# UNIT INFORMATION

100082
Revised 02/2024

**LCT SERIES**
**13 to 25 ton**
**45.7 to 88 kW**

***Service Literature***

## LCT156 through 300

The LCT156, 180, 210, 240 and 300 units are configure to order units (CTO) with a wide selection of factory installed options.

Cooling capacities range from 13 to 25 tons. LCT 156 utilize two compressors and three condenser fans. LCT 180 utilize three compressors and four condenser fans. LCT 210 utilize four compressors and four condenser fans. LCT 240 & 300 utilize four compressors and six condenser fans.

Optional electric heat is factory- or field-installed. Electric heat operates in single or multiple stages depending on the kW input size. 15kW to 60 kW heat sections are available for the LCT156 and 180 units and 15 kW to 90 kW heat sections are available for the LCT210, 240, 300.

Multi-Stage Air Volume MSAV® blower option is available. The VFD-driven blower will operate at lower speeds when demand is low and increase to higher speeds when demand is high.

Variable speed VAV system is available as an option which enables supply duct static measurement to control blower CFM and discharge air temperature to control cooling stages.

All LCT units are designed to accept any of several different energy management thermostat control systems with minimum field wiring. Factory- or field-provided control options connect to the unit through Smartwire connectors. When “plugged in” the controls become an integral part of the unit wiring.

The CORE Control System is designed to accelerate equipment install and service. Standard with all Enlight rooftop units, control system integrates key technologies that lower installation costs, drive system efficiency, and protect your investments.

The CORE Unit Controller is a microprocessor-based controller that provides flexible control of all unit functions.

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.

**⚠ WARNING**

**To prevent serious injury or death:**

**1- Lock-out/tag-out before performing maintenance.**

**2- If system power is required (e.g., smoke detector maintenance), disable power to blower, remove fan belt where applicable, and ensure all controllers and thermostats are set to the “OFF” position before performing maintenance.**

**3- Always keep hands, hair, clothing, jewelry, tools, etc., away from moving parts.**

**⚠ 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**

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## OPTIONS / ACCESSORIES

| Item Description | | Catalog Number | Unit Model No 156 | 180 | 210 | 240 | 300 |
|---|---|---|---|---|---|---|---|
| **COOLING SYSTEM** | | | | | | | |
| Condensate Drain Trap | PVC | **22H54** | X | X | X | X | X |
| | Copper | **76W27** | X | X | X | X | X |
| Drain Pan Overflow Switch | | **21Z07** | OX | OX | OX | OX | OX |
| **BLOWER - SUPPLY AIR** | | | | | | | |
| Blower Option | VAV Variable Air Volume (Without VFD Bypass Control) | Factory | O | O | O | O | O |
| | MSAV® Multi-Stage Air Volume (With VFD Bypass Control) | Factory | O | O | O | O | O |
| | MSAV® Multi-Stage Air Volume (Without VFD Bypass Control) | Factory | O | O | O | O | O |
| Motors | Belt Drive - 3 hp | Factory | O | O | O | | |
| | Belt Drive - 5 hp | Factory | O | O | O | O | O |
| | Belt Drive - 7.5 hp | Factory | | O | O | O | O |
| | Belt Drive - 10 hp | Factory | | | | O | O |
| Drive Kits | Kit #1 535-725 rpm | Factory | O | O | O | | |
| See Blower Data Tables for usage and selection | Kit #2 710-965 rpm | Factory | O | O | O | | |
| | Kit #3 685-856 rpm | Factory | O | O | O | O | O |
| | Kit #4 850-1045 rpm | Factory | O | O | O | O | O |
| | Kit #5 945-1185 rpm | Factory | O | O | O | O | O |
| | Kit #6 850-1045 rpm | Factory | | O | O | O | O |
| | Kit #7 945-1185 rpm | Factory | | O | O | O | O |
| | Kit #8 1045-1285 rpm | Factory | | O | O | O | O |
| | Kit #10 1045-1285 rpm | Factory | | | | O | O |
| | Kit #11 1135-1365 rpm | Factory | | | | O | O |
| | Blower Belt Auto-Tensioner | **24B80** | X | X | X | X | X |
| **CABINET** | | | | | | | |
| Combination Coil/Hail Guards | | **23U69** | OX | | | | |
| | | **23U71** | | OX | OX | OX | OX |
| Corrosion Protection | | Factory | O | O | O | O | O |
| **CONTROLS** | | | | | | | |
| Blower Proving Switch | | **21Z10** | OX | OX | OX | OX | OX |
| Commercial Controls | CPC Einstein Integration | Factory | O | O | O | O | O |
| | LonTalk® Module | **54W27** | OX | OX | OX | OX | OX |
| | Novar® LSE | Factory | O | O | O | O | O |
| Dirty Filter Switch | | **53W68** | OX | OX | OX | OX | OX |
| Fresh Air Tempering | | **21Z08** | OX | OX | OX | OX | OX |
| Smoke Detector - Supply or Return (Power board and one sensor) | | **22H56** | OX | OX | OX | OX | OX |
| Smoke Detector - Supply and Return (Power board and two sensors) | | **22H57** | OX | OX | OX | OX | OX |

NOTE - Catalog numbers shown are for ordering field installed accessories.

OX - Configure To Order (Factory Installed) or Field Installed

O = Configure To Order (Factory Installed)

X = Field Installed

## OPTIONS / ACCESSORIES

| Item Description | | Catalog Number | Unit Model No 156 | 180 | 210 | 240 | 300 |
|---|---|---|---|---|---|---|---|
| **INDOOR AIR QUALITY** | | | | | | | |
| **Air Filters** | | | | | | | |
| Healthy Climate® High Efficiency Air Filters 24 x 24 x 2 (Order 6 per unit) | MERV 8 | **54W67** | OX | OX | OX | OX | OX |
| | MERV 13 | **52W40** | OX | OX | OX | OX | OX |
| | MERV 16 | **21U42** | X | X | X | X | X |
| Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter media) | | **44N61** | X | 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 | X |
| Sensor - Wall-mount, off-white plastic cover, no display | | **23V86** | X | X | X | X | X |
| Sensor - Black plastic case with LCD display, rated for plenum mounting | | **87N52** | X | X | X | X | X |
| Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting | | **87N54** | X | X | X | X | X |
| $CO_2$ Sensor Duct Mounting Kit - for downflow applications | | **85L43** | X | X | X | X | X |
| Aspiration Box - for duct mounting non-plenum rated $CO_2$ sensors (**77N39**) | | **90N43** | X | X | X | X | X |
| **Needlepoint Bipolar Ionization (NPBI)** | | | | | | | |
| Needlepoint Bipolar Ionization (NPBI) Kit | | **21U37** | X | X | X | | |
| | | **21U38** | | | | X | |
| | | **21U39** | | | | | X |
| **UVC Germicidal Light Kit** | | | | | | | |
| [1] Healthy Climate® UVC Light Kit (110/230v-1ph) | | **21A94** | X | X | X | X | X |
| Step-Down Transformers | 460V primary, 230V secondary | **10H20** | X | X | X | X | X |
| | 575V primary, 230V secondary | **10H21** | X | X | X | X | X |
| **ELECTRICAL** | | | | | | | |
| Voltage 60 Hz | 208/230V - 3 phase | Factory | O | O | O | O | O |
| | 460V - 3 phase | Factory | O | O | O | O | O |
| | 575V - 3 phase | Factory | O | O | O | O | O |
| HACR Circuit Breakers | | Factory | O | O | O | O | O |
| [2] Short-Circuit Current Rating (SCCR) of 100kA (includes Phase/Voltage Detection) | | Factory | O | O | O | O | O |
| [3] Disconnect Switch (see Disconnect Table for usage, page 53) | 80 amp | **54W85** | OX | OX | OX | OX | OX |
| | [4] 150 amp | **54W86** | OX | OX | OX | OX | OX |
| | 250 amp | **54W87** | | | | | OX |
| GFI Service Outlets | 15 amp non-powered, field-wired (208/230V, 460V) | **74M70** | OX | OX | OX | OX | OX |
| | [4], [5] 15 amp factory-wired and powered (208/230V, 460V) | Factory | O | O | O | O | O |
| | [6] 20 amp non-powered, field-wired (208/230V, 460V, 575V) | **67E01** | X | X | X | X | X |
| | [6] 20 amp non-powered, field-wired (575V) | Factory | O | O | O | O | O |
| Weatherproof Cover for GFI | | **10C89** | X | X | X | X | X |

[1] 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).

[2] SCCR option is only available with factory installed electric heat or no electric heat.
SCCR option is not available if the MOCP of the configured unit is greater than 200A.

[3] Disconnect Switch is not available with the SCCR option.

[4] If a factory installed disconnect switch is ordered with a factory installed GFI, the default disconnect size is 150 amps.

[5] Unit powered GFI Service Outlets are not available with SCCR option.
Disconnect Switch or Circuit Breaker is required with unit powered GFI Service Outlets.

[6] Canada requires a minimum 20 amp circuit. Select 20 amp, non-powered, field wired GFI.

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## OPTIONS / ACCESSORIES

| Item Description | | Catalog Number | Unit Model No 156 | 180 | 210 | 240 | 300 |
|---|---|---|---|---|---|---|---|
| **ELECTRIC HEAT** | | | | | | | |
| 15 kW | 208/240V-3ph | **22H66** | OX | OX | OX | OX | OX |
| | 460V-3ph | **22H67** | OX | OX | OX | OX | OX |
| | 575V-3ph | **22V35** | OX | OX | OX | OX | OX |
| 30 kW | 208/240V-3ph | **22H68** | OX | OX | OX | OX | OX |
| | 460V-3ph | **22H69** | OX | OX | OX | OX | OX |
| | 575V-3ph | **22V36** | OX | OX | OX | OX | OX |
| 45 kW | 208/240V-3ph | **22H72** | OX | OX | OX | OX | OX |
| | 460V-3ph | **22H73** | OX | OX | OX | OX | OX |
| | 575V-3ph | **22V38** | OX | OX | OX | OX | OX |
| 60 kW | 208/240V-3ph | **22H76** | OX | OX | OX | OX | OX |
| | 460V-3ph | **22H77** | OX | OX | OX | OX | OX |
| | 575V-3ph | **22V40** | OX | OX | OX | OX | OX |
| 90 kW | 208/240V-3ph | **22H80** | | | OX | OX | OX |
| | 460V-3ph | **22H81** | | | OX | OX | OX |
| | 575V-3ph | **22V42** | | | OX | OX | OX |
| **ECONOMIZER** | | | | | | | |
| **High Performance Economizer (Approved for California Title 24 Building Standards AMCA Class 1A Certified)** | | | | | | | |
| High Performance Economizer<br>Downflow or Horizontal Applications - Includes Outdoor Air Hood.<br>Order Downflow or Horizontal Barometric Relief Dampers separately. | | **22J18** | OX | OX | OX | OX | OX |
| **Economizer Controls** | | | | | | | |
| Differential Enthalpy (Not for Title 24) | Order 2 | **21Z09** | OX | OX | OX | OX | OX |
| Sensible Control | Sensor is Furnished | Factory | O | O | O | O | O |
| Single Enthalpy (Not for Title 24) | | **21Z09** | OX | OX | OX | OX | OX |
| Global Control | Sensor Field Provided | Factory | O | O | O | O | O |
| Building Pressure Control | | **13J77** | X | X | X | X | X |
| Outdoor Air CFM Control | | **13J76** | X | X | X | X | X |
| **Barometric Relief Dampers With Exhaust Hood** | | | | | | | |
| Downflow Barometric Relief Dampers | | **54W78** | OX | OX | OX | OX | OX |
| Horizontal Barometric Relief Dampers | | **16K99** | X | X | X | X | X |
| **OUTDOOR AIR** | | | | | | | |
| **Outdoor Air Dampers With Outdoor Air Hood** | | | | | | | |
| Motorized | | **22J27** | OX | OX | OX | OX | OX |
| Manual | | **13U05** | X | X | X | X | X |

NOTE - Catalog numbers shown are for ordering field installed accessories.

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## OPTIONS / ACCESSORIES

| Item Description | | Catalog Number | Unit Model No 156 | 180 | 210 | 240 | 300 |
|---|---|---|---|---|---|---|---|
| **[1] POWER EXHAUST (DOWNFLOW APPLICATIONS ONLY)** | | | | | | | |
| Standard Static, SCCR Rated | 208/230V | **22H90** | OX | OX | OX | OX | OX |
| | 460V | **22H91** | OX | OX | OX | OX | OX |
| | 575V | **22V34** | OX | OX | OX | OX | OX |
| **HUMIDITROL® CONDENSER REHEAT OPTION - MSAV® MODELS ONLY** | | | | | | | |
| Humiditrol Dehumidification Option | | Factory | O | O | O | O | O |
| Humidity Sensor Kit, Remote mounted | | **17M50** | X | X | X | X | X |
| [1] Field installed Power Exhaust requires Economizer with Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood. Must be ordered separately. | | | | | | | |
| **ROOF CURBS** | | | | | | | |
| **Hybrid Roof Curbs, Downflow** | | | | | | | |
| 8 in. height | | **11F58** | X | X | X | X | X |
| 14 in. height | | **11F59** | X | X | X | X | X |
| 18 in. height | | **11F60** | X | X | X | X | X |
| 24 in. height | | **11F61** | X | X | X | X | X |
| **Adjustable Pitch Curb** | | | | | | | |
| 14 in. height | | **43W26** | X | X | X | X | X |
| **Standard Roof Curbs, Horizontal - Requires Horizontal Return Air Panel Kit** | | | | | | | |
| 26 in. height - slab applications | | **11T89** | X | X | X | X | |
| 30 in. height - slab applications | | **11T90** | | | | | X |
| 37 in. height - rooftop applications | | **11T96** | X | X | X | X | |
| 41 in. height - rooftop applications | | **11T97** | | | | | X |
| **Insulation Kit For Standard Horizontal Roof Curbs** | | | | | | | |
| For 26 in. Curb | | **73K32** | X | X | X | X | |
| For 30 in. Curb | | **73K33** | | | | | X |
| For 37 in. Curb | | **73K34** | X | X | X | X | |
| For 41 in. Curb | | **73K35** | | | | | X |
| **Horizontal Return Air Panel Kit** | | | | | | | |
| Required for Horizontal Applications with Roof Curb | | **87M00** | X | X | X | X | X |
| **CEILING DIFFUSERS** | | | | | | | |
| Step-Down - Order one | RTD11-185S | **13K63** | X | X | | | |
| | RTD11-275S | **13K64** | | | X | X | X |
| Flush - Order one | FD11-185S | **13K58** | X | X | | | |
| | FD11-275S | **13K59** | | | X | X | X |
| Transitions (Supply and Return) - Order one | C1DIFF33C-1 | **12X68** | X | X | | | |
| | C1DIFF34C-1 | **12X70** | | | X | X | X |

NOTE - Catalog numbers shown are for ordering field installed accessories.

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## SPECIFICATIONS — 13 TON

| | | | | |
|---|---|---|---|---|
| **General Data** | | **Nominal Tonnage** | **13 Ton** | **13 Ton** |
| | | **Model Number** | **LCT156H4M** | **LCT156H4V** |
| | | **Efficiency Type** | **High** | **High** |
| | | **Blower Type** | MSAV® Multi-Stage Air Volume | VAV Variable Air Volume |
| **Cooling Performance** | | Gross Cooling Capacity - Btuh | 152,000 | 152,000 |
| | | [1] Net Cooling Capacity - Btuh | 148,000 | 148,000 |
| | | [1] AHRI Rated Air Flow - cfm | 6000 | 6000 |
| | | Total Unit Power - kW | 12.3 | 12.3 |
| | | [1] IEER (Btuh/Watt) | 15.7 | 15.2 |
| | | [1] EER (Btuh/Watt) | 12.0 | 12.0 |
| **Refrigerant Charge** | | Refrigerant Type | R-410A | R-410A |
| | Without Reheat Option | Circuit 1 | 10 lbs. 7 oz. | 10 lbs. 7 oz. |
| | | Circuit 2 | 8 lbs. 15 oz. | 8 lbs. 15 oz. |
| | With Reheat Option | Circuit 1 | 10 lbs. 7 oz. | - - - |
| | | Circuit 2 | 8 lbs. 15 oz. | - - - |
| **Electric Heat (kW) Available** | | | 15, 30, 45, 60 kW | |
| **Compressor Type (number)** | | | (1) Two-Stage Scroll, (1) Single-Stage Scroll | |
| **Outdoor Coils** | | Net face area (total) - sq. ft. | 41.4 | 41.4 |
| | | Number of rows | 1 | 1 |
| | | Fins per inch | 23 | 23 |
| **Outdoor Coil Fans** | | Motor - horsepower | 1/3 | 1/3 |
| | | Motor Type | (1) ECM (2) PSC | (1) ECM (2) PSC |
| | | Motor rpm | 1075 | 1075 |
| | | Total Motor watts | 1100 | 1100 |
| | | Diameter - (No.) in. | 3 (24) | 3 (24) |
| | | Number of blades | 3 | 3 |
| | | Total Air volume - cfm | 12,000 | 12,000 |
| **Indoor Coils** | | Net face area (total) - sq. ft. | 21.4 | 21.4 |
| | | Tube diameter - in. | 3/8 | 3/8 |
| | | Number of rows | 3 | 3 |
| | | Fins per inch | 14 | 14 |
| | | Drain connection - No. and size | (1) 1in. FPT | (1) 1 in. FPT |
| | | Expansion device type | Balanced Port Thermostatic Expansion Valve (removable element head) | |
| [3] **Indoor Blower and Drive Selection** | | Nominal motor output | 3 hp, 5 hp | |
| | | Max. usable motor output (US) | 3.45 hp, 5.75 hp | |
| | | Motor - Drive kit number | 3 hp<br>Kit 1 535-725 rpm<br>Kit 2 710-965 rpm<br>5 hp<br>Kit 3 - 685-856 rpm<br>Kit 4 850-1045 rpm<br>Kit 5 945-1185 rpm | |
| | | Blower wheel nominal D x W - in. | (2) 15 x 15 in. | (2) 15 x 15 in. |
| **Filters** | | Type of filter | MERV 4, Disposable | |
| | | Number and size - in. | (6) 24 x 24 x 2 | |
| **Electrical characteristics** | | | 208/230V, 460V or 575V - 60 hertz - 3 phase | |

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 340/360; 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

[2] Integrated Energy Efficiency Ratio tested according to AHRI Standard 340/360.

[3] Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE – All units are limited to a motor service factor of 1.0.

## SPECIFICATIONS — 15 TON

| | | | | |
|---|---|---|---|---|
| **General Data** | | **Nominal Tonnage** | **15 Ton** | **15 Ton** |
| | | **Model Number** | **LCT180H4M** | **LCT180H4V** |
| | | **Efficiency Type** | **High** | **High** |
| | | **Blower Type** | MSAV®<br>Multi-Stage Air Volume | VAV<br>Variable Air Volume |
| **Cooling Performance** | | Gross Cooling Capacity - Btuh | 176,000 | 176,000 |
| | | [1] Net Cooling Capacity - Btuh | 172,000 | 172,000 |
| | | [1] AHRI Rated Air Flow - cfm | 5250 | 5250 |
| | | Total Unit Power - kW | 14.3 | 14.3 |
| | | [1] IEER (Btuh/Watt) | 15.2 | 15.2 |
| | | [1] EER (Btuh/Watt) | 12.0 | 12.0 |
| **Refrigerant Charge** | | Refrigerant Type | R-410A | R-410A |
| | Without Reheat Option | Circuit 1 | 6 lbs. 8 oz. | 6 lbs.8 oz. |
| | | Circuit 2 | 6 lbs. 5 oz. | 6 lbs. 5 oz. |
| | | Circuit 3 | 5 lbs. 8 oz. | 5 lbs. 8 oz. |
| | With Reheat Option | Circuit 1 | 6 lbs. 10 oz. | - - - |
| | | Circuit 2 | 6 lbs. 12 oz. | - - - |
| | | Circuit 3 | 5 lbs. 12 oz. | - - - |
| **Electric Heat (kW) Available** | | | 15, 30, 45, 60 kW | |
| **Compressor Type (number)** | | | Scroll (3) | Scroll (3) |
| **Outdoor Coils** | | Net face area (total) - sq. ft. | 55.2 | 55.2 |
| | | Number of rows | 1 | 1 |
| | | Fins per inch | 23 | 23 |
| **Outdoor Coil Fans** | | Motor - horsepower | 1/3 | 1/3 |
| | | Motor Type | (2) ECM (2) PSC | (2) ECM (2) PSC |
| | | Motor rpm | 1075 | 1075 |
| | | Total Motor watts | 1500 | 1500 |
| | | Diameter - (No.) in. | (4) 24 | (4) 24 |
| | | Number of blades | 3 | 3 |
| | | Total Air volume - cfm | 16,000 | 16,000 |
| **Indoor Coils** | | Net face area (total) - sq. ft. | 21.4 | 21.4 |
| | | Tube diameter - in. | 3/8 | 3/8 |
| | | Number of rows | 3 | 3 |
| | | Fins per inch | 14 | 14 |
| | | Drain connection - No. and size | (1) 1in. FPT | (1) 1in. FPT |
| | | Expansion device type | Balanced Port Thermostatic Expansion Valve<br>(removable element head) | |
| [2] **Indoor Blower and Drive Selection** | | Nominal motor output | 3 hp, 5 hp, 7.5 hp | |
| | | Max. usable motor output (US) | 3.45 hp, 5.75 hp, 8.62 hp | |
| | | Motor - Drive kit number | 3 hp<br>Kit 1 535-725 rpm<br>Kit 2 710-965 rpm<br>5 hp<br>Kit 3 685-856 rpm<br>Kit 4 850-1045 rpm<br>Kit 5 945-1185 rpm<br>7.5 hp<br>Kit 6 850-1045 rpm<br>Kit 7 945-1185 rpm<br>Kit 8 1045-1285 rpm | |
| | | Blower wheel nominal D x W - in. | (2) 15 x 15 | (2) 15 x 15 |
| **Filters** | | Type of filter | MERV 4, Disposable | |
| | | Number and size - in. | (6) 24 x 24 x 2 | |
| **Electrical characteristics** | | | 208/230V, 460V or 575V - 60 Hz - 3 phase | |

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 340/360; 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

[2] Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE – All units are limited to a motor service factor of 1.0.

## SPECIFICATIONS — 17.5 TON

| | | | | |
|---|---|---|---|---|
| **General Data** | | **Nominal Tonnage** | **17.5 Ton** | **17.5 Ton** |
| | | **Model Number** | **LCT210H4M** | **LCT210H4V** |
| | | **Efficiency Type** | **High** | **High** |
| | | **Blower Type** | MSAV® Multi-Stage Air Volume | VAV Variable Air Volume |
| **Cooling Performance** | | Gross Cooling Capacity - Btuh | 206,000 | 206,000 |
| | | [1] Net Cooling Capacity - Btuh | 200,000 | 200,000 |
| | | [1] AHRI Rated Air Flow - cfm | 6125 | 6125 |
| | | Total Unit Power - kW | 16.6 | 16.6 |
| | | [1] IEER (Btuh/Watt) | 16.2 | 15.7 |
| | | [1] EER (Btuh/Watt) | 12.0 | 12.0 |
| **Refrigerant Charge** | | Refrigerant Type | R-410A | R-410A |
| | Without Reheat Option | Circuit 1 | 6 lbs. 9 oz. | 6 lbs. 9 oz. |
| | | Circuit 2 | 7 lbs. 3 oz. | 7 lbs. 3 oz. |
| | | Circuit 3 | 5 lbs. 11 oz. | 5 lbs. 11 oz. |
| | | Circuit 4 | 6 lbs. 2 oz. | 6 lbs. 2 oz. |
| | With Reheat Option | Circuit 1 | 7 lbs. 1 oz. | - - - |
| | | Circuit 2 | 8 lbs. 15 oz. | - - - |
| | | Circuit 3 | 5 lbs. 14 oz. | - - - |
| | | Circuit 4 | 6 lbs. 7 oz. | - - - |
| **Electric Heat (kW) Available** | | | 15, 30, 45, 60, 90 kW | |
| **Compressor Type (number)** | | | Scroll (4) | Scroll (4) |
| **Outdoor Coils** | | Net face area (total) - sq. ft. | 55.2 | 55.2 |
| | | Number of rows | 1 | 1 |
| | | Fins per inch | 23 | 23 |
| **Outdoor Coil Fans** | | Motor - horsepower | 1/3 | 1/3 |
| | | Motor Type | (2) ECM (2) PSC | (2) ECM (2) PSC |
| | | Motor rpm | 1075 | 1075 |
| | | Total Motor watts | 1500 | 1500 |
| | | Diameter - (No.) in. | (4) 24 | (4) 24 |
| | | Number of blades | 3 | 3 |
| | | Total Air volume - cfm | 16,000 | 16,000 |
| **Indoor Coils** | | Net face area (total) - sq. ft. | 21.4 | 21.4 |
| | | Tube diameter - in. | 3/8 | 3/8 |
| | | Number of rows | 4 | 3 |
| | | Fins per inch | 14 | 14 |
| | | Drain connection - No. and size | (1) 1in. FPT | (1) 1in. FPT |
| | | Expansion device type | Balanced Port Thermostatic Expansion Valve (removable element head) | |
| [2] **Indoor Blower and Drive Selection** | | Nominal motor output | 3 hp, 5 hp, 7.5 hp | |
| | | Max. usable motor output (US) | 3.45 hp, 5.75 hp, 8.62 hp | |
| | | Motor - Drive kit number | 3 hp<br>Kit 1 535-725 rpm<br>Kit 2 710-965 rpm<br>5 hp<br>Kit 3 685-856 rpm<br>Kit 4 850-1045 rpm<br>Kit 5 945-1185 rpm<br>7.5 hp<br>Kit 6 850-1045 rpm<br>Kit 7 945-1185 rpm<br>Kit 8 1045-1285 rpm | |
| | | Blower wheel nominal D x W - in. | (2) 15 x 15 | (2) 15 x 15 |
| **Filters** | | Type of filter | MERV 4, Disposable | |
| | | Number and size - in. | (6) 24 x 24 x 2 | |
| **Electrical characteristics** | | | 208/230V, 460V or 575V - 60 Hz - 3 phase | |

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 340/360; 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

[2] Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE – All units are limited to a motor service factor of 1.0.

## SPECIFICATIONS — 20 TON

| | | | | |
|---|---|---|---|---|
| **General Data** | | **Nominal Tonnage** | **20 Ton** | **20 Ton** |
| | | **Model Number** | **LCT240H4M** | **LCT240H4V** |
| | | **Efficiency Type** | **High** | **High** |
| | | **Blower Type** | MSAV® Multi-Stage Air Volume | VAV Variable Air Volume |
| **Cooling Performance** | | Gross Cooling Capacity - Btuh | 236,000 | 236,000 |
| | | [1] Net Cooling Capacity - Btuh | 228,000 | 228,000 |
| | | [1] AHRI Rated Air Flow - cfm | 6400 | 6400 |
| | | Total Unit Power - kW | 19.0 | 19.0 |
| | | [1] IEER (Btuh/Watt) | 15.9 | 15.4 |
| | | [1] EER (Btuh/Watt) | 12.0 | 12.0 |
| **Refrigerant Charge** | | Refrigerant Type | R-410A | R-410A |
| | Without Reheat Option | Circuit 1 | 6 lbs. 9 oz. | 6 lbs. 9 oz. |
| | | Circuit 2 | 6 lbs. 13 oz. | 6 lbs. 13 oz. |
| | | Circuit 3 | 5 lbs. 15 oz. | 5 lbs. 15 oz. |
| | | Circuit 4 | 6 lbs. 2 oz. | 6 lbs. 2 oz. |
| | With Reheat Option | Circuit 1 | 6 lbs. 8 oz. | - - - |
| | | Circuit 2 | 7 lbs. 15 oz. | - - - |
| | | Circuit 3 | 6 lbs. 2 oz. | - - - |
| | | Circuit 4 | 6 lbs. 11 oz. | - - - |
| **Electric Heat (kW) Available** | | | 15, 30, 45, 60, 90 kW | |
| **Compressor Type (number)** | | | Scroll (4) | Scroll (4) |
| **Outdoor Coils** | | Net face area (total) - sq. ft. | 55.2 | 55.2 |
| | | Number of rows | 1 | 1 |
| | | Fins per inch | 23 | 23 |
| **Outdoor Coil Fans** | | Motor - horsepower | 1/3 | 1/3 |
| | | Motor Type | (2) ECM (4) PSC | (2) ECM (4) PSC |
| | | Motor rpm | 1075 | 1075 |
| | | Total Motor watts | 1075 - 1950 | 1075 - 1950 |
| | | Diameter - (No.) in. | (6) 24 | (6) 24 |
| | | Number of blades | 3 | 3 |
| | | Total Air volume - cfm | 20,000 | 20,000 |
| **Indoor Coils** | | Net face area (total) - sq. ft. | 21.4 | 21.4 |
| | | Tube diameter - in. | 3/8 | 3/8 |
| | | Number of rows | 4 | 4 |
| | | Fins per inch | 14 | 14 |
| | | Drain connection - No. and size | (1) 1in. FPT | (1) 1in. FPT |
| | | Expansion device type | Balanced Port Thermostatic Expansion Valve (removable element head) | |
| [3] **Indoor Blower and Drive Selection** | | Nominal motor output | 5 hp, 7.5 hp, 10 hp | |
| | | Max. usable motor output (US) | 5.75 hp, 8.62 hp, 11.5 hp | |
| | | Motor - Drive kit number | 5 hp<br>Kit 3 685-856 rpm<br>Kit 4 850-1045 rpm<br>Kit 5 945-1185 rpm<br>7.5 hp<br>Kit 6 850-1045 rpm<br>Kit 7 945-1185 rpm<br>Kit 8 1045-1285 rpm<br>10 hp<br>Kit 7 945-1185 rpm<br>Kit 10 1045-1285 rpm<br>Kit 11 1135-1365 rpm | |
| | | Blower wheel nominal D x W - in. | (2) 15 x 15 | |
| **Filters** | | Type of filter | MERV 4, Disposable | |
| | | Number and size - in. | (6) 24 x 24 x 2 | |
| **Electrical characteristics** | | | 208/230V, 460V or 575V - 60 Hz - 3 phase | |

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 340/360; 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

[2] Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE – All units are limited to a motor service factor of 1.0.

## SPECIFICATIONS — 25 TON

| General Data | | Nominal Tonnage | 25 Ton | 25 Ton |
|---|---|---|---|---|
| | | **Model Number** | **LCT300S4M** | **LCT300S4V** |
| | | **Efficiency Type** | **Standard** | **Standard** |
| | | **Blower Type** | MSAV® Multi-Stage Air Volume | VAV Variable Air Volume |
| **Cooling Performance** | | Gross Cooling Capacity - Btuh | 281,000 | 281,000 |
| | | [1] Net Cooling Capacity - Btuh | 270,000 | 270,000 |
| | | [1] AHRI Rated Air Flow - cfm | 7500 | 7500 |
| | | Total Unit Power - kW | 26.2 | 26.2 |
| | | [1] IEER (Btuh/Watt) | 14.5 | 14.0 |
| | | [1] EER (Btuh/Watt) | 10.5 | 10.5 |
| **Refrigerant Charge** | | Refrigerant Type | R-410A | R-410A |
| | Without Reheat Option | Circuit 1 | 7 lbs. 13 oz. | 7 lbs. 13 oz. |
| | | Circuit 2 | 6 lbs. 8 oz. | 6 lbs. 8 oz. |
| | | Circuit 3 | 5 lbs. 12 oz. | 5 lbs. 12 oz. |
| | | Circuit 4 | 5 lbs. 12 oz. | 5 lbs. 12 oz. |
| | With Reheat Option | Circuit 1 | 7 lbs. 7 oz. | - - - |
| | | Circuit 2 | 7 lbs. 2 oz. | - - - |
| | | Circuit 3 | 5 lbs. 15 oz. | - - - |
| | | Circuit 4 | 6 lbs. 1 oz. | - - - |
| **Electric Heat (kW) Available** | | | 15, 30, 45, 60, 90 kW | |
| **Compressor Type (number)** | | | Scroll (4) | Scroll (4) |
| **Outdoor Coils** | | Net face area (total) - sq. ft. | 55.2 | 55.2 |
| | | Number of rows | 1 | 1 |
| | | Fins per inch | 23 | 23 |
| **Outdoor Coil Fans** | | Motor - horsepower | 1/3 | 1/3 |
| | | Motor Type | (2) ECM (4) PSC | (2) ECM (4) PSC |
| | | Motor rpm | 1075 | 1075 |
| | | Total Motor watts | 1075 - 1950 | 1075 - 1950 |
| | | Diameter - (No.) in. | (6) 24 | (6) 24 |
| | | Number of blades | 3 | 3 |
| | | Total Air volume - cfm | 20000 | 20000 |
| **Indoor Coils** | | Net face area (total) - sq. ft. | 21.40 | 21.40 |
| | | Tube diameter - in. | 3/8 | 3/8 |
| | | Number of rows | 4 | 4 |
| | | Fins per inch | 14 | 14 |
| | | Drain connection - No. and size | (1) 1in. FPT | (1) 1in. FPT |
| | | Expansion device type | Balanced Port Thermostatic Expansion Valve (removable element head) | |
| [2] **Indoor Blower and Drive Selection** | | Nominal motor output | 5 hp, 7.5 hp, 10 hp | |
| | | Max. usable motor output (US) | 5.75 hp, 8.62 hp, 11.5 hp | |
| | | Motor - Drive kit number | 5 hp<br>Kit 3 685-856 rpm<br>Kit 4 850-1045 rpm<br>Kit 5 945-1185 rpm<br>7.5 hp<br>Kit 6 850-1045 rpm<br>Kit 7 945-1185 rpm<br>Kit 8 1045-1285 rpm<br>10 hp<br>Kit 7 945-1185 rpm<br>Kit 10 1045-1285 rpm<br>Kit 11 1135-1365 rpm | |
| | | Blower wheel nominal D x W - in. | (2) 15 x 15 | |
| **Filters** | | Type of filter | MERV 4, Disposable | |
| | | Number and size - in. | (6) 24 x 24 x 2 | |
| **Electrical characteristics** | | | 208/230V, 460V or 575V - 60 Hz - 3 phase | |

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 340/360; 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

[2] Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE – All units are limited to a motor service factor of 1.0.

## BLOWER DATA

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

**FOR ALL UNITS ADD:**

1 - Wet indoor coil air resistance of selected unit.
2 - Any factory installed options air resistance (electric heat, Economizer, etc.)
3 - Any field installed accessories air resistance (electric heat, duct resistance, diffuser, etc.)

Then determine from blower table blower motor output and drive required.
See page 12 for wet coil, option/accessory air resistance data, and factory installed drive kit specifications.
See page 13 for minimum air volume required for use with optional electric heat.

| Air Volume cfm | TOTAL STATIC PRESSURE - Inches Water Gauge (Pa) | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.20 | | 0.40 | | 0.60 | | 0.80 | | 1.00 | | 1.20 | | 1.40 | | 1.60 | | 1.80 | | 2.00 | | 2.20 | | 2.40 | | 2.60 | |
| | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP |
| 2750 | 385 | 0.30 | 505 | 0.50 | 600 | 0.70 | 680 | 0.90 | 755 | 1.10 | 820 | 1.30 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3000 | 395 | 0.35 | 515 | 0.55 | 610 | 0.75 | 685 | 1.00 | 760 | 1.20 | 825 | 1.45 | 885 | 1.70 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3250 | 405 | 0.40 | 520 | 0.60 | 615 | 0.85 | 695 | 1.10 | 765 | 1.30 | 830 | 1.60 | 890 | 1.85 | 950 | 2.10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3500 | 415 | 0.45 | 530 | 0.70 | 620 | 0.95 | 700 | 1.20 | 775 | 1.45 | 840 | 1.70 | 900 | 2.00 | 955 | 2.25 | 1005 | 2.55 | --- | --- | --- | --- | --- | --- | --- | --- |
| 3750 | 425 | 0.50 | 540 | 0.75 | 630 | 1.05 | 710 | 1.30 | 780 | 1.60 | 845 | 1.85 | 905 | 2.15 | 960 | 2.45 | 1010 | 2.70 | 1060 | 3.00 | 1110 | 3.30 | --- | --- | --- | --- |
| 4000 | 435 | 0.55 | 545 | 0.85 | 635 | 1.10 | 715 | 1.40 | 785 | 1.70 | 850 | 2.00 | 910 | 2.30 | 965 | 2.60 | 1020 | 2.90 | 1070 | 3.25 | 1115 | 3.55 | 1160 | 3.85 | 1205 | 4.15 |
| 4250 | 445 | 0.60 | 555 | 0.90 | 645 | 1.25 | 725 | 1.55 | 795 | 1.85 | 855 | 2.15 | 915 | 2.45 | 970 | 2.80 | 1025 | 3.10 | 1075 | 3.45 | 1120 | 3.75 | 1165 | 4.10 | 1210 | 4.45 |
| 4500 | 455 | 0.70 | 565 | 1.00 | 655 | 1.35 | 730 | 1.65 | 800 | 2.00 | 865 | 2.35 | 925 | 2.65 | 980 | 3.00 | 1030 | 3.30 | 1080 | 3.65 | 1130 | 4.05 | 1175 | 4.35 | 1215 | 4.70 |
| 4750 | 470 | 0.75 | 575 | 1.10 | 660 | 1.45 | 740 | 1.80 | 810 | 2.15 | 870 | 2.50 | 930 | 2.85 | 985 | 3.20 | 1040 | 3.55 | 1085 | 3.90 | 1135 | 4.25 | 1180 | 4.65 | 1225 | 5.00 |
| 5000 | 480 | 0.85 | 585 | 1.25 | 670 | 1.60 | 750 | 1.95 | 815 | 2.30 | 880 | 2.70 | 940 | 3.05 | 995 | 3.40 | 1045 | 3.80 | 1095 | 4.15 | 1140 | 4.50 | 1185 | 4.90 | 1230 | 5.30 |
| 5250 | 495 | 0.95 | 595 | 1.35 | 680 | 1.70 | 755 | 2.10 | 825 | 2.50 | 890 | 2.90 | 945 | 3.25 | 1000 | 3.65 | 1050 | 4.00 | 1100 | 4.40 | 1150 | 4.80 | 1195 | 5.20 | 1235 | 5.60 |
| 5500 | 505 | 1.05 | 605 | 1.45 | 690 | 1.85 | 765 | 2.25 | 835 | 2.65 | 895 | 3.05 | 955 | 3.45 | 1010 | 3.85 | 1060 | 4.25 | 1110 | 4.70 | 1155 | 5.10 | 1200 | 5.50 | 1240 | 5.90 |
| 5750 | 520 | 1.15 | 615 | 1.60 | 700 | 2.00 | 775 | 2.45 | 840 | 2.85 | 905 | 3.25 | 960 | 3.65 | 1015 | 4.10 | 1065 | 4.50 | 1115 | 4.95 | 1160 | 5.35 | 1205 | 5.80 | 1250 | 6.25 |
| 6000 | 530 | 1.30 | 630 | 1.75 | 710 | 2.15 | 785 | 2.60 | 850 | 3.05 | 910 | 3.45 | 970 | 3.90 | 1025 | 4.35 | 1075 | 4.80 | 1120 | 5.20 | 1170 | 5.65 | 1215 | 6.10 | 1255 | 6.55 |
| 6250 | 545 | 1.40 | 640 | 1.90 | 720 | 2.35 | 795 | 2.80 | 860 | 3.25 | 920 | 3.70 | 975 | 4.15 | 1030 | 4.60 | 1080 | 5.05 | 1130 | 5.50 | 1175 | 5.95 | 1220 | 6.45 | 1265 | 6.90 |
| 6500 | 560 | 1.55 | 650 | 2.05 | 730 | 2.50 | 805 | 3.00 | 870 | 3.45 | 930 | 3.95 | 985 | 4.40 | 1040 | 4.85 | 1090 | 5.35 | 1140 | 5.85 | 1185 | 6.30 | 1225 | 6.75 | 1270 | 7.25 |
| 6750 | 570 | 1.70 | 665 | 2.20 | 745 | 2.70 | 815 | 3.20 | 880 | 3.70 | 940 | 4.20 | 995 | 4.65 | 1045 | 5.10 | 1095 | 5.60 | 1145 | 6.10 | 1190 | 6.60 | 1235 | 7.10 | 1275 | 7.60 |
| 7000 | 585 | 1.85 | 675 | 2.35 | 755 | 2.90 | 825 | 3.40 | 890 | 3.95 | 950 | 4.45 | 1005 | 4.95 | 1055 | 5.40 | 1105 | 5.95 | 1155 | 6.45 | 1200 | 6.95 | 1240 | 7.45 | 1285 | 8.00 |
| 7250 | 600 | 2.00 | 690 | 2.60 | 765 | 3.10 | 835 | 3.65 | 900 | 4.15 | 955 | 4.65 | 1015 | 5.25 | 1065 | 5.75 | 1115 | 6.25 | 1160 | 6.75 | 1205 | 7.30 | 1250 | 7.85 | 1290 | 8.35 |
| 7500 | 615 | 2.20 | 700 | 2.75 | 775 | 3.30 | 845 | 3.85 | 910 | 4.45 | 965 | 4.95 | 1020 | 5.50 | 1075 | 6.05 | 1125 | 6.60 | 1170 | 7.15 | 1215 | 7.65 | 1260 | 8.25 | 1300 | 8.75 |
| 7750 | 630 | 2.40 | 715 | 3.00 | 790 | 3.55 | 855 | 4.10 | 920 | 4.70 | 975 | 5.25 | 1030 | 5.80 | 1080 | 6.35 | 1130 | 6.90 | 1180 | 7.50 | 1225 | 8.05 | 1265 | 8.60 | 1305 | 9.15 |
| 8000 | 640 | 2.55 | 725 | 3.20 | 800 | 3.80 | 865 | 4.35 | 930 | 4.95 | 985 | 5.50 | 1040 | 6.10 | 1090 | 6.70 | 1140 | 7.25 | 1185 | 7.85 | 1230 | 8.40 | 1275 | 9.00 | 1315 | 9.60 |
| 8250 | 655 | 2.80 | 740 | 3.40 | 810 | 4.00 | 880 | 4.65 | 940 | 5.25 | 995 | 5.85 | 1050 | 6.45 | 1100 | 7.05 | 1150 | 7.65 | 1195 | 8.25 | 1240 | 8.85 | 1280 | 9.40 | 1325 | 10.05 |
| 8500 | 670 | 3.00 | 750 | 3.65 | 825 | 4.30 | 890 | 4.90 | 950 | 5.55 | 1005 | 6.15 | 1060 | 6.80 | 1110 | 7.40 | 1160 | 8.05 | 1205 | 8.65 | 1250 | 9.25 | 1290 | 9.85 | 1330 | 10.45 |
| 8750 | 685 | 3.25 | 765 | 3.90 | 835 | 4.55 | 900 | 5.20 | 960 | 5.85 | 1015 | 6.45 | 1070 | 7.15 | 1120 | 7.75 | 1165 | 8.35 | 1215 | 9.05 | 1255 | 9.65 | 1300 | 10.30 | --- | --- |
| 9000 | 700 | 3.50 | 780 | 4.20 | 850 | 4.85 | 910 | 5.50 | 970 | 6.15 | 1025 | 6.80 | 1080 | 7.50 | 1130 | 8.15 | 1175 | 8.75 | 1220 | 9.40 | 1265 | 10.10 | --- | --- | --- | --- |
| 9250 | 715 | 3.75 | 790 | 4.45 | 860 | 5.15 | 925 | 5.85 | 985 | 6.55 | 1040 | 7.20 | 1090 | 7.85 | 1140 | 8.55 | 1185 | 9.20 | 1230 | 9.85 | 1275 | 10.55 | --- | --- | --- | --- |
| 9500 | 730 | 4.00 | 805 | 4.75 | 875 | 5.45 | 935 | 6.15 | 995 | 6.90 | 1050 | 7.60 | 1100 | 8.25 | 1150 | 8.95 | 1195 | 9.60 | 1240 | 10.30 | --- | --- | --- | --- | --- | --- |
| 9750 | 745 | 4.30 | 820 | 5.05 | 885 | 5.75 | 950 | 6.55 | 1005 | 7.20 | 1060 | 7.95 | 1110 | 8.65 | 1160 | 9.40 | 1205 | 10.05 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10,000 | 760 | 4.60 | 835 | 5.40 | 900 | 6.15 | 960 | 6.85 | 1015 | 7.60 | 1070 | 8.35 | 1120 | 9.05 | 1170 | 9.80 | 1215 | 10.50 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10,250 | 775 | 4.90 | 845 | 5.65 | 910 | 6.45 | 970 | 7.20 | 1030 | 8.00 | 1080 | 8.75 | 1135 | 9.55 | 1180 | 10.25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10,500 | 790 | 5.20 | 860 | 6.00 | 925 | 6.85 | 985 | 7.65 | 1040 | 8.40 | 1095 | 9.20 | 1145 | 10.00 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10,750 | 805 | 5.55 | 875 | 6.40 | 940 | 7.25 | 1000 | 8.05 | 1055 | 8.85 | 1105 | 9.65 | 1155 | 10.45 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11,000 | 820 | 5.90 | 890 | 6.80 | 950 | 7.60 | 1010 | 8.45 | 1065 | 9.30 | 1115 | 10.05 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

## BLOWER DATA

### FACTORY INSTALLED BELT DRIVE KIT SPECIFICATIONS

| Nominal hp | Maximum hp | Drive Kit Number | RPM Range |
|---|---|---|---|
| 3 | 3.45 | 1 | 535 - 725 |
| 3 | 3.45 | 2 | 710 - 965 |
| 5 | 5.75 | 3 | 685 - 856 |
| 5 | 5.75 | 4 | 850 - 1045 |
| 5 | 5.75 | 5 | 945 - 1185 |
| 7.5 | 8.63 | 6 | 850 - 1045 |
| 7.5 | 8.63 | 7 | 945 - 1185 |
| 7.5 | 8.63 | 8 | 1045 - 1285 |
| 10 | 11.50 | 7 | 945 - 1185 |
| 10 | 11.50 | 10 | 1045 - 1285 |
| 10 | 11.50 | 11 | 1135 - 1365 |

NOTE - Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE – All units are limited to a motor service factor of 1.0.

### FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE

| Air Volume cfm | Wet Indoor Coil | | Reheat Coil | Electric Heat | Economizer | Filters | | | Horizontal Roof Curb | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 156 180 | 210 240 300 | | | | | | | 156 thru 240 | 300 |
| | in. w.g. | in. w.g. | in. w.g. | in. w.g. | in. w.g. | MERV 8 | MERV 13 | MERV 16 | in. w.g. | in. w.g. |
| 2750 | .01 | .02 | .01 | - - - | - - - | .01 | .03 | .06 | .03 | - |
| 3000 | .01 | .02 | .01 | - - - | - - - | .01 | .03 | .06 | .04 | - |
| 3250 | .01 | .03 | .01 | - - - | - - - | .01 | .04 | .07 | .04 | .01 |
| 3500 | .01 | .03 | .02 | - - - | - - - | .01 | .04 | .08 | .05 | .01 |
| 3750 | .01 | .03 | .02 | - - - | - - - | .01 | .04 | .08 | .05 | .01 |
| 4000 | .02 | .04 | .02 | - - - | - - - | .01 | .04 | .09 | .06 | .02 |
| 4250 | .02 | .04 | .02 | - - - | - - - | .01 | .05 | .10 | .07 | .02 |
| 4500 | .02 | .05 | .02 | - - - | - - - | .01 | .05 | .10 | .07 | .02 |
| 4750 | .02 | .05 | .02 | - - - | - - - | .02 | .05 | .11 | .08 | .03 |
| 5000 | .02 | .05 | .02 | - - - | - - - | .02 | .06 | .12 | .08 | .03 |
| 5250 | .02 | .06 | .03 | - - - | - - - | .02 | .06 | .12 | .09 | .04 |
| 5500 | .02 | .07 | .03 | - - - | - - - | .02 | .06 | .13 | .10 | .04 |
| 5750 | .03 | .07 | .03 | - - - | - - - | .02 | .07 | .14 | .11 | .05 |
| 6000 | .03 | .08 | .03 | .01 | - - - | .03 | .07 | .14 | .11 | .06 |
| 6250 | .03 | .08 | .03 | .01 | .01 | .03 | .07 | .15 | .12 | .07 |
| 6500 | .03 | .09 | .04 | .01 | .02 | .03 | .08 | .16 | .13 | .08 |
| 6750 | .04 | .10 | .04 | .01 | .03 | .03 | .08 | .17 | .14 | .08 |
| 7000 | .04 | .10 | .04 | .01 | .04 | .04 | .08 | .17 | .15 | .09 |
| 7250 | .04 | .11 | .04 | .01 | .05 | .04 | .09 | .18 | .16 | .10 |
| 7500 | .05 | .12 | .05 | .01 | .06 | .04 | .09 | .19 | .17 | .11 |
| 8000 | .05 | .13 | .05 | .02 | .09 | .05 | .10 | .21 | .19 | .13 |
| 8500 | .06 | .15 | .05 | .02 | .11 | .05 | .10 | .22 | .21 | .15 |
| 9000 | .07 | .16 | .06 | .04 | .14 | .06 | .11 | .24 | .24 | .17 |
| 9500 | .08 | .18 | .07 | .05 | .16 | .07 | .12 | .25 | .26 | .19 |
| 10,000 | .08 | .20 | .07 | .06 | .19 | .07 | .12 | .27 | .29 | .21 |
| 10,500 | .09 | .22 | .08 | .09 | .22 | .08 | .13 | .29 | .31 | .24 |
| 11,000 | .11 | .24 | .08 | .11 | .25 | .09 | .14 | .30 | .34 | .27 |

## BLOWER DATA

### MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT

| Electric Heat kW | Minimum cfm |
|---|---|
| 15 | 5200 |
| 30 | 5200 |
| 45 | 5200 |
| 60 | 5200 |
| 90 | 6000 |

### POWER EXHAUST FAN PERFORMANCE

| Return Air System Static Pressure | Air Volume Exhausted |
|---|---|
| in. w.g. | cfm |
| 0.00 | 8630 |
| 0.05 | 8210 |
| 0.10 | 7725 |
| 0.15 | 7110 |
| 0.20 | 6470 |
| 0.25 | 5790 |
| 0.30 | 5060 |
| 0.35 | 4300 |
| 0.40 | 3510 |
| 0.45 | 2690 |
| 0.50 | 1840 |

### CEILING DIFFUSER AIR RESISTANCE - in. w.g.

| Air Volume cfm | Step-Down Diffuser | | | | | | Flush Diffuser | |
|---|---|---|---|---|---|---|---|---|
| | RTD11-185S | | | RTD11-275S | | | FD11-185S | FD11-275S |
| | 2 Ends Open | 1 Side/2 Ends Open | All Ends & Sides Open | 2 Ends Open | 1 Side/2 Ends Open | All Ends & Sides Open | | |
| 5000 | .51 | .44 | .39 | - - - | - - - | - - - | .27 | - - - |
| 5200 | .56 | .48 | .42 | - - - | - - - | - - - | .30 | - - - |
| 5400 | .61 | .52 | .45 | - - - | - - - | - - - | .33 | - - - |
| 5600 | .66 | .56 | .48 | - - - | - - - | - - - | .36 | - - - |
| 5800 | .71 | .59 | .51 | - - - | - - - | - - - | .39 | - - - |
| 6000 | .76 | .63 | .55 | .36 | .31 | .27 | .42 | .29 |
| 6200 | .80 | .68 | .59 | - - - | - - - | - - - | .46 | - - - |
| 6400 | .86 | .72 | .63 | - - - | - - - | - - - | .50 | - - - |
| 6500 | - - - | - - - | - - - | .42 | .36 | .31 | - - - | .34 |
| 6600 | .92 | .77 | .67 | - - - | - - - | - - - | .54 | - - - |
| 6800 | .99 | .83 | .72 | - - - | - - - | - - - | .58 | - - - |
| 7000 | 1.03 | .87 | .76 | .49 | .41 | .36 | .62 | .40 |
| 7200 | 1.09 | .92 | .80 | - - - | - - - | - - - | .66 | - - - |
| 7400 | 1.15 | .97 | .84 | - - - | - - - | - - - | .70 | - - - |
| 7500 | - - - | - - - | - - - | .51 | .46 | .41 | - - - | .45 |
| 7600 | 1.20 | 1.02 | .88 | - - - | - - - | - - - | .74 | - - - |
| 8000 | - - - | - - - | - - - | .59 | .49 | .43 | - - - | .50 |
| 8500 | - - - | - - - | - - - | .69 | .58 | .50 | - - - | .57 |
| 9000 | - - - | - - - | - - - | .79 | .67 | .58 | - - - | .66 |
| 9500 | - - - | - - - | - - - | .89 | .75 | .65 | - - - | .74 |
| 10,000 | - - - | - - - | - - - | 1.00 | .84 | .73 | - - - | .81 |
| 10,500 | - - - | - - - | - - - | 1.10 | .92 | .80 | - - - | .89 |
| 11,000 | - - - | - - - | - - - | 1.21 | 1.01 | .88 | - - - | .96 |

### CEILING DIFFUSER AIR THROW DATA - ft.

| Model No. | Air Volume cfm | [1] Effective Throw Range - ft. | | Model No. | Air Volume cfm | [1] Effective Throw Range - ft. | |
|---|---|---|---|---|---|---|---|
| | | RTD11-185S Step-Down | FD11-185S Flush | | | RTD11-275S Step-Down | FD11-275S Flush |
| 156<br>180 | 5600 | 39 - 49 | 28 - 37 | 210<br>240<br>300 | 7200 | 33 - 38 | 26 - 35 |
| | 5800 | 42 - 51 | 29 - 38 | | 7400 | 35 - 40 | 28 - 37 |
| | 6000 | 44 - 54 | 40 - 50 | | 7600 | 36 - 41 | 29 - 38 |
| | 6200 | 45 - 55 | 42 - 51 | | 7800 | 38 - 43 | 40 - 50 |
| | 6400 | 46 - 55 | 43 - 52 | | 8000 | 39 - 44 | 42 - 51 |
| | 6600 | 47 - 56 | 45 - 56 | | 8200 | 41 - 46 | 43 - 52 |
| | | | | | 8400 | 43 - 49 | 44 - 54 |
| | | | | | 8600 | 44 - 50 | 46 - 57 |
| | | | | | 8800 | 47 - 55 | 48 - 59 |

[1] Throw is the horizontal or vertical distance an airstream travels on leaving the outlet or diffuser before the maximum velocity is reduced to 50 ft. per minute. Four sides open.

## ELECTRICAL/ELECTRIC HEAT DATA — 13 TON

| | | Model No. | LCT156H4 | | | | | |
|---|---|---|---|---|---|---|---|---|
| [1] Voltage - 60Hz | | | 208/230V - 3 Ph | | 460V - 3 Ph | | 575V - 3 Ph | |
| Compressor 1 (Non-Inverter) | | Rated Load Amps | 17.6 | | 8.5 | | 6.3 | |
| | | Locked Rotor Amps | 136 | | 66.1 | | 55.3 | |
| Compressor 2 (Non-Inverter) | | Rated Load Amps | 22.4 | | 10.6 | | 7.7 | |
| | | Locked Rotor Amps | 149 | | 75 | | 54 | |
| Outdoor Fan Motors (3) | | Full Load Amps (1 ECM) | 2.8 | | 1.4 | | 1.1 | |
| | | Full Load Amps (2 Non-ECM) | 2.4 | | 1.3 | | 1 | |
| | | Total | 4.8 | | 2.6 | | 2 | |
| Power Exhaust (2) 0.33 HP | | Full Load Amps | 2.4 | | 1.3 | | 1 | |
| | | Total | 4.8 | | 2.6 | | 2 | |
| Service Outlet 115V GFI (amps) | | | 15 | | 15 | | 20 | |
| Indoor Blower Motor | | Horsepower | 3 | 5 | 3 | 5 | 3 | 5 |
| | | Full Load Amps | 10.6 | 16.7 | 4.8 | 7.6 | 3.9 | 6.1 |
| [2] Maximum Overcurrent Protection (MOCP) | | Unit Only | 80 | 90 | 40 | 40 | 30 | 30 |
| | | With (2) 0.33 HP Power Exhaust | 90 | 90 | 40 | 45 | 30 | 35 |
| [3] Minimum Circuit Ampacity (MCA) | | Unit Only | 66 | 72 | 32 | 35 | 24 | 26 |
| | | With (2) 0.33 HP Power Exhaust | 70 | 76 | 34 | 37 | 26 | 28 |

### ELECTRIC HEAT DATA

| | | Electric Heat Voltage | 208 | 240 | 208 | 240 | 480 | 480 | 600 | 600 |
|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat | 15 kW | 80 | 80 | 90 | 90 | 40 | 40 | 30 | 30 |
| | | 30 kW | [4] 100 | 110 | [4] 100 | 125 | 60 | 60 | 45 | 45 |
| | | 45 kW | 150 | 150 | [4] 150 | 175 | 80 | 80 | 60 | 70 |
| | | 60 kW | [4] 150 | 175 | [4] 150 | 175 | 80 | 90 | 70 | 70 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat | 15 kW | 66 | 66 | 72 | 72 | 32 | 35 | 24 | 26 |
| | | 30 kW | 92 | 104 | 100 | 112 | 52 | 55 | 41 | 44 |
| | | 45 kW | 131 | 149 | 139 | 157 | 74 | 78 | 60 | 62 |
| | | 60 kW | 139 | 158 | 146 | 166 | 79 | 82 | 63 | 66 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | 15 kW | 90 | 90 | 90 | 90 | 40 | 45 | 30 | 35 |
| | | 30 kW | [4] 100 | 110 | [4] 110 | 125 | 60 | 60 | 45 | 50 |
| | | 45 kW | [4] 150 | 175 | [4] 150 | 175 | 80 | 90 | 70 | 70 |
| | | 60 kW | [4] 150 | 175 | 175 | 175 | 90 | 90 | 70 | 70 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | 15 kW | 70 | 70 | 76 | 76 | 34 | 37 | 26 | 29 |
| | | 30 kW | 98 | 110 | 106 | 118 | 55 | 58 | 44 | 47 |
| | | 45 kW | 137 | 155 | 145 | 163 | 77 | 81 | 62 | 65 |
| | | 60 kW | 145 | 164 | 152 | 172 | 82 | 85 | 66 | 68 |

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.

[4] Factory installed circuit breaker not available.

## ELECTRICAL/ELECTRIC HEAT DATA — 15 TON

| | | Model No. | LCT180H4 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| [1] Voltage - 60Hz | | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | |
| Compressor 1 (Non-Inverter) | | Rated Load Amps | 13.2 | | | 6.3 | | | 4.9 | | |
| | | Locked Rotor Amps | 93 | | | 60 | | | 41 | | |
| Compressor 2 (Non-Inverter) | | Rated Load Amps | 13.2 | | | 6.3 | | | 4.9 | | |
| | | Locked Rotor Amps | 93 | | | 60 | | | 41 | | |
| Compressor 3 (Non-Inverter) | | Rated Load Amps | 13.2 | | | 6.3 | | | 4.9 | | |
| | | Locked Rotor Amps | 93 | | | 60 | | | 41 | | |
| Outdoor Fan Motors (4) | Full Load Amps (2 ECM) | | 2.8 | | | 1.4 | | | 1.1 | | |
| | | Total | 5.6 | | | 2.8 | | | 2.2 | | |
| | Full Load Amps (2 Non-ECM) | | 2.4 | | | 1.3 | | | 1 | | |
| | | Total | 4.8 | | | 2.6 | | | 2 | | |
| Power Exhaust (2) 0.33 HP | | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | |
| | | Total | 4.8 | | | 2.6 | | | 2 | | |
| Service Outlet 115V GFI (amps) | | | 15 | | | 15 | | | 20 | | |
| Indoor Blower Motor | | Horsepower | 3 | 5 | 7.5 | 3 | 5 | 7.5 | 3 | 5 | 7.5 |
| | | Full Load Amps | 10.6 | 16.7 | 24.2 | 4.8 | 7.6 | 11 | 3.9 | 6.1 | 9 |
| [2] Maximum Overcurrent Protection (MOCP) | | Unit Only | 70 | 90 | 100 | 35 | 40 | 50 | 30 | 30 | 40 |
| | | With (2) 0.33 HP Power Exhaust | 80 | 90 | 110 | 40 | 45 | 50 | 30 | 35 | 40 |
| [3] Minimum Circuit Ampacity (MCA) | | Unit Only | 67 | 74 | 83 | 33 | 36 | 40 | 26 | 28 | 32 |
| | | With (2) 0.33 HP Power Exhaust | 72 | 79 | 88 | 35 | 38 | 43 | 28 | 30 | 34 |

### ELECTRIC HEAT DATA

| | | Electric Heat Voltage | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat | **15 kW** | 70 | 70 | 90 | 90 | 100 | 100 | 35 | 40 | 50 | 30 | 30 | 40 |
| | | **30 kW** | [4] 100 | 110 | [4] 100 | 125 | [4] 110 | 125 | 60 | 60 | 60 | 45 | 45 | 50 |
| | | **45 kW** | 150 | 150 | [4] 150 | 175 | [4] 150 | 175 | 80 | 80 | 90 | 60 | 70 | 70 |
| | | **60 kW** | [4] 150 | 175 | [4] 150 | 175 | 175 | 175 | 80 | 90 | 90 | 70 | 70 | 70 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat | **15 kW** | 67 | 67 | 74 | 74 | 83 | 83 | 33 | 36 | 40 | 26 | 28 | 32 |
| | | **30 kW** | 92 | 104 | 100 | 112 | 109 | 121 | 52 | 55 | 59 | 41 | 44 | 48 |
| | | **45 kW** | 131 | 149 | 139 | 157 | 148 | 166 | 74 | 78 | 82 | 60 | 62 | 66 |
| | | **60 kW** | 139 | 158 | 146 | 166 | 156 | 175 | 79 | 82 | 86 | 63 | 66 | 69 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | **15 kW** | 80 | 80 | 90 | 90 | 110 | 110 | 40 | 45 | 50 | 30 | 35 | 40 |
| | | **30 kW** | [4] 100 | 110 | [4] 110 | 125 | [4] 125 | 150 | 60 | 60 | 70 | 45 | 50 | 50 |
| | | **45 kW** | [4] 150 | 175 | [4] 150 | 175 | 175 | 175 | 80 | 90 | 90 | 70 | 70 | 70 |
| | | **60 kW** | [4] 150 | 175 | 175 | 175 | [4] 175 | 200 | 90 | 90 | 90 | 70 | 70 | 80 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | **15 kW** | 72 | 72 | 79 | 79 | 88 | 88 | 35 | 38 | 43 | 28 | 30 | 34 |
| | | **30 kW** | 98 | 110 | 106 | 118 | 115 | 127 | 55 | 58 | 63 | 44 | 47 | 50 |
| | | **45 kW** | 137 | 155 | 145 | 163 | 154 | 172 | 77 | 81 | 85 | 62 | 65 | 68 |
| | | **60 kW** | 145 | 164 | 152 | 172 | 162 | 181 | 82 | 85 | 90 | 66 | 68 | 72 |

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.

[4] Factory installed circuit breaker not available.

## ELECTRICAL/ELECTRIC HEAT DATA — 17.5 TON

| Model No. | | LCT210H4 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| [1] Voltage - 60Hz | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | |
| Compressor 1 (Non-Inverter) | Rated Load Amps | 14.5 | | | 6.3 | | | 6 | | |
| | Locked Rotor Amps | 98 | | | 55 | | | 41 | | |
| Compressor 2 (Non-Inverter) | Rated Load Amps | 14.5 | | | 6.3 | | | 6 | | |
| | Locked Rotor Amps | 98 | | | 55 | | | 41 | | |
| Compressor 3 (Non-Inverter) | Rated Load Amps | 14.5 | | | 6.3 | | | 6 | | |
| | Locked Rotor Amps | 98 | | | 55 | | | 41 | | |
| Compressor 4 (Non-Inverter) | Rated Load Amps | 14.5 | | | 6.3 | | | 6 | | |
| | Locked Rotor Amps | 98 | | | 55 | | | 41 | | |
| Outdoor Fan Motors (4) | Full Load Amps (2 ECM) | 2.8 | | | 1.4 | | | 1.1 | | |
| | Total | 5.6 | | | 2.8 | | | 2.2 | | |
| | Full Load Amps (2 Non-ECM) | 2.4 | | | 1.3 | | | 1 | | |
| | Total | 4.8 | | | 2.6 | | | 2 | | |
| Power Exhaust (2) 0.33 HP | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | |
| | Total | 4.8 | | | 2.6 | | | 2 | | |
| Service Outlet 115V GFI (amps) | | 15 | | | 15 | | | 20 | | |
| Indoor Blower Motor | Horsepower | 3 | 5 | 7.5 | 3 | 5 | 7.5 | 3 | 5 | 7.5 |
| | Full Load Amps | 10.6 | 16.7 | 24.2 | 4.8 | 7.6 | 11 | 3.9 | 6.1 | 9 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit Only | 90 | 100 | 125 | 40 | 45 | 50 | 40 | 40 | 45 |
| | With (2) 0.33 HP Power Exhaust | 100 | 110 | 125 | 45 | 50 | 50 | 40 | 40 | 50 |
| [3] Minimum Circuit Ampacity (MCA) | Unit Only | 86 | 92 | 102 | 39 | 42 | 46 | 35 | 37 | 41 |
| | With (2) 0.33 HP Power Exhaust | 91 | 97 | 107 | 41 | 45 | 49 | 37 | 39 | 43 |

### ELECTRIC HEAT DATA

| Electric Heat Voltage | | | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat | **15 kW** | 90 | 90 | 100 | 100 | 125 | 125 | 40 | 45 | 50 | 40 | 40 | 45 |
| | | **30 kW** | [4]100 | 110 | [4]100 | 125 | 125 | 125 | 60 | 60 | 60 | 45 | 45 | 50 |
| | | **45 kW** | 150 | 150 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 90 | 60 | 70 | 70 |
| | | **60 kW** | [4]150 | 175 | [4]150 | 175 | 175 | 175 | 80 | 90 | 90 | 70 | 70 | 70 |
| | | **90 kW** | [4]225 | 250 | [4]225 | 250 | [4]225 | 250 | 125 | 125 | 125 | 100 | 100 | 100 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat | **15 kW** | 86 | 86 | 92 | 92 | 102 | 102 | 39 | 42 | 46 | 35 | 37 | 41 |
| | | **30 kW** | 92 | 104 | 100 | 112 | 109 | 121 | 52 | 55 | 59 | 41 | 44 | 48 |
| | | **45 kW** | 131 | 149 | 139 | 157 | 148 | 166 | 74 | 78 | 82 | 60 | 62 | 66 |
| | | **60 kW** | 139 | 158 | 146 | 166 | 156 | 175 | 79 | 82 | 86 | 63 | 66 | 69 |
| | | **90 kW** | 201 | 230 | 209 | 238 | 218 | 247 | 115 | 118 | 123 | 92 | 95 | 98 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | **15 kW** | 100 | 100 | 110 | 110 | 125 | 125 | 45 | 50 | 50 | 40 | 40 | 50 |
| | | **30 kW** | [4]100 | 110 | [4]110 | 125 | [4]125 | 150 | 60 | 60 | 70 | 45 | 50 | 50 |
| | | **45 kW** | [4]150 | 175 | [4]150 | 175 | 175 | 175 | 80 | 90 | 90 | 70 | 70 | 70 |
| | | **60 kW** | [4]150 | 175 | 175 | 175 | [4]175 | 200 | 90 | 90 | 90 | 70 | 70 | 80 |
| | | **90 kW** | [4]225 | 250 | [4]225 | 250 | [4]225 | [4]300 | 125 | 125 | 150 | 100 | 100 | 110 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | **15 kW** | 91 | 91 | 97 | 97 | 107 | 107 | 41 | 45 | 49 | 37 | 39 | 43 |
| | | **30 kW** | 98 | 110 | 106 | 118 | 115 | 127 | 55 | 58 | 63 | 44 | 47 | 50 |
| | | **45 kW** | 137 | 155 | 145 | 163 | 154 | 172 | 77 | 81 | 85 | 62 | 65 | 68 |
| | | **60 kW** | 145 | 164 | 152 | 172 | 162 | 181 | 82 | 85 | 90 | 66 | 68 | 72 |
| | | **90 kW** | 207 | 236 | 215 | 244 | 224 | 253 | 118 | 122 | 126 | 94 | 97 | 101 |

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.

[4] Factory installed circuit breaker not available.

## ELECTRICAL/ELECTRIC HEAT DATA — 20 TON

| | | Model No. | LCT240H4 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| [1] Voltage - 60Hz | | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | |
| Compressor 1 (Non-Inverter) | Rated Load Amps | | 13.2 | | | 6.3 | | | 4.9 | | |
| | Locked Rotor Amps | | 93 | | | 60 | | | 41 | | |
| Compressor 2 (Non-Inverter) | Rated Load Amps | | 13.2 | | | 6.3 | | | 4.9 | | |
| | Locked Rotor Amps | | 93 | | | 60 | | | 41 | | |
| Compressor 3 (Non-Inverter) | Rated Load Amps | | 13.2 | | | 6.3 | | | 4.9 | | |
| | Locked Rotor Amps | | 93 | | | 60 | | | 41 | | |
| Compressor 4 (Non-Inverter) | Rated Load Amps | | 13.2 | | | 6.3 | | | 4.9 | | |
| | Locked Rotor Amps | | 93 | | | 60 | | | 41 | | |
| Outdoor Fan Motors (6) | Full Load Amps (2 ECM) | | 2.8 | | | 1.4 | | | 1.1 | | |
| | Total | | 5.6 | | | 2.8 | | | 2.2 | | |
| | Full Load Amps (4 Non-ECM) | | 2.4 | | | 1.3 | | | 1 | | |
| | Total | | 9.6 | | | 5.2 | | | 4 | | |
| Power Exhaust (2) 0.33 HP | Full Load Amps | | 2.4 | | | 1.3 | | | 1 | | |
| | Total | | 4.8 | | | 2.6 | | | 2 | | |
| Service Outlet 115V GFI (amps) | | | 15 | | | 15 | | | 20 | | |
| Indoor Blower Motor | Horsepower | | 5 | 7.5 | 10 | 5 | 7.5 | 10 | 5 | 7.5 | 10 |
| | Full Load Amps | | 16.7 | 24.2 | 30.8 | 7.6 | 11 | 14 | 6.1 | 9 | 11 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit Only | | 100 | 125 | 125 | 50 | 50 | 60 | 40 | 45 | 50 |
| | With (2) 0.33 HP Power Exhaust | | 110 | 125 | 125 | 50 | 60 | 60 | 40 | 45 | 50 |
| [3] Minimum Circuit Ampacity (MCA) | Unit Only | | 92 | 101 | 110 | 45 | 49 | 53 | 35 | 39 | 41 |
| | With (2) 0.33 HP Power Exhaust | | 97 | 106 | 114 | 47 | 51 | 55 | 37 | 41 | 43 |

### ELECTRIC HEAT DATA

| | | Electric Heat Voltage | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat | **15 kW** | 100 | 100 | 125 | 125 | 125 | 125 | 50 | 50 | 60 | 40 | 45 | 50 |
| | | **30 kW** | [4]100 | 125 | 125 | 125 | [4]125 | 150 | 60 | 60 | 70 | 45 | 50 | 50 |
| | | **45 kW** | [4]150 | 175 | [4]150 | 175 | 175 | 175 | 80 | 90 | 90 | 70 | 70 | 70 |
| | | **60 kW** | [4]150 | 175 | 175 | 175 | [4]175 | 200 | 90 | 90 | 90 | 70 | 70 | 80 |
| | | **90 kW** | [4]225 | 250 | [4]225 | 250 | [4]250 | [4]300 | 125 | 125 | 150 | 100 | 100 | 110 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat | **15 kW** | 92 | 92 | 101 | 101 | 110 | 110 | 45 | 49 | 53 | 35 | 39 | 41 |
| | | **30 kW** | 100 | 112 | 109 | 121 | 117 | 129 | 55 | 59 | 63 | 44 | 48 | 50 |
| | | **45 kW** | 139 | 157 | 148 | 166 | 156 | 174 | 78 | 82 | 86 | 62 | 66 | 68 |
| | | **60 kW** | 146 | 166 | 156 | 175 | 164 | 183 | 82 | 86 | 90 | 66 | 69 | 72 |
| | | **90 kW** | 209 | 238 | 218 | 247 | 227 | 256 | 118 | 123 | 126 | 95 | 98 | 101 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | **15 kW** | 110 | 110 | 125 | 125 | 125 | 125 | 50 | 60 | 60 | 40 | 45 | 50 |
| | | **30 kW** | [4]110 | 125 | [4]125 | 150 | [4]125 | 150 | 60 | 70 | 70 | 50 | 50 | 60 |
| | | **45 kW** | [4]150 | 175 | 175 | 175 | [4]175 | 200 | 90 | 90 | 90 | 70 | 70 | 80 |
| | | **60 kW** | 175 | 175 | [4]175 | 200 | [4]175 | 200 | 90 | 90 | 100 | 70 | 80 | 80 |
| | | **90 kW** | [4]225 | 250 | [4]225 | [4]300 | [4]250 | [4]300 | 125 | 150 | 150 | 100 | 110 | 110 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | **15 kW** | 97 | 97 | 106 | 106 | 114 | 114 | 47 | 51 | 55 | 37 | 41 | 43 |
| | | **30 kW** | 106 | 118 | 115 | 127 | 123 | 135 | 58 | 63 | 66 | 47 | 50 | 53 |
| | | **45 kW** | 145 | 163 | 154 | 172 | 162 | 180 | 81 | 85 | 89 | 65 | 68 | 71 |
| | | **60 kW** | 152 | 172 | 162 | 181 | 170 | 189 | 85 | 90 | 93 | 68 | 72 | 74 |
| | | **90 kW** | 215 | 244 | 224 | 253 | 233 | 262 | 122 | 126 | 130 | 97 | 101 | 103 |

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.

[4] Factory installed circuit breaker not available.

## ELECTRICAL/ELECTRIC HEAT DATA — 25 TON

| | Model No. | LCT300S4 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| [1] Voltage - 60Hz | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | |
| Compressor 1 (Non-Inverter) | Rated Load Amps | 19.6 | | | 8.2 | | | 6.6 | | |
| | Locked Rotor Amps | 136 | | | 66.1 | | | 55.3 | | |
| Compressor 2 (Non-Inverter) | Rated Load Amps | 19.6 | | | 8.2 | | | 6.6 | | |
| | Locked Rotor Amps | 136 | | | 66.1 | | | 55.3 | | |
| Compressor 3 (Non-Inverter) | Rated Load Amps | 22.4 | | | 10.6 | | | 7.7 | | |
| | Locked Rotor Amps | 149 | | | 75 | | | 54 | | |
| Compressor 4 (Non-Inverter) | Rated Load Amps | 22.4 | | | 10.6 | | | 7.7 | | |
| | Locked Rotor Amps | 149 | | | 75 | | | 54 | | |
| Outdoor Fan Motors (6) | Full Load Amps (2 ECM) | 2.8 | | | 1.4 | | | 1.1 | | |
| | Total | 5.6 | | | 2.8 | | | 2.2 | | |
| | Full Load Amps (4 Non-ECM) | 2.4 | | | 1.3 | | | 1 | | |
| | Total | 9.6 | | | 5.2 | | | 4 | | |
| Power Exhaust (2) 0.33 HP | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | |
| | Total | 4.8 | | | 2.6 | | | 2 | | |
| Service Outlet 115V GFI (amps) | | 15 | | | 15 | | | 20 | | |
| Indoor Blower Motor | Horsepower | 5 | 7.5 | 10 | 5 | 7.5 | 10 | 5 | 7.5 | 10 |
| | Full Load Amps | 16.7 | 24.2 | 30.8 | 7.6 | 11 | 14 | 6.1 | 9 | 11 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit Only | 125 | 150 | 150 | 60 | 70 | 70 | 50 | 50 | 60 |
| | With (2) 0.33 HP Power Exhaust | 150 | 150 | 175 | 70 | 70 | 80 | 50 | 50 | 60 |
| [3] Minimum Circuit Ampacity (MCA) | Unit Only | 125 | 133 | 141 | 58 | 61 | 65 | 44 | 48 | 50 |
| | With (2) 0.33 HP Power Exhaust | 129 | 137 | 146 | 60 | 64 | 68 | 46 | 50 | 52 |

### ELECTRIC HEAT DATA

| | Electric Heat Voltage | | 208 | 240 | 208 | 240 | 208 | 240 | 480 | 480 | 480 | 600 | 600 | 600 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat | **15 kW** | 125 | 125 | 150 | 150 | 150 | 150 | 60 | 70 | 70 | 50 | 50 | 60 |
| | | **30 kW** | 125 | 125 | 150 | 150 | 150 | 150 | 60 | 70 | 70 | 50 | 50 | 60 |
| | | **45 kW** | [4] 150 | 175 | [4] 150 | 175 | 175 | 175 | 80 | 90 | 90 | 70 | 70 | 70 |
| | | **60 kW** | [4] 150 | 175 | 175 | 175 | [4] 175 | 200 | 90 | 90 | 90 | 70 | 70 | 80 |
| | | **90 kW** | [4] 225 | 250 | [4] 225 | 250 | [4] 250 | [4] 300 | 125 | 125 | 150 | 100 | 100 | 110 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat | **15 kW** | 125 | 125 | 133 | 133 | 141 | 141 | 58 | 61 | 65 | 44 | 48 | 50 |
| | | **30 kW** | 125 | 125 | 133 | 133 | 141 | 141 | 58 | 61 | 65 | 44 | 48 | 50 |
| | | **45 kW** | 139 | 157 | 148 | 166 | 156 | 174 | 78 | 82 | 86 | 62 | 66 | 68 |
| | | **60 kW** | 146 | 166 | 156 | 175 | 164 | 183 | 82 | 86 | 90 | 66 | 69 | 72 |
| | | **90 kW** | 209 | 238 | 218 | 247 | 227 | 256 | 118 | 123 | 126 | 95 | 98 | 101 |
| [2] Maximum Overcurrent Protection (MOCP) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | **15 kW** | 150 | 150 | 150 | 150 | 175 | 175 | 70 | 70 | 80 | 50 | 50 | 60 |
| | | **30 kW** | 150 | 150 | 150 | 150 | 175 | 175 | 70 | 70 | 80 | 50 | 50 | 60 |
| | | **45 kW** | [4] 150 | 175 | 175 | 175 | [4] 175 | 200 | 90 | 90 | 90 | 70 | 70 | 80 |
| | | **60 kW** | 175 | 175 | [4] 175 | 200 | [4] 175 | 200 | 90 | 90 | 100 | 70 | 80 | 80 |
| | | **90 kW** | [4] 225 | 250 | [4] 225 | [4] 300 | [4] 250 | [4] 300 | 125 | 150 | 150 | 100 | 110 | 110 |
| [3] Minimum Circuit Ampacity (MCA) | Unit+ Electric Heat and (2) 0.33 HP Power Exhaust | **15 kW** | 129 | 129 | 137 | 137 | 146 | 146 | 60 | 64 | 68 | 46 | 50 | 52 |
| | | **30 kW** | 129 | 129 | 137 | 137 | 146 | 146 | 60 | 64 | 68 | 47 | 50 | 53 |
| | | **45 kW** | 145 | 163 | 154 | 172 | 162 | 180 | 81 | 85 | 89 | 65 | 68 | 71 |
| | | **60 kW** | 152 | 172 | 162 | 181 | 170 | 189 | 85 | 90 | 93 | 68 | 72 | 74 |
| | | **90 kW** | 215 | 244 | 224 | 253 | 233 | 262 | 122 | 126 | 130 | 97 | 101 | 103 |

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.

[4] Factory installed circuit breaker not available.

## ELECTRIC HEAT CAPACITIES

| Volts Input | 15 kW | | | 30 kW | | | 45 kW | | | 60 kW | | | 90 kW | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kW Input | Btuh Output | No. of Stages | kW Input | Btuh Output | No. of Stages | kW Input | Btuh Output | No. of Stages | kW Input | Btuh Output | No. of Stages | kW Input | Btuh Output | No. of Stages |
| 208 | 11.3 | 38,600 | 1 | 22.5 | 76,800 | 1 | 33.8 | 115,300 | 2 | 45.0 | 153,600 | 2 | 67.6 | 230,700 | 2 |
| 220 | 12.6 | 43,000 | 1 | 25.2 | 86,000 | 1 | 37.8 | 129,000 | 2 | 50.4 | 172,000 | 2 | 75.6 | 258,000 | 2 |
| 230 | 13.8 | 47,100 | 1 | 27.5 | 93,900 | 1 | 41.3 | 141,000 | 2 | 55.1 | 188,000 | 2 | 82.7 | 282,200 | 2 |
| 240 | 15.0 | 51,200 | 1 | 30.0 | 102,400 | 1 | 45.0 | 153,600 | 2 | 60.0 | 204,800 | 2 | 90.0 | 307,100 | 2 |
| 440 | 12.6 | 43,000 | 1 | 25.2 | 86,000 | 1 | 37.8 | 129,000 | 2 | 50.4 | 172,000 | 2 | 75.6 | 258,000 | 2 |
| 460 | 13.8 | 47,100 | 1 | 27.5 | 93,900 | 1 | 41.3 | 141,000 | 2 | 55.1 | 188,000 | 2 | 82.7 | 282,200 | 2 |
| 480 | 15.0 | 51,200 | 1 | 30.0 | 102,400 | 1 | 45.0 | 153,600 | 2 | 60.0 | 204,800 | 2 | 90.0 | 307,100 | 2 |
| 550 | 12.6 | 43,000 | 1 | 25.2 | 86,000 | 1 | 37.8 | 129,000 | 2 | 50.4 | 172,000 | 2 | 75.6 | 258,000 | 2 |
| 575 | 13.8 | 47,100 | 1 | 27.5 | 93,900 | 1 | 41.3 | 141,000 | 2 | 55.1 | 188,000 | 2 | 82.7 | 282,200 | 2 |
| 600 | 15.0 | 51,200 | 1 | 30.0 | 102,400 | 1 | 45.0 | 153,600 | 2 | 60.0 | 204,800 | 2 | 90.0 | 307,100 | 2 |

**PARTS ARRANGEMENT**

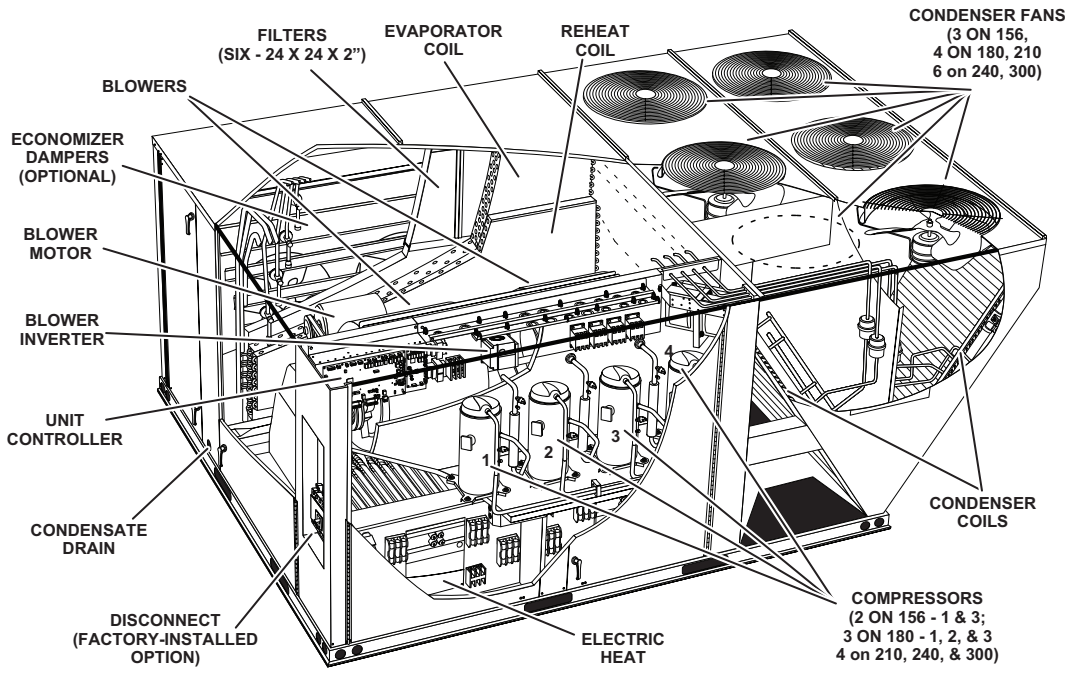



**FIGURE 1**

## I-UNIT COMPONENTS

All 13 through 25 ton (45.7 through 88 kW) units are configure to order units (CTO). Unit components are shown in figures 1. All units come standard with hinged unit panels. The unit panels may be held open with the door rod located inside the unit. All L1, L2 and L3 wiring is color coded; L1 is red, L2 is yellow and L3 is blue.

**⚠ 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.**

**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.**

### A-Control Box Components

Control box components are shown in FIGURE 3 and FIGURE 4. The control box is located in the upper portion of the compressor compartment.

### 1-Disconnect Switch S48

Units with higher SCCR rating may be equipped with an disconnect switch S48. Other factory or field installed optional circuit breakers may be used, such as CB10. S48 and CB10 are toggle or twist-style switches, which can be used by the service technician to disconnect power to the unit.

### 2-Control Transformer T1

All use a single line voltage to 24VAC transformer mounted in the control box. Transformer supplies power to control circuits in the unit. The transformer is rated at 70VA and is protected by a 3.5 amp circuit breaker (CB8). The 208/230 (Y) voltage transformers use two primary voltage taps as shown in FIGURE 2, while 460 (G) and 575 (J) voltage transformers use a single primary voltage tap.

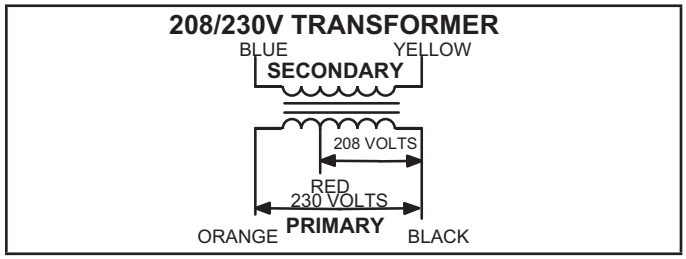



**FIGURE 2**

### 3-Contactor Transformer T18

T18 is a single line voltage to 24VAC transformer used in all LCT 13 to 25 ton units. Transformer T18 is protected by a 3.5 amp circuit breaker (CB18). T18 is identical to transformer T1. The transformer supplies 24VAC power to he contactors.

**Components Arrangement**

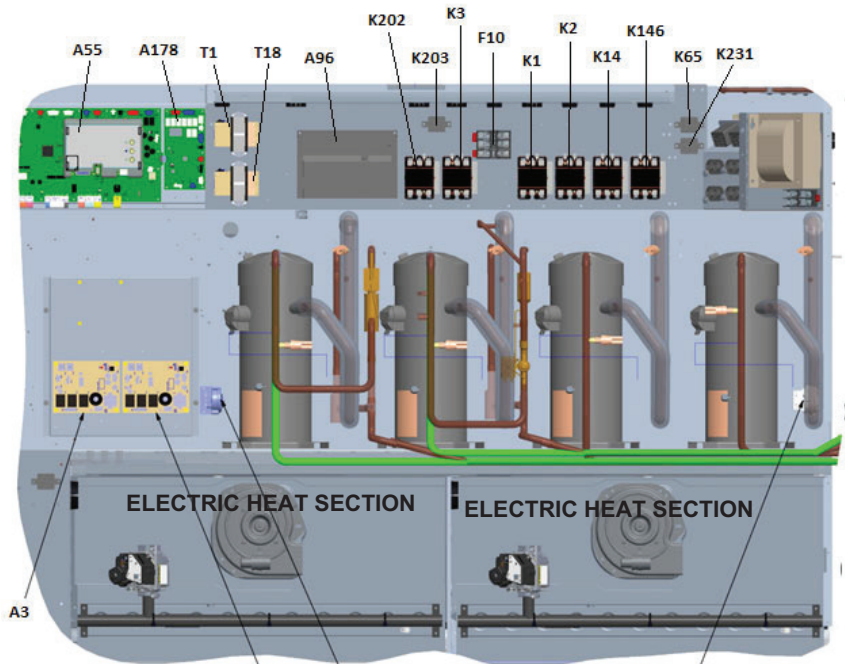



**FIGURE 3**

**Components Arrangement**

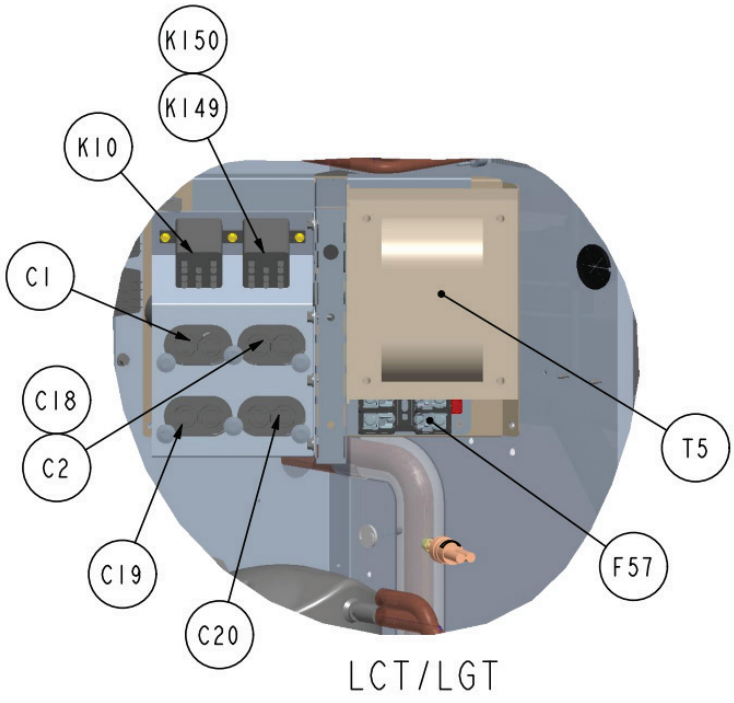



**FIGURE 4**

**4-Terminal Block TB13**

TB13 terminal block distributes line voltage power to the line voltage items in the unit.

**5-Outdoor Fan Motor Fuse Block & Fuses**

F10 Power Exhaust Fan Motor Fuse Block and Fuses F6. STD SCCR 240V, 300V and higher rated SCCR units have three line voltage fuses F10 provide overcurrent protection to all condenser fans. Two line voltage fuses F6 provide overcurrent protection to the two optional power exhaust fans. The fuses are rated at 30A in all 208/230V units but 10A in the 208/230V 240U and 300U models.

**6-Compressor Contactor K1, K2, K14, K146**

K1, K2: All units

K14: 180, 210, 240, 300 units

K146: 210, 240, 300 units

All compressor contactors are three-pole-double-break contactors with 24VAC coils. In 156 units, K1 (energized by A55) energizes compressors B1 in response to first stage cool demand, and K2 (energized by A55) energizes B2 in response to second stage cool demand. In the 180 units, K1 and K2 (energized by A55) energizes compressors B1 and B2 in response to first stage cool demand, and K14 (energized by A178) energizes B13 in response to second stage cool demand. In 210, 240 and 300 units K14 and K146 (energized by A178) energize compressors B13 and B20 in response to second stage cool demand.

**7-Blower Contactor K3**

Blower contactor K3, used in all units, is a three-pole-double-break contactor with a 24VAC coil used to energize the indoor blower motor B3 in response to blower demand. K3 is energized by Unit Controller (A55). Optional Staged-Blower units which are not equipped with a bypass option will not have a K3.

**8-Ultraviolet Germicidal Lamp (UVC)**

Transformer T49

UVC transformer T49 is used in 460V and 575V units which are equipped with a UVC. The auto voltage to 230VAC transformer is installed in the control box. The transformer has an output rating of 0.5 amps. T49 transformer supplies 230VAC power to the UVC lamp.

**9-Power Exhaust Relay K65 & K231 (PED units)**Power exhaust relays K65 and K231 are N.O. DPDT relays with a 24VAC coil. The relay are used in units equipped with the optional power exhaust dampers. K65 and K231 are energized by the A55 Unit Controller, after the economizer dampers reach 50% open (adjustable in ECTO). When K65 closes, exhaust fan B10 is energized and when K231 closes B11 is energized.

**10-Variable Frequency Drive A96 (optional)**

Staged-Blower units are equipped with a VFD which alters the supply power frequency and voltage to the blower motor. Blower speed is staged depending on the compressor stages, heating demand, ventilation demand, or smoke alarm. The amount of airflow for each stage is preset from the factory. Airflow can be adjusted by changing ECTO parameters in the A55 Unit Controller. The VFD is located below the Unit Controller.

**11-VFD Power To Motor Contactor K202 (optional)**

Contactor is used in Staged-Blower units equipped with a VFD bypass option. The three pole 40 amp contactor with a 24VAC coil is energized by the A55 Unit Controller. K202 allows power from the VFD to the B3 blower motor in response to blower demand.

**12-Inverter Start Forward Rotation Relay K203 (optional)**

Relay is used in optional Staged-Blower units and is a three-pole double-throw relay with a 24VAC coil. K203 is energized by the A55 Unit Controller and provides input to the A96 VFD to start blower forward rotation. K203 also de-energizes K3 allowing A96 to control B3 blower.

**13-Unit Controller A55**

The Unit Controller provides all unit control functions, unit status information, unit diagnostics, programmable parameters and USB verification and profile sharing. Refer to the Unit Controller guide provided with the unit. Thermostat wires are connected to J297 on the Unit Controller.

**14-Compressor 3 & 4 Controller**

The compressor 3 & 4 control module A178 controls two additional compressor stages. A178 includes all inputs and outputs required for compressor and fan control, compressor stage diagnostics and low ambient control.

The M3 unit controller is only compatible with L-Connection sensors provided with the unit or purchased separately as specified in the Product Specification. TABLE 1, TABLE 2, TABLE 3 and TABLE 4 show thermistor and pressure transducer readings.

**Temperature Sensors**

The return air (RT16) and discharge air (RT6) duct probes and the outdoor air (RT17) are all two wire thermistors. The resistance vs. temperature table is shown below:

**Relative Humidity Sensor - Optional**

The indoor relative humidity sensor (A91) is an analog sensor with a 0-10VDC output over a relative humidity range of 0-100% relative humidity. The sensor is powered with 24VAC.

**Enthalpy Sensor - Optional**

The optional enthalpy sensors (A7 and A63) used with the economizer have an output of 4-20mA. The sensor is powered with 18VAC provided by M3 unit control.

**Economizer Differential Pressure Sensor - Optional**

Rooftop units installed with Smart Airflow™ will have a Pressure Transducer (PT5) present in the economizer. PT5 requires 5VDC power supply (P266-5 and {P266-6) and gives 0.25 VDC to 4 VDC output (P266-4) corresponding to 0" water column and 2" water column respectively. For all practical purposes the output should be less than 1.2" water column if not an error code is stored and service alarm output is turned on.

**TABLE 1**

**Resistance vs. Temperature**

| Temp. °F (°C) | Resistance +/-2% | Temperature °F (°C) | Resistance +/-2% | Temp. °F (°C) | Resistance +/-2% |
|---|---|---|---|---|---|
| -40 (-40) | 335,671 | 40 (4.4) | 26,106 | 90 (32.2) | 7,332 |
| -20 (-28.9) | 164,959 | 50 (10) | 19,904 | 100 (37.8) | 5,826 |
| 0 (-17.8) | 85,323 | 60 (15.6) | 15,313 | 120 (48.9) | 3,756 |
| 20 (-6.7) | 46,218 | 70 (21.1) | 11,884 | 130 (54.4) | 3,047 |
| 30 (-1.1) | 34,566 | 80 (26.7) | 9,298 | | |

**Room Sensors**

Room sensor (A2) is a two-wire thermistor with 1k series resistor.

**TABLE 2**

**Two-Wire Thermistor**

| Temp. °F (°C) | Resistance +/-2% | Temperature °F (°C) | Resistance +/-2% | Temp. °F (°C) | Resistance +/-2% |
|---|---|---|---|---|---|
| 40 (4.4) | 27,102 | 60 (15.6) | 16,313 | 80 (26.7) | 10,299 |
| 45 (7.2) | 23,764 | 65 (18.3) | 14,474 | 85 (29.4) | 9,249 |
| 50 (10) | 20,898 | 70 (21.1) | 12,882 | 90 (32.2) | 8,529 |
| 55 (12.8) | 18,433 | 75 (23.9) | 11,498 | | |

**Carbon Dioxide Sensor**

The indoor carbon dioxide sensor (A63) is an analog sensor with a 0-10VDC output over a carbon dioxide range of 0-2000 ppm as shown in the following table. The sensor is powered with 24VAC.

**TABLE 3**

**Carbon Dioxide Range**

| Carbon Dioxide PPM | DC Voltage | Carbon Dioxide PPM | DC Voltage | Carbon Dioxide PPM | DC Voltage | Carbon Dioxide PPM | DC Voltage |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 600 | 3 | 1200 | 6 | 1800 | 9 |
| 200 | 1 | 800 | 4 | 1400 | 7 | 2000 | 10 |
| 400 | 2 | 1000 | 5 | 1600 | 8 | | |

**VAV Supply Static Sensor**

The supply duct differential static pressure sensor (A30) is an analog sensor with a 0-10VDC output over a range of 0-5"w.c as shown in the following table. The sensor is powered with 24VAC.

**TABLE 4**

**Carbon Dioxide Range**

| Pressure "w.c. | DC Voltage | Pressure "w.c. | DC Voltage | Pressure "w.c. | DC Voltage | Pressure "w.c. | DC Voltage |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 1.5 | 3 | 3 | 6 | 4.5 | 9 |
| 0.5 | 1 | 2 | 4 | 3.5 | 7 | 5 | 10 |
| 1 | 2 | 2.5 | 5 | 4 | 8 | | |

**15-Second-Stage Power Exhaust Relay K231 (Staged-Blower units equipped with power exhaust)**

The second power exhaust fan is controlled by K231. A133 will enable K231 only when the blower reaches 70% of full speed (adjustable ECTO). This prevents a negative building pressure when the blower is operating in low speed. Refer to the Unit Controller manual and ECTO labels on the unit.

**16-Outdoor Fan Transformers T5**

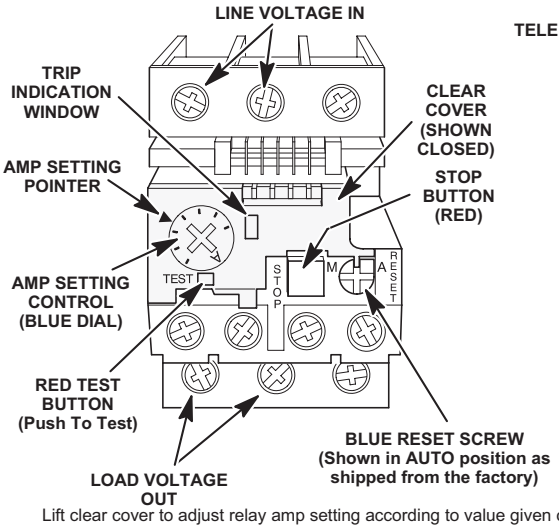
All 460 (G) and 575 (J) voltage units use transformer T5. The auto voltage to 230VAC transformer is mounted in the control box. The transformer has an output rating of 0.5A. T5 transformer supplies 230 VAC power to outdoor fans B21 (156), B5 & B22 (180/210), B21 & B24 (240/300).

**17-Fuse F61 (Higher SCCR units only)**

Fuse F61 is used on units with higher SCCR rating. F61 provides overcurrent protection to compressor and other cooling components. F61 and S48 are located inside a sheet metal enclosure in the unit left front corner mullion.

**18-Blower Motor Overload Relay S42**

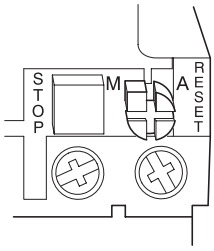
The relay (S42) is connected in line with the blower motor to monitor the current flow to the motor. When the relay senses an overload condition, a set of normally closed contacts open to de-energize pin #1 in plug P299 of the A55 Unit Controller. A55 de-energizes all outputs. Units will be equipped with a relay manufactured by Telemecanique FIGURE 5 or Siemens FIGURE 6.




**TELEMECANIQUE OVERLOAD RELAY**

**DETAIL SHOWING RESET BUTTON ADJUSTED TO MANUAL POSITION**

Lift clear cover and turn adjustment screw counterclockwise. Reset screw will pop out when pointer is in M (manual position). Close cover to lock reset screw into position.




Lift clear cover to adjust relay amp setting according to value given on the blower motor nameplate. Proper relay amp setting equals motor nameplate FLA X service factor of 1.15 X .95.

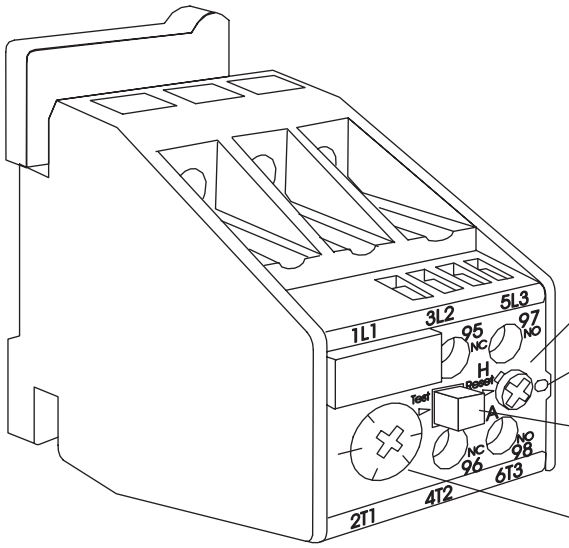
Cover must also be lifted to adjust control mode from automatic reset to manual reset (see detail above) and to test the control.

Control must be in the manual reset mode to perform a test. Use a pointed object to press the small red test button. A yellow marker should appear in the trip indication window to the right of the amp setting control. Press the blue reset screw to reset the relay.

The red STOP button opens the normally closed contacts which power the blower motor. This button stops blower motor operation as long as it is pressed in.

**FIGURE 5**

**SIEMENS OVERLOAD RELAY**




**BLUE RESET BUTTON IN FACTORY-SET AUTO MODE (Turn clockwise to H for manual reset)**

**GREEN TRIP INDICATOR (Flush with surface -- not tripped; Above surface -- tripped)**

**RED TEST BUTTON**

**AMP ADJUSTMENT DIAL**

Adjust relay amp setting according to value given on the blower motor nameplate. Proper relay amp setting equals motor nameplate FLA X service factor of 1.15 X .95.
Use small slotted screwdriver to adjust control mode from automatic reset (A) to manual reset (H).
Control must be in the manual reset mode (H) to perform a test. Press the red test button. Green trip indicator should pop out. Press the blue reset screw to reset the relay.

**FIGURE 6**

**Compressor Detail**
**B1, B2**

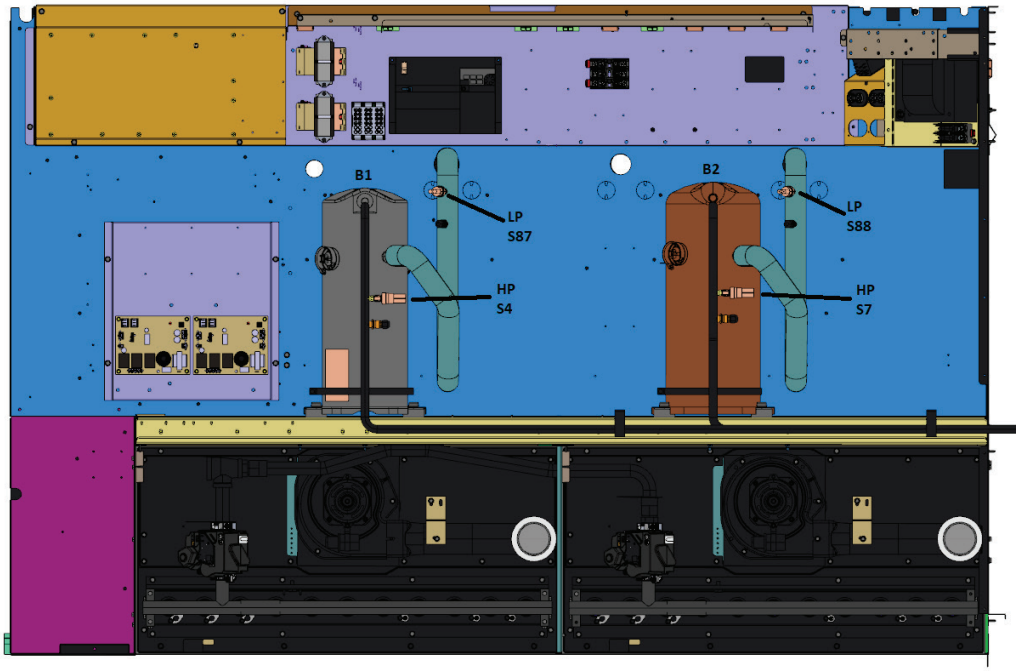



**FIGURE 7**

**Compressor Detail**
**B1, B2, B13**

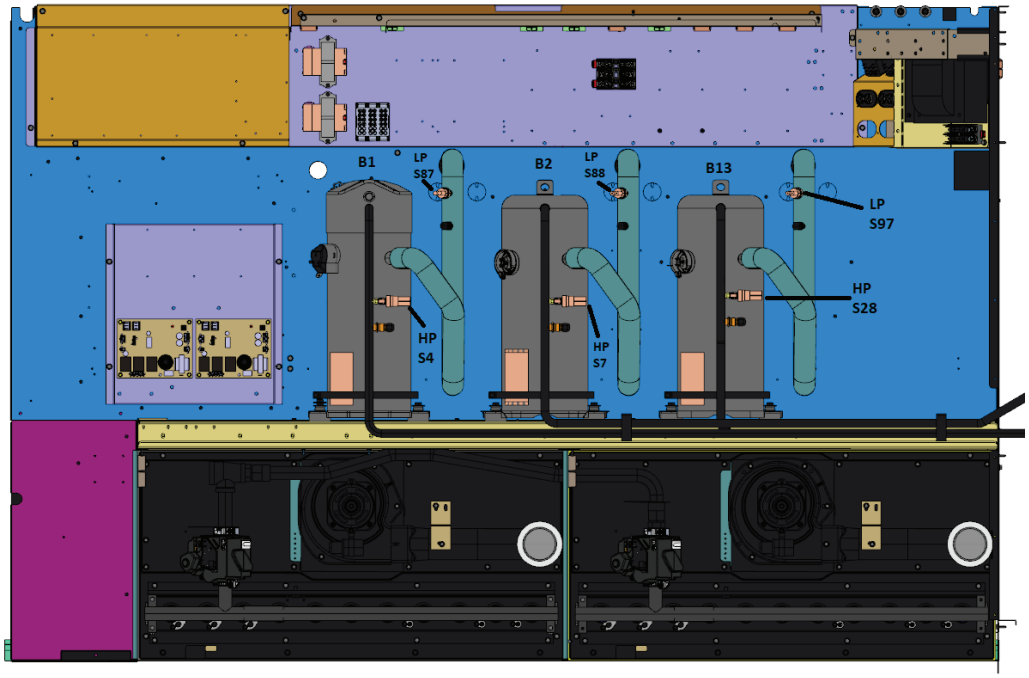



**FIGURE 8**

**Compressor Detail**
**B1, B2, B13, B20**

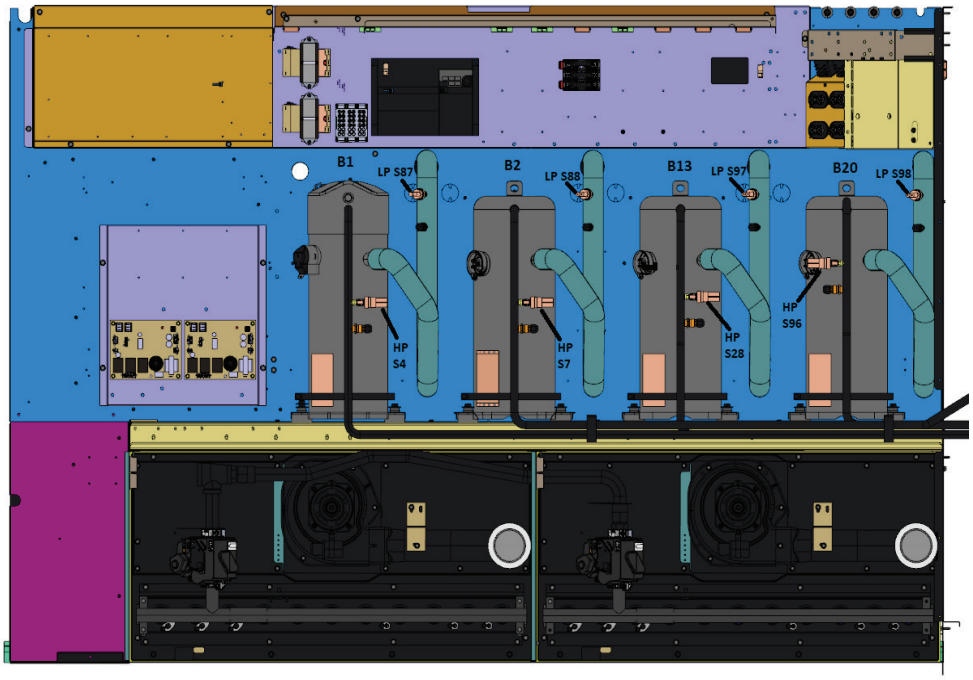



**FIGURE 9**

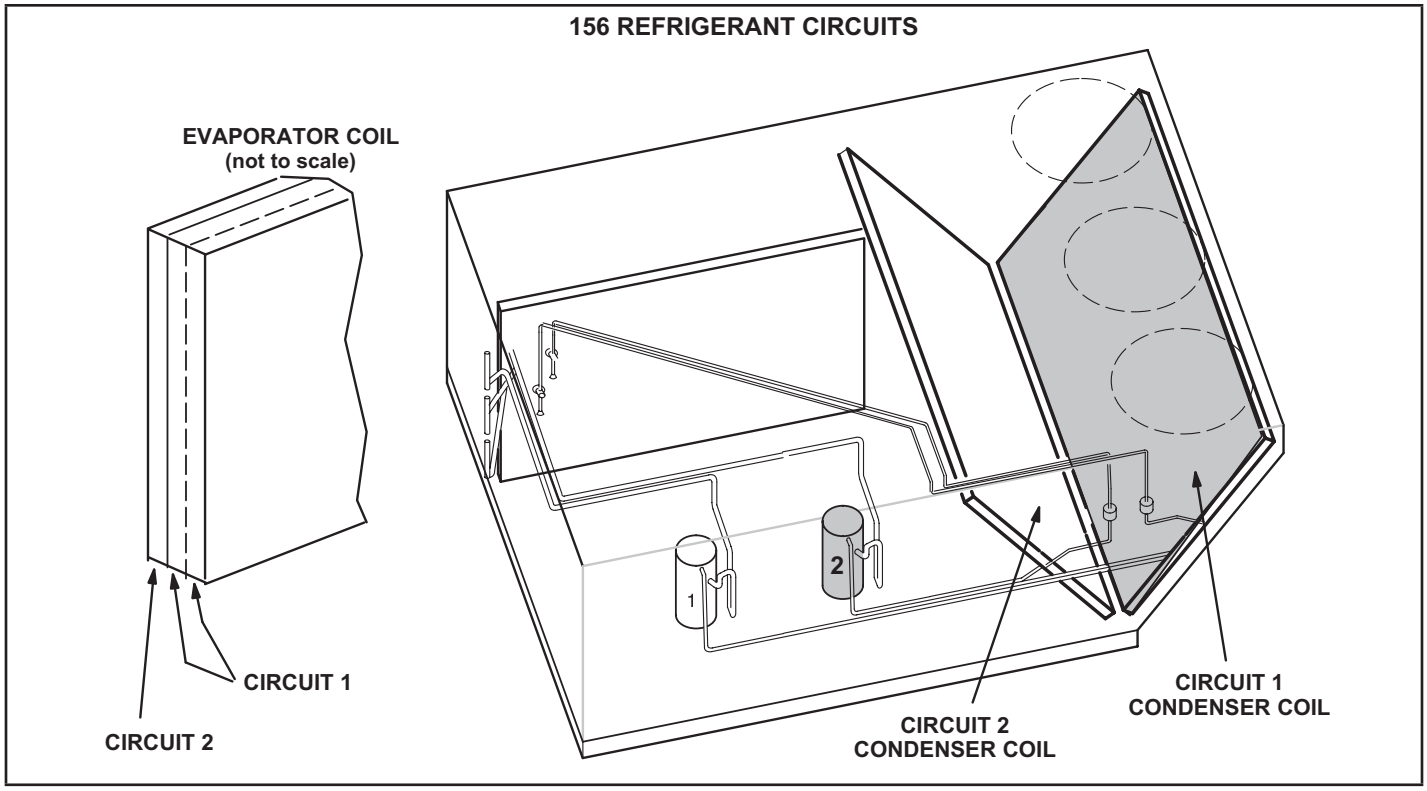



**FIGURE 10**

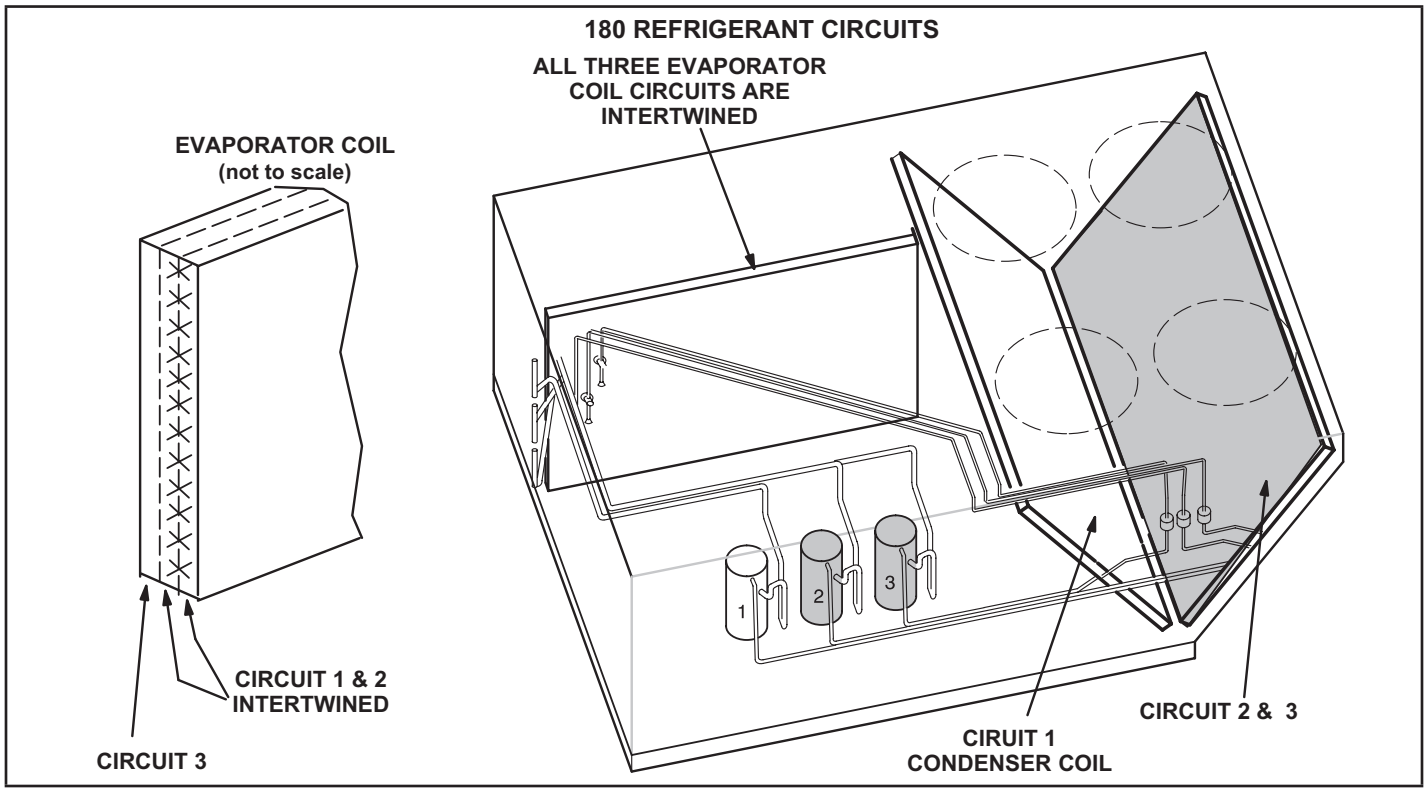



**FIGURE 11**

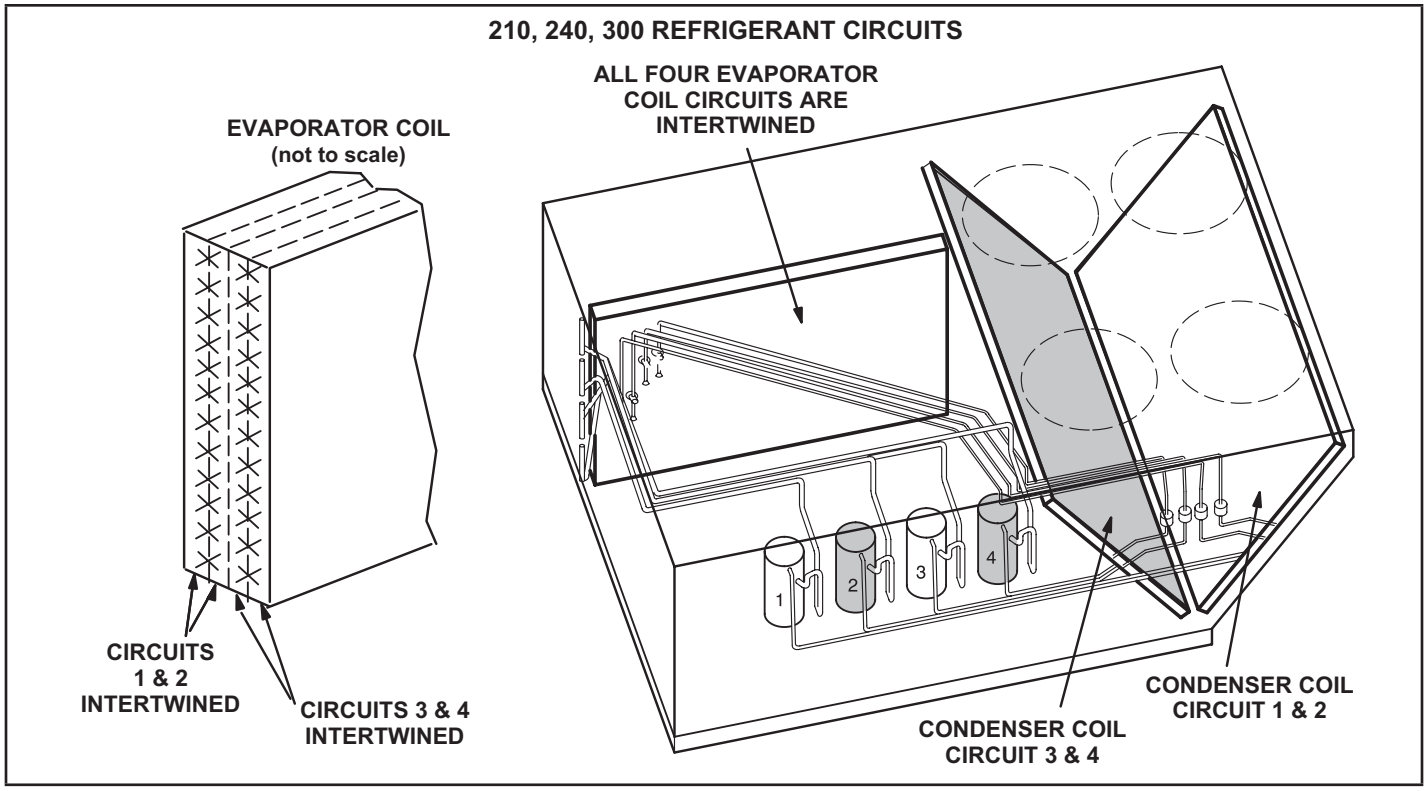



**FIGURE 12**

**B-Cooling Components**

Units use independent cooling circuits consisting of one compressor, one condenser coil, and one evaporator coil per circuit.

Three draw-through type condenser fans are used in LCT156, four draw-through type condenser fans are used in LCT180, 210 units and six draw-through type condenser fans are used in LCT240, 300 units.

Cooling may be supplemented by a factory-or field-installed economizer. 156 Units use a row split evaporator while 180, 210, 240 and 300 use intertwined evaporators. Each evaporator uses a thermostatic expansion valve as the primary expansion device. Each evaporator is also equipped with enhanced fins and rifled tubing. In all units each compressor is protected by a crankcase heater, high pressure switch and low pressure switch.

**1-Compressors B1, B2, B13, B20**

All units use scroll compressors. LCT156 use 2 compressors, 180 use 3 compressors and LCT 210, 240 and 300 use four compressors. Compressor capacity may vary from stage to stage. In all cases, the capacity of each compressor is added to reach the total capacity of the unit. See “SPECIFICATIONS” and “ELECTRICAL DATA” (table of contents) or compressor nameplate for compressor specifications.

**⚠ WARNING**

**Electrical shock hazard. Compressor must be grounded. Do not operate without protective coverover 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.**

Each compressor is energized by a corresponding compressor contactor.

***NOTE-****Refer to the wiring diagram section for specific unit operation.*

If a compressor replacement is necessary, call 1-800-453-6669.

**⚠ IMPORTANT**

**Some scroll compressors have an internal vacuum protector that will unload scrolls when suction pressure goes below 20 psig. A hissing sound will be heard when the compressor is running unloaded. Protector will reset when low pressure in system rises above 40 psig. DO NOT REPLACE COMPRESSOR.**

**2-Crankcase Heaters HR1, HR2, HR5 & HR11**

All LCT units use insertion type heaters. Heater HR1 is installed around compressor B1, heater HR2 compressor B2, HR5 compressor B13 and HR11 compressor B20.

**3-High Pressure Switches S4, S7, S28, S96**

S4 all units

S7 all units

S28 180, 210, 240, 300 units

S96 210, 240, 300

The high pressure switches is an auto-reset SPST N.C. switch which opens on a pressure rise. All units are equipped with this switch. The switch is located in the compressor discharge line and is wired in series with the compressor contactor coil through A55 unit controller or A178 compressor 3 and 4 controller. See FIGURE 7, FIGURE 8 and FIGURE 9.

S4 and S7 are is wired in series with B1 and B2 compressor contactors and S28 and S96 are wired in series with B13 and B20 compressor contactors.

When discharge pressure rises to 640 ± 10 psig (indicating a problem in the system) the switch opens and the respective compressor(s) is de-energized (the economizer can continue to operate). When discharge pressure drops to 475 ± 20 psig the pressure switch will close re-energizing the compressor(s).Main control A55 has a three-strike counter before locking out. This means the control allows three high pressure trips per one thermostat demand. The control can be reset by breaking and remaking the thermostat demand or manually resetting the control

**4-Low Pressure Switches S87, S88, S97, S98**

S87 all units

S88 all units

S97 180, 210, 240, 300 units

S98 210, 240, 300 units

The low pressure switch is an auto-reset SPST N.O. switch (held N.C. by refrigerant pressure) which opens on a pressure drop. All units are equipped with this switch. The switch is located in the compressor suction line. See FIGURE 7, FIGURE 8 and FIGURE 9. .

S87 and S88 (compressor one and two) and S98 (compressor three) ans S98 (compressor 4) are wired in series with the contactor coils through the A55 Unit Controller

The Unit Controller A55 governs the low pressure switches by shunting the switches during start up until pressure is stabilized. After the shunt period, the control has a three-strike counter, during a single thermostat demand, before the compressor(s) is locked out. The control is resetby breaking and remaking the thermostat demand or manually resetting the control.

When suction pressure drops to 40 $\pm$ 5 psig (indicating low pressure), the switch opens and the compressor(s) is de-energized. The switch automatically resets when pressure in the suction line rises to 90 $\pm$ 5 psig.

**5-Filter Drier (all units)**

Units have a filter drier located in the liquid line of each refrigerant circuit at the exit of each condenser coil. The drier removes contaminants and moisture from the system.

**6-Condenser Fans**

**B4, B5, B21 (156 units)**

**B4, B5, B21, B22 (180, 210 units)**

**B4, B5, B21, B22, B23 and B24 (240, 300 units)**

See SPECIFICATIONS tables at the front of this manual for specifications of condenser fans used in all units. All condenser fans used have single-phase motors. The fan assembly may be removed for servicing and cleaning.

**7-Temperature Thermistor**

**RT46/47/50/51 (ID) - RT48/49/52/53 OD**

Temperature thermistors are located on specific points for each refrigeration circuit. Temperature thermistors provide continuous temperature input to the unit controller for proper cooling operation as well as system protection.

Controller logic will de-energize compressors for each refrigeration circuit when evaporator coil temperature falls below 32°F to prevent evaporator freeze-up

**C-Blower Compartment**

The blower compartment is located between the evaporator coil and the compressor / control section on the opposite side of the condenser coil. The blower assembly is accessed by disconnecting the blower motor wiring (and all other plugs) and removing the screws on either side of the sliding base. The base pulls out as shown in FIGURE 14.

**1-Blower Wheels**

All units have two 15 in. x 15 in. blower wheels. Both wheels are driven by one motor.

**2-Indoor Blower Motor B3**

All units use three-phase single-speed blower motors. CFM adjustments are made by adjusting the motor pulley (sheave). Motors are equipped with sealed ball bearings. All motor specifications are listed in the SPECIFICATIONS (table of contents) in the front of this manual. Units may be equipped with motors manufactured by various manufacturers, therefore electrical FLA and LRA specifications will vary. See unit rating plate for information specific to your unit.

**OPERATION / ADJUSTMENT**

Supply Air Staged Units - The blower rotation will always be correct on units equipped with an inverter. Checking blower rotation is not a valid method of determining voltage phasing for incoming power.**Supply Air Staged Units and Units Equipped With Optional Voltage or Phase Detection -** The Unit Controller checks the incoming power during start-up. If the voltage or phase is incorrect, the Unit Controller will display an alarm and the unit will not start.

**A-Blower Operation**

Refer to the Unit Controller Setup Guide to energize blower. Use this mobile service app (the QR is located in the control area) menu:

SERVICE > TEST > BLOWER

Instructions provided with the thermostat may also be used to initiate blower only (G) demand. Unit will cycle on thermostat demand. The following steps apply to applications using a typical electro-mechanical thermostat.

1 - Blower operation is manually set at the thermostat subbase fan switch. With fan switch in ON position, blowers will operate continuously.

2 - With fan switch in AUTO position, the blowers will cycle with demand. Blowers and entire unit will be off when system switch is in OFF position.

## ⚠ IMPORTANT

**Three Phase Scroll Compressor Voltage Phasing**

**Three phase scroll compressors must be phased sequentially to ensure correct compressor and blower* rotation and operation. Compressor and blower are wired in phase at the factory. Power wires are color-coded as**

**follows: line 1-red, line 2-yellow, line 3-blue.**

**1-Observe suction and discharge pressures and blower* rotation on unit start-up.**

**2-Suction pressure must drop, discharge pressure must rise and blower* rotation must match rotation marking. If pressure differential is not observed or blower* rotation is not correct:**

**3-Disconnect all remote electrical power supplies.**

**4-Reverse any two field-installed wires connected to the line side of S48 disconnect or TB13 terminal strip. Do not reverse wires at blower contactor.**

**5-Make sure the connections are tight. Discharge and suction pressures should operate at their normal start-up ranges.**

***Supply air inverter blower motors should rotate in the correct direction; verify scroll compressor rotation separately. Contact technical support if the blower is rotating incorrectly.**

## ⚠ 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 start-up.**

**B-Blower Access**

1 - Disconnect jack/plug connector to blower motor. Also disconnect jack/plug connector heating limit switches on gas units.

2 - Remove screws on either side of blower assembly sliding base. See FIGURE 14.

3 - Pull base toward outside of unit.

**C-Determining Unit CFM**

***IMPORTANT -*** *Multi-staged supply air units are factory-set to run the blower at full speed when there is a blower (G) demand without a heating or cooling demand. Refer to the field-provided, design specified CFM for all modes of operation. Use the following procedure to adjust motor pulley to deliver the highest CFM called for in the design spec. See Inverter Start-Up section to set blower CFM for all modes once the motor pulley is set.*

1 - The following measurements must be made with a dry indoor coil. Run blower (G demand) without a cooling demand. Measure the indoor blower shaft RPM. Air filters must be in place when measurements are taken.

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 13.

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

3 - See table of contents for Blower Data and or Optional Accessories. Use static pressure and RPM readings to determine unit CFM.

4 - The blower RPM can be adjusted at the motor pulley. Loosen Allen screw and turn adjustable pulley clockwise to increase CFM. Turn counterclockwise to decrease CFM. See FIGURE 14. Do not exceed minimum and maximum number of pulley turns as shown in TABLE 5.

**TABLE 5**

MINIMUM AND MAXIMUM PULLEY ADJUSTMENT

| Belt | Min Turns Open | Max Turns Open |
|---|---|---|
| A Section | No Minimum | 5 |
| B Section | 1* | 6 |
| | | |

*No minimum number of turns open when B belt is used on pulleys 6” O.D. or larger.

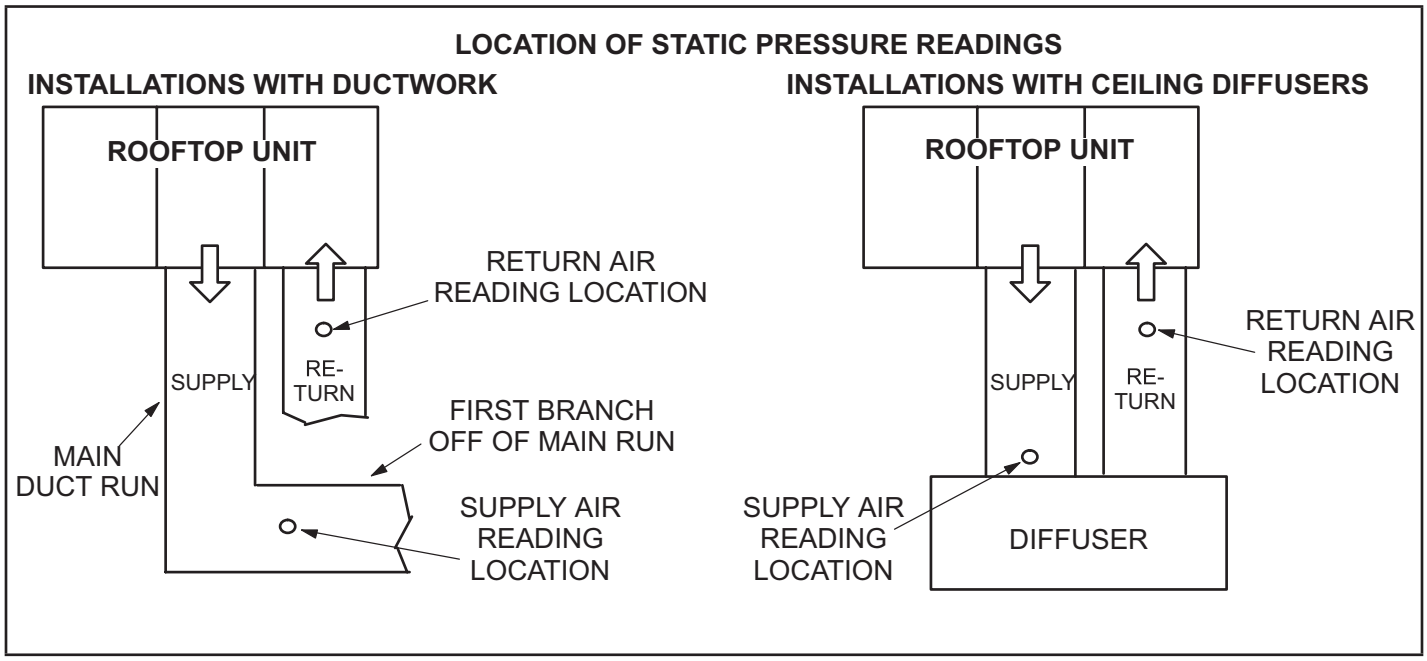



**FIGURE 13**

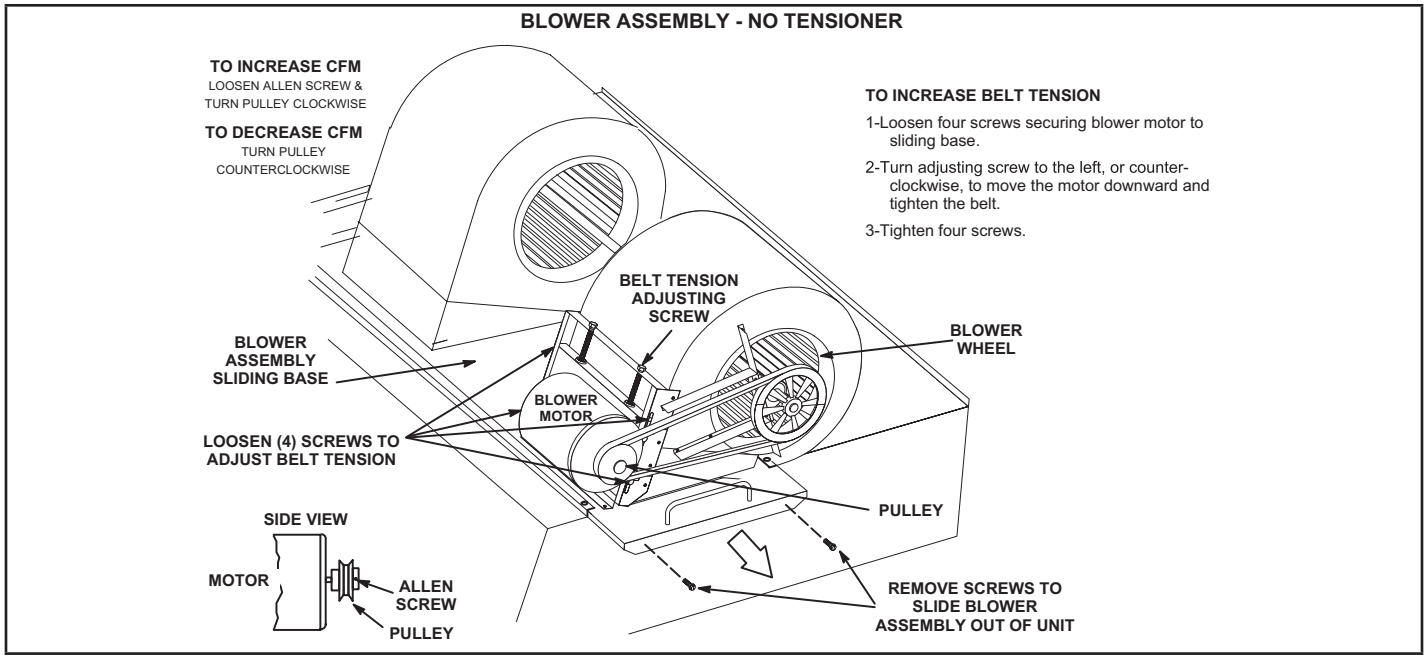



**FIGURE 14**

### D-Blower Belt Adjustment

Maximum life and wear can be obtained from belts only if proper pulley alignment and belt tension are maintained. Tension new belts after a 24-48 hour period of operation. This will allow belt to stretch and seat into pulley grooves. Make sure blower and motor pulley are aligned. See FIGURE 15 for blowers not equipped with a tensioner and FIGURE 16 for units equipped with an optional belt tensioner.

***Blowers Without Belt Tensioner***

1 - Loosen four screws securing blower motor to sliding base. See FIGURE 14.

2 - *To increase belt tension -*

Turn belt tension adjusting screw to the left, or counterclockwise, to tighten the belt. This increases the distance between the blower motor and the blower housing.

3 - To loosen belt tension -

Turn the adjusting screw to the right, or clockwise to loosen belt tension. 3- Tighten four screws securing blower motor to sliding base once adjustments have been made.

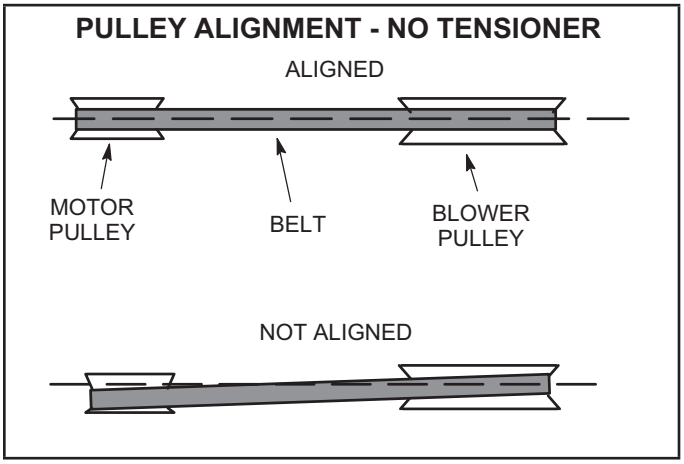



**FIGURE 15**

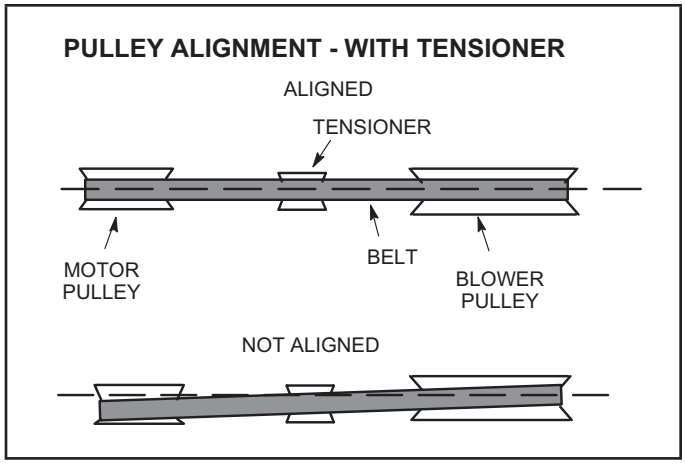



**FIGURE 16**

**E-Check Belt Tension**

Overtensioning belts shortens belt and bearing life. Check belt tension as follows:

1 - Measure span length X. See FIGURE 17.

2 - Apply perpendicular force to center of span (X) with enough pressure to deflect belt 1/64” for every inch of span length.

Example: Deflection distance of a 40” span would be 40/64” or 5/8”.

3 - Measure belt deflection force. For a used belt, the deflection force should be 5 lbs. . A new belt deflection force should be 7 lbs

A force below these values indicates and undertensioned belt. A force above these values indicates an overtensioned belt.

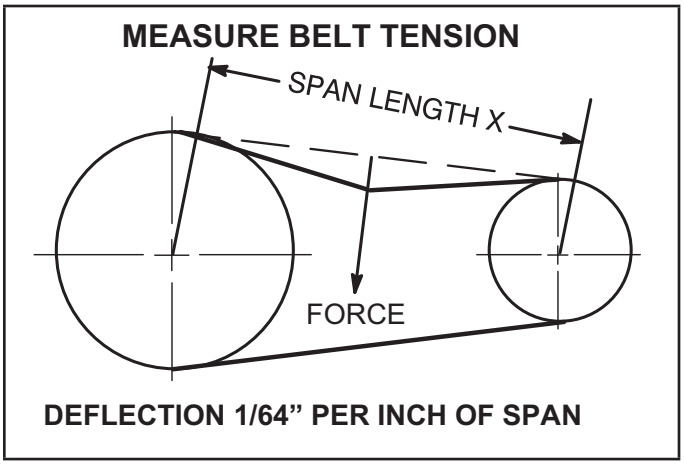



**FIGURE 17**

**F-Field-Furnished Blower Drives**

See BLOWER DATA tables for blower drives.

## D-OPTIONAL ELECTRIC HEAT

See ELECTRICAL / ELECTRIC HEAT DATA and ELECTRIC HEAT CAPACITIES (table of contents) for LCH to EHA match-ups and electrical ratings.

EHA parts arrangement is shown in FIGURE 19 and FIGURE 20. All electric heat sections consist of electric heating elements exposed directly to the air stream. Two electric heat sections (first section and second section) are used in all 15kW through 90kW heaters. See FIGURE 18. Multiple-stage elements are sequenced on and off in response to thermostat demand.

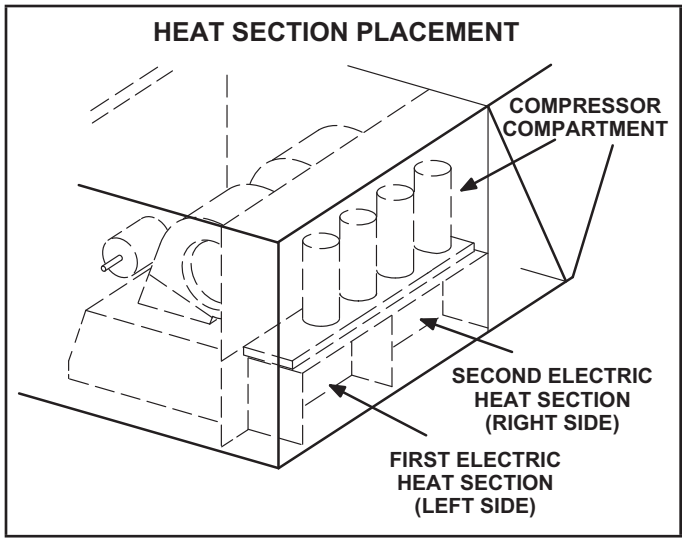



**FIGURE 18**

### 1-Main Control Box Components A55, K9

The main control box (FIGURE 3) houses the A55 Unit Controller and the K9 electric heat relay.

### 2-Contactors K15, K16, K17 and K18

Contactors K15, K16, K17 and K18 are all three-pole double-break contactors located on the electric heat vestibule. K15 and K16 are located on the first electric heat section, while K17 and K18 are located on the second electric heat section. However, in the 15 and 30kW heaters, the first section houses all contactors and fuses. All contactors are equipped with a 24VAC coil. The coils in the K15, K16, K17 and K18 contactors are energized by the main panel A55. Contactors K15 and K17 energize the first stage heating elements, while K16 and K18 energize the second stage heating elements.

### 3-High Temperature Limits S15 and S107 (Primary)

S15 and S107 are SPST N.C. auto-reset thermostats located on the back panel of the electric heat section below the heating elements. S15 is the high temperature limit for the first electric heat section, while S107 is the high temperature limit for the second electric heat section. Both thermostats are identical and are wired to the A55 Unit Controller. When either S15 or S107 opens, indicating a problem in the system, contactor K15 is de-energized. When K15 is de-energized, first stage and all subsequent stages of heat are de-energized. The thermostats used on EHA360-45-1 Y/G/J are factory set to open at 200F $\pm$ 5F on a temperature rise and automatically reset at 160F $\pm$ 6F on a temperature fall. All other electric heat section thermostats are factory set to open at 170F $\pm$ 5F on a temperature rise and automatically reset at 130F $\pm$ 6F on a temperature fall. The thermostats are not adjustable.

### 4-Terminal Strip TB3

Electric heat line voltage connections are made to terminal strip TB3 (or a fuse block on some models) located in the upper left corner of the electric heat vestibule.

### 5-Heating Elements HE1 through HE14

Heating elements are composed of helix wound bare nichrome wire exposed directly to the air stream. Three elements are connected in a three-phase arrangement. The elements in 208/230V units are connected in a “Delta” arrangement. Elements in 460 and 575V units are connected in “Wye” arrangement.

Each stage is energized independently by the corresponding contactors located on the electric heat vestibule panel. Once energized, heat transfer is instantaneous. High temperature protection is provided by primary and redundant high temperature limits and overcurrent protection is provided by fuses.

### 6-Fuse F3

Fuse F3 are housed in a fuse block which holds three fuses. Each F3 fuse is connected in series with each leg of electric heat. FIGURE 19, FIGURE 20 and TABLE 6 shows the fuses used with each electric heat section. For simplicity, the service manual labels the fuses F3 - 1 through F3 - 8..

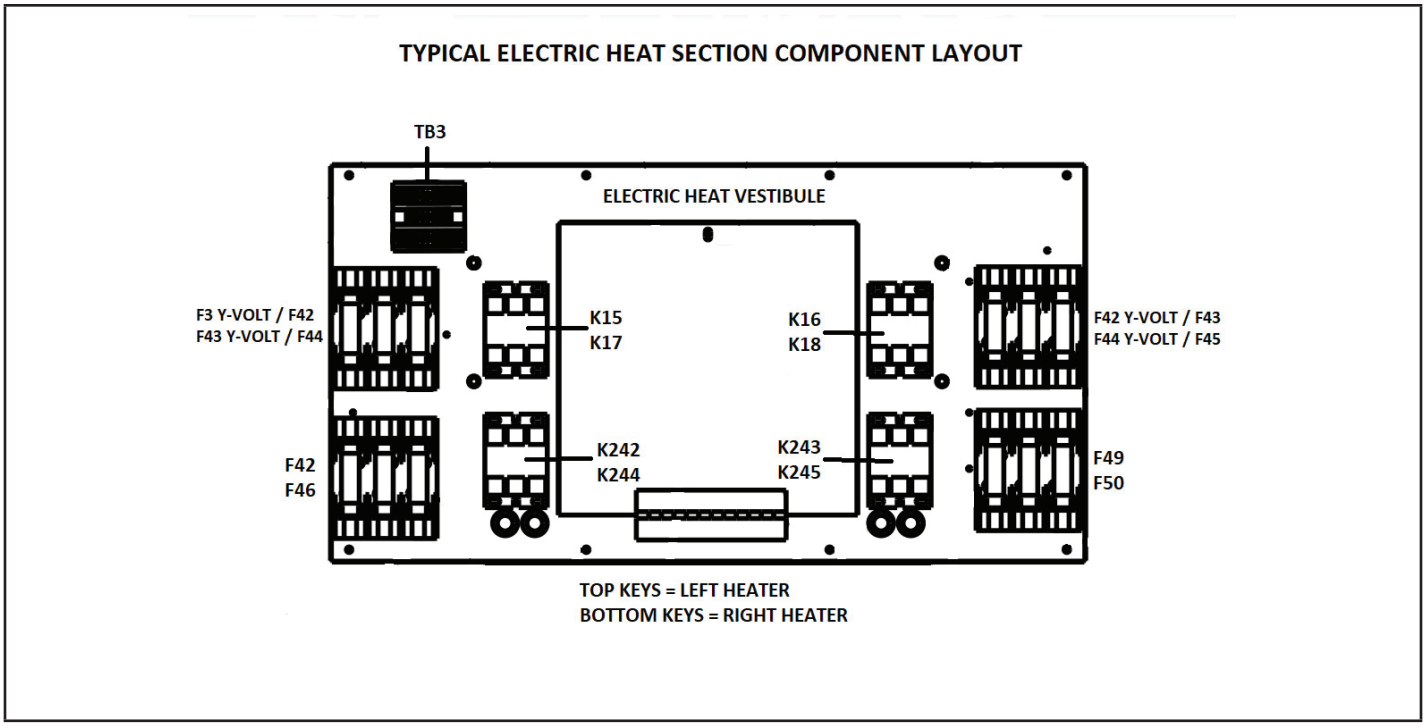



**FIGURE 19**

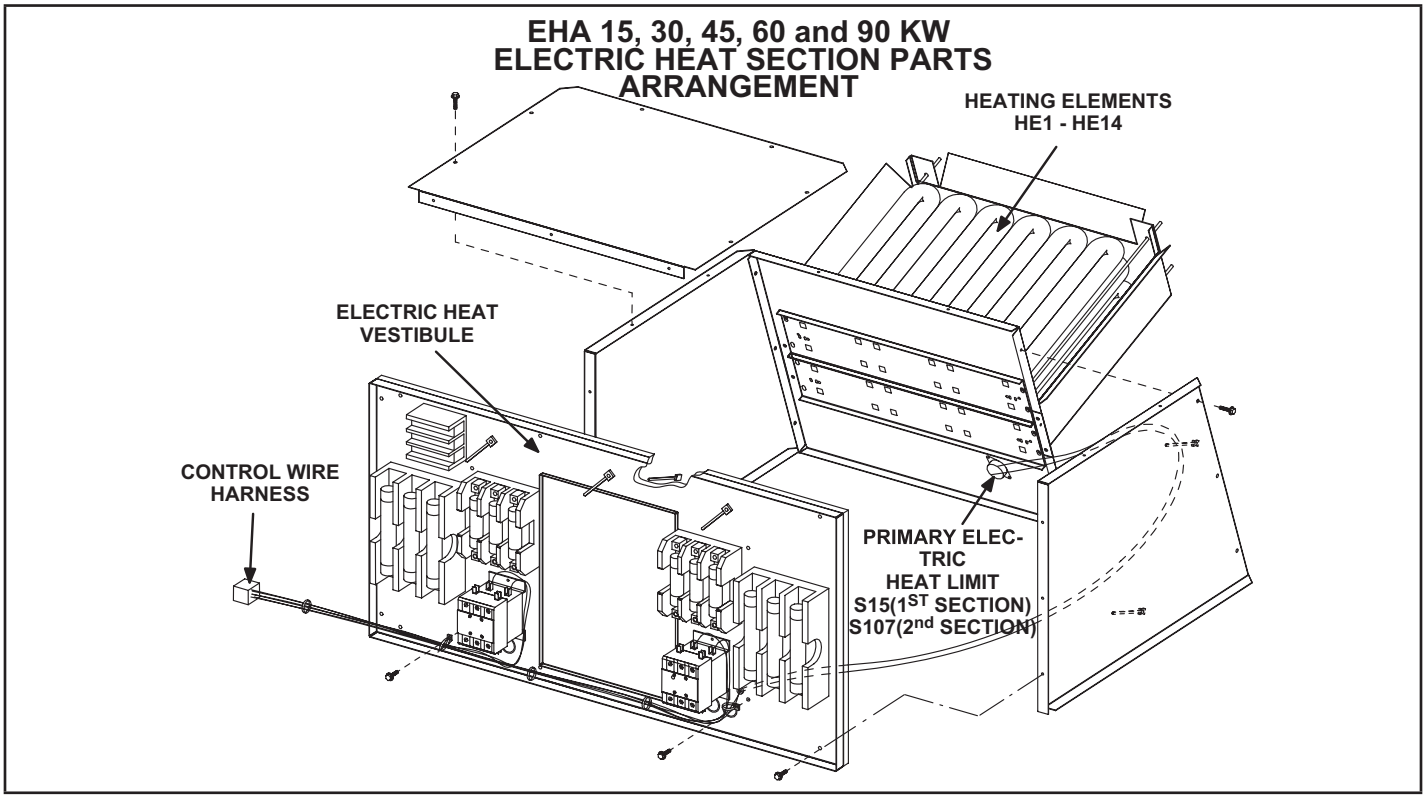



**FIGURE 20**

**TABLE 6**

| ELECTRIC HEAT SECTION FUSE RATING | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **EHA QUANTITY & SIZE** | **VOLTAGES** | **FUSE (3 each)** | | | | | | | |
| | | **F3 - 1** | **F3 - 2** | **F3 - 3** | **F3 - 4** | **F3 - 5** | **F3 - 6** | **F3 - 7** | **F3 - 8** |
| (1) EHA240-7.5 & (1) EHA240S-7.5 (15 kW Total) | 208/230V | 50 Amp 250V | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| | 460V | 25 Amp 600V | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| | 575V | 20 Amp 600V | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| (1) EHA360-15 & (1) EHA360S-15 (30 kW Total) or (1) EHA156-15 & (1) EHA156S-15 | 208/230V | 60 Amp 250V | 60 Amp 250V | ----- | ----- | ----- | ----- | ----- | ----- |
| | 460V | 50 Amp 600V | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| | 575V | 40 Amp 600V | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| (2) EHA360-22.5 (45 kW Total) or (2) EHA156-22.5 | 208/230V | 50 Amp 250V | ----- | ----- | 25 Amp 250V | 50 Amp 250V | ----- | ----- | 25 Amp 250V |
| | 460V | 25 Amp 600V | ----- | ----- | 15 Amp 600V | 25 Amp 600V | ----- | ----- | 15 Amp 600V |
| | 575V | 20 Amp 600V | ----- | ----- | 10 Amp 600V | 20 Amp 600V | ----- | ----- | 10 Amp 600V |
| (2) EHA150-30 (60 kW Total) or (2) EHA156-30 | 208/230V | 50 Amp 250V | ----- | ----- | 50 Amp 250V | 50 Amp 250V | ----- | ----- | 50 Amp 250V |
| | 460V | 25 Amp 600V | ----- | ----- | 25 Amp 600V | 25 Amp 600V | ----- | ----- | 25 Amp 600V |
| | 575V | 20 Amp 600V | ----- | ----- | 20 Amp 600V | 20 Amp 600V | ----- | ----- | 20 Amp 600V |
| (2) EHA360-45 (90 kW Total) | 208/230V | 50 Amp 250V | ----- | 60 Amp 250V | 60 Amp 250V | 50 Amp 250V | ----- | 60 Amp 250V | 60 Amp 250V |
| | 460V | 25 Amp 600V | ----- | ----- | 50 Amp 600V | 25 Amp 600V | ----- | ----- | 50 Amp 600V |
| | 575V | 20 Amp 600V | ----- | ----- | 40 Amp 600V | 20 Amp 600V | ----- | ----- | 40 Amp 600V |

## II-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.*

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

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

**IMPORTANT - Charge unit in normal cooling mode.**

1 - Attach gauge manifolds to discharge and suction lines. 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 4

2 - Use a thermometer to accurately measure the outdoor ambient temperature.

3 - Apply the outdoor temperature to TABLE 9 through TABLE 18 to determine normal operating pressures. Pressures are listed for sea level applications at 80°F dry bulb and 67°F wet bulb return air.

4 - Compare the normal operating pressures to the pressures obtained from the gauges. Minor variations in these pressures may be expected due to differences in installations. Significant differences could mean that the system is not properly charged or that a problem exists with some component in the system. **Correctany system problems before proceeding.**

5 - If discharge pressure is high, remove refrigerant from the system. If discharge pressure is low, add refrigerant to the system.

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

6 - Confirm charge amount using liquid temperature plots. Fine tune charge amount(s) to match liquid temperature plots as needed per the next section.

**E-Charge Confirmation and Fine Tuning - Liquid Temperature Check**

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

1 - 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.

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

3 - 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.

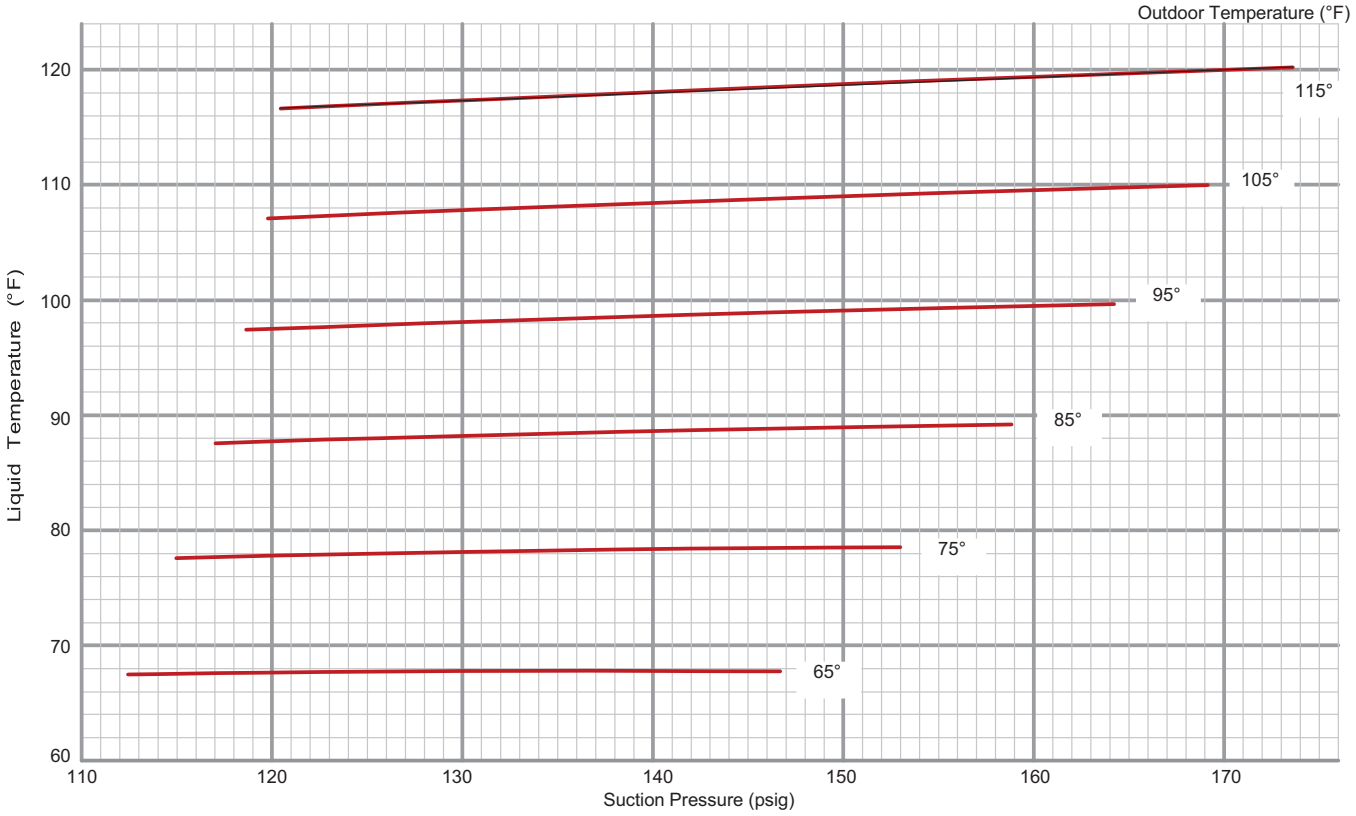
4 - Example: At 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 98°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

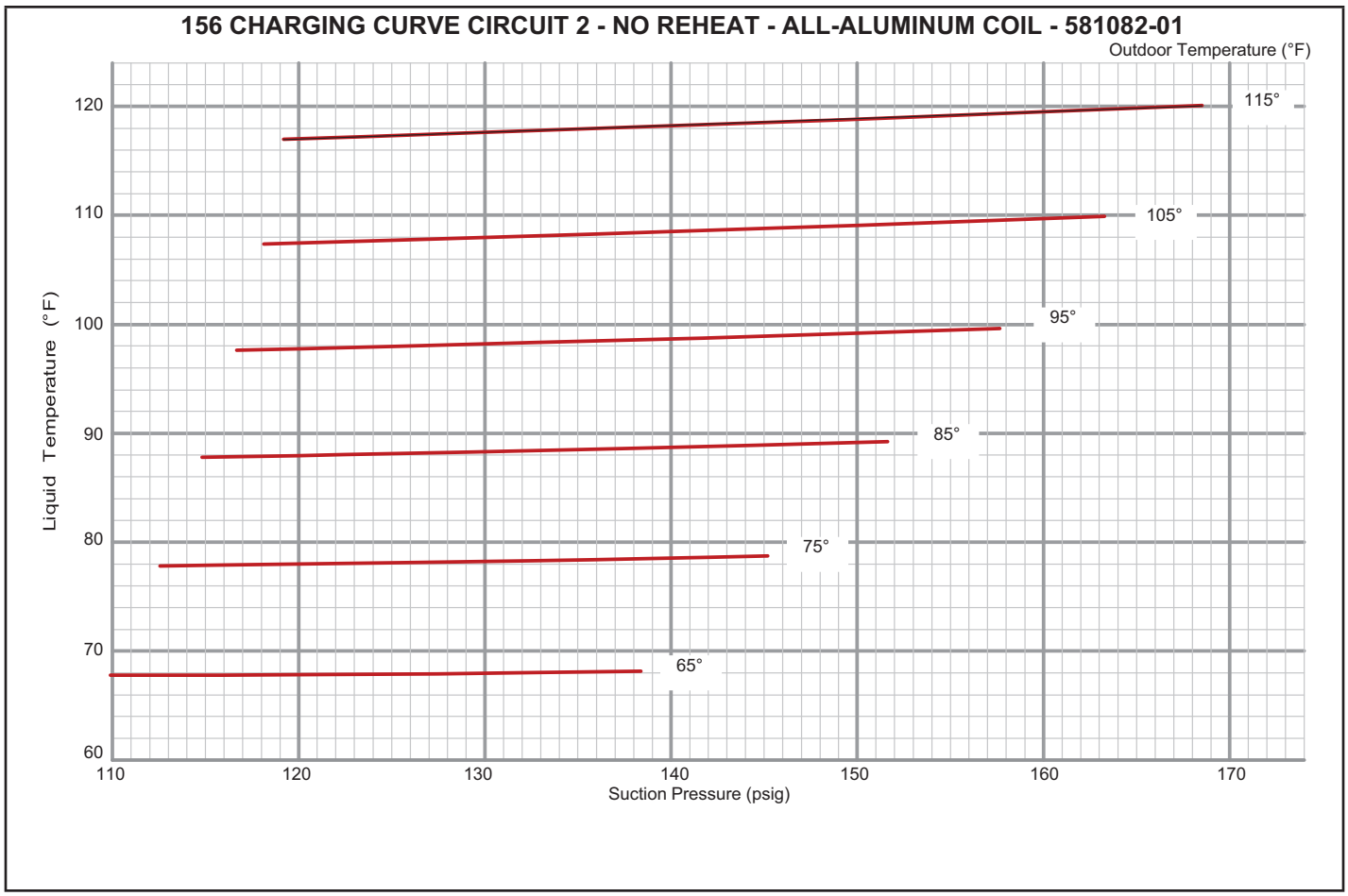
## TABLE 7

### 156 NORMAL OPERATING PRESSURES - NO REHEAT - ALL-ALUMINUM COIL - 581081-01

| | 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) |
| Circuit 1 | 112 | 231 | 115 | 269 | 117 | 313 | 119 | 362 | 120 | 416 | 120 | 475 |
| | 120 | 233 | 123 | 271 | 126 | 314 | 128 | 362 | 130 | 416 | 131 | 475 |
| | 133 | 240 | 138 | 277 | 142 | 319 | 146 | 366 | 150 | 419 | 153 | 477 |
| | 147 | 250 | 153 | 285 | 159 | 326 | 164 | 372 | 169 | 424 | 174 | 481 |
| Circuit 1 | 110 | 246 | 113 | 285 | 115 | 329 | 117 | 379 | 118 | 432 | 119 | 491 |
| | 116 | 249 | 119 | 288 | 122 | 333 | 125 | 382 | 127 | 435 | 129 | 494 |
| | 127 | 256 | 133 | 295 | 137 | 340 | 142 | 389 | 146 | 442 | 149 | 501 |
| | 138 | 264 | 145 | 304 | 152 | 348 | 158 | 396 | 163 | 450 | 169 | 509 |

### 156 CHARGING CURVE CIRCUIT 1 - NO REHEAT - ALL-ALUMINUM COIL - 581082-01



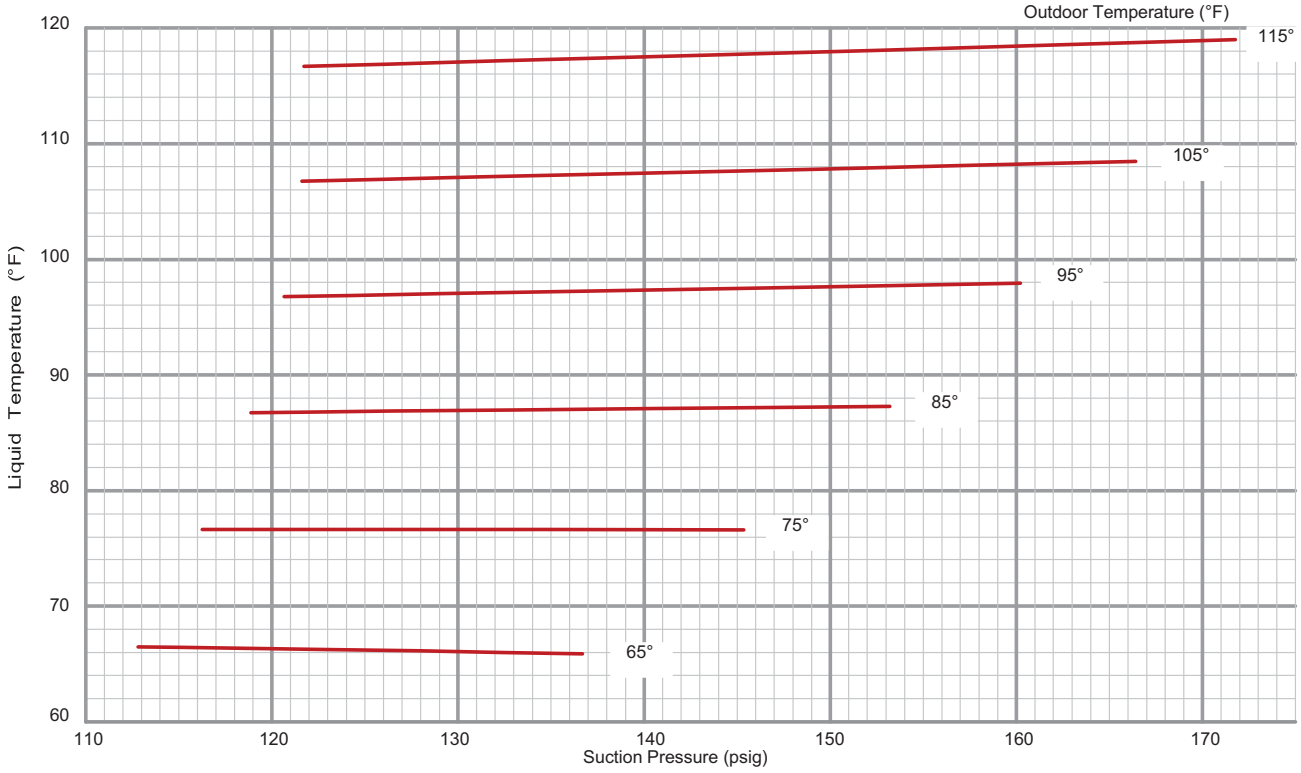

156 CHARGING CURVE CIRCUIT 2 - NO REHEAT - ALL-ALUMINUM COIL - 581082-01
Outdoor Temperature (°F)
115°
105°
95°
85°
75°
65°
Liquid Temperature (°F)
120
110
100
90
80
70
60
110
120
130
140
150
160
170
Suction Pressure (psig)

## TABLE 8

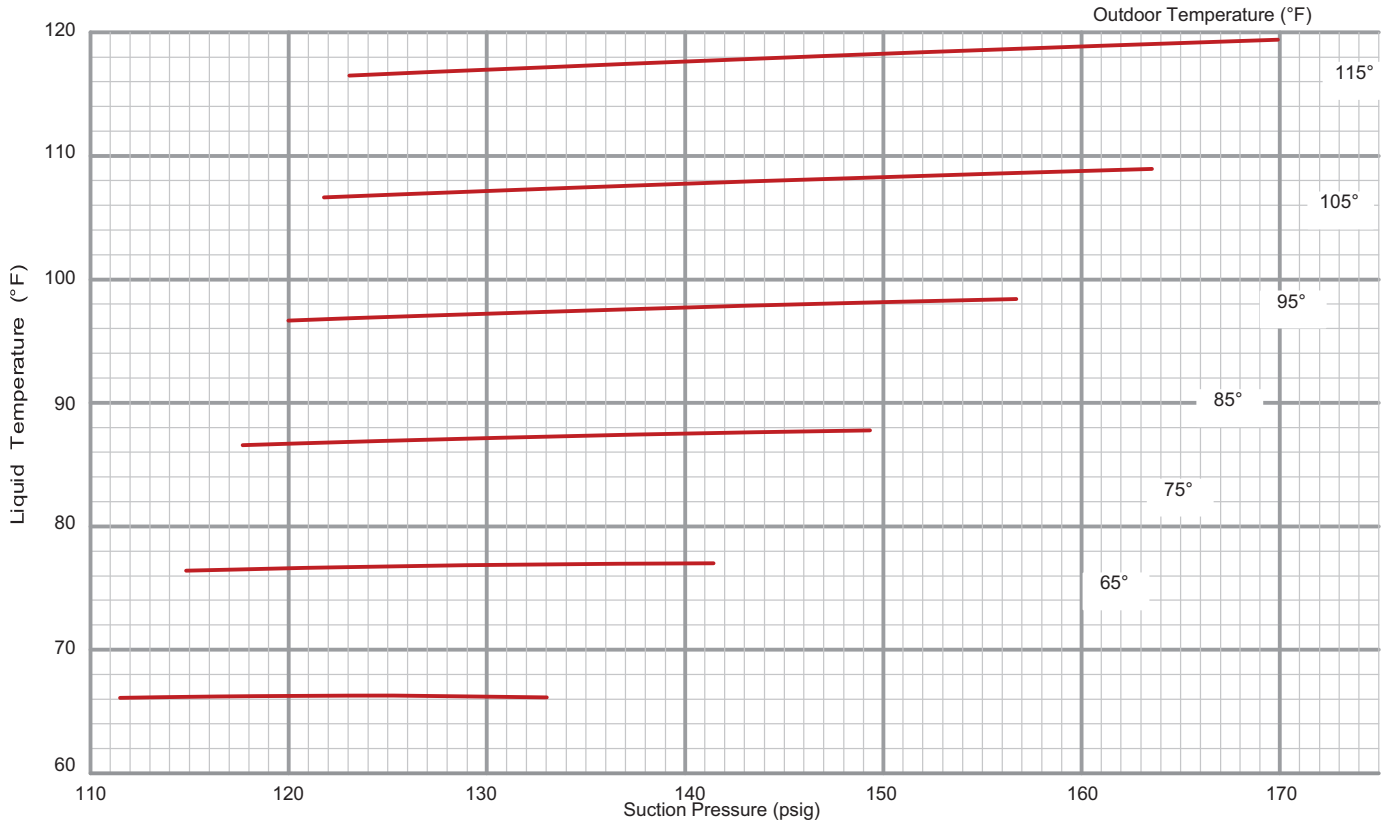
### 156 NORMAL OPERATING PRESSURES - REHEAT - ALL-ALUMINUM COIL - 581083-01

| | 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) |
| Circuit 1 | 113 | 245 | 116 | 282 | 119 | 324 | 121 | 372 | 122 | 425 | 122 | 484 |
| | 118 | 247 | 123 | 284 | 126 | 326 | 129 | 374 | 131 | 427 | 132 | 486 |
| | 128 | 255 | 135 | 291 | 140 | 333 | 145 | 380 | 149 | 433 | 153 | 492 |
| | 137 | 264 | 145 | 300 | 153 | 342 | 160 | 389 | 166 | 442 | 172 | 500 |
| Circuit 2 | 112 | 260 | 115 | 298 | 118 | 342 | 120 | 392 | 122 | 447 | 123 | 508 |
| | 116 | 262 | 121 | 300 | 125 | 344 | 128 | 393 | 131 | 449 | 133 | 510 |
| | 125 | 269 | 132 | 307 | 138 | 350 | 143 | 399 | 148 | 454 | 152 | 515 |
| | 133 | 280 | 141 | 318 | 149 | 361 | 157 | 409 | 164 | 464 | 170 | 524 |

### 156 CHARGING CURVE CIRCUIT 1 - REHEAT - ALL-ALUMINUM COIL - 581084-01



## 156 CHARGING CURVE CIRCUIT 2 - REHEAT - ALL-ALUMINUM COIL - 581084-01

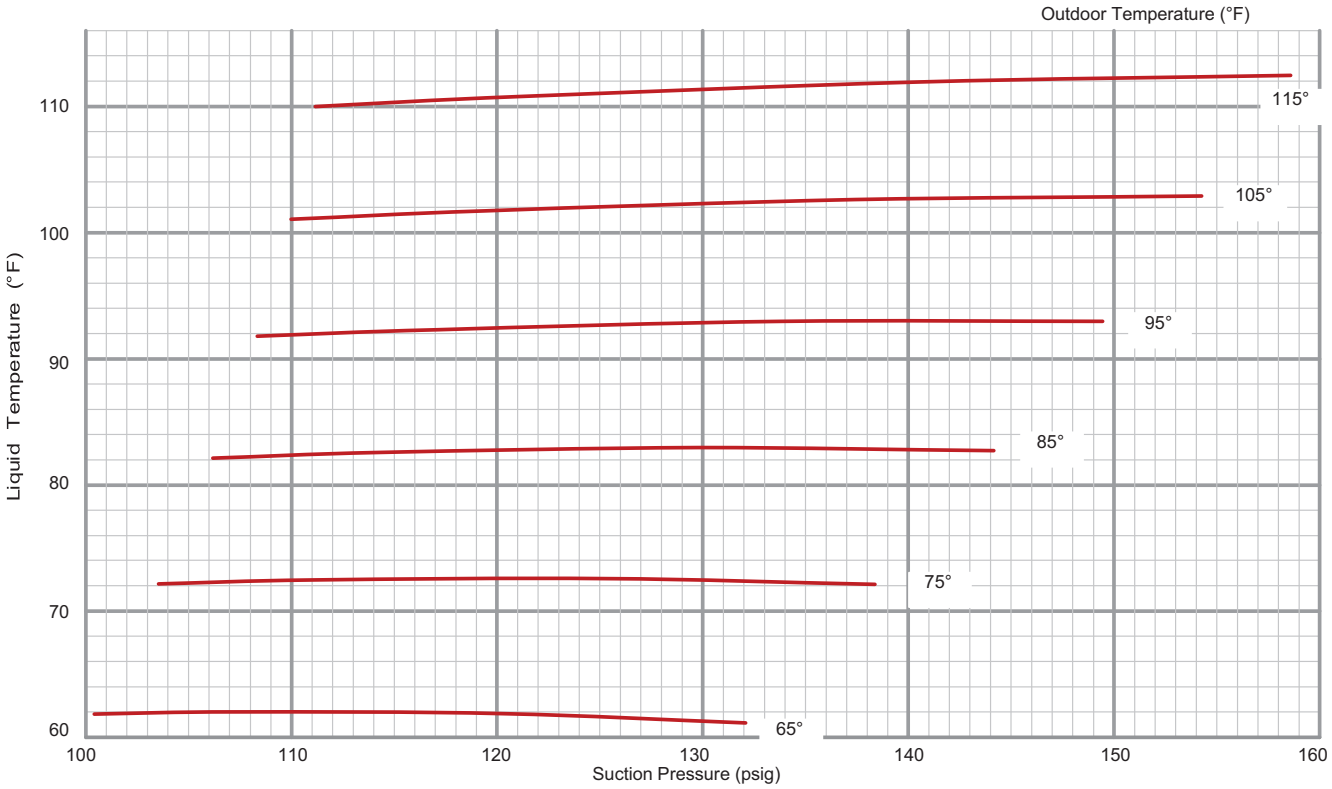


## TABLE 9

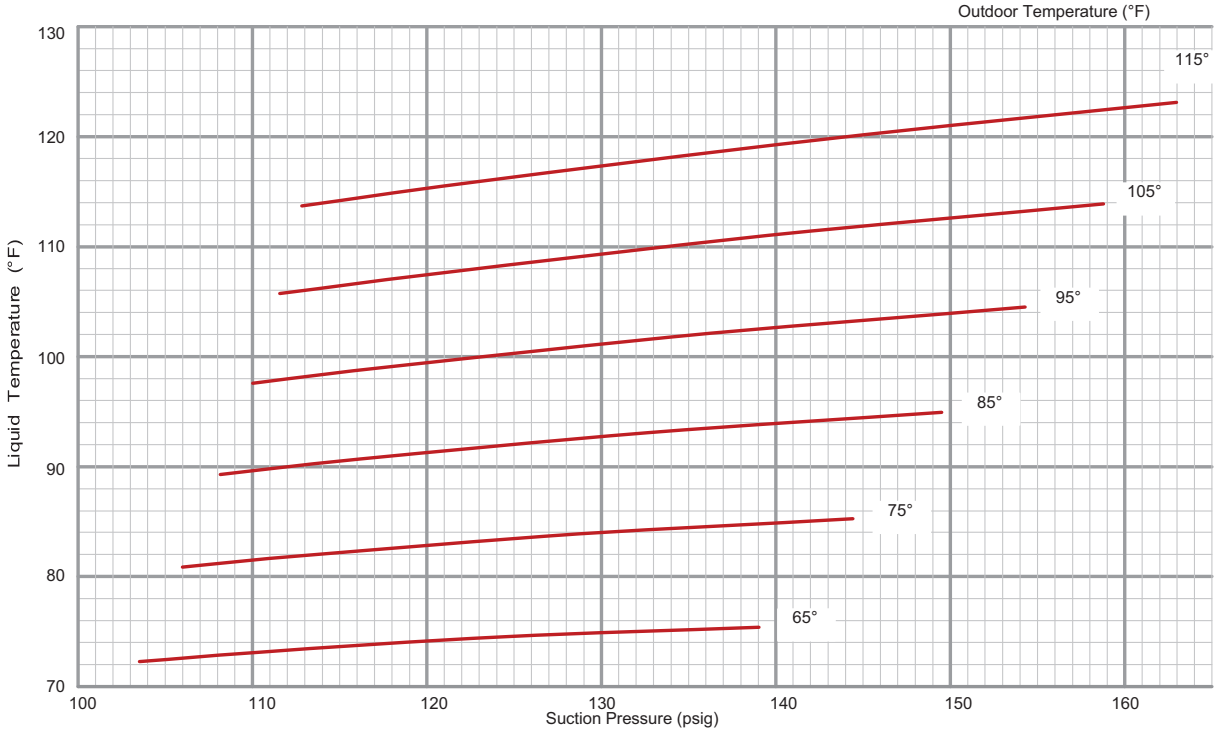
### 180 NORMAL OPERATING PRESSURES - NO REHEAT - ALL-ALUMINUM COIL - 581085-01

| | 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) |
| Circuit 1 | 100 | 217 | 104 | 249 | 106 | 287 | 108 | 331 | 110 | 379 | 111 | 433 |
| | 107 | 219 | 111 | 251 | 114 | 289 | 117 | 333 | 119 | 382 | 121 | 436 |
| | 120 | 222 | 125 | 255 | 130 | 293 | 134 | 337 | 137 | 386 | 140 | 440 |
| | 132 | 225 | 138 | 258 | 144 | 296 | 149 | 340 | 154 | 389 | 159 | 444 |
| Circuit 2 | 104 | 243 | 106 | 283 | 108 | 327 | 110 | 375 | 112 | 428 | 113 | 485 |
| | 110 | 246 | 113 | 286 | 116 | 330 | 119 | 378 | 121 | 431 | 123 | 489 |
| | 124 | 251 | 129 | 292 | 133 | 336 | 136 | 385 | 140 | 439 | 143 | 496 |
| | 139 | 258 | 144 | 299 | 150 | 344 | 154 | 393 | 159 | 447 | 163 | 505 |
| Circuit 3 | 119 | 242 | 119 | 282 | 120 | 325 | 123 | 373 | 127 | 424 | 131 | 479 |
| | 123 | 246 | 124 | 285 | 126 | 329 | 129 | 376 | 133 | 428 | 138 | 483 |
| | 135 | 252 | 138 | 292 | 141 | 336 | 145 | 384 | 150 | 435 | 157 | 491 |
| | 154 | 258 | 157 | 298 | 162 | 342 | 167 | 390 | 174 | 442 | 181 | 498 |

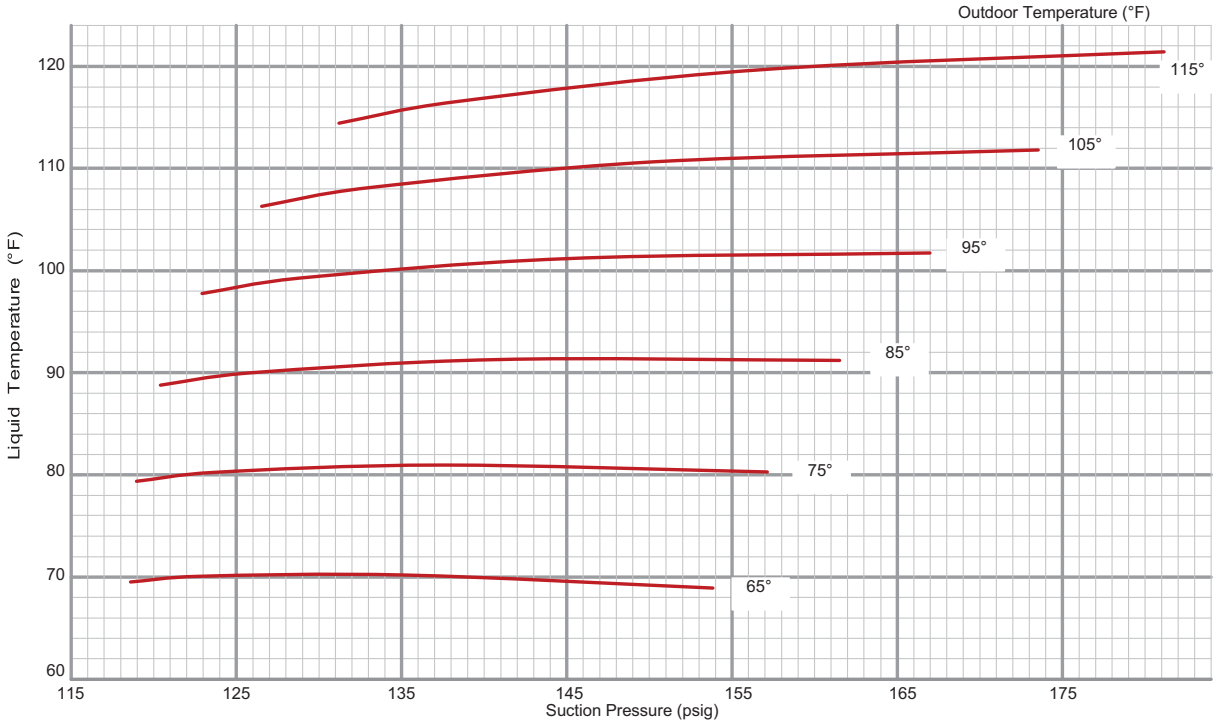
### 180 CHARGING CURVE CIRCUIT 1 - NO REHEAT - ALL-ALUMINUM COIL - 581086-01



## 180 CHARGING CURVE CIRCUIT 2 - NO REHEAT - ALL-ALUMINUM COIL - 581086-01




## 180 CHARGING CURVE CIRCUIT 3 - NO REHEAT - ALL-ALUMINUM COIL - 581086-01

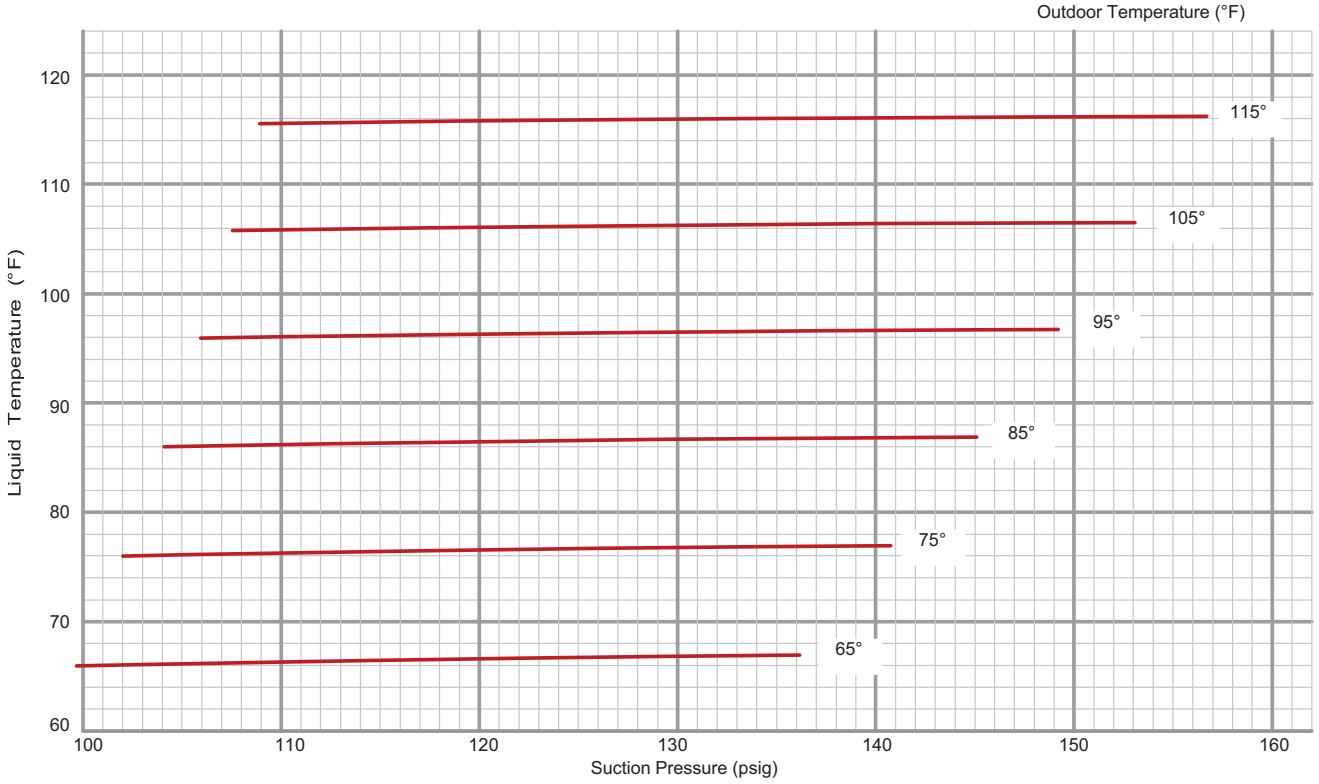


## TABLE 10

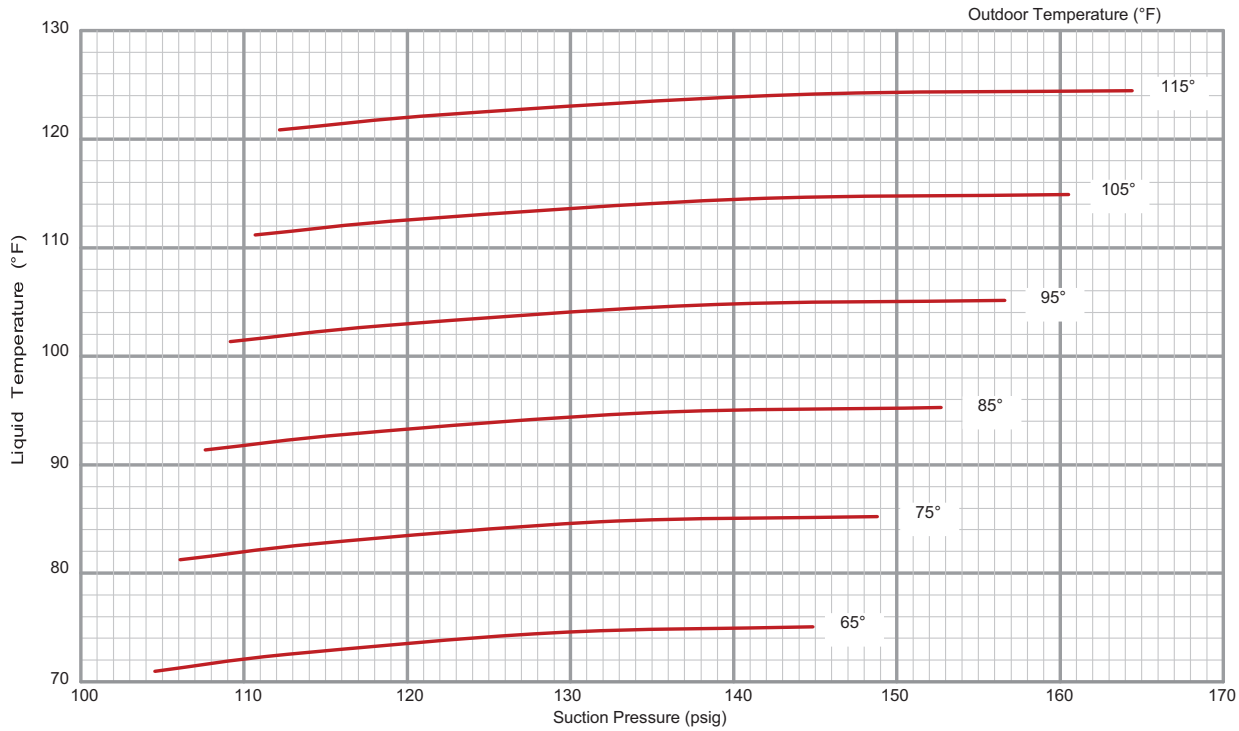
## 180 NORMAL OPERATING PRESSURES - REHEAT - ALL-ALUMINUM COIL - 581087-01

| | 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) |
| Circuit 1 | 100 | 237 | 102 | 271 | 104 | 312 | 106 | 357 | 108 | 409 | 109 | 465 |
| | 107 | 239 | 110 | 273 | 113 | 313 | 115 | 359 | 117 | 410 | 119 | 466 |
| | 122 | 245 | 126 | 279 | 129 | 318 | 133 | 363 | 136 | 414 | 138 | 470 |
| | 136 | 254 | 141 | 287 | 145 | 326 | 149 | 371 | 153 | 421 | 157 | 476 |
| Circuit 2 | 105 | 249 | 106 | 288 | 108 | 333 | 109 | 385 | 111 | 444 | 112 | 510 |
| | 113 | 251 | 115 | 288 | 117 | 332 | 119 | 384 | 121 | 442 | 123 | 507 |
| | 129 | 258 | 132 | 293 | 135 | 336 | 138 | 385 | 141 | 441 | 144 | 504 |
| | 145 | 271 | 149 | 305 | 153 | 345 | 157 | 393 | 161 | 447 | 164 | 508 |
| Circuit 3 | 113 | 251 | 115 | 290 | 116 | 333 | 118 | 382 | 120 | 435 | 122 | 494 |
| | 121 | 255 | 124 | 293 | 126 | 336 | 128 | 385 | 130 | 438 | 132 | 496 |
| | 139 | 264 | 141 | 303 | 144 | 346 | 147 | 394 | 150 | 447 | 153 | 504 |
| | 155 | 278 | 159 | 316 | 162 | 359 | 166 | 407 | 169 | 459 | 173 | 517 |

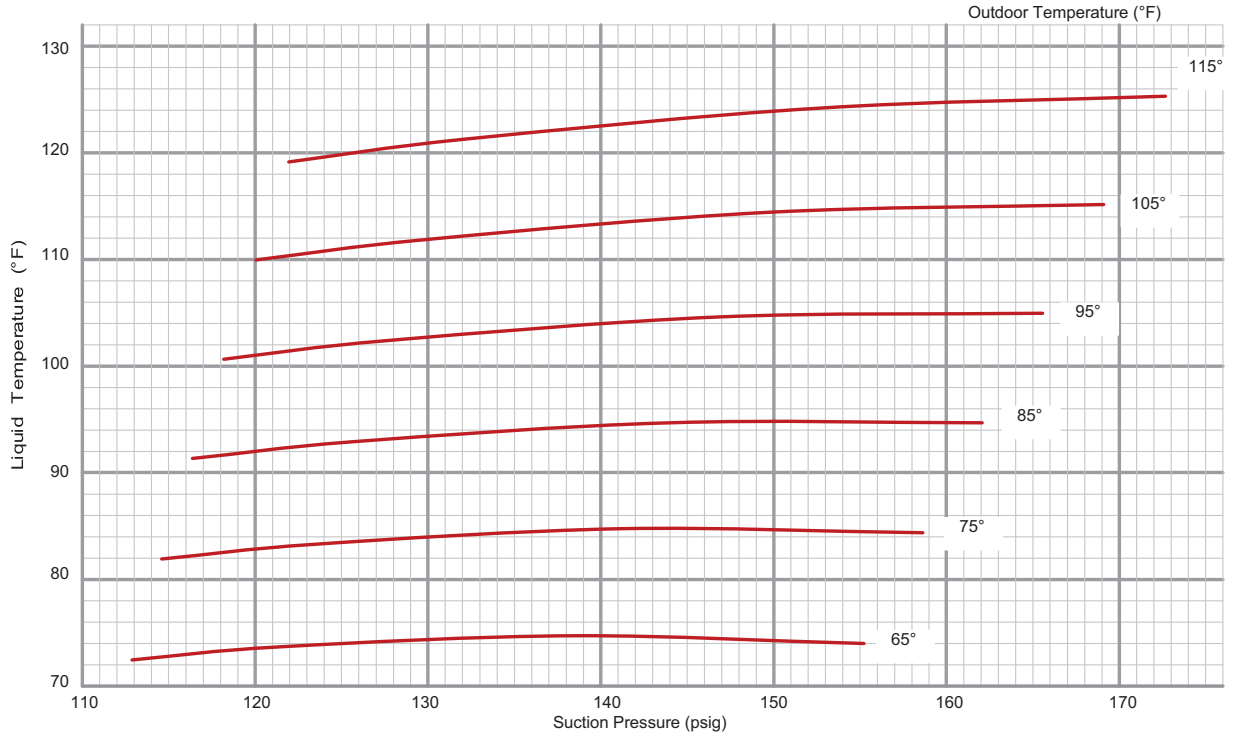
## 180 CHARGING CURVE CIRCUIT 1 - REHEAT - ALL-ALUMINUM COIL - 581088-01



## 180 CHARGING CURVE CIRCUIT 2 - REHEAT - ALL-ALUMINUM COIL - 581088-01




## 180 CHARGING CURVE CIRCUIT 3 - REHEAT - ALL-ALUMINUM COIL - 581088-01

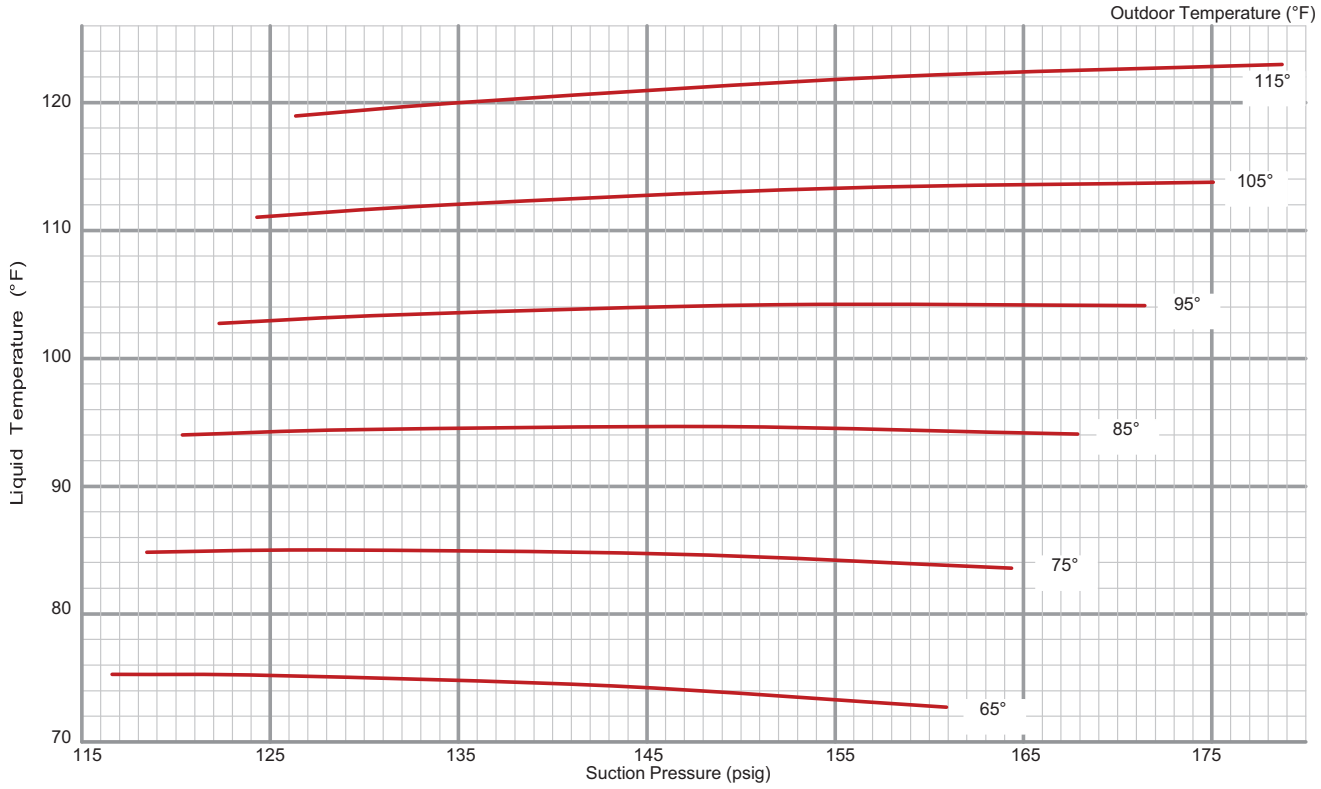


## TABLE 11

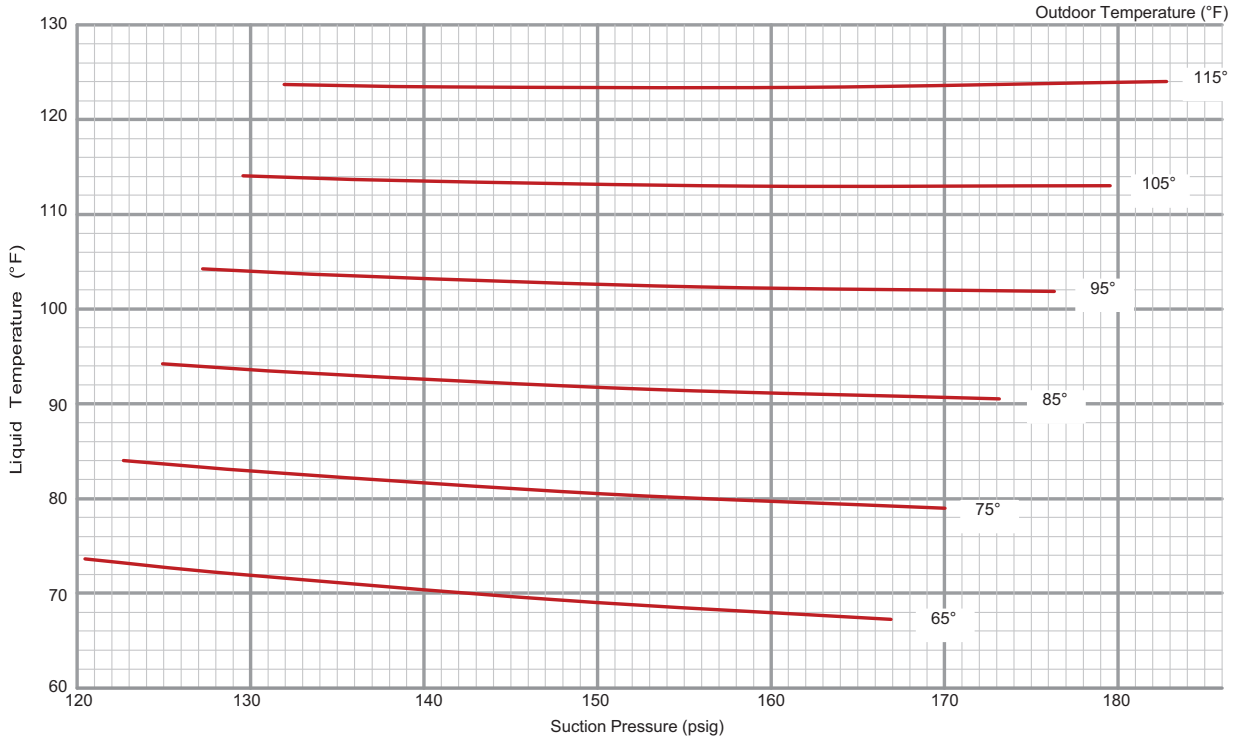
### 210 NORMAL OPERATING PRESSURES - NO REHEAT - ALL-ALUMINUM COIL - 581089-01

| | 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) |
| Circuit 1 | 117 | 250 | 118 | 288 | 120 | 330 | 122 | 376 | 124 | 426 | 126 | 480 |
| | 125 | 256 | 128 | 294 | 130 | 336 | 132 | 383 | 134 | 433 | 137 | 487 |
| | 143 | 268 | 146 | 306 | 149 | 349 | 152 | 396 | 155 | 446 | 158 | 501 |
| | 161 | 280 | 164 | 319 | 168 | 362 | 171 | 409 | 175 | 460 | 179 | 515 |
| Circuit 2 | 120 | 243 | 123 | 281 | 125 | 321 | 127 | 365 | 130 | 412 | 132 | 463 |
| | 129 | 249 | 132 | 287 | 134 | 328 | 137 | 372 | 139 | 419 | 142 | 470 |
| | 148 | 262 | 150 | 300 | 153 | 341 | 156 | 385 | 159 | 433 | 162 | 484 |
| | 167 | 276 | 170 | 314 | 173 | 355 | 176 | 400 | 180 | 448 | 183 | 499 |
| Circuit 3 | 104 | 249 | 106 | 290 | 108 | 335 | 110 | 385 | 112 | 438 | 114 | 496 |
| | 112 | 252 | 114 | 293 | 116 | 338 | 119 | 388 | 121 | 441 | 123 | 499 |
| | 129 | 258 | 132 | 299 | 134 | 345 | 137 | 394 | 139 | 447 | 142 | 505 |
| | 147 | 266 | 150 | 307 | 153 | 352 | 156 | 401 | 159 | 455 | 162 | 512 |
| Circuit 4 | 106 | 242 | 108 | 283 | 110 | 329 | 112 | 382 | 114 | 440 | 116 | 505 |
| | 113 | 244 | 116 | 284 | 118 | 330 | 120 | 382 | 123 | 440 | 125 | 504 |
| | 130 | 250 | 133 | 289 | 136 | 334 | 138 | 385 | 141 | 442 | 144 | 504 |
| | 147 | 260 | 150 | 298 | 154 | 341 | 157 | 391 | 161 | 447 | 164 | 508 |

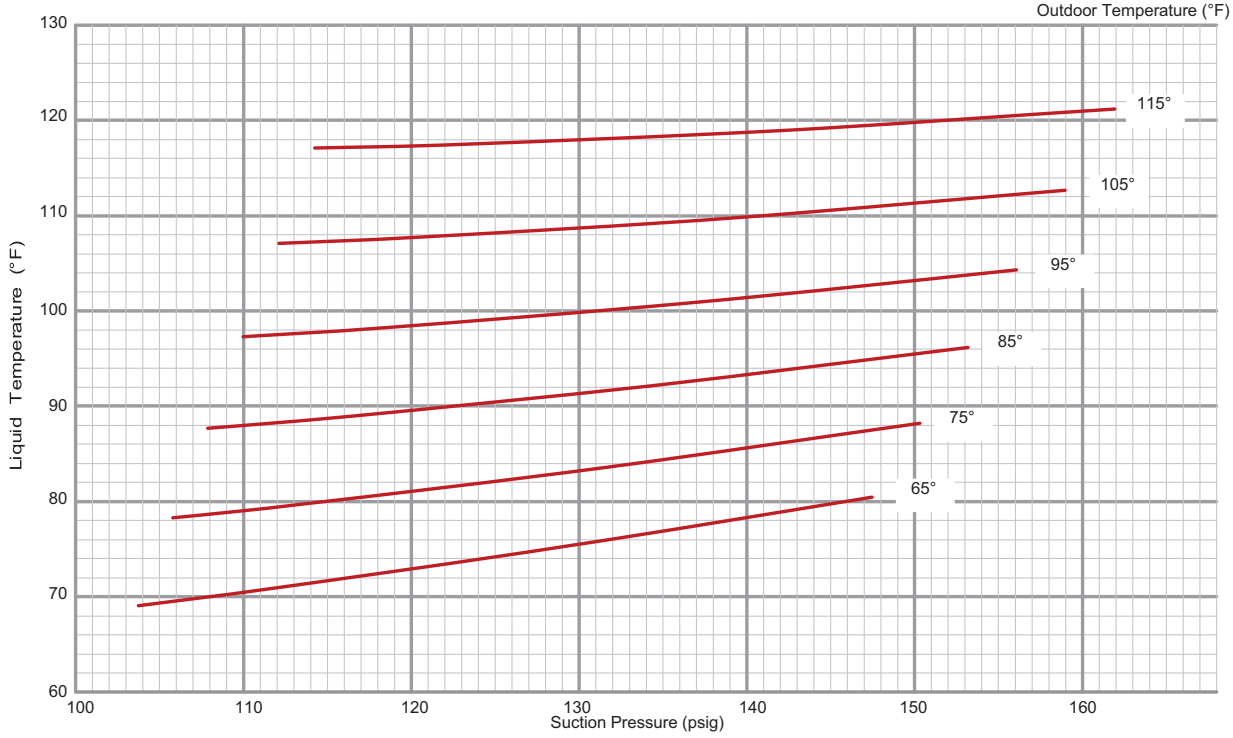
### 210 CHARGING CURVE CIRCUIT 1 - NO REHEAT - ALL-ALUMINUM COIL - 581090-01



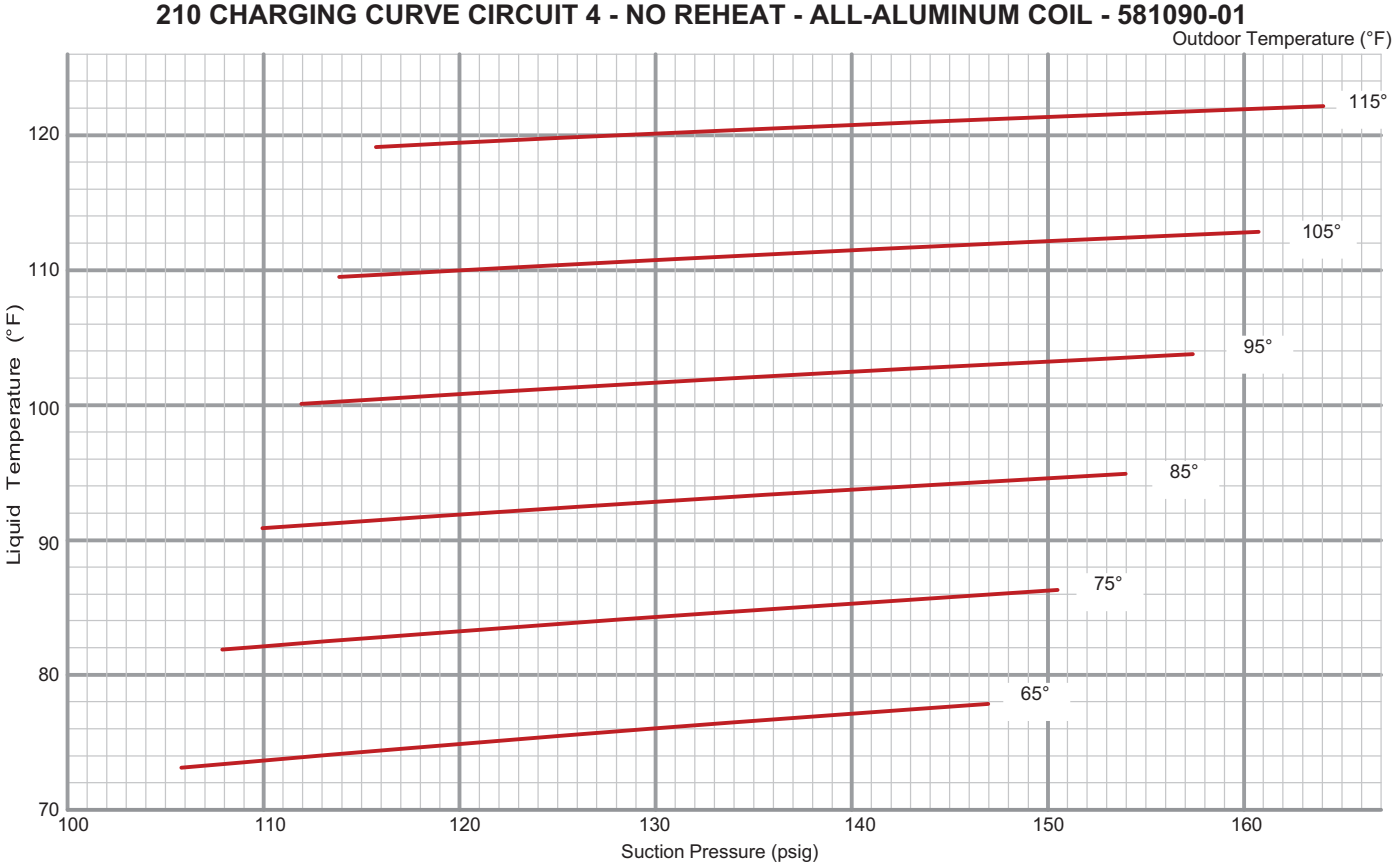
## 210 CHARGING CURVE CIRCUIT 2 - NO REHEAT - ALL-ALUMINUM COIL - 581090-01




## 210 CHARGING CURVE CIRCUIT 3 - NO REHEAT - ALL-ALUMINUM COIL - 581090-01



## 210 CHARGING CURVE CIRCUIT 4 - NO REHEAT - ALL-ALUMINUM COIL - 581090-01

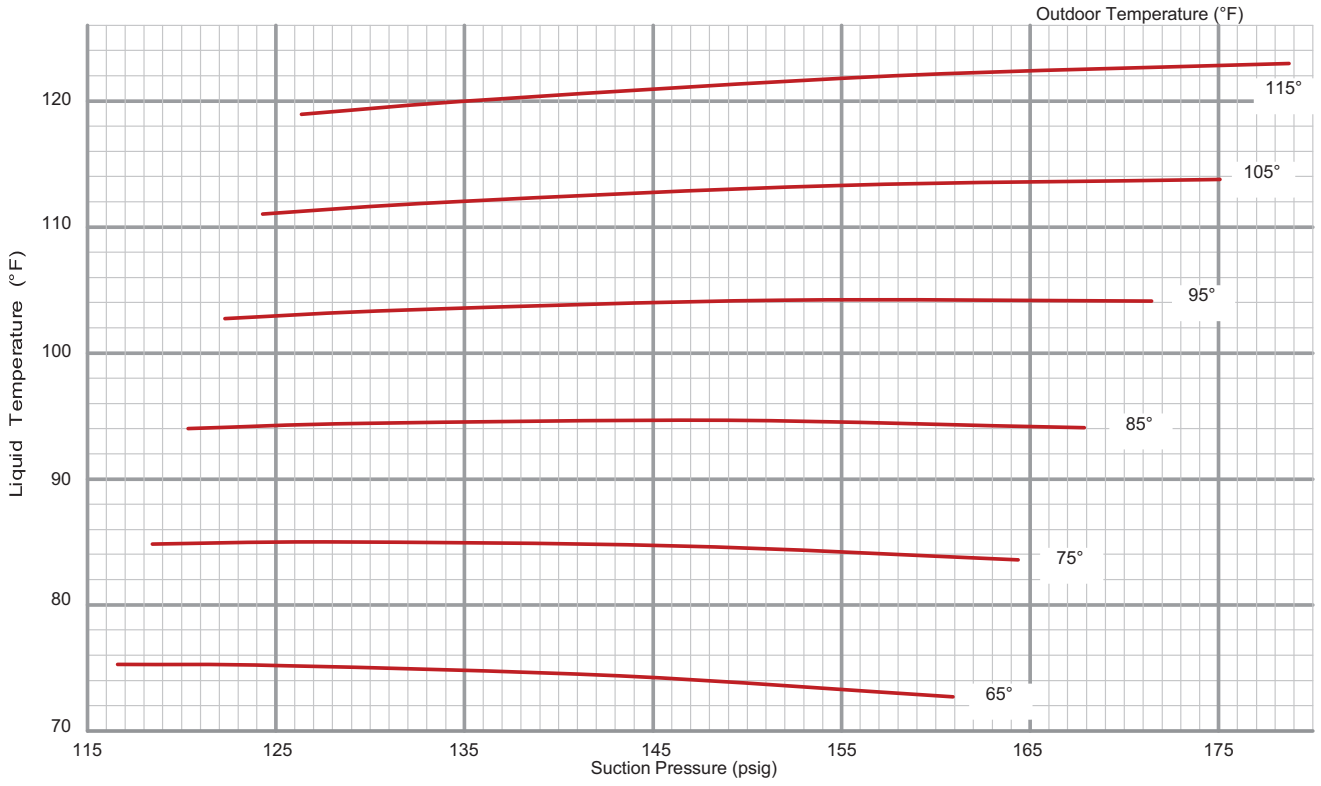


## TABLE 12

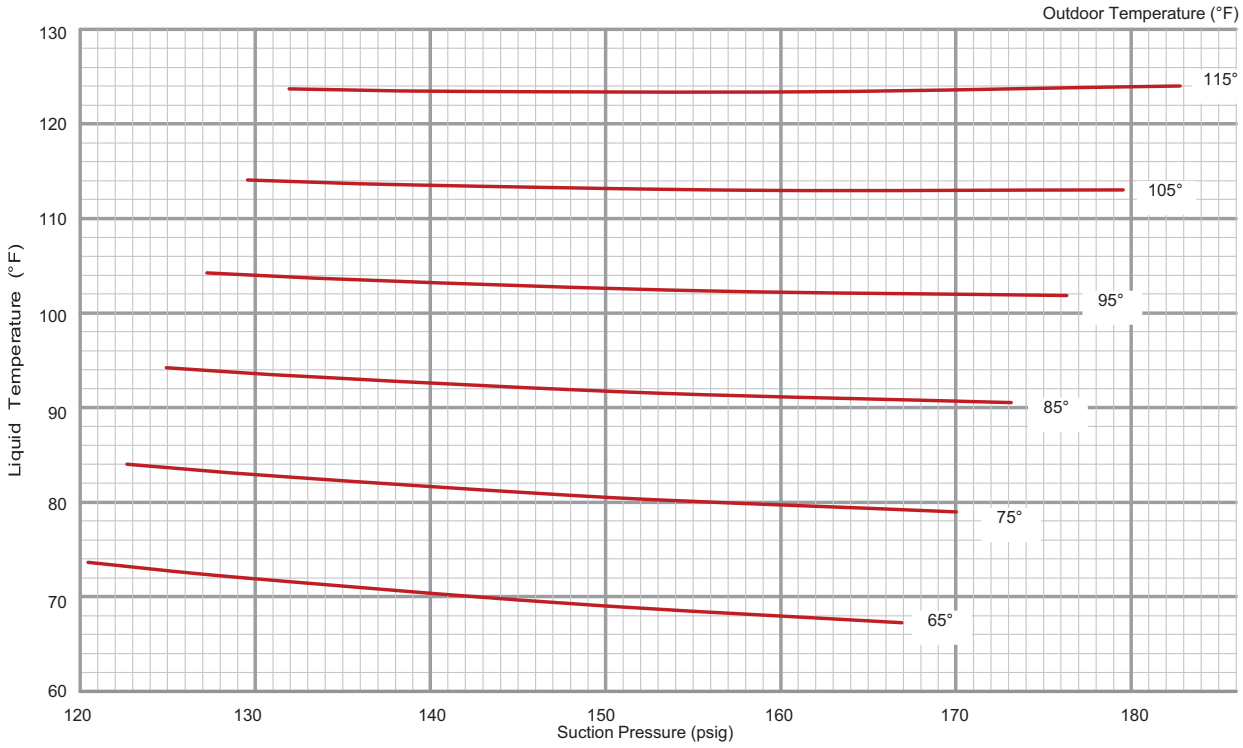
### 210 NORMAL OPERATING PRESSURES - REHEAT - ALL-ALUMINUM COIL - 581091-01

| | 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) |
| Circuit 1 | 117 | 250 | 118 | 288 | 120 | 330 | 122 | 376 | 124 | 426 | 126 | 480 |
| | 125 | 256 | 128 | 294 | 130 | 336 | 132 | 383 | 134 | 433 | 137 | 487 |
| | 143 | 268 | 146 | 306 | 149 | 349 | 152 | 396 | 155 | 446 | 158 | 501 |
| | 161 | 280 | 164 | 319 | 168 | 362 | 171 | 409 | 175 | 460 | 179 | 515 |
| Circuit 2 | 120 | 243 | 123 | 281 | 125 | 321 | 127 | 365 | 130 | 412 | 132 | 463 |
| | 129 | 249 | 132 | 287 | 134 | 328 | 137 | 372 | 139 | 419 | 142 | 470 |
| | 148 | 262 | 150 | 300 | 153 | 341 | 156 | 385 | 159 | 433 | 162 | 484 |
| | 167 | 276 | 170 | 314 | 173 | 355 | 176 | 400 | 180 | 448 | 183 | 499 |
| Circuit 3 | 104 | 249 | 106 | 290 | 108 | 335 | 110 | 385 | 112 | 438 | 114 | 496 |
| | 112 | 252 | 114 | 293 | 116 | 338 | 119 | 388 | 121 | 441 | 123 | 499 |
| | 129 | 258 | 132 | 299 | 134 | 345 | 137 | 394 | 139 | 447 | 142 | 505 |
| | 147 | 266 | 150 | 307 | 153 | 352 | 156 | 401 | 159 | 455 | 162 | 512 |
| Circuit 4 | 106 | 242 | 108 | 283 | 110 | 329 | 112 | 382 | 114 | 440 | 116 | 505 |
| | 113 | 244 | 116 | 284 | 118 | 330 | 120 | 382 | 123 | 440 | 125 | 504 |
| | 130 | 250 | 133 | 289 | 136 | 334 | 138 | 385 | 141 | 442 | 144 | 504 |
| | 147 | 260 | 150 | 298 | 154 | 341 | 157 | 391 | 161 | 447 | 164 | 508 |

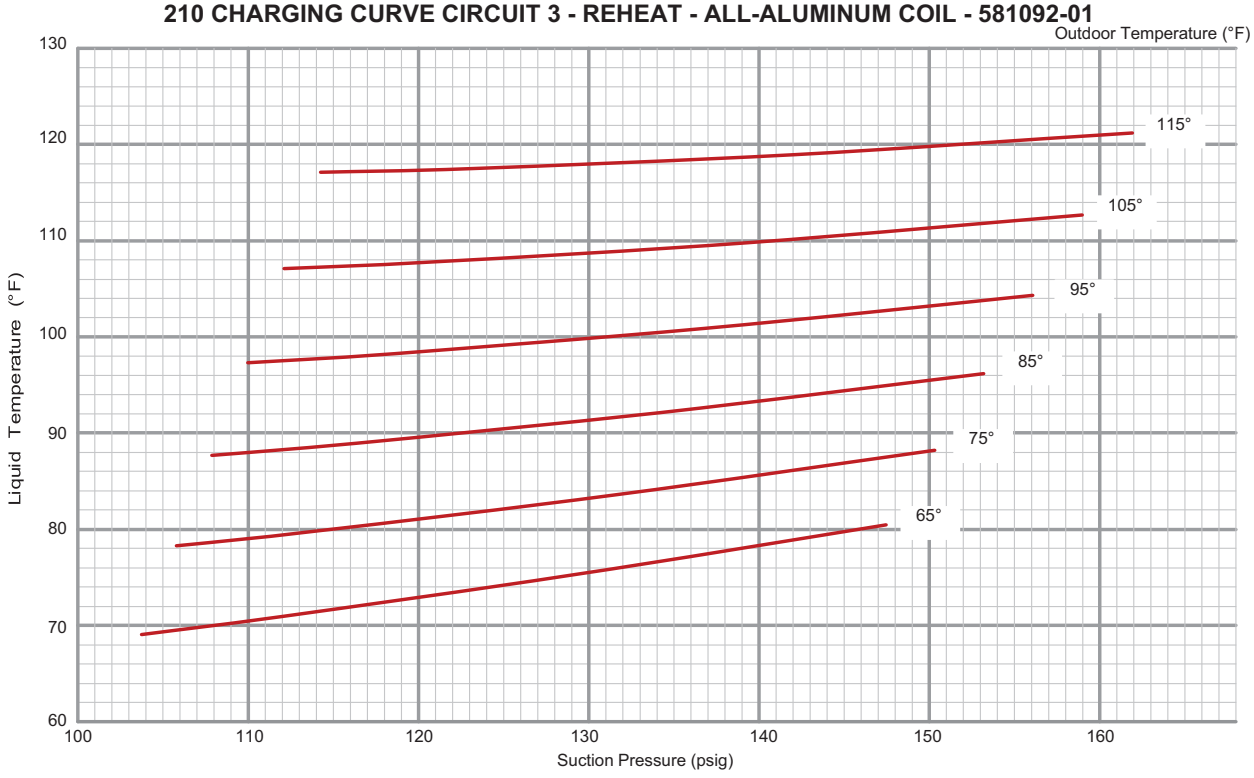
### 210 CHARGING CURVE CIRCUIT 1 - REHEAT - ALL-ALUMINUM COIL - 581092-01



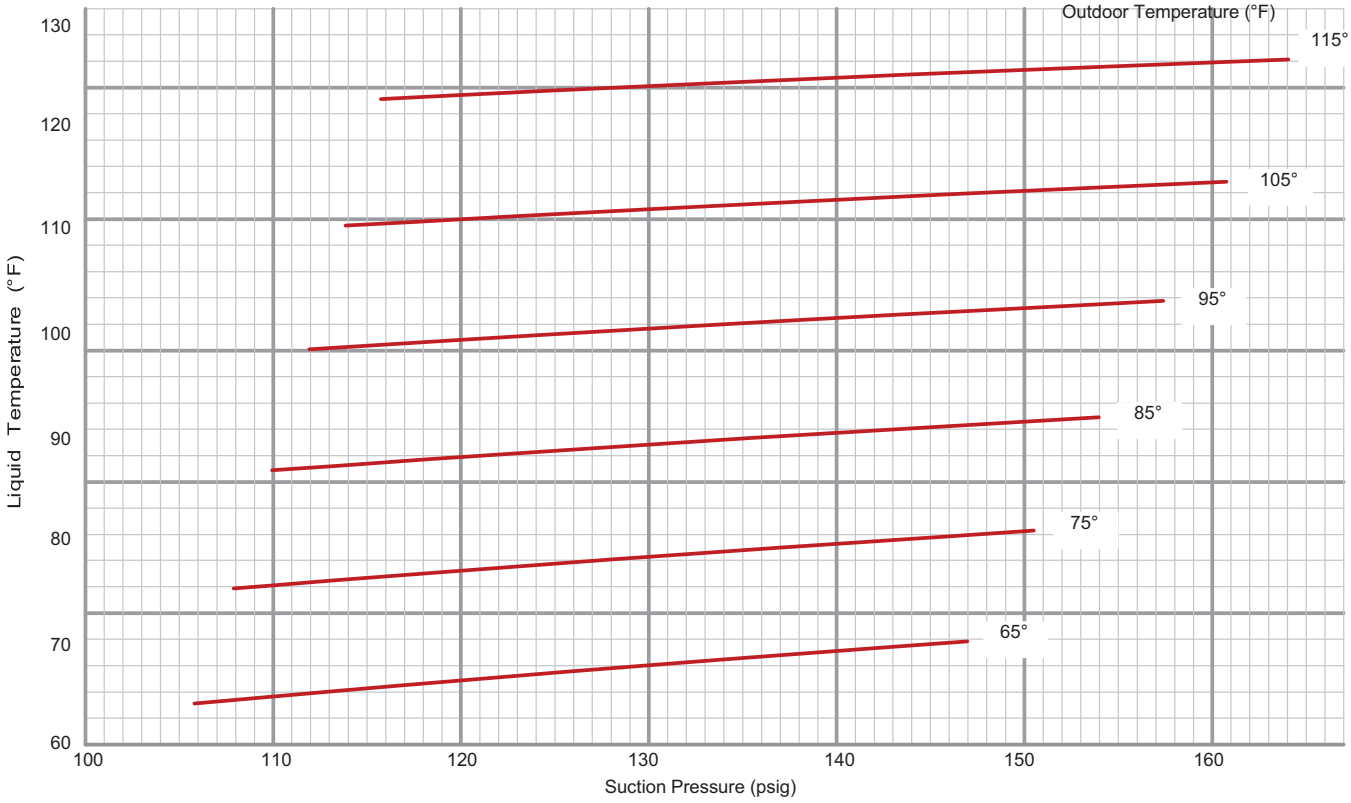
## 210 CHARGING CURVE CIRCUIT 2 - REHEAT - ALL-ALUMINUM COIL - 581092-01




## 210 CHARGING CURVE CIRCUIT 3 - REHEAT - ALL-ALUMINUM COIL - 581092-01



## 210 CHARGING CURVE CIRCUIT 4 - REHEAT - ALL-ALUMINUM COIL - 581092-01

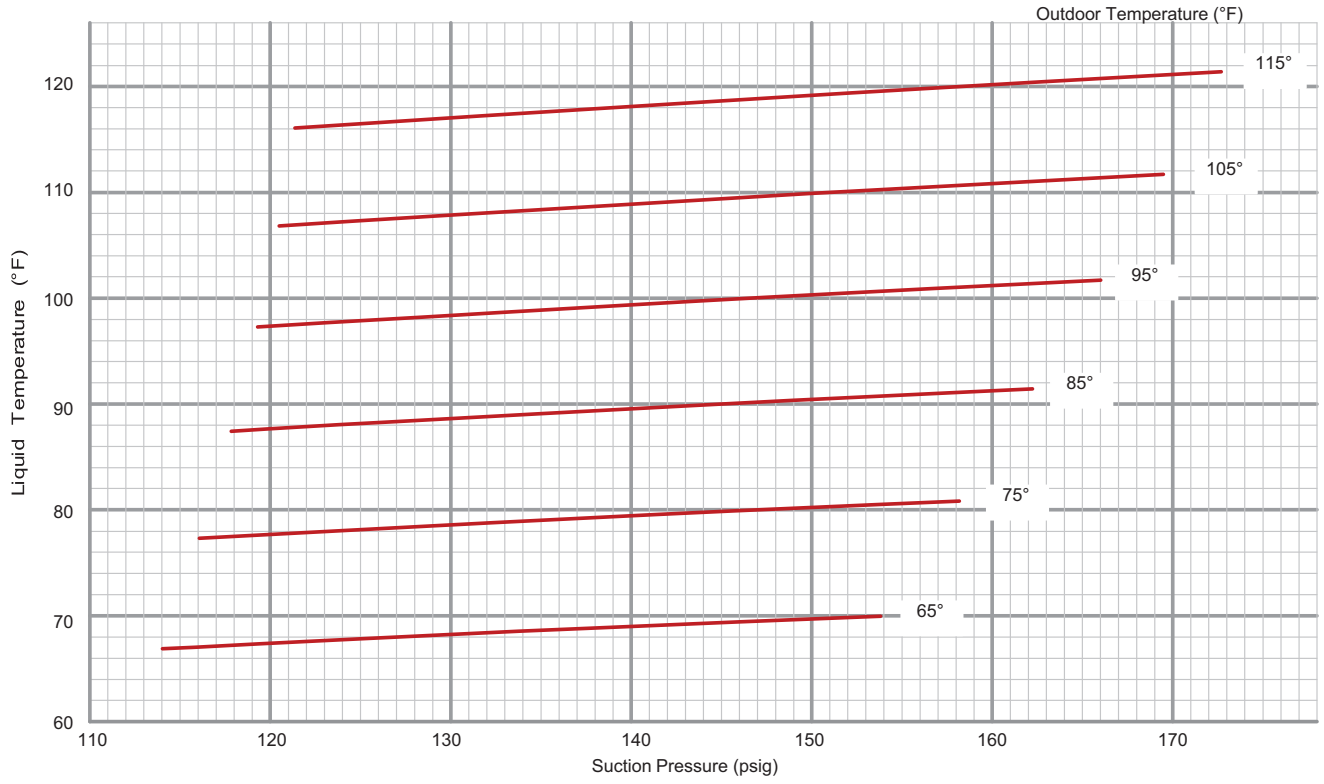


## TABLE 13

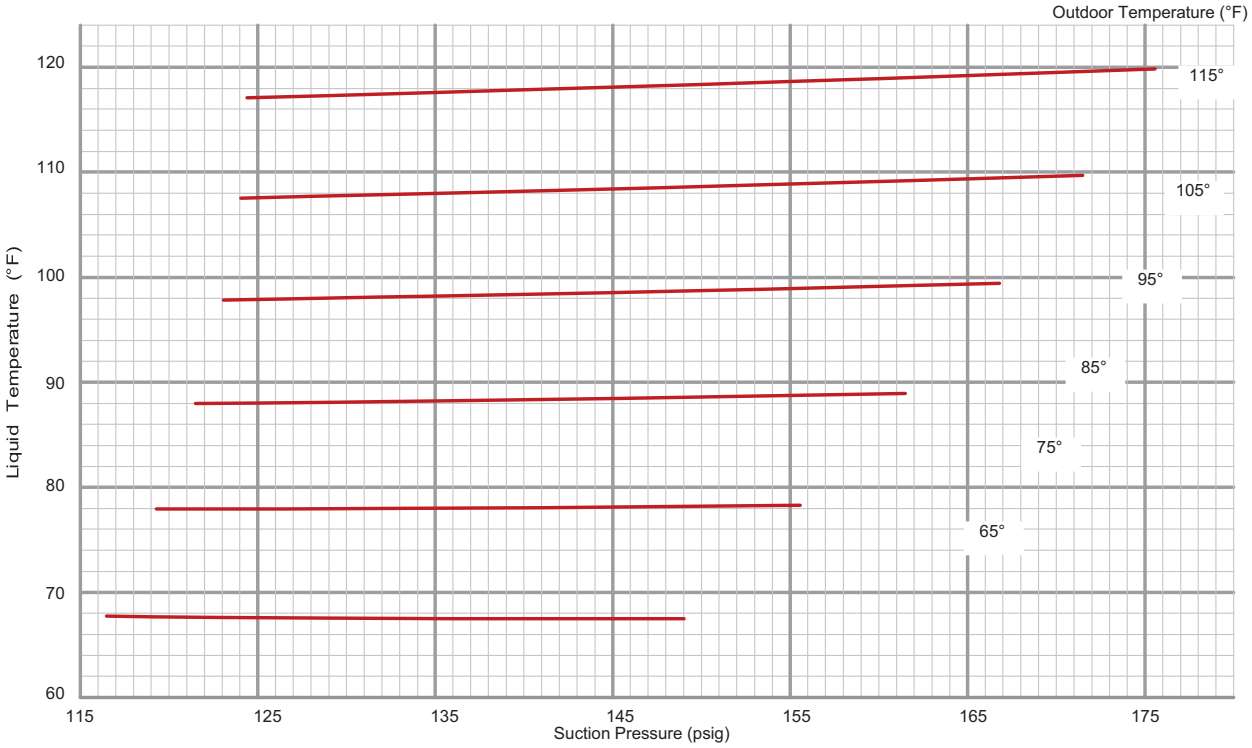
### 240 NORMAL OPERATING PRESSURES - NO REHEAT - ALL-ALUMINUM COIL - 581093-01

| | 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) |
| Circuit 1 | 114 | 253 | 116 | 292 | 118 | 337 | 119 | 387 | 120 | 441 | 121 | 501 |
| | 122 | 255 | 125 | 294 | 127 | 339 | 129 | 388 | 130 | 443 | 132 | 503 |
| | 138 | 262 | 141 | 301 | 145 | 345 | 147 | 394 | 150 | 448 | 152 | 507 |
| | 154 | 271 | 158 | 310 | 162 | 353 | 166 | 402 | 169 | 456 | 173 | 515 |
| Circuit 2 | 116 | 240 | 119 | 279 | 121 | 324 | 123 | 374 | 124 | 429 | 124 | 490 |
| | 123 | 243 | 127 | 281 | 129 | 326 | 132 | 375 | 134 | 430 | 135 | 490 |
| | 136 | 250 | 141 | 288 | 145 | 331 | 149 | 379 | 152 | 433 | 155 | 493 |
| | 149 | 259 | 156 | 296 | 161 | 339 | 167 | 386 | 171 | 439 | 176 | 498 |
| Circuit 3 | 101 | 250 | 103 | 290 | 105 | 335 | 107 | 385 | 109 | 439 | 111 | 498 |
| | 108 | 252 | 111 | 292 | 113 | 337 | 116 | 387 | 118 | 441 | 120 | 499 |
| | 124 | 257 | 127 | 298 | 130 | 343 | 133 | 392 | 135 | 446 | 138 | 504 |
| | 141 | 266 | 144 | 306 | 148 | 350 | 151 | 399 | 154 | 453 | 157 | 512 |
| Circuit 4 | 101 | 247 | 104 | 289 | 105 | 336 | 107 | 390 | 109 | 449 | 111 | 514 |
| | 109 | 249 | 111 | 290 | 114 | 336 | 116 | 389 | 118 | 447 | 120 | 511 |
| | 125 | 255 | 128 | 294 | 131 | 339 | 134 | 390 | 137 | 447 | 139 | 509 |
| | 141 | 264 | 145 | 301 | 149 | 345 | 153 | 394 | 156 | 449 | 160 | 510 |

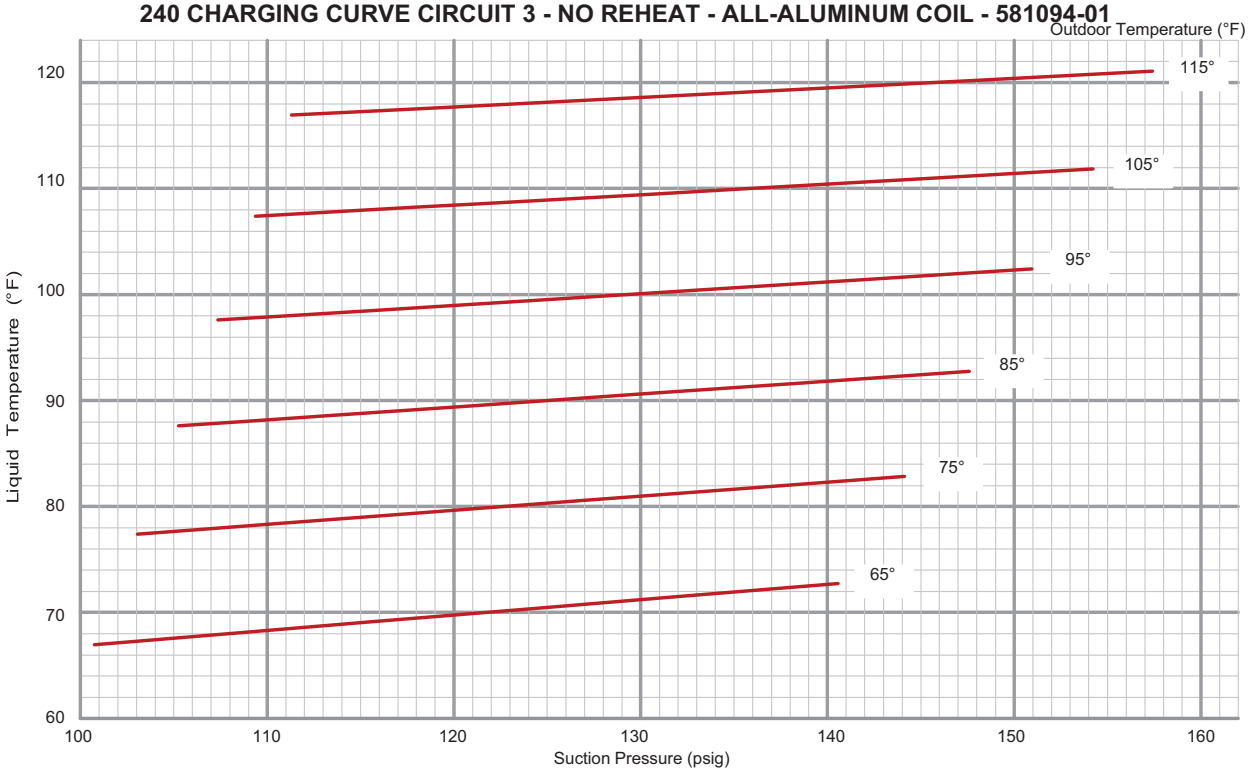
### 240 CHARGING CURVE CIRCUIT 1 - NO REHEAT - ALL-ALUMINUM COIL - 581094-01



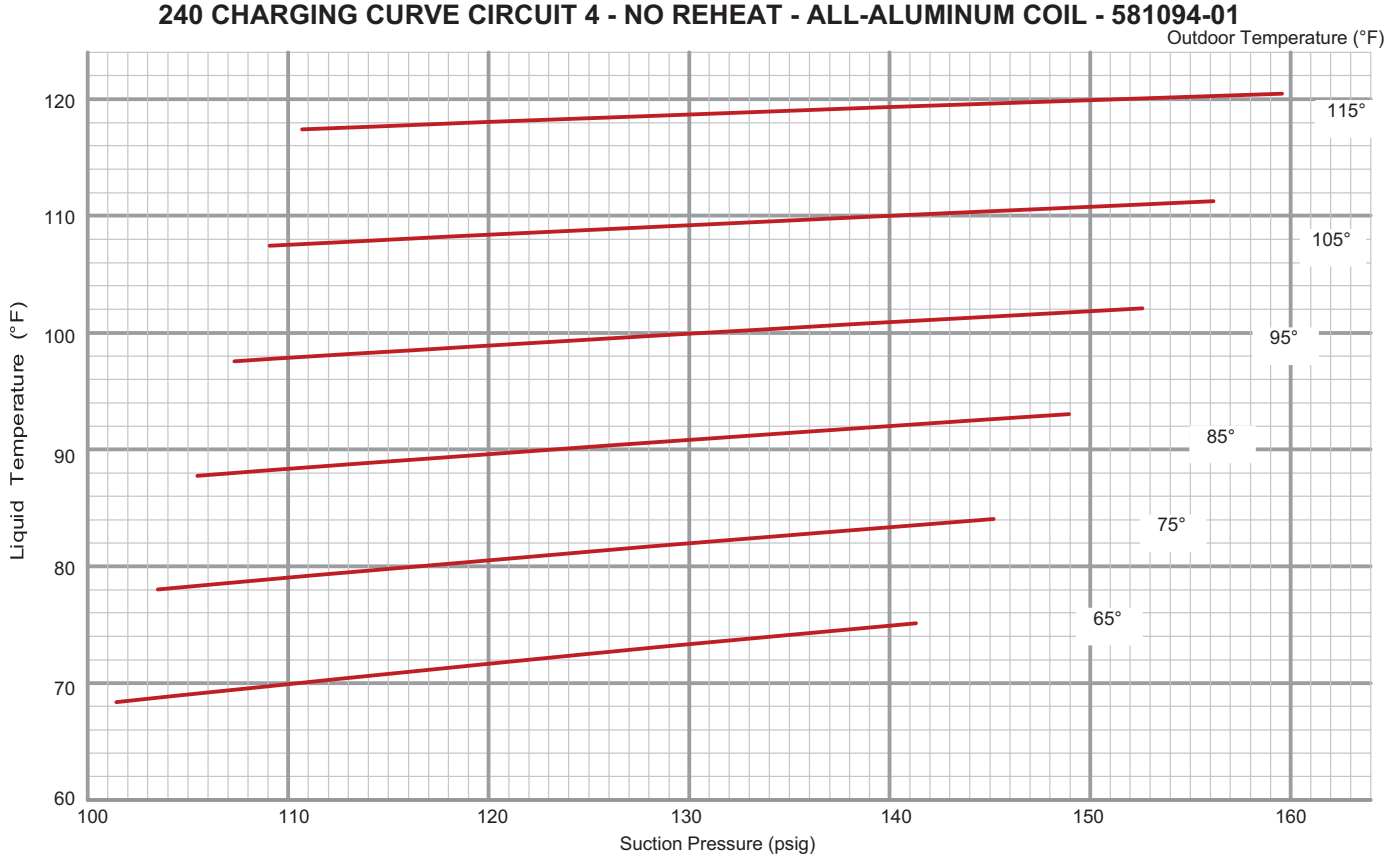
## 240 CHARGING CURVE CIRCUIT 2 - NO REHEAT - ALL-ALUMINUM COIL - 581094-01




## 240 CHARGING CURVE CIRCUIT 3 - NO REHEAT - ALL-ALUMINUM COIL - 581094-01



## 240 CHARGING CURVE CIRCUIT 4 - NO REHEAT - ALL-ALUMINUM COIL - 581094-01

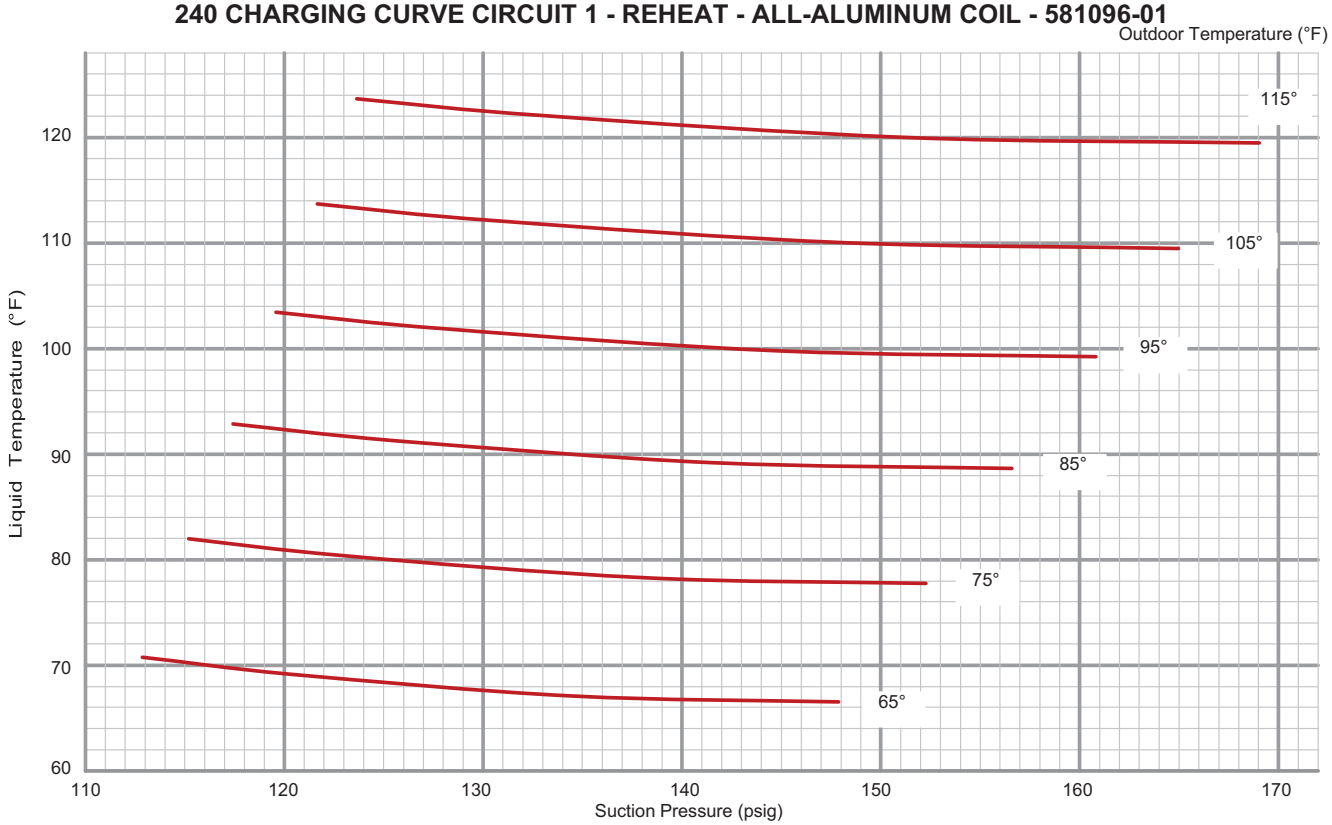


## TABLE 14

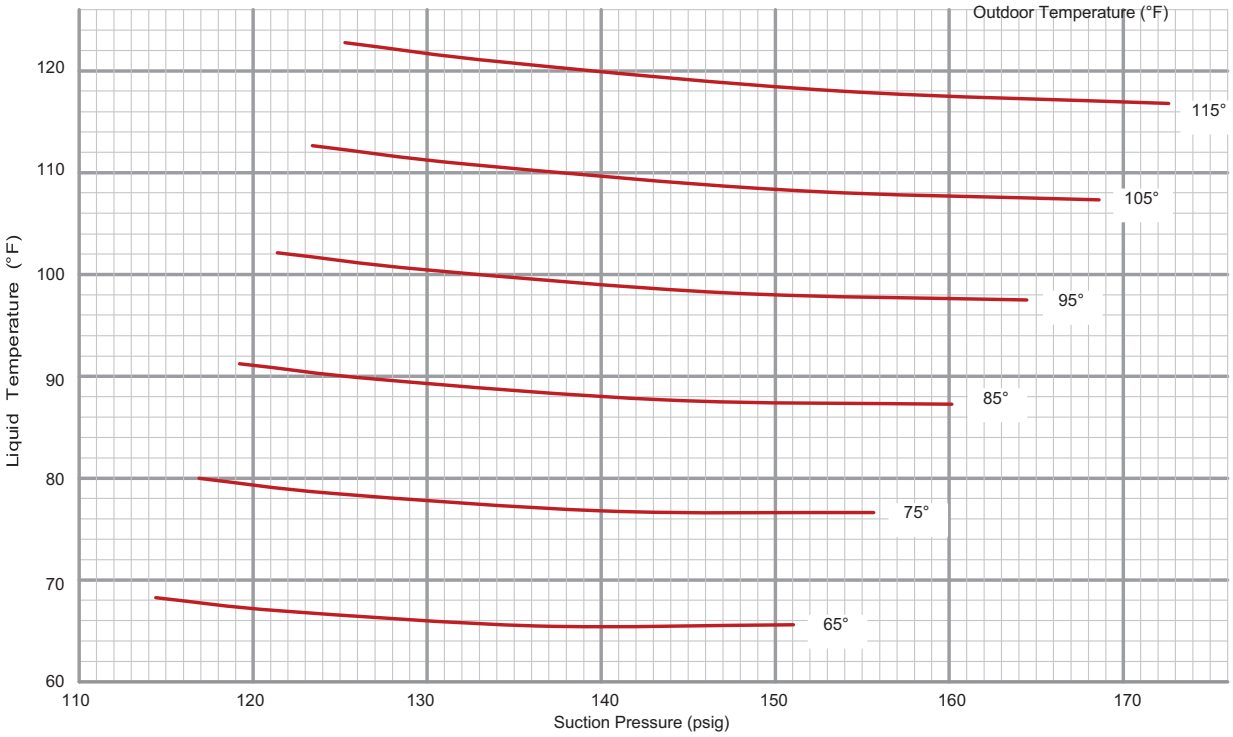
## 240 NORMAL OPERATING PRESSURES - REHEAT - ALL-ALUMINUM COIL - 581095-01

| | 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) |
| Circuit 1 | 113 | 247 | 115 | 281 | 117 | 320 | 120 | 363 | 122 | 411 | 124 | 463 |
| | 120 | 253 | 123 | 288 | 126 | 327 | 128 | 371 | 131 | 419 | 133 | 472 |
| | 134 | 265 | 138 | 301 | 142 | 341 | 145 | 386 | 148 | 435 | 151 | 488 |
| | 148 | 276 | 152 | 312 | 157 | 353 | 161 | 399 | 165 | 448 | 169 | 503 |
| Circuit 2 | 114 | 239 | 117 | 272 | 119 | 309 | 121 | 352 | 123 | 401 | 125 | 454 |
| | 122 | 249 | 125 | 281 | 127 | 319 | 130 | 362 | 132 | 410 | 135 | 464 |
| | 136 | 266 | 140 | 299 | 144 | 337 | 147 | 380 | 150 | 429 | 154 | 482 |
| | 151 | 284 | 156 | 316 | 160 | 355 | 164 | 398 | 169 | 447 | 173 | 501 |
| Circuit 3 | 99 | 241 | 102 | 281 | 104 | 325 | 106 | 373 | 108 | 426 | 109 | 483 |
| | 106 | 244 | 109 | 284 | 112 | 328 | 114 | 376 | 116 | 429 | 118 | 487 |
| | 121 | 252 | 125 | 291 | 128 | 335 | 131 | 383 | 133 | 436 | 136 | 493 |
| | 137 | 259 | 141 | 299 | 145 | 343 | 149 | 391 | 152 | 444 | 155 | 501 |
| Circuit 4 | 102 | 239 | 105 | 279 | 107 | 325 | 108 | 377 | 110 | 435 | 110 | 499 |
| | 109 | 241 | 112 | 281 | 115 | 326 | 117 | 378 | 118 | 435 | 120 | 498 |
| | 123 | 248 | 127 | 286 | 131 | 331 | 134 | 381 | 137 | 437 | 139 | 500 |
| | 138 | 257 | 143 | 294 | 148 | 338 | 152 | 387 | 156 | 442 | 159 | 503 |

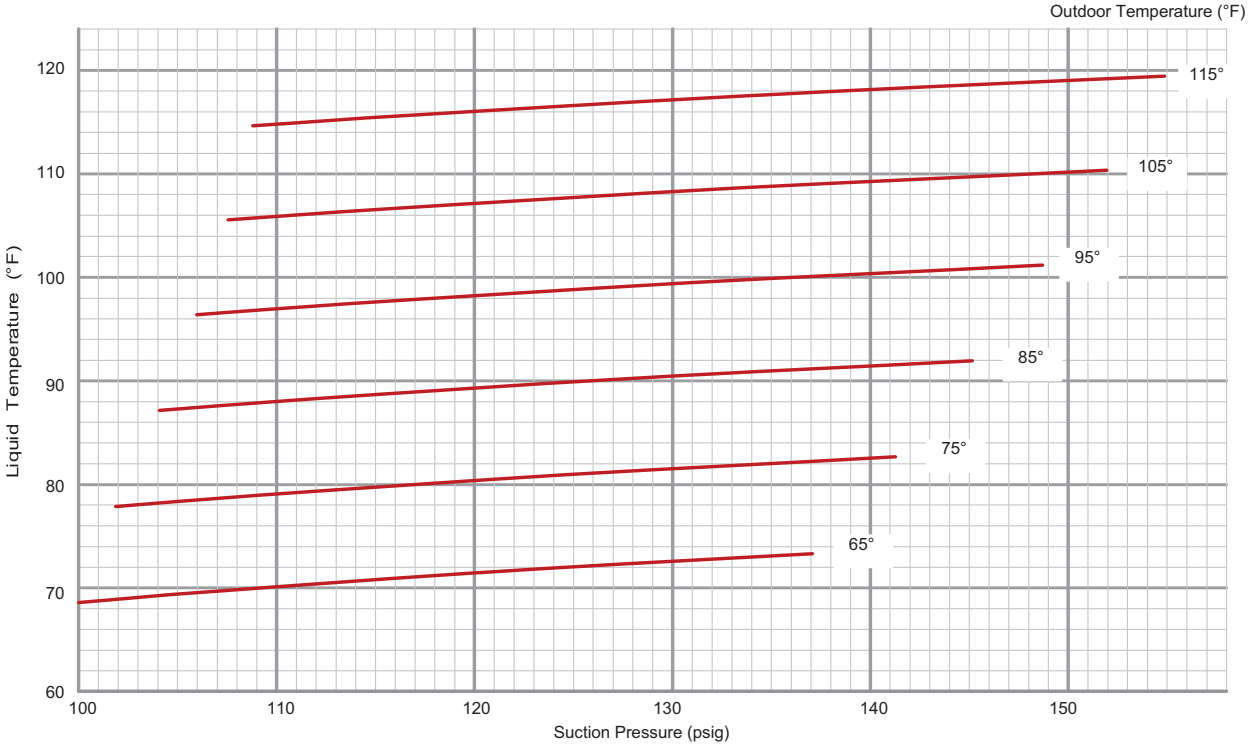
## 240 CHARGING CURVE CIRCUIT 1 - REHEAT - ALL-ALUMINUM COIL - 581096-01



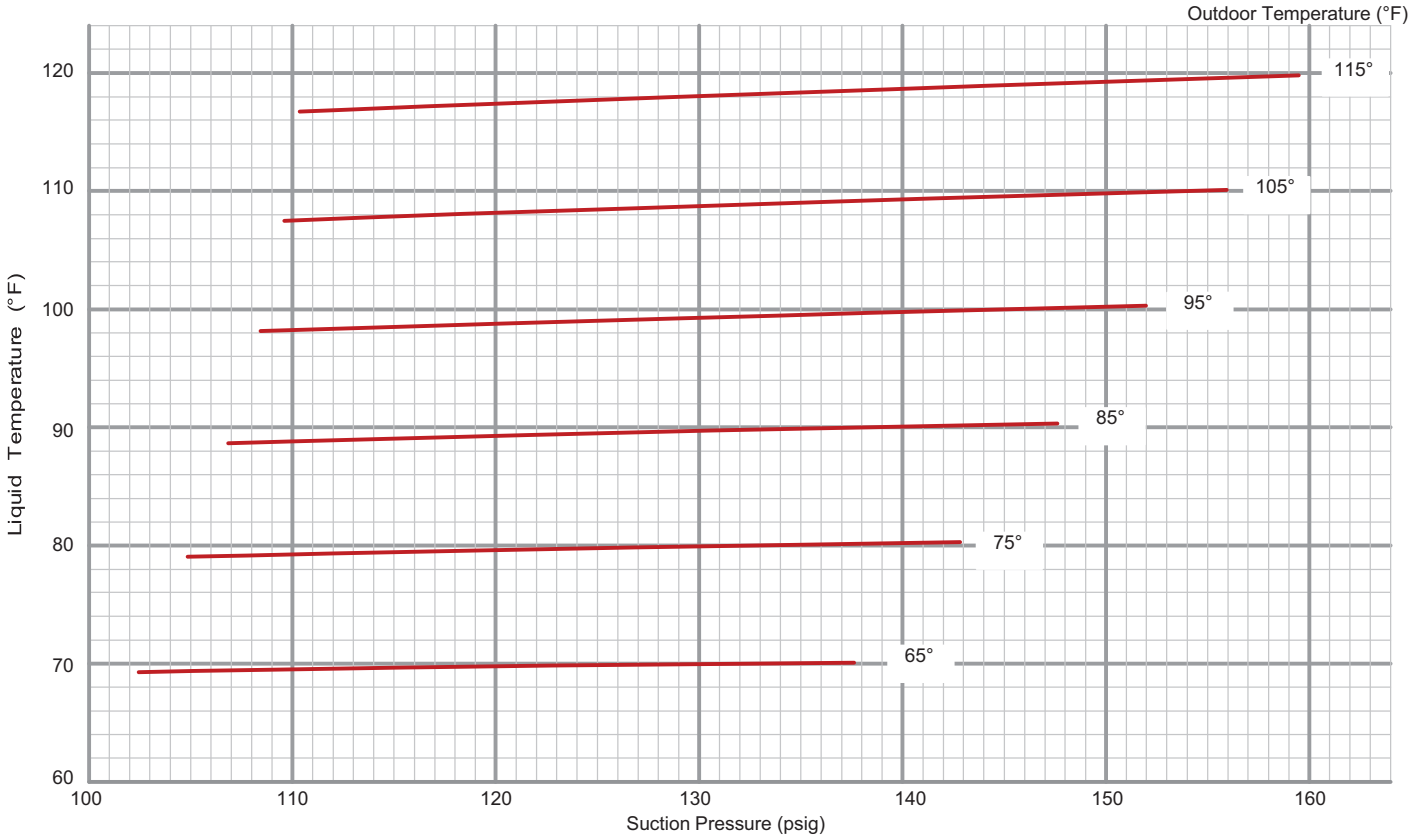
## 240 CHARGING CURVE CIRCUIT 2 - REHEAT - ALL-ALUMINUM COIL - 581096-01




## 240 CHARGING CURVE CIRCUIT 3 - REHEAT - ALL-ALUMINUM COIL - 581096-01



## 240 CHARGING CURVE CIRCUIT 4 - REHEAT - ALL-ALUMINUM COIL - 581096-01

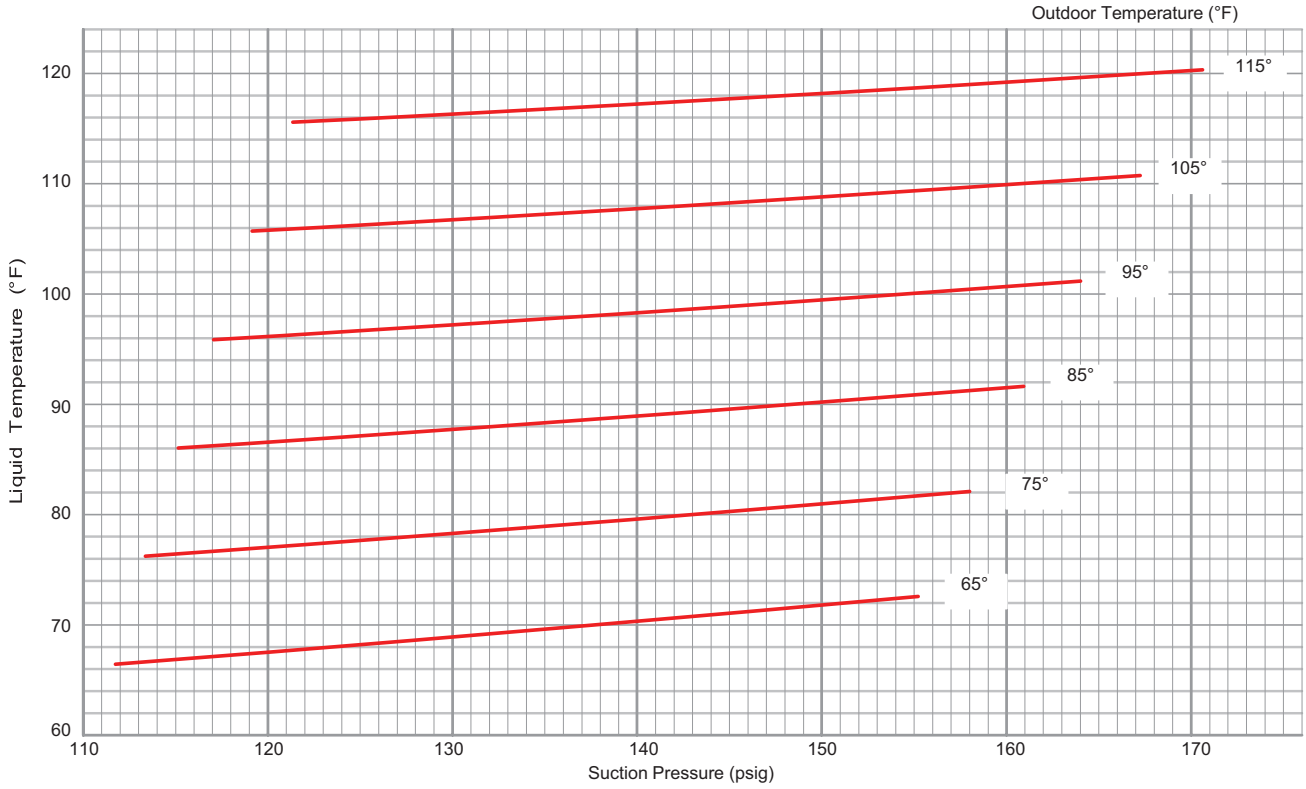


## TABLE 15

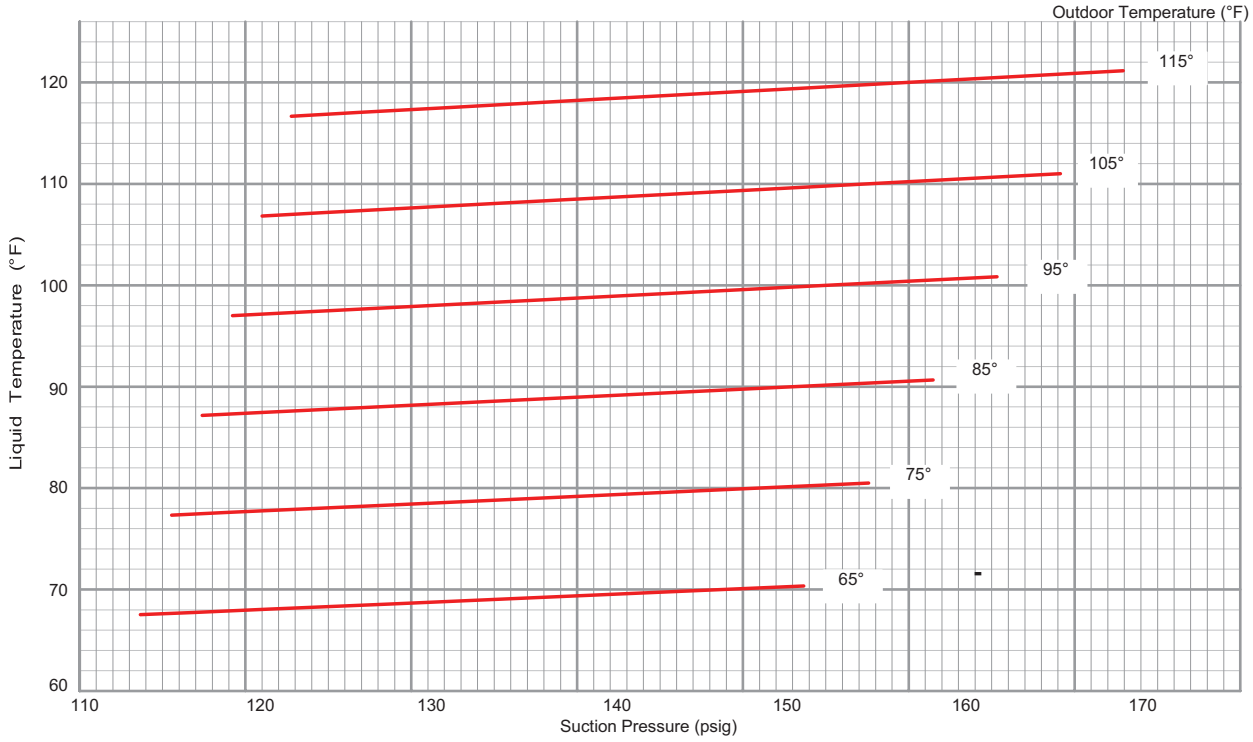
### 300 NORMAL OPERATING PRESSURES - NO REHEAT - ALL-ALUMINUM COIL - 581097-01

| | 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) |
| Circuit 1 | 112 | 260 | 113 | 302 | 115 | 349 | 117 | 401 | 119 | 459 | 121 | 523 |
| | 120 | 264 | 122 | 305 | 124 | 352 | 126 | 404 | 128 | 462 | 131 | 525 |
| | 137 | 273 | 140 | 313 | 142 | 359 | 145 | 410 | 147 | 467 | 150 | 529 |
| | 155 | 283 | 158 | 322 | 161 | 367 | 164 | 417 | 167 | 473 | 171 | 535 |
| Circuit 2 | 114 | 245 | 116 | 285 | 117 | 329 | 119 | 379 | 121 | 434 | 123 | 494 |
| | 121 | 249 | 124 | 289 | 126 | 333 | 128 | 383 | 130 | 438 | 133 | 497 |
| | 137 | 257 | 140 | 297 | 144 | 341 | 147 | 390 | 150 | 445 | 153 | 505 |
| | 154 | 265 | 158 | 304 | 161 | 348 | 165 | 397 | 169 | 451 | 173 | 511 |
| Circuit 3 | 95 | 259 | 97 | 300 | 99 | 346 | 102 | 398 | 104 | 454 | 107 | 515 |
| | 102 | 264 | 105 | 306 | 107 | 352 | 110 | 403 | 113 | 459 | 115 | 520 |
| | 118 | 274 | 121 | 315 | 124 | 362 | 127 | 413 | 130 | 469 | 134 | 530 |
| | 135 | 282 | 138 | 323 | 142 | 370 | 146 | 421 | 149 | 478 | 153 | 539 |
| Circuit 4 | 98 | 251 | 100 | 294 | 102 | 341 | 104 | 393 | 106 | 450 | 108 | 511 |
| | 105 | 259 | 107 | 301 | 110 | 347 | 112 | 399 | 115 | 456 | 117 | 517 |
| | 121 | 269 | 124 | 310 | 127 | 357 | 130 | 408 | 133 | 464 | 136 | 524 |
| | 137 | 274 | 141 | 315 | 145 | 360 | 148 | 411 | 152 | 466 | 156 | 526 |

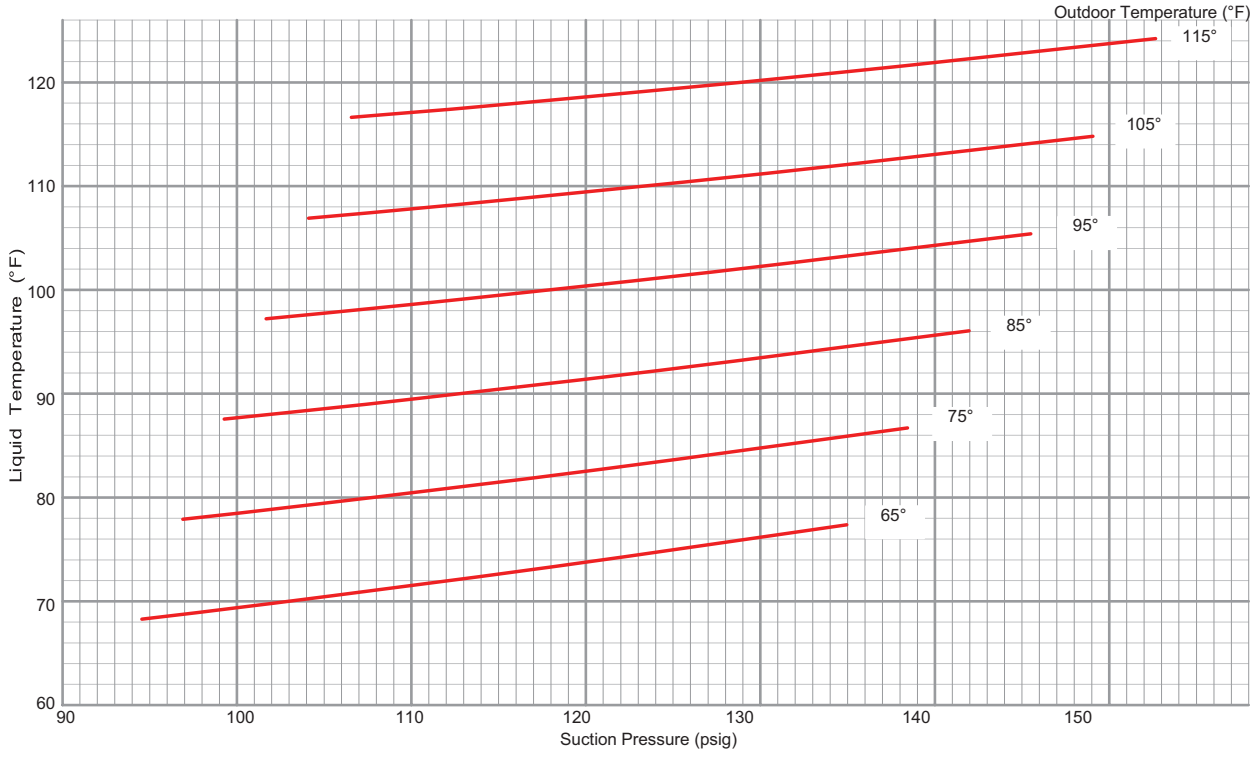
### 300 CHARGING CURVE CIRCUIT 1 - NO REHEAT - ALL-ALUMINUM COIL - 581098-01



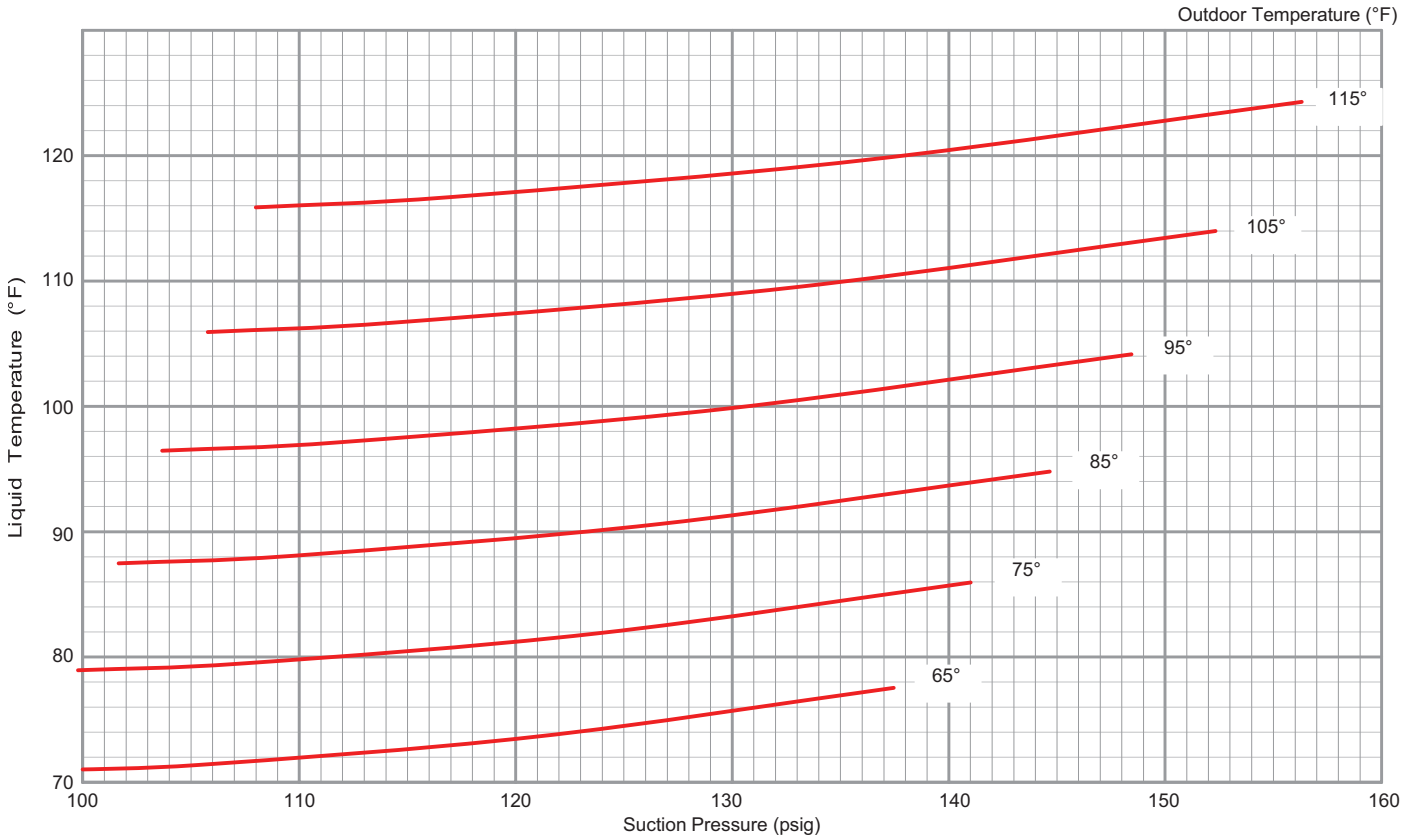
## 300 CHARGING CURVE CIRCUIT 2 - NO REHEAT - ALL-ALUMINUM COIL - 581098-01




## 300 CHARGING CURVE CIRCUIT 3 - NO REHEAT - ALL-ALUMINUM COIL - 581098-01



## 300 CHARGING CURVE CIRCUIT 4 - NO REHEAT - ALL-ALUMINUM COIL - 581098-01

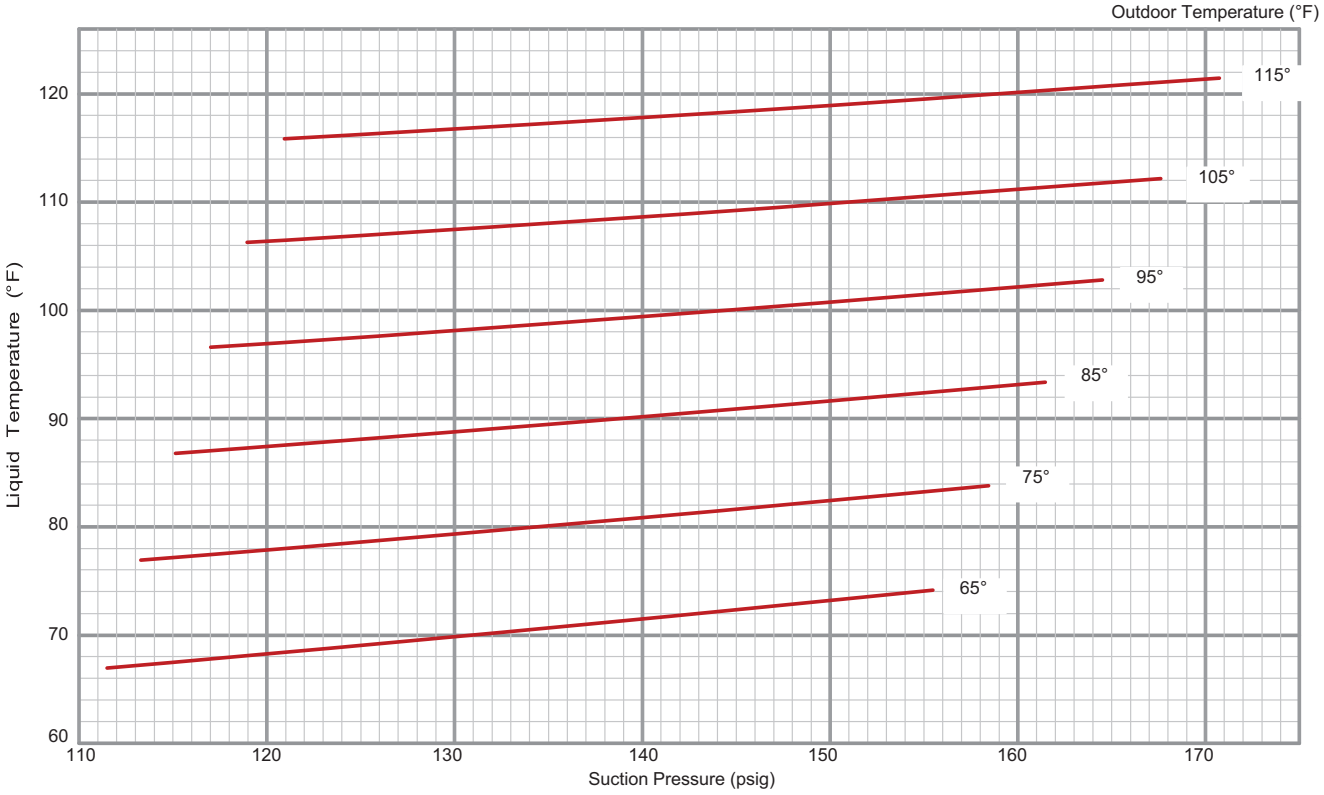


## TABLE 16

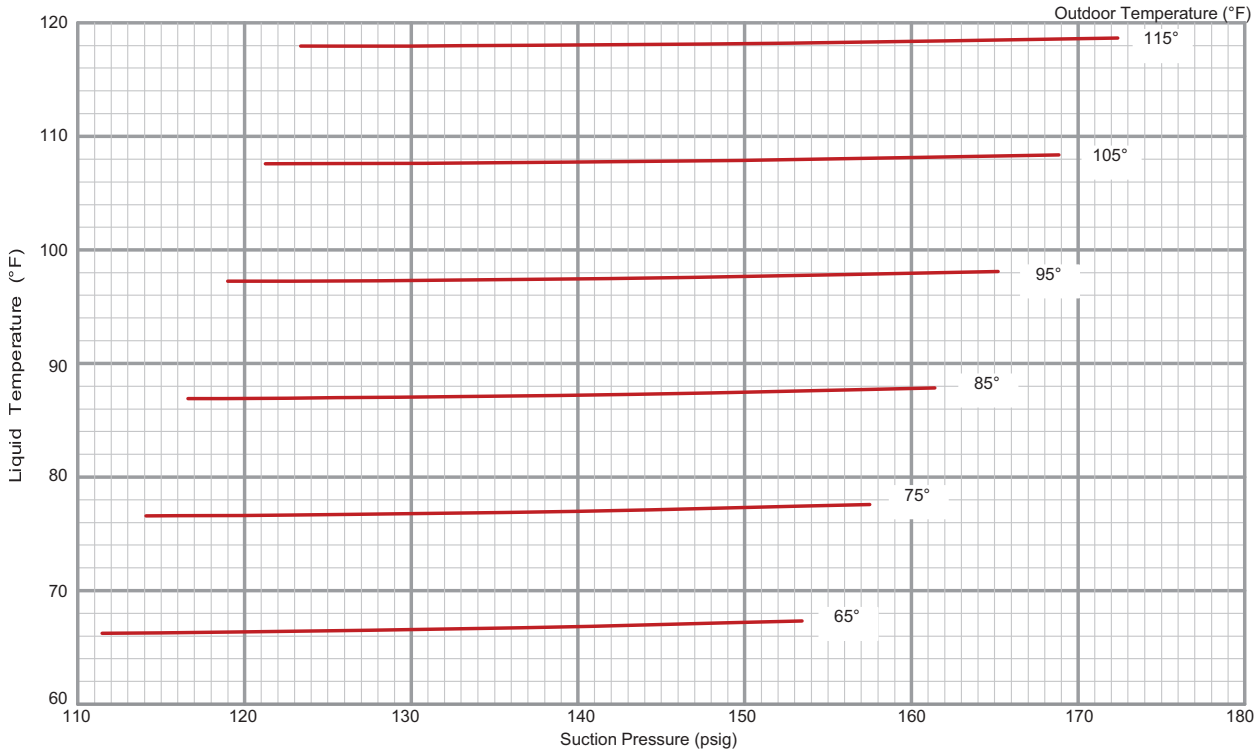
### 300 NORMAL OPERATING PRESSURES - REHEAT - ALL-ALUMINUM COIL - 581099-01

| | 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) |
| Circuit 1 | 111 | 270 | 113 | 310 | 115 | 355 | 117 | 405 | 119 | 461 | 121 | 522 |
| | 120 | 274 | 122 | 314 | 124 | 358 | 126 | 408 | 128 | 463 | 130 | 524 |
| | 137 | 285 | 140 | 323 | 142 | 367 | 145 | 416 | 147 | 470 | 150 | 529 |
| | 155 | 298 | 158 | 335 | 161 | 378 | 165 | 425 | 168 | 478 | 171 | 537 |
| Circuit 2 | 111 | 260 | 114 | 297 | 117 | 340 | 119 | 389 | 121 | 443 | 123 | 502 |
| | 120 | 268 | 123 | 306 | 126 | 349 | 128 | 398 | 131 | 452 | 133 | 512 |
| | 137 | 280 | 140 | 319 | 143 | 363 | 147 | 413 | 150 | 468 | 153 | 529 |
| | 153 | 287 | 158 | 326 | 161 | 372 | 165 | 422 | 169 | 479 | 172 | 540 |
| Circuit 3 | 95 | 263 | 97 | 304 | 100 | 350 | 102 | 401 | 104 | 458 | 106 | 519 |
| | 102 | 266 | 105 | 307 | 108 | 353 | 110 | 405 | 112 | 461 | 115 | 522 |
| | 118 | 274 | 122 | 315 | 125 | 361 | 128 | 412 | 130 | 468 | 133 | 529 |
| | 136 | 284 | 140 | 324 | 143 | 370 | 147 | 421 | 150 | 477 | 153 | 537 |
| Circuit 4 | 97 | 258 | 99 | 300 | 101 | 346 | 103 | 398 | 105 | 456 | 108 | 518 |
| | 105 | 263 | 107 | 304 | 109 | 351 | 112 | 402 | 114 | 459 | 117 | 521 |
| | 120 | 272 | 123 | 312 | 126 | 358 | 129 | 409 | 132 | 466 | 136 | 527 |
| | 137 | 280 | 141 | 320 | 145 | 365 | 148 | 416 | 152 | 472 | 156 | 532 |

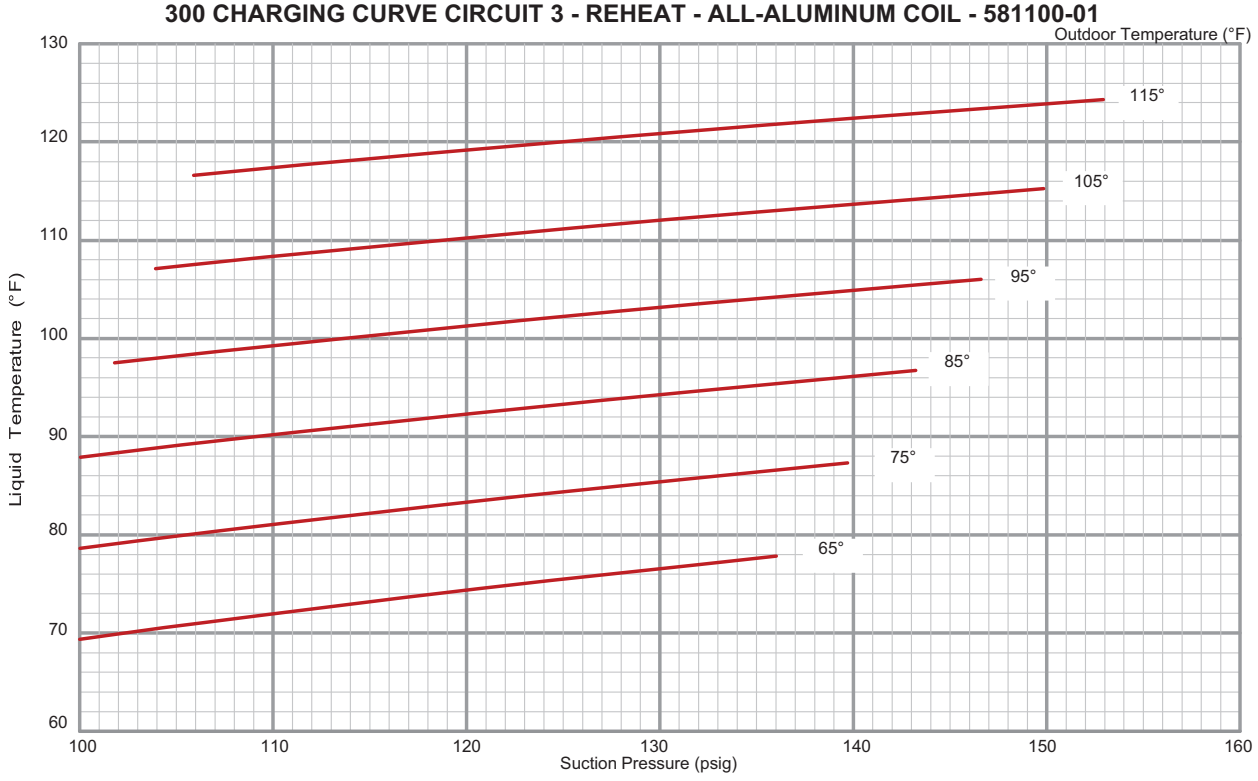
### 300 CHARGING CURVE CIRCUIT 1 - REHEAT - ALL-ALUMINUM COIL - 581100-01



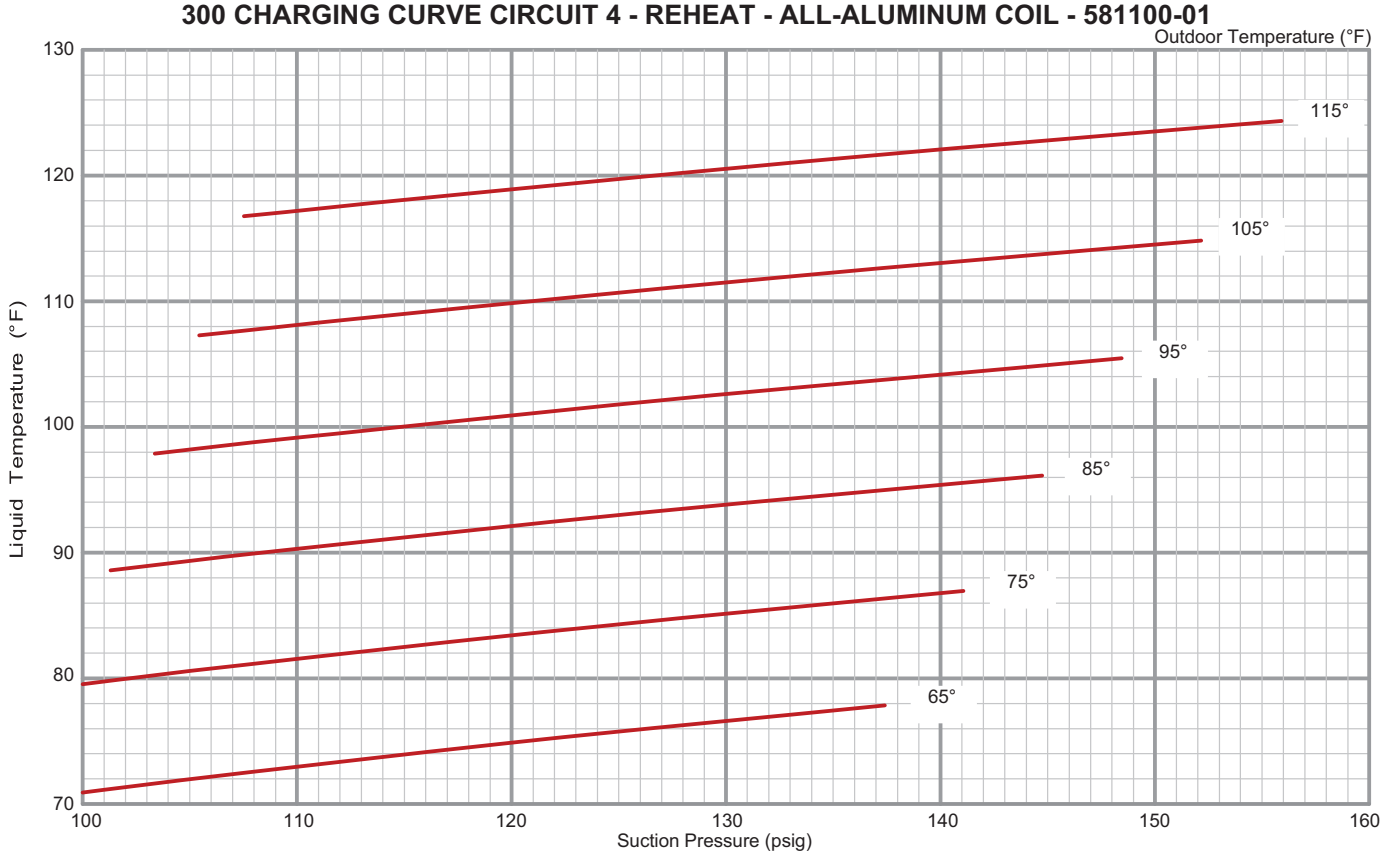
## 300 CHARGING CURVE CIRCUIT 2 - REHEAT - ALL-ALUMINUM COIL - 581100-01




## 300 CHARGING CURVE CIRCUIT 3 - REHEAT - ALL-ALUMINUM COIL - 581100-01



## 300 CHARGING CURVE CIRCUIT 4 - REHEAT - ALL-ALUMINUM COIL - 581100-01



## III-STARTUP - OPERATION

Refer to startup directions and to the unit wiring diagram when servicing. See unit nameplate for minimum circuit ampacity and maximum fuse size.

### A-Cooling Startup See FIGURE 10, FIGURE 11 and FIGURE 12 for unit refrigerant circuits

***NOTE-****Crankcase heaters must be energized 24 hours before attempting to start compressor. Set thermostat so that there is no demand to prevent compressor from cycling. Apply power to unit.*

1 - Initiate first and second stage cooling demands according to instructions provided with thermostat.

2 - First-stage thermostat demand will energize indoor blower in Low Cooling CFM. Second-stage thermostat demand will energize indoor blower in High Cooling CFM. Both demands energize compressor 1. The remaining compressors will be energized as needed to meet cooling demand.

3 - 156 units contain two refrigerant circuits or systems. 180 units contain three refrigerant circuits or systems. 210, 240 and 300 units contain four refrigerant circuits or systems.

4 - Each refrigerant circuit is separately charged with R410A refrigerant. See unit rating plate for correct amount of charge.

5 - Refer to the Refrigerant Check and Charge section to check refrigerant charge.

## IV- SYSTEMS SERVICE CHECKS

### 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 control box cover.

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. Voltage must be within the range listed on the nameplate. If not, consult 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.

6 - Inspect and adjust blower belt (see section on Blower Compartment - Blower Belt Adjustment).

### B-Cooling System Service Checks

LCT units are factory charged and require no further adjustment; however, charge should be checked periodically using the liquid temperature plots in section II CHARGING.

## V-MAINTENANCE

**⚠ 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.**

### A-Filters

LCT units use six 24 X 24 X 2” fiberglass throw-away type filters. Filters may be accessed through the economizer / filter access door. Filters should be checked monthly (or more frequently in severe use) and cleaned or replaced regularly. Take note of the “AIR FLOW DIRECTION” marking on the filter frame when re-installing.

### B-Lubrication

All motors and blower wheels used in LCT units are lubricated; no further lubrication is required.

### C-Supply Air 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.

### D-Evaporator Coil

Inspect and clean coil at beginning of each season. Clean using mild detergent or commercial coil cleanser. Check condensate drain pan and line, if necessary. Flush coil and condensate drain with water taking care not to get insulation, filters and return air ducts wet. Check connecting lines and coil for evidence of oil and refrigerant leaks.

### E-Condenser Coil

Clean condenser coil annually with detergent or commercial coil cleaner and inspect monthly during the cooling season. Check connecting lines and coil for evidence of oil and refrigerant leaks.

### F-Electrical

1 - Check all wiring for loose connections.

2 - Check for correct voltage at unit (unit operating).

3 - Check amp-draw on both condenser fan motor and blower motor.

Fan Motor Rating Plate ____ Actual _____

Indoor Blower Motor Rating Plate____ Actual____

## VII-ACCESSORIES

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

### A-Roof Curbs

When installing the LCT units on a combustible surface for downflow discharge applications, the hybrid C1CURB70C-1 8-in height, C1CURB71C-1 14-in height, C1CURB72C-01 18-in height and C1CURB73C-1 24-in roof mounting frame is used. The assembled hybribd mounting frame is shown in FIGURE 21. 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 22. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

For horizontal discharge applications, use the standard C1URB14C-1 26-in or C1CURB16C-1 37-in height roof mounting frame. This frame converts unit from down-flow to horizontal air flow. The 37 inch horizontal frame meets National Roofing Code requirements. The roof mounting frames are recommended in all other applications but not required. If the LCT 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.

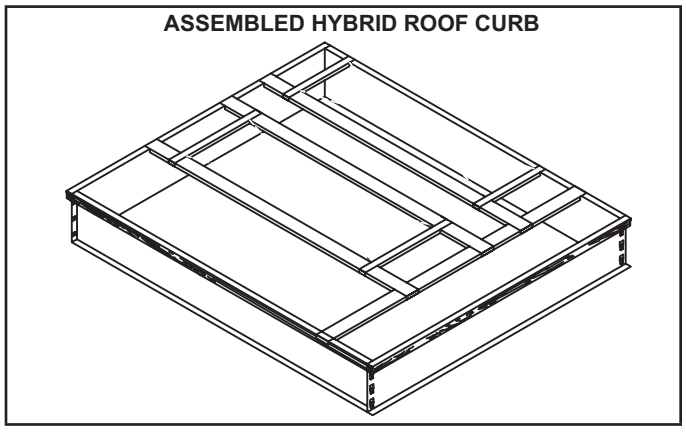



**FIGURE 21**

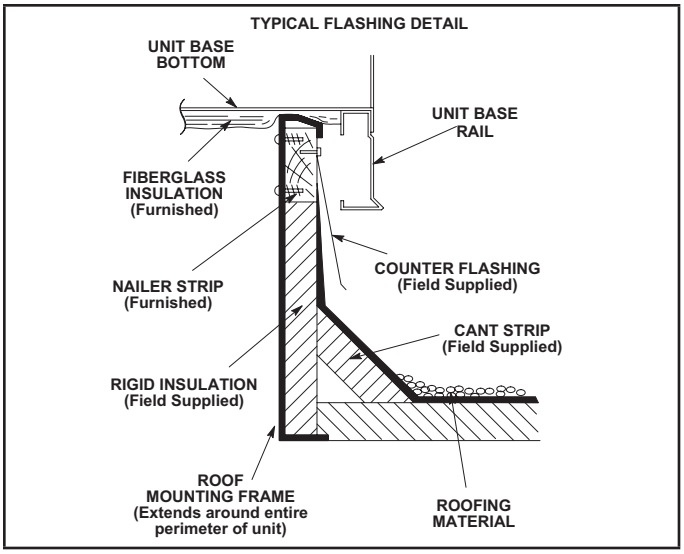



**FIGURE 22**

### B-Transitions

Optional supply/return transitions C1DIFF33C-1 and C1DIFF34C-1 are available for use with LCT series units utilizing optional C1CURB roof curbs. Transition must be installed in the roof curb before mounting the unit to the frame. Refer to the manufacturer’s instructions included with the transition for detailed installation procedures.

### C-C1DAMP10 & E1DAMP20 Outdoor Air Dampers

C1DAMP10C and E1DAMP20C (FIGURE 23) consist of a set of dampers which may be manually or motor operated to allow up to 25 percent outside air into the system at all times. Either air damper can be installed in LCT units. 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 reinstallation. Filter Handicoater is R.P. Products coating no. 418 and is available as Part No. P-8-5069.

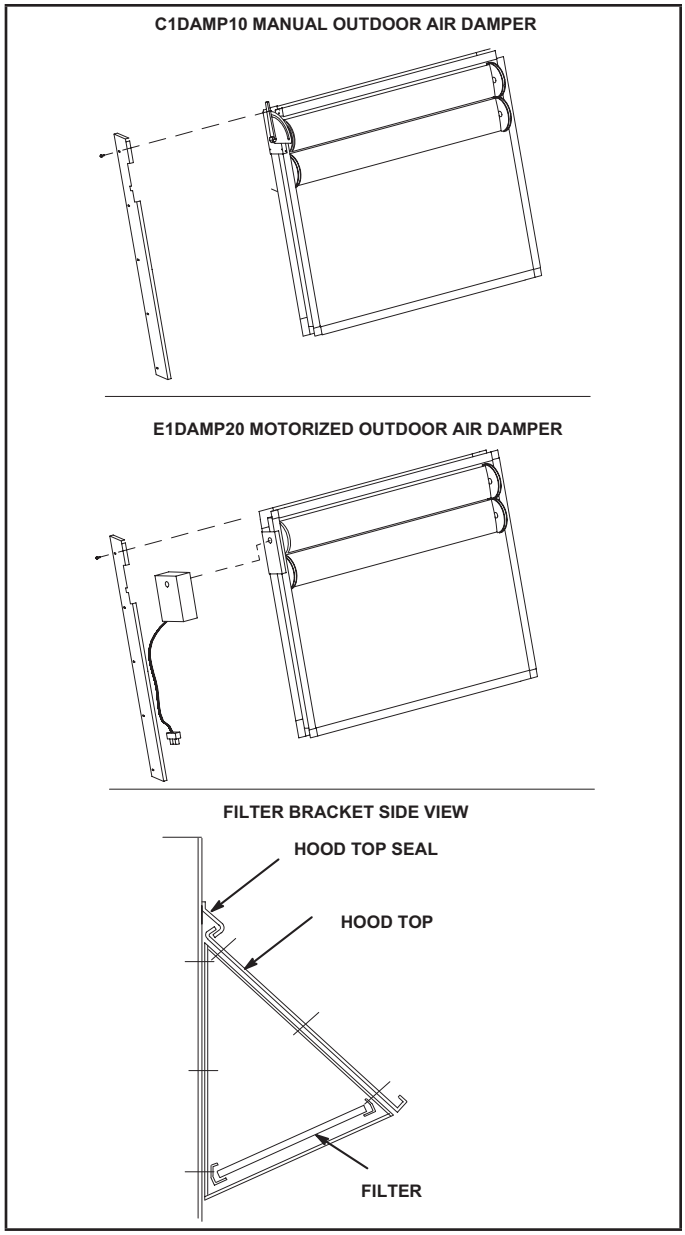



**FIGURE 23**

**D-Supply and Return Diffusers**

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

**E-E1ECON15C-2 Standard and E1ECON17C-1 High Performance Economizer (Field or Factory Installed)**

The optional economizer can be used with downflow and horizontal air discharge applications. The economizer uses outdoor air for free cooling when temperature and/or humidity is suitable. An economizer hood is furnished with the economizer.

***NOTE -*** *Gravity exhaust dampers are required with power exhaust.*

The economizer is controlled by the A55 Unit Controller. The economizer will operate in one of four modes. Each mode requires a different A55 Unit Controller DIP switch setting. Each mode also requires different sensors. The following is a brief description. See economizer installation instruction for more detail.

**1-"TMP" MODE (SENSIBLE TEMPERATURE)**

In the "TMP" mode, the IMC uses input from the factory installed RT6 Supply Air Sensor, RT16 Return Air Sensor and RT17 Outdoor Air Sensor to determine suitability of outside air and economizer damper operation. When outdoor sensible temperature is less than return air sensible temperature, outdoor air is used for cooling. This may be supplemented by mechanical cooling to meet comfort demands. This application does not require additional optional sensors.

**2-"ODE" MODE (OUTDOOR ENTHALPY)**

The "ODE" or outdoor enthalpy mode requires a field-provided and -installed Honeywell C7400 enthalpy sensor (16K96). The sensor monitors outdoor air temperature and humidity (enthalpy). When outdoor air enthalpy is below the enthalpy control setpoint, the economizer modulates to allow outdoor air for free cooling.

**3-"DIF" MODE (DIFFERENTIAL ENTHALPY)**

The "DIF" or differential enthalpy mode requires two field-provided and -installed Honeywell C7400 enthalpy sensors (16K97). One sensor is installed in the outside air opening and the other sensor is installed in the return air opening. When the outdoor air enthalpy is below the return air enthalpy, the economizer opens to bring in ou door air for free cooling.

**4-"GLO" MODE (GLOBAL)**

*Global Mode* - The "GLO" or global mode is used with an energy management system which includes a global control feature. Global control is used when multiple units (in one location) respond to a single outdoor air sensor. Each energy management system uses a specific type of outdoor sensor which is installed and wired by the controls contractor.

*Motorized Outdoor Air Damper* - The "GLO" mode is also used when a motorized outdoor air damper is installed in the system.

***NOTE -*** *All economizer modes of operation will modulate dampers to 55F supply air.*

### F-Gravity Exhaust Dampers

C1DAMP50C dampers (FIGURE 24) are used in downflow and LAGEDH are used in horizontal air discharge applications. LAGEDH gravity exhaust dampers are installed in the return air plenum . The dampers must be used any time an economizer or power exhaust fans are applied to LCT series units. An exhaust hood is furnished with the gravity exhaust damper.

Gravity exhaust dampers allow exhaust air to be discharged from the system when an economizer and/or power exhaust is operating. Gravity exhaust dampers also prevent outdoor air infiltration during unit off cycle. See installation instructions for more detail.

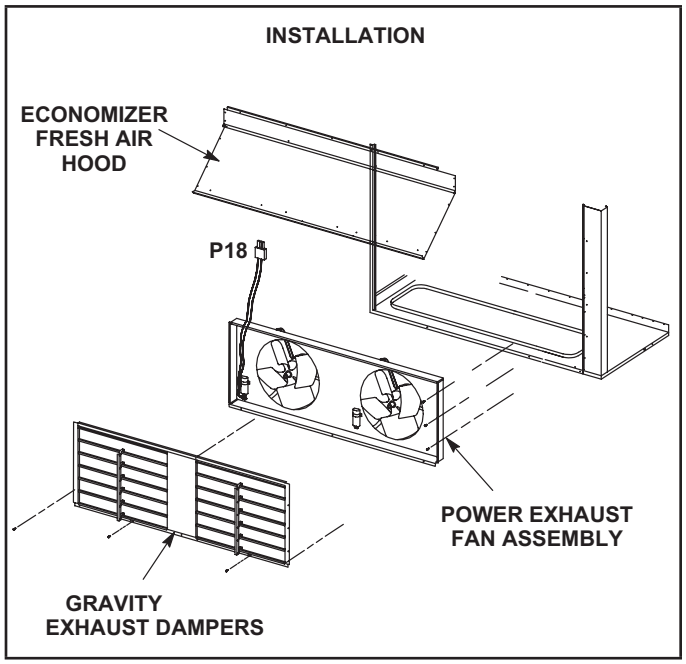



**FIGURE 24**

### G-C1PWRE10 Power Exhaust Fans

C1PWRE10 power exhaust fans are used in downflow applications only. C1PWRE10 fans require optional downflow gravity exhaust dampers and E1ECON15 economizers. Power exhaust fans provide exhaust air pressure relief and also run when return air dampers are closed and supply air blowers are operating. FIGURE 24 shows the location of the power exhaust fans. See installation instructions for more detail.

### H-Optional Cold Weather Kit (Canada only)

Electric heater is available to automatically control the minimum temperature in the gas burner compartment. Heater is C.G.A. certified to allow cold weather operation of unit down to -60° F.

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 (line voltage).

2 - A thermostat mounting box is installed on the vestibule of the heating 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 the switch opens and the gas heat section is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F.

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 K125 coil. When the temperature rises above 20° F the switch opens and the electric heater is de-energized through K125. The switch automatically resets when the heating compartment temperature reaches -10° F.

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 K125 coil. When temperature drops below 20° F the switch closes and electric heater is energized through K125. The switch automatically opens when heating compartment temperature reaches 76° F.

### I-Control Systems

The A55 Unit Controller provides all control function for the rooftop unit. Default operation requires a standard room thermostat or direct digital controller (DDC). The A55 can also control the unit from a zone temperature sensor. The A55 Unit Controller is a network controller when daisy-chained to the L Connection® Network Control System. For ease of configuration, the A55 can be connected to a PC with Unit Controller PC software installed.

**J-Smoke Detectors A171, A172, A173**

Photoelectric smoke detectors are a factory- and field-installed option. The smoke detectors can be installed in the supply air section (A172), return air section (A171), or in both the supply and return air section. Smoke detection control module (A173) is located below the control panel. Wiring for the smoke detectors are shown on the temperature control section (C) wiring diagram in back of this manual.

**K-Blower Proving Switch S52**

The blower proving switch monitors blower operation and locks out the unit in case of blower failure. The switch is N.O. and closes at .15" W.C. The switch is mounted on the middle left corner of the blower support panel. Wiring for the blower proving switch is shown on the temperature control section (C) wiring diagram in back of this manual.

**L-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. The switch is mounted on the top corner of the economizer. Wiring for the dirty filter switch is shown on the temperature control section (C) wiring diagram in back of this manual.

**M-Optional UVC Lights**

The Healthy Climate- 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.O-Optional UVC Lights The Healthy Climate 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.

**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.C. overflow switch is connected to the M2 Unit Controller (A55) through DI-3. When the switch opens, the Unit Controller will shut off the unit. After a five-minute time out, the Unit Controller will verify the overflow switch position and restart the unit (if the switch has closed). The Unit Controller has a three-strike counter before the unit locks out. This means the Unit Controller will allow the overflow switch to open three times per thermostat demand. If the unit locks out, a reset of the Unit Controller is required after the switch has closed to restore unit operation.

**O-Indoor Air Quality Sensor**

If a sensor fails, use the following procedures to physically remove the failed sensor from the unit. All units will have two IAQ sensors installed, one in the return air and the second one in the supply side. See FIGURE 25. The sensors are secured to the tray by two screws. The power cable assembly will need to be detached from the connector located on the bottom of the sensor as well.

***Removing the Sensor***

1 - Go to Menu > Network Integrations > Wireless Sensor Network Setup > Wireless Sensor Network.

2 - From the Network Nodes list, select the IAQ sensor that is being replaced.

3 - On the Sensor Information Screen, select the Remove Sensor option at the bottom of the screen.

4 - Type in the sensor name that is to be removed and select Proceed.

**Replacing the Sensor**

1 - Open the CORE Service App and navigate to Menu > (Setup) Network Integration > Wireless Sensor Network Setup > Wireless Sensor Network.

2 - Click Add node on the Network Nodes screen. This triggers the CORE Service App to scan for both the WIAQ Return Sensor and WIAQ Discharge Sensor.

3 - Follow the prompts on the screen to finish the adding process.

4 - Verify that the CORE Service App displays the “Node Provisioned” on the Provision Sensor Network.

5 - Verify if CORE Service app is showing PM2.5 counts for both return and supply mounted sensors and TVOC counts from return mounted sensor.

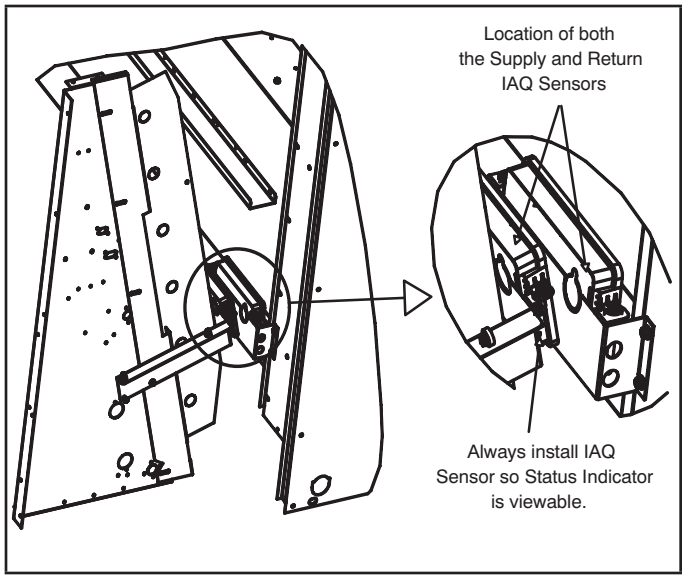



**FIGURE 25**

**P-Bipolar Ionizer**

The Needlepoint Bipolar Ionizer (NBPI) kit is specifically designed for LG/LC/LH/LD/KG/KC/KH 024-300 units. The ionizer is equipped with dry contacts which allow a Building Automation System (BAS) to interface and indicate ionizer functionality.

***Note -*** The BAS will be able to monitor units equipped with M4 Unit Controllers only. Units with an M3 Unit Controller or no controller need to be connected to a separate monitoring system.

The Ionizers are also equipped with a green LED which indicates power is on. When the blower is in operation, power is delivered to the Ionizers and ions are generated. See TABLE 17 for unit application.

**TABLE 17**

| LCT Unit | Part No. | |
|---|---|---|
| 156 | 21U37 | 622688-03 |
| 240 | 21U38 | 622688-04 |
| 300 | 21U39 | 622688-05 |

## VII-FACTORY-INSTALLED Hot Gas Re-Heat

### General

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 valves, L14 and L30, route 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. FIGURE 26 through FIGURE 31 show reheat refrigerant routing and cooling mode refrigerant routing.

### L14 and L30 Reheat Coil Solenoid Valves

When Unit Controller (P298-5 or J299-8) indicates room conditions require dehumidification, reheat valves L14 and L30 are energized (Unit Controller J394-1 or J394-3) 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.

### A91 Humidity Sensor

Relative humidity should correspond to the sensor (A91) output voltage listed in TABLE 18. For example: if indoor air relative humidity is 80% + 3%, the humidity sensor output should read 8.00VDC.

Check the sensor output annually for accuracy. Keep the air intake openings on the sensor clean and free of obstructions and debris.

**TABLE 18**

| Relative Humidity (%RH ± 3%) | Sensor Output (VDC) |
|---|---|
| 20 | 2.00 |
| 30 | 3.00 |
| 40 | 4.00 |
| 50 | 5.00 |
| 60 | 6.00 |
| 70 | 7.00 |
| 80 | 8.00 |
| 90 | 9.00 |

### Check-Out

Test hot gas 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 (the QR is located in the control area) menu path to select:

SERVICE > TEST > DEHUMIDIFIER

The blower, compressor 1 and compressor 2 (reheat) should be operating. Reheat mode will appear on the mobile service app display.

4 - Deselect:

SERVICE > TEST > DEHUMIDIFIER

*Compressor 1 and 2 (reheat) should de-energize, blower should still be energized.*

### Default Reheat Operation

Reheat will operate as shown in TABLE 19 once this condition is met:

1 - System must NOT be operating in heating mode.

**IMPORTANT - Free cooling does not operate during reheat.**

For other reheat control options, refer to the Unit Controller manual.

### Additional Cooling Stages

Units are shipped from the factory to provide two stages of cooling.

Compressors are not de-energized when unit operation changes from cooling to reheat or from reheat to cooling. Instead, L14 and L30 reheat valves are energized (reheat) or de-energized (cooling).

***NOTE -*** *Another thermostat staging option is available which allows both compressors to be energized during free cooling. See Unit Controller manual for details.*

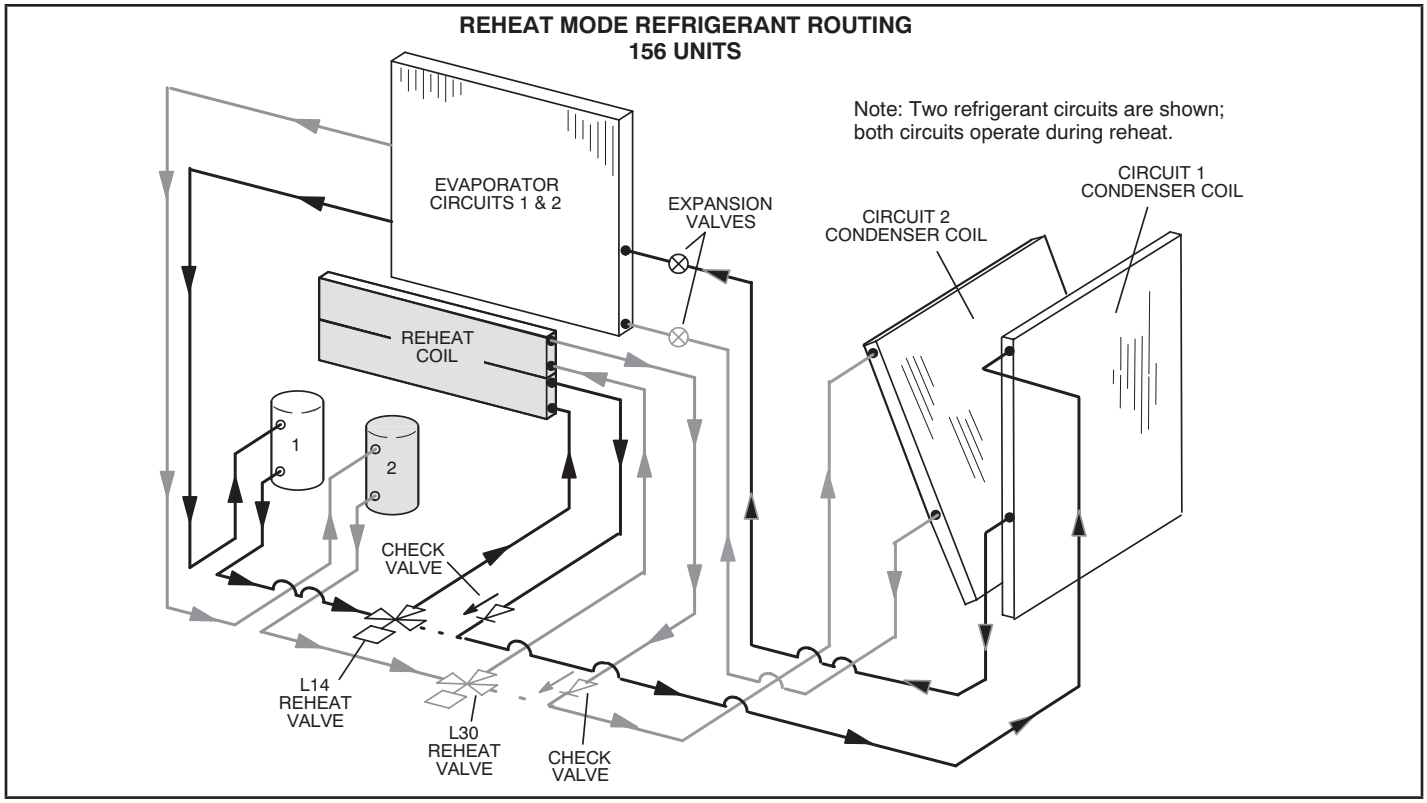



**FIGURE 26**

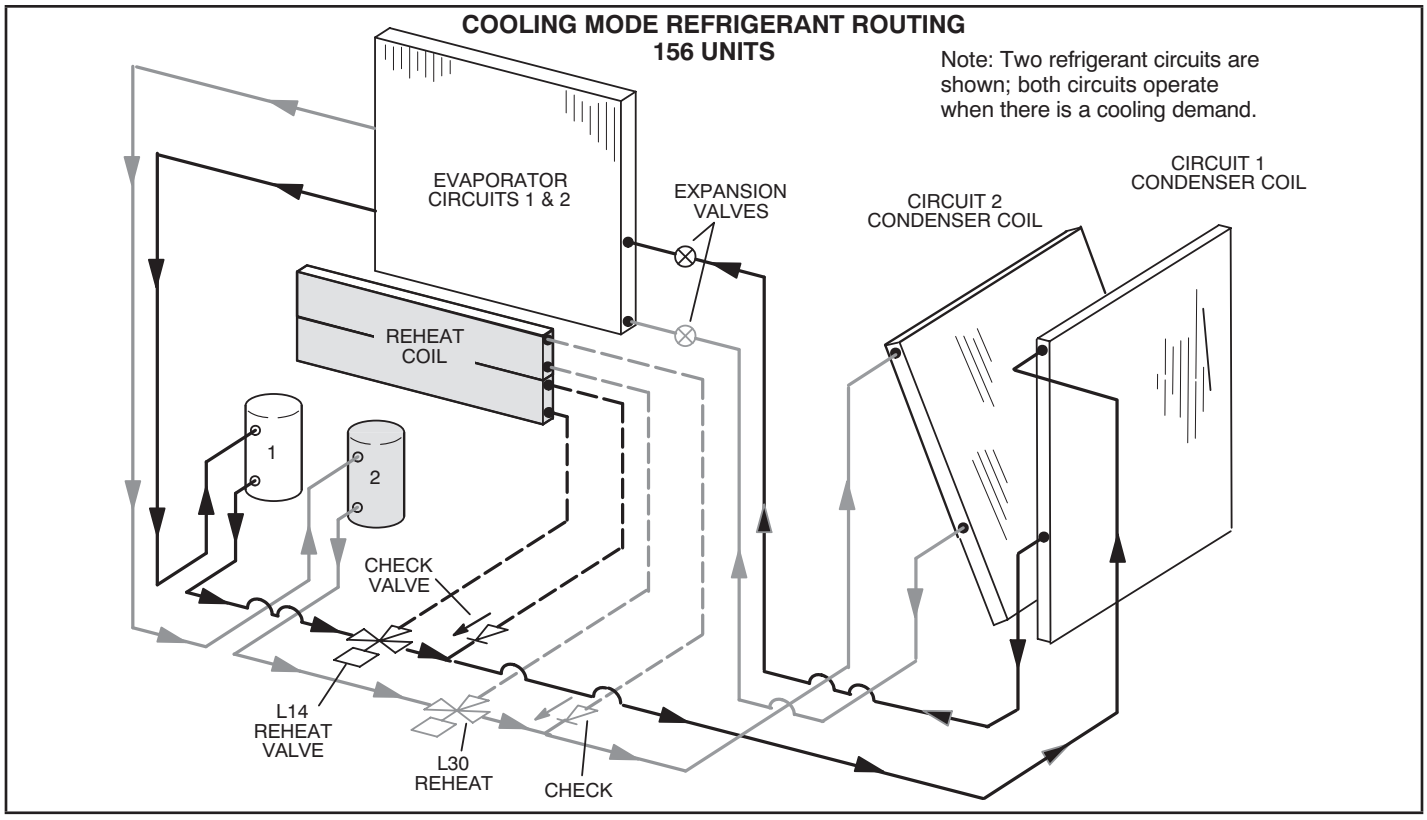



**FIGURE 27**

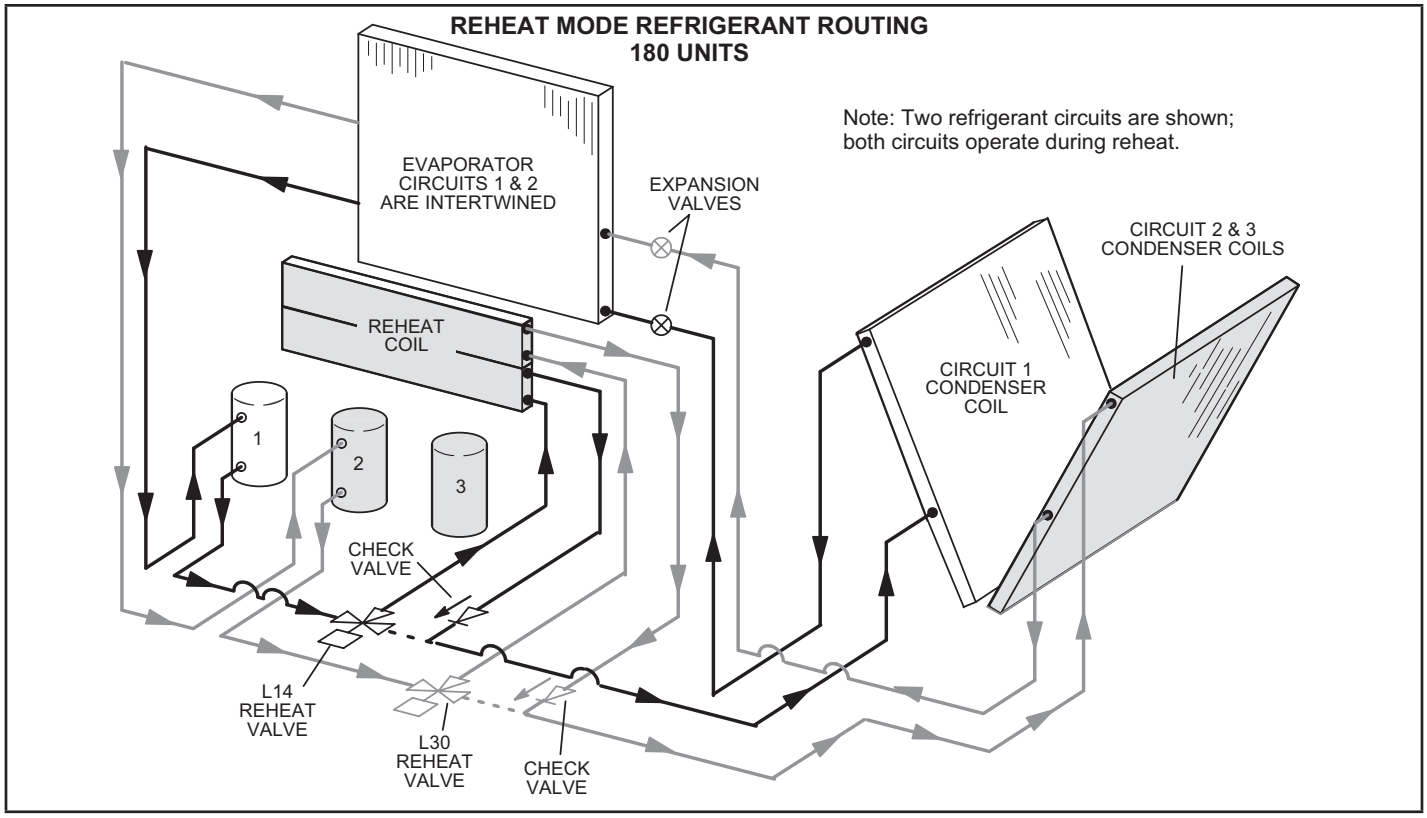



**FIGURE 28**

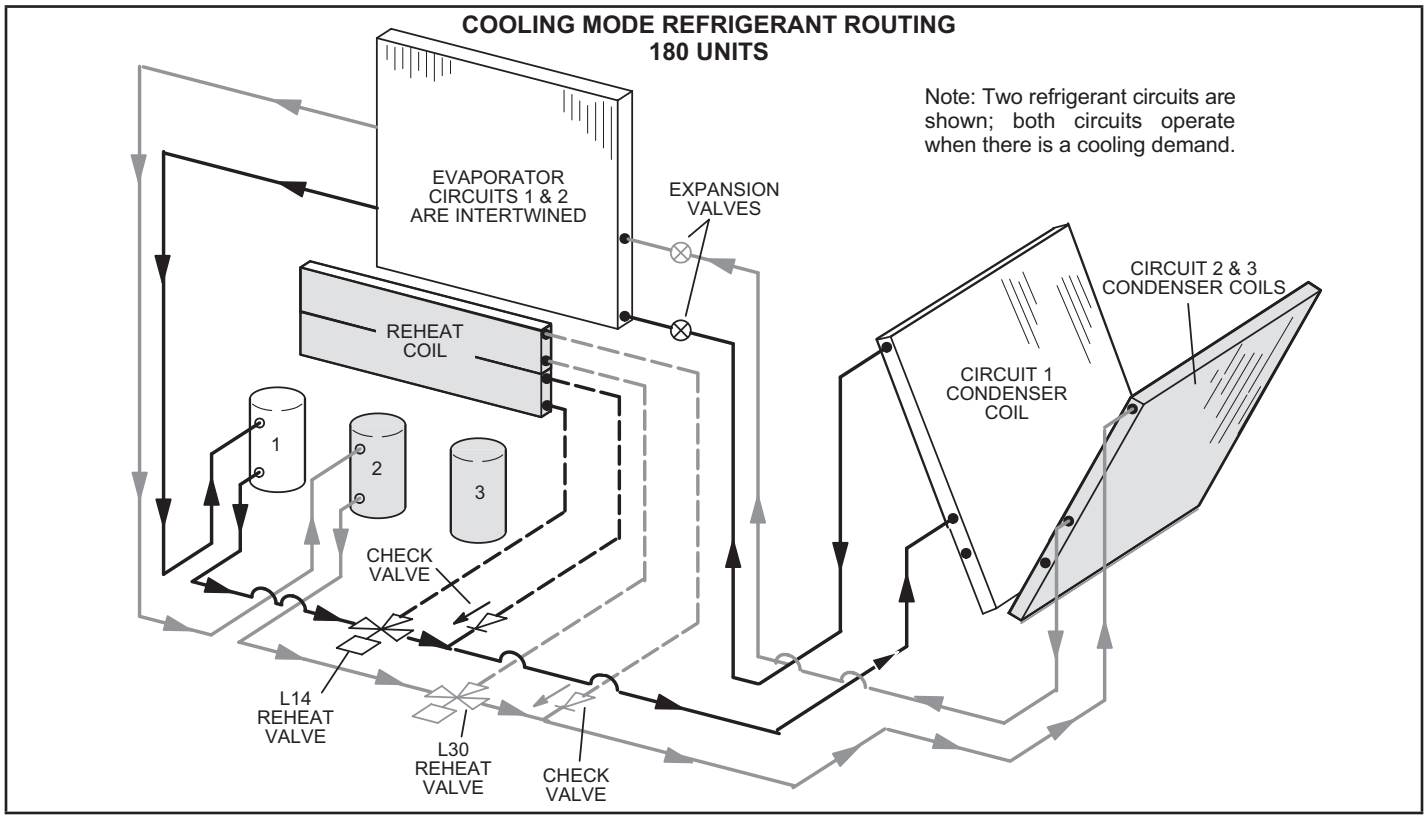



**FIGURE 29**

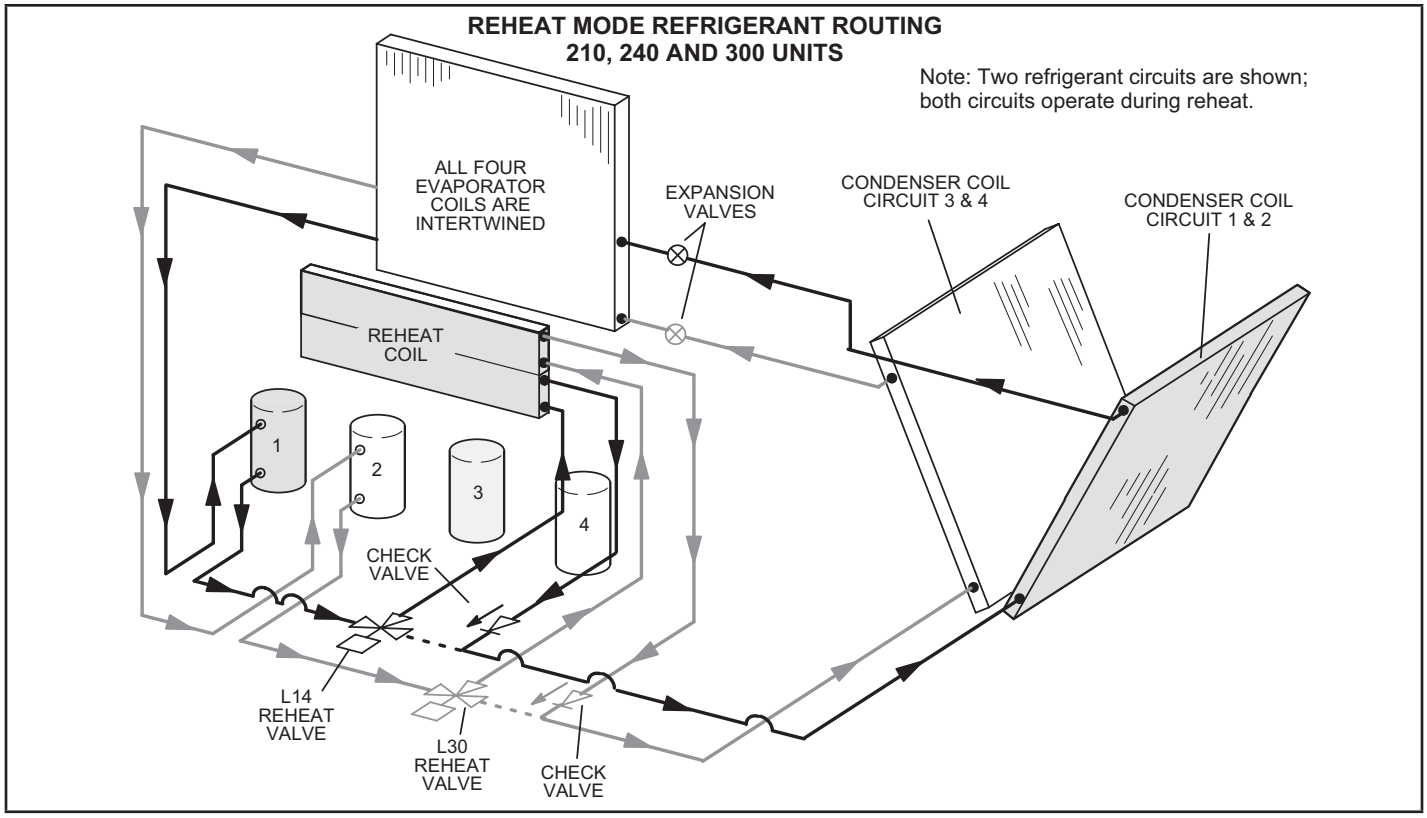



**FIGURE 30**

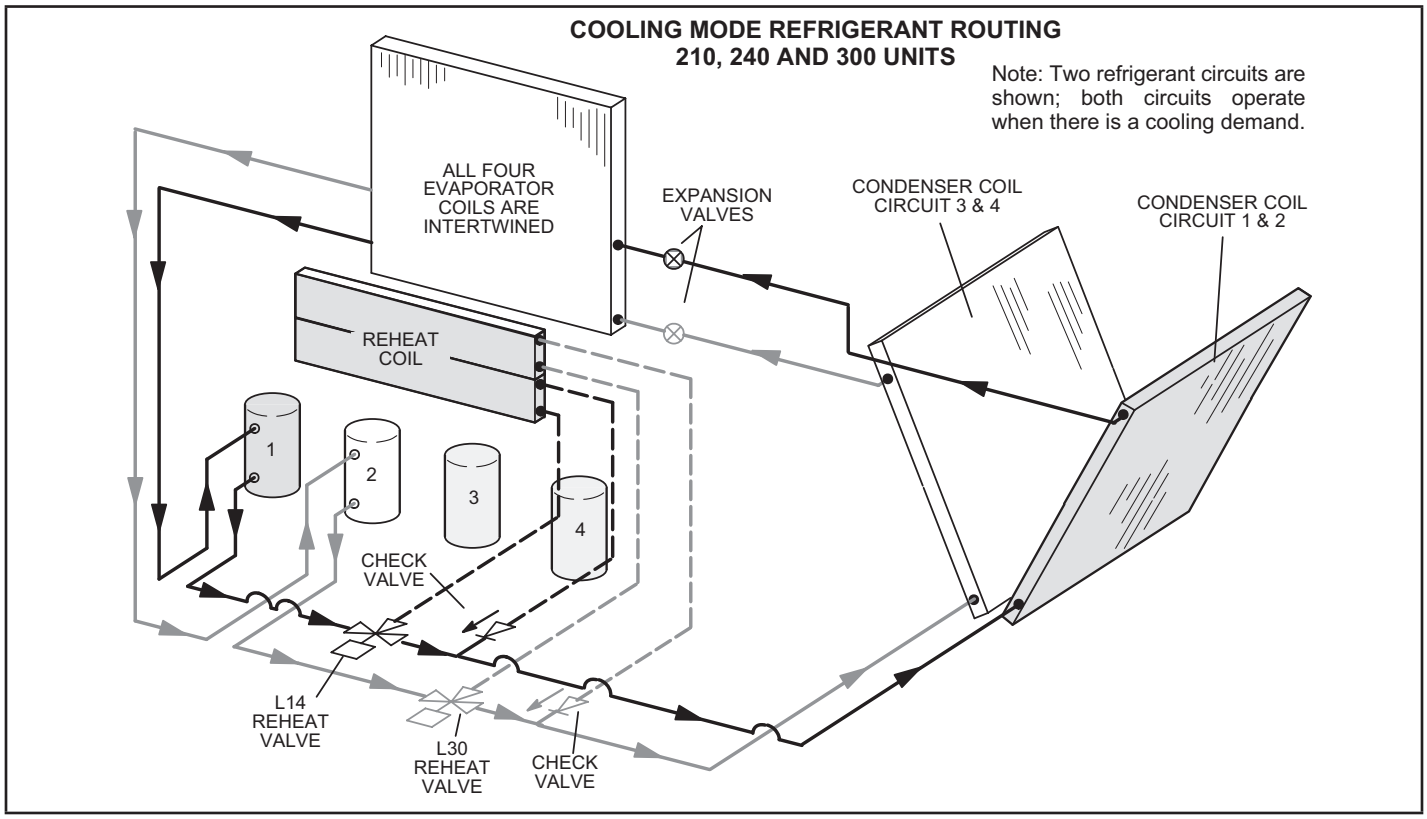



**FIGURE 31**

**TABLE 19**

**REHEAT OPERATION**

| Thermostat Mode With 24V Humidistat | |
|---|---|
| Humidity Demands | Operation |
| 24V Demand for Dehumidification only | • Compressor 1 and 2 reheat on<br>• Reheat valves are energized<br>• Remaining compressors are off |
| 24V Demand for Dehumidification only is still present after Five Minutes | • Compressor 1 & 2 reheat on<br>• Reheat valves are energized<br>• Remaining compressors are energized as needed to meet cooling |
| **Thermostat Mode with Zone Relative Humidity (RH) Sensor** | |
| Zone humidity is greater than Setpoint +2% | • Compressor 1 and 2 reheat on<br>• Reheat valves are energized<br>• Remaining compressors are off |
| Zone humidity is greater than Setpoint +2%<br>OR<br>Zone humidity is greater than Setpoint for 5 minutes | • Compressor 1 & 2 reheat on<br>• Reheat valves are energized<br>• Remaining compressors are energized as needed to meet cooling |

**IX--Multi-Staged Blower**

**A-Design Specifications**

Use the “Blower CFM Design Specifications” table attached to the unit (table 18 in the installation instructions) to fill in test and balance values when setting up the unit. If only high and low cooling design specifications are provided, set the medium cooling CFM at the high or low cooling design spec or any CFM between.

**B-Set Maximum CFM**

Use attached table to determine highest blower CFM for appropriate unit. Adjust the blower pulley to deliver that amount of CFM with only the blower operating. See Determining Unit CFM in the Blower Operation and Adjustment section.

**C-Set Blower Speeds**

1 - Use the following mobile service app menu to enter the blower design specified CFM into the Unit Controller. Make sure blower CFM is within limitations shown in TABLE 20 or TABLE 21. Refer to the Unit Controller manual provided with unit.

*RTU MENU > RTU OPTIONS > BLOWER > SPEED*

2 - Enter the following design specifications as shown in TABLE 20.

*Blower /*

*Heat CFM*

*Cooling High CFM*

*Cooling Low CFM*

*Vent CFM*

3 - Adjust the blower RPM to deliver the target CFM based on the measured static pressure using the blower table.

4 - Measure the static pressure again and apply the static pressure and RPM to the blower tables to determine adjusted CFM.

5 - Repeat adjustments until design CFM is reached.

**D-Set Damper Minimum Position**

To maintain required minimum ventilation air volumes when the unit is in the occupied mode, two minimum damper positions must be set.

*The Unit Controller will open the damper to “Min OCP Blwr High” when blower CFM is at or ABOVE the “midpoint” CFM.*

*The Unit Controller will open the dampers to “Min OCP Blwr Low” when blower CFM is BELOW a “midpoint” CFM*.

The Unit Controller will calculate the “midpoint” CFM.

*Available blower speeds vary by unit and thermostat stages.

**Set Minimum Position 1**

Use the following mobile service app menu to set “Min OCP Blwr High” for the blower CFM above the “midpoint” CFM. When navigating into this menu, the Unit Controller will run damper calibration and allow damper position adjustment.

*RTU MENU > SETTINGS > RTU OPTIONS > DAMPER*

Tap “Next” to skip tabs and complete damper position calibration until “Damper Calibration Blower Speed High” tab appears.

Measure the intake air CFM. If the CFM is lower than the design specified CFM for ventilation air, use the Unit Controller to increase the damper percent open. If the CFM is higher than specified, decrease the damper percent open.

***Note -*** *Intake air CFM can also be determined using the outdoor air temperature, return air temperature and mixed air temperature. Refer to the economizer or outdoor air damper installation instructions.*

**Set Minimum Position 2**

Use the following mobile service app menu in the Unit Controller to set “Min OCP Blwr Low” for the blower CFM below the “midpoint” CFM. When navigating into this menu, the Unit Controller will run damper calibration and allow damper position adjustment.

*RTU MENU > SETTINGS > RTU OPTIONS > DAMPER*

Tap “Next” to skip tabs and complete damper position calibration until “Damper Calibration Blower Speed High” tab appears.

Measure the intake air CFM. If the CFM is lower than the design specified CFM for ventilation air, use the Unit Controller to increase the damper percent open. If the CFM is higher than specified, decrease the damper percent open.

***Note -*** *Intake air CFM can also be determined using the outdoor air temperature, return air temperature and mixed air temperature. Refer to the economizer or outdoor air damper installation instructions.*

**E-Inverter Bypass Option**

The supply air inverter is factory-set to by-pass the inverter manually. To by-pass the inverter and operate the blower in the constant air volume mode, use the following Unit Controller menu and set to “engaged”:

*SETTINGS > RTU OPTIONS > BLOWER > VFD BYPASS*

To configure the unit to by-pass the inverter automatically, use the following Unit Controller menu.

*SETUP > INSTALL*

Press SAVE until the menu reads:

*CONFIGURATION ID 1*

Change the 6th character position to “A” for automatic by-pass option.

Press SAVE

***Caution -*** *Units not equipped with an inverter will have the 6th character set to “N”, indicating the inverter is not by-passed. The blower motor could be damaged and/or result in product or property damage if the setting is changed to automatic or manual.*

**TABLE 20**

**HEATING, VENTILATION & SMOKE MINIMUM AND MAXIMUM CFM**

| Unit | | | | Heating CFM | | | Vent CFM | | | Smoke CFM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tons | Model | Speed | Heat Code | Default | Min | Max | Default | Min | Max | Default | Min | Max |
| 13 | LCT156H | Low | L | 5200 | 2725 | 6250 | 5200 | 1950 | | 5200 | 1950 | 6250 |
| | | Std | S | | 4325 | | | | | | | |
| | | Med | M | | 4500 | | | | | | | |
| | LCT156H | All | N, E, J. K, L | | 5200 | | | | | | | |
| 15 | LCT180H | Low | L | 6000 | 2725 | 7200 | 6000 | 2250 | | 6000 | 2250 | 7200 |
| | | Std | S | | 4325 | | | | | | | |
| | | Med | M | | 4500 | | | | | | | |
| | | High | H | | 5125 | | | | | | | |
| | LCT180H | 15, 30, 45, 60kW | N, E, J. K, L | | 5200 | | | | | | | |
| 17.5 | LCT210H | Low, Std, Med | L, S, M | 7000 | 4500 | 8400 | 7000 | 2625 | | 7000 | 2625 | 8400 |
| | | High | H | | 5125 | | | | | | | |
| | LCT210H | 15, 30,45, 60kW | N, E, J, K, L | | 5200 | | | | | | | |
| | | 90kW | P | | 6000 | | | | | | | |
| 20 | LCT240H | Low, Std, Med | L, S, M | 8000 | 4500 | 9600 | 8000 | 3000 | | 8000 | 3000 | 9600 |
| | | High | H | | 5125 | | | | | | | |
| | LCT240H | 15, 30,45, 60kW | N, E, J, K, L | | 5200 | | | | | | | |
| | | 90kW | P | | 6000 | | | | | | | |
| 25 | LCT300S | Low, Std, Med | L, S, M | 10000 | 4500 | | 10000 | 3750 | | 10000 | 3750 | 1200 |
| | | High | H | | 5125 | | | | | | | |
| | LCT300S | 15, 30, 45, 60kW | N, E, J, L | | 5200 | | | | | | | |
| | | 90kW | P | | 6000 | | | | | | | |

*Use highest value between Heating and Cooling High CFM Max.

**TABLE 21**

**COOLING MINIMUM AND MAXIMUM CFM**

| Unit | Cool 1 CFM Cooling Low CFM | | | Cool 4 CFM Cooling High CFM | | |
|---|---|---|---|---|---|---|
| | De-fault | Min | Max | De-fault | Min | Max |
| 156H | 3380 | 1500 | 6250 | 5200 | 4000 | 6250 |
| 180H | 3900 | 2000 | 7200 | 5400 | 5000 | 7200 |
| 210H | 4550 | 2500 | 8400 | 6300 | 6000 | 8400 |
| 240H | 5200 | 3000 | 9600 | 7200 | 6250 | 9600 |
| 300S | 6500 | 3500 | 12000 | 9000 | 7000 | 12000 |

*Use Cooling High CFM Max

**X--VAV System**

Units contain a supply air blower equipped with a variable frequency drive A96 (VFD) which varies supply air CFM. The supply air VFD (A96) is located in the control area. See FIGURE 33.

**A-Start-Up**

1 - A pressure transducer (A30) is shipped in a box in the blower compartment. Install the transducer according to manufacturer's instructions.

***Note -*** *Make sure the transducer is installed in the main duct at least 2/3 of the distance away from the unit.*

2 - Two twisted pairs of shielded cable must be used to connect the pressure transducer. See FIGURE 32. J/P378 connector is hanging in the control box.

3 - Open all zone dampers and/or boxes.

4 - Locate the A55 Unit Controller. Refer to FIGURE 33.

5 - Use the mobile service app to calibrate the blower CFM. Select this menu to start the blower:

SETUP > TEST & BALANCE > BLOWER

The mobile app will display the percent of blower speed. Adjust blower speed percentage to meet design airflow specifications. Allow blower speed to stabilize.

6 - Press NEXT and follow the instructions to calibrate static pressure. If the static pressure meets the design specification, press NEXT again to set the setpoint. If the static pressure does not meet the design specification, adjust the pressure and press NEXT to set the setpoint.

7 - Record new setpoints in TABLE 22.

**TABLE 22**

**RECORD ADJUSTED SETPOINTS**

| Parameter | Setpoint Description | Setpoint "wc | Display Setting |
|---|---|---|---|
| 386 | Smoke | | |
| 387 | Ventilation | | |
| 388 | Heating | | |
| 389 | Cooling | | |

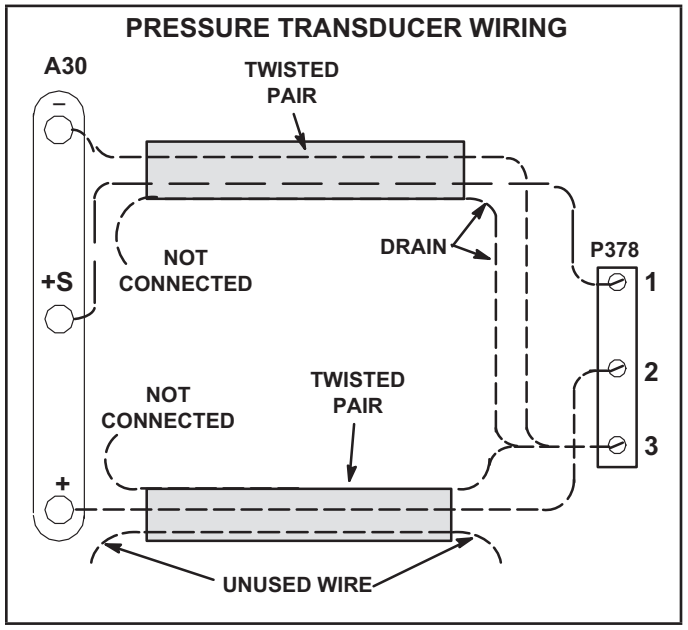



**FIGURE 32**

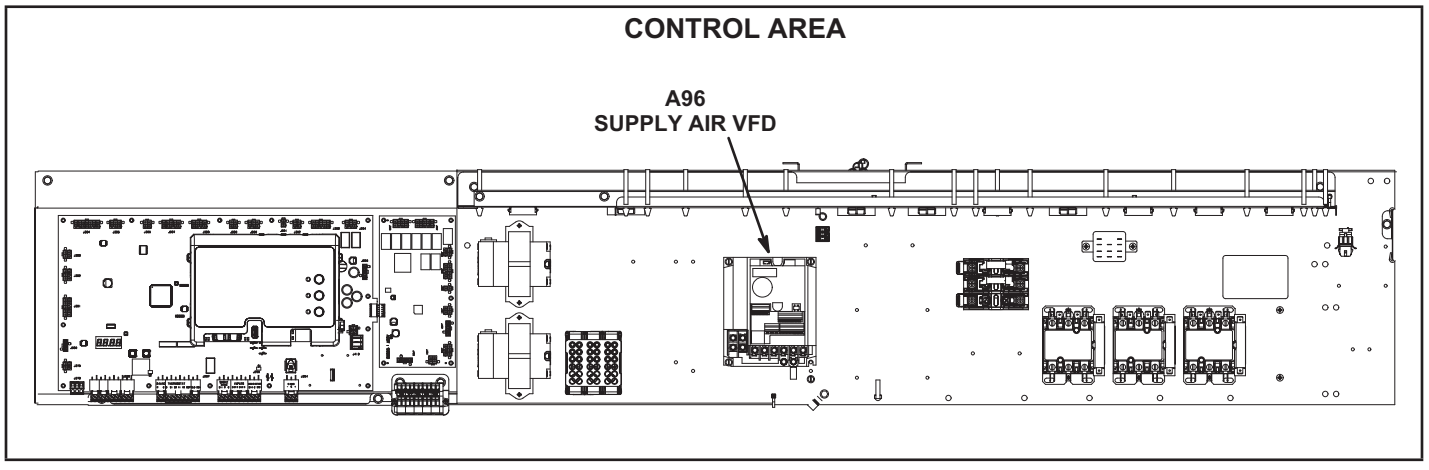



**FIGURE 33**

**B-Unit Operation**

Use the mobile app to check unit mechanical operation. See the Service - Test section of the Unit Controller manual.

**C-Manual Supply Air VFD Bypass**

**IMPORTANT - All dampers must be open to prevent damage to duct work and dampers.**

***Note -*** *This section does not apply to units equipped with optional automatic VFD bypass. That option will automatically change from multi-stage air volume to constant air volume operation in the event of VFD failure.*

Manually change blower operation to constant air volume as follows:

1 - Disconnect all power to unit and **WAIT AT LEAST 10 MINUTES** before opening the VFD cover.

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD.**

**STOP! Before you continue, make sure that power to the VFD has been off for at least 10 minutes. The capacitor in the VFD holds high voltage power for up to 10 minutes after power has been disconnected.**

2 - Locate P246 and P247 connectors near the VFD. See FIGURE 34.

3 - Disconnect P246 from P246 (power in to VFD) and P247 from P247 (power out to blower). See FIGURE 35.

4 - Connect P246 to P247. See FIGURE 36.

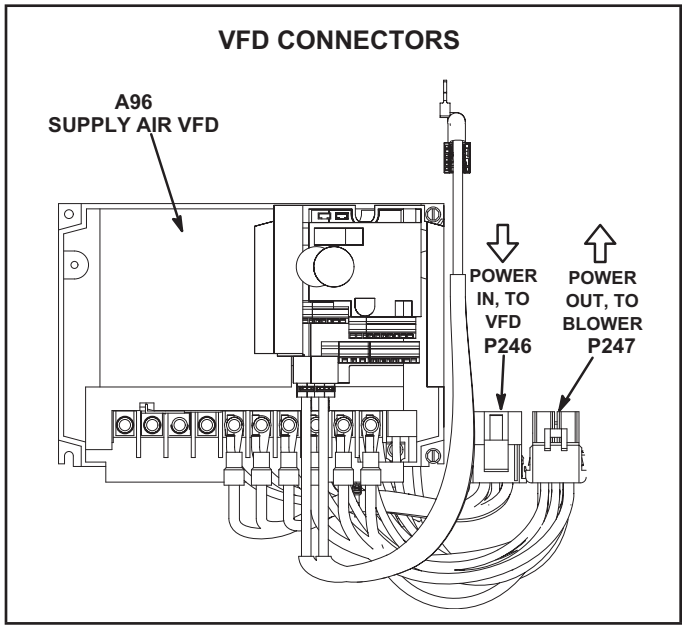



**FIGURE 34**

5 - Restore power to unit. Blower will operate in constant air volume (CAV) mode.

***Note -*** *The indoor blower motor will start as soon as the main unit power is restored. In manual bypass, the blower will run regardless of thermostat signals until main unit power is turned off. Manual bypass is meant for emergency operation only and not long-term usage.*

6 - Check the indoor blower motor nameplate for full load amperage (FLA) value. Measure the amp readings from the indoor blower motor operating in bypass mode. If measured amps are higher than nameplate FLA value, decrease the CFM by opening (turning counterclockwise) the motor pulley. See FIGURE 14. Do not exceed minimum and maximum number of pulley turns as shown in table 5.

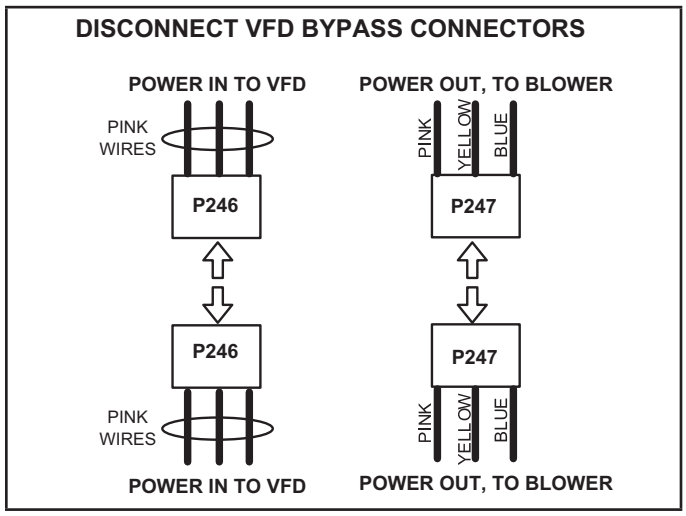



**FIGURE 35**

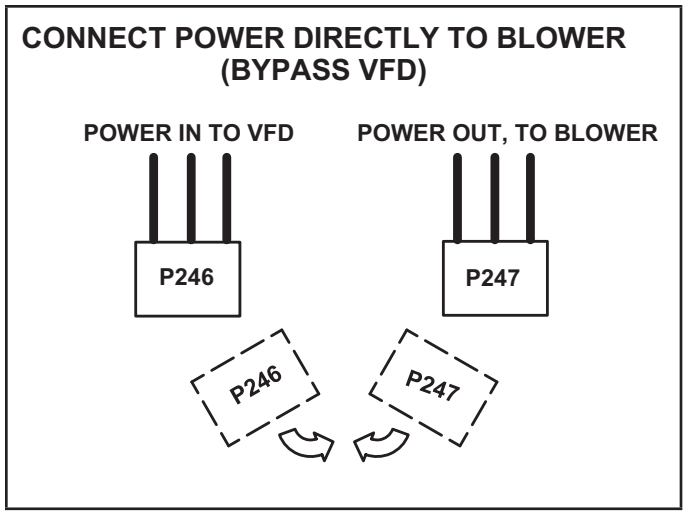


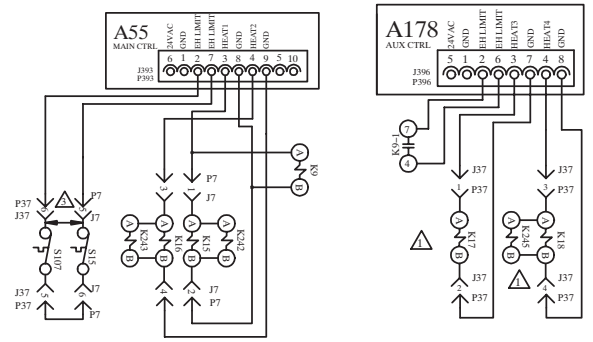

**FIGURE 36**

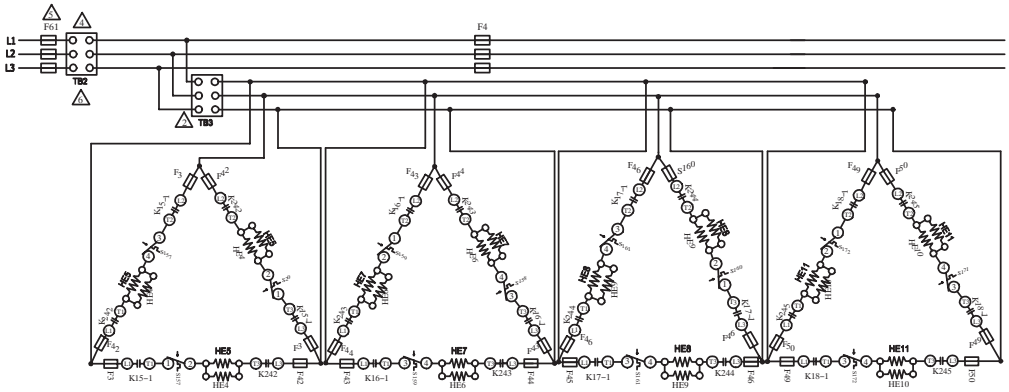
## XI-Wiring Diagrams and Sequence of Operation

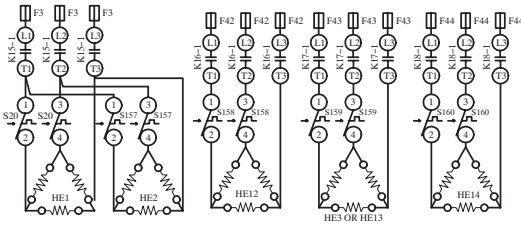
# EHA15/90 Y Voltage

| J/P | JACK/PLUG |
|---|---|
| 7 | ELECTRIC HEAT CONTROL |
| 37 | ELECTRIC HEAT CONTROL |

| KEY | DESCRIPTION |
|---|---|
| A55 | CONTROL, BOARD LENNOX |
| A178 | BOARD, COMP 3 & 4, C3 2nd STAGE HEAT |
| F3 | FUSE, ELECTRIC HEAT |
| F4 | FUSE, UNIT |
| F42 | FUSE, ELECTRIC HEAT 1 A, 2A |
| F43 | FUSE, ELECTRIC HEAT 3 |
| F44 | FUSE, ELECTRIC HEAT 4 |
| F45 | FUSE, ELECTRIC HEAT 5 |
| F46 | FUSE, ELECTRIC HEAT 6 |
| F49 | FUSE, ELECTRIC HEAT 7 |
| F50 | FUSE, ELECTRIC HEAT 8 |
| F61 | FUSE, UNIT – SCCR |
| HE1 | ELEMENT, ELECTRIC HEAT 1 |
| HE2 | ELEMENT, ELECTRIC HEAT 2 |
| HE3 | ELEMENT, ELECTRIC HEAT 3 |
| HE4 | ELEMENT, ELECTRIC HEAT 4 |
| HE5 | ELEMENT, ELECTRIC HEAT 5 |
| HE6 | ELEMENT, ELECTRIC HEAT 6 |
| HE7 | ELEMENT, ELECTRIC HEAT 7 |
| HE8 | ELEMENT, ELECTRIC HEAT 8 |
| HE9 | ELEMENT, ELECTRIC HEAT 9 |
| HE10 | ELEMENT, ELECTRIC HEAT 10 |
| HE11 | ELEMENT, ELECTRIC HEAT 11 |
| HE12 | ELEMENT, ELECTRIC HEAT 12 |
| HE13 | ELEMENT, ELECTRIC HEAT 13 |
| HE14 | ELEMENT, ELECTRIC HEAT 14 |
| K9,–1 | RELAY, HEAT |
| K15,–1 | CONTACTOR, ELECTRIC HEAT 1,2 |
| K16,–1 | CONTACTOR, ELECTRIC HEAT 1A,2A |
| K17,–1 | CONTACTOR, ELECTRIC HEAT 3,4 |
| K18,–1 | CONTACTOR, ELECTRIC HEAT 5,6 |
| K242 | CONTACTOR, ELECTRIC HEAT 1 |
| K243 | CONTACTOR, ELECTRIC HEAT 2 |
| K244 | CONTACTOR, ELECTRIC HEAT 3 |
| K245 | CONTACTOR, ELECTRIC HEAT 4 |
| S15 | SWITCH, LIMIT PRIMARY ELECTRIC HEAT |
| S20 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1,2 |
| S107 | SWITCH, PRIMARY ELECTRIC HEAT |
| S157 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 2 |
| S158 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 3 |
| S159 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 4 |
| S160 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 5 |
| S161 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 6 |
| S171 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 7 |
| S172 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 8 |
| TB2 | TERMINAL STRIP, UNIT |
| TB3 | TERMINAL STRIP, ELECTRIC HEAT |




| DESIGNATION | VOLTAGE |
|---|---|
| Y | 208–230/60/3 |

C UNITS 156 TO 300

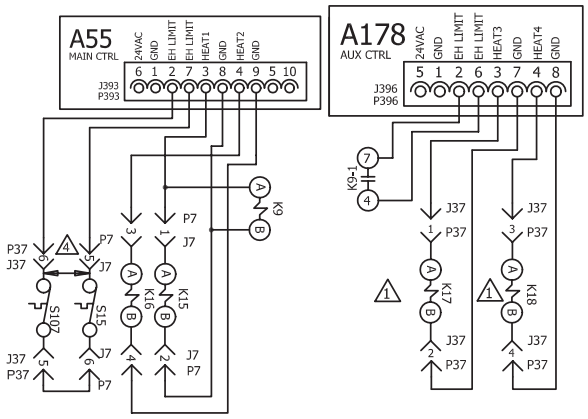
1. NOT USED ON 15 AND 30KW UNITS
2. TB3 IS USED IN SOME UNITS
3. REMOVE PLUG WHEN FIELD INSTALLING ELECTRIC HEAT
4. TB2, CB10 OR S48 MAY BE USED ON NON SCCR UNITS
5. F61 USED ON SCCR OPTION UNITS ONLY
6. TB2 IS USED IN SOME SCCR OPTION UNITS ONLY

DENOTES OPTIONAL COMPONENTS

| KW | HE1 | HE2 | HE3 | HE4 | HE5 | HE6 | HE7 | HE8 | HE9 | HE10 | HE11 | HE12 | HE13 | HE14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 7.5 | 7.5 | | | | | | | | | | | | |
| 30 | | | | 15 | 15 | | | | | | | | | |
| 45 | 15 | | | | | | | | | | | 7.5 | 15 | 7.5 |
| 60 | 15 | | | | | | | | | | | 15 | 15 | 15 |
| 90 | 15 | | 15 | | | 15 | 15 | | | 15 | 15 | | | |

| | | |
|---|---|---|
| 2020/10 | WIRING DIAGRAM<br>538127-01 | 10/20 |
| HEATING | | |
| ELECTRIC HEAT<br>E1EH, EHA - 15, 30, 45, 60, 90, - Y | | |
| SECTION A | | REV 0 |
| Supersedes | New Form No.<br>538127-01 | |

# EHA-15/90 G Voltage



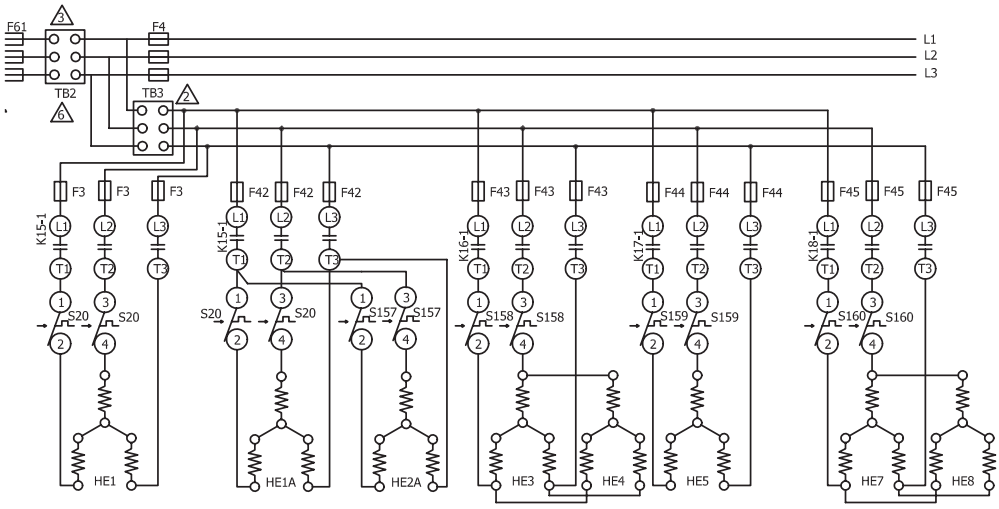

| KEY | DESCRIPTION |
|---|---|
| A55 | CONTROL, BOARD LENNOX |
| A178 | BOARD,COMPRESSORS 3 & 4 |
| F3 | FUSE, ELECTRIC HEAT |
| F4 | FUSE, UNIT |
| F42 | FUSE, ELECTRIC HEAT 1 A, 2A |
| F43 | FUSE, ELECTRIC HEAT 3, 4 |
| F44 | FUSE, ELECTRIC HEAT 5, 6 |
| F45 | FUSE, ELECTRIC HEAT 7, 8 |
| HE1 | ELEMENT, ELECTRIC HEAT 1 |
| HE3 | ELEMENT, ELECTRIC HEAT 3 |
| HE4 | ELEMENT, ELECTRIC HEAT 4 |
| HE5 | ELEMENT, ELECTRIC HEAT 5 |
| HE7 | ELEMENT, ELECTRIC HEAT 7 |
| HE8 | ELEMENT, ELECTRIC HEAT 8 |
| K9,-1 | RELAY, HEAT |
| K15,-1 | CONTACTOR, ELECTRIC HEAT 1,2 |
| K16,-1 | CONTACTOR, ELECTRIC HEAT 1A,2A |
| K17,-1 | CONTACTOR, ELECTRIC HEAT 3,4 |
| K18,-1 | CONTACTOR, ELECTRIC HEAT 5,6 |

| | |
|---|---|
| S15 | SWITCH, LIMIT PRIMARY ELECTRIC HEAT |
| S20 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1,2 |
| S107 | SWITCH, PRIMARY ELECTRIC HEAT |
| S157 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1A |
| S158 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 2A |
| S159 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 3,4 |
| S160 | SWITCH, LIMIT SECONDARY ELECTRIC HEAT 5,6 |
| TB2 | TERMINAL STRIP, UNIT |
| TB3 | TERMINAL STRIP, ELECTRIC HEAT |

| J/P | DESCRIPTION |
|---|---|
| 7 | ELECTRIC HEAT CONTROL |
| 37 | ELECTRIC HEAT CONTROL |

| DESIGNATION | VOLTAGE |
|---|---|
| G | 460/60/3 |

1. NOT USED ON 15 AND 30KW UNITS
2. TB3 IS USED IN SOME UNITS
3. TB2, S48 OR CB10 MAY BE USED
4. REMOVE JUMPER PLUG WHEN FIELD INSTALLING ELECTRIC HEAT
5. F61 USED ON UNITS WITH SCCR OPTION
6. TB2 IS USED IN SOME SCCR OPTION UNITS ONLY




| KW | HE1 | HE1A | HE2A | HE3 | HE4 | HE5 | HE7 | HE8 |
|---|---|---|---|---|---|---|---|---|
| 15 | | 7.5 | 7.5 | | | | | |
| 30 | | 15 | 15 | | | | | |
| 45 | 15 | | | 7.5 | | 15 | 7.5 | |
| 60 | 15 | | | 15 | | 15 | 15 | |
| 90 | 15 | | | 15 | 15 | 15 | 15 | 15 |

| | | |
|---|---|---|
| 2020/10 | WIRING DIAGRAM<br>538126-01 | 10/20 |
| HEATING<br>ELECTRIC HEAT<br>E1EH,EHA-15,30,45,60,90 - G | | |
| SECTION A | | REV.0 |
| Supersedes | New Form No.<br>538126-01 | |

## SEQUENCE OF OPERATION
## EHA-15, 30, 45, 60, 90 - Y & G

The Y voltage diagram use elements configured in a Wye. The G and J voltage diagram use elements configured in a Delta. Both diagrams follow the following sequence of operation:

***NOTE:T****wo electric heat sections are used in all 15kW through 90kW heaters. The heat sections are labelled first electric heat section (left side) and second electric heat section (right side). See FIGURE 18.*

***NOTE:*** *In the case of EHA 15 and 30kW, the second heat section (right side) is a slave (only has electric heat elements and a limit). Line voltage is supplied to elements in both heat section one (left side) and two (right side) by the contactors in heat section one (left side).*

**HEATING ELEMENTS:**

1 - Terminal strip TB3 is energized when the unit disconnect closes. TB3 supplies line voltage to electric heat elements HE1 through HE14. Each heating element is protected by fuse F3.

**FIRST STAGE HEAT:**

2 - Heating demand initiates at W1 in thermostat.

3 - 24VAC is routed to the main control module A55. After A55 proves N.C. primary limits S15 (heat section one, left side), S107 (heat section two, right side), the electric heat contactor K15 and heat relay K9 are energized.

4 - N.O. contact K15-1 closes allowing the first bank of elements in heat section one (left side) to be energized.

5 - At the same time, N.O. contacts K9-1 close. A N.O. contact in A55 closes, energizing electric heat relay K17.

6 - N.O. contacts K17-1 close allowing the first set of elements in heat section two (right side) to be energized.

**SECOND STAGE HEAT:**

7 - With the first stage heat operating, an additional heating demand initiates at W2 in the thermostat.

8 - 24VAC is routed through the main control module A55, which in turn energizes the electric heat contactor K16.

9 - N.O. contacts K16-1 close allowing the second set of elements in heat section one (left side) to be energized.

10 - Simultaneous with step eight, a N.O. contact in the A55 Unit controller closes, allowing 24VAC to energize electric heat contactor K18.

11 - N.O. contacts K18-1 close allowing the second set of elements in heat section two (right side) to be energized.

**END OF SECOND STAGE HEAT:**

12 - Heating demand is satisfied. Terminal W2 in the thermostat is de-energized.

13 - Electric heat contactors K16 and K18 are de-energized.

14 - The second set of electric heat elements in heat sections one (left side) and two (right side) are de-energized.

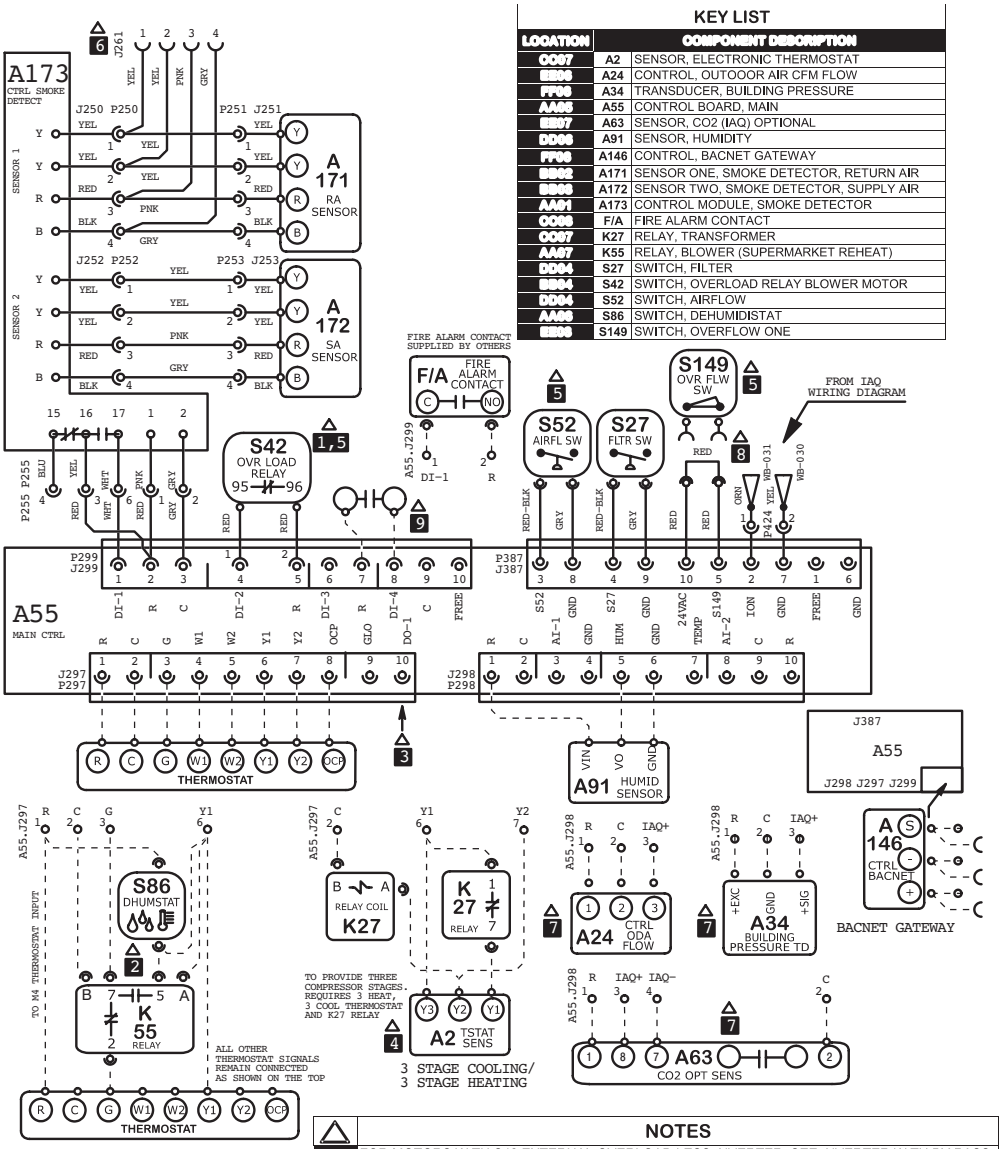
**END OF FIRST STAGE HEAT:**

15 - Heating demand is satisfied. Terminal W1 in the thermostat is de-energized.

16 - Electric heat contactors K15 and K17 are de-energized.

17 - The first set of electric heat elements in heat sections one (left side) and two (right side) are de-energized.

# THERMOSTAT




## KEY LIST

| LOCATION | | COMPONENT DESCRIPTION |
|---|---|---|
| OC67 | A2 | SENSOR, ELECTRONIC THERMOSTAT |
| [illegible] | A24 | CONTROL, OUTOOOR AIR CFM FLOW |
| [illegible] | A34 | TRANSDUCER, BUILDING PRESSURE |
| [illegible] | A55 | CONTROL BOARD, MAIN |
| [illegible] | A63 | SENSOR, CO2 (IAQ) OPTIONAL |
| DD66 | A91 | SENSOR, HUMIDITY |
| [illegible] | A146 | CONTROL, BACNET GATEWAY |
| [illegible] | A171 | SENSOR ONE, SMOKE DETECTOR, RETURN AIR |
| [illegible] | A172 | SENSOR TWO, SMOKE DETECTOR, SUPPLY AIR |
| [illegible] | A173 | CONTROL MODULE, SMOKE DETECTOR |
| OC66 | F/A | FIRE ALARM CONTACT |
| OC67 | K27 | RELAY, TRANSFORMER |
| [illegible] | K55 | RELAY, BLOWER (SUPERMARKET REHEAT) |
| [illegible] | S27 | SWITCH, FILTER |
| [illegible] | S42 | SWITCH, OVERLOAD RELAY BLOWER MOTOR |
| [illegible] | S52 | SWITCH, AIRFLOW |
| [illegible] | S86 | SWITCH, DEHUMIDISTAT |
| [illegible] | 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 | PRODIGY 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 |
| 8 | REMOVE JUMPER TO INSTALL S149 |
| 9 | EXTERNAL HUMIDITROL CONTACTS |

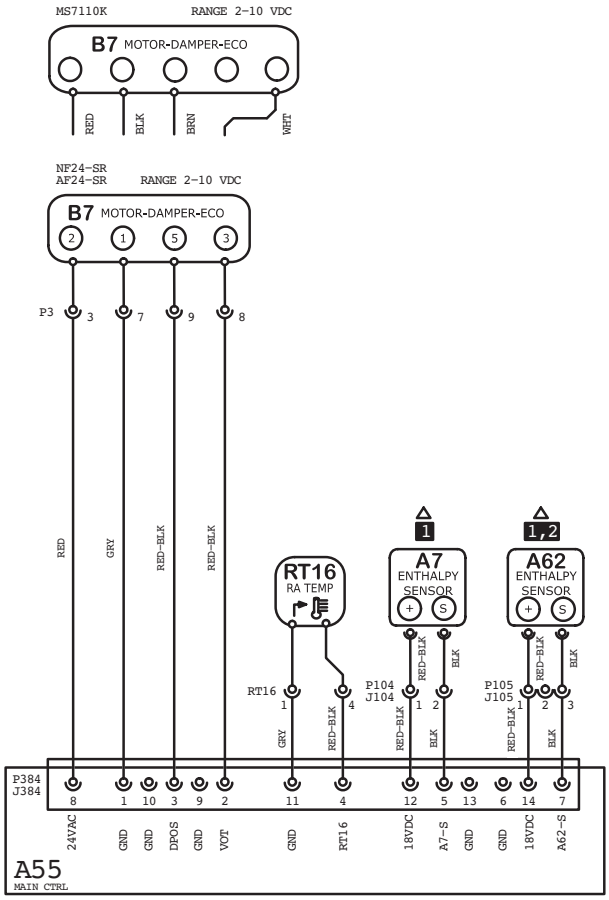


Model: LC, LG, LH, LD Series RTU Thermostat
Voltage: All Voltages
Supersedes: N/A Form No: 538078-01 Rev: 1

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

WIRING DIAGRAM FLOW

# Economizer




| △ | 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 | |
| C006 | A7 | SENSOR, SOLID STATE ENTHALPY |
| AA06 | A55 | CONTROL BOARD, MAIN |
| D006 | A62 | SENSOR, ENTHALPY INDOOR |
| BB02 | B7 | MOTOR, DAMPER ECONOMIZER |
| C006 | RT16 | SENSOR, RETURN AIR TEMP |



Model: LC, LG, LH, LD Series RTU Economizer & Motorized OAD

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

WIRING DIAGRAM FLOW

Voltage: All Voltages

Supersedes: N/A Form No: 538072-01 Rev: 1

**Sequence of Operation LCT156**

1 - Line voltage from TB13 energizes transformer T1 and T18. Transformer T1 and T18 provides 24VACpower to the main controller A55. The transformers also provides 24VAC power to the unit cooling, heating and blower controls and thermostat.

**ECONOMIZER OPERATION**

2 - The A55 Unit Controller receives a demand and energizes exhaust fan relay K65 and K231 with 24VAC at 50% (travel) outside air damper open (adjustable).

3 - N.O. K65-1, K65-2, K231-01 and K231-02 close, energizing exhaust fan motors B10 and B11.

**1ST STAGE COOLING**

4 - First stage cooling demand energizes Y1 and G in the thermostat. G energizes blower, if blower is not already running.

5 - 24VAC is routed to the A55 Unit Controller. After A55 proves N.C. low pressure switch S87 and high pressure switch S4, compressor contactor K1 and L34 are energized.

6 - A55 energizes outdoor fan B21 directly and fans B4 and B5 through K10.

7 - N.O. K1 closes energizing compressor B1, and N.C. K1-52 opens denergizing HR1.

**2ND STAGE COOLING**

8 - Second stage cooling demand energizes Y2.

9 - After A55 proves N.C. low pressure switch S88 and N.C. high pressure switch S7, contacotor K2 is energized.

10 - N.O. K2 closes energizing compressor B2 and K2-52 opens de-energizing crankcase heater HR2.

**BLOWER OPERATION**

***With By Pass Installed - Active***

1 - Main control A55 de-energizes relays K202 and K203

2 - K202 contacts open to interrupt power to B3 blower motor from A96 blower inverter.

3 - Main control A55 energizes relay K203-7.

4 - K203-1 N.C. contacts close allowing power to K3.

5 - K3 contacts close to allow power to B3 blower motor.

***With By Pass Installed - Inactive***

1 - Main control A55 energizes relays K202 and K203.

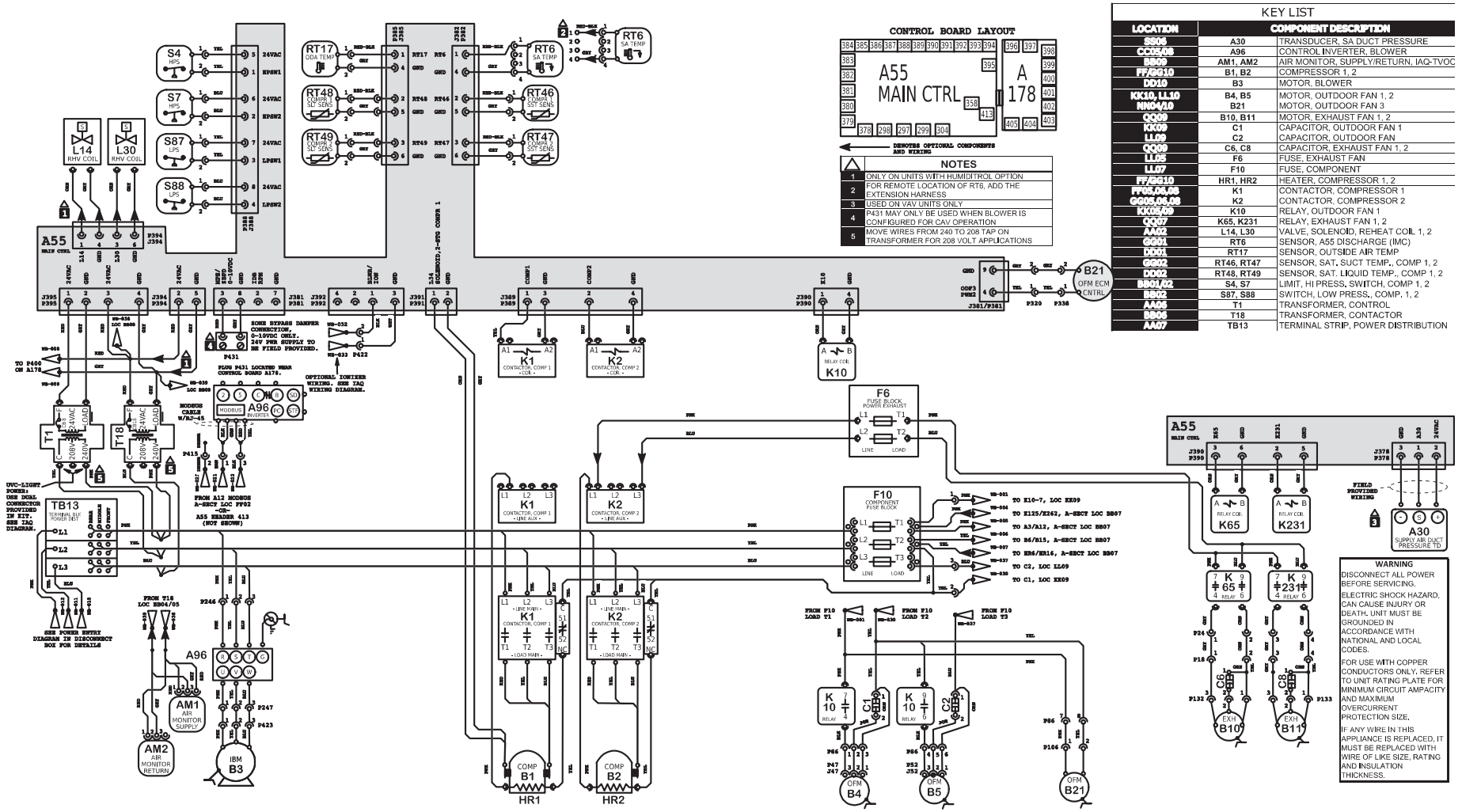
2 - K203-1 N.C. contacts open to de-energize K3 relay coil. K3 contacts open to interrupt power to B3 blower motor through K3 N.O. contacts.

3 - K202 contacts close to allow power to B3 blower motor from A96 blower inverter.

***By-Pass Not Installed***

1 - Control inverter A96 energizes B3.

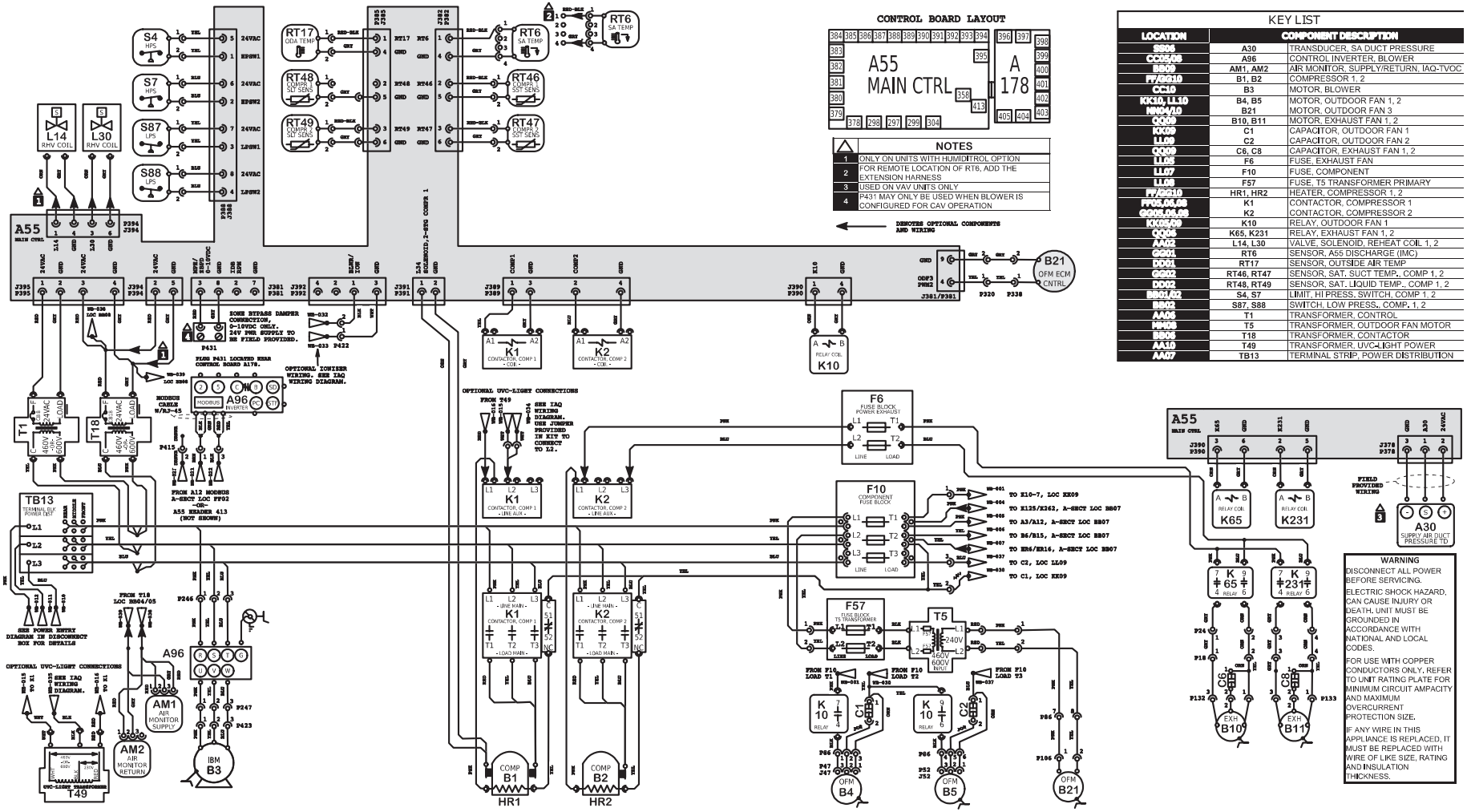
## LGT/LCT156 Y Voltage No By-Pass




LGT, LCT 156H - Y-VOLT
COOLING - MSAV NO BYPASS -OR- VAV - 2 COMPRESSORS 3 CONDENSER FANS

Voltage: 208-240V/3~/60Hz (Y)
Supersedes: N/A Form No: 538211-0 Rev: 3

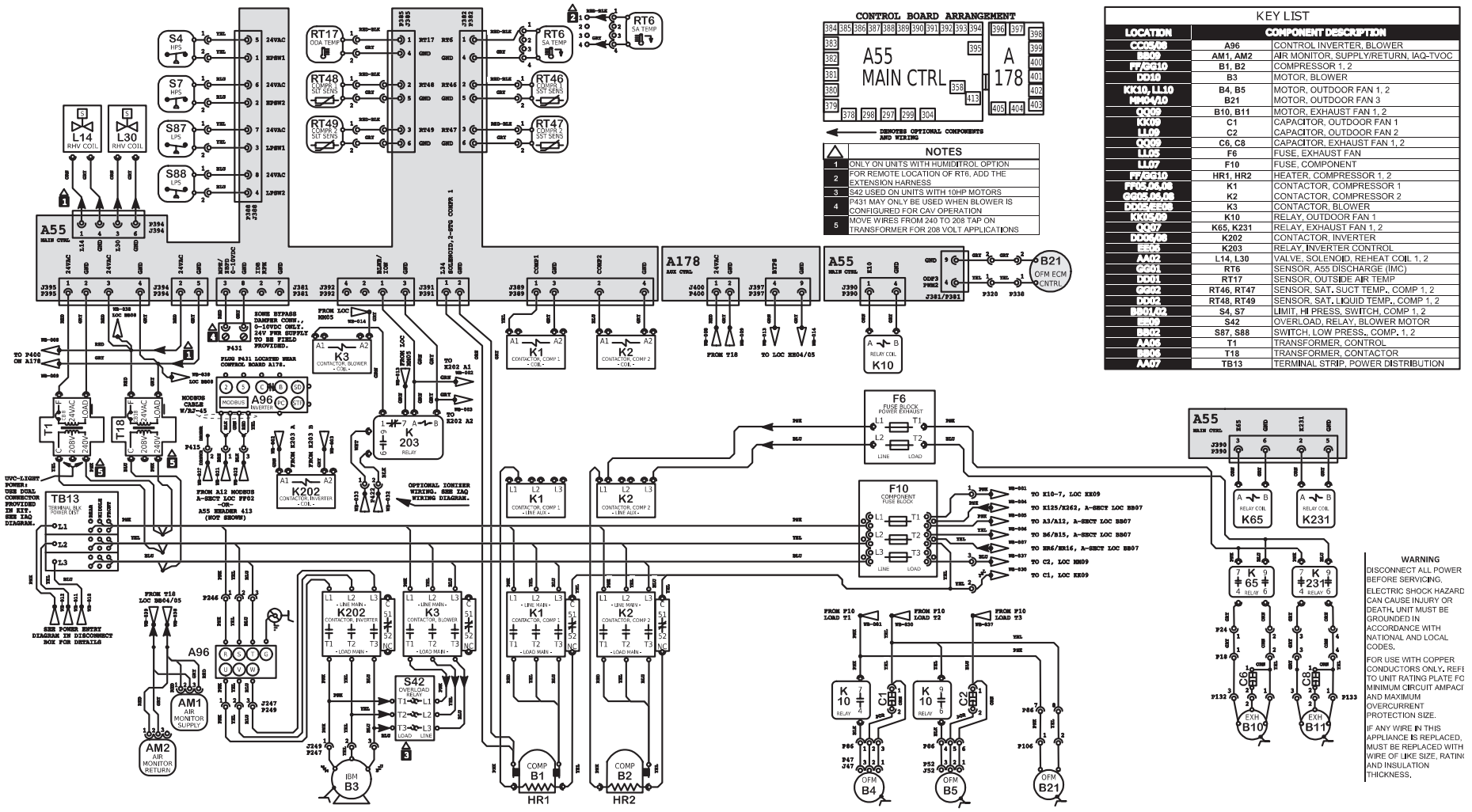
## LGT/LCT156 G, J Voltage  No By-Pass




LGT, LCT 156H – G, J–VOLT
COOLING – MSAV NO BYPASS –OR– VAV – 2 COMPRESSORS 3 CONDENSER FANS

Voltage: ..0V/3~/60Hz (G), 575V/3~/60Hz (J)
Supersedes: N/A  Form No: 538209-0  Rev: 3

# LGT/LCT156 Y Voltage With By-Pass



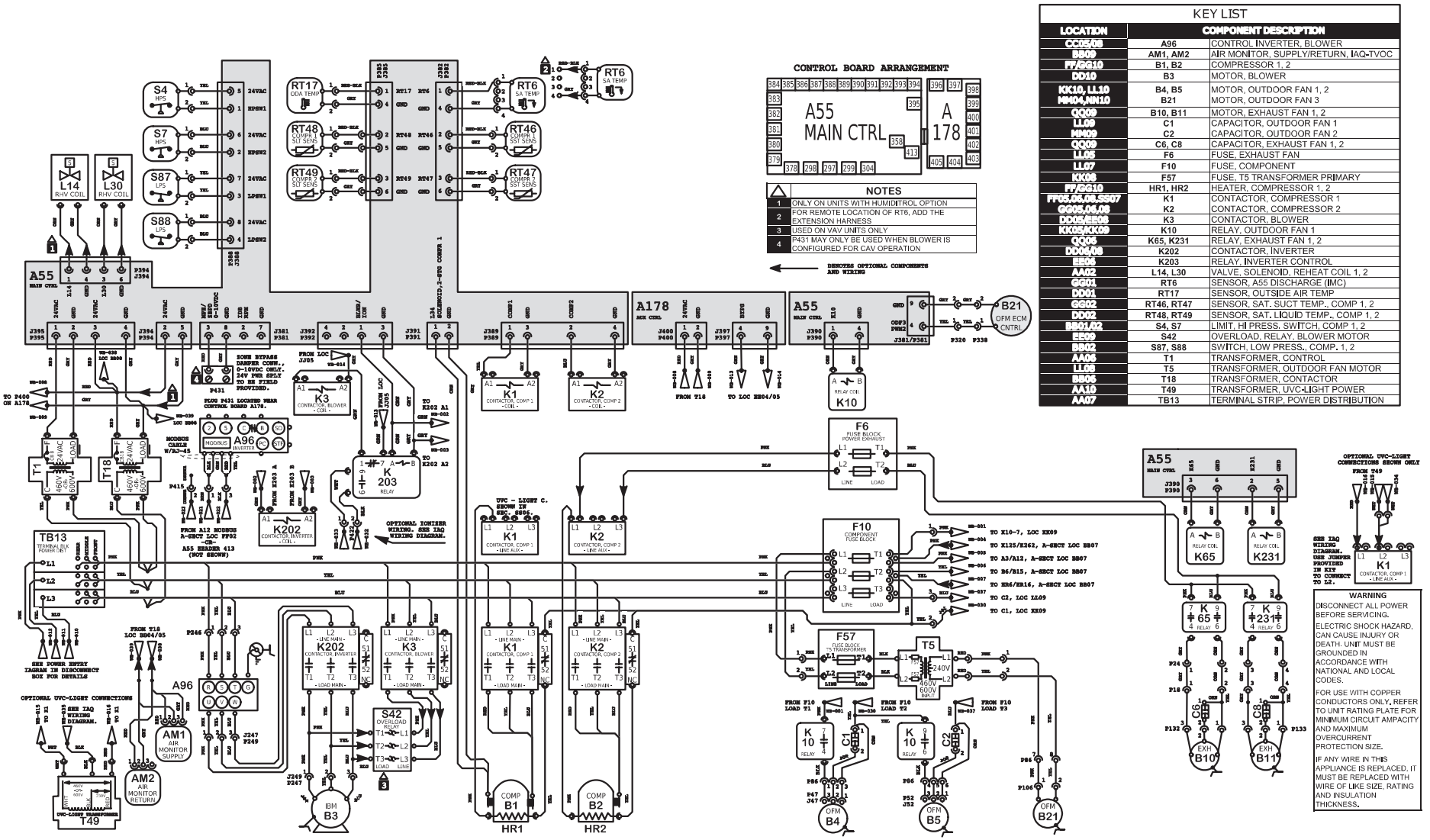

Voltage: 208-240V/3~/60Hz (Y)

LGT, LCT 156H - Y-VOLT

COOLING - MSAV WITH BYPASS - 2 COMPRESSORS 3 CONDENSER FANS

Supersedes: N/A Form No: 538212-0 Rev: 2

# LGT/LCT156 G, J Voltage With By-Pass




KEY LIST

| LOCATION | COMPONENT DESCRIPTION | |
|---|---|---|
| CC04/05 | A96 | CONTROL INVERTER, BLOWER |
| BB06 | AM1, AM2 | AIR MONITOR, SUPPLY/RETURN, IAQ-TVOC |
| F7/GG10 | B1, B2 | COMPRESSOR 1, 2 |
| DD10 | B3 | MOTOR, BLOWER |
| KK10, LL10 MM04,NN10 | B4, B5 B21 | MOTOR, OUTDOOR FAN 1, 2 MOTOR, OUTDOOR FAN 3 |
| QQ09 | B10, B11 | MOTOR, EXHAUST FAN 1, 2 |
| LL09 MM09 | C1 C2 | CAPACITOR, OUTDOOR FAN 1 CAPACITOR, OUTDOOR FAN 2 |
| QQ09 | C6, C8 | CAPACITOR, EXHAUST FAN 1, 2 |
| LL05 | F6 | FUSE, EXHAUST FAN |
| LL07 | F10 | FUSE, COMPONENT |
| KK08 | F57 | FUSE, T5 TRANSFORMER PRIMARY |
| F7/GG10 | HR1, HR2 | HEATER, COMPRESSOR 1, 2 |
| FF05,06,08,SS07 GG05,06,08 | K1 K2 | CONTACTOR, COMPRESSOR 1 CONTACTOR, COMPRESSOR 2 |
| DD05/EE08 | K3 | CONTACTOR, BLOWER |
| KK08/KK09 | K10 | RELAY, OUTDOOR FAN 1 |
| QQ06 | K65, K231 | RELAY, EXHAUST FAN 1, 2 |
| DD06/08 | K202 | CONTACTOR, INVERTER |
| EE06 | K203 | RELAY, INVERTER CONTROL |
| AA02 | L14, L30 | VALVE, SOLENOID, REHEAT COIL 1, 2 |
| GG01 | RT6 | SENSOR, A55 DISCHARGE (IMC) |
| DD01 | RT17 | SENSOR, OUTSIDE AIR TEMP |
| GG02 | RT46, RT47 | SENSOR, SAT. SUCT TEMP., COMP 1, 2 |
| DD02 | RT48, RT49 | SENSOR, SAT. LIQUID TEMP., COMP 1, 2 |
| BB01/02 | S4, S7 | LIMIT, HI PRESS. SWITCH, COMP 1, 2 |
| EE09 | S42 | OVERLOAD, RELAY, BLOWER MOTOR |
| BB02 | S87, S88 | SWITCH, LOW PRESS., COMP. 1, 2 |
| AA06 | T1 | TRANSFORMER, CONTROL |
| LL08 | T5 | TRANSFORMER, OUTDOOR FAN MOTOR |
| BB05 | T18 | TRANSFORMER, CONTACTOR |
| AA10 | T49 | TRANSFORMER, UVC-LIGHT POWER |
| AA07 | TB13 | TERMINAL STRIP, POWER DISTRIBUTION |

LGT, LCT 156H - G, J-VOLT
COOLING - MSAV WITH BYPASS - 2 COMPRESSORS 3 CONDENSER FANS

Voltage: 460V/3~/60Hz (G), 575V/3~/60Hz (J)
Supersedes: N/A Form No: 538210-0 Rev: 2

**Sequence of Operation LCT180**

1 - 1Line voltage from TB13 energizes transformer T1 and T18. Transformer T1 and T18 provides 24VAC power to the main controller A55. The transformers also provide 24VAC power to the unit cooling, heating and blower controls and thermostat

**ECONOMIZER OPERATION**

2 - The A55 Unit Controller receives a demand and energizes exhaust fan relay K65 and K231 with 24VAC at 50% (travel) outside air damper open (adjustable).

3 - N.O. K65-1, K65-2, K231-01 and K231-02 close, energizing exhaust fan motors B10 and B11.

**1ST STAGE COOLING**

4 - First stage cooling demand energizes Y1 and G in the thermostat. G energizes blower, if blower is not already running (see step 3).

5 - 24VAC is routed to the A55 Unit Controller. After A55 proves N.C. low pressure switch S87 and high pressure switch S4, compressor contactor K1 is energized. After A55 proves N.C. low pressure switch S88 and high pressure switch S7, compressor contactor K2 is energized.

6 - A55 energizes outdoor fan B5 directly and fan B4 through K10. A178 energizes outdoor fan B22 directly and fan B21 through K149.

7 - N.O. K1 closes energizing compressor B1, and N.C. K1-52 opens de-nergizing HR1.

8 - N.O. K2 closes energizing compressor B2, and N.C. K2-52 opens denergizing HR2.

**2ND STAGE COOLING**

9 - Second stage cooling demand energizes Y2.

10 - After A55 proves N.C. low pressure switch S97 and high pressure switch S28, compressor contactor K14 is energized.

11 - N.O. K14 closes energizing compressor B13, and N.C. K14-52 opens denergizing HR5.

**BLOWER OPERATION**

***With By Pass Installed - Active***

1 - Main control A55 de-energizes relays K202 and K203

2 - K202 contacts open to interrupt power to B3 blower motor from A96 blower inverter.

3 - Main control A55 energizes relay K203-7.

4 - K203-1 N.C. contacts close allowing power to K3.

5 - K3 contacts close to allow power to B3 blower motor.

***With By Pass Installed - Inactive***

1 - Main control A55 energizes relays K202 and K203.

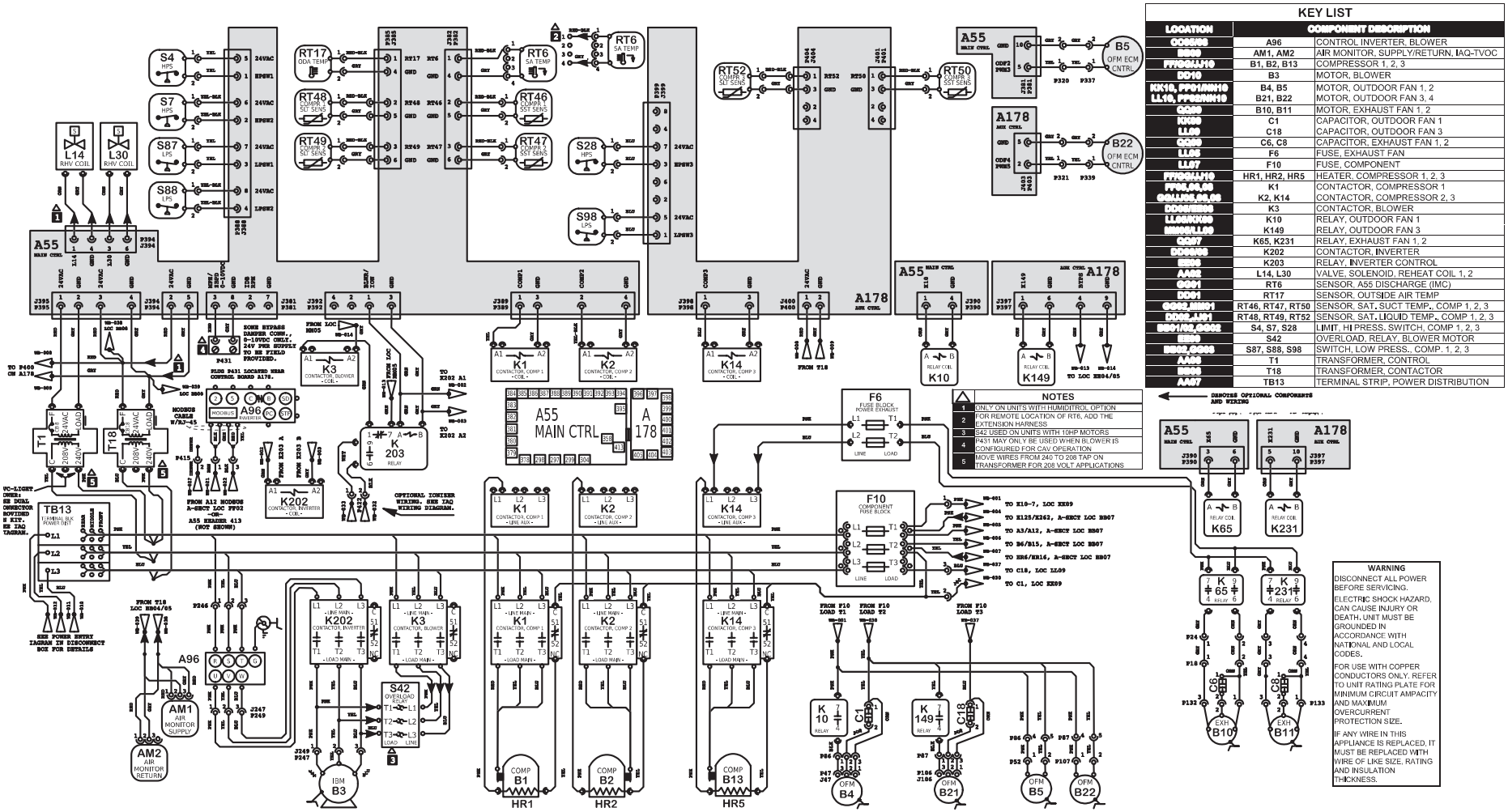
2 - K203-1 N.C. contacts open to de-energize K3 relay coil. K3 contacts open to interrupt power to B3 blower motor through K3 N.O. contacts.

3 - K202 contacts close to allow power to B3 blower motor from A96 blower inverter.

***By-Pass Not Installed***

1 - Control inverter A96 energizes B3.

## LGT/LCT180 Y Voltage With By-Pass



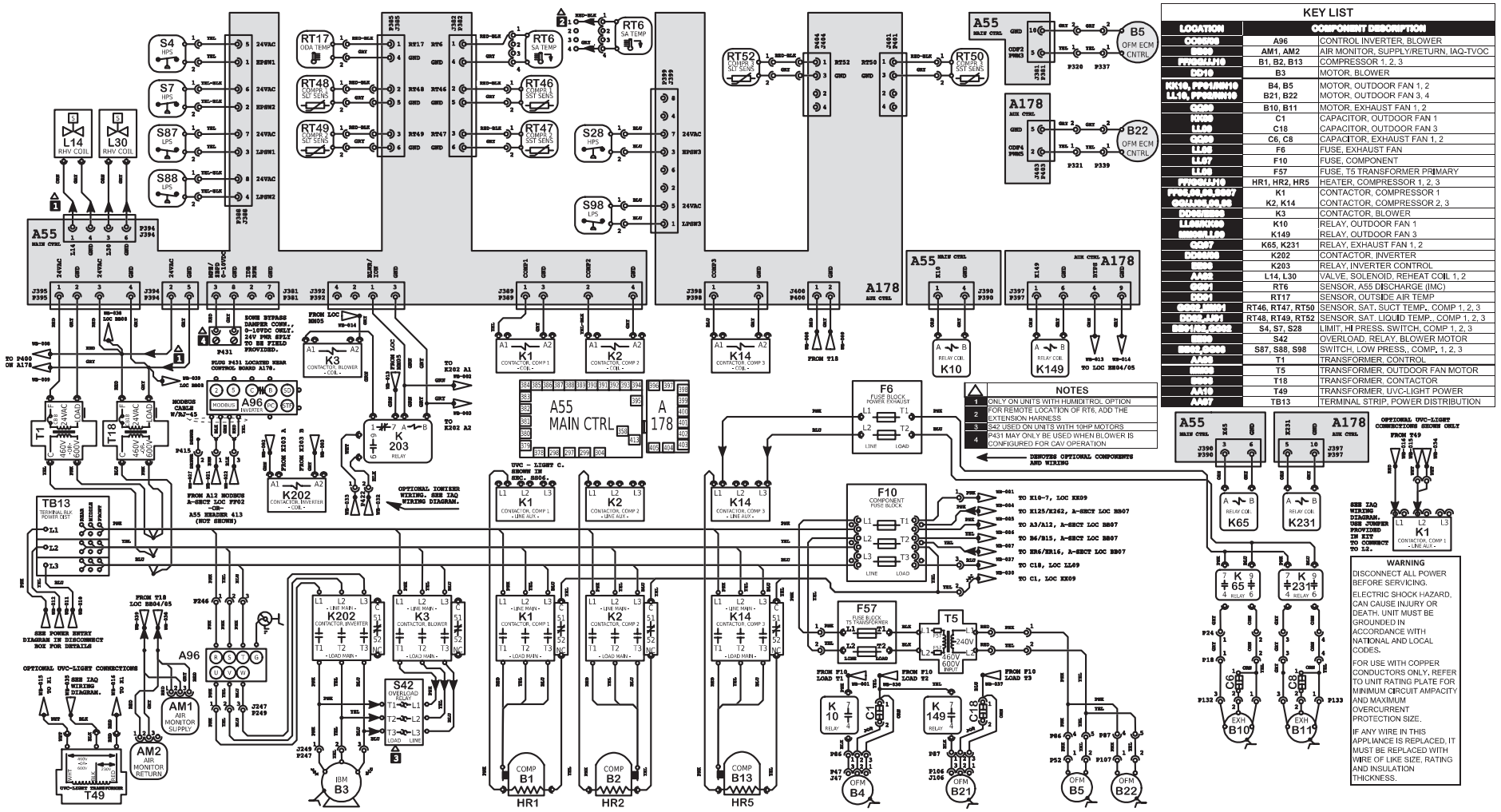

Model: LGT, LCT 180H – Y–VOLT

COOLING – MSAV WITH BYPASS – 3 COMPRESSORS 4 CONDENSER FANS

Voltage: 208–240V/3~/60Hz (Y)

Supersedes: N/A Form No: 538216–0 Rev: 1

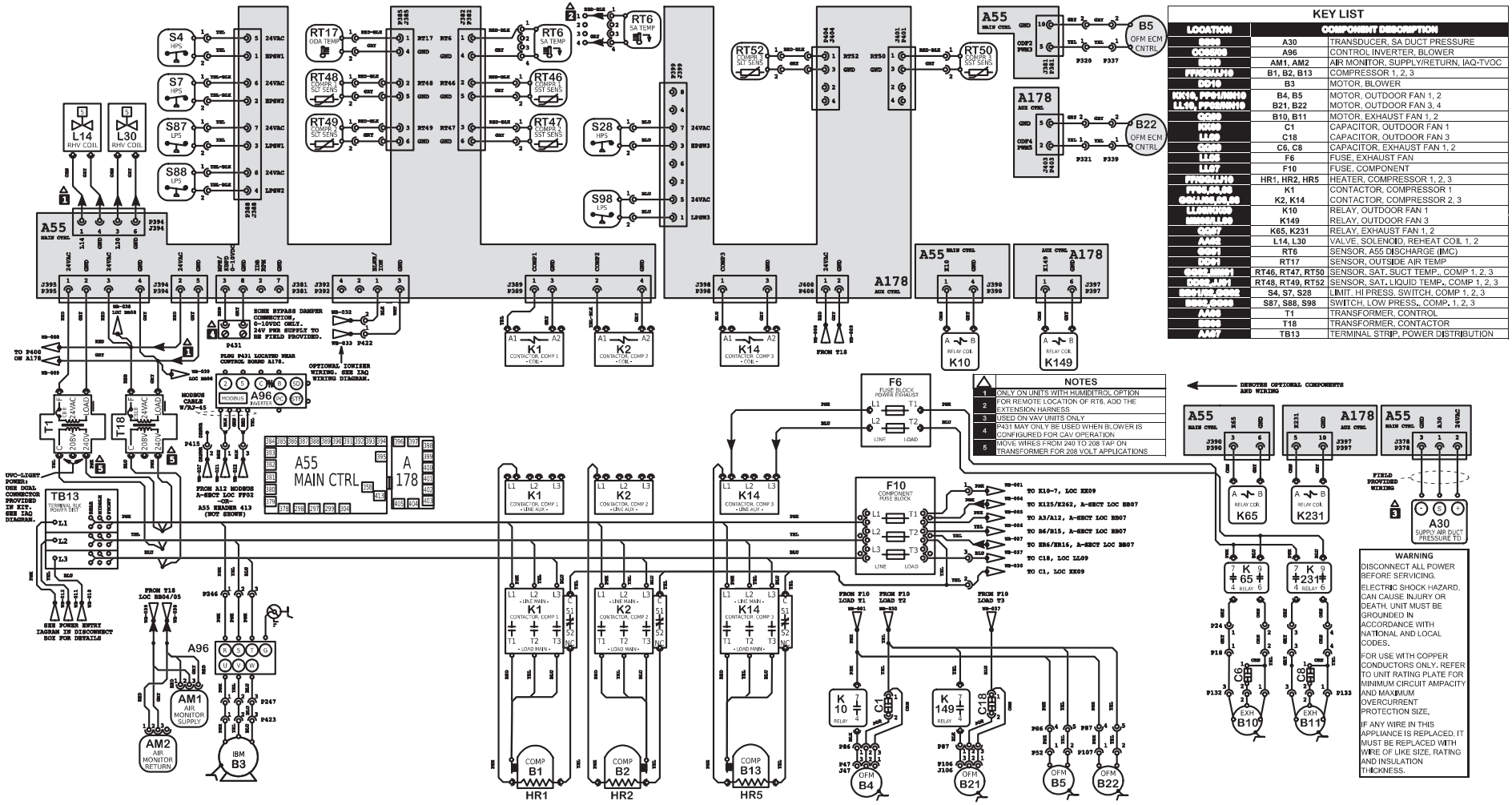
# LGT/LCT180 G, J Voltage With By-Pass




Model: LGT, LCT 180H - G, J-VOLT
COOLING - MSAV WITH BYPASS - 3 COMPRESSORS 4 CONDENSER FANS

Voltage: 460V/3~/60Hz (G), 575V/3~/60Hz (J)
Supersedes: N/A Form No 538214-0 Rev: 1

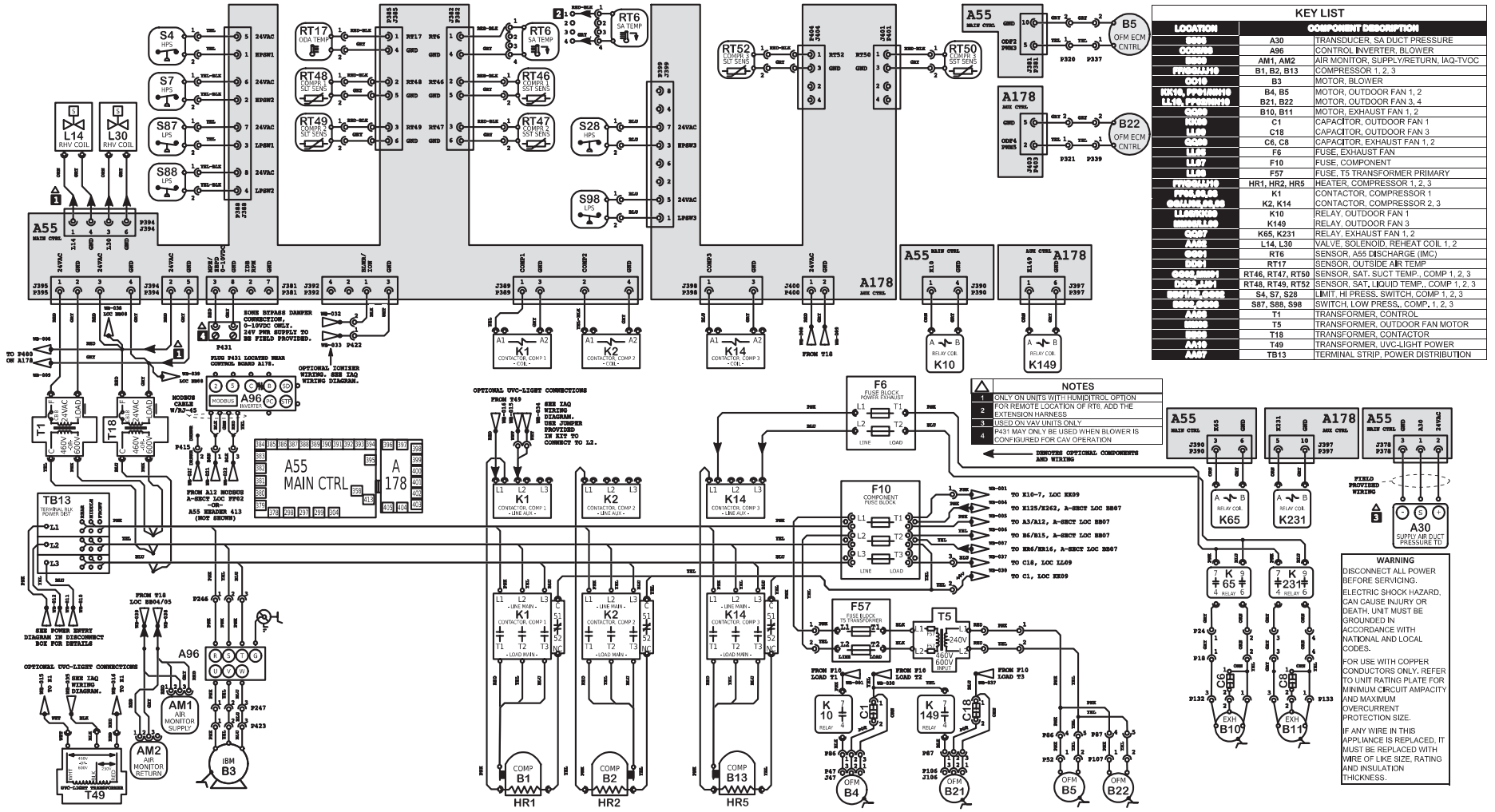
# LGT/LCT180 Y Voltage No By-Pass




Model: LGT, LCT 180H - Y-VOLT
COOLING - MSAV NO BYPASS -OR- VAV - 3 COMPRESSORS 4 CONDENSER FANS

Voltage: 208-240V/3~/60Hz (Y)
Supersedes: N/A Form No: 538215-0 Rev: 1

# LGT/LCT180 G, J Voltage No By-Pass



| KEY LIST | |
|---|---|
| LOCATION | COMPONENT DESCRIPTION |
| A30 | TRANSDUCER, SA DUCT PRESSURE |
| A96 | CONTROL INVERTER, BLOWER |
| AM1, AM2 | AIR MONITOR, SUPPLY/RETURN, IAQ-TVOC |
| B1, B2, B13 | COMPRESSOR 1, 2, 3 |
| B3 | MOTOR, BLOWER |
| B4, B5 | MOTOR, OUTDOOR FAN 1, 2 |
| B21, B22 | MOTOR, OUTDOOR FAN 3, 4 |
| B10, B11 | MOTOR, EXHAUST FAN 1, 2 |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C18 | CAPACITOR, OUTDOOR FAN 3 |
| C6, C8 | CAPACITOR, EXHAUST FAN 1, 2 |
| F6 | FUSE, EXHAUST FAN |
| F10 | FUSE, COMPONENT |
| F57 | FUSE, T5 TRANSFORMER PRIMARY |
| HR1, HR2, HR5 | HEATER, COMPRESSOR 1, 2, 3 |
| K1 | CONTACTOR, COMPRESSOR 1 |
| K2, K14 | CONTACTOR, COMPRESSOR 2, 3 |
| K10 | RELAY, OUTDOOR FAN 1 |
| K149 | RELAY, OUTDOOR FAN 3 |
| K65, K231 | RELAY, EXHAUST FAN 1, 2 |
| L14, L30 | VALVE, SOLENOID, REHEAT COIL 1, 2 |
| RT6 | SENSOR, A55 DISCHARGE (IMC) |
| RT17 | SENSOR, OUTSIDE AIR TEMP |
| RT46, RT47, RT50 | SENSOR, SAT, SUCT TEMP., COMP 1, 2, 3 |
| RT48, RT49, RT52 | SENSOR, SAT, LIQUID TEMP., COMP 1, 2, 3 |
| S4, S7, S28 | LIMIT, HI PRESS. SWITCH, COMP 1, 2, 3 |
| S87, S88, S98 | SWITCH, LOW PRESS., COMP., 1, 2, 3 |
| T1 | TRANSFORMER, CONTROL |
| T5 | TRANSFORMER, OUTDOOR FAN MOTOR |
| T18 | TRANSFORMER, CONTACTOR |
| T49 | TRANSFORMER, UVC-LIGHT POWER |
| TB13 | TERMINAL STRIP, POWER DISTRIBUTION |

| NOTES | |
|---|---|
| 1 | ONLY ON UNITS WITH HUMIDITROL OPTION |
| 2 | FOR REMOTE LOCATION OF RT6, ADD THE EXTENSION HARNESS |
| 3 | USED ON VAV UNITS ONLY |
| 4 | P431 MAY ONLY BE USED WHEN BLOWER IS CONFIGURED FOR CAV OPERATION |

△ DENOTES OPTIONAL COMPONENTS AND WIRING

**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: LGT, LCT 180H - G, J-VOLT
COOLING - MSAV NO BYPASS -OR- VAV - 3 COMPRESSORS 4 CONDENSER FANS

Voltage: 460V/3~/60Hz (G), 575V/3~/60Hz (J)
Supersedes: N/A Form No: 538213-0 Rev: 1

**Sequence of Operation LCT210**

1 - Line voltage from TB13 energizes transformer T1 and T18. Transformer T1 and T18 provides 24VAC power to the main controller A55. The transformers also provide 24VAC power to the unit cooling, heating and blower controls and thermostat.

**ECONOMIZER OPERATION**

2 - The A55 Unit Controller receives a demand and energizes exhaust fan relay K65 and K231 with 24VAC at 50% (travel) outside air damper open (adjustable).

3 - N.O. K65-1, K65-2, K231-01 and K231-02 close, energizing exhaust fan motors B10 and B11.

**1ST STAGE COOLING**

4 - First stage cooling demand energizes Y1 and G in the thermostat. G energizes blower, if blower is not already running.

5 - 24VAC is routed to the A55 Unit Controller. After A55 proves N.C. low pressure switch S87, and S88 and N.C. high pressure switch S4 and S7, compressor contactors K1 and K2 are energized.

6 - A55 energizes outdoor fan B5 directly, and fan B4 through K10.

7 - N.O. K1 closes energizing compressor B1, and N.C. K1-52 opens de-energizing HR1.

8 - N.O. K2 closes energizing compressor B2, and N.C. K2-52 opens de-energizing HR2.

**2ND STAGE COOLING**

9 - Second stage cooling demand energizes Y2.

10 - After A55 proves N.C. low pressure switches S97 & S98 and N.C. high pressure switches S28 & S96, contactors K14 and K146 are energized.

11 - A178 energizes outdoor fan B22 directly, and B22 through K149.

12 - N.O. K14 closes energizing compressor B13 and K14-52 opens de-energizing crankcase heater HR5.

13 - N.O. K146 closes energizing compressor B20 and K146-52 opens de-energizing crankcase heater HR11.

**BLOWER OPERATION**

***With By Pass Installed - Active***

1 - Main control A55 de-energizes relays K202 and K203

2 - K202 contacts open to interrupt power to B3 blower motor from A96 blower inverter.

3 - Main control A55 energizes relay K203-7.

4 - K203-1 N.C. contacts close allowing power to K3.

5 - K3 contacts close to allow power to B3 blower motor.

***With By Pass Installed - Inactive***

1 - Main control A55 energizes relays K202 and K203.

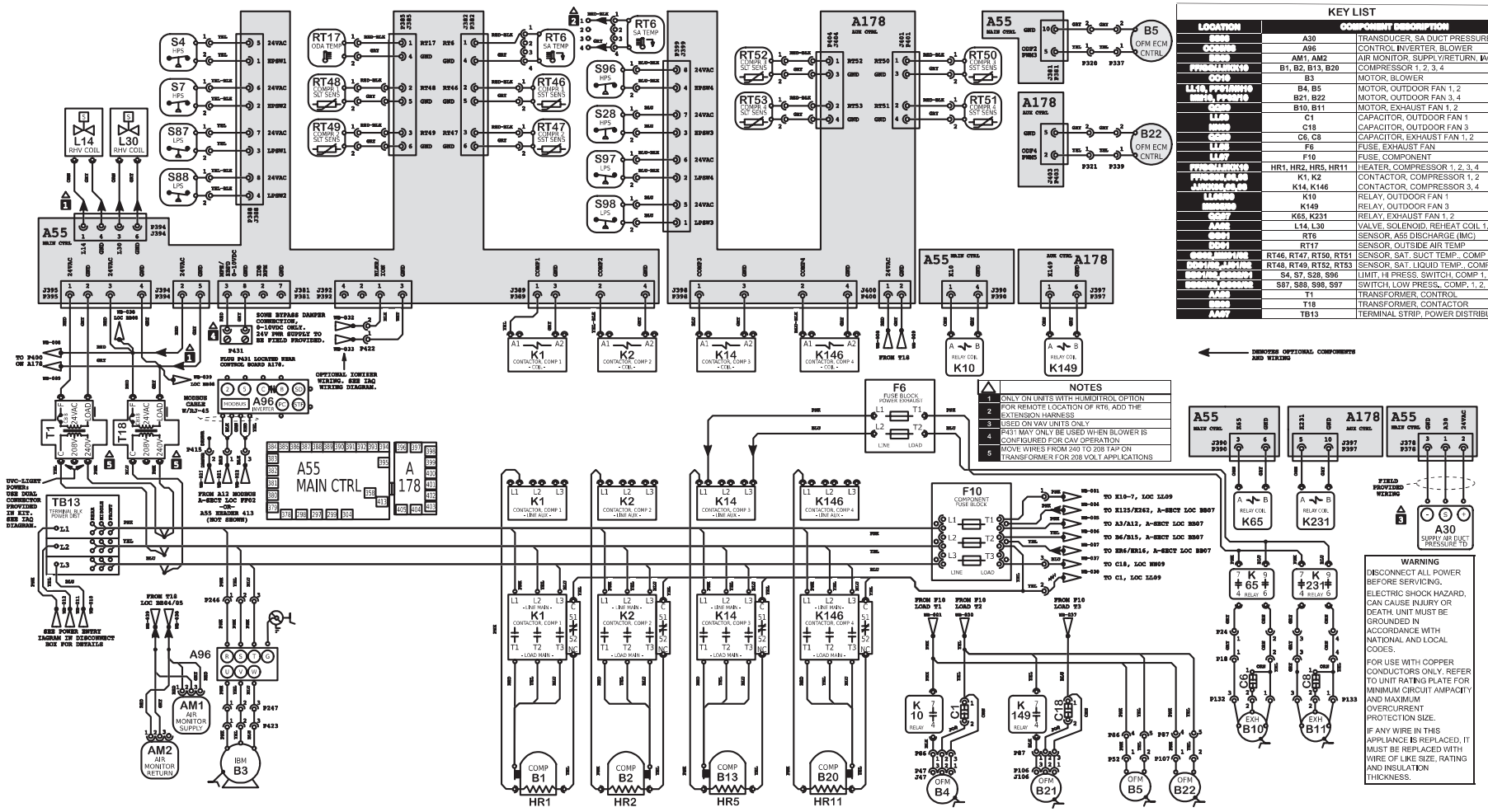
2 - K203-1 N.C. contacts open to de-energize K3 relay coil. K3 contacts open to interrupt power to B3 blower motor through K3 N.O. contacts.

3 - K202 contacts close to allow power to B3 blower motor from A96 blower inverter.

***By-Pass Not Installed***

1 - Control inverter A96 energizes B3.

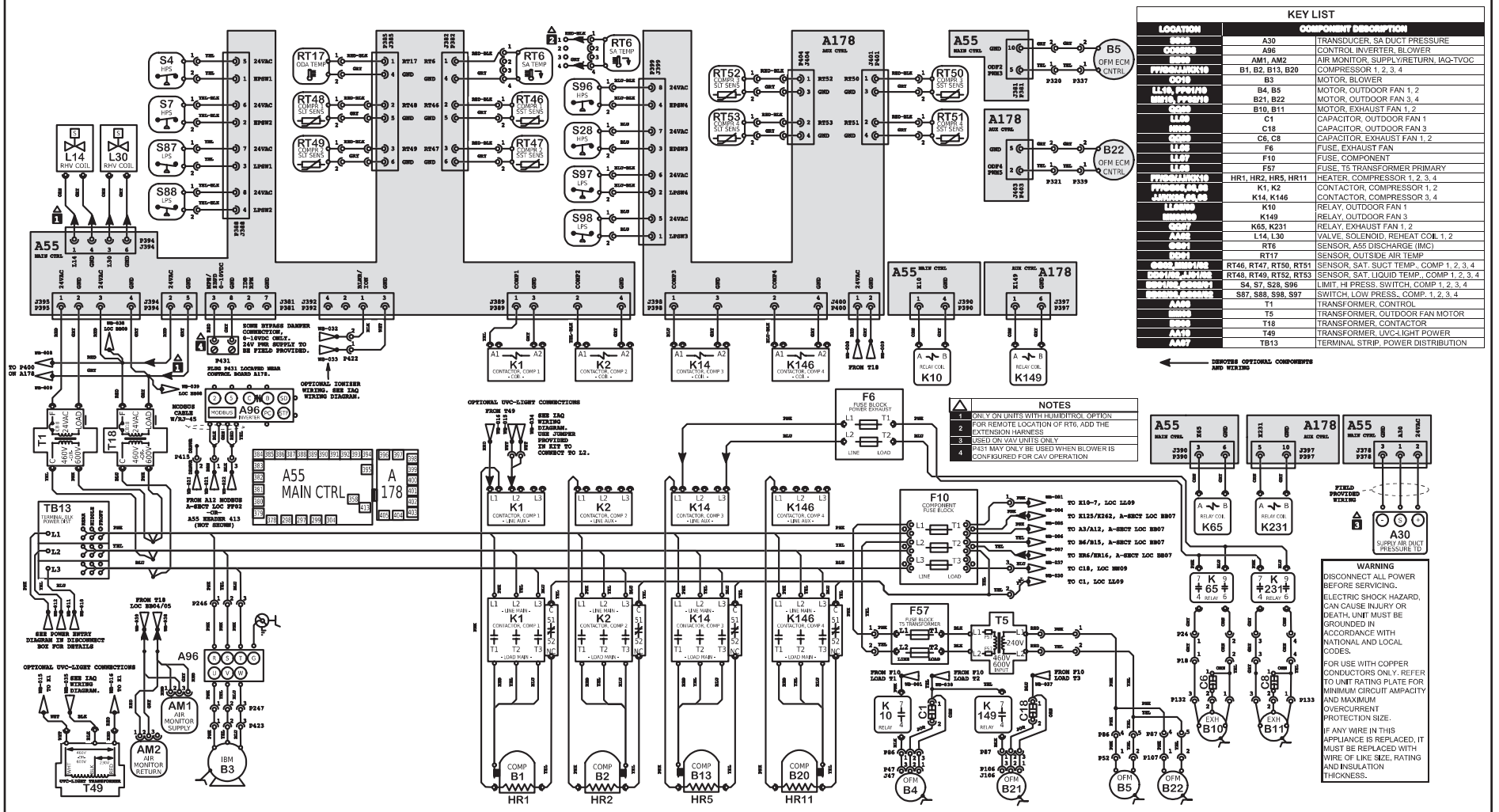
## LGT/LCT210 Y Voltage No By-Pass




LGT, LCT 210H - Y-VOLT
COOLING - MSAV NO BYPASS -OR- VAV - 4 COMPRESSORS 4 CONDENSER FANS

Voltage: 208-240V/3~/60Hz (Y)
Supersedes: N/A Form No: 538229-0 Rev: 1

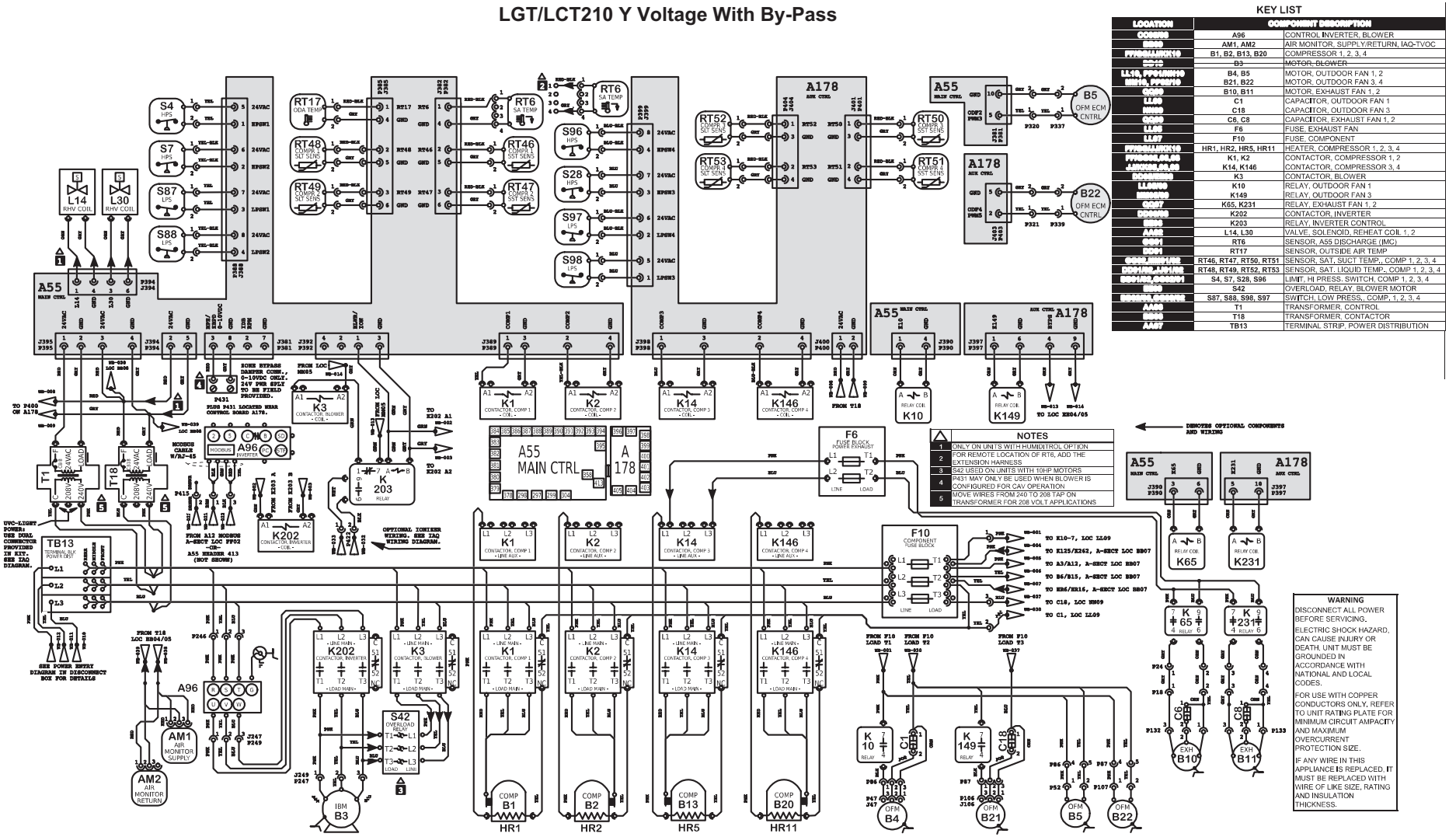
## LGT/LCT210 G, J Voltage No By-Pass




LGT, LCT 210H - G, J-VOLT
COOLING - MSAV NO BYPASS -OR- VAV - 4 COMPRESSORS 4 CONDENSER FANS

Voltage: 460V/3~/60Hz (G), 575V/3~/60Hz (J)
Supersedes: N/A Form No: 538227-0 Rev: 1

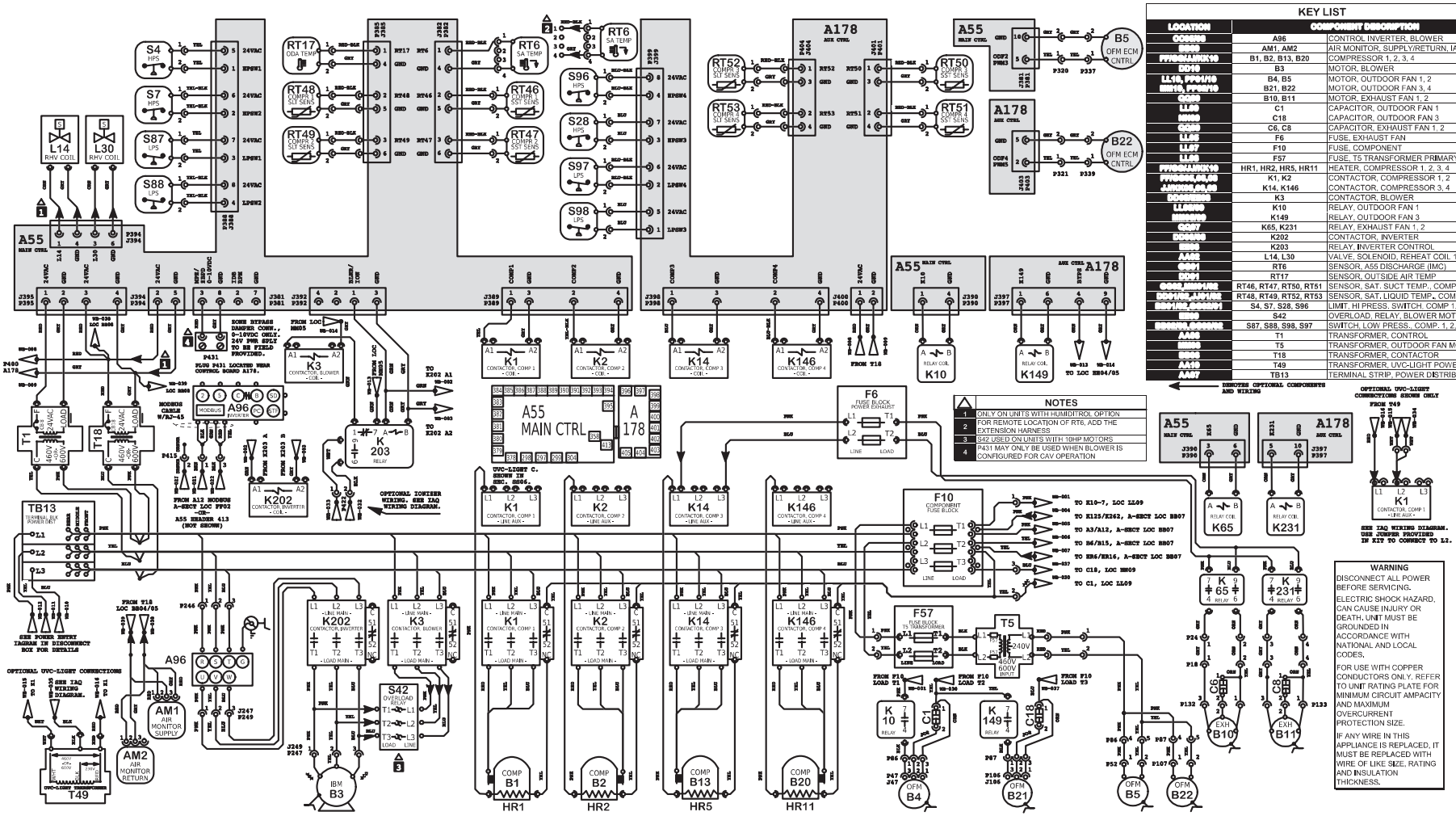
# LGT/LCT210 Y Voltage With By-Pass




LGT, LCT 210H - Y-VOLT
COOLING - MSAV WITH BYPASS - 4 COMPRESSORS 4 CONDENSER FANS

Voltage: 208-240V/3~/60Hz (Y)
Supersedes: N/A Form No: 538230-0 Rev: 1

# LGT/LCT210 G, J Voltage With By-Pass




| KEY LIST | |
|---|---|
| LOCATION | COMPONENT DESCRIPTION |
| A96 | CONTROL INVERTER, BLOWER |
| AM1, AM2 | AIR MONITOR, SUPPLY/RETURN, IAQ-TVOC |
| B1, B2, B13, B20 | COMPRESSOR 1, 2, 3, 4 |
| B3 | MOTOR, BLOWER |
| B4, B5 | MOTOR, OUTDOOR FAN 1, 2 |
| B21, B22 | MOTOR, OUTDOOR FAN 3, 4 |
| B10, B11 | MOTOR, EXHAUST FAN 1, 2 |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C18 | CAPACITOR, OUTDOOR FAN 3 |
| C6, C8 | CAPACITOR, EXHAUST FAN 1, 2 |
| F6 | FUSE, EXHAUST FAN |
| F10 | FUSE, COMPONENT |
| F57 | FUSE, T5 TRANSFORMER PRIMARY |
| HR1, HR2, HR5, HR11 | HEATER, COMPRESSOR 1, 2, 3, 4 |
| K1, K2 | CONTACTOR, COMPRESSOR 1, 2 |
| K14, K146 | CONTACTOR, COMPRESSOR 3, 4 |
| K3 | CONTACTOR, BLOWER |
| K10 | RELAY, OUTDOOR FAN 1 |
| K149 | RELAY, OUTDOOR FAN 3 |
| K65, K231 | RELAY, EXHAUST FAN 1, 2 |
| K202 | CONTACTOR, INVERTER |
| K203 | RELAY, INVERTER CONTROL |
| L14, L30 | VALVE, SOLENOID, REHEAT COIL 1, 2 |
| RT6 | SENSOR, A55 DISCHARGE (IMC) |
| RT17 | SENSOR, OUTSIDE AIR TEMP |
| RT46, RT47, RT50, RT51 | SENSOR, SAT, SUCT TEMP., COMP 1, 2, 3, 4 |
| RT48, RT49, RT52, RT53 | SENSOR, SAT, LIQUID TEMP., COMP 1, 2, 3, 4 |
| S4, S7, S28, S96 | LIMIT, HI PRESS. SWITCH, COMP 1, 2, 3, 4 |
| S42 | OVERLOAD, RELAY, BLOWER MOTOR |
| S87, S88, S98, S97 | SWITCH, LOW PRESS., COMP. 1, 2, 3, 4 |
| T1 | TRANSFORMER, CONTROL |
| T5 | TRANSFORMER, OUTDOOR FAN MOTOR |
| T18 | TRANSFORMER, CONTACTOR |
| T49 | TRANSFORMER, UVC-LIGHT POWER |
| TB13 | TERMINAL STRIP, POWER DISTRIBUTION |

REMOTE OPTIONAL COMPONENTS AND WIRING

| NOTES | |
|---|---|
| 1 | ONLY ON UNITS WITH HUMIDITROL OPTION |
| 2 | FOR REMOTE LOCATION OF RT6, ADD THE EXTENSION HARNESS |
| 3 | S42 USED ON UNITS WITH 10HP MOTORS |
| 4 | P431 MAY ONLY BE USED WHEN BLOWER IS CONFIGURED FOR CAV OPERATION |

**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.

LGT, LCT 210H - G, J-VOLT
COOLING - MSAV WITH BYPASS - 4 COMPRESSORS 4 CONDENSER FANS

Voltage: 460V/3~/60Hz (G), 575V/3~/60Hz (J)
Supersedes: N/A Form No: 538228-0 Rev: 1

**Sequence of Operation LCT240, 300**

1 - 1- Line voltage from TB13 energizes transformer T1 and T18. Transformer T1 and T18 provides 24VAC power to the main controller A55. The transformers also provide 24VAC power to the unit cooling, heating and blower controls and thermostat.

**ECONOMIZER OPERATION**

2 - The A55 Unit Controller receives a demand and energizes exhaust fan relay K65 and K231 with 24VAC at 50% (travel) outside air damper open (adjustable).

3 - N.O. K65-1, K65-2, K231-01 and K231-02 close, energizing exhaust fan motors B10 and B11.

**1ST STAGE COOLING**

4 - First stage cooling demand energizes Y1 and G in the thermostat.

5 - 24VAC is routed to the A55 Unit Controller. After A55 proves N.C. low pressure switches S87, S88 and N.C. high pressure switches S4 and S7, compressor contactors K1 and K2 are energized.

6 - A55 energizes fan B21 directly and fans B4 & B5 through K10.

7 - N.O. K1 closes energizing compressor B1, and N.C. K1-52 opens de-energizing HR1, N.O. K2 closes energizing compressor B2, and N.C. K2-52 opens de-energizing HR2.

**2ND STAGE COOLING**

8 - Second stage cooling demand energizes Y2.

9 - N.O. contacts K14-1 close energizing compressor B13, de-energizing HR5.

10 - A178 energizes fan B24 directly and fans B22 & B23 through K150.

11 - N.O. K14 closes energizing compressor B13, and N.C. K14-52 opens de-energizing HR5.

12 - \N.O. K146 closes energizing compressor B20, and N.C. K146-52 opens de-energizing HR11.

**BLOWER OPERATION**

***With By Pass Installed - Active***

1 - Main control A55 de-energizes relays K202 and K203

2 - K202 contacts open to interrupt power to B3 blower motor from A96 blower inverter.

3 - Main control A55 energizes relay K203-7.

4 - K203-1 N.C. contacts close allowing power to K3.

5 - K3 contacts close to allow power to B3 blower motor.

***With By Pass Installed - Inactive***

1 - Main control A55 energizes relays K202 and K203.

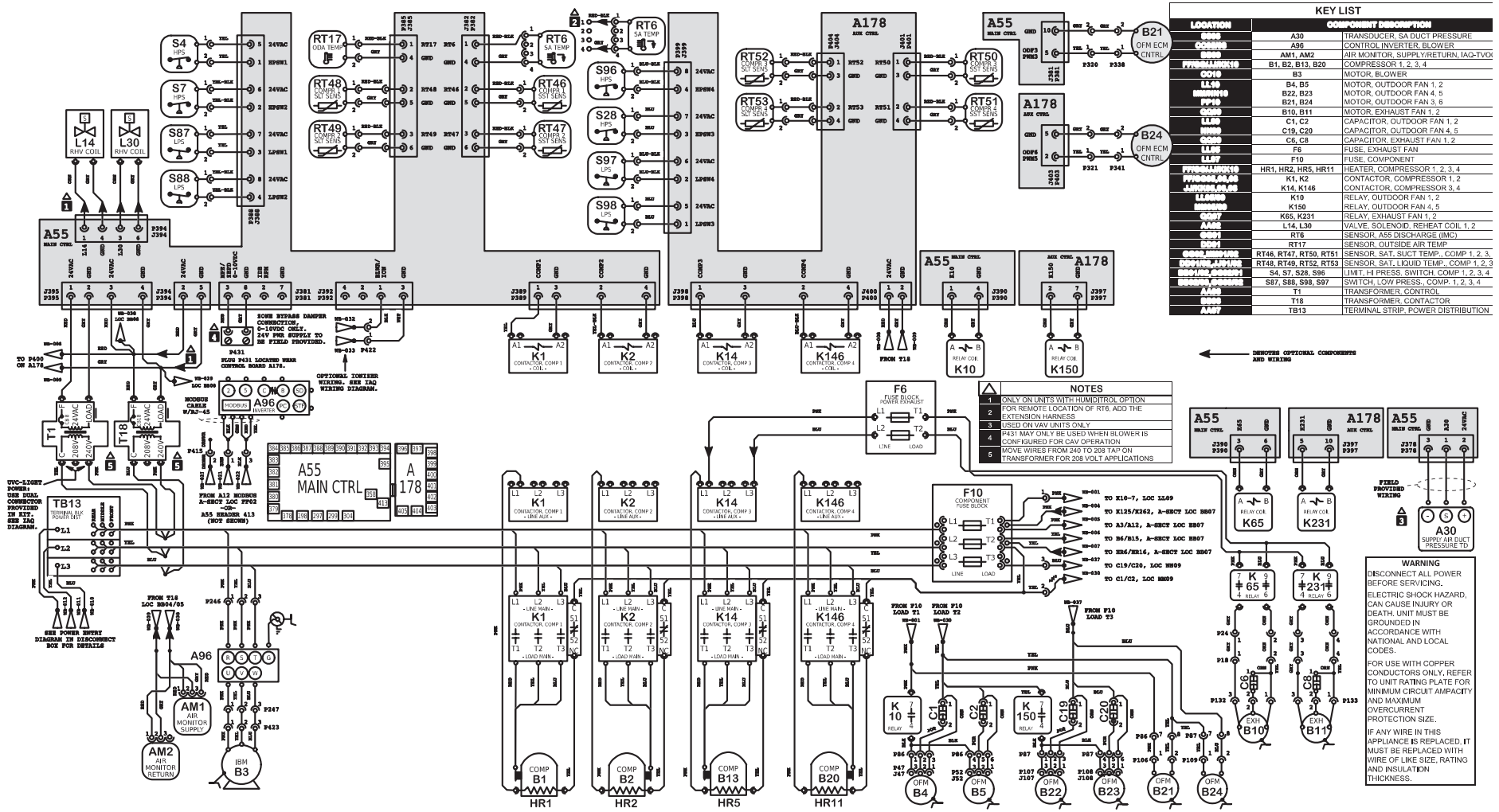
2 - K203-1 N.C. contacts open to de-energize K3 relay coil. K3 contacts open to interrupt power to B3 blower motor through K3 N.O. contacts.

3 - K202 contacts close to allow power to B3 blower motor from A96 blower inverter.

***By-Pass Not Installed***

1 - Control inverter A96 energizes B3.

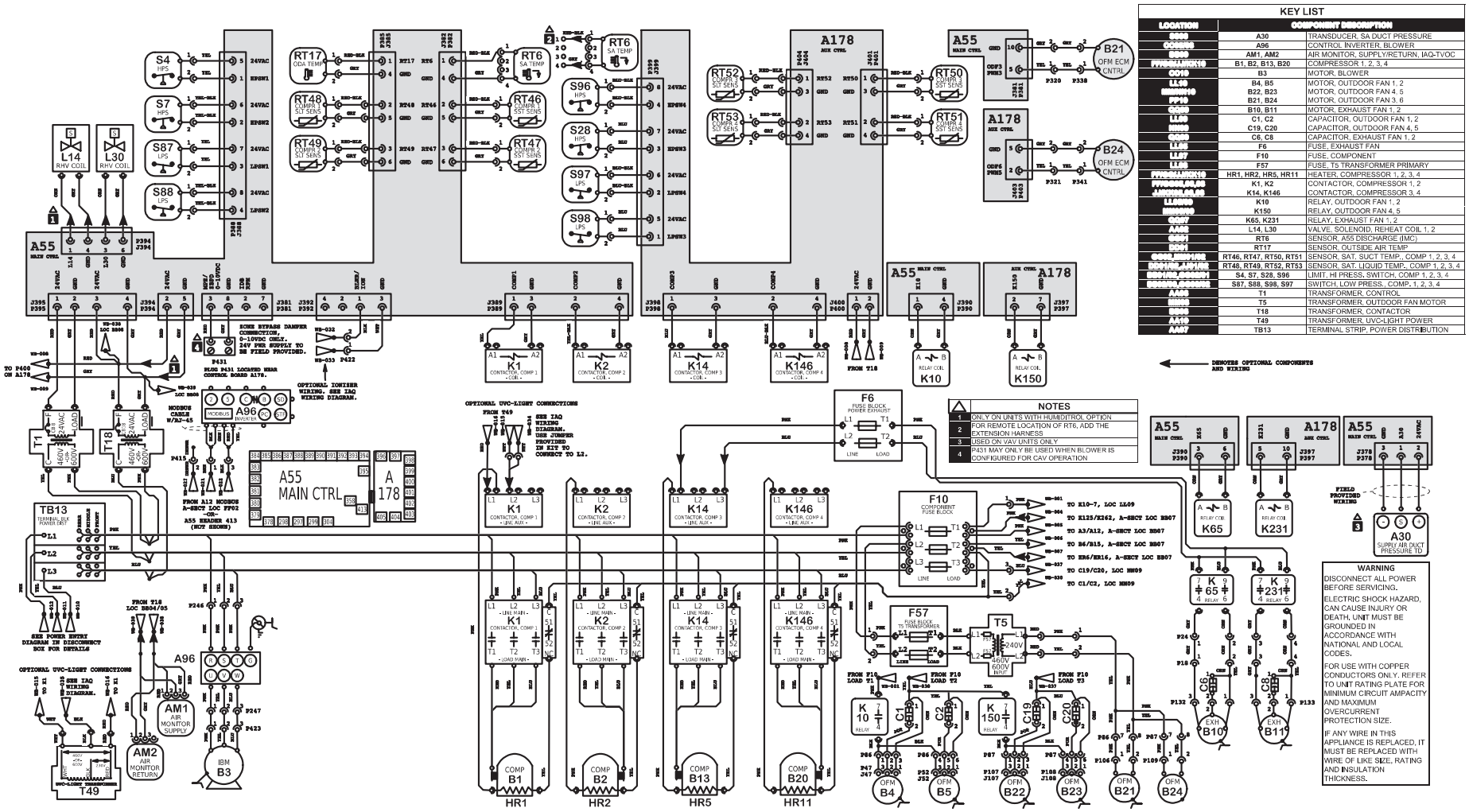
## LGT/LCT240, 300 Y Voltage No By-Pass




LGT, LCT 240H, 300S - Y-VOLT Voltage 208-240V/3~/60Hz (Y)

COOLING - MSAV NO BYPASS -OR- VAV - 4 COMPRESSORS, 6 CONDENSER FANS Form No 538219-0 Rev: 1

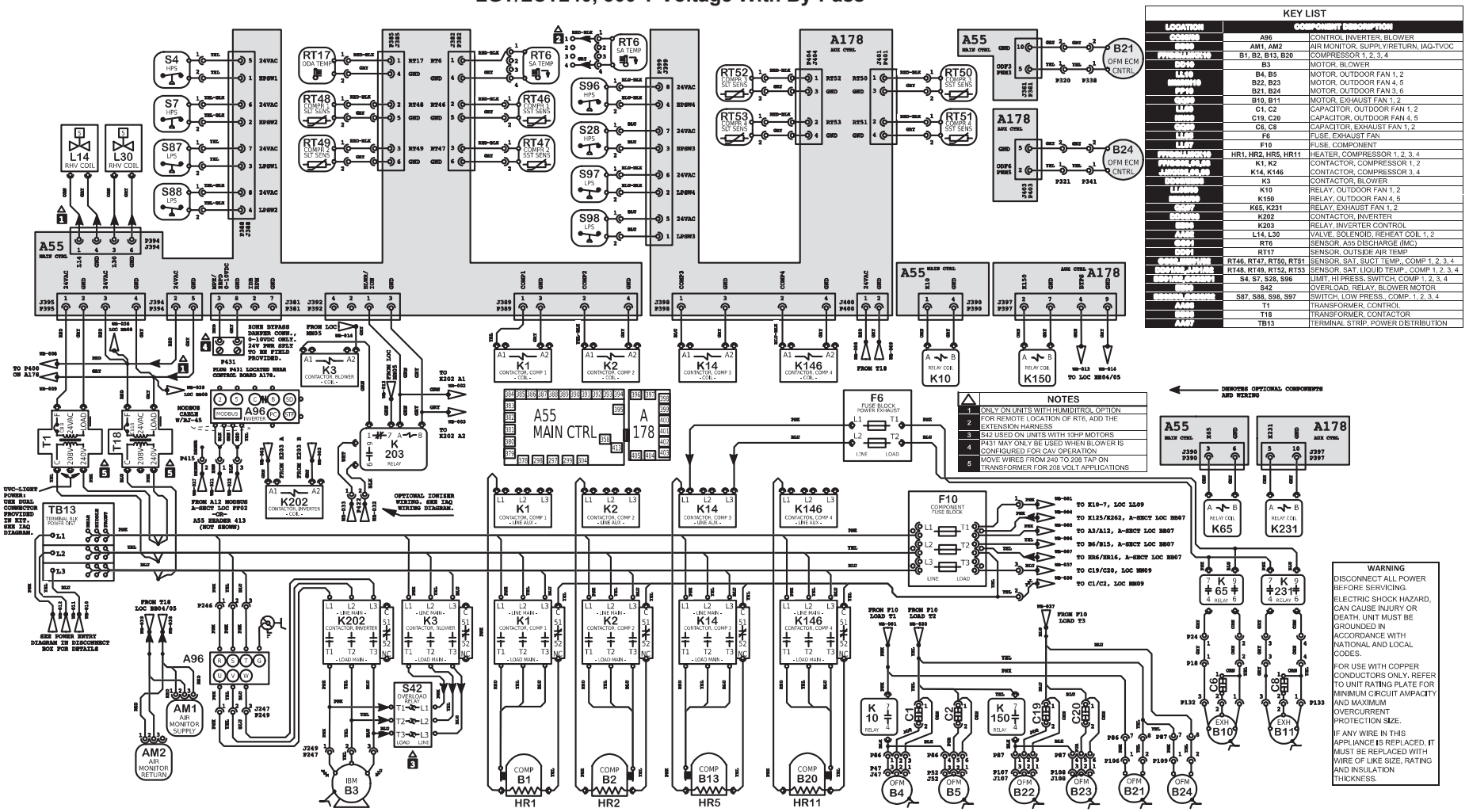
## LGT/LCT240, 300 G, J Voltage No By-Pass




LGT, LCT 240H, 300S – G, J-VOLT COOLING – MSAV NO BYPASS –OR– VAV – 4 COMPRESSORS 6 CONDENSER FANS Supersedes:Form No: 538217-0 Rev: 1

Voltage: 460V/3~/60Hz (G), 575V/3~/60Hz (J)

# LGT/LCT240, 300 Y Voltage With By-Pass

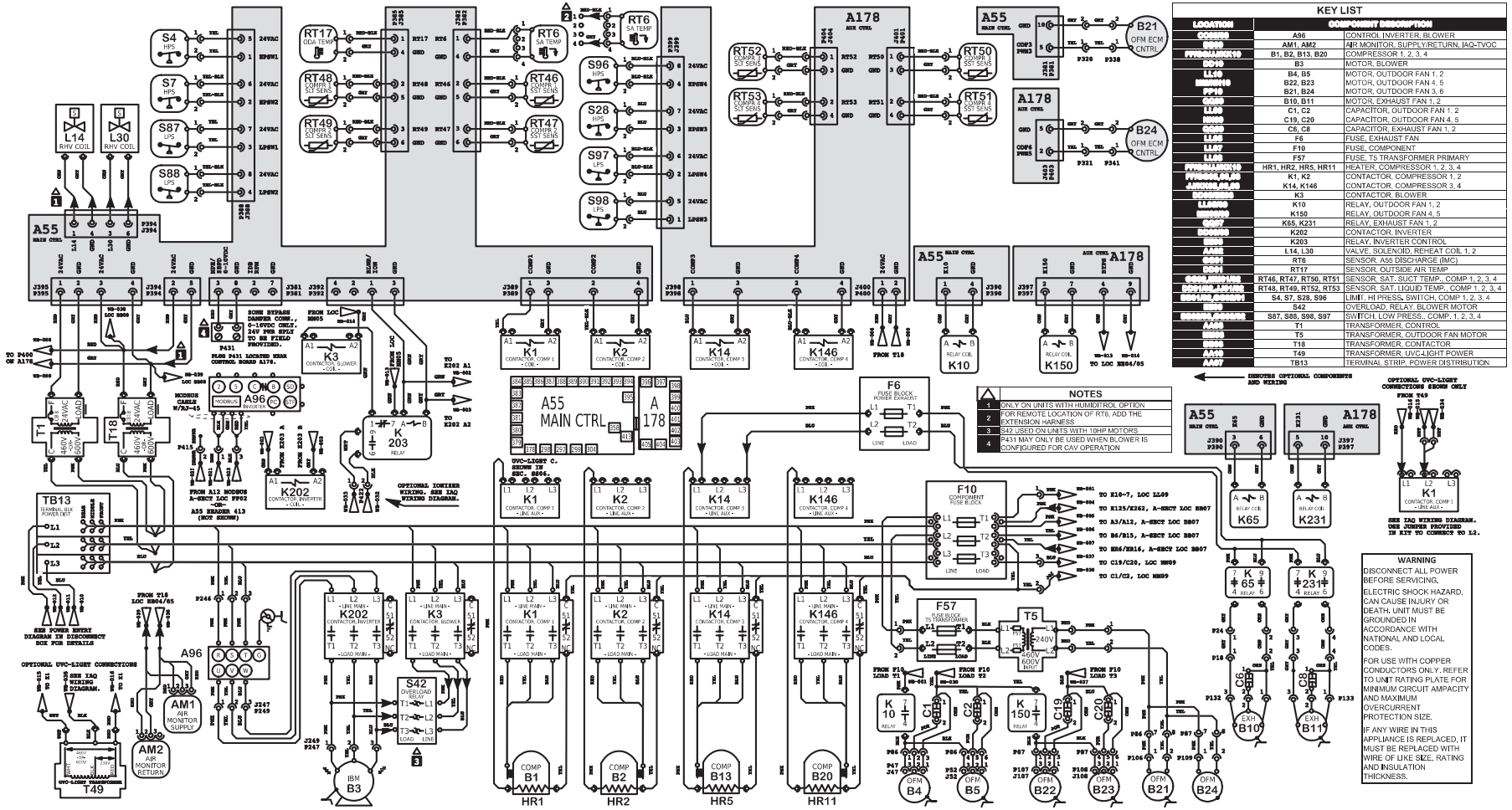



LGT, LCT 240H, 300S – Y–VOLT

COOLING – MSAV WITH BYPASS – 4 COMPRESSORS 6 CONDENSER FANS Voltage: 208–240V/3~/60Hz (Y)

Supersedes:N/A Form No:538220-0 Rev:1

## LGT/LCT240, 300 G, J Voltage With By-Pass




Model: LGT, LCT 240H, 300S - G, J-VOLT

Voltage: 460V/3~/60Hz (G), 575V/3~/60Hz (J)

Supersedes:N/A Form No:538218-0 Rev:1

COOLING - MSAV WITH BYPASS - 4 COMPRESSORS 6 CONDENSER FANS