoint or if the remote manual pull station is pulled, an electric signal is sent to the appliance protection fire system solenoid and the hood duct and plenum water system solenoid. Two electric water solenoids are energized allowing the flow of water to the hood duct and plenum and the appliance nozzles. At the same time, surfactant is continually injected into the water stream to help suppress the fire.

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. Two timers are also energized upon fire system activation. The first timer is factory set for 30 minutes and keeps the duct and plenum water spray system running for a minimum of 30 minutes. The second timer is set for 15 minutes and keeps the appliance water spray running for a minimum of 15 minutes. This is necessary to ensure complete extinguishment of all fire potential.

The fire system is electrically operated and thus requires a battery backup system. In the event of a loss of 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 three days and be able to operate the fire system circuit for a minimum of 30 minutes. Once power is restored, the battery will automatically recharge.

## **CORE Protection Test Mode Overview**

The CORE Protection System has an integrated option for testing. This test mode, when active, will shut down the appliance coverage solenoid and prevent the water from spraying on the appliances. It will allow activation of the fire system including the water spray in the duct and plenum, audible alarm, shunt trip breaker (if applicable) and shut-down of appliances via gas valve reset relay. This mode will also activate any additional CORE package attached to the system, including any Pollution Control Unit CORE Protection systems and other hood mounted CORE Protection systems.

Please note that the appliances must be started before test mode is entered on any CORE Protection package for proper demonstration of this function.

## **CORE Protection Reset Overview**

There are multiple actions required to reset the fire system. First, the duct Firestat must be cooled to below its internal set point and the remote pull station must be reset using a standard allen wrench key. Once both of these devices have been reset, the timer will automatically stop the fire system once its time duration has ended. An alternative method to bypassing the timer is to press the fire system reset button on the face of electrical control package. This will de-energize the timer and reset the system. NOTE: The Firestat must be cool and the remote pull station must be reset for this button to work.

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

## CORE Total Flood Protection Fire System Start Up

This is the test method for hoods with CORE Total Flood Protection. For CORE Protection with separate appliance coverage, see previous section.

### Special Tools Required

- AC Voltage Meter
- Standard Hand Tools
- Hand-held Propane Torch
- Surfactant (Part Number WWDETER for 4 Gallons, WWDETER-1G for 1 Gallon)
- High Temperature Wire for Supervised Loop (Type MG, Tan Part Number CW04427, Black Part Number CW04427B)
- Supervised Loop Wire (Belden Part Number 6320UL or similar)

### Start Up Procedure – CORE Protection Fire System

1. Perform the Self Cleaning hood start-up as outlined in the Self Cleaning Hood Manual.
2. The CORE Protection water connection must be  $\frac{3}{4}$ " pipe and must be dedicated to the hood. This must be connected to a water supply line immediately downstream from the building main shut-off valve or a water fire system. This main valve must be continuously supervised.
3. 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 CORE system is armed and ready.
4. Ensure that the maximum water static pressure on the panel is less than 90 PSI.

**NOTE: Activating a CORE 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 PCU panels in the test mode and ensuring hood filters and drains are in place.**

### Start Up Procedure – Firestat Activation

1. Place any PCU CORE panel (if present) in "Test Mode"
2. Place Hood CORE Package in Test Mode to prevent Appliances from getting wet.
3. Remove a hood filter directly below the Firestat.
4. Use a portable propane torch to apply heat to the duct Firestat. Heat should activate the fire system and water should begin to spray. Air pressure should exit the appliance drops.
5. Replace the filter and allow the water to spray while reviewing the system.
6. Verify that the water operating pressure is 30 PSI minimum and 70 PSI maximum.
7. Verify that surfactant is constantly being injected into the water stream.
8. Verify that fire system timer is keeping plenum spray system running for 30 minutes and appliance spray system for 15 minutes.
9. Verify that all gas and electric cooking appliances have been disabled.
10. Verify that the "Fire System Activated" light illuminates on the control panel and that the audible alarm is sounding.
11. If all of the above is confirmed, reset the fire system by pressing the button on the face of the electrical control package.
12. Place the PCU CORE panel (if present) in "Armed Mode"
13. Place Hood CORE Package in "Armed Mode".

### Start Up Procedure – Remote Pull Station Activation

1. Place the PCU CORE panel (if present) in "Test Mode"
2. Place the Hood CORE Package in "Test Mode".
3. Lift clear, protective cover and depress pushbutton until it latches.
4. Verify that the water operating pressure is 30 PSI minimum and 70 PSI maximum.

5. Verify that surfactant is constantly being injected into the water stream.
6. Reset the remote pull station. Lift clear, protective cover and rotate pushbutton clockwise to release pushbutton.
7. Verify that fire system timer is keeping plenum spray system running for 30 minutes and the appliance spray system for 15 minutes.
8. Verify that all gas and electric cooking appliances have been disabled.
9. Verify that the "Fire System Activated" light illuminates on the control panel and that the audible alarm is sounding.
10. If all of the above is confirmed, reset the fire system by pressing the button on the face of the electrical control package.
11. Place the PCU CORE panel (if present) in "Armed Mode"
12. Place Hood CORE Package in "Armed Mode".

### **Start Up Procedure – Battery Back Up**

1. Place the PCU CORE panel (if present) in "Test Mode"
2. Place the Hood CORE Package in "Test Mode".
3. Remove 120VAC to the hood control panel by shutting down the circuit breaker to the panel. After a few seconds, the "Fire System Activated" light will flash a power failure supervision fault code (11 flashes followed by a pause).
4. Lift clear, protective cover and depress pushbutton until it latches.
5. Verify that the water operating pressure is 30 PSI minimum and 70 PSI maximum.
6. Verify that surfactant is constantly being injected into the water stream.
7. Reset the remote pull station. Lift clear, protective cover and rotate pushbutton clockwise to release pushbutton.
8. Verify that fire system timer is keeping plenum spray system running for 30 minutes and the appliance spray system for 15 minutes.
9. Verify that all gas and electric cooking appliances have been disabled.
10. If all of the above is confirmed, reset the fire system by pressing the button on the face of the electrical control package.
11. Reset the circuit breaker applying power to the hood panel. "Fire System Activated" light will begin flashing one brief flash every 3 seconds, indicating the CORE system is armed and ready.
12. Place the PCU CORE panel (if present) in "Armed Mode"
13. Place the Hood CORE Package in "Armed Mode".

### **Start Up Procedure – Final**

1. Verify that the "Fire System Activated" light is flashing one brief flash every 3 seconds, indicating the CORE system is armed and ready.
2. Verify that remote pull station is reset.
3. Fill the surfactant tank with surfactant.

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

1. Fully inspect system to make sure fire is extinguished.
2. If fire is out, Firestat should be cool.
3. Reset remote manual pull station if tripped.
4. CORE system will automatically reset once fire system timer expires after 30 minutes. Alternatively, the reset button on the face of the electrical control package can be pressed to reset system.
5. Fill the surfactant tank with surfactant.
6. Inspect or Replace the Appliance Coverage nozzles.
7. Inspect all piping connections, hood lights, wiring, and hood insulation for integrity.

# Start Up Checklists

## Self Cleaning Hood Start Up Checklist

Action	Completed (Yes/No)	Result
Check All Nozzles for Tightness		
Open all Valves to Hood		
Fill Surfactant Tank		
Prime Surfactant Pump		
Set All Timers		
Check Fan Operation		
Operate Wash Cycle		
Verify Surfactant Pump Operation		
Verify Operating Hot Water Pressure (30-70 PSI)		
Verify Max Water Static Pressure (90 PSI)		
Verify Hot Water Temperature		
Check For Leaks in Manifold		
Check For Leaks through Filters		
Verify that Water is Draining Properly		

## CORE Protection System Start Up Checklist

Action	Completed (Yes/No)	Result
Self Cleaning Startup Complete		
Main Water line ¾" or Larger		
Main Water Line from Dedicated Supply		
"Fire System Activated" light flashing ready code (1 short flash every 3 seconds)		
Test Firestat System Activation		
Test Remote Pull Station System Activation		
Verify Water Pressure (30-70 PSI).		
Verify Max Water Static Pressure (90 PSI)		
Verify Constant Surfactant Injection		
Verify Appliance System Activates		
All Gas and Electric Appliances Shut Down		
Fire System Activated Light Illuminates		
Audible Alarm Sounds		
Verify CORE Timer Works Correctly		
Verify Reset Button Works Correctly		
System Activates on Battery Backup		
Verify Surfactant Tank is Full		
Verify Appliance System Test Switch is in Armed Mode		
Reset Remote Pull Station		

## CORE Protection System Reset Checklist

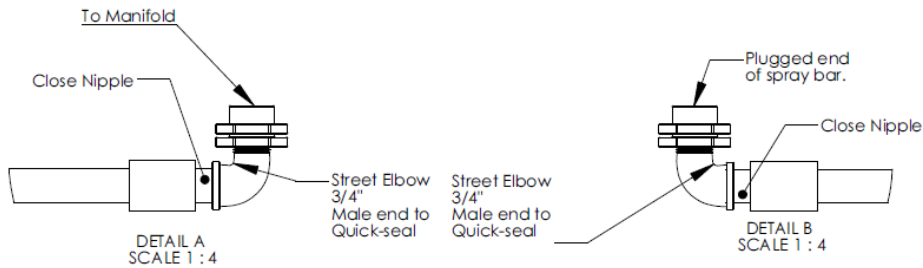
Action	Completed (Yes/No)	Result
Ensure Fire is Extinguished		
Reset Remote Pull Station (if pulled)		
Press The CORE Reset Button		
Verify Surfactant Tank is Full		
Verify Appliance System Test Switch is in Armed Mode		
Replace All Appliance Nozzles After a Fire		
Inspect All Piping Connections After a Fire		
Inspect All Hood Lights After a Fire		
Inspect All Wiring and Hood Insulation After a Fire		

## Component Description

The following section lists the major controls and components used in the Self Cleaning hood and the CORE Protection fire system.

### Self Cleaning Spray Bar/CORE Duct and Plenum Coverage

The Self Cleaning hood contains a spray bar that extends the entire length of the hood immediately behind the filters in the hood. The bar is  $\frac{3}{4}$ " brass fittings with nozzles that spray directly toward the back of the hood. The same spray bar is used in hot water wash, cold water mist and CORE Protection fire systems. Water enters the spray bar through a  $\frac{3}{4}$ " quickseal. The other end of the spray bar is plugged. If hoods are installed back-to-back or end-to-end, the plugged end of the spray bar can be un-plugged and connected to the next spray bar. See Figure 5 below for details.



#### Notes:

1. All fittings and pipe will be Brass.
2. Sections of pipe and tees can be pre-assembled for use. The majority of the length will use these parts.
3. Ends will be made using a Street elbow inside a quick-seal. See Detail A and B.
4. The Variable length section of pipe will be used to complete the spray assembly.
5. On hoods 10' and longer, a tee will be installed at the center of the spray bar for support. This will be a  $\frac{3}{4}$ " Tee with a plugged quick-seal. If this interferes with riser, move supports to both sides of riser.
6. Riser plumbing will be  $\frac{1}{4}$ " NPT Brass. The placement of the elbow is dependant on the riser location. The nozzle needs be centered, both vertically and horizontally, within the riser. Riser nozzle must follow table to right.
7. When riser nozzle is located directly under center of riser on spray bar, main elbow must point upwards.

Nozzles for CORE Protection (WC)			
Description	Part Number	Macola	Flow Rate
Riser Nozzle	1/4TT+TP1530+CP1325	2593	2.6 GPM @ 30 PSI
Spray Bar Nozzle	1/4TT+TH-4.3W and 4193A-5-50-SS	2591 and 2592	.70 GPM @ 30 PSI

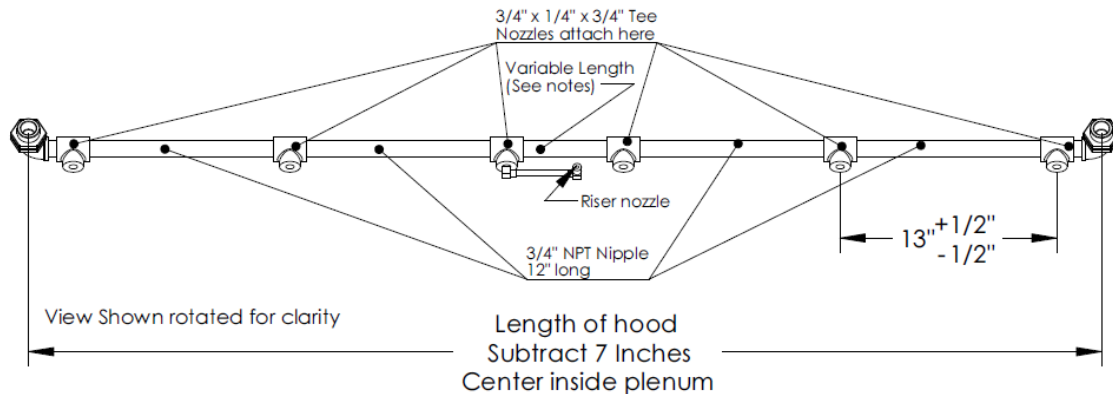
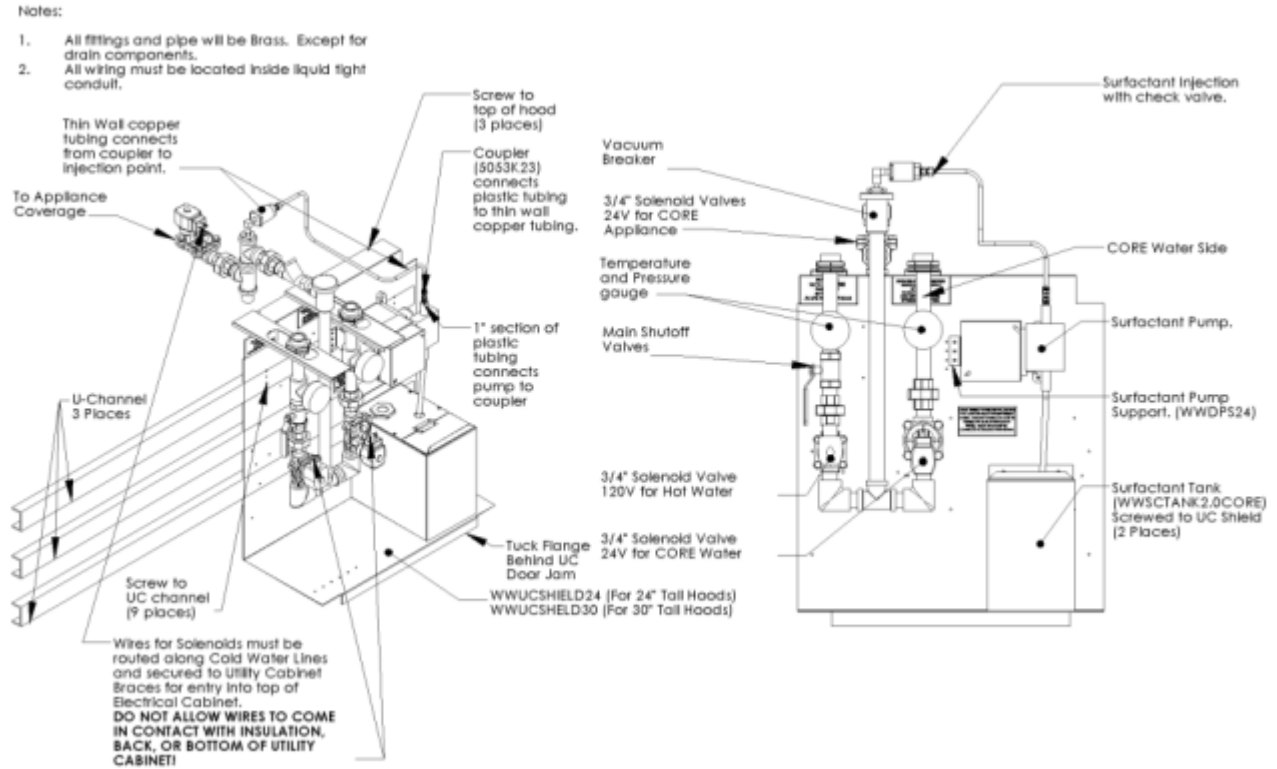


Figure 5

## Water Manifolds

The Self Cleaning with CORE Protection fire system has one hot water connection and one dedicated water source connection for CORE. Figures 6-7 show self cleaning hood and CORE Protection manifold component details.



Self Cleaning with CORE Total Flood Protection

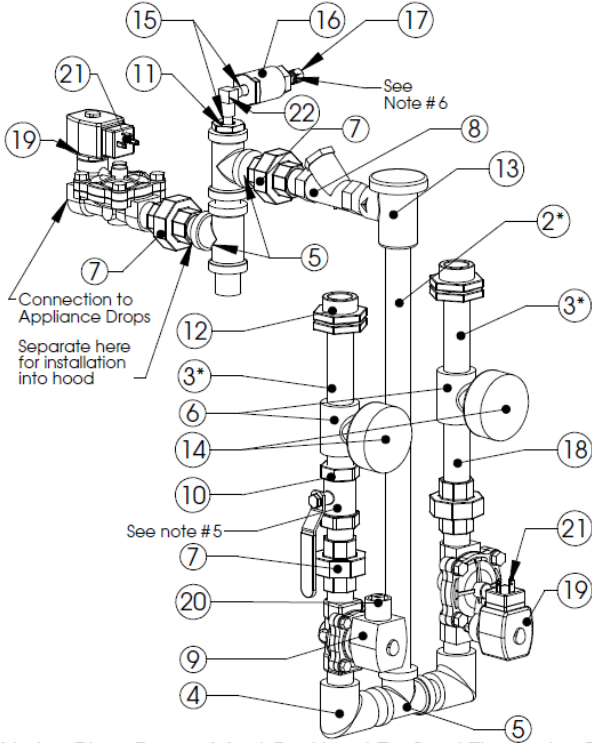
Figure 6

## Self Cleaning with CORE Total Flood Protection Detail

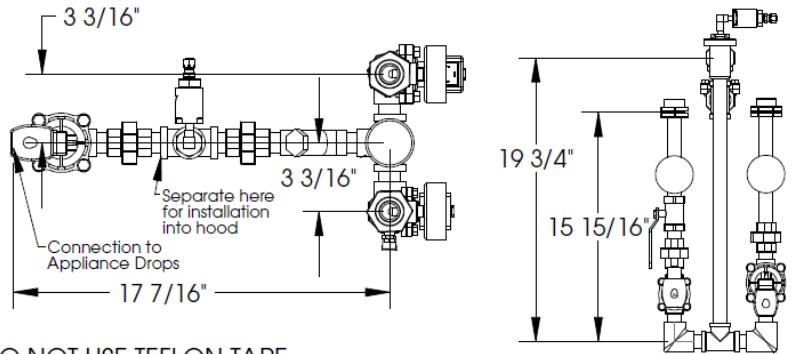
### 24V CORE MANIFOLD WITH APPLIANCE DETAIL

Notes:

1. All fittings and pipe will be Brass, except for drain components.
2. Length and width of manifold must match measurements listed on this page.
3. All pipe nipples are close unless otherwise noted.
4. For 30" tall hoods, plumbing must be lengthened in three places by 6". This is noted below with an \*.
5. Valves can be rotated for best fit inside cabinet
6. Thin wall copper tubing to be run to the coupling near the pump to # 17. 1' of plastic tubing is used between coupler and pump.
7. Do not use Pipe Dope on union mating surfaces as this can cause leaks.



Manifold Parts				
#	Description	Part #	Macola #	Quantity Used
1	3/4" Close Brass Nipple	4568K191	4568K191	15
2	3/4" x 1/8" Brass Nipple	4512K19	4512K19	1
3	3/4" x 4 1/2" Brass Nipple	4568K335	A0003792	1
4	3/4" Brass Elbow	4429K164	4429K164	2
5	3/4" Brass Tee	4429K254	4429K254	3
6	3/4" x 1/2" x 3/4" Brass Tee	BRF205IG	A0007789	2
7	3/4" Brass Union	4429K215	4429K215	4
8	3/4" Brass Wye Strainer	4393K24	4393K24	1
9	3/4" Brass Solenoid Valve, 120V	SC8210G009-120/60,110/50	AQ3105	1
10	3/4" Manual Ball Valve	47865K24	47865K24	1
11	3/4" To 1/4" Brass Bushing	AQ2564	A0007016	1
12	3/4" Quick Seal	172	372	2
13	3/4" Vacuum Breaker	288A	AQ2584	1
14	Temperature and Pressure gage	AQ2516	AQ2516	2
15	1/4" Close Brass Nipple	4568K131	4568K131	2
16	1/4" Check Valve	47715K21	47715K21	1
17	1/4" to Copper tubing adapter	5220K65	5220K65	1
	1/4" Thin Wall Copper tubing			1
	1/4" Tube Coupler	5053K23	5053K23	1
18	3/4" x 3 1/2" Brass Nipple	4568K195	A0003788	1
19	3/4" Brass Solenoid Valve, 24V	SC8210G003-24DC	AQ3205	2
20	Solenoid Connection Cable 120V	5J684-551-US0A	AQ3602	1
21	Solenoid Connection Cable 24V	5J684-251-US0A	AQ3603	2
22	1/4" Brass Elbow	AQ2509	AQ2509	1
23	CORE Appliance Manual			1



Note: Pipe Dope Must Be Used To Seal Threads. DO NOT USE TEFLON TAPE.

**Figure 7**

## CORE Protection Fire System Printed circuit board

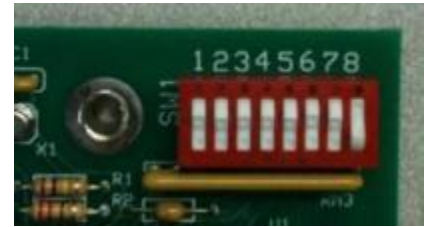
The CORE Fire System printed circuit board is a microprocessor based control that provides all the necessary monitoring, timing and supervision functions required for the reliable operation of the CORE Protection Fire System. Under normal conditions the "Fire System Activated" light is flashing one brief flash every 3 seconds, indicating the CORE system is armed and ready. If a fault is detected anywhere in the CORE system the 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 dealt with and rectified immediately to insure continued CORE protection.



<b>Catastrophic faults for CORE Total Flood Protection</b>		
<b>Number of flashes</b>	<b>Fault condition</b>	<b>Corrective Action</b>
2	Main CORE water solenoid	Check solenoid and wiring to solenoid, replace as needed
3	CORE Appliance solenoid	Check solenoid and wiring to solenoid, replace as needed
5	Microcontroller fault	Replace CORE printed circuit board
<b>Critical faults</b>		
<b>Number of flashes</b>	<b>Fault condition</b>	<b>Corrective Action</b>
6	CORE surfactant pump	Check surfactant pump motor and wiring to the motor, replace as needed
7	Supervised Loop +	Check the wiring to all the pull stations and fire sensors, replace as needed
8	Supervised Loop -	Check the wiring to all the pull stations and fire sensors, replace as needed
<b>Important faults</b>		
<b>Number of flashes</b>	<b>Fault condition</b>	<b>Corrective Action</b>
9	Surfactant Low	Add surfactant, check/replace float switch
10	Battery voltage low	Replace batteries, wait for batteries to recharge if there was a power failure
11	AC power failure	Check breakers, call power company
12	Door tamper switch	Close cabinet door
13	CORE Total Flood Test mode	Place switch in armed position when testing is complete.
14	CORE Interlock	Check Dip Switches on all Boards and RS-485 Network Wires connecting boards
15	Fault on hood in network	Check all hoods in CORE network for faults
16	Fault on PCU in network	Check all PCUs in CORE network for faults

## DIP switch Settings

In the photo to the right switches 1 through 7 are shown in their open or OFF positions, switch 8 is shown in its closed or ON position. This is the factory default and should not normally be changed.



The Table below describes each switch and its function.

DIP SWITCH #	Description				
1 through 4	Dip Switch position				Interlock Network Address of this unit
	1	2	3	4	
	ON	OFF	OFF	OFF	1
	OFF	ON	OFF	OFF	2
	ON	ON	OFF	OFF	3
	OFF	OFF	ON	OFF	4
	ON	OFF	ON	OFF	5
	OFF	ON	ON	OFF	6
	ON	ON	ON	OFF	7
	OFF	OFF	OFF	ON	8
	ON	OFF	OFF	ON	9
	OFF	ON	OFF	ON	10
	ON	ON	OFF	ON	11
	OFF	OFF	ON	ON	12
	ON	OFF	ON	ON	13
OFF	ON	ON	ON	14	
ON	ON	ON	ON	15	
OFF	OFF	OFF	OFF	THIS UNIT IS NOT PART OF AN INTERLOCK NETWORK	
5	Set this switch to ON if this unit has the highest address on the interlock network, otherwise this switch must be OFF (open)				
6	Factory test, leave OFF (open)				
7	Setting switch 7 to its closed, ON position connects a 120 Ohm terminating resistor to the interlock network. This switch must be ON if this unit is at either physical end of the interlock network cable, otherwise it must be OFF (open).				
8	Setting switch 8 to its closed, ON position connects a 120 Ohm terminating resistor to the ModBus network. This switch is factory set and may be ON or OFF.				

- 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 on will be the “master” and 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

## Appliance Shutdown in Fault Conditions

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

Number Of Flashes	Fault Condition	Gas Valve Shut Down		Shut Down Shunt Trip Breaker and UDS Kill Switch		Mute Local Alarm with 4 Hour Reset	Local Trouble relay
		Local System	Networked System	Local System	Networked System		
<b>Catastrophic Faults for CORE Appliance Protection</b>							
2	CORE water solenoid	X	X	X	X		X
3	CORE Appliance solenoid	X	X	X	X		X
5	Microcontroller fault	X	X	X	X		
<b>Critical Faults</b>							
6	CORE surfactant pump					X	X
7	Supervised Loop +						X
8	Supervised Loop -						X
<b>Important Faults</b>							
9	Surfactant Low					X	
10	Battery voltage low					X	X
11	AC power failure	X	X	X	X		X
12	Door tamper switch					X	
13	CORE Appliance 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

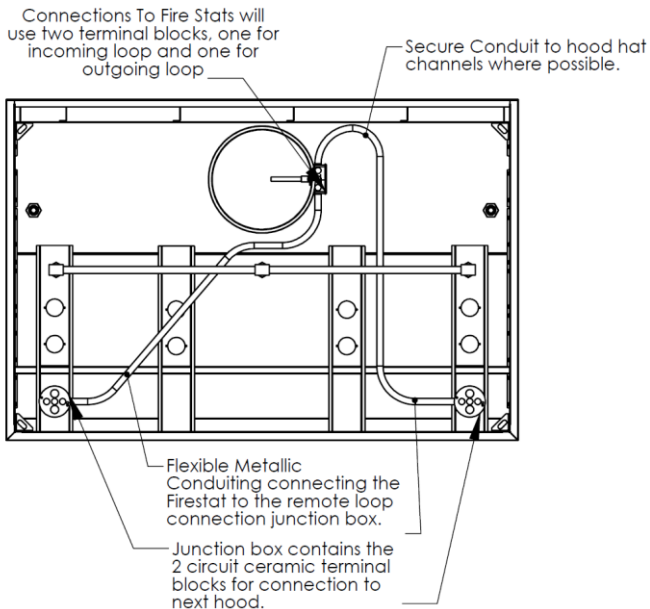
Depressing the fire system reset button can mute the local alarm. This will disable the sounder for 4 hours under specific conditions. The table above shows which errors can be muted. It should be noted that the fault will not clear until the fault condition is corrected.

### \*\*CORE Appliance Test Mode

The CORE Appliance 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.

### CORE Protection Supervised Loop

The supervised loop is integral to proper operation and activation of the CORE protection system. The loop consists of two conductors, one positive and one negative, interconnecting all sensors and 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 pull station, must be made with a plenum rated wire. It is recommended to use a two conductor Belden 6230UL, 18 AWG, wire or similar for these connections.



For connections on or above the hood, use Type MG or MGT wiring with High 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.

Supervised Loop Connection Kit Part Number	Length	Location Used
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 Components	Part Number
Type MG Wire, Tan, 16 AWG	CW04427
Type MG Wire, Black, 16 AWG	CW04427B
Two Position High Temp Terminal Block	20MC4174

## CORE Protection Firestat

The Firestat is a device installed in the hood's duct connection that measures temperature. The standard temperature setting is 360°F. Other temperatures are available. If a temperature higher than the set point is sensed, the Firestat contacts will close and energize the fire system. The fire system will run for a minimum of 30 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, which must be connected into the supervised loop. High temp wirenuts or terminal blocks must be used. There must be one sensor installed for every 12 feet of hood. Multiple sensors are wired in parallel in the supervised loop. Solid Fuel appliances require a firestat sensor at the end of the duct near the exhaust fan if duct is longer than 10 feet or has horizontal runs. The firestat may be installed on the opposite side of the quick seal for access in the duct. SOLO filters and listed ductwork are required for Solid Fuel appliances. See Figure 8 below for details.

NOTES: One Sensor per Riser  
: Multiple Sensors Wired in Parallel  
: Wire Both Black Wires to One Lead, Both White Wires to Second Lead  
: Sensor may be installed on inside or outside of quick seal. When installed in riser, install as shown for sensor access from hood.  
When installed in duct, install on opposite side of quick seal, or as shown with access door for cleanability.

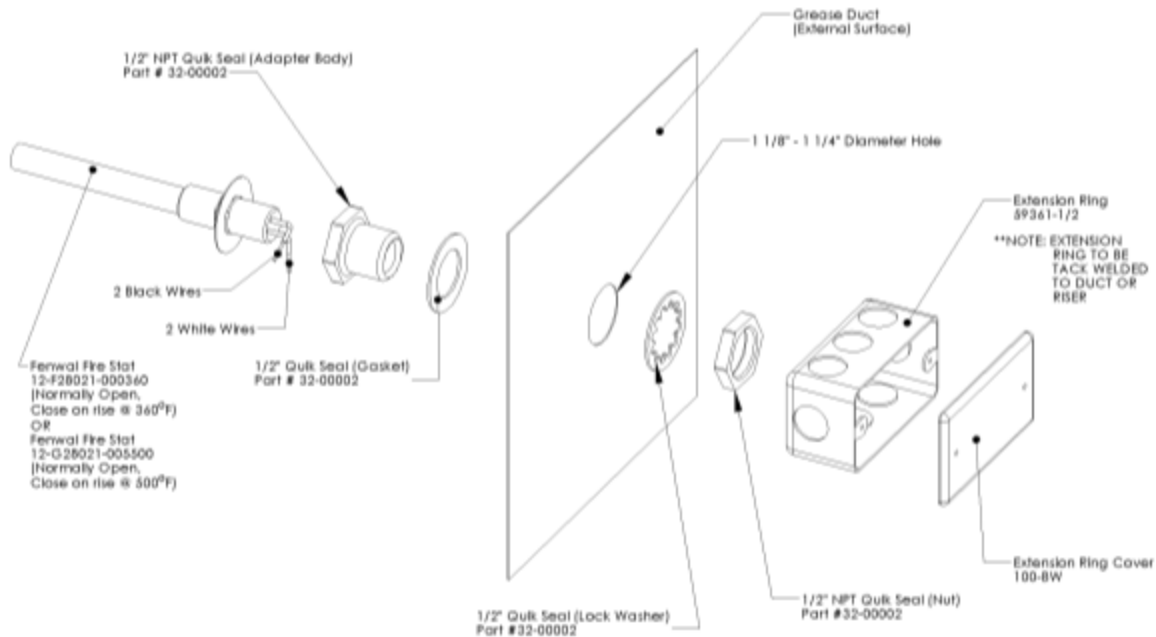


Figure 8

### CORE Protection Pull Station

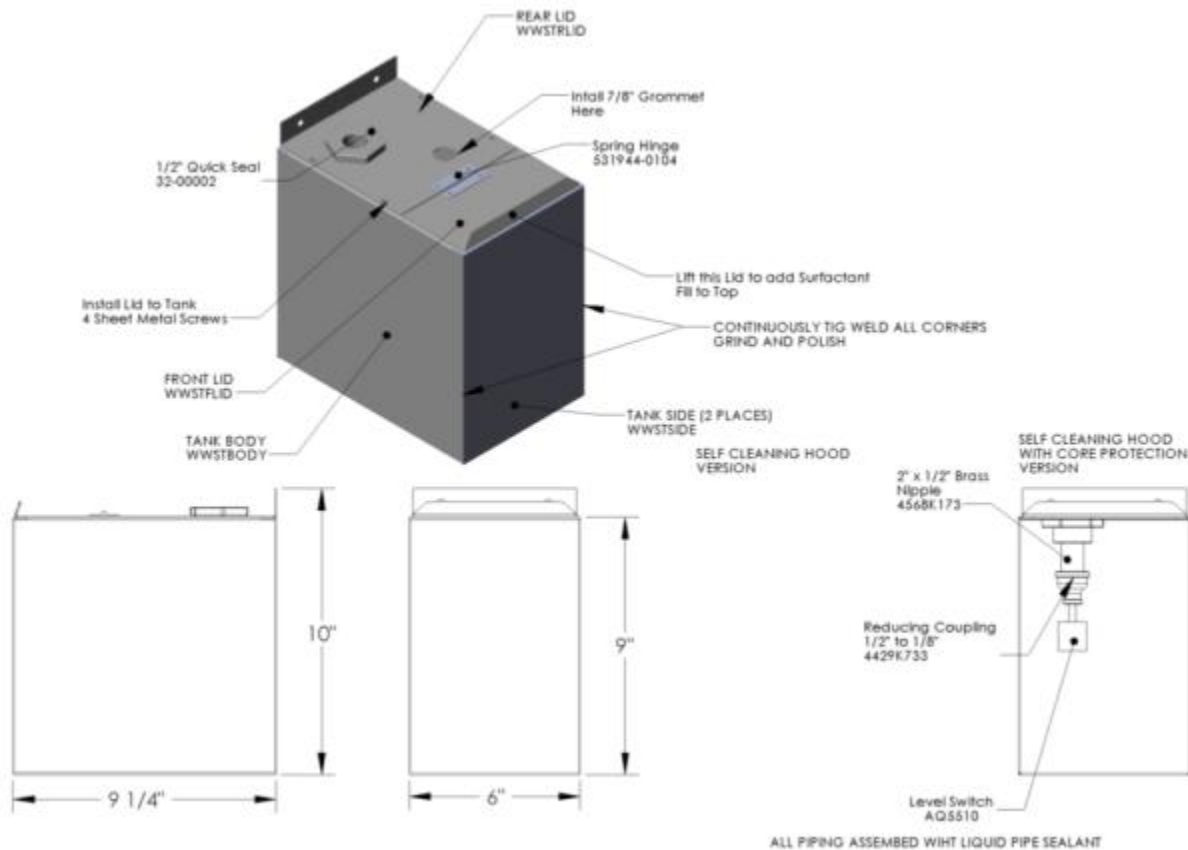
The pull station is a manual device to activate the fire system. This pull station contains one set of normally open contacts, and mounts to any standard junction box. When the front button is pressed, the electrical connection to the fire system is completed, thus activating the fire system.

The remote 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 pull stations are acceptable to use in the CORE system and are wired in parallel per the electrical schematic. The pull station is reset by twisting the push button clockwise until the internal latch is released.



### Surfactant Tank

The surfactant tank for CORE has a low level control that is located at the 1 gallon mark. In the event of a fire, surfactant is continuously injected into the water spray to help suppress the fire. One gallon of surfactant will last for approximately 15 minutes of fire protection. In the event that the low level sensor is activated, an “Add Surfactant” light will illuminate on the control panel. To reset light, simply fill the surfactant tank with surfactant. Figure 9 below shows tank details.



**NOTE: SC-5 surfactant from 20/10 Products Incorporated must be used.**

Figure 9

## CORE Protection Waterline Supervision

The Pressure Reducing Valve is capable of reducing the sprinkler line supply pressure and flow rate down to the CORE control package requirements. Since the valve is capable of shutting down the water flow, it must be monitored to ensure the valve is open. The pressure reducing valve is an Elkhart Brass UR series and is supervised by a Potter PCVS2 Switch. The valve is available in 1 1/2" NPT.



Complete Parts Kit	UR-20 Valve	Reduction Presentage	Supervision Switch	Switch Bracket
<b>UR-20-W KIT</b>	UR-20-W	28.7%	PL-PCVS2	80574001
<b>UR-20-X KIT</b>	UR-20-X	33.8%	PL-PCVS2	80574001
<b>UR-20-Z KIT</b>	UR-20-Z	56.5%	PL-PCVS2	80574001

Reduced Pressure (PSI)	UR-20 Valve	Incoming Pressure (PSI)												
		50	60	70	80	90	100	110	120	130	140	150	160	170
UR-20-W	UR-20-W	35.65	42.78	49.91	57.04	64.17	71.3	78.43	85.56	92.69	99.82	106.95	114.08	121.21
UR-20-X	UR-20-X	33.1	39.72	46.34	52.96	59.58	66.2	72.82	79.44	86.06	92.68	99.3	105.92	112.54
UR-20-Z	UR-20-Z	21.75	26.1	30.45	34.8	39.15	43.5	47.85	52.2	56.55	60.9	65.25	69.6	73.95

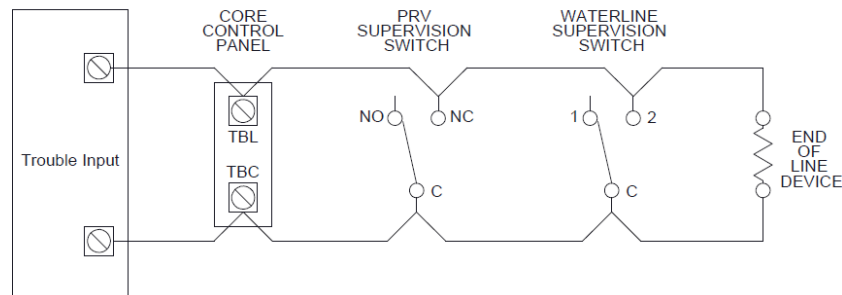
The Pressure Supervision Switch, part number PL is used to verify incoming water pressure. This switch is preset at 40 PSI, but is adjustable, up to 60 PSI, to account for different length hood systems.



Each Supervision device above has two single pole, double throw switches. One set of switches from each device must be connected to the trouble input of the building fire system to indicate an issue.

### Wiring Connections For Supervision Controls

BUILDING FIRE ALARM OR MONITORING SYSTEM

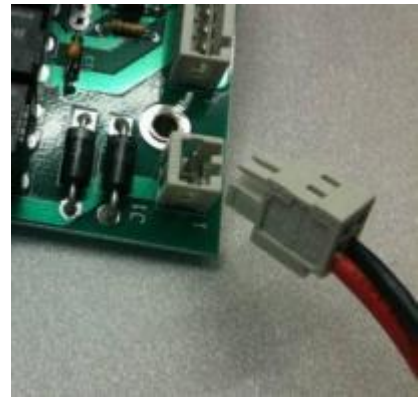


## Battery Backup

The CORE system contains a battery backup. In the event of a power loss, the battery backup will run the CORE system in its armed and ready state for up to 3 days. In the event of a fire, the battery will keep the fire system energized for a minimum of 30 minutes. 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. Part number BP7-12-T2, two 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 CORE printed circuit board. 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 CORE system will be without AC power for more than 2 days, such as a shutdown or natural disaster, it is best to decommission the CORE 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 allowing them to charge for 48 Hrs.



### **IMPORTANT!!**

**CORE Protection battery backup system requires that the batteries be changed every 2 years 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.**

## Troubleshooting

The following table lists causes and corrective actions for possible problems with Self Cleaning hoods. Review this list prior to consulting manufacturer.

**Self Cleaning Hood Troubleshooting Chart**

<b>Problem</b>	<b>Potential Cause</b>	<b>Corrective Action</b>
Plenum not being cleaned	No Water Pressure	Verify Hot Water Pressure >30 PSI Open Manual Valve if closed
	Clogged nozzles	Clean or replace nozzles or strainer
	Timer Settings improperly set	Wash timer should be set for approximately 3 minutes
	No water pressure	Turn main building water valve on
	Nozzle spray pattern incorrect	Nozzles must be pointed toward back of plenum
	No Surfactant	Add Surfactant
Leaking Manifold Pipes	Pipes not tight or sealed	Reseal and tighten pipes
Water Leaking from Vacuum Breaker	Riser nozzle installed too high	Verify that vacuum breaker is installed higher than all downstream piping components
Add Surfactant Light On	Low Surfactant Level	Add Surfactant
Water leaks out of Filters	Filters have gaps between them	Add Filter Drip Blanks or reorient filters
Water Overflows Grease Trough	Clogged Drain	Clean Drain or grease trap
	Wrong Filters Installed	Install Proper Filters per Manufacturer
	Water Pressure Too High	Water Pressure should be 70 PSI max
	Wash Timer Set Too Long	Reduce Wash Time
	Nozzles are Loose	Tighten Nozzles
	Filters are Clogged with Grease	Clean Filters

### CORE Protection Fire System Troubleshooting Chart

<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
Add Surfactant Light On	Low Surfactant Level	Add Surfactant
Fire System Activated Light On	Fire System is Activated	Make Sure Fire is Out and Reset Fire System
Audible Alarm is On	Fire System is Activated	Make Sure 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 CORE Protection Fire system	Count the flashes and lookup the fault cause in section "CORE Protection Fire System Printed circuit board" of this manual.
Fire System will not turn off	Duct Sensor is Hot	Heat has activated the duct sensor. Remove heat source or let system extinguish fire. Once Heat source or problem is resolved, press reset button on the face of the electrical control package.
	Remote Pull Station has been pulled	Reset Remote pull station with allen key once fire is out and press reset button on the face of the electrical control package.
	Fire system is running on timer	Make sure duct sensor is cool and pull station is reset, than press reset button on the face of the electrical control package.

# MAINTENANCE

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. All water connections must be verified for tightness and leak-free operation.
3. The “Add Surfactant” indicating light will illuminate when the surfactant tank is ½ empty. Surfactant must be added immediately to guarantee proper cleaning of the hood duct and plenum and proper fire protection.

## Every 6 months

1. Clean all duct sensors in hood duct connections (if equipped).
2. Check all nozzles for proper and evenly distributed water flow. If nozzles are clogged, clean or replace.
3. The main line strainer in the manifold must be cleaned.
4. All nozzle strainers should be removed and cleaned. Nozzles must be re-installed tightly.
5. Check drain(s) on hood to verify there is no blockage. Improper drainage could cause hood leaks or water to back up into trough and overflow onto appliances.
6. Inspect hood plenum and wipe down any areas not being cleaned by the self-cleaning system. There may be an area where the water spray does not directly contact the metal.
7. Inspect the surfactant pump for proper operation and ensure liquid level sensor in surfactant tank is operational. Test by manually lowering the sensor to see if the “Add Surfactant” light illuminates.
8. Fill surfactant tank with surfactant.
9. Verify that system has proper water pressure and temperature per the labels on the unit.
10. A certified technician should test and inspect CORE system. This includes verifying proper operation of the duct Firestat, all remote pull stations, proper surfactant injection and battery backup operation. Refer to the CORE Protection startup procedure to check the proper operation of these components.

## Every 2 Years

1. Replace batteries for the CORE Protection Systems. The replacement battery part number is BP7-12-T2; two are required. Once the battery is disconnected, the connected equipment is not protected from power outages. The new battery must be installed immediately. Refer to the replacement battery installation guide for more details.
2. Inspect condition of all wires and plumbing. Plumbing should be free of corrosion and wire insulation must be in good condition.

## Decommissioning

1. If it should become necessary to disconnect the CORE system 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. Replace all nozzles.
2. Inspect all piping connections for tightness.
3. Inspect all hood lights for proper seals and security.
4. Inspect all wiring and Hood insulation to ensure all are in good condition.

# 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

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

## Self Cleaning Hood Information

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

Name Plate and Unit Information	
Hood Model Number	
Serial Number	
Volts	
Hertz	
Phase	

Field Measured Information	
Input Voltage	
Check All Nozzles for Tightness	
Open all Valves to Hood	
Fill Surfactant Tank	
Set All Timers	
Check Fan Operation	
Operate Wash Cycle	
Verify Surfactant Pump Operation	
Verify Operating Water Pressure (30-70 PSI)	
Verify Max Static Water Pressure (90 PSI)	
Verify Water Temperature	
Check For Leaks in Manifold	
Check For Leaks through Filters	
Verify that Water is Draining Properly	

## Fire System Information (When Supplied)

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

Name Plate and Unit Information	
Hood Model Number	
Serial Number	
Volts	
Hertz	

Field Measured Information	
Self Cleaning Startup Complete	
Main Water line 3/4" or Larger	
Main Water Line from Dedicated Supply	
Batteries plugged in and light flashes ready	
Test Firestat System Activation	
Test Remote Pull Station System Activation	
Verify Operating Water Pressure (30-70 PSI)	
Verify Max Static Water Pressure (90 PSI)	
Verify Constant Surfactant Injection	
Verify Appliance System Activates	
All Gas and Electric Appliances Shut Down	
Fire System Activated Light Illuminates	
Audible Alarm Sounds	
Verify CORE Timer Works Correctly	
Verify Reset Button Works Correctly	
System Activates on Battery Backup	
Verify Surfactant Tank is Full	
Verify Appliance System Test Switch is in Armed Mode	

