AAON, Inc.

RF SERIES
HEATING • COOLING
&
COMBINATION
ROOFTOP UNITS

INSTALLATION, SERVICE
&
OWNERS
INFORMATION
MANUAL

★

⚠ WARNING

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

FOR YOUR SAFETY

WHAT TO DO IF YOU SMELL GAS

- *EXTINGUISH ANY OPEN FLAME.*
- *DO NOT TOUCH ANY ELECTRICAL SWITCH.*
- *DO NOT TRY TO LIGHT ANY APPLIANCE.*
- *DO NOT USE ANY PHONE IN YOUR BUILDING.*
- *IMMEDIATELY CALL YOUR GAS SUPPLIER FROM A NEIGHBOR'S PHONE. FOLLOW THE GAS SUPPLIER'S INSTRUCTIONS.*
- *IF YOU CANNOT REACH YOUR GAS SUPPLIER, CALL THE FIRE DEPARTMENT.*

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Owner should pay particular attention to the words: ***NOTE, CAUTION AND WARNING.*** ***NOTES*** are intended to clarify or make the installation easier. ***CAUTIONS*** are given to prevent equipment damage. ***WARNINGS*** are given to alert owner that personal injury and/or equipment damage may result if installation procedure is not handled properly.

GENERAL DESCRIPTION

The units are designed as self-contained heating, cooling or combination units for outdoor installation only, using refrigerant 22, chilled water, natural gas, electric resistance, steam or hot water.

UNPACKING

When received, the unit should be checked for damage that might have occurred in transit. If damage is found, it should be noted on the carrier's Freight Bill. Request for inspection by carrier's agent should be made in writing at once.

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer, service agency or the gas supplier.

NOTE: These units must not be used as a "construction heater" at any time during any phase of construction. Very low return air temperatures, harmful vapors, and misplacement of the filters will damage the unit and its efficiency.

CERTIFICATION

- GAS HEAT MODELS
  - (a) Design Certified as a forced air furnace with or without cooling unit.
  - (b) Certified for outdoor installation only.
  - (c) Certified for installation on combustible floor with a minimum of 12" high curb.
  - (d) Certified with Heat Exchanger located downstream from Evaporator coil.

- STEAM OR HOT WATER HEAT MODELS
  - (a) Certified as a forced air furnace with or without cooling unit.
  - (b) Certified for outdoor installation only.
  - (c) Certified for installation on combustible floor with a minimum of 12" high curb.
  - (d) ARI certified coils.

- ELECTRIC HEAT MODELS
  - (a) Certified as a electric warm air furnace with or without cooling unit.
  - (b) Certified for outdoor installation only.
  - (c) Certified for installation on combustible floor with a minimum of 12" high curb.

- COOLING MODELS
  - (a) Certified as a commercial central air-conditioner with or without electrically operated compressor.
  - (b) Certified for outdoor installation only.
  - (c) Certified for installation on combustible floor with a minimum of 12" high curb.
  - (d) ARI certified coils.

CODES AND ORDINANCES

System should be sized in accordance with National Warm Air Heating and Air Conditioning Association Literature, or the Guide of American Society of Heating, Refrigeration and Air Conditioning Engineers. The installation must conform with local building codes or, in the absence of local codes with (United States) National Fuel Gas Code "ANSI-Z223.1", (Canada) current CAN / CGA- B149.1 or . 2. Installation Codes for Gas Burning Appliances and Equipment, current C.S.A. Standard C22.1, Canadian Electrical Code Part 1, and C.S.A. Standard B52 Mechanical Refrigeration Code, and Local Plumbing or Waste Water Codes.

⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFC's and HCFC's) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for non-compliance.

OWNER'S INFORMATION

WARNING
Failure to observe the following instructions will result in premature failure of your system, and possible voiding of the warranty.

DIRECT EXPANSION (DX) COOLING UNITS
Never cut off the main power supply to the unit, except for complete shutdown. When power is cut off from the unit, the compressor crankcase heaters cannot prevent refrigeration migration. This means the compressor will cool down, and liquid refrigerant will accumulate in the compressor. Since the compressor is designed to pump refrigerant gas, it will damage its valves when power is restored.
If power must be cut off for more than an hour, turn the thermostat system switch to "OFF", and leave it off until the main power switch has been turned on again for at least twenty four hours. This will give the crankcase heater time to clear any liquid accumulation out of the compressor before it is required to run.
Always control the system from the thermostat, or control panel, never at the main power supply (except for emergency or for complete shutdown of the system).

During the cooling season, if the air flow is reduced, the cooling coils will get too cold and will cause excessive liquid to return to the compressor. As the liquid concentration builds up, oil is washed out of the compressor, leaving it starved for lubrication.

THE COMPRESSOR LIFE WILL BE SERIOUSLY SHORTENED BY THIS REDUCED LUBRICATION, AND THE PUMPING OF EXCESSIVE AMOUNTS OF LIQUID OIL AND REFRIGERANT.

GAS OR ELECTRIC HEATING
The system is designed to cool or heat a given amount of air each minute it operates. If this amount of air is greatly reduced (approximately 1/3 during the heating season), the heat exchanger / heater coil will overheat, and may cut the burner / heater off entirely by action of the safety high temperature limit device which is incorporated in the exchanger or heating area.

GAS HEAT UNITS - Should overheating occur, or the gas supply fail to shut off; shut off the manual gas valve to the furnace before shutting off the electrical supply.

PROLONGED OVERHEATING OF THE HEAT EXCHANGER WILL SHORTEN ITS LIFE.

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer, service agency or if gas fired units; the gas supplier. Refer to installation instructions provided with the unit and this manual.

CAUTION: While the following incorrect operations may not cause damage to the system, they will impair the performance, and may cause the built-in safety devices to cut the system off completely.

1. LOW AMBIENT OPERATION

   The cooling section of a direct expansion (DX) unit will not operate properly when the outdoor temperature is below 20° degrees. Outside air intake options are recommended if operation below 60° degrees is expected.

2. MULTIPLE UNIT OPERATION

   When several units are used in conditioning space, and part or all of them are combination heating-cooling units, all systems thermostat switches must be set at either heating or cooling (or set at "off"). Do not leave part of the systems switched to cooling. All cooling only units should be switched to "off" at the thermostat during the heating season.

NORMAL OPERATION

HEATING

Set the thermostat system switch to "HEAT".
Set the thermostat fan switch to "AUTO" or "ON".
Set the thermostat temperature at the desired point.

COOLING

Set the thermostat system switch to "COOL".
Set the thermostat fan switch to "AUTO" or "ON".
Set the thermostat temperature at the desired point.

AIR CIRCULATION

Set the thermostat system switch to "OFF".
Set the thermostat fan switch to "ON".
Do not change temperature setting.
With these settings, the air circulating blower will run continuously but the air will not be heated or cooled.

SYSTEM OFF

Set the thermostat system switch to "OFF".
Set the thermostat fan switch to "AUTO".
Do not change temperature setting.
With these settings, the system is shut down, with the exception of the control power (24 volts), and the crankcase heater of the compressor (about 60 watts). **DO NOT TURN OFF THE MAIN POWER SWITCH.**

RECOMMENDED NIGHT AND VACANT WEEKEND OPERATION

If it is desired to reduce the operating time during the night, and during periods when the space is unused, it is recommended that the temperature setting be raised about five degrees during these periods of the cooling season, and lowered about ten degrees during the heating season.

GAS HEATING SYSTEM
The heating section is for use with natural gas supply pressure of 6" to 10.5" Water Column. A 1/8" pressure tap must be supplied by the installer in the piping just ahead of the gas valve. The rating plate on the furnace shall be inspected to make sure that the unit is stamped for the proper gas. The pressure tap on the outlet end of the gas valve should be removed and the valve adjusted for the proper manifold pressure to 3.5" on natural gas. Re-install pressure tap.
The burner area is not sealed and combustion air is supplied by a centrifugal blower which draws in fresh air through a protected opening. This air is introduced into the burner tubes by the action of the induced draft blower. This insures an even flow of primary and secondary air to the burners.
The heating system and safety controls are 100% tested on each unit before it leaves the factory.

INSTALLATION IS TO BE ADJUSTED TO OBTAIN A TEMPERATURE RISE WITHIN THE RANGE SPECIFIED ON THE RATING PLATE.

The units are equipped with a direct spark ignition system.
Power to the ignition control is 24 Volts to reduce hazards. Burner ignition is by a high intensity spark.

ELECTRIC HEATING SYSTEM
Heating is accomplished by passing amperage through a specified amount of resistance heat strips which will produce the required heat. The indoor motor will energize at the same time as the heat strips.

STEAM OR HOT WATER HEATING SYSTEM
Heating is accomplished by passing steam or hot water through the steam or hot water coil assembly.

COOLING SECTION • DX
All direct expansion refrigeration systems are factory assembled, charged with R-22, tested and operated. On all units the refrigerant system includes multiple circuit evaporator (interlaced) and condenser coils (face split) providing two or more stages of cooling. These systems are provided with liquid line filter driers, expansion valves, and fully hermetic scroll compressors. Compressors are equipped with a positive pressure forced lubrication system. The air cooled condenser coil(s) is constructed of copper tubes with aluminum fins, the air is pulled through with propeller fans. The evaporator coil is draw through, made of copper tubes with aluminum fins.

The refrigeration section of these appliances has been found by E.T.L. and C.G.A. applicable provisions of "ANSI / UL 1995-1990", "ANSI / ASHRAE 15-1978", current "C.S.A. Standard C22.1, Canadian Electrical Code Part 1 and C.S.A. Standard B52".

⚠ WARNING

Scroll compressors will be damaged by operation with the wrong rotation.
THE LOW PRESSURE SWITCH HAS BEEN DISCONNECTED AFTER TESTING AT THE FACTORY.
The wiring must be reconnected and proper rotation determined at the time of start-up by a qualified service technician using suction and discharge pressures gauges.
Any alteration should only be made at the unit power connection.

***NOTE:* Crankcase Heater Operation**
Some units are equipped with a crankcase heater, which should be energized at least 24 hours prior to setting the thermostat for cooling operation with the compressor.

COOLING SECTION • CHILLED WATER OR NON-COMPRESSORIZED UNIT
Chilled water or non-compressorized units have factory installed coils. These systems are provided with internal header connections for field connection. Coils are aluminum fin / copper tube construction.

WIRING DIAGRAMS
A complete set of unit specific wiring diagrams in both ladder and point-to-point form are laminated in plastic and located inside the control compartment door.

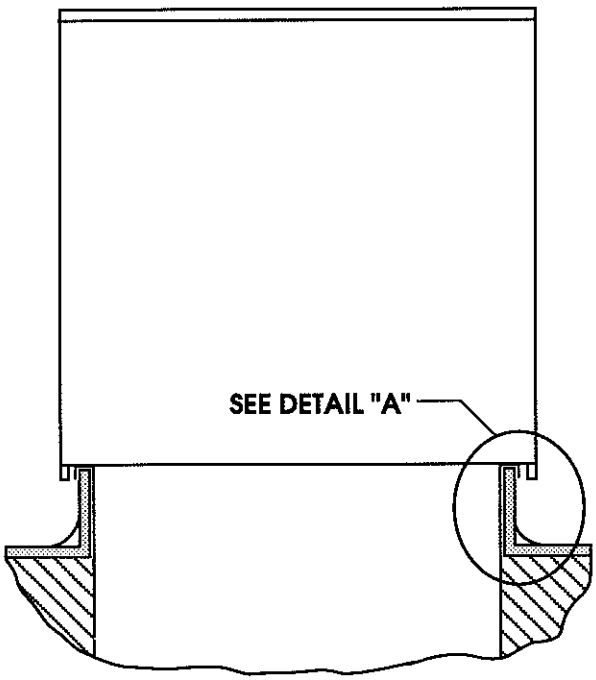
INSTALLATION

AAON Rooftop units are designed for fast, easy installation. The curb is to be located so that duct connections will be clear of structural members of the building.

NEW BUILDINGS

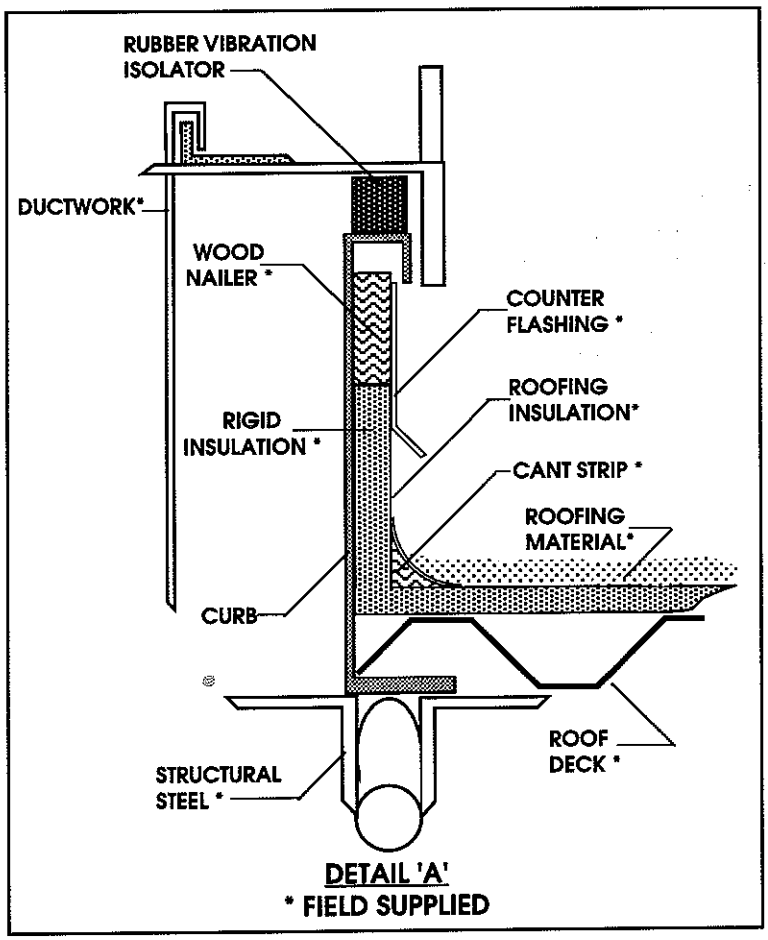
WARNING:
IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE INJURY OR PROPERTY DAMAGE. CONSULT A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER FOR INFORMATION OR ASSISTANCE.
INSTALL THE GAS FIRED UNIT SO THAT THE RECTANGULAR FLUE OUTLET IS LOCATED **AT LEAST 120" AWAY FROM ANY OPENING** THROUGH WHICH COMBUSTION PRODUCTS COULD ENTER THE BUILDING.
FOR SERVICE CLEARANCES SEE CHART ON PAGE 11.
INSTALL THE GAS FIRED UNIT TO ASSURE THE FLOW OF COMBUSTION AND VENTILATING AIR IS NOT OBSTRUCTED FROM REACHING THE FURNACE.

When using factory curb, leave an opening in roof decking the same size as inside of curb. Set the curb so the inside of the curb coincides with the opening, and the bottom flange of the curb rests on the steel.



SECTIONAL VIEW OF UNIT ON ROOF CURB

(Diagrams are for practical guidelines only)



DETAIL 'A'
*** FIELD SUPPLIED**

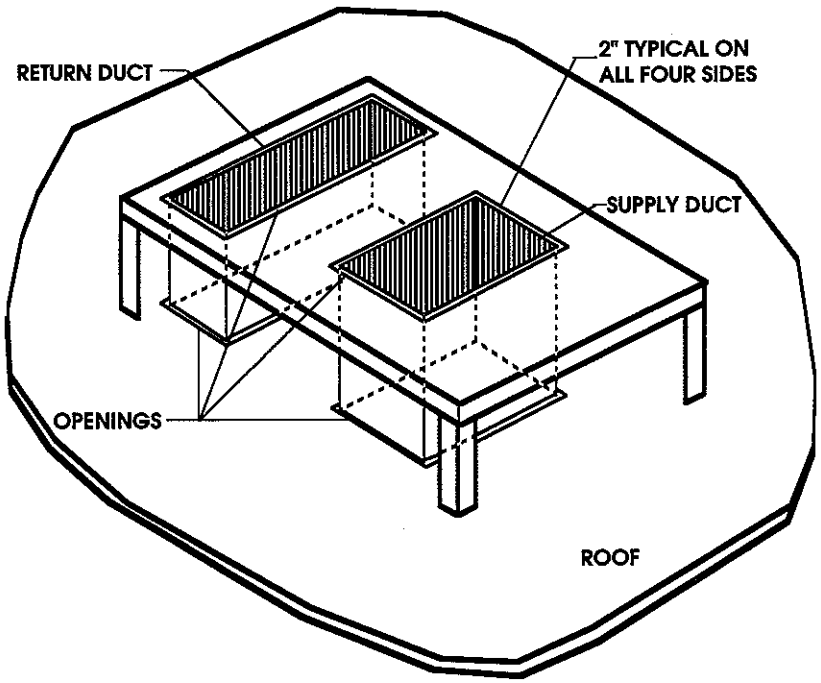
For installation of unit without factory curb, place the unit on a vibration isolator at least 12" above the level of the roof. **MAKE SURE THE STRUCTURE IS LEVEL.** The structure shall be built from non-combustible material and must meet local codes. In areas of snow build-up, the platform should be built high enough to meet local codes.

CAUTION: Where the supply or warm air duct passes through a combustible roof, a clearance of one inch must be maintained between the outside edges of the duct and combustible material in accordance with National Fire Protection Association Standard No. 90A. Provide flashings or enclosure between structure and roof and all joints must be sealed with mastic roofing to insure a watertight seal.

CAUTION: All roofing work should be done by competent roofers to avoid leakage.

WARNING: INSULATION MATERIALS MAY BE COMBUSTIBLE.

STRUCTURE INSTALLATION



SETTING THE UNIT

Check the unit data plate voltage to make sure it agrees with the power supply. Connect power to the unit according to the wiring diagram provided with the unit.

If cables or chains are used to hoist the unit, care should be taken to prevent damage to the cabinet. For more information on hoisting, see AAON Rooftop Units "Lifting & Rigging Instructions".

Hoist unit to a point directly above the openings, and lower unit while guiding so the electric conduit passes into the unit utility entry. Continue lowering until the unit skirt fits around the curb. Make sure the unit is properly seated on the curb.
Connect the control wiring and apply power to the unit.

CAUTION: All motors and compressors are three phase. Wires on compressors must be re-connected and checked for rotation by checking suction and discharge pressures. Scroll compressors will fail if run the wrong direction; check by using suction and discharge gauges. Blower rotation should be checked and only be altered, if necessary at the power connection to the unit only since condenser fans and compressors also are affected.

CONDENSATE PIPING

The unit requires a drain trap to be connected to the drainpan at the unit. If codes require a condensate drain line, the line should be the same pipe size as drain nipple and should pitch downward toward drain.
The condensate drain pipe ("P" trap) is factory supplied and is shipped loose in the control access compartment for field installation.

ELECTRICAL

The power and control wiring may be brought up through the utility entry. Protect the branch circuit in accordance with code requirements. Control wires should not be run inside the same conduit, use 600 volt wire or as required by applicable codes. The unit must be electrically grounded in accordance with the National Electric Code, ANSI / NFPA No. 70. In Canada use current C.S.A. Standard C22.1 Canadian Electric Code Part 1. Power wiring is to the unit terminal block or main disconnect. All wiring beyond this point is done by the manufacturer.

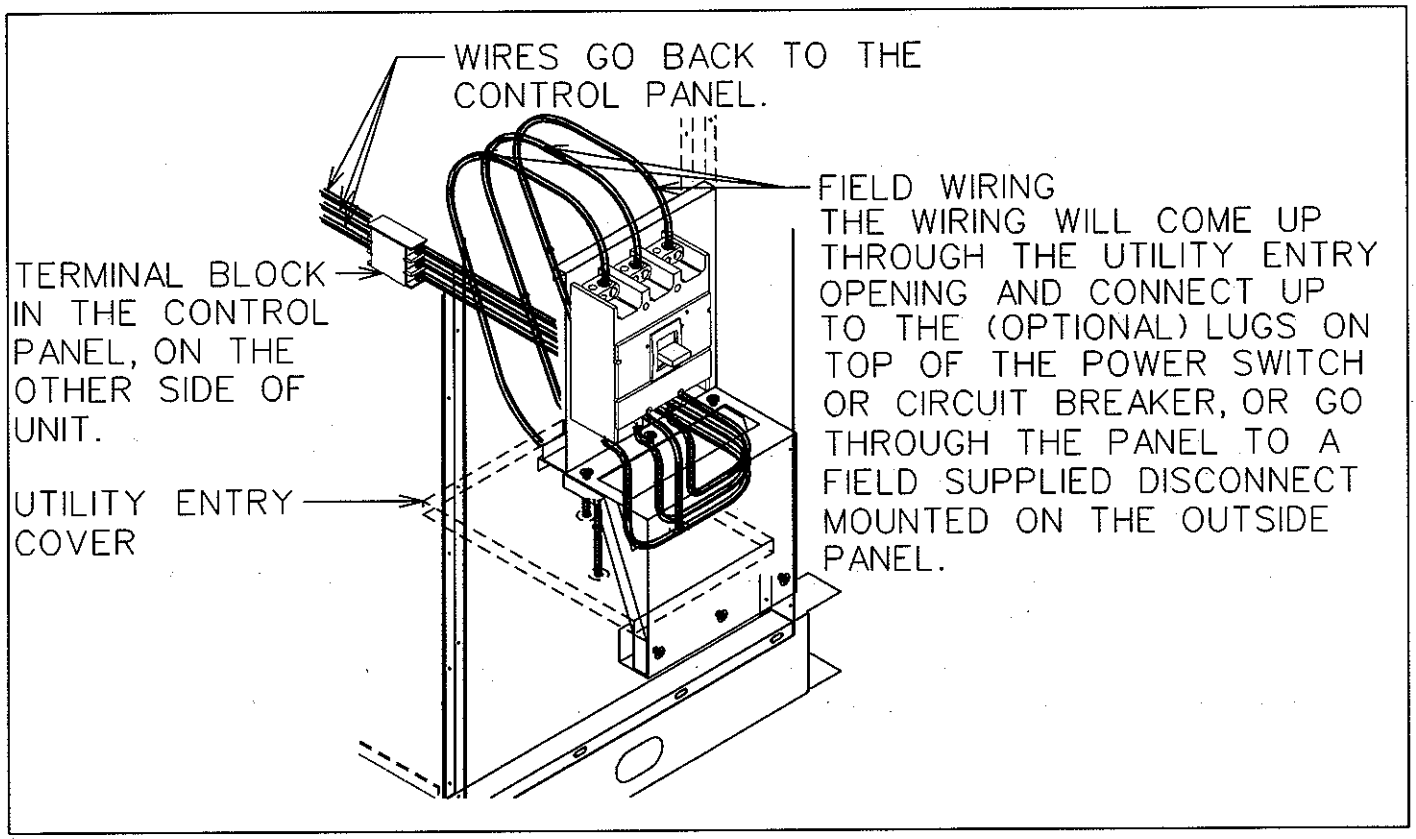
INSTALLATION IS TO BE ADJUSTED TO OBTAIN A TEMPERATURE RISE WITHIN THE RANGE SPECIFIED ON THE RATING PLATE.

START-UP TECHNICIAN: CHECK BLOWER MOTOR AMPERAGE AND ADJUST DRIVES SO AS NOT TO EXCEED THE AMPERAGE LISTED ON THE MOTOR NAMEPLATE.

WARNING

Electrical power is to be disconnected prior to servicing.

NOTE: All units are factory wired for 240 or 480 volt. If unit is to connected to a 208 volt supply, the transformer must be rewired for 208 volt service. For 208 volt service interchange the yellow and red conductor. (RED - BLK 208 volt ; YEL - BLK 240 volt). Units may be factory wired 208 volt at customers request.



⚠ IMPORTANT

Three phase Scroll Compressors are directional and start-up must be performed by a qualified service technician using suction and discharge gauges.

⚠ WARNING

Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit to OFF at disconnect switch(es). Unit may have multiple power supplies.

GAS

Size gas piping to supply the unit with 6" to 10.5" water column pressure for natural gas. Install piping in accordance with local codes, the piping must conform with the latest ANSI-Z223.1 National Fuel Gas Code; in Canada, Current Standards CAN / CGA-B149.1 or .2, Installation Codes for Gas Burning Appliances and Equipment.
Some utility companies will require pipe sizes larger than the minimum sizes listed.
Gas piping on units with (2) two heat exchangers are connected as shown in the illustration on the following page.

(A) ***CAUTION:*** Gas piping is to be supported DIRECTLY AT CONNECTION TO UNIT and must not be strained or bent and shall be supported by metal straps, blocks or hooks at intervals not to exceed that shown in the following table:

SIZE OF PIPE		INTERVALS (IN FEET)
3/4" OR 1"		8'
1 1/4" OR LARGER	(HORIZONTAL)	10'
1 1/4" OR LARGER	(VERTICAL)	EVERY FLOOR LEVEL

(B) Pipe joint compounds used on all gas piping connections shall be resistant to the action of petroleum gases.

(C) A 1/8" NPT plugged tap is required immediately ahead of the appliance gas control.

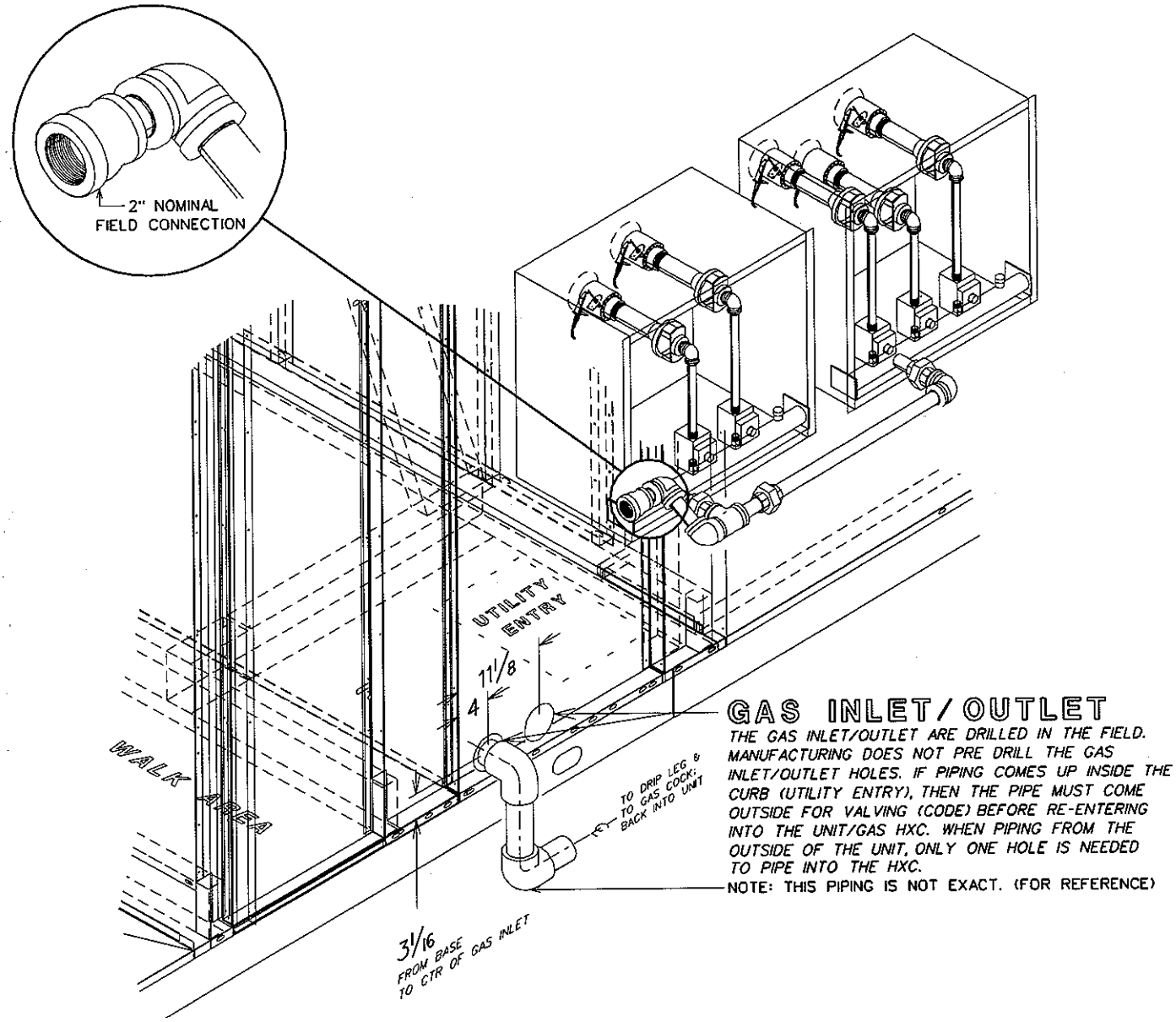
(D) All piping connections shall be checked with a soap solution for gas leaks before operating the appliance. ***CAUTION:*** The furnace must be isolated by closing the manual shut off valve or disconnected from the gas supply piping during pressure testing of the piping system with pressures in excess of 1/2 PSIG.

(E) The unit shall be installed so that the rectangular flue is located at least **120"** away from any opening through which combustion products could enter the building. The unit shall also be installed so that the flow of combustion and ventilating air is not obstructed from reaching the furnace. Do not position flue opening to discharge into a fresh air intake of any other piece of equipment.

(F) Flames should be observed as blue with slight or no yellow tipping. The flame should go directly down the burner tube with no rolling-out into burner box.

(G) The flow of combustion and ventilating air shall not be blocked or otherwise obstructed in any way. After electrical power is turned on, set unit controls for heating, and check for operation.

GAS PIPING INFORMATION



CLEARANCES

LOCATION	UNIT SIZE RF 040 Thru RF 130
Return Air (Back)	100"
Vent Side (Front)	100"
Left Side	100"
Right Side	100"
Top	UNOBSTRUCTED

WARNING:

Do not use an open flame or other source of ignition for leak testing.

The furnace must be isolated or disconnected by closing its individual manual shut-off valve from the gas supply piping system during pressure testing of the gas supply piping at test pressure greater than 1/2 PSIG. Excessive pressure may damage the gas valves.

LIGHTING INSTRUCTIONS

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING: IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do <u>not</u> try to light the pilot by hand.

B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

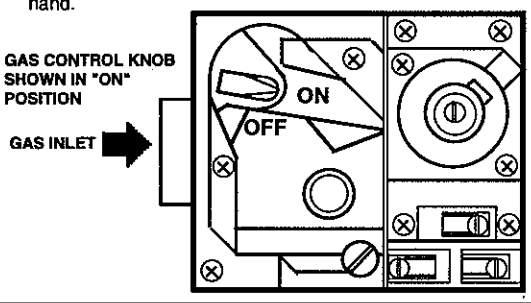
- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do <u>not</u> try to light the pilot by hand.



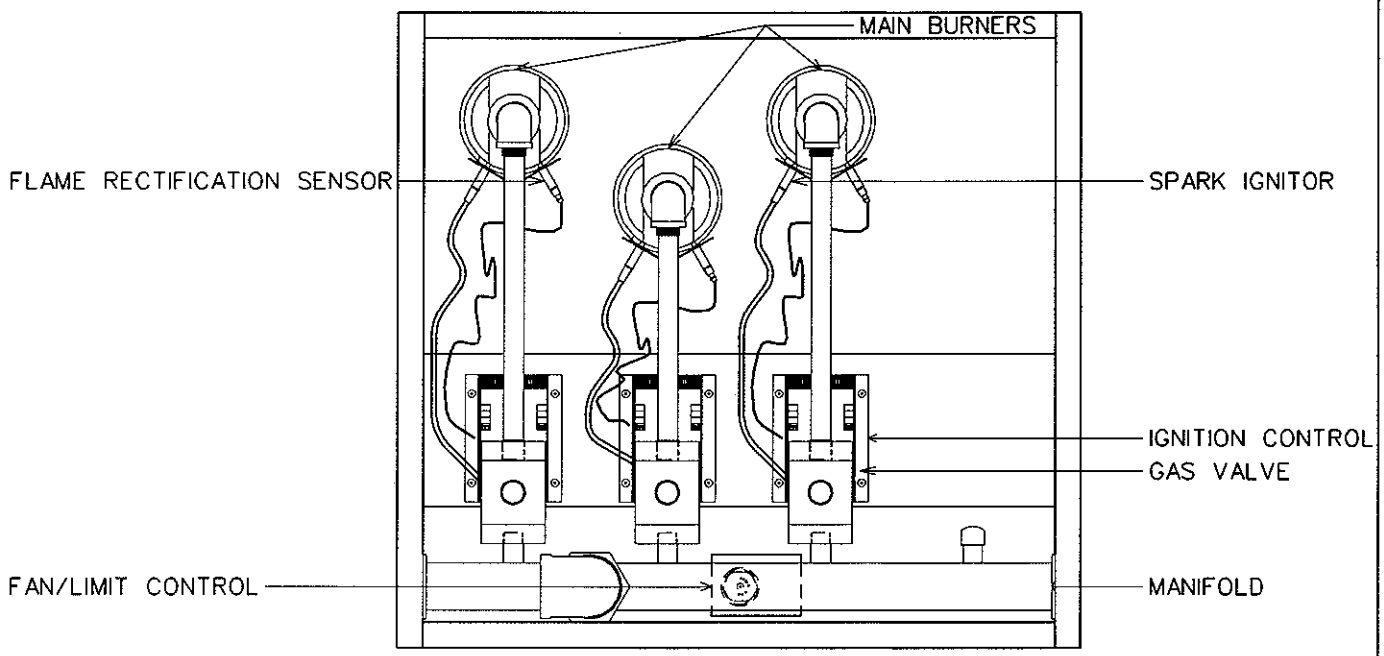
5. Open control access panel.
6. Push in gas control knob slightly and turn clockwise ↷ to "OFF". NOTE: Knob cannot be turned to "OFF" unless knob is pushed in slightly. Do not force.
7. WAIT five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
8. Turn gas control knob counterclockwise ↶ to "ON".
9. Close control access panel.
10. Turn on all electric power to the appliance.
11. Set thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

TO TURN OFF GAS TO APPLIANCE

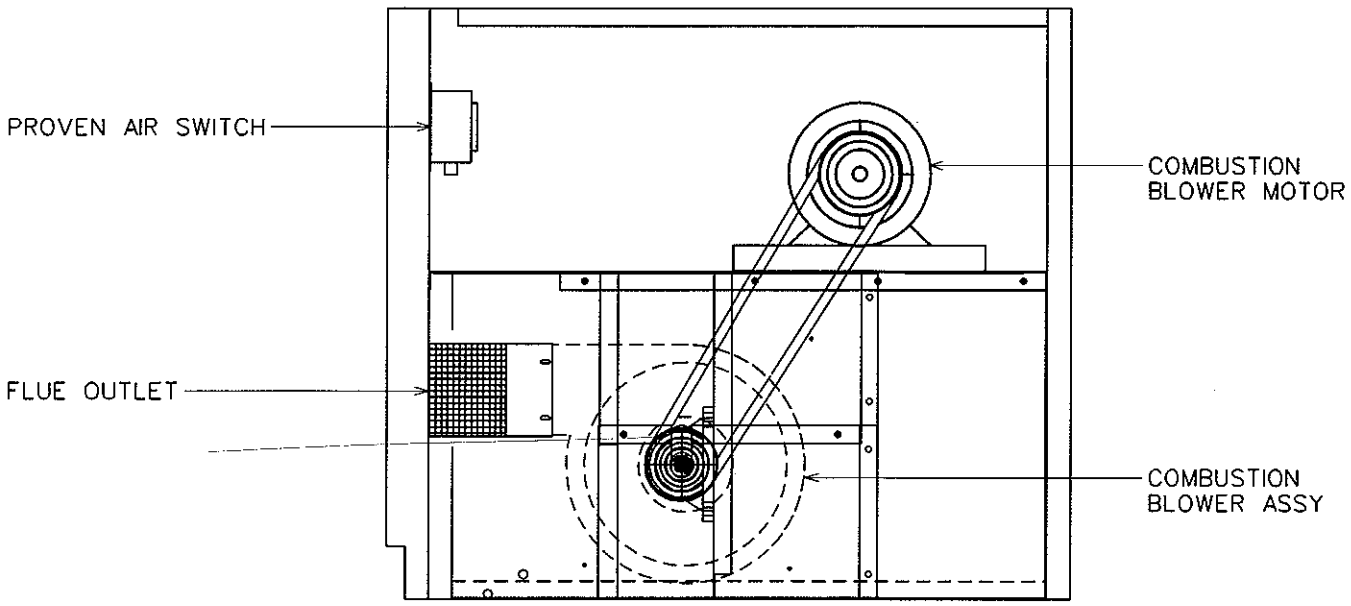
1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Open control access panel.
4. Push in gas control knob slightly and turn clockwise ↷ to "OFF". Do not force.
5. Close control access panel.

GAS HEATING ILLUSTRATION

RF GAS HEATING SECTION (TYPICAL)
FRONT



RF GAS HEATING SECTION (TYPICAL)
BACK



PERIODIC INSPECTION PROCEDURES • Gas Units

1. The flow of combustion and ventilating air shall not be blocked or otherwise obstructed in any way. The indoor blower, evaporator coil and filters should be inspected monthly.

2. Once each year, before unit is turned on for the heating season, a qualified serviceman must inspect all flue product carrying areas of the furnace, its vent system and main burners for continued safe operation.

   WARNING: At least once each year, a qualified serviceman should check out all of the items listed under the servicing and trouble shooting and maintenance section of this manual.

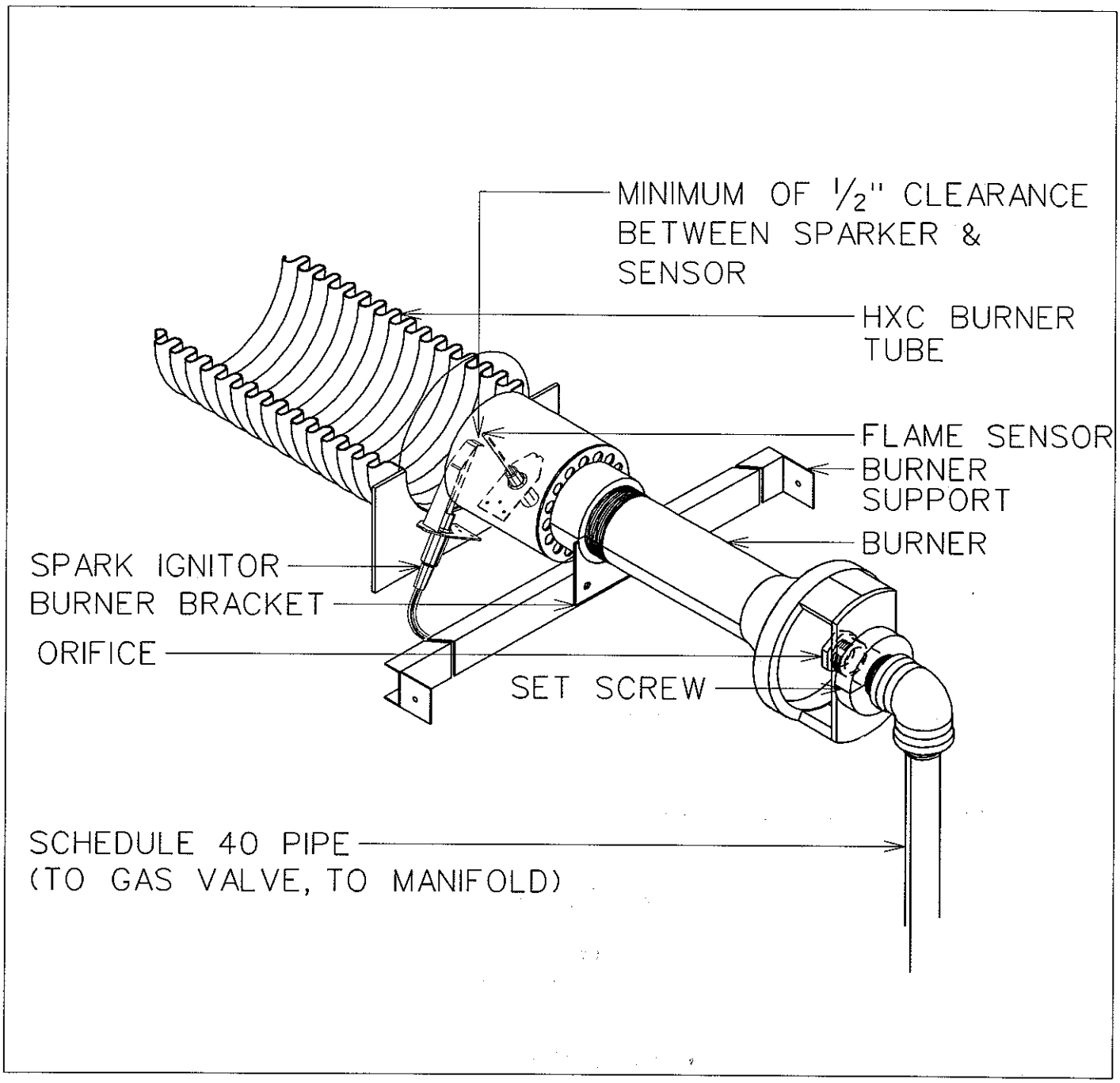
3. If the induced draft blower/motor assembly has to be replaced, care must be taken to provide an air-tight seal between the blower housing and the burner box. High Temp. Silicone sealant must be used to insure a good seal.

4. **MANUFACTURE'S RECOMMENDED METHOD FOR CLEANING MAIN GAS BURNERS & BURNER TUBES**
   It is recommended that if the Main Gas Burner require cleaning, call the AAON Service Engineer at (918) 583-2266. The burners should never require cleaning, so if it becomes a necessity, it indicates faulty operation of the unit. The cleaning should only be done by a qualified service agency and only after consultation with a Service Representative.

PERIODIC INSPECTION PROCEDURES
Electric, Steam, Hot Water, Cooling and Chilled Water Units

1. Indoor blower, coils and filters should be inspected monthly.
2. Once each year, before unit is turned on for the heating season, a qualified serviceman must inspect the unit for proper operation.
   WARNING: All of the items listed under the service and trouble-shooting and maintenance section of this manual should be performed once a year.
3. Inspect all valves and steam traps in accordance with Manufacturers Recommendations.

PERIODIC INSPECTION PROCEDURES Continued



IT IS RECOMMENDED THAT IF THE HEAT EXCHANGER REQUIRES CLEANING, CALL AN AAON SERVICE ENGINEER AT (918) 583-2266. The necessity for cleaning the exchanger could indicate faulty operation and should only be checked by a qualified service agency and only after they have discussed the problem with a Service Representative.

GENERAL LUBRICATING INSTRUCTIONS

Blower motors and fan bearings are pre-lubricated at the factory.

RE-LUBRICATE TYPE BEARINGS

Use a lithium base grease conforming to NLGI grade #2 consistency. This medium viscosity, low torque grease is rust inhibited and water resistant. Its temperature range is -30°F to +200°F with intermittent highs of +250°F.

LUBRICATION INTERVAL

Re-lubrication type bearings must be re-lubricated periodically to assure long life. The length of interval between greasing is dependent on the running speed and ambient conditions. The chart below is a general guide for the specific bearings in the RF.

BEARING LOCATION	BEARING SIZE	MAX. GREASE CAPACITY OF THE BEARING CHAMBER (In Ounces)	GREASING INTERVAL
Supply & Return Blowers	(1) 3 3/16"	3 1/2 oz.	2 to 6 months
	(1) 1 15/16"	7/8 oz.	
Gas Flue Exhaust	1/2"	1/8 oz.	2 months

MOTORS

For long operating life, re-lubrication of motor bearings should be on a yearly basis. Recommended greases are:

Shell Oil Company - "Dolium R"
Chevron Oil - "SRI No. 2"
Texaco Inc. - "Premium RB"

SERVICING, TROUBLE SHOOTING AND MAINTENANCE

In the event the unit cannot be made to function correctly, and a service company is required, it is strongly recommended that only companies with service technicians qualified and experienced in both gas and electric heating and air conditioning be permitted to service the systems. The service tech may call the factory if assistance is required.

BEFORE CALLING IT IS SUGGESTED TO HAVE THE MODEL AND SERIAL NUMBER OF THE UNIT AVAILABLE FOR THE SERVICE DEPARTMENT ENGINEER TO HELP ANSWER QUESTIONS REGARDING THE UNIT.

AAON, Inc.
Phone: 918-583-2266
Fax: 918-583-6094
Ask for Service Department Engineer

CHIEF CAUSES OF REDUCED AIR FLOW

A. **DIRTY FILTERS** - Filters must be inspected and replaced on a regular basis. It is strongly recommended that the media be replaced monthly. Clean filters are your best insurance against premature system breakdown.

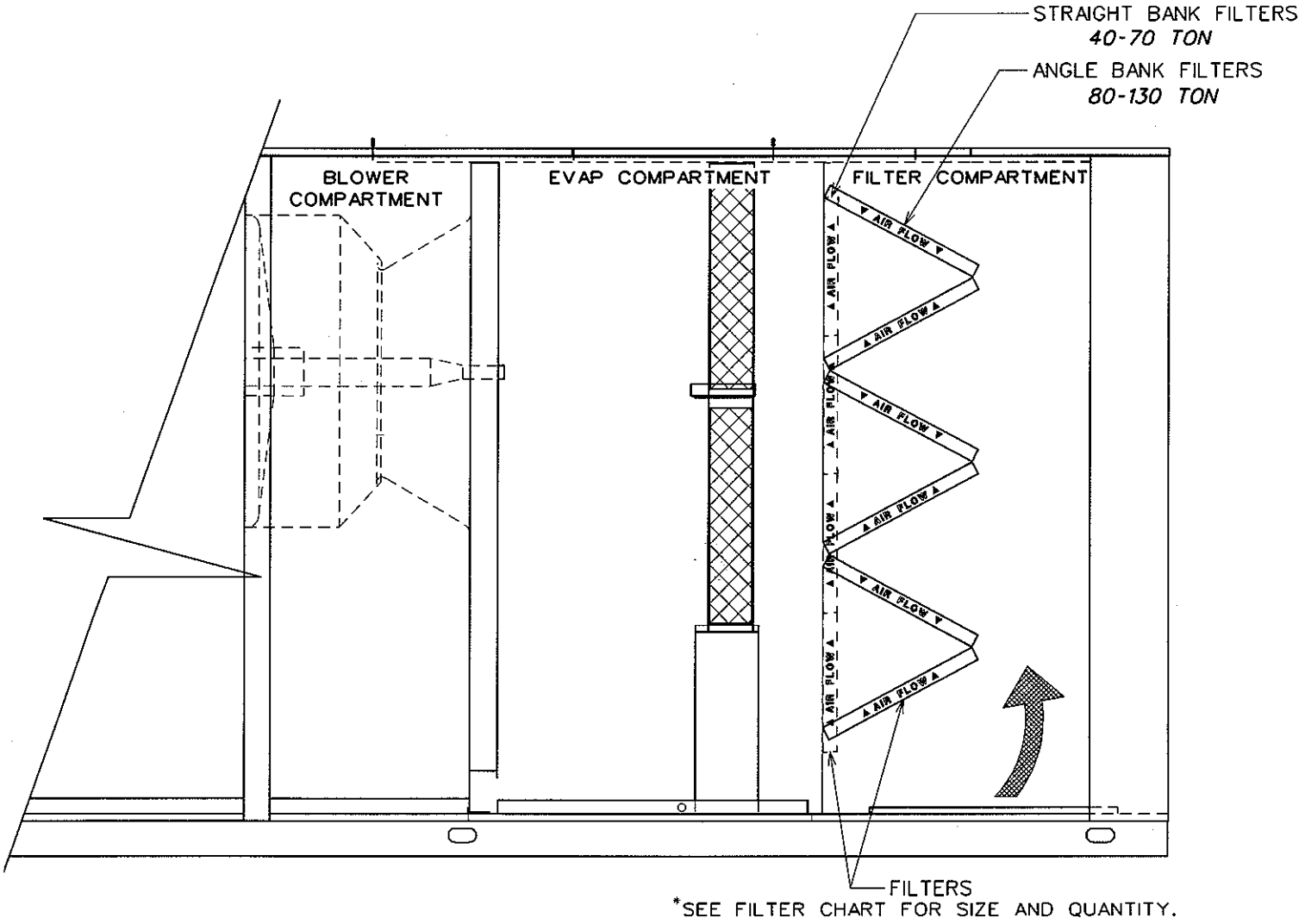
Do not permit the unit to be operated unless the filters are in place. Operation of the unit without filters will result in a clogged evaporator coil - a very expensive service job to correct.

B. **OBSTRUCTION TO AIR FLOW** - Supply and return air grilles must be kept clear so air can be freely drawn into and discharged from the system.

FILTER INSTALLATION / REPLACEMENT

Open filter access door. Slide filters towards you and inspect. Replace old filters with the size indicated on filters or as shown in the filter chart below. Be sure arrow points towards the blower. See illustration below. (Filters should be checked every 30 days and replaced or cleaned as necessary).

IT IS IMPORTANT TO KEEP COILS, BLOWER AND FILTERS CLEAN !



NOTE: CHART REFLECTS STANDARD FACTORY SUPPLIED FILTERS AND SIZES. CONTACT FACTORY FOR SPECIAL OPTIONAL FILTER PACKAGES.

FILTERS

CFM RANGE	(QTY) 20" x 25" x 2" PLEATED	(QTY) 20" x 25" x 4" PLEATED	(QTY) 24" x 24" x 12" CARTRIDGE
12,000 - 28,000	16	16	16
28,001 - 32,000	30	30	16
32,001 - 40,000	30	30	20 Requires 8 Ft. Filter Box
40,001 - 50,000	30	30	N/A

FILTERS SHOULD BE REPLACED EVERY 30 DAYS OR AS REQUIRED.

SERVICING

TROUBLE	POSSIBLE CAUSE
ELECTRIC HEATING	
SYSTEM OFF	1. Check power at line side of contactor(s). 2. Thermostat not set for heating.
EVAPORATOR MOTOR WILL NOT RUN	1. Overload relay tripped. 2. Heater Relay not energized. 3. Blower Contactor not energized.
BLOWER DOESN'T DELIVER AIR	1. Blower running backwards. 2. Dirty air filters. 3. Dirty coils. 4. Duct obstruction. 5. Belts loose.
BLOWER COMES ON, BUT LITTLE OR NO HEAT	1. One or more heater contactors are open. 2. Limit switches are open. 3. Heater relay open. 4. Heat strips burned out.
GAS HEATING	
SYSTEM OFF	1. Check power and gas supply. 2. Check thermostat switches and settings. 3. Check 24 volt power to ignition control.
COMBUSTION AIR BLOWER WON'T RUN	1. Thermostat not calling for heat. 2. Relay not closing. (No power to motor) 3. Motor stuck or winding open. 4. Internal motor overload open. 5. Wheel or motor seized.
BURNER GOES "OFF" ON HIGH LIMIT	1. Unit blower not coming on. (Check fan control) 2. Blower motor running backward. 3. Filters dirty. 4. Ducts obstructed or dampers closed. 5. Manifold gas pressure too high.
IGNITION ON, BURNER WON'T LIGHT	1. Hand valve "off" (turn to on)(main gas valve). 2. Gas off or very low pressure. 3. Check for power at main gas valve. 4. Check continuity of differential pressure switch with motor turning. If open, replace differential pressure switch. 5. Combustion air pulleys adjusted for too much air. (Re-set pulleys) 6. Sparker sensor out of adjustment. (See illustration page 15) 7. Main orifice blocked.

SERVICING Continued

TROUBLE	POSSIBLE CAUSE
STEAM AND HOT WATER HEATING	
SYSTEM OFF	1. Check power at line side of contactor(s). 2. Thermostat not set for heating.
BLOWER MOTOR WILL NOT RUN	1. Overload relay tripped. 2. Heater Relay not energized. 3. Blower Contactor not energized.
BLOWER DOESN'T DELIVER AIR	1. Blower running backwards. 2. Dirty air filters. 3. Dirty coils. 4. Duct obstruction. 5. Belts loose.
BLOWER COMES ON, BUT LITTLE OR NO HEAT	1. Check steam traps valves and steam or hot water supply in accordance with manufactures instructions. 2. Faulty thermostat.
COOLING PACKAGE and UNITS with REMOTE CONDENSERS	
SYSTEM OFF	1. Check power at lineside of contactor(s). 2. Thermostat not set for cooling. 3. High pressure control tripped. 4. Low pressure switch open (loss of charge).
CONDENSER FAN WILL NOT RUN	1. Check power at lineside of contactor(s). 2. Contactor not closing. 3. Motor failed. 4. Internal motor overload open. **REFER TO MFG'S INSTRUCTIONS IF REMOTE CONDENSER**
EVAPORATOR BLOWER WILL NOT RUN	1. Overload relay tripped. 2. Contactor not closing. 3. Motor failed.
COMPRESSOR SHORT CYCLES	1. Check for low refrigeration charge. 2. Compressor overload setting. 3. Ambient temperature too low. 4. Filters dirty or air flow restricted. 5. Evaporator blower not running. **REFER TO MFG'S INSTRUCTIONS IF REMOTE CONDENSER**
FAN MOTOR RUNS HOT AND CUTS OUT	1. Line voltage too high.
COMPRESSOR WILL NOT START	1. Line voltage too low. 2. Limit switches are open. 3. Overload or pressure control tripped. **REFER TO MFG'S INSTRUCTIONS IF REMOTE CONDENSER**
BLOWER DOES NOT DELIVER AIR	1. Blower running backwards. 2. Dirty filters. 3. Duct obstruction. 4. Belts loose.

SERVICING Continued

TROUBLE	POSSIBLE CAUSE
COOLING - CHILLED WATER	
SYSTEM OFF	1. Check power at line side of contactor(s). 2. Thermostat not set for cooling.
EVAPORATOR BLOWER WILL NOT RUN	1. Over load thermal protector open in motor. 2. Contactor not closing. 3. Motor failed.
FAN MOTOR RUNS HOT AND CUTS OUT	1. Line voltage too high.
BLOWER DOES NOT DELIVER AIR	1. Blower running backwards. 2. Dirty air filters. 3. Duct obstruction. 4. Belt loose.
BLOWER COMES ON, BUT LITTLE OR NO COOLING	1. Check supply water and temperature. 2. Check water control valves operation. 3. Check water temperature rise entering and leaving unit to determine if adequate water is flowing.

ROOFTOP UNIT REPLACEMENT PARTS

A complete list of replacement parts may be obtained from the manufacturer. When ordering parts, always reference the unit model number, serial number and part number.

It is the intent of AAON, Inc. to provide accurate and current specification information. However, in the interest of product improvement, AAON, Inc. reserves the right to change Pricing, Specifications and/or Design of it's Products without notice, obligation or liability.

For Parts, Order From:

AAON, Inc.

2425 South Yukon Ave.
Tulsa, Oklahoma 74107
Phone: 918-583-2266
Fax: 918-583-6094

Ask for Parts Service Department

FOR REPLACEMENT ITEMS USE MANUFACTURER SPECIFIED PARTS

AAON, Inc. — QUALITY ASSURANCE FACTORY TEST SHEET

TESTING TECHNICIAN: _____ DATE: _____

UNIT MODEL No: _____ DSO No: _____

UNIT SERIAL No: _____ WORK ORDER No: _____

HEATING TEST • NATURAL GAS • LP GAS

NATURAL GAS	PROPANE (L.P.)

MANIFOLD LEAKAGE: ☐

BURNER LIGHTS: ☐

FAN ON TEST: ☐

LIMIT CUT OUT TEST: ☐

AUX. LIMIT TEST: ☐

FAN OFF TEST: ☐

FLAME CORRECT: ☐

INPUT CAPACITY: _____ BTUH

METER TIMED AT _____ SECONDS

L.P GAS • LINE PRESS. 12" VALVE SET 11": ☐

LL CONTROL ☐

HEATING TEST • ELECTRIC •

HEATER No. & AMPS

1			11		
2			12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

LIMIT CUTOUT ☐ AUX. LIMIT ☐

LL CONTROL ☐ SEQUENCER(S) ☐

COOLING TEST • AMBIENT TEMP: _____ °F

COMP. No. & AMPS 3 Ø L1	L2	L3	Crankcase Heater	HI-Press Switch	Head Pressure PSIG	Suction Pressure PSIG
1						
2						
3						
4						
5						
6						
7						
8						

LOW AMBIENT CUTOUT: ☐

HOT GAS BYPASS: ☐

HOT GAS REHEAT: ☐

SIGHT GLASS: ☐

TIME DELAY • TYPE(S): ☐

CONDENSER ASSEMBLY

MOTOR MAKE & AMPS	3 Ø			MOTOR MAKE & AMPS	3 Ø		
1				5			
2				6			
3				7			
4				8			

NOMENCLATURE AMPS: _____ FAN CYCLE SWITCH(S): IN OUT

EVAPORATOR BLOWER ASSEMBLY

MOTOR MAKE / *AMPS	3 Ø		
1			
2			

FAN(S) ALIGNMENT: ☐ BELT(S) TENSION: ☐

NOMENCLATURE AMPS: _____ * VAV CONTROLS: ☐

POWER EXHAUST ASSEMBLY

MOTOR MAKE / *AMPS	3 Ø		
1			
2			

FAN(S) ALIGNMENT: ☐ BELT(S) TENSION: ☐

NOMENCLATURE AMPS: _____ AUTO AIR BALANCE: ☐

ECONOMIZER

TYPE: _____ MOTOR TYPE: _____

WIRING: _____ GEARS: _____

OPERATION: _____

ECON. CHG.OVER • TYPE: _____ OPERATION: ☐

CONTROLS

CLOGGED FILTER SW.	R/A SMOKE DETECTOR
NIGHT SETBACK	S/A SMOKE DETECTOR
PHASE BROWN OUT	R/A FIRESTAT
MAGNEHELIC GA.	S/A FIRESTAT
VVT CONTROL	

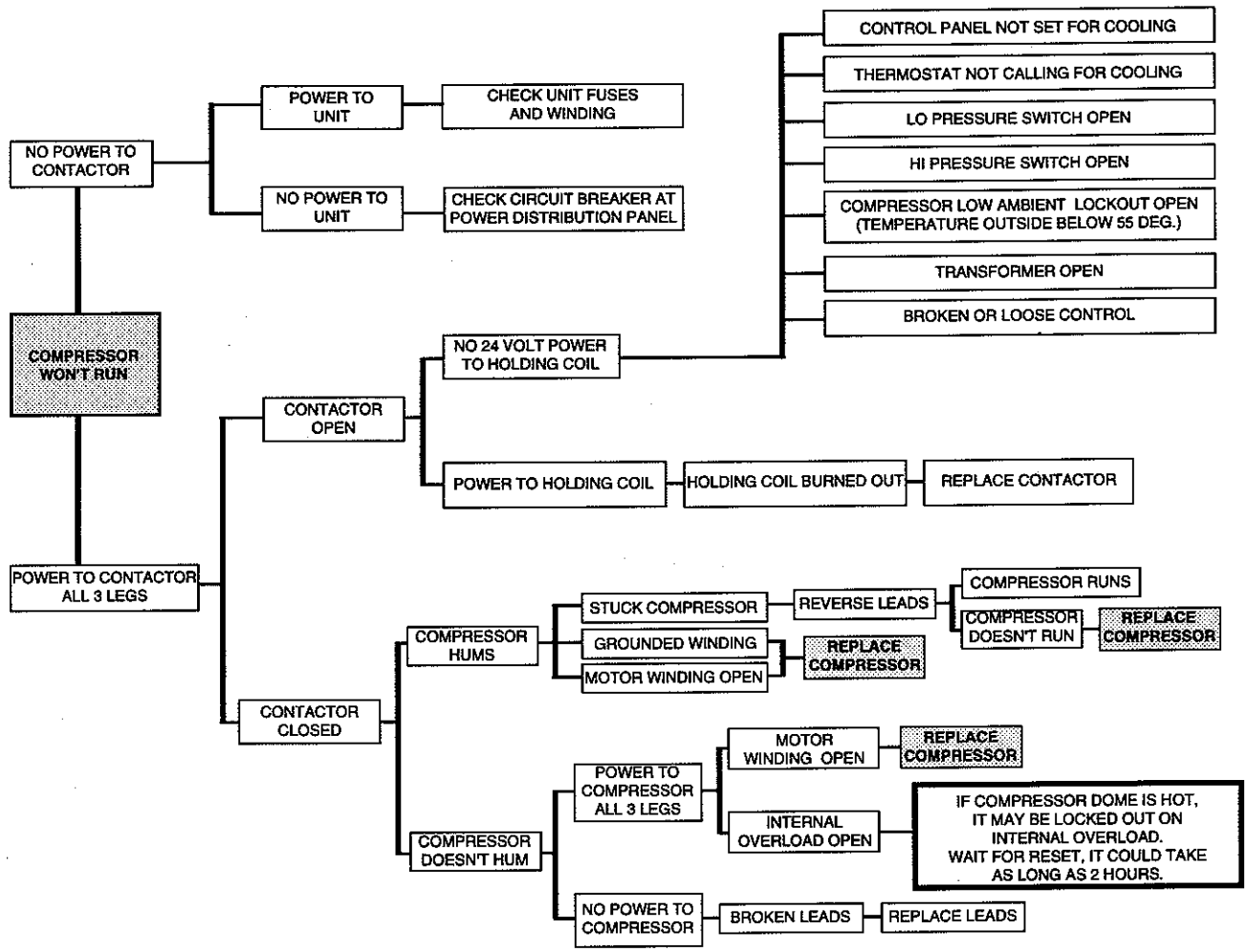
WIRING DIAGRAM(S)	MANUALS	OVERALL GENERAL APPEARANCE

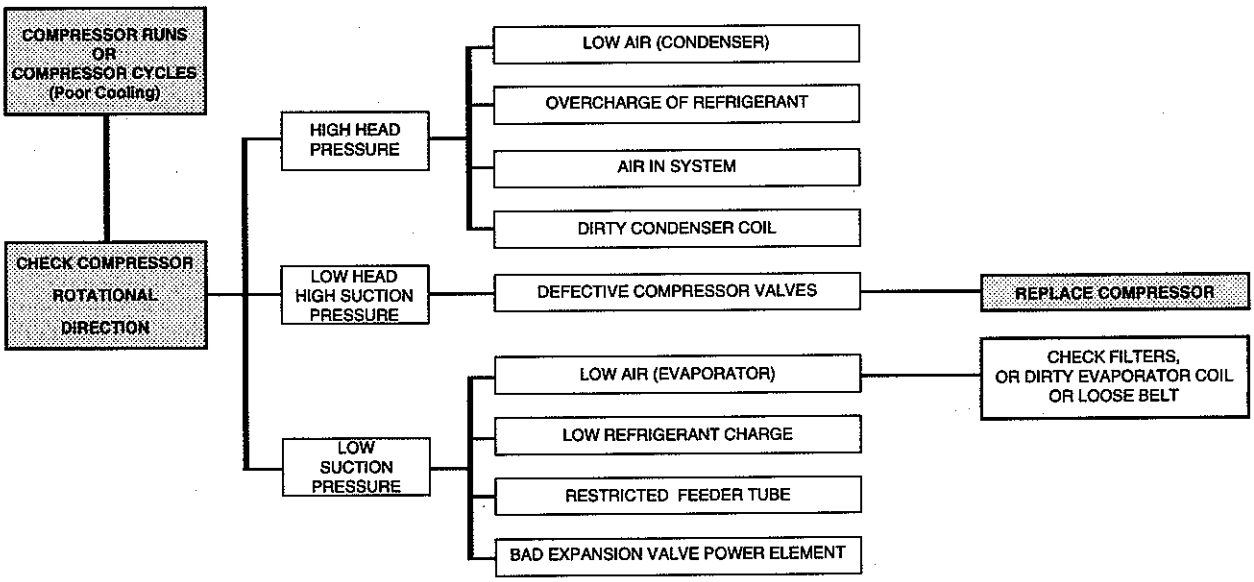
Special Option: _____ Test: _____ Result: _____

Special Option: _____ Test: _____ Result: _____

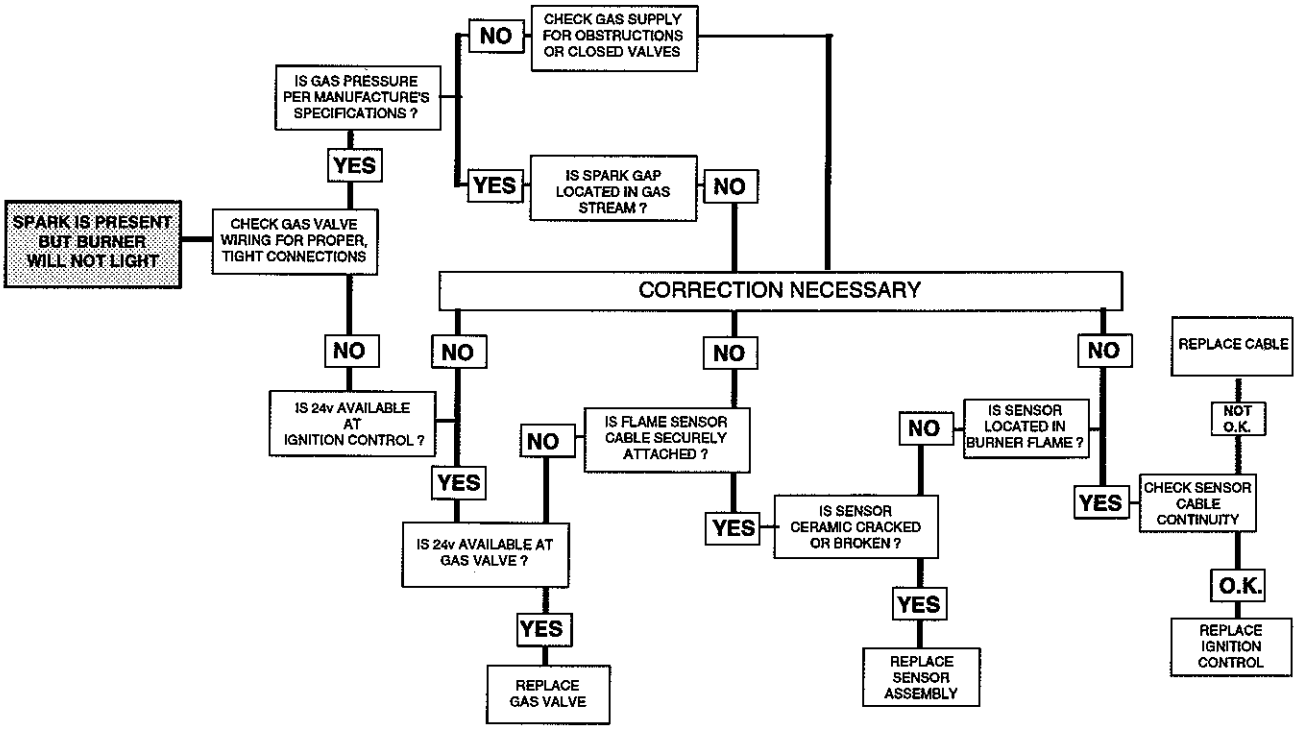
*NOTE: MOTOR AMPS ARE TAKEN AT "NO LOAD" AND MAY BE HIGHER THAN NOMENCLATURE AMPS.

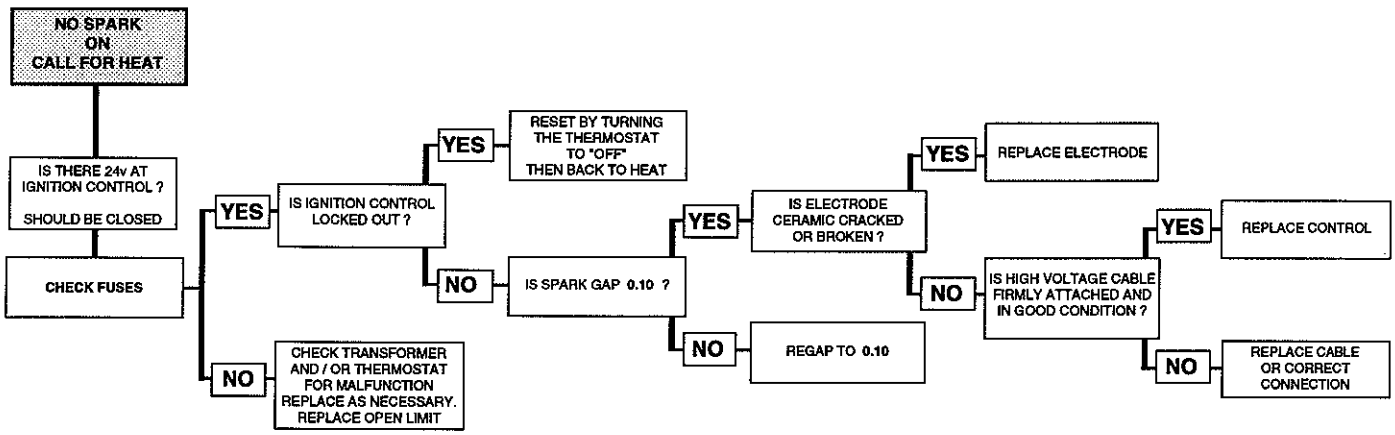
COMPRESSOR CHECKOUT PROCEDURE





IGNITION CONTROL CHECKOUT PROCEDURE





AAON ROOFTOP UNITS

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RF SERIES INSTALLATION, SERVICE & OWNERS INFORMATION MANUAL

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