# UNIT INFORMATION

LGM SERIES
3 to 6 ton

100126
01/2025

***Service Literature***

## Ultra High Efficiency LGM036U through 074U with R-454B

LGM036U, 048U, 060U, and 074U are ultra high efficiency gas packaged units equipped with variable speed direct drive blowers, an inverter-driven variable speed compressor, and a variable speed outdoor fan.

LGM036 units are available in 65,000 to 108,000 Btuh (19 to 31 kW) heating inputs. LGM048, 060 and 074 units are available in 65,000 to 150,000 Btuh (19 to 43.9 kW) heating inputs. Gas heat sections are designed with aluminized (stainless optional) steel tube heat exchangers. Cooling capacities range from 3 to 6 tons (7 to 21kW).

Information contained in this manual is intended for use by qualified service technicians only. All specifications are subject to change. Procedures outlined in this manual are presented as a recommendation only and do not supersede or replace local or state codes.

If the unit must be lifted for service, rig unit by attaching four cables to the holes located in the unit base rail (two holes at each corner). Refer to the installation instructions for the proper rigging technique.

False ceilings or drop ceiling may be used as a return air plenum only if the unit being installed has a Refrigerant Detection System installed.

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out with work in confined spaces being avoided.

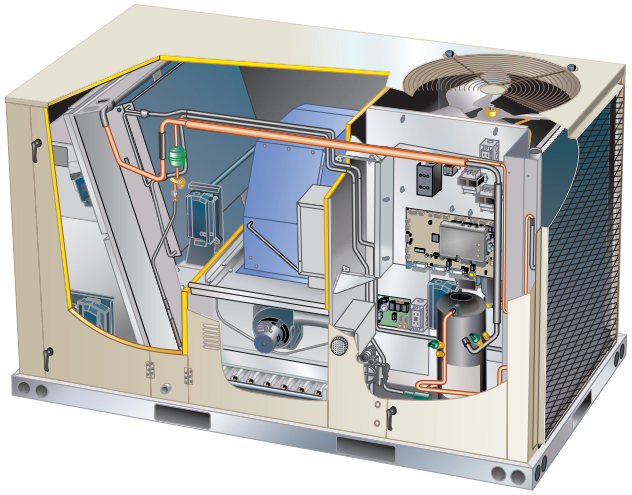
Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

**⚠ CAUTION**

**As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.**

**⚠ WARNING**

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



**ELECTROSTATIC DISCHARGE (ESD)**
**Precautions and Procedures**

**⚠ CAUTION**

**Electrostatic discharge can affect electronic components. Take precautions to neutralize electrostatic charge by touching your hand and tools to metal prior to handling the control.**

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## ⚠ WARNING

Only manufacturer approved auxiliary devices are permitted to be installed in this unit.

## ⚠ WARNING

If this appliance is conditioning a space with an area smaller than TAmin or stored in a space with an area smaller than Amin as defined by this instruction, then that space must be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (e.g. an operating electric heater or similar hot surface). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest system.

## ⚠ WARNING

•Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

•The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).

•Do not pierce or burn.

•Be aware that refrigerants may not contain an odor.

## ⚠ CAUTION

Auxiliary devices which may be a potential ignition source shall not be installed in the duct work. Examples of such potential ignition sources are hot surfaces with a temperature exceeding 700°C and electric switching devices.

## ⚠ CAUTION

Any personnel installing, decommissioning, or performaing maintenance on the unit must be properly trained with A2L refrigerants.

## ⚠ CAUTION

Leak Detection System installed. Unit must be powered except for service.

## ⚠ CAUTION

Servicing shall be performed only as recommended by the manufacturer.

## ⚠ WARNING

•This appliance must be installed in accordance with local and national wiring regulations.

•If the appliance is not fitted with an option for full disconnection from power, a means of disconnection must be incorporated in the fixed wiring in accordance with national and local wiring regulations.

## ⚠ WARNING

**Ducts connected to an appliance shall not contain a potential ignition source.**

## ⚠ CAUTION

The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction

## ⚠ CAUTION

Children should be supervised not to play with the appliance.

## ⚠ IMPORTANT

Pipe work, including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.

## ⚠ IMPORTANT

Refrigerant sensors for refrigerant detection systems shall only be replaced with sensors specified by the appliance manufacture.

## ⚠ CAUTION

This unit is equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

## ⚠ WARNING

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

**A2L Refrigerant Considerations**

Ensure that the work area is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects, taking into account the effects of aging or continual vibration from sources such as compressors or fans.

Under no circumstances shall potential sources of ignition be used when searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practices be followed since flammability is a consideration. The following procedure shall be adhered to:

-Safely remove refrigerant following local and national regulations.

-Evacuate the circuit.

-Purge the circuit with inert gas.

-Evacuate.

-Purge the circuit with inert gas.

-Open the circuit

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. Refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

## OPTIONS / ACCESSORIES

| Item | | Order Number | Size 036 | 048 | 060 | 074 |
|---|---|---|---|---|---|---|
| **COOLING SYSTEM** | | | | | | |
| Condensate Drain Trap | PVC | **22H54** | OX | OX | OX | OX |
| | Copper | **76W27** | X | X | X | X |
| Drain Pan Overflow Switch | | **21Z07** | OX | OX | OX | OX |
| **HEATING SYSTEM** | | | | | | |
| Bottom Gas Piping Kit | | **19W50** | OX | OX | OX | OX |
| Combustion Air Intake Extensions | | **19W51** | X | X | X | X |
| Gas Heat Input | Standard Two-Stage - 53/65 kBtuh input | Factory | O | O | O | O |
| | Medium Two Stage - 81/108 kBtuh input | Factory | O | O | O | O |
| | High Two-Stage - 113/150 kBtuh input | Factory | | O | O | O |
| Low Temperature Vestibule Heater | 208/230V-3ph | **21Z17** | X | X | X | X |
| | 460V-3ph | **21Z18** | X | X | X | X |
| | 575V-3ph | **21Z19** | X | X | X | X |
| LPG/Propane Conversion Kits | For two-stage standard models | **21Z24** | X | X | X | X |
| | For two-stage medium and high models | **21Z23** | X | X | X | X |
| Stainless Steel Heat Exchanger | | Factory | O | O | O | O |
| Vertical Vent Extension | | **31W62** | X | X | X | X |
| **BLOWER - SUPPLY AIR** | | | | | | |
| Motors | DirectPlus™ Direct Drive ECM Blower System with MSAV® | Factory | O | O | O | O |
| | DirectPlus™ Direct Drive ECM Blower System with VAV | Factory | O | O | O | O |
| **CABINET** | | | | | | |
| Combination Coil/Hail Guards | | **13T03** | OX | OX | OX | OX |
| Corrosion Protection (indoor coil / outdoor coil) | | Factory | O | O | O | O |
| **CONTROLS** | | | | | | |
| Commercial Controls | Lennox® CORE Control System - LonTalk® Module | **54W27** | OX | OX | OX | OX |
| | CPC Einstein Integration | Factory | O | O | O | OX |
| | Novar® LSE | Factory | O | O | O | O |
| Dirty Filter Switch | | **53W66** | OX | OX | OX | OX |
| Fresh Air Tempering | | **21Z08** | OX | OX | OX | OX |
| Smoke Detector - Supply or Return (Power board and one sensor) | | **21Z11** | OX | OX | OX | OX |
| Smoke Detector - Supply and Return (Power board and two sensors) | | **21Z12** | OX | OX | OX | OX |
| **ELECTRICAL** | | | | | | |
| Voltage 60 Hz | 208/230V - 3ph | Factory | O | O | O | O |
| | 460V - 3ph | Factory | O | O | O | O |
| | 575V-3ph | Factory | O | O | O | O |
| HACR Circuit Breakers | | Factory | O | O | O | O |
| [1] Short-Circuit Current Rating (SCCR) of 100kA (includes Phase/Voltage Detection) | | Factory | O | O | O | O |
| Disconnect Switch | 80 amp | **22A25** | OX | OX | OX | OX |
| GFI Service Outlets | 15 amp non-powered, field-wired (208/230V, 460V only) | **74M70** | OX | OX | OX | OX |
| | [2] 20 amp non-powered, field-wired (208/230V, 460V, 575V) | **67E01** | X | X | X | X |
| | [2] 20 amp non-powered, field-wired (575V only) | Factory | O | O | O | O |
| Weatherproof Cover for GFI | | **10C89** | X | X | X | X |
| Phase/Voltage Detection - 3 Phase Models Only | | Factory | O | O | O | O |

[1] Disconnect Switch is furnished and factory installed with High SCCR option.
[2] Canada requires a minimum 20 amp circuit. Select 20 amp, non-powered, field wired GFI.

## OPTIONS / ACCESSORIES

| Item | | Order Number | Size 036 | 048 | 060 | 074 |
|---|---|---|---|---|---|---|
| **ECONOMIZER** | | | | | | |
| **High Performance Economizer With Outdoor Air Hood (Sensible Control) (Approved for California Title 24 Building Standards / AMCA Class 1A Certified)** | | | | | | |
| High Performance Economizer - Includes Barometric Relief Dampers and Combination Hood | | **20H48** | OX | OX | OX | OX |
| High Performance Economizer - No Exhaust Option | | Factory | O | O | O | O |
| **Economizer Accessories** | | | | | | |
| Horizontal Economizer Conversion Kit | | **17W45** | X | X | X | X |
| **Economizer Controls** | | | | | | |
| Differential Enthalpy (Not for Title 24) | Order 2 | **21Z09** | OX | OX | OX | OX |
| Sensible Control | Sensor is Furnished | Factory | O | O | O | O |
| Single Enthalpy (Not for Title 24) | | **21Z09** | OX | OX | OX | OX |
| Outdoor Air CFM Control | | **13J76** | X | X | X | X |
| Global Control | Sensor Field Provided | Factory | O | O | O | O |
| Building Pressure Control | | **13J77** | X | X | X | X |
| **POWER EXHAUST FAN** | | | | | | |
| Standard Static | 208/230V-3ph | **21Z13** | OX | OX | OX | OX |
| *NOTE - Factory installed Power Exhaust Fan requires "Barometric Relief Dampers for Power Exhaust Kit" for field installation. See below.* | 460V-3ph | **21Z14** | OX | OX | OX | OX |
| | 575V-3ph | **21Z15** | OX | OX | OX | OX |
| **BAROMETRIC RELIEF** | | | | | | |
| [3] Barometric Relief Dampers for Power Exhaust Kit | | **21Z21** | X | X | X | X |
| [4] Horizontal Barometric Relief Dampers With Outdoor Air and Exhaust Hood | | **19F01** | X | X | X | X |
| **OUTDOOR AIR** | | | | | | |
| **Outdoor Air Dampers With Outdoor Air Hood** | | | | | | |
| Motorized | | **15D17** | OX | OX | OX | OX |
| Manual | | **15D18** | X | X | X | X |
| **HUMIDITROL™+ HOT GAS REHEAT OPTION** | | | | | | |
| Humiditrol™+ Dehumidification Option | | Factory | O | O | O | O |

[3] Required when Economizer is factory installed with factory installed Power Exhaust Fan option.
[4] Required when Economizer is configured for horizontal airflow.

## OPTIONS / ACCESSORIES

| Item | | Order Number | Size 036 | 048 | 060 | 074 |
|---|---|---|---|---|---|---|
| **INDOOR AIR QUALITY** | | | | | | |
| **Air Filters** | | | | | | |
| Healthy Climate® High Efficiency Air Filters 20 x 20 x 2 in. | MERV 8 (Order 4) | **54W21** | OX | OX | OX | OX |
| | MERV 13 (Order 4) | **52W39** | OX | OX | OX | OX |
| | MERV 16 (Order 4) | **21U40** | OX | OX | OX | OX |
| Replaceable Media Filter With Metal Mesh Frame 20 x 20 x 2 in. (includes non-pleated filter media) | (Order 4) | **44N60** | X | X | X | X |
| **Needlepoint Bipolar Ionization (NPBI)** | | | | | | |
| Needlepoint Bipolar Ionization Kit | | **21U35** | X | X | X | X |
| **Indoor Air Quality ($CO_2$) Sensors** | | | | | | |
| Sensor - Wall-mount, off-white plastic cover with LCD display | | **77N39** | X | X | X | X |
| Sensor - Wall-mount, off-white plastic cover, no display | | **23V86** | X | X | X | X |
| Sensor - Black plastic case, LCD display, rated for plenum mounting | | **87N52** | X | X | X | X |
| Sensor - Black plastic case, no display, rated for plenum mounting | | **87N54** | X | X | X | X |
| CO2 Sensor Duct Mounting Kit - for downflow applications | | **85L43** | X | X | X | X |
| Aspiration Box - for duct mounting non-plenum rated $CO_2$ sensors (**77N39**) | | **90N43** | X | X | X | X |
| **UVC Germicidal Lamps** | | | | | | |
| [5] Healthy Climate® UVC Light Kit (110/230V-1ph) | | **21A92** | X | X | X | X |
| Step-Down Transformer | 460V primary, 230V secondary | **10H20** | X | X | X | X |
| | 575V primary, 230V secondary | **10H21** | X | X | X | X |
| **ROOF CURBS** | | | | | | |
| **Hybrid Roof Curbs, Downflow** | | | | | | |
| 8 in. height | | **11F50** | X | X | X | X |
| 14 in. height | | **11F51** | X | X | X | X |
| 18 in. height | | **11F52** | X | X | X | X |
| 24 in. height | | **11F53** | X | X | X | X |
| **Adjustable Pitched Curb** | | | | | | |
| 14 in. height | | **43W27** | X | X | X | X |
| **Transition Curb** | | | | | | |
| Matches Model L™ 036-074 Units to existing L Series® Curbs | | **31B05** | X | X | X | X |
| **CEILING DIFFUSERS** | | | | | | |
| Step-Down - Order one | RTD9-65S | **13K60** | X | X | X | |
| | RTD11-95S | **13K61** | | | | X |
| Flush - Order one | FD9-65S | **13K55** | X | X | X | |
| | FD11-95S | **13K56** | | | | X |
| Transitions (Supply and Return) - Order one | T1TRAN10AN1 | **17W53** | X | X | X | |
| | T1TRAN20N-1 | **17W54** | | | | X |

[5] Lamps operate on 110-230V single-phase power supply. Step-down transformer may be ordered separately for 460V and 575V units. Alternately, 110V power supply may be used to directly power the UVC ballast(s).

## SPECIFICATIONS — UNIT

| Model | | LGM036U5E | LGM048U5E | LGM060U5E | LGM074U5E |
|---|---|---|---|---|---|
| **Blower Type** | | DirectPlus™ ECM Direct Drive with SZVAV | DirectPlus™ ECM Direct Drive with SZVAV | DirectPlus™ ECM Direct Drive with SZVAV | DirectPlus™ ECM Direct Drive with SZVAV |
| **Model Number** | | **LGM036U5P** | **LGM048U5P** | **LGM060U5P** | **LGM074U5P** |
| **Blower Type** | | DirectPlus™ ECM Direct Drive with VAV | DirectPlus™ ECM Direct Drive with VAV | DirectPlus™ ECM Direct Drive with VAV | DirectPlus™ ECM Direct Drive with VAV |
| **Efficiency Type** | | Ultra-High | Ultra-High | Ultra-High | Ultra-High |
| **Nominal Tonnage** | | 3 Ton | 4 Ton | 5 Ton | 6 Ton |
| **Cooling Performance** | Gross Cooling Capacity (Btuh) | 36,000 | 48,500 | 60,000 | 71,000 |
| | [1] Net Cooling Capacity (Btuh) | 35,000 | 48,000 | 58,000 | 69,000 |
| | AHRI Rated Air Flow (cfm) | 1320 | 1600 | 1850 | 2150 |
| | SEER2 (Btuh/Watt) | 21.2 | 19.9 | 19.5 | - - - |
| | EER2 (Btuh/Watt) | 14.3 | 13.2 | 12.5 | - - - |
| | IEER (Btuh/Watt) | - - - | - - - | - - - | 23.1 |
| | EER (Btuh/Watt) | - - - | - - - | - - - | 12.2 |
| | Total Unit Power - kW | 2.5 | 3.6 | 4.6 | 5.5 |
| **Sound Rating Number** | dBA | 73 | 76 | 78 | 80 |
| **Refrigerant Charge** | Refrigerant Type | R-454B | R-454B | R-454B | R-454B |
| | Without Reheat Option | 4 lbs. 8 oz. | 5 lbs. 1 oz. | 5 lbs. 1 oz. | 5 lbs. 1 oz. |
| | With Reheat Option | 5 lbs. 11 oz. | 5 lbs. 9 oz. | 5 lbs. 9 oz. | 5 lbs. 9 oz. |
| **Gas Heating Options** | | See page 8 | | | |
| **Compressor Type (Number)** | | Variable Capacity Scroll (1) | | | |
| **Outdoor Coil** | Net face area - ft.$^2$ | 17.8 | 17.8 | 17.8 | 17.8 |
| | Rows | 1 | 1 | 1 | 1 |
| | Fins - in. | 23 | 23 | 23 | 23 |
| **Outdoor Coil Fans** | Motor HP (number and type) | 1/3 (1 ECM) | 1/3 (1 ECM) | 1/3 (1 ECM) | 1/3 (1 ECM) |
| | Rpm | 550 - 850 | 600 - 900 | 700 - 950 | 700 - 1050 |
| | Watts | 50 - 200 | 80 - 236 | 120 - 272 | 120 - 360 |
| | Diameter (Number) - in. | (1) 24 | (1) 24 | (1) 24 | (1) 24 |
| | Blades | 3 | 3 | 3 | 3 |
| | Total air volume - cfm | 2500 - 3850 | 2750 - 4100 | 3200 - 4300 | 3200 - 4700 |
| **Indoor Coil** | Net face area - ft.$^2$ | 8.65 | 8.65 | 8.65 | 8.65 |
| | Rows | 1 | 1 | 1 | 1 |
| | Fins - in. | 20 | 20 | 20 | 20 |
| | Condensate drain size (NPT) - in. | (1) 1 | | | |
| | Expansion device type | Balanced Port Thermostatic Expansion Valve,removable power head | | | |
| **Indoor Blower** | Motor HP (number and type) | 1.5 HP (1 ECM) | 1.5 HP (1 ECM) | 1.5 HP (1 ECM) | 1.5 HP (1 ECM) |
| | Wheel (Number) diameter x width - in. | (1) 14 x 5 | (1) 14 x 5 | (1) 14 x 5 | (1) 14 x 5 |
| **Filters** | Type of filter | MERV 4, Disposable | | | |
| | Number and size - in. | (4) 20 x 20 x 2 | | | |
| **Line voltage data (Volts-Phase-Hz)** | | 208/230-3-60, 460-3-60, 575-3-60 | | | |

NOTE - Net capacity includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.

[1] AHRI Certified to AHRI Standard 210/240 (3-5 ton) or 340/360 (6 ton): 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

## SPECIFICATIONS — GAS HEAT

| Model | | 036, 048 060, 074 | 036, 048 060, 074 | 048 060, 074 |
|---|---|---|---|---|
| **Heat Input Type** | | **Standard (2 Stage)** | **Medium (2 Stage)** | **High (2 Stage)** |
| Input Btuh | 1st Stage | 53,000 | 81,000 | 113,000 |
| | 2nd Stage | 65,000 | 108,000 | 150,000 |
| Output Btuh | 1st Stage | 43,000 | 66,000 | 92,000 |
| | 2nd Stage | 52,000 | 87,000 | 121,000 |
| Temperature Rise Range - °F | 1st stage | 5 - 35 | 25 - 55 | 30 - 60 |
| | 2nd Stage | 15 - 45 | 30 - 70 | 45 - 75 |
| [1] Thermal Efficiency | | 81% | 81% | 81% |
| Gas Supply Connections | | 1/2 in. NPT | | |
| Recommended Gas Supply Pressure - Nat. / LPG | | 7 in. w.g. / 11 in. w.g. | | |
| Gas Supply Pressure Range | Min./Max. (Natural) | 4.5 - 10.5 in. w.g. | | |
| | Min./Max. (LPG) | 10.8 - 13.5 in. w.g. | | |

[1] Thermal Efficiency at full input.

## HIGH ALTITUDE DERATE

NOTE - Units may be installed at altitudes up to 2000 ft. above sea level without any modifications. At altitudes above 2000 ft. units must be derated 2% for each 1000 ft. above sea level.

NOTE - This is the only permissible derate for these units.

Refer to the Installation Instructions for more detailed information.

| Heat Input Type | Altitude Feet | Gas Manifold Pressure in. w.g. | | Input Rate (Btuh) |
|---|---|---|---|---|
| | | Natural Gas | LPG/Propane | |
| Standard (2 stage) | 2001 - 4500 | 3.0/1.7 | 9.0/5.1 | 60,000 / 49,000 |
| Medium (2 stage) | 2001 - 4500 | 3.0/1.7 | 9.0/5.1 | 100,000 / 75,000 |
| High (2 stage) | 2001 - 4500 | 3.0/1.7 | 9.0/5.1 | 139,000 / 104,000 |

## BLOWER DATA 1.5 HP

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

**Minimum Air Volume Required For Different Gas Heat Sizes:**
Standard Heat - 1075 cfm; Medium Heat - 1150 cfm; High Heat - 1500 cfm

See page 11 for wet coil and options/accessory air resistance data.

**DOWNFLOW**

| Total Air cfm | Total Static Pressure - in. w.g. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.1 | | 0.2 | | 0.3 | | 0.4 | | 0.5 | | 0.6 | | 0.7 | | 0.8 | | 0.9 | | 1.0 | | 1.1 | | 1.2 | | 1.3 | |
| | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts |
| 400 | - - - | - - - | 734 | 19 | 823 | 40 | 910 | 60 | 985 | 78 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| 600 | 766 | 28 | 856 | 51 | 944 | 73 | 1029 | 93 | 1108 | 111 | 1180 | 127 | 1248 | 139 | 1315 | 149 | 1383 | 158 | 1451 | 169 | - - - | - - - | - - - | - - - | - - - | - - - |
| 800 | 899 | 57 | 989 | 81 | 1079 | 104 | 1163 | 125 | 1242 | 145 | 1317 | 161 | 1386 | 174 | 1454 | 185 | 1519 | 198 | 1582 | 214 | 1643 | 234 | 1701 | 255 | 1755 | 281 |
| 1000 | 1084 | 95 | 1163 | 117 | 1244 | 139 | 1323 | 160 | 1398 | 180 | 1470 | 196 | 1538 | 211 | 1603 | 227 | 1663 | 245 | 1721 | 267 | 1776 | 292 | 1828 | 320 | 1876 | 350 |
| 1200 | 1319 | 113 | 1385 | 138 | 1451 | 162 | 1517 | 186 | 1581 | 209 | 1644 | 231 | 1703 | 254 | 1759 | 278 | 1812 | 306 | 1863 | 337 | 1912 | 367 | 1960 | 397 | 2003 | 427 |
| 1400 | 1542 | 146 | 1596 | 177 | 1649 | 208 | 1703 | 239 | 1757 | 269 | 1809 | 300 | 1860 | 331 | 1909 | 362 | 1956 | 393 | 2003 | 425 | 2050 | 456 | 2095 | 483 | 2139 | 508 |
| 1600 | 1721 | 225 | 1772 | 258 | 1823 | 291 | 1873 | 324 | 1923 | 356 | 1972 | 388 | 2019 | 419 | 2065 | 450 | 2110 | 480 | 2156 | 510 | 2200 | 539 | 2244 | 565 | 2287 | 590 |
| 1800 | 1909 | 309 | 1957 | 341 | 2006 | 373 | 2054 | 404 | 2101 | 435 | 2146 | 465 | 2190 | 495 | 2234 | 526 | 2277 | 557 | 2320 | 588 | 2362 | 620 | 2404 | 651 | 2444 | 685 |
| 2000 | 2103 | 385 | 2148 | 417 | 2193 | 450 | 2239 | 483 | 2283 | 516 | 2325 | 550 | 2367 | 584 | 2408 | 620 | 2449 | 658 | 2490 | 696 | 2529 | 735 | 2568 | 777 | 2605 | 822 |
| 2200 | 2299 | 478 | 2342 | 514 | 2384 | 552 | 2426 | 590 | 2467 | 630 | 2507 | 671 | 2547 | 714 | 2586 | 757 | 2625 | 800 | 2663 | 844 | 2700 | 889 | 2735 | 935 | 2770 | 982 |
| 2400 | 2500 | 606 | 2540 | 647 | 2580 | 690 | 2618 | 734 | 2656 | 779 | 2694 | 824 | 2731 | 870 | 2768 | 915 | 2804 | 961 | 2839 | 1006 | 2874 | 1051 | 2907 | 1096 | 2941 | 1141 |
| 2600 | 2704 | 768 | 2741 | 810 | 2778 | 855 | 2813 | 901 | 2849 | 947 | 2884 | 993 | 2918 | 1039 | 2952 | 1085 | 2986 | 1129 | 3019 | 1173 | 3051 | 1217 | 3083 | 1259 | 3115 | 1300 |
| 2800 | 2908 | 941 | 2943 | 985 | 2976 | 1030 | 3010 | 1076 | 3042 | 1121 | 3075 | 1166 | 3107 | 1210 | 3139 | 1253 | 3170 | 1296 | 3200 | 1338 | 3231 | 1379 | 3261 | 1419 | 3290 | 1456 |
| 3000 | 3110 | 1111 | 3142 | 1156 | 3173 | 1201 | 3205 | 1245 | 3236 | 1289 | 3267 | 1332 | 3296 | 1373 | 3325 | 1414 | 3354 | 1455 | 3382 | 1496 | 3412 | 1536 | 3439 | 1573 | 3465 | 1609 |

| Total Air cfm | Total Static Pressure - in. w.g. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.4 | | 1.5 | | 1.6 | | 1.7 | | 1.8 | | 1.9 | | 2.0 | |
| | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts |
| 800 | 1805 | 309 | 1850 | 337 | 1895 | 366 | 1940 | 392 | - - - | - - - | - - - | - - - | - - - | - - - |
| 1000 | 1920 | 380 | 1962 | 410 | 2005 | 439 | 2050 | 466 | 2094 | 492 | 2138 | 517 | 2181 | 541 |
| 1200 | 2045 | 456 | 2087 | 484 | 2130 | 510 | 2174 | 537 | 2217 | 563 | 2260 | 589 | 2302 | 615 |
| 1400 | 2182 | 531 | 2225 | 555 | 2268 | 581 | 2310 | 610 | 2352 | 640 | 2393 | 671 | 2433 | 703 |
| 1600 | 2330 | 616 | 2371 | 645 | 2412 | 678 | 2452 | 713 | 2491 | 750 | 2530 | 787 | 2568 | 824 |
| 1800 | 2484 | 723 | 2523 | 765 | 2561 | 808 | 2598 | 849 | 2636 | 890 | 2672 | 931 | 2708 | 971 |
| 2000 | 2641 | 868 | 2677 | 915 | 2713 | 961 | 2749 | 1003 | 2784 | 1044 | 2819 | 1084 | 2853 | 1124 |
| 2200 | 2804 | 1028 | 2839 | 1072 | 2873 | 1114 | 2907 | 1155 | 2940 | 1194 | 2973 | 1234 | 3006 | 1272 |
| 2400 | 2974 | 1184 | 3006 | 1225 | 3039 | 1266 | 3071 | 1305 | 3103 | 1344 | 3134 | 1382 | 3166 | 1420 |
| 2600 | 3146 | 1340 | 3177 | 1379 | 3207 | 1417 | 3238 | 1456 | 3269 | 1494 | 3299 | 1532 | 3329 | 1569 |
| 2800 | 3319 | 1493 | 3347 | 1530 | 3376 | 1567 | 3406 | 1605 | 3435 | 1643 | 3465 | 1681 | 3495 | 1718 |
| 3000 | 3491 | 1644 | 3517 | 1680 | 3543 | 1716 | 3572 | 1754 | 3602 | 1792 | 3631 | 1830 | 3661 | 1867 |

## BLOWER DATA 1.5 HP

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

**Minimum Air Volume Required For Different Gas Heat Sizes:**
Standard Heat - 1075 cfm; Medium Heat - 1150 cfm; High Heat - 1500 cfm

See page 11 for wet coil and options/accessory air resistance data.

**HORIZONTAL**

| Total Air cfm | Total Static Pressure - in. w.g. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.1 | | 0.2 | | 0.3 | | 0.4 | | 0.5 | | 0.6 | | 0.7 | | 0.8 | | 0.9 | | 1.0 | | 1.1 | | 1.2 | | 1.3 | |
| | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts |
| 400 | 708 | 16 | 793 | 37 | 872 | 53 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| 600 | 835 | 46 | 918 | 65 | 1000 | 82 | 1077 | 95 | 1149 | 107 | 1221 | 109 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| 800 | 981 | 75 | 1064 | 92 | 1144 | 109 | 1221 | 124 | 1294 | 139 | 1365 | 148 | 1434 | 154 | 1497 | 163 | 1555 | 179 | 1607 | 200 | 1656 | 226 | 1704 | 254 | - - - | - - - |
| 1000 | 1166 | 105 | 1241 | 124 | 1315 | 141 | 1387 | 159 | 1454 | 176 | 1520 | 191 | 1582 | 207 | 1638 | 227 | 1689 | 252 | 1737 | 279 | 1783 | 308 | 1829 | 335 | 1873 | 362 |
| 1200 | 1374 | 142 | 1440 | 162 | 1506 | 182 | 1569 | 203 | 1630 | 224 | 1687 | 246 | 1739 | 271 | 1787 | 299 | 1832 | 330 | 1876 | 361 | 1920 | 391 | 1964 | 419 | 2007 | 444 |
| 1400 | 1591 | 183 | 1647 | 209 | 1701 | 235 | 1755 | 263 | 1806 | 291 | 1854 | 320 | 1899 | 351 | 1942 | 382 | 1984 | 412 | 2026 | 442 | 2068 | 469 | 2110 | 496 | 2153 | 520 |
| 1600 | 1778 | 258 | 1827 | 290 | 1876 | 323 | 1923 | 355 | 1970 | 386 | 2015 | 416 | 2059 | 444 | 2102 | 470 | 2144 | 494 | 2185 | 519 | 2227 | 545 | 2268 | 572 | 2309 | 600 |
| 1800 | 1973 | 352 | 2018 | 383 | 2063 | 415 | 2107 | 445 | 2151 | 476 | 2194 | 504 | 2237 | 531 | 2279 | 557 | 2319 | 584 | 2359 | 613 | 2397 | 645 | 2435 | 679 | 2471 | 713 |
| 2000 | 2182 | 437 | 2224 | 468 | 2265 | 499 | 2306 | 531 | 2346 | 563 | 2385 | 596 | 2424 | 630 | 2461 | 666 | 2496 | 705 | 2530 | 745 | 2564 | 786 | 2598 | 826 | 2631 | 866 |
| 2200 | 2388 | 540 | 2426 | 576 | 2464 | 613 | 2500 | 651 | 2536 | 691 | 2571 | 731 | 2605 | 774 | 2637 | 819 | 2668 | 863 | 2700 | 907 | 2732 | 949 | 2764 | 990 | 2795 | 1029 |
| 2400 | 2589 | 679 | 2624 | 719 | 2658 | 761 | 2691 | 803 | 2724 | 846 | 2756 | 890 | 2786 | 935 | 2816 | 980 | 2846 | 1025 | 2876 | 1068 | 2907 | 1109 | 2937 | 1149 | 2967 | 1188 |
| 2600 | 2787 | 845 | 2819 | 887 | 2850 | 930 | 2881 | 973 | 2911 | 1017 | 2941 | 1060 | 2970 | 1104 | 2999 | 1147 | 3028 | 1189 | 3057 | 1230 | 3087 | 1270 | - - - | - - - | - - - | - - - |
| 2800 | 2983 | 1021 | 3013 | 1063 | 3042 | 1106 | 3070 | 1149 | 3099 | 1191 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |

| Total Air cfm | Total Static Pressure - in. w.g. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.4 | | 1.5 | | 1.6 | | 1.7 | | 1.8 | | 1.9 | | 2.0 | |
| | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts |
| 800 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| 1000 | 1916 | 386 | 1957 | 408 | 1998 | 428 | 2037 | 447 | 2077 | 465 | - - - | - - - | - - - | - - - |
| 1200 | 2049 | 468 | 2089 | 490 | 2128 | 510 | 2168 | 529 | 2207 | 549 | 2246 | 569 | 2285 | 591 |
| 1400 | 2194 | 543 | 2235 | 565 | 2274 | 588 | 2313 | 611 | 2350 | 637 | 2387 | 664 | 2423 | 694 |
| 1600 | 2349 | 627 | 2387 | 657 | 2423 | 688 | 2457 | 722 | 2490 | 757 | 2522 | 793 | 2554 | 830 |
| 1800 | 2506 | 749 | 2539 | 787 | 2571 | 825 | 2602 | 864 | 2632 | 903 | 2662 | 942 | 2692 | 981 |
| 2000 | 2663 | 906 | 2694 | 945 | 2725 | 985 | 2755 | 1024 | 2785 | 1063 | 2815 | 1101 | 2845 | 1138 |
| 2200 | 2826 | 1068 | 2857 | 1107 | 2887 | 1146 | 2916 | 1184 | 2946 | 1221 | 2975 | 1259 | 3005 | 1296 |
| 2400 | 2997 | 1227 | 3027 | 1266 | 3056 | 1304 | 3085 | 1342 | - - - | - - - | - - - | - - - | - - - | - - - |
| 2600 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| 2800 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |

## BLOWER DATA

**FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE - in. w.g.**

| Air Volume cfm | Wet Indoor Coil | | Humiditrol™+ Reheat Coil | Gas Heating | | Economizer | Filters | | |
|---|---|---|---|---|---|---|---|---|---|
| | 036, 048 | 060, 074 | | Medium Heat | High Heat | | MERV 8 | MERV 13 | MERV 16 |
| 800 | 0.01 | - - - | - - - | 0.02 | 0.02 | 0.04 | 0.04 | 0.05 | 0.04 |
| 1000 | 0.02 | 0.02 | 0.00 | 0.02 | 0.02 | 0.04 | 0.04 | 0.07 | 0.05 |
| 1200 | 0.03 | 0.04 | 0.00 | 0.02 | 0.02 | 0.04 | 0.04 | 0.07 | 0.05 |
| 1400 | 0.04 | 0.05 | 0.01 | 0.02 | 0.03 | 0.04 | 0.04 | 0.07 | 0.06 |
| 1600 | 0.05 | 0.07 | 0.02 | 0.03 | 0.04 | 0.04 | 0.04 | 0.07 | 0.08 |
| 1800 | 0.06 | 0.08 | 0.02 | 0.04 | 0.05 | 0.05 | 0.04 | 0.07 | 0.09 |
| 2000 | 0.08 | 0.10 | 0.02 | 0.04 | 0.06 | 0.05 | 0.05 | 0.08 | 0.10 |
| 2200 | - - - | 0.11 | 0.04 | 0.04 | 0.07 | 0.05 | 0.05 | 0.08 | 0.11 |
| 2400 | - - - | 0.13 | 0.04 | 0.05 | 0.08 | 0.05 | 0.05 | 0.08 | 0.12 |

**POWER EXHAUST FAN PERFORMANCE**

| Return Air System Static Pressure in. w.g. | Air Volume Exhausted cfm |
|---|---|
| 0.00 | 2000 |
| 0.05 | 1990 |
| 0.10 | 1924 |
| 0.15 | 1810 |
| 0.20 | 1664 |
| 0.25 | 1507 |
| 0.30 | 1350 |
| 0.35 | 1210 |

## BLOWER DATA

**CEILING DIFFUSERS AIR RESISTANCE (in. w.g.)**

| Air Volume cfm | RTD9-65S Step–Down Diffuser | | | FD9-65S Flush Diffuser | RTD11-95S Step–Down Diffuser | | | FD11-95S Flush Diffuser |
|---|---|---|---|---|---|---|---|---|
| | 2 Ends Open | 1 Side & 2 Ends Open | All Ends & Sides Open | | 2 Ends Open | 1 Side & 2 Ends Open | All Ends & Sides Open | |
| 800 | 0.15 | 0.13 | 0.11 | 0.11 | - - - | - - - | - - - | - - - |
| 1000 | 0.19 | 0.16 | 0.14 | 0.14 | - - - | - - - | - - - | - - - |
| 1200 | 0.25 | 0.20 | 0.17 | 0.17 | - - - | - - - | - - - | - - - |
| 1400 | 0.33 | 0.26 | 0.20 | 0.20 | - - - | - - - | - - - | - - - |
| 1600 | 0.43 | 0.32 | 0.20 | 0.24 | - - - | - - - | - - - | - - - |
| 1800 | 0.56 | 0.40 | 0.30 | 0.30 | 0.13 | 0.11 | 0.09 | 0.09 |
| 2000 | 0.73 | 0.50 | 0.36 | 0.36 | 0.15 | 0.13 | 0.11 | 0.10 |
| 2200 | 0.95 | 0.63 | 0.44 | 0.44 | 0.18 | 0.15 | 0.12 | 0.12 |
| 2400 | - - - | - - - - | - - - | - - - | 0.21 | 0.18 | 0.15 | 0.14 |
| 2600 | - - - | - - - - | - - - | - - - | 0.24 | 0.21 | 0.18 | 0.17 |
| 2800 | - - - | - - - - | - - - | - - - | 0.27 | 0.24 | 0.21 | 0.20 |
| 3000 | - - - | - - - - | - - - | - - - | 0.32 | 0.29 | 0.25 | 0.25 |

**CEILING DIFFUSER AIR THROW DATA**

| Air Volume - cfm | [1] Effective Throw - ft. | |
|---|---|---|
| **Model** | **RTD9-65S** | **FD9-65S** |
| 800 | 10 - 17 | 14 - 18 |
| 1000 | 10 - 17 | 15 - 20 |
| 1200 | 11 - 18 | 16 - 22 |
| 1400 | 12 - 19 | 17 - 24 |
| 1600 | 12 - 20 | 18 - 25 |
| 1800 | 13 - 21 | 20 - 28 |
| 2000 | 14 - 23 | 21 - 29 |
| 2200 | 16 - 25 | 22 - 30 |
| **Model** | **RTD11-95S** | **FD11-95S** |
| 2600 | 24 - 29 | 19 - 24 |
| 2800 | 25 - 30 | 20 - 28 |
| 3000 | 27 - 33 | 21 - 29 |

[1] Effective throw based on terminal velocities of 75 ft. per minute.

## ELECTRICAL DATA — 3 TON

| Model | | LGM036U5E / LGM036U5P | | |
|---|---|---|---|---|
| [1] Voltage - 60Hz | | 208/230V-3ph | 460V-3ph | 575V-3ph |
| Compressor (Inverter) | Rated Load Amps | 9.1 | 5.1 | 4.1 |
| | Locked Rotor Amps | 11 | 6 | 12 |
| Outdoor Fan Motor | Full Load Amps (1 ECM) | 2.8 | 1.4 | 1.1 |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | 1.3 | 1 |
| Service Outlet 115V GFI (amps) | | 15 | 15 | 20 |
| Indoor Blower Motor | Horsepower | 1.5 | 1.5 | 1.5 |
| | Full Load Amps | 4.4 | 2.3 | 2.3 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit Only | 25 | 15 | 15 |
| | With (1) 0.33 HP Power Exhaust | 30 | 15 | 15 |
| [3] Minimum Circuit Ampacity (MCA) | Unit Only | 19 | 11 | 9 |
| | With (1) 0.33 HP Power Exhaust | 21 | 12 | 10 |

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.
[1] Extremes of operating range are plus and minus 10% of line voltage.
[2] HACR type breaker or fuse.
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

## ELECTRICAL DATA — 4 TON

| Model No. | | LGM048U5E / LGM048U5P | | |
|---|---|---|---|---|
| [1] Voltage - 60Hz | | 208/230V-3ph | 460V-3ph | 575V-3ph |
| Compressor (Inverter) | Rated Load Amps | 13.8 | 6.5 | 5.5 |
| | Locked Rotor Amps | 17 | 10 | 12 |
| Outdoor Fan Motor | Full Load Amps (1 ECM) | 2.8 | 1.4 | 1.1 |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | 1.3 | 1 |
| Service Outlet 115V GFI (amps) | | 15 | 15 | 20 |
| Indoor Blower Motor | Horsepower | 1.5 | 1.5 | 1.5 |
| | Full Load Amps | 4.4 | 2.3 | 2.3 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit Only | 35 | 15 | 15 |
| | With (1) 0.33 HP Power Exhaust | 40 | 15 | 15 |
| [3] Minimum Circuit Ampacity (MCA) | Unit Only | 25 | 12 | 11 |
| | With (1) 0.33 HP Power Exhaust | 27 | 14 | 12 |

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.
[1] Extremes of operating range are plus and minus 10% of line voltage.
[2] HACR type breaker or fuse.
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

## ELECTRICAL DATA — 5 TON

| Model | | LGM060U5E / LGM060U5P | | |
|---|---|---|---|---|
| [1] Voltage - 60Hz | | 208/230V-3ph | 460V-3ph | 575V-3ph |
| Compressor (Inverter) | Rated Load Amps | 14.6 | 7 | 5.8 |
| | Locked Rotor Amps | 21 | 11 | 12 |
| Outdoor Fan Motor | Full Load Amps (1 ECM) | 2.8 | 1.4 | 1.1 |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | 1.3 | 1 |
| Service Outlet 115V GFI (amps) | | 15 | 15 | 20 |
| Indoor Blower Motor | Horsepower | 1.5 | 1.5 | 1.5 |
| | Full Load Amps | 4.4 | 2.3 | 2.3 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit Only | 40 | 15 | 15 |
| | With (1) 0.33 HP Power Exhaust | 40 | 20 | 15 |
| [3] Minimum Circuit Ampacity (MCA) | Unit Only | 26 | 13 | 11 |
| | With (1) 0.33 HP Power Exhaust | 28 | 14 | 12 |

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.
[1] Extremes of operating range are plus and minus 10% of line voltage.
[2] HACR type breaker or fuse.
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

## ELECTRICAL DATA — 6 TON

| Model | | LGM074U5E / LGM074U5P | | |
|---|---|---|---|---|
| [1] Voltage - 60Hz | | 208/230V-3ph | 460V-3ph | 575V-3ph |
| Compressor (Inverter) | Rated Load Amps | 16.9 | 8.3 | 6.8 |
| | Locked Rotor Amps | 21 | 11 | 12 |
| Outdoor Fan Motor | Full Load Amps (1 ECM) | 2.8 | 1.4 | 1.1 |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | 1.3 | 1 |
| Service Outlet 115V GFI (amps) | | 15 | 15 | 20 |
| Indoor Blower Motor | Horsepower | 1.5 | 1.5 | 1.5 |
| | Full Load Amps | 4.4 | 2.3 | 2.3 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit Only | 45 | 20 | 15 |
| | With (1) 0.33 HP Power Exhaust | 45 | 20 | 15 |
| [3] Minimum Circuit Ampacity (MCA) | Unit Only | 29 | 15 | 12 |
| | With (1) 0.33 HP Power Exhaust | 31 | 16 | 13 |

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.
[1] Extremes of operating range are plus and minus 10% of line voltage.
[2] HACR type breaker or fuse.
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

**FIELD WIRING NOTES**

- For use with copper wiring only
- Field wiring not furnished
- All wiring must conform to NEC or CEC and local electrical codes
- For specific wiring information, please refer to the installation instructions

## Minimum R454B Space and CFM Requirements

| Minimum Airflow[1] | | |
|---|---|---|
| Unit | $Q_{min}$(CFM) | $Q_{min}$($m^3h$) |
| LGM036 | 500 | 850 |
| LGM048 | 500 | 850 |
| LGM060 | 500 | 850 |
| LGM074 | 500 | 850 |
| LGM036 W/ Humidtrol | 500 | 850 |
| LGM048 W/ Humidtrol | 500 | 850 |
| LGM060 W/ Humidtrol | 500 | 850 |
| LGM074 W/ Humidtrol | 500 | 850 |

| Refrigerant Charge R-454B | | |
|---|---|---|
| Unit | $M_c$(lbs) | $M_c$(kg) |
| LGM036 | 4.50 | 2.0412 |
| LGM048 | 5.0625 | 2.2963 |
| LGM060 | 5.0625 | 2.2963 |
| LGM074 | 5.0625 | 2.2963 |
| LGM036 W/ Humidtrol | 5.6875 | 2.5798 |
| LGM048 W/ Humidtrol | 5.5625 | 2.5231 |
| LGM060 W/ Humidtrol | 5.5625 | 2.5231 |
| LGM074 W/ Humidtrol | 5.5625 | 2.5231 |

[1] ***NOTE -*** *The minimum airflow is the lowest CFM allowed during venting operation (leak mitigation).*

| Minimum Room Area of Conditioned Space[2] | | |
|---|---|---|
| Unit | $TA_{min}$($ft^2$) | $TA_{min}$($m^2$) |
| LGM036 | 46.73 | 4.34 |
| LGM048 | 75.44 | 7.01 |
| LGM060 | 71.19 | 6.61 |
| LGM074 | 70.31 | 6.53 |
| LGM036 W/ Humidtrol | 78.52 | 7.29 |
| LGM048 W/ Humidtrol | 76.17 | 7.08 |
| LGM060 W/ Humidtrol | 70.02 | 6.51 |
| LGM074 W/ Humidtrol | 66.07 | 6.14 |

[2] ***NOTE -*** *The minimum room area of conditioned space is the smallest area the unit can service.*

| Altitude Adjustment Factor[3] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Halt | 0 | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 | 1600 |
| AF | 1 | 1 | 1 | 1 | 1.02 | 1.05 | 1.07 | 1.1 | 1.12 |
| Halt | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 |
| AF | 1.12 | 1.15 | 1.18 | 1.21 | 1.25 | 1.28 | 1.32 | 1.36 | 1.4 |

[3] ***NOTE -*** *Use the Altitude Adjustment Factor to adjust the values in the tables above to different altitudes. Find the relevant altitude above sea level in the two "Halt" rows and then multiply the value needed from the tables above by the altitude factor number. Example: For the minimum airflow in CFM for an LGM036 at 1000 ft. above see level, multiply 500 by 1.05 to get 525 CFM as the new $Q_{min}$.*

## PARTS ARRANGEMENT

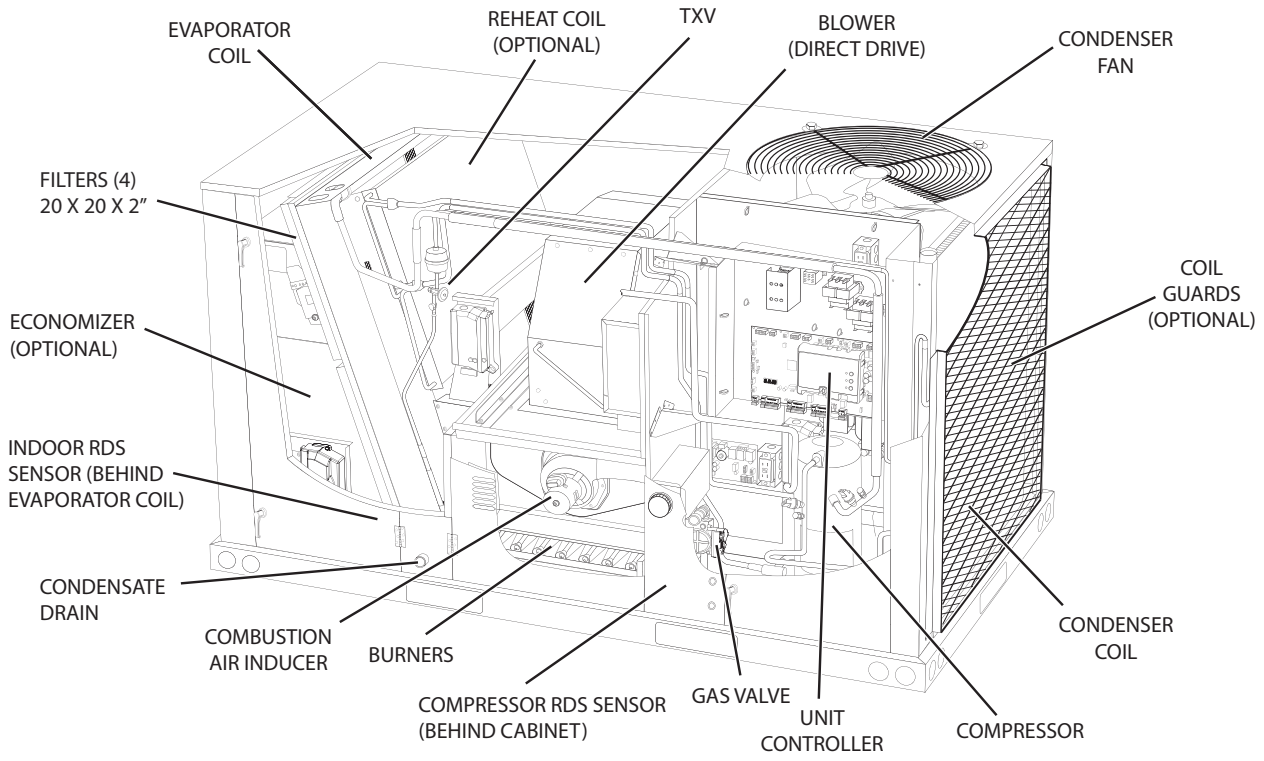



**FIGURE 1**

## LGM HINGED CONTROL PANEL

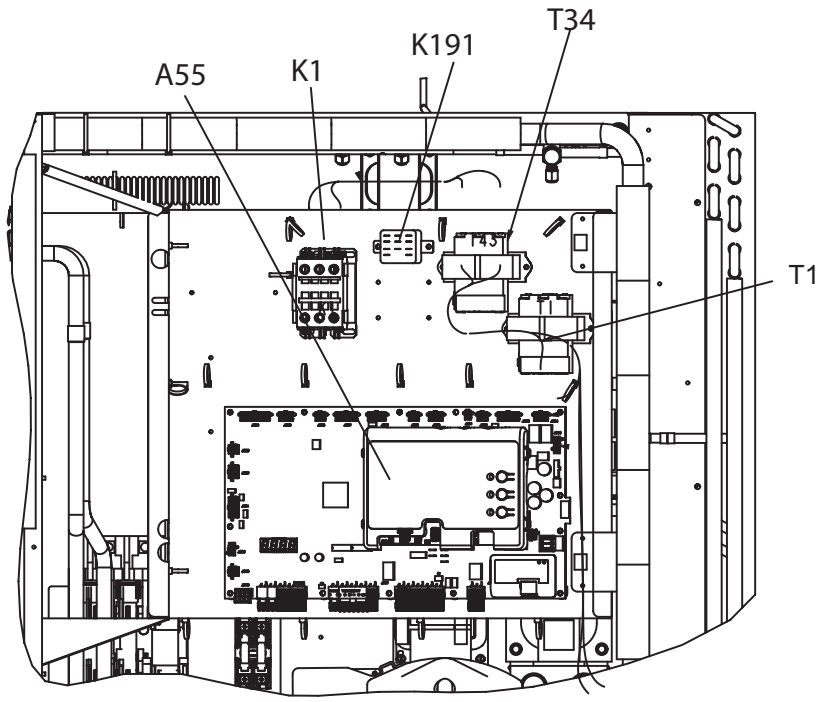



**FIGURE 2**

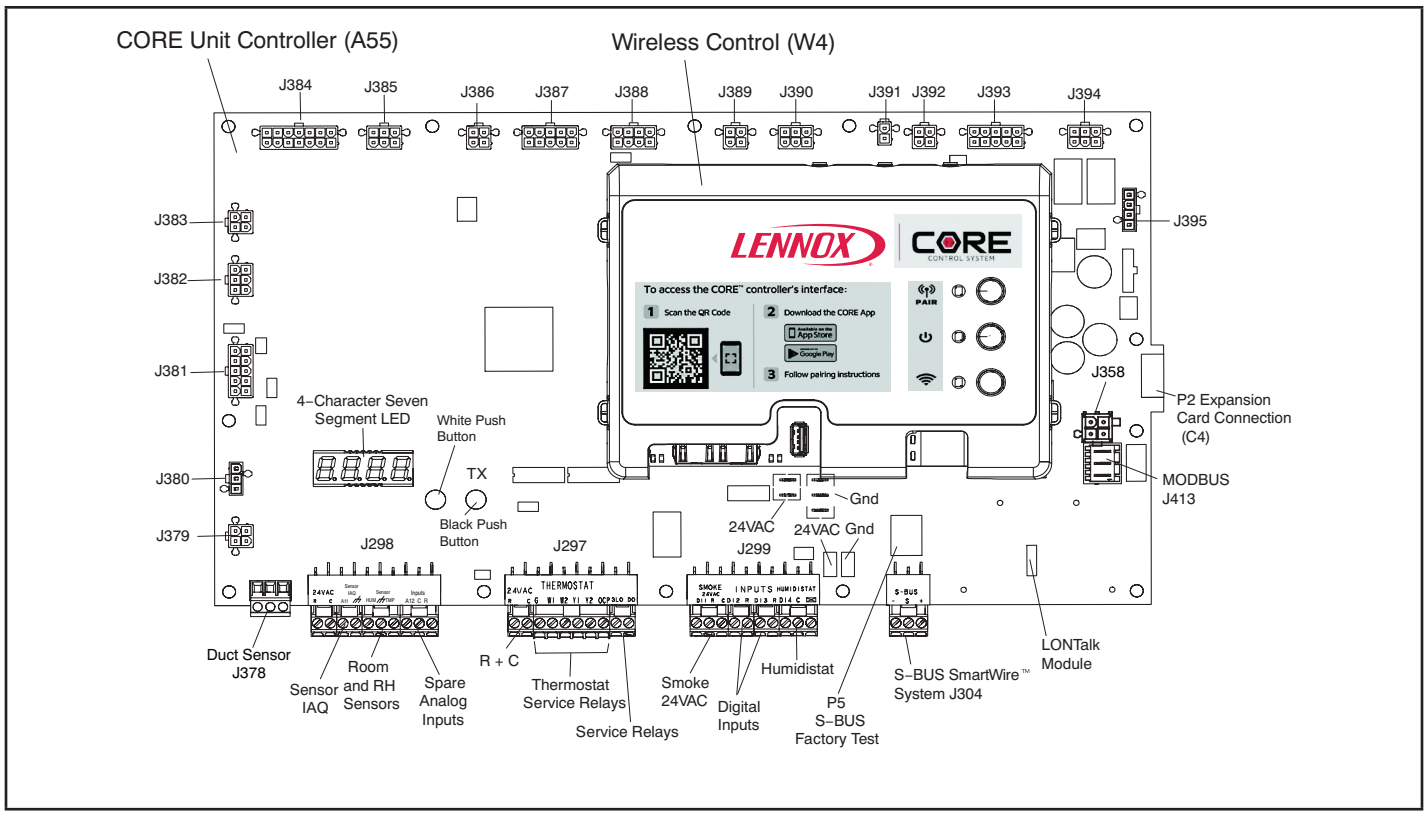



**FIGURE 3**

## I-UNIT COMPONENTS

All 3 through 6 ton (19 through 43.9 kW) units are configure to order units (CTO). The LGM unit components are shown in figure 1. All units come standard with hinged unit panels. All L1, L2, and L3 wiring is color coded; L1 is red, L2 is yellow, and L3 is blue.

### A-Control Box Components

LGM control box components are shown in FIGURE 2. The control box is located in the upper right portion of the compressor compartment.

### 1-Control Transformers T1/T43

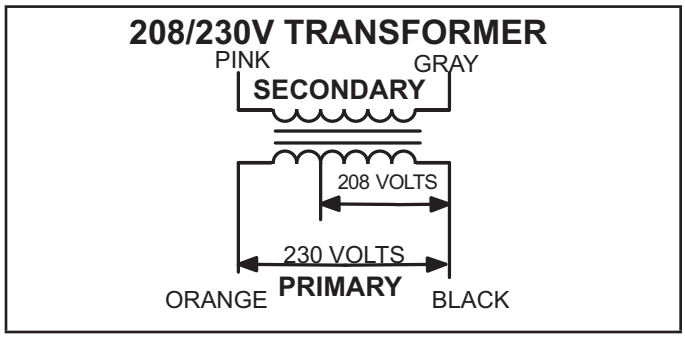



**FIGURE 4**

All use a single line voltage to 24VAC transformer mounted on the hinged control panel. Transformer supplies power to control circuits in the unit. The transformer is rated at 70VA and is protected by a 3.5 amp circuit (CB8).

The 208/230 (Y) voltage transformers use two primary voltage taps as shown in FIGURE 4, while the 460 (G) voltage transformer use a single primary voltage tap. T43 is used for units with hot gas reheat for additional 24VAC.

### 2-Transformer T4 (J voltage)

All J volt units are equipped with a line voltage to 460V 3-phase transformer to power the indoor blower motor. T4 is mounted in the back panel of the compressor section above T5.

### 3-Transformer T5 (G and J voltage)

All units use transformer T5 mounted in the back panel in the compressor section. T5 is a line voltage to 230V transformer to power the combustion air inducer, outdoor fan motor, and optional UVC light ballast.. It is connected to line voltage and is powered at all times.

### 4-Unit Controller A55 (FIGURE 3)

The Unit Controller provides all unit control functions, unit status information, unit diagnostics, programmable parameters, and USB verification and profile sharing. The unit controller can only be interfaced with via the CORE Service mobile app. Refer to the Unit controller instructions provided for additional details on pairing and app functions

## Attention!

Use this QR code to download the mobile service app. Follow the prompts to pair the app with the unit control system and configure the unit. Refer to the “Download Mobile App” section in this manual and the Setup Guide provided with this unit. The QR code is also available in the unit control area.

The app can be downloaded from the appropriate iOS or Android store. Look for the following icon.

The Unit Controller uses input from a zone/room sensor cooling, a thermostat, or a third-party controller to operate the unit. Zone/room sensor, thermostat, and third-party controller wires are connected to J297 on the Unit Controller.

Many default Unit Controller settings are adjustable. Refer to the unit installation instruction or the Unit Controller manual provided with the unit.

The Unit Controller is configured to identify optional kits and accessories for proper function. Each character in the configuration ID represents a different option. Refer to the unit installation instruction or the Unit Controller manual provided with the unit.

**5-Compressor Contactor K1**

The Unit Controller closes n.o. K1 contacts to provide power to the inverter control board (A192). The contactor does not energize the compressor in the same manner as a traditional cooling system. Three phase units use three pole double break contactors with a 24 volt coil.

**6-Crankcase Heater Relay K191**

All units use relay K191 to control crnkcase heater HR1.

**7-Power Exhaust Relay K65 (PED units)**

Power exhaust relay K65 is a N.O. DPDT relay with a 24VAC coil. K65 is used in all LGM units equipped with the optional power exhaust dampers. K65 is energized by the economizer control panel (A56), after the economizer dampers reach 50% open (adjustable in ECTO). When K65 closes, the exhaust fan B10 is are energized.

**B-Cooling Components**

All units use a single cooling circuit consisting of a variable speed compressor, fin/tube condenser coil and evaporator coil. See FIGURE 5. All units use one draw-through type condenser fan and a single direct drive blower. The blower draws air across the evaporator during unit operation. Cooling may be supplemented by a factory- or field-installed economizer. The evaporator coil is slab type and uses a thermostatic expansion valve as the primary refrigerant metering device. The evaporator is also equipped with enhanced fins and rifled tubing. The compressor is protected by a high pressure switch (S4) on the discharge line, a high temperature limit switch (S5) on the compressor, and a low pressure switch (S87) on the suction line.

**1-High Pressure Switch S4**

The high pressure switch is an auto-reset SPST N.C. switch which opens on a pressure rise.

S4 is located in the compressor discharge line and wired to the A55 Unit Controller.

When discharge pressure rises to 640 ± 10 psig (4412 ± 69 kPa) (indicating a problem in the system) the switch opens and the compressor inverter is de-energized (the economizer can continue to operate). The switch automatically resets at 475 + 10 psig.

**2-Low Pressure Switch S87**

The compressor circuit is protected by a loss of charge switch located on the suction line. Switch opens at 40 psig ± 5 psig (276 ± 34 kPa) and automatically resets at 90 psig ± 5 psig (621 kPa ± kPa).

**3-High Temperature Limit Switch S5**

The variable speed compressor is equipped with a compressor- mounted normally closed temperature switch that prevents compressor damage due to overheating caused by internal friction. The switch is located on top of the compressor casing. This switch senses the compressor casing temperature and opens at 239-257°F to shut-off compressor operation. The auto-reset switch closes when the compressor casing temperature falls to 151-187°F, and the compressor is re-energized. This switch is a single-pole, single-throw (SPST) bi-metallic switch and is wired to the A55 Unit Controller.

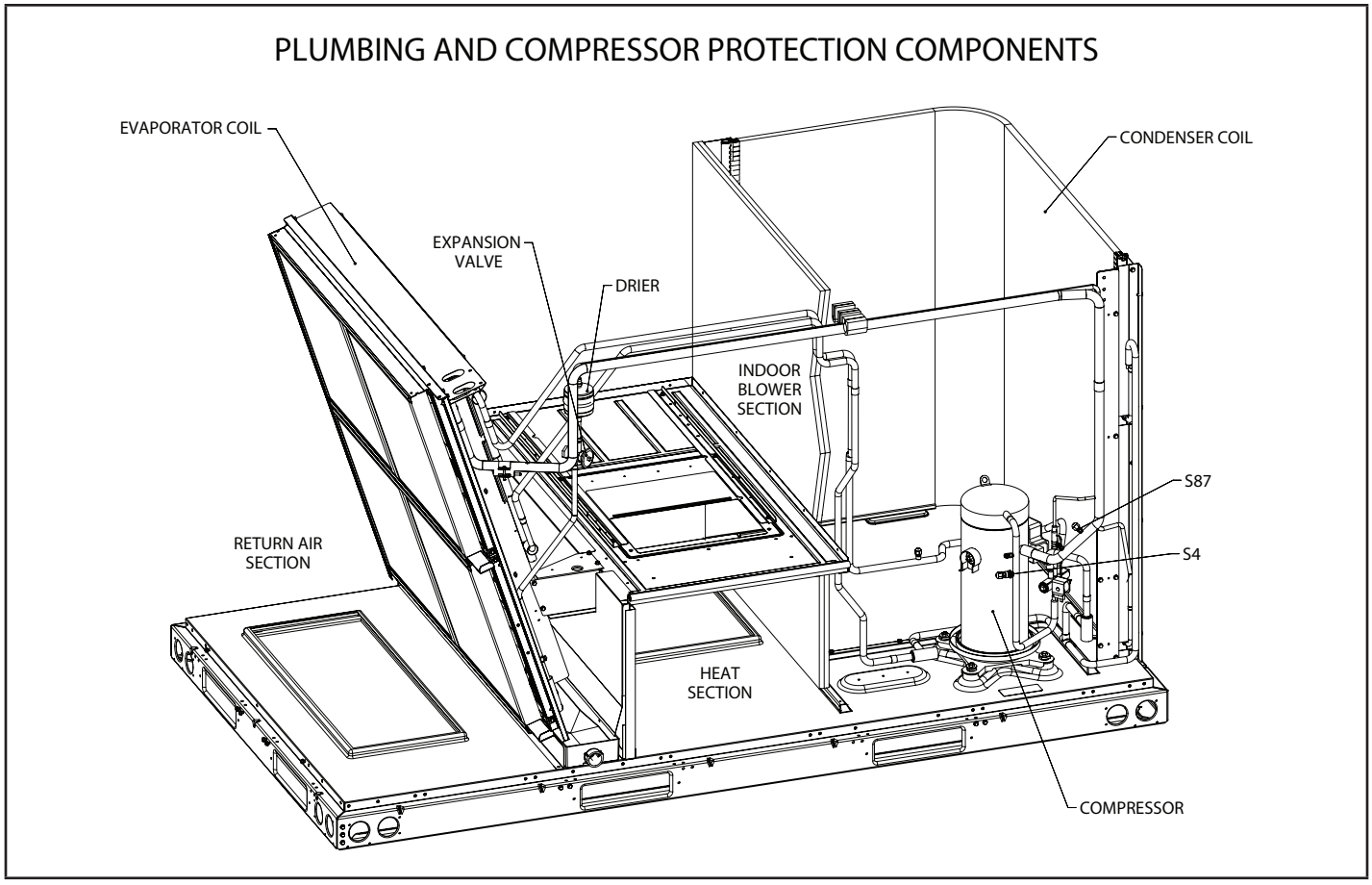



**FIGURE 5**

**4-Thermistors**

Units are equipped with four factory-installed thermistors (RT42, RT44, RT46, and RT48) located on different points on the refrigerant circuit.

The thermistors provide the Unit Controller with constant temperature readings of four specific locations on the refrigeration circuit. These temperatures are used as feedback in certain modes of unit operation. In addition, the Unit Controller uses these temperatures to initiate alarms such as loss of condenser or evaporator airflow and loss of charge.

Each thermistor must be specifically placed for proper unit operation and to initiate valid alarms. See TABLE 1 for proper locations.

**TABLE 1**
**THERMISTOR LOCATION**

| Sensor | Figure |
|---|---|
| RT42, RT46 | FIGURE 6 |
| RT44 | FIGURE 7 |
| RT48 | FIGURE 8 |

**LGM/LCM/LGT/LCT/SGH/SCH036, 048, 060, 072/074**
**EVAPORATOR COIL**
**RT42, 46**

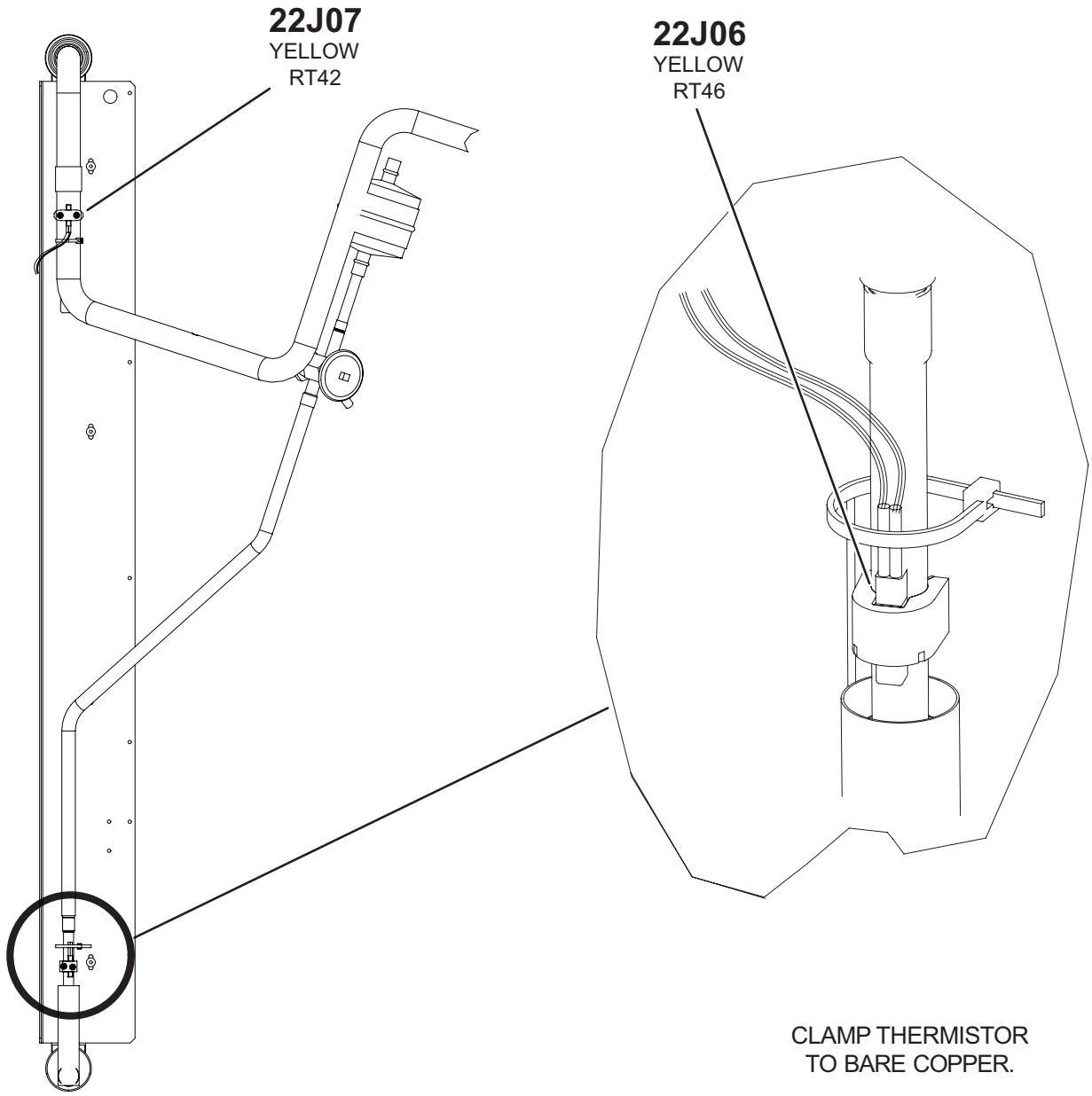



**FIGURE 6**

**LGM/LCM036, 048, 060, 074U5**
**CONDENSER COIL**
**(RT44)**

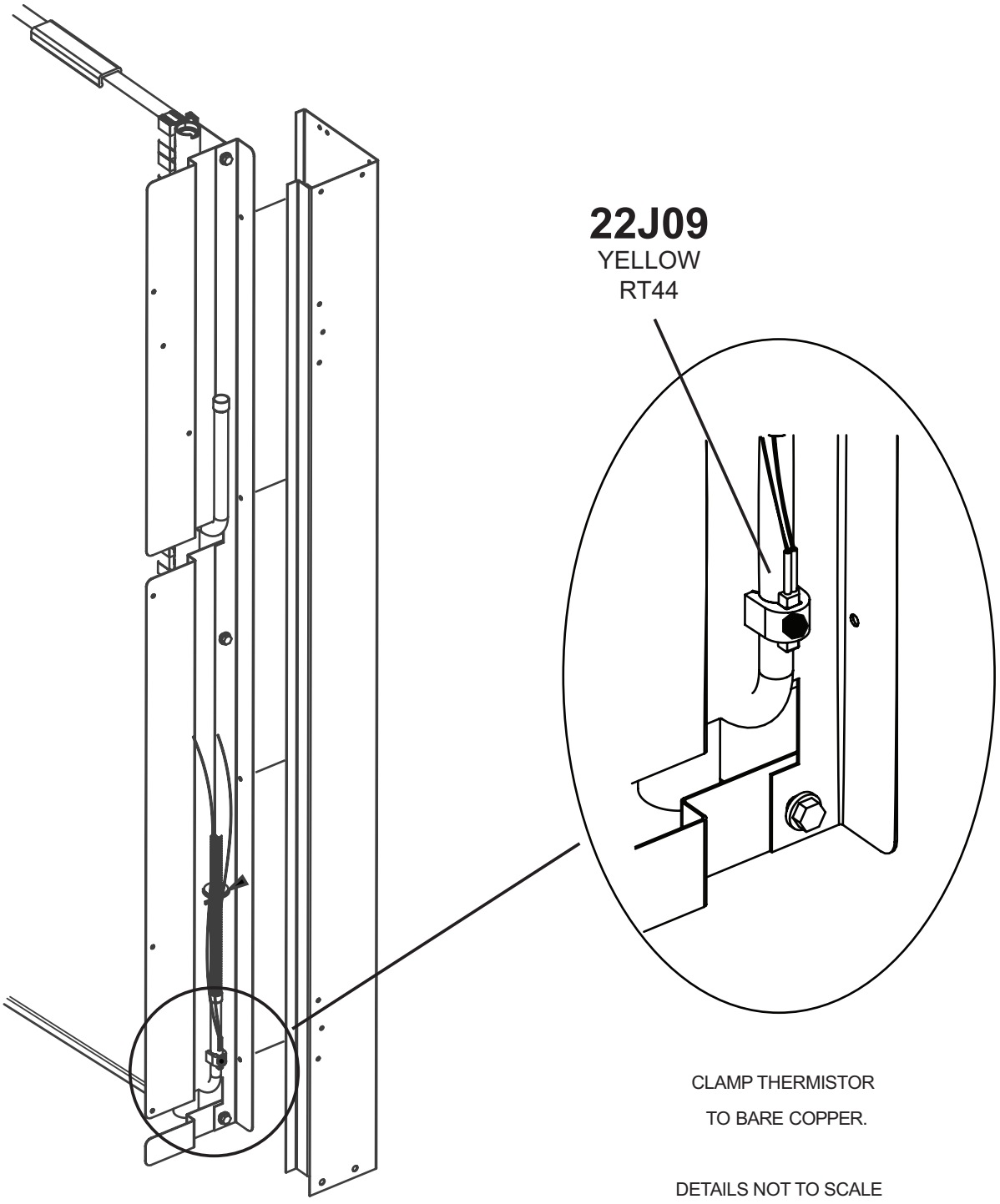



**FIGURE 7**

**LCM/LGM036, 048, 060, 074**
**CONDENSER COIL**
**RT48**

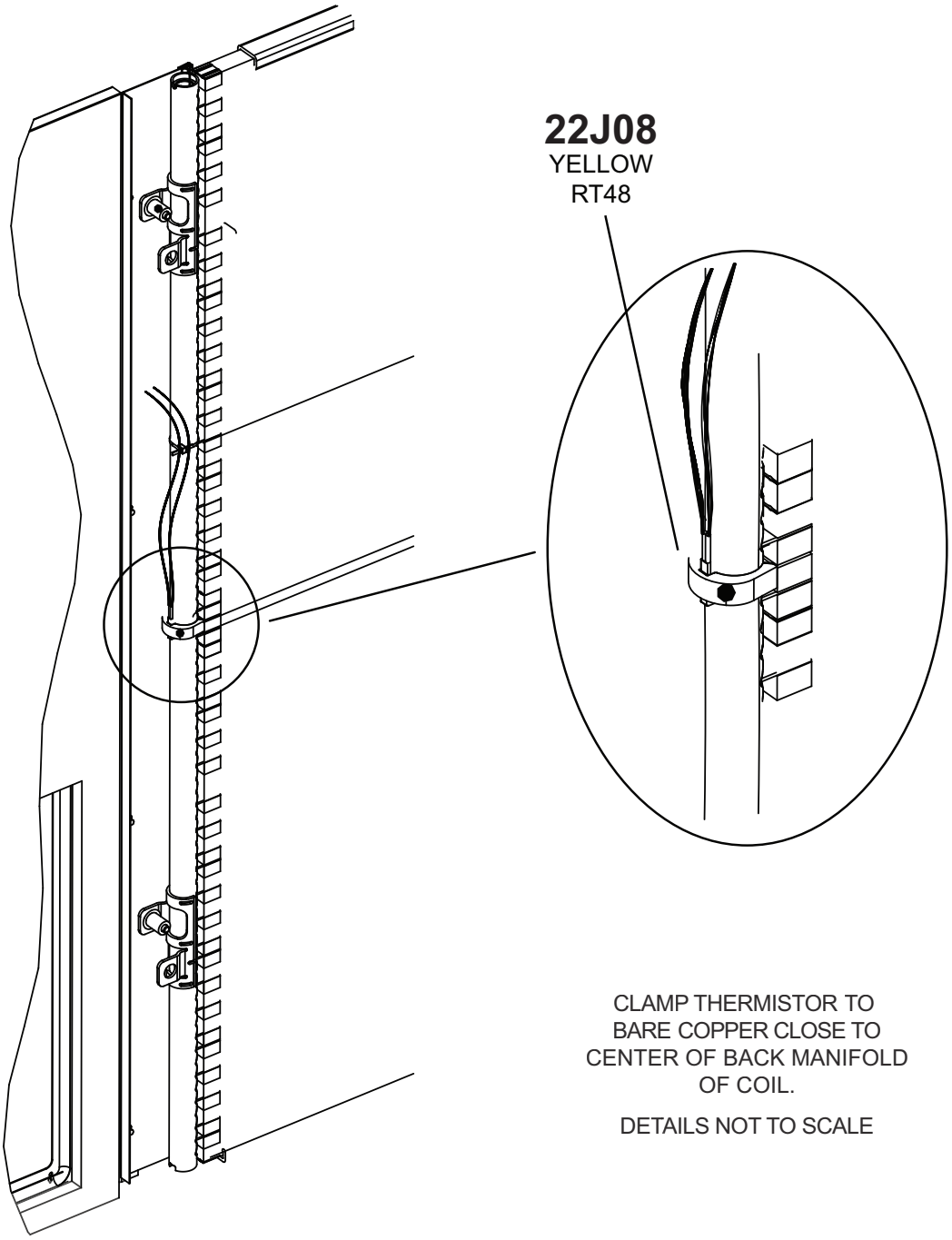



**FIGURE 8**

### 5-RDS Sensors

Units are equipped with factory-installed RDS Sensors located on different points on the unit. The RDS sensors provide the Unit Controller with continuous readings for leaked refrigerant concentration levels and sensor health status (Good or Fault). These readings are used to modify unit operation to disperse the leaked refrigerant and to remove possible ignition sources. In addition, the Unit Controller uses these readings to initiate alarms to alert the operator of a refrigerant leak or faulty sensor(s).

Each sensor must be specifically placed for proper unit operation and to initiate valid alarms. To identify sensor locations see TABLE 2.

**TABLE 2**

**RDS Sensor Figures**

| Model | Qty. | Type | Figure |
|---|---|---|---|
| LGM036-074 | 2 sensors | INDOOR SENSOR | FIGURE 9 |
| | | COMPRESSOR SENSOR | FIGURE 10 |

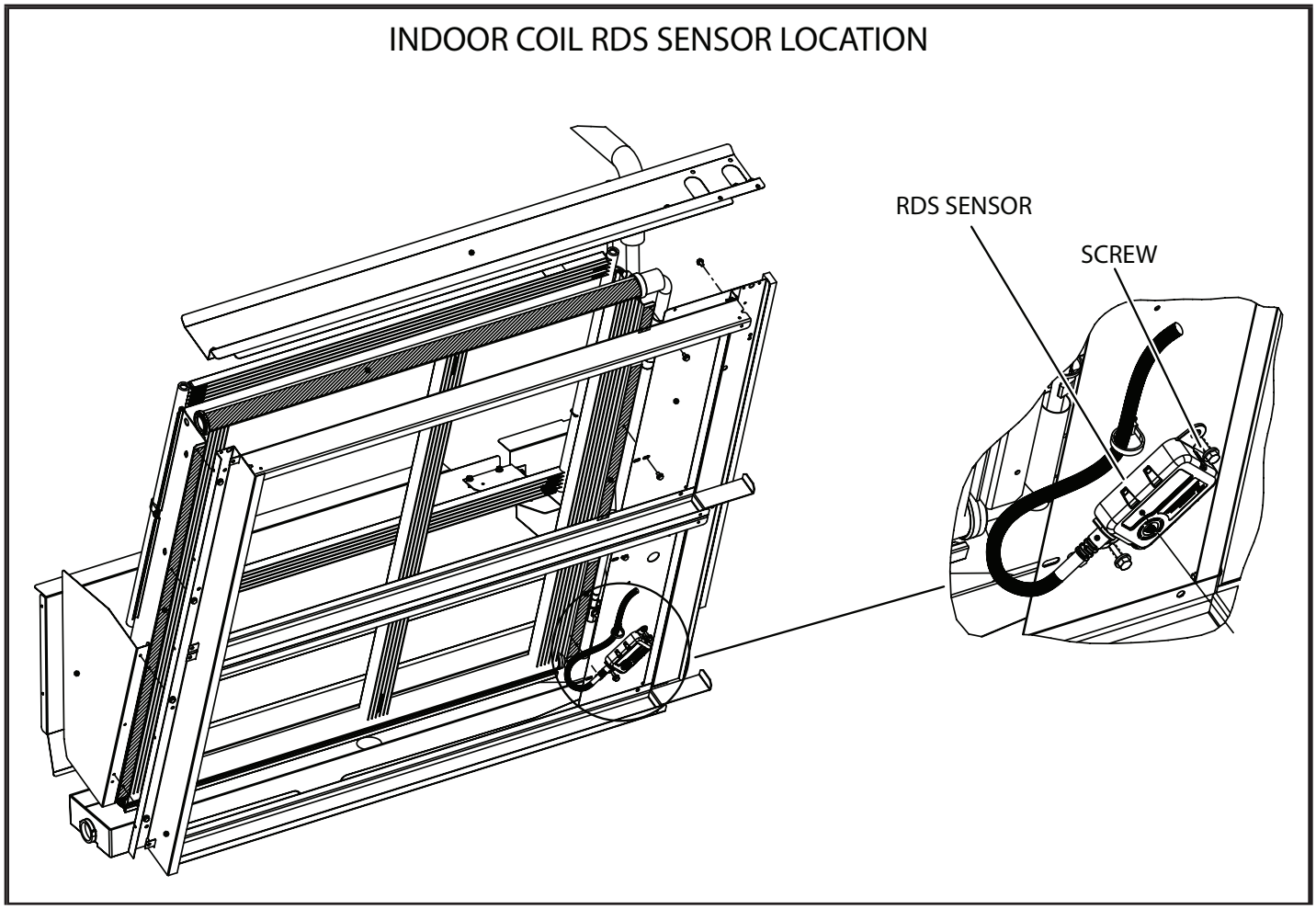



**FIGURE 9**

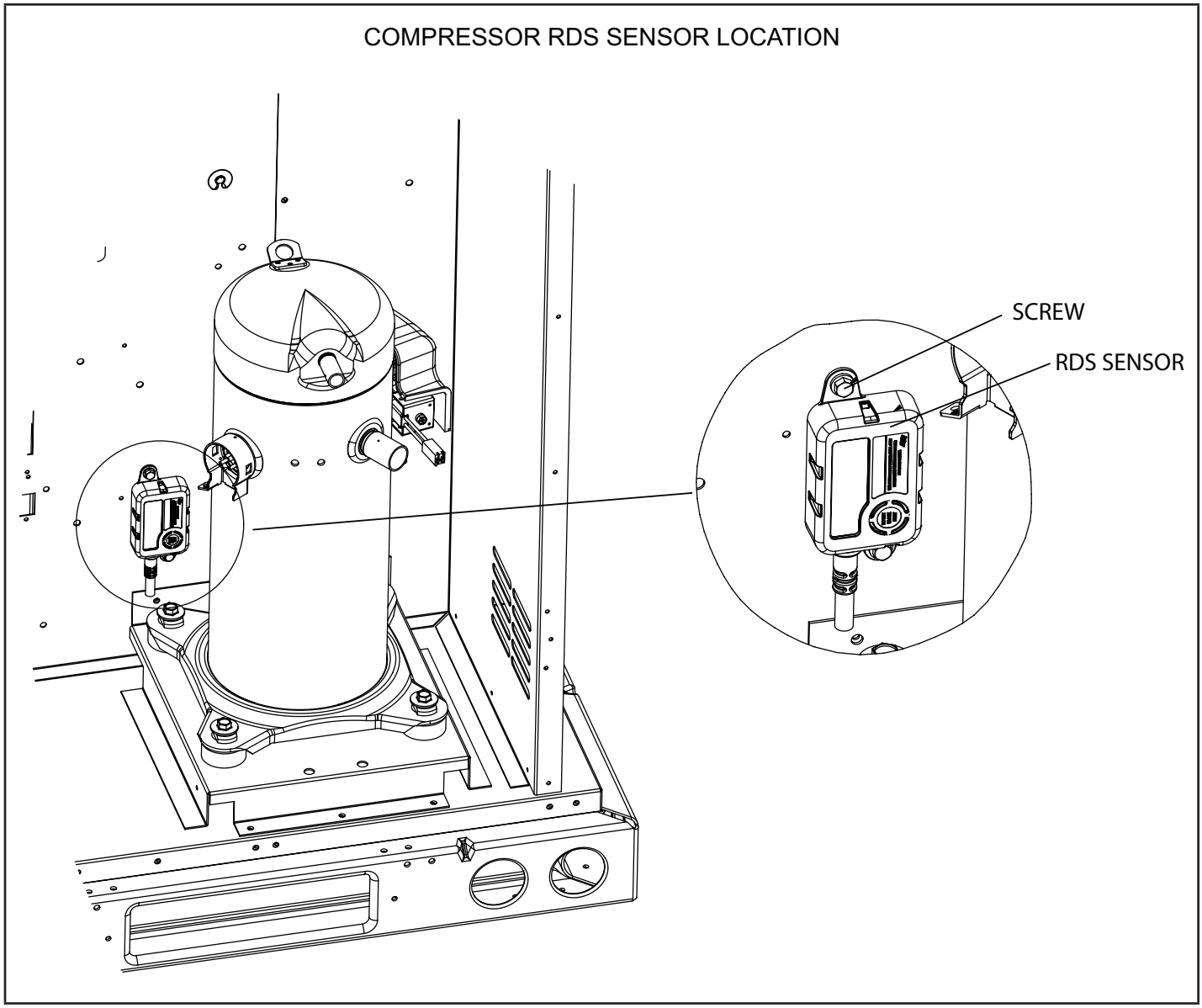



**FIGURE 10**

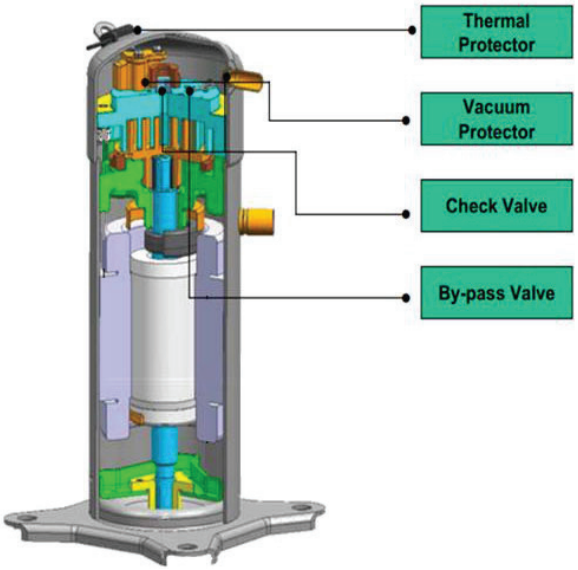
## ⚠ WARNING

**Electrical shock hazard. Compressor must be grounded. Do not operate without protective cover over terminals. Disconnect power before removing protective cover. Discharge capacitors before servicing unit. Failure to follow these precautions could cause electrical shock resulting in injury or death.**

### 6-Variable Speed Compressor B1

All units use one variable speed scroll compressor. See “SPECIFICATIONS” and “ELECTRICAL DATA” (table of contents) or compressor nameplate for compressor specifications. Refer to FIGURE 11 for compressor safety devices and FIGURE 12 for compressor diagnostics.

## COMPRESSOR SAFETY DEVICES




Temperature protection:
Opens 248±9°F; Closes 168.8 ±18°F

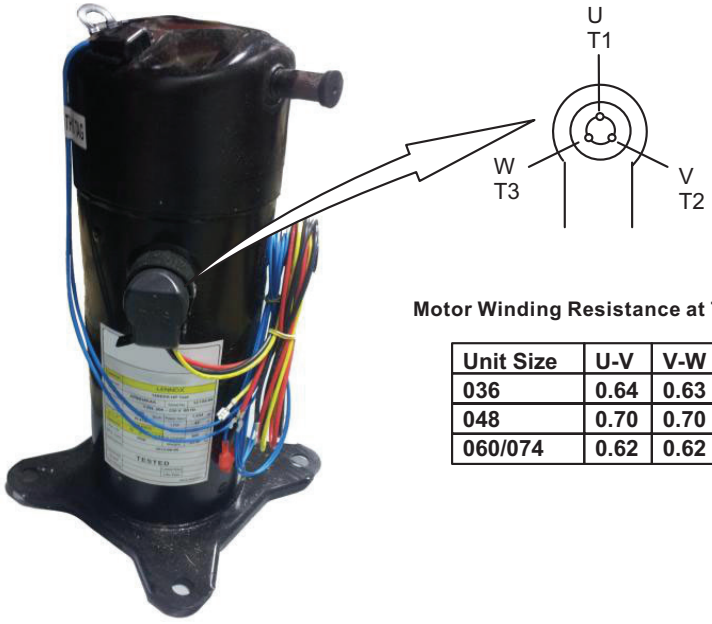
Low suction pressure protection:
Opens below 20 psig

Prevents reverse rotation after stop and increased Cd value

By-passes liquids during compression.

**FIGURE 11**

## COMPRESSOR DIAGNOSTICS




**Motor Winding Resistance at 77°F (+/-7%)**

| Unit Size | U-V | V-W | W-U |
|---|---|---|---|
| 036 | 0.64 | 0.63 | 0.63 |
| 048 | 0.70 | 0.70 | 0.70 |
| 060/074 | 0.62 | 0.62 | 0.62 |

**FIGURE 12**

**7-Compressor Inverter A192**

**⚠ WARNING**

**Electrical Hazard**
**High Voltage**
**Wait 7 Minutes**
**Electrical components may hold charge. Do not remove this panel or service this area for 7 minutes after the power has been removed.**

See FIGURE 13 for compressor inverter controls located behind the hinged control panel.

The inverter varies the compressor speed (capacity) by converting an AC input signal to a pulse high voltage DC output. To initiate cooling operation, the Unit Controller (A55) supplies a control signal to the inverter (A192) via a MODBUS protocol. Inverter status and diagnostics are continuously monitored and reported to the Unit Controller such as:

-Improper Unit Controller input voltage compared to unit model number

-High input voltage

-Low input voltage

-Imbalanced input voltage

-A communication issue - check MODBUS communication wire for good connections between the Unit Controller and the inverter board. See TABLE 3 for inverter-related alarms. Inverter component wire routing is shown in FIGURE 14.

**⚠ WARNING**

**Electrical shock hazard. Variable speed compressor components must be grounded. Failure to follow these precautions could cause electrical shock resulting in injury or death.**

**INVERTER CONTROLS BEHIND THE HINGED CONTROL PANEL**

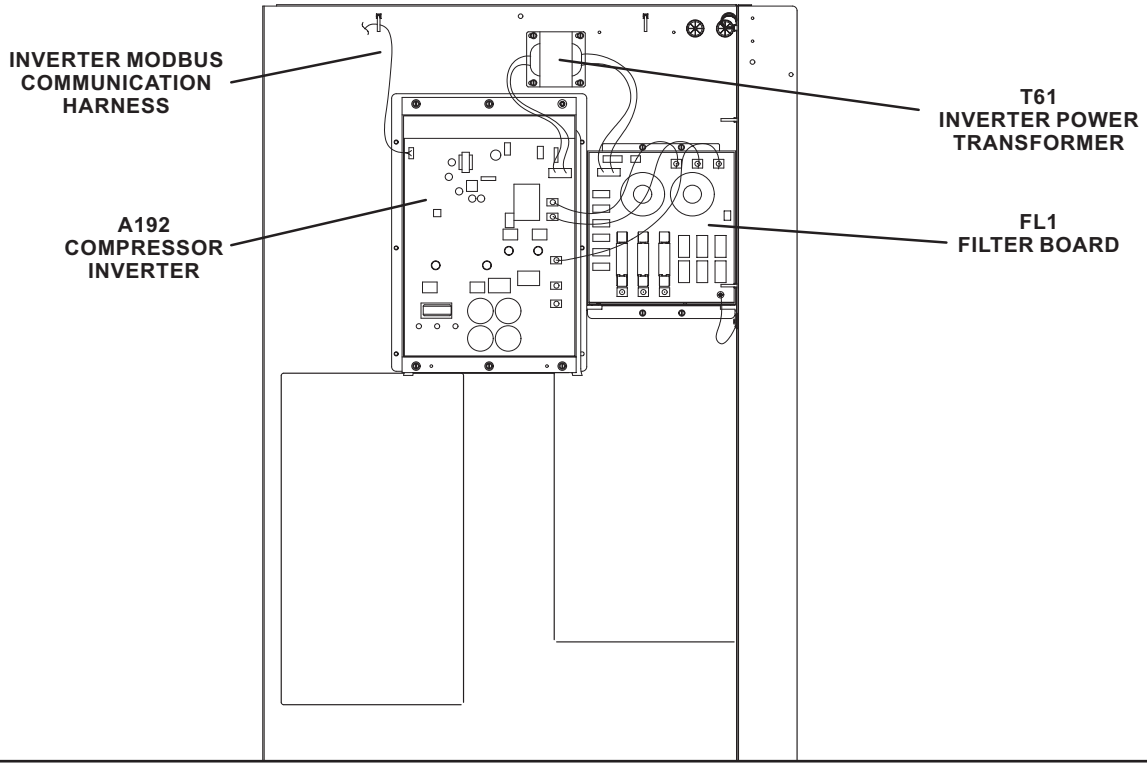



**FIGURE 13**

**TABLE 3**

| INVERTER-RELATED ALARMS | | |
|---|---|---|
| **ALARM CODE** | **DISPLAY MESSAGE** | **EVENT ACTION** |
| 187 | INVERTER LOW LEVEL ALARM | Possible alarming values for Prodigy Alarm 187 are:<br>12 - High compressor input current<br>13 - High heat sink temperature<br>14 - High PFC input current<br>Alarm might be caused by outdoor fan abnormal operation, high ambient conditions, dirty outdoor coil, refrigerant overcharge, or a blocked heat sink.<br>The compressor speed will slow down until the temperature or current lowers, then the compressor will speed up again.<br>If the alarm continues after outdoor conditions have moderated, check the fan, charge and coil. Alarm 187 will automatically clear when minimum off time expires.<br>**REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.** |
| 188 | INVERTER HIGH LEVEL ALARM | Possible alarming values for Prodigy Alarm 188 are:<br>21 - Peak DC current - Intelligent Power Module (IPM) fault condition (follow 12)<br>22 - Maximum current reached lockout<br>23 - DC link low voltage<br>26 - Locked rotor<br>28 - DC link high voltage<br>29 - Compressor over-current<br>61 - Low outdoor ambient inverter lockout<br>62 - High heat sink temperature lockout<br>75 - Low input voltage<br>No action required. Compressor stops for the duration of the minimum run time (anti-short-cycle delay of 180 seconds). Unit shuts down after ten occurrences in one hour and Alarm 189 is initiated. Alarm 188 will automatically clear when inverter error clears.<br>**REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.** |
| 189 | INVERTER FATAL ALARM | Possible alarming values for Prodigy Alarm 189 are the same as alarm 188.<br>Alarm 189 will clear upon manual reset.<br>**REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.** |
| 190 | INVERTER COMMUNICATION ERROR | Unable to communicate with inverter. Unit Controller will disable compressor operation. Replace communication cable between inverter and M3 unit controller. If alarm continues, replace M3 unit controller or inverter. |
| 191 | INVERTER VOLTAGE MISMATCH | Unit Controller will disable compressor operation. Replace with correct inverter part. |

**8-Filter Board FL1**

The filter, also called a line or noise filter, is used to prevent static interference from outside sources. In addition, the filter prevents electrical interference from transferring to other appliances. The input voltage should read the same value as the output voltage. The same filter is used on all unit sizes and voltages.

**9-Inverter Transformer T61**

This transformer is used to supply power to the inverter's low voltage logic circuit. It also provides electrical isolation to protect sensitive components from electrical surges.

**10-Inverter Heat Sink**

An inverter heat sink is located on the back side of the wall between the compressor and outdoor fan sections. The outdoor fan draws air across the heat sink to cool inverter control board components. See FIGURE 15.

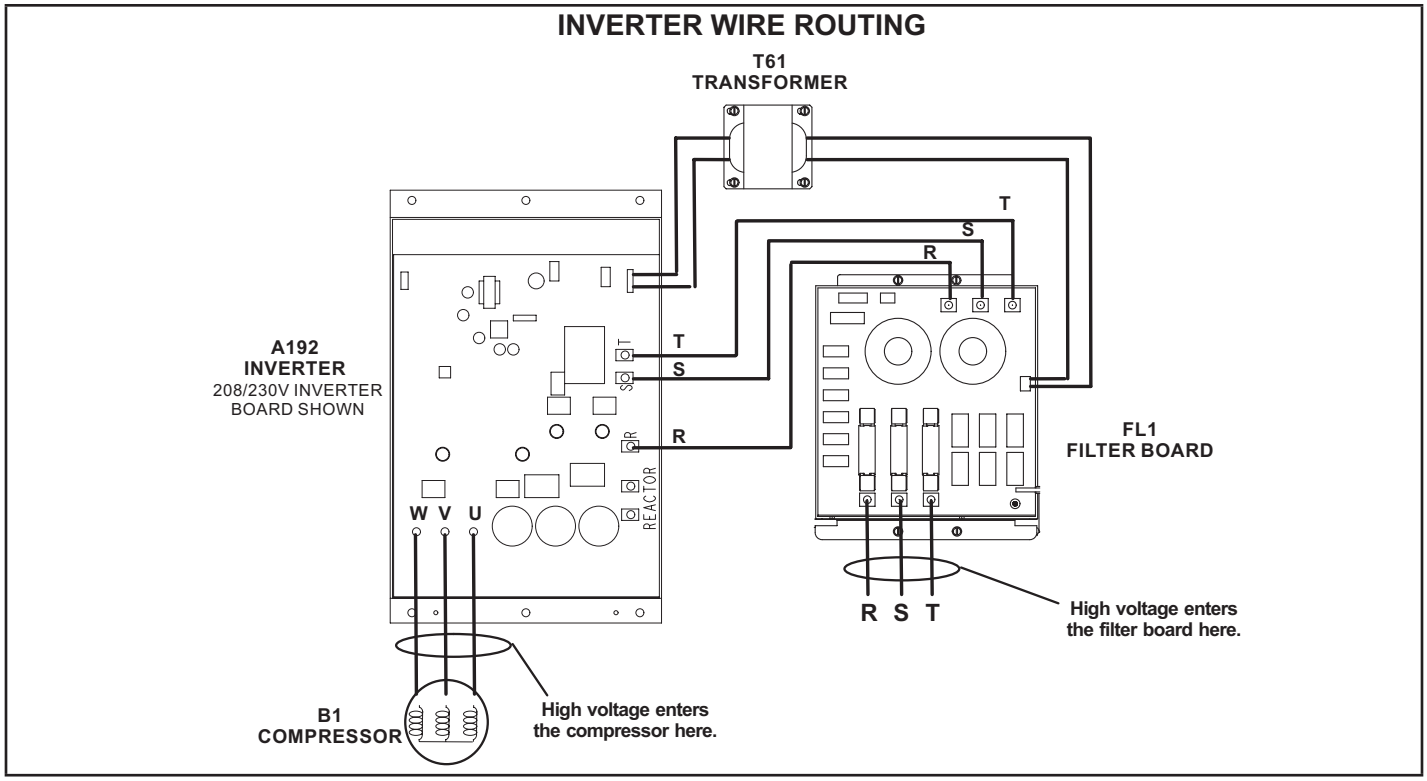



**FIGURE 14**

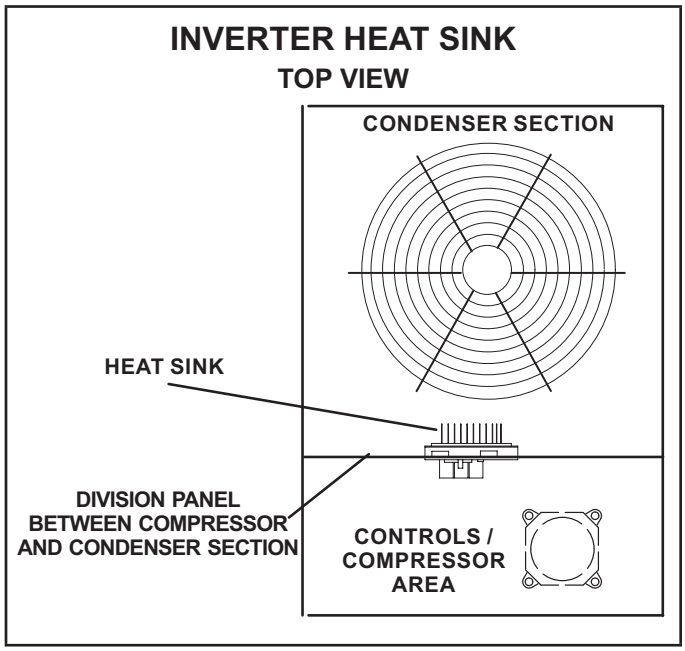



**FIGURE 15**

## C-GAS HEAT COMPONENTS

LGM units are available with two stages of gas heat. See SPECIFICATION - GAS HEAT

### 1-Ignition Control A3

The ignition control provides three main functions: gas valve control, ignition, and flame sensing. The control has a red LED to show control status (TABLE 4).

**TABLE 4**

| UTEC | |
|---|---|
| **LED Flashes** | **Indicates** |
| Steady Off | No power or control hardware fault. |
| Steady On | Power applied. Control OK. |
| 3 Flashes | Ignition lockout from too many trials. |
| 4 Flashes | Ignition lockout from too many flame losses within single call for heat. |
| 5 Flashes | Control hardware fault detected. |

Flame rectification sensing is used on all LGM units. Loss of flame during a heating cycle is indicated by an absence of flame signal (0 microamps). If this happens, the control will immediately restart the ignition sequence and then lock out if ignition is not gained after the third trial. See System Service Checks section for flame current measurement.

The control shuts off gas flow immediately in the event of a power failure. Upon restoration of gas and power, the control will restart the ignition sequence and continue until flame is established or system locks out.

**⚠ WARNING**

**Shock hazard. Spark related components contain high voltage which can cause personal injury or death. Disconnect power before servicing. Control is not field repairable. Unsafe operation will result. If control is inoperable, simply replace the entire control.**

### Operation

On a heating demand, the ignition control checks for a closed limit switch. Once this check is complete and conditions are correct, the ignition control then allows 30 seconds for the combustion air inducer to vent exhaust gases from the burners. When the combustion air inducer is purging the exhaust gases, the combustion air prove switch closes proving that the combustion air inducer is operating before allowing the ignition control to energize. When the combustion air prove switch is closed and the delay is over, the ignition control activates the gas valve(s), the spark electrode and the flame sensing electrode.

At the start of the ignition sequence, the adjustable 40 second (default) indoor blower delay period begins. Sparking stops immediately after flame is sensed or at the end of the 8 second trial for ignition. If flame is not sensed, A3 or A12 will wait 5 minutes before attempting ignition again. If the third trial fails, A3 or A12 will lock-out for one hour. The A55 counts this as a first strike. After the first lock-out hour elapses, A3 or A12 will attempt ignition three more times. If flame is still not sensed, A3 or A12 will lock-out for the second hour. A55 counts this as the second strike. After the second lockout hour, A3 or A12 will attempt ignition three more times. If ignition fails, A55 considers this the third strike and will lock-out unit operation. Service relay contacts close and alarm 59 or 69 is displayed. The unit will remain in lock-out until:

1-A55 is reset

or

2-The alarm condition is cleared AND the alarm status is read through the SBUS command.

Once the flame is sensed, the ignition control then proceeds to “steady state” mode where all inputs are monitored to ensure the limit switch, roll-out switch and prove switch are closed as well as flame is present. When the heat call is satisfied the gas valve and combustion air inducer are de-energized. An adjustable 120-second (default) blower off delay begins.

### 2-Primary High Temperature Limits S10

S10 is a SPST N.C. high temperature primary limit for gas heat. Limits are located in the control box next to the discharge air sensor. See FIGURE 16.

Limits are wired to the A3 ignition control. N.C. contacts open to de-energize the ignition control when excessive temperature is reached in the blower compartment.

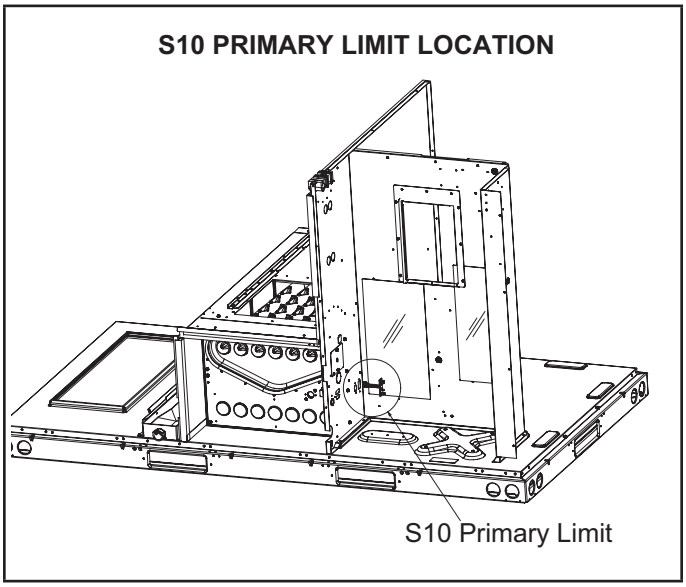



**FIGURE 16**

### 3-Heat Exchanger FIGURE 17

The LGM units use aluminized steel inshot burners with tubular aluminized (stainless is optional) steel heat exchangers and redundant gas valve. Burners in all units use a burner venturi to mix gas and air for proper combustion. Combustion takes place at each tube entrance. As hot combustion gases are drawn upward through each tube by the combustion air inducer, exhaust gases are drawn out the top and fresh air/gas mixture is drawn in at the bottom. Heat is transferred to the air stream from all surfaces of the heat exchanger tubes. The supply air blower forces air across the tubes to extract the heat of combustion. The shape of the tubes ensures maximum heat exchange.

The gas valves on two stage units accomplish staging by allowing more or less gas to the burners as called for by heating demand.

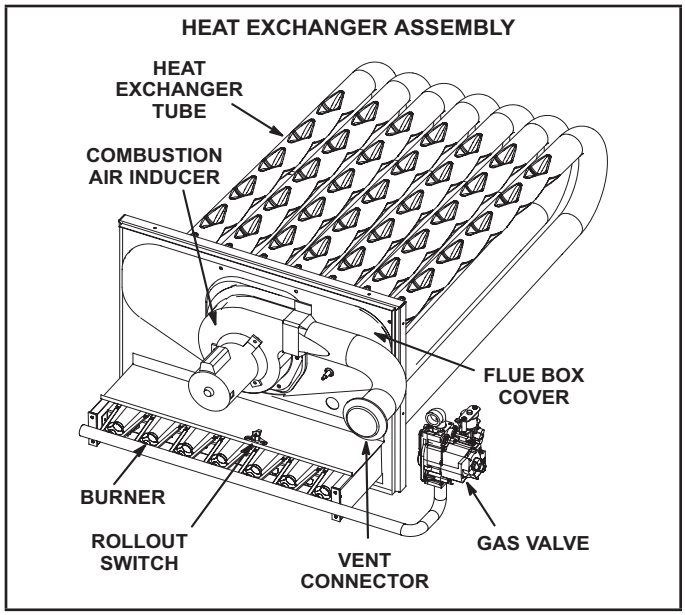



**FIGURE 17**

### 4-Burner Box Assembly FIGURE 18

The burner assembly consists of a spark electrode, flame sensing electrode and gas valve. Ignition board A3 and A12 control all functions of the assembly.

#### *Burners*

All units use inshot burners. Burners are factory set and do not require adjustment. A peep hole with cover is furnished in the heating access panel for flame viewing. Always operate the unit with the access panel in place.

Burners can be removed individually for service on older units. On newer units, burners are connected and the entire assembly can be removed. Burner maintenance and service is detailed in the SERVICE CHECKS section of this manual. See FIGURE 19 for number of burners.

#### *Orifice*

Each burner uses an orifice which is matched to the burner input. The orifice is threaded into the burner manifold. The burner is supported by the orifice and will easily slide off for service once the mounting screws are removed from the burners.

***NOTE -*** *Do not use thread sealing compound on the orifices. Using thread sealing compound may plug the orifices.*

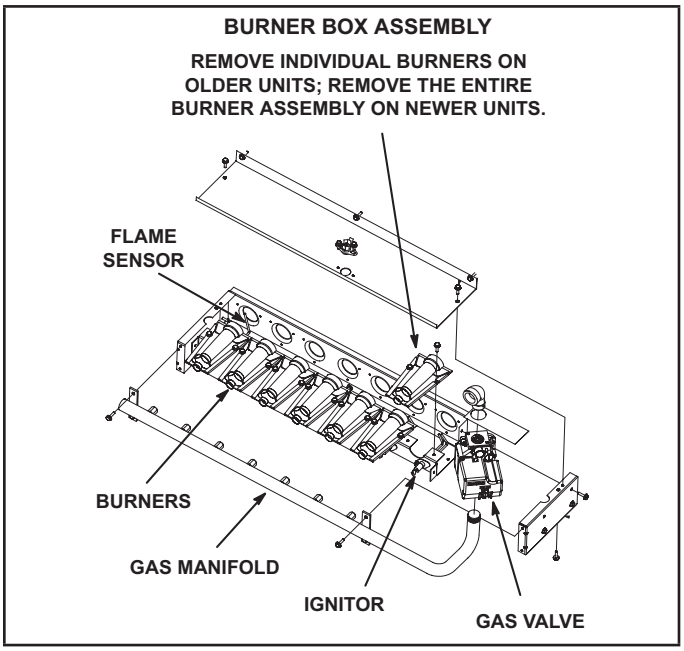



**FIGURE 18**

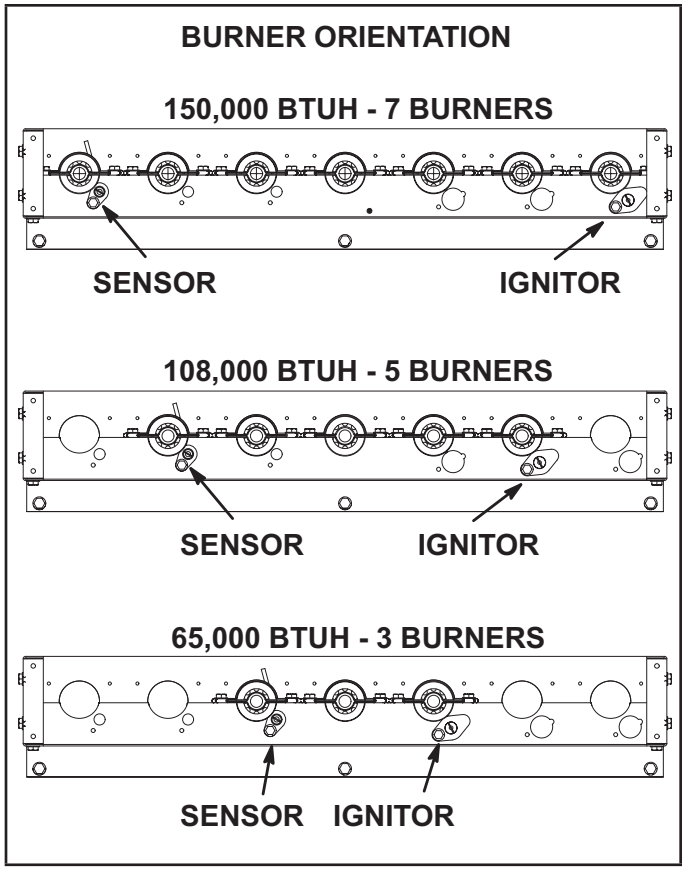



**FIGURE 19**

**5-Flame Roll-out Limit Switch S47**

The flame roll-out limit switch is a SPST N.C. high temperature limit located just above the burner air intake opening in the burner enclosures. The switch is wired to the A3 ignition controller. When the limit switch senses flame roll-out (indicating a blockage in the combustion air passages), the flame roll-out limit trips, and the Unit Controller immediately closes the gas valve. Limit is factory preset to open at 340F ± 16F on a temperature rise on all units. All flame roll-out limits are manual reset.

**6-Combustion Air Prove Switch S18**

Prove switch S18 is a SPST N.O. switch located to the right of the induced draft assembly. See FIGURE 20. S18 monitors combustion air inducer operation. Switch S18 is wired to A3 ignition controller which checks its status upon a call for heating. The switch closes at negative 0.10"W.C. ± 0.05" (24.8 Pa ± 12.4 Pa) on pressure fall. This negative pressure fall and switch actuation allows the ignition sequence to continue (proves, by closing, that the combustion air inducer is operating before allowing the gas valve to open.) The combustion air prove switch is factory set and not adjustable.

**7-Combustion Air Motor Capacitor C3**

The combustion air inducer motors in all LGM units require run capacitors. Capacitor C3 is connected to combustion air inducer B6. Ratings will be on side of capacitor or combustion air motor nameplate.

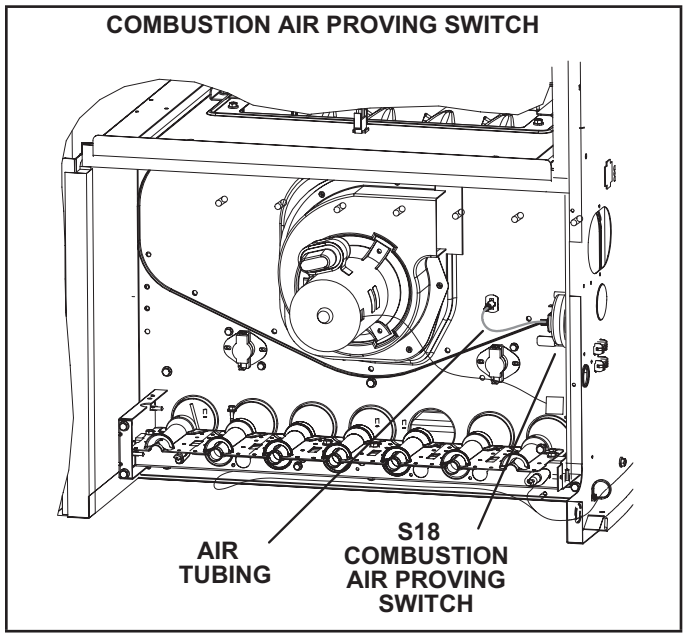



**FIGURE 20**

**8-Combustion Air Inducer B6**

Combustion air inducers provide air to the corresponding burners while clearing the combustion chamber of exhaust gases. The inducer begins operating immediately upon receiving a thermostat demand and is de-energized when thermostat demand is satisfied.

The inducer uses a 208/230V single-phase PSC motor and a 5.24 in. x .96in. blower wheel. All motors operate at 3300RPM and are equipped with auto-reset overload protection. Two-speed units have reduced RPM for low speed. Inducers are supplied by various manufacturers. Ratings may vary by manufacturer. Specific inducer electrical ratings can be found on the unit rating plate.

The ignition control board energizes an internal relay to route power to the combustion air blower motor. A3 then allows 30 to seconds for the combustion air inducer to vent exhaust gases from the burners. When the combustion air inducer is purging the exhaust gases, the combustion air

prove switch closes, proving that the combustion air inducer is operating before allowing the ignition sequence to continue. When the combustion air prove switch is closed and the delay is over, the A3 ignition control activates the appropriate stage operator of the gas valve, the spark and the flame sensing electrode. Sparking stops immediately after flame is sensed or at the end of the eight second trial for ignition.

On two-stage natural gas units, the inducer will operate on low speed for first stage heat (W1) and ramp up to high speed for second stage heat (W2).

All combustion air inducer motors are sealed and cannot be oiled. The inducer cannot be adjusted but can be removed from the heat section for cleaning.

**IGNITION CONTROL A3**

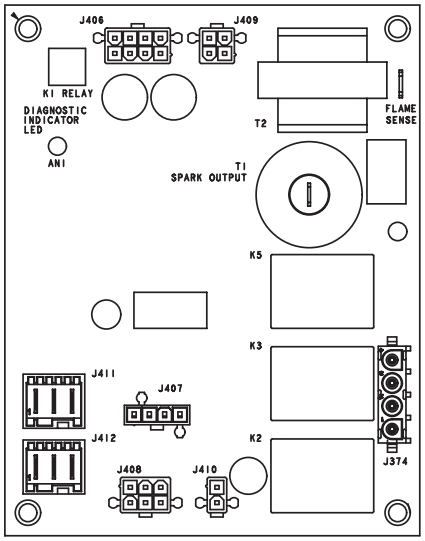



**FIGURE 21**

**9-Gas Valves GV1**

Units are equipped with a two-stage gas valve. When a heating demand is present, the valve is energized in low fire by the ignition control at the same time as the spark electrode.

If the heating demand increases, the high fire signal is provided by the ignition controller. Both the low fire and high fire signals are required for the gas valve to operate in high fire.

A shut-off knob/switch is provided on the valve for manual shut-off. The shut-off knob/switch will immediately close both stages without delay.

Both low fire and high fire (if applicable) valve outputs are adjustable. FIGURE 26 shows gas valve components. TABLE 5 shows factory gas valve operating manifold pressures.

**TABLE 5**

**Operating Pressure (outlet) Factory Setting "W.C**

| Natural | | LP | |
|---|---|---|---|
| Low | High | Low | High |
| 2.0 ± 0.3" | 3.5 ± 0.3 | 5.9" ± 0.3 | 10.5" ± 0.5 |

The gas manifold pressure should be adjusted when the unit is installed at altitudes higher than 2000 feet. See HIGH ALTITUDE table in SPECIFICATIONS - GAS HEAT

**10-Spark Electrode (Ignitor) FIGURE 22**

An electrode assembly is used for ignition spark. The electrode is inserted through holes in the burner support. See FIGURE 19. The electrode tip protrudes into the flame envelope of the adjacent burner. The electrode assembly is fastened to burner supports and can be removed for service without removing any part of the burners.

During ignition, spark travels through the spark electrode (FIGURE 22) and ignites the appropriate burner depending on the heating stage. Flame travels from burner to burner until all are lit.

The spark electrode is connected to the ignition control by a 8 mm silicone-insulated stranded high voltage wire. The wire uses 1/4" (6.35 mm)female quick connect on both ends of the wire.

***NOTE -*** *If electrode wire must be replaced, wire and suppression must be same type cable.*

The spark electrode assembly can be removed for inspection by removing the screw securing the electrode assembly and sliding it out of unit.

For proper unit operation, electrodes must be positioned and gapped correctly.

Spark gap may be checked with appropriately sized twist drills or feeler gauges. Disconnect power to the unit and remove electrode assembly. The gap should be between 0.125" ± 0.015" (3.2 mm ± .4 mm). See FIGURE 22.

**⚠ IMPORTANT**

**In order to maximize spark energy to electrode, high voltage wire should touch unit cabinet as little as possible.**

**IGNITOR**

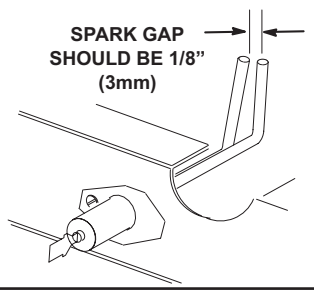



**FIGURE 22**

**11-Flame Sensor**

The flame sensor (FIGURE 23) is mounted through a hole in the burner support and the tip protrudes into the flame envelope of the appropriate burner. See FIGURE 19 for location. The sensor assembly is fastened to burner supports and can be removed for service without removing any part of the burners.

When flame is sensed by the flame sensor (indicated by microamp signal through the flame) sparking stops immediately or after the eight second trial for ignition. During operation, flame is sensed by current passed along the ground electrode (located on the spark electrode), through the flame and into the sensing electrode. The ignition control allows the gas valve to stay open as long as a flame signal (current passed through the flame) is sensed.

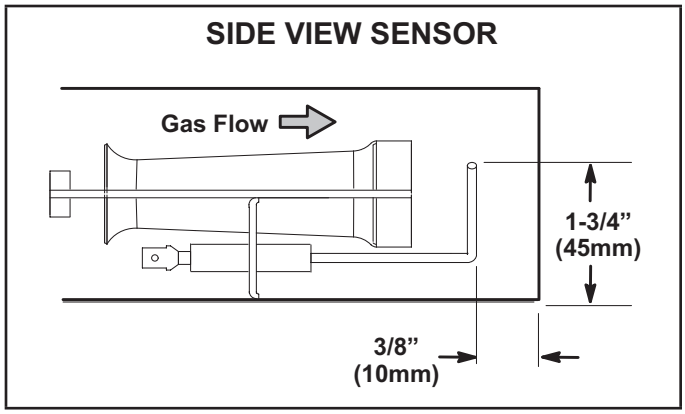



**FIGURE 23**

**D-BLOWER COMPARTMENT**

Units are equipped with a variable speed, direct drive blower. The installer is able to enter the design-specified supply air CFM into the Unit Controller for optimal efficiency. The Unit Controller calibrates the supply air volume which eliminates the need to manually take duct static measurements.

**1-Indoor Blower Motor B3**

All direct drive blower motors are electronically commutated, brushless, DC motors. The motors are powered with high voltage 3-phase AC power. CFM adjustments are made by changing Unit Controller parameters via the service app. Motors are equipped with sealed ball bearings. All motor specifications are listed in the SPECIFICATIONS (table of contents) in the front of this manual. Motors come with pre-mounted aluminum impellers.

## ⚠ IMPORTANT

**Three phase scroll compressors must be phased sequentially for correct compressor and blower rotation. Follow "COOLING START-UP" section of installation instructions to ensure proper compressor and blower operation.**

**A-Blower Operation**

Refer to the Unit Controller Setup Guide to energize blower. Use the mobile service app menu; see:

**RTU MENU > COMPONENT TEST > BLOWER > START TEST.**

## ⚠ WARNING

**1-Make sure that unit is installed in accordance with the installation instructions and applicable codes.**

**2-Inspect all electrical wiring, both field-and factoryinstalled, for loose connections. Tighten as required.**

**3-Check to ensure that refrigerant lines do not rub against the cabinet or against other refrigerant lines.**

**4-Check voltage at disconnect switch. Voltage must be within range listed on nameplate. If not, consult power company and have voltage condition corrected before starting unit.**

**5-Make sure filters are new and in place before startup.**

**B-Determining Unit CFM**

CFM is calculated using a supplied pressure transducer and can be viewed in the mobile service app. CFM can also be manually checked as follows:

1 - The following measurements must be made with air filters in place.

***IMPORTANT -*** *A low speed adjustment less than 2/3 of high speed will improve humidity removal; refer to product data for more information.*

2 - With all access panels in place, measure static pressure external to unit (from supply to return). Blower performance data is based on static pressure readings taken in locations shown in FIGURE 24.

*Note - Static pressure readings can vary if not taken where* shown.

3 - Measure the indoor blower wheel RPM.

4 - Referring to the blower tables in the front of this manual, use static pressure and RPM readings to determine unit CFM. Apply the optional accessory air resistance.

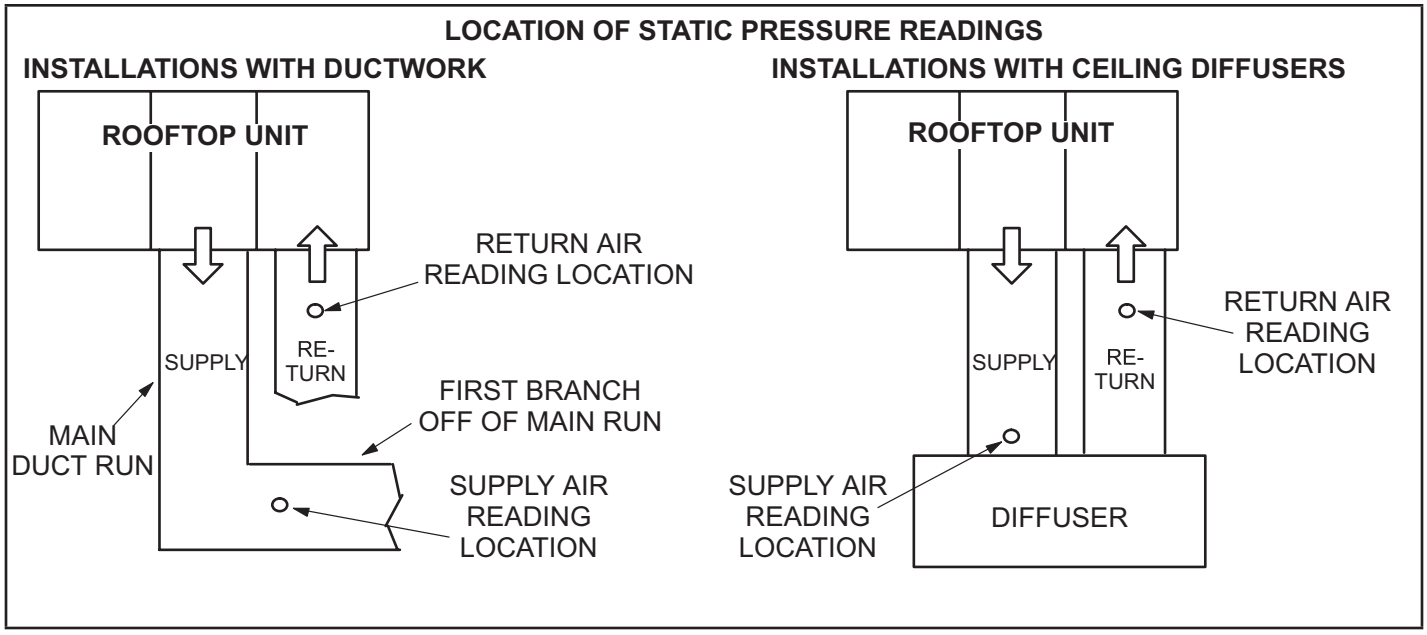



**FIGURE 24**

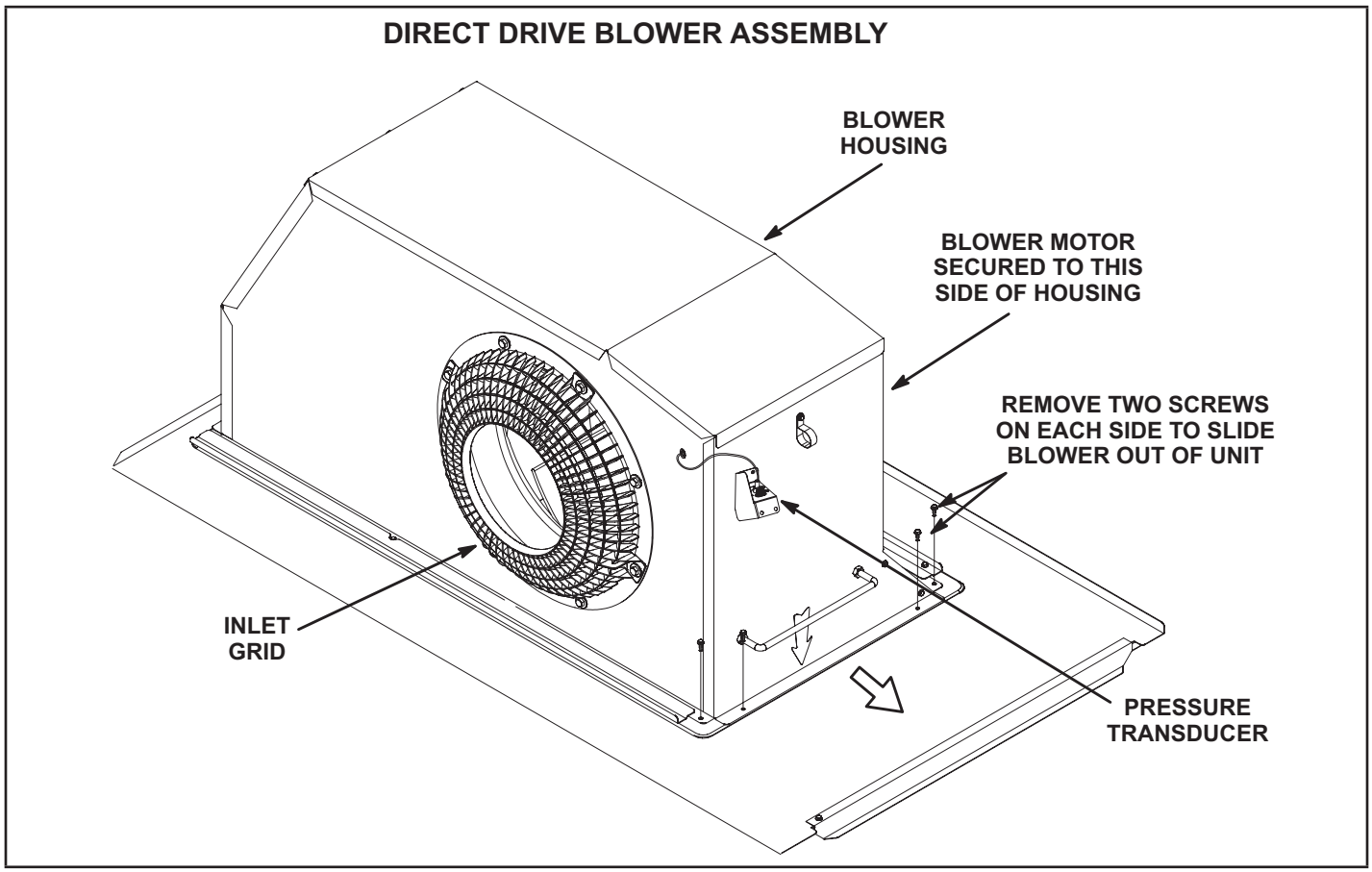



**FIGURE 25**

### C-Adjusting Unit CFM

The supply CFM can be adjusted by changing Unit Controller settings. Refer to TABLE 6 for menu paths and default settings. Record any CFM changes on the parameter settings label located on the inside of the compressor access panel.

**⚠ CAUTION**

**The BLOWER CALIBRATION process starts the indoor blower at operational speeds and moves the economizer damper blades. Before starting this process, replace any access panels and close all unit doors except compressor compartment door.**

Blower calibration is required only on units that are newly installed or if there is a change in the duct work or air filters after installation. Use the mobile service app to navigate to the SETUP>TEST & BALANCE>BLOWER menu. After the new CFM values are entered, select START CALIBRATION. The blower calibration status is displayed as a % complete. Upon successful completion, the mobile service app will display CALIBRATION SUCCESS and go back to the blower calibration screen.

***IMPORTANT -*** *The default value for Cooling Low CFM is lower than a traditional singe- or two-speed blower. If operating the unit with a 2- or 3-stage controller (2- or 3-stage thermostat, DDC controller, etc.), it is recommended to increase the Cooling Low CFM default value to a suitable level for part load cooling (typically 60% of full load CFM).*

**TABLE 6**
**DIRECT DRIVE PARAMETER SETTINGS**

| Parameter | Factory Setting | | | | Field Setting | Description |
|---|---|---|---|---|---|---|
| | 036 | 048 | 060 | 074 | | |
| ***NOTE -*** *Any changes to Smoke CFM setting must be adjusted before the other CFM settings. Use SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 12* | | | | | | |
| BLOWER SMOKE CFM | 1200 | 1600 | 2000 | 2400 | CFM | Smoke blower speed |
| **SETUP > TEST & BALANCE > BLOWER** | | | | | | |
| BLOWER HEATING HIGH CFM | 1350 | 1600 | 2000 | 2000 | CFM | High heat blower speed |
| BLOWER COOLING HIGH CFM | 1100 | 1450 | 1825 | 2200 | CFM | High cooling blower speed |
| BLOWER COOLING LOW CFM | 575 | 750 | 950 | 950 | CFM | Low cooling blower speed |
| BLOWER VENTILATION CFM | 575 | 750 | 950 | 1150 | CFM | Ventilaton blower speed |
| **SETUP > TEST & BALANCE > DAMPER** | | | | | | |
| BLOWER HIGH CFM DAMPER POS % | 0% | 0% | 0% | 0% | % | Minimum damper position for high speed blower operation. |
| BLOWER LOW CFM DAMPER POS% | 0% | 0% | 0% | 0% | % | Minimum damper position for low speed blower operation. |
| BLOWER EXHAUST DAMPER POS% | 50% | 50% | 50% | 50% | % | Minimum damper position for power exhaust operation. |
| **SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 216** | | | | | | |
| POWER EXHAUST DEADBAND % | 10% | 10% | 10% | 10% | % | Deadband % for power exhaust operation. |
| **SETTINGS > RTU OPTIONS > EDIT PARAMETER = 10 (Applies to Thermostat Mode ONLY)** | | | | | | |
| FREE COOLING STAGE-UP DELAY | 300 sec. | 300 sec. | 300 sec. | 300 sec. | sec | Number of seconds to hold indoor blower at low speed before switching to indoor blower at high speed. |

*Installer - Circle applicable unit model number and record any parameter changes under "Field Setting" column. Settings need to be recorded by installer for use when Unit Controller is replaced or reprogrammed.*

**II-PLACEMENT AND INSTALLATION**

Make sure the unit is installed in accordance with the installation instructions and all applicable codes. See accessories section for conditions requiring use of the optional roof mounting frame (T1CURB-AN or C1CURB-AN).

**III-START UP - OPERATION**

**A-Preliminary and Seasonal Checks**

1 - Make sure the unit is installed in accordance with the installation instructions and applicable codes.

2 - Inspect all electrical wiring, both field and factory installed for loose connections. Tighten as required. Refer to unit diagram located on inside of unit compressor access panel.

3 - Check to ensure that refrigerant lines are in good condition and do not rub against the cabinet or other refrigerant lines.

4 - Check voltage at the disconnect switch. Voltage must be within the range listed on the nameplate. If not, consult the power company and have the voltage corrected before starting the unit.

5 - Recheck voltage and amp draw with unit running. If voltage is not within range listed on unit nameplate, stop unit and consult power company. Refer to unit nameplate for maximum rated load amps.

**B-Heating Start up**

**FOR YOUR SAFETY READ BEFORE LIGHTING**

BEFORE LIGHTING 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.

No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

**⚠ WARNING**

**Electric shock hazard. Can cause injury or death. Do not use this unit if any part has been under water. Immediately call a qualified service technician to inspect the unit and to replace any part of the control system and any gas control which has been under water.**

**⚠ WARNING**

**Danger of explosion. Can cause injury or product or property damage. If overheating occurs or if gas supply fails to shut off, shut off the manual gas valve to the appliance before shutting off electrical supply.**

**⚠ CAUTION**

**SMOKE POTENTIAL**

**The heat exchanger in this unit could be a source of smoke on initial firing. Take precautions with respect to building occupants and property. Vent initial supply air outside when possible.**

The gas valve may be equipped with either a gas control lever or gas control knob. Use only your hand to push the lever or turn the gas control knob. Never use tools. If the the lever will not move or the knob will not push in or turn by hand, do not try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire or explosion.

This unit is equipped with an automatic spark ignition system. There is no pilot. In case of a safety shutdown, move thermostat switch to **OFF** and return the thermostat switch to **HEAT** to reset ignition control.

**⚠ WARNING**

**Danger of explosion. Can cause injury or death. Do not attempt to light manually. Unit has a direct spark ignition system.**

**Gas Valve Operation (FIGURE 26)**

1 - Set thermostat to lowest setting.

2 - Turn off all electrical power to appliance.

3 - This appliance is equipped with an ignition device(s) which automatically lights the burner. Do not try to light the burner by hand.

4 - Open or remove the heat section access panel.

5 - Move gas valve switch(es) to **OFF**. See FIGURE 26.

6 - Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Immediately call your gas supplier from a neighbor’s phone. Follow the gas supplier’s instructions. If you do not smell gas, go to the next step.

7 - Move gas valve switch(es) to **ON**. See FIGURE 26.

8 - Close or replace the control access panel.

9 - Turn on all electrical power to appliance.

10 - Set thermostat to desired setting.

***NOTE -*** *When unit is initially started, steps 1 through 9 may need to be repeated to purge air from gas line.*

11 - The ignition sequence will start.

12 - If the furnace does not light the first time (gas line not fully purged), it will attempt up to two more ignitions before locking out.

13 - If lockout occurs, repeat steps 1 through 10.

14 - If the appliance will not operate, follow the instructions “Turning Off Gas to Appliance” and call your service technician or gas supplier.

**Turning Off Gas to Unit**

1 - If using an electromechanical thermostat, set to the lowest setting.
2 - Before performing any service, turn off all electrical power to the appliance.
3 - Open or remove the control access panel.
4 - Move gas valve switch(es) to OFF.
5 - Close or replace the control access panel.

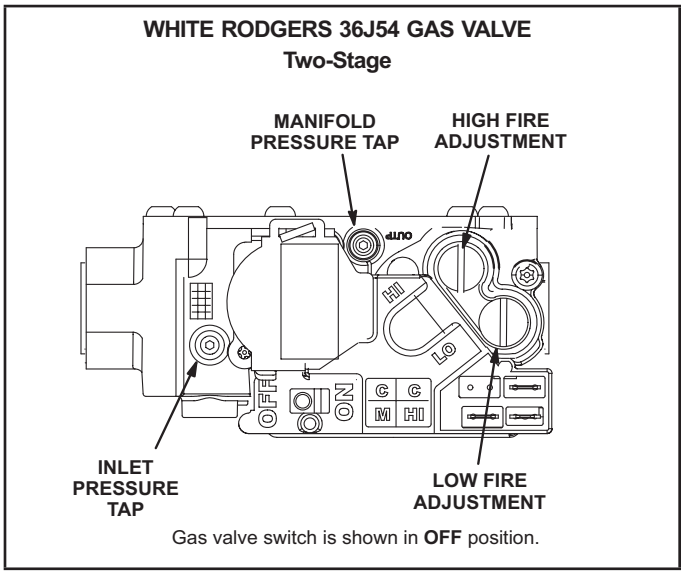



**FIGURE 26**

**C-Cooling Start up**

**1-Operation**

1 - Initiate full load cooling operation using the following mobile service app menu path:

**SERVICE > TEST > COOL > COOL 3**

**(COOL 4 on 074U units)**

***NOTE -*** *Refore to Cooling Operation section for ultra high efficiency unit operation in zone sensor mode.*

2 - Units contain one refrigerant circuit or stage.
3 - Unit is charged with R-454B refrigerant. See unit rating plate for correct amount of charge.
4 - Refer to charging section method to check refrigerant charge.

**D-Safety or Emergency Shutdown**

Turn off power to unit. Close manual and main gas valves.

No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

**E-Refrigerant Leak Detection System**

The Refrigerant Leak Detection System can be tested by using the following mobile service app menu path:

**RTU MENU > COMPONENT TEST > LEAK DETECTION > START TEST**

Ensure that the indoor blower, outdoor fan, and combustion air blower (LGM Only) are energized.

**IV-CHARGING**

**A-Refrigerant Charge and Check - All-Aluminum Coil**

**WARNING - Do not exceed nameplate charge under any condition.**

This unit is factory charged and should require no further adjustment. If the system requires additional refrigerant, *reclaim the charge*, *evacuate the system*, and *add required nameplate charge*.

| Refrigerant Charge R-454B | | |
|---|---|---|
| Unit | $M_c$(lbs) | $M_c$(kg) |
| LGM036 | 4.50 | 2.0412 |
| LGM048 | 5.0625 | 2.2963 |
| LGM060 | 5.0625 | 2.2963 |
| LGM074 | 5.0625 | 2.2963 |
| LGM036 W/ Humidtrol | 5.6875 | 2.5798 |
| LGM048 W/ Humidtrol | 5.5625 | 2.5231 |
| LGM060 W/ Humidtrol | 5.5625 | 2.5231 |
| LGM074 W/ Humidtrol | 5.5625 | 2.5231 |

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed and, since flammability is a consideration, the following procedure shall be adhered to:

- Safely remove refrigerant following local and national regulations
- Evacuate the circuit
- Purge the circuit with inert gas
- Evacuate
- Purge with inert gas
- Open the circuit

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. Refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system

shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the unit is earth grounded prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the unit.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i. e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-of f valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

***NOTE -*** *System charging is not recommended below 60°F (15°C). In temperatures below 60°F (15°C), the charge must be weighed into the system.*

If weighing facilities are not available, or to check the charge, use the following procedure:

1 - Make sure outdoor coil is clean. Attach gauge manifolds and operate unit at full CFM in cooling mode with economizer disabled until system stabilizes (approximately five minutes). Make sure all outdoor air dampers are closed.

2 - Compare the normal operating pressures to the pressures obtained from the gauges. Check unit components if there are significant differences.

3 - Measure the outdoor ambient temperature and the suction pressure. Refer to the charging curve to determine a target liquid temperature.

***NOTE -*** *Pressures are listed for sea level applications.*

4 - Use the same thermometer to accurately measure the liquid temperature (in the outdoor section).

- If measured liquid temperature is higher than the target liquid temperature, add refrigerant to the system.
- If measured liquid temperature is lower than the target liquid temperature, recover some refrigerant from the system..

5 - Add or remove charge in increments. Allow the system to stabilize each time refrigerant is added or removed.

6 - Continue the process until measured liquid temperature agrees with the target liquid temperature. Do not go below the target liquid temperature when adjusting charge. Note that suction pressure can change as charge is adjusted.

7 - Example: For the 036 non-reheat model at 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 96°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

**B-Subcooling Method - Ultra High Efficiency Units**

1 - Attach gauge manifold to the liquid line. With the economizer disabled, operate the unit in cooling mode at high speed using the following mobile service app menu path:

SERVICE > TEST > COOL > COOL 3

(COOL 4 on 074U units)

2 - Use the liquid line pressure and a PT chart to determin the saturated liquid temperature.

3 - Measure the liquid line temperature at the condenser outlet.

Subcooling Temperature = Liquid Saturated Temperature Minus Liquid Temperature.

4 - The subcooling temperature should be as shown in TABLE 7. A subcooling temperature greater than this value indicates an overcharge. A subcooling temperature less than this value indicates an undercharge.

**TABLE 7**

**SUBCOOLING TEMPERATURE**

| Unit | Liquid Saturated Temp. Minus Liquid Temperature |
|---|---|
| 036U | 11°F ± 1 (6.0°C ± 0.5) |
| 048U | 11.5°F ± 1 (6.4°C ± 0.5) |
| 060U | 13.5°F ± 1 (7.5°C ± 0.5) |
| 074U | 15°F ± 1 (8.3°C ± 0.5) |

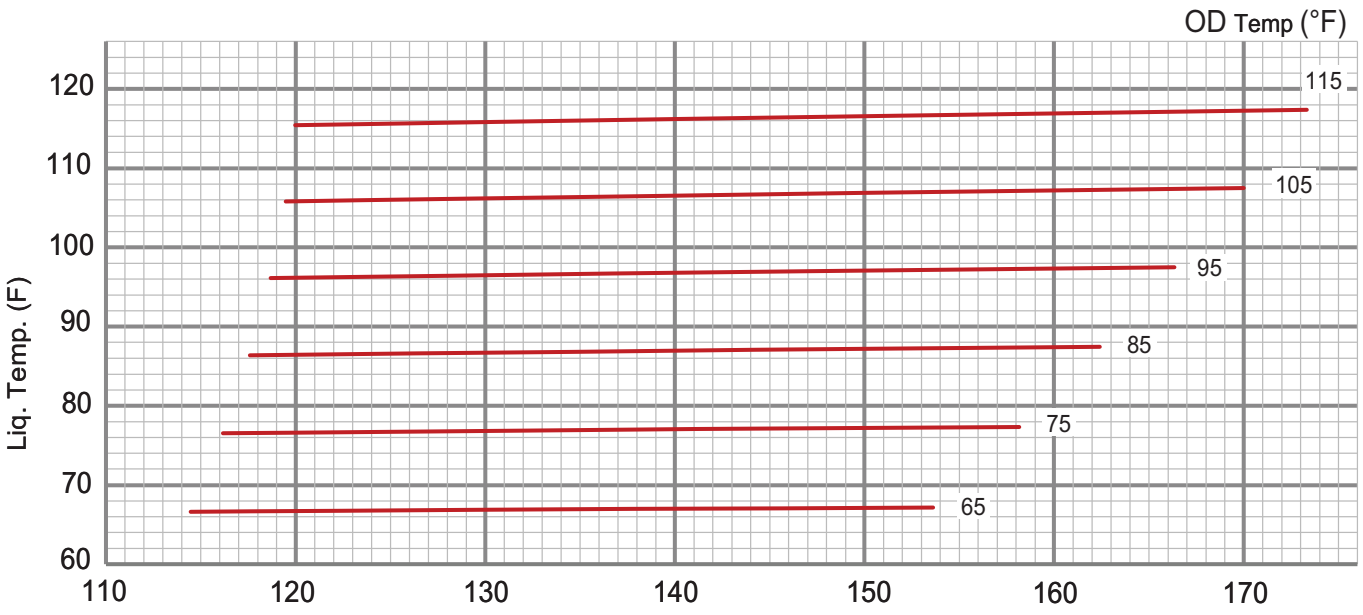
**TABLE 8**

**036 Normal Operating Pressures - No Reheat - All-Aluminum Coil - 581223-01**

**Outdoor Coil Entering Air Temperature**

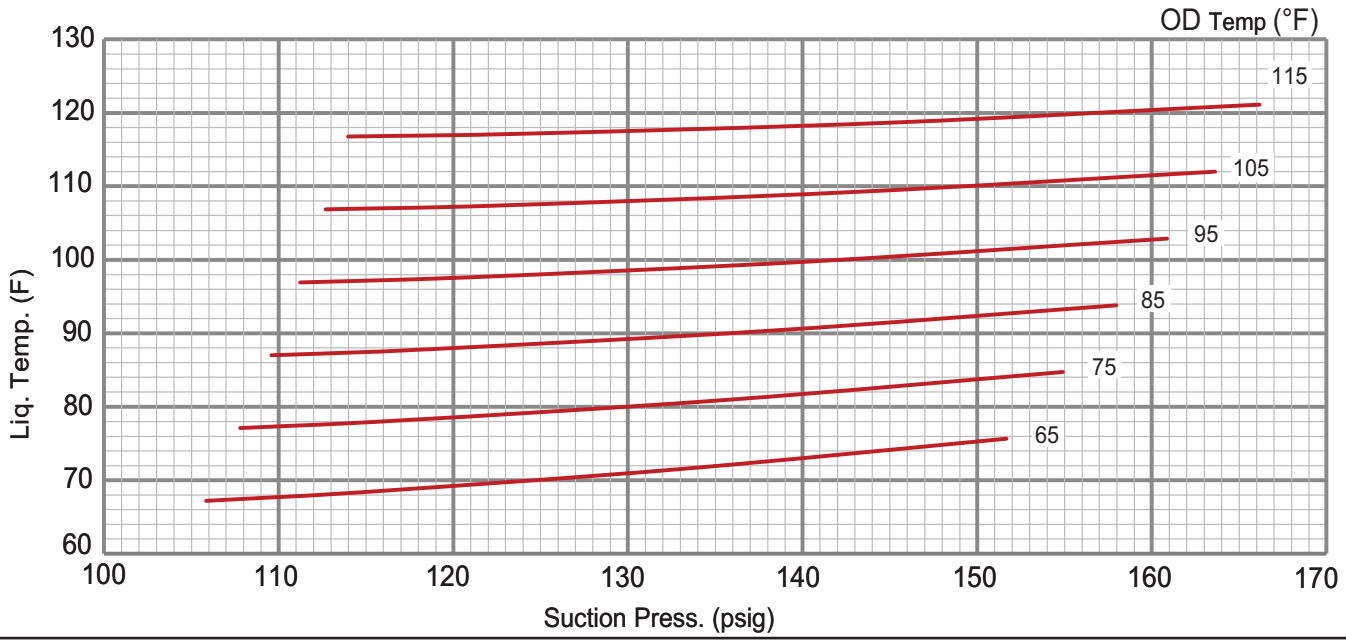
| 65°F | | 75°F | | 85°F | | 95°F | | 105°F | | 115°F | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) |
| 114 | 214 | 116 | 251 | 118 | 292 | 119 | 340 | 119 | 392 | 120 | 449 |
| 122 | 216 | 124 | 253 | 126 | 294 | 128 | 341 | 129 | 393 | 131 | 450 |
| 138 | 222 | 141 | 257 | 144 | 298 | 147 | 344 | 150 | 395 | 152 | 452 |
| 154 | 228 | 158 | 263 | 162 | 303 | 166 | 348 | 170 | 399 | 173 | 454 |

**036 Charging Curve - No Reheat - All-Aluminum Coil - 581223-01**



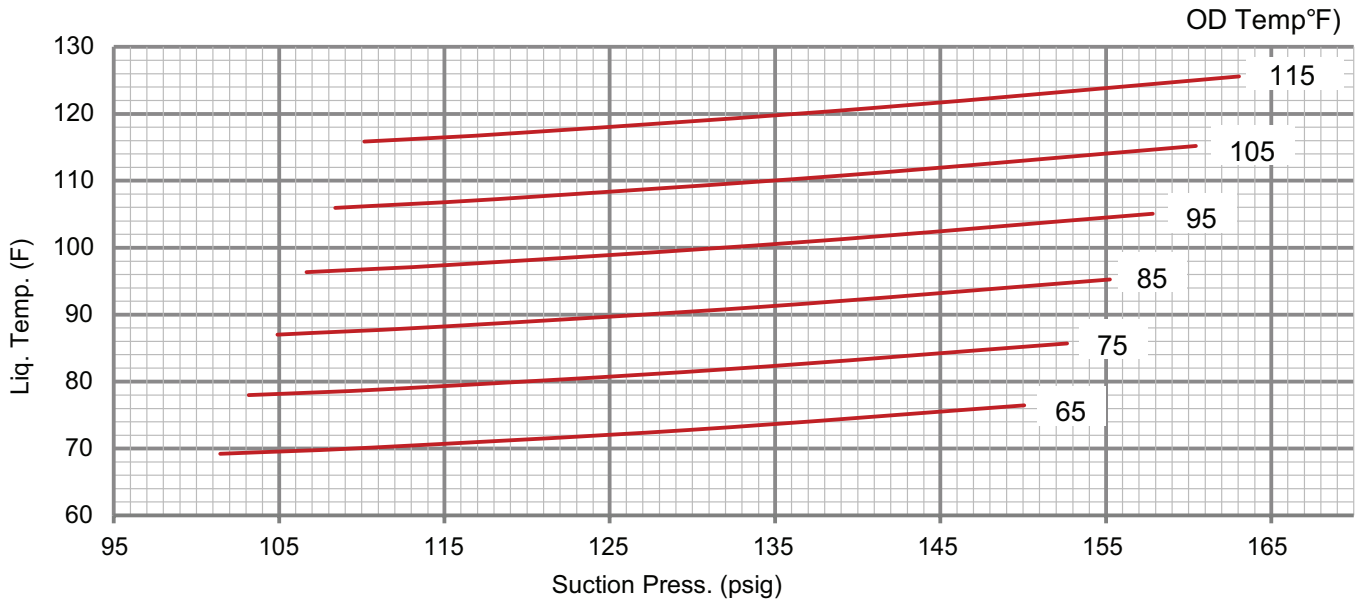
| TABLE 9 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 048 Normal Operating Pressures - No Reheat - All-Aluminum Coil - 581224-01 | | | | | | | | | | | |
| Outdoor Coil Entering Air Temperature | | | | | | | | | | | |
| 65°F | | 75°F | | 85°F | | 95°F | | 105°F | | 115°F | |
| Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) |
| 106 | 224 | 108 | 259 | 110 | 300 | 111 | 347 | 113 | 400 | 114 | 459 |
| 115 | 227 | 117 | 261 | 119 | 302 | 121 | 349 | 123 | 401 | 124 | 460 |
| 133 | 235 | 136 | 269 | 138 | 309 | 141 | 354 | 143 | 406 | 145 | 463 |
| 152 | 247 | 155 | 280 | 158 | 318 | 161 | 363 | 164 | 413 | 166 | 470 |

**048 Charging Curve - No Reheat - All-Aluminum Coil - 581224-01**



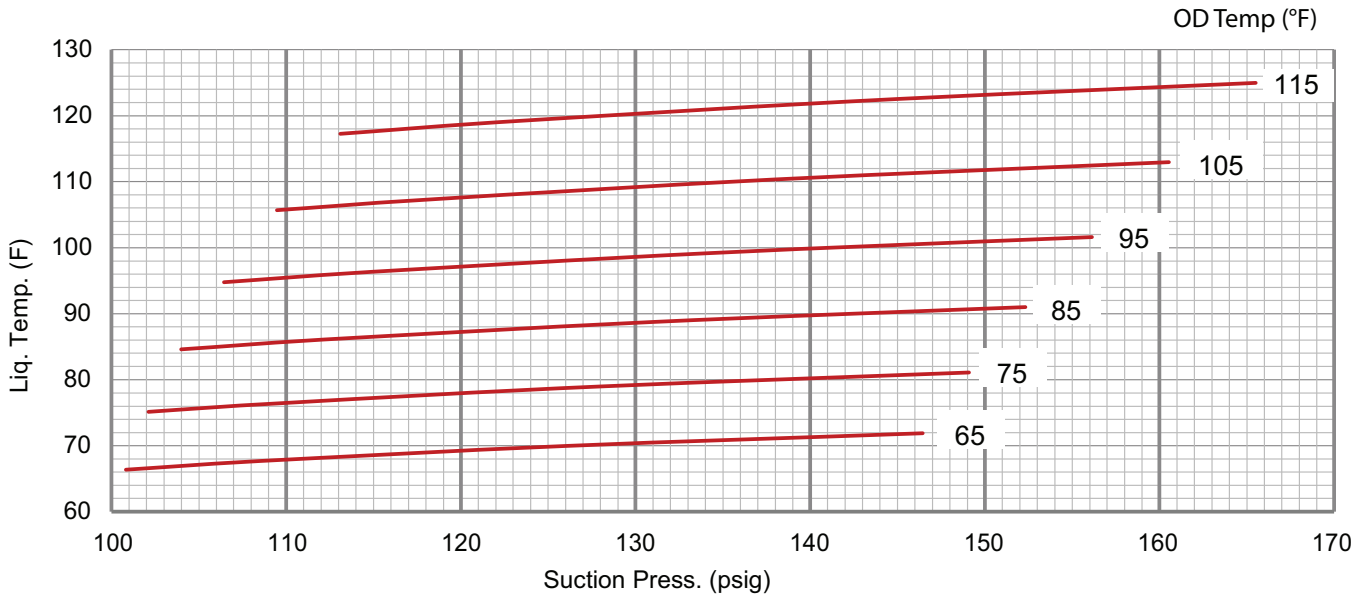
| TABLE 10 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 060 Normal Operating Pressures - No Reheat - All-Aluminum Coil - 581225-01 | | | | | | | | | | | |
| Outdoor Coil Entering Air Temperature | | | | | | | | | | | |
| 65°F | | 75°F | | 85°F | | 95°F | | 105°F | | 115°F | |
| Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) |
| 101 | 231 | 103 | 269 | 105 | 313 | 107 | 360 | 108 | 413 | 110 | 471 |
| 111 | 236 | 112 | 274 | 114 | 317 | 116 | 364 | 118 | 417 | 120 | 475 |
| 130 | 243 | 132 | 281 | 134 | 324 | 137 | 372 | 139 | 424 | 141 | 482 |
| 150 | 250 | 153 | 288 | 155 | 331 | 158 | 378 | 160 | 431 | 163 | 488 |

**060 Charging Curve - No Reheat - All-Aluminum Coil - 581225-01**



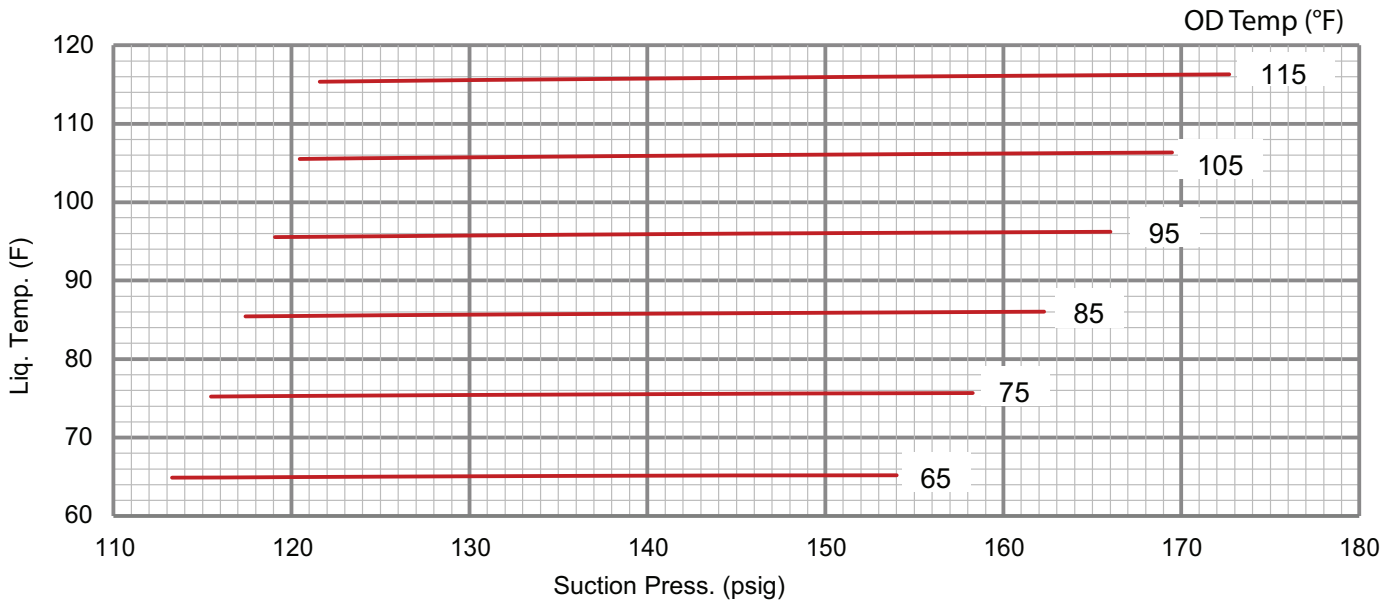
| TABLE 11 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 074 Normal Operating Pressures - No Reheat - All-Aluminum Coil - 581226-01 | | | | | | | | | | | |
| Outdoor Coil Entering Air Temperature | | | | | | | | | | | |
| 65°F | | 75°F | | 85°F | | 95°F | | 105°F | | 115°F | |
| Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) |
| 101 | 237 | 102 | 279 | 104 | 324 | 106 | 370 | 109 | 419 | 113 | 470 |
| 108 | 242 | 110 | 284 | 112 | 329 | 115 | 375 | 118 | 424 | 122 | 475 |
| 126 | 252 | 128 | 294 | 131 | 338 | 134 | 384 | 138 | 433 | 142 | 484 |
| 146 | 260 | 149 | 302 | 152 | 346 | 156 | 393 | 161 | 441 | 166 | 492 |

**074 Charging Curve - No Reheat - All-Aluminum Coil - 581226-01**



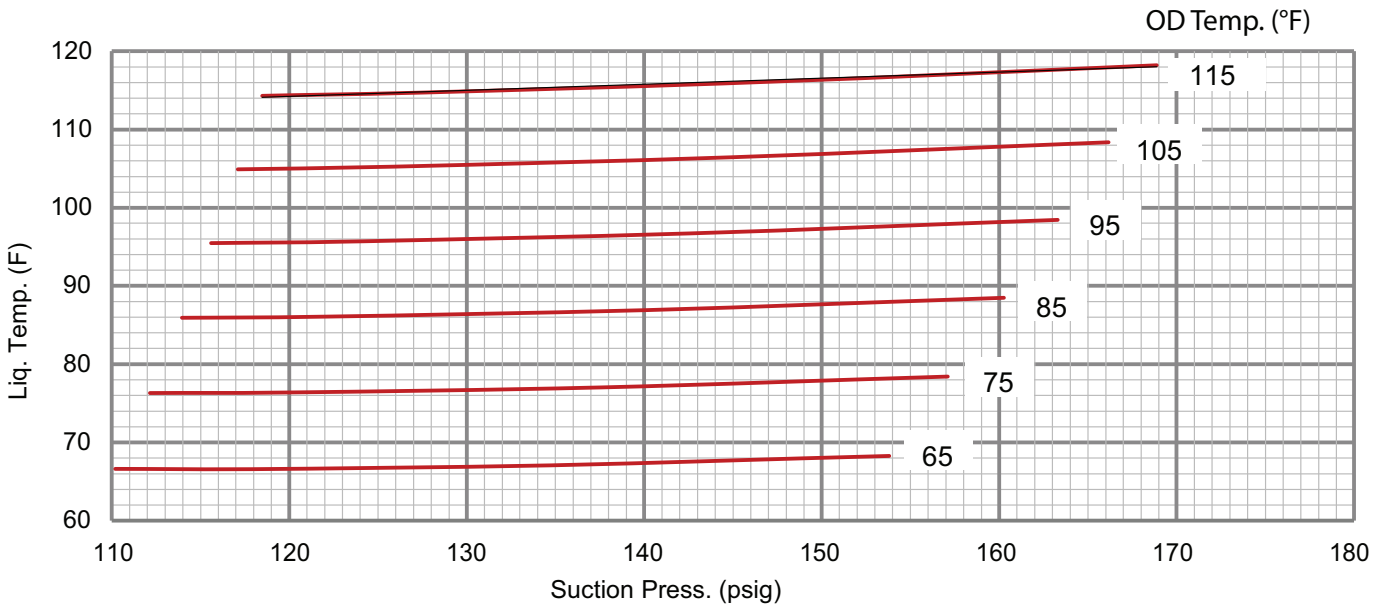
| TABLE 12 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 036 Normal Operating Pressures - Reheat - All-Aluminum Coil - 581267-01 | | | | | | | | | | | |
| Outdoor Coil Entering Air Temperature | | | | | | | | | | | |
| 65°F | | 75°F | | 85°F | | 95°F | | 105°F | | 115°F | |
| Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) |
| 113 | 217 | 115 | 252 | 117 | 291 | 119 | 335 | 120 | 384 | 122 | 437 |
| 120 | 219 | 123 | 254 | 125 | 293 | 127 | 338 | 129 | 386 | 131 | 440 |
| 136 | 224 | 140 | 259 | 143 | 299 | 146 | 343 | 148 | 392 | 151 | 445 |
| 154 | 229 | 158 | 264 | 162 | 304 | 166 | 348 | 169 | 397 | 173 | 451 |

**036 Charging Curve - Reheat - All-Aluminum Coil - 581267-01**



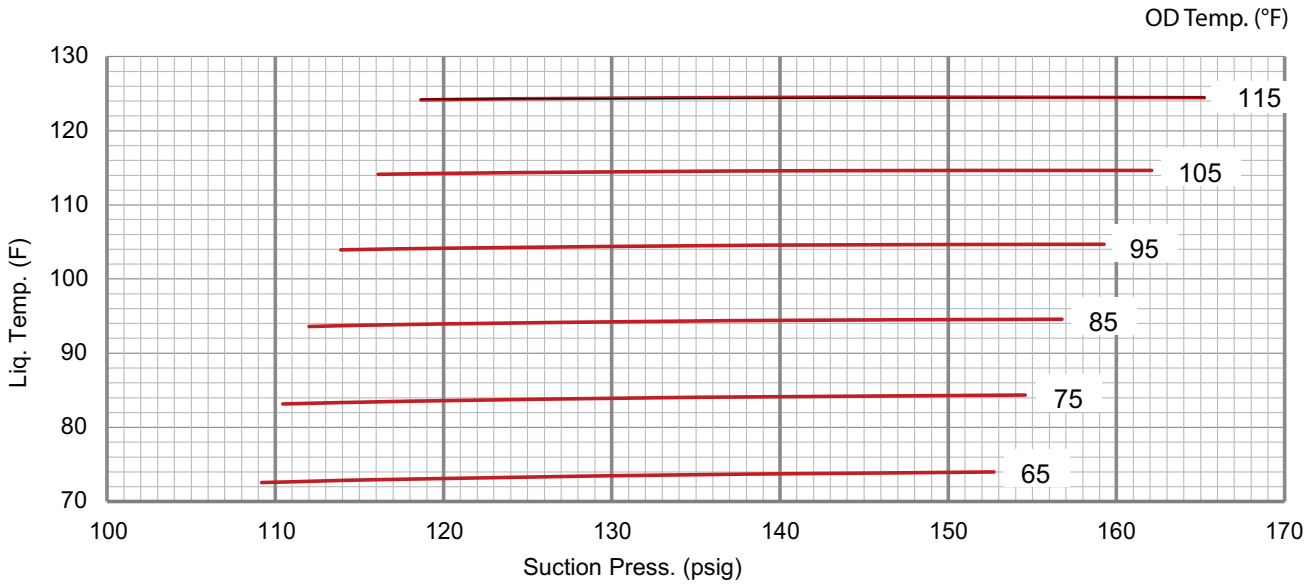
| TABLE 13 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 048 Normal Operating Pressures - Reheat - All-Aluminum Coil - 581268-01 | | | | | | | | | | | |
| Outdoor Coil Entering Air Temperature | | | | | | | | | | | |
| 65°F | | 75°F | | 85°F | | 95°F | | 105°F | | 115°F | |
| Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) |
| 110 | 228 | 112 | 264 | 114 | 304 | 116 | 348 | 117 | 396 | 118 | 448 |
| 118 | 232 | 120 | 268 | 122 | 309 | 124 | 353 | 126 | 401 | 127 | 454 |
| 135 | 239 | 137 | 276 | 140 | 317 | 143 | 362 | 145 | 411 | 147 | 464 |
| 154 | 245 | 157 | 283 | 160 | 324 | 163 | 370 | 166 | 420 | 169 | 473 |

**048 Charging Curve - Reheat - All-Aluminum Coil - 581268-01**



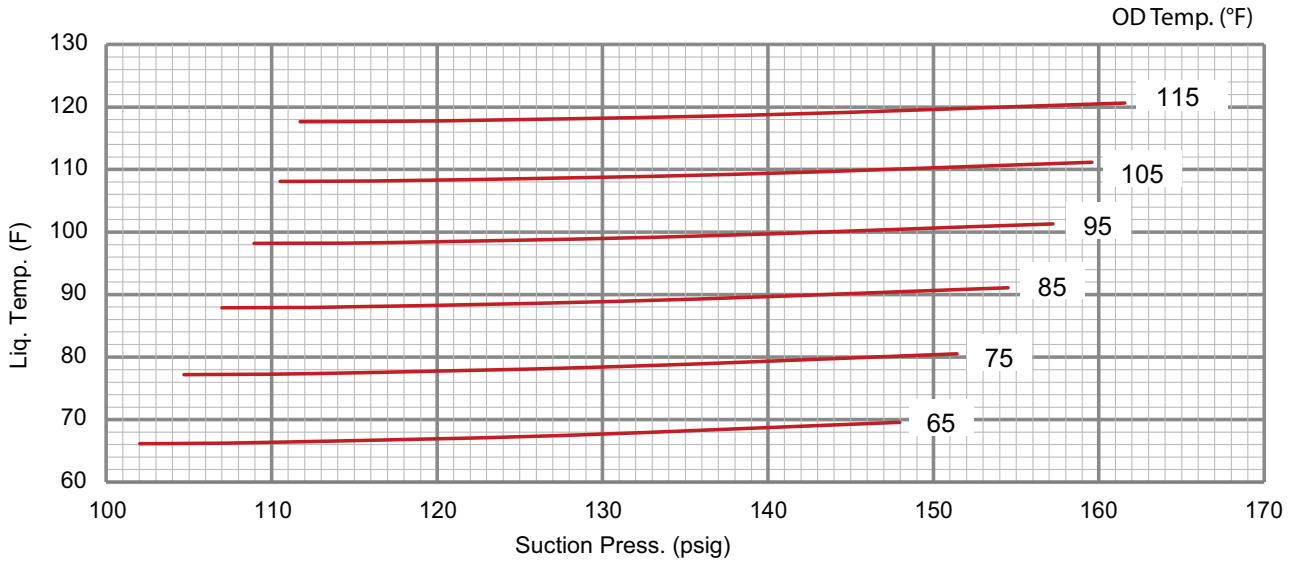
| TABLE 14 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 060 Normal Operating Pressures - Reheat - All-Aluminum Coil - 581269-01 | | | | | | | | | | | |
| Outdoor Coil Entering Air Temperature | | | | | | | | | | | |
| 65°F | | 75°F | | 85°F | | 95°F | | 105°F | | 115°F | |
| Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) |
| 109 | 233 | 110 | 269 | 112 | 308 | 114 | 352 | 116 | 400 | 119 | 453 |
| 117 | 241 | 118 | 277 | 120 | 318 | 122 | 363 | 124 | 412 | 127 | 465 |
| 133 | 253 | 135 | 291 | 137 | 333 | 139 | 380 | 142 | 431 | 145 | 486 |
| 153 | 259 | 155 | 299 | 157 | 344 | 159 | 392 | 162 | 445 | 165 | 502 |

**060 Charging Curve - Reheat - All-Aluminum Coil - 581269-01**



| TABLE 17 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 074 Normal Operating Pressures - Reheat - All-Aluminum Coil - 581270-01 | | | | | | | | | | | |
| Outdoor Coil Entering Air Temperature | | | | | | | | | | | |
| 65°F | | 75°F | | 85°F | | 95°F | | 105°F | | 115°F | |
| Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) | Suct (psig) | Disc (psig) |
| 102 | 244 | 105 | 280 | 107 | 321 | 109 | 366 | 111 | 417 | 112 | 472 |
| 110 | 251 | 113 | 288 | 115 | 329 | 117 | 375 | 119 | 426 | 120 | 482 |
| 128 | 262 | 131 | 300 | 133 | 343 | 136 | 391 | 138 | 443 | 140 | 500 |
| 148 | 270 | 151 | 309 | 155 | 353 | 157 | 402 | 160 | 456 | 162 | 514 |

**074 Charging Curve - Reheat - All-Aluminum Coil - 581270-01**




## V- SYSTEMS SERVICE CHECKS

### A-Heating System Service Checks

All LGM units are C.S.A. design certified without modification.

Before checking piping, check with gas company or authorities having jurisdiction for local code requirements. Refer to the LGM Installation instruction for more information.

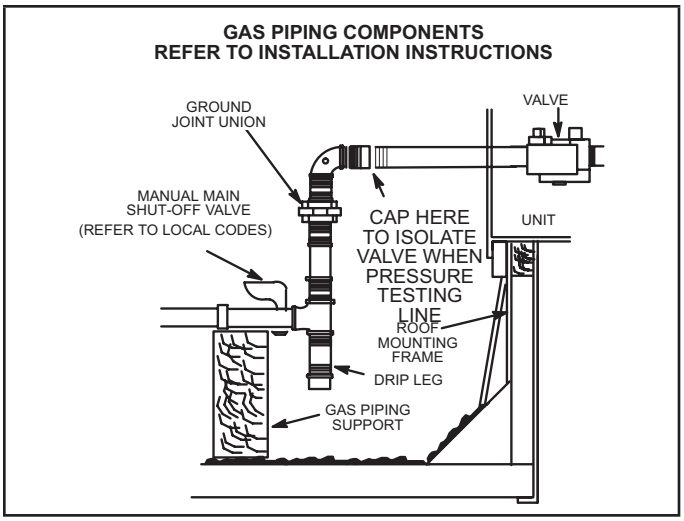



**FIGURE 27**

### 1-Gas Piping

Gas supply piping must not allow more than 0.5”W.C. (124.3 Pa) drop in pressure between the gas meter and the unit. Supply gas pipe must not be smaller than the unit gas connection. Refer to installation instructions for details.

**2-Testing Gas Piping**

***NOTE-*** *In case shutdown is required, turn off the main manual shut-off valve and disconnect the main power to the unit. These controls should be properly labeled by the installer.*

When pressure testing gas lines, the gas valve must be disconnected and isolated. Gas valves can be damaged if subjected to more than 0.5 psig [14"W.C. (3481 Pa)]. See FIGURE 28.

When checking piping connection for gas leaks, use the preferred means. Common kitchen detergents can cause harmful corrosion on various metals used in gas piping. The use of specialty Gas Leak Detector is strongly recommended.

***Do not use matches, candles, flame or any other source of ignition to check for gas leaks.***

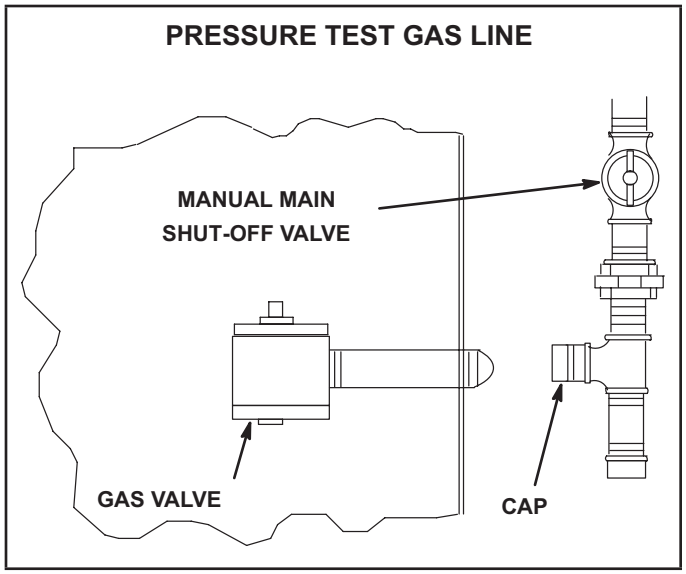



**FIGURE 28**

**3-Testing Gas Supply Pressure**

When testing gas supply pressure, connect test gauge to the inlet pressure tap located on unit gas valve GV1. Test supply gas pressure with unit firing at maximum rate (both stages energized). Make sure the reading falls within the range of the following values. Low pressure may result in erratic operation or "under fire." High pressure can result in permanent damage to the gas valve or "over fire." For natural gas units, operating pressure at the unit gas connection must be between 4.5"W.C. and 10.5"W.C. For L.P. gas units, operating pressure at the unit gas connection must be between 10.5"W.C. and 13.0"W.C.

On multiple unit installations, each unit should be checked separately while operating at maximum rate, beginning with the one closest to the supply gas main and progressing to the one furthest from the main. Multiple units should also be tested with and without the other units operating. Supply pressure must fall within the range listed in the previous paragraph.

**4-Check and Adjust Manifold Pressure**

After line pressure has been checked and adjusted, check manifold pressure. Move test gauge to the outlet pressure tap located on unit gas valve GV1. See FIGURE 26 for location of pressure tap on the gas valve.

The manifold pressure is factory set and should not require adjustment. See TABLE 5. If manifold pressure is incorrect and no other source of improper manifold pressure can be found, the valve must be replaced. See FIGURE 26 for location of gas valve (manifold pressure) adjustment screw.

All gas valves are factory regulated. The gas valve should completely and immediately cycle off in the event of gas or power failure. The manual shut-off knob/switch can be used to immediately shut off gas supply.

**⚠ CAUTION**

**For safety, connect a shut-off valve between the manometer and the gas tap to permit shut off of gas pressure to the manometer.**

**Manifold Adjustment Procedure**

1 - Connect test gauge to the outlet pressure tap on the gas valve. Start the unit (call for second stage heat) and allow five minutes for the unit to reach steady state.

2 - While waiting for the unit to stabilize, notice the flame. The flame should be stable without flashback and should not lift from the burner heads. Natural gas should burn basically blue with some clear streaks. L.P. gas should burn mostly blue with some clear yellow streaks.

3 - After allowing the unit to stabilize for five minutes, record the manifold pressure and compare to the values given in TABLE 5. On two-stage units, check low fire, make adjustments, and recheck high fire before recording values.

***Combustion gases***

Flue products must be analyzed and compared to the unit specifications. Problems detected during the inspection may make it necessary to temporarily shut down the furnace until the items can be repaired or replaced.

**5-Proper Gas Flow**

Furnace should operate at least 5 minutes before checking gas flow. Determine time in seconds for two revolutions of gas through the meter. (Two revolutions assures a more accurate time.) Divide by two and compare to time in TABLE 15. Seconds in TABLE 15 are based on a 1 ft.3. dial and gas value of 1000 Btu/ft3 for natural and 2500 Btu/ft3' for LP. Adjust manifold pressure on gas valve to match time needed.

***NOTE -*** *To obtain accurate reading, shut off all other gas appliances connected to meter.*

**TABLE 15**

| Input Rate | Seconds Natuarl | Seconds LP/Propane |
|---|---|---|
| 65,000 | 55 | 138 |
| 105,000 | 34 | 86 |
| 150,000 | 24 | 60 |

**⚠ IMPORTANT**

**Disconnect heating demand as soon as an accurate reading has been obtained.**

**6-Heat Exchanger**

To Access or Remove Heat Exchanger From Unit:

1 - Turn off gas and electric power.
2 - Remove access panel(s) and unit center mullion.
3 - Remove gas valve, manifold assembly and burners.
4 - Remove combustion air inducer. Pay careful attention to the order in which gaskets and orifice are removed.
5 - Support heat exchanger (to prevent it from falling when final screws are removed.)
6 - Remove screws supporting heat exchanger.
7 - To install heat exchanger, reverse procedure. Be sure to secure all wires and check plumbing and burner plate for airtight seal. Screws must be torqued to 35 in.-lbs. to ensure proper operation.

**7-Flame Sensing**

Flame current is an electrical current which passes from the ignition control through the sensor electrode during unit operation. The current passes from the sensor through the flame to the ground electrode (located on the flame electrode) to complete a safety circuit. The electrodes should be located so the tips are at least 1/2" (12.7 mm) inside the flame envelope.Do not bend electrodes. To measure flame current, follow the procedure below:

***NOTE-****Electrodes are not field adjustable. Any alterations to the electrode may create a hazardous condition that can cause property or personal injury.*

1 - Disconnect power to unit.
2 - Remove lead from sensing electrode and install a 0-50DC microamp meter in series between the sensing electrode and the sensing lead.
3 - Reconnect power and adjust thermostat for heating demand.
4 - When flame is established, microamp reading should be 0.5 to 1.0. Do not bend electrodes.

*Drop out signal is .09 or less.*

5 - Disconnect power to unit before disconnecting meter. Make sure sensor wire is securely reconnected before reconnecting power to unit.

*NOTE-If the meter scale reads 0, the leads are reversed. Disconnect power and reconnect leads for proper polarity.*

**B-Cooling System Service Checks**

LGM units are factory charged and require no further adjustment;

however, charge should be checked periodically using the approach method. The approach method compares actual liquid temperature with the outdoor ambient temperature. See section IV- CHARGING.

*NOTE-When unit is properly charged discharge line pressures should approximate those in TABLE 8 through TABLE 17.*

**VI-MAINTENANCE**

**IMPORTANT MAINTENANCE / REPAIR SAFETY INSTRUCTIONS**

**⚠ WARNING**

Any service personnel installing, decommissioning, or performing maintenance on the unit must be properly trained with A2L refrigerants

• All work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

• The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i. e. non-sparking, adequately sealed or intrinsically safe.

• If any hot work is to be conducted on the refrigerating equipment or any associated parts, the appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

• No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

• Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.

• A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

• Where electrical components are being changed, service technicians shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using flammable refrigerants as applicable:

1 - The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.

2 - The ventilation machinery and outlets are operating adequately and are not obstructed.

3 - If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.

4 - Markings on the equipment should be visible and legible. Markings and signs that are illegible shall be corrected.

• Refrigerating pipes or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

• For systems containing refrigerant all repair and maintenance to electrical components shall include initial safety checks and component inspection procedures such as that capacitors are discharged in a safe manner to avoid possibility of sparking, that no live electrical components and wiring are exposed while charging, recovering, or purging the system, and that there is continuity of earth bonding. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used that is reported to the owner of the equipment, so all parties are advised.

***NOTE -*** *Sealed electrical components shall be replaced, not repaired.*

***NOTE -*** *Intrinsically safe components must be replaced, not repaired.*

• Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

• When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

a. Safely remove refrigerant following local and national regulations

b. Evacuate the circuit

c. Purge the circuit with inert gas

d. Evacuate

e. Purge with inert gas,

f. Open the circuit.

• The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. Refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

## ⚠ WARNING

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

## ⚠ IMPORTANT

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

**A-Filters**

Units are equipped with temporary filters which must be replaced prior to building occupation. See FIGURE 29. All units have 20 X 20 X 2 in. (508 X 508 X 51mm) filters.

Refer to local codes or appropriate jurisdiction for approved filters.

***NOTE-****Filters must be U.L.C. certified or equivalent for use in Canada.*

**B-Lubrication**

All motors are lubricated at the factory. No further lubrication is required.

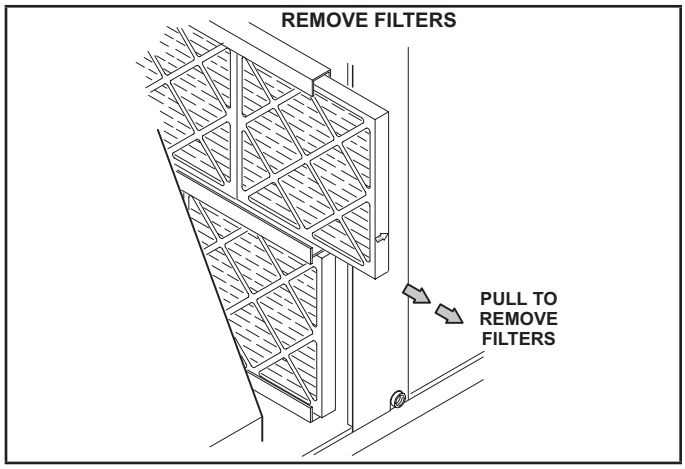



**FIGURE 29**

**C-Burners**

Periodically examine burner flames for proper appearance during the heating season. Before each heating season examine the burners for any deposits or blockage which may have occurred.

Clean burners as follows:

1 - Turn off both electrical power and gas supply to unit.
2 - Remove burner compartment access panel.
3 - Remove top burner box panel.
4 - Remove two screws securing burners to burner support and lift the burners from the orifices. See FIGURE 18. Clean as necessary.

**⚠ WARNING**

**Danger of explosion. Can cause injury or death. Do not overtighten main burner mounting screws. Snug tighten only.**

**D-Combustion Air Inducer**

A combustion air proving switch checks combustion air inducer operation before allowing power to the gas controller. Gas controller will not operate if inducer is obstructed.

Under normal operating conditions, the combustion air inducer wheel should be checked and cleaned prior to the heating season. However, it should be examined periodically during the heating season to establish an ideal cleaning schedule.

Clean combustion air inducer as follows:

1 - Shut off power supply and gas to unit.
2 - Remove the mullion on the right side of the heat section.
3 - Disconnect pressure switch air tubing from combustion air inducer port.
4 - Remove and retain screws securing combustion air inducer to flue box. Remove vent connector. See FIGURE 17.
5 - Clean inducer wheel blades with a small brush and wipe off any dust from housing. Take care not to damage exposed fan blades. Clean accumulated dust from front of flue box cover.
6 - Return combustion air inducer motor and vent connector to original location and secure with retained screws. It is recommended that gaskets be replaced during reassembly.
7 - Replace mullion.
8 - Clean combustion air inlet louvers on heat access pane lusing a small brush.

**E-Flue Passageway and Flue Box**

Remove flue box cover only when necessary for equipment repair. Clean inside of flue box cover and heat exchanger tubes with a wire brush when flue box cover has to be removed. Install a new flue box cover gasket and replace cover. Make sure edges around flue box cover are tightly sealed.

**F-Evaporator Coil**

Inspect and clean coil at beginning of each cooling season. Clean the all-aluminum coil by spraying the coil steadily and uniformly from top to bottom. Do not exceed 900 psi or a 45° angle; nozzle must be at least 12 inches from the coil face. Take care not to fracture the braze between f ins and refrigerant tubes. Reduce pressure and work cautiously to prevent damage. Flush condensate drain with water, taking care not to get insulation, filters, and return air ducts wet through entire cleaning process.

**G-Condenser Coil**

Clean condenser coil annually with water and inspect monthly during the cooling season. Clean the all-aluminum coil by spraying the coil steadily and uniformly from top to bottom. Do not exceed 900 psi or a 45° angle; nozzle must be at least 12 inches from the coil face. Take care not to fracture the braze between the fins and refrigerant tubes. Reduce pressure and work cautiously to prevent damage.

***NOTE -*** *Remove all screws and gaskets prior to cleaning procedure and replace upon completion.*

**H-Supply Blower Wheel**

Annually inspect supply air blower wheel for accumulated dirt or dust. Turn off power before attempting to remove access panel or to clean blower wheel.

## VII-ACCESSORIES

The accessories section describes the application of most of the optional accessories which can be factory- or field-installed to the LGM units.

### A-C1/T1CURB

When installing the LGM units on a combustible surface for downflow discharge applications, the C1/T1CURB 8 inch, 14-inch, 18 inch or 24-inch height roof mounting frame is used. The roof mounting frames are recommended in all other applications but not required. If the LGM units are not mounted on a flat (roof) surface, they MUST be supported under all edges and under the middle of the unit to prevent sagging. The units MUST be mounted level within 1/16" per linear foot or 5mm per meter in any direction.

The assembled mounting frame is shown in FIGURE 30. Refer to the roof mounting frame installation instructions for details of proper assembly and mounting. The roof mounting frame MUST be squared to the roof and level before mounting. Plenum system MUST be installed before the unit is set on the mounting frame. Typical roof curbing and flashing is shown in FIGURE 31. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

### B-Transitions

Optional supply/return transitions are available for use with the LGM 3, 4, 5, and 6 ton units (refer to EHB for appropriate transition model). Transition must be installed in the C1/T1CURB mounting frame before mounting the unit to the frame. Refer to the manufacturer's instructions included with the transition for detailed installation procedures.

### C-Outdoor Air Dampers

Optional outdoor air dampers are available for use with the LGM 3, 4, 5, and 6 ton units in both manually operated and motorized options (refer to EHB for appropriate damper model). Both sets include the outdoor air hood. The manual damper is set at a fixed point to bring outside air into the building anytime the blower is operating.The motorized damper opens when the blower is operating and the thermostat is sending an occupied signal to the Unit Controller. If the thermostat signal is unoccupied, the motorized damper will not open. Washable filter supplied with the outdoor air dampers can be cleaned with water and a mild detergent. It should be sprayed with Filter Handicoater when dry prior to re-installation. Filter Handicoater is R.P. Products coating no. 418 and is available as Part No. P-8-5069.

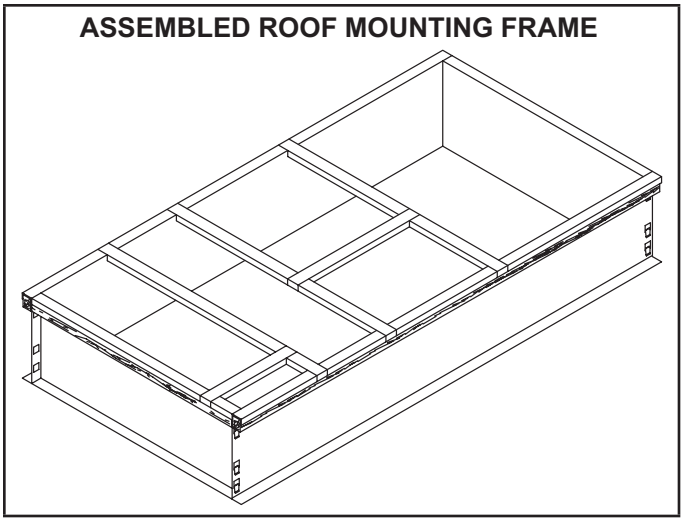



**FIGURE 30**

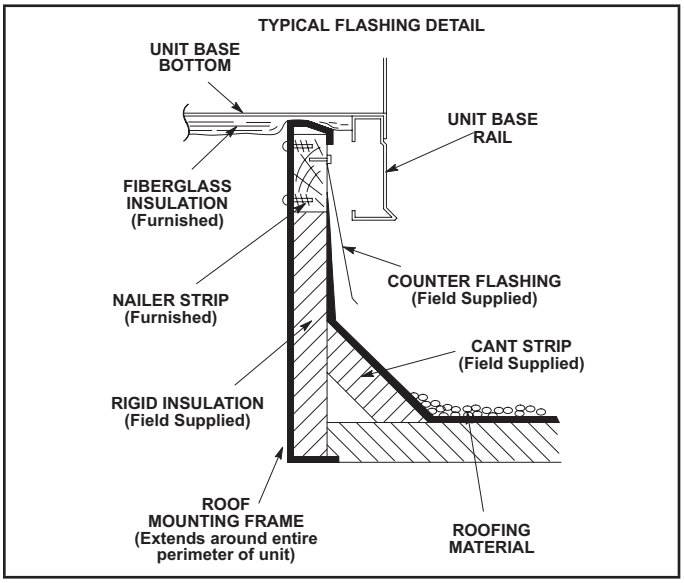



**FIGURE 31**

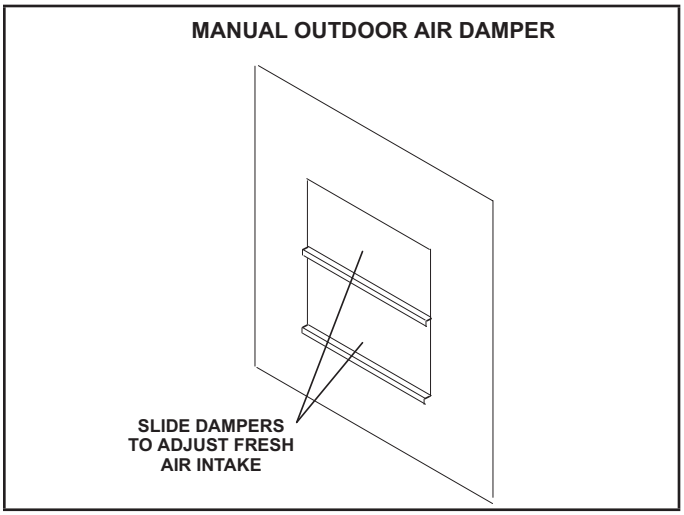



**FIGURE 32**

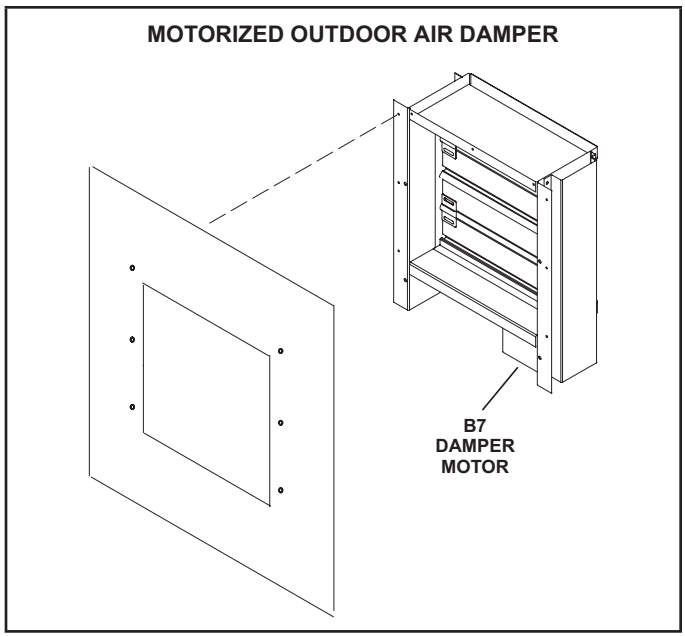



**FIGURE 33**

**D-Supply and Return Diffusers**

Optional flush mount diffuser/return FD9-65 and FD11-95 and extended mount diffuser/return RTD9-65 and RTD11-95 are available for use with all LGM units. Refer to manufacturer's instructions included with transition for detailed installation procedures.

**E-Economizer**

(Optional Field- or Factory-Installed)

The economizer uses outdoor air for free cooling when temperature is suitable. See FIGURE 34.

When outdoor air is suitable, the Unit Controller will modulate the economizer dampers to maintain 55°F discharge air (RT6). Refer to unit controller manual for menu paths to adjust economizer setpoints.

***Sensors***

Units are equipped with the following factory-installed, EC Title 24 approved sensors:

RT17 - Outside Air Temperature

RT16 - Return Air Temperature

RT6 - Discharge Air Temperature

See FIGURE 35 for sensor location.

Optional field-provided sensors may be used instead of unit sensors to determine whether outdoor air is suitable for free cooling. Refer to TABLE 16 TEMP OFFSET

is the default mode.

***Note -*** *Network OAS signal and California Title 24 Compliance options use either TEMPERATURE OFFSET or TEMPERATURE SETPT mode.*

***Minimum Position***

The Unit Controller will move the dampers to minimum position during the following:

Ventilation mode (G demand only)

Outdoor air is NOT suitable for free cooling

The damper position will vary linearly with blower speed based on the damper position settings for high and low CFM. Damper calibration must be initiated in the mobile service app to set high and low damper positions.

***GED (Gravity Exhaust / Barometric Relief Dampers)***

***Field-Installed Option***

The GED is located in the economizer except in downflow applications or when a PEF (power exhaust fan) is NOT installed. In horizontal airflow applications or when a PEF is installed, the GED is located in the exhaust air hood.

***Horizontal Air Discharge Economizers***

The economizer is located in the unit the same as downflow applications but note the position of the return air duct. The duct attaches to a duct transition and duct inlet on the end of the unit. An optional GED is located in the duct transition. See FIGURE 36.

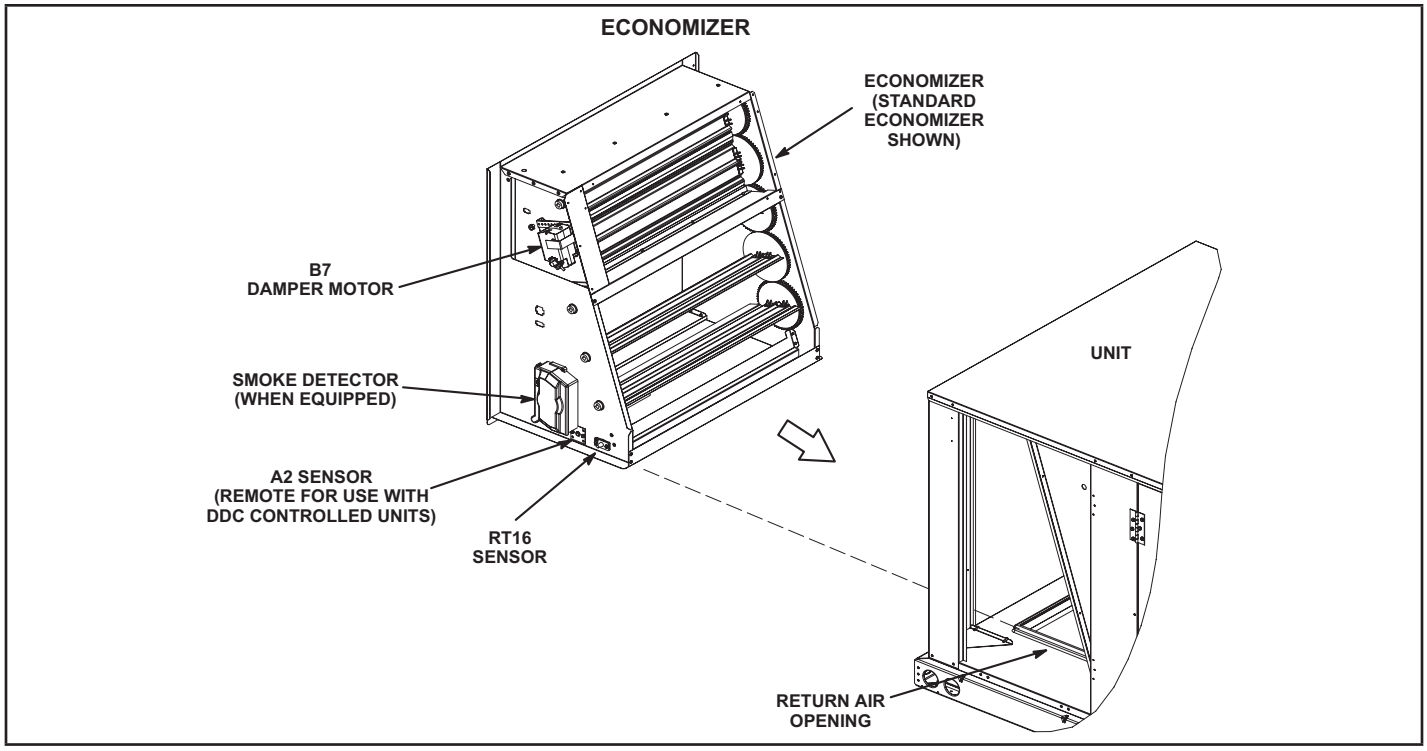



**FIGURE 34**

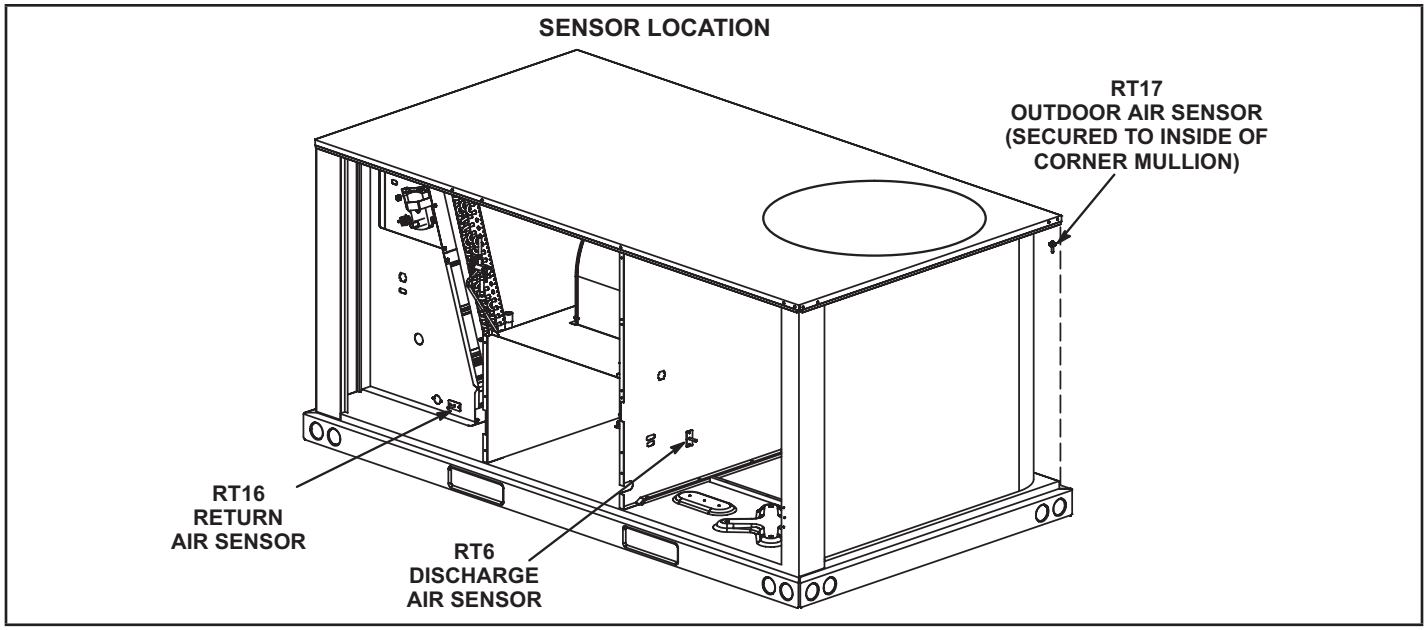



**FIGURE 35**

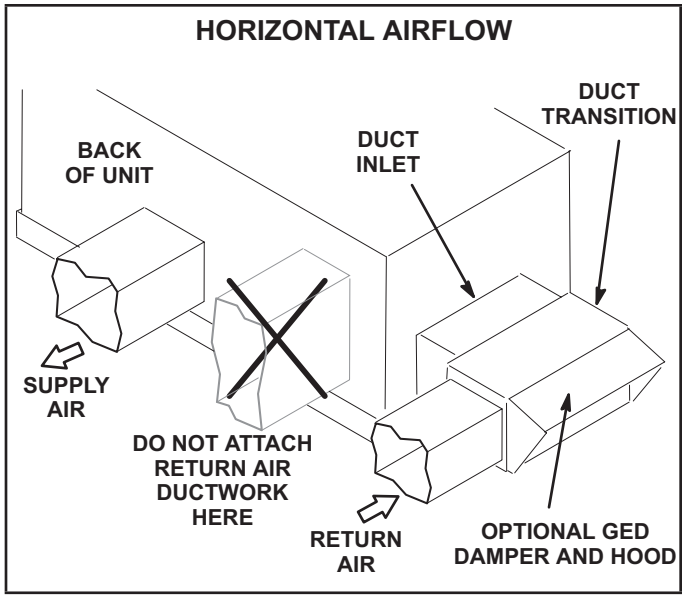



**FIGURE 36**

**TABLE 16**

**ECONOMIZER MODES AND SETPOINT**

| Free\| Cooling Mode | Free Cooling Setpoint | Field-Provide Sensors | **Dampers will modulate to 55°F discharge air (RT6) when outdoor air is suitable:** | Permitted Inputs |
|---|---|---|---|---|
| TEMP | OFFSET | None Needed | Outdoor air temperature (RT17) is less than return air temperature (RT16) by at least the OFFSET value. | 0-40°F |
| TEMP | OAT STPT | None Needed | Outdoor air temperature (RT17) is less than the OAT STPT value. | 41-75°F |
| Remote | Remote | Eneergy Management System** | Either of the TEMP modes can be used when a network OAS signal is provided by an energy management or building control system, via BACnet, LonTalk, or L Connection. The network can command OAS, NOT OAS, or AUTO. AUTO returns to local control of OAS, which is the selected TEMP mode. | NA |
| ENTH | DIFF OFFSET | (Two) C7400 | Outdoor air enthalpy* (A7) is less than return air enthalpy (A62) by at least the OFFSET value. | 0mA-4mA |
| ENTH | ODE STPT | C7400 | Outdoor air enthalpy (A7) is less than free cooling setpoint. | 12-19mA |
| GLOBAL | GLOBAL | 24VAC Input Signal | Global input is energized by (P297-9). This setting is also used for outdoor air damper applications. Global input also brings on the blower. (This mode is NOT used when OAS signal is provided via network connection. GLO is only used when a 24VAC signal is used to energize the P297-9 GLO input.) | NA |

**Outdoor Air Damper and Economizer Operation**

**DIRECT DRIVE DRIVE SYSTEM OPERATION:**

***Note:*** *Direct drive units feature ECM condenser fans that are staged to match the compressor's capacity. The condenser fans speed linearly follows the compressor speed.*

**Modulating Outdoor Air Damper:**

Damper minimum positions #1 and 2 are adjusted during unit setup to provide minimum fresh air requirements at the indicated supply fan speeds per ASHRAE 62.1.

-Supply fan is off and the outdoor air damper is closed

-Supply fan is on low speed and the outdoor air damper is at minimum position 1

-Supply fan is on high speed and the outdoor air damper is at minimum position 2

**[1]Outdoor Air is Suitable**

Note: When outdoor air is not suitable during the occupied time period, damper modulates to minimum position. When outdoor air is not suitable during the unoccupied time period, damper modulates closed.

1-Economizer With Outdoor Air Suitable

Low Cooling Demand -

Compressor Off

Blower Variable

Dampers Modulate

High Cooling Demand -

Compressor Variable

Blower Variable

Dampers Full Open

***Note -*** *Compressor is energized after damper has been at full open for three minutes.*

***Note -*** *Free cooling is locked out when a dehumidification demand is received. The unit operates in dehumidification mode as if the outdoor air is not suitable.*

2-No Economizer or Outdoor Air Not Suitable

Any Demand -

Compressor Variable

Blower Variable

Damper Minimum Position

**F-Power Exhaust Relay K65 (power exhaust units)**

Power exhaust relay K65 is a DPDT relay with a 24VAC coil. K65 is used in all LGM units equipped with the optional power exhaust dampers. K65 is energized by the Unit Controller after the economizer dampers reach 50% open (adjustable). When K65 closes, exhaust fan B10 is energized.

**G-Power Exhaust Fans**

Optional power exhaust fans are available for use with the LGM 3, 4, 5, and 6 ton units to provide exhaust air pressure relief (refer to EHB for appropriate fan model). See FIGURE 37 and installation instructions for more detail.

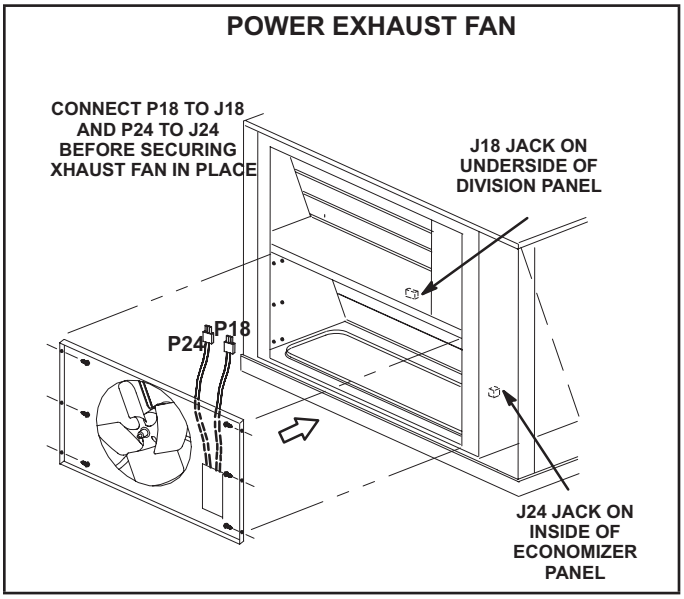



**FIGURE 37**

**H-Optional UVC Lights**

The germicidal light emits ultraviolet (UVC) energy that has been proven effective in reducing microbial life forms (viruses, bacteria, yeasts, and molds) in the air.

UVC germicidal lamps greatly reduce the growth and proliferation of mold and other bio-aerosols (bacteria and viruses) on illuminated surfaces.

Germicidal lamps are NOT intended to be used for removal of active mold growth. Existing mold growth must be appropriately removed PRIOR to installation of the germicidal lamp.

Refer closely to UVC light installation instruction warnings when servicing units.

**I-Needlepoint Bipolar Ionizer (Optional)**

The optional, brush-type ionizer produces positive and negative ions to clean air and reduce airborne contaminants. The ionizer was designed to be low maintenance. The device should be checked semi-annually to confirm the brushes are clean for maximum output. The ionizer is located behind on the blower deck to the left of the blower. See FIGURE 39.

1 - On the back side of the unit, remove the screw securing the back of the ionizer bracket. See FIGURE 38. Retain the screw to secure the back side of the ionizer bracket.

2 - Remove two screws securing the front side of the ionizer bracket and pull out of unit and clean brushes.

3 - Replace ionizer in the reverse order it was removed

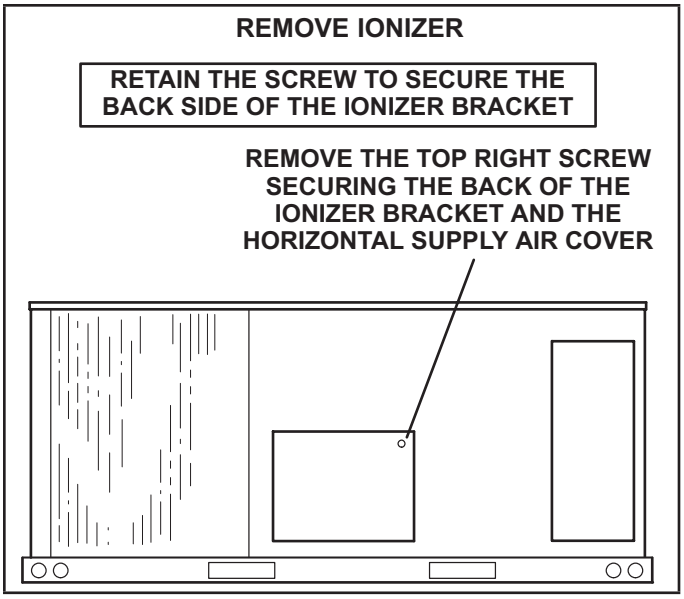



**FIGURE 38**

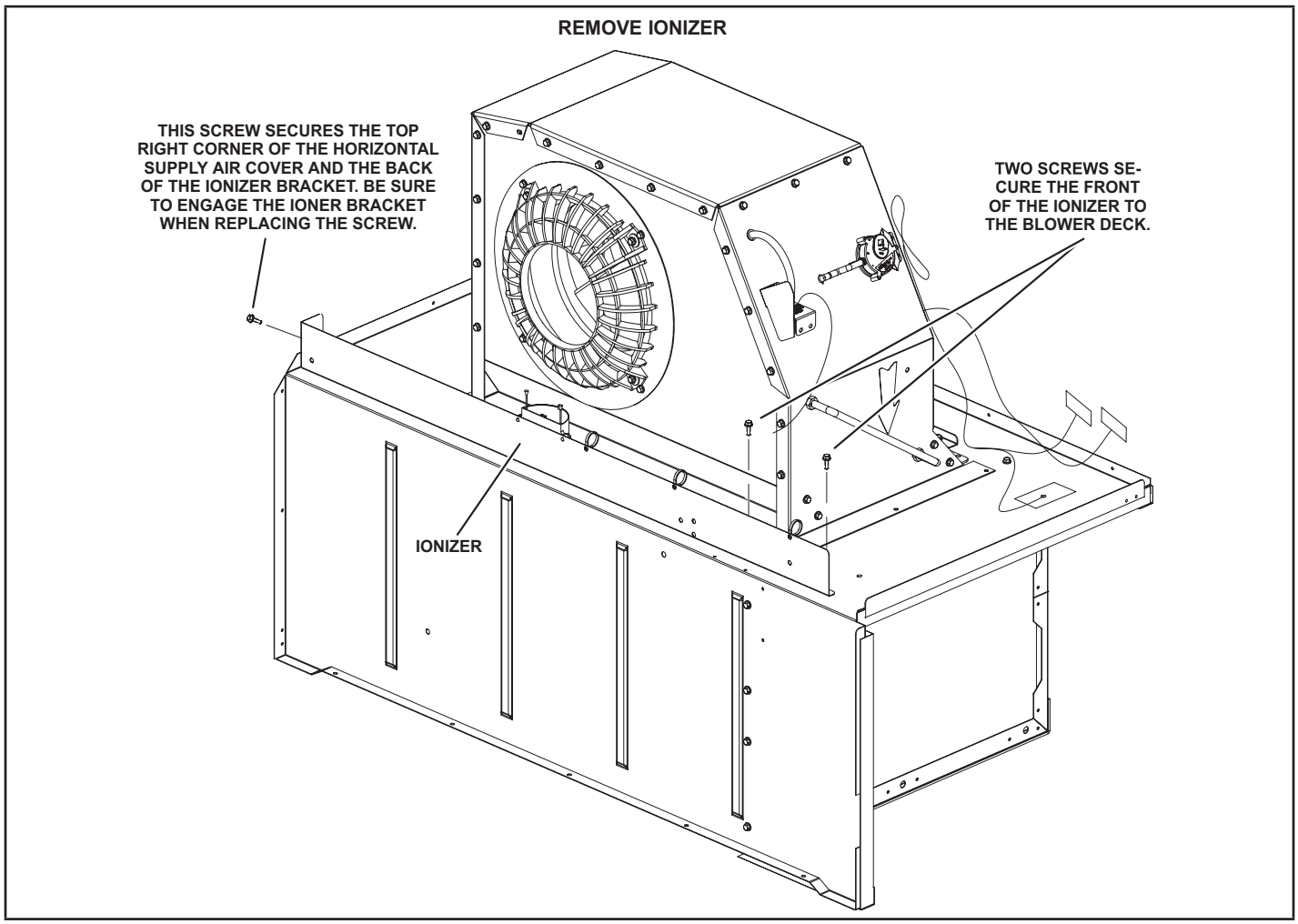



**FIGURE 39**

**J-Optional Cold Weather Kit**

An electric heater is available to automatically control the minimum temperature in the gas burner compartment. Heater is C.S.A. certified to allow cold weather operation of unit down to -60° F (-50° C ). The kit includes the following parts:

1 - The strip heater (HR6) is located as close as possible to the gas valve. The strip heater is rated at 500 Watts

2 - A thermostat mounting box is installed on the wall of the compressor compartment. Included in the box are the following thermostat switches:

   a. Thermostat switch (S59) is an auto-reset SPST N.C. switch which opens on a temperature drop. The switch is wired in series with 24v power and the combustion air blower switch. When the temperature drops below -30° F (-35° C) the switch opens and the gas heat section is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F (-12° C).

   b. Thermostat switch (S60) is an auto-reset SPST N.C. switch which opens on a temperature rise. The switch is wired in series with HR6. When the temperature rises above 20° F (-7° C) the switch opens and the electric heater is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F (23.3° C).

   c. Thermostat switch (S61) is an auto-reset SPST N.O. switch which closes on a temperature drop. The switch is wired in series with HR6. When temperature drops below 20° F (-7° C) the switch closes and electric heater is energized. The switch automatically opens when heating compartment temperature reaches 70° F (21° C).

**K-Smoke Detectors A171 and A172**

Photoelectric smoke detectors are a factory- or field-installed option. The smoke detectors can be installed in the supply air duct (A172), return air section (A171), or in both the supply duct and return air section.

**L-Indoor Air Quality (CO2) Sensor A63**

The indoor air quality sensor monitors CO2 levels and reports the levels to the Unit Controller. The Unit Controller adjusts the economizer dampers according to the CO2 levels. The sensor is mounted next to the indoor thermostat or in the return air duct. Refer to the indoor air quality sensor installation instructions for proper adjustment.

**M-LP / Propane Kit**

All units operated on LP/Propane require a natural to LP / propane kit. The kit for single-stage units include one LP spring, seven burner orifices, and three stickers. Two-stage kits include the same but has a prove switch used to lock out first stage on the combustion air inducer. Four-stage units require (2) two-stage kits. For more detail refer to the natural to LP gas changeover kit installation instructions.

**N-Drain Pan Overflow Switch S149 (optional)**

The overflow switch is used to interrupt cooling operation when excessive condensate collects in the drain pan. The N.O. overflow switch is controlled by K220 and DL46 relays, located in the unit control panel. When the overflow switch closes, 24VAC power is interrupted and after a five-second delay unit compressors are de-energized. Once the condensate level drops below the set level, the switch will open. After a five-minute delay the compressor will be energized.

**O-Dirty Filter Switch S27**

The dirty filter switch senses static pressure increase indicating a dirty filter condition. The switch is N.O. and closes at 1” W.C. (248.6 Pa) The switch is mounted in the supply air section on the evaporator coil seal.

**P-Hot Gas Reheat**

Hot gas reheat units provide a dehumidifying mode of operation. These units contain a reheat coil adjacent to and downstream of the evaporator coil. Reheat coil solenoid valve, L14, routes hot discharge gas from the compressor to the reheat coil. Return air pulled across the evaporator coil is cooled and dehumidified; the reheat coil adds heat to supply air. See FIGURE 40 for reheat refrigerant routing and FIGURE 41 for standard cooling refrigerant routing.

**L14 Reheat Coil Solenoid Valve**

When Unit Controller input (Unit Controller J298-5 or J299-8) indicates room conditions require dehumidification, L14 reheat valve is energized (Unit Controller P269-3) and refrigerant is routed to the reheat coil.

**Reheat Setpoint**

Reheat is factory-set to energize when indoor relative humidity rises above 60% (default). The reheat setpoint can be adjusted by changing mobile service app *Settings - Control* menu. A setting of 100% will operate reheat from an energy management system digital output. The reheat setpoint can also be adjusted using an optional Network Control Panel (NCP).

Reheat will terminate when the indoor relative humidity falls 3% (57% default) or the digital output de-energizes. The reheat deadband can be adjusted at *Settings - Control* menu.

**Check-Out**

Test reheat operation using the following procedure.

1 - Make sure reheat is wired as shown in wiring section.

2 - Make sure unit is in local thermostat mode.

3 - Use mobile service app menu path to select

**RTU MENU > COMPONENT > TEST > DEHUMIDIFICATION**

*The blower, compressor, and reheat valve should be energized. Pressure can be checked on the reheat line pressure tap. Pressure on the reheat line should match discharge pressure closely in reheat mode.*

**Default Reheat Operation**

During reheat mode free cooling is locked out.

***A-Thermostat Mode With 24V Humidistat***

No Y1 demand but a call for dehumidification:

Compressor operates at 100%, blower and outdoor fan modulate to maintain indoor coil and discharge air temperatures, reheat valve is energized.

Y1 demand:

Compressor is modulating, blower is on low, and the reheat valve is de-energized.

Y2 demand:

Compressor is modulating, blower is on high, reheat valve is de-energized.

***B-Thermostat Mode With Zone RH Sensor***

No Y1 demand but a call for dehumidification.

Compressor modulates based on zone relative humidity, blower and outdoor fan modulate to maintain indoor coil and discharge air temperatures, reheat valve is energized.

Y1 and dehumidification demand:

Compressor is modulating, blower is on low, and the reheat valve is de-energized.

Y2 and dehumidification demand:

Compressor is modulating, blower is on high, reheat valve is de-energized.

***C-Zone Sensor Mode With Humidistat***

No cooling demand but a call for dehumidification:

Compressor operates at 100%, blower and outdoor fan modulate to maintain indoor coil and discharge air temperatures, reheat valve is energized.

Cooling and dehumidification demand:

Compressor is modulating, blower is modulating, reheat valve is de-energized.

***D-Zone Sensor Mode With Zone RH Sensor***

No cooling demand but a call for dehumidification:

Compressor modulates based on zone relative humidity, blower and outdoor fan modulate to maintain indoor coil and discharge air temperatures, reheat valve is energized.

Cooling and dehumidification demand:

Compressor is modulating, blower is modulating, and the reheat valve is de-energized.

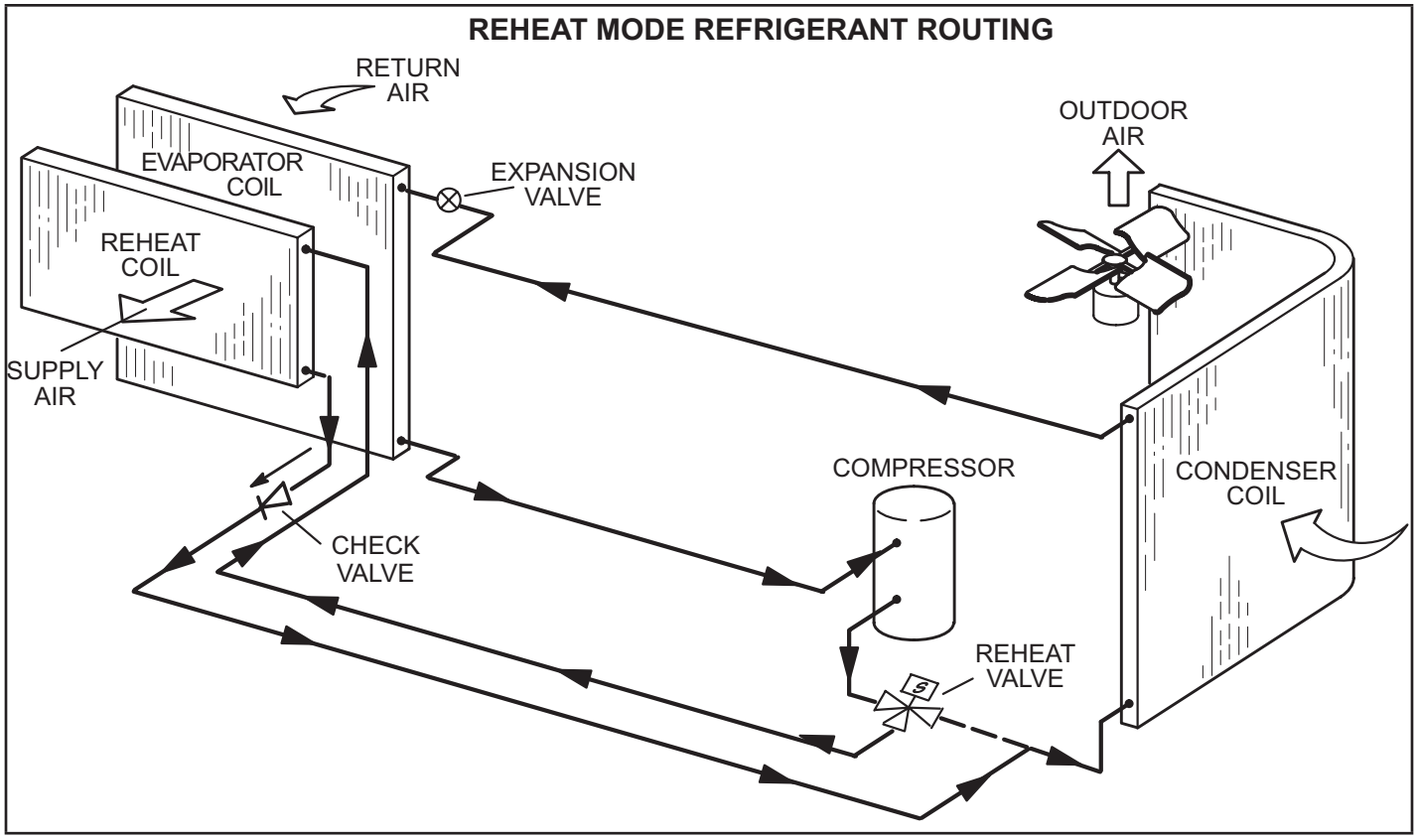



**FIGURE 40**

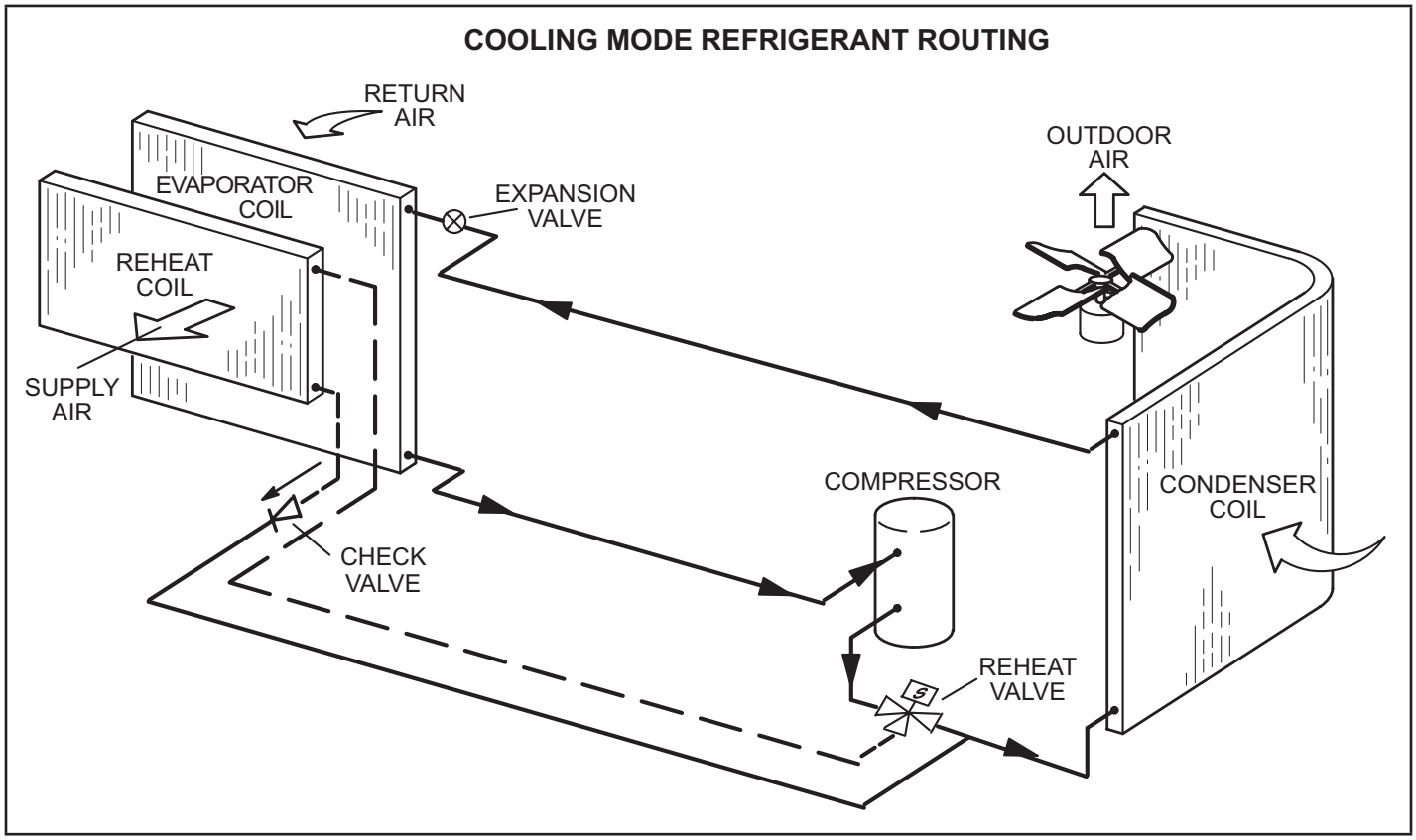



**FIGURE 41**

**VIII-Decommissioning**

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available befor the task is commenced.

Steps to ensure this are:

- Become familiar with the equipment and its operation,
- Isolate the system electrically,
- Ensure that before attempting the procedure that mechanical handling equipment is available, if required, for handling refrigerant cylinders, and that all personal protective equipment is available and being used correctly while the recovery process is supervised at all times by a competent person and that the recovery equipment and cylinders conform to the appropriate standards.

Additionally, pump down refrigerant system, if possible, and if a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system. Make sure that cylinders are situated on the scales before recovery takes place. Start the recovery machine and operate in accordance with instructions. Do not overfill cylinders (no more than 80 % volume liquid charge). Do not exceed the maximum working pressure of the cylinder, even temporarily. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off. Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area).

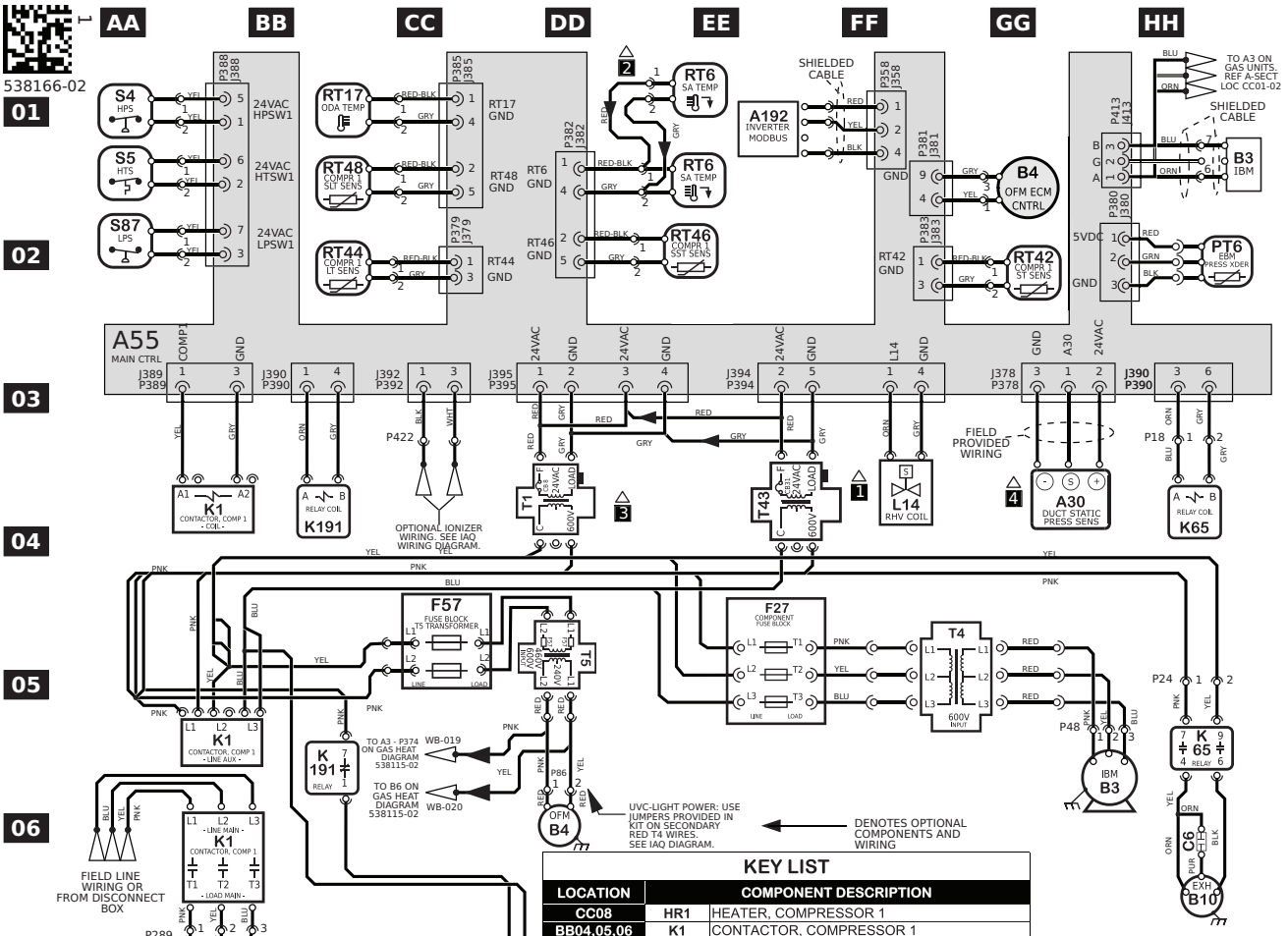
Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

- Safely remove refrigerant following local and national regulations,
- Evacuate the circuit,
- Purge the circuit with inert gas,
- Evacuate,
- Purge with inert gas,
- Open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. Refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

## LGM036-074 J VOLT DIAGRAM




### KEY LIST

| LOCATION | COMPONENT DESCRIPTION | |
|---|---|---|
| CC08 | HR1 | HEATER, COMPRESSOR 1 |
| BB04,05,06 | K1 | CONTACTOR, COMPRESSOR 1 |
| HH05,06 | K65 | RELAY, EXHAUST FAN 1 |
| BB04,05 | K191 | RELAY, CRANKCASE HEATER 1 |
| FF04 | L14 | VALVE, SOLENOID, REHEAT COIL 1 |
| HH02 | PT6 | PRESSURE TRANSDUCER, EBM MOTOR |
| EE01 | RT6 | SENSOR, A55 DISCHARGE (IMC) |
| CC01 | RT17 | SENSOR, OUTSIDE AIR TEMP |
| GG02 | RT42 | SENSOR, SUCTION TEMP., COMP 1 |
| CC02 | RT44 | SENSOR, LIQUID TEMP., COMP 1 |
| EE02 | RT46 | SENSOR, SATURATION SUCT TEMP., COMP 1 |
| CC01 | RT48 | SENSOR, SATURATION LIQUID TEMP., COMP 1 |
| AA01 | S4 | LIMIT, HI PRESS. SWITCH, COMPRESSOR 1 |
| AA01 | S5 | LIMIT, HI TEMP. SWITCH, COMPRESSOR 1 |
| AA02 | S87 | SWITCH, LOW PRESS., COMP. 1 |
| DD04 | T1 | TRANSFORMER, CONTROL |
| GG05 | T4 | TRANSFORMER, BLOWER MOTOR |
| DD05 | T5 | TRANSFORMER, OUTDOOR FAN MOTOR |
| EE04 | T43 | TRANSFORMER, REHEAT |
| CC07 | T61 | TRANSFORMER, INV INTERNAL POWER |

### KEY LIST

| LOCATION | COMPONENT DESCRIPTION | |
|---|---|---|
| AA02 | A55 | CONTROL BOARD, MAIN |
| GG04 | A30 | SENSOR, DUCT STATIC PRESS. |
| EE01, BB08 | A192 | INVERTER, COMPRESSOR 1 |
| CC08 | B1 | COMPRESSOR 1 |
| EE06 | B3 | MOTOR, BLOWER |
| DD06, GG01 | B4 | MOTOR, OUTDOOR FAN 1 |
| HH06 | B10 | MOTOR, EXHAUST FAN 1 |
| HH05 | C6 | CAPACITOR, EXHAUST FAN 1 |
| EE05 | F27 | FUSE, T4 TRANSFORMER PRIMARY |
| CC05 | F57 | FUSE, T5 TRANSFORMER PRIMARY |
| AA07 | FL1 | FILTER BOARD |

### NOTES

| | |
|---|---|
| 1 | ONLY ON UNITS WITH HUMIDITROL OPTION |
| 2 | RT6 REMOTE MOUNT WIRING |
| 3 | T1 CONNECTED TO J/P395-1,2 ONLY WITH HUMIDITROL |
| 4 | USED ON VAV UNITS ONLY |

**WARNING**

DISCONNECT ALL POWER BEFORE SERVICING.

ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

Model: LCM, LGM 036U - 074U J VOLT
Cooling Diagram without Higher SCCR
Voltage: 600/3/60 (J)
Supersedes: N/A Form No: 538166-02 Rev: 1

| HEATING | COOLING | COOLING | ACCS | ACCS |
|---|---|---|---|---|
| SECTION A | SECTION B | SECTION B3 | SECTION C | SECTION D |

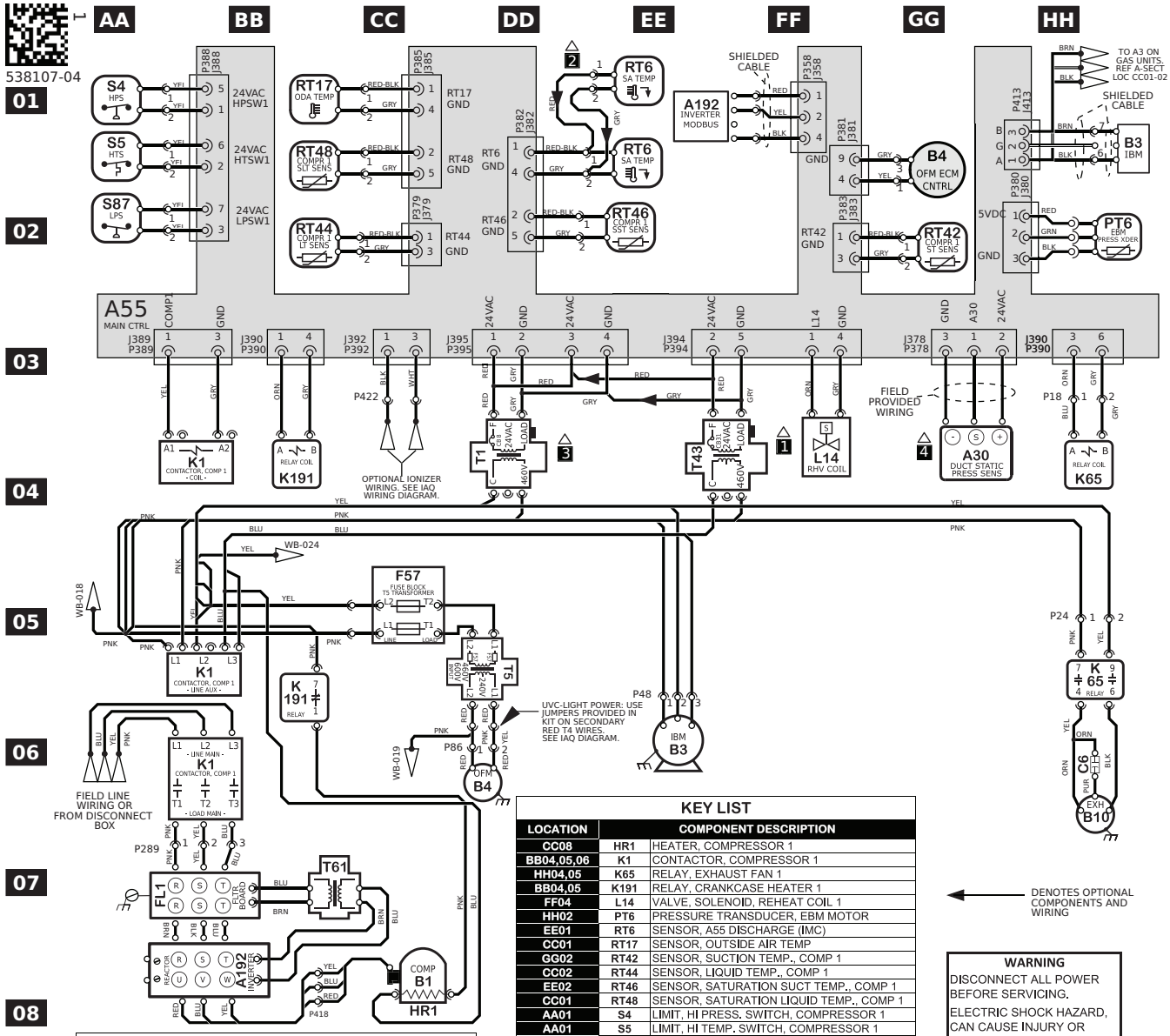
WIRING DIAGRAM FLOW

8.5 X 10 CUT SIZE

| REV | EC NO. | DATE | BY | APVD | REVISION NOTE |
|---|---|---|---|---|---|
| -- | CN-008852AS | 01/10/2023 | AXL | AAH | ORIGINATED AT PD&R CARROLLTON, TX |
| 1 | CN-013185 | 1/7/2025 | AXL | AAH | A) REMOVED AM1/AM2 |
| | | | | | |

# LGM036-074 G VOLT DIAGRAM

538107-04




## KEY LIST

| LOCATION | COMPONENT DESCRIPTION | |
|---|---|---|
| AA02 | A55 | CONTROL BOARD, MAIN |
| GG04 | A30 | SENSOR, DUCT STATIC PRESS. |
| EE01, BB08 | A192 | INVERTER, COMPRESSOR 1 |
| CC08 | B1 | COMPRESSOR 1 |
| EE06 | B3 | MOTOR, BLOWER |
| DD06, GG01 | B4 | MOTOR, OUTDOOR FAN 1 |
| HH06 | B10 | MOTOR, EXHAUST FAN 1 |
| HH05 | C6 | CAPACITOR, EXHAUST FAN 1 |
| CC05 | F57 | FUSE, T5 TRANSFORMER PRIMARY |
| AA07 | FL1 | FILTER BOARD |

## KEY LIST

| LOCATION | COMPONENT DESCRIPTION | |
|---|---|---|
| CC08 | HR1 | HEATER, COMPRESSOR 1 |
| BB04,05,06 | K1 | CONTACTOR, COMPRESSOR 1 |
| HH04,05 | K65 | RELAY, EXHAUST FAN 1 |
| BB04,05 | K191 | RELAY, CRANKCASE HEATER 1 |
| FF04 | L14 | VALVE, SOLENOID, REHEAT COIL 1 |
| HH02 | PT6 | PRESSURE TRANSDUCER, EBM MOTOR |
| EE01 | RT6 | SENSOR, A55 DISCHARGE (IMC) |
| CC01 | RT17 | SENSOR, OUTSIDE AIR TEMP |
| GG02 | RT42 | SENSOR, SUCTION TEMP., COMP 1 |
| CC02 | RT44 | SENSOR, LIQUID TEMP., COMP 1 |
| EE02 | RT46 | SENSOR, SATURATION SUCT TEMP., COMP 1 |
| CC01 | RT48 | SENSOR, SATURATION LIQUID TEMP., COMP 1 |
| AA01 | S4 | LIMIT, HI PRESS. SWITCH, COMPRESSOR 1 |
| AA01 | S5 | LIMIT, HI TEMP. SWITCH, COMPRESSOR 1 |
| AA02 | S87 | SWITCH, LOW PRESS., COMP. 1 |
| DD04 | T1 | TRANSFORMER, CONTROL |
| DD05 | T5 | TRANSFORMER, OUTDOOR FAN MOTOR |
| EE04 | T43 | TRANSFORMER, REHEAT |
| CC07 | T61 | TRANSFORMER, INV INTERNAL POWER |

DENOTES OPTIONAL COMPONENTS AND WIRING

## NOTES

| | |
|---|---|
| 1 | ONLY ON UNITS WITH HUMIDITROL OPTION |
| 2 | RT6 REMOTE MOUNT WIRING |
| 3 | T1 CONNECTED TO J/P395-1,2 ONLY WITH HUMIDITROL |
| 4 | USED ON VAV UNITS ONLY |

**WARNING**

DISCONNECT ALL POWER BEFORE SERVICING.

ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

Model: LCM, LGM 036U - 074U G VOLT
Cooling Diagram without Higher SCCR

Voltage: 460/3/60 (G)

Supersedes: N/A Form No: 538107-04 Rev: 1

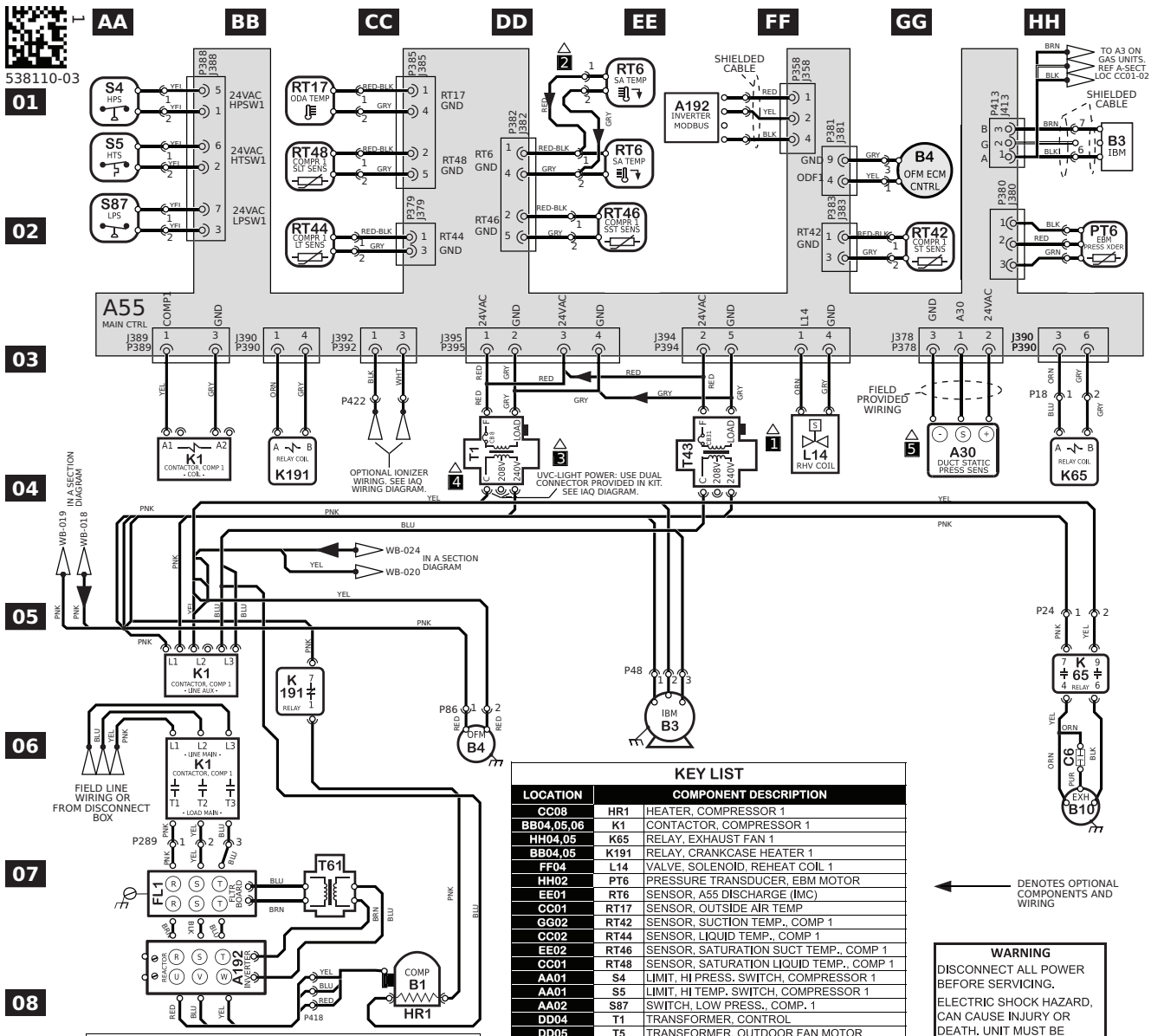
| HEATING | COOLING | COOLING | ACCS | ACCS |
|---|---|---|---|---|
| SECTION A | SECTION B | SECTION B3 | SECTION C | SECTION D |

WIRING DIAGRAM FLOW

8.5 x 10 CUT SIZE

| REV | EC NO. | DATE | BY | APVD | REVISION NOTE |
|---|---|---|---|---|---|
| --- | CN-011764C | 07/24/2024 | AXL | AAH | ORIGINATED AT PD&R CARROLLTON, TX |
| 1 | CN-013185 | 1/7/2025 | AXL | AAH | A) REMOVED AM1/AM2 |
| | | | | | |

# LGM036-074 Y VOLT DIAGRAM




| KEY LIST | | |
|---|---|---|
| LOCATION | COMPONENT DESCRIPTION | |
| CC08 | HR1 | HEATER, COMPRESSOR 1 |
| BB04,05,06 | K1 | CONTACTOR, COMPRESSOR 1 |
| HH04,05 | K65 | RELAY, EXHAUST FAN 1 |
| BB04,05 | K191 | RELAY, CRANKCASE HEATER 1 |
| FF04 | L14 | VALVE, SOLENOID, REHEAT COIL 1 |
| HH02 | PT6 | PRESSURE TRANSDUCER, EBM MOTOR |
| EE01 | RT6 | SENSOR, A55 DISCHARGE (IMC) |
| CC01 | RT17 | SENSOR, OUTSIDE AIR TEMP |
| GG02 | RT42 | SENSOR, SUCTION TEMP., COMP 1 |
| CC02 | RT44 | SENSOR, LIQUID TEMP., COMP 1 |
| EE02 | RT46 | SENSOR, SATURATION SUCT TEMP., COMP 1 |
| CC01 | RT48 | SENSOR, SATURATION LIQUID TEMP., COMP 1 |
| AA01 | S4 | LIMIT, HI PRESS. SWITCH, COMPRESSOR 1 |
| AA01 | S5 | LIMIT, HI TEMP. SWITCH, COMPRESSOR 1 |
| AA02 | S87 | SWITCH, LOW PRESS., COMP. 1 |
| DD04 | T1 | TRANSFORMER, CONTROL |
| DD05 | T5 | TRANSFORMER, OUTDOOR FAN MOTOR |
| EE04 | T43 | TRANSFORMER, REHEAT |
| CC07 | T61 | TRANSFORMER, INV INTERNAL POWER |

DENOTES OPTIONAL COMPONENTS AND WIRING

| KEY LIST | | |
|---|---|---|
| LOCATION | COMPONENT DESCRIPTION | |
| AA02 | A55 | CONTROL BOARD, MAIN |
| GG04 | A30 | SENSOR, DUCT STATIC PRESS. |
| EE01, BB08 | A192 | INVERTER, COMPRESSOR 1 |
| CC08 | B1 | COMPRESSOR 1 |
| EE06 | B3 | MOTOR, BLOWER |
| DD06, GG01 | B4 | MOTOR, OUTDOOR FAN 1 |
| HH06 | B10 | MOTOR, EXHAUST FAN 1 |
| HH05 | C6 | CAPACITOR, EXHAUST FAN 1 |
| AA07 | FL1 | FILTER BOARD |

| NOTES | |
|---|---|
| 1 | ONLY ON UNITS WITH HUMIDITROL OPTION |
| 2 | RT6 REMOTE MOUNT WIRING |
| 3 | T1 CONNECTED TO J/P395-1,2 ONLY WITH HUMIDITROL |
| 4 | MOVE WIRES FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS |
| 5 | USED ON VAV UNITS ONLY |

**WARNING**

DISCONNECT ALL POWER BEFORE SERVICING.

ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

| HEATING | COOLING | COOLING | ACCS | ACCS |
|---|---|---|---|---|
| SECTION A | SECTION B | SECTION B3 | SECTION C | SECTION D |

WIRING DIAGRAM FLOW

Model: LCM, LGM 036U - 074U Y VOLT
Cooling Diagram without Higher SCCR
Voltage: 208-230/3/60 (Y)
Supersedes: N/A Form No: 538110-03 Rev: 1

8.5 x 10 CUT SIZE

| REV | EC NO. | DATE | BY | APVD | REVISION NOTE |
|---|---|---|---|---|---|
| -- | CN-011764C | 07/24/2024 | AXL | AAH | ORIGINATED AT PD&R CARROLLTON, TX |
| 1 | CN-013185 | 1/7/2025 | AXL | AAH | A) REMOVED AM1/AM2 |
| | | | | | |

## Cooling Sequence of Operation

**Power:**

1 - Line voltage energizes transformer T1. T1 provides 24VAC power to the A55 Unit Controller. A55 provides 24VAC to the unit cooling, heating and blower controls.

2 - Line voltage provides voltage to compressor crankcase heater relay K191-1 N.C. contacts, compressor contactor K1, blower motor B3, and outdoor fan motor B4 (on G volt units line voltage is supplied to two fuses F27, transformer T4, blower motor B3, and outdoor fan motor B4).

**Blower Operation:**

3 - A55 Unit Controller receives a cooling demand from the room/zone sensor. Unit Controller A55 energizes the blower motor B3 by sending a PWM signal. The blower motor modulates between High Cool CFM and Low Cool CFM (based on the difference between the zone/room temperature A2 and setpoint).

**Cooling**

4 - A55 proves high temperature switch S5, N.C. low pressure switch S87, N.C. high pressure switch S4, and compressor contactor K1 is energized. A55 makes sure unit voltage and variable speed compressor inverter A192 voltage are equal. A55 also communicates the unit refrigeration tonnage to A192.

5 - N.O. contacts K1-1 close providing voltage to A192 through FL1 filter board, T61 transformer, and L43 reactor. A192 varies B1 compressor speed based on a compressor demand from A55 P358 via MODBUS. The A55 compressor demand varies based on the difference between discharge air temperature (RT6) and discharge air temperature setting (default 55°F).

***Note -*** *The A55 will start to reduce the three- through five-ton compressor speed at a heat sink temperature of 125°F. Typical competitor equipment reduces compressor speed at 115°F.*

6 - A55 modulates outdoor fan B4 speed by sending a PWM signal from P259 (based on the compressor speed).

7 - During cooling operation, A55 energizes crankcase heater relay K191. K191-1 N.C. Contacts open to de-energize HR1 crankcase heater.

**Power Exhaust Fan Operation**

8 - A55 receives a position feedback signal from the economizer damper motor and energizes exhaust fan relay K65 with 24VAC at 50% outside air damper open (adjustable).

9 - N.O. contact K65-1 & 2 close, energizing exhaust fan motor B10.

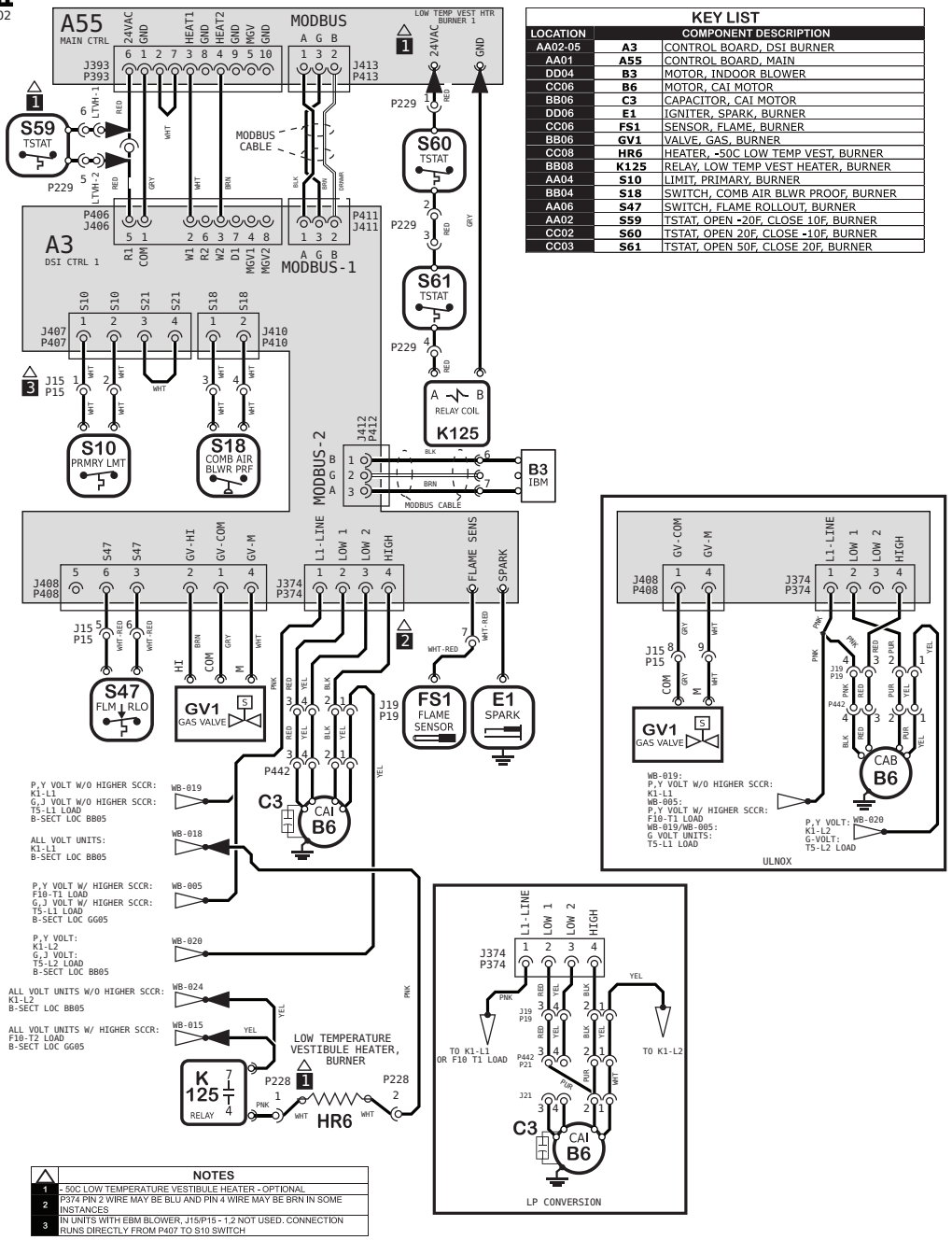
# LGM036-074 GAS HEAT DIAGRAM

Rev 0

538237-02

AA BB CC DD EE FF

01 02 03 04 05 06 07 08 09 10




| KEY LIST | | |
|---|---|---|
| LOCATION | COMPONENT DESCRIPTION | |
| AA02-05 | A3 | CONTROL BOARD, DSI BURNER |
| AA01 | A55 | CONTROL BOARD, MAIN |
| DD04 | B3 | MOTOR, INDOOR BLOWER |
| CC06 | B6 | MOTOR, CAI MOTOR |
| BB06 | C3 | CAPACITOR, CAI MOTOR |
| DD06 | E1 | IGNITER, SPARK, BURNER |
| CC06 | FS1 | SENSOR, FLAME, BURNER |
| BB06 | GV1 | VALVE, GAS, BURNER |
| CC08 | HR6 | HEATER, -50C LOW TEMP VEST, BURNER |
| BB08 | K125 | RELAY, LOW TEMP VEST HEATER, BURNER |
| AA04 | S10 | LIMIT, PRIMARY, BURNER |
| BB04 | S18 | SWITCH, COMB AIR BLWR PROOF, BURNER |
| AA06 | S47 | SWITCH, FLAME ROLLOUT, BURNER |
| AA02 | S59 | TSTAT, OPEN -20F, CLOSE 10F, BURNER |
| CC02 | S60 | TSTAT, OPEN 20F, CLOSE -10F, BURNER |
| CC03 | S61 | TSTAT, OPEN 50F, CLOSE 20F, BURNER |

| NOTES | |
|---|---|
| 1 | - 50C LOW TEMPERATURE VESTIBULE HEATER - OPTIONAL |
| 2 | P374 PIN 2 WIRE MAY BE BLU AND PIN 4 WIRE MAY BE BRN IN SOME INSTANCES |
| 3 | IN UNITS WITH EBM BLOWER, J15/P15 - 1,2 NOT USED. CONNECTION RUNS DIRECTLY FROM P407 TO S10 SWITCH |

DENOTES OPTIONAL COMPONENTS AND WIRING



Model: LG, LDT SERIES RTU - GAS HEAT
Input Heat Capacity 60k - 150k Btuh

Voltage: 208-240/1/60(P),208-240/3/60(Y),460/3/60(G), 575/3/60(J)

Supersedes: N/A Form No: 538237-02 Rev: 0

| HEATING | COOLING | COOLING | ACCS | ACCS |
|---|---|---|---|---|
| SECTION A | SECTION B | SECTION B3 | SECTION C | SECTION D |

WIRING DIAGRAM FLOW

7x10 CUT SIZE

| REV | EC NO. | DATE | BY | APVD | REVISION NOTE |
|---|---|---|---|---|---|
| -- | CN-011764 | 06/01/2022 | AXL | AAH | ORIGINATED AT PD&R CARROLLTON, TX |
| | | | | | |
| | | | | | |

## TWO-STAGE GAS HEAT SEQUENCE OF OPERATION

**First Stage Heat:**

1 - The thermostat initiates W1 heating demand.

2 - 24VAC is routed to controller A3. A3 proves N.C. primary limit S10..

3 - Control board A3 energizes combustion air inducer B6. After B6 has reached full speed, the combustion air blower proving switch S18 contacts close.

4 - After a 30 second delay A3 energizes the ignitor and gas valve GV1 on first stage.

**Second Stage Heat:**

5 - With first stage heat operating, an additional heating demand from the thermostat initiates W2.

6 - A second stage heating demand is received by A55.

7 - A3 energizes HI terminal (high fire) of gas valve.

8 - A3 energizes combustion air inducer B6 on high speed.

**End of Second Stage Heat:**

9 - Heating demand is satisfied. Terminal HI (second stage) is de-energized.

10 - Second stage heat is de-energized on GV1..

11 - Combustion air inducer B6 is now on low speed.

**End of First Stage Heat:**

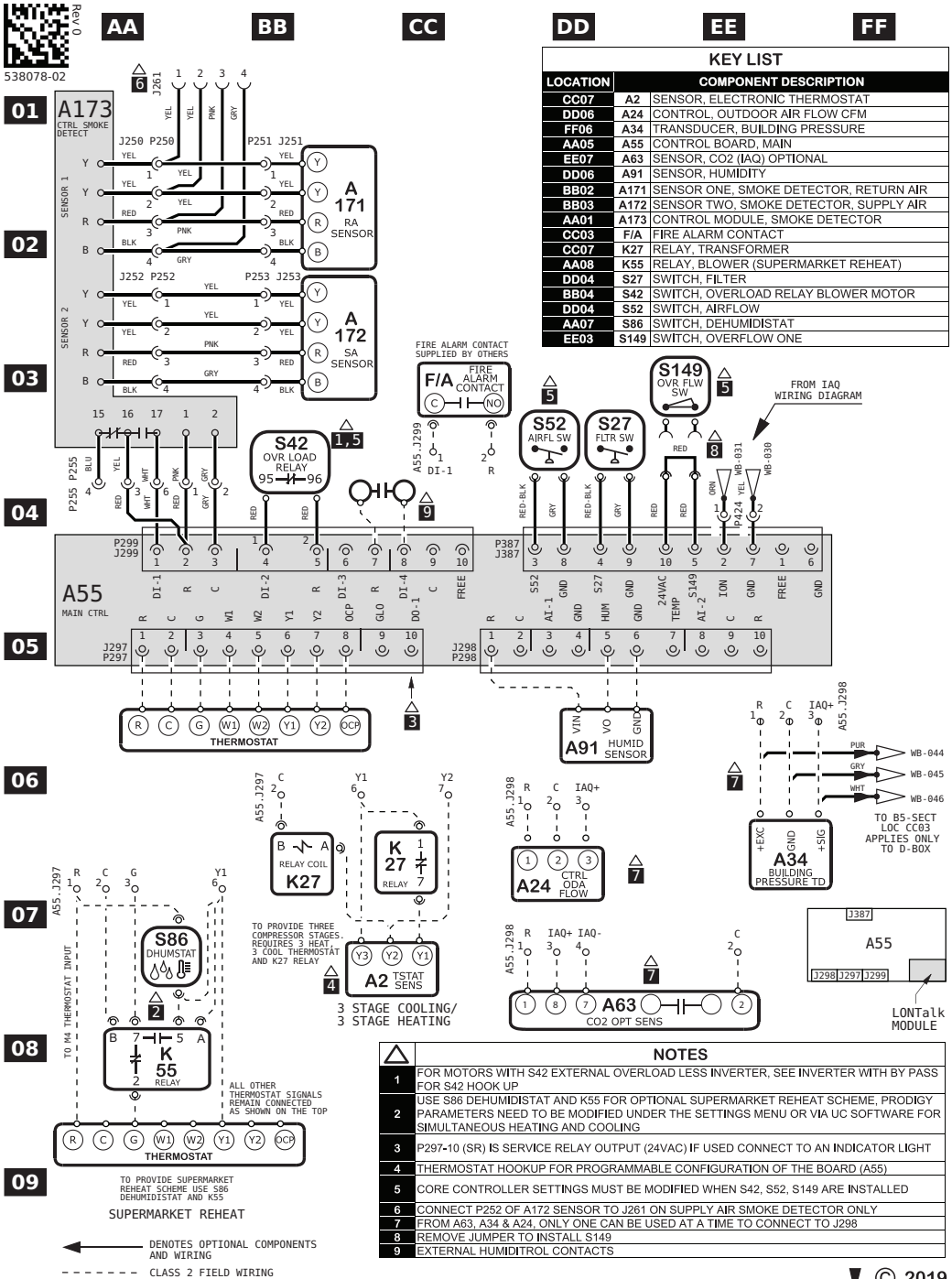
12 - Heating demand is satisfied. Terminal W1 (first stage) is de-energized.

13 - Ignition A3 is de-energized in turn de-energizing gas valve GV1 and combustion air inducer B6.

**Optional Low Ambient Kit: (C.S.A. -50° C Low Ambient Kit)**

14 - Line voltage is routed through the N.C. low ambient kit thermostats S60 and S61, to energize low ambient kit heater HR6.

# THERMOSTAT




| KEY LIST | | |
|---|---|---|
| **LOCATION** | **COMPONENT DESCRIPTION** | |
| CC07 | A2 | SENSOR, ELECTRONIC THERMOSTAT |
| DD06 | A24 | CONTROL, OUTDOOR AIR FLOW CFM |
| FF06 | A34 | TRANSDUCER, BUILDING PRESSURE |
| AA05 | A55 | CONTROL BOARD, MAIN |
| EE07 | A63 | SENSOR, CO2 (IAQ) OPTIONAL |
| DD06 | A91 | SENSOR, HUMIDITY |
| BB02 | A171 | SENSOR ONE, SMOKE DETECTOR, RETURN AIR |
| BB03 | A172 | SENSOR TWO, SMOKE DETECTOR, SUPPLY AIR |
| AA01 | A173 | CONTROL MODULE, SMOKE DETECTOR |
| CC03 | F/A | FIRE ALARM CONTACT |
| CC07 | K27 | RELAY, TRANSFORMER |
| AA08 | K55 | RELAY, BLOWER (SUPERMARKET REHEAT) |
| DD04 | S27 | SWITCH, FILTER |
| BB04 | S42 | SWITCH, OVERLOAD RELAY BLOWER MOTOR |
| DD04 | S52 | SWITCH, AIRFLOW |
| AA07 | S86 | SWITCH, DEHUMIDISTAT |
| EE03 | S149 | SWITCH, OVERFLOW ONE |

| △ | NOTES |
|---|---|
| 1 | FOR MOTORS WITH S42 EXTERNAL OVERLOAD LESS INVERTER, SEE INVERTER WITH BY PASS FOR S42 HOOK UP |
| 2 | USE S86 DEHUMIDISTAT AND K55 FOR OPTIONAL SUPERMARKET REHEAT SCHEME, PRODIGY PARAMETERS NEED TO BE MODIFIED UNDER THE SETTINGS MENU OR VIA UC SOFTWARE FOR SIMULTANEOUS HEATING AND COOLING |
| 3 | P297-10 (SR) IS SERVICE RELAY OUTPUT (24VAC) IF USED CONNECT TO AN INDICATOR LIGHT |
| 4 | THERMOSTAT HOOKUP FOR PROGRAMMABLE CONFIGURATION OF THE BOARD (A55) |
| 5 | CORE CONTROLLER SETTINGS MUST BE MODIFIED WHEN S42, S52, S149 ARE INSTALLED |
| 6 | CONNECT P252 OF A172 SENSOR TO J261 ON SUPPLY AIR SMOKE DETECTOR ONLY |
| 7 | FROM A63, A34 & A24, ONLY ONE CAN BE USED AT A TIME TO CONNECT TO J298 |
| 8 | REMOVE JUMPER TO INSTALL S149 |
| 9 | EXTERNAL HUMIDITROL CONTACTS |



**10** Model: LC, LG, LH, LD Series RTU Thermostat
Voltage: All Voltages
Supersedes: 538078-01 Form No: 538078-02 Rev: 0

| HEATING | COOLING | COOLING | ACCS | ACCS |
|---|---|---|---|---|
| SECTION A | SECTION B | SECTION B3/5 | SECTION C | SECTION D |

WIRING DIAGRAM FLOW

7x10 CUT SIZE

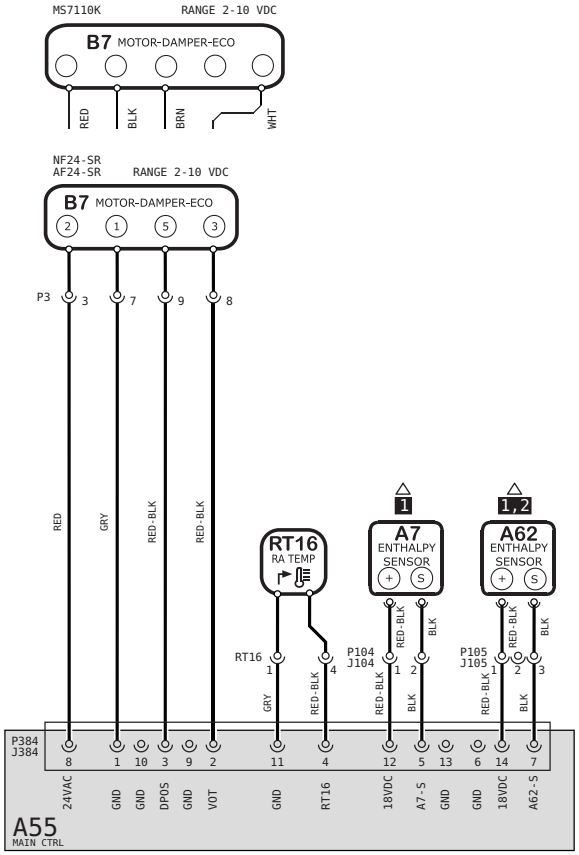
| REV | EC NO. | DATE | BY | APVD | REVISION NOTE |
|---|---|---|---|---|---|
| --- | CN-012295C | 04-03-2024 | MXR6 | MXT5 | ORIGINATED AT PD&R CARROLLTON, TX |
| | | | | | |
| | | | | | |

# ECONOMIZER

Rev 2
538072-01

AA BB CC DD

01 02 03 04 05 06 07 08 09




| △ | NOTES |
|---|---|
| 1 | A7 AND A62 NOT USED FOR SENSIBLE TEMPERATURE CONTROL |
| 2 | FOR UNIT DIFFERENTIAL ENTHALPY CONTROL, ADD A62 RETURN AIR ENTHALPY SENSOR |

| KEY LIST | | |
|---|---|---|
| LOCATION | COMPONENT DESCRIPTION | |
| CC05 | A7 | SENSOR, SOLID STATE ENTHALPY |
| AA06 | A55 | CONTROL BOARD, MAIN |
| DD05 | A62 | SENSOR, ENTHALPY INDOOR |
| BB02 | B7 | MOTOR, DAMPER ECONOMIZER |
| CC05 | RT16 | SENSOR, RETURN AIR TEMP |

10



| HTG SEC A | CLG SEC B | CLG SEC B3 | ACCS SEC C | ACCS SEC D |
|---|---|---|---|---|

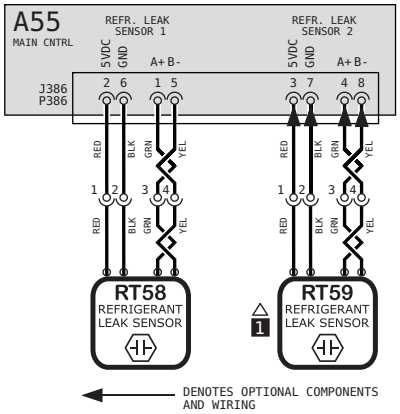
WIRING DIAGRAM FLOW

Model: LC,LG,LH,LD,SC,SG Series
Economizer & Motorized OAD
Voltage: All Voltages
Supersedes: N/A Form No: 538072-01 Rev: 2

5x10 CUT SIZE

| REV | EC NO. | DATE | BY | APVD | REVISION NOTE |
|---|---|---|---|---|---|
| --- | CN-008594 | 10/15/2020 | RV | MXR6 | ORIGINATED AT PD&R CARROLLTON, TX |
| 001 | CN-010356B | 03/24/2022 | MXR6 | JAL21 | UPDATED APPLICABLE MODEL NUMBERS. |
| 002 | CN-012457P | 03/06/2024 | AXL | AAH | A) ADDED SC, SG TO MODELS |

# RDS SENSOR




| KEY LIST | |
|---|---|
| **COMPONENT** | **DESCRIPTION** |
| **A55** | CONTROL BOARD, MAIN |
| **RT58** | SENSOR 1, REFR. LEAK DETECTION |
| **RT59** | SENSOR 2, REFR. LEAK DETECTION |

| △ | NOTES |
|---|---|
| 1 | REFRIGERANT LEAK SENSOR 2 (RT59), MAY NOT BE PRESENT IN ALL UNITS. |

**WARNING**

DISCONNECT ALL POWER BEFORE SERVICING.

ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

MODEL: Units w/CORE Contr. Refr. Leak Detection
VOLT: All
SUPSDS: N/A NO: 538440-01

Rev 0

3 x 7
CUT SIZE

| REV | EC NO. | DATE | BY | APVD | REVISION NOTE |
|---|---|---|---|---|---|
| --- | CN-012295C | 04-03-2024 | MXR6 | MXT5 | ORIGINATED AT PD&R CARROLLTON, TX |
| | | | | | |
| | | | | | |