

Installation, Maintenance & Start-Up Instructions

FOR YOUR SAFETY

If you smell gas:

1. Open all windows
2. Do not touch any electrical switches
3. Extinguish any open flame, and
4. Call your gas supplier-immediately

FOR YOUR SAFETY

The use and storage of gasoline and other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

WARNING

Gas-fired appliances are not designed for use in atmospheres containing flammable vapors or dust, or atmospheres containing chlorinated or halogenated hydrocarbons.

OUTDOOR HEATERS

Those heaters to be installed outdoors must have the Inlet Rain Hood option or other means of weather protection, whether provided with MAU manufacturer or others.

HAZARD INTENSITY LEVELS

- DANGER:** Failure to comply will result in severe personal injury or death.
- WARNING:** Failure to comply can result in minor personal injury or death.
- CAUTION:** Failure to comply could result in minor personal injury or property damage.

AIRCRAFT HANGER INSTALLATION

This heating unit is listed for use in Aircraft Hangers when installed, as applicable, in accordance with ANSINFPA 409 "Standard on Aircraft Hangers:" NFPA 54 "National Fuel Gas Code" and NFPA 90A Installation of Air Conditioning and Ventilating System".

Before installing this equipment as a recirculating, suspended or elevated heater for aircraft hanger use, refer to ANSI / NFPA 409 "Aircraft Hangers," Chapter 9-I for clearance and specific installation instructions.

PARKING STRUCTURE and REPAIR GARAGE INSTALLATION

This heating unit is listed for use in Parking Structures and Repair Garages when installed, as applicable, in accordance with NFPA 88A "Standard for Parking Structures." NFPA 54 "National Fuel Gas Code" and NFPA 90A "Installation of Air Conditioning and Ventilating System."

Before installing this equipment as a suspended or recirculating heater in a parking structure or repair garage, refer to NFPA 88A, Chapter 4-2 and NFPA 88B, Chapter 3-2 for clearance and specific installation instructions.

Installer

Please take the time to read and understand these instructions prior to any installation. Installer must give a copy of this manual to the owners.

Owner

Keep this manual in a safe place in order to provide your serviceman with necessary information.

Instructions d'installation , d'entretien et de start-up

FOR YOUR SAFETY

Si vous sentez une odeur de gaz :

1. ouvrir toutes les fenêtres
2. ne touchez pas de commutateurs électriques
3. Éteignez toute flamme nue, et
4. Appelez votre fournisseur de gaz-immédiatement

POUR VOTRE SÉCURITÉ

L'utilisation et le stockage de l'essence et d'autres des vapeurs inflammables et des liquides dans l'ouvert conteneurs à proximité de ce appareil est dangereux

CHAUFFE-TERRASSE

Une mauvaise installation, adaptation, altération, service ou entretien peut causer la propriété dommages, des blessures ou la mort. Lire l'installation, instructions d'utilisation et d'entretien soigneusement avant d'installer ou de réparer cet appareil.

AVERTISSEMENT

Appareils au gaz ne sont pas conçus pour une utilisation dans atmosphères contenant des vapeurs inflammables ou poussières, ou atmosphères contenant chlorés ou halogénés des hydrocarbures .

PLEIN AIR CHAUFFE

Ces chauffe-eau doit être installé à l'extérieur doit avoir la Option Rain Hood d'admission ou autres moyens de météo protection, qu'ils soient fournis avec le fabricant MAU ou autres

NIVEAUX DE DANGER INTENSITÉ

DANGER:	Le non-respect entraînera de graves des blessures ou la mort.
AVERTISSEMENT:	Le non-respect peut entraîner la mineur des blessures ou la mort.
MISE EN GARDE:	Le non-respect peut entraîner de mineur des blessures corporelles ou dommages matériels.

AVIONS DE SUSPENSION D'INSTALLATION

Ce foyer est inscrite pour une utilisation en avion cintres lorsque installé, le cas échéant, conformément à l'ANSINFPA 409 "Standard sur des cintres de l'avion:" NFPA 54 "National Fuel Code du gaz » et NFPA 90 a l'Installation de climatisation et de ventilation" .

Avant d'installer cet équipement comme une recirculation, chauffage suspendu ou élevée verser avion cintre utilisation, se référer à la norme ANSI / NFPA 409 « Avion cintres, » chapitre 9-J'ai pour l'espacement et les instructions d'installation.

PARKING ET LE Garage automobile INSTALLATION

Ce foyer est répertorié pour utilisation dans la construction de Parking et Garages de réparation lorsque installé, le cas échéant, en conformément à la norme NFPA 88 a "Standard pour Parking Ouvrages d'art. » NFPA 54 « National Fuel Gas Code » et NFPA 90 a "Installation de la climatisation et système de ventilation."

Avant d'installer cet équipement comme une suspension ou radiateur dans un garage de stationnement de structure ou de réparation, de recirculation se référer à la norme NFPA 88 a, chapitre 4-2 et NFPA 88 b, chapitre 3-2 pour l'autorisation et les instructions d'installation.

Installer

Veillez prendre le temps de lire et comprendre ces mode d'emploi avant toute installation. Installateur doit remettre une copie de ce manuel pour les propriétaires.

Propriétaire

Gardez ce manuel dans un endroit sûr afin de fournir vos militaire avec les informations nécessaires.



Customer: _____

Sales Representative: _____

Model Number: _____

Serial Number: _____

Field Start-Up Sheet

Direct Gas Fired Equipment

Please Print

INITIAL INSPECTION

I. Installer Responsibilities

- Remote Panel: All interconnecting wires run from remote to unit Yes
DFM Cat 5 Cable run in a separate conduit
Temperature control interconnect wires to remote ran in: Shielded Cable Separate Conduit
Remote Panel Location: Inside Wall Outside Wall _____ Feet From Unit (approx.)
NOTE: If the Remote to Main Panel Interconnect Wiring is over 200' Long, Please Consult Factory
- Indoor Return Air Unit: Building Pressure Switch Tubing for "Low-Tap" is run outdoors Yes
- Outdoor Return Air Unit: Building Pressure Switch Tubing for "High-Tap" is run indoors Yes
- Gas supply run connected with proper gas pressure regulator and drip leg Yes
- R-Series Models: Mix tube wiring installed Smoke Dectector wiring installed Discharge Damper wiring installed
- Electrical Supply properly installed to main panel, at the voltage and amperage as stated on the unit nameplate Yes
- Multi-section units: joints caulked at mating frames, all bolts and nuts installed and tightened, seam tape applied Yes
- Upright Units: Legs attached and bolted, shimmed properly so unit does not "rock" Yes
- Duct connections made and sealed properly Yes Return air screen installed at building wall Yes
- Discharge head installed secure, with diffuser blades tightened and in the open position Yes
- All "shipped loose" items installed properly - filters, vibration isolators, smoke detectors, dampers, louvers, service lights supply fan belts, service platform, roof curb, humidistat, CO detector, etc. Yes
- All paint scratches have been properly touched-up Yes
- Check all electrical connections on all components for tightness including motor connections. Yes

Comments: _____

II. Miscellaneous Items

- Visible Physical Damage? _____ NO IF YES, Specify _____
- Type of Installation: Outdoor Indoor Roof Curb Platform Post Suspended Upright
- Hardware Tight & Secure _____
- Damper Linkages Secure _____

Comments: _____

III. Fan & Motor Sheaves

- ___ Fan & Motor Sheaves Secured Tightly to Shafts
- ___ V-Belts Aligned Properly
- ___ Fan Bearing Set screws Tight
- ___ Fan Motor: Manufacturer _____
- ___ Fan Hub Set Screws Tight
- ___ Fan Sheave size: _____
- ___ V-Belts Tensioned Properly
- ___ Fan Bearing Mounting Bolts Tight
- HP _____ FLA _____ Frame Size _____
- ___ Motor Wiring Connections Tight

Comments: _____

IV. Burner Inspection

- ___ Spark Igniter Secured Properly
- ___ Flame Rod Secured Properly
- ___ Ignition Wire Attached at Igniter & Transformer
- ___ UV Scanner Secured Properly
- ___ Pilot Line Fittings Tight
- ___ Unions Tight and Secure

Comments: _____

V. Gas Manifold & Vent Piping

1. Manifold Assy. Components Tight & Securely Mounted 3. Vent Screens Installed (if required)
2. Vent Piping Run to Outdoors (some indoor models) 4. Tighten Fittings and Components as Necessary

Comments: _____

VI. Filters

1. Filters Installed Properly 2. Type: Aluminum Pleated 30% Pad & Frame Other _____

Comments: _____

VII. Electric Service

1. Electrical Service Provided to Unit: _____ Volts _____ Phase _____ Hertz _____ Amps
2. Unit Nameplate Electrical Requirement: _____ Volts _____ Phase _____ Hertz _____ Amps
3. Terminal Strip Wires Tight: Main Panel Yes Remote Panel Yes
4. Componentry and Relays Mounted Securely in Place Yes
5. Light Bulbs Installed in Sockets for Control Enclosure Lighting Yes
6. Main Fusing Size: _____ Volts _____ Amps 6. Overload Relay Setting _____
7. The Unit has been grounded by the installer at the main unit panel Yes

Comments: _____

VIII. Gas Service

(See maximum and minimum gas pressure requirements on unit rating plate)

1. Natural Gas LP Gas Service Pressure: _____ " W.C. -or- _____ Oz. -or- _____ Lbs
2. Manual Gas Shut-off Cock in line-of-sight Yes No 3. Handle Present on Manual Shut-off Cock Yes No

VERIFICATION OF OPERATION

**NOTE: Refer to the Sequence of Operation & Wiring Diagram in the Owners Manual for specific data on this unit.
See Factory Start-up & Test Sheet in the Unit Owners Manual to note the unit settings prior to shipment.**

I. Fan Operation

1. The Inlet Damper is fully open when fan comes on Yes NA Discharge Damper operates properly Yes NA
2. The low-temperature limit switch is field set at _____°F. (Factory set at 40°F.)
3. The low-limit by-pass timer completes its cycle in _____ minutes _____ seconds (normal: 5 minutes)
4. Fan Rotation is in the same direction as the rotation arrow Yes Fan RPM _____
5. Discharge External Static Pressure Rating Plate _____ W.C. Actual _____ W.C.
6. Check the following:

Unit Off	Fan Running (Burner Off)	
A-B _____ Volts	A-B _____ Volts _____ Amps	Verify the motor running
B-C _____ Volts	B-C _____ Volts _____ Amps	amps does not exceed the
A-C _____ Volts	A-C _____ Volts _____ Amps	motor nameplate FLA

7. Approximate Outdoor Air Temperature _____° F

II. Burner Operation

1 – Enter "Gas Pressure Required at Burner for Max Rated Capacity" found on rating plate: _____ "w.c.

3 – The resulting pressure (_____ "w.c.) is the net pressure reading required at the BGPT during High Fire

2 – Subtract the Negative pressure measured at BGPT when just the fan is operating: _____ "w.c.

Forcing High Fire

Δ- Max14 system – disconnect wire 29
Δ-DFM system – jumper wires 29 and 30

Δ- Max44 system – disconnect wires 24 and 29
Δ- Signal conditioner – full mA or VDC signal

Example: 4.6" w.c. on rating plate – 1.2" w.c. burner suction (measured with just fan running = 3.4" w.c. net measured at the BGPT.

4. The Profile Pressure Drop is _____ " W.C. (measured using High & Low pressure ports)
5. The Burner Suction Static Pressure is _____ " W.C. (measured at the manifold pressure tap with unit fan on and gas off)
6. The Burner High Fire Pressure is _____ "W.C. (measured as above, but with fan and gas on, and unit in forced high fire)
7. The Service Pressure with burner *in high fire* is : _____ " W.C. -or- _____ Oz. -or- _____ Lbs
8. The High Temperature Limit Switch is field set to _____ °F (maximum recommended setting is 150°F)
9. The Low Gas Pressure Limit Switch is field set to _____ " WC (factory set at 3" WC)
10. The High Gas Pressure Limit Switch is field set to _____ " WC (factory set at 1.5" WC above the high fire pressure)
11. The Pilot Flame should be the approximate size of a baseball Yes (adjust as needed)
12. Set the burner low-fire gas pressure so there is a continuous "ribbon" of flame approximately 1" wide across face of burner
13. Flame Relay. If a Honeywell model, it should read **1.25 to 5.0 VDC** at terminals marked (+ -) on the flame relay face, if Fireye, it should read **4.0 to 10.0 VDC** at terminals marked (+ -) on the flame relay face
14. Mild Weather Stat (optional) trips the burner when outside air temp is higher than the stat set point Yes, _____°F Set (factory setting is 65°F)

III. Space Temperature Control Systems (Maxitrol 44 and DFM Series)

1. Modulating Regulator Valve ("MR Valve"): Voltage at Low Fire _____ VDC Voltage at High Fire _____ VDC
2. The Minimum Discharge Temperature is field set at _____ °F (factory set at 55°F)
3. The Maximum Discharge Temperature is field set at _____ °F (factory set at 95°F, Maximum setting is 120°F)
4. Burner responds to demand for heat from Room Temperature Selector in remote panel Yes
5. Check calibration of the minimum/maximum discharge temperature control. Adjust if necessary.
6. Operation of Occupied/Unoccupied Switch (if applicable) or time clock verified Yes
7. Is there evidence of temperature hunting? Yes ** No

IV. Discharge Temperature Control Systems (Maxitrol 14 Series)

1. Modulating Regulator Valve ("MR Valve"): Voltage at Low Fire _____ VDC Voltage at High Fire _____ VDC
2. Check calibration of the Discharge Air Temperature Selector. Adjust if necessary.
3. Is there evidence of temperature hunting? Yes ** No

V. Space Temperature Control System (BMS or Internal DDC)

1. Input signal from BMS 0-10 4-20mA

**** Refer to the Maxitrol Troubleshooting Guide in the Owners Manual for further instructions**

VI. Damper Control Options

Manual Pot Control:

1. With the manual pot set to zero (0%), the outdoor air damper is closed and the return air damper is open. Yes
2. With the manual pot set to 100%, the outdoor air damper is open and the return air damper is closed. Yes
3. The manual pot was left set at _____% and the owner was instructed on its operation by me. Yes

Building Pressure Control:

1. The differential setting on the building pressure switch is field set at _____ " WC (Typical is .01 - .03" WC)
2. By opening a building door or turning on an exhaust fan in the building, the unit pressure switch calls for more outside air (OA), causing the OA damper to open, and the return air (RA) damper to close. When the building door is closed, or the exhaust fan turned off, the OA and RA dampers react opposite. Yes

Comments: _____

VII. Variable Frequency Drive Operation

1. Does VFD respond to BPS Pressure Transmitter Manual Pot
2. Does the burner profile stay within airflow parameters when the fan ramps up and ramps down Yes No

VIII. Miscellaneous Operational Checks:

1. With the unit fan and burner operating, all of the circuit check lights are illuminated (except the burner lock-out pilot light and the low temperature switch pilot light) Yes
2. If furnished, the time clock has been programmed per owner instructions, and training provided to him by me Yes
3. If provided, the following temperature control stats have been set by me, and instructions provided to the owner:
 _____ Cycle Stat _____ Cool-down Stat _____ Mild Weather Stat _____ Freeze Stat
4. The electrical drawing and sequence of operation is taped to the enclosure door. Yes
5. The owner's manual was reviewed by me with the owner, and placed back inside the unit enclosure Yes
6. The owner was instructed by me on the operation of the following controls and options (check those that apply):

- Keyed Switches on remote panel
- Remote Reset for Flame Relay
- Burner Alarm Horn
- Natural Gas/Propane Changeover Switch
- CO Detector
- Photohelic Gauge
- Dirty Filter Light/Alarm
- Fan Bearing Grease Type & Lube Cycle
- Exhaust Cycle Operation
- Discharge Head Deflection Blade Adjustment
- Burner Maintenance
- _____

- Maxitrol 44 Space Temperature Selector
- Maxitrol 14 Discharge Temperature Selector
- 3-phase Power Monitor
- Smoke Detector
- Magnehelic Gauge
- 120V GFI Outlet
- Evaporative Cooler
- Filter Maintenance
- Internal By-Pass Operation
- Coil Maintenance
- Spray/Bake Control Operation
- _____

Comments

THE ABOVE START-UP WAS PERFORMED BY

Company Name: _____ Date: _____
 Phone Number: (_____) - _____ Fax Number: (_____) - _____
 My Name (Service Tech) _____

- MAKE A COPY FOR YOUR FILES AS NECESSARY

The Owner Representative that I met with and discussed the unit controls and operation was:

NAME: _____ **TITLE:** _____
 (Please Print)

CUSTOMER'S AUTHORIZED SIGNATURE

I acknowledge that I have been instructed on the operation of this unit:

Signature _____ Date: _____ Phone No. _____

After Completion, Return this start-up sheet to:

AbsolutAire, Inc.

5496 North Riverview Drive

Kalamazoo, MI 49004

Phone (800) 804-4000 Fax (269) 382-5291

website: www.absolutaire.com

email: customerservice@absolutaire.com

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ABSOLUTAIRE, INC.

5496 North Riverview Drive / Kalamazoo, MI 49004

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**GENERAL INSTALLATION INSTRUCTIONS
DIRECT-FIRED GAS HEATING AND MAKE-UP AIR UNITS**



The following recommendations are not intended to replace or void any requirements of federal, state or local codes having jurisdiction. All local authorities having jurisdiction should be consulted before installation is made. The heater should be installed and piped in accordance with the requirements of the National Fuel Gas Code, NFPA 54, and all wiring must be in accordance with the National Electrical Code, NFPA 70 current edition.

Inspect the unit for visible damage. The unit was thoroughly inspected before leaving the factory, and the carrier has accepted and signed for it. Any damage or irregularities should be noted at the time of delivery and immediately reported to the delivery carrier. Request a written inspection report from the Claims Inspector to substantiate any necessary claim. File the claim with the delivery carrier, not with AbsolutAire, Inc.

Further inspect the unit as follows:

- A) Unlatch and open Unit Access Doors. Inspect for internal damage.
- B) Remove and inspect all loose-shipped items, including remote mount control panel. Make certain all items are undamaged.

If questions or complications should arise regarding the application or installation of the AbsolutAire Air Handling System, that cannot be solved by using these instructions, our Maintenance Guidelines, or the Troubleshooting Guide, please feel free to contact us at (800) 804-4000.

It is the responsibility of the installing contractor to see that the unit is installed within the manufacturers design parameters, as stated on the rating plate, and that the start-up procedure specified by the manufacturer is followed. Failure to comply may void our warranty and/or the component manufacturer's warranty.

INSTALLATION

Inspect the blower wheels, shaft and motor for any shipping blocks which must be removed before operation.

ROOFTOP/CURB MOUNTED

For a unit that discharges downward through a curb, locate the required opening for connecting ductwork. Cut through roof deck for connection of duct to blower discharge. Allow adequate, at least one inch, clearance on all sides between ductwork and decking material. Position the curb on the roof in relation to the roof penetration, as shown on the blueprint. Secure the curb to the structural members. The curb may now be flashed into the roof. Roof top, down discharge units are provided with a skirt that is larger than the curb on all sides. This allows for roofing up to the top of the curb, if so desired. On applicable "AA"



or “V” models, attach the furnished support legs to the intake end of unit, one on each side. The unit may now be lifted up onto the curb.

NOTE: Units which discharge down through the curb with discharge dampers must have the roof opening cut large enough to allow access to the damper motor and linkage from below the roof. The damper should be mounted and motor wired with pigtail provided before the unit is set on the curb.

NOTE: We recommend the connection of a short length of ductwork to the unit before setting on the curb to extend through the roof if minimum (1") clearance is being used around the duct.

PAD MOUNTED

For a unit designed to mount on a pad or other support and discharge horizontally, vibration isolators are recommended. A channel iron support adequate to carry the weight of the unit must be secured to the bottom of the unit, one at each end, extending at least 3" past the sides of the unit. On standard "AA" models, four vibration isolators will be used, one for each corner of the unit. On some "AA" models, and all “R” models, refer to your submittal or record drawing for size, quantity, and location of isolators. Anchor the vibration isolators to the pad. The unit may now be set down onto the isolators and bolted to them.

INDOOR/SUSPENDEDED

For a unit designed to be suspended within the building, hanger rods and channel iron adequate to support the weight of the unit will be required. On standard "AA" models, the channel iron must be secured to the bottom of the unit, one at each end, extending at least 3" past the sides of the unit. On some "AA" models, and all “R” models, refer to your submittal or record drawing for size, quantity, and location of channel iron and isolators. Attach the hanger rods to the building structure so they hang down to the channel extensions under the unit. Make sure the rod location does not interfere with the removal of unit access panels. Provide one suspension type vibration isolator in each hanger rod. The minimum combined ratings of the vibration isolators and suspension materials should equal the total weight of the fully assembled unit. Move the unit to its installation location. Fully assemble the unit with all included components (motorized discharge dampers, etc.) Raise the unit so that one hanger rod drops through holes in the channel extensions. Attach two nuts to hanger rods and level unit, jamb the two nuts together to prevent loosening.

The unit is now ready for piping, wiring, and connection to any required ductwork.

PIPING

A male pipe connection has been provided on outside of the unit for connection of the gas service pipe. This is the only gas connection required. Be sure the gas supply pipe is large enough to insure the proper gas volume and line pressure at the inlet of the unit, per the unit nomenclature. Gas pipe must be sized and installed in accordance with applicable codes and standards. After connection of the gas pipe, check for leaks and bleed the line.



NOTE: NFPA 54 National Fuel Gas Code requires that an approved manual gas valve be installed within six feet of the unit. We recommend use of a gas valve with a pressure tap on the inlet to measure gas supply pressure.

NOTE: An inlet gas pressure measurement must be taken to insure proper inlet gas pressure. Inlet pressure should be neither too low or too high. Check your submittal or unit nameplate for the minimum and maximum pressure requirements for your unit. If the supply gas pressure exceeds the maximum inlet supply pressure as stated on the unit rating plate, an auxiliary high pressure regulator must be installed in the incoming gas line by the contractor. The gas supply pressure must meet or exceed the minimum inlet

gas supply pressure, as stated on the unit rating plate, while the burner is under full fire. (See Start-Up Procedure to operate unit on high fire).

This heater and its gas shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at pressures in excess of 1/2 PSI (3.5 KPA). In addition, pressure testing of the gas supply piping system at pressures at or below 1/2 PSI (3.5 KPA) requires isolation from the heater by closing its individual manual shut-off valve.

WIRING (*Refer to unit mechanical drawing for location of electrical rough in*).

All electrical wiring must be in accordance with applicable codes and standards. See the electrical diagram on the unit door or in the service manual before attempting any wiring. Refer to the unit rating plate for required incoming voltage and phase. Check for concurrence with voltage and phase shown on the wiring diagram.

Refer to wiring diagram for numbers of wires needed for main power connection and remote control wiring. Field wiring is shown with dashed lines.

WARNING!!! - Spark testing or shorting of control wires by any means will render the control transformer inoperative. DO NOT allow this to happen as it IS NOT covered under the warranty.

We recommend that the wires for the control circuit be routed through the conduit provided with the main electrical service to the equipment. This procedure is provided for in Chapter 3, Article 300-3(a) of the NFPA 70 1984 National Electrical Code. It reads as follows: "Conductors of 600 volts or less shall be permitted to occupy the same equipment wiring enclosure, cable or raceway, without regard to whether the individual circuits are alternating current or direct current, where all conductors are insulated for the maximum voltage of any conductor within the enclosure, cable or raceway."

An electric disconnect switch having adequate ampacity shall be installed in accordance with Article 430 of the National Electric Code (N.E.C.), ANSI/NFPA 70. If not factory installed, please refer to the unit rating plate for voltage and ampacity requirements.

Open cover on disconnect box, connect line voltage wiring to terminal block provided. Then feed the control wiring through the conduit to the master panel. Connect color coded and/or numbered control wires to terminal strip per the wiring diagram.



NOTE: Wires for Maxitrol Series 14 and Series 44 temperature controls must be run in shielded cable. For best results, run control wiring in separate conduit if the run is over 100 feet. For longer runs see Maxitrol Installation Instructions.

DUCTWORK

Ductwork must be sized and installed in accordance with applicable codes and standards. On units mounted outdoors, it is recommended that all discharge and return air ducts be insulated to prevent condensation during the "Off" cycle in cold weather. A fresh air intake hood with bird screen and/or filters can be supplied by AbsolutAire with the heater. Our intake hood or one of a similar design is recommended.

On units mounted indoors with through the roof intake ductwork, a suitable weather resistant intake hood must be installed. Sheet metal standards should be adhered to ensure uniform air delivery to the heater inlet. This aids in preventing moisture entrainment. When using a through the wall intake duct, an intake louver properly sized should be used, having adequate moisture baffling characteristics for the design air volume.

In lieu of an intake louver, a wall mounted intake hood with mesh screen may be used. This can be supplied by AbsolutAire. It is recommended that all intake ductwork which is exposed to the heated space be insulated.

The requirements for discharge ductwork are usually considerably less than with a conventional system, as the pressurization principle lends itself to effective air distribution. Generally, a "Splash Plate" or other method of distributing the air is all that is necessary.

SOUND CONTROL

Flexible connectors should be employed on all ductwork connections. Unit vibration isolators are recommended for suspended units and can be supplied by AbsolutAire as optional equipment.

DO NOT OPERATE UNIT FOR MORE THAN SIXTY (60) SECONDS WITHOUT ALL

ACCESS DOORS CLOSED. WITH THE EXCEPTION OF THE MASTER ELECTRICAL

PANEL OR GAS MANIFOLD ENCLOSURE DOORS.

Energize the system and check for unusual noises or vibrations, etc. Check the fan for proper rotation. **THIS MUST BE A VISUAL CHECK** as fans will move air even if they are running backward, but the system will not perform properly. Check the amp draw to all motors to insure it does not exceed the rated maximum current rating of the motor.

If not factory installed, a low temperature limit switch should be interlocked with this heater to prevent prolonged discharge of cold air in the event of burner lockout or shutdown.



Recirculation of room air may be hazardous in the presence of:

- *Flammable liquids, solids and gases**
- *Explosive dusts or powders**
- *Substances which become toxic when exposed to heat**

In order to reduce the chance of interior condensation, recirculation is not recommended in non-insulated buildings where outdoor temperatures fall below 32°F (0°C).

PROCEED WITH THE FIELD START-UP AND CHECK LIST

ABSOLUTAIRE, INC.

5496 North Riverview Drive

Kalamazoo, MI 49004-1595

Telephone: (800) 804-4000 Facsimile: (269) 382-5291

Email: customerservice@absolutaire.com



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MAINTENANCE GUIDELINES

DIRECT-FIRED GAS HEATERS AND MAKE-UP AIR UNITS

Your ABSOLUTAIRE product is engineered to provide trouble-free operation. In order to assure proper performance the following maintenance schedule is recommended.

MOTOR: Check the motor sheave set-screws and the motor slide base bolts for tightness upon initial start-up and before each heating season. The motor bearings are pre-lubricated at the factory for initial operation but should be re-lubricated (when provided with grease fittings) at six (6) month intervals. AbsolutAire recommends the use of Shell Oil Company's "Dolium R", Chevron Oil's "SRI No. 2", or Texaco "Premium RB" lubricant. Clean the grease fitting and then apply the grease with a proper grease gun. Use two full strokes for each bearing.

CAUTION: Do not over lubricate.
Keep grease clean.
Lubricate motors at standstill.
Do not mix petroleum grease with silicone grease.

BLOWER: After initial start-up, check the tightness of the fan sheave, fan hub set screws, fan bearing collar set screws, and fan bearing mounting bolts. Also when re-tensioning the v-belts, when re-lubricating the fan bearings, and before each heating season.

AA & V Model Heaters: Most units with 18" and smaller blowers are provided with pre-lubricated sealed bearings which require no additional lubrication for the life of the bearing. Some models are provided with pillow block bearings and should be lubricated monthly using the following (or equivalent) grease:

ESSO Beacon 325 or Shell Alvania #3 or equivalent

R-Series Model Heaters: All R-Series fan bearings should be lubricated after the first one hundred (100) hours of operation, and re-lubricated on a monthly basis thereafter. AbsolutAire recommends the use of the following (or equivalent) grease:



MOBIL SHC460

Clean the grease fitting and then apply the grease with a proper grease gun. Inject enough grease until a small amount shows between the seal and the bearing race.

Examine the blower wheel at six (6) month intervals for accumulation of dust and dirt on the fan blades. Any build-up must be cleaned off to maintain performance. If the accumulation is heavy, more frequent cleaning may be required.

BELTS: Due to belt stretching, adjust belt tension after the first one hundred (100) hours of operation. Check belts every three months thereafter for proper tension. Do not over tighten. Adjustment should result in a belt deflection of 3/4" to 1" for each foot of span when applying medium thumb pressure inward at the center of the span.

FILTERS: Inspect monthly until an appropriate schedule can be established, based on need. Replace or clean as necessary.

COILS: Inspect and clean the coil fins on the entering air side annually. If these inspections indicate that more frequent cleaning is required, establish a cleaning schedule accordingly. Fins should be cleaned by brushing and/or back-washing with high pressure air or water. In extreme cases the coils may have to be removed and cleaned with high pressure steam or washed with a mild alkali solution followed by a water rinse.

TRAPS AND STRAINERS: Periodic inspections of traps, inspections of check and air valves, and the replacement of worn parts are important. Strainers should be cleaned regularly.

BURNER: Prior to each heating season, a check should be made of the burner and components. Clean the igniter and flame rod and examine porcelain for cracks. Wipe the sight glass clean on the UV scanner and inspect the sight tube for spider webs, removing as necessary.

Periodic maintenance will insure continued trouble-free operation of your burner system. We recommend a yearly inspection, in advance of the heating season.

- 1) Shut the system down totally, disconnecting or locking out the power supply so there can be no accidental start-up during the inspection.



- 2) Inspect the burner carefully, including upstream and downstream sides of mixing plates as well as burner body face. Any accumulation of scale or foreign material on either side of the mixing plates should be removed with a wire brush. Check visually that no holes in the mixing plates are blocked. If any mixing plates are loose or missing fasteners, tighten/replace as necessary. Always use zinc plated or stainless fasteners.
- 3) Check burner orifices for carbon build-up and clean if necessary. Use a pin vise with a #31 drill bit for cleaning Midco natural gas burner orifices, a #45 drill bit for cleaning Midco propane (LPG) gas burner orifices, a #47 (5/64") drill bit for Maxon NP-I burner orifices, and a #50 (1/16") drill bit for Maxon NP-II burner orifices.

DO NOT ENLARGE BURNER ORIFICES - THIS MAY AFFECT PERFORMANCE

- 4) Put the system back into operation and view the burner from the downstream side while cycling the burner through its full firing range. A good flame will be blue, with minimal yellow "fingers". The flame length in forced "high fire" should be 12-18" long. The pilot only flame should be about the size of a baseball when properly adjusted.

GAS TRAIN: An annual inspection of the gas control assembly should be made. Internal and external piping should be checked for leaks. Relief vents on gas controls should be checked for clogging.

AIR PRESSURE SWITCHES: An annual check of the tube for the air flow switch, and the entering and leaving side of building pressure switches, should be made to insure against blockage.

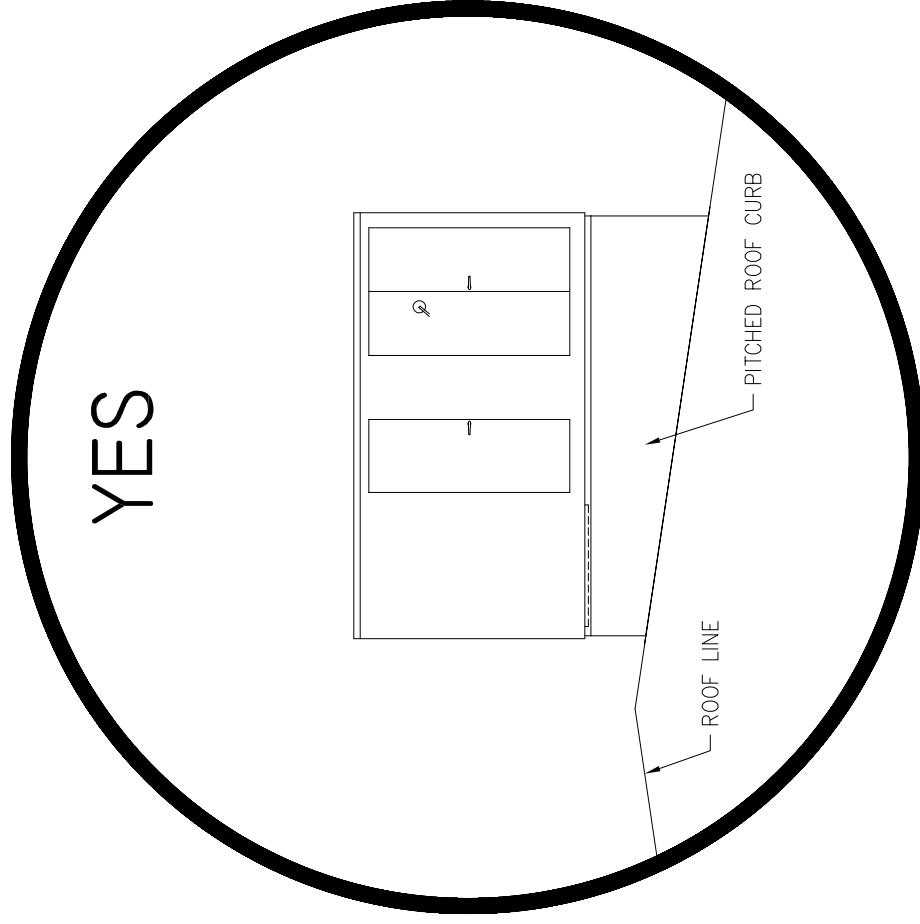
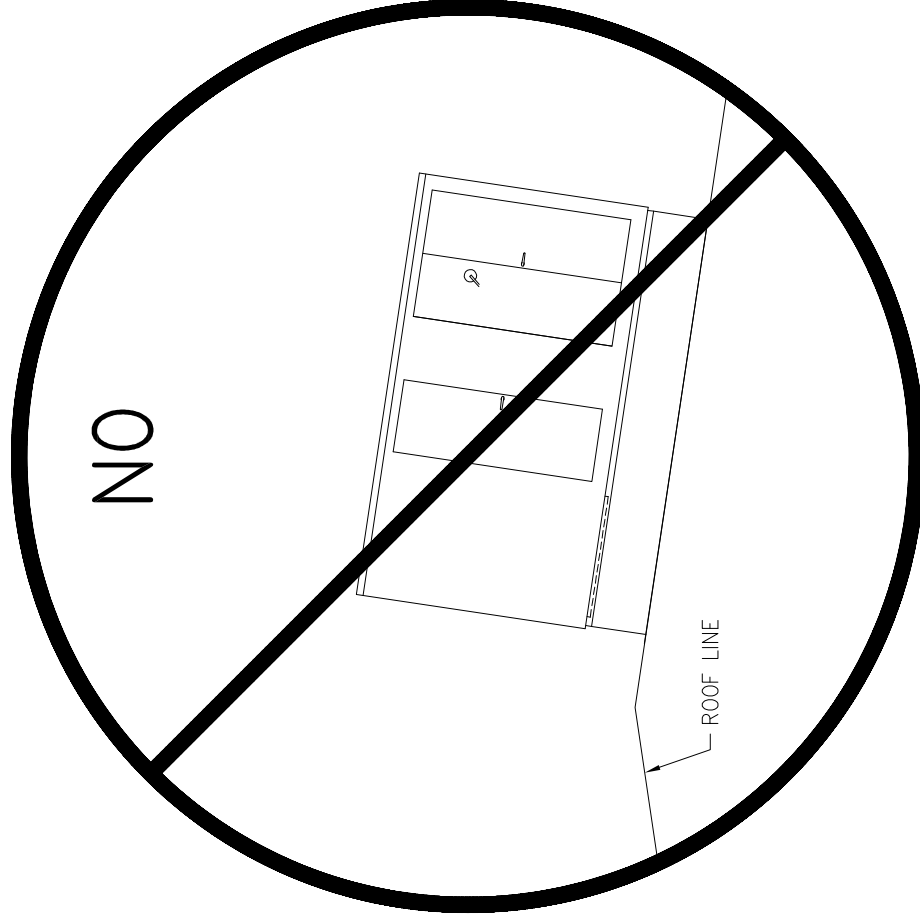
DAMPER AND MOTOR: Check linkage connection and/or set screws for tightness. Lubricate the damper bushings as required.

PAINTING: After unit installation, touch up any scratches caused by handling. Periodic touch-up painting should be done thereafter as needed.

GASKETS: Inspect door gasket seals annually. Replace those showing damage or deterioration.

INSTALLATION GUIDELINES

WHEN INSTALLING UPRIGHT ABSOLUTAIRE EQUIPMENT ON WARPED, UNLEVEL OR RAISED SURFACES, BE SURE TO SQUARE/LEVEL THE UNIT IN BOTH THE X & Y AXIS' TO INSURE PROPER UNIT OPERATION & LONGEVITY OF COMPONENTS.



NOTES:

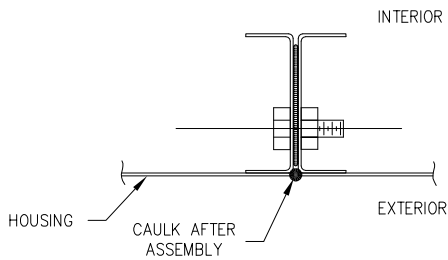
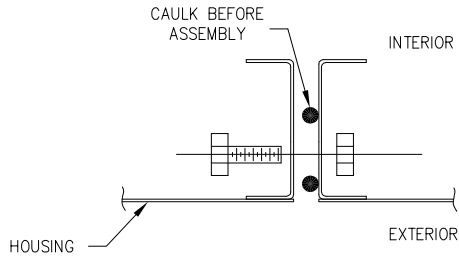
REV.	ECO#	DATE	CK BY
A	-	01-05-00	AMB
AAI PART #:		-	

DRAWING FILE LOCATION:		T:\HTR-LIT
DESC.		R300 HORIZONTAL UNIT INSTALLATION GUIDELINES
SCALE	NONE	
DRAWN BY:	AMB	
DATE:	04-21-94	
PLOT RATIO:	1=1	
CK BY:	-	
WO#	-	
REV.	A	FILE NO.:
		LEVEL2

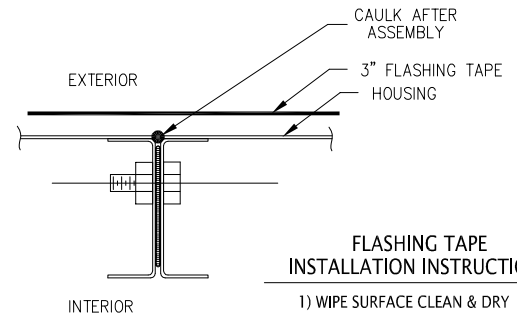
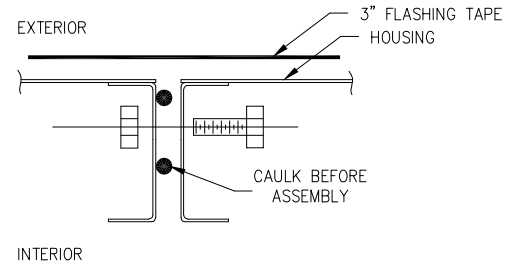
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CAULKING THE HEATER

All field joints must be properly caulked and sealed for the heater to operate correctly.



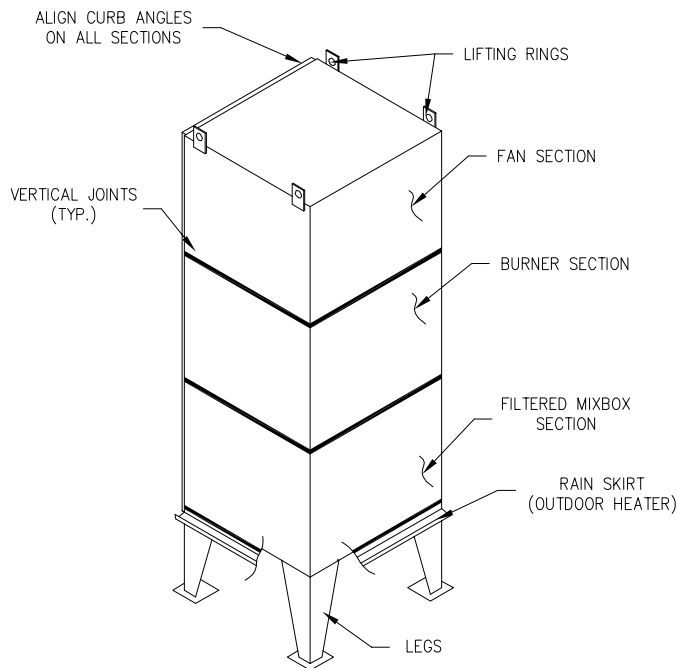
SIDE SEAMS CAULK JOINT



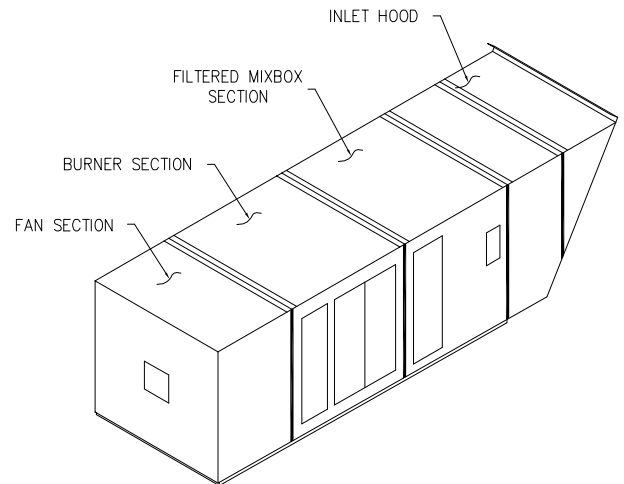
FLASHING TAPE INSTALLATION INSTRUCTIONS

- 1) WIPE SURFACE CLEAN & DRY
- 2) PEEL BACKING OFF FLASHING TAPE
- 3) APPLY FLASHING TAPE FIRMLY OVER FIELD JOINT.

ROOF SEAMS CAULK & TAPE JOINT



UPRIGHT MODEL



SEALING INSTRUCTIONS

- ≡ COVER WITH 3" FLASHING TAPE
- SEAL WITH A HEAVY BEAD OF CAULK

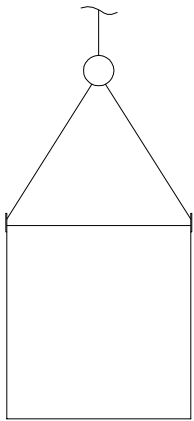
HORIZONTAL MODEL

PLEASE NOTE: ALL HORIZONTAL, VERTICAL & ROOF JOINTS MUST BE HEAVILY CAULKED PRIOR TO AND AFTER ASSEMBLY

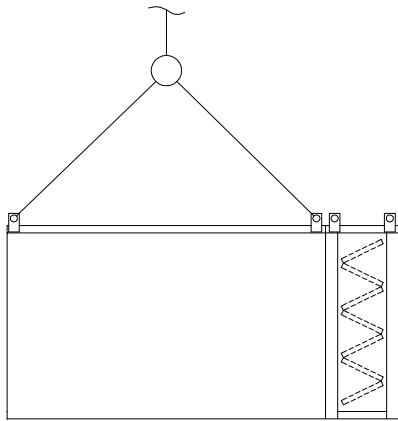
INSTALLATION TECHNICIAN

PLEASE READ BEFORE INSTALLING
ANY ABSOLUTAIRE PRODUCTS

RIGGING TIPS & GUIDELINES

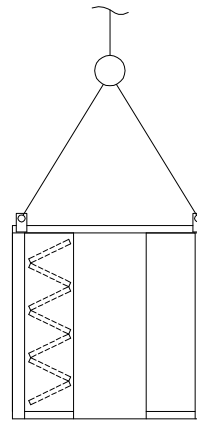


END VIEW
BASE UNIT

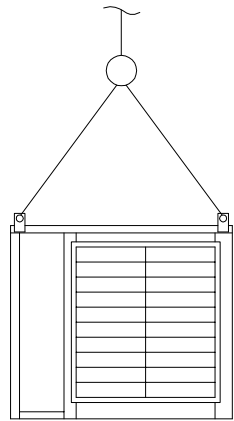


SIDE VIEW
BASE UNIT

OA FILTER
SECTION



OA /RA FILTERED
MIXBOX



OA LOUVERED
INLET PLENUM

- NOTES:
- 1) OA FILTER SECTION, OA INLET HOOD & SERVICE PLATFORMS SHOULD BE FINAL ASSEMBLED TO "BASE UNIT" BEFORE LIFTING INTO PLACE.
 - 2) OA/RA FILTERED MIXBOX, OA LOUVERED INLET PLENUM, DISCHARGE HEADS, & ROOF CURBS ARE RIGGED SEPARATE FROM THE "BASE UNIT" AND ASSEMBLED TO THE UNIT, ONCE IN PLACE.
 - 3) TWO-PIECE "BASE UNIT" MODELS SHOULD BE RIGGED SEPARATELY AND ASSEMBLED IN PLACE.

V-, AA-, R300-, & R400-Series - Approximate Rigging Weights (LBS.)

-- **INSTALLATION TECHNICIAN:** Please Read Before Installing **ANY** AbsolutAire Products --

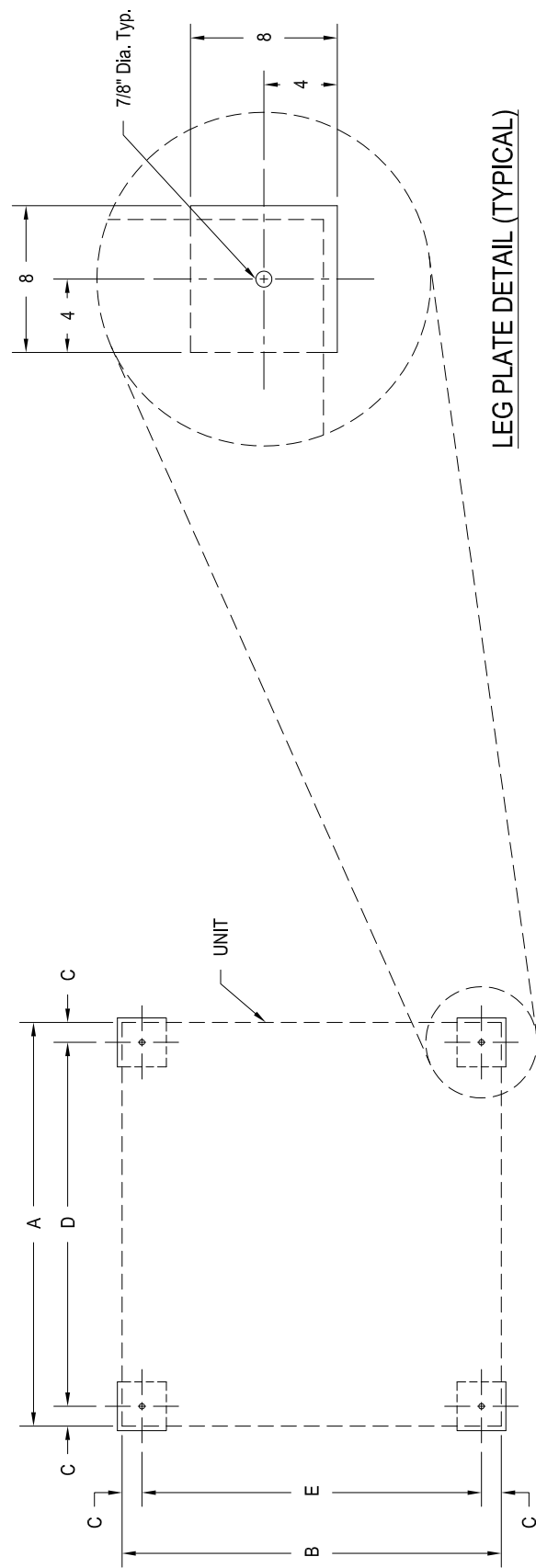
MODEL	BASE UNIT				OA FILTER SECTION				OA/RA FILTERED MIXBOX		UPRIGHT PLENUM BASE		OA INLET HOOD		OA FILTERED INLET HOOD		OA LOUVERED INLET PLENUM		UPRIGHT SERVICE PLATFORM
	Single Wall		w/20 Ga. D.W.		Single Wall		w/20 Ga. D.W.		Single Wall	w/20 Ga. D.W.	Single Wall	w/20 Ga. D.W.	Single Wall	w/20 Ga. D.W.	Single Wall	w/20 Ga. D.W.	Single Wall	w/20 Ga. D.W.	
V1	255	285	325	355	40	55	80	95	N/A	N/A	N/A	N/A	30	35	35	40	45	50	N/A
V2	335	385	455	505	50	70	90	110	N/A	N/A	N/A	N/A	40	50	50	60	65	75	N/A
V3	490	560	670	740	75	100	125	150	N/A	N/A	N/A	N/A	50	65	60	75	90	105	N/A
V4	590	715	810	935	85	120	145	180	N/A	N/A	N/A	N/A	55	75	70	90	100	120	N/A
V5	790	940	1,060	1,210	100	150	170	220	N/A	N/A	N/A	N/A	60	100	80	120	130	170	N/A
UNIT MATERIAL	ALUM.	GALV.	ALUM.	GALV.	ALUM.	GALV.	ALUM.	GALV.	N/A	N/A	N/A	N/A	ALUM.	GALV.	ALUM.	GALV.	ALUM.	GALV.	N/A

MODEL	BASE UNIT		OA FILTER SECTION		OA/RA FILTERED MIXBOX		UPRIGHT PLENUM BASE		OA INLET HOOD	OA FILTERED INLET HOOD	OA LOUVERED INLET PLENUM	UPRIGHT SERVICE PLATFORM
	Single Wall	w/20 Ga. D.W.	Single Wall	w/20 Ga. D.W.	Single Wall	w/20 Ga. D.W.	Single Wall	w/20 Ga. D.W.				
AA1700	350	425	75	125	CF	CF	125	175	50	50	CF	250
AA3000	500	625	125	175	200	300	150	200	50	75	CF	250
AA1	800	1,000	150	200	275	375	225	300	75	100	CF	300
AA2	800	1,000	150	200	275	375	225	300	75	100	CF	300
AA3	975	1,200	200	250	375	525	325	425	75	100	CF	325
AA4	1,375	1,650	250	325	475	650	450	600	150	300	CF	375
AA5	2,325	2,700	350	425	650	900	600	800	325	500	CF	400
AA6	2,600	2,975	350	425	650	900	600	800	325	500	CF	400
AA7	4,125	4,750	500	625	1,050	1,425	1,000	1,325	450	725	CF	475
AA8	4,600	5,325	650	800	1,200	1,630	1,100	1,500	550	800	CF	525

MODEL	BASE UNIT				OA FILTER SECTION		OA/RA FILTERED MIXBOX		UPRIGHT PLENUM BASE		OA INLET HOOD	OA FILTERED INLET HOOD	OA LOUVERED INLET PLENUM	UPRIGHT SERVICE PLATFORM
	Single Wall	w/20 Ga. D.W.			Single Wall	w/20 Ga. D.W.	Single Wall	w/20 Ga. D.W.	Single Wall	w/20 Ga. D.W.				
R327	2,500	2,850			450	550	625	825	500	650	375	500	950	375
R330 - R336	2,750	3,200			525	650	825	1,100	700	900	450	625	1,300	375
R340	4,125	4,650			625	750	1,000	1,325	850	1,100	500	650	1,600	375
R344 - R349	4,500	5,150			750	900	1,250	1,675	1,150	1,500	625	800	2,050	500
R354	6,125	6,925			900	1,050	1,500	1,975	1,400	1,800	750	1,050	2,550	525
R360	6,550	7,425			1,000	1,175	1,750	2,300	1,600	2,050	850	1,125	3,000	550
*R366	4,400	3,600	5,000	4,100	1,125	1,300	2,050	2,700	2,000	2,575	900	1,200	3,500	600
*R373	4,900	4,100	5,550	4,650	1,300	1,500	2,400	3,150	2,250	2,900	1,000	1,400	4,000	650
*R380	7,600	5,900	8,450	6,500	1,500	1,725	2,600	3,425	2,500	3,225	1,200	1,600	4,550	700
*R389	7,900	6,100	8,850	6,800	1,600	1,825	2,900	3,825	2,800	3,625	1,250	1,750	5,700	725
*(2) PIECE UNIT	FAN	BURNER	FAN	BURNER										

MODEL	BASE UNIT		OA FILTER SECTION		OA/RA FILTERED MIXBOX		UPRIGHT PLENUM BASE		OA INLET HOOD	OA FILTERED INLET HOOD	OA LOUVERED INLET PLENUM	UPRIGHT SERVICE PLATFORM
	w/20 Ga. D.W.		w/20 Ga. D.W.		w/20 Ga. D.W.		w/20 Ga. D.W.					
R427	3,150		625		925		725		375	500	950	375
R430 - R436	3,525		725		1,225		1,000		450	625	1,300	375
R440	5,125		825		1,475		1,225		500	650	1,600	375
R444 - R449	5,675		1,000		1,850		1,650		625	800	2,050	500
R454	7,625		1,175		2,175		2,000		750	1,050	2,550	525
R460	8,175		1,300		2,550		2,275		850	1,125	3,000	550
*R466	5,500	4,525	1,450		2,975		2,850		900	1,200	3,500	600
*R473	6,125	5,125	1,650		3,475		3,200		1,000	1,400	4,000	650
*R480	9,300	7,150	1,900		3,775		3,550		1,200	1,600	4,550	700
*R489	9,750	7,500	2,025		4,225		4,000		1,250	1,750	5,700	725
*(2) PIECE UNIT	FAN		BURNER									

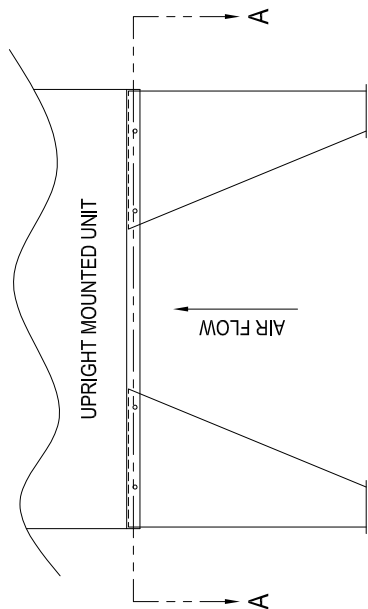
N/A = Not Available CF = Consult Factory



SECTION VIEW A-A

LEG PLATE DETAIL (TYPICAL)

**** NOTE: DIMENSIONS BELOW APPLY ONLY TO UPRIGHT MOUNTED UNITS ****
 (CONSULT FACTORY FOR HORIZONTAL MOUNT APPLICATIONS - LEG QTY & LOCATION WILL VARY)



ELEVATION VIEW

AA SERIES				
MODEL	A	B	C	E
AA1700	28	24	3 1/4	21 1/2
AA3000	32	28	3 1/4	25 1/2
AA1 & AA2	40	33	3 1/4	33 1/2
AA3	48	38	3 1/4	41 1/2
AA4	55	47	3 1/4	48 1/2
AA5 & AA6	74	54	3 1/4	67 1/2
AA7	90	70	3 1/4	83 1/2
AA8	98	77	3 1/4	91 1/2

R300 & R400 SERIES				
MODEL	A	B	C	E
27	56	52	3 1/4	49 1/2
30 & 36	66	62	3 1/4	59 1/2
40	74	70	3 1/4	67 1/2
44 & 49	84	80	3 1/4	77 1/2
54	92	88	3 1/4	85 1/2
60	98	94	3 1/4	91 1/2
66	107	103	3 1/4	100 1/2
73	118	114	3 1/4	111 1/2
80	128	124	3 1/4	121 1/2
89	135	131	3 1/4	128 1/2

LAST REVISION: ADDED ELEVATION VIEW & NOTES

NOTES:

ALL O-LINES (OR 0,0) WILL ALWAYS BE IN THE LOWER LEFT-HAND CORNER OF THE PART

DRAWING FILE LOCATION: T:\HTR-LIT

REV.	ECO#	DATE	CK BY	NET QTY	MATERIAL	MATERIAL SIZE
F	-	03-27-19	CAP	-	-	-
E	-	06-23-09	AMB	-	-	-
D	-	04-22-08	ADR	-	-	-
C	-	05-26-05	AMB	-	-	-
B	-	03-20-03	AMB	-	-	-
AAI PART #:	-	-	-	1=24	CK BY: -	WO# -

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DESC. AA & R-SERIES UPRIGHT UNIT LEG PAD LOCATIONS

SCALE NONE DRAWN BY: AMB DATE: 04-14-93 REV. FILE NO.:

F 10001181

**** *Warning* ****

Opening Access doors on this equipment may expose user to MOVING PARTS.

For your safety, Lock-Out - Tag-Out procedures should be followed when servicing this equipment.

**** *Warning* ****

If this unit was not provided with an integral freeze protection system, a low temperature limit control should be installed (if freeze protection is needed in the event of burner shut-down).

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<u>CHECK LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
POWER ON	<u>Power On Is Unlit</u>	<ol style="list-style-type: none"> 1. Disconnect switch is turned off (open). Turn it to <u>ON</u> (closed) position. 2. Fuse(s) blown on disconnect switch. Check for cause of excessive current. Replace blown fuse(s). 3. Control fuse on transformer is blown (check voltage on line & load side of fuse). If there is <u>NO</u> voltage on load side, but there is on the line side, replace the fuse.

<u>CHECK LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
FAN ON	<p><u>Fan On light is Unlit and no alarm lights are lit</u></p> <p><u>Fan Does Not Run Fan on Light Is Lit</u></p>	<ol style="list-style-type: none"> 1. Remote panel switch turned off or is defective. Check for voltage at timer coil. If there is <u>NO</u> voltage, check the selector switch. 2. Damper motor auxiliary switch misadjusted or defective. Check terminals at the damper motor. If there <u>IS</u> voltage and the motor is operating, but the auxiliary switch is not closing, adjust end switch setpoint. If end switch adjustment will not close, then replace the damper motor. 3. Voltage through end switch, but fan is not moving, check control relay 17. Replace if necessary. 4. One (1) to three (3) of the overload heater(s) are tripped. Check for voltage at the overload relay. If there is <u>NO</u> voltage, reset overloads, & check motor running amps. 5. If on INITIAL START UP of a newly installed system, the overload heaters keep tripping, causing the fan to stop, check motor running amperage against motor name plate full load amperage i.e. low service voltage, excessive voltage drop or the fan is handling too much air due to less static pressure than design. 6. Defective contactor (M1). Check for voltage at the contactor (coil). If there <u>IS</u> voltage, and the contactor does not pull in, the coil is defective. If the motor contactor pulls in, but does not run the motor, the contacts or overload heaters may be defective. 7. Check voltage on motor leads at starter. If voltage is present and motor does not run, check motor wiring and connections on motor for open circuit. Check for possible open circuit in motor windings.

<u>CHECK LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
HIGH TEMP	<u>High Temperature Switch light is Unlit.</u>	<ol style="list-style-type: none"> 1. Remote panel switch not turned to "WINTER" or "BURNER ON" position. 2. High temperature limit switch is set too low. <u>FACTORY SET</u> AA-Series @ <u>130 deg. F.</u>, R-Series @ <u>150 deg. F.</u> If there is <u>NO</u> voltage present at switch, adjust high limit switch. 3. Unit discharging high temperature air. Check burner gas pressure and temp. control operation. 4. Defective high limit switch. Replace switch.

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<u>CHECK LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
AIR FLOW	<p><u>Air Flow Switch light is Unlit</u></p> <p><u>NOTE: All possible causes will supply NO Voltage (120) out of the normally open terminal on Air Flow Switch.</u></p>	<ol style="list-style-type: none"> 1. Fan is running backwards. Reverse any two (2) motor leads at the contactor. (3 phase units only). 2. Tubing to air flow switch is plugged by dirt or insects. 3. Dirt or snow obstructing the air filters. 4. Loose or worn fan belts. 5. Access door(s) open. 6. Discharge damper is frozen – binding. If frozen, this prevents the damper motor from completing full stroke. Belimo – manual release – move manually. 7. Defective damper motor. Check terminals at the discharge damper motor. If there IS voltage and the motor is not operating, replace the damper motor. <u>Make sure damper blades are moving with damper actuator.</u> 8. Air flow switch set too light. Adjust switch. .35 W.C. nominal @ high fire. 9. Defective air flow switch – Replace.

<u>CHECK LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
LOW GAS PRESSURE SWITCH	<p><u>Low Gas Pressure Switch unlit.</u></p> <p><u>NOTE: New PSI SW has Auto Reset for Low Gas</u></p>	<ol style="list-style-type: none"> 1. Low gas pressure or gas supply is turned off. 2. Low gas pressure switch is set too high. Check terminals at switch. If there is <u>NO</u> voltage, adjust low gas pressure switch or increase gas pressure. Investigate pressure drop through supply piping. <u>SWITCH IS FACTORY SET @ 3” W.C.</u>

<u>CHECK LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
HIGH GAS	<p><u>High Gas Pressure Switch light is Unlit</u></p> <p><u>NOTE: This is a manual reset switch</u></p>	<ol style="list-style-type: none"> 1. High gas pressure at burner. 2. High gas pressure switch is set too low. If there is <u>NO</u> voltage at switch, adjust high gas pressure switch or set correct burner pressure according to tag. <u>SWITCH FACTORY SET</u> at 1.5” W.C. above total gas pressure. 3. Defective high gas pressure switch.

<u>CHECK LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
PILOT	<p><u>PILOT light remains Unlit. If pilot lamp turns on for a short time then goes out, see burner lockout alarm light section.</u></p>	<ol style="list-style-type: none"> 1. If this unit has a mild weather switch, the outdoor air temperature maybe above setpoint. This is <u>FACTORY SET @ 65 deg. F.</u> 2. Flame relay contact screws are loose. Remove the flame relay cover and check the contact base terminal screws for tightness.

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<u>CHECK LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
POWER TO VALVES	<u>Power To Valves light is Unlit</u>	1. If pilot light is on and power to valves is unlit, check wiring and terminals on flame safeguard. If wiring is <i>not damaged</i> , replace flame safeguard.

<u>CHECK LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
BURNER ON	<u>Burner On light is Unlit</u>	<ol style="list-style-type: none"> 1. Block valve auxiliary switch misadjusted. Check the normally open switch terminal at the actuator. If there is <u>NO</u> voltage, look through the actuator observation window. If the valve is open, adjust the actuator auxiliary N.O. switch to be closed. 2. Defective actuator. Check for voltage between terminals at the coil of the actuator. If there <u>IS</u> voltage, and the valve is not open, replace the actuator. 3. If there is voltage through the end switch, check CR15.

<u>ALARM LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
LOW TEMP	<u>On</u>	<ol style="list-style-type: none"> 1. Unit discharging low temperature air. Burner has dropped out due to burner related malfunction (see burner alarm) or operation in summer mode with low outdoor temp. 40 deg. F. or less. 2. Low temperature switch setting maybe too high. <u>FACTORY SET @ 40 deg. F. Time @ 5 min.</u> 3. Check sensor connections on timer. Remove sensor from timer, use OHM meter to check continuity through sensor. If open circuit; check sensor in fan housing for damage. 4. If low temp light <i>lights</i>, after the 5 min. as set on the timer, regardless of discharge temp. check sensor, if OK replace timer. 5. If low temp light <i>lights</i>, immediately in summer or winter mode, replace defective low limit timer.

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Kalamazoo, MI 49004

<u>ALARM LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
BURNER LOCKOUT	* Burner lockout light is lit	<ol style="list-style-type: none"> 1. If on <u>INITIAL START UP</u> of a newly installed system, the gas line may have air trapped in it. Remove the test plug upstream of the safety shut off valve and bleed the gas line to remove the air. It may require resetting the flame safeguard several times. 2. If pilot does light as proven by the flame light on the flame safeguard, but does not stay lit, adjust needle valve on pilot gas line. Close valve fully and open ½ turn and retry. If pilot will not stay lit, open to 1 turn open. 3. Push burner reset button on flame safeguard or the burner reset button on the remote panel. If burner continues to lock out, check for spark during ignition process. 4. No ignition spark. Crack access door (or view pilot through view-port) and look at the pilot side of the burner. You should be able to see the igniter sparking. (spark is present only when the pilot light is lit, this is only 10 sec.) 5. Spark plug fouled. If the spark is not visible, remove the spark plug and clean it with a wire brush. Check the gap between ground electrode, it should be approximately 3/32". 6. Ignition wire broken or grounded against unit. 7. Defective ignition transformer or spark plug. Disconnect the ignition wire from the spark plug and thread it back through the hole on the control side of the unit. Hold the wire by the insulated cover and place the spark plug electrode approx. 1/16" from a bare surface of the unit. Start the ignitions sequence; it should spark. (REMEMBER TO RESET THE FLAME RELAY BEFORE DOING THIS) If no spark is observed, replace the ignition transformer. 8. Low pilot flame. Increase pilot gas pressure by adjusting pilot regulator. 9. Ultra-violet flame detector sight glass is obstructed. Check lens or sight tube for moisture, dirt, or insects. Clean or dry lens with a soft cloth.

<u>ALARM LIGHT</u>	<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
DIRTY FILTER	<u>Dirty Filter Light is lit</u>	<ol style="list-style-type: none"> 1. If the dirty filter light is <i>lit</i>, the filters are dirty to the point to where the airflow is reduced. Change or clean filters.