INSTALLATION INSTRUCTIONS FOR R7TQ MODELS

PACKAGED GAS HEATING/ELECTRIC COOLING UNIT,
81% STEADY STATE EFFICIENCY,
UNIT SIZES 072 (6-TON), 090 (7.5-TON), 120 (10-TON), AND 150 (12.5-TON)

⚠ WARNING

FIRE OR EXPLOSION HAZARD

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

– 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 neighbors phone. Follow the gas suppliers 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.

DO NOT DESTROY THIS MANUAL. READ ALL INSTRUCTIONS IN THIS MANUAL AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

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IMPORTANT SAFETY INFORMATION

Please read all instructions before servicing this equipment. Pay attention to all safety warnings and any other special notes highlighted in the manual. Safety markings are used frequently throughout this manual to designate a degree or level of seriousness and should not be ignored.

WARNING indicates a potentially hazardous situation that if not avoided, could result in personal injury or death.

CAUTION indicates a potentially hazardous situation that if not avoided, may result in minor or moderate injury or property damage.

⚠ WARNING:

Improper installation, service, adjustment, or maintenance may cause explosion, fire, electrical shock or other hazardous conditions which may result in personal injury or property damage. Unless otherwise noted in these instructions, only factory-authorized kits or accessories may be used with this product.

⚠ WARNING:

Do not place combustible material on or against the unit cabinet. Do not place combustible materials, including gasoline and any other flammable vapors and liquids, in the vicinity of the unit.

⚠ WARNING:

PROPOSITION 65 WARNING: This product contains fiberglass insulation. Disturbing the insulation of this product during installation, maintenance, or repair may expose you to fiberglass insulation.

- **Breathing this material may cause respiratory irritations.**
- **Fiberglass insulation may also cause eye irritation, skin sensitization, or other allergic responses in susceptible individuals.**
- **Always wear goggles, disposable gloves, long sleeved shirt, and appropriate breathing protection when working near this insulation. If contact with skin occurs, wash immediately with soap and water. In case of contact with eyes, flush immediately with water for at least 15 minutes. Contact a physician if needed.**

⚠ WARNING:

The information listed below and must be followed during the installation, service, and operation of this unit. Unqualified individuals should not attempt to interpret these instructions or install this equipment. Failure to follow safety recommendations could result in possible damage to the equipment, serious personal injury or death.

- This equipment contains liquid and gaseous refrigerant under high pressure. Installation or servicing should only be performed by qualified trained personnel thoroughly familiar with this type equipment.
- Before beginning the installation, verify that the unit model is correct for the job. The unit model number is printed on the data label.
- Never test for gas leaks with an open flame. Use a commercially available soap solution to check all connections See page 10.
- Follow all precautions in the literature, on tags, and on labels provided with the equipment. Read and thoroughly understand the instructions provided with the equipment prior to performing the installation and operational checkout of the equipment.
- This unit is designed only for outdoor installations and should be located with consideration of minimizing the length of the supply and return ducts.
- The installer should become familiar with the unit's wiring diagram before making any electrical connections to the unit. See the unit wiring label or Figure 16 (page 37), Figure 17 (page 39), Figure 18 (page 41), Figure 19 (page 43), Figure 20 (page 45), Figure 21 (page 47), and Figure 22 (page 48).
- Use caution when handling this appliance or removing components. Personal injury can occur from sharp metal edges present in all sheet metal constructed equipment.

REQUIREMENTS AND CODES

- **This equipment must be installed in accordance with instructions outlined in this manual, all applicable local building codes, and the current revision of the National Fuel Gas Code (NFPA54/ANSI Z223.1) or the Natural Gas and Propane Installation Code, CAN/CSA B149.1.**
- All electrical wiring must be completed in accordance with local, state and national codes and regulations and with the National Electric Code (ANSI/NFPA 70) or in Canada the Canadian Electric Code Part 1 CSA C.22.1.
- The installer must comply with all local codes and regulations which govern the installation of this type of equipment. Local codes and regulations take precedence over any recommendations contained in these instructions. Consult local building codes and the National Electrical Code (ANSI CI) for special installation requirements.
- Air Ducts must be installed in accordance with the standards of the National Fire Protection Association "Standards for

Installation of Air Conditioning and Ventilation Systems" (NFPA 90A), "Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems" (NFPA 90B), these instructions, and all applicable local codes.
- Consult Table 17 (page 50), and the rating plate for the proper circulating air flow and temperature rise. It is important that the duct system be designed to provide the correct flow rates and external pressure rise. An improperly designed duct system can result in nuisance shutdowns, and comfort or noise issues.
- This unit is designed for outdoor installations only and should be located as described on page 4.
- Use only with the type of gas approved for this unit. Refer to the unit rating plate.
- Provide adequate combustion and ventilation air to the unit. See page 5 and page 6.
- Provide adequate clearances around the air vent intake terminal as specified on page 5.
- Combustion products must be discharged outdoors. Connect this unit to an approved vent system only, as specified on page 6.
- The information listed below is for reference purposes only and does not necessarily have jurisdiction over local or state codes. Always consult with local authorities before installing any gas appliance.

Combustion and Ventilation Air
- US: National Fuel Gas Code (NFGC), Air for Combustion and Ventilation
- CANADA: Natural Gas and Propane Installation Codes (NSCNGPIC), Venting Systems and Air Supply for Appliances

Duct Systems
- US and CANADA: Air Conditioning Contractors Association (ACCA) Manual D, Sheet Metal and Air Conditioning Contractors National Association (SMACNA), or American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Fundamentals Handbook

Electrical Connections
- US: National Electrical Code (NEC) ANSI/NFPA 70
- CANADA: Canadian Electrical Code CSA C22.1

Gas Piping and Gas Pipe Pressure Testing
- US: NFGC and National Plumbing Codes
- CANADA: NSCNGPIC

General Installation
- US: Current edition of the NFGC and the NFPA 90B. For copies, contact the National Fire Protection Association Inc., Batterymarch Park, Quincy, MA 02269; or American Gas Association, 400 N. Capitol, N.W., Washington DC 20001 or www.NFPA.org
- CANADA: NSCNGPIC. For a copy, contact Standard Sales, CSA International, 178 Rexdale Boulevard, Etobicoke (Toronto), Ontario, M9W 1R3 Canada

Safety
- US: (NFGC) NFPA 54–1999/ANSI Z223.1 and the Installation Standards, Warm Air Heating and Air Conditioning Systems ANSI/NFPA 90B.
- CANADA: CAN/CSA-B149.1 and .2–M00 National Standard of Canada. (NSCNGPIC)

GENERAL INFORMATION

About the Rooftop Unit

Single Package Gas Heating/Electric Cooling Rooftop Units are designed only for outdoor rooftop or ground level installations and can be readily connected to the duct system of a building.

This unit has been tested for capacity and efficiency in accordance with AHRI Standards and will provide many years of safe and dependable comfort, providing it is properly installed and maintained. With regular maintenance, this unit will operate satisfactorily year after year. Abuse, improper use, and/or improper maintenance can shorten the life of the appliance and create unsafe hazards.

To achieve optimum performance and minimize equipment failure, it is recommended that periodic maintenance be performed on this unit. The ability to properly perform maintenance on this equipment requires certain tools and mechanical skills.

Before You Install this Equipment

√ The cooling load of the area to be conditioned must be calculated and a system of the proper capacity selected. It is recommended that the area to be conditioned be completely insulated and vapor sealed.

√ Check the electrical supply and verify the power supply is adequate for unit operation. Consideration should be given to availability of electric power, service access, noise, and shade. If there is any question concerning the power supply, contact the local power company.

√ All units are securely packed at the time of shipment and upon arrival should be carefully inspected for damage prior to installing the equipment at the job site. Verify coil fins are straight. If necessary, comb fins to remove flattened or bent fins. Claims for damage (apparent or concealed) should be filed immediately with the carrier.

√ Please consult your dealer for maintenance information and availability of maintenance contracts. Read all instructions before installing the unit.

Locating the Unit

- Survey the job site to determine the best location for the packaged unit. The unit should be located with consideration of minimizing the length of the supply and return ducts. If practical, place the equipment and its ducts in an area where they will be shaded from the afternoon sun, when the heat load is greatest.
- For horizontal Installations: Select a solid, level position, preferably on a concrete slab, slightly above the grade level, and parallel to the building.
- Overhead obstructions, poorly ventilated areas, and areas subject to accumulation of debris should be avoided. Do not place the unit in a confined space or recessed area where discharge air from the unit could re-circulate back through the condenser coil.
- Sufficient clearance for unobstructed airflow through the louvered control access panel and outdoor coil must be maintained in order to achieve rated performance. See Figure 1 (page 5) for minimum clearance requirements.
- **If minimum clearances to combustibles are greater than recommended serviceability clearances, then clearances to combustibles must take precedence.**

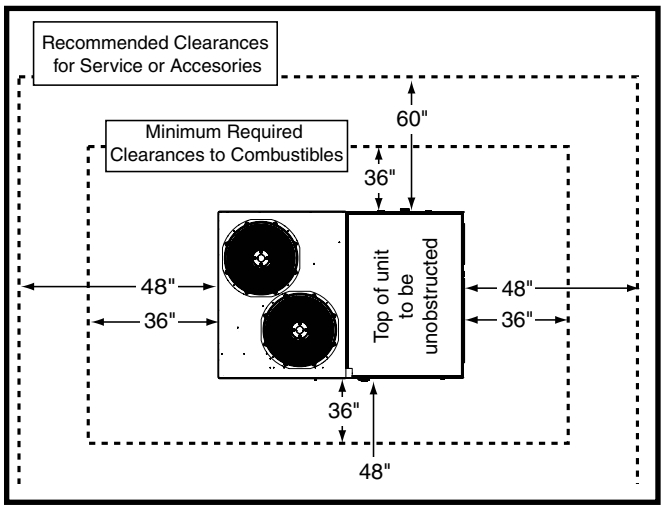


Figure 1. Unit Clearance Requirements

Heating Load

This unit should be sized to provide the design heating load requirement. Heating load estimates can be made using approved methods available from Air Conditioning Contractors of America (Manual N); American Society of Heating, Refrigerating, and Air Conditioning Engineers; or other approved engineering methods. For installations above 2,000 ft., the unit should have a sea level input rating large enough that it will meet the heating load after deration for the installed elevation.

COMBUSTION AIR AND VENTING

⚠ WARNING:

Installation methods other than those described in the following sections must comply with the National Fuel Gas Code and all applicable local codes for providing sufficient combustion air to the furnace.

Provisions must be made during the installation of this unit that provide an adequate supply of air for combustion.

- Instructions for determining the adequacy of an installation can be found in the current revision of the NFGC (ANSI Z223.1/NFPA54). **Consult local codes for special requirements**. These requirements are for US installations as found in the NFGC.
- The requirements in Canada (B149.1) are structured differently. Consult with B149.1 and local code officials for Canadian installations.

⚠ WARNING:

Combustion air must not be drawn from a contaminated atmosphere. Excessive exposure to contaminated combustion air will result in safety and performance related problems.

To maximize heat exchanger life, the combustion air must be free of chemicals which form corrosive acidic compounds in the combustion gases.

IMPORTANT NOTE:

Do not store any chemicals with flammable or caustic vapors near the vent termination. Some examples of these chemicals are:

- Carbon tetrachloride
- Cements, glues, paint removers, varnishes, etc.
- Cleaning solvents
- Chlorine based swimming pool chemicals
- Chlorinated waxes & cleaners
- De-icing salts or chemicals
- Gasoline/Kerosene
- Halogen type refrigerants
- Hydrochloric acid
- Masonry acid washing materials
- Permanent wave solutions
- Water softening chemicals

Combustion air openings in the door of the unit must never be restricted. If the unit does not receive an adequate supply of air for combustion, the flame roll-out control located above the burners will open, turning off the gas supply to the burners. This safety device is a manually reset switch.

IMPORTANT NOTE:

DO NOT install jumper wires across this control to defeat its function or reset the control without identifying and correcting the fault condition.

If this control must be replaced, use only factory-authorized replacement parts specified in the Replacement Parts List provided online.

Vent Termination

This unit has been equipped with an integral venting system and designed to operate only with this venting system. If desired, an accessory venting kit is available. **Use only approved venting kit listed in the technical service literature**.

⚠ WARNING:

This unit is intended for outdoor installation only. Do not vent the unit through a conventional venting system.

A vent cover assembly has been supplied with the unit and can be found secured inside the compressor area of this unit. Figure 2 displays the proper installation of the vent cover assembly over the vent outlet. The fasteners used to secure the vent cover are affixed to the cover for transport.

The list below summarizes the location requirements for the venting system termination:

- The location of the vent termination must be consistent with the National Fuel Gas Code (ANSI Z223.1) or CAN/CSA-B149 Installation Codes.
- Must be located at least 4 feet horizontally from any electric meters, gas meters, regulators, and relief equipment.
- Must be located at least 3 feet above any forced air inlet located within 10 feet of unit.
- Must be located at least 4 feet below, 4 feet horizontally from, or 1 foot above any door, window, or gravity air inlet into any building.
- Must be located at least 1 foot above grade and installed in such a manner as to prevent snow accumulation from obstructing the vent termination.
- The vent termination must not be located above any public walkways.
- The vent cover assembly must be installed to assure proper operation of the unit.
- Make sure the exhaust gases will not impinge on windows or building surfaces, which may be compromised or damaged by condensation.
- Do not install the unit in a location where exhaust from the vent termination will be directed into windows, stairwells, under decks, or other recessed areas.

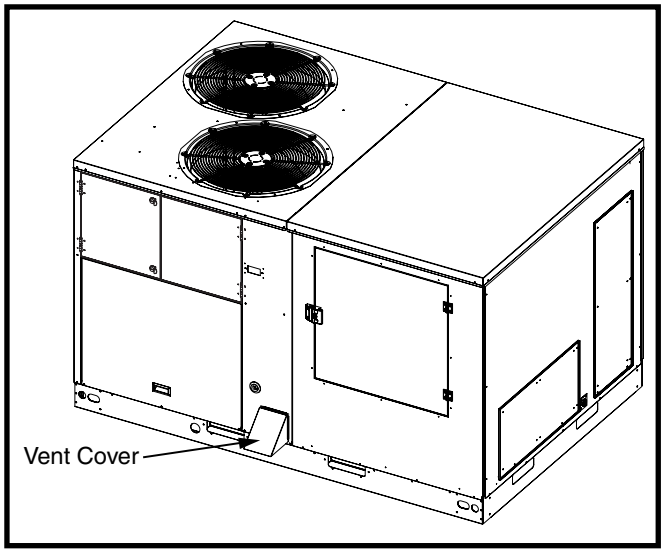


Figure 2. Vent Cover Installed

CIRCULATING AIR SUPPLY

⚠ WARNING:

Products of combustion must not be allowed to enter the return air ductwork or the circulating air supply. Failure to prevent products of combustion from being circulated into the living space can create potentially hazardous conditions including carbon monoxide poisoning that could result in personal injury or death.

All return ductwork must be adequately sealed, all joints must be taped, and the ductwork must be secured to the unit with sheet metal screws. When return air is provided through the bottom of the unit, the joint between the unit and the return air plenum must be air tight.

The roof curb or cement pad that the unit is mounted to must provide sound physical support of the unit with no gaps, cracks, or sagging between the unit and pad.

Return air and circulating air ductwork must not be connected to any other heat producing device such as a fireplace insert, stove, etc. Doing so may result in fire, explosion, carbon monoxide poisoning, personal injury, or property damage.

This unit is designed only for use with a supply and return duct. Air ducts should be installed in accordance with the standards of the National Fire Protection Association "Standard for Installation of Air Conditioning Systems" (NFPA 90A), "Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems" (NFPA 90B), and all applicable local codes. NFPA publications are available by writing to: National Fire Protection Association, Batterymarch Park, Quincy, ME 02269 or visit their website: **www.NFPA.org**.

- Design the duct work according to Manual Q by the Air Conditioning Contractors of America (ACCA) or similar commercial methods.
- If roof curb is installed, the ducts must be attached to the curb hangers, not the unit.
- Duct work should be attached directly to the unit end panel for horizontal applications.
- It is recommended that the outlet duct be equipped with a removable access panel. This opening should be accessible when the unit is installed in service and shall be of a size such that the smoke or reflected light may be observed inside the casing to indicate the presence of leaks in the heat exchanger. The cover for the opening shall be attached in such a manner as to prevent leaks.
- If outside air is utilized as return air to the unit for ventilation or to improve indoor air quality, the system must be designed so that the return air to the unit is not less than 50° F (10° C) during heating operation.
- If a combination of indoor and outdoor air is used, the ducts and damper system must be designed so that the return air supply to the furnace is equal to the return air supply under normal, indoor return air applications.
- This unit is shipped ready for vertical duct connections and is easily converted for horizontal duct connections.

Unconditioned Spaces

All ductwork passing through unconditioned space must be properly insulated to prevent condensation and minimize duct losses. Use insulation with an outer vapor barrier. Refer to local codes for insulation material requirements.

Acoustical Ductwork

Certain installations may require the use of acoustical lining inside the supply duct work.

- Acoustical insulation must be in accordance with the current revision of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) application standard for duct liners.
- Duct lining must be UL classified batts or blankets with a fire hazard classification of FHC-25/50 or less.
- Fiber duct work may be used in place of internal duct liners if the fiber duct work is in accordance with the current revision of the SMACNA construction standard on fibrous glass ducts. Fibrous duct work and internal acoustical lining must be NFPA Class 1 air ducts when tested per UL Standard 181 for Class 1 ducts.

Air Filter Requirements

⚠ WARNING:

Never operate the unit without a filter in place. Dust and lint could accumulate on internal parts, resulting in loss of efficiency, equipment damage and possible fire.

All return air must pass through the filters before entering the unit. It is important that all filters be kept clean and replaced frequently to ensure proper operation of unit. Dirty or clogged filters will reduce the efficiency of the unit and result in unit shutdowns. Air filter pressure drop must not exceed 0.08 IN WC. When replacing the air filters, a suitable air filter must be installed ahead of the evaporator coil of the return air system. Refer to Table 1 for recommended filter sizes.

UNIT	FACTORY FILTER SIZE	QTY
R7TQ-072	20 × 20 × 2	4
R7TQ-090	20 × 20 × 2	4
R7TQ-120	20 × 20 × 2	4
R7TQ-150	20 × 25 × 2	4

Table 1. Filter Sizes and Quantities

UNIT INSTALLATION

Packaging Removal

All units have been securely packaged at the point of shipment. After unpacking the unit, carefully inspect for apparent and concealed damage. Claims for damage should be filed with the carrier by the consignee.

1. Remove any shipping brackets. **DO NOT remove base rails from unit.**
2. Inspect unit thoroughly for shipping damage.
3. Carefully lower and position unit to its permanent location.

Rigging and Hoisting

⚠ WARNING:

To avoid the risk of property damage, personal injury, or death, it is the rigger's responsibility to ensure that whatever means are used to hoist the unit are safe and adequate:

- **The lifting equipment must be adequate for the load. Refer to Table 3 (page 22) for unit weights.**
- **The unit must be lifted from the holes in the base rails using cables or chains.**
- **Spreader bars are required to protect the unit and ensure even loading. See Figure 3.**
- **Keep the unit in an upright position at all times. The rigging must be located outside the unit's center of gravity. Refer to Table 3 (page 22) for locating the center of gravity.**
- **All panels must be securely in place during rigging and hoisting.**

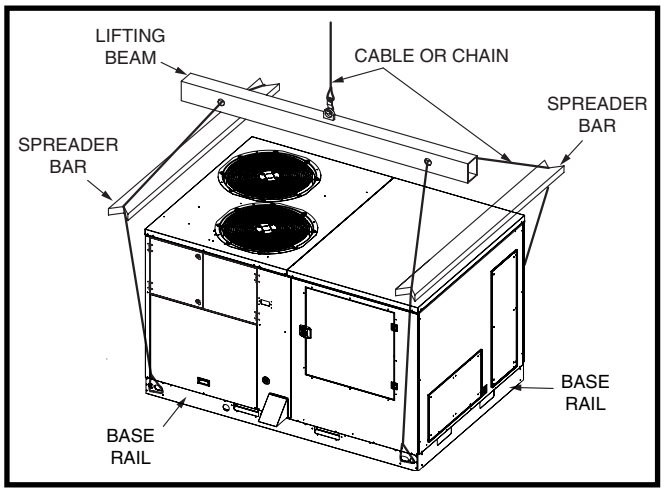


Figure 3. Rigging and Hoisting

Minimum Clearance Requirements

R7TQ units are certified as combination heating and cooling equipment for outdoor installation only. Figure 1 (page 5) displays the minimum clearances to combustible materials for both Downflow and Horizontal discharge.

R7TQ units may be installed on non-combustible surfaces when used with bottom supply and return air ducts. Units may be installed on wood flooring or on Class A, B, or C roof covering material as long as the following requirements are met:

- If using side supply with return air ducts, the unit must be converted for horizontal connections. Refer to Vertical to Horizontal section below. **NOTE:** This must be converted prior to unit installation.
- If using vertical discharge and return air ducts a roof curb must be installed prior to unit installation. See Rigging and Hoisting section (page 7) for setting of the unit.

Vertical to Horizontal Conversion

The unit is shipped ready for downflow duct connections. If horizontal ducts are required, the unit must be converted prior to attaching duct work to unit.

1. Remove both return and supply horizontal duct covers. Do not discard the covers. These will be used to cover the openings in the bottom of the unit. See Figure 4.
2. Cut both return and supply openings following along the tabbed cutouts. **NOTE:** There are tabs on the inside and the outside of the panels. Discard the cut sections when done. These will not be needed. Figure 5.

IMPORTANT NOTE:

Use caution when cutting left vertical side of return air panel. The filter rack is in close proximity to opening

3. Remove 2 screws securing the air baffle bracket to the heat exchanger air baffles. This provides additional clearance for correct positioning of the supply air cover below the heat tubes. See Figure 13 (page 19).
4. Install the duct covers that were removed in step 1 over the openings in the bottom of the unit. **NOTE:** Apply adhesive to one side of each cover and secure them to the bottom of the unit.
5. Install the covers using predrilled locating holes and reinstall the air baffle bracket.

Rooftop Mounting

Rooftop installations must be located according to local building codes or ordinances and these requirements:

- The roof must be capable of handling the weight of the unit. For unit weights, see Table 3 (page 22). Reinforce the roof if necessary.
- The appropriate accessory roof curb Figure 6 (page 9) must be installed prior to unit installation. See available roof curb height offering in the Technical Sales Literature. The roof curb must be square and level to ensure proper condensate drainage. **Please follow all instructions provided with the kit**.

⚠ WARNING:

Never drill or punch holes in unit base when installing downflow units. Leakage may occur if bottom pan is punctured.

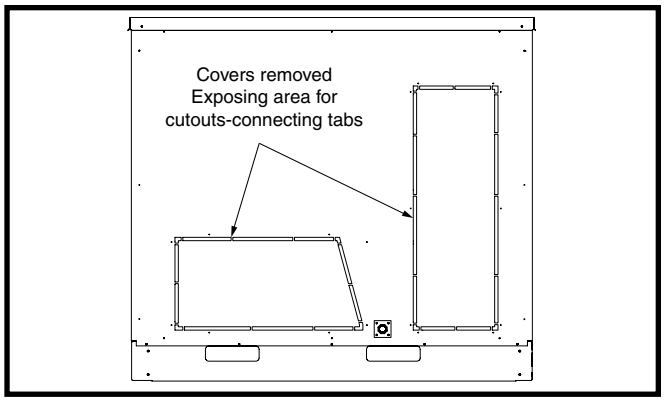


Figure 4. Vertical to Horizontal Conversion (Right-Side View)

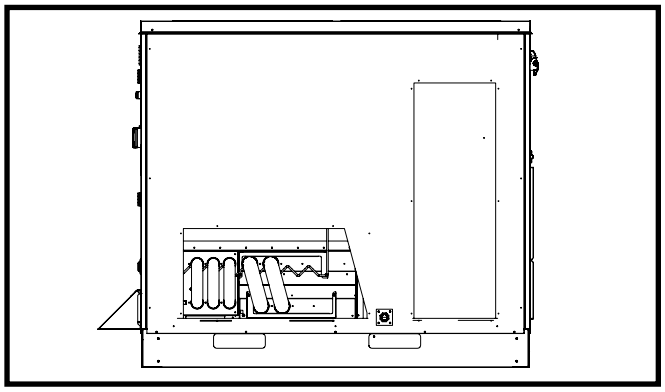


Figure 5. Cutouts Removed (Right-Side View)

- On bottom discharge applications, the supply and return air ducts must be attached to the roof curb duct supports, not the unit. Install all ductwork before setting unit on curb or frame.
- Frame support must be constructed using noncombustible materials. Full perimeter support is required under the unit. Supports must be made of steel or weather resistant wooden materials. The unit must be square and level to ensure proper condensate drainage.
- The frame must be high enough to ensure prevention of any moisture from entering the unit. Recommended height to unit base is 8**"** (20 cm) for both downflow and horizontal installations.
- Secure roof curb or frame to roof using acceptable mechanical methods per local codes.

Ground Level

Ground level installations must be located according to local building codes or ordinances and these requirements:

- Clearances must be in accordance with those shown in Figure 1 (page 5).
- A mounting pad Figure 7 (page 9) must be provided and separate from the building foundation. The pad must be level to ensure proper condensate disposal and strong enough to support the unit's weight. The slab height must be a minimum of 3**"** (8 cm) above grade and with adequate drainage.
- When using horizontal supply with return air ducts, the unit must be converted for horizontal connections prior to unit installation. Refer to the Vertical to Horizontal conversion section on page 8.

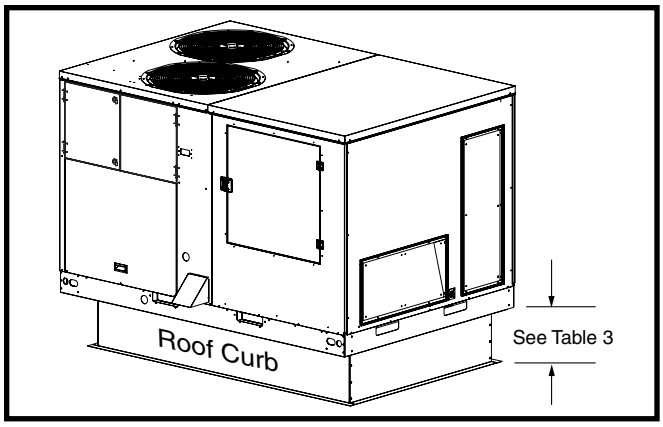


Figure 6. Roof Curb

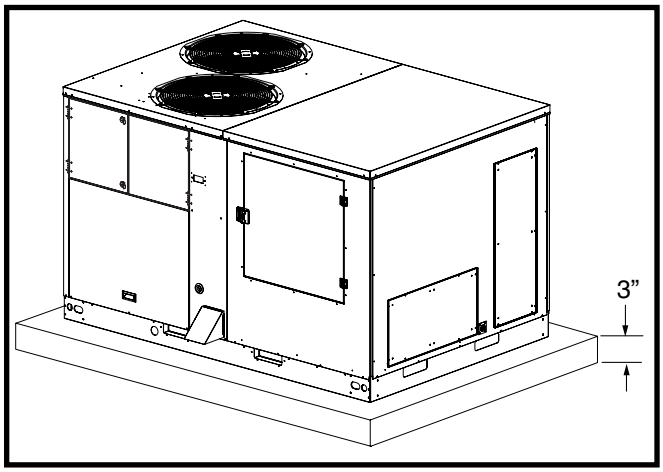


Figure 7. Mounting Pad

Condensate Drain

The method for disposing of condensate varies according to local codes. Consult your local code or authority having jurisdiction.

Condensate is drained from the unit through a 1**"** (25 mm) PVC pipe located on end of the unit (Figure 8). For proper drainage, install a 3**"** (8 cm) Min. trap between the drain line and an open vent of the same size. Avoid areas where condensate drainage may cause problems.

The condensate drain line must be J-trapped using field supplied parts and may be combined with other drain lines when routed to the drain.

When connecting rigid drain line, hold any fittings with a wrench to prevent twisting. **Do not overtighten!**

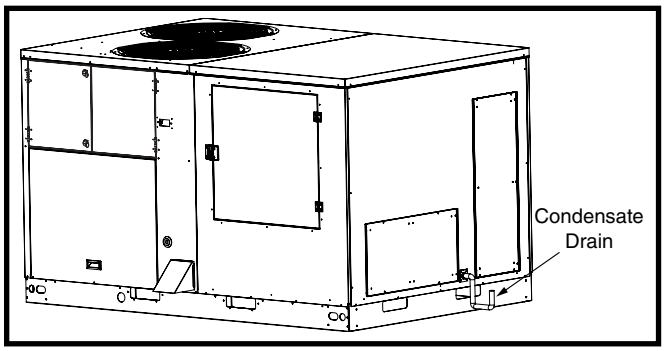


Figure 8. Condensate Drain

GAS SUPPLY AND PIPING

⚠ WARNING:

FIRE OR EXPLOSION HAZARD

- **Failure to follow safety warnings exactly could result in serious injury or property damage.**
- **Installation and service must be performed by a qualified installer, service agency or the gas supplier.**
- **Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**

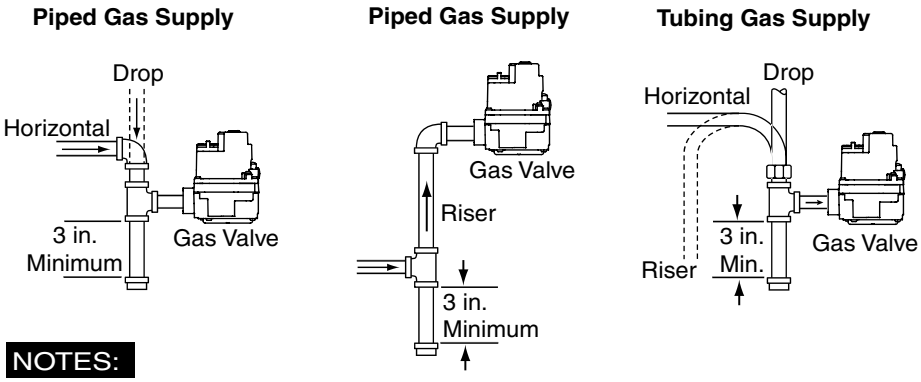
WHAT TO DO IF YOU SMELL GAS

- **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 neighbor’s phone. Follow the gas supplier’s instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

IMPORTANT NOTES:

- **All gas piping must be installed in compliance with local codes and utility regulations. In the absence of local codes the gas line installation must comply with the latest edition of the National Fuel Gas Code ANSI Z223.1 or CAN/CSA B149 Installation Codes.**
- **Some local codes require the installation of a manual main shut-off valve and ground joint union external to the furnace. The shut-off valve should be readily accessible for service and/or emergency use. See Figure 9. Consult the local utility or gas supplier for additional requirements regarding placement of the manual main gas shut-off.**
- **Gas piping must never run in or through air ducts, chimneys, gas vents, or elevator shafts.**
- **Compounds used to seal joints on gas piping must be resistant to the actions of LP propane gas.**
- **The main gas valve and main power disconnect to the furnace must be properly labeled by the installer in case emergency shutdown is required.**
- **A 1/8 inch NPT plugged tap must be installed in the gas line immediately upstream of the gas supply connection to the furnace for use when measuring the gas supply pressure. The plug should be readily accessible for service use.**
- **A drip leg should be installed in the vertical pipe run to the unit. See Figure 9.**

This unit is shipped from the factory for natural gas operation at sea level elevation and is equipped with an orifice at each burner. Table 15 (page 49), lists gas pipe capacities for standard pipe sizes as a function of length in typical applications based on nominal pressure drop in the line.



NOTES:

1. All piping must comply with local codes, ordinances, and/or National Fuel Gas Codes.
2. If local codes allow the use of a flexible gas appliance connector, always use a new listed connector. Do not use a connector that has previously serviced another gas appliance.
3. A manual shutoff valve must be installed within 6 feet of this equipment.
4. Always include a drip leg in piping.

Figure 9. Typical Gas Service Connection

This unit only has right side gas entry. When connecting the gas, provide clearance between the gas supply line and the entry hole in the unit's casing to avoid unwanted noise and/or damage to the unit. Gas pipe inlet sizes are dependent on heat size as follows:

H100 and H166 heat sections: 1/2" NPT
H200 and H225 heat sections: 3/4" NPT

A typical gas service hookup is shown in Figure 9.

Leak Check

⚠ WARNING:

FIRE OR EXPLOSION HAZARD

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

Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

After the gas piping to the unit is complete, all connections must be tested for gas leaks. This includes pipe connections at the main gas valve, emergency shutoff valve and other gas connectors.

The soap and water solution can be applied on each joint or union using a small paintbrush. If any bubbling is observed, the connection is not sealed adequately and must be retightened. Repeat the tightening and soap check process until bubbling ceases.

IMPORTANT NOTES:

- **If pressure testing the gas supply lines at pressures greater than 1/2 psig (14 IN WC), the unit must be disconnected from the gas supply piping system to prevent damage to the gas valve.**
- **If the test pressure is less than or equal to 1/2 psig (14 IN WC), the unit must be isolated from the gas supply line by closing the manual shut-off valve.**

High Altitude Deration

High altitude application with this unit depends on the installation altitude and the heating value of the gas. At high altitudes, the heating value of natural gas is always lower than the heating value at sea level.

All installations of this equipment must be made in accordance with the National Fuel Gas Code or with local jurisdiction codes. For installations at exactly 2,000 feet in altitude or under, the installer does not need to derate the heat exchanger performance. For any installation that exceeds 2,000 feet, please see the following instructions and example:

⚠ WARNING:

The reduction of input rating necessary for high altitude installation may only be accomplished with factory-supplied orifices. Do not attempt to drill out orifices in the field. Improperly drilled orifices may cause fire, explosion, carbon monoxide poisoning, personal injury or death.

- If installing this unit above 2,000 feet, the input rate must be reduced 4% per 1,000 feet of altitude (Example: 12% at 3,000 feet, 16% at 4,000 feet, etc.). Always round up to the next highest value of 1,000. So an installation at 3,120 feet is derated by 16% due to rounding up to 4,000. **NOTE:** This deration is necessary to compensate for low atmospheric pressure at high altitudes. Generally this will require obtaining the gas heating value from the local gas utility and replacing the burner orifices.
- Table 18 (page 50) lists the correct orifice size to use at different altitudes. To determine the unit rating and orifice size, see the installation example on page 11.
- After changing the orifices, it is required that you measure the gas input rate by clocking the gas meter and using the local gas heating value. See section on Verifying and Adjusting the Firing Rate on page 15.

IMPORTANT NOTE:

Observe the action of the burners to make sure there is no yellowing, lifting or flashback of the flame.

INSTALLATION EXAMPLE:

Elevation: .....3,890 feet
Type of Gas:.....Natural
Unit Model: ..... R7TQ090-CM (200 kBTU)

At 4,000 feet, the unit needs to be derated by 4% for each 1,000 feet of elevation. This equates to 16% or less than the sea level rating of 200,000 Btu/h.

1. Determine unit input rating:
   [200k × (100-16)%] = 168,000 Btuh. The required heating rate for 3,890 feet is 168,000 Btu/h.
2. Determine orifice size:
   From Table 18 (page 50), find the BTU output. Follow across the row and stop at the 3,000–4,000 elevation columns. For this example, the orifice size displayed is #31. Install one #31 orifice in every burner and check firing rate. In this example, the firing rate must not exceed 168,000 Btu/h.

Conversion to LP/Propane

⚠ WARNING:

The furnace was shipped from the factory equipped to operate on natural gas. Conversion to LP/propane gas must be performed by qualified service personnel using a factory-supplied conversion kit. Failure to use the proper conversion kit can cause fire, explosion, property damage, carbon monoxide poisoning, personal injury, or death.

If installing the unit in the US above 2,000 feet, refer to Table 18 (page 50) to determine the correct orifice size. When conversion is complete, verify the input rate is correct as listed in the tables. Approved conversion kit must be used. **Please follow the instructions provided with each kit**.

ELECTRICAL WIRING

⚠ WARNING:

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

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

Improper servicing could result in dangerous operation, serious injury, death or property damage.

- **Before servicing, disconnect all electrical power to furnace.**
- **When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.**
- **Verify proper operation after servicing.**

Pre-Electrical Checklist

√ Verify that the voltage, frequency, and phase of the supply source match the specifications on the unit rating plate.
√ Verify that the service provided by the utility is sufficient to handle the additional load imposed by this equipment. For proper MCA/MOP data see the unit wiring label or Table 14 (page 36).
√ Verify factory wiring is in accordance with the unit wiring diagram. Inspect for loose connections.
√ For 3 phase units always check the phase balance. See page 12.

Line Voltage

- Electrical connections must be in compliance with all applicable local codes and ordinances, and with the current revision of the National Electric Code (ANSI/NFPA 70). For Canadian installations the electrical connections and grounding shall comply with the current Canadian Electrical Code (CSA C22.1 and/or local codes).
- Provide power supply for the unit in accordance with the unit wiring diagram and the unit rating plate. The line voltage to the unit should be supplied from a dedicated branch circuit containing the correct fuse or circuit breaker for the unit.
- **An electrical disconnect must be located within sight of and readily accessible to the unit.** This switch shall be capable of electrically de-energizing the outdoor unit. See unit data label for proper incoming field wiring. Any other wiring methods must be acceptable to authority having jurisdiction.
- A wiring diagram is located on the inside cover of the control access panel of the outdoor unit. The installer should become familiar with the wiring diagrams before making any electrical connections to the outdoor unit. See Figure 16 (page 37), Figure 17 (page 39), Figure 18 (page 41), Figure 19 (page 43), Figure 20 (page 45), Figure 21 (page 47), and Figure 22 (page 48).
- If any of the original wires supplied with the unit must be replaced, they must be replaced with material of the same voltage, gauge, and temperature rating.
- Connect the line-voltage leads to the terminals on the 3-pole terminal block (inside the control compartment).
- Use only copper wire for the line voltage power supply

to this unit. Use proper code agency listed conduit and connector for connecting the supply wires. Use of rain tight conduit is recommended.

- Units are shipped from the factory wired for 230 or 460 volt operation. On 208-230V units being placed into 208 volt operation, remove the lead from the transformer terminal marked 240V and connect it to the terminal marked 208V.
- Overcurrent protection must be provided at the branch circuit distribution panel and sized as shown on the unit rating label and according to the National Electric Code and applicable local codes. **NOTE:** See the unit rating plate for maximum circuit ampacity and maximum overcurrent protection limits.

Grounding

⚠ WARNING:

The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. Do not use gas piping as an electrical ground!

This unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code (ANSI/NFPA 70) or the CSA C22.1 Electrical Code. Use the grounding lug provided in the control box for grounding the unit.

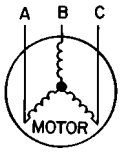
Unbalanced 3-Phase Supply Voltage

Voltage unbalance occurs when the voltages of all phases of a 3-phase power supply are no longer equal. This unbalance reduces motor efficiency and performance. Some underlying causes of voltage unbalance may include: Lack of symmetry in transmission lines, large single-phase loads, and unbalanced or overloaded transformers. A motor should never be operated when a phase imbalance in supply is greater than 2%.

Perform the following steps to determine the percentage of voltage imbalance:

1. Measure the line voltages of your 3-phase power supply where it enters the building and at a location that will only be dedicated to the unit installation. (at the units circuit protection or disconnect).

EXAMPLE:



AB = 451V
BC = 460V
AC = 453V

2. Determine the average voltage in the power supply.

In this example, the measured line voltages were 451, 460, and 453. The average would be 454 volts (451 + 460 + 453 = 1,364 / 3 = 454).

3. Determine the maximum deviation:

EXAMPLE

From the values given in step 1, the BC voltage (460V) is the greatest difference in value from the average:

460 - 454 = 6
454 - 451 = 3
454 - 453 = 1

4. Determine percent of voltage imbalance by using the results from steps 2 and 3 in the following equation.

EXAMPLE

$$100 \times \frac{6}{454} = 1.32\%$$

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

The amount of phase imbalance (1.32%) is satisfactory since the amount is lower than the maximum allowable 2%. Please contact your local electric utility company if your voltage imbalance is more than 2%.

Thermostat/Low Voltage Connections

- Single Package Gas Heating/Electric Cooling Rooftop Units are designed to operate with a 24VAC Class II control circuit. The control circuit wiring must comply with the current provisions of the NEC (ANSI/NFPA 70) and with applicable local codes having jurisdiction. Thermostat connections should be made in accordance with the instructions supplied with the thermostat.
- A two-stage heating/cooling thermostat is required for R7TQ series units. Select a thermostat which operates in conjunction with the installed accessories. See Figure 10 for proper wire gauge and their recommended lengths for typical thermostat connections.
- The low voltage wires must be properly connected to the units low voltage terminal block. Route 24V control wires through the compressor/gas furnace side of the unit, then up through bottom of the control panel using grommet in front of the low volatge terminal strip. Recommended wire gauge and wire lengths for typical thermostat connections are shown in Figure 10 (page 13).
- The thermostat should be mounted about 5 feet above the floor on an inside wall. DO NOT install the thermostat on an outside wall or any other location where its operation may be adversely affected by radiant heat from fireplaces, sunlight, or lighting fixtures, and convective heat from warm air registers or electrical appliances. Refer to the thermostat manufacturer's instruction sheet for detailed mounting information.

Heat Anticipator

Verify if the thermostat being used for the installation has a heat anticipator setting. This function allows the thermostat to anticipate the space heating rate and time the burner to shutoff accordingly. Always refer to the thermostat manufacturer's instructions for the correct settings.

Blower Speed

The blower speed is preset at the factory but must be verified at each installation. For optimum system performance and comfort, it may be necessary to change the factory-set

speed. Refer to Table 4 (page 24), Table 5 (page 25), Table 6 (page 26), Table 7 (page 27), Table 8 (page 28), Table 9 (page 29), Table 10 (page 30), Table 11 (page 31) and Table 12 (page 32) for proper blower performance data. Always ensure drive belt is secure and tensioned properly. Also inspect variable pitch sheaves for proper tightness of the setscrews

⚠ CAUTION:

To avoid personal injury or property damage, make certain that the motor leads do not make contact with any uninsulated metal components of the unit.

To change blower speed on 2- and 3-HP 2-speed motors:

1. **Disconnect all electrical power to the unit** and open the blower access door.
2. Loosen the motor mounting nuts and mounting plate adjustment bolt to allow removal of the blower belt from the motor sheave.
3. Loosen top set screw on motor sheave and turn clockwise to close (increases blower speed), or counterclockwise to open (decreases blower speed).
4. Replace belt on pulleys and position motor mounting plate to correct position for proper belt tension.
5. Tighten motor nuts.

3-HP/5-Speed HSD Motor - Speed Change (6T-10T Option)
Locate motor controller 10-pin plug. Speed taps 1 and 3 are suitable for most applications. Refer to High Static Drive airflow Tables 11 or 12 for additional speed tap selections to meet your specific application if required.

Low-Speed Taps 1 and 2: Fan On "G" or Stage 1 Cooling call.

- Relocate low voltage Violet wire from Tap #1 to tap 2.

High-Speed Taps 3, 4, and 5: Stage 2 Cooling call.

- Relocate low voltage (Orange wire) from Tap #3 to tap 4 or 5.

NOTE: Blower operates at same heating and cooling speed.

With a Fan On or Stage 1 Cooling call from the thermostat, the blower will energize and run on low speed. When thermostat calls for Stage 2 cooling, the motor will ramp to high speed.

T-Stat Wire Gauge	Recommended T-Stat Wire Length - Ft. (Unit to T-Stat)
20 Ga.	60
18 Ga.	150
16 Ga.	250
14 Ga.	350

Field Supplied Wiring - - - - - Use Solid Class II Copper Wire

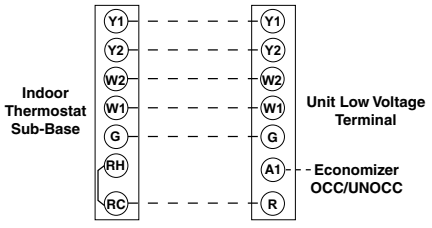


Figure 10. Typical 2 - Stage Heat/Cool Thermostat Connection

STARTUP AND ADJUSTMENTS

Pre-Start Checklist

√ Verify unit is properly supported.
√ Verify unit is level for proper condensate drainage.
√ Verify all clearance requirements are met. Airflow to and from the outdoor coil must be unrestricted.
√ Verify the ductwork is adequately sealed to prevent air leakage. Insulate if necessary.
√ Verify the line voltage power leads are securely connected and the unit is properly grounded.
√ Verify low voltage wires are securely connected to the correct leads in the low voltage area of the control box.
√ Verify gas line pressure. For natural gas, the line pressure must not exceed 10.0 IN WC (0.36 psig), or be less than 5.5 IN WC (0.20 psig). For LP gas, the line pressure must not exceed 14 IN WC (0.51 psig) and must not be less than 11.0 IN WC (0.40 psig).
√ Verify the flame roll-out control is closed.

IMPORTANT NOTE:
This safety device is a manually reset switch. If necessary, press the red button to reset the control. DO NOT install a jumper wire across the control to defeat its function. If the control reopens upon start-up, DO NOT reset the control without identifying and correcting the fault condition which caused the control to trip.

√ Verify the gas line has been purged and all connections are adequately sealed. To check for gas leakage, see page 10.
√ Verify the indoor blower is properly set for the installation.
√ Verify the outdoor fan turns freely.
√ Verify the power supply branch circuit overcurrent protection is properly sized.
√ Verify all exterior panels have been reinstalled and securely fastened.
√ Verify the thermostat is wired correctly and preset for initial operation. Set the thermostat system switch to OFF and the fan switch to AUTO.

Startup Procedures

⚠ WARNING:

The unit is equipped with crankcase heaters. Allow 24 hours prior to continuing the start up procedures to allow for heating of the refrigerant compressor crankcase. Failure to comply may result in damage and could cause premature failure of the system. This warning should be followed at initial start up and any time the power has been removed for 12 hours or longer.

IMPORTANT NOTE:
Failure to follow the crankcase heater instructions for units equipped with microchannel coils may lead to a discharge pressure spikes which could cause the unit high pressure switch to trip. If this occurs, wait for unit pressures to equalize before depressing the manual reset switch and re-start the unit again.

- Check all electrical wiring for loose connections and tighten as required.
- Check unit for return air filters and condensate trap.
- Close all electrical disconnects to energize the system.

Air Circulation

1. Set thermostat system switch to OFF and the fan switch to ON.
2. Verify the blower motor runs continuously. Check for air delivery at the register(s). Ensure that there are no obstructions at the registers or in the ductwork.
3. Set thermostat fan switch to AUTO and verify the blower shuts down immediately.

NOTE: If blower is turning opposite of arrow direction, shut off main power to the unit and switch any two field wires at the disconnect. **DO NOT alter unit wiring**.

System Cooling

1. Set the thermostat system switch to COOL and the fan switch to AUTO.
2. Lower the thermostat temperature switch below room temperature and observe that the blower, both compressors and fans) energize.
3. Verify blower is turning in direction indicated by arrow and air discharged at the register is cooler than room temperature.
4. Verify HI and LO refrigerant pressures.

NOTE: If refrigerant pressures are abnormal and blower is rotating in the opposite direction of the arrow, shut off main power to the unit and switch any two field wires at the disconnect. Ensure proper rotation of the blower. DO NOT alter unit wiring. Listen for any unusual noises. Locate the source and correct as needed.

5. Allow the unit to run for several minutes. Set the temperature selector above room temperature and verify that the fan, blower, and compressors cycle off with the thermostat.

System Heating

1. Set the thermostat to the lowest setting.
2. Follow the startup procedures on this page or the operating instruction label inside the louvered control access panel.
3. Set the thermostat above room temperature and verify the Operating Sequence. See page 16.
4. Verify that the compressor and outdoor fan motor are not energized.
5. Run the unit and after approximately five minutes, set the thermostat below room temperature. Verify the shutdown sequence. See Operating Sequence.

Verifying and Adjusting Temperature Rise

Verify the temperature rise through the unit is within the range specified on the unit data label. Temperature rises outside the specified range could result in premature heat exchanger failure.

1. Place thermometers in the return and supply air stream as close to the unit as possible. The thermometer on the supply air side must be shielded against direct radiation from the heat exchanger to avoid false readings.
2. Adjust all registers and duct dampers to the desired position. Run the unit for 10 to 15 minutes before taking any temperature readings. The temperature rise is the difference between the supply and return air temperatures.

NOTE: For typical duct systems, the temperature rise will fall within the range specified on the data label (with the blower speed at the factory-recommended setting) shown in Table 17 (page 50). If the measured temperature rise falls outside the specified range, it may be necessary to change the blower speed. Lowering the blower speed increases the temperature rise and a higher speed decreases the temperature rise.

The unit is equipped with a belt driven blower and variable pitch motor sheave. The selection of a sheave setting should be based on the desired CFM and the duct system parameters. Refer to the ACCA's Manual Q for a complete description of how to determine these parameters and Manual N for determination of the commercial load requirements. Blower performance data can be found in Table 4 (page 24), Table 5 (page 25), Table 6 (page 26), Table 7 (page 27), Table 8 (page 28), Table 9 (page 29), Table 10 (page 30), Table 11 (page 31) and Table 12 (page 32).

The integrated control is designed to start the circulating air blower 30 seconds after the gas valve opens and turns the blower motor off 160 seconds after the gas valve is closed during heating operation. For cooling the integrated control is designed to start the circulating air blower 7 seconds after the compressor energizes and turns the blower motor off 90 seconds after the compressor deenergizes.

Verifying Burner Operation

⚠ WARNING:

Uninsulated live components are exposed when the louvered control access panel is removed.

1. Open the louvered control access panel (to ensure there is power to the unit) and then remove the louvered heat exchanger access panel.
2. Set the thermostat above room temperature and observe the ignition sequence. The burner flame should carry over immediately between all burners and should extend from each burner without lifting off, curling, or floating. The flames should be blue, without yellow tips.
3. After verifying flame characteristics, set the thermostat below room temperature and verify that the burner flame extinguishes completely.

Verifying Operation of Over-Temperature Limit Control

To verify operation of the over-temperature limit control, make sure the louvered control access panel is in place and that there is power to the unit.

1. Block the return airflow to the unit by installing a close-off plate in place of or upstream of the filter.
2. Set the thermostat above room temperature and verify the unit operates with the correct sequence of operation. See Operating Sequence (page 16).

NOTE: The over-temperature limit control should function to turn off the gas valve within approximately four minutes (exact time depends on the efficiency of the close-off when blocking the return air). The circulating air and combustion blowers should continue to run when the over-temperature limit control switch opens.

3. Remove the close-off plate immediately after the over-temperature limit control opens. If the unit operates for more than four minutes with no return air, set the thermostat below room temperature, shut off power to the unit, and replace the over-temperature limit control.

Verifying and Adjusting Firing Rate

The firing rate must be verified for both HIGH fire and LOW fire for each installation to prevent over-firing of the unit.

⚠ CAUTION:

Do not re-drill the burner orifices. If the orifice size must be changed, use only new orifices.

IMPORTANT NOTE:

The firing rate must not exceed the rate shown on the unit data label. At altitudes above 2,000 ft., it must not exceed that on the data label less 4% for each 1,000 ft.

Follow the steps below to determine the unit firing rate:

- For installations at 2,000 feet and less, the firing rate is the same as shown on the unit rating label.
- For installations above 2,000 feet, compute the firing rate as shown in the installation example on page 11.

1. Obtain the gas heating value from the gas supplier (HHV).
2. Shut off all other gas fired appliances.
3. Turn ON the main gas supply at the manual valve.
4. Start the unit in heating mode and allow it to run for at least three minutes in HIGH fire mode (Stages 1 and 2).
5. Measure the time (in seconds) required for the gas meter to complete one revolution.
6. Convert the time per revolution to cubic feet of gas per hour using Table 16 (page 49).
7. Multiply the gas flow rate in cubic feet per hour by the heating value of the gas in Btu per cubic foot to obtain the firing rate in Btu per hour. See Example below.

EXAMPLE:

- Time for 1 revolution of a gas meter with a 1 cubic foot dial = 40 seconds.
- From Table 16 read 90 cubic feet gas per hour.
- Local heating value of the gas (obtained from gas supplier) = 1,040 Btu per cubic foot.
- Input rate = 1,040 × 90 = 93,600 Btuh.

8. Adjustments to the firing rate can be made by adjusting the gas manifold pressure. See the High Altitude Deration section (page 10) for additional information of firing rate at elevations above 2000 ft.
9. Low fire input (Stage 1) must also be verified by repeating all steps outlined for high fire input rate. Obtain low fire input values from Table 17 (page 50). If necessary, follow the manifold pressure adjustment instructions for the low fire regulator spring to obtain the required input rate.

Manifold Pressure Adjustment

The manifold pressure for both HIGH and LOW firing rates must be set to the appropriate value. To adjust the manifold pressure for either high fire (stages 1 and 2) or low fire (stage 1 only), follow these instructions after identifying the correct regulator spring adjustment screw from Figure 24 (page 51) and Figure 25 (page 52) for your particular gas valve:

1. Obtain the required input firing rate from Table 17 (page 50). **NOTE:** The values listed in the table is based on sea level values. At higher altitudes, the heating value of gas is lower than the sea level heating value. See High Altitude Deration section (page 10).
2. Turn OFF the gas supply at the manual valve located on the outside of the unit.
3. Using a 3/16-inch Allen wrench, remove the plug from the OUTLET pressure tap (OUTLET side of gas valve). See Figure 23 (page 51).
4. Install an 1/8-inch NPT pipe thread fitting that is compatible with a manometer or similar pressure gauge.
5. Connect the manometer or pressure gauge to the OUTLET pressure tap.
6. Turn ON the main gas supply at the manual valve.
7. Remove the regulator cap. Turn the regulator adjusting screw clockwise to increase the pressure or counterclockwise to reduce the pressure.
8. Replace the regulator cap after adjustments are complete.
9. Turn OFF the gas supply at the manual valve.
10. Disconnect the Manometer or pressure gauge.
11. Remove the NPT fitting and reinstall the OUTLET pressure tap plug. Hand tighten the plug first to prevent cross-threading. Tighten with a 3/16-inch Allen wrench.

Refrigerant Charging

⚠ WARNING:

If repairs make it necessary for evacuation and charging, it should only be done by qualified, trained personnel thoroughly familiar with this equipment. Some local codes require licensed installation/service personnel to service this type of equipment. Under no circumstances should the owner attempt to install and/or service this equipment.

Failure to comply with this warning could result in property damage, personal injury, or death.

The R7TQ Series packaged gas/electric units are fully charged at the factory and when installed accordingly, no charging is required. The refrigerant charge can be checked and adjusted through the service ports provided on the units. Use only gauge lines which have a “Schrader” depression device present to actuate the valve.

Refrigerant charging must be done by qualified personnel familiar with safe and environmentally responsible refrigerant handling procedures. See Unit Rating Plate for the proper type and amount of refrigerant.

OPERATING SEQUENCE

The operating sequences for the heating, cooling, and fan modes are described below. Refer to the wiring diagrams: Figure 16 (page 37), Figure 17 (page 39), Figure 18 (page 41), Figure 19 (page 43), Figure 20 (page 45), Figure 21 (page 47), and Figure 22 (page 48).

Cooling Mode

1. On a call for cooling the thermostat closes, applying 24VAC to **Y1**, **G**, and **Y2** if Stage 2 cooling is calling.
2. **G** applies 24VAC to the main circulating blower circuit.
3. **Y1** and **Y2** apply 24VAC through all safety switches before energizing their respective contactors.
4. When the thermostat is satisfied the contactors are de-energized.
5. The circulating blower motor de-energizes immediately.

Heating Mode

1. On a call for heat, the thermostat closes, applying 24VAC to the **W1** terminal (and **W2** terminal if Stage 2 heat is required).
2. The integrated control monitors the safety circuit at all times. If either the roll-out switch or the over-temperature limit controls open, the gas valve will not energize. The main blower continues to operate until the over-temperature limits close, the flame roll-out switch is manually reset, or the thermostat is satisfied.
3. The integrated control checks all safety switches at the beginning of each heating cycle. If closed, the combustion blower performs a 10 second pre-purge.
4. The integrated control will then supply power to the direct spark ignitor and immediately energizes the gas valve. **NOTE:** Burner operation begins in high fire mode with both Stage 1 and Stage 2 gas valve energized, independent of the thermostat call for Stage 2 heat. If after 30 seconds of operation with no call for Stage 2 heat, the integrated control will resume heating operation in low fire mode of operation and Stage 2 gas valve is de-energized.
5. The flame must be proven through the flame sensor in 10 seconds to hold the gas valve open. The integrated control will monitor the gas flame with the flame sensor for the entire time the gas valve is open. If for any reason the gas flame drops out, the gas valve will immediately close. After 30 second purge, the integrated control will try to ignite fourteen more times.
6. The main air blower will start and continue to run 40 seconds after the gas valve opens.
7. When the thermostat is satisfied, the integrated control is de-energized. The gas valve and combustion blower de-energize immediately while the main air blower continues to run through the blower off delay of approximately 150 seconds.
8. If the unit fails to prove flame after fifteen ignition attempts, it will go into a soft lockout. The unit will re-attempt the start-up procedure every hour until the thermostat is satisfied or 24VAC power is removed from the unit for a minimum period of 5 seconds. **NOTE:** See Troubleshooting section (page 19) for a complete list of heating operation fault codes.

Blower Mode

1. On a call for fan operation, the thermostat applies 24VAC directly to the blower contactor.
2. The circulating blower is energized immediately.

UNIT MAINTENANCE

⚠ WARNING:

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

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

Improper servicing could result in dangerous operation, serious injury, death or property damage.

- **Before servicing, disconnect all electrical power to furnace.**
- **When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.**
- **Verify proper operation after servicing.**

NOTE: These maintenance instructions are primarily intended to assist qualified technicians experienced in the proper maintenance and operation of this appliance.

To achieve optimum performance from the air conditioner and minimize equipment failure, it is recommended that periodic maintenance be performed on this unit. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. Please consult your dealer for maintenance information and availability of maintenance contracts.

Routine Maintenance

Please consult your dealer for maintenance information and availability of maintenance contracts. At a minimum, routine maintenance should include the following items:

⚠ CAUTION:

Use care when removing parts from this unit. Personal injury can result from sharp metal edges present in all equipment of sheet metal construction.

Air Filters

⚠ WARNING:

Never operate the unit without filters in place. Dust and lint in the return air can build up on internal components, resulting in loss of efficiency, equipment damage, and possible fire.

It is recommended that the air filters be inspected and cleaned or replaced every three to four weeks using filters of like size and kind. Table 1 (page 7) lists the factory-installed filter sizes and quantities for each unit. **NOTE:** R7TQ units are equipped with 2-inch pleated disposable filters.

Blower Compartment

Buildup of dirt and lint on the blower and motor can create excessive loads on the motor resulting in higher than normal operating temperatures and possible shortened service life. It is recommended that the blower compartment be cleaned monthly during heating and cooling seasons to remove any dirt and lint that may have accumulated in the compartment or on the blower and motor. Inspect the blower drive belt for cracks, excessive wear and proper tension after cleaning the compartment.

Condensate Drain and Outdoor Coil

Inspect the condensate drain and outdoor coil at the beginning of each cooling season. Remove any debris. Clean the outdoor coil and hail guard louvers (optional) as necessary using a mild detergent and water. Rinse thoroughly with water.

Electrical

⚠ WARNING:

This unit may have more than one electrical supply. To avoid risk of electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service.

⚠ CAUTION:

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

Inspect the electrical connections for tightness at the beginning of each heating and cooling season. Service as necessary.

Motor/Bearing Lubrication

⚠ WARNING:

Lubrication of the motors in this unit is not required. Do not lubricate any motor in this product.

- The blower assembly in this unit is equipped with two support bearings. The support bearings are sealed cartridge units and require no further lubrication.
- The indoor blower motor is pre-lubricated at the factory and does not require additional lubrication.
- The combustion air blower motor and outdoor fan motors are equipped with pre-lubricated sealed ball bearings. No further oiling is required for the life of this product

Heat Exchanger and Burner Maintenance

⚠ WARNING:

Holes in the heat exchanger can cause products of combustion to enter the structure. Replace the heat exchanger if leaks are found. Failure to prevent products of combustion from being circulated into the occupied space can create potentially hazardous conditions including carbon monoxide poisoning that could result in personal injury or death.

The unit should operate for many years without excessive scale buildup in the heat exchanger, however, the heat exchanger, the vent system, and the burners should be inspected and cleaned (if required) by a qualified technician annually to ensure continued safe operation. Particular attention must be given to identify deterioration from corrosion or other sources.

Vent Cover Assembly

Inspect and clean the screen of the vent cover assembly at the beginning of each heating and cooling seasons.

Cleaning of Burners

It is recommended that the burners be inspected and cleaned periodically (if required) by a qualified technician annually to ensure continued safe operation. Particular attention must be given to identify deterioration from corrosion or other sources. If the burners must be cleaned, follow the steps below. See Figure 11 (page 18) for more detail.

1. **Shut off the gas supply to the unit either at the meter or at a manual valve in the supply piping.**
2. **Turn off all power to the unit and set the thermostat to the lowest temperature setting.**
3. Remove the louvered access panel from the unit.
4. Turn the gas control knob to the “OFF” position. See Figure 26 (page 53) and Figure 27 (page 54) for gas valve shut off instructions.

⚠ CAUTION:

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

5. Disconnect the wires from the gas valve, ignitor, and flame sensor.
6. Using two wrenches, separate the ground-joint union in the gas supply piping at the unit.
7. Remove the piping between the gas valve and the ground-joint union (if necessary).
8. Remove four screws securing the burner assembly to the unit.
9. Carefully remove the burner assembly from the unit. **DO NOT DAMAGE THE IGNITOR WHILE REMOVING THE BURNER ASSEMBLY.**
10. Inspect the burners for accumulated dust or debris. If necessary, carefully clean them with a soft wire brush and/or the nozzle of a vacuum cleaner. **DO NOT DAMAGE THE IGNITOR OR FLAME SENSOR WHILE CLEANING THE BURNER.**

11. Replace all the parts in reverse order from which they were removed.
12. Follow the lighting instructions found on the right side door to return the unit to operation. Verify proper operation after servicing.

Cleaning of Heat Exchanger

If the heat exchanger must be cleaned due to soot or scale build up, follow the steps below.

1. **Shut off the gas supply to the unit either at the meter or at the manual valve in the gas supply piping.**
2. **Turn off all power to the unit and set the thermostat to the lowest temperature setting. See** Figure 26 (page 53) and Figure 27 (page 54) **for gas valve shut off instructions.**

⚠ WARNING:

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

3. Disconnect the wires from the gas valve, ignitor, and flame sensor. See Figure 11 (page 18) for wire locations.
4. Using two wrenches, separate the ground-joint union in the gas supply piping at the unit.
5. Remove the piping between the gas valve and the ground-joint union, if necessary.
6. Remove the four screws securing the burner assembly to the unit.
7. Carefully remove the burner assembly from the unit. **DO NOT DAMAGE THE IGNITOR OR FLAME SENSOR WHILE REMOVING THE BURNER ASSEMBLY.**
8. Remove 6 screws securing the combustion blower to the collector pan.
9. Remove the complete combustion blower from the unit.
10. Remove the screws securing the collector box cover to the unit and remove cover plate.
11. Remove the screws securing the balance plate to the collector box and the balance plate.
12. Remove the turbulator from each heat exchanger tube.
13. Attach a round wire brush to a length of high grade stainless steel cable, such as drain cleanout cable. Attach the other end of the spring cable to a variable speed reversible drill. Slowly insert and rotate the cable into the top portion of the heat exchanger. Operate the drill alternating between forward and reverse, working the cable in and out several times to obtain sufficient cleaning. Repeat this sequence for each heat exchanger tube.
14. Remove all loosened debris from the heat exchanger tubes using a vacuum cleaner.
15. Using a light, check the condition of the upper and lower sections of the heat exchanger tube.
16. Inspect the burners and if necessary, clean them carefully with a soft wire brush and/or the nozzle of a vacuum cleaner. **DO NOT DAMAGE THE IGNITOR OR FLAME SENSOR WHILE CLEANING THE BURNER.**
17. Replace all the parts in reverse order from which they were removed. **NOTE:** If screws or other hardware are corroded, replace only with corrosion resistant stainless steel hardware of similar design.
18. Follow the operating instructions found on the right side door and the User's Information Manual to return the unit to operation.

Removing the Burner Tubes

1. Remove 3 screws securing the compressor access door. See Figure 11.
2. Remove the compressor access door from the unit.
3. Remove retaining screw and heat access panel.
4. Remove 4 screws securing the burner manifold.
5. Remove the burner manifold from the unit.

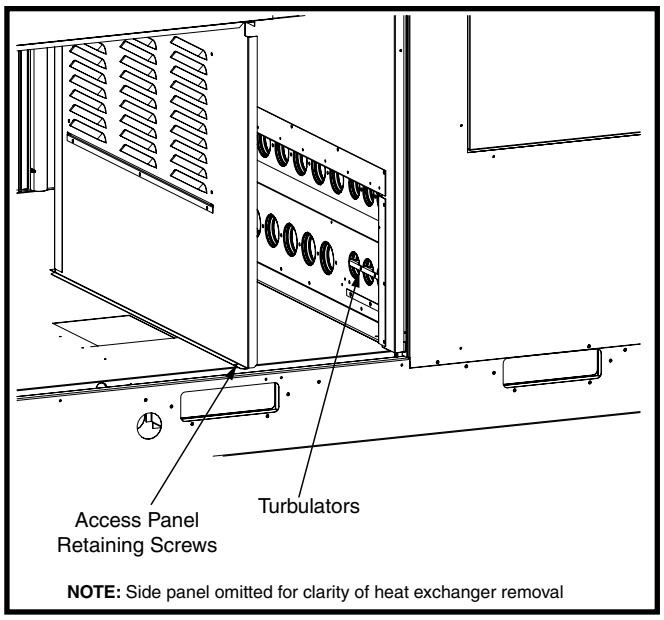


Figure 11. Heat Exchanger Removal

Removing the Heat Exchanger

1. Remove 6 screws securing the venter housing plate from the venter housing. See Figure 12 (page 19).
2. Remove the venter housing plate from the venter housing.
3. Remove 4 screws securing the venter housing to the collection box.
4. Remove the venter housing from the collection box.
5. Remove 8 screws securing the collection box to the turning box.
6. Remove the collection box from the turning box.
7. Remove 4 screws securing the burner cover to the burner support.
8. Remove the burner cover from the burner support.
9. Remove 4 screws from the burner support.
10. Remove the burner support from the unit.
11. Remove 20 screws securing the turning box to the unit.
12. Remove the turning box from the unit.
13. Remove 2 screws from the turbulators and pull out the turbulators.
14. Remove 8 screws securing the horizontal supply air cover.
15. Remove the horizontal supply air cover from the unit.
16. Remove 2 nuts securing the heat exchanger rod. **NOTE:** Support rod nuts (2) can be accessed through blower compartment. Heat Exchanger tubes will exit out horizontal supply air opening. See Figure 13 (page 19).

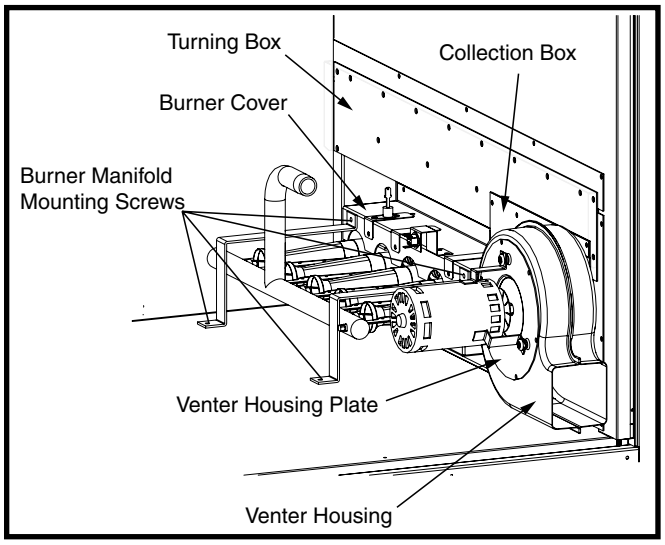
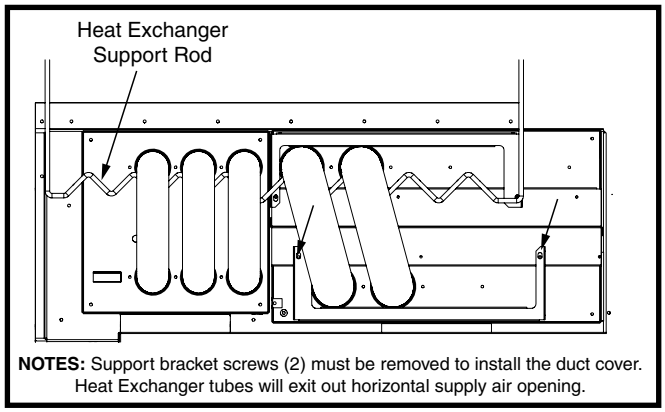


Figure 12. Burner Removal



NOTES: Support bracket screws (2) must be removed to install the duct cover. Heat Exchanger tubes will exit out horizontal supply air opening.

Figure 13. Support Rod Locations

TROUBLESHOOTING

If the unit does not operate properly in the cooling mode, check the following:

- The thermostat is operating properly.
- Electrical power to the unit is turned on.
- All safety switches are closed.
- The service doors are in place.
- Transformer circuit breaker is reset.

If the unit does not operate properly in the heating mode, check the following:

- The thermostat is operating properly.
- Electrical power to the unit is turned on.
- All safety switches are closed.
- The gas is on and shut-off valve is open.
- The service doors are in place.
- The flame roll-out control is closed.
- Refer to the diagnostic codes in Table 2.
- Transformer circuit breaker is reset.

DSI BOARD LED'S		
LED STATE		DESCRIPTION
COLOR	CODE	
GREEN	STEADY ON	NORMAL OPERATION NO CALL FOR HEAT
GREEN	FAST FLASH	NORMAL OPERATION CALL FOR HEAT
GREEN	1 FLASH	IN LOCK OUT FROM FIELD IGNITIONS OF FLAME LOSSES
GREEN	2 FLASH	PRESSURE SWITCH DOES NOT CLOSE WITHIN 30 SECONDS OF VENTER ENERGIZED
GREEN	3 FLASH	LIMIT SWITCH OPEN
GREEN	4 FLASH	PRESSURE SWITCH IS CLOSED BEFORE VENTER IS ENERGIZED
GREEN	STEADY OFF	INTERNAL CONTROL FAULT OR NO POWER
YELLOW	STEADY ON	FLAME SENSED
YELLOW	SLOW FLASH	WEAK FLAME
YELLOW	FAST FLASH	UNDESIRED FLAME (VALVE OPEN AND NO CALLFOR HEAT)

Table 2. Diagnostic Codes for 6- Through 10-Ton Units

COMPONENT FUNCTIONS

The descriptions below are various functional components that affect the operation and shutting down of this unit. Some of these components and their locations are shown in Figure 14. If any component on this unit must be replaced, use only factory-authorized replacement parts specified in the Replacement Parts List provided online.

Pressure Switch - The pressure switch acts to verify that the inducer motor is running. Combustion gases are drawn through the heat exchanger tubes and vented through the vent system.

Flame Roll-Out Control - The flame roll-out control acts to verify that the burner flame is being drawn into the heat exchanger tubes. If the burner flame is not being drawn into the heat exchanger tubes, the roll-out control will open within several seconds. The combustion blower will continue to operate if the flame roll-out control opens until it is manually reset.

Flame Sensor - The flame sensor acts to prove that flame has carried over from the ignitor to the right-most burner. If no flame is sensed, the unit will be shut down automatically and attempt two additional ignition trials before going into lockout. Recovery from lockout requires a manual reset by either resetting the thermostat or removing 24 volts for a period of 5 seconds. If the thermostat is still calling for heat after one hour the control will automatically reset and attempt to ignite the burner again.

Gas Valve - The gas valve controls the flow of gas to the burners in both low and high fire. When the valve is energized, it automatically opens and regulates the gas pressure to the manifold.

High Pressure Switch - This factory-installed switch is designed to de-energize the unit when excessive pressure occurs due to abnormal conditions. Under normal conditions, the switch is closed. If the discharge pressure rises above 650 psig, then the switch will open and de-energize the outdoor unit. The switch is a manually reset type and will remain open until the button on top of the switch is depressed.

Over-Temperature Limit Control - The over-temperature limit control acts to prevent the air temperature leaving the unit from exceeding the maximum outlet air temperature. If the limit opens, the blower limit relay will energize. The circulating air blower and combustion blower will continue to operate if the over-temperature limit control opens.

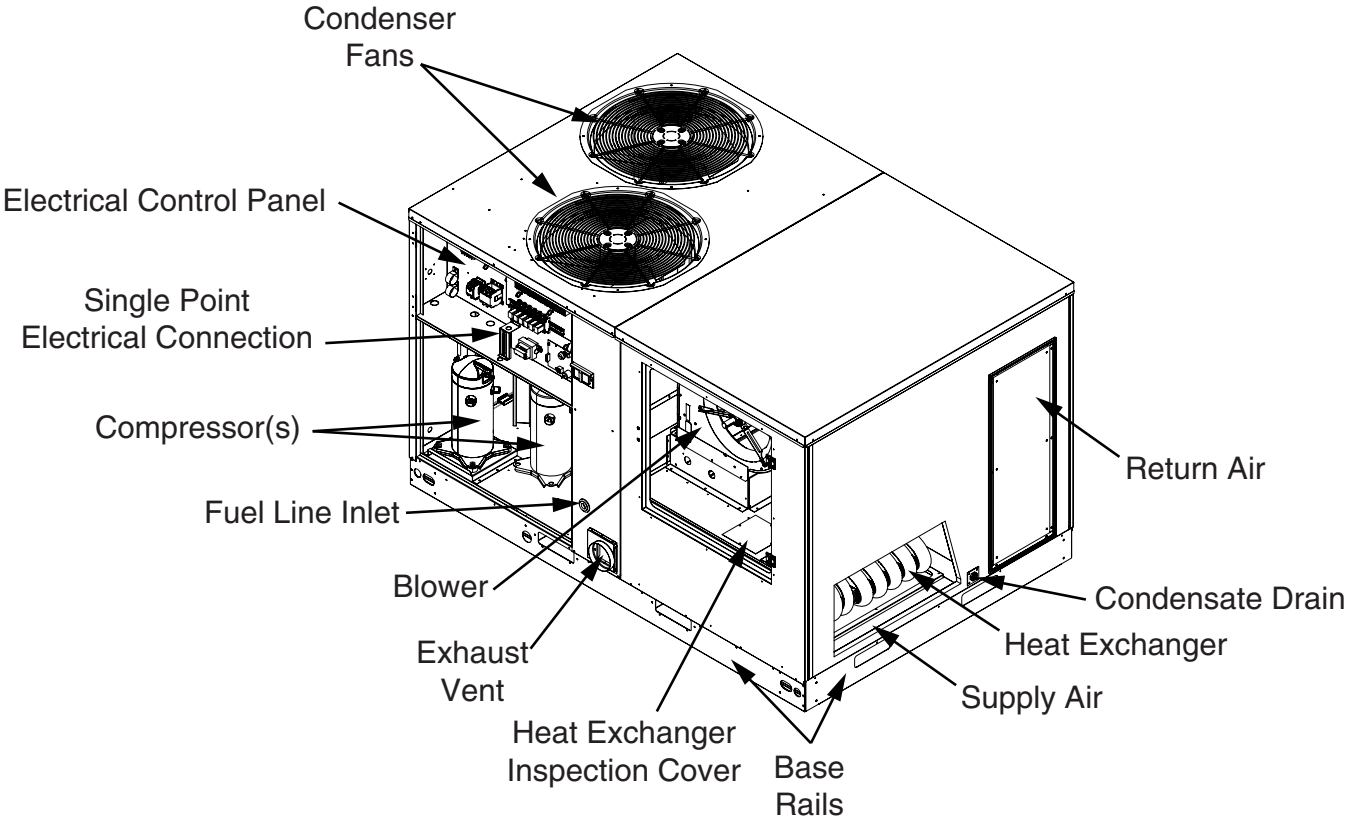


Figure 14. Location of Unit Components

FIGURES AND TABLES

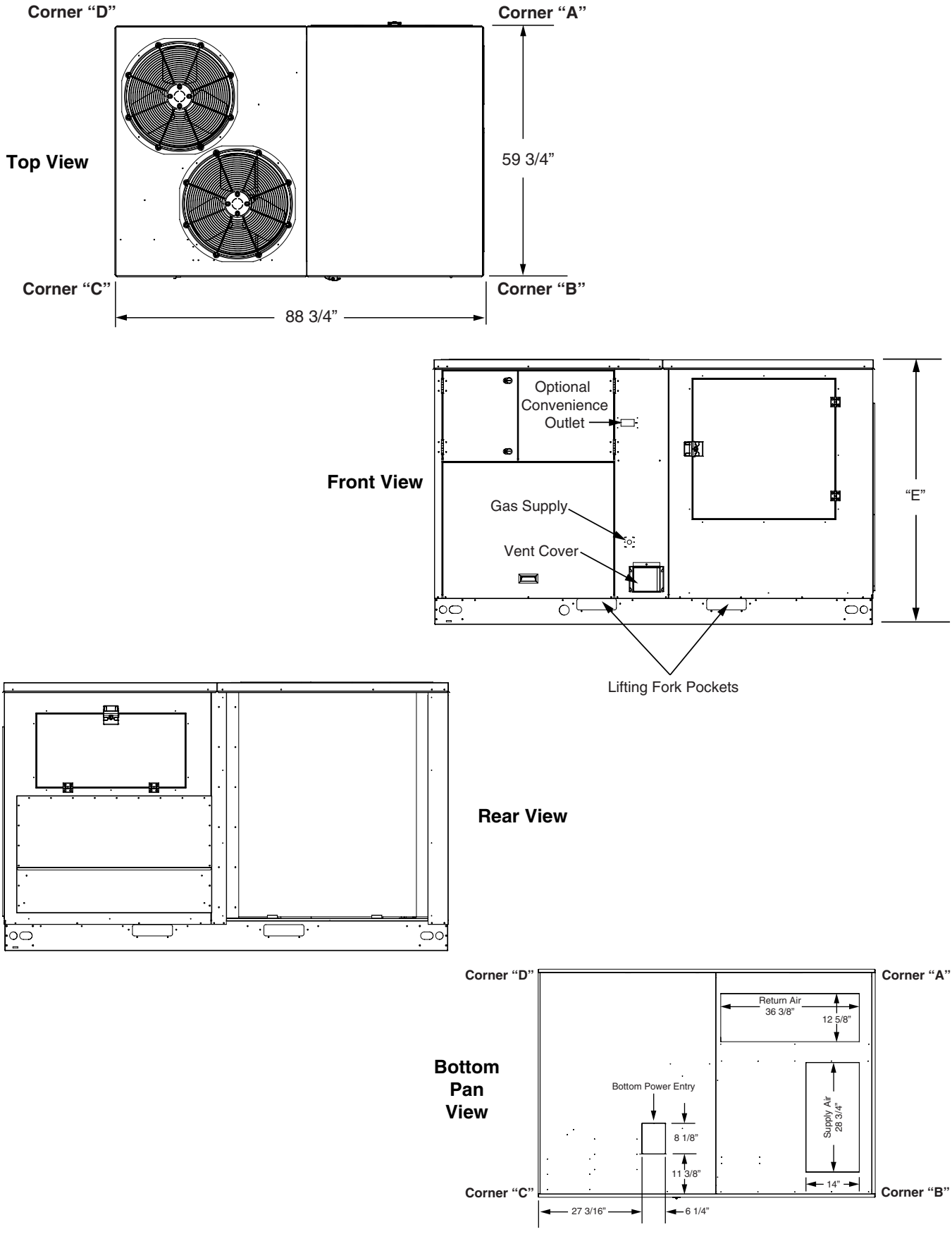
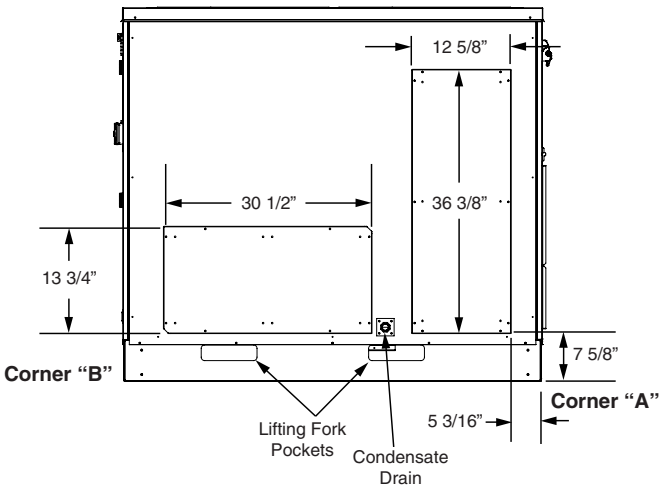
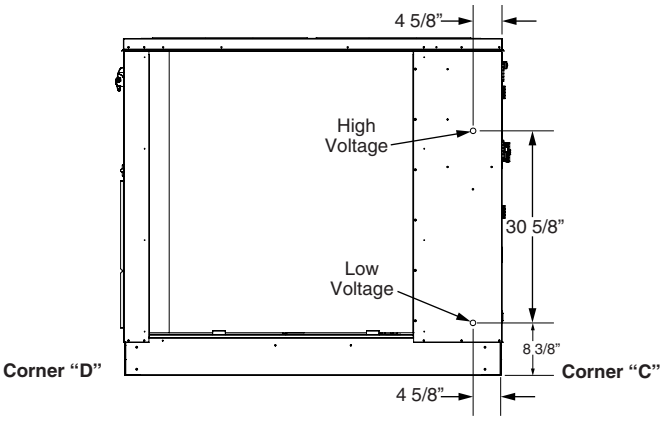


Figure 15. Physical Dimensions for R7TQ Units



Side View
Corners A and B



Side View
Corners C and D

R7TQ With Optional Hoods Installed

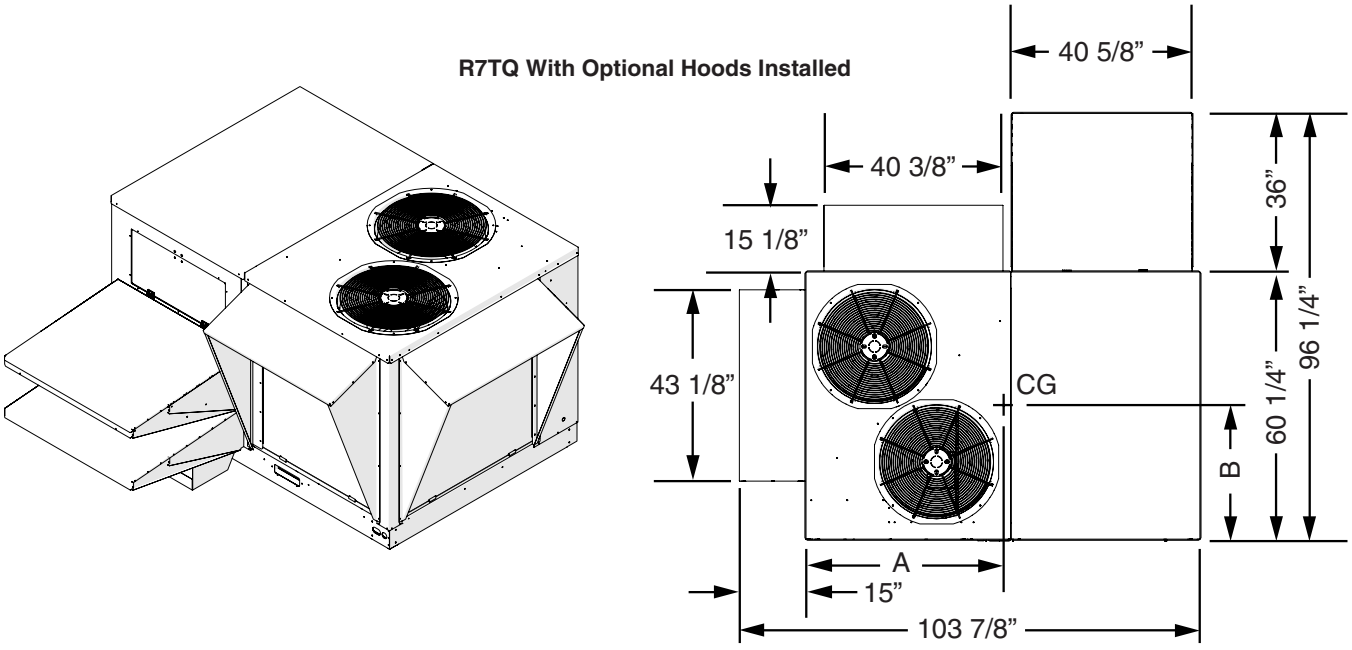


Figure 15. Continued

MODEL NUMBER	UNIT WEIGHT*		SHIPPING WEIGHT		CENTER OF GRAVITY INCHES (MM)		CORNER WEIGHTS								UNIT HEIGHT (E) (INCHES (MM))**	
							A		B		C		D		HORIZONTAL DUCT APPLICATIONS	VERTICAL DUCT APPLICATIONS
	LB	KG	LB	KG	A	B	LB	KG	LB	KG	LB	KG	LB	KG		
R7TQ-072	1086	493	1208	548	47.75 (1213)	23.5 (597)	232	105	362	164	302	137	199	90	54 (1372)	48.5 (1232)
R7TQ-090	1184	538	1306	593		27 (686)	291	132	346	157	298	135	249	113		
R7TQ-120	1196	543	1318	598	46.88 (1191)	25.75 (654)	275	125	347	157	319	145	246	112		
R7TQ-150	1370	623	1492	678	46.50 (1181)	26.50 (673)	318	145	399	181	363	165	289	131	64 (1626)	58.5 (1486)

*Unit weight without packaging or field installed accessories.
**Baserails are not intended to be removed. Information provided is total unit height for horizontal duct applications or height dimension added to selected roof curb height for vertical duct applications.

Table 3. Center of Gravity and Unit Shipping Weights

Blower Performance Data

This equipment is outfitted with a belt driven blower assembly in order to accommodate a large variety of duct configurations and airflow selections. The blower has been factory-inspected for proper alignment, operation and rotational direction prior to the drive motor being situated in the shipping position. The blower drive belt is located with these instructions and must be installed by the service technician.

The factory standard drive installed in these units has been set to deliver 350-400 Cfm/ton at an External Static Pressure (ESP) of 0.25-0.30 in-Wg. Table 4 (page 24), Table 5 (page 25), Table 6 (page 26), Table 7 (page 27), Table 8 (page 28), Table 9 (page 29), Table 10 (page 30), Table 11 (page 31), Table 12 (page 32), and Table 13 (page 34) show the full blower curves of these drive configurations and can be utilized to easily set the adjustable motor sheave for alternate configurations. Refer to the Legend below for a description of the table information. After a sheave setting has been made, always inspect the blower amp draw to ensure that it is less than the service factor amps listed on the motor.

For units being placed into service configured for horizontal flow operation, make sure to note any required blower drive belt or pulley changes.

3493
1017
2.07

Factory Drive Setting: Recommended operational point

3862
1159
3.03

Medium Static Setting (Optional): Recommended operational point

2946
741
0.85

Italic font Indicates an allowable setting that is not recommended for unit operation.
These operational points should be carefully examined by the installer for proper unit setup and heater operation if used.

Indicates a setting that is not permitted for unit operation

EXTERNAL UNIT STATIC (IN WC)		OPERATING @ 230V, 460V, OR 575V	ADJUSTABLE MOTOR SHEAVE SETTING										
			FULLY CLOSED	1/2 TURN OPEN	1 TURN OPEN	1.5 TURN OPEN	2 TURNS OPEN*	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN	4 TURNS OPEN	4.5 TURNS OPEN	5 TURNS OPEN
HIGH-SPEED OPERATION													
0.1		CFM		*2874*	2808	2749	2690	2608	2525	2443	2360	2303	2256
		RPM		*1026*	1008	986	964	940	915	891	867	842	817
		kW		*1.69*	1.65	1.51	1.37	1.30	1.23	1.16	1.09	1.04	0.99
0.2		CFM	2840	2778	2715	2643	2570	2483	2395	2308	2220	2157	2093
		RPM	1046	1028	1009	987	965	941	916	892	867	843	818
		kW	1.71	1.65	1.60	1.47	1.33	1.26	1.19	1.12	1.06	1.00	0.95
0.3		CFM	2740	2681	2623	2536	2450	2358	2265	2173	2080	2010	*1930*
		RPM	1048	1029	1011	988	966	941	917	892	868	843	*819*
		kW	1.68	1.62	1.55	1.42	1.28	1.22	1.15	1.09	1.02	0.97	*0.91*
0.4		CFM	2635	2583	2530	2430	2330	2233	2135	2040	2410		
		RPM	1049	1031	1012	990	967	942	918	893	1018		
		kW	1.65	1.58	1.51	1.37	1.24	1.18	1.11	1.05	1.50		
0.5		CFM	2510	2440	2370	2270	2190	2093	2485	2388	2290		
		RPM	1050	1032	1013	991	969	944	1074	1047	1019		
		kW	1.60	1.52	1.44	1.31	1.22	1.15	1.50	1.49	1.48		
0.6		CFM	2385	2298	2210	2130	2050	2490	2400	2285	2170		
		RPM	1051	1033	1014	992	970	1105	1076	1048	1020		
		kW	1.54	1.46	1.37	1.28	1.19	1.56	1.48	1.46	1.44		
0.7		CFM	2245	2155	2065	2400	2490	2383	2275				
		RPM	1053	1034	1015	1160	1137	1108	1078				
		kW	1.48	1.40	1.32	1.75	1.71	1.50	1.28				
0.8		CFM	2105	2013	2550	2460	2370	2260	2150				
		RPM	1054	1035	1185	1162	1138	1109	1079				
		kW	1.42	1.34	1.80	1.72	1.64	1.44	1.23				
0.9		CFM	*1943*	2540	2460	2368	2275						
		RPM	*1056*	1208	1187	1165	1143						
		kW	*1.35*	1.85	1.79	1.69	1.58						
1.0		CFM	2530	2450	2370	2275	2180						
		RPM	1231	1210	1189	1168	1147						
		kW	1.90	1.84	1.78	1.65	1.52						
1.1		CFM	2450	2345	2240	2120	2000						
		RPM	1233	1212	1191	1170	1148						
		kW	1.75	1.74	1.73	1.61	1.49						
1.2		CFM	2400	2273	2145								
		RPM	1233	1213	1192								
		kW	1.65	1.60	1.55								
LOW-SPEED OPERATION (FOR REFERENCE ONLY)													
Low Static	0.1	CFM		1790	1750	1709	1668	1610	1551	1495	1434	1352	1270
		RPM		684	670	655	641	625	609	592	576	554	532
		kW		0.71	0.67	0.64	0.61	0.57	0.53	0.50	0.46	0.46	0.45
	0.2	CFM	1679	1629	1579	1529	1479	1415	1350	1286	1221		
		RPM	699	685	671	656	642	626	610	593	577		
		kW	0.69	0.66	0.62	0.59	0.56	0.52	0.48	0.45	0.41		
	0.3	CFM	1425	1335	1240	1150	1057						
		RPM	701	686	672	658	644						
		kW	0.65	0.60	0.55	0.51	0.46						
Medium Static	0.2	CFM			1940	1890	1840	1760	1680				
		RPM			794	778	761	740	718				
		kW			0.82	0.77	0.71	0.67	0.62				
	0.3	CFM	1875	1833	1790	1728	1665	1585	1505				
		RPM	826	810	795	779	763	741	720				
		kW	0.78	0.75	0.72	0.68	0.64	0.62	0.61				
	0.4	CFM	1740	1690	1640	1565	1490	1410	1330				
		RPM	827	812	796	780	764	743	721				
		kW	0.74	0.68	0.61	0.59	0.56	0.58	0.59				
	0.5	CFM	1590	1520	1450	1375	1300						
		RPM	828	814	799	783	766						
		kW	0.65	0.62	0.60	0.51	0.43						

NOTES:

* Denotes Recommended Sheave Setting.

- Boldface type indicates factory-recommended blower operating range.
- Values include losses for 2**"** standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.

FACTORY DRIVE CONSISTS OF:
12**"** × 12**"** FC Blower, 2-HP/2-Speed Motor
1VP40 Sheave, BK70 Pulley Belt, and B56 Belt
MEDIUM STATIC DRIVE (OPTIONAL) CONSISTS OF:
Same except uses BK60 Blower Pulley.

Table 4. R7TQ-072 C/D/N Series - Downflow Models

EXTERNAL UNIT STATIC (IN WC)		OPERATING @ 230V, 460V, OR 575V	ADJUSTABLE MOTOR SHEAVE SETTING									
			FULLY CLOSED	1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN	4 TURNS OPEN	4.5 TURNS OPEN*	5 TURNS OPEN
HIGH-SPEED OPERATION												
0.1		CFM										*2900*
		RPM										*746*
		kW										*0.86*
0.2		CFM								**2960**	**2830**	**2700**
		RPM								**793**	**770**	**746**
		kW								**0.91**	**0.89**	**0.87**
0.3		CFM							*2903*	**2790**	**2655**	**2520**
		RPM							*818*	**793**	**770**	**747**
		kW							*0.88*	**0.89**	**0.87**	**0.85**
0.4		CFM					**2963**	**2840**	**2705**	**2570**	**2425**	**2280**
		RPM					**865**	**843**	**819**	**795**	**771**	**748**
		kW					**0.89**	**0.89**	**0.90**	**0.91**	**0.89**	**0.87**
0.5		CFM				*2920*	**2785**	**2650**	**2500**	**2350**	**2175**	2540
		RPM				*888*	**867**	**845**	**821**	**796**	**773**	823
		kW				*0.87*	**0.88**	**0.89**	**0.92**	**0.94**	**0.90**	0.87
0.6		CFM		*2945*	**2828**	**2710**	**2555**	**2400**	**2230**	2655	2468	2280
		RPM		*927*	**908**	**889**	**868**	**846**	**822**	879	852	826
		kW		*0.89*	**0.87**	**0.86**	**0.88**	**0.90**	**0.91**	0.84	0.85	0.87
0.7		CFM	*2930*	**2760**	**2610**	**2460**	**2295**	**2130**	2595	2440	2230	2020
		RPM	*958*	**928**	**909.5**	**891**	**869.5**	**848**	905	881	854	826
		kW	*0.92*	**0.90**	**0.88**	**0.86**	**0.86**	**0.86**	0.85	0.84	0.86	0.87
0.8		CFM	**2710**	**2515**	**2358**	**2200**	2688	2510	2330	2150	*1895*	
		RPM	**960**	**931**	**912**	**893**	955	930	906	881	*856*	
		kW	**0.92**	**0.89**	**0.88**	**0.88**	0.86	0.85	0.85	0.85	*0.86*	
0.9		CFM	**2490**	**2270**	**2070**	2670	2470	2270				
		RPM	**962**	**933**	**914**	982	957	932				
		kW	**0.92**	**0.89**	**0.88**	0.86	0.85	0.85				
1.0		CFM	**2220**	2735	2588	2440	2200	*1960*				
		RPM	**966**	1023	1003	984	959	*934*				
		kW	**0.91**	0.86	0.87	0.87	0.86	*0.84*				
1.1		CFM	2850	2500	2333	2165						
		RPM	1065	1024	1005	986						
		kW	0.92	0.86	0.86	0.86						
LOW-SPEED OPERATION (FOR REFERENCE ONLY)												
Low Static	0.1	CFM	*2380*	*2270*	*2210*	*2150*	**2075**	**2000**	**1930**	**1860**	**1780**	**1700**
		RPM	*639*	*619*	*607*	*594*	**579**	**564**	**547**	**530**	**516**	**501**
		kW	*0.69*	*0.71*	*0.72*	*0.73*	**0.73**	**0.73**	**0.73**	**0.74**	**0.73**	**0.73**
	0.2	CFM	*2170*	**2050**	**1978**	**1905**	**1823**	**1740**	**1640**	**1540**	**1433**	**1325**
		RPM	*640*	**621**	**608**	**595**	**581**	**566**	**549**	**531**	**516**	**501**
		kW	*0.70*	**0.72**	**0.72**	**0.73**	**0.73**	**0.73**	**0.73**	**0.74**	**0.73**	**0.73**
	0.3	CFM	**1900**	**1760**	**1668**	**1575**	**1478**	**1380**	**1225**	**1070**		
		RPM	**642**	**624**	**610**	**596**	**582**	**567**	**550**	**533**		
		kW	**0.71**	**0.72**	**0.73**	**0.73**	**0.74**	**0.75**	**0.75**	**0.75**		
Medium Static	0.2	CFM	*2540*	*2412*	*2326*	*2240*	*2145*	2050	1960	1870	1765	1660
		RPM	*706*	*683*	*670*	*656*	*639*	621	605	589	571	552
		kW	*0.72*	*0.73*	*0.73*	*0.72*	*0.71*	0.70	0.70	0.71	0.71	0.71
	0.3	CFM	*2330*	*2186*	2078	1970	1870	1770	1665	1560	1415	1270
		RPM	*710*	*687*	672	657	640	622	606	590	572	553
		kW	*0.72*	*0.72*	0.72	0.72	0.71	0.70	0.71	0.72	0.72	0.71
	0.4	CFM	2080	1890	1775	1660	1525	1390	1280	1170		
		RPM	711	688	674	659	641	622	607	591		
		kW	0.72	0.72	0.72	0.72	0.72	0.71	0.72	0.73		
	0.5	CFM	1770	1560								
		RPM	716	689								
		kW	0.73	0.72								

NOTES:

* Denotes Recommended Sheave Setting.

- Boldface type indicates recommended blower operating range.
- Values include losses for 2" standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.
- Boldface type indicates alternate drive.

LOW STATIC DRIVE (OPTIONAL) CONSISTS OF:
12" x 12" FC Blower, 2-HP/2-Speed Motor
1VP40 Sheave, BK77 Pulley, and B56 Belt.

FACTORY DRIVE CONSISTS OF:
Same except uses BK70 Blower Pulley.

Table 5. R7TQ-072 C/D/N Series - Horizontal Models

EXTERNAL UNIT STATIC (IN WC)	OPERATING @ 230V, 460V OR 575V	ADJUSTABLE MOTOR SHEAVE SETTING										
		FULLY CLOSED	1/2 TURN OPEN	1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN*	3.5 TURNS OPEN	4 TURN OPEN	4.5 TURNS OPEN	5 TURNS OPEN
HIGH-SPEED OPERATION												
0.1	CFM							*3505*	**3368**	**3230**	**3148**	**3065**
	RPM							*827*	**806**	**784**	**762**	**739**
	kW							*1.66*	**1.51**	**1.36**	**1.31**	**1.27**
0.2	CFM						*3460*	**3346**	**3238**	**3130**	**3024**	**2917**
	RPM						*850*	**828**	**807**	**785**	**763**	**740**
	kW						*2.00*	**1.63**	**1.46**	**1.30**	**1.20**	**1.11**
0.3	CFM					*3425*	**3320**	**3214**	**3088**	**2963**	*2850*	*2745*
	RPM					*873*	**851**	**829**	**808**	**786**	*764*	*742*
	kW					*1.81*	**1.69**	**1.57**	**1.42**	**1.27**	*1.17*	*1.08*
0.4	CFM			*3480*	**3375**	**3270**	**3176**	**3081**	**2938**	*2795*		
	RPM			*911*	**893**	**874**	**852**	**830**	**809**	*787*		
	kW			*2.03*	**1.89**	**1.76**	**1.63**	**1.50**	**1.37**	*1.24*		
0.5	CFM			**3338**	**3228**	**3118**	**2964**	*2810*				
	RPM			**913**	**894**	**875**	**854**	*832*				
	kW			**1.95**	**1.81**	**1.68**	**1.54**	*1.40*				
0.6	CFM		**3280**	**3195**	**3080**	**2965**	*2750*					
	RPM		**931.5**	**914**	**895**	**876**	*855*					
	kW		**1.98**	**1.86**	**1.73**	**1.60**	*1.45*					
0.7	CFM	*3200*	**3075**	**2950**	*2780*							
	RPM	*951*	**934**	**917**	*899*							
	kW	*1.99*	**1.87**	**1.75**	*1.57*							
0.8	CFM	**3035**	*2870*	*2705*								
	RPM	**952**	*935.5*	*919*								
	kW	**1.88**	*1.75*	*1.63*								
0.9	CFM											
	RPM											
	kW											
LOW-SPEED OPERATION (FOR REFERENCE ONLY)												
0.1	CFM	**2530**	**2470**	**2410**	**2355**	**2300**	**2220**	**2140**	**2061**	**1982**	*1664*	*1345*
	RPM	**628**	**617**	**606**	**594**	**582**	**567**	**552**	**536**	**520**	*506*	*491*
	kW	**0.90**	**0.85**	**0.80**	**0.77**	**0.73**	**0.67**	**0.60**	**0.58**	**0.57**	*0.52*	*0.48*
0.2	CFM	**2340**	**2280**	**2220**	**2138**	**2055**	**1973**	*1890*	*1745*	*1600*		
	RPM	**629**	**618**	**607**	**595**	**583**	**568**	*553*	*537*	*521*		
	kW	**0.73**	**0.75**	**0.78**	**0.71**	**0.65**	**0.61**	*0.57*	*0.56*	*0.56*		
0.3	CFM	**2025**	**1998**	**1970**	*1795*	*1620*						
	RPM	**631**	**620**	**609**	*596*	*584*						
	kW	**0.73**	**0.72**	**0.72**	*0.66*	*0.61*						
0.4	CFM	*1710*	*1715*	*1720*								
	RPM	*632*	*621*	*610*								
	kW	*0.73*	*0.70*	*0.66*								

NOTES:
* Denotes Recommended Sheave Setting.
- Boldface type indicates factory-recommended blower operating range.
- Values include losses for 2" standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.

FACTORY DRIVE CONSISTS OF:
15" x 15" FC Blower, 2-HP/2-Speed Motor 1
1VP4O Sheave, BK77 Pulley and B56 Belt.

Table 6. R7TQ-090 C/D/N* Series - Downflow Models

EXTERNAL UNIT STATIC (IN WC)	OPERATING @ 230V, 460V OR 575V	ADJUSTABLE MOTOR SHEAVE SETTING										
		FULLY CLOSED	1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN	4 TURNS OPEN	4.5 TURNS OPEN	5 TURNS OPEN*	5.5 TURNS OPEN
HIGH-SPEED OPERATION												
0.1	CFM									*3775*	**3640**	**3500**
	RPM									*686*	**665**	**648**
	kW									*1.44*	**1.38**	**1.18**
0.2	CFM							*3880*	*3730*	**3595**	**3460**	**3260**
	RPM							*728*	*707*	**687**	**666**	**648**
	kW							*1.52*	*1.43*	**1.37**	**1.32**	**1.11**
0.3	CFM						*3830*	**3685**	**3540**	**3365**	**3190**	**3020**
	RPM						*752*	**730**	**707**	**688**	**668**	**649**
	kW						*1.53*	**1.44**	**1.34**	**1.29**	**1.24**	**1.04**
0.4	CFM				*3890*	*3758*	**3625**	**3448**	**3270**	**3095**	**2920**	*2690*
	RPM				*790*	*772*	**754**	**732**	**709**	**689**	**668**	*650*
	kW				*1.75*	*1.61*	**1.46**	**1.37**	**1.27**	**1.19**	**1.11**	*0.96*
0.5	CFM			*3820*	**3680**	**3530**	**3380**	**3170**	**2960**	*2590*		
	RPM			*809*	**793**	**774**	**755**	**733**	**711**	*691*		
	kW			*1.81*	**1.67**	**1.52**	**1.37**	**1.27**	**1.17**	*1.08*		
0.6	CFM		*3780*	**3610**	**3440**	**3255**	**3070**					
	RPM		*826*	**810**	**793**	**774**	**755**					
	kW		*1.87*	**1.71**	**1.56**	**1.40**	**1.25**					
0.7	CFM		**3480**	**3225**	**2970**	*2650*						
	RPM		**828**	**811**	**794**	*779*						
	kW		**1.75**	**1.57**	**1.40**	*1.22*						
0.8	CFM		**2900**	*2640*								
	RPM		**833**	*816*								
	kW		**1.48**	*1.34*								
0.9	CFM		*2440*									
	RPM		*834*									
	kW		*1.33*									
1.0	CFM											
	RPM											
	kW											
LOW-SPEED OPERATION (FOR REFERENCE ONLY)												
0.1	CFM		*2900*	*2810*	*2720*	*2630*	*2540*	**2455**	**2370**	**2250**	**2130**	**2020**
	RPM		*558*	*545*	*532*	*518*	*504*	**493**	**481**	**465**	**449**	**437**
	kW		*0.77*	*0.74*	*0.71*	*0.66*	*0.61*	**0.57**	**0.52**	**0.52**	**0.51**	**0.47**
0.2	CFM		*2620*	*2515*	**2410**	**2300**	**2190**	**2080**	**1970**	**1730**	**1490**	**1385**
	RPM		*559*	*546*	**533**	**520**	**507**	**495**	**482**	**467**	**452**	**438**
	kW		*0.71*	*0.68*	**0.65**	**0.60**	**0.55**	**0.56**	**0.57**	**0.50**	**0.43**	**0.40**
0.3	CFM		**2250**	**2020**	*1790*	*1653*	*1515*	*1398*	*1280*	*1145*	*1010*	*900*
	RPM		**563**	**550**	*536*	*524*	*511*	*498*	*484*	*468*	*452*	*438*
	kW		**0.63**	**0.59**	*0.54*	*0.50*	*0.46*	*0.42*	*0.39*	*0.39*	*0.39*	*0.36*
0.4	CFM		*1570*	*1460*	*1350*	*1230*	*1110*	*930*	*750*			
	RPM		*565*	*552*	*538*	*525*	*512*	*499*	*485*			
	kW		*0.53*	*0.51*	*0.49*	*0.45*	*0.41*	*0.38*	*0.35*			

NOTES:

Drive Change Required: Values in Horizontal table requires change to BK85 Blower Pulley and B58 Belt.

* Denotes Recommended Sheave Setting.

- Boldface type indicates factory-recommended blower operating range.
- Values include losses for 2" standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.
- See TSL for Drive Components and High Static kits.

Table 7. R7TQ-090 C/D/N* Series - Horizontal Models

HIGH-SPEED OPERATION

EXTERNAL UNIT STATIC (IN WC)	OPERATING @ 230V, 460V, OR 575V	ADJUSTABLE MOTOR SHEAVE SETTING								
		1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN*	4 TURNS OPEN	4.5 TURNS OPEN	5 TURNS OPEN
0.1	CFM						3755	3620	3505	3390
	RPM						871	849	826	802
	kW						2.05	1.86	1.73	1.59
0.2	CFM						3625	3520	3395	3270
	RPM						871	849	826	803
	kW						1.90	1.74	1.63	1.52
0.3	CFM						3480	3355	3275	3195
	RPM						873	851	827	804
	kW						1.88	1.71	1.60	1.49
0.4	CFM					3480	3335	3190	3155	3120
	RPM					897	875	852	829	805
	kW					2.02	1.85	1.68	1.57	1.46
0.5	CFM				3455	3295	3165	3035	2885	2735
	RPM				922	899	876	854	831	808
	kW				2.08	1.92	1.75	1.58	1.44	1.30
0.6	CFM				3270	3110	3000	2880		
	RPM				924	900	878	855		
	kW				1.98	1.83	1.65	1.48		
0.7	CFM			3160	3015	2865				
	RPM			950	926	902				
	kW			2.03	1.87	1.71				
0.8	CFM			2890	2754					
	RPM			952	928					
	kW			1.924	1.76					
0.9	CFM									
	RPM									
	kW									

LOW-SPEED OPERATION (FOR REFERENCE ONLY)

EXTERNAL UNIT STATIC (IN WC)	OPERATING @ 230V, 460V, OR 575V	ADJUSTABLE MOTOR SHEAVE SETTING								
		1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN †	4 TURNS OPEN	4.5 TURNS OPEN	5 TURNS OPEN
0.1	CFM			2560	2475	2390	2310	2230	2157	2083
	RPM			627	612	596	582	568	551	533
	kW			0.95	0.88	0.82	0.76	0.70	2.05	3.40
0.2	CFM			2350	2275	2200	2110	2020	1918	1815
	RPM			628	613	598	584	569	552	534
	kW			0.94	0.86	0.77	0.71	0.66	2.03	3.40
0.3	CFM			2033	1909	1785	1688	1590		
	RPM			630	614	599	585	570		
	kW			0.85	0.78	0.71	0.67	0.63		
0.4	CFM			1715						
	RPM			631						
	kW			0.75						

NOTES:
* Denotes Recommended Sheave Setting.
- Boldface type indicates factory-recommended blower operating range.
- Values include losses for 2" standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.

FACTORY DRIVE CONSISTS OF:
15" × 15" FC Blower, 2-HP/2-Speed Motor
1VP40 Sheave, BK70 Pulley, and B56 Belt

Table 8. R7TQ-120 C/D/N* Series - Downflow Models

HIGH-SPEED OPERATION

EXTERNAL UNIT STATIC (IN WC)	OPERATING @ 230V, 460V, OR 575V	ADJUSTABLE MOTOR SHEAVE SETTING										
		FULLY CLOSED	1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN	4 TURNS OPEN*	4.5 TURNS OPEN	5 TURNS OPEN	5.5 TURNS OPEN
0.1	CFM									3775	3640	3500
	RPM									686	665	648
	kW									1.44	1.38	1.18
0.2	CFM						4030	3880	3730	3595	3460	3260
	RPM						749	728	707	687	666	648
	kW						1.62	1.52	1.43	1.37	1.32	1.11
0.3	CFM				4080	3955	3830	3685	3540	3365	3190	3020
	RPM				788	770	752	730	707	688	668	649
	kW				1.84	1.69	1.53	1.44	1.34	1.29	1.24	1.04
0.4	CFM		4140	4015	3890	3758	3625	3448	3270	3095	2920	2690
	RPM		823	807	790	772	754	732	709	689	668	650
	kW		2.04	1.90	1.75	1.61	1.46	1.37	1.27	1.19	1.11	0.96
0.5	CFM		3960	3820	3680	3530	3380	3170	2960	2590		
	RPM		824	809	793	774	755	733	711	691		
	kW		1.95	1.81	1.67	1.52	1.37	1.27	1.17	1.08		
0.6	CFM		3780	3610	3440	3255	3070					
	RPM		826	810	793	774	755					
	kW		1.87	1.71	1.56	1.40	1.25					
0.7	CFM		3480	3225	2970	2650						
	RPM		828	811	794	779						
	kW		1.75	1.57	1.40	1.22						
0.8	CFM		2900	2640								
	RPM		833	816								
	kW		1.48	1.34								
0.9	CFM		2440									
	RPM		834									
	kW		1.33									
1.0	CFM											
	RPM											
	kW											

LOW-SPEED OPERATION (FOR REFERENCE ONLY)

EXTERNAL UNIT STATIC (IN WC)	OPERATING @ 230V, 460V, OR 575V	ADJUSTABLE MOTOR SHEAVE SETTING										
		FULLY CLOSED	1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN	4 TURNS OPEN †	4.5 TURNS OPEN	5 TURNS OPEN	5.5 TURNS OPEN
0.1	CFM		2900	2810	2720	2630	2540	2455	2370	2250	2130	2020
	RPM		558	545	532	518	504	493	481	465	449	437
	kW		0.77	0.74	0.71	0.66	0.61	0.57	0.52	0.52	0.51	0.47
0.2	CFM		2620	2515	2410	2300	2190	2080	1970	1730	1490	1385
	RPM		559	546	533	520	507	495	482	467	452	438
	kW		0.71	0.68	0.65	0.60	0.55	0.56	0.57	0.50	0.43	0.40
0.3	CFM		2250	2020	1790	1653	1515	1398	1280	1145	1010	900
	RPM		563	550	536	524	511	498	484	468	452	438
	kW		0.63	0.59	0.54	0.50	0.46	0.42	0.39	0.39	0.39	0.36
0.4	CFM		1570	1460	1350	1230	1110	930	750			
	RPM		565	552	538	525	512	499	485			
	kW		0.53	0.51	0.49	0.45	0.41	0.38	0.35			

NOTES:

Drive Change Required: Values in Horizontal table requires change to BK85 Blower Pulley and B58 Belt.

* Denotes Recommended Sheave Setting.

- Boldface type indicates factory-recommended blower operating range.
- Values include losses for 2**"** standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.
- See TSL for Drive Components and High Static kits.

Table 9. R7TQ-120 C/D/N* Series - Horizontal Models

7.5-TON HIGH STATIC DRIVE - DOWNFLOW															
ESP	**0.1**			**0.2**			**0.3**			**0.4**			**0.5**		
SPEED TAP	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**
1-Low	**2100**	**554**	**0.55**	**2000**	**589**	**0.57**	**1890**	**620**	**0.60**	*1745*	*648*	*0.74*			
2-Low	**2395**	**610**	**0.74**	**2306**	**637**	**0.77**	**2204**	**662**	**0.81**	**2032**	**690**	**0.86**	**1950**	**721**	**0.91**
3-High	**3445**	**8215**	**1.71**	**3380**	**838**	**1.72**	**3325**	**854**	**1.75**	**3235**	**874**	**1.78**	**3175**	**895**	**1.81**
4-High				**3595**	**877**	**1.98**	**3530**	**894**	**2.01**	**3450**	**913**	**2.05**	**3385**	**931**	**2.07**
5-High													*3670*	*975*	*2.41*
ESP	**0.6**			**0.7**			**0.8**			**0.9**			**1.0**		
SPEED TAP	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**
1-Low															
2-Low															
3-High	**3095**	**913**	**1.87**	**3040**	**933**	**1.92**	**2940**	**957**	**1.93**	**2845**	**975**	**1.97**	*2755*	*988*	*1.97*
4-High	**3335**	**946**	**2.14**	**3275**	**965**	**2.17**	**3165**	**984**	**2.17**	**3030**	**998**	**2.17**	**2925**	**1007**	**2.14**
5-High	**3620**	**985**	**2.44**	**3550**	**1000**	**2.44**	**3370**	**1005**	**2.37**	**3150**	**1008**	**2.29**	**3010**	**1011**	**2.20**

7.5-TON HIGH STATIC DRIVE - HORIZONTAL															
ESP	**0.1**			**0.2**			**0.3**			**0.4**			**0.5**		
SPEED TAP	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**
1-Low	**2125**	**441**	**0.39**	**2010**	**481**	**0.42**	**1845**	**527**	**0.45**	*1665*	*576*	*0.48*	*1545*	*604*	*0.51*
2-Low	*2455*	*489*	*0.5*	*2360*	*522*	*0.53*	**2265**	**554**	**0.56**	**2100**	**608**	**0.6**	**1950**	**643**	**0.64**
3-High	**3518**	**640**	**1.02**	**3435**	**661**	**1.04**	**3350**	**684**	**1.08**	**3281**	**707**	**1.11**	**3213**	**730**	**1.14**
4-High	*3690*	*665*	*1.13*	**3600**	**688**	**1.17**	**3530**	**709**	**1.20**	**3465**	**733**	**1.23**	**3400**	**757**	**1.26**
5-High	*1845*	*333*	*0.57*	*3840*	*710*	*1.32*	*3750*	*730*	*1.38*	*3690*	*759*	*1.40*	**3630**	**774**	**1.42**
ESP	**0.6**			**0.7**			**0.8**			**0.9**			**1.0**		
SPEED TAP	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**
1-Low															
2-Low															
3-High	**3135**	**753**	**1.18**	**3058**	**776**	**1.22**	**2943**	**812**	**1.28**	*2829*	*849*	*1.33*	*2718*	*877*	*1.36*
4-High	**3330**	**776**	**1.31**	**3260**	**794**	**1.36**	**3185**	**819**	**1.40**	**3110**	**844**	**1.44**	**2975**	**882**	**1.48**
5-High	**3560**	**799**	**1.46**	**3510**	**818**	**1.5**	**3440**	**944**	**1.53**	**3360**	**865**	**1.58**	**3260**	**889**	**1.61**

NOTES:

1. Factory-recommended settings are in bold.
2. Shaded areas are not recommended or approved for proper operation of equipment.
3. 7.5-Ton High Static Drive Consists of: 3-HP ECM Motor and Controller, BK45 Motor Pulley, BK77 Blower Pulley, and B56 Belt. See Accessory offering in Technical Sales Literature.

Table 10. R7TQ-090C/D/N* Series High Static Drive

10-TON HIGH STATIC DRIVE - DOWNFLOW															
ESP	**0.1**			**0.2**			**0.3**			**0.4**			**0.5**		
SPEED TAP	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**
1-Low	**2200**	**549**	**0.60**	**2115**	**574**	**0.62**	**1995**	**634**	**0.64**						
2-Low	*2460*	*601*	*0.74*	**2390**	**622**	**0.75**	**2285**	**648**	**0.76**	**2195**	**684**	**0.83**	**2050**	**713**	**0.85**
3-High	*3680*	*855*	*1.83*	**3635**	**874**	**1.88**	**3560**	**892**	**1.92**	**3480**	**906**	**1.97**	**3430**	**868**	**1.94**
4-High	*3905*	*900*	*2.14*	*3840*	*917*	*2.20*	**3760**	**932**	**2.21**	**3710**	**945**	**2.23**	**3650**	**933**	**2.23**
5-High	*4130*	*945*	*2.45*	*4042*	*961*	*2.51*	*3960*	*973*	*2.50*	*3937*	*984*	*2.50*	**3870**	**997**	**2.52**
ESP	**0.6**			**0.7**			**0.8**			**0.9**			**1.0**		
SPEED TAP	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**
1-Low															
2-Low															
3-High	**3390**	**937**	**1.99**	**3335**	**953**	**2.01**	**3275**	**971**	**2.06**	**3230**	**986**	**2.11**	**3170**	**1009**	**2.13**
4-High	**3595**	**973**	**2.26**	**3535**	**986**	**2.28**	**3465**	**1000**	**2.31**	**3400**	**1014**	**2.33**	**3335**	**1031**	**2.34**
5-High	**3800**	**1009**	**2.53**	**3735**	**1018**	**2.55**	**3650**	**1029**	**2.56**	**3570**	**1043**	**2.56**	**3505**	**1053**	**2.55**

10-TON HIGH STATIC DRIVE - HORIZONTAL															
ESP	**0.1**			**0.2**			**0.3**			**0.4**			**0.5**		
SPEED TAP	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**
1-Low	**2300**	**466**	**0.40**	**2180**	**505**	**0.43**	**2100**	**532**	**0.46**	**1930**	**583**	**0.49**	*1760*	*634*	*0.53*
2-Low							*2406*	*569*	*0.56*	**2317**	**601**	**0.58**	**2228**	**633**	**0.61**
3-High	*3775*	*676*	*1.14*	*3710*	*697*	*1.17*	**3645**	**718**	**1.21**	**3580**	**739**	**1.25**	**3515**	**762**	**1.28**
4-High							3850	745	1.37	3790	764	1.40	3730	786	1.43
5-High													*3850*	*802*	*1.53*
ESP	**0.6**			**0.7**			**0.8**			**0.9**			**1.0**		
SPEED TAP	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**	**CFM**	**RPM**	**KW**
1-Low	*1655*	*657*	*0.55*												
2-Low	**2051**	**675**	**0.65**	**1874**	**716**	**0.69**	**1768**	**738**	**0.70**	**1662**	**760**	**0.72**			
3-High	**3450**	**784**	**1.30**	**3385**	**806**	**1.34**	**3320**	**828**	**1.37**	**3245**	**850**	**1.40**	*3170*	*872*	*1.44*
4-High	3670	807	1.46	3600	829	1.50	3530	851	1.53	3460	874	1.57	3390	896	1.60
5-High	*3790*	*821*	*1.57*	*3732*	*842*	*1.60*	**3668**	**862**	**1.63**	**3610**	**879**	**1.66**	**3540**	**904**	**1.70**

NOTES:
1. Factory-recommended settings are in bold.
2. Shaded areas are not recommended or approved for proper operation of equipment.
3. 10-Ton High Static Drive Consists of: 3-HP ECM Motor and Controller, BK45 Motor Pulley, BK70 Blower Pulley, and B56 Belt. See Accessory offering in Technical Sales Literature.

Table 11. R7TQ-120C/D/N* Series High Static Drive

HIGH-SPEED OPERATION													
EXTERNAL UNIT STATIC (IN WC)		OPERATING @ 230V OR 460V	ADJUSTABLE MOTOR SHEAVE SETTING										
			FULLY CLOSED	0.5 TURN OPEN	1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN *	4 TURNS OPEN	4.5 TURNS OPEN	5 TURNS OPEN
Factory Drive	0.1	CFM					*4670*	*4540*	*4410*	4270	4130	3935	4240
		RPM					*989*	*967*	*944*	920	895	851	887
		kW					*2.98*	*2.75*	*2.52*	2.37	2.22	1.98	2.57
	0.2	CFM				*4590*	4490	4360	4230	4110	4000	4225	4040
		RPM				*1007*	990	968	945	921	896	911	888
		kW				*3.05*	2.85	2.68	2.51	2.32	2.13	2.47	2.44
	0.3	CFM			*4535*	4440	4345	4215	4085	3958	4210	4060	3910
		RPM			*1024*	1008	991	969	946	921	936	913	889
		kW			*3.17*	2.98	2.80	2.61	2.43	2.25	2.48	2.40	2.32
	0.4	CFM	*4500*	4445	4380	4290	4200	4070	3940	4240	4080	3920	4360
		RPM	*1048*	1037	1025	1009	992	970	947	960	937	914	987
		kW	*3.30*	3.24	3.09	2.92	2.75	2.55	2.34	2.27	2.25	2.23	2.91
	0.5	CFM	4385	4308	4230	4138	4045	3908	4250	4095	3940	4390	4240
		RPM	1050	1038	1026	1010	993	971	986	962	938	1011	989
		kW	3.28	3.14	3.00	2.82	2.64	2.44	2.34	2.33	2.32	2.98	2.77
	0.6	CFM	4260	4170	4080	3985	3890	4305	4110	3935	4400	4250	4100
		RPM	1052	1040	1027	1011	994	1006	987	963	1035	1013	990
		kW	3.18	3.04	2.90	2.72	2.53	2.68	2.32	2.31	3.13	2.89	2.65
	0.7	CFM	4135	4050	3965	3855	4220	4070	3920	4370	4260	4105	3950
		RPM	1054	1041	1028	1012	1029	1009	988	1056	1036	1014	991
		kW	3.09	2.96	2.84	2.65	3.01	2.60	2.28	3.19	3.03	2.77	2.52
	0.8	CFM	4010	3930	4230	4150	4070	3935	4360	4225	4090	3950	*3810*
		RPM	1055	1042	1065	1048	1031	1010	1078	1058	1038	1016	*993*
		kW	3.00	2.89	3.11	3.03	2.96	2.53	3.31	3.10	2.90	2.65	*2.41*
Medium Static Drive	0.9	CFM	4320	4215	4110	4010	3910	4330	4240	4090	3940	*3785*	
		RPM	1096	1082	1068	1051	1033	1101	1080	1060	1040	*1017*	
		kW	3.53	3.26	2.99	2.96	2.87	3.54	3.26	3.04	2.83	*2.59*	
	1.0	CFM	4160	4075	3990	3900	4370	4225	4080	3930	*3780*		
		RPM	1098	1084	1069	1052	1123	1103	1082	1062	*1042*		
		kW	3.53	3.14	2.85	2.83	3.72	3.43	3.14	2.96	*2.78*		
	1.1	CFM	4040	3930	4400	4310	4220	4090	3960	*3790*			
		RPM	1099	1085	1151	1138	1124	1105	1085	*1064*			
		kW	3.38	3.06	3.89	3.74	3.60	3.32	3.05	*2.85*			
	1.2	CFM	3925	4345	4270	4165	4060	3930	*3800*				
		RPM	1099	1168	1153	1139	1125	1107	*1088*				
		kW	3.23	3.96	3.75	3.64	3.52	3.24	*2.97*				
High Static Drive	1.3	CFM	4300	4235	4170	4050	3930	*3755*					
		RPM	1183	1170	1156	1142	1127	*1108*					
		kW	4.06	3.88	3.71	3.55	3.38	*3.06*					
	1.4	CFM	4150	4080	4010	3895	*3780*						
		RPM	1186	1172	1159	1144	*1128*						
		kW	3.94	3.73	3.52	3.36	*3.20*						
	1.5	CFM	4080	3975	3870								
		RPM	1188	1175	1162								
		kW	3.80	3.61	3.42								
	1.6	CFM	3900										
		RPM	1192										
		kW	3.75										

NOTES:
- Denotes Recommended Sheave Setting.
- Values include losses for 2" standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.

FACTORY DRIVE CONSISTS OF:
15" × 15" FC Blower, 3-HP/2-Speed Motor
1VP44 Sheave, BK75 Pulley, and B56 Belt

MEDIUM STATIC DRIVE CONSISTS OF:
Same as factory except uses BK72 Pulley

HIGH STATIC DRIVE CONSISTS OF:
5-HP motor, 1VP50 Sheave, and BK75 Pulley

Table 12. R7TQ-150 C/D* Series - Downflow Models

LOW-SPEED OPERATION (FOR REFERENCE ONLY)													
EXTERNAL UNIT STATIC (IN WC)		OPERATING @ 230V OR 460V	ADJUSTABLE MOTOR SHEAVE SETTING										
			FULLY CLOSED	0.5 TURN OPEN	1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN *	4 TURNS OPEN	4.5 TURNS OPEN	5 TURNS OPEN
Factory Drive	0.1	CFM	3050	3025	3000	2920	2840	2755	2670	2610	2550	2450	2350
		RPM	694	686	677	666	654	640	625	610	595	578	561
		kW	1.22	1.18	1.14	1.06	0.97	0.91	0.85	0.79	0.74	0.72	0.70
	0.2	CFM	2885	2843	2800	2720	2640	2565	2490	2405	2320	2220	2120
		RPM	695	687	679	667	655	641	626	611	596	579	562
		kW	1.17	1.11	1.05	0.98	0.91	0.87	0.82	0.76	0.70	0.67	0.63
	0.3	CFM	2685	2640	2595	2498	2400	2298	2195	2130	2065	1993	1920
		RPM	697	689	681	668	656	642	628	613	598	581	564
		kW	1.10	1.05	0.99	0.93	0.87	0.81	0.76	0.70	0.65	0.62	0.58
	0.4	CFM	2490	2440	2390	2275	2160	2030	1900				
		RPM	699	691	682	670	658	644	630				
		kW	1.04	0.98	0.93	0.85	0.77	0.73	0.70				
Medium Static Drive	0.2	CFM	3140	3075	3010	2975	2940	2855	2770	2645	2520	2545	2570
		RPM	723	713	703	692	681	665.5	650	634	618	602	586
		kW	1.33	1.24	1.16	1.14	1.11	1.09	1.06	0.98	0.90	0.84	0.77
	0.3	CFM	2960	2885	2810	2770	2730	2620	2510	2400	2290	2305	2320
		RPM	725	715	705	694	682	667	651	635	619	603	587
		kW	1.28	1.21	1.15	1.12	1.09	1.05	1.02	0.93	0.85	0.78	0.71
	0.4	CFM	2730	2670	2610	2560	2510	2395	2280	2150	2020	2045	2070
		RPM	726	716.5	707	696	684	668	652	636	620	603	586
		kW	1.19	1.17	1.14	1.03	0.92	0.94	0.97	0.89	0.81	0.74	0.66
	0.5	CFM	2530	2470	2410	2365	2320	2185	2050	2000			
		RPM	729	719	709	697	685	670	654	637			
		kW	1.16	1.10	1.04	0.96	0.88	0.90	0.92	0.86			
High Static Drive	0.3	CFM	3280	3220	3160	3101	3041	2971	2900	2795	2690	2595	2500
		RPM	782	773	763	751	739	726	713	699	684	671	657
		kW	1.54	1.46	1.39	1.37	1.34	1.28	1.21	1.13	1.05	0.98	0.92
	0.4	CFM	3130	3065	3000	2925	2850	2765	2680	2590	2500	2400	2300
		RPM	786	776	766	753	740	728	716	701	686	672	658
		kW	1.51	1.43	1.34	1.30	1.26	1.19	1.12	1.08	1.03	0.97	0.91
	0.5	CFM	2900	2855	2810	2730	2650	2570	2490	2385	2280		
		RPM	788	779	769	756	743	730	717	703	688		
		kW	1.44	1.35	1.27	1.25	1.22	1.12	1.02	1.01	1.01		
	0.6	CFM	2750	2690	2630	2535	2440						
		RPM	789	781	772	758	744						
		kW	1.38	1.28	1.18	1.15	1.11						
	0.7	CFM	2520	2490	2460								
		RPM	791	783	774								
		kW	1.25	1.21	1.16								

NOTES:
- Denotes Recommended Sheave Setting.
- Values include losses for 2" standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.

FACTORY DRIVE CONSISTS OF:
15" x 15" FC Blower, 3-HP/2-Speed Motor
1VP44 Sheave, BK75 Pulley, and B56 Belt

MEDIUM STATIC DRIVE CONSISTS OF:
Same as factory except uses BK72 Pulley

HIGH STATIC DRIVE CONSISTS OF:
5-HP motor, 1VP50 Sheave, and BK75 Pulley

Table 12. R7TQ-150 C/D* Series - Downflow Models (Continued)

HIGH-SPEED OPERATION													
EXTERNAL UNIT STATIC (IN WC)		OPERATING @ 230V OR 460V	ADJUSTABLE MOTOR SHEAVE SETTING										
			FULLY CLOSED	0.5 TURN OPEN	1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN	4 TURNS OPEN	4.5 TURNS OPEN	5 TURNS OPEN
Low Static Drive	0.1	CFM							*4790*	4625	4460	4360	4260
		RPM							*775*	754	732	714	697
		kW							*1.73*	1.65	1.56	1.50	1.44
	0.2	CFM							4570	4420	4270	4155	4620
		RPM							773	753	733	715	773
		kW							1.64	1.57	1.51	1.42	1.60
	0.3	CFM						4550	4380	4240	4100	4640	4480
		RPM						793	775	755	734	798	775
		kW						1.73	1.61	1.52	1.42	1.68	1.61
	0.4	CFM					4500	4370	4240	4040	4590	4430	4270
		RPM					811	794	776	756	823	801	779
		kW					1.79	1.68	1.57	1.45	1.63	1.60	1.57
	0.5	CFM		4725	4600	4455	4310	4170	4030	4590	4390	4220	4050
		RPM		860	846	829	812	795	777	846	825	803	781
		kW		2.00	1.87	1.77	1.67	1.60	1.53	1.74	1.62	1.54	1.46
	0.6	CFM	4620	4515	4410	4240	4070	3940	4560	4380	4200	4530	4325
		RPM	875	862	849	831	813	796	867	847	827	904	834
		kW	1.99	1.90	1.82	1.68	1.54	1.41	1.75	1.68	1.61	1.76	1.61
	0.7	CFM	4430	4295	4160	3993	3825	4555	4360	4155	4520	4325	4130
		RPM	876	864	851	833	814	889	870	850	877	857	836
		kW	1.88	1.83	1.78	1.65	1.52	1.91	1.83	1.73	1.88	1.77	1.66
	0.8	CFM	4170	4055	3940	4680	4520	4350	4180	4435	4350	4105	3860
		RPM	877	865	853	927	909	890	871	901	880	859	838
		kW	1.84	1.75	1.66	2.04	1.88	1.80	1.72	1.92	1.84	1.62	1.41
	0.9	CFM	3920	3750	4630	4455	4280	4110	4330	4190	4050		
		RPM	878	866	946	928	910	892	924	903	881		
		kW	1.73	1.67	2.05	1.96	1.88	1.71	1.82	1.70	1.58		
Medium Static Drive	1.0	CFM	*4780*	4640	4500	4280	4060	4375	4110	3955	3800		
		RPM	*978*	963	948	930	911	948	925	904	882		
		kW	*2.32*	2.18	2.05	1.94	1.82	1.88	1.72	1.61	1.50		
	1.1	CFM	4580	4408	4235	4665	4450	4180	3910				
		RPM	977	964	950	991	972	949	926				
		kW	2.20	2.04	1.87	2.17	1.93	1.80	1.68				
	1.2	CFM	4360	4155	3950	4385	4150	3840					
		RPM	982	968	953	993	975	954					
		kW	2.14	2.01	1.88	2.08	1.90	1.82					
	1.3	CFM	4080	4228	4375	4118	3860						
		RPM	986	1000	1014	996	978						
		kW	2.01	2.10	2.19	1.95	1.72						
	1.4	CFM	3760	4315	4125	3800							
		RPM	989	1033	1018	1001							
		kW	1.91	2.14	1.98	1.89							
High Static Drive	1.5	CFM	4175	3990	3810								
		RPM	1053	1038	1022								
		kW	2.09	1.97	1.85								
	1.6	CFM	3950										
		RPM	1055										
		kW	2.00										

NOTES:

- Values include losses for 2" standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.

FACTORY DRIVE CONSISTS OF:
15" × 15" FC Blower, 3-HP/2-Speed Motor
1VP44 Sheave, BK75 Pulley, and B56 Belt

MEDIUM STATIC DRIVE CONSISTS OF:
Same as factory except uses BK80 Pulley

LOW STATIC DRIVE CONSISTS OF:
Same as factory except uses BK90 Pulley

Table 13. R7TQ-150 C/D Series - Horizontal Models

LOW-SPEED OPERATION (FOR REFERENCE ONLY)													
EXTERNAL UNIT STATIC (IN WC)		OPERATING @ 230V OR 460V	ADJUSTABLE MOTOR SHEAVE SETTING										
			FULLY CLOSED	0.5 TURN OPEN	1 TURN OPEN	1.5 TURNS OPEN	2 TURNS OPEN	2.5 TURNS OPEN	3 TURNS OPEN	3.5 TURNS OPEN	4 TURNS OPEN	4.5 TURNS OPEN	5 TURNS OPEN
Factory Drive	0.1	CFM	3300	3245	3190	3105	3020	2950	2880	2755	2630	2560	2490
		RPM	574	560	546	540	533	522	510	497	483	466	449
		kW	0.48	0.44	0.40	0.39	0.38	0.34	0.31	0.30	0.29	0.27	0.25
	0.2	CFM	3080	3015	2950	2855	2760	2650	2540	2430	2320	2210	2100
		RPM	576	566	555	545	535	524	512	498	484	468	452
		kW	0.44	0.41	0.39	0.37	0.35	0.32	0.29	0.28	0.26	0.25	0.23
	0.3	CFM	2770	2665	2560	2475	2390	2255	2120	1935	1750	1600	1450
		RPM	578	569	559	548	537	525	513	499	485	470	454
		kW	0.41	0.39	0.37	0.35	0.33	0.30	0.28	0.24	0.21	0.20	0.19
	0.4	CFM	2380	2260	2140	1975	1810	1520	1230				
		RPM	580	571	561	550	539	527	515				
		kW	0.37	0.35	0.33	0.29	0.26	0.21	0.17				
Medium Static Drive	0.2	CFM	3660	3560	3460	3365	3270	3165	3060	2945	2830	2715	2600
		RPM	643	633	622	610	597	585	572	558.5	545	531.5	518
		kW	0.61	0.54	0.47	0.48	0.50	0.47	0.44	0.38	0.31	0.31	0.30
	0.3	CFM	3410	3305	3200	3085	2970	2865	2760	2630	2500	2375	2250
		RPM	645	634	623	611	599	587	574	560.5	547	533.5	520
		kW	0.59	0.53	0.46	0.46	0.45	0.41	0.37	0.33	0.29	0.28	0.27
	0.4	CFM	3170	3035	2900	2765	2630	2480	2330	2130	1930	1685	1440
		RPM	648	637	626	614	602	589	576	563	549	536	522
		kW	0.55	0.50	0.45	0.41	0.37	0.31	0.26	0.26	0.27	0.21	0.15
	0.5	CFM	2820	2670	2520	2315	2110	1805	1500	1415			
		RPM	650	640	629	617	604	591	578	565			
		kW	0.53	0.44	0.36	0.31	0.27	0.24	0.20	0.18			
	0.6	CFM	2250	1935	1620	1540	1460						
		RPM	653	643	632	620	607						
		kW	0.38	0.35	0.31	0.26	0.22						
High Static Drive	0.3	CFM			3600	3455	3310	3200	3090	2965	2840	2685	2530
		RPM			665	652	638	624	610	598	585	568	551
		kW			0.61	0.60	0.58	0.49	0.39	0.39	0.40	0.36	0.33
	0.4	CFM	3425	3388	3350	3235	3120	2930	2740	2625	2510	2325	2140
		RPM	688	678	668	655	641	628	614	600	586	570	553
		kW	0.72	0.59	0.46	0.48	0.51	0.45	0.38	0.37	0.37	0.33	0.30
	0.5	CFM	3210	3145	3080	2920	2760	2570	2380	2175	1970	1660	1350
		RPM	694	683	672	661	649	633	616	602	588	572	556
		kW	0.62	0.56	0.50	0.45	0.40	0.38	0.37	0.35	0.34	0.26	0.18
	0.6	CFM	2880	2740	2600	2450	2300	1900	1500	1460	1420		
		RPM	697	687	677	664	651	635	619	605	591		
		kW	0.57	0.48	0.39	0.36	0.34	0.32	0.30	0.28	0.27		
	0.7	CFM	2410	2105	1800	1700	1600						
		RPM	704	692	679	667	654						
		kW	0.47	0.38	0.29	0.28	0.27						

NOTES:
- Values include losses for 2" standard air filters, unit casing, and dry evaporator coil.
- For 208V operation deduct approximately 0.5% from CFM shown.

FACTORY DRIVE CONSISTS OF:
15" × 15" FC Blower, 3-HP/2-Speed Motor
1VP44 Sheave, BK75 Pulley, and B56 Belt

MEDIUM STATIC DRIVE CONSISTS OF:
Same as factory except uses BK80 Pulley

LOW STATIC DRIVE CONSISTS OF:
Same as factory except uses BK90 Pulley

Table 13. R7TQ-150 C/D Series - Horizontal Models (Continued)

Electrical Data and Diagrams

Unit equipped with		Standard 2-HP Motor			Standard 2-HP Motor + PE			3-HP ECM HSD Motor			3-HP ECM HSD Motor + PE		
LC UNIT (Ton)	VOLTAGE	TOTAL LINE CURRENT	MCA	MOP	TOTAL LINE CURRENT	MCA	MOP	TOTAL LINE CURRENT	MCA	MOP	TOTAL LINE CURRENT	MCA	MOP
6	208-230	26.4	30.8	45	30.4	34.8	50	29.3	33.7	50	33.3	37.7	55
	460	12.8	14.9	20	14.8	16.9	25	14.3	16.4	20	16.3	18.4	25
	575	9.8	11.4	15	11.7	13.3	15	N/A	N/A	N/A	N/A	N/A	N/A
7.5	208-230	36.8	40.1	50	40.8	44.1	50	39.7	43.0	50	43.7	47.0	60
	460	17.7	19.2	25	19.7	21.2	25	19.2	20.7	25	21.2	22.7	25
	575	13.2	14.3	15	15.1	16.2	20	N/A	N/A	N/A	N/A	N/A	N/A
10	208-230	42.6	46.6	60	46.6	50.6	60	45.5	49.5	60	49.5	53.5	60
	460	21.1	23.1	30	23.1	25.1	30	22.6	24.6	30	24.6	26.6	30
	575	15.8	17.2	20	17.7	19.1	20	N/A	N/A	N/A	N/A	N/A	N/A

Unit equipped with		Standard 3-HP Motor			Standard 3-HP Motor + PE			5-HP HSD Motor			5-HP HSD Motor + PE		
LC UNIT (Ton)	VOLTAGE	TOTAL LINE CURRENT	MCA	MOP	TOTAL LINE CURRENT	MCA	MOP	TOTAL LINE CURRENT	MCA	MOP	TOTAL LINE CURRENT	MCA	MOP
12.5	208-230	53.4	58.2	70	57.4	62.2	80	57.6	62.4	80	61.6	66.4	80
	460	27.3	29.7	35	29.3	31.7	40	29.5	31.9	40	31.5	33.9	40

NOTES:
1) To achieve the rated unit performance, unit voltage should be within 2% of nominal.
2) For C series units:
Nominal Unit Input Voltage = 208-230 Volt, 60 Hertz, 3 Phase
Minimum allowed unit voltage = 187V
Maximum allowed voltage = 253V
3) For D series units:
Nominal Unit Input Voltage = 460 Volt, 60 Hertz, 3 Phase
Minimum allowed unit voltage = 414V
Maximum allowed voltage = 506V
FLA = Full Load Amps; MCA = Minimum Circuit Ampacity; RLA = Rated Load Amps;
MOP = Maximum Over-Current Protection; LRA = Locked Rotor Amps
PE = Power Exhaust
HSD = High Static Drive

Table 14. Factory Unit MCA/MOP Data

DSI BOARD LED's

LED STATE COLOR	CODE	
GREEN	STEADY ON	NORMAL OPERATION NO CALL FOR HEAT
GREEN	FAST FLASH	NORMAL OPERATION CALL FOR HEAT
GREEN	1 FLASH	IN LOCKOUT FROM FIELD IGNITIONS OR FLAME LOSSES
GREEN	2 FLASHES	PRESSURE SWITCH DOES NOT CLOSE WITHIN 30 SECONDS OF VENTER ENERGIZED
GREEN	3 FLASHES	LIMIT SWITCH OPEN
GREEN	4 FLASHES	PRESSURE SWITCH IS CLOSED BEFORE VENTER IS ENERGIZED
GREEN	STEADY OFF	INTERNAL CONTROL FAULT OR NO POWER
YELLOW	STEADY ON	FLAME SENSED
YELLOW	SLOW FLASH	WEAK FLAME
YELLOW	FAST FLASH	UNDESIRED FLAME (VALVE OPEN & NO CALL FOR HEAT)

REFER TO DRAWING # 1011991 FOR STANDARD PLUG & ECONOMIZER PLUG CONNECTION

NOTES

1. DISCONNECT ALL POWER BEFORE SERVICING.
2. CAUTION: IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 105 DEGREES C.,
3. LINE AND BLOWER MOTOR BRANCH CIRCUIT WIRE SHOULD BE OF A SIZE TO PREVENT VOLTAGE DROP BEYOND FIVE PERCENT OF SUPPLY LINE VOLTAGE.
4. SEE RATING PLATE LABEL FOR MCA, TO DETERMINE LINE FEED COPPER WIRE SIZE. LINE FEEDS CONNECT TO THE LOCKABLE DISCONNECT OR DISTRIBUTION BLOCKS.
5. USE #18 GA. WIRE FOR 24 VOLT CONTROL WIRING ON UNIT.
6. WHEN PROVIDING OR REPLACING FUSES IN THE FUSIBLE DISCONNECT SWITCH USE DUAL ELEMENTS TIME DELAY FUSES AND SIZE ACCORDING TO 1.25 TIMES THE MAXIMUM TOTAL INPUT AMPS.
7. ALL MOTORS MARKED IOL HAVE INTERNAL LINE BREAK.
8. FUSIBLE DISCONNECT IS FIELD FURNISHED OR AVAILABLE FROM FACTORY AS AN OPTION.
9. THE LINE SIDE OF THE DISCONNECT SWITCH MUST BE CONNECTED TO THE INCOMING POWER SUPPLY SUCH THAT THE VOLTAGE BETWEEN L1 AND GROUND IS THE GREATER VALUE.

FIELD CONTROL WIRING

TOTAL WIRE LENGTH	MINIMUM RECOMMENDED WIRE SIZE
150 FEET	#18 GA.
250 FEET	#16 GA.
350 FEET	#14 GA.

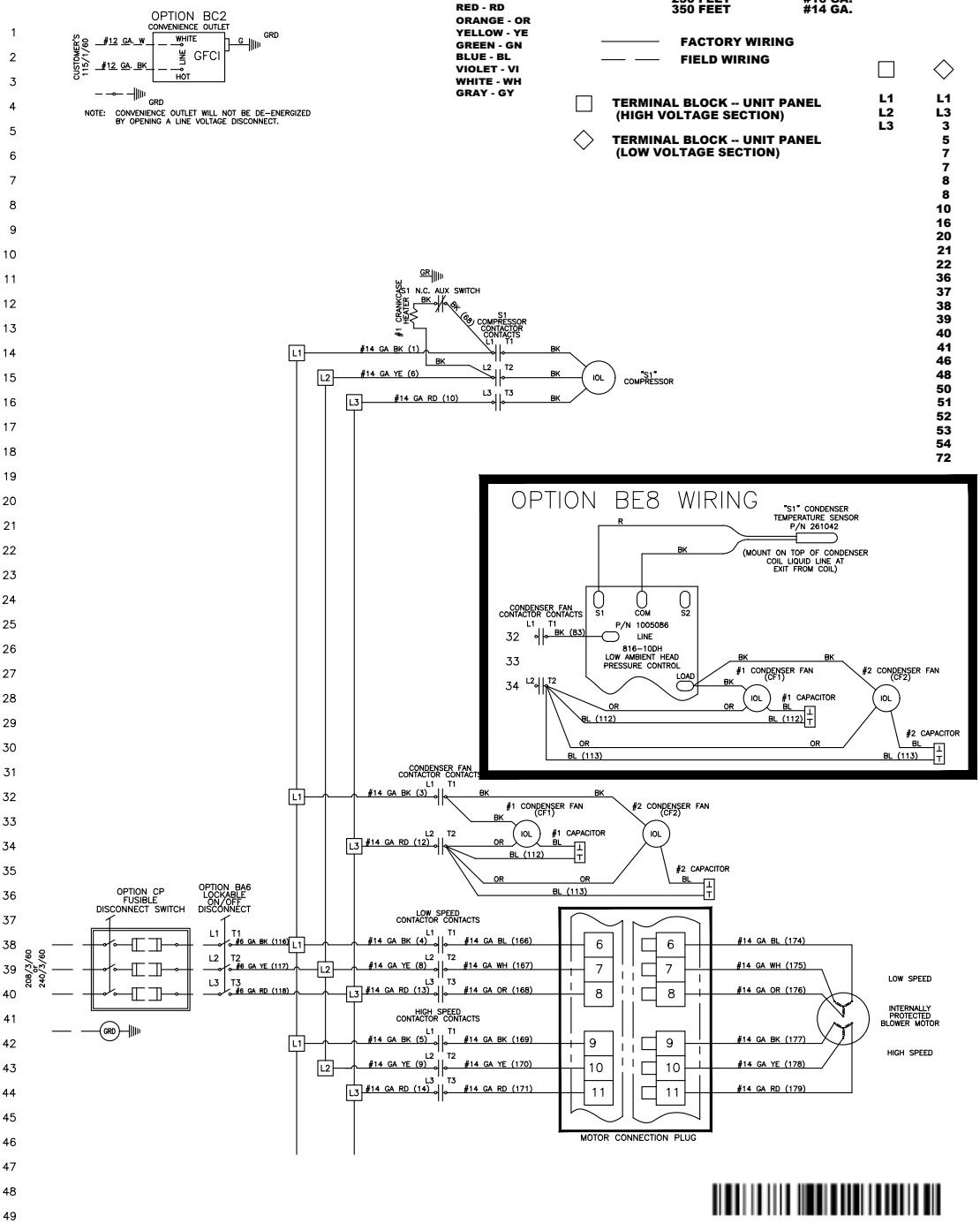
WIRING CODE

BLACK - BK
BROWN - BR
RED - RD
ORANGE - OR
YELLOW - YE
GREEN - GN
BLUE - BL
VIOLET - VI
WHITE - WH
GRAY - GY

FACTORY WIRING
FIELD WIRING

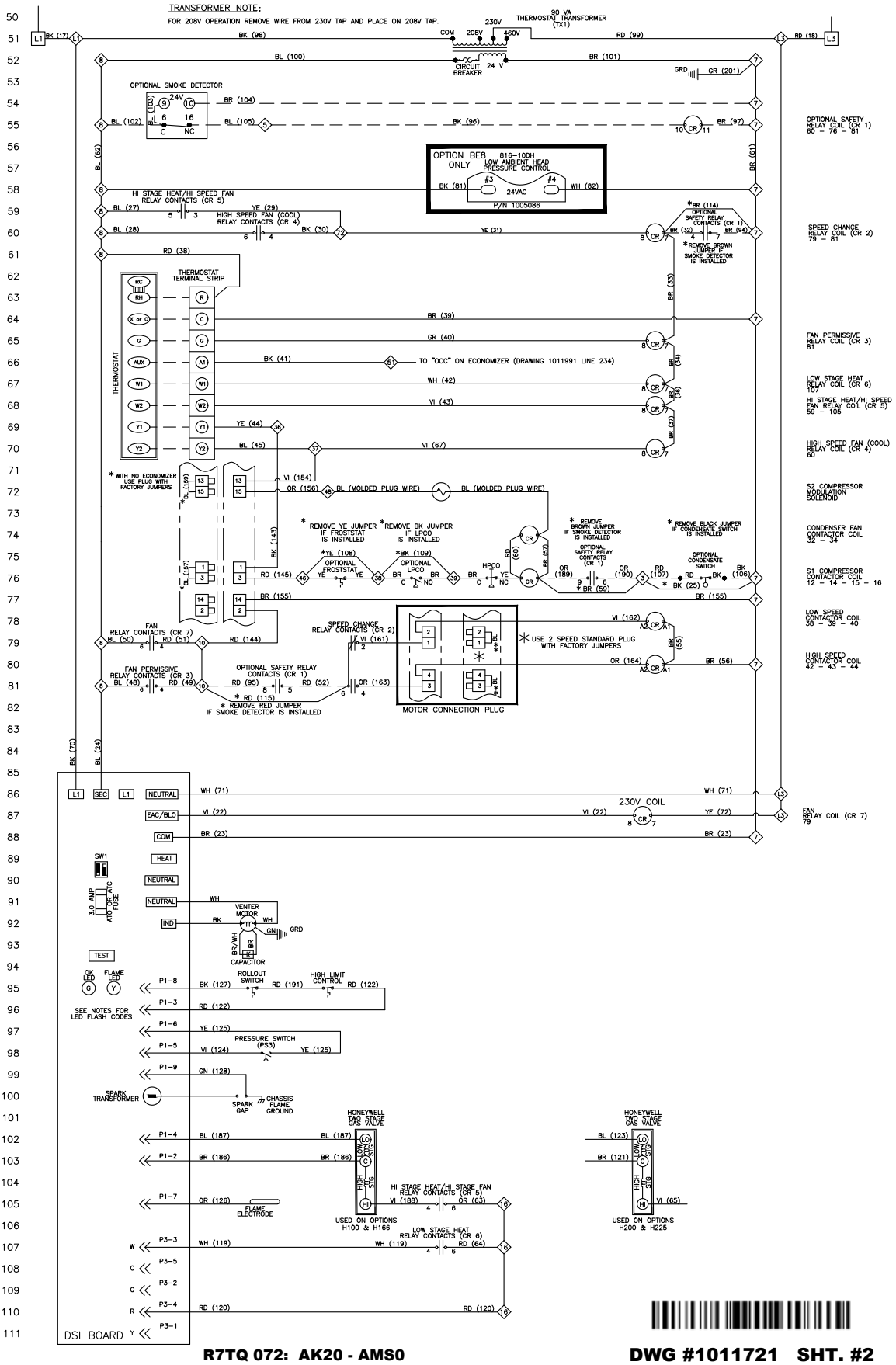
TERMINAL BLOCK -- UNIT PANEL (HIGH VOLTAGE SECTION)
TERMINAL BLOCK -- UNIT PANEL (LOW VOLTAGE SECTION)

L1	L1
L2	L3
L3	3
	5
	7
	7
	8
	8
	10
	16
	20
	21
	22
	36
	37
	38
	39
	40
	41
	46
	48
	50
	51
	52
	53
	54
	72



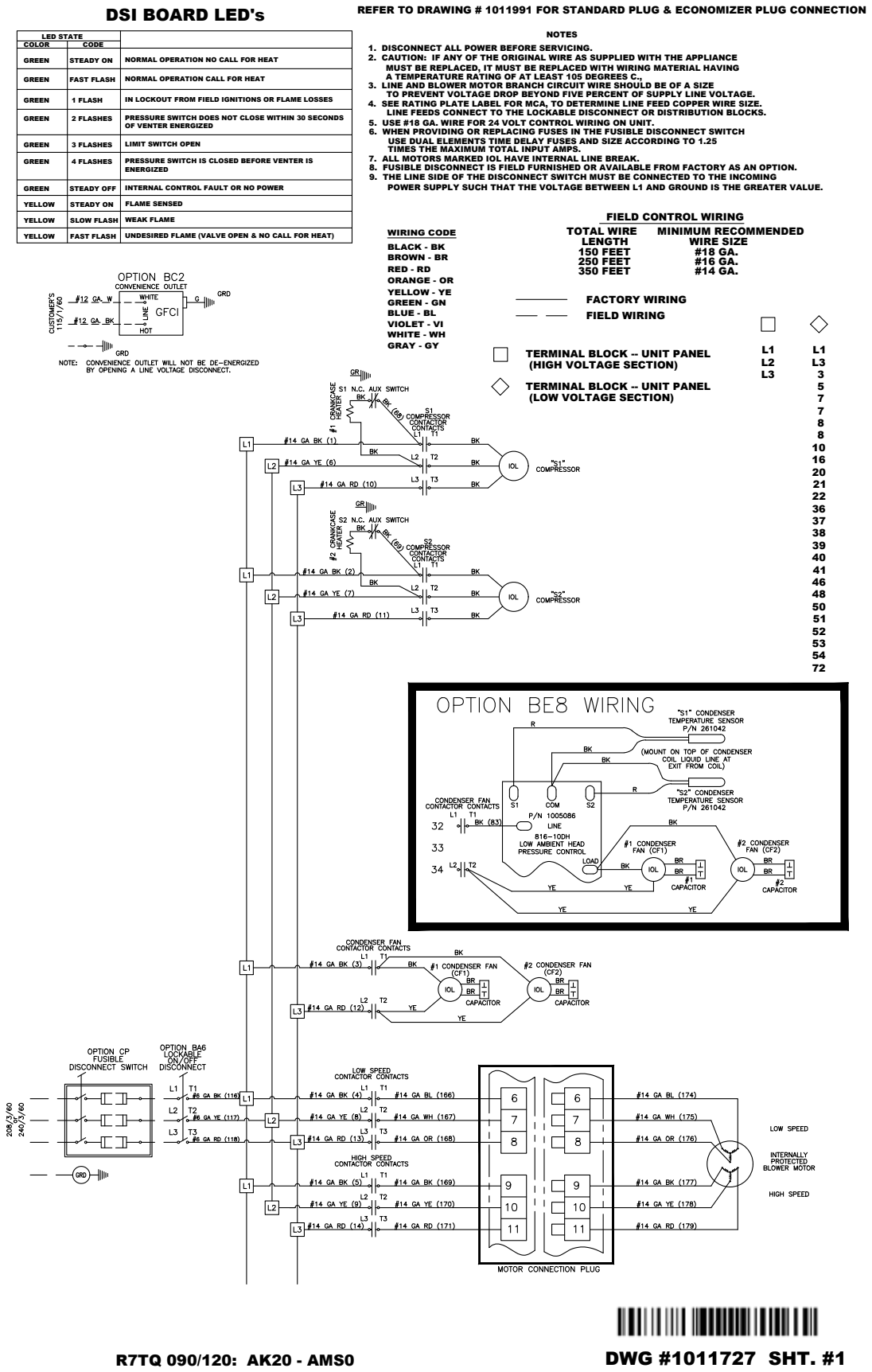
R7TQ 072: AK20 - AMS0 **DWG #1011721 SHT. #1**

Figure 16. Wiring Diagram for 072 Models (2-Speed Motor)



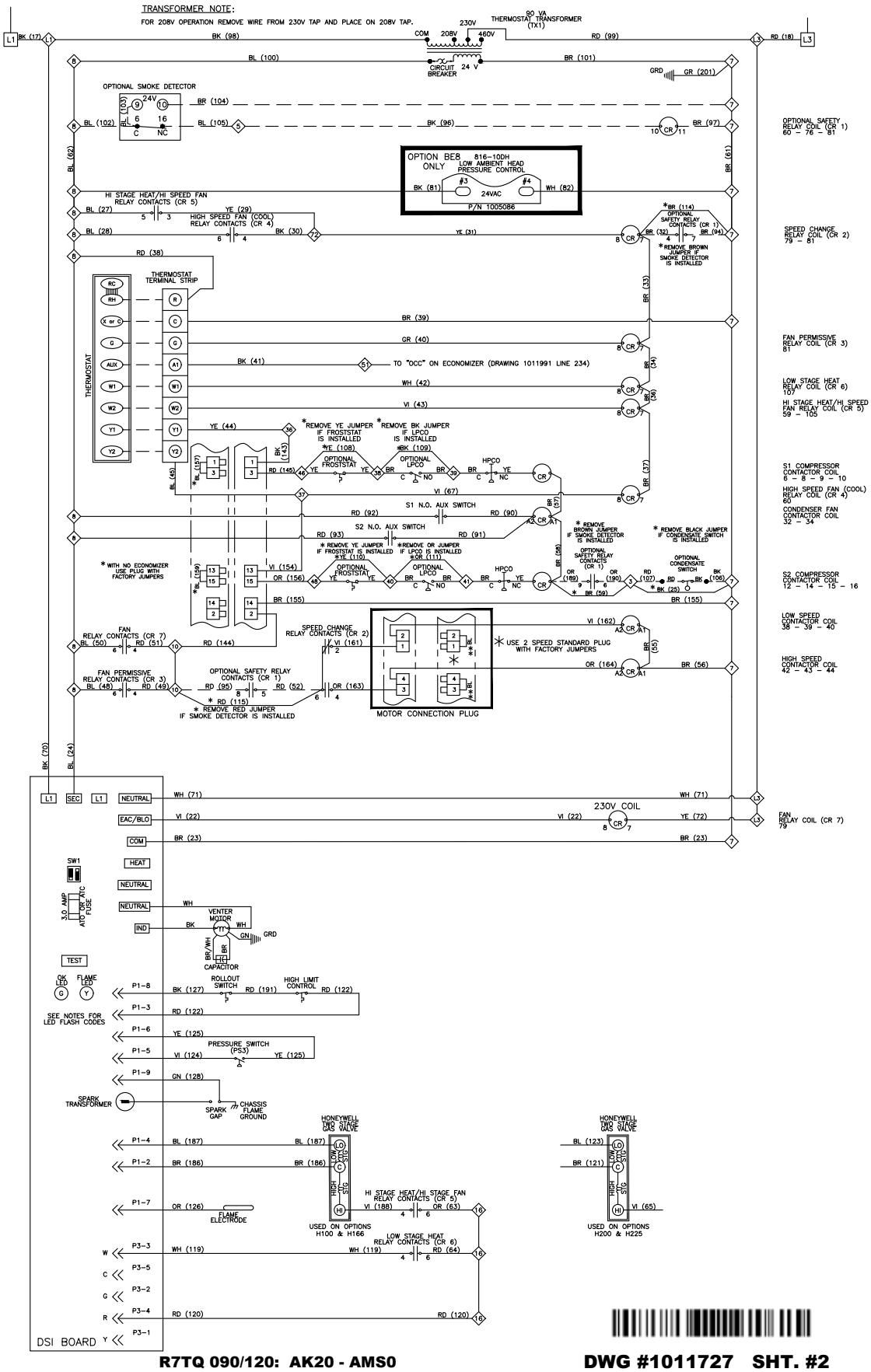
R7TQ 072: AK20 - AMS0 **DWG #1011721 SHT. #2**

Figure 16. Continued



LED STATE		
COLOR	CODE	
GREEN	STEADY ON	NORMAL OPERATION NO CALL FOR HEAT
GREEN	FAST FLASH	NORMAL OPERATION CALL FOR HEAT
GREEN	1 FLASH	IN LOCKOUT FROM FIELD IGNITIONS OR FLAME LOSSES
GREEN	2 FLASHES	PRESSURE SWITCH DOES NOT CLOSE WITHIN 30 SECONDS OF VENTER ENERGIZED
GREEN	3 FLASHES	LIMIT SWITCH OPEN
GREEN	4 FLASHES	PRESSURE SWITCH IS CLOSED BEFORE VENTER IS ENERGIZED
GREEN	STEADY OFF	INTERNAL CONTROL FAULT OR NO POWER
YELLOW	STEADY ON	FLAME SENSED
YELLOW	SLOW FLASH	WEAK FLAME
YELLOW	FAST FLASH	UNDESIRED FLAME (VALVE OPEN & NO CALL FOR HEAT)

Figure 17. Wiring Diagram for 090/120 Models (2-Speed Motor)



R7TQ 090/120: AK20 - AMS0 **DWG #1011727 SHT. #2**

Figure 17. Continued

DSI BOARD LED's

LED STATE		
COLOR	CODE	
GREEN	STEADY ON	NORMAL OPERATION NO CALL FOR HEAT
GREEN	FAST FLASH	NORMAL OPERATION CALL FOR HEAT
GREEN	1 FLASH	IN LOCKOUT FROM FIELD IGNITIONS OR FLAME LOSSES
GREEN	2 FLASHES	PRESSURE SWITCH DOES NOT CLOSE WITHIN 30 SECONDS OF VENTER ENERGIZED
GREEN	3 FLASHES	LIMIT SWITCH OPEN
GREEN	4 FLASHES	PRESSURE SWITCH IS CLOSED BEFORE VENTER IS ENERGIZED
GREEN	STEADY OFF	INTERNAL CONTROL FAULT OR NO POWER
YELLOW	STEADY ON	FLAME SENSED
YELLOW	SLOW FLASH	WEAK FLAME
YELLOW	FAST FLASH	UNDESIRED FLAME (VALVE OPEN & NO CALL FOR HEAT)

REFER TO DRAWING # 1011991 FOR STANDARD PLUG & ECONOMIZER PLUG CONNECTION

NOTES

1. DISCONNECT ALL POWER BEFORE SERVICING.
2. CAUTION: IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 105 DEGREES C.,
3. LINE AND BLOWER MOTOR BRANCH CIRCUIT WIRE SHOULD BE OF A SIZE TO PREVENT VOLTAGE DROP BEYOND FIVE PERCENT OF SUPPLY LINE VOLTAGE.
4. SEE RATING PLATE LABEL FOR MCA, TO DETERMINE LINE FEED COPPER WIRE SIZE. LINE FEEDS CONNECT TO THE LOCKABLE DISCONNECT OR DISTRIBUTION BLOCKS.
5. USE #18 GA. WIRE FOR 24 VOLT CONTROL WIRING ON UNIT.
6. WHEN PROVIDING OR REPLACING FUSES IN THE FUSIBLE DISCONNECT SWITCH USE DUAL ELEMENTS TIME DELAY FUSES AND SIZE ACCORDING TO 1.25 TIMES THE MAXIMUM TOTAL INPUT AMPS.
7. ALL MOTORS MARKED IOL HAVE INTERNAL LINE BREAK.
8. FUSIBLE DISCONNECT IS FIELD FURNISHED OR AVAILABLE FROM FACTORY AS AN OPTION.
9. THE LINE SIDE OF THE DISCONNECT SWITCH MUST BE CONNECTED TO THE INCOMING POWER SUPPLY SUCH THAT THE VOLTAGE BETWEEN L1 AND GROUND IS THE GREATER VALUE.

FIELD CONTROL WIRING

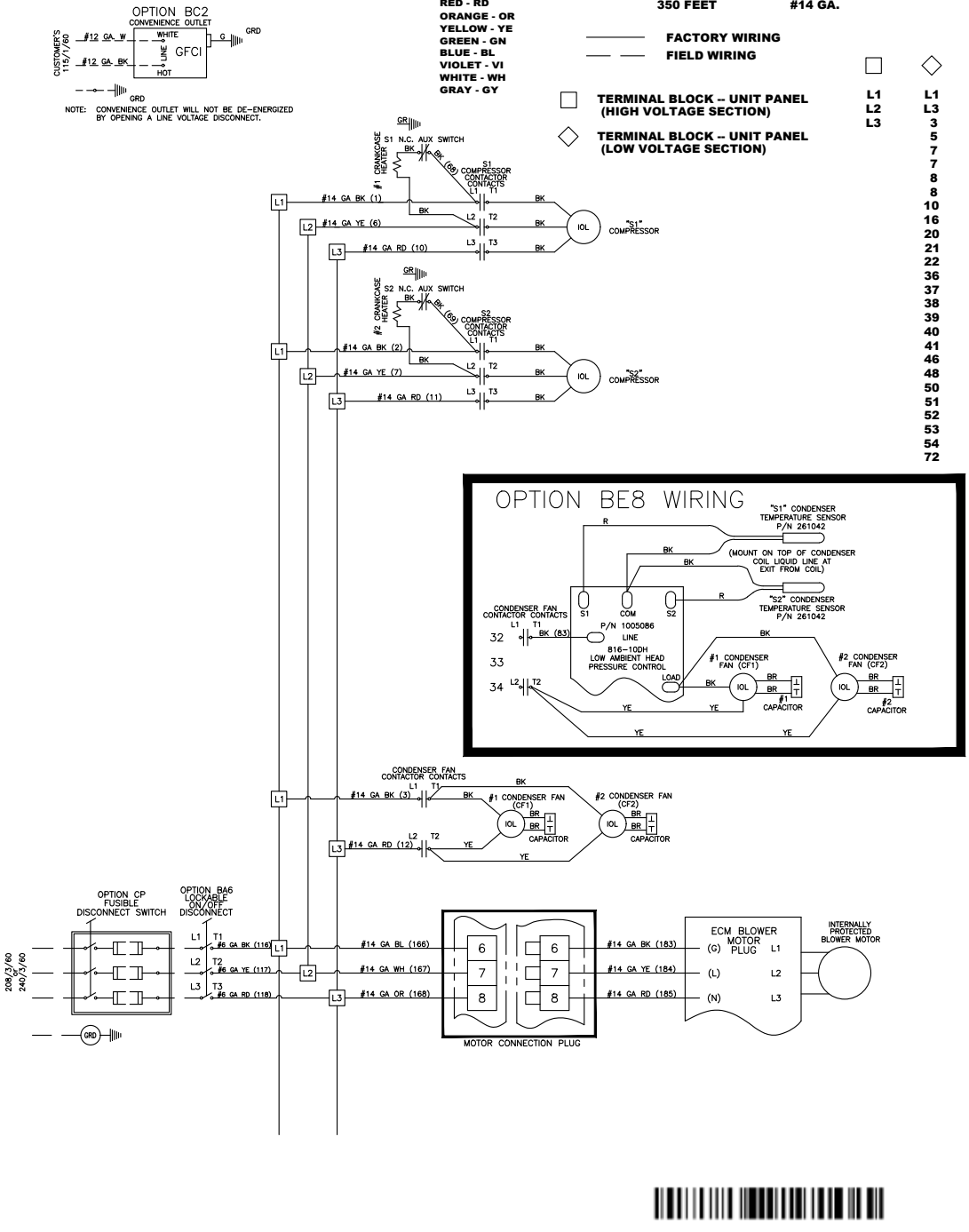
TOTAL WIRE LENGTH	MINIMUM RECOMMENDED WIRE SIZE
150 FEET	#18 GA.
250 FEET	#16 GA.
350 FEET	#14 GA.

WIRING CODE

BLACK - BK
BROWN - BR
RED - RD
ORANGE - OR
YELLOW - YE
GREEN - GN
BLUE - BL
VIOLET - VI
WHITE - WH
GRAY - GY

FACTORY WIRING
FIELD WIRING

TERMINAL BLOCK -- UNIT PANEL (HIGH VOLTAGE SECTION)
TERMINAL BLOCK -- UNIT PANEL (LOW VOLTAGE SECTION)



R7TQ 090/120: AK20 - AMS6

DWG #1011728 SHT. #1

Figure 18. Wiring Diagram for 090/120 Models With ECM Motor

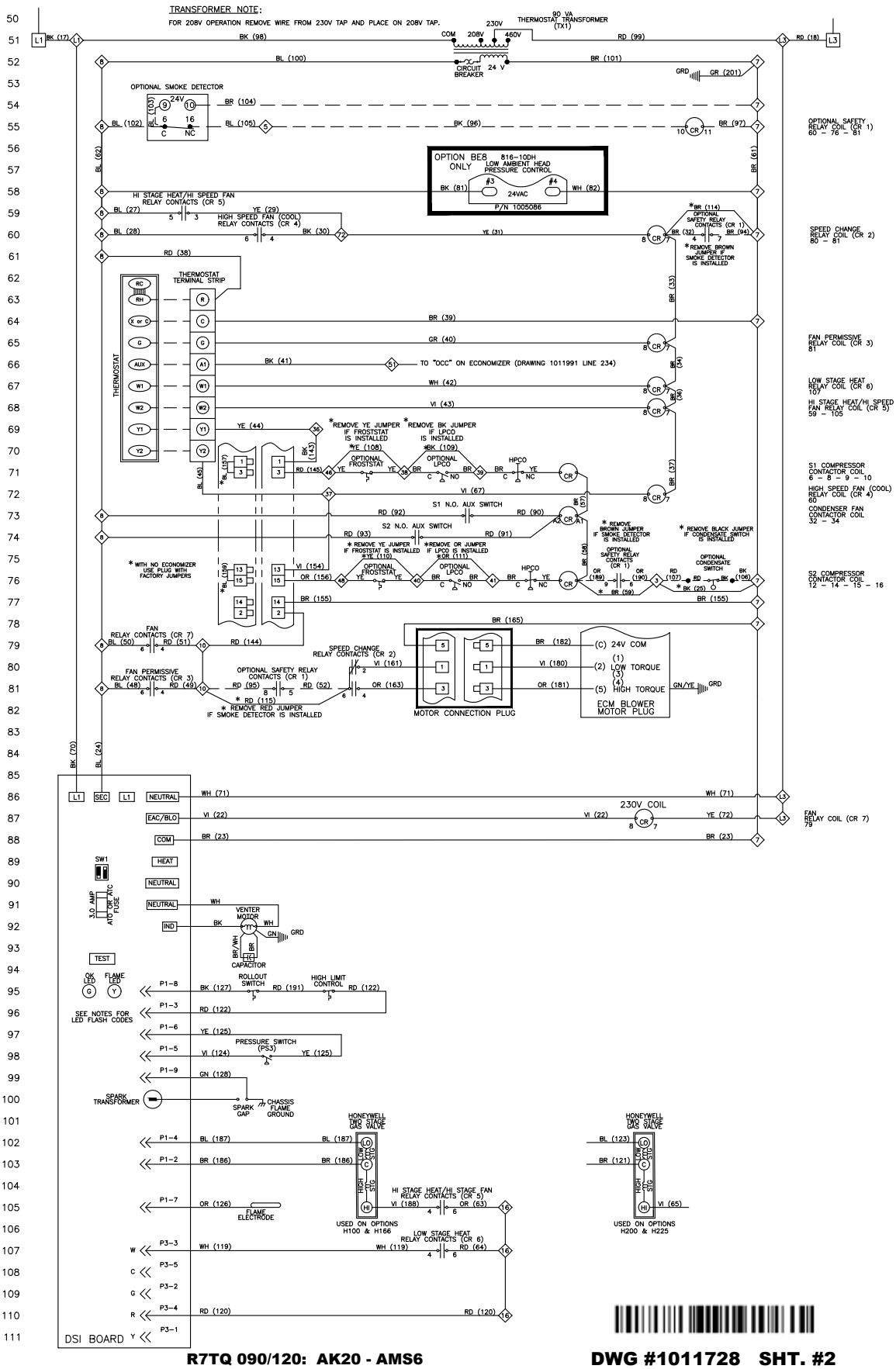


Figure 18. Continued

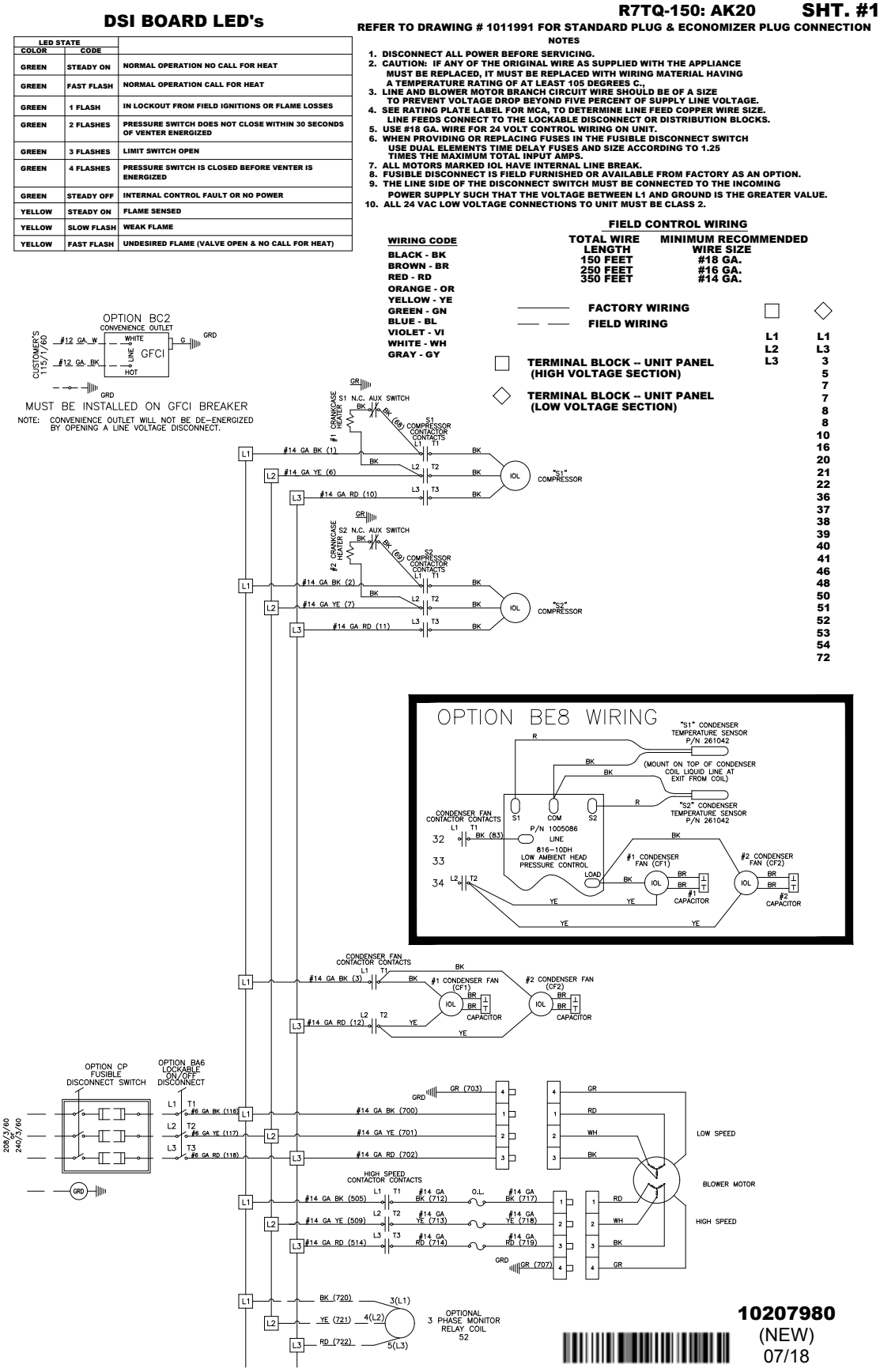


Figure 19. Wiring Diagram for 150 Models (208–230V)

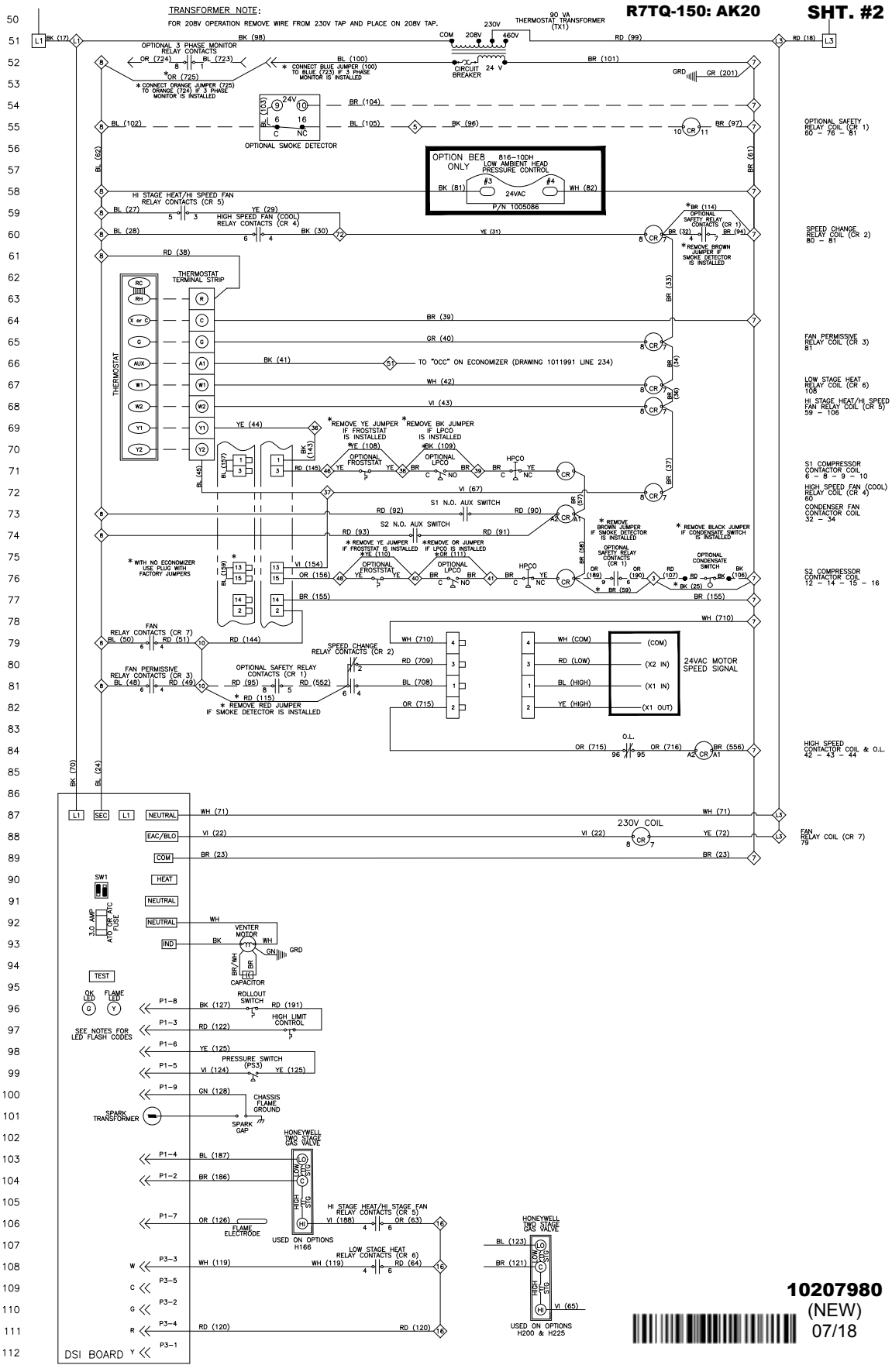


Figure 19. Continued

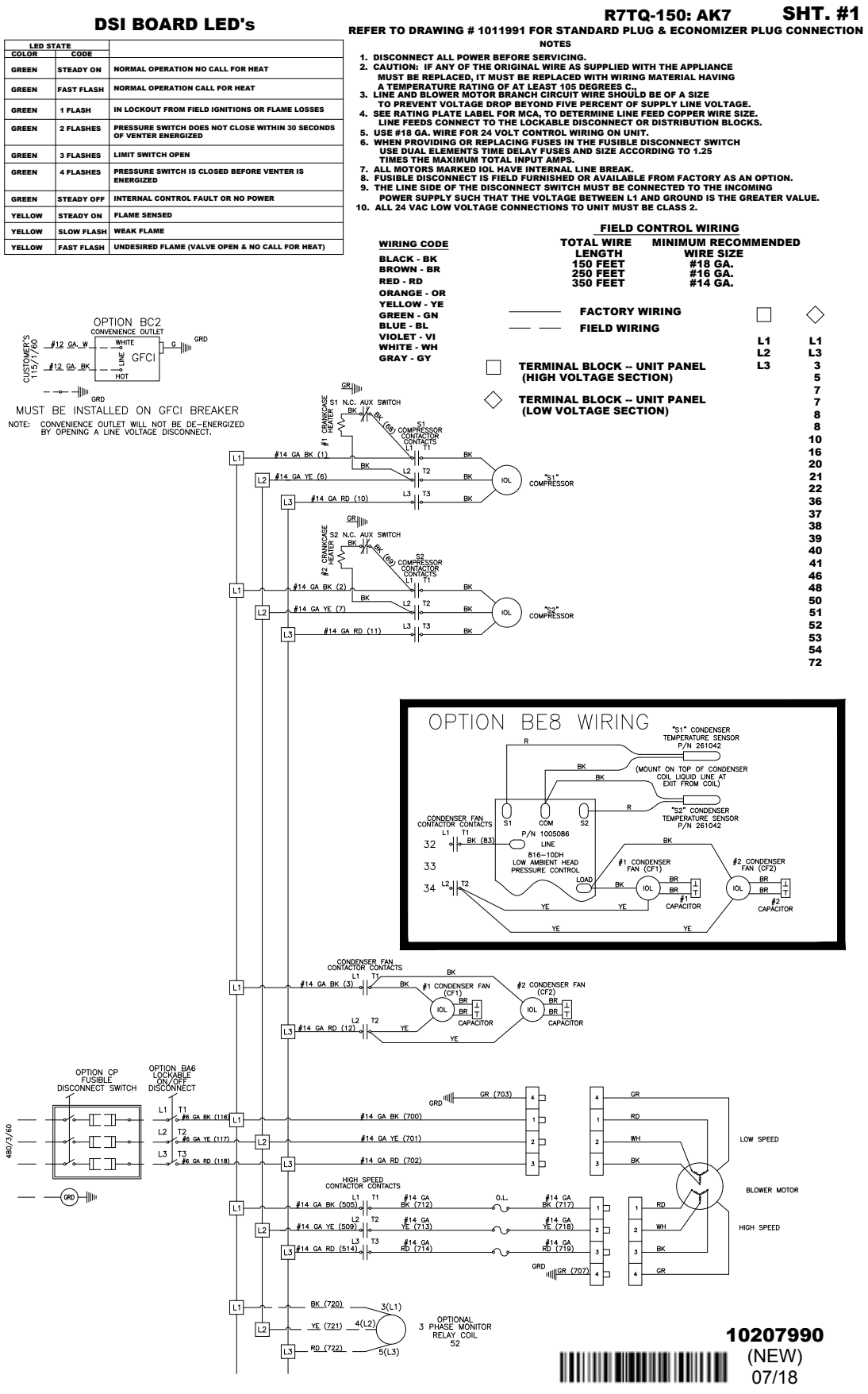


Figure 20. Wiring Diagram for 150 Models (460V)

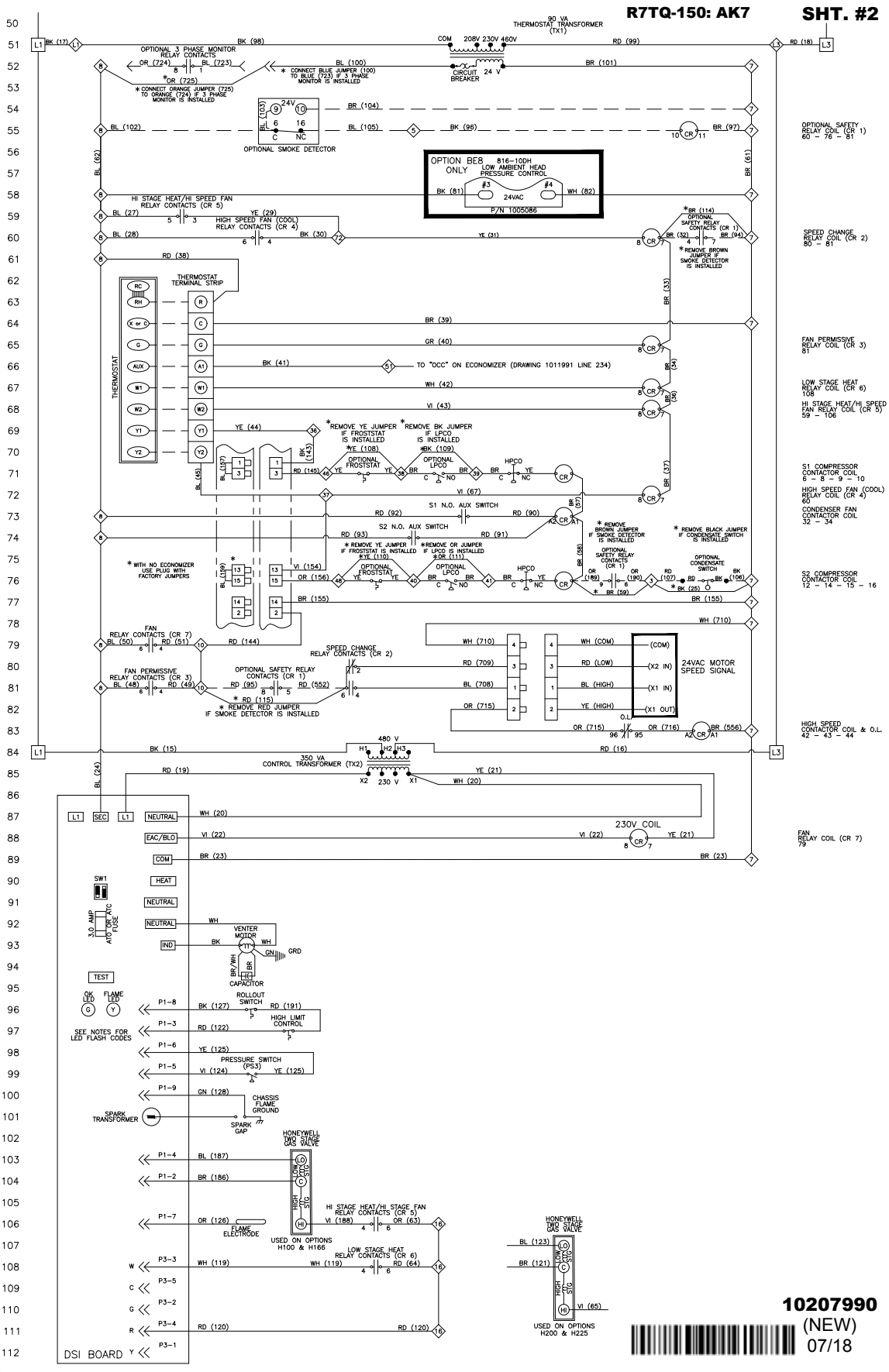


Figure 20. Continued

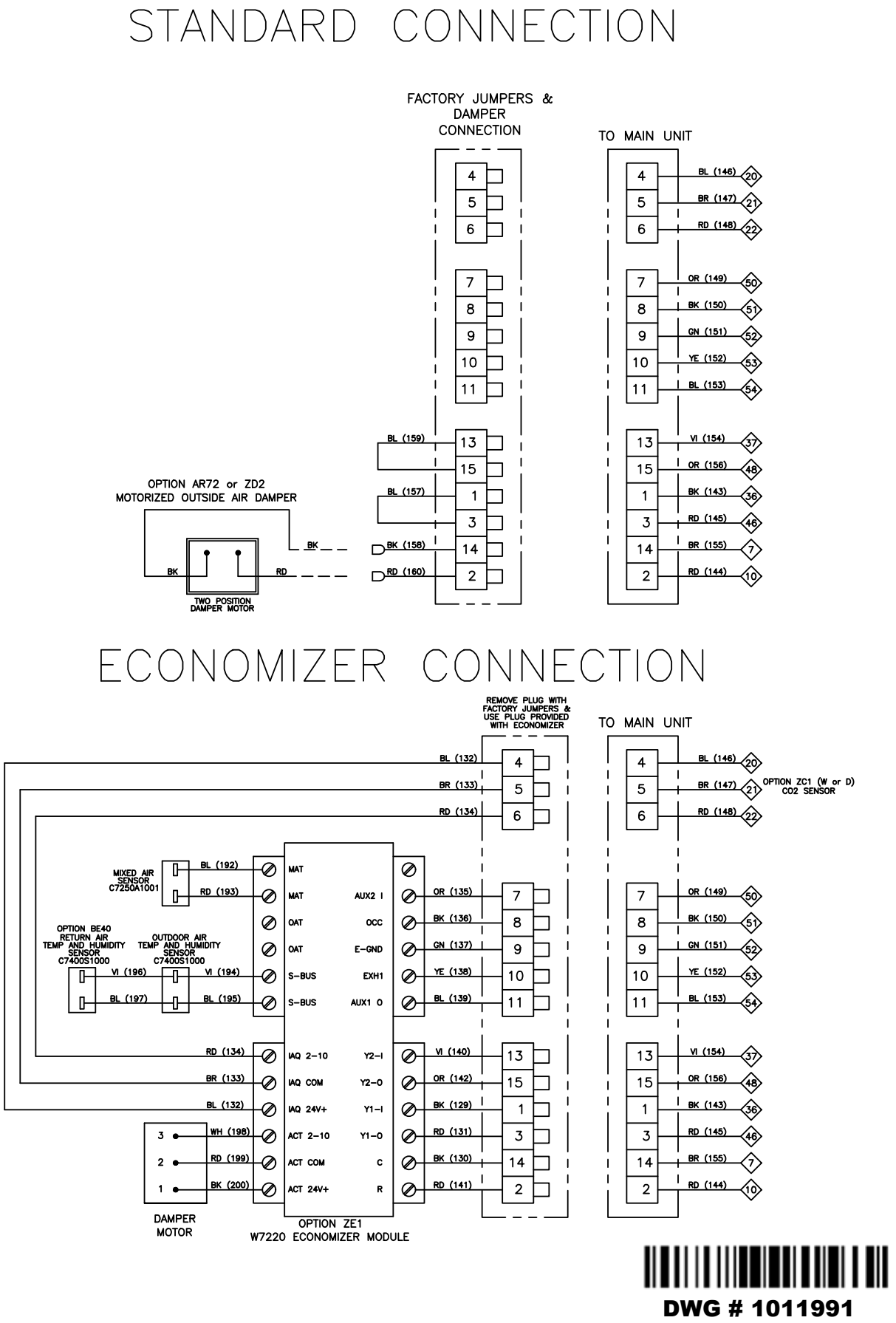


Figure 21. Wiring Diagram for Units with Optional Economizer

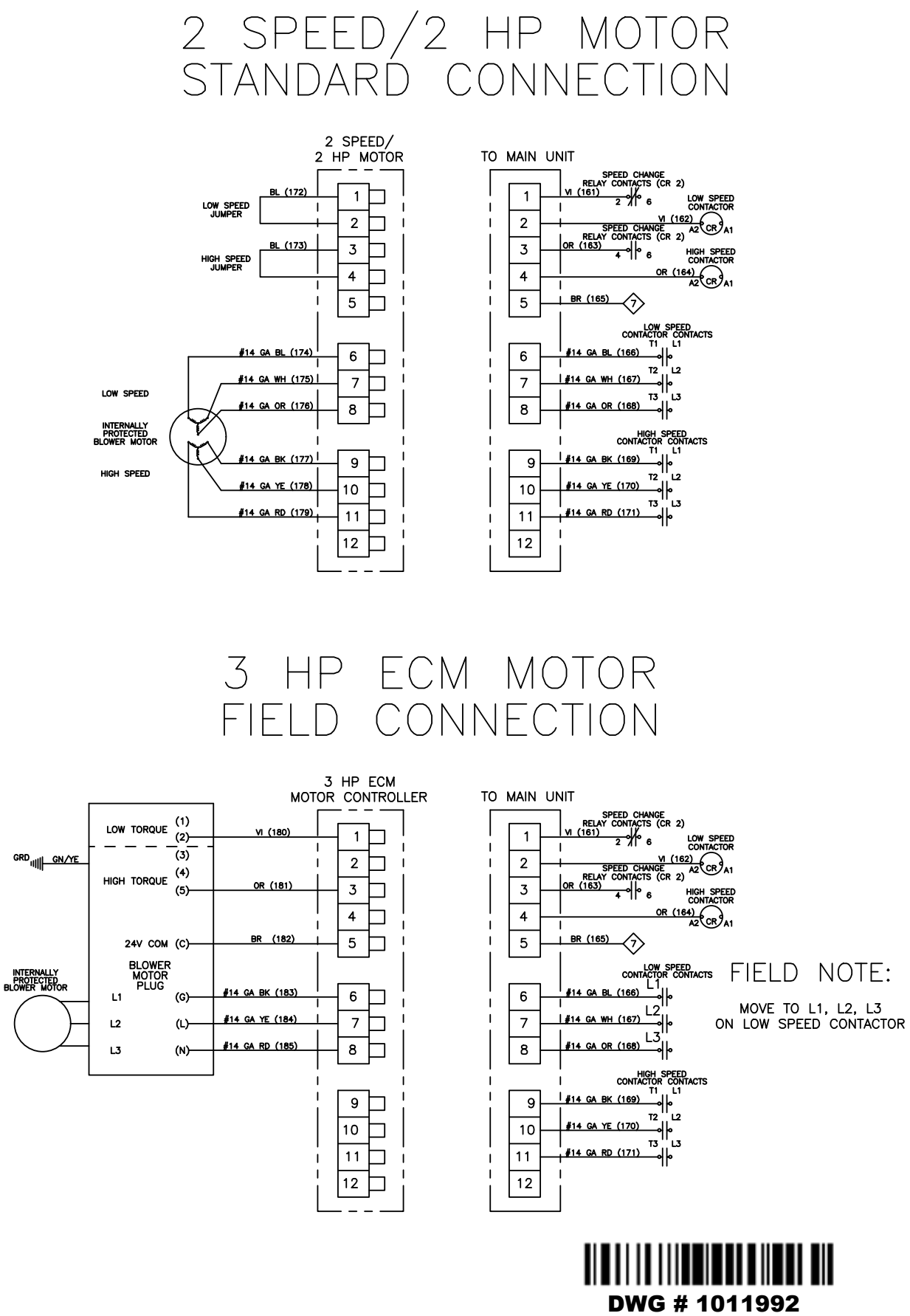


Figure 22. Wiring Diagram for Models With 3-HP ECM Motor

Gas Information

CAPACITY OF BLACK IRON GAS PIPE (CU. FT. PER HOUR) FOR NATURAL GAS (SPECIFIC GRAVITY - 0.60)								
NOMINAL PIPE DIAMETER (IN.)	LENGTH OF PIPE RUN (FEET)							
	10	20	30	40	50	60	70	80
1/2	130	90	75	65	55	50	45	40
3/4	280	190	150	130	115	105	95	90
1	520	350	285	245	215	195	180	170
1 1/4	1,050	730	590	500	440	400	370	350
1 1/2	1,600	1,100	890	760	670	610		

$$\text{Cubic Feet Per Hour Required} = \frac{\text{Input To Furnace (Btu/hr)}}{\text{Heating Value of Gas (Btu/Cu. Ft.)}}$$

NOTE: The cubic feet per hour listed in the table above must be greater than the cubic feet per hour of gas flow required by the furnace. To determine the cubic feet per hour of gas flow required by the furnace, divide the input rate of the furnace by the heating value (from gas supplier) of the gas.

Table 15. Gas Pipe Capacities

GAS FLOW RATES (CUBIC FEET PER HOUR)			
TIME FOR ONE REVOLUTION (SECONDS)	CUBIC FEET PER REVOLUTION OF GAS METER		
	1	5	10
10	360	1,800	3,600
12	300	1,500	3,000
14	257	1,286	2,571
16	225	1,125	2,250
18	200	1,000	2,000
20	180	900	1,800
22	164	818	1,636
24	150	750	1,500
26	138	692	1,385
28	129	643	1,286
30	120	600	1,200
32	113	563	1,125
34	106	529	1,059
36	100	500	1,000
38	95	474	947
40	90	450	900
42	86	429	857
44	82	409	818
46	78	391	783
48	75	375	750
50	72	360	720
52	69	346	692
54	67	333	667
56	64	321	643
58	62	310	621
60	60	300	600
62	58	290	581
64	56	281	563

GAS FLOW RATES (CUBIC FEET PER HOUR)			
TIME FOR ONE REVOLUTION (SECONDS)	CUBIC FEET PER REVOLUTION OF GAS METER		
	1	5	10
66	55	273	545
68	53	265	529
70	51	257	514
72	50	250	500
74	49	243	486
76	47	237	474
78	46	231	462
80	45	225	450
82	44	220	439
84	43	214	429
86	42	209	419
88	41	205	409
90	40	200	400
92	39	196	391
94	38	191	383
96	38	188	375
98	37	184	367
100	36	180	360
102	35	176	353
104	35	173	346
106	34	170	340
108	33	167	333
110	33	164	327
112	32	161	321
114	32	158	316
116	31	155	310
118	31	153	305
120	30	150	300

Table 16. Gas Flow Rates

Model	Heat Size mBTU	High Fire		Low Fire		Temp rise @ High fire	CFM
		Heating Input	Heating Output	Heating Input	Heating Output		
R7TQ-072-*L	100	100,000	81,000	70,000	56,700	25-55	2550
R7TQ-072-*H	166	166,000	134,460	116,200	94,122	30-60	2550
R7TQ-090-*L	166	166,000	134,460	116,200	94,122	30-60	3150
R7TQ-090-*M	200	200,000	162,000	140,000	113,400	30-60	3150
R7TQ-090-*H	225	225,000	182,250	157,500	127,575	25-55	3150
R7TQ-120-*L	166	166,000	134,460	116,200	94,122	30-60	3450
R7TQ-120-*M	200	200,000	162,000	140,000	113,400	30-60	3450
R7TQ-120-*H	225	225,000	182,250	157,500	127,575	25-55	3450
R7TQ-150-*L	166	166,000	134,460	116,200	94,122	30-60	4150
R7TQ-150-*M	200	200,000	162,000	140,000	113,400	35-65	4150
R7TQ-150-*H	225	225,000	182,250	157,500	127,575	40-70	4150

Table 17. Heat Rise and Range

mBTU	Std. to 2k	3k	4k	5k	6k	7k	8k	9k	10k	Orifice qty
100	30	31	31	31	31	32	32	33	35	2
166/200	31	31	32	32	33	34	35	36	37	4/5
225	.125	31	32	32	33	34	35	36	37	5

Table 18. Natural Gas High Altitude (Feet) Drill Sizes

mBTU	to 2k	3k	4k	5k	6k	7k	8k	9k	10k	Orifice qty
100	46	47	47	48	48	49	49	50	50	2
166/200	50	50	50	51	51	51	52	52	52	4/5
225	48	49	49	50	50	50	51	51	52	5

NOTE: Refer to Instructions for High Altitude Deration section (page 41) to determine heat exchanger capacity at increased elevations

Table 19. LP Gas Conversion and LP Gas High Altitude (Feet) Conversion Drill Sizes

MANIFOLD PRESSURE (IN WC)		
TYPE	HIGH	LOW
Natural Gas	3.5	1.8
LP Gas	10	5

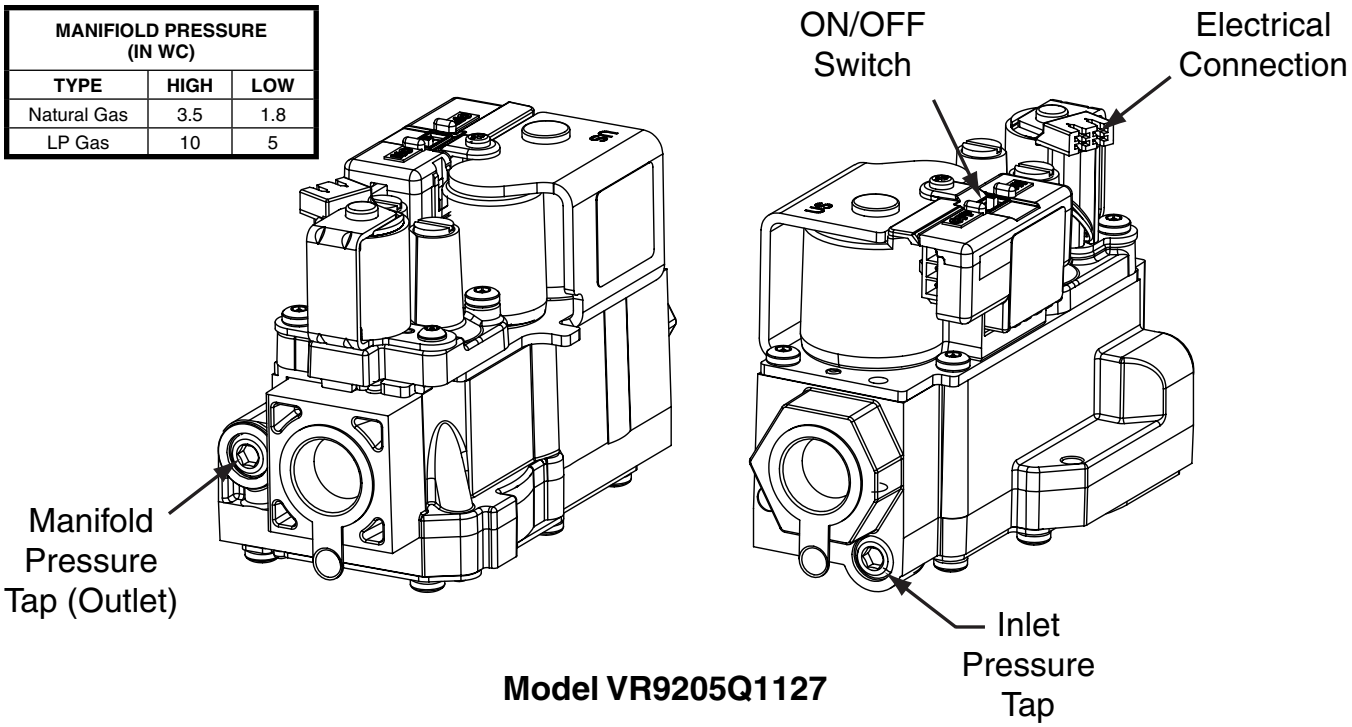


Figure 23. Inlet and Manifold Pressure Tap Locations

HONEYWELL MODEL VR9205Q1127 - 100,000 AND 166,000 HEAT SIZES - (PN 624787)

IMPORTANT NOTES:

- **When converting to LP/Propane gas from natural gas, the springs from gas valve must be replaced by the larger springs from the kit. The LP/Propane springs for both HIGH and LOW fire are the same size, shape and color.**
- **Use only a Torx-25 or 3/16-inch flathead screwdriver when removing adjustment screws or during pressure adjustment.**

1. Remove the HIGH fire cap screw. See Figure 24.
2. Remove and discard the HIGH fire adjustment screw from the gas valve.
3. Remove the spring from the gas valve and discard.
4. Install a larger spring from the conversion kit.
5. Install a new adjusting screw from the kit.
6. Repeat steps 1–5 for replacement of the LOW fire spring and adjustment screw.
7. Check and adjust the regulator setting. See Gas Pressure Adjustment Section.
8. Reinstall the cap screws on the HIGH and LOW regulators. Plastic replacement cap screws are provided in the conversion kit.
9. Affix the label from the conversion kit to the gas valve.

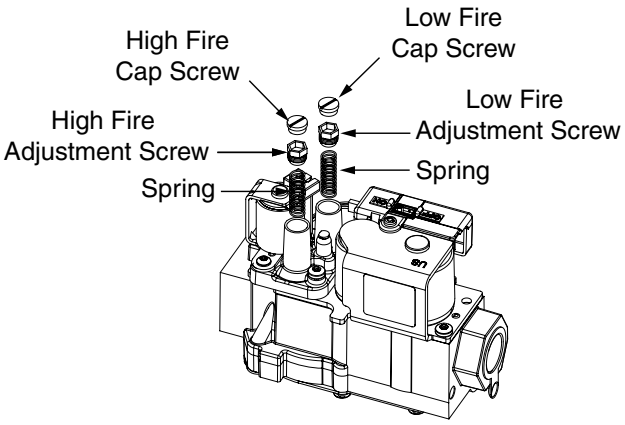


Figure 24. Regulator Spring and Adjustment Screw Removal

HONEYWELL VR8305 (PN 197067)
Direct Ignition Dual Automatic Valve Combination Gas Control
Valve is used for the following heat sizes: 200,000 and 225,000 BTUH

Converting Between Natural and LP Gas

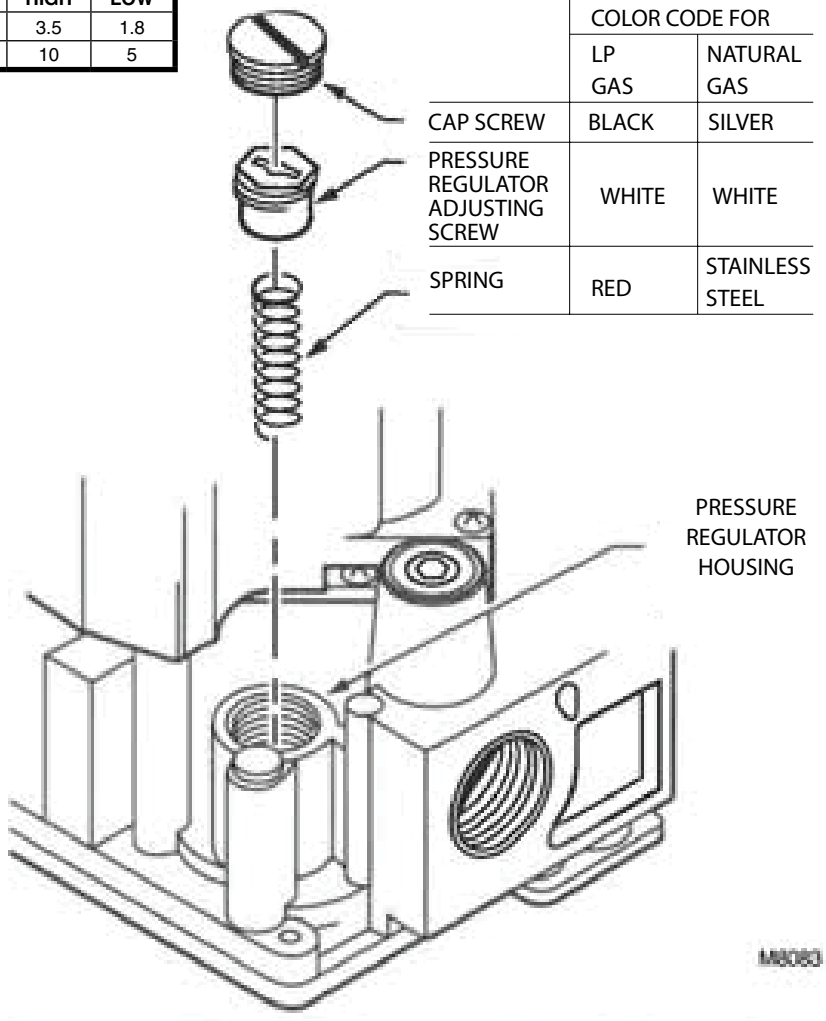
VR8305 gas controls can be converted from one gas to another. To convert from natural gas to LP, use the 393691 LP Conversion Kit that is included with the VR8305 Gas Control. To convert from LP to natural gas, use the 394588 Natural Gas Conversion Kit (order separately). Step-opening gas controls cannot be converted.

To convert control from one gas to another:

1. Turn off main gas supply to the appliance.
2. Remove the regulator cap screw and pressure regulator adjusting screw. See illustration below.
3. Remove the existing spring.
4 Insert the replacement spring with tapered end down. See Fig. 2.
5. Install the new plastic pressure regulator adjustment screw so that the top of the screw is flush (level) with the top of the regulator. Turn the pressure regulator adjustment screw clockwise ↷ six complete turns. This provides a preliminary pressure setting of about 10.0 IN WC [2.5 kPa] for LP regulator and 3.5 IN WC [0.9 kPa] for natural gas regulator.
6. Check the regulator setting either with a manometer or by clocking the gas meter. Refer to Start-Up and Checkout on page 8.
7. Install the new cap screw.
8. Mount conversion label on control.
9. Install control and appliance according to appliance manufacturer's instructions.

MANIFIOLD PRESSURE (IN WC)		
TYPE	HIGH	LOW
Natural Gas	3.5	1.8
LP Gas	10	5

	COLOR CODE FOR	
	LP GAS	NATURAL GAS
CAP SCREW	BLACK	SILVER
PRESSURE REGULATOR ADJUSTING SCREW	WHITE	WHITE
SPRING	RED	STAINLESS STEEL



Installation of conversion kit in regulated gas control.

Figure 25. Honeywell Gas Valve (VR8305)

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING: If you do not follow these instructions exactly fire or explosion may result causing property damage, personal injury, or loss of life.

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
B. BEFORE OPERATING, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS.

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

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or move by hand, do not try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

POUR VOTRE SÉCURITÉ, VEUILLEZ LIRE CE QUI SUIT AVANT L'UTILISATION

AVERTISSEMENT : Si ces directives ne sont pas respectées à la lettre, un incendie ou une explosion pourrait survenir et causer des dommages matériels, des blessures ou des pertes de vie.

A. Cet appareil n'est pas doté d'une veilleuse d'allumage. Il est pourvu d'un dispositif d'allumage qui allume automatiquement le brûleur. N'essayez pas d'allumer le brûleur de façon manuelle.
B. AVANT DE FAIRE FONCTIONNER L'APPAREIL, sentez tout autour de l'appareil pour déceler toute odeur de gaz. Sentez à proximité du sol, car certains gaz sont plus lourds que l'air et se déposent sur le sol.

QUE FAIRE S'IL Y A UNE ODEUR DE GAZ.

- N'essayez d'allumer aucun appareil.
- Ne touchez à aucun interrupteur électrique; n'utilisez aucun téléphone dans le bâtiment.
- Appelez immédiatement le fournisseur de gaz en employant le téléphone d'un voisin. Respectez les instructions du fournisseur de gaz.
- Si personne ne répond, appelez le service des incendies.

C. Enfoncez ou faites tourner le robinet à gaz à la main seulement. N'utilisez jamais d'outils. S'il n'est pas possible de faire tourner ou d'enfoncer le robinet à la main, n'essayez pas de le réparer. Faites appel à un spécialiste. Si vous forcez l'interrupteur ou tentez de le réparer, cela pourrait causer un incendie ou une explosion.
D. N'utilisez pas cet appareil si l'une de ses pièces a été immergée dans de l'eau. Appelez immédiatement un technicien qualifié pour inspecter l'appareil et remplacer toute pièce du système de commande ou toute commande de gaz qui a été immergée dans de l'eau.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set the thermostat to the lowest setting.
3. Turn off all electrical power to the appliance.
4. The appliance's ignition device automatically lights the burner. Do not try to light burner by hand.
5. Remove the control access door/panel (upper door if two-door model).
6. Move the gas control switch to the "OFF" position. (See Figure 1)
7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in above information. If you don't smell gas, go to the next step.
8. Move the gas control switch to the "ON" position. (See Figure 1)
9. Replace the control access door/panel (upper door if two-door model).
10. Turn on all electrical power to the appliance.
11. Turn the thermostat to a desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

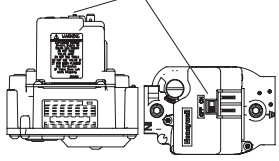


Figure 1

DIRECTIVES DE FONCTIONNEMENT

1. **ARRÊTEZ!** Veuillez lire les renseignements de sécurité à la partie supérieure de la présente étiquette.
2. Réglez le thermostat au réglage le plus bas.
3. Coupez l'alimentation électrique à l'appareil.
4. Cet appareil ménager étant doté d'un système d'allumage automatique, n'essayez pas d'allumer le brûleur manuellement.
5. Retirez le panneau/volet d'accès de commande (panneau supérieur s'il s'agit d'un modèle à deux panneaux).
6. Réglez l'interrupteur de commande du gaz en position « OFF » (arrêt). (Voyez la Figure 1.)
7. Attendez cinq (5) minutes pour s'assurer de la dissipation du gaz. Vérifiez alors s'il y a une odeur de gaz, y compris au niveau du sol. En cas d'odeur, ARRÊTEZ LE PROCÉDÉ! Suivez les instructions ci-dessus (Section B). Si vous ne remarquez aucune odeur de gaz, passez à l'étape suivante.
8. Réglez l'interrupteur de commande du gaz en position « ON » (marche). (Voyez la Figure 1.)
9. Remettez le panneau/volet d'accès de commande en place (panneau supérieur s'il s'agit d'un modèle à deux panneaux).
10. Allumez toute alimentation électrique à l'appareil.
11. Ajustez le thermostat à la position désirée.
12. Si l'appareil ne fonctionne pas, suivez les directives de la section « Pour couper l'alimentation en gaz de l'appareil » et appelez un technicien ou le fournisseur de gaz.

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to the lowest setting.
2. Turn off all electrical power to the appliance if service is to be performed.
3. Remove the control access door/panel (upper door if two-door model).
4. Move the gas control switch to the "OFF" position. Do not use force. (See Figure 1)
5. Replace the control access door/panel (upper door if two-door model).

POUR COUPER L'ALIMENTATION EN GAZ DE L'APPAREIL

1. Réglez le thermostat au réglage le plus bas.
2. Coupez toute alimentation électrique à l'appareil si un entretien doit être effectué.
3. Retirez le panneau/volet d'accès de commande (panneau supérieur s'il s'agit d'un modèle à deux panneaux).
4. Tournez l'interrupteur de commande du gaz en position « OFF » (arrêt). Ne forcez pas. (Voyez la Figure 1.)
5. Remettez le panneau/volet d'accès de commande en place (panneau supérieur s'il s'agit d'un modèle à deux panneaux).

710674-0 (Replaces/remplace 7104030)(03/07)

Figure 26. Gas Valve Label for 100 and 166 kBTU Models - Operating Instructions

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury, or loss of life.

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

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

WHAT TO DO IF YOU SMELL GAS

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

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

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

POUR VOTRE SÉCURITÉ. À LIRE AVANT L'EMPLOI

ATTENTION! L'inobservation de ces instructions peut entraîner un incendie ou une explosion pouvant causer des dammages à votre propriété à votre personne, ou la mort.

A. Cet appareil ménager n'a pas de veilleuse. Il est doté d'un système d'allumage automatique. Ne pas essayer d'allumer le brûleur manuellement.

B. AVANT L'USAGE. Attention à une possible odeur de gaz surtout au niveau du plancher où les gaz les plus lourds ont la tendance de se concentrer.

EN CAS D'ODEUR DE GAZ.

- Ne mettre en marche aucun appareil électrique.
- Ne toucher à aucun commutateur électrique, ne pas employer le téléphone.
- Quitter le bâtiment immédiatement et avertir la compagnie du gaz en utili sant le téléphone d'un voisin.
- A défaut de la compagnie du gaz, avertir le service des pompiers.

C. Enfoncer ou faire tourner le robinet à gaz à la main seulement. Ne jamais utiliser d'outils. S'il n'est pas possible de faire tourner ou d'enfoncer le robinet à la main, ne pas essayer de le réparer. Faire appel à un spécialiste. Forcer ou tenter de réparer le robinet pourrait être à l'origine d'une explosion ou d'un incendie.

D. Il est déconseillé d'utiliser cet appareil en contact prolongé avec l'eau. Faire inspecter ou remplacer toute commande par un technicien qualifié si un des systèmes de contrôle du gaz s'est trouvé sous l'eau.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set the thermostat to the lowest setting.
3. Turn off all electrical power to the appliance.
4. The appliance's ignition device automatically lights the burner. Do not try to light burner by hand.
5. Remove the control access door/panel (upper door if two-door model).
6. Move the gas control knob clockwise ↷ to "OFF". (See Figure 1)
7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in above information. If you don't smell gas, go to the next step.
8. Move the gas control knob counterclockwise ↶ to "ON". (See Figure 1)
9. Replace the control access door/panel (upper door if two-door model).
10. Turn on all electrical power to the appliance.
11. Turn the thermostat to a desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

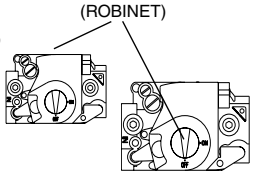


Figure 1

MODE D'EMPLOI

1. **ATTENTION!** Lire d'abord la liste des mesures de sécurité ci-dessus.
2. Mettre le thermostat à la position minimale.
3. Couper le courant électrique qui mène à l'appareil.
4. Cet appareil ménager étant doté d'un système d'allumage automatique, ne pas essayer d'allumer le brûleur manuellement.
5. Retirer le panneau/volet d'accès de commande (panneau supérieur s'il s'agit d'un modèle à deux panneaux).
6. Faire tourner le robinet à gaz dans le sens des aiguilles d'une montre ↷ pour l'amener sur la position OFF (Arrêt) (Voir Figure 1).
7. Attendre cinq (5) minutes pour s'assurer de la dissipation du gaz.
   En cas d'odeur, ARRÊTER LE PROCÉDÉ. Suivre les instructions ci-dessus (Section B). En l'absence de toute odeur de gaz, avancer à l'étape suivante.
8. Faire tourner le robinet à gaz dans le sens inverse des aiguilles d'une montre ↶ pour l'amener sur la position ON (Marche) (Voir Figure 1).
9. Remettre le panneau/volet d'accès de commande en place (panneau supérieur s'il s'agit d'un modèle à deux panneaux).
10. Rebrancher l'appareil sur le réseau électrique.
11. Ajuster le thermostat à la position désirée.
12. Si l'appareil ne fonctionne pas, suivre les "Directives d'arrêt" cidessous et appeler le technicien de service.

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to the lowest setting.
2. Turn off all electrical power to the appliance if service is to be performed.
3. Remove the control access door/panel (upper door if two-door model).
4. Move the gas control knob clockwise ↷ to "OFF". Do not use force. (See Figure 1)
5. Replace the control access door/panel (upper door if two-door model).

DIRECTIVES D'ARRÊT

1. Mettre le thermostat à la position minimale.
2. Débrancher l'appareil en prévision de la réparation.
3. Retirer le panneau/volet d'accès de commande (panneau supérieur s'il s'agit d'un modèle à deux panneaux).
4. Faire tourner le robinet à gaz dans le sens des aiguilles d'une montre ↷ pour l'amener sur la position OFF (Arrêt) Ne pas forcer (Voir Figure 1).
5. Remettre le panneau/volet d'accès de commande en place (panneau supérieur s'il s'agit d'un modèle à deux panneaux).

7106750 (Replaces 710329A) (03/07)

Figure 27. Gas Valve Label for 200 and 225 kBTU Models - Operating Instructions

Charging Charts and Application Notes

This equipment's cooling systems contain refrigerant under high pressure, always use safe practices when servicing the unit. Always review the factory literature and safety warnings prior to servicing.

All R7TQ units are shipped from the factory with the proper amount and type of refrigerant. Always inspect the unit rating label to determine the unit's information prior to working on the system. Do not mix different refrigerants or charge the unit with a refrigerant not listed on the unit rating label.

The charging charts are valid for a variety of indoor, return air conditions and are most highly influenced by the outdoor ambient temperature, outdoor fan operation and the unit operating voltage. Before referencing the charts, always ensure that all compressor circuits are energized and have stable operation. As can be seen in the charging charts, the ideal system sub-cooling can vary over the range of operation. See Figure 28, Figure 29 (page 56), Figure 30, and Figure 31 (page 57). Always reference the charts to determine the ideal amount of sub-cooling for a given liquid pressure. Units charged to other values will not perform at the rated unit efficiency (EER). See Table 20.

To inspect a systems operation, using quality instruments, match the measured liquid temperature to the units chart. The measured liquid pressure reading should be within 3% of the value shown for most installations. For two stage systems, the charts are valid for both compressor stages.

Do not utilize the charts for two stage systems operating only under a single stage call for cooling.

Do not utilize the charts in systems that do not have all the outdoor fans energized, or have the fans cycling under a low-ambient control. Refer to the low-ambient kit instructions for more information, if applicable.

For systems that are operating with more than a 5% deviation, inspect the unit for leaks first and see Note in Table 20. Always use safe and environmentally sound methods for refrigerant handling. When repairing system leakages, always utilize a nitrogen (inert) gas to protect the refrigerant system and pressure check the repair before re-charging. Always replace the filter-dryers when performing any repair to the refrigeration system. After completing the repairs, evacuate the system to 350-500 microns and weight in the refrigerant to the amount specified on the unit rating label.

NOMINAL TONNAGE	STAGE 1 CHARGE LEVEL	STAGE 2 CHARGE LEVEL
6	126 Oz.	N/A
7 1/2	93 Oz.	94 Oz.
10	97 Oz.	94 Oz.
12.5	115 Oz.	123 Oz.

NOTE: If unit is unable to operate within above guidelines and equipped with an adjustable txv, the txv can be adjusted (not recommended) by turning cw to close (increase sub-cooling) and ccw to open (lower sub-cooling).

Table 20. Refrigerant Charge Table

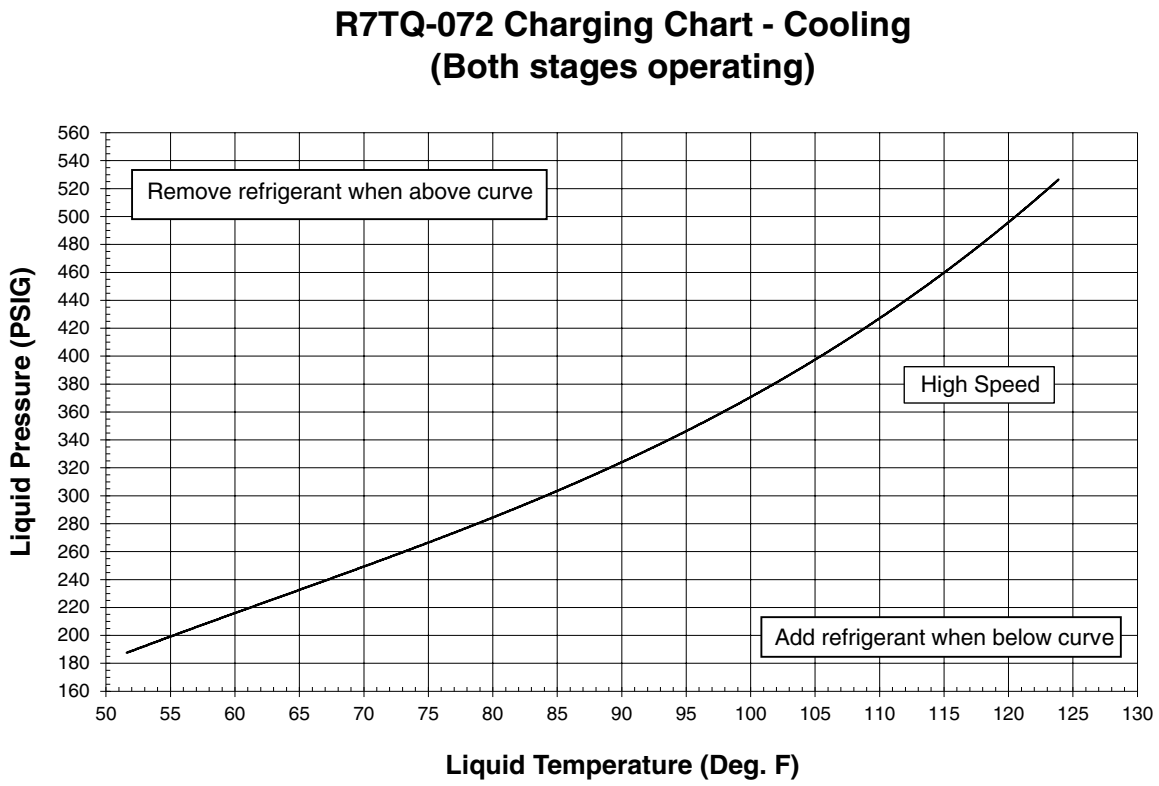


Figure 28. R7TQ-072 Charging Chart (6-Ton)

R7TQ-090 Charging Chart - Cooling (Both stages operating)

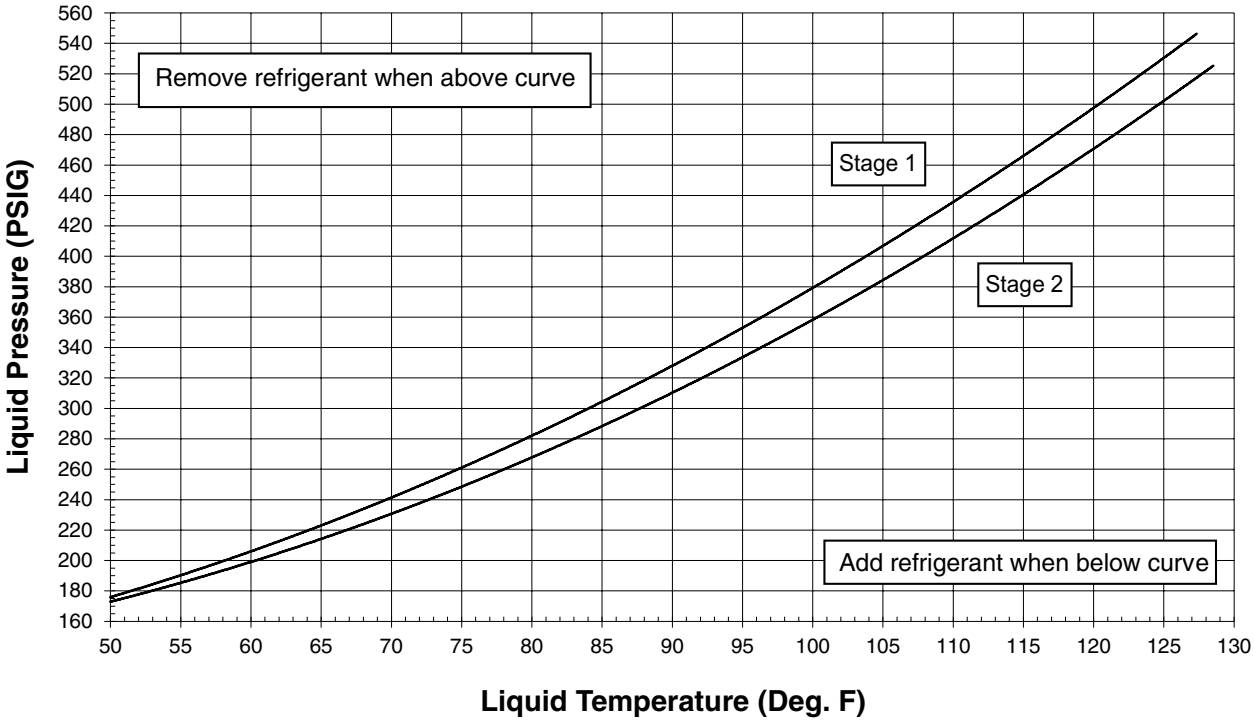


Figure 29. R7TQ-090 Charging Chart (7.5-Ton)

R7TQ-120 Charging Chart - Cooling (Both stages operating)

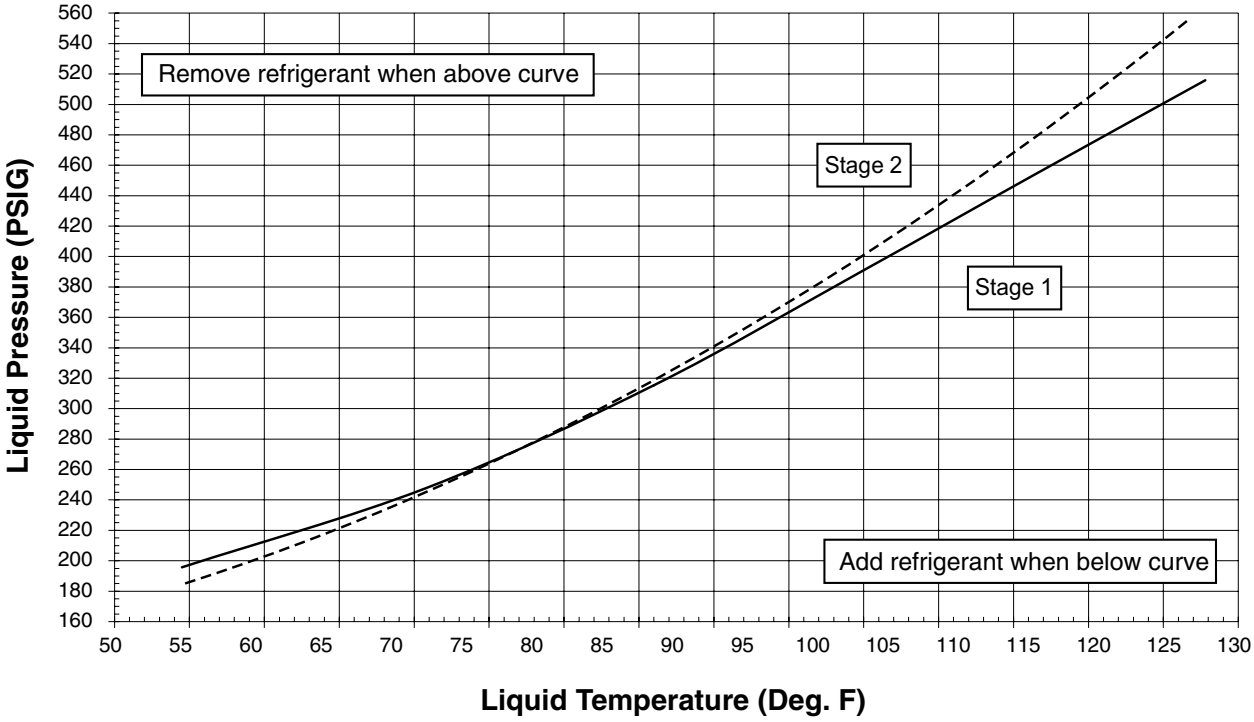


Figure 30. R7TQ-120 Charging Chart (10-Ton)

R7TQ-150 Charging Chart - Cooling
(Both stages operating)

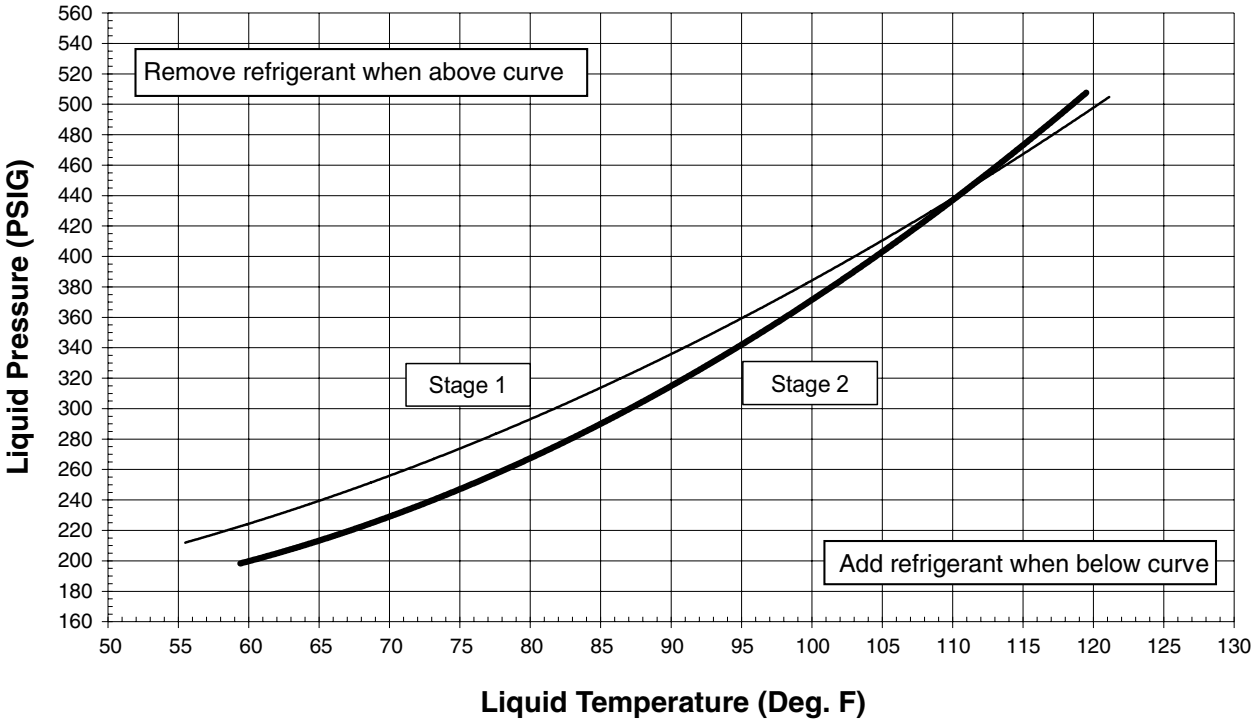


Figure 31. R7TQ-150 Charging Chart (12.5-Ton)

INSTALLATION CHECKLIST

INSTALLATION ADDRESS:		
CITY:	STATE:	
UNIT MODEL #		
UNIT SERIAL #		
Unit Installed Minimum clearances per Figure 1 (page 5)?	YES	NO
INSTALLER NAME:		
CITY:	STATE:	
Has the owner's information been reviewed with the customer?	YES	NO
Has the Literature Package been left with the unit?	YES	NO

ELECTRICAL SYSTEM		
Electrical connections tight?	YES	NO
Line voltage polarity correct?	YES	NO
Has the thermostat been calibrated?	YES	NO
Is the thermostat level?	YES	NO
Is the heat anticipator setting correct?	YES	NO
Single Phase Units		
Rated Voltage	VOLTS:	
L1-L2 Volts	VOLTS:	
3–Phase Units		
Rated Voltage	VOLTS:	
L1-L2 Volts	VOLTS:	
L1-L3 Volts	VOLTS:	
L2-L3 Volts	VOLTS:	
Avg. Volts	VOLTS:	
Max. deviation of voltage from avg. volts	VOLTS:	
% Volt Imbalance:	VOLTS:	

VENTING SYSTEM		
Is the heat exchanger and vent cover installed?	YES	NO
Is vent free of restrictions?	YES	NO
Filter(s) secured in place?	YES	NO
Filter(s) clean?	YES	NO

GAS SYSTEM		
Gas Type: (circle one)	Natural Gas	Propane
Gas pipe connections leak-tested?	YES	NO
Gas Line Pressure	in - W.C.	
Is there adequate fresh air supply for combustion and ventilation?	YES	NO
Installation Altitude	FT.	
Deration Percentage	%	
Heating Input	Btuh	
Supply Air Temperature	° F	
Return Air Temperature	° F	
Temperature Rise	° F	
During Unit Operation:		
High Fire Manifold pressure	in - W.C.	
Low Fire Manifold pressure	in - W.C.	

REFRIGERATION SYSTEM			
Was unit given 24 hr warm up period for crankcase heaters (if equipped)?		YES	NO
Liquid Pressure (high side)	Stage 1		
	Stage 2		
Suction Pressure (low side)	Stage 1		
	Stage 2		

ATTENTION INSTALLERS:

It is your responsibility to know this product better than your customer. This includes being able to install the product according to strict safety guidelines and instructing the customer on how to operate and maintain the equipment for the life of the product. Safety should always be the deciding factor when installing this product and using common sense plays an important role as well. Pay attention to all safety warnings and any other special notes highlighted in the manual. Improper installation of the unit or failure to follow safety warnings could result in serious injury, death, or property damage. These instructions are primarily intended to assist qualified individuals experienced in the proper installation of this appliance. Some local codes require licensed installation/service personnel for this type of equipment.

Intertek

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* AHRI CERTIFIED www.ahridirectory.org Commercial Furnaces DOE 10 CFR Part 431

AHRI CERTIFIED www.ahridirectory.org Unitary Large AC AHRI Standard 340/360 Certification applies only when the complete system is listed with AHRI

HRAI YOUR ENVIRONMENT OUR EXPERTISE MEMBER COMPANY

* AHRI commercial furnace certification listing applies only to 3 phase units having an input rate 225,000 Btu/hr or greater

I-R7TQ (08-19) PN1011481R4

1011481-D
REPLACES 1011481-C