

Commercial Kitchen Hoods

Installation, Operation, and Maintenance Manual



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 unit should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Read this manual thoroughly before installing or servicing this 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 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.

LISTINGS

This hood is ETL-listed to standard UL710 when installed in accordance with these installation instructions and National Fire Protection Association Standard “NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.”

INSTALLATION

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

WARNING: IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTAINANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH. READ THE INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR SERVICING THIS EQUIPMENT.

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Consider general service and installation space when locating unit.
2. Locate unit close to the space it will serve to reduce long, twisted duct runs.
3. Thoroughly review the plans and specifications of the project.
4. Determine the exact location in which the cooking hood will be installed and verify that there are no interferences which will prevent proper installation.
5. Verify that all overhead beams and angles are structurally strong enough to support the weight of the hood and hanging system. It is often necessary to strengthen existing structural beams, as they are not designed to carry the weight of a stainless steel hood. Refer to the project submittal drawing for hood weight(s). It may also be necessary to create a support structure suspended from the ceiling joists to better align with the desired hood location.
6. Determine if adequate room is available to install the hood and all ductwork with proper clearances from combustible material. IMC, NFPA96 and local authorities having jurisdiction call for a minimum clearance (typically 18 inches for type 1, grease rated hoods) between the cooking hood(s), exhaust ducts, and building materials which are combustible. However, IMC and NFPA96 outline acceptable clearance reduction methods; **most authorities accept the clearance reduction methods approved in the manufacturer’s ETL listing for Type 1, grease rated hoods. See Figure 1.** It is important to check with the local authority having jurisdiction to determine that the installation method is satisfactory to meet their requirements prior to installing the equipment.

**FOLLOW SMACNA GUIDES AND RECOMMENDATIONS FOR THE HANGING AND
INSTALLATION OF HOODS.**

Clearance Reduction Methods

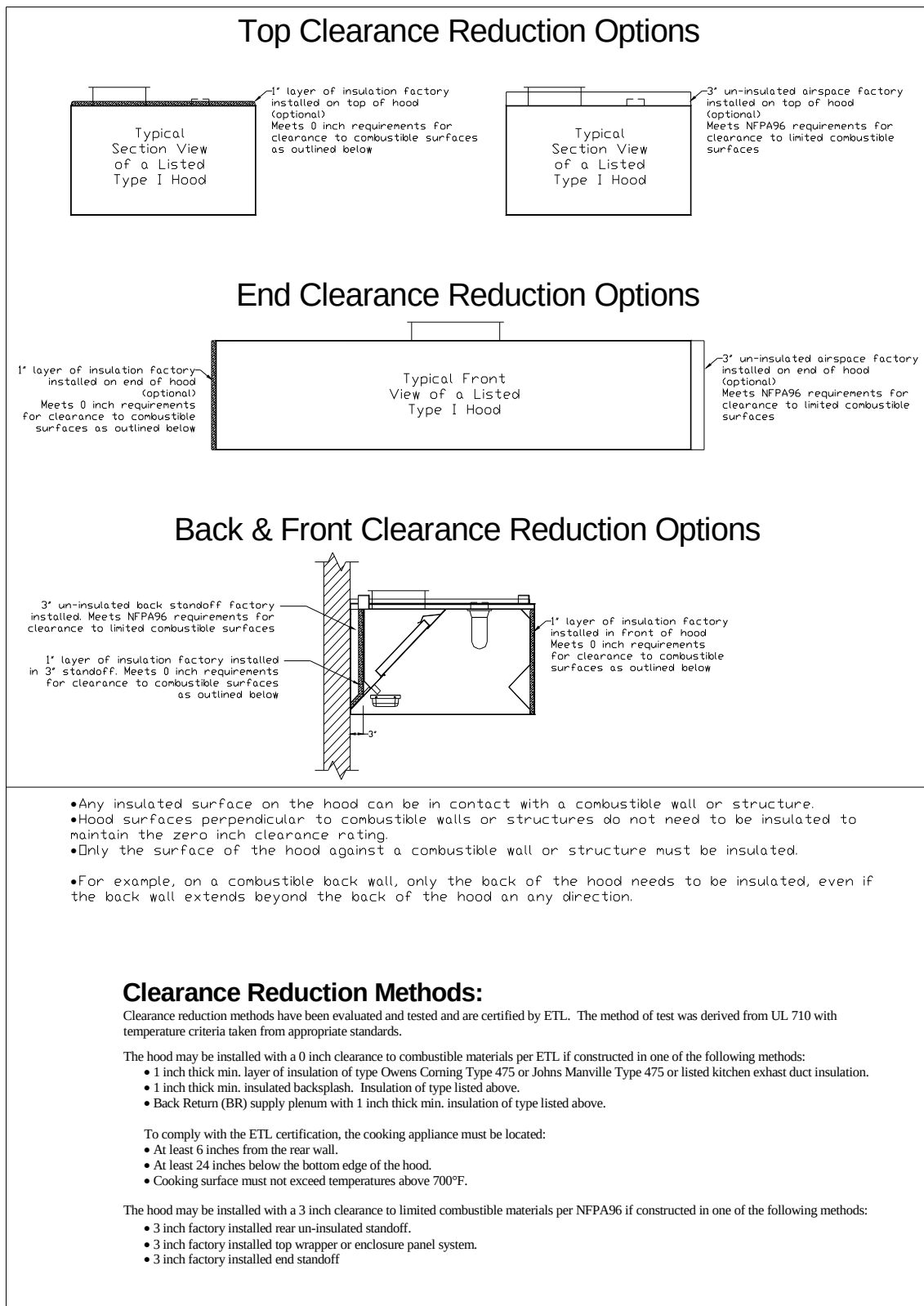


Figure 1

Installation of a Single Hood (Wall or Island)

The following is a step-by-step procedure for installation of the ventilation hood.

1. Uncrate the hood, being very careful not to dent or scratch the outer surface. **NOTE: Report any damage to the delivering freight carrier and file a claim if appropriate.** Refer to the installation drawing for typical details of the ventilation system prior to hanging the hood. Check the nameplate on the equipment to make certain it meets the specifications provided by the architect and/or engineer. **If discrepancies exist, notify the manufacturer immediately.**

The nameplate will also give information regarding the following:

- Clearance from cooking surface to front lower edge of the hood
- Minimum exhaust air flow
- Maximum supply air flow (if applicable)
- Minimum front overhang from cooking surface
- Minimum side overhang from cooking surface
- Maximum cooking surface temperature
- Replacing fusible links for exhaust and supply damper (if applicable)
- Replacing filters

2. Determine the height at which the hood will be hung:

Canopy hoods are typically hung so that the front lower edge of the hood is within 6'6" - 7'0" AFF. However, the hood should be hung so that the proper clearance from the cooking surface to the front lower edge of the hood is maintained. See nameplate for clearance from cooking surface to front lower edge of hood. Exact hood hanging height should be verified with local authorities having jurisdiction.

Note: If there are wrappers (enclosure panels) with the order, measure down from the ceiling the height of the wrappers. That will be the top hanging height of the hood as long as the following criteria are met:

- The front lower edge of the hood is within 6'6" to 7'0" AFF,
- The front lower edge of the hood is within the clearance requirement from the cooking surfaces, and
- If the hanging height based on wrappers does not fall in this range, contact your local office.

Backshelf hoods are typically hung at the maximum height allowed from the cooking surfaces. See nameplate for clearance from cooking surface to front lower edge of hood. Exact hood hanging should be verified with local authorities having jurisdiction.

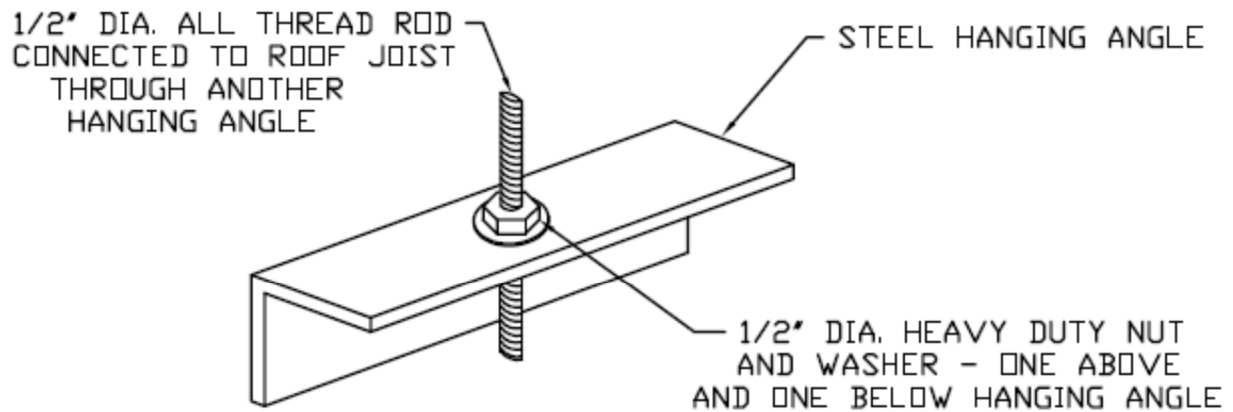
Note: If there are wrappers with the order, measure down from the ceiling the height of the wrappers. That will be the top hanging height of the hood as long as the front lower edge of the hood is within the clearance requirement from the cooking surfaces. If the hanging height based on wrappers does not fall in this range, contact your local office.

3. If the hood has a back return, install it now. See the *Installation of Hood Accessories* section.
4. If the hood has a bolt-together standoff, install it now. See the *Installation of Hood Accessories* section.
5. If the hood has duct thermostats, install them now per the thermostat installation drawing.
6. Position hood on the floor in its approximate final position with the supply and exhaust risers on the hood located directly beneath the corresponding openings in the roof, if possible. It is advisable to finalize the location using a plumb-bob or laser. **Protect the hood when it is on the jacks to avoid dents, scratches, and other damage to the hood.**
7. Proceed to weld exhaust duct to hood while on the floor, if possible.

8. Use 1/2" threaded rod to hang hoods. Drill 9/16" holes in the structural support system or use Unistrut® to line up with the welded-on angle mounting brackets on the hood. There are several types of mounting brackets depending upon the hood type; each, however, has a predrilled hole. See Figure 2 for details. **The structural integrity of the structural support system is the responsibility of the contractor and the structural engineer.** There are also center hanging angles on hoods 12 feet in length and longer. **Center hanging angles must be used to support the hood weight and prevent filter fit and grease drainage problems.** Some backshelf hoods do not have hanging angles and must be anchored to back wall using the standing flange provided. Structural lagbolts must be used every 12 inches on center maximum and must be secured to studs behind wall.
9. The spacing on the hole for the modified support should line up with the mounting bracket on top of the hood. The top hanger should be 1/2" closer to the back wall than the mounting bracket on the hood to pull the hood against the wall. **See Figure 3.** Some hoods are designed for island installations where a wall is not present.
10. With the hood well protected against possible scratching, raise the hood into position using high lifts or equipment jacks at each end to keep the hood level. When the hood is elevated to the proper height, install 1/2" threaded rod between each mounting bracket on the hood and the modified support. Secure rods with heavy duty nuts and appropriately sized fender washers above and below the hanging angle.
11. Make final adjustments as needed to ensure the hood is hung level. Maintain tension on all rods to ensure the hood weight is evenly distributed. If it is necessary to stand or work on top of the hood, use pieces of plywood to evenly distribute weight on the hood so no damage occurs.
12. Brace hood to ceiling joists and wall(s), as applicable, so that the hood does not move. Secure hood to wall in a manner acceptable to the authority having jurisdiction.
13. If the hood has Back and/or Side Perforated Supply Plenums (i.e. PSPs), install them now. See the *Installation of Hood Accessories* section.
14. If an AC-PSP is to be installed with the hood, install it now. See the *Installation of Hood Accessories* section.
15. Install the exhaust ductwork. The entire exhaust duct system must be continuously welded, liquid tight unless it is Listed Factory Built Grease Duct. The duct must be welded to the hood exhaust collar and the roof curb cap must be welded to the exhaust duct. See *Guidelines for Ductwork Installation - By Others*.
16. Install the supply ductwork. See *Guidelines for Ductwork Installation – By Others*.
17. If the hood is equipped with a control unit, an installation wiring diagram will be provided inside of the control unit. The jobsite electrician is responsible for making the appropriate field connections. This includes all lights and duct/hood mounted thermostats. **All field wiring on top of the hood must use high temp wire and wire nuts (black). Wiring must be routed through hard or flex conduit. Route and attach all conduit on top of, or above, structural joists (Hat Channel) on top of hood. Conduit cannot contact the surface of the hood ceiling.**
18. If the hood is equipped with a factory prepiped fire suppression system, a certified fire system installer is responsible for completing the field hookup, testing, and certifying the system in accordance with the manufacturer's specifications and the local fire codes. If the hood is not prepiped, a certified fire system installer is responsible for installing, testing and certifying the system in accordance with the manufacturer's specifications and the local fire codes.
19. If the hood is equipped with wrappers (enclosure panels), end panels, and/or backsplash panels, install them now. See the *Installation of Hood Accessories* section.
20. Caulk the lower edge of the hood where it meets the wall. This does not apply to hoods installed in island configurations.
21. Install light bulbs, light globes, and grease filters in the hood.
22. Install grease cups in the brackets/slots provided.
23. Use a stainless steel polish to clean the hood of dust or dirt acquired in transit.
24. It is recommended that the protective plastic sheeting remain on the installed hood until construction is complete, so as to avoid any damage to the equipment.

WARNING: NEVER PUNCTURE THE HOOD GREASE CONTAINMENT AREA TO HANG HOOD OR TO HANG ITEMS FROM HOOD. PUNCTURING THE GREASE CONTAINMENT AREA WILL VOID WARRANTY AND LISTING ON HOOD.

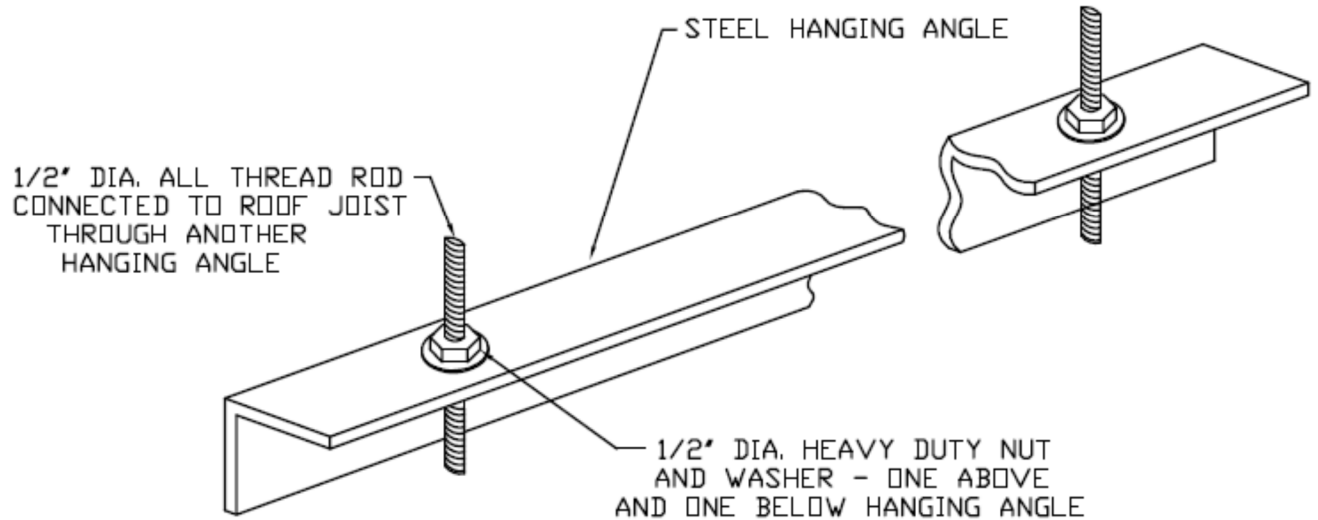
Basic Hanging Angle



ROD, NUTS, AND WASHERS TO BE SUPPLIED BY INSTALLING CONTRACTOR
HANGING ANGLE IS PRE-PUNCHED AT FACTORY

Figure 2A

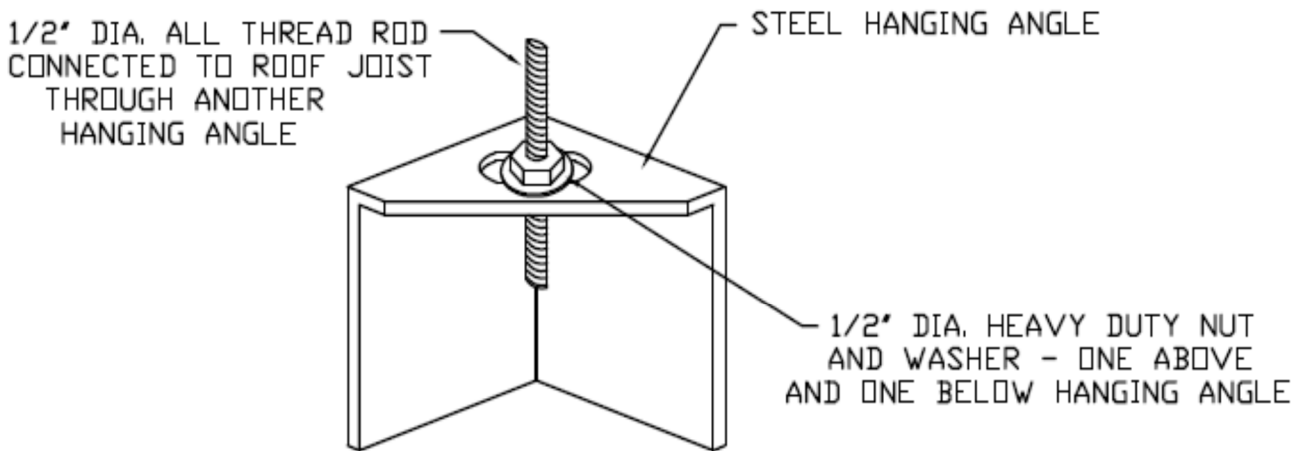
Full Length Hanging Angle



ROD, NUTS, AND WASHERS TO BE SUPPLIED BY INSTALLING CONTRACTOR
HANGING ANGLE IS PRE-PUNCHED AT EACH END AT FACTORY

Figure 2B

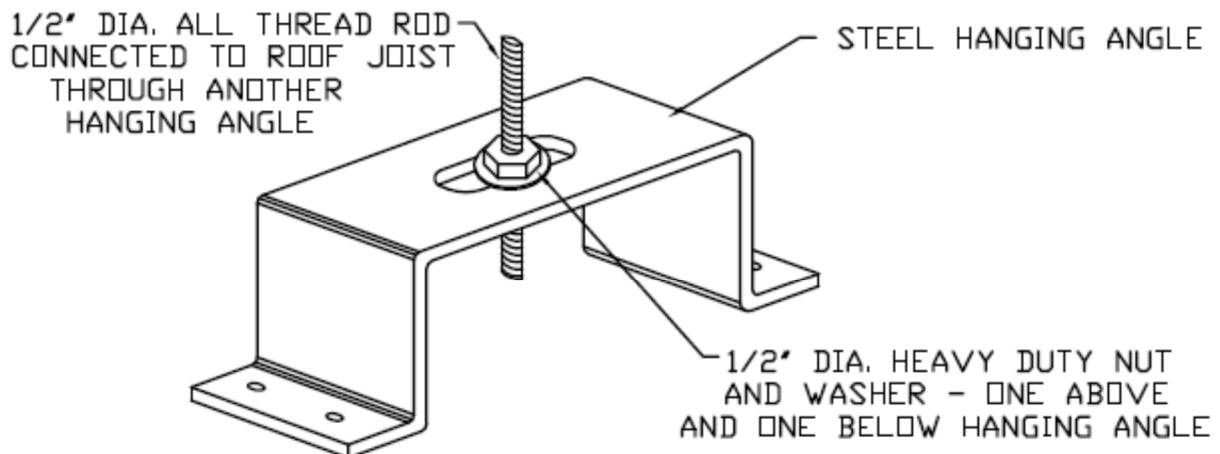
Corner Hanging Angle



ROD, NUTS, AND WASHERS TO BE SUPPLIED BY INSTALLING CONTRACTOR
HANGING ANGLE IS PRE-PUNCHED AT FACTORY

Figure 2C

PSP Hanging Angle



ROD, NUTS, AND WASHERS TO BE SUPPLIED BY INSTALLING CONTRACTOR
HANGING ANGLE IS PRE-PUNCHED AT FACTORY

Figure 2D

Side View of Typical Hood

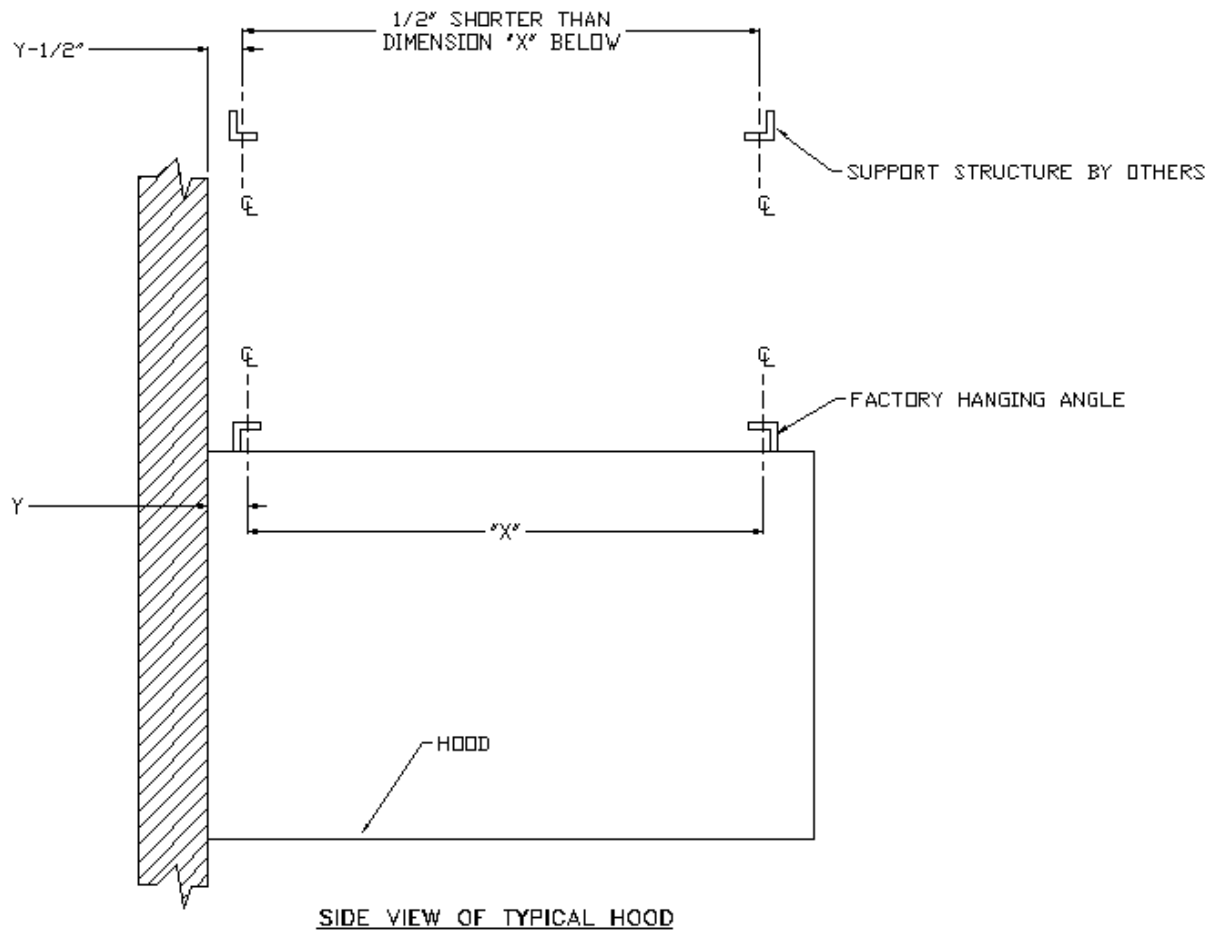


Figure 3

End-to-End Hoods

The following is a step-by-step procedure for installation of end-to-end ventilation hoods. **Refer to Figures 4 and 5.**

1. Follow steps 1 through 10 of the *Installation of a Single Hood* section for each hood.
2. Adjust tension on hanging rods to position hoods so they fit flush with each other as shown in **Figure 4.**
3. Bolt the top of the hoods together. **See Figure 5.**
4. Once all of the hoods are hung, follow steps 11 through 19 of the *Installation of a Single Hood* section.
5. NOTE: Hoods having more than a $1/8"$ gap between them must be repositioned so that gap between hoods is $\leq 1/8"$. Run a bead $\geq 1/8"$ of silicone sealant along the lower horizontal seam of the two hoods. Slip the U-channel trim, if applicable, over the seam as shown in **Figure 4.** Tape can be used to hold the U-channel in place until the silicone cures. **U-channel is not required on hoods with Flanged ends.**
6. Run a bead of the same silicone sealant along the front vertical seam between the two hoods. Slip the T-strip trim between the hoods if applicable. **See Figure 5. T Strip is not required on hoods with flanged ends and fully welded, ground, and polished corners.**
7. Proceed with steps 20 through 23 of the *Installation of a Single Hood* section.

Hanging Detail for Multiple Hood Models Hung End-to-End (Hemmed Ends)

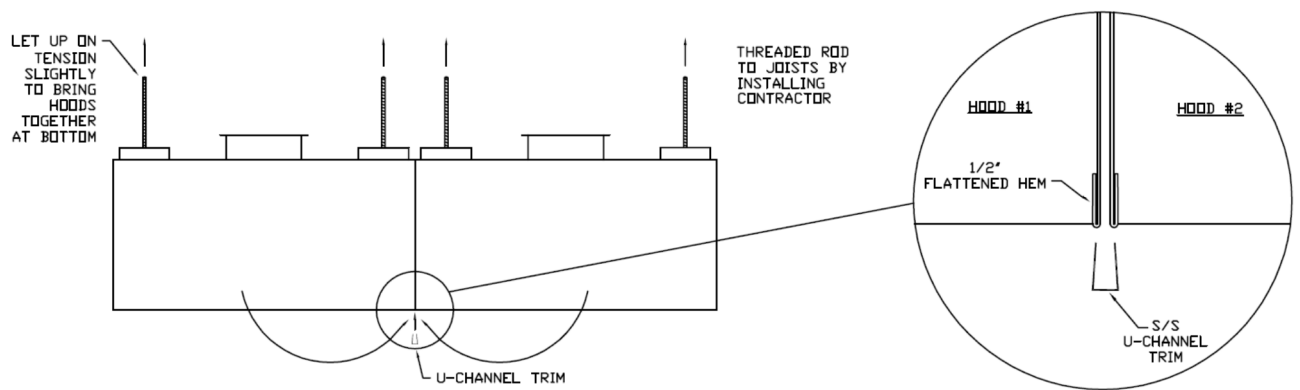


Figure 4A

Hanging Detail for Multiple Hood Models Hung End-to-End (Flanged Ends)

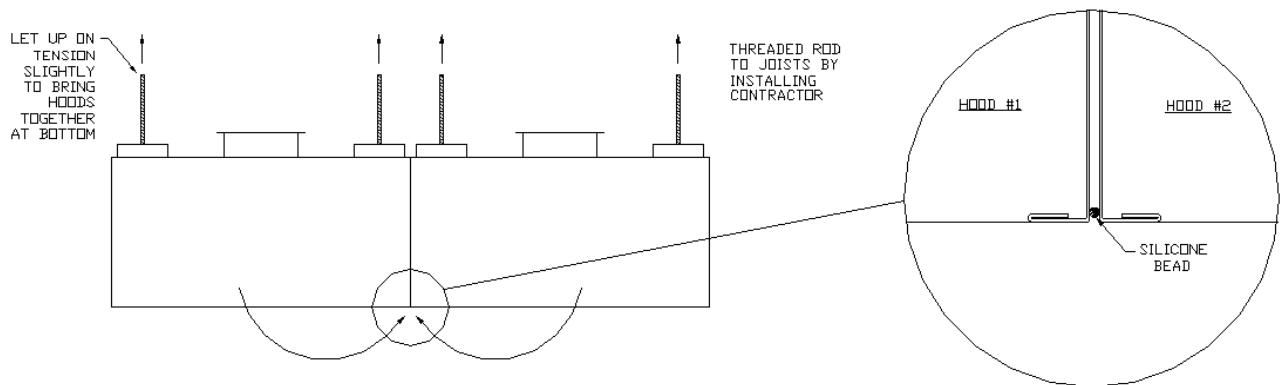


Figure 4B

Hood Connection Detail for Multiple Hood Models (Hemmed Ends with Trim Strip)

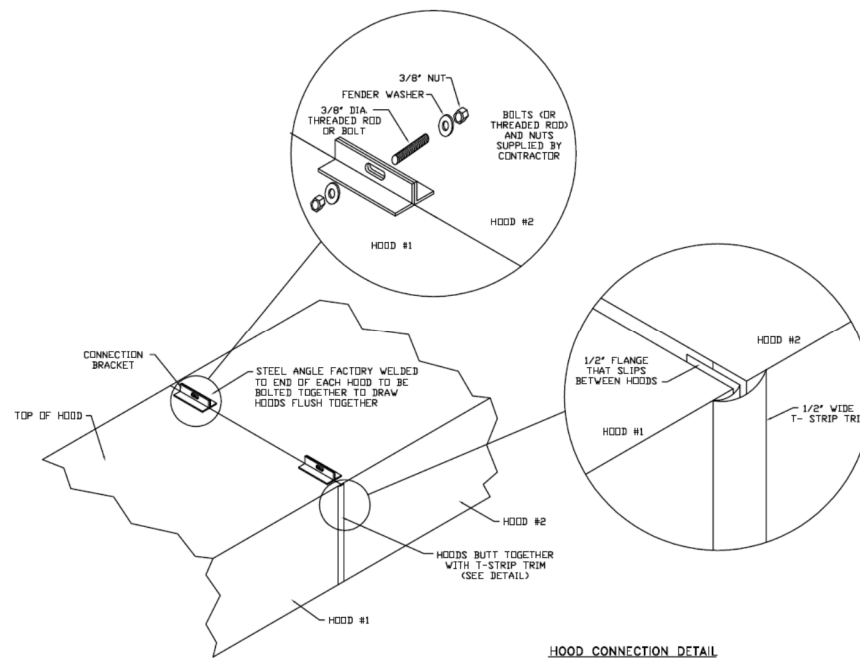


Figure 5A

Hood Connection Detail for Multiple Hood Models (Flanged Ends w/out Trim Strip)

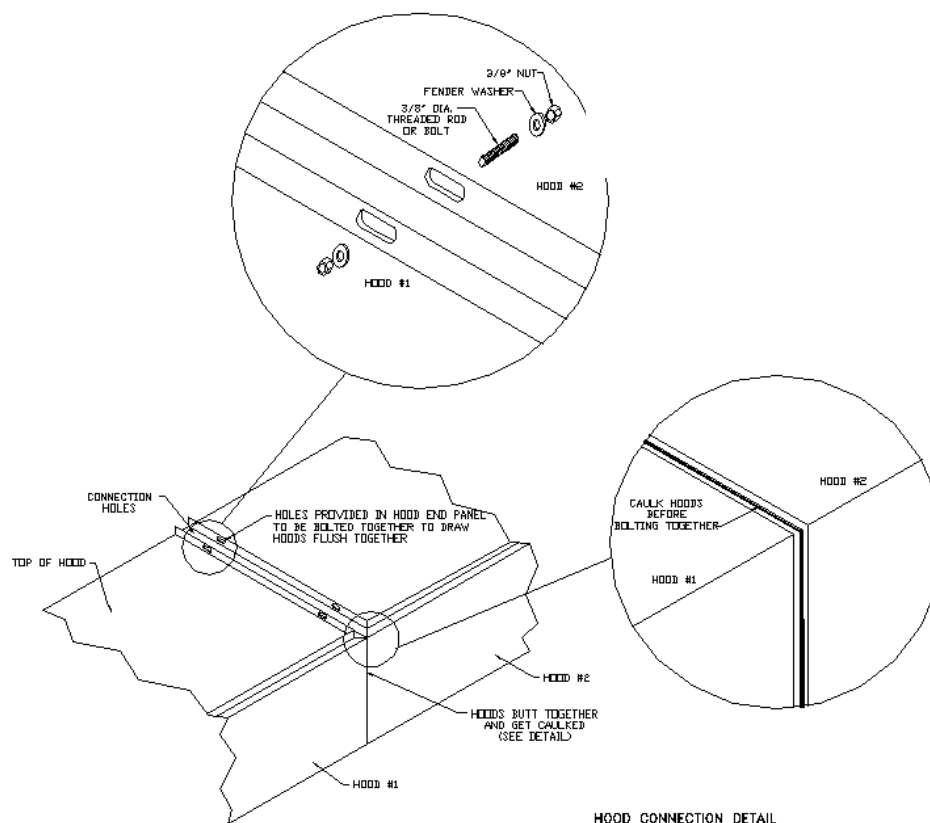


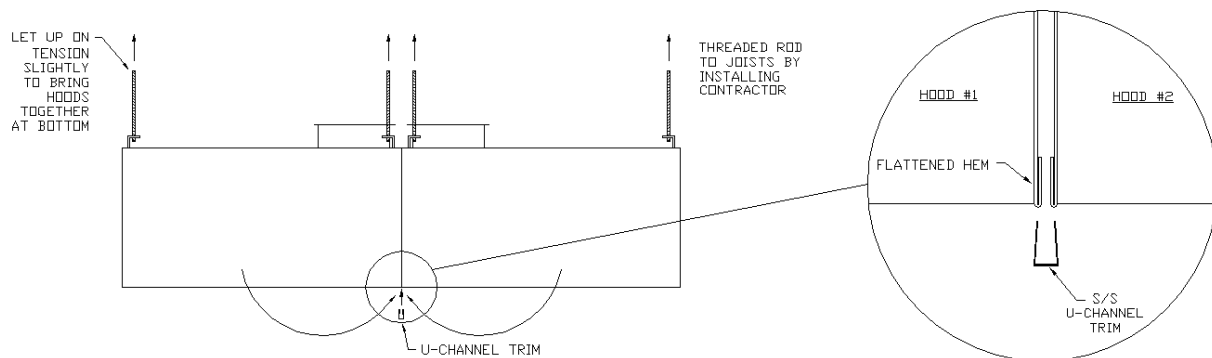
Figure 5B

Back-to-Back Hoods

The following is a step-by-step procedure for installation of back-to-back ventilation hoods. **Refer to Figures 5 and 6.**

1. Follow steps 1 through 10 of the *Installation of a Single Hood* section for each hood.
2. Adjust tension on hanging rods to position hoods so they fit flush with each other as shown in **Figure 6**.
3. Bolt the top of the hoods together by sliding a threaded rod through the connection bracket slots and fastening it into position by using heavy duty nuts and washers. **See Figure 5.**
4. Once all of the hoods are hung, follow steps 11 through 19 of the *Installation of a Single Hood* section.
5. Run a bead $\geq 1/8$ " of silicone sealant on the lower horizontal seam between the two hoods. Slip the U-channel over the seam as shown in **Figure 6**. Tape can be used to hold the U-channel in place until the silicone cures.
6. Run a bead of the same silicone sealant along the side vertical seam between the two hoods. Slip the T-strip trim between the hoods. **See Figure 5. T Strip is not required on hoods with flanged ends and fully welded, ground, and polished corners.**
7. Proceed with steps 20 through 23 of the *Installation of a Single Hood* section.

Hanging Detail for Hoods Hung Back-to-Back



HANGING DETAIL FOR HOODS HUNG BACK-TO-BACK

Figure 6

Guidelines for Ductwork Installation

Ductwork is furnished by supplier only if specified by the customer. The following information is provided as a guideline only. Ductwork should be installed in accordance with the local codes and restrictions. It is the responsibility of the installer to check local codes prior to installing the ductwork.

1. All ductwork must be installed in the most direct manner possible.
2. Exhaust duct must be made of 16 gauge carbon steel, 18 gauge stainless steel or must be listed for use with commercial kitchen hoods and follow the manufacturer's listing.
3. Per NFPA 96, all exhaust duct seams and joints must have a continuous liquid tight external weld; exception would be Listed Factory Built Grease Duct.
4. Exhaust risers on the hood have been sized to achieve a velocity of 500-2200 FPM, per NFPA 96, based upon the CFM required for the hood. Maintain the area of each riser when connecting duct offsets or transitions.
5. Branches should enter at gradual expansions and at a preferred angle of 30 degrees or 45 degrees if necessary.
6. When a "pantleg duct" is required to bring two ducts into one exhaust fan, observe the following in order to obtain desired performance:
 - a. Use ONLY radius back and radius throat elbows. 2 to 2.5 diameter center line radius is recommended.
 - b. Maintain the distance between the center lines of exhaust ducts at a maximum of 12' apart.
 - c. The main duct going to the exhaust fan must be the sum of the area of the separate legs.
7. Supply air risers are sized around a maximum of 600 FPM. Maintain this area when installing ducts.
8. Do not use "flexible" type duct for supply duct. Only rigid type duct installed in accordance with SMACNA Low Pressure requirements will be acceptable.
9. Access Doors should be provided at the sides or at the top of the duct, as well as changes of direction. Please refer to your AHJ if questions on requirements for horizontal and vertical duct run.
10. **IMPORTANT:** When a fusible link is installed in the make-up air damper at the hood collar, an access door must be cut into the supply duct by the installer.
11. Duct sensor may ship loose on hoods with field cut risers. When double wall duct or ductwork with a diameter smaller than 10" is used, loose duct sensors should be installed in the top of the plenum near the riser in the path of the exhaust airflow.

Installation of Hood Accessories

Back Return Installation

1. Locate the assembly and unpack the product from the crate, being very careful not to dent or scratch the outer surface. **NOTE: Report any damage to the delivering freight carrier and file a claim if appropriate.**
2. If the supply risers are to be field cut, cut the risers in as desired. **NOTE: For factory cut supply risers, the manufacturer installs a 2" vertical flange around the opening.** This flange is intended to slip inside a supply boot that is provided by the installer.
3. Locate the wall and ceiling joists which will support the assembly.
4. Use 1/2" threaded rod to hang the back return. Install the threaded rod and angle or Unistrut® that will be used to hang the assembly from the ceiling joists. Drill 9/16" holes as needed in the angle for the threaded rod. Be sure to line up with the welded-on angle mounting brackets on the back return.
5. The back return is typically hung so its top edge is the same height as the top edge of the hood. **See Figure 7.** Refer to Step 2 in the *Installation of a Single Hood* instructions to determine the hood and back return hanging heights.
6. Slowly raise the back return until hanging rods can be attached to the hanging angles. It is advisable to do this before the back return reaches its final height. **NOTE: Please use caution as weight is not proportionally dispersed.** Install the threaded rod into the back return hanging angles and use heavy duty nuts to secure the connection.
7. Make sure the back return is level. Secure to wall in a manner acceptable to the AHJ.
8. If there are multiple back return sections, install the remaining sections now. Use caulk and the T-strip trim between adjacent back return sections. **See Figure 8.**
9. Peel the protective plastic coating on the back return down below where the bottom edge of the hood will rest against it, so it does not remain behind the hood.
10. Caulk the seams between the wall and the back return assembly after the hood and all other accessories have been installed.

Section View of Typical Hood with Back Return

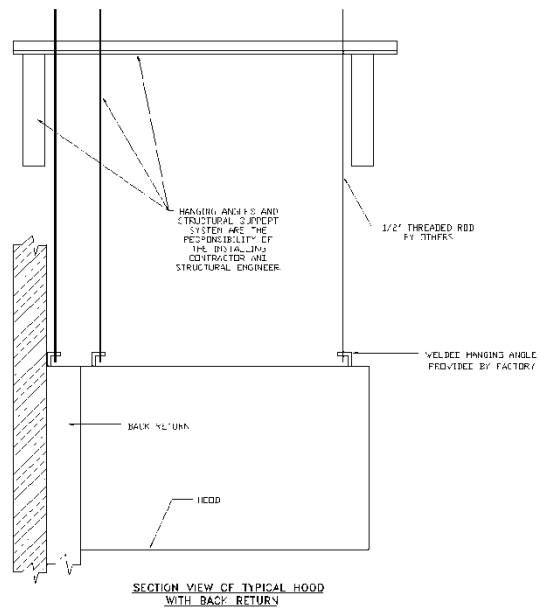


Figure 7

Back Return – Multiple Sections

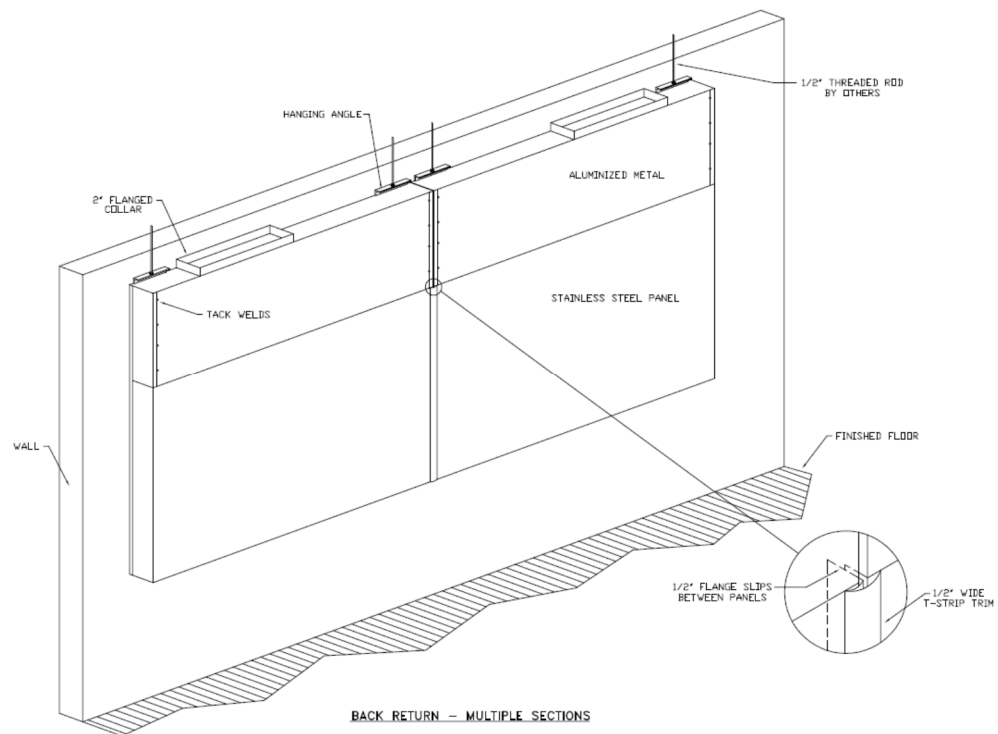
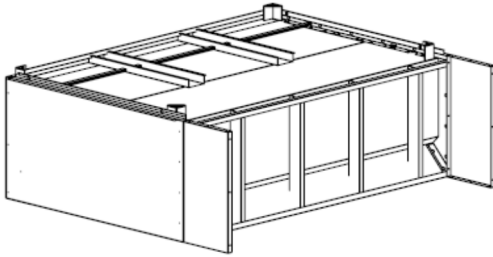


Figure 8

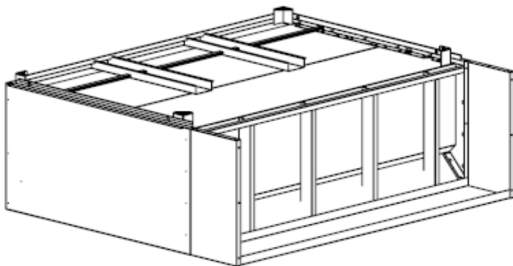
Bolt-Together Standoff Installation

1. Unpack the standoff panels from the shipping container, being very careful not to dent or scratch the panels. **NOTE: Report any damage to the delivering freight carrier and file a claim if appropriate.**
2. Mount the end caps for the back standoff to the hood securely with self-tapping sheet metal screws. Clamp the back standoff and the hood together before screwing so they do not shift. **See Figure 9.**
3. Place the back standoff filler piece into place flush with the rear bottom edge of the hood and secure with self-tapping sheet metal screws.
4. Continue with hood installation instructions.
5. After the hood installation is complete, secure the bolt-together standoff to the wall or other hoods as applicable in a manner acceptable to the authority having jurisdiction.

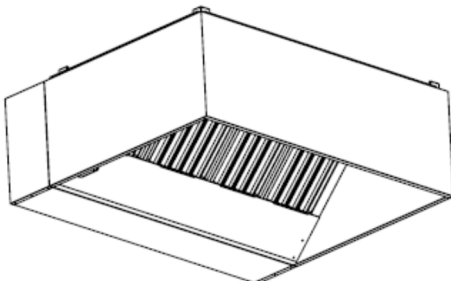
Bolt Together Standoff Installation



Mount the end caps for the back standoff to the hood using self-tapping sheet metal screws provided. Screw through the end cap flanges into the flanges on the hood.



Place the back standoff horizontal filler piece into place. Mount the filler piece using self-tapping sheet metal screws provided. Screw through the filler piece flanges into the studs on the back side of the hood. Do not penetrate into the capture area. Once complete, no screws should be visible from the outside of the hood.



Attach the back standoffs to the wall using screws appropriate for the wall. Screw through the flanges of the standoff into the wall. If standoff mounts against another hood, use the procedure from steps 1 and 2 for the second hood.

Figure 9

Back and Side PSP (Perforated Supply Plenum) Installation

1. Locate the assembly and unpack it from the crate, being very careful not to dent or scratch the outer surface. **NOTE: Report any damage to the delivering freight carrier and file a claim if appropriate.**
2. Upon completion of the hood install, install the back PSP first. Then if applicable, install the side PSPs.
3. If the supply risers are to be field cut, cut the risers in as desired.
4. Locate the ceiling joists which will support the assembly. If using Unistrut®, then securely attach to the ceiling joist.
5. Use 1/2" threaded rod to hang the PSP. Install the threaded rod and angle that will be used to hang the assembly from the ceiling joists. Drill 9/16" holes in the angle if not using Unistrut®. Be sure to line up with the angle mounting brackets on the PSP.
6. Peel the protective plastic coating on the hood down below where the bottom edge of the PSP will rest against the hood, so it does not remain behind the PSP.
7. Move the PSP into position as indicated by the project submittal drawings; lining up the top edge of the PSP with the top edge of the hood. Remove the protective coating from the back of the PSP. **See Figure 10.**
8. Install the threaded rod into the PSP hanging angles and use heavy duty nuts to secure the connection. Adjust tension on hanging rods to position PSP so it fits flush with the hood. **NOTE: Do not apply too much tension; otherwise, a gap between the PSP and Hood will be created at the bottom.**
9. Install additional PSPs, if applicable, in the same manner.
10. Where applicable, use sheet metal screws to secure the PSP attaching bracket on top of side PSPs to front PSP. **See Figure 11.**
11. Caulk the seams between the hood(s) and each PSP assembly, as well as between adjacent PSP assemblies (if applicable) after the hood(s) and hood accessories have been installed. An isometric view of the hood assembly for a model PSPFBSS is shown in **Figure 12.**

PSP Installation on Model PSPFBSS

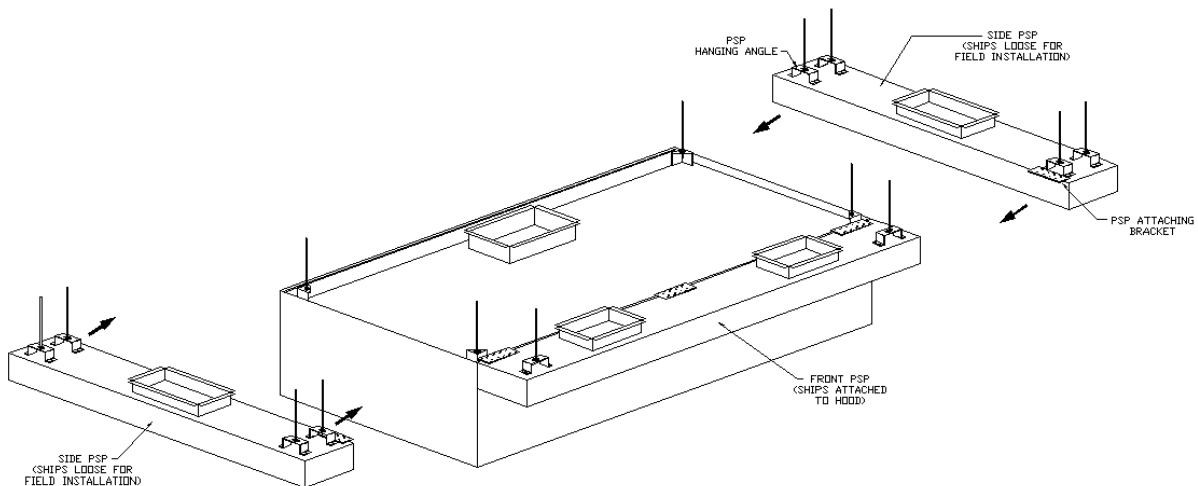


Figure 10

Attachment of Side PSP

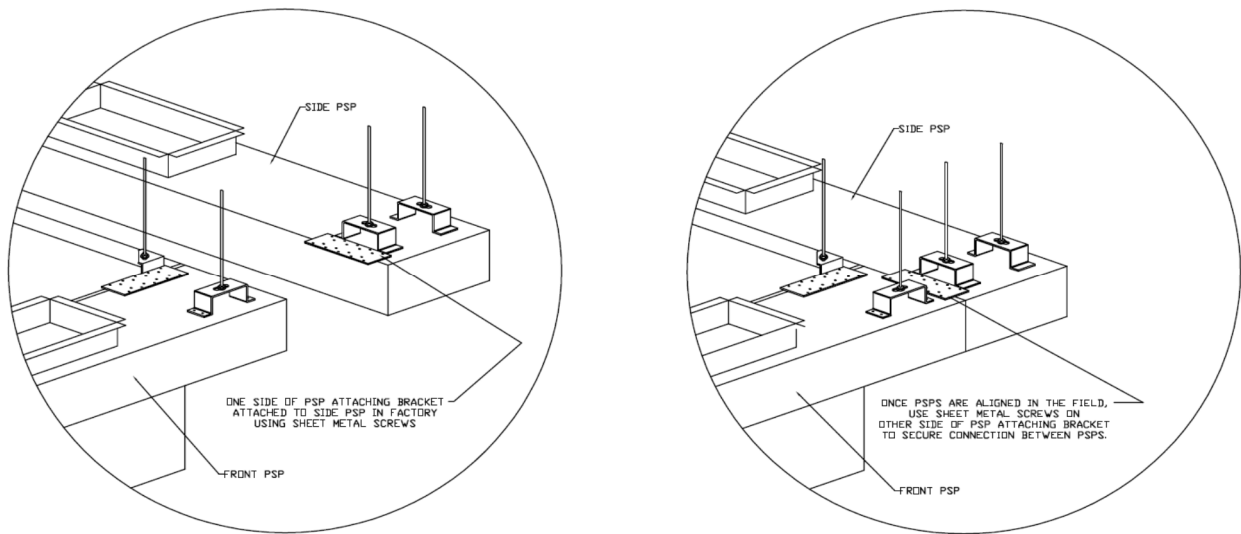


Figure 11

PSP with a FBSS Configuration

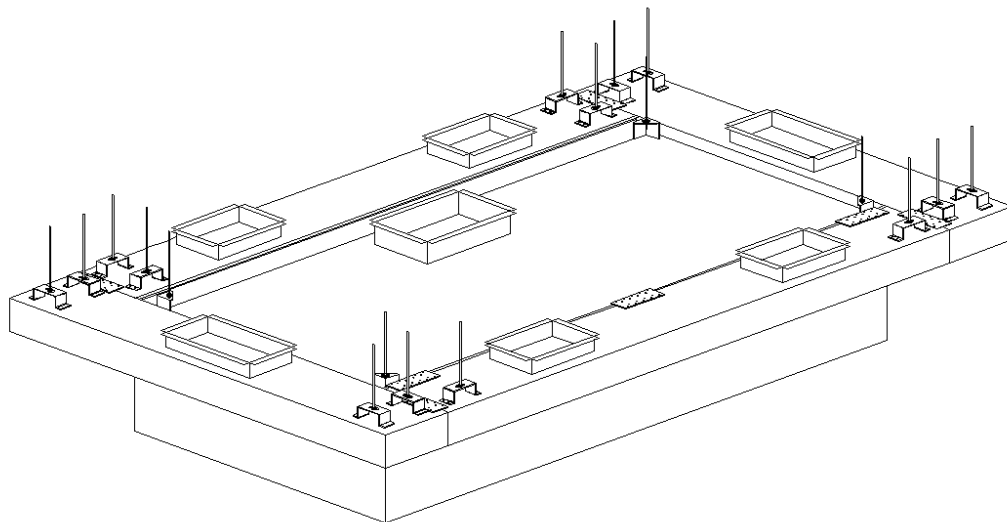


Figure 12

AC-PSP Installation

1. Locate the assembly and unpack it from the crate, being very careful not to dent or scratch the outer surface. **NOTE: Report any damage to the delivering freight carrier and file a claim if appropriate.**
2. If the supply risers are to be field cut, cut the risers in as desired.
3. Locate the ceiling joists which will support the assembly. If using Unistrut®, then securely attach to the ceiling joist.

4. Use 1/2" threaded rod to hang the AC-PSP. Install the threaded rod and angle that will be used to hang the assembly from the ceiling joists. Drill 9/16" holes as needed in the angle for the threaded rod. Be sure to line up with the welded-on angle mounting brackets on the AC-PSP.
5. Peel the protective plastic coating on the hood down below where the bottom edge of the AC-PSP will rest against the hood so it does not remain behind the AC-PSP.
6. Move the AC-PSP into position as indicated by the project submittal drawings; lining up the top edge of the AC-PSP with the top edge of the hood. Remove the protective plastic coating from the back of the AC-PSP. **See Figure 13a and 13b.**
7. Install the threaded rod into the AC-PSP hanging angles and use heavy-duty nuts to secure the connection. Adjust tension on hanging rods to position AC-PSP so it fits flush with the hood.
8. Caulk the seams between the hood(s) and the AC-PSP assembly, as well as between adjacent AC-PSP assemblies (if applicable) after the hood(s) and hood accessories have been installed.

AC-PSP Installation

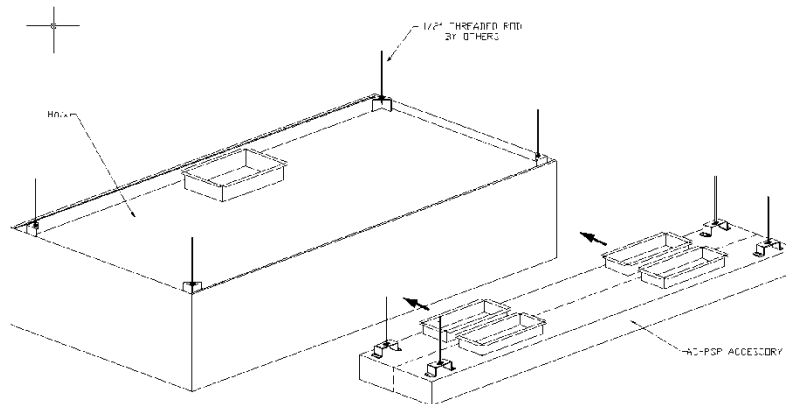


Figure 13A

AC-PSP Installation

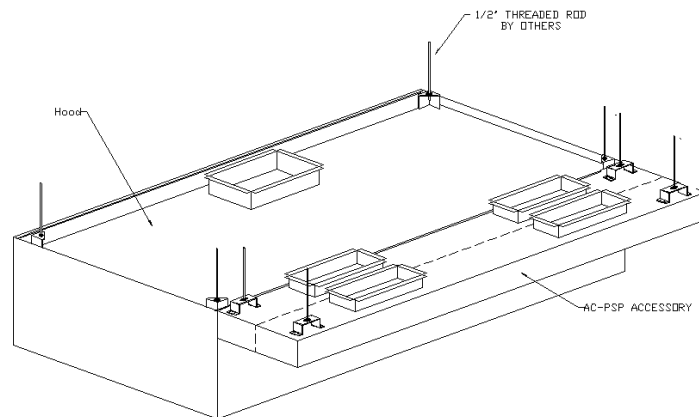


Figure 13B

Wrapper (Enclosure Panel) Installation

1. Unpack the wrapper panels from the shipping container, being very careful not to dent or scratch the panels. **NOTE: Report any damage to the delivering freight carrier and file a claim if appropriate.**
2. Locate one of the side wrapper panels and position it on the hood so that the 1/2" flange on the bottom of the panel slips underneath the side channel on top of the hood. **See Figure 14A: Wrapper Detail.** **NOTE:** A notch will have to be cut on the wrapper flange using shears (tin snips) where interference occurs, where applicable. **See Figure 14B: Top Hood Seam Detail.**
3. Press fit panel into place until wrapper face is flush with hood face. Screw or pop-rivet wrapper to the side channel and wall. **See Figure 14C: Wrapper Detail and Rear Wall Attachment.**
4. Locate front wrapper panel. Position its lower 1/2" flange under front channel on hood and slide panel into position, so that the end of front panel is behind the 90 degree bend of the side panel. **See Figure 14D: Front Corner Assembly.** Once in place, press fit the lower flange of the front panel into the front channel in order to have wrapper face flush with the front of the hood. Screw or pop-rivet bottom of front panel to the front channel.
5. Drill appropriate holes and rivet front to side wrapper panel. **See Figure 14D: Front Corner Assembly.**
6. If multiple panels are used, a stainless trim piece will be provided to attach multiple panels together (i.e. hood is side to side, hood is back to back to another, or the wrapper length exceeds 16 feet). Attach the panels by slipping them behind the stainless trim and fastening with screws or rivets. **See Figure 15.** **NOTE:** Trim will have to be cut to fit. In most instances, trim should extend from bottom of hood to top of wrapper panel.
7. Locate the other side panel. Repeat steps 2 and 3. Attach to front wrapper panel as instructed in step 4. **NOTE:** In most instances where hood is located against a side wall, fasten the front wrapper panel to the wall. **See Figure 14E: Side Wall Attachment.**
8. Caulk all gaps and seams after the hood(s) and hood accessories have been installed.

Wrapper Detail

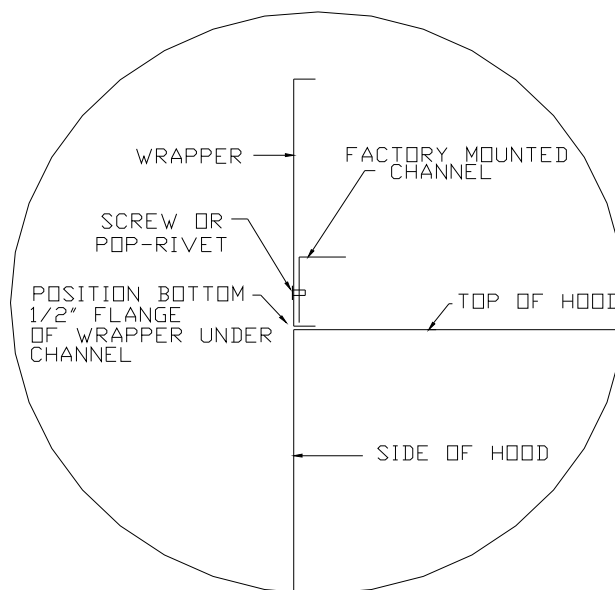


Figure 14A

Top Hood Seam Detail (Not on all models)

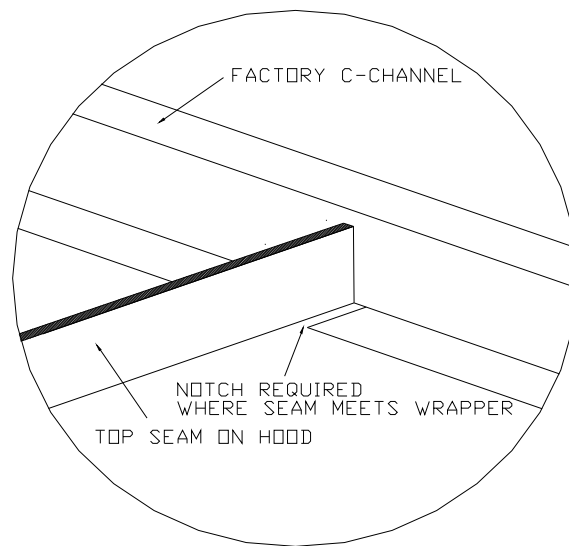


Figure 14B

Rear Wall Attachment

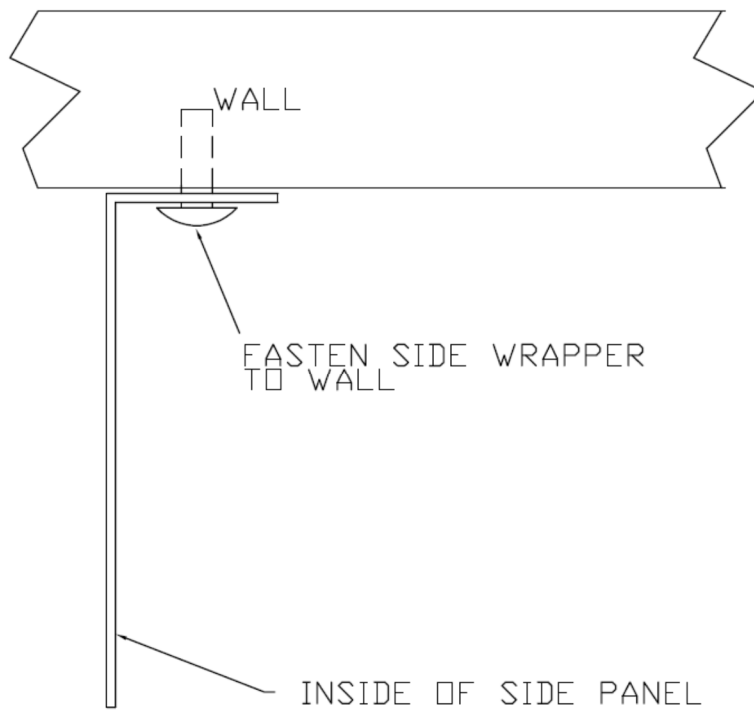


Figure 14C

Front Corner Assembly

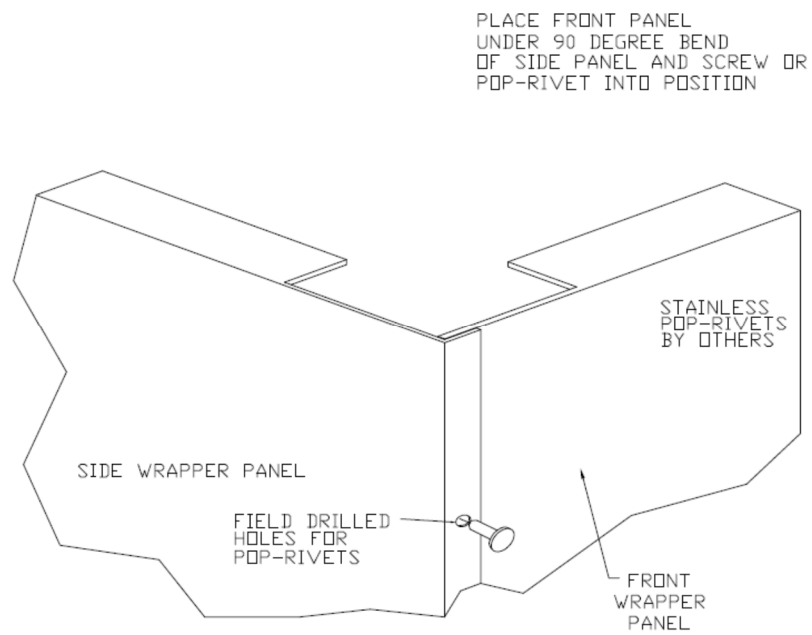


Figure 14D

Side Wall Attachment

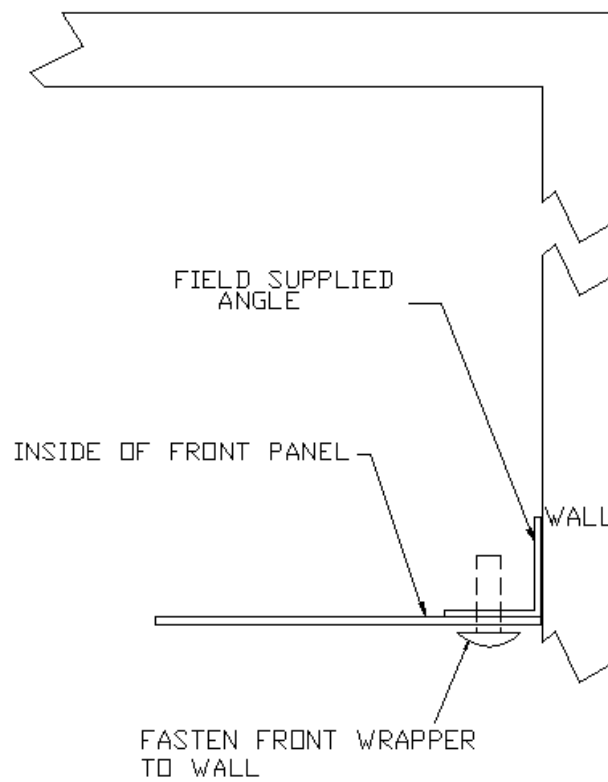
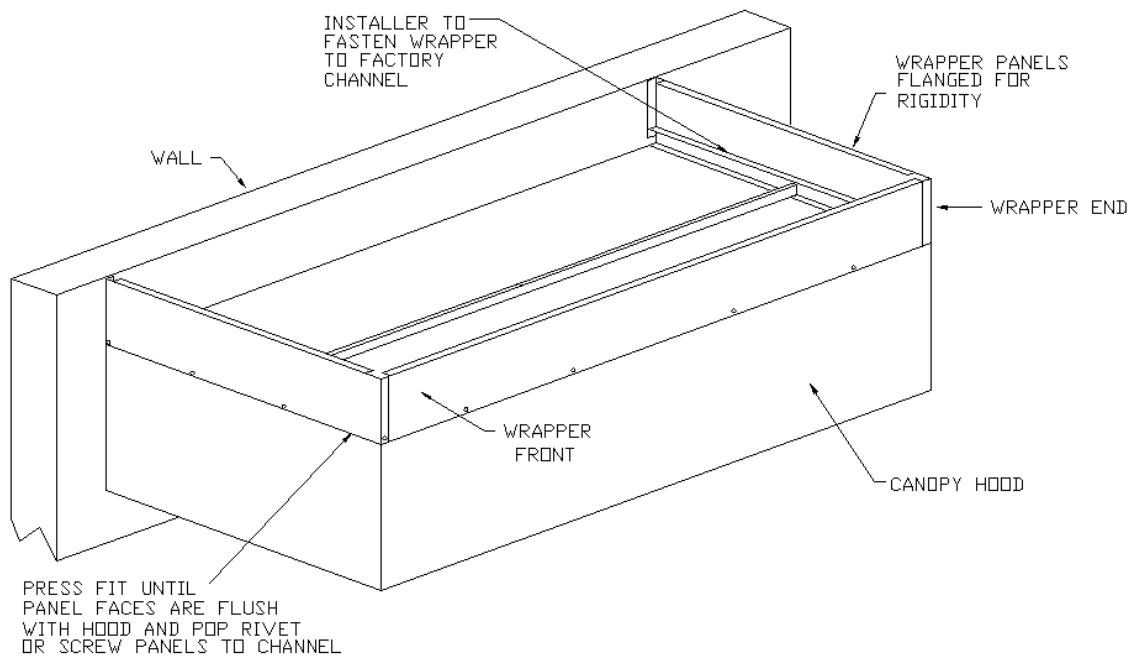


Figure 14E

Completed Wrapper Assembly



Completed Wrapper Assembly on End-to-End Hoods

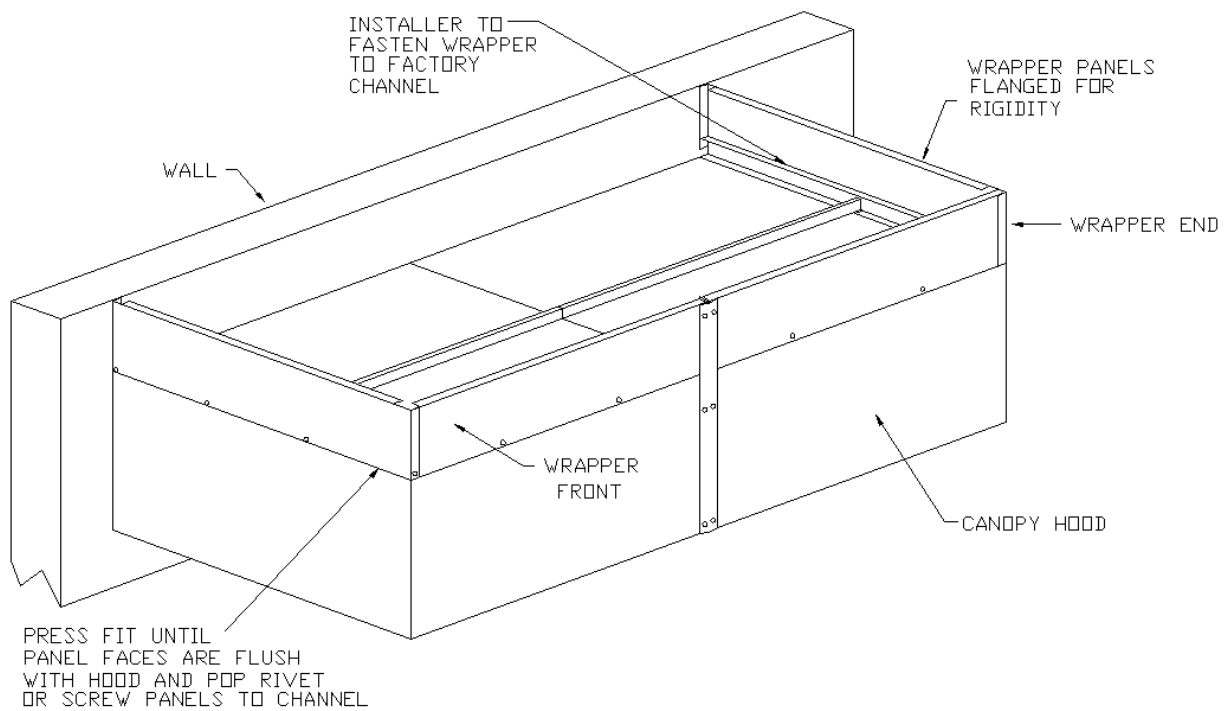


Figure 15

End-panel Installation

1. Unpack the end-panel(s) from the shipping container, being very careful not to dent or scratch the panels. **NOTE: Report any damage to the delivering freight carrier and file a claim if appropriate.**
2. Refer to the project submittal drawings to determine mounting location.
3. Position the end panel with the kinked top located flush against the inside of the hood end and the rear flange located flush against the rear wall and facing toward the interior of the hood. **Refer to Figure 16.**
4. Attach the top edge of the end-panel to the end of the hood using the acorn nuts provided. Hand tighten each acorn nut, then use a wrench to add an additional 1/4 turn – **do not over tighten.**
5. Secure the rear flange to the wall using stainless steel sheet metal screws, being sure to keep the end panel straight vertically.
6. Caulk all seams between the end-panel and the hood after the hood(s) and hood accessories have been installed.

End panel Installation (Hoods with Hems on Ends)

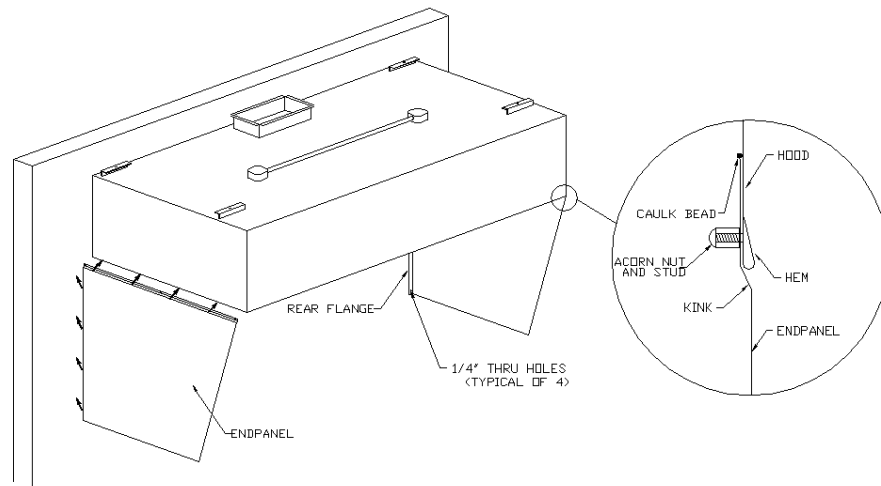


Figure 16A

End panel Installation (Hoods with Flanges on Ends)

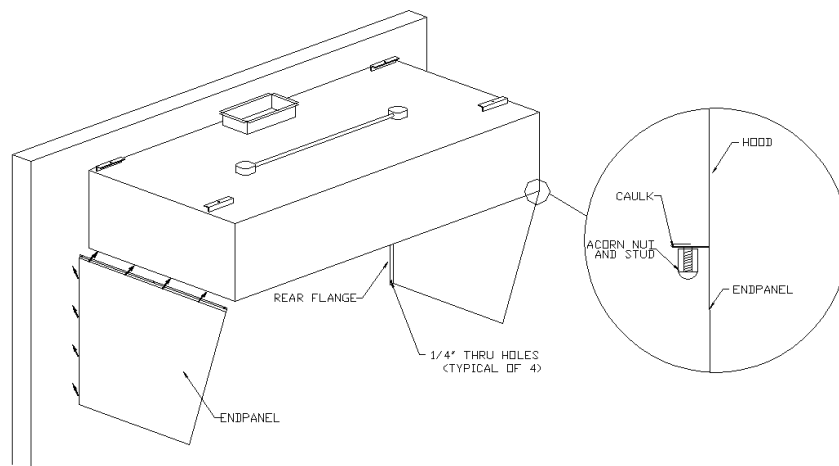


Figure 16B

Quarter End panel Installation

1. Refer to Figure 17.
2. Follow steps 1 through 6 of the end panel Installation instructions.

Quarter End panel Installation (Hoods with Hems on Ends)

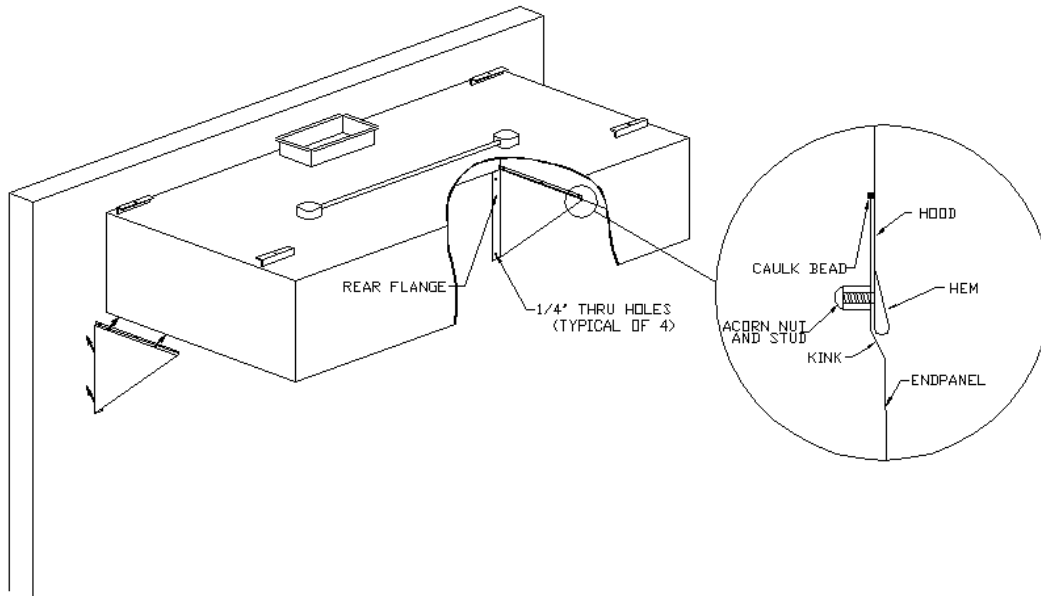


Figure 17A

Quarter End panel Installation (Hoods with Flanges on Ends)

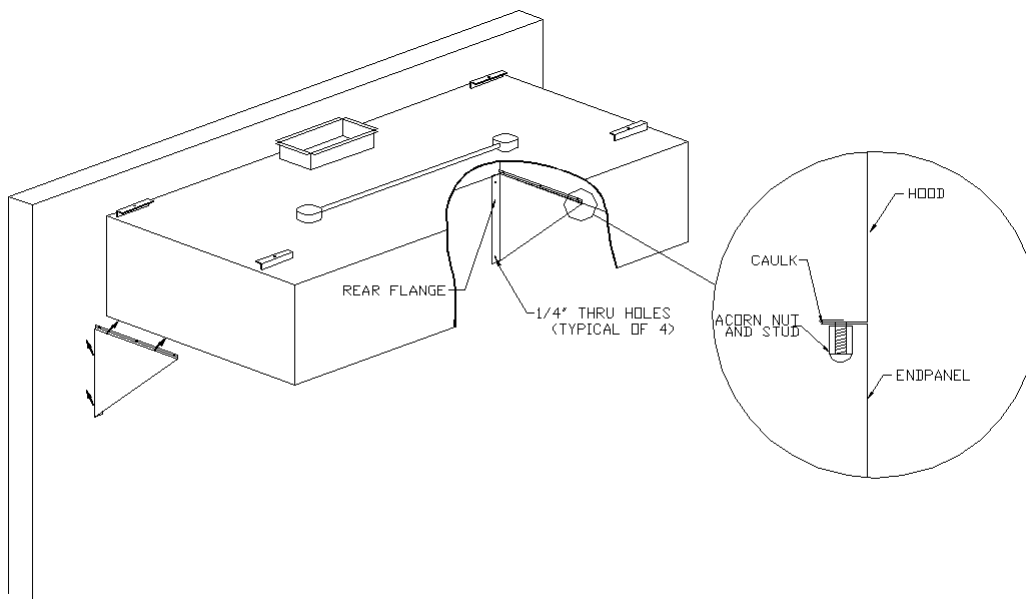


Figure 17B

Insulated End panel Installation

1. Refer to Figure 18 & 19.
2. Follow steps 1 through 6 of the end-panel Installation instructions.

Insulated End panel Installation (Hoods with Hems on Ends)

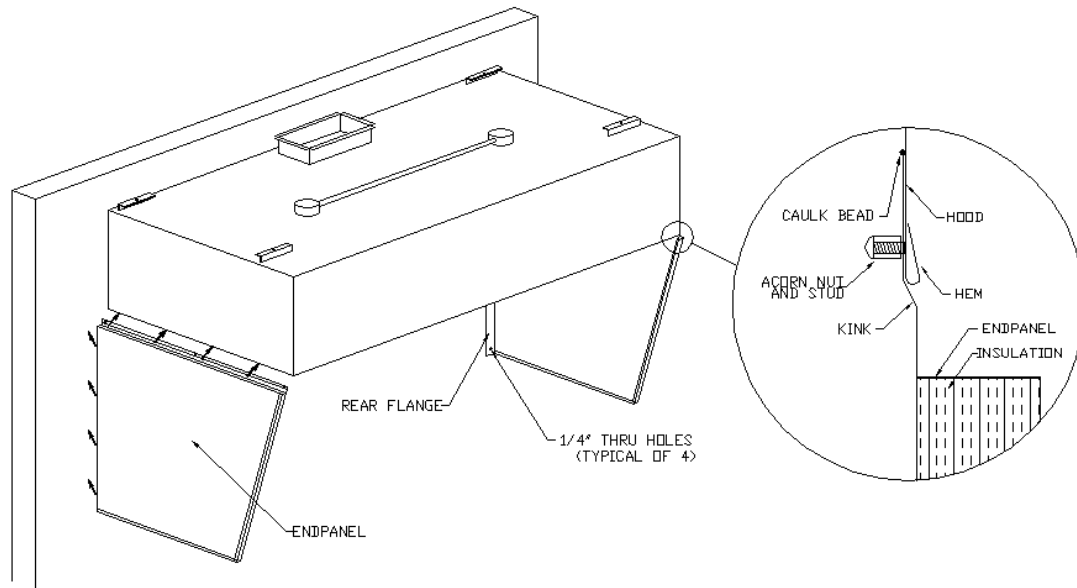


Figure 18

Insulated End panel Installation (Hoods with Flanges on Ends)

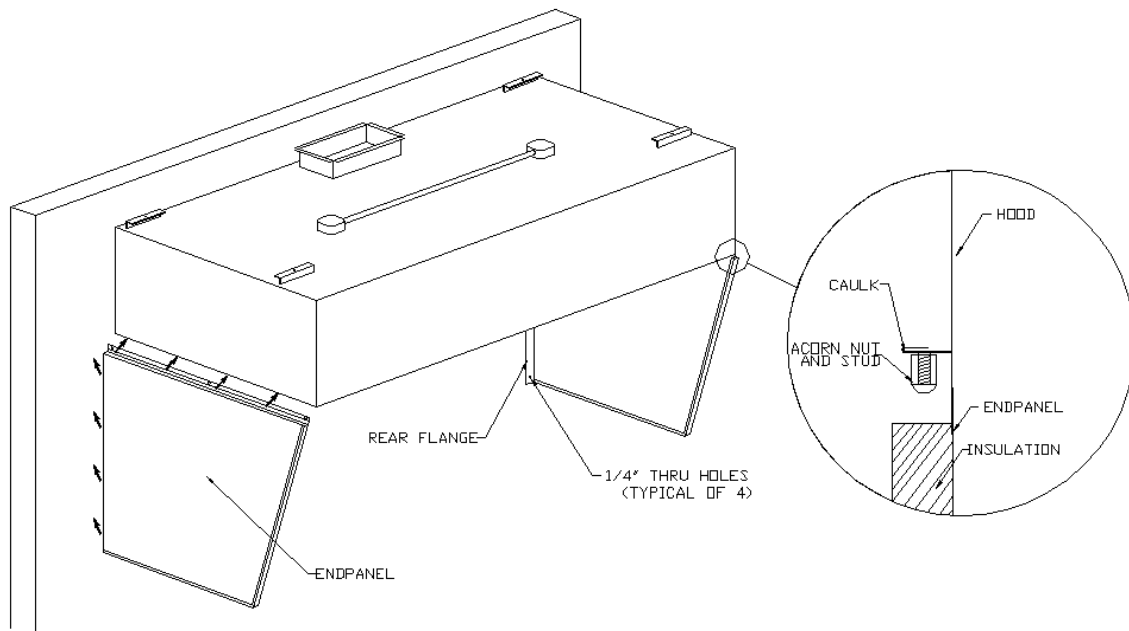


Figure 19

Vertical End panel Installation

1. Refer to Figure 20.
2. Follow steps 1 & 2 of the end-panel Installation instructions.
3. Position the end panel with the top located flush against the bottom of the hood end and the rear flange located flush against the rear wall and facing toward the interior of the hood. Studs on bottom of hood ends should align with slots on top of vertical end panel. Refer to Figure 20.
4. Adjust legs to create slight tension between the vertical end panel and bottom of hood. Confirm that the top side of the vertical end panel is flush with the bottom of the hood.
5. Secure the rear flange to the wall using stainless steel sheet metal screws, being sure to keep the end panel straight vertically.
6. Caulk all seams between the vertical end panel and the hood after the hood(s) and hood accessories have been installed.

Vertical End panel Installation (Hoods with Flanges on Ends)

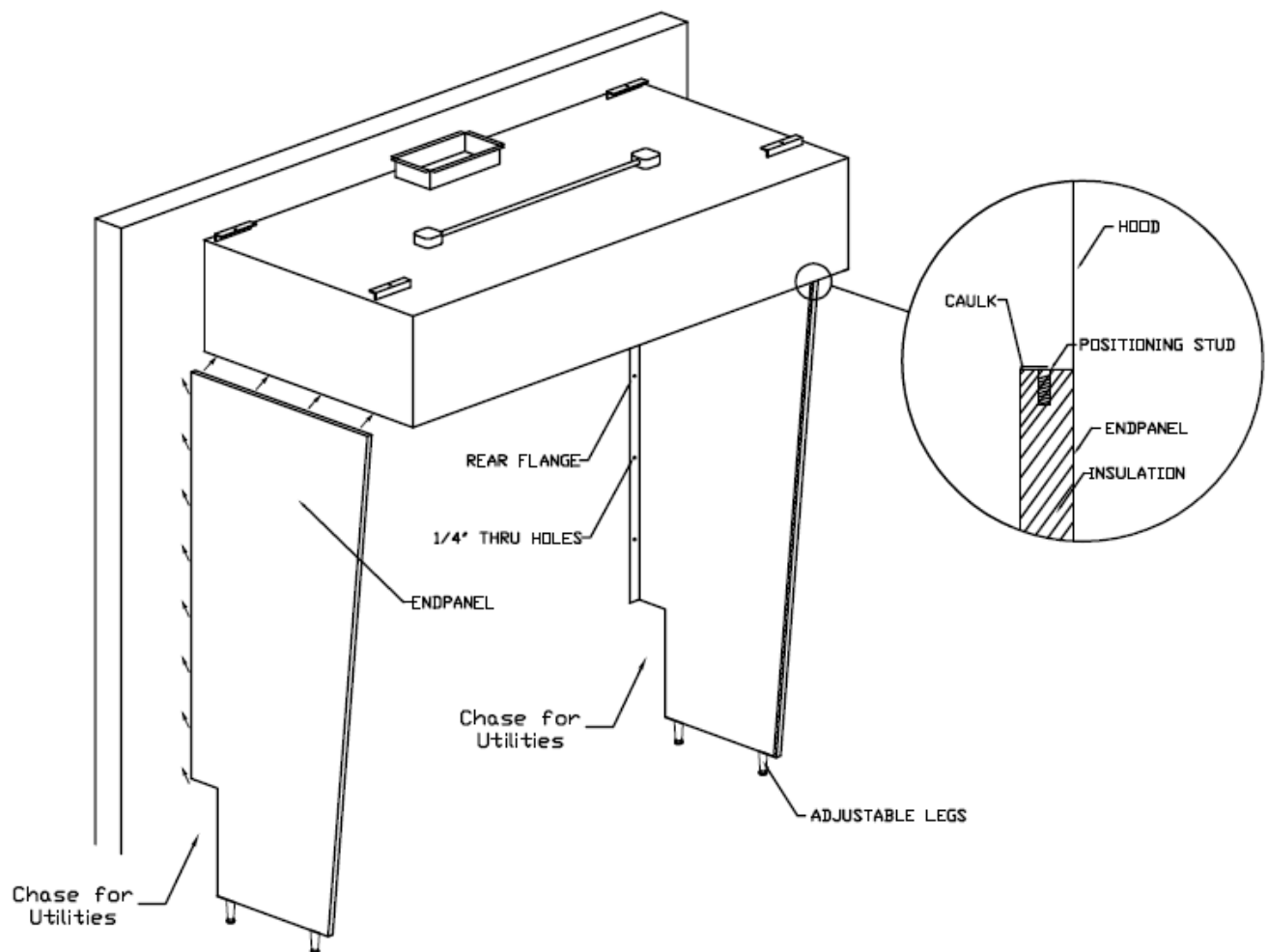


Figure 20

Backsplash Installation

1. Unpack the backsplash panels from the shipping container, being very careful not to dent or scratch the outer surface. **NOTE: Report any damage to the delivering freight carrier and file a claim if appropriate.**
2. Refer to the project submittal drawings to determine mounting orientation (vertical or horizontal) and mounting location. If panels intended for the same wall are of different widths, position them in a symmetrical arrangement.
3. Determine whether or not cutouts are required to accommodate electrical outlets, pipes, etc. and make appropriate cutouts being careful not to crease the backsplash panels.
4. Secure panels and trim pieces to the wall using construction adhesive. **See Figure 21.**

Standard Backsplash

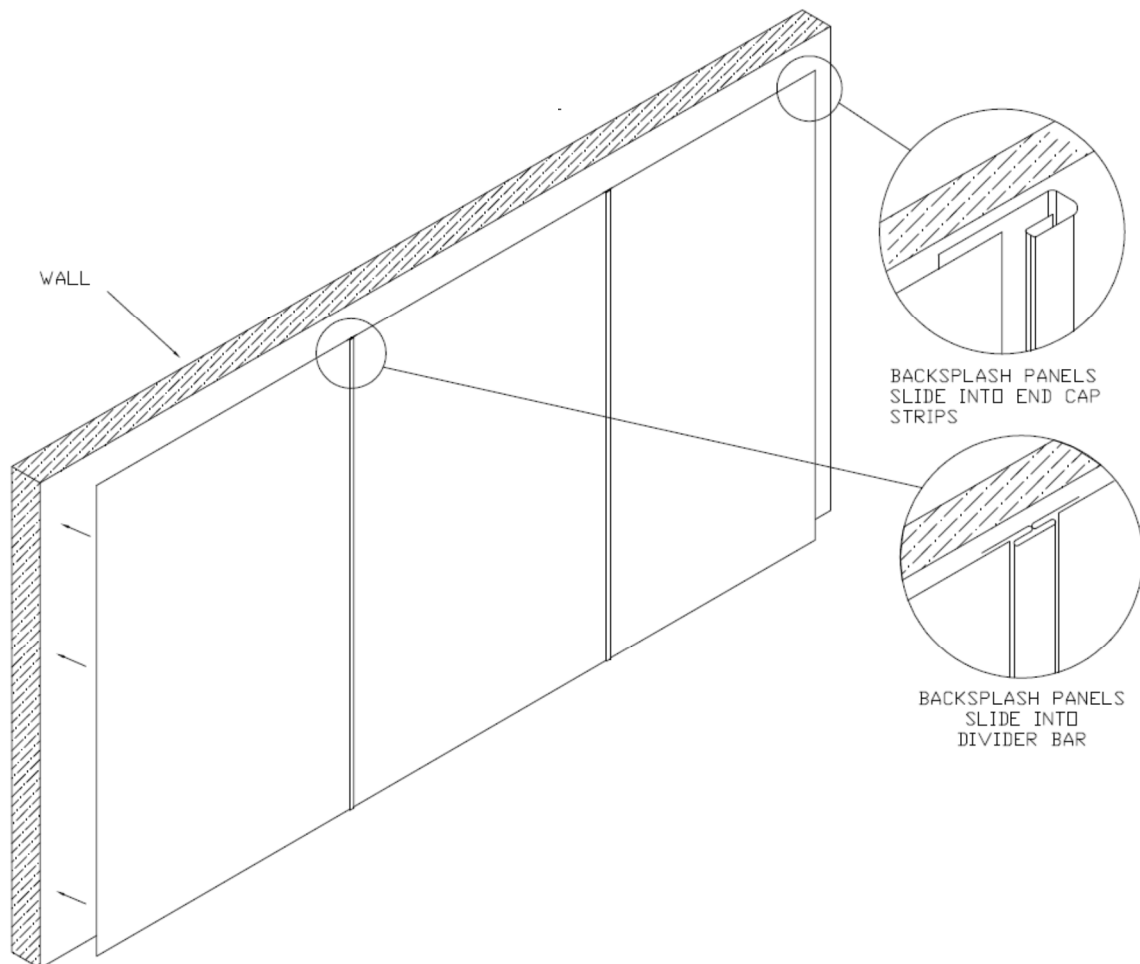


Figure 21

Insulated Backsplash Installation

1. Follow steps 1 through 3 of the Backsplash Installation instructions.
2. Slide the top flange behind the lower rear edge of the hood. Secure the bottom flange to the wall using stainless steel sheet metal screws. **See Figure 20.**
3. If there are multiple insulated backsplash sections, install the others now.
4. Caulk the seams between the wall and the insulated backsplash panel after the hood(s) and hood accessories have been installed.

Insulated Backsplash

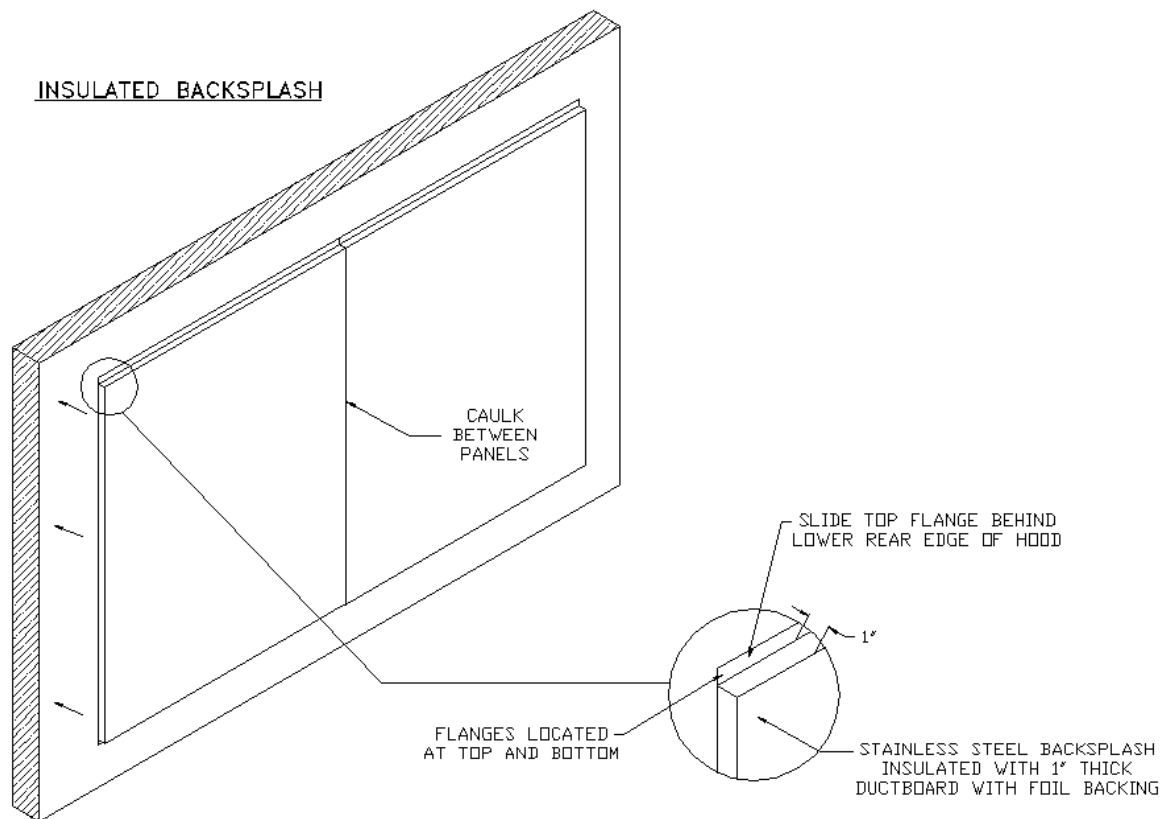


Figure 22

Pizza Oven Top Mount Flange Installation

1. Thoroughly inspect hood for damage including Pizza Oven Top Mount Flanges.
2. Carefully unpack hood, remove shipping screws from rear flange before moving hood.
3. Use supplied 3M 2000+ fire barrier sealant to apply a double bead to the underside of the flanges.
4. Centrally position the hood on top of the oven over the opening. The front edge of the side flanges should be flush with the front face of the oven.
5. Use supplied self-drilling screws to fasten hood to oven. Every mounting holes needs to be used.

ND-2 (BACK) PIZZA OVEN TOP MOUNT FLANGES

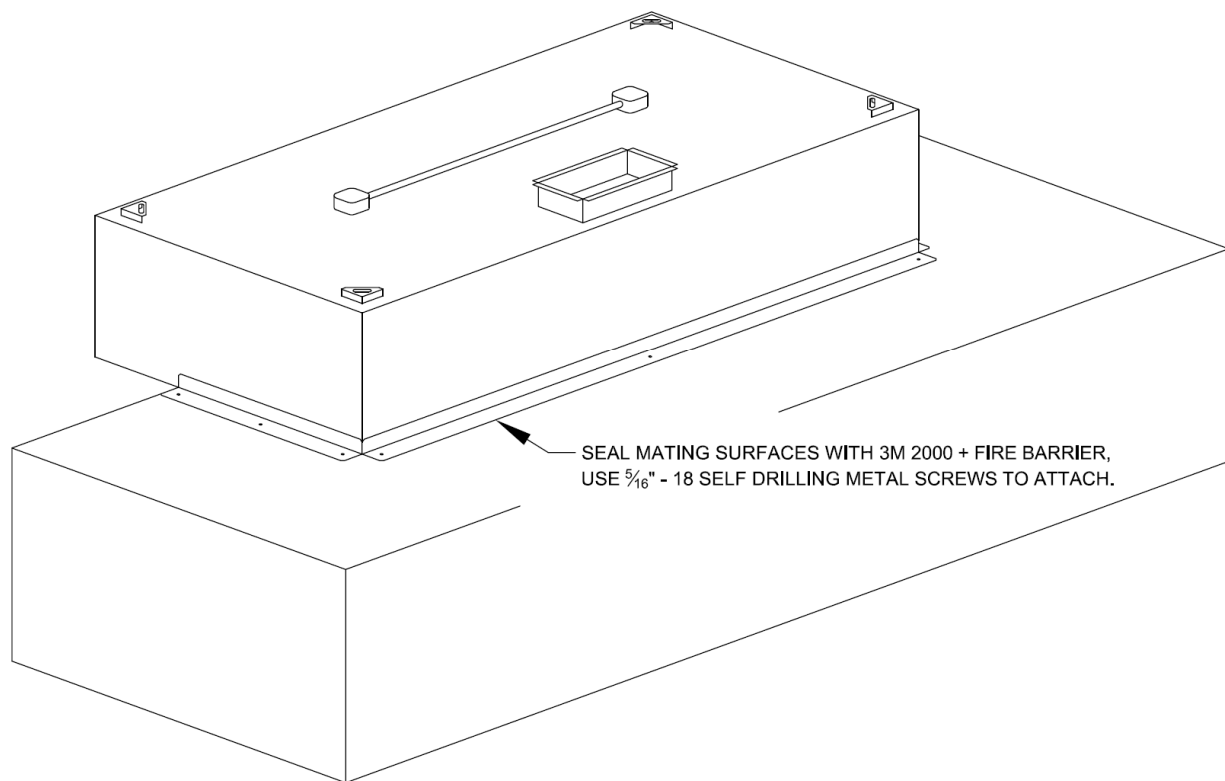


Figure 23

OPERATION

Commercial kitchen ventilation hoods are intended to be used in conjunction with ductwork and fans, which have been properly sized and properly installed in accordance with manufacturer's specifications and local code requirements.

Before turning on cooking equipment, make sure that the make-up air and exhaust fans are on. Leave fans on for at least 30 minutes after cooking equipment is shut off.

Clean hood as needed to comply with local code requirements and as directed in the Maintenance section of this manual.

Performance Evaluation

A performance evaluation of the system can be performed only after all of the following items have been verified:

1. All fans are operational and rotations visually verified by observation of the arrows stamped on them.
2. All filters are in place.
3. Equipment under the hood is in place and operational.
4. HVAC units are in place and operational with blowers operating correctly.

Guidelines before Beginning

The testing and balancing of a system is necessary to ensure proper and efficient operation of the system as it was designed. In any building where effluent and hot air is removed, the mass of air must be replaced to maintain a constant pressure in the space. Any change in the pressure differential between inside and outside air will in some way affect the operation of a system; most commonly that affect is a negative one.

A test and balance, as well as the simple performance test in International Mechanical Code Section 507.16.1 should be included in all jobs; code inspectors are increasingly enforcing these requirements. Requirements in the 2006 IMC, which is currently effective in most parts of the United States, are as follows:

“507.16 Performance test. A performance test shall be conducted upon completion and before final approval of the installation of a ventilation system serving commercial cooking appliances. The test shall verify the rate of exhaust airflow required by Section 507.13, makeup airflow required by Section 508, and proper operation as specified in this chapter. The permit holder shall furnish the necessary test equipment and devices required to perform the tests.

507.16.1 Capture and containment test. The permit holder shall verify capture and containment performance of the exhaust system. This field test shall be conducted with all appliances under the hood at operating temperatures, with all sources of outdoor air providing makeup air for the hood operating and with all sources of recirculated air providing conditioning for the space in which the hood is operating. Capture and containment shall be verified visually by observing smoke or steam produced by actual or simulated cooking, such as with smoke candles, smoke puffers, etc.”

The simplest means of doing the performance test is using a T-T puffer from www.evhill.com. Activate the puffer and use it to trace effluent around the entire perimeter of the hood, emitting smoke every few inches under the lower edges of the hood.

External Factors which may affect Hood Performance

1. HVAC units are generally specified to supply 25% outside air (OA) to the room ventilation. If RTU's are not supplying the proper amount of OA to the building, then negative pressure will exist.
2. HVAC return grilles located close to a hood can cause performance problems. The return grille competes with the hood to capture air in the room. For example, a return grille for a 10-ton HVAC unit can draw anywhere from 3000 to 4000 CFM. This is equivalent to the exhaust of a 10' to 13' canopy hood. As a result, a return air grille located within six feet (6') of the hood can have a serious effect on the capture ability of the hood.
3. HVAC diffusers located near a hood can create flows in the room that detract from the capture ability of the hood. If the HVAC diffuser bounces air off the front of the hood or directs air along the hood and past the end, the air flow created can draw smoke and contaminants out of the hood.

Using a Shortridge Instrument

The Shortridge is a sophisticated instrument that, with its built-in features, is basically a self contained test and balance kit. It has a “velocity grid” for filter face readings, a “velocity probe” for ductwork readings, a “differential pressure” function to check room pressure and static pressure, as well as a “temperature probe” so it can calculate accurate values based on varying temperature (most equipment assumes standard temperature and pressure), and many other useful features.

Hood Information

To calculate the CFM, the following information must first be acquired:

1. Hood size and length
2. Filter size and length
3. PSP width and length

Measuring Hood Static and Room Pressure

Static Pressure:

1. Measure hood static pressure at exhaust collar using the Shortridge instrument.

Static Pressure = _____

Room Pressure:

For an exhaust hood to work properly, the kitchen should be at a slight negative pressure to the dining area (caused by its air removal) and the building overall slightly positive. The dining room should be a slight positive to the outdoors and the kitchen +0.02” w.c. or about 300 CFM positive. This will keep dust and bugs outside and doors will be easy to open. The kitchen should be a slight negative to the dining room to keep the odors in the kitchen. The kitchen should be balanced to slightly negative, 0” to -0.02” w.c., to the dining room. Generally, if there is not enough negative, or if there is positive pressure there will be smoke roll out from the hood that occurs due to the wind currents from people moving around in the area, while if there is too much negative, there becomes a pressure problem on the building(opening doors, drafts, hot water heaters, etc.)

1. Measure room static pressure using the Shortridge instrument. Adjust the supply fan to set room to 0.02” negative to dining area.

Room Pressure = _____

Calculating Make-up Air CFM with a Shortridge Instrument and Spreadsheet

1. Use the Velgrid mode of the Shortridge instrument to measure supply air velocity. Make sure to take measurements every twelve (12) inches along the length of the PSP.
2. Locate the appropriate Excel spreadsheet for the PSP/Supply velocity and record all necessary data. This spreadsheet will calculate the total supply CFM for the hood.
3. The spreadsheet is located on the manufacturer’s website.

Calculating Make-up Air CFM without a Shortridge Instrument

1. Compute the open area of the supply plenum of the hood. This area must be calculated at the same plane that velocity readings are taken. Area can be calculated using the following formula:

$$\text{Area (ft}^2\text{)} = \text{Length (ft)} \times \text{Width (ft)}$$

If both the length and width are measured in inches, use the following formula:

$$\text{Area (ft}^2\text{)} = \text{Length (in)} \times \text{Width (in)} / 144$$

2. Record velocity of air through supply openings from left to right on raw data sheet.
3. Compute and record average velocity through supply openings.
4. Compute and record CFM through supply openings.

$$\text{CFM} = \text{Free area} \times \text{Average Velocity}$$

5. Compute total CFM through all supply openings for each hood.

Calculating Exhaust Air CFM with a Shortridge Instrument and Spreadsheet

1. Use the Velgrid mode of the Shortridge instrument to measure the velocity at each filter.
2. Locate the appropriate Excel spreadsheet for the exhaust velocity and record all necessary data. This spreadsheet will calculate the total exhaust CFM for the hood.

Calculating Exhaust CFM without a Shortridge Instrument

1. Record filter sizes of each hood on raw data sheet.
2. Compute free area of the filters.

Examples:

$$16'' \times 16'' = 14 \times 14 = 1.36 \text{ ft}^2$$

$$10'' \times 20'' = 8 \times 18 = 1.00 \text{ ft}^2$$

$$12'' \times 16'' = 10 \times 14 = 0.97 \text{ ft}^2$$

3. Record velocity of exhaust gases through filters starting top left to right (5 reading/filter).
4. Find average velocity through each filter.
5. Compute CFM through each filter.

$$\text{CFM} = \text{Free area} \times \text{Average Velocity}$$

6. Total the exhaust CFM for each hood.
7. Multiply total exhaust CFM x 0.78 (this is the K factor necessary when using the EDRA velometer).

Adjustments

1. A hood with multiple risers should be balanced according to the cooking load beneath it. For example, if a hood with multiple risers has a charbroiler in the center and several ovens on the ends, the risers should be evenly balanced. This will achieve the most efficient contaminant capture.
2. Perforated supply plenums discharging air around the hood should be set to the designed discharge velocity.
3. When fan pulleys are adjusted, belts should then be re-checked for correct tension and an amperage reading should be taken on the motor to make certain it is not overloaded.
4. The prime objective of balancing is to ensure that each hood will capture all the contaminants produced by the equipment it covers without causing undesirable conditions in the kitchen (i.e. excessive negative pressure, excessive quantities of hot or cold air in the kitchen, etc.)

If problems occur, then refer to the Troubleshooting Section of this manual.

Conclusion

1. Compare specified data to the data recorded. Adjust exhaust as necessary using adjustable pulley on fan. Adjust supply as necessary using dampers on supply risers and adjustable pulley on supply fan.
2. After setting hoods to specified data, the room parameters should be checked.
3. If room parameters are not acceptable yet, the hood can be modified to improve them without decreasing hood performance. This is an acceptable condition.
4. Use a smoke bomb to verify that the hood captures adequately. This can be your final verification.

Complete Equipment List for Performance Evaluations

- Closed End Wrenches (9/16, 1/2, 7/16, 3/8, 5/16, 1/4)
- Socket Set & Ratchet (9/16, 1/2, 7/16, 3/8, 5/16, 1/4)
- Extension for Ratchet
- Cheater Bar
- Screwdrivers (Phillips & Standard, Short & Long)
- Adjustable Wrenches (Large & Small)
- 5/32" 9" Long Allen Wrench
- Multi-key Hex Set (Standard Assortment)
- Tape Measure, Hammers (Hard & Soft)
- 2-Channel Locks
- Vise-Grip Pliers (Medium Size)
- Shortridge Air Multimeter
- Velometer or similar unit, Edra 5LV or Davis LCA6000 recommended
- Manometer or similar unit, Dwyer Magnehelic Model #2000-00 recommended
- Work Gloves
- 6' Step Ladder
- 20' Extension Ladder
- Tachometer (Mechanical)
- Amprobe (Volt & Amp Meter)

Troubleshooting

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

Troubleshooting Chart

Problem	Potential Cause	Corrective Action
Smoke is not being captured/Low Exhaust	Filters are clogged	Clean filters (See Pg. 39 of manual)
	Extreme negative pressure in space	Increase MUA Quantity to balance building
	Exhaust Fan operating in incorrect direction	Check motor wiring to wiring diagram located on fan motor
	Hood overhang on appliance is not correct	Hood should overhang cooking appliances adequately
	Exhaust airflow too low	Increase exhaust fan RPM/HP
	Exhaust Duct Static Pressure higher than design	Increase exhaust fan RPM/HP or have ductwork re-worked
No Exhaust	Exhaust Fan not running	Turn fan disconnect on
		Check fan belts
		Check circuit breaker/voltage
	Exhaust Fan running backwards	Wheel should turn per rotation arrow on fan
		3 Phase Motor direction may be reversed by switching any 2 leads
		1 Phase Motors must be wired per their label
No Make-Up Air	Make-Up Air Fan not running	Make sure electrical package is controlling the correct fan
		Turn Fan disconnect on
		Check fan belts
	Make-Up Air Damper closed	Check circuit breaker/voltage
		Ensure blades open on damper
		Wheel should turn per rotation arrow on fan
	Make-Up Air Fan running backwards	3 Phase Motor direction may be reversed by switching any 2 leads
		1 Phase Motors must be wired per their label
		Eliminate flexible ductwork and remove number of elbows in duct.
Exhaust/Make-Up Air Motor cycles on and off	Make-Up Air Duct Static Pressure higher than design	Clean filters (See Pg. 39 of manual)
		Microswitch on Fire System is keeping make-up air from operating and fire system must be armed
	Clogged Make-Up Air Filters	Make sure motor amperage is below FLA of motor label
	Fire System activated or not armed	Ensure motor wiring is adequately sized
		Increase exhaust airflow or use higher temperature rated motor
Grease does not drain	Grease trough full	Clean grease trough behind hood filters
Grease dripping from hood	Hood not being cleaned often enough	Clean surface of hood more frequently
	Exhaust rate too low	Speed up exhaust fan
Hood is vibrating	Vibrating Exhaust or MUA Fan	Find source of vibration in fans and correct (Often times a rag or other debris will be in exhaust fan wheel)
Light Globes are full of fluid	Duct Leak above hood	Check ductwork or fan to roof connection for leaks and seal where necessary

MAINTENANCE

To guarantee trouble free operation of this hood, the manufacturer suggests following these guidelines. Most problems associated with hoods are directly related to poor service and maintenance such as not replacing or cleaning filters.

Please record any maintenance or service performed on this fan in the documentation section located at the end of this manual.

General Maintenance

1. Proper operation of the hood depends on how well the hood is maintained. All surfaces should be kept free of grease build-up for sanitation reasons and to reduce the risk of fire.
2. Grease filters must always be installed and clean to reduce build-up of grease in the exhaust duct and to allow for proper exhaust airflow (Recommended cleaning options on Pg. 39 of manual).
3. Maintain all belts, motors, and electrical connections on fans attached to the hood. Ensure MUA filters are kept clean and there are no leaks in MUA ductwork.

Daily Maintenance

1. Remove the grease baffle filters and clean in a dishwasher or soak sink daily (Recommended cleaning options on Pg. 39 of manual).
2. Empty and clean grease drain and grease collection cups.
3. Carefully wipe away gritty substances clinging to stainless steel surfaces to avoid scratching.
4. Dilute ½ cup of laundry detergent (e.g. Tide) with one (1) gallon of warm water.
5. Soak a clean cloth in the water detergent solution and wring out the excess water.
6. Wipe the hood surfaces moving in the direction of the grain and periodically rinsing cloth in detergent solution.
7. Using a different clean cloth soaked in clean warm water, wipe the hood surfaces to remove all traces of the detergent solution.
8. Wipe hood surfaces dry with a clean, dry cloth. Clean the hood temperature sensor in riser if equipped with one.
9. Reapply stainless steel polish.

CAUTION

DO NOT use iron wool (Brillo or SOS pads), scrapers, or spatulas to clean hood!

DO NOT use the following substances on or around the hood:

1. Chlorine or chlorine based substances.
2. Acids (e.g. acetic, hydrochloric, sulfuric).
3. Chloride based substances (e.g. mercuric chloride, ferric chloride).

Vapors of the above substances can corrode stainless steel!

Quarterly Maintenance

1. Inspect the unit and duct for grease or air leaks and repair leaks where required.
2. Clean ductwork attached to hood to prevent a mass accumulation of grease.

Recommended Cleaning Agents

Cleaning Method/Agent Type	Supplier	Product
Dishwasher Detergent	Ecolab	Solid Powder/Plus
	Johnson Diversey	Suma DiverPak/Plus
Soak Method – Pot and Pan Detergent	Ecolab	Powder Detergent
Soak Method – Commercial Degreaser	Ecolab	DeCarbonizer MPX
	Johnson Diversey	Soak Tank Solution
	Zep	ZEP FS Pot Scrub
Heavy Duty Commercial Degreaser	Ecolab	Grease Cutter Plus
	Johnson Diversey	Suma Star
	Zep	ZEP FS C.I.P. Cleaner

Recommended Commercial Soak Tanks

Description	Supplier	Product	Contact
Heated Soak Tank	Hyginix	FOG Tank® [Use only Tiger Carbon Powder Remover®]	www.fogtank.com (858) 566-6212 info@fogtank.com Use Discount Code "CAPFOG10" To Receive a 10% discount

Start-Up and Maintenance Documentation

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

Job Information

Job Name	
Address	
City	
State	
Zip	
Phone Number	
Fax Number	
Contact	
Purchase Date	

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

Hood Information

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

Name Plate and Unit Information	
Model Number	
Job Number	

Maintenance Record

Date	Service Performed

Date	Service Performed

Factory Service Department

Phone: 1-866-784-6900
Fax: 1-919-554-9374

Electrical Controls Installation, Operation, and Maintenance Manual



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 control panel 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.

SAFETY INFORMATION

General

This control panel utilizes a mixture of traditional controls along with a “smart” digital circuit board controller, referred to as the ECPM03 control board. It is intended to be installed within a UL508A electrical control package. The board is powered by 24 Volts DC, which is provided by an approved 10-20 Watt class 2 power supply included inside the panel.

Some parts of the ECPM03 circuit board can be electrically live and some surfaces can be hot. Inappropriate use and incorrect installation or operation creates the risk of injury to personnel and/or damage to equipment. All operations concerning installation, commissioning and maintenance must be carried out by qualified, skilled person who is familiar with the installation, assembly, commissioning, and operation of the control panel and the application for which it is being used.

Installation

Ensure proper handling and avoid excessive mechanical stress. Do not bend any components during transport, handling, installation or maintenance. Do not touch any electronic components or contacts. This board contains electrostatically sensitive components, which can easily be damaged by inappropriate handling. Static control precautions must be adhered to during installation, testing, servicing and repairing of this board. Component damage may result if proper procedures are not followed.

To ensure proper operation, do not install the board where it is subjected to adverse environmental conditions such as combustible, oily, or hazardous vapors; corrosive chemicals; excessive dust, moisture or vibration; direct sunlight or extreme temperatures.

The ECPM03 may be mounted by means of DIN rail clips and board standoffs or by standoffs alone. It will be mounted in a NEMA 1 enclosure for indoor use only.

When working on live panel controllers, applicable national safety regulations must be observed. The electrical installation must be carried out according to the appropriate regulations (e.g. cable cross-sections, circuit breaker, protective earth [PE] connection). While this document does make recommendations in regards to these items, national and local codes must be adhered to.

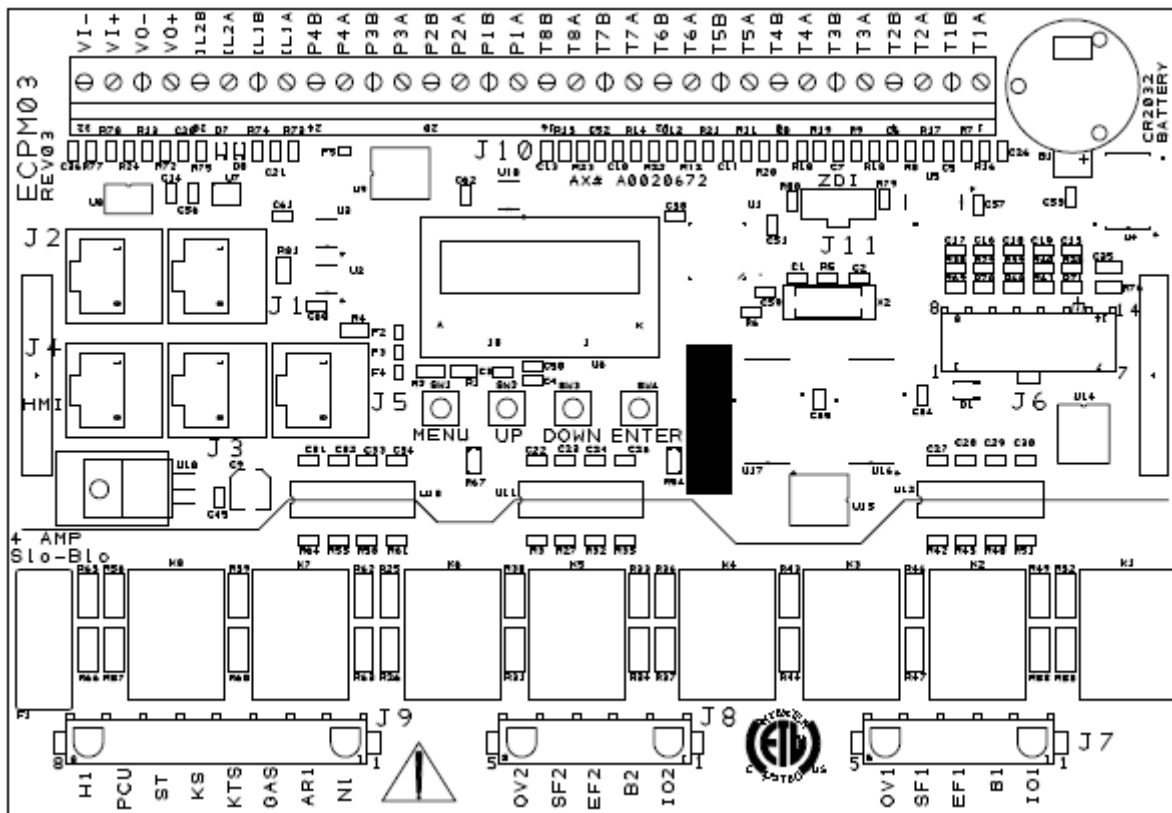
Control board (ECPM03) Technical Information

Ratings	24VDC, 10-20Watts
Other Ratings	On-board relay contacts are 120VAC with 4Amps Max
Listings	•Conforms to UL STD 61010-1 & 61010-2-030 •Certified to CSA STD C22.2 No. 61010-1 
Flammability	FR4 board with 94V0 flammability rating
IP rating	IPX0
Fuse on board	Slo-Blo 4 Amp fuse, 5x20mm
Humidity	< 95% non-condensing
Temperature range	-10 to +55°C or +15 to +130 °F
Battery	Model 2032 - Lithium Coin Cell, 3VDC, 0.043mA
Dimensions	203mm L x 140mm W x 46mm H
Weight	0.6 lbs

NOTE: The following is for reference only. All 120 Volt AC field wiring is landed on terminal blocks, not on the board itself. See Installation section for details. Low voltage class 2 field wiring may be landed at J3, J4, J5, or J10 connectors only, as indicated by the panel labeling and installation schematic. Provision for spacing and routing of the field wiring is provided in the panel.

J7, J8, J9 are provided for the control of 120 Volt AC relays, contactors, solenoids and shunt trip breakers. Under no circumstances shall any lighting or motor loads be directly connected to these connectors. These connectors are intended to be used for factory wiring only by a UL508A panel shop.

J1, J2, J6, are reserved for low voltage class 2 factory wiring.



Control Board (ECPM03) diagram

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with the manual and applicable codes. 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

WARNING: DO NOT LIFT CONTROL BY WIRING COMPONENTS

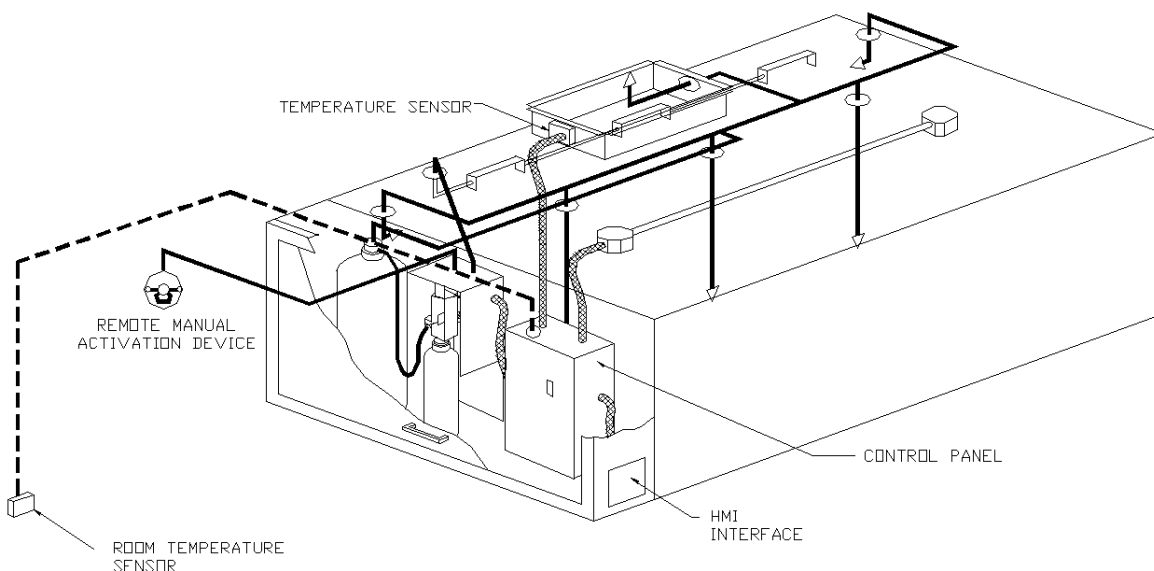
Site Preparation

1. Provide clearance around installation site to safely install equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.

Assembly

When the control panel is ordered in a utility cabinet installed on the hood, there is no mechanical assembly required by the installer. If the control panel is ordered as a wall mounted panel, the enclosure must be secured to a fixed wall near the exhaust hoods. **Be certain to maintain adequate clearance from excessive heat sources such as appliances to prevent damage of the components.**

Utility Cabinet Installation (Typical)

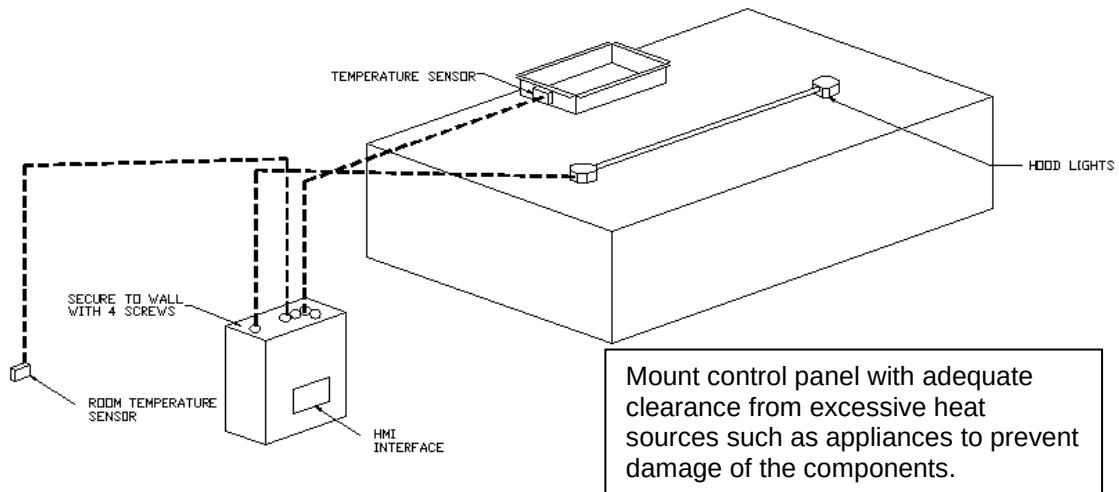


TYPICAL CONTROL CENTER INSTALLATION

Room Sensor Installation

A room temperature sensor is provided with the panel. It should be installed in a safe location, free of influence from external heat sources. It should be indicative of the average kitchen temperature away from the appliances. For packages with 2 separate fan zones, a 2nd room sensor may require installation. Refer to the Installation Schematic for landing terminal locations.

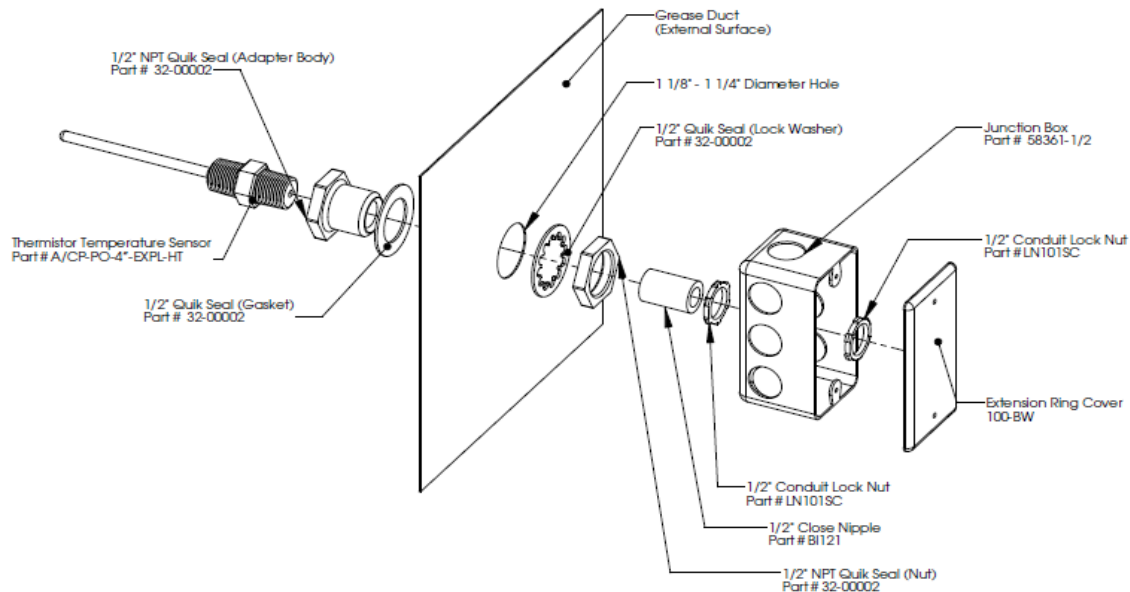
Wall Mount Installation (Optional)



WALL MOUNTED CONTROL CENTER

Duct Sensor Installation

When the control panel is ordered, the system typically consists of one duct sensor per hood exhaust riser. These sensors are typically shipped factory installed in factory assembled hood risers. If the risers are field cut, the sensor and other components are shipped loose for field installation as shown below. A hole must be cut in the grease duct, and the quick seal and sensor must be assembled as shown below. A 2-wire plenum rated thermistor cable (18 gauge typical), run in conduit, should be used to wire the sensors back to the controller and landed on connector J10 as indicated on the installation schematic.



IMPORTANT!!

When exhaust duct connections are located and cut in the field, duct temperature probes are shipped loose in the electrical package enclosure. These must be installed in the duct immediately above the hood for proper system operation.

Electrical

Before connecting power to the control, read and understand this entire 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 within a paperwork pouch internal to the panel.

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!!

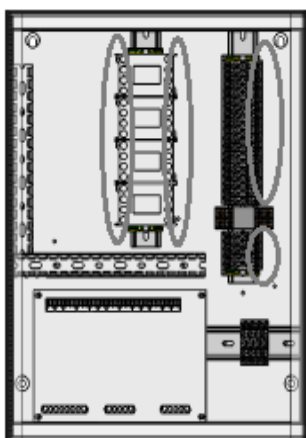
Disconnect power before installing or servicing control. High voltage electrical input is needed for this equipment. This work should be performed by a qualified electrician.

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. Make certain that the power source is compatible with the requirements of your equipment. The installation wiring schematic identifies the **proper phase and voltage** of the source breakers.
3. Before connecting control to power source, verify power line wiring is de-energized.
4. Secure all wiring to prevent contact with sharp objects.
5. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces or chemicals.
6. Before powering up the system, make sure that the interior of the control is free of loose debris, metal shavings, or shipping materials.
7. If any of the original wire supplied with the system must be replaced, it must be replaced with type THHN wire or equivalent.

Copper Wire Ampacity

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

High Voltage Wiring



1. All high voltage wiring shall be terminated on the right side of the terminal blocks or directly on the starters as designated in the circled areas on the left hand diagram.
2. **There are multiple electrical connections** required for this control. **120VAC** should be wired to terminals **H1** and **N1**. Input power to the motors should be wired to “**L**” series terminals. Motor output power should be connected to “**T**” terminals on the starters.
3. The hood light wiring will also need to be wired to terminals as indicated on the installation diagram.
4. If an ANSUL fire system is present, the fire system micro-switch will need to be wired to terminals as indicated on the installation diagram, typically “**C1**”, “**AR1**”. C1 is the common and connects to terminal 1 on the micro-switch. AR1 is the armed state and connects to terminal 2 on the micro-switch. If a CORE fire system is present, this connection is not required.

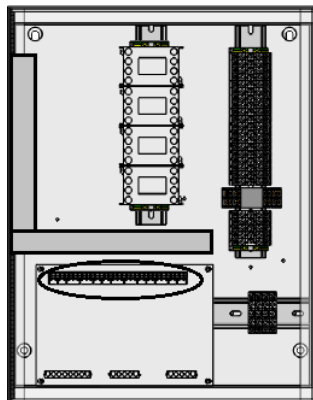
Low Voltage Wiring

Low voltage field wiring consists of Duct and Room Temperature sensors, EC motors, 0-10VDC output, 24VDC input, or Modbus communication over CAT-5 cables for HMIs and remote equipment.

Additionally, panels can be ordered with Building Management Options. Refer to the Building Management Owner's Manual, if equipped, for low voltage building management wiring requirements.

Low voltage wiring must be run through the wireway show below in the grey rectangle area. Wires will be terminated on the terminals located on the ECPM03 board, circled below.

WARNING: Low voltage wires should never be run together with high voltage wires.



- 1- **Room temperature sensor(s):** For all installations utilizing duct thermostats, at least 1 room temperature sensor must be installed in a safe location, free of influence from external heat sources. It should be indicative of the average kitchen temperature away from the appliances. For packages with 2 separate fan zones, 1 or 2 room sensors can be used. 2-wire 18 AWG thermistor cable must be used. The room temperature sensor shall be wired according to the installation wiring schematic, typically terminals "**T1A**", "**T1B**".
 - 2- **Duct temperature sensors:** For all installations excluding a single hood with factory risers and a hood mounted panel, duct mounted temperature sensors will need to be wired in the field. 2-wire 18 AWG plenum rated thermistor cable must be used. The temperature sensor should be wired to terminal blocks as indicated on the installation wiring schematic.
 - 3- **HMI(s)** are connected to the ECPM03 board through **CAT-5** cable. The HMI have two RJ-45 connectors connected together for Modbus.
 - a. If the panel was ordered with only 1 fan switch and/or 1 light switch, the HMI would connect to port J4 (RJ-45) of the ECPM03 board. The other RJ-45 port of the HMI will typically be occupied by a RJ-45 end-of-line terminator (Part # EOL120A).
 - b. If the panel was ordered and configured for 2 fan or 2 light switches, the first HMI would connect to port J4 (RJ-45) of the ECPM03 board. The second HMI would connect to ECPM03 board two ways:
 - Connect the second HMI to the first HMI through CAT-5 cable. In this case the RJ-45 end-of-line terminator (Part # EOL120A) would only be used on the second HMI.
 - Connect the second HMI to port J5 (RJ-45) of the ECPM03 Board. The other RJ-45 port of the HMI will typically be occupied by a RJ-45 end-of-line terminator (Part # EOL120A).
 - 4- **Two end-of-line terminators** (Part # EOL120A) are included in each panel. They are typically plugged in at the factory on J3 and either on port J4 or in the back of the first HMI. If another HMI or other equipment need to connect to a port occupied by an end-of-line terminator, it shall be removed and place on the HMI or equipment that became connected at the end of the Modbus network.
- NOTE:** A third end-of-line terminator would be included with the package if the panel is ordered with 2 fan or 2 light switches. The extra end-of-line terminators will be mounted on the second HMI, if decided to connect the HMI to J5. Otherwise, if daisy chained both HMIs, the third-end-line terminator should be mounted on J5.
- 5- If other pieces of equipment such as PCU Advanced Filter Monitoring (AFM) are connected to this panel, a cat-5 cable will also be used to run the Modbus communication between these devices. The cable would be plugged in port J3 of the ECPM03 board. The end-of-line terminators should then be relocated from J3 to the empty RJ45 port of the PCU AFM module.

OPERATION

Start-Up Procedure

NOTE: FIRE system must be in **ARMED** state before proceeding.

1. Once all required connections have been completed as indicated on the installation schematic, startup can begin. Apply power to the panel. The ECPM03 board and the HMI will power up and beep. If that is not the case, check all power connections. Verify that there is no alarm message displayed on any HMI screen. If there are alarms present, you can press the MUTE button to silence the alarm and then work to resolve them.

A HMI has 4 buttons; function is displayed adjacent to them on the screen. These functions will change depending on the status of the panel. If no text is adjacent to the button, it does not have a function.

Typically LIGHTS and FANS functions are shown on the bottom 2 buttons. The status of those elements is shown by the shading used inside the box associated with the function. An empty box around the FAN function means that the FANS are turned OFF. A dark box around the FAN function means that the FANS are turned ON. The same applies to LIGHTS.

Note: For the rest of the document, the term button will be used to refer to either the actual button or the function associated with it.



The center two lines of the HMI are reserved for displaying informational or fault messages

When a fault occurs, an audible alarm is triggered and a message is displayed on the HMI(s). The Audible Alarm can be silenced by pushing the **Mute** button that appears on the top right corner.

2. Press the **Lights** button on the HMI to energize the hood lights. If the lights do not come on, make sure the light bulbs are installed and/or check the lighting circuit.
3. Press the **Fans** button on the HMI to energize the fans.
If there are multiple fan zones, pressing the **Fans** button on the first HMI will only energize the fans in zone #1. Pressing the **Fans** button on the second HMI will energize the fans in zone #2.
If the supply fan does not come ON, verify that there is not a Fire Condition Alarm on the screen. If that is the case, the fire system might be tripped or not properly wired.
4. If cooking appliances are connected to an Electric gas valve controlled by the control panel, the gas valve can be turned ON by pressing the **Gas Reset** button on the top right corner of the HMI. The icon will only show if the Gas Valve Option is turned ON under the ECPM03 menu: *Configuration / Misc. Options / Set Gas Valve*, or if a CORE fire protection system is enabled.

5. Turn the Fans off. Turn on the cooking appliance(s) and allow them to reach idle temperature. The fans should automatically activate as the cooking appliance(s) heats up. The factory set activation point for duct temperature override of the fan switch is 15 degrees above kitchen room temperature. Each duct temperature sensor has its own temperature offset setting. These values should be adjusted based on the cooking appliances and cooking load. Refer to paragraph (e) under the Configuration section for further details.
6. If the controls include the Self Cleaning or Hood CORE Protection Fire System option, a **Wash** button will be displayed on the HMI screen. Push the button to start the wash cycle. Water will be sprayed in the plenum and duct of the hood and surfactant will be injected at a predetermined frequency. The wash cycle will stop when the wash timer expires or when the Stop Wash button is pressed. **Make sure Hood filters remain in place during the wash cycle.**
7. If the controls include the Proving Interlock Option, as indicated on the installation schematic with current sensors included inside the package, a calibration step is required at startup. Please refer to the Fan Proving Interlock section below under Functionality for further details about this function. To perform the calibration, refer to paragraph (i) under the Configuration section.

Functionality

Fan Control

The control panel controls fans through starters. Each ECPM03 board can control 1 or 2 Fan zones. A fan zone includes all exhaust fans and supply fans that will come ON and OFF simultaneously. Fan zones are typically independent from each other, except in certain conditions like fire.

Hood Lights

1. A control panel can have 1 or 2 HMI light switches. Typically each light switch controls one light circuit with a maximum of 1400W per circuit. If more than 2800 watts of lights are needed, additional 15 amp circuits can be brought to the panel and be run through a lighting contactor. Panel specific lighting limitations are indicated on the installation schematic.
2. Hood lights can be controlled manually through the Light button on the HMI screen. They will also be automatically turned ON or OFF when the fans assigned to that same fan zone turn ON or OFF. Manual light switch command on the HMI screen always takes priority.

Electric Gas Valve Reset

If the Gas Valve option is turned ON, an additional button is displayed on the HMI screen to allow the user to reset or re-energize an electric gas valve connected to the panel. The gas valve is de-energized at initial startup, when the Fire System is triggered or in other conditions as well.

Refer to paragraph (h) under Configuration section to turn this option ON or OFF.

Appliances Pilot Check Warning:

Every time an electric gas valve is reset, a warning message will be displayed on the HMI for 1 minute. A CLEAR button will be displayed on the HMI to clear the warning message and stop the beeps. If after 1 minute, the clear button is not pressed, the message disappears. This message is normal and provided as a reminder only. There is no need to take any action.

Building Management System (Dry Contact)

1. Removing the signal from IO1 will typically cause the fans to turn off. However if the duct thermostat sensors are hot or if the fans are energized through the fan button on the HMI, then the fans will continue to run.

NOTE: If the panel is ordered with a digital building management option, such as CASlink, BACnet, or Lonworks, please refer to the Building Management Owner's Manual for alternative fan interlock scheduling.

Minimum Room Temperature

This option is designed to prevent unnecessary automatic fan activation due to excessively cold room temperatures. This value is adjustable between 50 degrees and 85 degrees. As long as the room temperature reading is above the Min Room Temp set value, the package will use the actual room temperature sensor reading to calculate the duct thermostat offset. However, if the room temperature sensor reading is below the Min Room Temp set value, the package will ignore the actual room temp reading and use the Min Room Temp set value as a reference instead. This prevents a system from activating the fans unnecessarily, due to a large gap between room temperature and the hood duct temperature. This option can also help alleviate fan activation troubles with lower temperature appliances, which are not satisfying the minimum temperature requirements for fan activation.

Self-Cleaning Function (Optional)

1. During the wash cycle, water will be sprayed in the plenum and duct and surfactant will be injected at a set frequency. The wash cycle will stop when the wash timer expires or when the Wash button is pressed again.
2. The wash timer is factory set to 3 minutes and is adjustable through the Configuration Menu. The surfactant is injected for 1 second at the start of each minute of Wash. This setting is not adjustable. If equipped with CORE Fire Protection, the wash timer is not configurable through the ECPM03 control board. Refer to the CORE Owner's Manual for further information.
3. **Hood filters MUST remain in place during the wash cycle.**
4. The wash cycle can be initiated in several ways:
 - a. Manually, when the WASH button is pressed on the HMI.
 - b. Automatically, if the following conditions are met
 - Fans will need to go out of modulation mode either with the FANS button being pressed or by the duct temperature cooling down and hysteresis value and timer are met.
 - The fans will need to have effectively run cumulatively for a period of time longer than the "Wash Min Fan Runtime" value configured under "Misc Options". Preparation Time mode and Cool Down mode fan time do not count towards runtime. The runtime is reset to zero when the wash cycle is run.
 - The amount of time elapsed since the previous wash cycle is greater than the "Wash Min Interval time" value configured under "Misc Options". That elapsed time is reset to zero when the wash cycle is run.
 - c. If a Building Management System (BMS) is remotely controlling the fans through the external input terminal IO1, when the Fans are turned ON and then OFF through the IO1 terminal, granted that the fans are not maintained on by the duct temperature sensors or the fan button.
 - d. Through a digital Building Management System. Refer to the Building Management Owner's Manual for more information.
5. If the surfactant level is too low, an alarm will be triggered on the HMI. If the wash cycle is initiated while this alarm is active, water will be sprayed but no surfactant will be injected. Refill Surfactant as soon as possible for best results. (Refer to Self-Cleaning or CORE Manual for additional information)

Fan Proving Interlock (Optional) (i.e. Loss of Load Interlock/Airflow Fault Interlock)

1. This function is only available if there is a supply fan in the system and the panel was ordered from the factory with current sensors.
2. This function is designed to prevent exhaust fans from running if the supply fans are not running, which in turn would shut off the cooking equipment. In practical terms, this means that all fans will shut off along with cooking equipment if any of the exhaust or supply fans are not properly running. Examples of reasons why a fan would not be properly running are: overload tripped, broken fan belt, defective motor, disconnect switch off, etc.
3. This function requires calibration, which can be performed through the *Configuration/Misc Options/Proving Calibration* setting on the ECPM03 LCD.
4. When fans initially start, the supply fan(s) will be energized first, the motorized damper(s) (if present) will open. Once open the supply blower(s) will start running which in turn will allow the exhaust fans to run. If a supply blower doesn't run within 90 sec, a proving fault will occur.
5. Once the fans are running, the load on all the exhaust and supply fans is constantly monitored. If the load for an exhaust fan or the load for a supply fan drops below the threshold calculated after calibration for more than the 15 sec, all exhaust and supply fans will shut down.
6. If an electric gas valve and shunt trip are attached to the system, they will shut down as well.
7. To reset the system after a Proving fault, press the Fault Reset button on the HMI.

CORE Fire Protection System (Optional)

1. If a CORE Protection Fire system is connected to the control panel, alarms from the CORE system will automatically be displayed on the HMI.
2. Multiple CORE systems can be connected to the same control panel. Refer to the CORE Manual for setup of CORE Interlock Network addressing to prevent communication conflicts.

PCU Advanced Filter Monitoring (AFM) (Optional)

- a. If a PCU AFM is connected to the control panel through Modbus, alarms from the PCU will automatically be displayed on the HMI.
- b. To connect the AFM system to the HMI, run a cat-5 connection from terminal J3 to the RJ45 port on the PCU AFM internal to the PCU. This is outlined in the installation schematics.
- c. Up to 8 PCU AFM can be connected to the same Control panel. . Note that each additional PCU AFM must be assigned a unique Modbus address. Refer to PCU AFM manual for more information.

Electric Gas Valve Follow Fans (optional)

This option is only available when an electric gas valve is enabled. If this option is ON, the gas valve is shut off whenever the fans are off and requires a reset when the fans are turned ON. This is meant to prevent gas cooking appliances from running when the fans are off and is only required in some jurisdictions. This option can be enabled under *Configuration/Misc Options/Gas Follow Fans*. NOTE: Pilot lights must be relit after each fan cycle when this option is enabled.

Shunt Trip Follow Fans (Optional)

If this option is ON, the shut trip will be energized whenever the fans are off. This is meant to prevent electric cooking appliances from running when the fans are off and is only required in some jurisdictions. This option can be enabled under *Configuration/Misc Options/Shunt trip Follow Fans*.

Dimmable HMI (Optional)

This option allows the backlight on all HMIs to turn off whenever a timer is satisfied. The timer is refreshed every time the HMI button is pressed. This option is factory set to be disabled and can be enabled under *Configuration/Misc Options/ Set HMI Dimming*.

PCU CORE ONLY (Optional)

This option can only be enabled if CORE Hood is disabled. If this option is enabled, all the faults occurring on a connected PCUCORE system will be displayed on the HMI. A cat5 cable will be needed to connect the PCUCORE to the slave side of the network, typically J3. Factory Default Setting is OFF.

Configuration and Diagnostics

Security

1. To access the *Configuration / Factory*, the password 1111 must be used.
2. To access the *Configuration / Fire Options*, the password 1234 must be used.

Setup Options



The ECPM03 board allows the user to configure a broad range of options associated with the functionality of the system through the setup menus on its LCD as shown above. Below the ECPM03 LCD are 4 buttons for navigation: MENU, UP, DOWN, ENTER.

The MENU button typically takes you up one level in the menu tree while the ENTER button takes you down one level. UP and DOWN navigate through the same level of the menu tree and also allow the user to change the value of a parameter.

After changing some parameters in the configuration menus, the user needs to press MENU multiple times until the screen displays the message "Press any Key to reboot." As indicated, the processor will reboot after any key is pressed. This allows the board to correctly process the parameters changed.

NOTE: a reboot of the board will cause the electric gas valve (if equipped) to shut off. Confirm that gas/pilot lights are re-lit if necessary.

1. Display System Information

Starting from the Main menu, press the DOWN button, press DOWN again. Screen displays "Info". Press the ENTER button. Screen displays "Fault History". Press DOWN to View the Version number. Press DOWN to view the package Type, which should be "Standard Prewire".

2. Display Fault History

Starting from the Main menu, press the DOWN button, press DOWN again. Screen displays "Info". Press the ENTER button. Screen displays "Fault History". Press ENTER. Press UP and DOWN to scroll through the fault history, with 1 being the most recent fault. To clear the fault history, please ENTER and press ENTER again when prompted "Clear Fault History". Or press MENU to go back without clearing.

3. Display temperature readings

Starting from the Main menu, press the DOWN button. Screen displays "Temperatures". Press the ENTER button. Press the UP and DOWN buttons to view all temperatures measured by the room and duct temperature sensors.

4. System Bypass (optional)

This option is designed to bypass the HMI and have the fans running at full speed. Starting from the Main menu, press UP or DOWN until the screen displays "System Bypass". Press the ENTER button. Press the UP or DOWN buttons to activate or deactivate the system bypass. Press enter to save the selection.

5. Configure Temperature Sensor Assignments

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Screen displays "Temperature Sensor Assignment". Press ENTER.

Screen displays "Select Temp Sens to assign:1"

To navigate to another Temperature sensor, press the UP button.

To configure the assignment for Temperature Sensor 1, press ENTER.

- a. For Temperature sensor 1, the options are either to follow the room sensor wired to terminal T1A, T1B ("Room Temp 1"), or to assign a preset room temperature (75°F by default). Press UP or DOWN to choose the proper option. Press MENU to confirm the selection. To change the default preset value, press the ENTER button when displaying the Preset Temperature. Press UP or DOWN to change the preset value. Press MENU multiple times to get out to main menu.
- b. For Temperature sensor 2, the options are: Riser1, Capture Volume 1, Auxiliary Temp, Hood Coil Input, Hood Coil Output, PSP Discharge, or ACPSP Discharge.
- c. If 2 Fan zones are present, the menu for Temperature Sensor 2 will include these options: Room Temp 2, Riser2, and Capture Volume 2.
- d. Riser1 and Capture Volume1 are the only factors that determine how fans connected to zone 1 are controlled.
If Fan Zone 2 is selected, Riser 2 and Capture Volume 2 would determine how the fans connected to zone 2 are controlled.
If Room Temp 2 is selected, the sensor reading would be used for fan zone 2 only.
- e. The extra options, within each sensor assignment menu, are only used for monitoring and **do not** interfere with the control logic.
- f. For Temperature sensor 3 and above, the options will be the same as Temperature Sensor 2 except Room Temp option.

Press MENU multiple times to get out to the main menu and reboot the processor.

6. Configure Temperature Sensor Offset values (Factory Default: 15 Deg °F)

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN. Screen displays "Temperature Sens Offset". Press ENTER.

Screen displays "Select Temp Sens to assign:2"

Press UP or DOWN to navigate between the different Duct Temperature sensors. Press ENTER to select one. Then press UP or DOWN to adjust the offset Temperature.

Press MENU multiple times to get out to the main menu and reboot the processor.

7. Enable Electric Gas Valve control (Factory Default: OFF)

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Gas Valve". Press ENTER. Press UP or DOWN to turn this option ON or OFF.

Press MENU multiple times to get out to the main menu and reboot the processor.

8. Enable Electric Gas Valve Follow Fans (Factory Default: OFF)

This option is only available when Gas Valve is turned ON. Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Gas Valve Follow Fans". Press ENTER. Press UP or DOWN to turn this option ON or OFF.

Press MENU multiple times to get out to the main menu and reboot the processor.

9. Enable Shunt Trip Follow Fans (Factory Default: OFF)

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Shunt Trip Follow Fans". Press ENTER. Press UP or DOWN to turn this option ON or OFF.

Press MENU multiple times to get out to the main menu and reboot the processor.

10. Adjust the Temperature Hysteresis (Factory Default: 2°F):

The hysteresis is used to prevent the fans from cycling ON and OFF when the temperature in the duct is near the activation value. The fans will turn ON when the duct temperature exceeds the activation value, but they will only turn off when the duct temperature goes below the activation temperature minus the temperature hysteresis. For example, if the activation Temperature is at 85 °F and Temperature Hysteresis is set to 2 °F, the fans will turn ON at 85 °F and will turn OFF at 83 °F.

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set Temp Hyst". Press ENTER. Press UP or DOWN to adjust the Hysteresis value. Press ENTER

Press MENU multiple times to get out to the main menu and reboot the processor.

11. Adjust the Hysteresis Timer (Factory Default: 30 min):

The hysteresis is used to prevent the fans from cycling on and off too often due to small appliances generating just enough heat to turn on the fans but not enough to keep them ON for a long time. The Hysteresis Timer will maintain the fans on after they have been activated by temperature for a minimum time set by this timer, even if the temperature in the duct cools back down.

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set Hyst Timer". Press ENTER. Press UP or DOWN to adjust the Timer value. Press ENTER

Press MENU multiple times to get out to the main menu and reboot the processor.

12. Fan Proving Interlock Settings

If the Fan Proving Interlock option is enabled, two related settings are displayed: Proving Calibration and Proving Percentage.

- a. Calibration is required at startup. To perform calibration, make sure Test and Balance has been performed on the entire system first. Filters should be in place.

From the previous menu (Misc Option), press DOWN until the screen displays "Set Proving Calib". Press ENTER. Press ENTER again to start the Calibration process which takes about 90 sec. Press MENU once when calibration is complete.

- b. Proving Percentage can be adjusted. Value can range between 50% and 100% (factory default 0.8). The greater the ratio, the tighter the limits will be for fault detection, which also means the greater likelihood of false positive.

From the previous menu (Misc Option), press DOWN until the screen displays "Set Proving Percent". Press ENTER. Press UP or DOWN to adjust the ratio value. Press ENTER. Press MENU multiple times to get out to the main menu and reboot the processor.

13. Adjust Wash Time (Min): (Factory Default: 3 min):

This option is available if the control system includes self-cleaning option from the factory. The wash time value is setup in minutes with a maximum value of 30 minutes.

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set Wash Time". Press ENTER. Press UP or DOWN to adjust the time value. Press ENTER

Press MENU multiple times to get out to the main menu and reboot the processor.

14. Set Wash Min Fan Runtime (Factory Default: 480 min):

This option is available if the control system includes self-cleaning option from the factory. Its maximum value is 1440 minutes or 24 hours. Refer to the Self-Cleaning Section under Functionality for more details about this option.

Starting from the Main menu of HMI, press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set Wash Min Fan Runtime". Press ENTER. Press UP or DOWN to adjust the time value. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

15. Set Wash Min Interval Time (Factory Default: 720 min):

This option is available if the control system includes self-cleaning option from the factory. Its maximum value is 1440 minutes or 24 hours. Refer to the Self-Cleaning Section under Functionality for more details about this option.

Starting from the Main menu of HMI, press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set Wash Min Interval time". Press ENTER. Press UP or DOWN to adjust the time value. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

16. Adjust the number of PCU Advanced Filter Monitoring (AFM) Units

If PCU AFM units are connected to the control panel (through Modbus), the number of units has to be adjusted through this parameter. Refer to the PCU AFM manual for additional information on how to setup the PCU AFM unit number at the unit control panel.

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set Number of PCU AFM". Press ENTER. Press UP or DOWN to adjust the number of units. Press ENTER. Press MENU multiple times to get out to the main menu and reboot the processor.

17. Set HMI Dimming (Factory Default: OFF)

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set HMI Dimming". Press ENTER. Press UP or DOWN to turn this option ON or OFF. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

18. Set Dim Delay Time(Factory Default: 60sec)

This option is only accessible when HMI dimming is ENABLED. It allows the user to modify the time for which the backlight of the HMI remains on before it will turn off. The Dim Delay Time is factory set to 60 seconds, and is refreshable every time a button on the HMI is pressed. The Dim Delay Time is adjustable between 10 seconds and 5 minutes.

Starting from the Main menu, press the MENU button. Screen displays "Configuration". Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set DimDelay Time". Press ENTER. Press UP or DOWN to adjust the time value. Press ENTER

Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

19. Set Min Room Temp(Factory Default: 50 Degrees °F)

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set Min Room Temp". Press ENTER. Press UP or DOWN to adjust the set value. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

20. Set Min Room Temp2(Factory Default: 50 Degrees °F)

This option will only show when the board is configured for two fan zones and the second duct stat is assigned to Room Temp2.

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set Min Room Temp2". Press ENTER. Press UP or DOWN to adjust the set value. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

21. PCU CORE Only(Factory Default: OFF)

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "PCU CORE Only ON/OFF". Press ENTER. Press UP or DOWN to turn this option ON or OFF. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor. NOTE: This will not be present if HOOD CORE is enabled under the Factory Options menu.

22. Set IO1 Delay Time (Factory Default: 0 min)

This option is intended to be used with some BMSs that require the fans on the first fan zone to keep running for a specific amount of time right after the BMS signal is OFF. The delay time value is setup in minutes with a maximum value of 15 minutes.

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set IO1 Delay Time". Press ENTER. Press UP or DOWN to adjust the set value. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

23. Set IO2 Delay Time (Factory Default: 0 min)

This option is intended to be used with some BMSs that require the fans on the second fan zone to keep running for a specific amount of time right after the BMS signal is OFF. The delay time value is setup in minutes with a maximum value of 15 minutes.

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Set IO2 Delay Time". Press ENTER. Press UP or DOWN to adjust the set value. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

24. Manual to Auto Fans ON/OFF(Factory Default: OFF)

When this option is turned ON and fans are manually turned on, a timer is started. Once the timer expires, the fans will automatically turn off if the temperature allows them to.

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Manual to Auto Fans ON/OFF". Press ENTER. Press UP or DOWN to turn this option ON or OFF. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

25. Manual to Auto Fan Time(Factory Default : 2 hours)

This option allows adjustment of the timer associated with Manual to Auto Fan option. The timer is adjustable between 1 hour and 18 hours.

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Misc Options". Press ENTER. Press UP or DOWN until the screen displays "Manual to Auto Fan Time". Press ENTER. Press UP or DOWN to adjust the set value. Press ENTER. Press MENU multiple times to get back to the main menu or one more time to reboot the processor.

26. Configure the Fire Options

This sub-menu is Password protected and **changes should not be made after passing an inspection.**

Starting from the Main menu, press the MENU button. Screen displays "Configuration" Press the ENTER button. Press DOWN or UP until the screen displays "Fire Options". Press ENTER. When prompted, enter the password specified under the security section of this manual above. Press UP or DOWN until one of the options below is displayed. Press ENTER to access that option. Press UP or DOWN to change the value of that option. Press ENTER to move on to the next option.

- a. Exhaust On in Fire (Factory Default: ON): When this option is turned ON, the exhaust fans will be turned ON in a fire condition. If the option is turned OFF, the exhaust fans will stay in whatever state they were before the fire condition.
- b. Lights Out in Fire (Factory Default: ON): When this option is turned ON, the hood lights will be turned OFF in a Fire condition. If the option is turned OFF, the hood lights will stay in whatever state they were before the fire condition.
- c. Supply Off in Fire (Factory Default: OFF): When this option is turned OFF, the Supply fans will be turned OFF in a Fire condition. If the option is turned ON, the Supply fans will turn ON in a fire condition.

Once all the changes are complete, press MENU multiple times to get to the main menu and reboot the processor.

27. Configure Factory Options

This sub-menu is password protected and should only be accessed by the factory since all the settings under it are directly related to the hardware configuration of the system. Only access this page if instructed by the manufacturer.

Starting from the Main menu, press the DOWN button until the screen displays "Factory". Press ENTER. When prompted, enter the password specified under the security section of this manual above. Press UP or DOWN until one of the options below is displayed. Press ENTER to access that option. Press UP or DOWN to change the value of that option. Press ENTER to move on to the next option.

a. Set Number of Temp Sensors

This includes all Room Temperature Sensors and Duct Temperature sensors connected to the ECPM03 board. Valid values range from 2 to 32. Set the number of Temp Sensors to 0 is also a valid, if the system is controlled only by HMI and no temperature sensor is used.

b. Set Number of Fan Zones:

This defines the number of independent fan zones controlled by the system. There can be 0, 1 or 2 fan zones. This defines the number of fan switches controlled by the system. There can be 0, 1 or 2 fan switches. A fan switch will be displayed on a HMI accordingly. If 0 is selected, the fans will be only controlled by the temperature sensors.

c. Set Number of Light switches

This defines the number of hood light switches controlled by the system. There can be 0, 1 or 2 light switches. A light switch will be displayed on the HMI accordingly.

d. Set Proving Enable

This option enables or disables the Fan Proving Interlock. Refer to the Fan Proving Interlock paragraph under Functionality for further details. If this option is enabled, Proving calibration is required. Refer to paragraph j under Setup Options.

e. Set Hood CORE

This option determines if the system is connected to a CORE Fire Protection system.

f. Set Wash

This option determines if the system includes a self-cleaning option. This option will not be available if CORE is enabled.

g. Set KTS

This option determines if a Kill switch or Tamper switch are connected to the system. If this option enabled, the input KTS shall be maintained energized for normal cooking operations. If KTS is deenergized, an electric gas valve connected to the system would drop and the shunt trip output will be energized.

Once all the changes are complete, press MENU multiple times to get out to the main menu and reboot the processor.

Component Description

Temperature Sensor

The temperature sensor is a 10K Ohm Thermistor. The sensor gives constant feedback to the controller. One sensor is installed in every riser.



Room Temperature Sensor

The Room temperature sensor is a 10K Ohm Thermistor. The sensor provides constant room temperature to the controller. It should be installed on a wall somewhere in the space but not directly under the hood or close to an appliance so that the reading is not affected by heat.

Typically a system will have one room temperature sensor. However systems configured with 2 fan zones have the option to be ordered with 2 room temperature sensors, one for each zone. They should be mounted in the space accordingly.



HMI

The HMI is designed to withstand grease and water when installed on the face of the hood or utility cabinet.

The HMI is connected to the ECPM03 through a CAT-5 cable. If the HMI is installed on the face of the hood, a high temperature CAT-5 Cable is used.

The HMI can be mounted to a standard 2-gang junction box.



Current Sensor

One or several current sensors are included in the panel when the Proving Option has been ordered. A current sensor has a solid core and provides a 4-20 mA analog output that is proportional to the current measured. It has an adjustable range of 0-10 amp, 0-20 amp or 0-50 amp based on the position of the jumper on the top of it: L, M or H respectively. The jumper is typically adjusted at the factory. The range selected should be the smallest range possible that includes the FLA of the motor being monitored.



ECPM03 board

The ECPM03 is the main brain of the system. It receives all the digital and analog inputs, delivers the digital outputs, and sends out messages to other devices.

Connector Descriptions

- J1, J2: Modbus slave network connectors feed through RJ45s, which conform to the Modbus pin out for RS485 2 wire differential Modbus RTU standard. See <http://www.modbus.org>. Modbus communication is not configured for third party integration without additional components.
- J3, J4, J5: Modbus master network connectors, feed through RJ45s, which conform to the Modbus pin out for RS485 2 wire differential Modbus RTU standard. J4 or J5 are the only RJ45 port on the ECPM03 which serves as a power source for HMI(s).
- J6 Factory low voltage connections
 - Pin 1 positive side of the 24 Volt DC input to the board
 - Pin 2 – 7 Open collector outputs, 100ma max each, suitable for driving 24VDC relays or indicator lamps.
 - Pin 8 – 12 4-20ma current inputs. 150 Ohm impedance to 24 VDC ground pin 14.
 - Pin 13 Chassis ground connection, this pin connects to the 24VDC ground through a paralleled 1000pf 2000V cap and a 100k Ohm 1/4W resistor.
 - Pin 14 negative side of the 24 volt DC power input (ground or common side of the low voltage circuitry)
- J7: 120 VAC control connector for factory wiring
 - Pin 1 IO1, BMS input, can detect the presence of 120VAC, this forces the fans on.
 - Pin 2 B1, input, this pin can detect the presence of 120VAC
 - Pin 3 EF1, output and input, this pin can source 120VAC and detect the presence of 120VAC
 - Pin 4, SF1, output, this pin can source 120VAC
 - Pin 5, OV1, input, this pin can detect the presence of 120VAC
- J8: 120 VAC control connector for factory wiring
 - Pin 1 IO2, output and input, this pin can source 120VAC and detect the presence of 120VAC
 - Pin 2 B2, input, this pin can detect the presence of 120VAC
 - Pin 3 EF2, output and input, this pin can source 120VAC and detect the presence of 120VAC
 - Pin 4, SF2, output, this pin can source 120VAC
 - Pin 5, OV2, input, this pin can detect the presence of 120VAC
- J9: 120 VAC control connector for factory wiring
 - Pin 1 N1, Neutral, this is the neutral or return path for the detection of 120VAC by the input pins. It would be connected to the Neutral side of the 120 VAC supply
 - Pin 2 AR1, input, this pin can detect the presence of 120VAC
 - Pin 3 GAS, output, this pin can source 120VAC
 - Pin 4 KTS, input, this pin can detect the presence of 120VAC
 - Pin 5 KS, output, this pin can source 120VAC
 - Pin 6 ST, output, this pin can source 120VAC
 - Pin 7 PCU, input, this pin can detect the presence of 120VAC
 - Pin 8 H1, this is the 120 Volt AC 50/60Hz input to the board, it feeds through an on board 4 Amp Slo-Blo fuse and is used to source 120 VAC to all the pins described as 120 VAC outputs. The total current draw of all the 120VAC outputs must not exceed 4Amps.



- J10 Low voltage field connections
 - Pin 1,2 – 15,16 thermistor temperature probe inputs. 10k type B thermistors are connected to these inputs.
 - Pin 17, 19, 21, 23, 25, 27, sources 24VDC which is current limited through an on board 200ma PTC Poly-Fuse. This is the high side of the pulse with modulated outputs, and low voltage inputs listed below.
 - Pin 18, 20, 22, 24 Open collector PWM outputs, 100ma max each. Suitable for driving the opto-isolated PWM speed control inputs of ECM motors.
 - Pin 26, 28 low voltage inputs, suitable for detecting dry contact closures with pins 25, 27 above.
 - Pin29 0-10 Volt output, 5ma max, suitable for driving instrumentation inputs.
 - Pin 30, negative, common or ground side of the above 0-10 Volt output
 - Pin 31 0-10 Volt input, 10k Ohm impedance to ground or common.
 - Pin 32, negative, common or ground side of the above 0-10 Volt output
- J11: factory programming only, Zilog ZDI microcontroller debug/programming interface
 - Pin 1 3.3VDC
 - Pin 2 /reset
 - Pin 3,5 GND
 - Pin 4 DBG input
 - Pin 6 NC

Troubleshooting

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

Troubleshooting Chart

Problem	Potential Cause	Corrective Action
Smoke Rollout of Hood – Fans don't start-up when appliances are ON	Dirty temperature sensor	Clean grease and dirt from sensor
	Poor Heat detection	Decrease duct Temperature offset values
	Improper hood installation	Check for proper hood overhang, cross drafts or improper hood design
Fans Spin Wrong Direction	3 phase Motor output wired backward	Swap 2 of the 3 phase wires on the output of the starter feeding the motor
Light icon On but No Lights Come On	Light bulbs are blown	Replace hood light bulbs
	Loose wiring connection	Check light terminal block wiring connections
Fan icon On but Fan doesn't comes On	Broken fan belt	Replace fan belt
	Loose wiring connection	Check wiring connections on starters

The following table lists Fault messages displayed on the HMI and corrective actions. Review this list prior to consulting manufacturer.

Fault Message on HMI	Potential Cause	Corrective Action
"Fire"	FIRE or fire circuit not wired properly.	If no fire, verify connection between terminal blocks C1 and AR1.
"Light Fault Zone x Bx De-energized" (x=1 or 2)	Light output is energized but no power is detected on terminal Bx.	Verify that the light relay is not damaged and that the light circuit breaker is not tripped.
"Light Fault Zone x Bx energized" (x=1 or 2)	Light output is de-energized but power is detected on terminal Bx.	Verify that the light relay contact is not welded in the close position.
"Overload Trip Zone x" (x=1 or 2)	One of the overload relays for fans associated with zone x is tripped.	Reset overload relay. Monitor fan to see why overload tripped.
"Surfactant Low"	Surfactant level is low.	Refill Surfactant into the tank. Refer to Self-Cleaning or CORE manual.
"PCU Fault"	PCU filters are clogged or missing.	Verify PCU filters and replace if needed.
"Proving Fault"	Fan Proving Interlock enabled. Exhaust fan not meeting its minimum calibrated load.	Verify fans are running properly. Verify Fan Proving calibration. Refer to Fan Proving Interlock section.
"Fuse F1 Blown"	Fuse F1 is blown or missing	Replace fuse and verify there is no short-circuit and load is below 4 amps.
"Temp Sensor x Not Connected"	Temperature sensor x is not wired to the ECPM03 board.	Verify proper wiring to terminals TxA and TxB on the board and wiring to the sensor.
"Modbus Communication Fault"	One or several components on the Modbus network are not responding.	Verify HMIs are all plugged in. Verify CORE or PCU AFM are plugged in if configured as such.
"CORE x Fault" Fault description	Specific fault is present on the CORE fire system	Refer to the CORE manual for specific fault description.
"PCU x Fault" Fault description	Specific fault is present on the PCU AFM x connected to the system.	Refer to the PCU AFM manual for specific fault description.
"Temp Sensor x Bad Sensor"	Bad Temp Sensor due to overheating or internal failure	Replace the Temperature Sensor
"Communications fault Check Configuration"	ECPM03 board and HMI not communicating due to: • Software incompatible Switchplate # doesn't match number of zones	• Re-flash the HMI • Change switchplate # • Replace cat5 cable • Replace EOL

MAINTENANCE

To guarantee trouble free operation of this control, the manufacturer suggests following these guidelines. Most problems associated with unit failures are directly related to poor service and maintenance.

Please record any maintenance or service performed on this equipment in the documentation section located at the end of this manual.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THIS CONTROL UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Control enclosure should be kept clean and free from any grease or dirt build-up.
2. All fasteners should be checked for tightness each time maintenance checks are preformed prior to restarting unit.
3. Control enclosure door panel should be securely closed after maintenance to prevent tampering or electrical shock.
4. Real Time Clock (RTC) battery should be replaced every 10 Years.

Every Month

1. **Temperature sensor(s)** in exhaust hood riser(s) need to be cleaned by wiping any grease or dust build-up from probe with a clean cloth. A clean sensor ensures that the temperature switch will quickly respond to changes in exhaust air temperature.
2. Check all fasteners, sensors, and electrical connections for proper tightness and continuity.

Self-Cleaning

Please refer to the Self-Cleaning or CORE Manual for Installation, Operation, and Maintenance of the Self-Cleaning system.

Start-Up and Maintenance Documentation

START-UP AND MEASUREMENTS SHOULD BE PERFORMED AFTER THE SYSTEM HAS BEEN AIR BALANCED (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	

Maintenance Record

Date	Service Performed

Factory Service Department

Phone: 1-866-784-6900

Fax: 1-919-554-9374