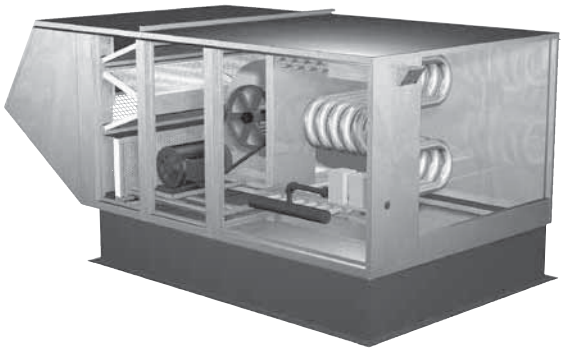
ACCUREX®
ENGINEERED RESTAURANT SYSTEMS

Document 481154
Model XIG/XIGX
Make-Up Air Unit

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage!



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General Safety Information

Only qualified personnel should install this unit. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if high winds or seismic activity are present. If more information is needed, contact a licensed professional engineer before moving forward.

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC), the National Fire Protection Agency (NFPA), where applicable. Follow the Canadian Electrical Code (CEC) in Canada.
2. The rotation of the wheel is critical. It must be free to rotate without striking or rubbing any stationary objects.
3. Motor must be securely and adequately grounded.
4. Do not spin fan wheel faster than the maximum cataloged fan rpm. Adjustments to fan speed significantly affects motor load. If the fan RPM is changed, the motor current should be checked to make sure it is not exceeding the motor nameplate amps.
5. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces, or chemicals. Replace cord immediately if damaged.
6. Verify that the power source is compatible with the equipment.
7. Never open blower access doors while the fan is running.

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in serious injury, death or property damage.

Be sure to read and understand the installation,operation and service instructions in this manual.

Improper installation, adjustment alteration, service or maintenance can cause serious injury, death or property damages.

— Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

— WHAT TO DO IF YOU SMELL GAS

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

— Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Receiving

Upon receiving the product, check to ensure all items are accounted for by referencing the delivery receipt or packing list. Inspect each crate or carton for shipping damage before accepting delivery. Alert the carrier of any damage detected. The customer will make notation of damage (or shortage of items) on the delivery receipt and all copies of the bill of lading which is countersigned by the delivering carrier. If damaged, immediately contact your manufacturer's representative. Any physical damage to the unit after acceptance is not the responsibility of the manufacturer.

Unpacking

Verify that all required parts and the correct quantity of each item have been received. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts. Sometimes it is not possible that all items for the unit be shipped together due to availability of transportation and truck space. Confirmation of shipment(s) must be limited to only items on the bill of lading.

Handling

Units are to be rigged and moved by the lifting brackets provided or by the skid when a forklift is used. Location of brackets varies by model and size. Handle in such a manner as to keep from scratching or chipping the coating. Damaged finish may reduce ability of unit to resist corrosion.

Storage

Units are protected against damage during shipment. If the unit cannot be installed and operated immediately, precautions need to be taken to prevent deterioration of the unit during storage. The user assumes responsibility of the unit and accessories while in storage. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user.

1. Plug all piping.
2. Store belts flat to keep them from warping and stretching.

INDOOR — The ideal environment for the storage of units and accessories is indoors, above grade, in a low humidity atmosphere which is sealed to prevent the entry of blowing dust, rain or snow. Temperatures should be evenly maintained between 30°F *(-1°C)* and 110°F *(43°C)* (wide temperature swings may cause condensation and “sweating” of metal parts). All accessories must be stored indoors in a clean, dry atmosphere.

Remove any accumulations of dirt, water, ice, or snow and wipe dry before moving to indoor storage. To avoid “sweating” of metal parts allow cold parts to reach room temperature. To dry parts and packages use a portable electric heater to get rid of any moisture build up. Leave coverings loose to permit air circulation and to allow for periodic inspection.

The unit should be stored at least 3½ in. *(89 mm)* off the floor on wooden blocks covered with moisture proof paper or polyethylene sheathing. Aisles between parts and along all walls should be provided to permit air circulation and space for inspection.

OUTDOOR — Units designed for outdoor applications may be stored outdoors, if absolutely necessary. Roads or aisles for portable cranes and hauling equipment are needed.

The fan should be placed on a level surface to prevent water from leaking into the unit. The unit should be elevated on an adequate number of wooden blocks so that it is above water and snow levels and has enough blocking to prevent it from settling into soft ground. Locate parts far enough apart to permit air circulation, sunlight, and space for periodic inspection. To minimize water accumulation, place all unit parts on blocking supports so that rain water will run off.

Do not cover parts with plastic film or tarps as these cause condensation of moisture from the air passing through heating and cooling cycles.

Inspection and Maintenance during Storage

While in storage, inspect fans once per month. Keep a record of inspection and maintenance performed.

If moisture or dirt accumulations are found on parts, the source should be located and eliminated. At each inspection, rotate the fan wheel by hand ten to fifteen revolutions to distribute lubricant on motor. Every three months, the fan motor should be energized. If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair.

Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. Immediately remove the original rust preventive coating with petroleum solvent and clean with lint-free cloths. Polish any remaining rust from surface with crocus cloth or fine emery paper and oil. Do not destroy the continuity of the surfaces. Wipe thoroughly clean with Tectyl® 506 (Ashland Inc.) or the equivalent. For hard to reach internal surfaces or for occasional use, consider using Tectyl® 511M Rust Preventive or WD-40® or the equivalent.

REMOVING FROM STORAGE — As units are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion, until the equipment goes into operation.

Prior to installing the unit and system components, inspect the unit assembly to make sure it is in working order.

1. Check all fasteners, set screws on the fan, wheel, bearings, drive, motor base, and accessories for tightness.
2. Rotate the fan wheel(s) by hand and assure no parts are rubbing.
3. Purge grease before putting fan into service.

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Maintenance Log . . . . . Backcover
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Indirect Gas-Fired Unit Installations

Units are listed for installation in the United States and Canada.

- Installation of gas-fired duct furnaces must conform with local building codes. In the absence of local codes, installation must conform to the National Fuel Gas code, ANSI Z223.1 or in Canada, CAN/CGA-B149 installation codes.
- All electrical wiring must be in accordance with the regulation of the National Electrical Code, ANSI/NFPA 70.
- Unit is approved for installation downstream from refrigeration units. In these conditions, condensate could form in the duct furnace and provision must be made to dispose of the condensate.

Clearance to Combustibles / Service Clearances

	Floor	Top	Sides	Ends
Indirect Fired Units*	0 inches *(0 mm)*	0 inches *(0 mm)*	0 inches *(0 mm)*	0 inches *(0 mm)*

Clearance to combustibles is defined as the minimum distance required between the heater and adjacent combustible surfaces to ensure the adjacent surface's temperature does not exceed 90° above the ambient temperature.

*Reference venting guidelines for combustion blower clearances.

Recommended Minimum Service Clearances	
Housing 32 and less	42 inches *(1067 mm)* on the controls side of the unit

Clearances for component removal (such as evaporative cooler media) should be 6 in. wider than the width of the module itself.

Additional IOMs for Reference

For complete furnace information reference the Indirect Gas-Fired Heat Modules Installation, Operation and Maintenance Manual. Available turndown control options include:

	Electronic Modulation
Single Furnace Unit	4:1- uses modulating valve and furnace controller
	*High turndown uses a 4:1 modulating valve with a proprietary manifold and furnace controller
Two Furnace Unit	8:1- uses one 4:1 modulating furnace with furnace controller and one 2-stage furnace
	4:1 - uses two 4:1 modulating furnaces controlled in parallel
	*High turndown furnaces in a series configuration use one high turndown furnace and one 2-stage furnace
	*High turndown furnaces in a parallel configuration use two high turndown furnaces, controlled in parallel
Three Furnace Unit	12:1 - uses one 4:1 modulating furnace, one 2 stage furnace and one 1-stage furnace
	*High turndown uses one high turndown furnace, one 2-stage furnace, and one 1-stage furnace

** High turndown furnace patent pending.*

	Staged
Single Furnace Unit	8 stage
	2 stage
	1 stage
Two Furnace Unit	4-stage uses two 2-stage furnaces
	2-stage uses two single-stage furnaces
Three Furnace Unit	6-stage uses three 2-stage furnaces
	3-stage uses three 1-stage furnaces

Installation of Indoor Hanging Unit

NOTE

To prevent premature heat exchanger failure, do not locate units where chlorinated, halogenated, or acid vapors are present.

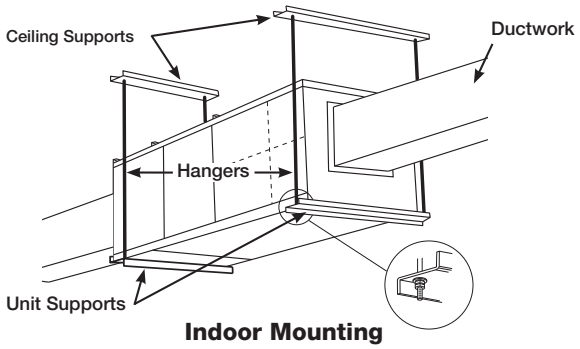
1. Install Hangers

Install threaded hangers from ceiling supports. When locating hangers, allow enough room to open the unit's access panel(s). Two nuts must be used on the end of each threaded hanger. Ceiling supports are supplied by others.

2. Install Unit

Raise the unit into place. Using two nuts per hanger, fasten the unit supports to hangers under the unit. Appropriate unit supports, such as a c-channel or angle iron (supplied by others) should be used.

Using self-tapping screws, attach ductwork to unit. In order to prevent the unit from swinging and to provide a safe environment for service and maintenance, additional field-provided measures must be taken to secure the unit in all directions.



Indoor Mounting

NOTE

Two nuts must be used on each end of each threaded hanging rod for proper support.

WARNING

All factory-provided lifting lugs must be used when lifting any unit. Failure to comply with this safety precaution could result in property damage, serious injury or death.

NOTE

Good duct practices should be followed for all ductwork. Ductwork should be installed in accordance with SMACNA and AMCA guidelines, NFPA 96 and any local codes. Reference the CAPS submittal for duct sizes.

3. Install Vent Piping

Refer to the Indoor Venting Instructions. Refer to your unit submittal to determine the correct venting option.

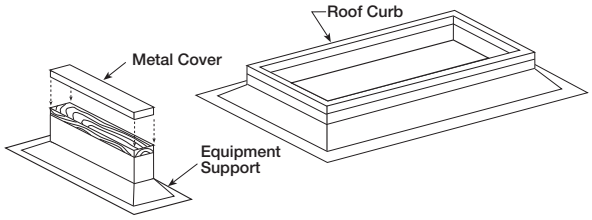
NOTE

Vent piping is supplied by others and not supplied by manufacturer.

Installation of Arrangement Downblast (DB) / Horizontal (HZ)

1. Install Curb and/or Equipment Support(s)

Position curb/equipment support(s) on the roof (reference the CAPS submittal for placement of curb/equipment support(s) in relation to the unit). Verify that unit supports are level; shim if necessary. Attach curb to roof and flash into place. Attach the equipment support(s) to the roof, remove metal cover, flash to wooden nailer, and reinstall cover.



Roof Curb and Equipment Support

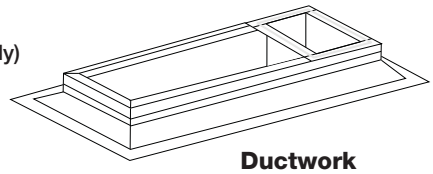
NOTE

Refer to Outdoor Venting instructions when locating the unit.

2. Install Ductwork

Good duct practices should be followed for all ductwork. All ductwork should be installed in accordance with SMACNA and AMCA guidelines, NFPA 96 and all local codes. Reference the CAPS submittal for ductwork size and location.

Supply Air Ductwork (Arrangement DB only)



Ductwork

NOTE

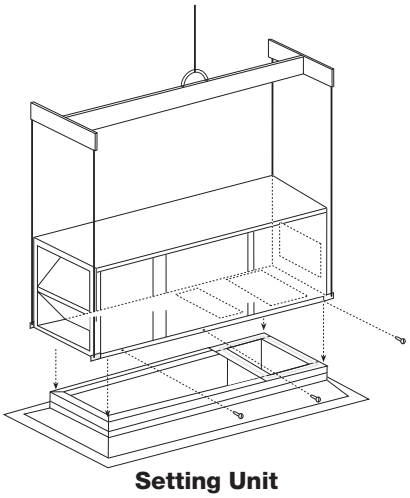
The use of a duct adapter is recommended on a downblast (DB) arrangement to align the ductwork with the supply unit. The duct adapter is only a guide and is not to be used as support for the ductwork.

3. Apply Sealant

Apply an appropriate sealant around the perimeter of the curb and duct adapter(s) to isolate fan vibration and prevent water penetration.

4. Install Unit

Use a crane and a set of spreader bars hooked to the



Setting Unit

factory lifting lugs to lift and center the unit on the curb/equipment support(s).

Use self-tapping sheet metal screws to fasten the unit to the curb/equipment support(s).

NOTE

The use of all lifting lugs and a set of spreader bars is mandatory when lifting the unit.

NOTE

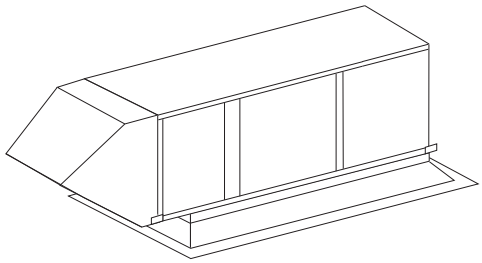
Some units come with the weatherhood attached and Step 5 may not apply.

5. Assemble and Attach Weatherhood

The weatherhood can now be assembled and attached to the unit. Detailed assembly instructions can be found with the weatherhood. If the optional evaporative cooling module was selected, this step does not apply. Instead, refer to the installation instructions for the optional Evaporative Cooling Module section, page 7.

6. Seal Weatherhood Seam

Using an appropriate sealant, seal the seam between the weatherhood and the unit.

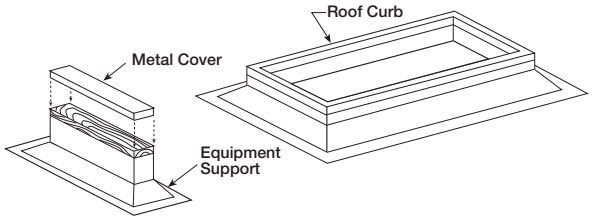


Complete Rooftop Installation

Installation of Roof Mounted Unit Arrangement Combination Curb

1. Install Curb/Equipment Support(s)

Position curb/equipment support(s) on the roof (reference the CAPS submittal for placement of curb/equipment support(s) in relation to the unit). Verify that all unit supports are level; shim if necessary. Attach curb to roof and flash into place. Attach the equipment support(s) to the roof, remove metal cover, flash to wooden nailer, and reinstall cover.



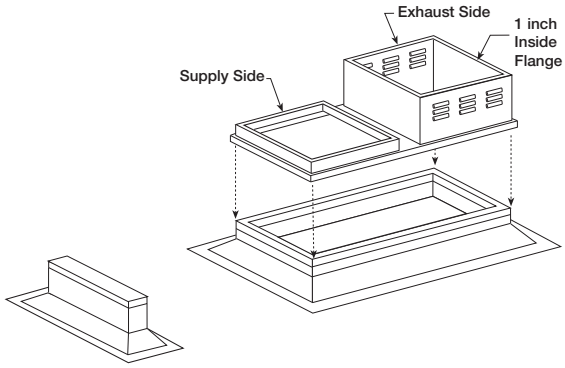
Roof Curb and Equipment Support

NOTE

Refer to Outdoor Venting instructions when locating the unit.

2. Install Combination Curb Adaptor

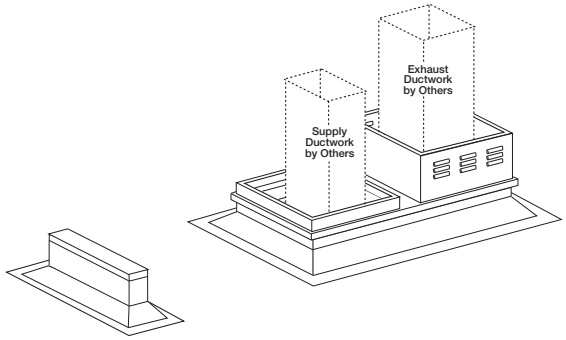
Install combination curb adaptor over curb, use wood screws to lag in place. Locate extension so the tall louvered side is over the exhaust opening, as shown in illustration. Caulk extension to combination curb adaptor. Fasten extension to curb adaptor with #12 sheet metal screws (field provided).



Combination Extension

3. Install Ductwork

Good duct practices should be followed for all ductwork. All ductwork should be installed in accordance with SMACNA and AMCA guidelines, NFPA 96 and any local codes. Reference the CAPS submittal for ductwork size and location.



Ductwork

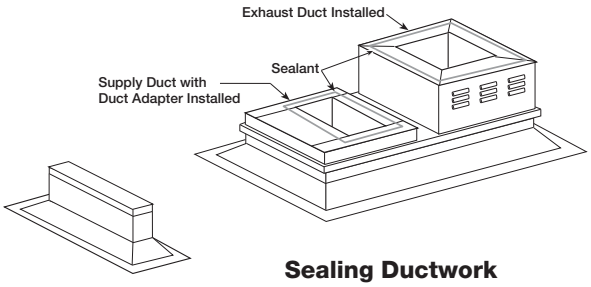
NOTE

The use of a duct adapter is recommended on a downblast (DBC) arrangement to align the ductwork with the supply unit. The duct adapter is only a guide and is not to be used as support for the ductwork.

Installation of Roof Mounted Unit Arrangement DBC, *continued*

4. Apply Sealant

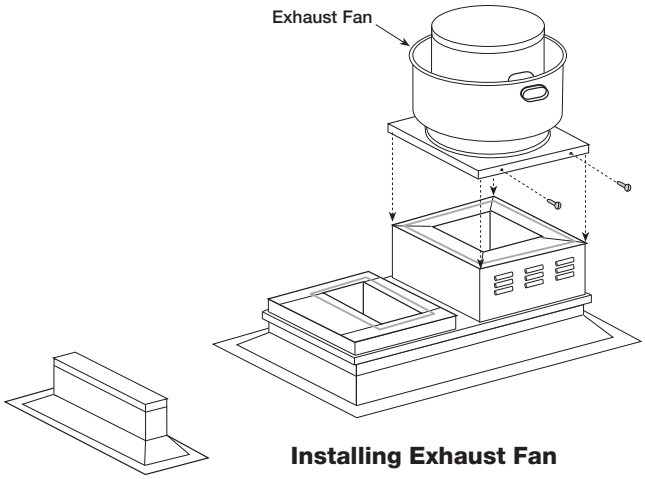
Apply an appropriate sealant around the perimeter of the curb and duct adapter(s) to isolate fan vibration and prevent water penetration.



Sealing Ductwork

5. Install Exhaust Fan

Fasten exhaust fan to curb extension with self-tapping sheet metal screws.



Installing Exhaust Fan

NOTE

Installing the exhaust fan prior to the supply unit will allow for easier installation of options.

6. Install Exhaust Options

Install optional hinge kit with restraining cables and grease trap with drain connection.

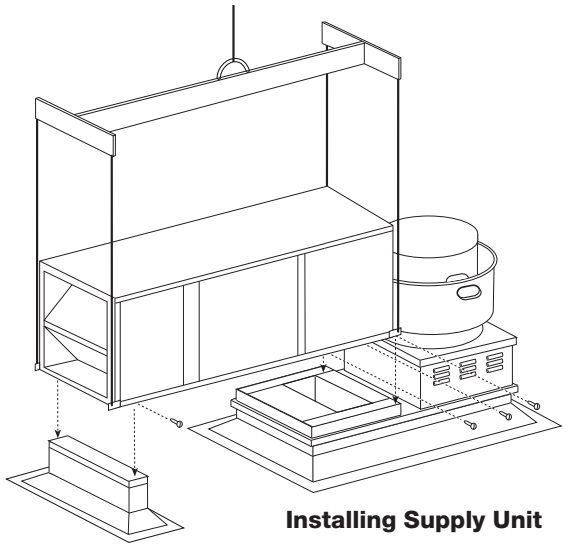
NOTE

NFPA 96 requires that the exhaust fan be hinged.

7. Install Supply Unit

Use a crane and a set of spreader bars hooked to the factory lifting lugs to lift and center the unit on the extension/equipment support(s).

Use self-tapping sheet metal screws to fasten the unit to the extension/equipment support(s).



Installing Supply Unit

NOTE

The use of all lifting lugs and a set of spreader bars is mandatory when lifting unit.

NOTE

Be sure to complete the outdoor venting installation instructions.

NOTE

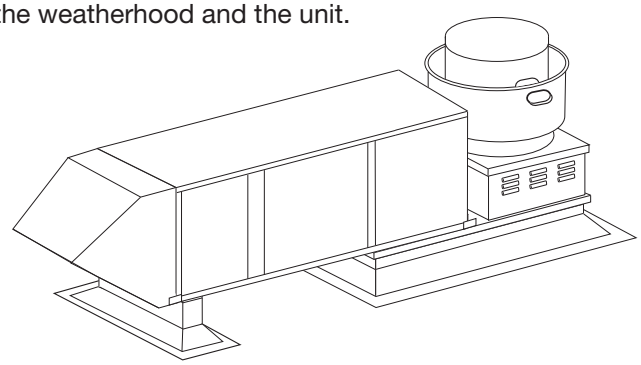
Some units come with the weatherhood attached and Step 8 may not apply.

8. Assemble and Attach Weatherhood

The weatherhood can now be assembled and/or attached to the unit. Detailed assembly instructions can be found with the weatherhood. If the optional evaporative cooling module was selected, this step does not apply. Instead, refer to the installation instructions for the optional Evaporative Cooling Module section, page 7.

9. Seal Weatherhood Seam

Using an appropriate sealant, seal the seam between the weatherhood and the unit.



Complete Combination Installation

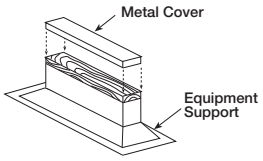
Installation of Evaporative Cooling Module (optional)

NOTE

Small evaporative coolers ship attached to the base unit and require no additional mounting.

1. Locate Equipment Support(s)

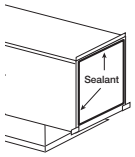
Position equipment support(s) on the roof; reference the CAPS submittal for placement of equipment support(s) in relation to the unit. Verify that all unit supports are level; shim if necessary. Attach equipment support to the roof, remove metal cover, flash to wooden nailer, and reinstall cover.



Equipment Support

2. Apply Sealant

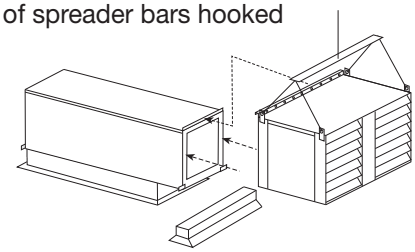
Apply an appropriate sealant around the airstream opening to create an air tight seal.



Sealant

3. Set Evaporative Cooling Module

Use a crane and a set of spreader bars hooked to the factory lifting lugs to lift and center the module on the equipment support(s). The flange on the evaporative cooler should overlap the flange on the unit.



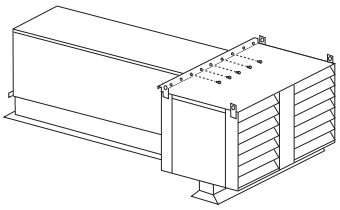
Placing Evaporative Module

NOTE

The use of all lifting lugs and a set of spreader bars is mandatory when lifting the evaporative cooling module.

4. Secure Cooling Module to Unit

Use self-tapping screws to fasten the cooling module to the base unit along the top and down both sides. Fasten at the top through the flanges. To fasten the sides, the media must be removed. To remove the media, first remove the access panel on the evaporative module and disconnect the evaporative pump(s). The media will now slide out. With the media removed, you can access the side fastening points inside the evaporative module. With all the screws in place, reinstall the media, reconnect the pumps, and reinstall the access panel.



Securing Evaporative Module

NOTE

When mounting the evaporative cooler, it is important that the evaporative cooler is level to ensure proper operation and water drainage.

Installation of Furnace Connections

Refer to separate furnace Installation, Operation and Maintenance Manual for detailed information about installation of furnace venting and gas piping.

Installation - Electrical Wiring

IMPORTANT

Before connecting power to the unit, read and understand the following instructions and wiring diagrams. Complete wiring diagrams are attached on the inside of the control center door(s).

IMPORTANT

All wiring should be done in accordance with the latest edition of the National Electrical Code ANSI/NFPA 70 and any local codes that may apply. In Canada, wiring should be done in accordance with the Canadian Electrical Code.

CAUTION

If replacement wire is required, it must have a temperature rating of at least 105°C, except for energy cut-off or sensor lead wire which must be rated to 150°C.

IMPORTANT

The equipment must be properly grounded. Any wiring running through the unit in the airstream must be protected by metal conduit, metal clad cable, or raceways.

DANGER

High voltage electrical input is needed for this equipment. This work should be performed by a qualified electrician.

CAUTION

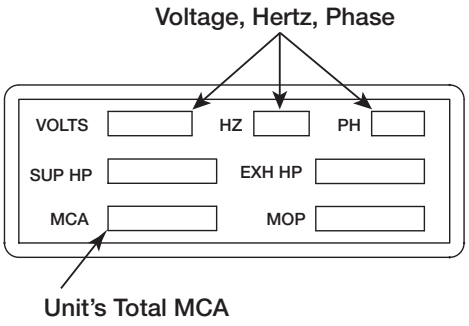
Any wiring deviations may result in personal injury or property damage. Manufacturer is not responsible for any damage to, or failure of, the unit caused by incorrect final wiring.

IMPORTANT

Manufacturer's standard control voltage is 24 VAC. Control wire resistance should not exceed 0.75 ohms (approximately 285 feet total length for 14 gauge wire; 455 feet total length for 12 gauge wire). If the resistance exceeds 0.75 ohms, an industrial-style, plug-in relay should be wired in place of the remote switch. The relay must be rated for at least 5 amps and have a 24 VAC coil. Failure to comply with these guidelines may cause motor starters to chatter or not pull in, resulting in contactor failures and/or motor failures.

1. Determine the Size of the Main Power Lines

The unit's nameplate states the voltage and the unit's total MCA. The main power lines to the unit should be sized accordingly. The nameplate is located on the outside of the unit on the control panel side.



Electrical Nameplate

2. Provide the Opening(s) for the Electrical Connections

Electrical openings vary by unit size and arrangement and are field-supplied.

3. Connect the Main Power

Connect the main power lines to the disconnect switch and main grounding lug(s). Torque field connections to 20 in.-lbs.

4. Wire the Optional Convenience Outlet

The convenience outlet requires a separate 115V power supply circuit. The circuit must include short circuit protection which may need to be supplied by others.

5. Wire the Optional Accessories

Reference the ladder diagram on the inside of the control center door for correct wiring of the following accessories:

- Selectra Stat
- Room Override
- Blower Switch
- Heat Switch
- Indicating Lights
- Dirty Filter Indicator
- Industrial Remote Panel
- Kitchen Remote Panel
- Economizer Activator
- Room Stat

NOTE

Wiring to the Selectra Stat or room override should be in separate conduit or run with shielded cable.

NOTE

The Industrial Remote Panels use point-to-point wiring to connect to the unit's main control center.

6. Wire the Evaporative Cooler (optional)

Reference the ladder diagram on the inside of the control center door for correct wiring of the pump and the optional water valves.

7. Install Economizer Sensors (optional)

All economizer options (EC) require an outdoor air temperature or enthalpy sensor to be field-installed inside of the weatherhood and field-wired to the economizer. Reference unit specific ladder diagram from proper terminals.

Economizer options EC-3 and EC-4 require a return air temperature or enthalpy sensor to be field-installed in the return air duct and field-wired to the economizer. Reference unit specific ladder diagram from proper terminals.

The sensors are provided by the factory and ship with the unit.

8. Install Discharge Air Sensor

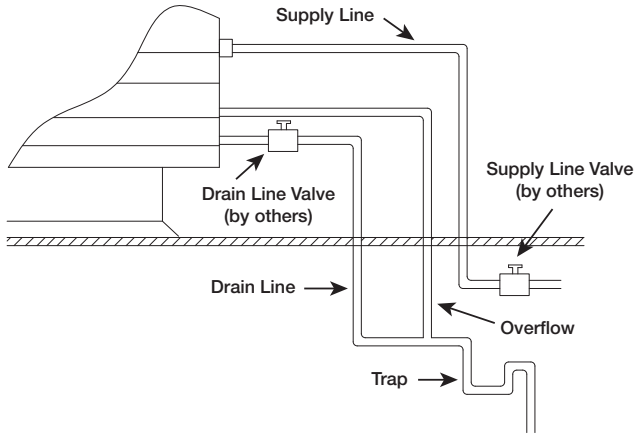
For units with 1:1, 2:1, 3:1, 6:1, 8:1, 16:1 and 24:1 staged turndown; or 4:1, 8:1, 12:1, and high turndown electronic modulation, a discharge air sensor is used. Upon installation, the sensor must be relocated from the control center to the ductwork, at a minimum of three duct diameters downstream of the heat exchanger.

9. Install DDC Interface (Optional)

Some units may use an external signal from a building management system to control the dampers, discharge air temperature, or other settings. Reference the unit ladder diagram for the correct wiring.

Installation - Evaporative Cooler Piping (optional)

Evaporative Cooling with Recirculating Pump



Recirculating Evaporative Piping

CAUTION

The supply line should be of adequate size and pressure to resupply the amount of water lost due to bleed-off and evaporation. The drain line should be the same size or larger than the supply line.

IMPORTANT

All solenoid valves and traps must be installed below the roof to protect the supply water line from freezing. If they cannot be installed below the roof, an alternative method must be used to protect the lines from freezing.

CAUTION

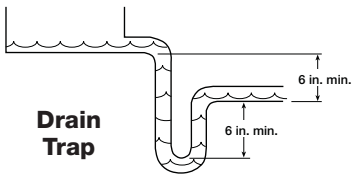
Provisions must be taken to prevent damage to the evaporative cooling section during freezing conditions. The sump, drain lines and supply lines must be drained prior to freezing conditions or an alternate method must be used to protect the lines and media.

1. Install the Water Supply Line

Supply line opening requirements vary by unit size and arrangement, and are field-supplied. Connect the water supply line to the float valve through the supply line opening in the evaporative cooling unit. Install a manual shutoff valve in the supply line.

2. Install the Drain Line

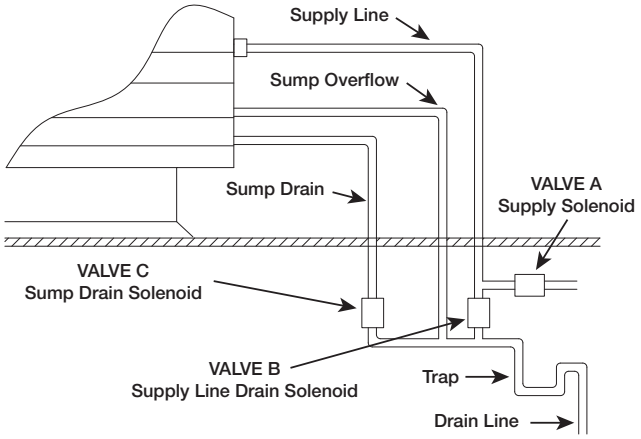
Connect an unobstructed drain line to the drain and overflow connections on the evaporative cooler. A manual shut off valve (by others) is required for the evaporative cooler drain line. A trap must be used to overcome the internal negative pressure in the unit and allow the water to drain while the unit is operating.



3. Check/Adjust Water Level

Check the water level in the sump tank. The water level should be above the pump intake and below the overflow. Adjust the float as needed to achieve the proper water level.

Evaporative Cooling with Auto Drain and Fill



Auto Drain & Fill Evaporative Piping

IMPORTANT

The supply line should be of adequate size and pressure to resupply the amount of water lost due to bleed-off and evaporation. The drain line should be the same size or larger than the supply line.

CAUTION

All solenoid valves and traps must be installed below the roof to protect the supply water line from freezing. If they cannot be installed below the roof, an alternative method must be used to protect the lines from freezing.

IMPORTANT

The supply solenoid (Valve A) is NOT the same as the drain solenoids (Valve B and Valve C). Make sure to use the proper solenoid for each location. Check your local code requirements for proper installation of this type of system.

CAUTION

Provisions must be taken to prevent damage to the evaporative cooling section during freezing conditions. The sump, drain lines and supply lines must be drained prior to freezing conditions or an alternate method must be used to protect the lines and media.

Auto Drain & Flush Valves (when provided by manufacturer)

Assembly Number	Mfg. Part Number	ASCO™ Part Number	Solenoid Type	De-Energized Position	Diameter	Qty.
852178	461262	8210G2	Supply	Closed	1/2 inch *(12.7 mm)*	1
	461263	8262G262	Supply Line Drain	Open	1/4 inch *(6.35 mm)*	1
	461264	8210G35	Sump Drain	Open	3/4 inch *(19.05 mm)*	1

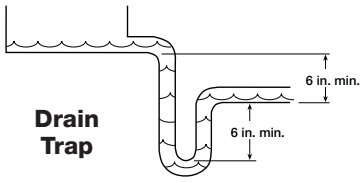
Part numbers subject to change.

1. Install the Water Supply Line

Supply line opening requirements vary by unit size and arrangement and are field-supplied. Connect the water supply line to the float valve through the supply line opening in the evaporative cooling unit. Install the 1/2 inch normally closed solenoid (Valve A) in the supply line. Install the 1/4 inch normally open solenoid (Valve B) between the supply line and the drain line as shown.

2. Install the Drain Line

Connect an unobstructed drain line to the sump drain overflow connection. Install the 3/4 in. normally open solenoid (Valve C) between the sump drain connection and the drain line. A trap must be used to overcome the internal negative pressure in the unit and allow the water to drain while the unit is operating.



3. Check/Adjust Water Level

Check the water level in the sump tank. The water level should be above the pump intake and below the overflow. Adjust the float as needed to achieve the proper water level.

Installation - Direct Expansion (DX) Coil Piping (optional)

IMPORTANT

Guidelines for the installation of direct expansion cooling coils have been provided to ensure proper performance and longevity of the coils. These are general guidelines that may have to be tailored to meet the specific requirements of any one job. As always, a qualified party or individual should perform the installation and maintenance of any coil. Protective equipment such as safety glasses, steel toe boots and gloves are recommended during the installation and maintenance of the coil.

IMPORTANT

All field-brazing and welding should be performed using high quality materials and an inert gas purge (such as nitrogen) to reduce oxidation of the internal surface of the coil.

IMPORTANT

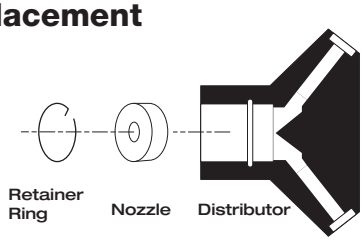
All field-piping must be self-supporting and flexible enough to allow for the thermal expansion and contraction of the coil.

1. Locate the Distributor(s) by Removing the Distributor Access Panel

Distributor Access Panel

2. Verify Nozzle Placement

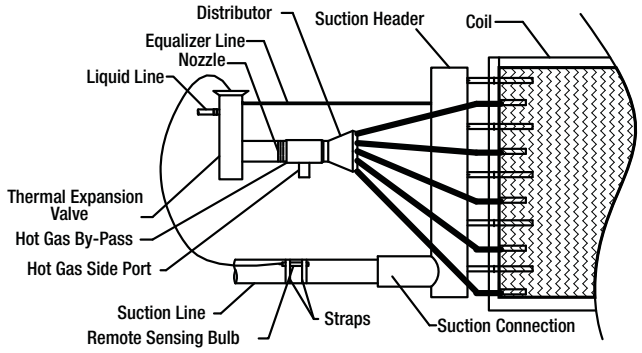
Inspect the refrigerant distributor and verify that the nozzle is in place. The nozzle is generally held in place by a retaining ring or is an integral part of the distributor itself.



Nozzle Placement

NOTE

If a hot gas bypass kit was provided by others, refer to the manufacturer's instructions.



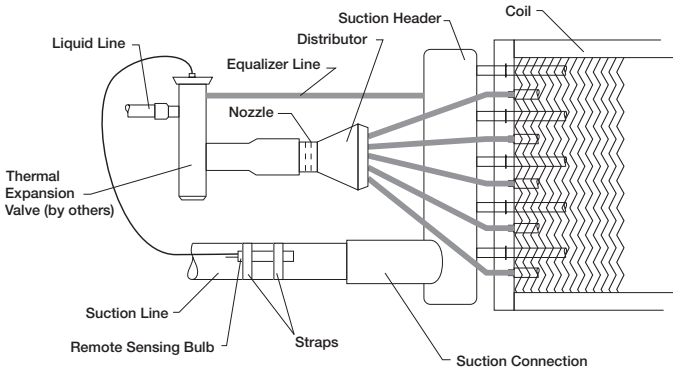
Installation with Hot Gas Bypass

3. Install Suction Line

Install suction line(s) from the compressor to the suction connection(s) which are stubbed through the side of the cabinet.

4. Install the Liquid Line and Thermal Expansion Valve (TEV) (by others)

Liquid line openings vary by coil size and circuiting and are field-supplied. Follow the TEV recommendations for installation to avoid damaging the valve. If the valve is externally equalized, use a tubing cutter to cut off the plugged end of the factory-installed equalizer line. Use a de-burring tool to remove any loose metal from the equalizer line and attach it to the TEV. If the valve is internally equalized, the factory-installed equalizer line can be left as-is.



General Installation

5. Mount the Remote Sensing Bulb (by others)

The expansion valve's remote sensing bulb should be securely strapped to the horizontal run of the suction line at the 3 or 9 o'clock position and shall be insulated.

6. Check Coil Piping for Leaks

Pressurize the coil to 100 psig with dry nitrogen or other suitable gas. The coil should be left pressurized for a minimum of 10 minutes. If the coil holds the pressure, the hook-up can be considered leak-free. If the pressure drops by 5 psig or less, re-pressurize the coil and wait another 10 minutes. If the pressure drops again, there is likely one or more small leaks which should be located and repaired. Pressure losses greater than 5 psig indicate a large leak that should be isolated and repaired.

7. Evacuate and Charge the Coil

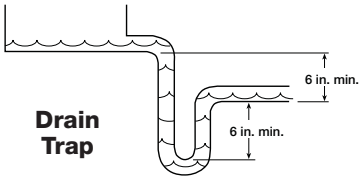
Use a vacuum pump to evacuate the coil and any interconnecting piping that has been open to the atmosphere. Measure the vacuum in the piping using a micron gauge located as far from the pump as possible. Evacuate the coil to 500 microns or less and then close the valve between the pump and the system. If the vacuum holds to 500 microns or less for one minute, the system is ready to be charged or refrigerant in another portion of the system can be opened to the coil. A steady rise in microns would indicate that moisture is still present and that the coil should be further vacuumed until the moisture has been removed.

NOTE

Failure to obtain a high vacuum indicates a great deal of moisture or a small leak. Break the vacuum with a charge of dry nitrogen or other suitable gas and recheck for leaks within the system. If no leaks are found, continue to pull a vacuum on the coil until an acceptable reading is reached (500 microns).

8. Install the Drain Line

Connect an unobstructed drain line to the drain pan. A trap must be used to overcome the internal negative pressure in the unit and allow the water to drain while the unit is operating.



Drain Trap

IMPORTANT

All traps must be installed below the roof line or be otherwise protected from freezing.

Installation of Chilled Water Coil Piping (optional)

IMPORTANT

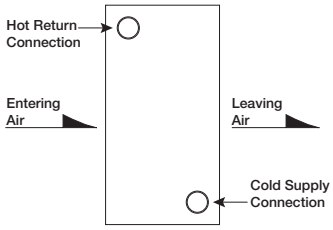
Guidelines for the installation of the cooling coil have been provided to ensure proper performance of the coils and their longevity. These are general guidelines that may have to be tailored to meet the specific requirements of any one job. As always, a qualified party or individual should perform the installation and maintenance of the coil. Protective equipment such as safety glasses, steel toe boots and gloves are recommended during the installation and maintenance of the coil.

When installing couplings, do not apply undue stress to the connection. Use a backup pipe wrench to avoid breaking the weld between the coil connection and the header.

All field-piping must be self-supporting. System piping should be flexible enough to allow for the thermal expansion and contraction of the coil.

1. Verify Coil Hand Designation

Check the coil hand designation to ensure that it matches the system. Coils are generally plumbed with the supply connection located on the bottom of the leaving air-side of the coil and the return connection at the top of the entering air-side of the coil. This arrangement provides a counter flow heat exchanger and positive coil drainage.



2. Check the Coil for Leaks

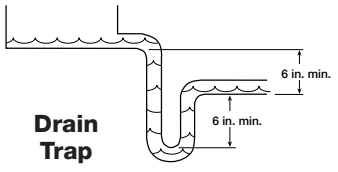
Pressurize the coil to 100 psig with dry nitrogen or other suitable gas. The coil should be left pressurized for a minimum of 10 minutes. If the coil holds the pressure, the hook-up can be considered leak free. If the pressure drops by 5 psig or less, re-pressurize the coil and wait another 10 minutes. If the pressure drops again, there is likely one or more small leaks which should be located and repaired. Pressure losses greater than 5 psig indicate a large leak that should be isolated and repaired.

3. Connect the Supply & Return Lines

Connect the supply and return lines as shown above.

4. Install the Drain Line

Connect an unobstructed drain line to the drain pan. A trap must be used to overcome the internal negative pressure in the unit and allow the water to drain while the unit is operating.



IMPORTANT

All traps must be installed below the roof line or be otherwise protected from freezing.

Installation of Building Pressure Control (optional)

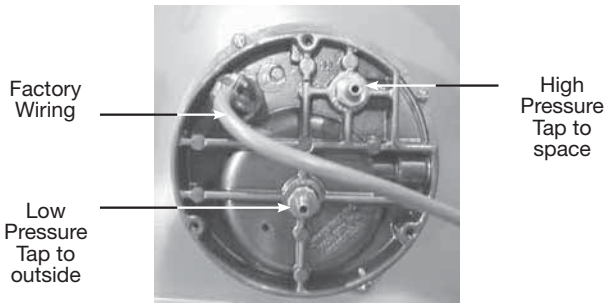
1. Mount Pressure Tap

Using the factory provided bracket, mount the pressure tap to the outside of the unit. To ensure accurate reading, choose a location out of the prevailing winds and away from supply or exhaust fans.

2. Run Pressure Tap Lines

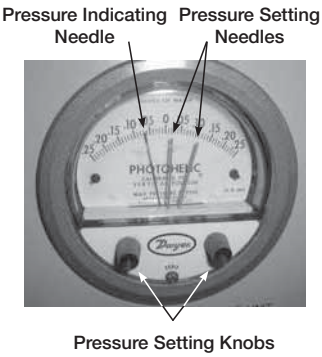
Run a pressure tap line from the pressure tap on the outside of the unit to the low pressure tap on the back of the photohelic gauge. Run a second pressure tap line from the high pressure tap on the back of the photohelic gauge to the space that the unit is sensing. Fifty feet of tubing is supplied with the unit.

3. Set the Building Pressure



Connections for Photohelic Gauge

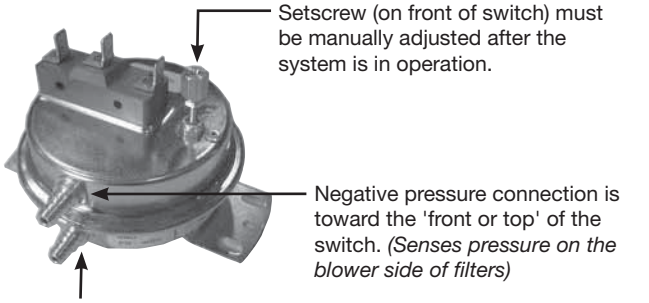
The pressure gauge is used to set the desired building pressure. The pressure is set by adjusting the knobs for the upper and lower pressure limits. Typical settings are 0.0 in. wg for the lower and 0.10 in. wg for the upper pressure setting.



Typical Photohelic Gauge Settings

Installation of Dirty Filter Switch (optional)

To adjust the switch, the unit must be running with all of the access doors in place, except for the compartment where the switch is located. The adjusting screw is located on the top of the switch.



1. Open the filter access door and place a sheet of plastic or cardboard over 50% of the filter media.
2. Replace the filter access door.
3. Check to see if there is power at the alert signal leads (refer to electrical diagram).
4. If power was on, turn adjustment screw counter clockwise until just before power goes off. If power was off, turn adjustment screw clockwise until power comes on.
5. Open the filter access door and remove the obstructing material.
6. Replace the door and check to make sure that you do **not** have power at the alert signal leads. The unit is now ready for operation.

Start-Up - Blower

Refer to the Start-Up Checklist in the Reference Section Before Proceeding Further!

Pre Start-Up Check

Rotate the fan wheel by hand and make sure no parts are rubbing. Check the V-belt drive for proper alignment and tension. A guide for proper belt tension and alignment is provided in the Routine Maintenance section. Check fasteners, set screws, and locking collars on the fan, bearings, drive, motor base, and accessories for tightness.

WARNING

Disconnect and lock-out all power and gas before performing any maintenance or service to the unit. Failure to do so could result in serious injury or death and damage to equipment.

SPECIAL TOOLS REQUIRED

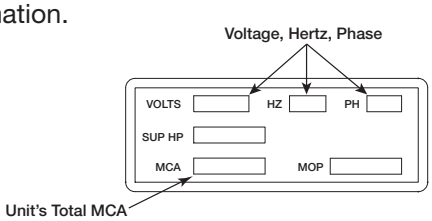
- Voltage Meter (with wire probes)
- Amperage Meter
- Micro Amp Meter
- Pressure Gauges – (refrigerant)
- Tachometer
- Thermometer
- Incline manometer or equivalent

WARNING

Check the housing, blower, and ductwork for any foreign objects before running the blower.

1. Check the Voltage

Before starting the unit, compare the supplied voltage, hertz, and phase with the unit and motor's nameplate information.

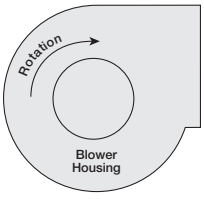


Electrical Nameplate

2. Check the Blower Rotation

Open the blower access door and run the blower momentarily to determine the rotation.

Arrows are placed on the blower scroll to indicate the proper direction or reference the example shown.



Blower Rotation

NOTE

To reverse the rotation on three phase units, disconnect and lock-out the power, then interchange any two motor leads.

NOTE

To reverse the rotation on single phase units, disconnect and lock-out the power, then rewire the motor per the manufacturer's instructions.

IMPORTANT

If the blower is rotating in the wrong direction, the unit will move some air, but will not perform as designed. Be sure to perform a visual inspection to guarantee the correct blower rotation.

3. Check for Vibration

Check for unusual noise, vibration or overheating of the bearings. Reference the Troubleshooting section for corrective actions.

IMPORTANT

Excessive vibration may be experienced during the initial start-up. Left unchecked, it can cause a multitude of problems including structural and/or component failure.

IMPORTANT

Generally, fan vibration and noise is transmitted to other parts of the building by the ductwork. To minimize this undesirable effect, the use of heavy canvas duct connectors is recommended.

4. Motor Check

Measure the motor's voltage, amps and RPM. Compare to the specifications. Motor amps can be reduced by lowering the motor RPM or increasing system static pressure.

IMPORTANT

Additional starters and overloads may be provided in the make-up air control center for optional exhaust blowers. Any additional overloads must be checked for proper voltage, amps, and RPMs.

5. Air Volume Measurement & Check

Measure the unit's air volume (cfm) and compare it with its rated air volume. If the measured air volume is off, adjust the fan's RPM by changing/adjusting the drives.

NOTE

The most accurate way to measure the air volume is by using a pitot traverse method downstream of the blower. Other methods can be used but should be proven and accurate.

IMPORTANT

Changing the air volume can significantly increase the motor's amps. If the air volume is changed, the motor's amps must be checked to prevent overloading the motor.

NOTE

To ensure accuracy, the unit's dampers are to be open when measuring the air volume.

6. Set-up Optional Components

Adjust the settings on the optional components. See the Control Center Layout in the Reference section for location of optional components.

- Heating Inlet Air Sensor
  Typical setting: 60-70ºF
- Cooling Inlet Air Sensor
  Typical setting: 75-85ºF
  Microprocessor default: 80ºF
- Building Freeze Protection
  Typical setting: 5 minutes; 45ºF
- Dirty Filter Gauge
  Typical setting: Settings vary greatly for each unit. See Reference section for adjusting information.

NOTE

If your unit is equipped with a 4:1 modulation or 8:1 staged control, the inlet air sensor and building freeze protection may be included in the furnace controller. If this is the case, instructions for setting the inlet air sensor and building freeze protection are included in the Furnace Start-Up.

7. Furnace Controller IOM

Refer to separate furnace controller Installation, Operation and Maintenance Manual for detailed information about furnace start-up.

Start-Up - Economizer (optional)

NOTE

Only models IG-HV and IGX-HV with options EC-1, 2, 3 or 4 use an economizer.

NOTE

To prevent premature heat exchanger failure, do not locate units where chlorinated, halogenated, or acid vapors are present.

NOTE

Units with an economizer are designed for either 0-30% outside air (HV-1), 31-75% outside air (HV-2) or 100% return air (HV-3). Refer to the CAPS submittal for the unit's ventilation type.

IMPORTANT

The outside air volume must be measured and compared to the total air volume when setting the minimum outside air. The minimum outside air should never be set based on the inlet damper or potentiometer position.

NOTE

Program the optional room stat. Separate detailed instructions for programming the room stat are included with the optional room stat.

The following economizer sequences will function to modulate the outdoor and return air dampers to determine and maximize the availability of free cooling. Although the Honeywell economizer controller contains numerous set points, the adjustment of only a few is necessary to ensure optimal performance.

Sequences

EC-1 Outdoor Air Temperature Reference

This mode compares the outdoor air temperature to the dry bulb temperature set point (DRYBLB SET). Once the outdoor air temperature is less than DRYBLB SET, the unit will modulate the position of the dampers to maintain a predetermined mixed air temperature (MAT SET).

EC-2 Outdoor Air Enthalpy Reference

This mode compares the outdoor air enthalpy to a preset enthalpy curve. When the outdoor air conditions are within this curve, the dampers will modulate to maintain a mixed air temperature (MAT SET).

EC-3 Differential Temperature Reference

This mode compares the outdoor air temperature and the return air temperatures. If the outdoor air is cooler than the return, the dampers will modulate to maintain a preset mixed air temperature (MAT SET).

EC-4 Differential Enthalpy Reference

This mode compares the outdoor air enthalpy and the return air enthalpy. If the outdoor air enthalpy is lower than the return air, the dampers will modulate to maintain a preset mixed air temperature (MAT SET).

Relevant Set Points

1. **MAT SET** - The mixed air temperature set point. The control will modulate the damper to maintain temperature as best as it can (Set point menu, Default 53°F)
2. **LOW T LOCK** - The set point for the low temperature mechanical cooling lockout. (Set point menu, Default 32°F)
3. **DRYBLB SET** - The outdoor air set point to call for economizer. (Set point menu, Default 63°F)
4. **MIN POS** - The minimum signal voltage sent to the dampers. (Set point menu, Default 2.8 VDC)
5. **AUX1 O** – The controllers operating sequence structure. (Set point menu, Default 'None')
6. **ERV OAT SP** - The set point for low temperature economizer lockout. This is the low temperature set point when AUX1 O is set to ERV. (Set point menu, Default 32°F)
7. **STG3 DLY** - Time delay after second cooling stage is enabled (Advanced setup menu, Default 2 hrs.)

Using the Keypad with Settings and Parameters

To use the keypad when working with Set points, System and Advanced Settings, Checkout tests, and Alarms:

1. Navigate to the desired menu.
2. Press ↵ (enter) to display the first item in the currently displayed menu.
3. Use the ▲ and ▼ buttons to scroll to the desired parameter.
4. Press ↵ (enter) to display the value of the currently displayed item.
5. Press the ▲ button to increase (change) the displayed parameter value.[a]
6. Press the ▼ button to decrease (change) the displayed parameter value.[a]
7. Press ↵ (enter) to accept the displayed value and store it in non-volatile RAM.
8. CHANGE STORED displays.
9. Press ↵ (enter) to return the current menu parameter.
10. Press ⓘ (escape) to return to the current menu parameter.

[a] When values are displayed, pressing and holding the ▲ or ▼ button causes the display to automatically increment.

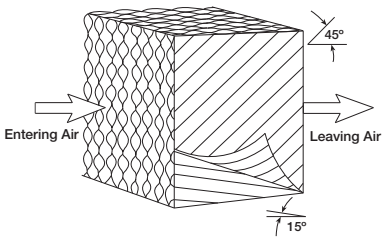
Modulate Dampers

1. Navigate to the Checkout menu and press ↵ (enter).
2. The cooling should turn off
3. Navigate to Damper Open and press ↵ (enter) twice to run the test.
4. Voltage between terminals ACT 2-10 and ACT COM should be 10 VDC. This will open the outdoor air damper and close the return air damper
5. Press ⓪ (escape), navigate to Damper Close and press ↵ (enter) twice to run the test.
6. Voltage between terminal ACT 2-10 and ACT COM should be 2 VDC. This will close the outdoor air damper and open the return air damper.

Start-Up - Evaporative Cooling Recirculating (optional)

1. Check the Installation

The media may have been removed during installation, so its orientation should be double checked. The media should be installed with the steeper flute angle sloping down towards the entering air side.



Media Orientation

Verify that the stainless steel caps and distribution headers are in place. The headers should be located over the media towards the entering air side. The caps should be placed over the headers.

2. Check the Pump Filter

Check that the pump filter is around the pump inlet.

3. Fill the Sump and Adjust the Float

Turn on the water supply and allow the sump tank to fill. Adjust the float valve to shut off the water supply when the sump is filled to within 1 inch of the bottom of the overflow.

4. Break-In the Media

Open the bleed-off valve completely and saturate the media with the blower(s) off for no less than 20 minutes.

NOTE

A jumper will need to be installed in the control center to power the evaporative pumps with the blower(s) off. Reference the unit's ladder diagram to determine proper terminals.

5. Check the Flow Rate

The pumps should provide enough water to saturate the media in 45 to 60 seconds. If adequate flow is not achieved, consult the factory.

Manual Ball Valve

NOTE

If too much water is flowing to the media, the flow can be adjusted using the manual ball valve. If flow adjustments are made, verify that sufficient water is still being supplied to the media to keep the entire pad wet during normal operation. Too high of a water flow can cause water carryover problems.

6. Adjust the Water Bleed-Off Rate

The water bleed-off rate is dependent on the water's mineral content. The bleed-off should be adjusted based on the media's mineral deposits after two weeks of service.

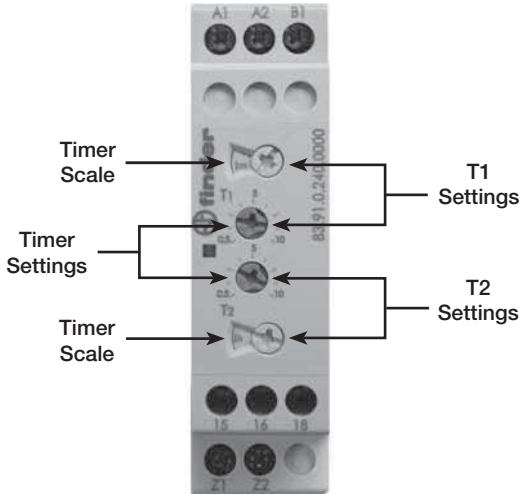
7. Set the Optional Auto Drain and Fill

This system will automatically drain the sump tank and fill it with fresh water at the field-adjustable intervals, typically once every 24 hours. This flushes mineral build-up and debris from the tank to promote low maintenance and increase media pad life.

In addition, the system will protect the evaporative cooler from freezing by draining the sump tank and supply line when the outside temperatures fall below the set point of the outside air sensor. This is set to 45ºF and is not adjustable. The auto drain and fill outdoor air sensor should be installed in an area that is shaded from direct sunlight so the outside air sensor probe will detect an accurate air temperature.

Set the Timer Scale and Settings dials:

- **T1** timer setting set to **10** and timer scale set to **1d** for 1 day of operation
- **T2** timer setting set to **10** and the timer scale set to **10m** for 10 minutes of drain time



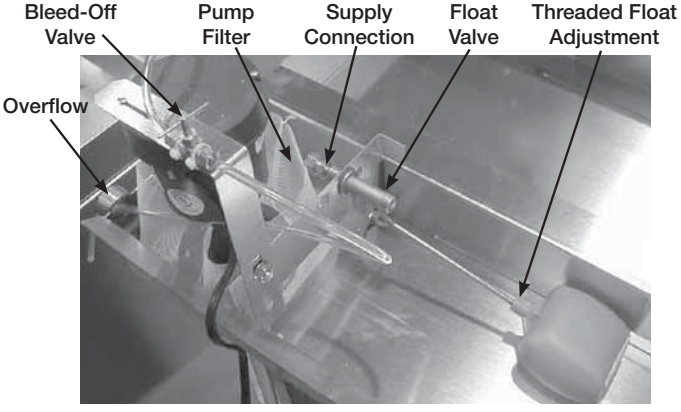
Auto Drain and Flush Timer

8. Put the Unit into Service

Remove the jumper and energize the blower(s). Verify proper operation.

IMPORTANT

Check the media for mineral deposits after two weeks of service and adjust the bleed-off rate accordingly.



Evaporative Cooler Set-Up

Check Operation - VAV Units (optional)

NOTE

Blower Start-Up, steps 1-5 should be performed before the blower is run.

NOTE

For maintenance issues associated with variable frequency drives, consult the drive's manual, supplied with the unit. The drives are programmed at the factory and should not need any adjustment during installation and start-up. For kitchen applications, the drive may be located either in the kitchen or in the unit.

Variable Air Volume Operation

The variable air volume (VAV) option is recommended when a building's exhaust volume may vary. This option uses a variable frequency drive (VFD) to allow the make-up air volume to track with the exhaust volume, providing only the amount of make-up air required. Control strategies include 2-speed and modulating operation. Before the unit is left in service, the variable volume control system should be tested.

2-Speed VFD Operation

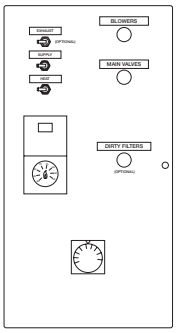
A VFD is used on a single speed motor to control air volumes. The VFD is factory-programmed for two speed operations. It can be switched to low or high speed from a remote control panel. Turn the fan speed switch on the remote control panel to each position and confirm that the fan speed adjusts accordingly.

Modulating VFD Operation

Potentiometer Control

A VFD is controlled according to an input from a remote speed selector (potentiometer). This unit allows easy manual adjustment of make-up air volumes. To test potentiometer operation, turn the potentiometer to the two extremes. With variable volume, make sure the fan goes to maximum and minimum speed.

When the potentiometer is at 0%, the fan will be at its minimum speed. When the potentiometer is at 100%, the fan will be at its maximum speed.



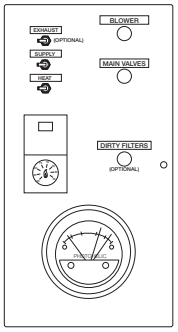
Potentiometer Control

Building Pressure Control

A VFD is controlled according to an input from a pressure sensing device.

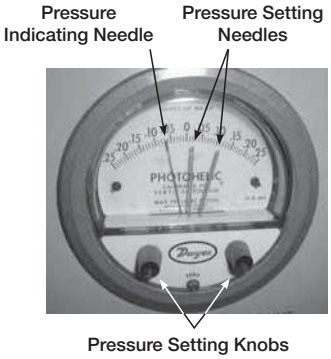
Turn both device knobs to the upper most pressure setting. You may have to remove the outdoor pressure tap tubing. VAV systems should go to maximum speed. Set both device knobs at the lowest setting and the VAV systems should go to minimum speed.

Reset the correct pressure limits before starting the unit.



Building Pressure Control

This picture shows a typical photohelic setting. Typical settings are 0.0 in. wg for the lower pressure setting and 0.10 in. wg for the upper pressure setting. The needle indicates a negative building pressure. During correct operation, the indicating needle will remain between or near the setting needles.



Photohelic Gauge

External Signal

A VFD is controlled according to an input from an external 2-10 VDC or 4-20 mA signal (by others).

A 2 VDC or 4 mA signal will send the blower to low speed. The blower will go to maximum speed with a 10 VDC or 20 mA signal.

Variable Kitchen Control

A VFD is controlled according to an input from a remote speed control. This unit allows automatic adjustment of make-up air volumes based on varying cooking loads.

Microprocessor

If the optional microprocessor is mounted in the control center of the unit, it may be configured to control the VFD.

NOTE

Similar control hardware is used for the network interfacing control. Only the microprocessor controller will contain keypad buttons on both the left and right side of the display. For any other hardware, please reference the Check Operation section. If the make-up air unit has been supplied with the microprocessor controller, additional information can be found by referencing the Microprocessor Controller Installation, Operation and Maintenance Manual.

Check Operation - Recirculating Units (optional)

NOTE

Blower Start-Up, steps 1-5 should be performed before the blower is run.

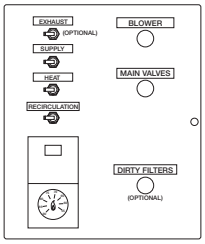
Recirculation Operation

The recirculation operation option is recommended when the ventilation equipment provides the primary source of heating for the space. Recirculation can vary from 100% return air to 100% outside air. Control strategies include 2-position and modulating dampers.

Before the unit is left in service, the recirculation control system should be tested.

2-Position Damper Operation

A 2-position spring return actuator is used to control the return air amounts. The damper moves from open to closed. If power is cut to the unit, the outdoor air damper will fail to close.



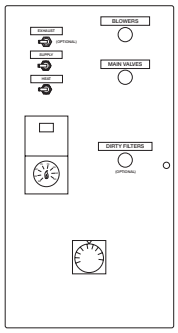
2-Position Damper Control

Turn the recirculating switch on the remote control panel to each position and confirm that the return air damper adjusts accordingly. The damper actuator may take a few minutes to open or close.

Modulating Damper Operation

Potentiometer Control

A modulating spring return actuator is used to control the return air amounts. The return air damper modulates from fully open to fully closed based on a signal from a remote potentiometer.



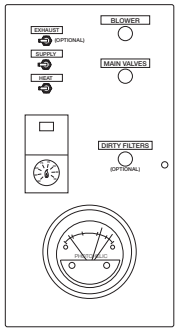
Potentiometer Control

To test potentiometer operation, turn the potentiometer to the two extremes. Confirm that the return air damper fully opens and fully closes.

When the potentiometer is at 0%, the return air damper will fully open. When the potentiometer is at 100%, the return air damper will fully close. The damper actuator may take a few minutes to open or close.

Building Pressure Control

A modulating spring return actuator is used to control the return air amounts. The return air damper modulates from fully open to fully closed based on a signal from a remote pressure sensing device.



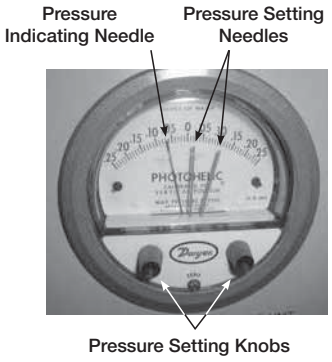
Building Pressure Control

Turn both device knobs to the upper most pressure setting. You may have to remove the outdoor pressure tap tubing. The return air damper should close.

Set both device knobs at the lowest setting and the damper should open. It may take one to two minutes for the damper to reach the desired position.

Reset the correct pressure limits before starting the unit.

This picture shows a typical photohelic setting. Typical settings are 0.0 in. wg for the lower pressure setting and 0.10 in. wg for the upper pressure setting. The needle in this photo indicates a negative building pressure. During correct operation, the indicating needle will remain between or near the setting needles.



Photohelic Gauge

External Signal

A modulating spring return actuator is used to control the return air amounts. Return air damper modulates from fully open to fully closed based on an external 2-10 VDC or 4-20 mA signal (by others).

The return air damper will fully open with a 2 VDC or 4mA signal. The return air damper will fully close with a 10 VDC or 20 mA signal. The damper actuator may take a few minutes to open or close.

Microprocessor

If the optional microprocessor is mounted in the control center of the unit, it may be configured to control the VFD.

NOTE

Similar control hardware is used for the network interfacing control. Only the microprocessor controller will contain keypad buttons on both the left and right side of the display. For any other hardware, please reference the Check Operation section. If the make-up air unit has been supplied with the microprocessor controller, additional information can be found by referencing the Microprocessor Controller Installation, Operation and Maintenance Manual.

Sequence of Operation

1. Exhaust Fan Contact (S1) Manually Closed (optional)

- Power passes through N.C. contact on exhaust fan overload (ST2 OL), which is closed if exhaust fan (M2) has not overloaded
- Power passes to exhaust fan starter (ST2)
- N.O. contact on exhaust fan starter (ST2) is energized and closed
- Power passes to and energizes exhaust fan (M2)

2. Supply Fan Contact (S2) Manually Closed

- Power passes through N.C. field-supplied fire contact (FSC)
- Power passes through optional N.O. contact on exhaust fan starter (ST2), which is closed when the optional exhaust starter (ST2) is activated
- Power passes through N.C. contact on supply starter overload (ST1 OL), which is closed if the supply fan has not overloaded
- Power passes through N.C. contact on optional freeze protection timer (RT4), which is closed if the temperature has remained above the set point
- Power passes to and energizes optional inlet damper (D1), which opens
- Power passes through optional damper limit switch (DL1), which is energized and closed if the optional inlet damper is open. It may take several minutes for the damper to fully open and for the damper limit switch to close
- Power passes to and energizes fan relay (RF)
- Power passes through N.O. contact on fan relay (RF), which is closed once the fan relay (RF) is activated
- Power passes to and energizes starter relay (ST1)
- N.O. contact on supply fan starter (ST1) is energized and closed
- Supply fan (M1) starts

3. Heat Contact (S4) Manually Closed

- Power passes through N.O. fan relay (RF), which is energized and closed if the supply fan (M1) is on
- Power passes through N.C. contact on optional inlet air sensor (TS4), which is closed if inlet air temperature is below the set point
- Power passes to and energizes the heat relay (RH)
- N.O. contact on heat relay (RH) closes and heat is enabled.

Reference furnace Installation, Operation and Maintenance Manual for details on furnace sequence.

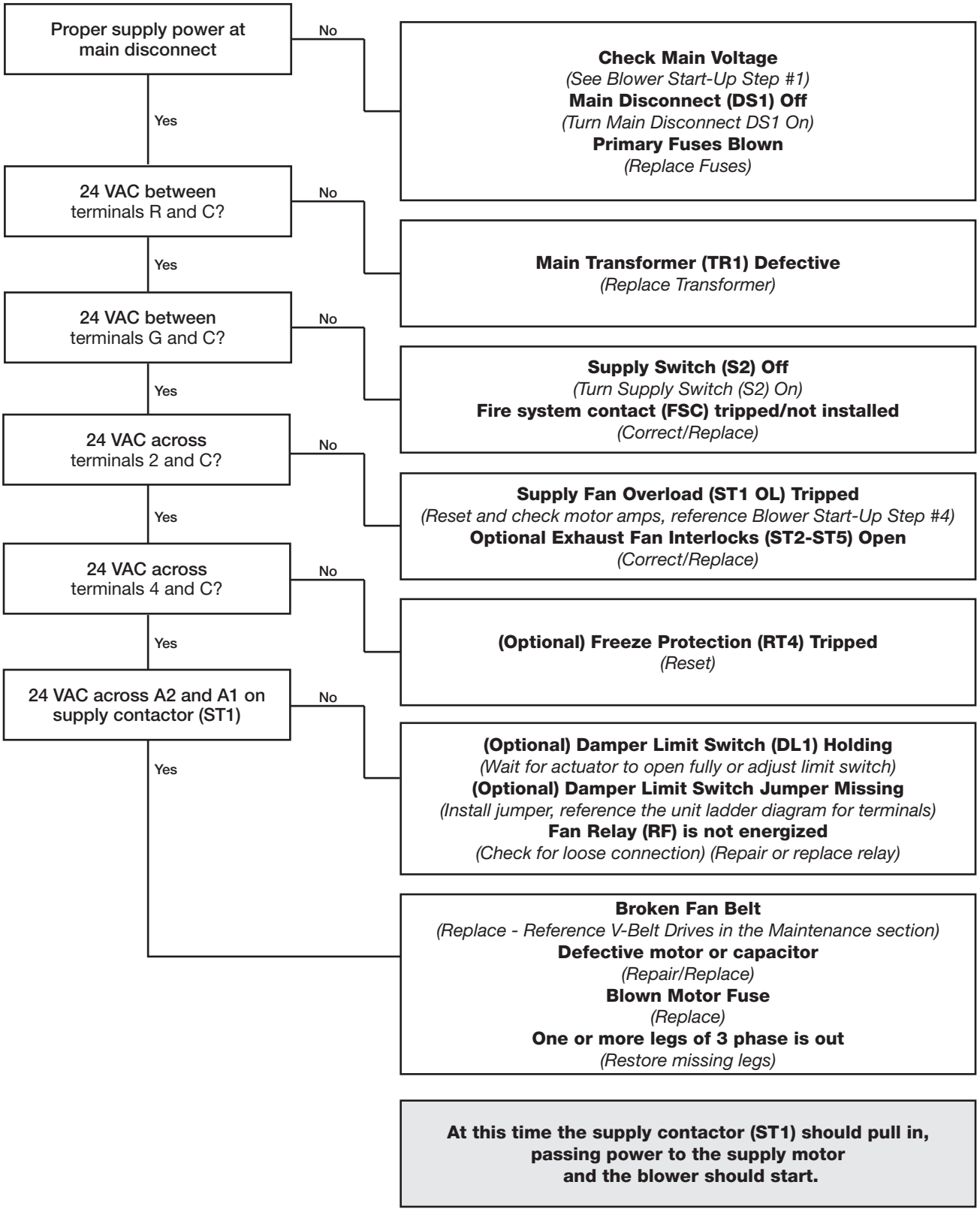
4. Optional Evaporative Cooling Contact (S4) Closed*

- N.O. contact on fan relay (RF) is energized and closed
- Power passes through N.O. contact on optional inlet air sensor (TS4), which is energized and closed if the inlet air temperature is above the set point
- Power passes to and energizes cool relay (RC)
- N.O. contact on cool relay (RC) is energized and closed
- Power passes to evaporative cooling pump (P1)

**If DX or chilled water coils are used rather than an evaporative cooler, the cooling sequence of operation will depend on the coil controls. Cooling coil controls are supplied by others.*

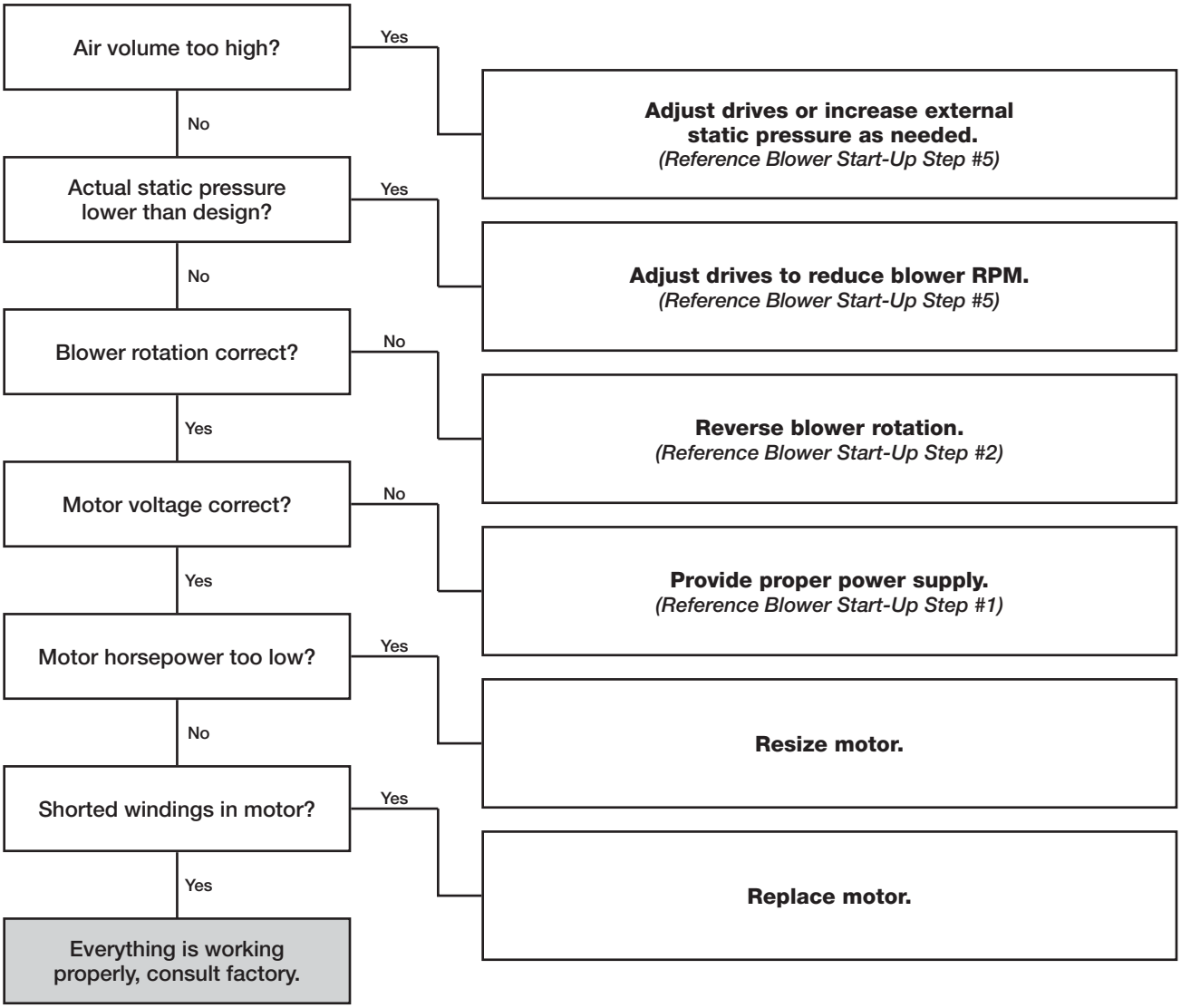
Troubleshooting

Blower Does Not Operate



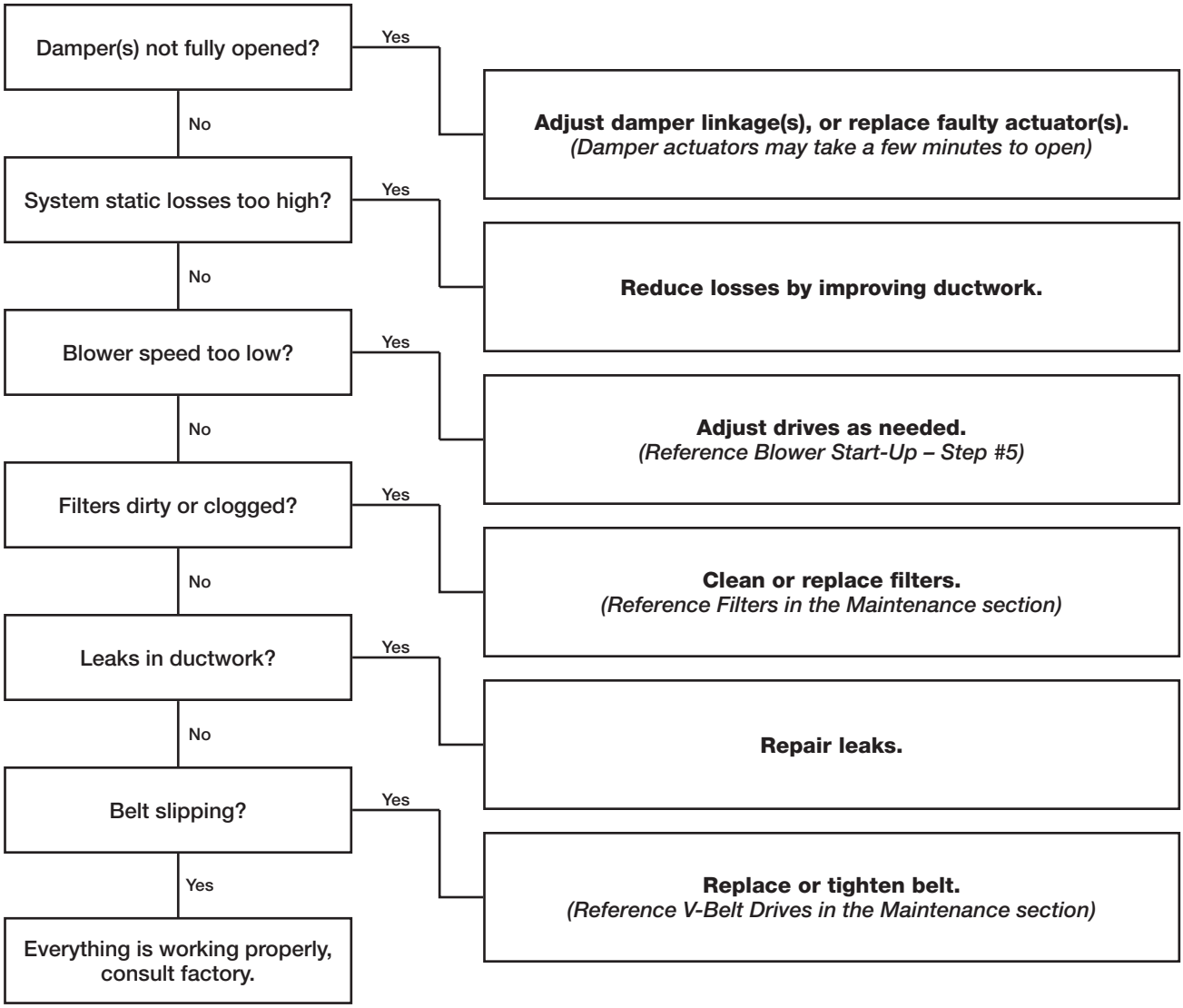
Troubleshooting

Motor Over Amps

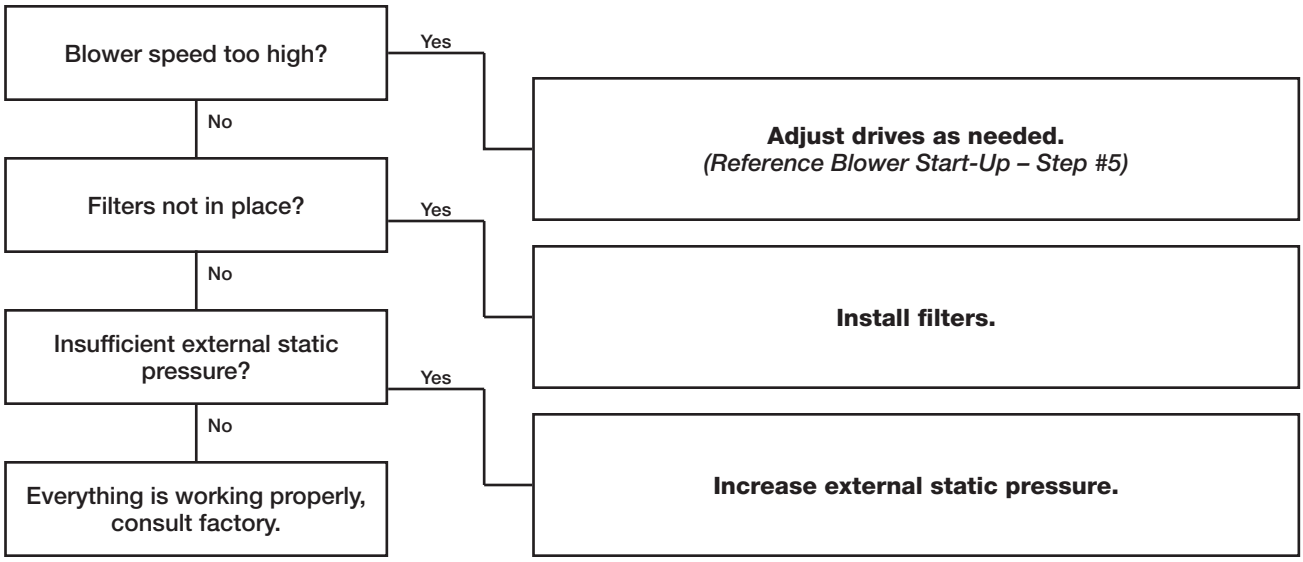


Troubleshooting

Insufficient Airflow

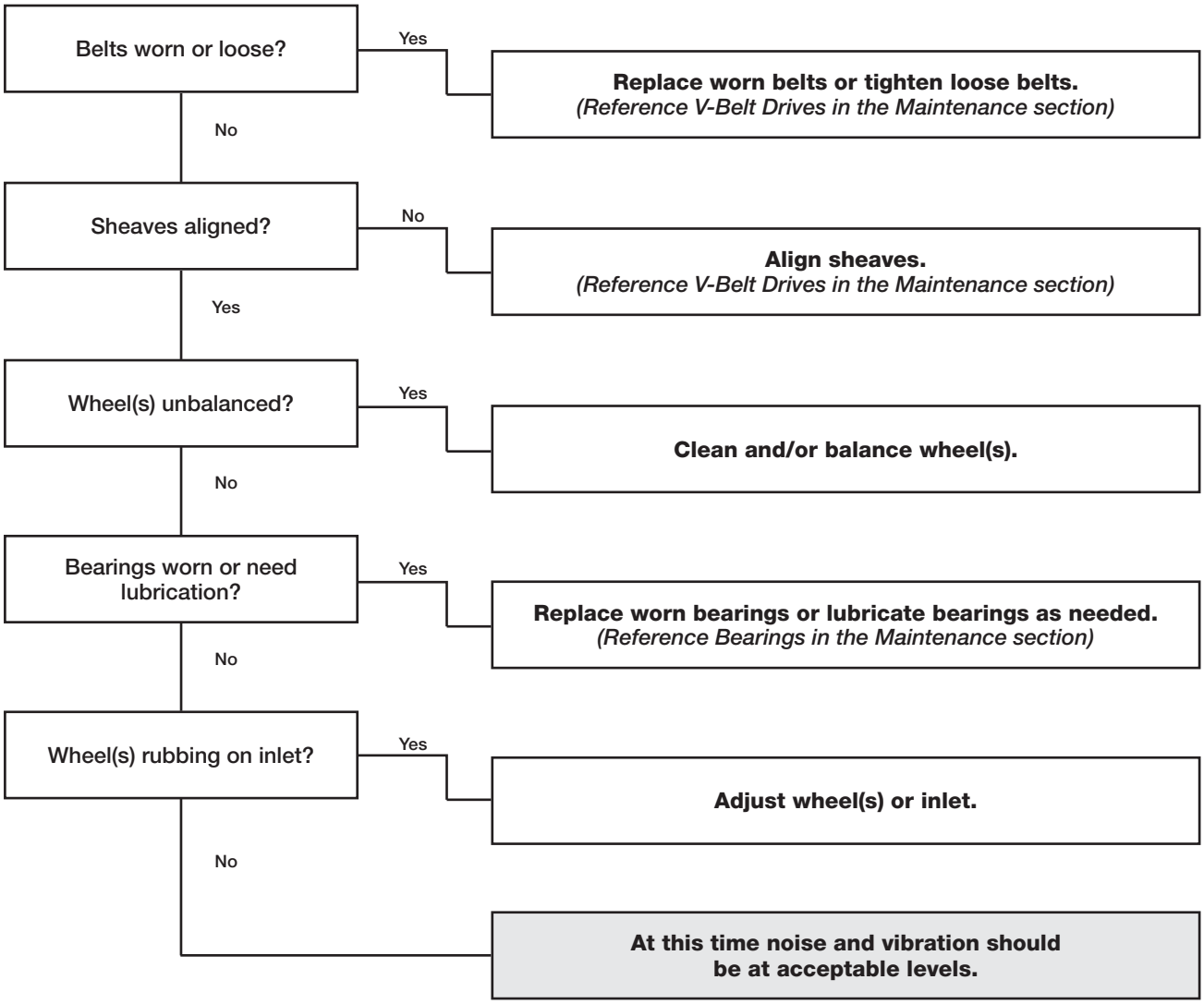


Too Much Airflow



Troubleshooting

Excessive Noise or Vibration



Troubleshooting

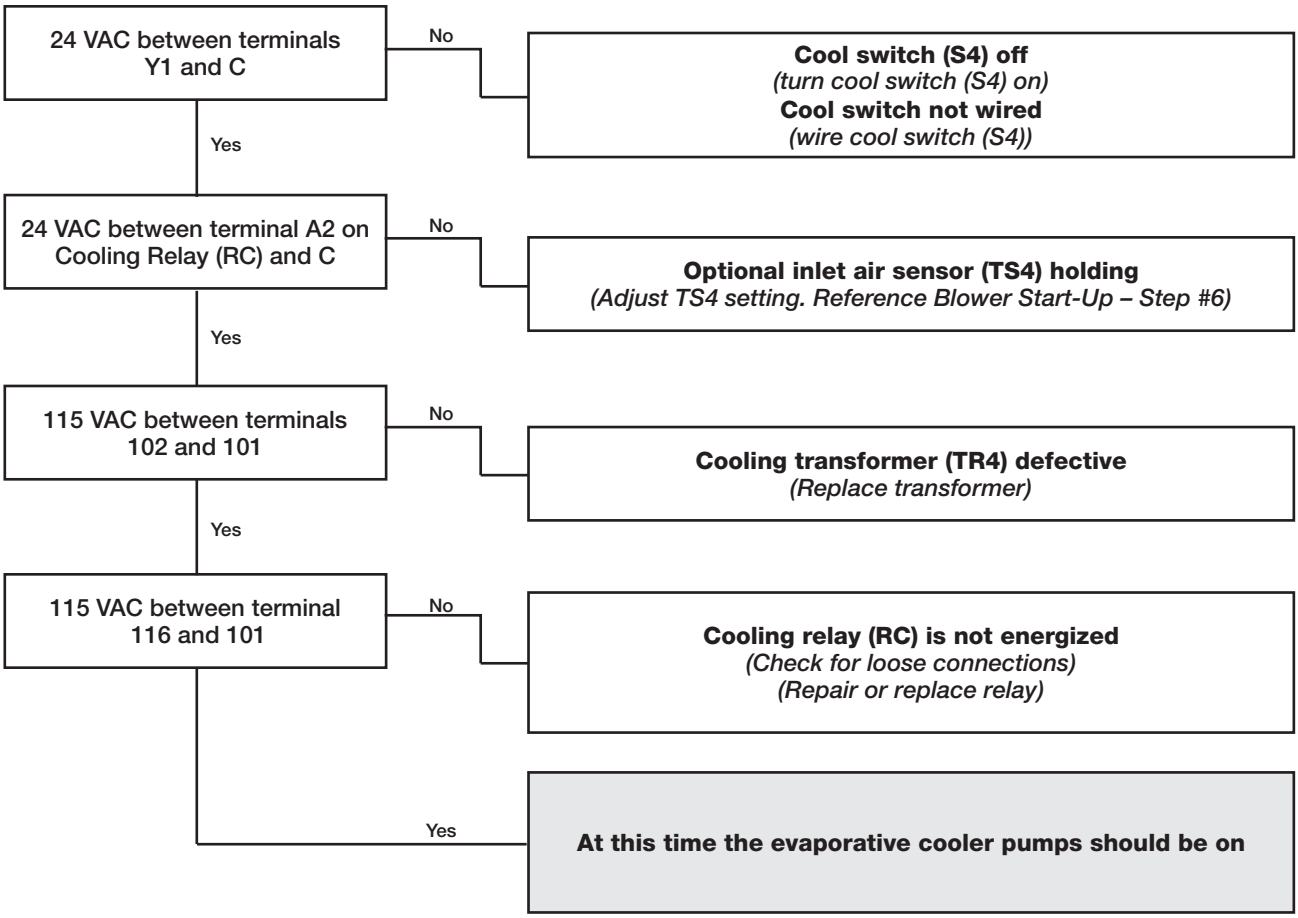
Furnace

Refer to the separate furnace Installation, Operation and Maintenance Manual for detailed information regarding furnace troubleshooting.

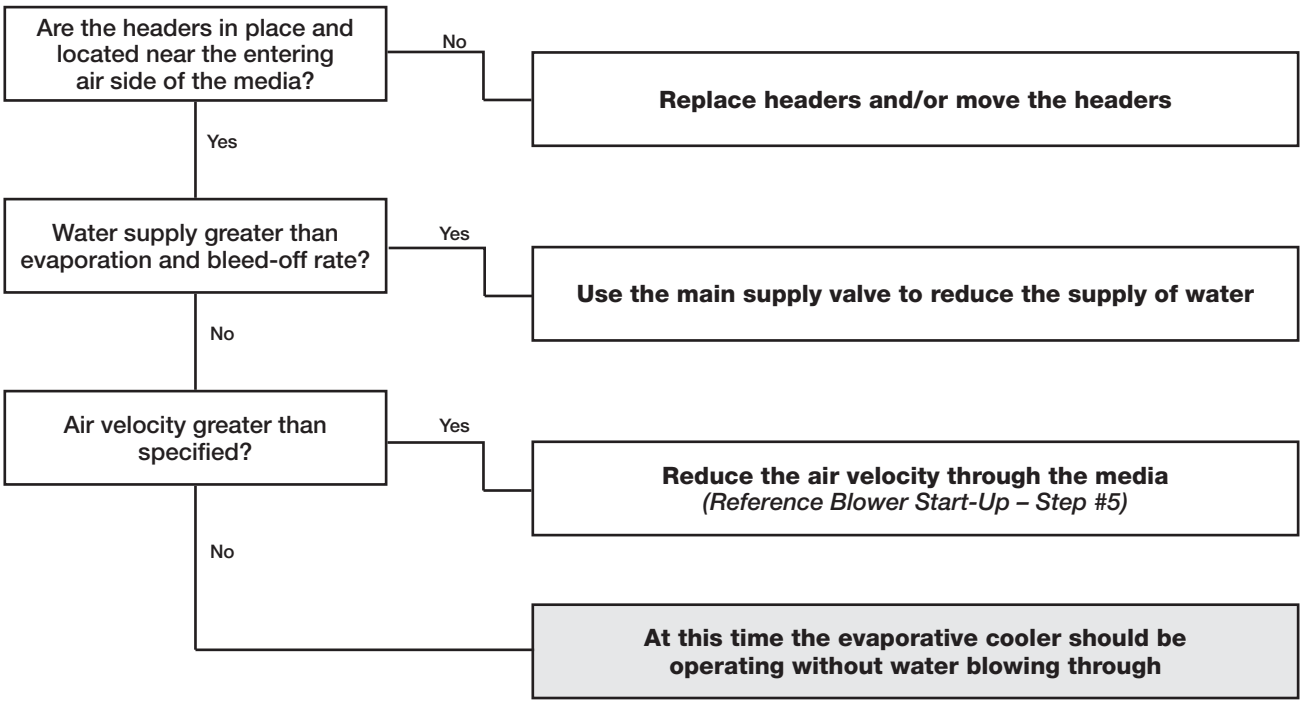
Troubleshooting

Evaporative Cooler does not Operate (Recirculating pump)

Supply fan must be on for cooler to operate



Water Blows through Evaporative Cooler



CAUTION

Lock-out the gas and the electrical power to the unit before performing any maintenance or service operations to this unit.

V-Belt Drives

V-belt drives must be checked on a regular basis for wear, tension, alignment, and dirt accumulation.

Check the tension by measuring the deflection in the belt as shown below.

Check the alignment by using a straight edge across both sheaves as shown below.

IMPORTANT

Premature or frequent belt failures can be caused by improper belt tension, or misaligned sheaves.

- Abnormally high belt tension or drive misalignment will cause excessive bearing loads and may result in failure of the fan and/or motor bearings.
- Abnormally low belt tension may cause squealing on start-up, excessive belt flutter, slippage, or overheated sheaves.

IMPORTANT

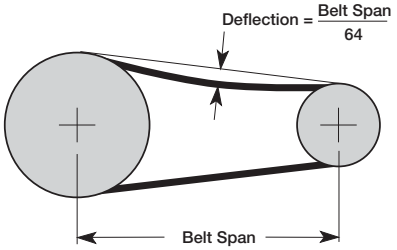
Do not pry belts on or off the sheave. Loosen belt tension until belts can be removed by simply lifting the belts off the sheaves.

IMPORTANT

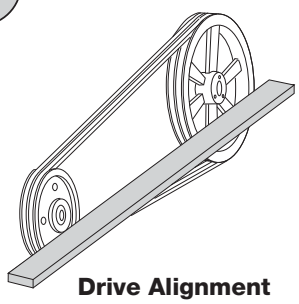
When replacing V-belts on multiple groove drives, all belts should be changed to provide uniform drive loading.

IMPORTANT

Do not install new belts on worn sheaves. If the sheaves have grooves worn in them, they must be replaced before new belts are installed.



Belt Tension



Drive Alignment

Snow Accumulation

Clear snow away from roof mounted units. Keep the snow clear of the intake and access doors.

Wheels

Wheels require little attention when moving clean air. Occasionally oil and dust may accumulate on the wheel, causing imbalance. When this occurs, the wheel and housing should be cleaned to assure proper operation.

Bearings

The bearings for our fans are carefully selected to match the maximum load and operating conditions of the specific class, arrangement, and fan size. The instructions provided in this manual and those provided by the bearing manufacturer will minimize any bearing problems.

IMPORTANT

Lubricate bearings prior to periods of extended shutdowns or storage and rotate shaft monthly to aid in corrosion prevention. If the fan is stored more than three months, purge the bearings with new grease prior to start-up.

Recommended Bearing Lubrication Schedule (in months*)

Fan RPM	Bearing Bore Size (inches)				
	½ - 1	1⅛ - 1½	1⅝ - 1⅞	1 15/16 - 2 3/16	2 7/16 - 3
250	6	6	6	6	6
500	6	6	6	5	4
750	6	5	4	3	3
1000	5	3	2	1	1
1250	5	3	2	1	1
1500	5	2	1	1	0.5
2000	5	1	1	0.5	0.25

*Suggested initial greasing interval is based on 12 hours per day operation and 150°F maximum housing temperature. For continuous (24 hour) operation, decrease greasing interval by 50%

- If extended grease lines are present, relubricate while in operation, only without endangering personnel.
- For ball bearings (operating) relubricate until clean grease is seen purging at the seals. Be sure not to unseat the seal by over lubricating.
- For ball bearings (idle) add 1-2 shots of grease up to 2 inch bore size, and 4-5 shots above 2 inch bore sizes with a hand grease gun.
- For roller bearings add 4 shots of grease up to 2 inch bore size, and 8 shots for 2-5 inch bore size with a hand grease gun.
- Adjust relubrication frequency based on condition of purged grease.
- A high quality lithium based grease conforming to NLGI Grade 2 consistency, such as those listed here:

Mobil 532	Texaco Multifak #2	B Shell Alavania #2
Mobilux #2	Texaco Premium #2	Exxon Unirex #2

Motors

Motor maintenance is generally limited to cleaning and lubrication (where applicable).

Cleaning should be limited to exterior surfaces only. Removing dust and grease build-up on the motor assures proper motor cooling.

Motors supplied with grease fittings should be greased in accordance with the manufacturer's recommendations.

IMPORTANT

Do not allow water or solvents to enter the motor or bearings. Motors and bearings should never be sprayed with steam, water or solvents.

IMPORTANT

Greasing motors is only intended when fittings are provided. Many motors are permanently lubricated, requiring no additional lubrication.

Filters

Filter maintenance is generally limited to cleaning and replacement.

If aluminum mesh filters are installed, they can be washed in warm soapy water.

An adhesive spray can be added to aluminum mesh filters to increase their efficiency.

If disposable filters are installed, they can be checked by holding up to a light source. If light cannot pass through the filter, it should be replaced.

IMPORTANT

When reinstalling filters, be sure to install them with the airflow in the correct direction. An airflow direction arrow is located on the side of the filters.

IMPORTANT

Replacement filters should be from the same manufacturer and the same size as the original filters provided with the unit.

Chilled Water Coils

Test the circulating fluid for sediment, corrosive products and biological contaminants. Make the necessary corrective measures.

Maintain adequate fluid velocities and proper filtering of the fluid.

If automatic air vents are not utilized, periodic venting of the coil is recommended to remove accumulated air.

Evaporative Coolers

The media should be periodically brushed lightly with a soft bristle brush in an up and down motion while flushing with water. This aids in reducing the amount of mineral build-up.

For large amounts of mineral build-up, clean or replace the media and increase the water bleed-off or flush rate.

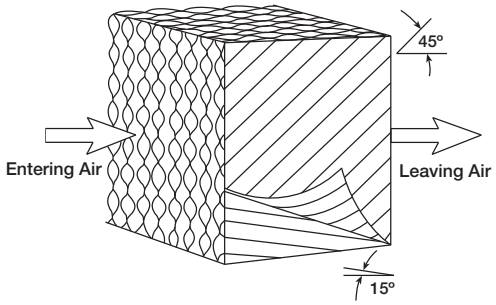
The cooling media has a useful life of 3 to 5 years depending on the water quality and the bleed-off or flush rate.

IMPORTANT

When reinstalling the evaporative media, make sure that it is installed correctly. Reference the drawing shown below.

IMPORTANT

Replacement media should be from the same manufacturer and be the same size as the original media provided with the unit.



Media Orientation

Cooling Coils

WARNING

Repair and replacement of the coil and the connecting piping, valves, etc., should be performed by a qualified individual.

Inspect the coil for signs of corrosion and/or leaks. Repair any leaks as required.

Inspect the coil's surface for foreign material. If the coil surface needs cleaning, clean the coil from the leaving air-side so that foreign material will be washed out of the coil rather than pushed farther in.

Inspect and clean the drain pan to prevent the growth of algae and other organisms.

IMPORTANT

Be sure to read and follow the manufacturer's recommendations before using any cleaning fluid.

CAUTION

Caution should be used to avoid injury when venting the coil. High pressure and/or high temperature fluids can cause serious injuries.

Maintenance - Fall

High Limit
The high limit switch may have tripped over the summer; it should be checked and reset if necessary.

CAUTION

Lock-out the gas and the electrical power to the unit before performing any maintenance or service operations to this unit.

Gas Line
Remove the drip leg and clean any liquid or debris that may have accumulated. Once the drip leg is cleaned, reattach it.

Gas Train
The gas connections, joints and valves should be checked annually for tightness. Apply a soap and water solution to all piping; watch for bubbling which indicates a leak. Other leak testing methods can be used.

Vent Piping
Remove any debris from the drip legs on the combustion air and exhaust pipes.

Burners and Orifices
Before each heating season, examine the burners and gas orifices to make sure they are clear of any debris such as spider webs, etc. Clean burner as follows:

- Turn off both electrical and gas supplies to the unit.
- Disconnect union between manifold and gas valve.
- Remove manifold and burner assembly.
- Inspect and clean orifices and burners as necessary. Avoid using any hard or sharp instruments which could cause damage to the orifices or burners.
  - Remove any soot deposits from the burner with a wire brush.
  - Clean the ports with an aerosol degreaser or compressed air.
  - Wipe the inside of the burner clean. Cleaning the burner with a degreaser will slow the future build-up of dirt.
- Before reinstalling the burner assembly, look down the heat exchanger tubes to make sure they are clear of any debris.
- Reinstall manifold and burner assembly, reconnect wire leads and gas supply piping.
- Turn on the electrical power and gas supply.
- Follow the start-up procedure to light the burners and verify proper operation.

Heat Exchanger
The heat exchanger should be checked annually for cracks. If a crack is detected, the heat exchanger should be replaced before the unit is put back into operation. Also, airflow across the heat exchanger should be checked to make sure the blower is operating properly.

Flue Collector Box
The flue passageway and flue collector box should be inspected prior to each heating season and cleared of any debris.

Electrical Wiring
The electrical wiring should be checked annually for loose connections or deterioration.

Replacement Parts
When ordering replacement parts, include the complete unit model number and serial number listed on the unit nameplate.

Evaporative Coolers
The water should be shut off and all the lines drained when the outside temperature drops below 45°F *(7°C)*.

Remove drain plugs for the winter.

Clean all interior parts of any mineral deposits or foreign materials that may have built-up during the cooling season.

Replace any worn or non-functioning parts.

Winterizing Chilled Water Coils
During the winter, chilled water coils need to be protected against freezing. Manufacturer recommends protecting the coils by either blowing-out the coils or by flushing the coils.

Blowing-Out Coils
1. Close valves on the supply and return lines.
2. Open drain valves and/or drain plug. Remove vent plug to allow coil to drain faster.
3. After coil is fully drained, connect a blower to the caps. Do not connect the blower to the air vent or drain plug.
4. Close the vent plug on the header that the blower is connected to. Open the drain valve or cap on the other header.
5. Turn on blower for 30 minutes. Place mirror at discharge. If the mirror fogs up, repeat procedure until no fog appears on the mirror.
6. After drying the coil, wait a few minutes then repeat Step #5.
7. Leave drains open and do not install plugs until beginning of cooling season.

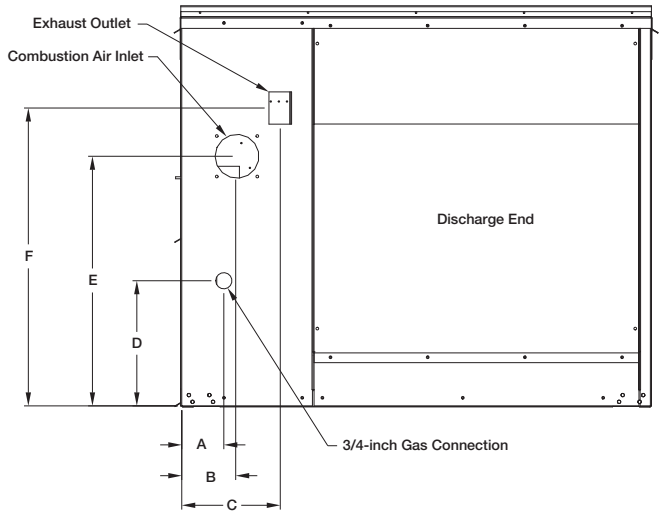
Flushing Coils

Manufacturer recommends the use of inhibited glycol (such as propylene or ethylene) to flush water coils to protect against freezing. Additionally, the use of inhibited glycol provides corrosion protection.

The table below indicates the percentage of glycol required to prevent freezing in a coil at a given outdoor air freeze point. Completely fill coil with solution. Drain coil. Residual glycol fluid per these concentrations can be left in the coil without concern of freezing. Recovered fluid can be used to flush other coils.

Percent of Ethylene Glycol by Volume	Freeze Point		Percent of Propylene Glycol by Volume	Freeze Point	
	ºF	ºC		ºF	ºC
0	32	*0*	0	32	*0*
10	25	*-4*	10	26	*-3*
20	16	*-9*	20	19	*-7*
30	3	*-16*	30	8	*-13*
40	-13	*-25*	40	-7	*-22*
50	-34	*-37*	50	-28	*-33*
60	-55	*-48*	60	-60	*-51*

Reference - Model XIG Venting Connection Location

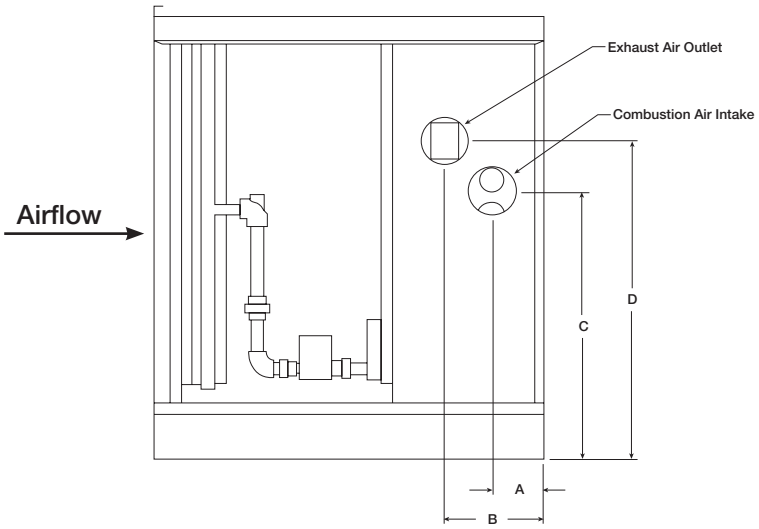


Venting Location Dimensions						
XIG Housing	A	B	C	D	E	G
10	3.89	5.12	9.12	11.59	23.11	27.58
20	3.91	3.89	7.89	11.62	25.34	32.27
30	3.91	3.89	7.89	11.62	25.34	32.27

Dimensions are in inches.
Dimensions B and E are not needed for standard venting. A round adapter should be used for the exhaust connection.

Flue Connection Size (diameter in inches)					
XIG Housing	Standard	Non-Concentric		Concentric	
	Exhaust	Exhaust	Intake	Exhaust	Intake
10	4.0	4.0	4.0	4.0	6.0
20	6.0	6.0	6.0	6.0	8.0
30	6.0	6.0	6.0	6.0	8.0

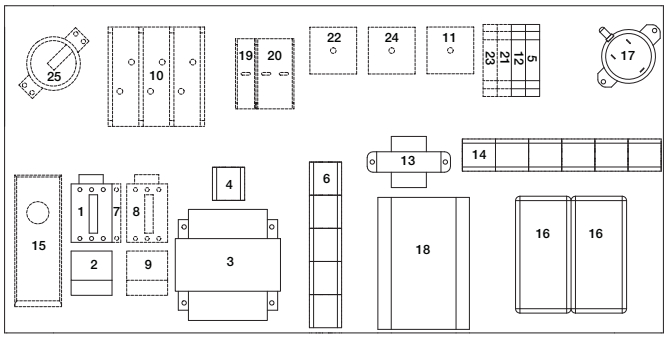
Reference - Model XIGX Venting Connection Location



XIGX Housing	Furnace Size (MBH)	A	B	C	D	Flue Connection Size (diameter in inches)				
						Standard	Non-Concentric		Concentric	
						Exhaust	Exhaust	Intake	Exhaust	Intake
12	100	4.45	8.45	23.43	27.90	4.0	4.0	4.0	4.0	6.0
	150	4.45	8.45	23.43	27.90	4.0	4.0	4.0	4.0	6.0
	200	5.64	9.64	23.97	30.90	6.0	6.0	6.0	6.0	8.0
	250	5.64	9.64	23.97	30.90	6.0	6.0	6.0	6.0	8.0
22	150	4.45	8.45	29.38	33.85	4.0	4.0	4.0	4.0	6.0
	200	5.67	9.67	24.97	31.90	6.0	6.0	6.0	6.0	8.0
	250	5.67	9.67	24.97	31.90	6.0	6.0	6.0	6.0	8.0
	300	5.67	9.67	24.97	31.90	6.0	6.0	6.0	6.0	8.0
	350	5.67	9.67	19.01	25.94	6.0	6.0	6.0	6.0	8.0
	400	5.67	9.67	19.01	25.94	6.0	6.0	6.0	6.0	8.0
	500	5.67	9.67	24.97	31.90	6.0	6.0	6.0	6.0	8.0
	600	5.67	9.67	24.97	31.90	6.0	6.0	6.0	6.0	8.0
32	350	5.96	9.71	28.31	35.24	6.0	6.0	6.0	6.0	8.0
	400	5.96	9.71	28.31	35.24	6.0	6.0	6.0	6.0	8.0
	500	5.96	9.71	28.31	35.24	6.0	6.0	6.0	6.0	8.0
	600	5.96	9.71	28.31	35.24	6.0	6.0	6.0	6.0	8.0
	700	5.96	9.71	28.31	35.24	6.0	6.0	6.0	6.0	8.0
	800	5.96	9.71	28.31	35.24	6.0	6.0	6.0	6.0	8.0
	1050	5.96	9.71	28.31	35.24	6.0	6.0	6.0	6.0	8.0
	1200	5.96	9.71	28.31	35.24	6.0	6.0	6.0	6.0	8.0

Dimensions are in inches. Dimensions A and C are not needed for standard venting.

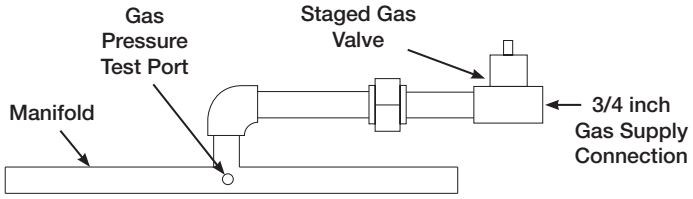
Reference - Model XIG (Single or 2 Stage)



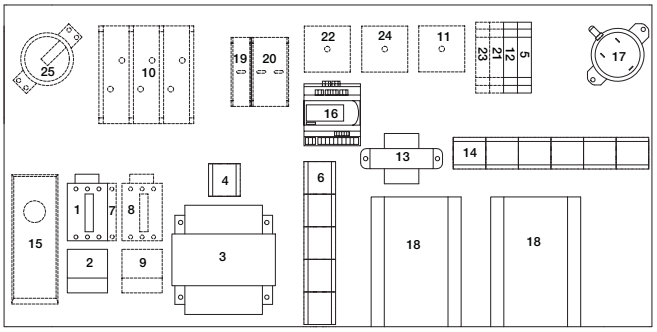
NOTE

This is a typical blower control center, the control center in your unit may be different. Reference the ladder diagram on the inside of the control center door for a unit specific wiring diagram.

1. **Supply Motor Starter** - 24 volt magnetic contacts for starting supply motor.
2. **Supply Overload** - Provides electronic overload protection to supply motor.
3. **Low Voltage Transformer** - Provides low voltage to fan/heat/cooling enable controls, staged furnace controls and optional evaporative cooling controls.
4. **Control Terminal Block** - Provides wiring access to controls.
5. **Fan Relay** - Allows power to pass to energize motor starter.
6. **Control Terminal Block** - Provides wiring access to fan/heat/cooling enable controls.
7. **Auxiliary Contact (Optional)** - Provides one normally closed and one normally open contact for other equipment.
8. **Exhaust Motor Starter (Optional)** - 24 volt magnetic contacts for starting exhaust motor.
9. **Exhaust Overload (Optional)** - Provides electronic overload protection to exhaust motor.
10. **Exhaust Fuses (Optional)** - Provides proper fusing for exhaust fan motor(s).
11. **Building Freeze Protection Timer (Optional)** - Prevents the discharge of cold air into the building.
12. **Heat Relay** - Allows power to pass to heating controls.
13. **Low Voltage Transformer** - Provides low voltage to the ignition controller.
14. **Heating Terminal Block** - Provides wiring access to heating controls.
15. **Inlet Air Sensor (Optional)** - Outdoor air stat that automatically controls the heating and/or cooling based on outdoor air temperature.
16. **Stage Controller** - Provides single or two stage control of the furnace.
17. **Airflow Switch** - Monitors the airflow inside the heat exchanger.
18. **Ignition Controller** - Controls the ignition of the furnace. Maintains safe operation of the furnace.
19. **Evaporative Cooling Fuses (Optional)** - Provides proper fusing to evaporative cooling pump and controls.
20. **Transformer Fuse (Optional)** - Provides proper fusing for evaporative cooling transformer.
21. **Cooling Relay (Optional)** - Allows power to pass to cooling controls.
22. **Reset Timer (Optional)** - Resets cooling system to run a time interval.
23. **Auto Drain Relay (Optional)** - Assures supply pump does not operate during drain interval. Allows pump to operate in cooling mode.
24. **Cooling Timer (Optional)** - Allows for automatic draining of the evaporative cooling system based on time schedule.
25. **Dirty Filter Switch (Optional)** - Monitors filter pressure drop. Turns on indicating light when pressure drop is above field adjustable set point.



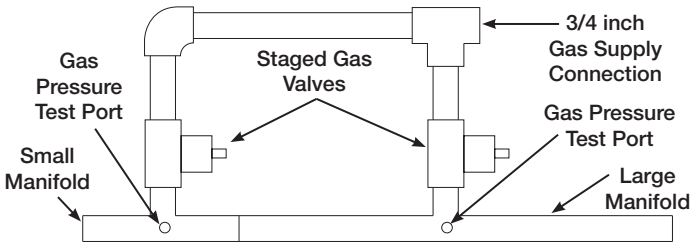
Reference - Model XIG (8:1 Staged)



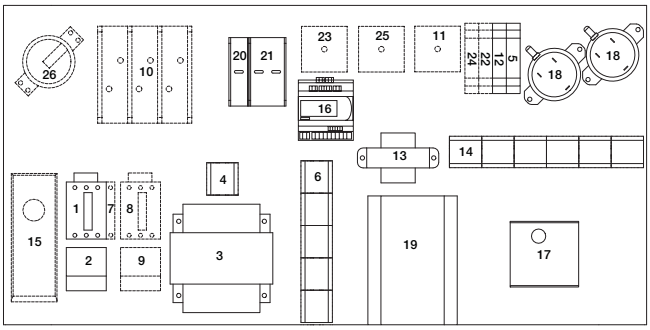
NOTE

This is a typical blower control center, the control center in your unit may be different. Reference the ladder diagram on the inside of the control center door for a unit specific wiring diagram.

1. **Supply Motor Starter** - 24 volt magnetic contacts for starting supply motor.
2. **Supply Overload** - Provides electronic overload protection to supply motor.
3. **Low Voltage Transformer** - Provides low voltage to fan/heat/cooling enable controls, staged furnace controls and optional evaporative cooling controls.
4. **Control Terminal Block** - Provides wiring access to controls.
5. **Fan Relay** - Allows power to pass to energize motor starter.
6. **Control Terminal Block** - Provides wiring access to fan/heat/cooling enable controls.
7. **Auxiliary Contact (Optional)** - Provides one normally closed and one normally open contact for other equipment.
8. **Exhaust Motor Starter (Optional)** - 24 volt magnetic contacts for starting exhaust motor.
9. **Exhaust Overload (Optional)** - Provides electronic overload protection to exhaust motor.
10. **Exhaust Fuses (Optional)** - Provides proper fusing for exhaust fan motor(s).
11. **Building Freeze Protection Timer (Optional)** - Prevents the discharge of cold air into the building.
12. **Heat Relay** - Allows power to pass to heating controls.
13. **Low Voltage Transformer** - Provides low voltage to the ignition controller.
14. **Heating Terminal Block** - Provides wiring access to heating controls.
15. **Inlet Air Sensor (Optional)** - Outdoor air stat that automatically controls the heating and/or cooling based on outdoor air temperature.
16. **Stage Controller** - Provides 8 stage control of the furnace.
17. **Airflow Switch** - Monitors the airflow inside the heat exchanger.
18. **Ignition Controller** - Controls the ignition of the furnace. Maintains safe operation of the furnace.
19. **Evaporative Cooling Fuses (Optional)** - Provides proper fusing to evaporative cooling pump and controls.
20. **Transformer Fuse (Optional)** - Provides proper fusing for evaporative cooling transformer.
21. **Cooling Relay (Optional)** - Allows power to pass to cooling controls.
22. **Reset Timer (Optional)** - Resets cooling system to run a time interval.
23. **Auto Drain Relay (Optional)** - Assures supply pump does not operate during drain interval. Allows pump to operate in cooling mode.
24. **Cooling Timer (Optional)** - Allows for automatic draining of the evaporative cooling system based on time schedule.
25. **Dirty Filter Switch (Optional)** - Monitors filter pressure drop. Turns on indicating light when pressure drop is above field adjustable set point.



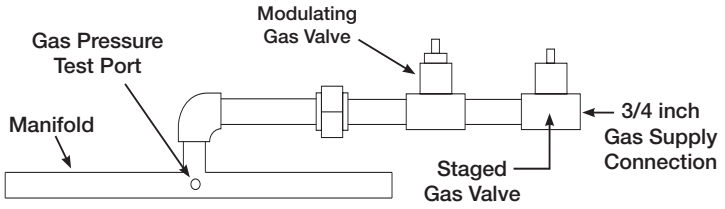
Reference - Model XIG (4:1 Modulation)



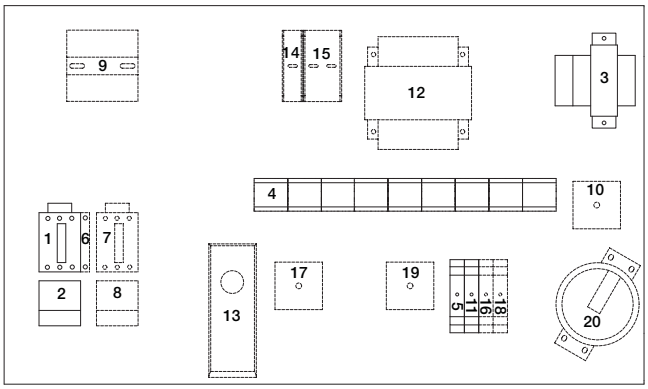
NOTE

This is a typical blower control center, the control center in your unit may be different. Reference the ladder diagram on the inside of the control center door for a unit specific wiring diagram.

1. **Supply Motor Starter** - 24 volt magnetic contacts for starting supply motor.
2. **Supply Overload** - Provides electronic overload protection to supply motor.
3. **Low Voltage Transformer** - Provides low voltage to fan/heat/cooling enable controls, modulating furnace controls and optional evaporative cooling controls.
4. **Control Terminal Block** - Provides wiring access to controls.
5. **Fan Relay** - Allows power to pass to energize motor starter.
6. **Control Terminal Block** - Provides wiring access to fan/heat/cooling enable controls.
7. **Auxiliary Contact (Optional)** - Provides one normally closed and one normally open contact for other equipment.
8. **Exhaust Motor Starter (Optional)** - 24 volt magnetic contacts for starting exhaust motor.
9. **Exhaust Overload (Optional)** - Provides electronic overload protection to exhaust motor.
10. **Exhaust Fuses (Optional)** - Provides proper fusing for exhaust fan motor(s).
11. **Building Freeze Protection Timer (Optional)** - Prevents the discharge of cold air into the building.
12. **Heat Relay** - Allows power to pass to heating controls.
13. **Low Voltage Transformer** - Provides low voltage to the ignition controller.
14. **Heating Terminal Block** - Provides wiring access to heating controls.
15. **Inlet Air Sensor (Optional)** - Outdoor air stat that automatically controls the heating and/or cooling based on outdoor air temperature.
16. **Modulation Controller** - Provides 4:1 modulating turndown control of the furnace.
17. **Amplifier** - Controls the modulating valve based on the input from the modulation controller settings and the discharge air sensor.
18. **Airflow Switch** - Monitors the airflow inside the heat exchanger.
19. **Ignition Controller** - Controls the ignition of the furnace. Maintains safe operation of the furnace.
20. **Modulation Controller (Optional)** - Provides proper fusing to modulation controller.
21. **Transformer Fuse (Optional)** - Provides proper fusing to low voltage transformer.
22. **Cooling Relay (Optional)** - Allows power to pass to cooling controls.
23. **Reset Timer (Optional)** - Resets cooling system to run a time interval.
24. **Auto Drain Relay (Optional)** - Assures supply pump does not operate during drain interval. Allows pump to operate in cooling mode.
25. **Cooling Timer (Optional)** - Allows for automatic draining of the evaporative cooling system based on time schedule.
26. **Dirty Filter Switch (Optional)** - Monitors filter pressure drop. Turns on indicating light when pressure drop is above field adjustable set point.



Reference - Model XIGX (Blower Control Center)



NOTE

This is a typical blower control center, the control center in your unit may be different. Reference the ladder diagram on the inside of the control center door for a unit specific wiring diagram.

1. **Supply Motor Starter** - 24 volt magnetic contacts for starting supply motor.
2. **Supply Overload** - Provides electronic overload protection to supply motor.
3. **Low Voltage Transformer** - Provides low voltage to fan/heat/cooling enable controls.
4. **Control Terminal Block** - Provides wiring access to controls.
5. **Fan Relay** - Allows power to pass to energize motor starter.
6. **Auxiliary Contact (Optional)** - Provides one normally closed and one normally open contact for other equipment.
7. **Exhaust Motor Starter (Optional)** - 24 volt magnetic contacts for starting exhaust motor.
8. **Exhaust Overload (Optional)** - Provides electronic overload protection to exhaust motor.
9. **Exhaust Fuses (Optional)** - Provides proper fusing for exhaust fan motor(s).
10. **Building Freeze Protection Timer (Optional)** - Prevents the discharge of cold air into the building.
11. **Heat Relay** - Allows power to pass to heating controls.
12. **Low Voltage Transformer** - Provides low voltage to the optional evaporative cooling controls.
13. **Inlet Air Sensor (Optional)** - Outdoor air stat that automatically controls the heating and/or cooling based on outdoor air temperature.
14. **Evaporative Cooling Fuses (Optional)** - Provides proper fusing to evaporative cooling pump and controls.
15. **Transformer Fuse (Optional)** - Provides proper fusing for evaporative cooling transformer.
16. **Cooling Relay (Optional)** - Allows power to pass to cooling controls.
17. **Reset Timer (Optional)** - Resets cooling system to run a time interval.
18. **Auto Drain Relay (Optional)** - Assures supply pump does not operate during drain interval. Allows pump to operate in cooling mode.
19. **Cooling Timer (Optional)** - Allows for automatic draining of the evaporative cooling system based on time schedule.
20. **Dirty Filter Switch (Optional)** - Monitors filter pressure drop. Turns on indicating light when pressure drop is above field adjustable set point.

Reference - Start-Up Checklist

Unit Model Number _____
(e.g. XIGX-120-H32-DB)

Unit Serial Number _____
(e.g. 10111000)

Start-Up Date _____

Start-Up Personnel Name _____

Start-Up Company _____

Phone Number _____

Pre Start-Up Checklist – check boxes as items are completed.

- ☐ Check tightness of all factory wiring connections
- ☐ Verify control wiring wire gauge
- ☐ Hand-rotate blower to verify free rotation
- ☐ Verify supply voltage to the main disconnect
- ☐ Verify the supply gas pressure
- ☐ Verify remote controls wiring

Start-Up Blower Checklist – refer to Blower Start-Up section for further detail.

- ☐ Check line voltage L1-L2 _____
  L2-L3 _____
  L1-L3 _____
- ☐ Check blower rotation
- ☐ Check for vibration
- ☐ Supply fan RPM _____ RPM
- ☐ Motor nameplate amps _____ Amps
- ☐ Actual motor L1 _____ Amps
  L2 _____ Amps
  L3 _____ Amps
- ☐ Actual CFM delivered _____ CFM

Optional Accessories – refer to Blower Start-Up section, Step #6 for further detail.

- ☐ Heating Inlet Air Sensor
  _____ Actual Setting
  Typical setting 60º-70ºF (15º-21ºC)
- ☐ Cooling Inlet Air Sensor
  _____ Actual Setting
  Typical setting 75ºF (24ºC)
- ☐ Building Freeze Protection
  _____ Actual Setting
  Typical setting 5 minutes; 45ºF (7ºC)
- ☐ Dirty Filter Gauge
  _____ Actual Setting
  Typical setting varies

Start-Up Indirect Gas – refer to Furnace Start-Up section in separate furnace Installation, Operation and Maintenance Manual for further detail

Furnace 1

- ☐ Determine furnace control type:
  1 Stage - 2 Stage - 8 Stage - 4:1 Modulation
- ☐ Check supply gas pressure
  _____ Maximum
  _____ Minimum
  _____ Actual
- ☐ Set the High Manifold pressure
  _____ in. wg
- ☐ Set the Low Manifold pressure
  _____ in. wg
- ☐ Set the unit's desired discharge temperature
  _____ °F (°C)

Furnace 2 (Optional)

- ☐ Determine furnace control type:
  1 Stage - 2 Stage - 8 Stage - 4:1 Modulation
- ☐ Check supply gas pressure
  _____ Maximum
  _____ Minimum
  _____ Actual
- ☐ Set the High Manifold pressure
  _____ in. wg
- ☐ Set the Low Manifold pressure
  _____ in. wg

Furnace 3 (Optional)

- ☐ Determine furnace control type:
  1 Stage - 2 Stage - 8 Stage - 4:1 Modulation
- ☐ Check supply gas pressure
  _____ Maximum
  _____ Minimum
  _____ Actual
- ☐ Set the High Manifold pressure
  _____ in. wg
- ☐ Set the Low Manifold pressure
  _____ in. wg

Start-Up Evaporative Cooler (optional) – refer to Evaporative Cooler Start-Up section for further detail.

- ☐ Check media orientation
- ☐ Check for proper water flow to distribution headers
- ☐ Check for distribution header orientation to prevent water spillage

Maintenance Log

Date _____Time _____ AM/PM
Notes:_____
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Date _____Time _____ AM/PM
Notes:_____
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Date _____Time _____ AM/PM
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Date _____Time _____ AM/PM
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Date _____Time _____ AM/PM
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Date _____Time _____ AM/PM
Notes:_____
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Our Commitment

As a result of our commitment to continuous improvement, Accurex reserves the right to change specifications without notice.

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