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AIREDALE

INSTALLATION AND SERVICE MANUAL

Sentinel®

Unit Ventilator

Models UVV, UVD and UVF



IMPORTANT

The use of this manual is specifically intended for a qualified installation and service agency. A qualified installation and service agency must perform all installation and service of these appliances.

Inspection On Arrival

1. Inspect unit upon arrival. In case of damage, report immediately to transportation company and your local factory sales representative.
2. Check serial plate on unit to verify that the power supply meets available electric power at the point of installation.
3. Inspect unit upon arrival for conformance with description of product ordered (including specifications where applicable).

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death, and could cause exposure to substances which have been determined by various state agencies to cause cancer, birth defects or other reproductive harm. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

THIS MANUAL IS THE PROPERTY OF THE OWNER.
PLEASE BE SURE TO LEAVE IT WITH THE OWNER WHEN YOU LEAVE THE JOB.

SPECIAL PRECAUTIONS

SPECIAL PRECAUTIONS

THE INSTALLATION AND MAINTENANCE INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED TO PROVIDE SAFE, EFFICIENT, AND TROUBLE-FREE OPERATION. IN ADDITION, PARTICULAR CARE MUST BE EXERCISED REGARDING THE SPECIAL PRECAUTIONS LISTED BELOW. FAILURE TO PROPERLY ADDRESS THESE CRITICAL AREAS COULD RESULT IN PROPERTY DAMAGE OR LOSS, PERSONAL INJURY, OR DEATH. THESE INSTRUCTIONS ARE SUBJECT TO ANY MORE RESTRICTIVE LOCAL OR NATIONAL CODES.

HAZARD INTENSITY LEVELS

1. **DANGER:** Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.
2. **WARNING:** Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.
3. **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.
4. **IMPORTANT:** Indicates a situation which, if not avoided, MAY result in a potential safety concern.

DANGER

Appliances must not be installed where they may be exposed to potentially explosive or flammable atmosphere.

WARNING

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All appliances must be wired strictly in accordance with the wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105°C.
4. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than rated voltage.
5. When servicing or repairing this equipment, use only factory-approved service replacement parts. A complete replacement parts list may be obtained by contacting Modine Manufacturing Company. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.

CAUTION

1. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.
2. Units not approved for use in potable water systems.
3. Hot water supplied to the hot water heating option must not exceed 200°F temperature or 125 PSIG pressure.
4. Do not operate the units within steam pressure greater than 10 PSIG. Steam pressure must be 10 PSIG or lower to avoid excessive discharge air temperatures that could cause burns or personal injury.
5. Do not attempt to reuse any mechanical or electrical component which has been wet. Such component must be replaced.

IMPORTANT

1. Start-up and adjustment procedures should be performed by a qualified service agency.
2. No water-flow can cause a freeze condition resulting in damage to the coil.
3. Do not release refrigerant to the atmosphere. When adding or removing refrigerant, all national, state/province, and local laws must be followed.
4. To check most of the Possible Remedies in the troubleshooting guide listed in Table 23.1, refer to the applicable sections of the manual.

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UNIT LOCATION / INSTALLATION

Table 3.1 - SI (Metric) Conversion Factors

To Convert	Multiply By	To Obtain	To Convert	Multiply By	To Obtain
"W.C.	0.24	kPa	CFH	1.699	m ³ /min
psig	6.893	kPa	Btu/ft ³	0.0374	mJ/m ³
°F	(°F-32) x 0.555	°C	pound	0.453	kg
inches	25.4	mm	Btu/hr	0.000293	kW/hr
feet	0.305	meters	gallons	3.785	liters
CFM	0.028	m ³ /min	psig	27.7	"W.C.

UNIT LOCATION


DANGER

Appliances must not be installed where they may be exposed to potentially explosive or flammable atmosphere.

Handling

Each unit will be shipped to the site on a wood skid. Whenever possible, all lifting and handling of the unit should be done with the packing and skid in position.

When slinging or using a forklift to lift the unit, the support points should be sufficiently apart to give stability when lifting. Unless otherwise noted, the lifting points should be equidistant from the centerline. Extreme care should be taken not to drop the unit.

Considerable damage can occur to the unit during positioning, in particular, to the paneling and exterior paint. Use an adequate number of personnel and the correct tools when moving the unit. The unit is designed to remain upright so care should be taken when lifting the unit up steps.

The use of torque screwdrivers on panel, cover or component mounting screws is not recommended. Hand-start all screws. If electric drills are used – set at the lowest possible torque.

Preparation

1. Before installation, ensure that the correct electrical power supply is available for the unit.
2. Each unit requires an independently fused and isolated power supply.
3. If the installation has multiple units, check that unit identifications correspond with the network diagrams. Advise Modine immediately if discrepancies are noted.
4. Check to make sure that the units will have adequate installation clearance around them.
5. Note that each unit has a condensate connection at the rear and suitable provisions should be made for draining. If multiple units tee into a common drain manifold, the drain line must be sized to ensure free draining with all the units in operation.
6. Inspect the wall sleeve installation for gaps that would allow leakage of outdoor air into the space. All joints and abutments should be sealed with waterproof sealant.

Drainage

Each unit has an internal condensate drain, terminating internally to the unit. A 1-3/8" condensate drain hole is available on the back side of the unit (see Figure 9.1 for the location). This must be connected to the main drain system in accordance with any local codes and general good piping practice.

Electrical

Electrical wiring should be done in accordance with all applicable national and local codes. It is the responsibility of the electrical contractor to adhere to such codes. The warranty will be voided if wiring is not in accordance with the specifications of the unit. Modine recommends using copper conductors only.

All power supply wiring must be capable of carrying the maximum current load under no fault conditions at the stipulated voltages. Care should be taken to avoid significant voltage drops.

A 1.38" diameter knockout for power connection is provided at the top of the unit.

Plumbing

If the unit provided has a hot water or steam coil, all plumbing connections in the field must be compliant with local building codes. When leak testing connections in the field, components will be leak tight up to 125PSIG water pressure, or 50PSIG of Nitrogen.

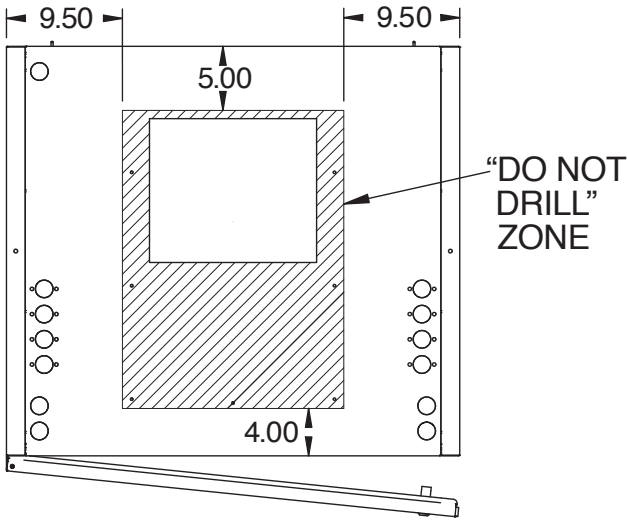
INSTALLATION

The instructions detailed below are for the Installation of a "Standard" unit. Accommodations and adjustments will be required for the usage of additional unit accessories. Should assistance be required for the installation of these additional items, consult Modine at the phone number listed on the back cover of this manual.

1. Check the floor for levelness and check to ensure the wall is at a right angle to the floor. Should there be any irregularity, the placement of foam tape on the outside edges of the unit will fill the gaps between the unit and the wall, allowing for the use of a sealant, to create a smooth transition from the unit to the wall.
2. After adjusting for any irregularity in the location site, locate the position for the floor mounting bolts (see figures 8.1-11.1). Drill the appropriate sized holes, for the fasteners that are to be utilized, and insert the anchors that are to be used.
3. Remove the backing strip from the gasket on the wall sleeve. Place the unit in the correct location, ensuring a tight seal with the wall sleeve and the wall.
4. Check to ensure that the unit is plumb and level in both directions. If adjustment is necessary, Modine recommends the placement of metal shims in the outer most corners of the base.
5. The cabinet must be secured to either the back wall or the floor. The floor of the cabinet has four pre-punched holes and the back of the cabinet has a hole on each side. The type of materials used for the floor and the walls will determine the type of fastener to use. If unit is mounted on a floorstand, use mounting hardware supplied by the factory, otherwise Modine recommends the use of 1/2" diameter fasteners with 1-1/2" diameter washers. Securing the cabinet to the floor or wall helps to reduce movement and noise due to vibration.
6. Make the condensate drain connection and the necessary electrical connections to the unit.
7. When connecting a duct flange or ductwork directly to the top of the unit, do not drill or put screws into the area immediately surrounding the supply air opening(s). See Figure 4.1 (dimensions in inches). Holes in the top of the cabinet indicate recommended mounting locations.

INSTALLATION

Figure 4.1 - Do Not Drill Zone - UVD Only



Installation of wiring must conform with local building codes, or in the absence of local codes, with the National Electric Code ANSI/NFPA 70 - Latest Edition. Unit must be electrically grounded in conformance to this code. In Canada, wiring must comply with CSA C22.1, Part 1, Electrical Code.

Electric wiring must be sized to carry the full load amp draw of the motor, starter and any controls that are used with the unit. See Tables 14.1-15.1 for Electrical Data.

Any damage to or failure of units caused by incorrect wiring of the units is not covered by warranty.

The electrical supply can be connected to the unit power lead extension at a customer supplied junction box.

When installing any wiring into the electrical panel, extra cable must be left outside the panel to allow the panel to open fully. Failure to follow these instructions may cause damage to the wiring and/or the unit.

Wiring



WARNING

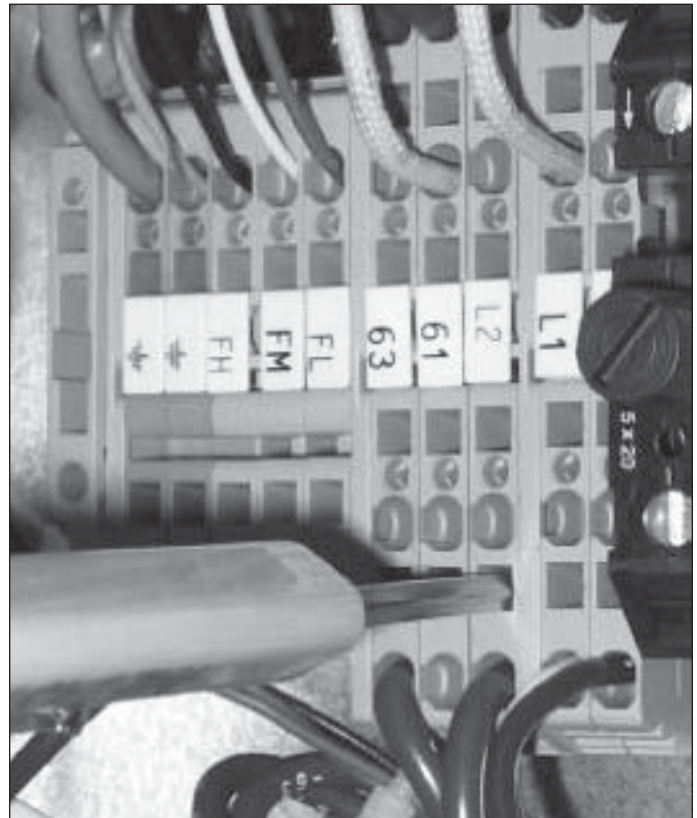
1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All appliances must be wired strictly in accordance with the wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105°C.
4. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than rated voltage.

Terminal Strip Connections

The terminal strip connections are designed to clamp down on the wires. To properly connect the wires to the terminal strip:

1. Push a small flat-head screwdriver into the square hole on the terminal. Press firmly until the screwdriver hits the back stop and opens the terminal (see Figure 4.2).
2. Remove approximately 3/8" of insulation from the end of the wire and push the stripped wire into the oval hole in the terminal.
3. Remove the screwdriver. Pull on the wire to make sure that it is securely clamped in the terminal.
4. Make sure that the terminal clamp is in contact with bare wire (insulation removed).

Figure 4.2 - Terminal Strip



CAUTION

Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.

START-UP PROCEDURE

START-UP PROCEDURE

IMPORTANT

Start-up and adjustment procedures should be performed by a qualified service agency.

The unit has been factory tested and set for proper operation, but a full unit start-up is recommended.

See start-up sheet examples - Figures 6.1 and 7.1.

Pre-Start Checks

1. Check that the supply voltage matches the unit supply voltage listed on the Unit Serial Plate. Verify that all wiring is secure and properly protected. Trace circuits to insure that the unit has been wired according to the wiring diagram.
2. Check that the unit has no visible damage and that all the components are secure.
3. Check that all field electrical and mechanical work has been performed according to all applicable Federal, State, and Local codes.
4. Check the supply voltage to the unit is within +/- 5% of the voltage on the unit serial plate.

Unit Start-Up Procedure

1. Turn the disconnect switch to the "ON" position.
2. Follow the instructions in the Modine microprocessor book. The control parameters and setpoints have all been factory set to the default values.
3. During the unit operation, measure and record all the information that is required to complete the Start-Up Sheets that are supplied with the unit. Copy the information onto the Start-Up Sheets, Figures 6.1 and 7.1, in this manual for your records.

Sequence of Operation

Microprocessor: A Carel microprocessor will control the unit and allow for networking and remote monitoring. The microprocessor will monitor the room temperature (either via an optional wall thermostat or return air sensor), supply air and outdoor air. With this information the unit is able to operate at maximum efficiency. The occupied/unoccupied control can be via optional time clock or from a signal from a building central time clock.

If a wall or unit mounted thermostat is selected, the setpoint can be either fully adjustable or +/- three degrees. This allows some control of the room temperature while limiting its adjustment. The thermostat will also have an occupied override button to allow a temporary override until the next scheduled occupancy change.

Fan: The fan will run continuously during occupied mode and will be intermittent on a call for cooling or heating during unoccupied mode. A built in fan purge time allows for maximum heating and cooling efficiency.

Cool: When the temperature increases above the cooling setpoint, the cooling valve will modulate open and fan will be energized.

Hot Water/Steam Heat: When the temperature decreases below the heating setpoint, the heating valve will modulate open and fan will be energized.

Electric Heat: When the temperature decreases below the heating setpoint, the first stage of electric heat will be energized. If two stages of electric heat are fitted, the second stage will only be enabled if the first stage of heat is not keeping up with heating demand.

Energy Recovery Ventilator (Optional): During operation when the unit is cooling the room (summer), cool room return air is drawn across the enthalpy wheel. This air is then exhausted external to the room. Warm, humid ambient air is drawn across the other side of the ERV and as the enthalpy wheel turns, the air is cooled and dehumidified. This air is then mixed with the room air and recirculated through the indoor section.

During operation when the unit is heating the room (winter) the warm, moist air from the room is used to temper the cold, dry external ambient air.

START-UP SHEET - EXAMPLE

Figure 6.1 - Start-Up Sheet - EXAMPLE Page 1



Modine Manufacturing Company – Sentinel™ (UV) Start-up Sheet

This document should be returned to Modine within 30 days of start-up to validate warranty

Date	<input type="text"/>	Job Reference	<input type="text"/>	TAG ID	<input type="text"/>
Drawing #	<input type="text"/>	SPO #	<input type="text"/>	Room ID	<input type="text"/>
Unit Type	<input type="text"/>	Serial #	<input type="text"/>		
Sales Rep	<input type="text"/>	Installer	<input type="text"/>		

Installation Checks

Unit mounted level	<input type="text"/>	Condensate drain correct	<input type="text"/>
Unit secured to the floor or wall	<input type="text"/>	Gravity flow or Pump assisted	<input type="text"/>
Wall sleeve installed correctly	<input type="text"/>	All electrical connection tight	<input type="text"/>
15" rear extension fitted	<input type="text"/>	Any visual damage to unit	<input type="text"/>
Splitter plate sealed to louver	<input type="text"/>	Fresh Air and exhaust ducted	<input type="text"/>

Main Voltage L1 + L2 L2 + L3 L3 + L1

XFMR Voltage **Primary** **Secondary**

Indoor Fan Motor (Standard / ECM)

Motor Size	(hp)	<input type="text"/>	FLA	<input type="text"/>	Make	<input type="text"/>
Amps	Hi	<input type="text"/>	Med	<input type="text"/>	Lo	<input type="text"/>
Tapings @	+15%	<input type="text"/>	-15%	<input type="text"/>	Program	<input type="text"/>

Outdoor Fan Motor (Standard / ECM)

Motor Size	(hp)	<input type="text"/>	FLA	<input type="text"/>	Make	<input type="text"/>
Amps	Hi	<input type="text"/>	Med	<input type="text"/>	Lo	<input type="text"/>
Tapings @	+15%	<input type="text"/>	-15%	<input type="text"/>	Program	<input type="text"/>

Heat Recovery Wheel Section

Motor Voltage rating	<input type="text"/>
Build and operation correct	<input type="text"/>
Motor Full Load Amps (FLA)	<input type="text"/>
Motor operational Amps	<input type="text"/>
OA damper operation correct	<input type="text"/>

Controller Information

Make	<input type="text"/>	Model	<input type="text"/>	Program	<input type="text"/>
BACnet card Fitted	<input type="text"/>	MS/TP (MAC) Address	<input type="text"/>	Device Instance	<input type="text"/>
LON card Fitted	<input type="text"/>	Neuron ID	<input type="text"/>		
Occupied Setpoint	<input type="text"/>				
Unoccupied Setpoint	<input type="text"/>				

Component Tests

Damper / HRW section tested	<input type="text"/>	Hot water / Steam Actuator tested	<input type="text"/>
Freeze protection setting	<input type="text"/>	Chilled water Actuator tested	<input type="text"/>
Freeze protection tested	<input type="text"/>	Face & Bypass Actuator tested	<input type="text"/>
Fire link / smoke detector tested	<input type="text"/>	Occupancy sensor tested	<input type="text"/>
Override key / button tested	<input type="text"/>	Filter change switch set	<input type="text"/>
3 Speed switch tested	<input type="text"/>	Change over Aqua-stat / sensor tested	<input type="text"/>
Time clock set	<input type="text"/>	Condensate High limit(s) tested	<input type="text"/>

Air Temperatures

Return Air Temperature	°F	<input type="text"/>
Supply Air Temperature	°F	<input type="text"/>
Outside Air Temp	°F	<input type="text"/>

CW Cooling

HW /Steam Heating

<input type="text"/>
<input type="text"/>

START-UP SHEET - EXAMPLE

Figure 7.1 - Start-Up Sheet - EXAMPLE Page 2

S/N

Technicians Notes:

Customer Feedback: Please relay any comments regarding quality and service

Service Technician

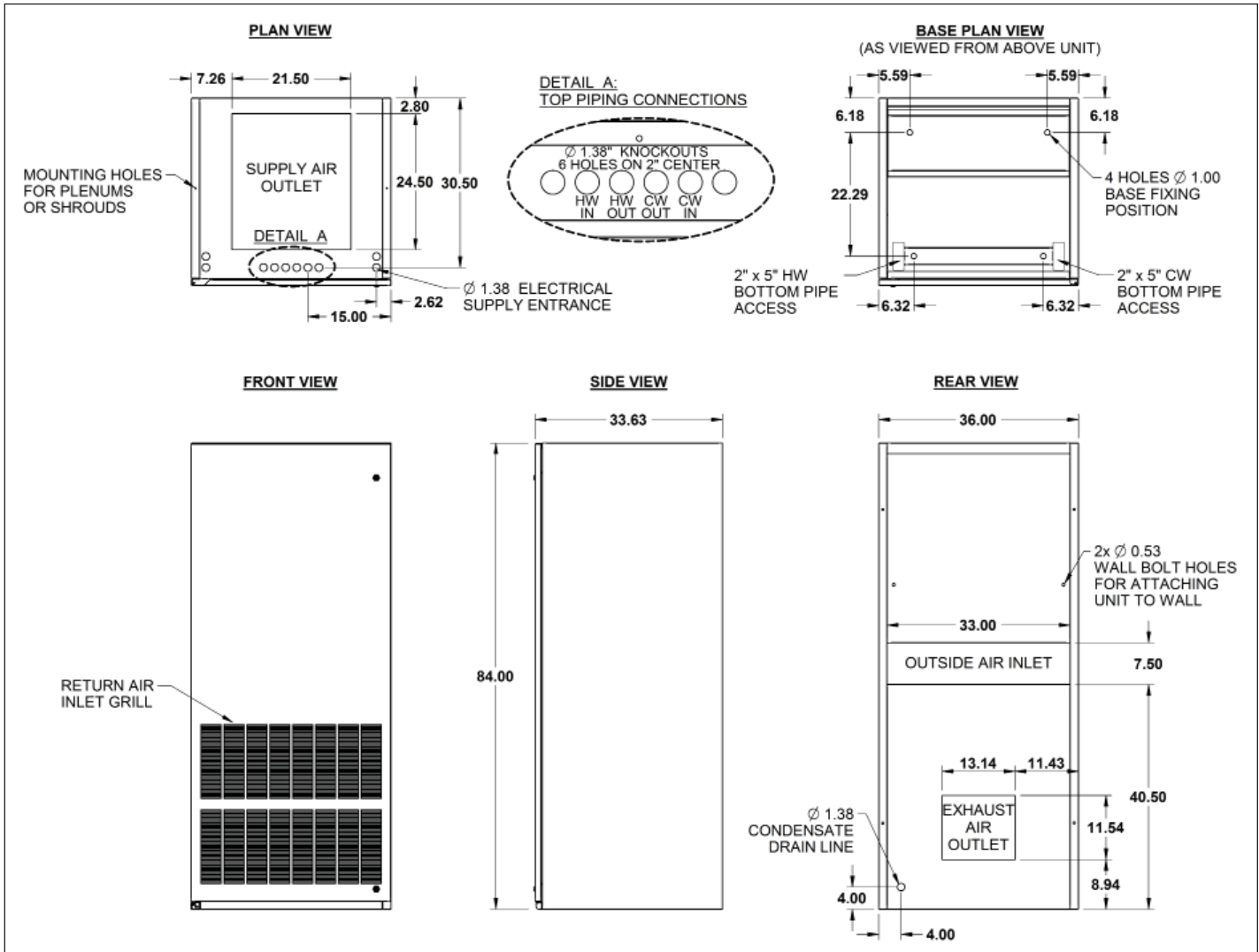
Service Company

Service Company Telephone

2

DIMENSIONS

Figure 8.1 - Dimensions – Base Unit UVV (Digit 9: Ventilation Configuration = A, B, C or D)

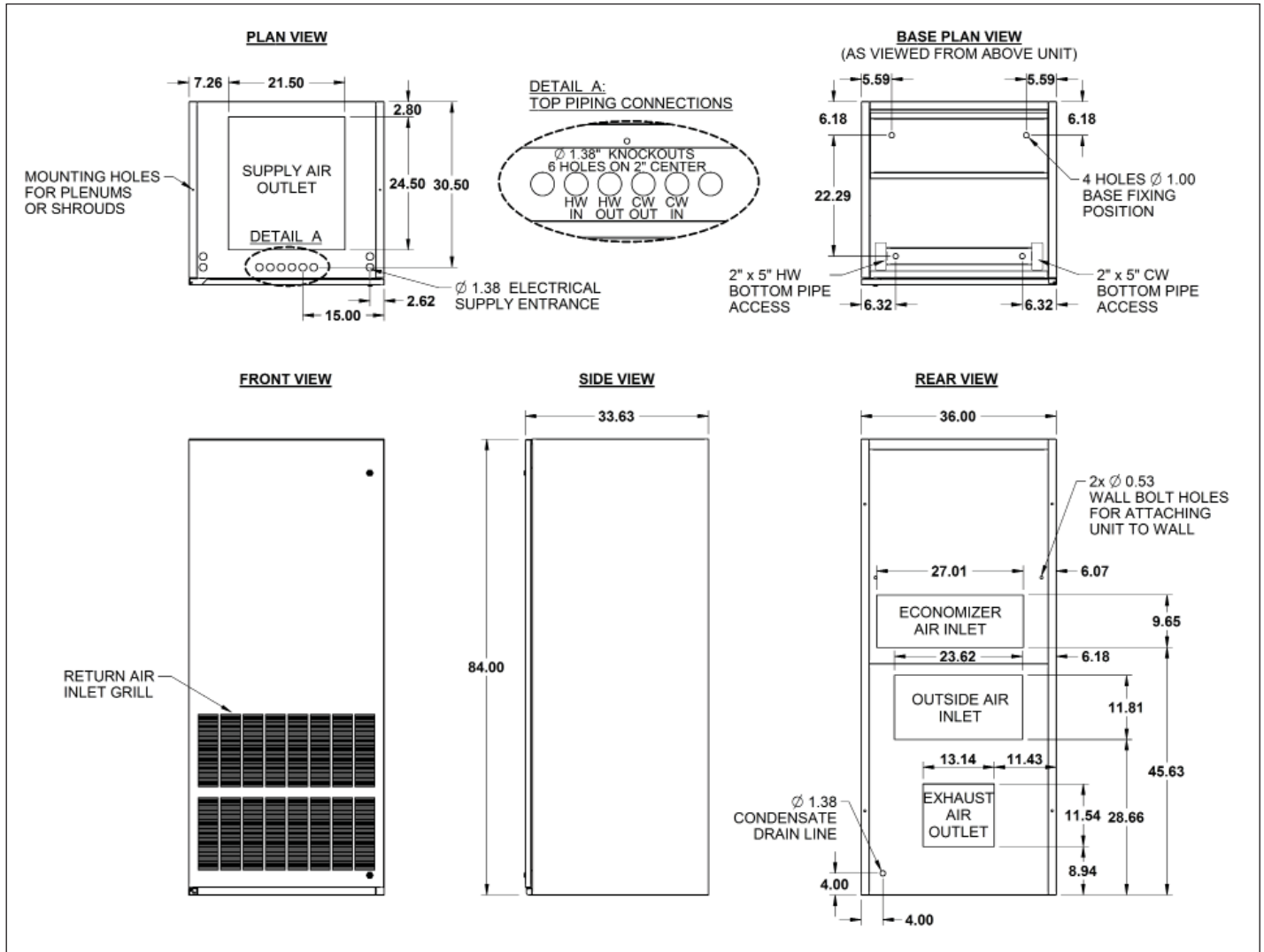


NOTE:

1. Base Unit UVV (Digit 9: Ventilation Configuration = A) will be provided with no Exhaust Air Outlet.
2. Unit will be provided with top and bottom piping knockouts. Reference Digit 20 in unit nomenclature to understand where terminations are located.

DIMENSIONS

Figure 9.1 – Dimensions – Base Unit UVV (Digit 9: Ventilation Configuration = E)

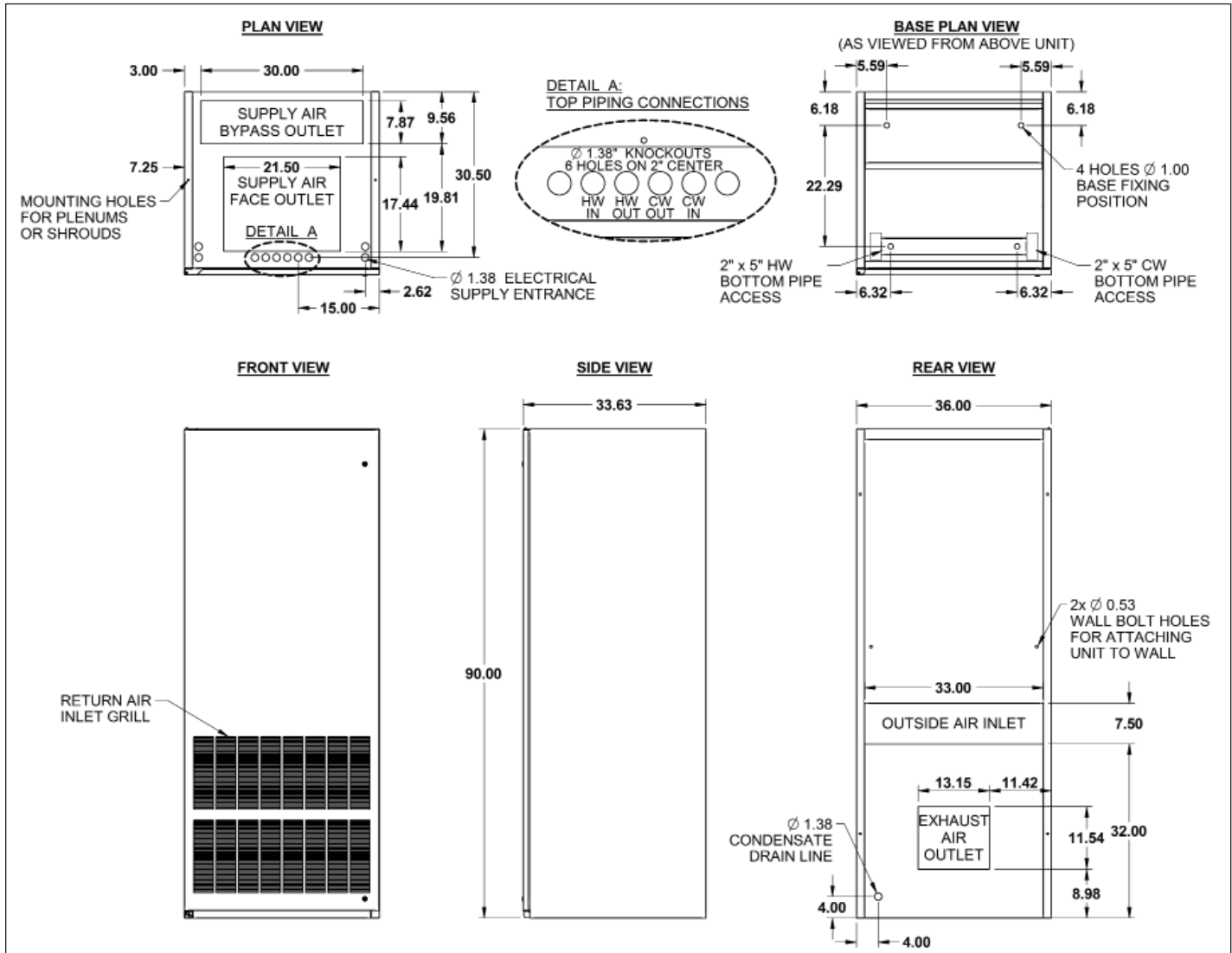


NOTE:

Unit will be provided with top and bottom piping knockouts. Reference Digit 20 in unit nomenclature to understand where terminations are located.

DIMENSIONS

Figure 10.1 - Dimensions – Base Unit UVF (Digit 9: Ventilation Configuration = A, B or C)

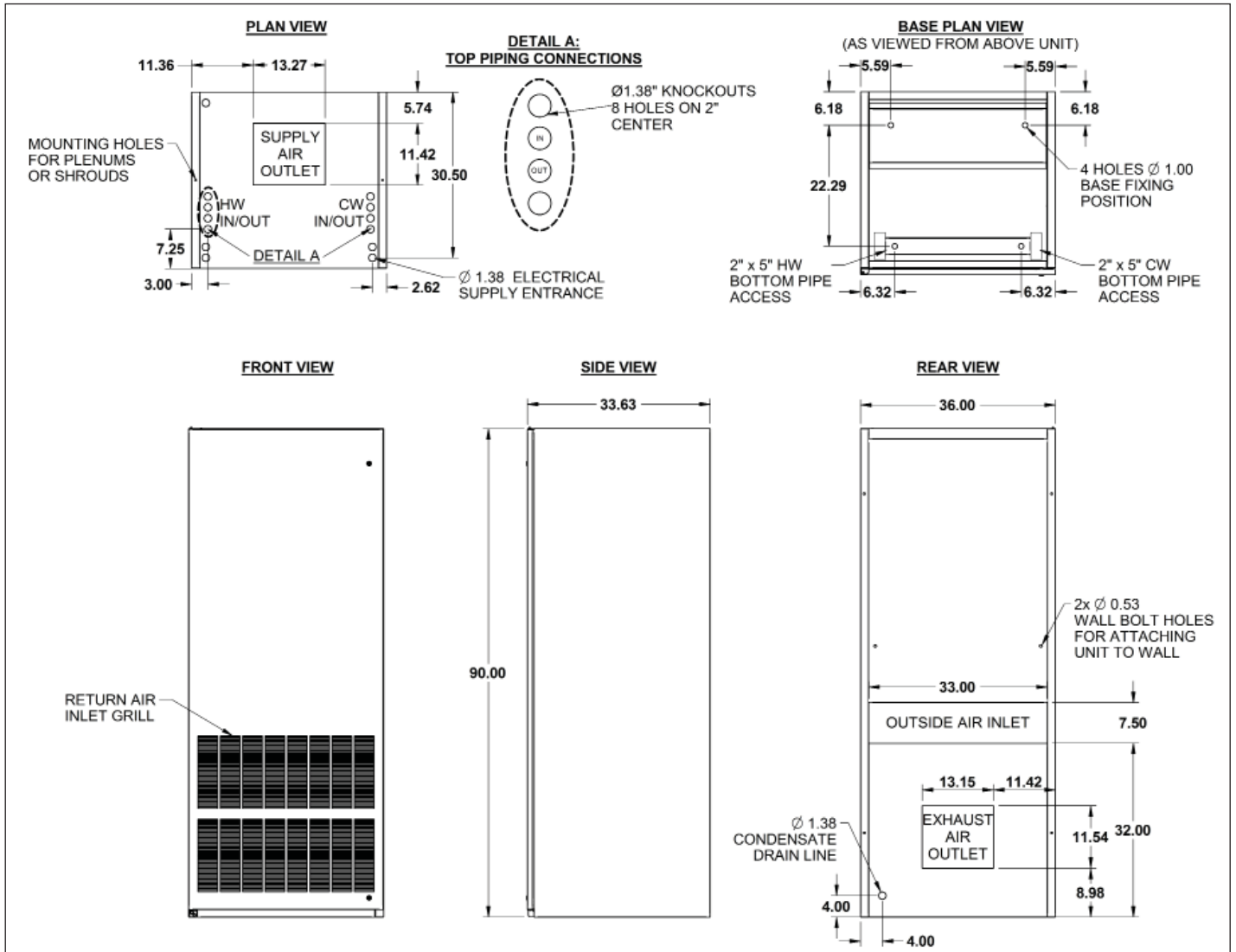


NOTE:

1. Base Unit UVV (Digit 9: Ventilation Configuration = A) will be provided with no Exhaust Air Outlet.
2. Unit will be provided with top and bottom piping knockouts. Reference Digit 20 in unit nomenclature to understand where terminations are located.

DIMENSIONS

Figure 11.1 – Dimensions – Base Unit UVD (Digit 9: Ventilation Configuration A, B or C)



NOTE:

1. Base Unit UVV (Digit 9: Ventilation Configuration = A) will be provided with no Exhaust Air Outlet.
2. Unit will be provided with top and bottom piping knockouts. Reference Digit 20 in unit nomenclature to understand where terminations are located.

PERFORMANCE DATA PAGE HEAD

Table 12.1 - Performance Data - UV

UV	Units	30		40		50		60	
Nominal Cooling Capacity (Digit 15: Cooling Option)		MBH	GPM	MBH	GPM	MBH	GPM	MBH	GPM
3 Row 'A' Coil (Digit 15 = 3) ①	MBH (GPM)	28.8	6.0	36.2	7.3	44.4	8.8	53.2	10.7
4 Row 'A' Coil (Digit 15 = 4) ①	MBH (GPM)	35.3	7.0	44.5	8.9	59.3	11.9	72.2	14.4
Nominal Heating Capacity (Digit 16: Heating Option)		MBH	GPM	MBH	GPM	MBH	GPM	MBH	GPM
1 Row 'A' Coil (Digit 15 = 3 or 4, Digit 16 = 1) ②	MBH (GPM)	43.3	2.2	52.1	2.6	60.2	3.0	72.1	3.6
1 Row Slab Coil (Digit 15 = 0, Digit 16 = 1) ②	MBH (GPM)	43.3	2.2	53.3	2.7	62.8	3.1	71.4	3.6
2 Row Slab Coil (Digit 15 = 0, Digit 16 = 2) ②	MBH (GPM)	62.3	3.1	79.0	3.9	95.6	4.8	111.0	5.5
3 Row 'A' Coil (Digit 16 = 3) ③	MBH (GPM)	51.3	6.0	64.9	7.3	79.2	8.8	98.9	10.7
3 Row 'A' Coil (Digit 16 = 3) ②	MBH (GPM)	76.4	3.8	91.3	4.6	104.3	5.2	119.6	6.0
4 Row 'A' Coil (Digit 16 = 4) ③	MBH (GPM)	52.3	7.0	66.9	8.9	86.0	11.9	106.4	14.4
4 Row 'A' Coil (Digit 16 = 4) ②	MBH (GPM)	77.1	3.9	98.8	4.9	127.2	6.4	159.4	8.0
1 Row Steam Slab Coil (Digit 16 = 9)	MBH	99.6		118.0		132.0		143.5	
Coils - 'A' Frame - Chilled Water and Hot Water									
Quantity		2		2		2		2	
Face Area	FT ²	4.44		4.44		4.44		4.44	
Coils - Slab - Hot Water and Steam									
Quantity		1		1		1		1	
Face Area	FT ²	3.33		3.33		3.33		3.33	
SUPPLY FAN		Direct Drive Centrifugal							
Fan Quantity		1		1		1		1	
Motor Size (Qty 1)	HP	1/2		1/2		1/2		3/4	
Motor Type		Electronically Commutated Motor (ECM)							
Nominal Airflow (High/Med/Low)	CFM	750 / 600 / 500		1000 / 750 / 600		1250 / 1000 / 750		1500 / 1250 / 1000	
Rated/Max External Static Pressure	IN. WG	0.5		0.5		0.5		0.5	
POWERED EXHAUST (optional)		Direct Drive Centrifugal							
Fan Quantity		1		1		1		1	
Motor Size (Qty 1)	HP	1/2		1/2		1/2		1/2	
Motor Type		Electronically Commutated Motor (ECM)							
Max Room Exhaust Airflow	CFM	600		800		1000		1200	
Rated/Max External Static Pressure	IN. WG	0.5		0.5		0.5		0.5	
UNIT WEIGHT									
Operating Weight	LBS	340		340		340		340	
FILTER		MERV 8,11,13							
Quantity		2							
Dimensions	IN	12 x 24							
ELECTRIC HEATING (optional)									
Electric Heating Capacity	KW	10							
Stages		2							
ENERGY RECOVERY WHEEL (optional)		DATA SHOWN FOR ALL UNITS							
Outdoor Air Volume	CFM	200		300		350		400	
Total Capacity Recovered (Cooling) ④	MBH	13.9		12.4		13.9		15.2	
Measured Cooling Effectiveness	%	79.4		73.5		70.2		67.7	
Total Capacity Recovered (Heating) ⑤	MBH	14.8		13.2		14.8		16.3	
Measured Heating Effectiveness	%	80.6		75.1		72.4		69.7	

① Cooling Capacity based on Air On 80/67°F Dry/Wet Bulb, 45°F Entering Water, 55°F Leaving Water, High Fan Speed.

② Hot water heating capacity based on Air On 70/58.5°F Dry/Wet Bulb, 180°F Entering Water, 140°F Leaving Water, High Fan Speed. Steam Capacity based on Air On 70/58.5°F Dry/Wet Bulb, Steam at 5 PSIG, High Fan Speed.

③ Hot water heating capacity based on Air On 70/58.5°F Dry/Wet Bulb, 140°F Entering Water, flow equal to cooling flow, High Fan Speed.

④ Cooling capacity based on: Room 75/63°F Dry/Wet Bulb, Ambient 95/78°F Dry/Wet Bulb.

⑤ Heating capacity based on: Room 70/58.5°F Dry/Wet Bulb, Ambient 35/33°F Dry/Wet Bulb.

ACCESSORY INSTALLATION

ACCESSORY INSTALLATION

IMPORTANT

The use of this manual is specifically intended for a qualified installation and service agency. A qualified installation and service agency must perform all installation and service of these appliances.

Wall Sleeve and Louver (Optional)

Instructions only applicable to accessories sold by Modine. If not provided by Modine, consult manufacturer's recommendations.

The wall sleeve is designed to provide a sealed plenum from the fresh air intake and exhaust air outlet on the back of the classroom unit to the outside of the building. When a single wall sleeve is used, the intake and exhaust airstreams are separated with a splitter plate. Units may use a single wall sleeve with horizontal splitter plate or double wall sleeves depending on the unit configuration.

Wall Sleeve Kit Includes:

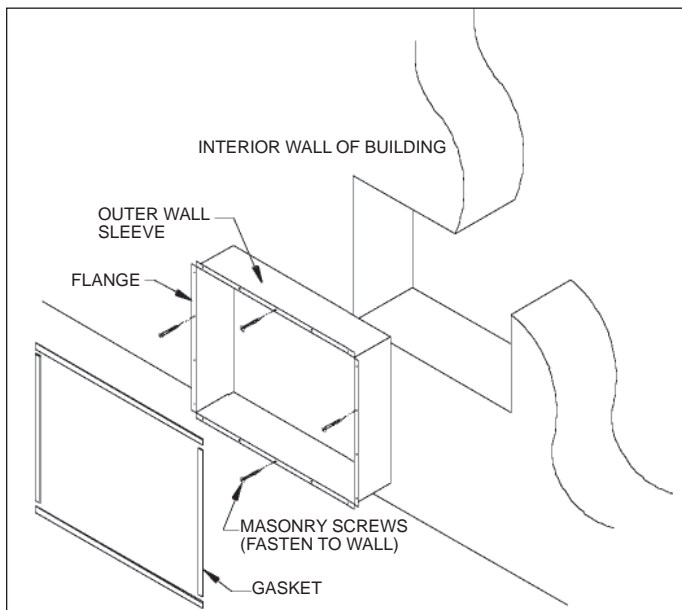
- Outer wall sleeve
- Inner splitter plate (if applicable)
- Outer splitter plate (if applicable)
- Inner wall sleeve
- Masonry screws
- One roll of gasket material

Assembly/Installation

The recommended procedure for assembly and installation is described as follows:

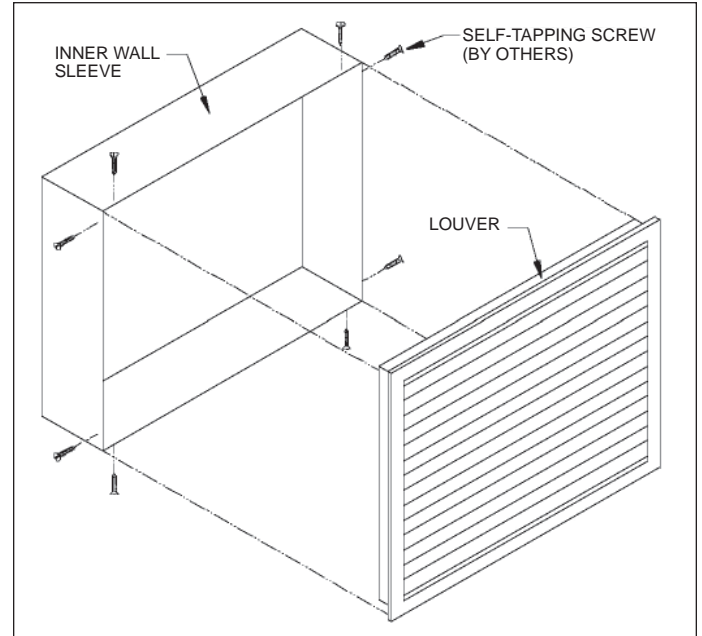
1. Check to insure that the opening in the wall is at the correct height from the floor and that the size of the opening is correct. This information is contained in the Modine Engineering Manual or submittal.
2. From inside the building, slide the outer wall sleeve into the wall opening until the flange is in tight contact with the wall. See Figure 17.1.

Figure 13.1 - Outer Wall Sleeve



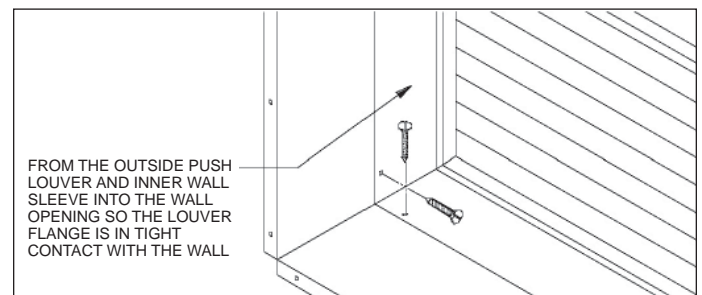
3. Use the masonry screws provided to fasten the wall sleeve flange to the wall. Do not attach the wall sleeve to the classroom unit.
4. Slide the louver (sold separately) into the inner wall sleeve. Use self-tapping screws (by others) to secure the louver to the wall sleeve. See Figure 17.2.

Figure 13.2 - Louver and Inner Wall Sleeve



5. From outside the building, slide the louver and inner wall sleeve into the wall opening and the outer wall sleeve until the louver flange is in tight contact with the wall.
6. Use an exterior grade sealant to seal the louver to the wall.
7. From inside the building, use self-tapping screws (by others) to fasten the two halves of the wall sleeve together. See Figure 17.3.

Figure 13.3 - Wall Installation



8. Seal the seam between the inner and outer wall sleeve.

ACCESSORY INSTALLATION

9. Clean the front flange of the outer splitter plate and attach the gasket to the flange. See Figure 18.1.

Figure 14.1 - Splitter Plate Installation

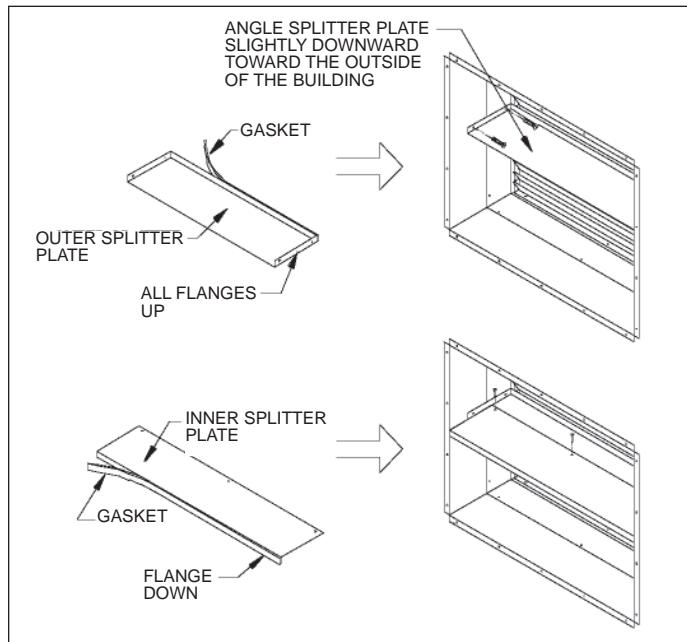
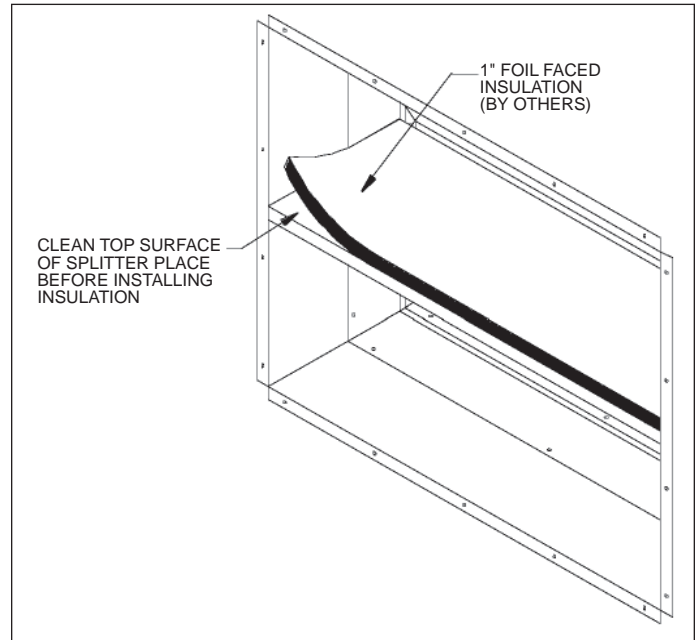


Figure 14.2 - Splitter Plate Insulation



10. Place the outer splitter plate in the proper position inside the wall sleeve. The splitter plate must be positioned between the fresh air intake and the exhaust air outlet on the back of the classroom unit. The splitter plate should be angled slightly downward (approx 1/2" over a distance of 8"), toward the outside of the building, and the gasket should be in tight contact with a blade near the center of the louver.
11. Use self-tapping screws (by others) to fasten the outer splitter plate to the wall sleeve.
12. Place the inner splitter plate over the outer splitter plate, ensuring that the room side flange is flush with the wall sleeve flange. Figure 18.1.
13. Use self-tapping screws (by others) to fasten the inner splitter plate to the outer splitter plate.
14. Seal the inner and outer splitter plates to the wall sleeve, ensuring that no air can pass from one side to the other.
15. Clean the top surface of the two splitter plates and attach 1" thick foil-faced insulation (by others). See Figure 18.2.
16. Clean the wall sleeve flange and inner splitter plate flange and attach the double-sided gasket. **Note:** Do not remove the backing strip from the room side of the gasket until the classroom unit is ready for installation. See Figure 18.1.

ACCESSORY INSTALLATION

REAR EXTENSION (Optional)

Instructions only applicable to accessories sold by Modine. If not provided by Modine, consult manufacturer's recommendations.

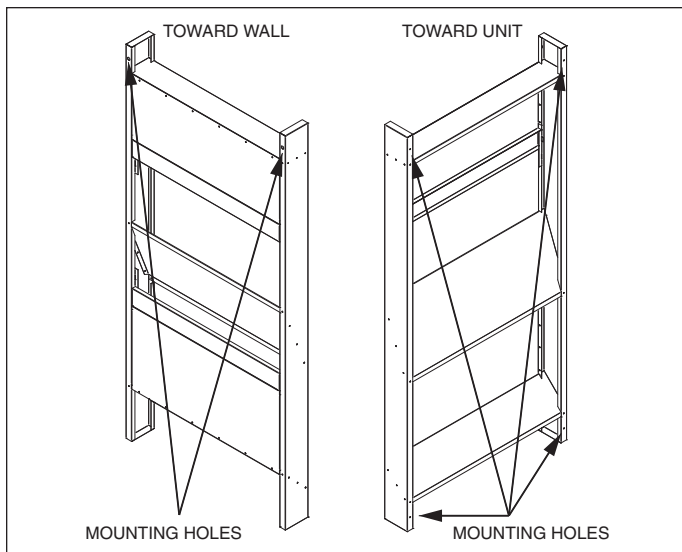
The rear extension is designed to provide a sealed transition from the fresh air intake and exhaust air outlet on the back of the classroom unit to the outside of the building, specifically when the wall openings are not aligned. Units are available with a 15" deep or 6" deep rear extension with adjustable sill heights (consult technical manual AIR 3-101 for available configurations).

Installation

The recommended procedure for installation is described as follows (reference Unit Installation Instructions beginning on page 3 of this manual. Unit must comply with all requirements, regardless if a rear extension is installed or not):

1. Check the floor for levelness and check to ensure the wall is at a right angle to the floor. Should there be any irregularity, the placement of foam tape on the outside edges of the rear extension will fill the gaps between the rear extension and the wall. The tape will act as a sealant, creating a smooth transition from the rear extension to the wall.
2. After adjusting for any irregularity in the location site, locate the position for the unit mounting bolts.
3. Remove the backing strip from the gasket on the rear extension. Place the unit against the rear extension in the correct location, ensuring a tight seal between the two.
4. Using sheetmetal screws (by others) screw above top plate and below bottom plate, totaling 4 connection points from the rear extension, into the unit (see Figure 19.1).
5. Measure the sill height and adjust the movable plates prior to moving cabinet and rear extension to the wall. The movable plates and rear extension openings are designed so there is an overlap of the wall opening, allowing for a sealing surface from the outside.
6. Move the cabinet and rear extension against the wall.
7. Check to ensure that the unit is plumb and level in both directions. If adjustment is necessary, Modine recommends the placement of metal shims in the outer most corners of the base.
8. Remove the backing strip from the gasket on the wall sleeve, and place the unit and rear extension in the correct location (see Figure 19.1).
9. Using screws (by others) screw above top plate and into the wall in each side panel – 2 connection points.
10. Complete installation of unit referencing page 3 of this manual (unit must be secured to the floor).

Figure 15.1 - Rear Extension



PLENUM (Optional)

Instructions only applicable to accessories sold by Modine. If not provided by Modine, consult manufacturer's recommendations.

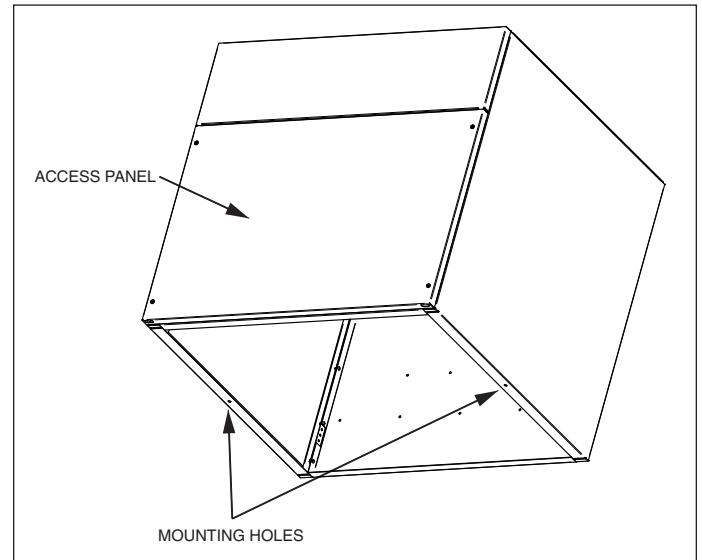
The field installed plenum is designed to discharge air directly into the space without ductwork to distribute air. Plenums are provided in 2" height increments, and multiple discharge configurations (consult technical manual AIR 3-101 for available configurations).

Installation

The recommended procedure for installation is described as follows:

1. Unit must be secured to the floor before plenums are mounted on top to prevent injury.
2. Place plenum centered on the top of the unit.
3. Remove the front access panel, so interior base of plenum is available.
4. Mount the plenum by using sheet metal screws (by others) through mounting holes at bottom center of each side panel (see Figure 19.2). Be sure to use a minimum of one screw for each side panel even if you are not able to use holes provided.

Figure 15.2 - Plenum Installation (Top Discharge Shown)



ACCESSORY INSTALLATION

DUCT SHROUD (Optional)

Instructions only applicable to accessories sold by Modine. If not provided by Modine, consult manufacturer's recommendations.

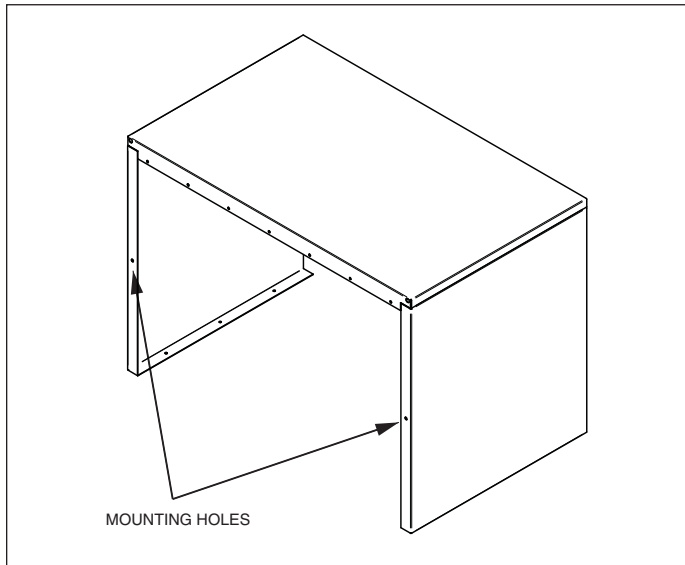
The field installed duct shroud is designed to cover ductwork that is connected to the unit, until it is above a ceiling. Duct shrouds are provided as 26" or 38" high (consult technical manual AIR 3-101 for available configurations).

Installation

The recommended procedure for installation is described as follows:

1. Unit must be secured to the floor before duct shroud can be mounted on top to prevent injury.
2. Place duct shroud centered on the top of the unit.
3. Mount the duct shroud by using sheet metal screws (by others) through mounting holes at bottom center of each side panel (see Figure 20.2). Be sure to use a minimum of one screw for each side panel even if you are not able to use holes provided.

Figure 16.1 - Duct Shroud Installation



FILLER PANEL (Optional)

Instructions only applicable to accessories sold by Modine. If not provided by Modine, consult manufacturer's recommendations.

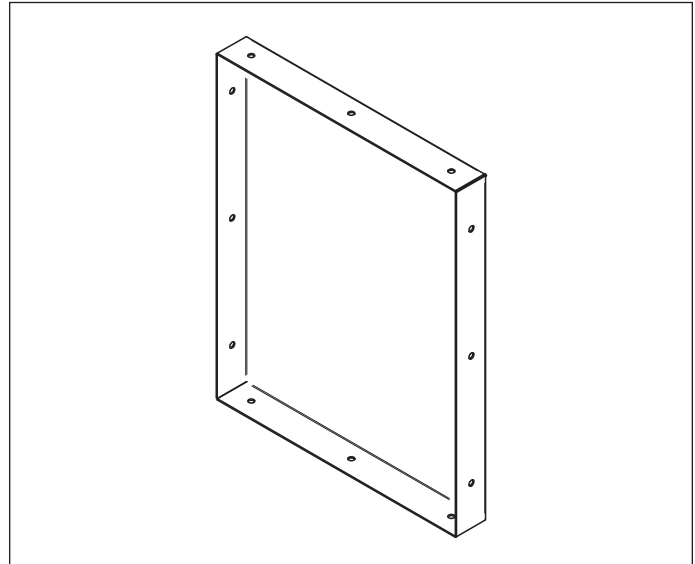
The field installed filler panel is designed to be installed above a rear extension, and behind a plenum or duct shroud so the sheet metal goes all the way to the ceiling, and to the wall (consult technical manual AIR 2-104 for availability).

Installation

The recommended procedure for installation is described as follows:

1. Mount the filler panel by using sheet metal screws (by others) through mounting holes on flanges (see Figure 20.3). Be sure to use a minimum of one screw, on two different sides for proper installation of each panel, even if you are not able to use holes provided.

Figure 16.2 - Filler Panel



FLOORSTAND (Optional)

Instructions only applicable to accessories sold by Modine. If not provided by Modine, consult manufacturer's recommendations.

The field installed floorstand is designed to be installed below the unit to move the unit to match existing sill heights (consult technical manual AIR 2-104 for availability).

Installation

The recommended procedure for installation is described as follows:

1. Reference unit installation steps on page 3, steps 1 and 2.
2. Floorstand must be secured to the floor. The floorstand has four pre-punched holes. The type of materials used for the floor will determine the type of fastener to use. Modine recommends the use of 1/2" diameter fasteners with 1-1/2" diameter washers. Securing the floorstand to the floor helps to reduce movement and noise due to vibration.
3. Unit needs to be installed to the floorstand, per instructions on page 3, use mounting hardware supplied by the factory.

MAINTENANCE

MAINTENANCE

WARNING

When servicing or repairing this equipment, use only factory-approved service replacement parts. A complete replacement parts list may be obtained by contacting Modine Manufacturing Company. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.

CAUTION

Do not attempt to reuse any mechanical or electrical component which has been wet. Such component must be replaced.

IMPORTANT

To check most of the Possible Remedies in the troubleshooting guide listed in Table 23.1, refer to the applicable sections of the manual.

The routine care and maintenance of this unit will increase longevity, provide for the proper operational performance, and reduce the probability of failure.

Once the unit is operational, it will be necessary to perform certain routine maintenance/service checks. Following is a Maintenance Schedule with the recommended checks. If your unit is equipped with special features, there may be additional checks that are required. Consult Modine for assistance.

The use of torque screwdrivers on panel, cover or component mounting screws is not recommended. Hand-start all screws. If electric drills are used – set at the lowest possible torque.

Access

1. Access to the unit is gained by opening the door using the Modine door key that is provided.
2. Access to the optional powered exhaust fan is gained by removal of the sound trap panel in the bottom section of the unit.
3. Access to the supply fan is gained by carefully swinging open the control panel.

Maintenance Schedule

Every THREE (3) MONTHS

Change the main filters, by sliding the filter out of the track. The filters are positioned under the indoor coil. Never run the unit without filters.

Every SIX (6) MONTHS

(Before the heating and cooling season)

1. With the Disconnect Switch in the "OFF" position, inspect all electrical circuits for loose connections and signs of overheating, arcing, chafing or other physical damage. The electrical control section should also be wiped clean of all dirt that may affect the unit operation.
2. Check for correct fan operation, no excessive noise or vibrations.
3. Wash the outside air filters (energy recovery wheel or economizer filters (Optional).
4. Check the electric heat (Optional). See procedure below.
5. Wash down the cabinet using mild detergent and treat any paint damage or rust as necessary.
6. Check the control wiring and sensors. Check the operation and sequencing of controls and ensure that all relevant set points are recorded.

Every EIGHTEEN (18) MONTHS

1. Clean the Energy Recovery Wheel. See procedure below.

Energy Recovery Wheel (Optional)

The Energy Recovery Wheel is mounted in a fully assembled cartridge for easy installation, removal and maintenance. Rotary counterblow heat exchangers (heat wheels) with laminar airflow are "self cleaning" with respect to dry particles. Small particles may pass through, while larger particles that land on the surface are blown clear as the flow direction is reversed. For this reason, the primary need for cleaning is to remove films of oil based aerosols that have condensed on energy transfer surfaces.

1. Remove the bolts holding the ERV assembly to the right hand and left hand side panels and lower sound panel section. Disconnect the ERV plug and socket and slide the entire assembly out of the unit. It is recommended that two people are used for this operation.
2. Remove the top panel of the ERV assembly and disconnect the wheel motor plug and socket. Lift the wheel (attached to plate), top edge first, out of the ERV assembly. After detaching the wheel belt, unscrew the wheel fasteners and crossbar and remove the wheel from the plate.
3. Clean the wheel according to the Cleaning Airxchange Energy Recovery Wheels instructions available on the Airxchange website: www.airxchange.com.

Electric Heat (Optional)

1. Check that the electrical connections are secure.
2. Check the operation of the electric heaters.
3. Check the operation of the manual and auto-reset overheat cut-out switches. The auto-reset overheat cut-out switch opens at 130°F and the manual reset overheat cut-out switch opens at 180°F.

MAINTENANCE

REPLACEMENT PARTS

For ease of identification when ordering replacement parts or contacting the factory about your unit, please quote the unit type and unit serial number. This information can be found on the serial plate attached to your unit (see Figure 21.2).

When a component part fails, a replacement part should be obtained through our Parts Department. If the part is considered to be under warranty, the following details are required to process this requirement:

1. Full description of part required, including Unit's part number, if known.
2. The original equipment serial number.
3. An appropriate purchase order number.

Figure 18.1 - Model Number Designations

Sentinel® - MODEL NOMENCLATURE

1,2	3	4,5	G	7	8	9	10	11	12,13	14	15	16	17	18,19	20
PT	CC	MBH	SV	G	C	VC	F	CG	DM	PA	CO	HO	HP	EH	PC

1,2 - Product Type (PT)

UV - Sentinel

3 - Cooling Control (CC)

V - Valve Control - Blow Thru
D - Face & Bypass - Draw Thru
F - Face & Bypass - Blow Thru

4,5 - Nominal Capacity (MBH)

30 - 30,000 Btu/hr
40 - 40,000 Btu/hr
50 - 50,000 Btu/hr
60 - 60,000 Btu/hr

6 - Supply Voltage (SV)

A - 115/60/1
B - 208/60/1
C - 230/60/1
H - 277/60/1

7 - Generation (G)

A - Current Design

8 - Control (C)

M - Modline Control System
F - Factory Installed Free Issue
B - By Others - Field Installed

9 - Ventilation Configuration (VC)

A - Economizer with No Exhaust
B - Economizer with Gravity Exhaust
C - Economizer with powered exhaust
D - ERV with OA Damper (Digit 3 = V only)
E - ERV with OA Damper & Economizer (Digit 3 = V only)

10 - Filtration (F)

A - MERV 8 (Standard)
B - MERV 11
C - MERV 13

11 - Case Gauge (CG)

A - 20Ga (Standard)
B - 16Ga

12 - Door Mounted Stat (DS)

N - None
V - Vertical Stat
H - Horizontal Stat

13 - Door Mounted Other (DO)

N - None
K - Key Over-ride
S - Occupancy Sensor
L - Indicator Light
T - Twist Timer

14 - Piping Arrangement (PA)

2 - 2 Pipe
4 - 4 Pipe

15 - Cooling Option (CO)

0 - None
3 - 3-row coil
4 - 4-row coil

16 - Heating Option (HO)

0 - None
1 - 1-row coil
2 - 2-row coil
3 - 3-row coil
4 - 4-row coil
9 - 1-row steam coil

17 - Heating Position (HP)

N - Not Applicable
R - Reheat

18,19 - Electric Heat (EH)

00 - None
02 - 2 kW (1-stage)
03 - 3 kW (1-stage)
04 - 4 kW (1-stage)
05 - 5kW (1-stage)
06 - 6 kW (2-stage)
07 - 7 kW (2-stage)
08 - 8 kW (2-stage)
09 - 9 kW (2-stage)
10 - 10 kW (2-stage)

20 - Piping Connections (PC)

T - Top Connections
B - Bottom Connections

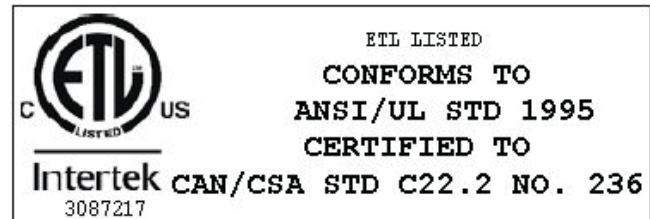
Figure 18.2 - Serial Plate EXAMPLE



Airedale
1500 DeKoven Avenue
Racine, WI 53403-2552
Phone: 1-866-823-1631

SENTINEL UNIT

MODEL NUMBER / NUMERO DE MODELE UVV40AABCABNN441R00T	OPTIONAL ITEMS: HOT WATER COIL: MAX TEMP PRESSURE 200 F 125 PSIG
SERIAL NUMBER / NUMERO DE SERIE 242877S9999-9999	STEAM COIL: MAX TEMP PRESSURE 300 F 50 PSIG
VOLTS / PHASE / HZ 115V/1Ph/60Hz	ELECTRIC REHEAT: CAPACITY AMPS n/a kW n/a A
EXHAUST FAN MOTOR 6.2 FLA 1/2 HP	EH FREEZE PROTECT: CAPACITY AMPS n/a kW n/a A
SUPPLY FAN MOTOR 6.2 FLA 1/2 HP	ENERGY WHEEL n/a A n/a HP
WIRING DIAGRAM 8H007186-9999	CIRCULATING PUMP n/a A n/a HP
CONDENSATE PUMP n/a FLA n/a HP	
ELECTRICAL RATINGS	
FLA	MCA
12.4A	14.0A
MOP	
20.0A	
MAXIMUM EXTERNAL STATIC PRESSURE PRESSION STATIQUE EXTERIEUR MAXIMUM 0.25 INWC PO. CD'E	
CLEARANCE TO COMBUSTIBLE MATERIAL DÉGAGEMENT DE MATIÈRES COMBUSTIBLES 0 INWC PO	



5H101919B, REV. F

TROUBLESHOOTING

Figure 19.1 - Troubleshooting - General

Trouble	Possible Cause	Possible Remedy UV
A. Unit Not Operating - Power On	1. Unit mounted disconnect in the "OFF" position.	1. Turn the disconnect switch to the "ON" position.
	2. Unit mounted 3-speed selector switch in the "0" position.	2. Turn the 3-speed selector switch to the "1, 2, or 3" position.
	2. Unit switched OFF in the microprocessor.	2. Consult microprocessor documentation.
	3. Delay on start set incorrectly.	3. Consult microprocessor documentation.
	4. Unit not in occupied mode.	4. Consult microprocessor documentation, and consult microprocessor occupied setpoints.
	5. Fire/smoke alarm tripped.	5. De-energize and re-energize unit.
	6. Tripped circuit breakers.	6. Reset the tripped circuit breaker(s).
	7. Loose mains or control wiring.	7. With power OFF from distribution panel inspect the field wiring connections in the electrical panel.
	8. Occupancy sensor malfunction.	8. Inspect connections beginning with sensor input from the microprocessor.
9. Hot water freeze protection (optional) stat tripped.	9. Manually reset at stat.	
B. Unit Operating - No Mechanical Heating/Cooling	1. Heating/cooling not required.	1. Verify applicable set point with return air temperature.
	2. No output from microprocessor.	2. Consult microprocessor documentation.
	3. Loose control wiring connections.	3. Inspect connections beginning with compressor output from the microprocessor.
	4. Tripped circuit breakers.	4. Reset the tripped circuit breaker(s).
	5. Low temperature unit lockout.	5. Consult microprocessor setpoints.
	6. Condensate pan/pump float switch tripped.	6. Check condensate pan/pump and piping for blockage.
C. No Indoor Fan	1. Motor tripped on internal overload.	1. Let motor cool down and reset - possible bad motor or blocked filter.
	2. Fan not required	2. Consult microprocessor documentation, or set thermostat to "ON". Check if unit is in unoccupied and standby mode.
	3. No power to the fan.	3. Check to make sure plugs are locked in place and all pins are secure. Check for 24V control signal.
	4. Current sensor fault.	4. Make sure sensor is functioning correctly.
D. Electric Heat Not Operation (Optional)	1. Electric heat not required.	1. Consult microprocessor documentation.
	2. Faulty electric heat relay.	2. Check operation of relay and wiring connections.
	3. Automatic or Manual reset overheat cutout switch is tripped (open).	3. The manual switch requires manual reset. Check automatic reset switch is closed. Check current draw of heating elements and compare to nameplate. Check location of sensing probe. To avoid incidental tripping of switch, do not power off unit in electric heating mode. Check for dirty filters and confirm correct airflow.
	4. Faulty heating element(s).	4. Replace elements as necessary.
E. Hot Water / Chilled Water Valve Not Operational (Option)	1. Heating not required.	1. Consult microprocessor documentation.
	2. Loose wiring connections.	2. Inspect connections beginning with valve output from the microprocessor. Check to ensure 24V supply power is present at actuator.
	3. Faulty heating actuator.	3. Replace actuator if faulty.
	4. Isolation valves are open.	4. Check for additional external isolation valves.
	5. Check for DC control signal.	5. Check for 2-10vDC signal from microprocessor.
F. Condensate Leaking	1. Condensate drain not piped up.	1. Pipe condensate drain.
	2. Condensate pan/line plugged.	2. Clean drain pan and piping.
	3. Condensate pump (optional) faulty.	3. Check operation of condensate pump. Replace pump if necessary.
G. Microprocessor Not Working - Faulty Operation	1. Loose sensor wire connectors.	1. Inspect sensor connections at the microprocessor.
	2. Strategy file corrupted.	2. Consult microprocessor documentation.
	3. Loose control wiring.	3. Check 24V power supply wiring.

COMMERCIAL WARRANTY

Seller warrants its products to be free from defects in material and workmanship, EXCLUSIVE, HOWEVER, of failures attributable to the use of materials substituted under emergency conditions for materials normally employed. This warranty covers replacement of any parts furnished from the factory of Seller, but does not cover labor of any kind and materials not furnished by Seller, or any charges for any such labor or materials, whether such labor, materials or charges thereon are due to replacement of parts, adjustments, repairs, or any other work done. This warranty does not apply to any equipment which shall have been repaired or altered outside the factory of Seller in any way so as, in the judgment of Seller, to affect its stability, nor which has been subjected to misuse, negligence, or operating conditions in excess of those for which such equipment was designed. This warranty does not cover the effects of physical or chemical properties of water or steam or other liquids or gases used in the equipment.

BUYER AGREES THAT SELLER'S WARRANTY OF ITS PRODUCTS TO BE FREE FROM DEFECT IN MATERIAL AND WORKMANSHIP, AS LIMITED HEREIN, SHALL BE IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, WHETHER ARISING FROM LAW, COURSE OF DEALING, USAGE OF TRADE, OR OTHERWISE, **THERE ARE NO OTHER WARRANTIES, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE, WHICH EXTEND BEYOND THE PRODUCT DESCRIPTION CONFIRMED BY BUYER AND SELLER AS OF THE DATE OF FINAL AGREEMENT.**

This warranty is void if the input to the product exceeds the rated input as indicated on the product serial plate by more than 5% on gas-fired and oil-fired units, or if the product in the judgment of SELLER has been installed in a corrosive atmosphere, or subjected to corrosive fluids or gases, been subjected to misuse, negligence, accident, excessive thermal shock, excessive humidity, physical damage, impact, abrasion, unauthorized alterations, or operation contrary to SELLER'S printed instructions, or if the serial number has been altered, defaced or removed.

BUYER AGREES THAT IN NO EVENT WILL SELLER BE LIABLE FOR COSTS OF PROCESSING, LOST PROFITS, INJURY TO GOODWILL, OR ANY OTHER CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND RESULTING FROM THE ORDER OR USE OF ITS PRODUCT, WHETHER ARISING FROM BREACH OF WARRANTY, NONCONFORMITY TO ORDERED SPECIFICATIONS, DELAY IN DELIVERY, OR ANY LOSS SUSTAINED BY THE BUYER.

BUYER'S REMEDY FOR BREACH OF WARRANTY, EXCLUSIVE OF ALL OTHER REMEDIES PROVIDED BY LAW, IS LIMITED TO REPAIR OR REPLACEMENT AT THE FACTORY OF SELLER, ANY COMPONENT WHICH SHALL, WITHIN THE APPLICABLE WARRANTY PERIOD DEFINED HEREIN AND UPON PRIOR WRITTEN APPROVAL, BE RETURNED TO SELLER WITH TRANSPORTATION CHARGES PREPAID AND WHICH THE EXAMINATION OF SELLER SHALL DISCLOSE TO HAVE BEEN DEFECTIVE; EXCEPT THAT WHEN THE PRODUCT IS TO BE USED BY BUYER AS A COMPONENT PART OF EQUIPMENT MANUFACTURED BY BUYER, BUYER'S REMEDY FOR BREACH, AS LIMITED HEREIN, SHALL BE LIMITED TO ONE YEAR FROM DATE OF SHIPMENT FROM SELLER. FOR GAS-FIRED PRODUCTS INSTALLED IN HIGH HUMIDITY APPLICATIONS AND UTILIZING STAINLESS STEEL HEAT EXCHANGERS, BUYER'S REMEDY FOR BREACH, AS LIMITED HEREIN, SHALL BE LIMITED TO TEN YEARS FROM DATE OF SHIPMENT FROM SELLER.

These warranties are issued only to the original owner-user and cannot be transferred or assigned. No provision is made in these warranties for any labor allowance or field labor participation. Seller will not honor any expenses incurred in its behalf with regard to repairs to any of Seller's products. No credit shall be issued for any defective part returned without proper written authorization (including, but not limited to, model number, serial number, date of failure, etc.) and freight prepaid.

OPTIONAL SUPPLEMENTAL WARRANTY

Provided a supplemental warranty has been purchased, Seller extends the warranty herein for an additional four (4) years on certain compressors.

Provided a supplemental warranty has been purchased, Seller extends the warranty herein for an additional four (4) years or nine (9) years on certain heat exchangers.

EXCLUSION OF CONSUMABLES & CONDITIONS BEYOND SELLER'S CONTROL

This warranty shall not be applicable to any of the following items: refrigerant gas, belts, filters, fuses and other items consumed or worn out by normal wear and tear or conditions beyond Seller's control, including (without limitation as to generality) polluted or contaminated or foreign matter contained in the air or water utilized for heat exchanger (condenser) cooling or if the failure of the part is caused by improper air or water supply, or improper or incorrect sizing of power supply.

<u>Component</u> Applicable Models	"APPLICABLE WARRANTY PERIOD"
<u>Heat Exchangers</u> Gas-Fired Units except PSH/BSH	TEN YEARS FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN TEN YEARS FROM DATE OF RESALE BY BUYER OR ANY OTHER USER, WITHIN TEN YEARS FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN ONE HUNDRED TWENTY-SIX MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST
<u>Heat Exchangers</u> Low Intensity Infrared Units <u>Compressors</u> Condensing Units for Cassettes	FIVE YEARS FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN FIVE YEARS FROM DATE OF RESALE BY BUYER OR ANY OTHER USER, WITHIN FIVE YEARS FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN SIXTY-SIX MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST
<u>Burners</u> Low Intensity Infrared Units <u>Other</u> Components excluding Heat Exchangers, Coils, Condensers, Burners, Sheet Metal	TWO YEARS FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN TWO YEARS FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN THIRTY MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST
<u>Heat Exchangers/Coils</u> Indoor and Outdoor Duct Furnaces and System Units, PSH/BSH, Steam/Hot Water Units, Oil-Fired Units, Electric Units, Cassettes, Vertical Unit Ventilators, Geothermal Units <u>Compressors</u> Vertical Unit Ventilators, Geothermal Units <u>Burners</u> High Intensity Infrared Units <u>Sheet Metal Parts</u> All Products	ONE YEAR FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN ONE YEAR FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN EIGHTEEN MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST

As Modine Manufacturing Company has a continuous product improvement program, it reserves the right to change design and specifications without notice.



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