# LCH092 through 152U

The LCH092H, 094U, 102H, 120H, 122U, 150S, 150H and 152Uunits are configure to order units (CTO) with a wide selection of factory installed options.

Cooling capacities range from 7.5 to 12.5 tons (38.1 to 70.3 kW). All units are equipped with two compressors.

Optional electric heat is factory-or field-installed. Electric heat operates in single or multiple stages depending on the kW input size. 7.5kW to 45kW heat sections are available for the 092 & 102 and 15kW to 60kW heat sections are available for 120 &150.

Ultra-high efficiency units are available with an optional direct drive blower or belt drive blower equipped with a supply air inverter. Standard and high efficiency units are available with a belt drive blower equipped with an optional supply air inverter. The blower will operate at lower speeds when demand is low and increase to higher speeds when demand is high.

Standard and high efficiency units come standard with a lightweight, all-aluminum condenser coil; optional, fin/tube condenser coils are available. Ultra-high efficiency units come standard with a tube/fin condenser coil.

Ultra high efficiency units come standard with two single-speed compressors plumbed in tandem to form a single refrigerant circuit.

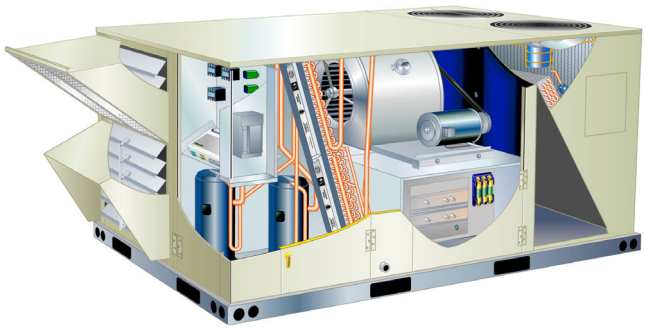
All LCH units are designed to accept any of several different energy management thermostat control systems with minimum field wiring. Factory or field provided control options connect to the unit with jack plugs. When "plugged in" the controls become an integral part of the unit wiring.

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**

**Improper installation, adjustment, alteration, service or maintenance can cause property va, 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**



## Table of Contents



**⚠CAUTION**

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

**⚠WARNING**

**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.**

## OPTIONS / ACCESSORIES

| Item Description | Model Number | Catalog Number | Unit Model No 092 | 102 | 120 | 150 |
|---|---|---|---|---|---|---|
| **COOLING SYSTEM** | | | | | | |
| Condensate Drain Trap | PVC - C1TRAP20AD2 | 76W26 | OX | OX | OX | OX |
| | Copper - C1TRAP10AD2 | 76W27 | OX | OX | OX | OX |
| Conventional Fin/Tube Condenser Coil (replaces Environ Coil System) | | Factory | O | O | O | |
| Corrosion Protection | | Factory | O | O | O | O |
| Drain Pan Overflow Switch | E1SNSR71AD1 | 68W88 | OX | OX | OX | OX |
| Refrigerant Type | | R-410A | O | O | O | O |
| Service Valves (not for Environ™ Coil System or Humiditrol® equipped units) | | Factory | O | O | O | O |
| **BLOWER - SUPPLY AIR** | | | | | | |
| Blower Option | CAV (Constant Air Volume) | Factory | O | O | O | O |
| | MSAV (Multi-Stage Air Volume) supply air blower option (With VFD Bypass Control) | Factory | O | O | O | O |
| | MSAV (Multi-Stage Air Volume) supply air blower option (Without VFD Bypass Control) | Factory | O | O | O | O |
| Motors - Constant Air Volume (CAV) | Belt Drive (standard efficiency) - 2 hp | Factory | O | O | O | O |
| | Belt Drive (standard or high efficiency) - 3 hp | Factory | O | O | O | O |
| | Belt Drive (standard efficiency) - 5 hp | Factory | O | O | O | O |
| Motors - MSAV® Multi-Stage Air Volume supply air | Belt Drive (standard efficiency) - 2 hp | Factory | O | O | O | O |
| | Belt Drive (standard efficiency) - 3 hp | Factory | O | O | O | O |
| | Belt Drive (standard efficiency) - 5 hp | Factory | O | O | O | O |
| Drive Kits See Blower Data Tables for selection | Kit #1 590-890 rpm | Factory | O | O | O | O |
| | Kit #2 800-1105 rpm | Factory | O | O | O | O |
| | Kit #3 795-1195 rpm | Factory | O | O | O | O |
| | Kit #4 730-970 rpm | Factory | O | O | O | O |
| | Kit #5 940-1200 rpm | Factory | O | O | O | O |
| | Kit #6 1015-1300 rpm | Factory | O | O | O | O |
| | Kit #7 730-970 rpm | Factory | O | O | O | O |
| | Kit #8 940-1200 rpm | Factory | O | O | O | O |
| | Kit #9 1015-1300 rpm | Factory | O | O | O | O |
| | Kit #10 900-1135 rpm | Factory | O | O | O | O |
| | Kit #11 1040-1315 rpm | Factory | O | O | O | O |
| | Kit #12 1125-1425 rpm | Factory | O | O | O | O |
| | Blower Belt Auto-Tensioner | Factory | O | O | O | O |
| **CABINET** | | | | | | |
| Combination Coil/ Hail Guards | Furnished Environ™ Coil System - C1GARD52B-1 | 13T05 | X | X | X | |
| | Optional Conventional Fin/Tube Condenser Coil - E1GARD51B-1 | 13T04 | X | X | X | |
| | Furnished Conventional Fin/Tube Condenser Coil System - C1GARD52B-1 | 13T05 | | | | X |
| Horizontal Discharge Kit | K1HECK00B-1 | 51W25 | X | X | X | X |
| Return Air Adaptor Plate (for LC/LG/LH and TC/TG/TH unit replacement) | C1CONV10B-1 | 54W96 | OX | OX | OX | OX |

NOTE - Catalog and model numbers shown are for ordering field installed accessories.
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## OPTIONS / ACCESSORIES

| Item Description | | Model Number | Catalog Number | Unit Model No 092 | 102 | 120 | 150 |
|---|---|---|---|---|---|---|---|
| CONTROLS | | | | | | | |
| Blower Proving Switch | | C1SNSR35FF1 | 53W65 | OX | OX | OX | OX |
| Commercial Controls | Prodigy® Control System - BACnet® Module - C0CTRL60AE1L | | **59W51** | OX | OX | OX | OX |
| | Prodigy® Control System - LonTalk® Module - C0CTRL65FF1 | | 54W27 | OX | OX | OX | OX |
| | Novar® ETM-2051 - E0CTRL30B1 | | 64W73 | OX | OX | OX | OX |
| | Novar® LSE | | Factory | O | O | O | O |
| | L Connection® Building Automation System | | - - - | X | X | X | X |
| Dirty Filter Switch | | E1SNSR55B-1 | 53W67 | OX | OX | OX | OX |
| General Purpose Control Kit | | E1GPBK30C1 | 13J78 | X | X | X | X |
| Fresh Air Tempering | | C1SNSR75AD1 | 58W63 | OX | OX | OX | OX |
| Smoke Detector - Supply or Return (Power board and one sensor) | | C1SNSR44B-2 | 11K76 | OX | OX | OX | OX |
| Smoke Detector - Supply and Return (Power board and two sensors) | | C1SNSR43B-2 | 11K80 | OX | OX | OX | OX |
| INDOOR AIR QUALITY | | | | | | | |
| Air Filters | | | | | | | |
| Healthy Climate® High Efficiency Air Filters | MERV 8 - C1FLTR15B-1 | | 50W61 | OX | OX | OX | OX |
| 20 x 25 x 2 in. (Order 4 per unit) | MERV 13 - C1FLTR40B-1 | | 52W41 | OX | OX | OX | OX |
| Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter media) | | C1FLTR30B-1- | Y3063 | X | X | X | X |
| Indoor Air Quality ($CO_2$) Sensors | | | | | | | |
| Sensor - Wall-mount, off-white plastic cover with LCD display | | C0SNSR50AE1L | 77N39 | X | X | X | X |
| Sensor - Wall-mount, off-white plastic cover, no display | | C0SNSR52AE1L | 87N53 | X | X | X | X |
| Sensor - Black plastic case with LCD display, rated for plenum mounting | | C0SNSR51AE1L | 87N52 | X | X | X | X |
| Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting | | C0MISC19AE1 | 87N54 | X | X | X | X |
| $CO_2$ Sensor Duct Mounting Kit - for downflow applications | | C0MISC19AE1- | 85L43 | X | X | X | X |
| Aspiration Box - for duct mounting non-plenum rated $CO_2$ sensors (**87N53** or **77N39**) | | C0MISC16AE1- | 90N43 | X | X | X | X |
| UVC Germicidal Lamps | | | | | | | |
| [1] Healthy Climate® UVC Light Kit (208/230v-1ph) | | C1UVCL10B-1 | 54W62 | OX | OX | OX | OX |
| HUMIDITROL® CONDENSER REHEAT OPTION | | | | | | | |
| Humiditrol Dehumidification Option | | | Factory | O | O | O | O |
| Humidity Sensor Kit, Remote mounted (required) | | C0SNSR31AE-1 | 17M50 | X | X | X | X |
| ELECTRICAL | | | | | | | |
| Voltage 60 hz | | 208/230V - 3 phase | Factory | O | O | O | O |
| | | 460V - 3 phase | Factory | O | O | O | O |
| | | 575V - 3 phase | Factory | O | O | O | O |
| HACR Circuit Breakers | | | Factory | O | O | O | O |
| Disconnect Switch - See Electrical/Electric Heat tables for selection | 80 amp - C1DISC080B-1 | | 54W56 | OX | OX | OX | OX |
| | 150 amp - C1DISC150B-1 | | 54W57 | OX | OX | OX | OX |
| GFI Service Outlets | 15 amp non-powered, field-wired (208/230V, 460V only) | LTAGFIK10/15 | 74M70 | OX | OX | OX | OX |
| | 20 amp non-powered, field-wired (575V only) | C1GFCI20FF1 | 67E01 | OX | OX | OX | OX |
| Weatherproof Cover for GFI | | C1GFCI99FF1 | 10C89 | X | X | X | X |
| Phase/Voltage Detection (Optional for CAV options only, furnished with MSAV® option) | | | Factory | O | O | O | O |

[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)

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## OPTIONS / ACCESSORIES

| Item Description | Model Number | Catalog Number | Unit Model No 092 | 102 | 120 | 150 |
|---|---|---|---|---|---|---|
| ELECTRIC HEAT | | | | | | |
| 7.5 kW | 208/230V-3ph - C1EH0075B-1Y | 56W38 | OX | OX | | |
| | 460V-3ph - C1EH0075B-1G | 56W39 | OX | OX | | |
| | 575V-3ph - C1EH0075B-1J | 56W40 | OX | OX | | |
| 15 kW | 208/230V-3ph - C1EH0015B-1Y | 56W41 | OX | OX | OX | OX |
| | 460V-3ph - C1EH0150B-1G | 56W42 | OX | OX | OX | OX |
| | 575V-3ph - C1EH0150B-1J | 56W43 | OX | OX | OX | OX |
| 22.5 kW | 208/230V-3ph - C1EH0225B-1Y | 56W44 | OX | OX | OX | OX |
| | 460V-3ph - C1EH0225B-1G | 56W45 | OX | OX | OX | OX |
| | 575V-3ph - C1EH0225B-1J | 56W46 | OX | OX | OX | OX |
| 30 kW | 208/230V-3ph - C1EH0300B-1Y | 56W47 | OX | OX | OX | OX |
| | 460V-3ph - C1EH0300B-1G | 56W48 | OX | OX | OX | OX |
| | 575V-3ph - C1EH0300B-1J | 56W49 | OX | OX | OX | OX |
| 45 kW | 208/230V-3ph - C1EH0450B-1Y | 56W50 | OX | OX | OX | OX |
| | 460V-3ph - C1EH0450B-1G | 56W51 | OX | OX | OX | OX |
| | 575V-3ph - C1EH0450B-1J | 56W52 | OX | OX | OX | OX |
| 60 kW | 208/230V-3ph - C1EH0600B-1Y | 55W02 | | | OX | OX |
| | 460V-3ph - C1EH0600B-1G | 55W03 | | | OX | OX |
| | 575V-3ph - C1EH0600B-1J | 55W04 | | | OX | OX |
| [1] SCR (Silicon Controlled Rectifier) Electric Heat Control | | Factory | O | O | O | O |
| Thermostat (required) | | 45N59 | X | X | X | X |
| Duct Sensor (required) | | 45N60 | X | X | X | X |
| ECONOMIZER | | | | | | |
| Standard Economizer (Not for Title 24) | | | | | | |
| Standard Economizer<br>Downflow or Horizontal - Includes Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood<br>Order Horizontal Barometric Relief Dampers separately | E1ECON15B-2 | 13U46 | OX | OX | OX | OX |
| High Performance Economizer (Approved for California Title 24 Building Standards / AMCA Class 1A Certified) | | | | | | |
| High Performance Economizer<br>Downflow or Horizontal - Includes Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood<br>Order Horizontal Barometric Relief Dampers separately | E1ECON17B-1 | 10U59 | OX | OX | OX | OX |
| Horizontal Barometric Relief Dampers | | | | | | |
| Horizontal Low Profile Barometric Relief Dampers (Exhaust hood furnished) | LAGEDH03/15 | 53K04 | X | X | X | X |
| Economizer Controls | | | | | | |
| Differential Enthalpy (Not for Title 24) | Order 2 - C1SNSR64FF1 | 53W64 | OX | OX | OX | OX |
| Sensible Control | Sensor is Furnished | Factory | O | O | O | O |
| Single Enthalpy (Not for Title 24) | C1SNSR64FF1 | 53W64 | OX | OX | OX | OX |
| Building Pressure Control | E1GPBK20C1 | 13J77 | X | X | X | X |
| Outdoor Air CFM Control | E1GPBK10C1 | 13J76 | X | X | X | X |
| Global Control | Sensor Field Provided | Factory | O | O | O | O |
| OUTDOOR AIR | | | | | | |
| Outdoor Air Dampers With Outdoor Air Hood | | | | | | |
| Motorized | C1DAMP20B-1 | 14G28 | OX | OX | OX | OX |
| Manual | C1DAMP10B-2 | 14G29 | OX | OX | OX | OX |
| POWER EXHAUST | | | | | | |
| Standard Static | 208/230V-3ph - K1PWRE10B-1Y | 53W44 | OX | OX | OX | OX |
| | 460V-3ph - K1PWRE10B-1G | 53W45 | OX | OX | OX | OX |
| | 575V-3ph - K1PWRE10B-1J | 53W46 | OX | OX | OX | OX |

[1] NOTE - The SCR option is not available with 45 kW and 60 kW electric heat (208/230V) models.

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## OPTIONS / ACCESSORIES

| Item Description | Model Number | Catalog Number | Unit Model No 092 | 102 | 120 | 150 |
|---|---|---|---|---|---|---|
| ROOF CURBS | | | | | | |
| Hybrid Roof Curbs, Downflow | | | | | | |
| 8 in. height | C1CURB70B-1 | 11F54 | X | X | X | X |
| 14 in. height | C1CURB71B-1 | 11F55 | X | X | X | X |
| 18 in. height | C1CURB72B-1 | 11F56 | X | X | X | X |
| 24 in. height | C1CURB73B-1 | 11F57 | X | X | X | X |
| Adjustable Pitch Curb | | | | | | |
| 14 in. height | C1CURB55B-1 | 54W50 | X | X | X | X |
| CEILING DIFFUSERS | | | | | | |
| Step-Down - Order one | RTD11-95S | 13K61 | X | | | |
| | RTD11-135S | 13K62 | | X | X | |
| | RTD11-185S | 13K63 | | | | X |
| Flush - Order one | FD11-95S | 13K56 | X | | | |
| | FD11-135S | 13K57 | | X | X | |
| | FD11-185S | 13K58 | | | | X |
| Transitions (Supply and Return) - Order one | C1DIFF30B-1 | 12X65 | X | | | |
| | C1DIFF31B-1 | 12X66 | | X | X | |
| | C1DIFF32B-1 | 12X67 | | | | X |
| **Sunsource® Commercial Energy System** | | | | | | |
| Solar Module CE Kit | One 285W Solar Module (silver frame), One PanelClaw Polar Bear III Mounting System and One Enphase M250 Microinverter | 10U67 | X | X | X | X |
| Solar Power Entry with Disconnect | | Factory | O | O | O | O |
| Enphase Envoy Communications Gateway (with Wireless Capability) | | **13L89** | X | X | X | X |
| Line Communication Filter (external) | C1C400D11A | 10F93 | X | X | X | X |
| Transformer (6 kW) | E1TRFM15AD3Y (208Y to 208 VAC Delta) | 11H71 | X | X | X | X |
| | E1TRFM15AD2Y (230 VAC Delta) | 11H28 | X | X | X | X |
| | E1TRFM15AD3G (460 VAC Delta or Wye) | 11H29 | X | X | X | X |

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## SPECIFICATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| General Data | Nominal Tonnage | | 7.5 Ton | 7.5 Ton | 8.5 Ton | 8.5 Ton |
| | Model Number | | LCH092H4B | LCH092H4M | LCH102H4B | LCH102H4M |
| | Efficiency Type | | High | High | High | High |
| | Blower Type | | Constant Air Volume CAV | MSAV® (Multi-Stage Air Volume) | Constant Air Volume CAV | MSAV® (Multi-Stage Air Volume) |
| Cooling Performance | Gross Cooling Capacity - Btuh | | 93,000 | 93,000 | 103,800 | 103,800 |
| | [1] Net Cooling Capacity - Btuh | | 90,000 | 90,000 | 100,000 | 100,000 |
| | AHRI Rated Air Flow - cfm | | 3000 | 2800 | 3400 | 3400 |
| | Total Unit Power - kW | | 7.5 | 7.5 | 8.1 | 8.1 |
| | [1] EER (Btuh/Watt) | | 12.7 | 12.7 | 12.4 | 12.4 |
| | [2] IEER (Btuh/Watt) | | 13.0 | 14.0 | 12.9 | 14.0 |
| | Refrigerant Type | | R-410A | R-410A | R-410A | R-410A |
| Refrigerant Charge | Environ™ Coil System | Circuit 1 | 6 lbs. 13 oz. | 6 lbs. 13 oz. | 6 lbs. 8 oz. | 6 lbs. 8 oz. |
| | | Circuit 2 | 7 lbs. 2 oz. | 7 lbs. 2 oz. | 6 lbs. 15 oz. | 6 lbs. 15 oz. |
| | Environ™ Coil System with Humiditrol® | Circuit 1 | 6 lbs. 13 oz. | 6 lbs. 13 oz. | 6 lbs. 8 oz. | 6 lbs. 8 oz. |
| | | Circuit 2 | 7 lbs. 2 oz. | 7 lbs. 2 oz. | 6 lbs. 15 oz. | 6 lbs. 15 oz. |
| | Conventional Fin/Tube Coil Option | Circuit 1 | 12 lbs. 14 oz. | 12 lbs. 14 oz. | 13 lbs. 8 oz. | 13 lbs. 8 oz. |
| | | Circuit 2 | 11 lbs. 3 oz. | 11 lbs. 3 oz. | 12 lbs. 7 oz. | 12 lbs. 7 oz. |
| | Conventional Fin/Tube With Humiditrol® | Circuit 1 | 16 lbs. 6 oz. | 16 lbs. 6 oz. | 17 lbs. 0 oz. | 17 lbs. 0 oz. |
| | | Circuit 2 | 11 lbs. 3 oz. | 11 lbs. 3 oz. | 12 lbs. 7 oz. | 12 lbs. 7 oz. |
| Electric Heat Available | | | 7.5, 15, 22.5, 30 & 45 kW | | | |
| Compressor Type (number) | | | Scroll (2) | Scroll (2) | Scroll (2) | Scroll (2) |
| Outdoor Coils Environ (Fin/Tube) | Net face area (total) - sq. ft. | | 28.0 (29.33) | 28.0 (29.33) | 28.0 (29.33) | 28.0 (29.33) |
| | Number of rows | | 1 (3) | 1 (3) | 1 (3) | 1 (3) |
| | Fins per inch | | 20 (20) | 20 (20) | 20 (20) | 20 (20) |
| Outdoor Coil Fans | Motor - (No.) hp | | (2) 1/3 | (2) 1/3 | (2) 1/3 | (2) 1/3 |
| | Motor rpm | | 1075 | 1075 | 1075 | 1075 |
| | Total Motor watts | | 800 | 800 | 800 | 800 |
| | Diameter - (No.) in. | | (2) 24 | (2) 24 | (2) 24 | (2) 24 |
| | Number of blades | | 3 | 3 | 3 | 3 |
| | Total Air volume - cfm | | 8800 | 8800 | 8800 | 8800 |
| Indoor Coil | Net face area (total) - sq. ft. | | 12.78 | 12.78 | 12.78 | 12.78 |
| | Tube diameter - in. | | 3/8 | 3/8 | 3/8 | 3/8 |
| | Number of rows | | 4 | 4 | 4 | 4 |
| | Fins per inch | | 14 | 14 | 14 | 14 |
| | Drain connection - Number and size | | (1) 1 in. NPT coupling | | | |
| | Expansion device type | | Balance port TXV, removable head | | | |
| 3 Indoor Blower and Drive Selection | Nominal motor output | | 2 hp, 3 hp, 5 hp | | | |
| | Maximum usable motor output (US Only) | | 2.3 hp, 3.45 hp, 5.75 hp | | | |
| | Motor - Drive kit number | | 2 hp<br>Kit 1 590-890 rpm (std. and high efficiency)<br>Kit 2 800-1105 rpm (std. and high efficiency)<br>Kit 3 795-1195 rpm (std. and high efficiency)<br>3 hp<br>Kit 4 730-970 rpm (std. efficiency)<br>Kit 5 940-1200 rpm (std. efficiency)<br>Kit 6 1015-1300 rpm (std. efficiency)<br>Kit 7 730-970 rpm (high efficiency)<br>Kit 8 940-1200 rpm (high efficiency)<br>Kit 9 1015-1300 rpm (high efficiency)<br>5 hp<br>Kit 10 900-1135 rpm (std. efficiency)<br>Kit 11 1040-1315 rpm (std. efficiency)<br>Kit 12 1125-1425 rpm (std. efficiency) | | | |
| | Blower wheel nominal diameter x width - in. | | (1) 15 X 15 | (1) 15 X 15 | (1) 15 X 15 | (1) 15 X 15 |
| Filters | Type of filter | | Disposable | | | |
| | Number and size - in. | | (4) 20 x 25 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 certified and 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 – Units equipped with MSAV® (Multi-Stage Air Volume) option are limited to a motor service factor of 1.0.

## SPECIFICATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| General Data | | Nominal Tonnage | 10 Ton | 10 Ton | 12.5 Ton | 12.5 Ton |
| | | Model Number | LCH120H4B | LCH120H4M | LCH150H4B | LCH150H4M |
| | | Efficiency Type | High | High | High | High |
| | | Blower Type | Constant Air Volume (CAV) | MSAV® (Multi-Stage Air Volume) | Constant Air Volume (CAV) | MSAV® (Multi-Stage Air Volume) |
| Cooling Performance | | Gross Cooling Capacity - Btuh | 122,000 | 122,000 | 148,000 | 148,000 |
| | | [1] Net Cooling Capacity - Btuh | 118,000 | 118,000 | 142,000 | 142,000 |
| | | AHRI Rated Air Flow - cfm | 3600 | 3300 | 3950 | 3950 |
| | | Total Unit Power - kW | 9.9 | 9.8 | 12.9 | 12.9 |
| | | [1] EER (Btuh/Watt) | 12.2 | 12.2 | 11.0 | 11.0 |
| | | [2] IEER (Btuh/Watt) | 13.2 | 14.0 | 12.4 | 13.5 |
| AHRI Reference No. | | | 202088988 | 202090494 | 10569904 | 10569906 |
| Refrigerant Charge | | Refrigerant Type | R-410A | R-410A | R-410A | R-410A |
| | Environ™ Coil System | Circuit 1 | 7 lbs. | 7 lbs. | - - - | - - - |
| | | Circuit 2 | 6 lbs. 12 oz. | 6 lbs. 12 oz. | - - - | - - - |
| | Environ™ Coil System with Humiditrol® | Circuit 1 | 7 lbs. | 7 lbs. | - - - | - - - |
| | | Circuit 2 | 6 lbs. 12 oz. | 6 lbs. 12 oz. | - - - | - - - |
| | Conventional Fin/Tube Coil Option | Circuit 1 | 14 lbs. 8 oz. | 14 lbs. 8 oz. | 12 lbs. 8 oz. | 12 lbs. 8 oz. |
| | | Circuit 2 | 13 lbs. 8 oz. | 13 lbs. 8 oz. | 10 lbs. 12 oz. | 10 lbs. 12 oz. |
| | Conventional Fin/Tube with Humiditrol® | Circuit 1 | 17 lbs. 8 oz. | 17 lbs. 8 oz. | 12 lbs. 9 oz. | 12 lbs. 9 oz. |
| | | Circuit 2 | 13 lbs. 8 oz. | 13 lbs. 8 oz. | 10 lbs. 12 oz | 10 lbs.12 oz. |
| Electric Heat Available | | | 15, 22.5, 30, 45 & 60 kW | | | |
| Compressor Type (number) | | | Scroll (2) | Scroll (2) | Scroll (2) | Scroll (2) |
| Outdoor Coils Environ (Fin/Tube) | | Net face area (total) - sq. ft. | 28.0 (29.33) | 28.0 (29.33) | - - - (25.9) | - - - (25.9) |
| | | Number of rows | 1 (3) | 1 (3) | 3 | 3 |
| | | Fins per inch | 20 (20) | 20 (20) | 20 | 20 |
| Outdoor Coil Fans | | Motor - (No.) hp | (2) 1/3 | (2) 1/3 | (2) 1/2 | (2) 1/2 |
| | | Motor rpm | 1075 | 1075 | 1075/600 | 1075/600 |
| | | Total Motor watts | 800 | 800 | 1050 | 1050 |
| | | Diameter - (No.) in. | (2) 24 | (2) 24 | (2) 24 | (2) 24 |
| | | Number of blades | 3 | 3 | 3 | 3 |
| | | Total Air volume - cfm | 8800 | 8800 | 9700 | 9700 |
| Indoor Coil | | Net face area (total) - sq. ft. | 13.54 | 13.54 | 13.54 | 13.54 |
| | | Tube diameter - in. | 3/8 | 3/8 | 3/8 | 3/8 |
| | | Number of rows | 4 | 4 | 4 | 4 |
| | | Fins per inch | 14 | 14 | 14 | 14 |
| | | Drain connection - Number and size | (1) 1 in. NPT coupling | | | |
| | | Expansion device type | Balance port TXV, removable head | | | |
| [3] Indoor Blower and Drive Selection | | Nominal motor output | 2 hp, 3 hp, 5 hp | | | |
| | | Maximum usable motor output (US Only) | 2.3 hp, 3.45 hp, 5.75 hp | | | |
| | | Motor - Drive kit number | 2 hp<br>**Kit 1** 590-890 rpm (std. and high efficiency)<br>**Kit 2** 800-1105 rpm (std. and high efficiency)<br>**Kit 3** 795-1195 rpm (std. and high efficiency)<br>3 hp<br>**Kit 4** 730-970 rpm (std. efficiency)<br>**Kit 5** 940-1200 rpm (std. efficiency)<br>**Kit 6** 1015-1300 rpm (std. efficiency)<br>**Kit 7** 730-970 rpm (high efficiency)<br>**Kit 8** 940-1200 rpm (high efficiency)<br>**Kit 9** 1015-1300 rpm (high efficiency)<br>5 hp<br>**Kit 10** 900-1135 rpm (std. efficiency)<br>**Kit 11** 1040-1315 rpm (std. efficiency)<br>**Kit 12** 1125-1425 rpm (std. efficiency) | | | |
| | | Blower wheel nominal diameter x width - in. | (1) 15 X 15 | (1) 15 X 15 | (1) 15 X 15 | (1) 15 X 15 |
| Filters | | Type of filter | Disposable | | | |
| | | Number and size - in. | (4) 20 x 25 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 certified and 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 – Units equipped with MSAV® (Multi-Stage Air Volume) option are limited to a motor service factor of 1.0.

## OPTIONS / ACCESSORIES

| Item Description | Model Number | Catalog Number | Unit Model No 094 | 122 | 152 |
|---|---|---|---|---|---|
| COOLING SYSTEM | | | | | |
| Condensate Drain Trap | PVC - C1TRAP20AD2 | 76W26 | OX | OX | OX |
| | Copper - C1TRAP10AD2 | 76W27 | OX | OX | OX |
| Corrosion Protection | | Factory | O | O | O |
| Drain Pan Overflow Switch | E1SNSR71AD1 | 68W88 | OX | OX | OX |
| Refrigerant Type | | R-410A | O | O | O |
| BLOWER - SUPPLY AIR | | | | | |
| Blower | DirectPlus™ (Direct Drive) MSAV (Multi-Stage Air Volume) supply air blower | Factory | O | O | O |
| | Belt Drive MSAV (Multi-Stage Air Volume) supply air blower (With VFD Bypass Control) | Factory | O | O | O |
| | Belt Drive MSAV (Multi-Stage Air Volume) supply air blower (Without VFD Bypass Control) | Factory | O | O | O |
| Motors - MSAV® Multi-Stage Air Volume supply air | DirectPlus™ (direct drive) ECM 3.75 hp | Factory | O | O | O |
| | Belt Drive (standard efficiency) - 2 hp | Factory | O | O | O |
| | Belt Drive (standard efficiency) - 3 hp | Factory | O | O | O |
| | Belt Drive (standard efficiency) - 5 hp | Factory | O | O | O |
| Drive Kits See Blower Data Tables for selection | Kit #1 590-890 rpm | Factory | O | O | O |
| | Kit #2 800-1105 rpm | Factory | O | O | O |
| | Kit #3 795-1195 rpm | Factory | O | O | O |
| | Kit #4 730-970 rpm | Factory | O | O | O |
| | Kit #5 940-1200 rpm | Factory | O | O | O |
| | Kit #6 1015-1300 rpm | Factory | O | O | O |
| | Kit #7 730-970 rpm | Factory | O | O | O |
| | Kit #8 940-1200 rpm | Factory | O | O | O |
| | Kit #9 1015-1300 rpm | Factory | O | O | O |
| | Kit #10 900-1135 rpm | Factory | O | O | O |
| | Kit #11 1040-1315 rpm | Factory | O | O | O |
| | Kit #12 1125-1425 rpm | Factory | O | O | O |
| | Blower Belt Auto-Tensioner | Factory | O | O | O |
| CABINET | | | | | |
| Combination Coil/Hail Guards | E1GARD51BP1 | 13T06 | X | X | X |
| Horizontal Discharge Kit | K1HECK00B-1 | 51W25 | X | X | X |
| Return Air Adaptor Plate (for LC/LG and TC/TG/TH unit replacement) | C1CONV10B-1 | 54W96 | OX | OX | OX |

NOTE - Catalog and model numbers shown are for ordering field installed accessories.
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O = Configure To Order (Factory Installed)
X = Field Installed

## OPTIONS / ACCESSORIES

| Item Description | Model Number | Catalog Number | Unit Model No 094 | 122 | 152 |
|---|---|---|---|---|---|
| CONTROLS | | | | | |
| Blower Proving Switch | C1SNSR35FF1 | 53W65 | OX | OX | OX |
| Commercial Controls — L Connection® Building Automation System | | Factory | X | X | X |
| Prodigy® Control System - BACnet® Module - C0CTRL60AE1L | | **59W51** | OX | OX | OX |
| Prodigy® Control System - LonTalk® Module - C0CTRL65FF1 | | 54W27 | OX | OX | OX |
| Novar® ETM-2051 - E0CTRL30B1 | | 64W73 | OX | OX | OX |
| Novar® LSM | | Factory | O | O | O |
| Dirty Filter Switch | E1SNSR55B-1 | 53W67 | OX | OX | OX |
| Fresh Air Tempering | C1SNSR75AD1 | 58W63 | OX | OX | OX |
| General Purpose Control Kit | E1GPBK30C1 | 13J78 | X | X | X |
| Smoke Detector - Supply or Return (Power board and one sensor) | C1SNSR44B-2 | 11K76 | OX | OX | OX |
| Smoke Detector - Supply and Return (Power board and two sensors) | C1SNSR43B-2 | 11K80 | OX | OX | OX |
| INDOOR AIR QUALITY | | | | | |
| Air Filters | | | | | |
| Healthy Climate® High Efficiency Air Filters 20 x 25 x 2 (Order 4 per unit) — MERV 8 | C1FLTR15B-1 | 50W61 | OX | OX | OX |
| MERV 13 | C1FLTR40B-1 | 52W41 | OX | OX | OX |
| Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter media) | C1FLTR30B-1- | Y3063 | X | X | X |
| Indoor Air Quality ($CO_2$) Sensors | | | | | |
| Sensor - Wall-mount, off-white plastic cover with LCD display | C0SNSR50AE1L | 77N39 | X | X | X |
| Sensor - Wall-mount, off-white plastic cover, no display | C0SNSR52AE1L | 87N53 | X | X | X |
| Sensor - Black plastic case with LCD display, rated for plenum mounting | C0SNSR51AE1L | 87N52 | X | X | X |
| Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting | C0MISC19AE1 | 87N54 | X | X | X |
| $CO_2$ Sensor Duct Mounting Kit - for downflow applications | C0MISC19AE1- | 85L43 | X | X | X |
| Aspiration Box - for duct mounting non-plenum rated $CO_2$ sensors (**87N53** or **77N39**) | C0MISC16AE1- | 90N43 | X | X | X |
| UVC Germicidal Lamps | | | | | |
| [1] Healthy Climate® UVC Light Kit (208/230v-1ph) | C1UVCL10B-1 | 54W62 | OX | OX | OX |
| ELECTRICAL | | | | | |
| Voltage 60 hz — 208/230V - 3 phase | | Factory | O | O | O |
| 460V - 3 phase | | Factory | O | O | O |
| 575V - 3 phase | | Factory | O | O | O |
| HACR Circuit Breakers | | Factory | O | O | O |
| Disconnect Switch - See Electrical/Electric Heat tables for selection — 80 amp | C1DISC080B-1 | 54W56 | OX | OX | OX |
| 150 amp | C1DISC150B-1 | 54W57 | OX | OX | OX |
| GFI Service Outlets — 15 amp non-powered, field-wired (208/230V, 460V only) | LTAGFIK10/15 | 74M70 | OX | OX | OX |
| 20 amp non-powered, field-wired (575V only) | C1GFCI20FF1 | 67E01 | OX | OX | OX |
| Weatherproof Cover for GFI | C1GFCI99FF1 | 10C89 | 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)

NOTE - Catalog and model numbers shown are for ordering field installed accessories.
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## OPTIONS / ACCESSORIES

| Item Description | Model Number | Catalog Number | Unit Model No 094 | 122 | 152 |
|---|---|---|---|---|---|
| ELECTRIC HEAT - DIRECT DRIVE UNITS | | | | | |
| 7.5 kW | 208/230V-3ph - E1EH0075BP1Y | 10U96 | OX | | |
| | 460V-3ph - E1EH0075BP1G | 10U97 | OX | | |
| | 575V-3ph - E1EH0075BP1J | 11J19 | OX | | |
| 15 kW | 208/230V-3ph - E1EH0150BP1Y | 10U99 | OX | OX | OX |
| | 460V-3ph - E1EH0150BP1G | 10X01 | OX | OX | OX |
| | 575V-3ph - E1EH0150BP1J | 10X02 | OX | OX | OX |
| 22.5 kW | 208/230V-3ph - E1EH0225BP1Y | 10X03 | OX | OX | OX |
| | 460V-3ph - E1EH0225BP1G | 10X04 | OX | OX | OX |
| | 575V-3ph - E1EH0225BP1J | 10X05 | OX | OX | OX |
| 30 kW | 208/230V-3ph - E1EH0300BP1Y | 10X06 | OX | OX | OX |
| | 460V-3ph - E1EH0300BP1G | 10X07 | OX | OX | OX |
| | 575V-3ph - E1EH0300BP1J | 10X08 | OX | OX | OX |
| 45 kW | 208/230V-3ph - E1EH0450BP1Y | 10X09 | OX | OX | OX |
| | 460V-3ph - E1EH0450BP1G | 10X11 | OX | OX | OX |
| | 575V-3ph - E1EH0450BP1J | 10X12 | OX | OX | OX |
| 60 kW | 208/230V-3ph - E1EH0600BP1Y | 10X13 | | OX | OX |
| | 460V-3ph - E1EH0600BP1G | 10X14 | | OX | OX |
| | 575V-3ph - E1EH0600BP1J | 10X15 | | OX | OX |
| ELECTRIC HEAT - BELT DRIVE UNITS | | | | | |
| 7.5 kW | 208/230V-3ph - C1EH0075B-1Y | 56W38 | OX | | |
| | 460V-3ph - C1EH0075B-1G | 56W39 | OX | | |
| | 575V-3ph - C1EH0075B-1J | 56W40 | OX | | |
| 15 kW | 208/230V-3ph - C1EH0015B-1Y | 56W41 | OX | OX | OX |
| | 460V-3ph - C1EH0150B-1G | 56W42 | OX | OX | OX |
| | 575V-3ph - C1EH0150B-1J | 56W43 | OX | OX | OX |
| 22.5 kW | 208/230V-3ph - C1EH0225B-1Y | 56W44 | OX | OX | OX |
| | 460V-3ph - C1EH0225B-1G | 56W45 | OX | OX | OX |
| | 575V-3ph - C1EH0225B-1J | 56W46 | OX | OX | OX |
| 30 kW | 208/230V-3ph - C1EH0300B-1Y | 56W47 | OX | OX | OX |
| | 460V-3ph - C1EH0300B-1G | 56W48 | OX | OX | OX |
| | 575V-3ph - C1EH0300B-1J | 56W49 | OX | OX | OX |
| 45 kW | 208/230V-3ph - C1EH0450B-1Y | 56W50 | OX | OX | OX |
| | 460V-3ph - C1EH0450B-1G | 56W51 | OX | OX | OX |
| | 575V-3ph - C1EH0450B-1J | 56W52 | OX | OX | OX |
| 60 kW | 208/230V-3ph - C1EH0600B-1Y | 55W02 | | OX | OX |
| | 460V-3ph - C1EH0600B-1G | 55W03 | | OX | OX |
| | 575V-3ph - C1EH0600B-1J | 55W04 | | OX | OX |
| SCR (Silicon Controlled Rectifier) Electric Heat Control<br>NOTE - The SCR option is not available with 45 kW and 60 kW electric heat (208/230V) models. | | Factory | O | O | O |
| Thermostat (required) | | 45N59 | X | X | X |
| Duct Sensor (required) | | 45N60 | X | X | X |

NOTE - Catalog and model numbers shown are for ordering field installed accessories.
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## OPTIONS / ACCESSORIES

| Item Description | Model Number | Catalog Number | Unit Model No 094 | 122 | 152 |
|---|---|---|---|---|---|
| ECONOMIZER | | | | | |
| Standard Economizer (Not for Title 24) | | | | | |
| Standard Economizer<br>Downflow or Horizontal - Includes Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood<br>Order Horizontal Barometric Relief Dampers separately | E1ECON15B-1 | 55W05 | OX | OX | OX |
| High Performance Economizer (Approved for California Title 24 Building Standards / AMCA Class 1A Certified) | | | | | |
| High Performance Economizer<br>Downflow or Horizontal - Includes Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood<br>Order Horizontal Barometric Relief Dampers separately | E1ECON17B-1 | 10U59 | OX | OX | OX |
| Economizer Controls | | | | | |
| Differential Enthalpy (Not for Title 24) | Order 2 - C1SNSR64FF1 | 53W64 | OX | OX | OX |
| Sensible Control | Sensor is Furnished | Factory | O | O | O |
| Single Enthalpy (Not for Title 24) | C1SNSR64FF1 | 53W64 | OX | OX | OX |
| Global Control | Sensor Field Provided | Factory | O | O | O |
| Building Pressure Control | E1GPBK20C1 | 13J77 | X | X | X |
| Outdoor Air CFM Control | E1GPBK10C1 | 13J76 | X | X | X |
| Horizontal Barometric Relief Dampers | | | | | |
| Horizontal Low Profile Barometric Relief Dampers With Exhaust Hood | LAGEDH03/15 | 53K04 | X | X | X |
| OUTDOOR AIR | | | | | |
| Outdoor Air Dampers | | | | | |
| Motorized Dampers (Hood furnished) | C1DAMP20B-1 | 14G28 | OX | OX | OX |
| Manual Dampers (Hood furnished) | C1DAMP10B-2 | 14G29 | OX | OX | OX |
| POWER EXHAUST | | | | | |
| Standard Static | 208/230V-3ph - K1PWRE10B-1Y | 53W44 | OX | OX | OX |
| | 460V-3ph - K1PWRE10B-1G | 53W45 | OX | OX | OX |
| | 575V-3ph - K1PWRE10B-1J | 53W46 | OX | OX | OX |

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## OPTIONS / ACCESSORIES

| Item Description | Model Number | Catalog Number | Unit Model No 094 | 122 | 152 |
|---|---|---|---|---|---|
| ROOF CURBS | | | | | |
| Hybrid Roof Curbs, Downflow | | | | | |
| 8 in. height | C1CURB70B-1 | 11F54 | X | X | X |
| 14 in. height | C1CURB71B-1 | 11F55 | X | X | X |
| 18 in. height | C1CURB72B-1 | 11F56 | X | X | X |
| 24 in. height | C1CURB73B-1 | 11F57 | X | X | X |
| Adjustable Pitch Curb | | | | | |
| 14 in. height | C1CURB55B-1 | 54W50 | X | X | X |
| CEILING DIFFUSERS | | | | | |
| Step-Down - Order one | RTD11-95S | 13K61 | X | | |
| | RTD11-135S | 13K62 | | X | |
| | RTD11-185S | 13K63 | | | X |
| Flush - Order one | FD11-95S | 13K56 | X | | |
| | FD11-135S | 13K57 | | X | |
| | FD11-185S | 13K58 | | | X |
| Transitions (Supply and Return) - Order one | C1DIFF30B-1 | 12X65 | X | | |
| | C1DIFF31B-1 | 12X66 | | X | |
| | C1DIFF32B-1 | 12X67 | | | X |
| **Sunsource® Commercial Energy System** | | | | | |
| Solar Module CE Kit | One 285W Solar Module (silver frame), One PanelClaw Polar Bear III Mounting System and One Enphase M250 Microinverter | 10U67 | X | X | X |
| Solar Power Entry with Disconnect | | Factory | O | O | O |
| Enphase Envoy Communications Gateway (with Wireless Capability) | | **13L89** | X | X | X |
| Line Communication Filter (external) | C1C400D11A | 10F93 | X | X | X |
| Transformer (6 kW) | E1TRFM15AD3Y (208Y to 208 VAC Delta) | 11H71 | X | X | X |
| | E1TRFM15AD2Y (230 VAC Delta) | 11H28 | X | X | X |
| | E1TRFM15AD3G (460 VAC Delta or Wye) | 11H29 | X | X | X |

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## SPECIFICATIONS - DIRECTPLUS™ (DIRECT DRIVE) MODELS

| | | | | |
|---|---|---|---|---|
| General Data | Nominal Tonnage | 7.5 Ton | 10 Ton | 12.5 Ton |
| | Model Number | LCH094U4E | LCH122U4E | LCH152U4E |
| | Efficiency Type | Ultra | Ultra | Ultra |
| | Blower Type | MSAV (Multi-Stage Air Volume) DirectPlus™ (Direct Drive) | MSAV (Multi-Stage Air Volume) DirectPlus™ (Direct Drive) | MSAV (Multi-Stage Air Volume) DirectPlus™ (Direct Drive) |
| Cooling Performance | Gross Cooling Capacity - Btuh | 93,700 | 119,000 | 141,900 |
| | [1] Net Cooling Capacity - Btuh | 92,000 | 116,000 | 138,000 |
| | AHRI Rated Air Flow - cfm | 2800 | 3600 | 4000 |
| | Total Unit Power - kW | 6.6 | 8.8 | 11.2 |
| | [1] EER (Btuh/Watt) | 13.9 | 13.1 | 12.3 |
| | [2] IEER (Btuh/Watt) | 21.5 | 20.0 | 18.9 |
| | Refrigerant Type | R-410A | R-410A | R-410A |
| Refrigerant Charge | Circuit 1 | 29 lbs. 0 oz. | 29 lbs. 0 oz. | 29 lbs. 0 oz. |
| Electric Heat Available | | 7.5, 15, 22.5, 30, 45 kW | 15, 22.5, 30, 45, 60 kW | |
| Compressor Type (number) | | Tandem Scroll (2) | Tandem Scroll (2) | Tandem Scroll (2) |
| Outdoor Coils | Net face area (total) - sq. ft. | 40.8 | 40.8 | 40.8 |
| | Number of rows | 2 | 2 | 2 |
| | Fins per inch | 20 | 20 | 20 |
| Outdoor Coil Fans | Motor - (No.) hp | (3) 1/3 ECM | (3) 1/3 ECM | (3) 1/3 ECM |
| | Motor rpm | 520 - 900 | 640 - 900 | 640 - 900 |
| | Total Motor watts | 160 - 650 | 280 - 650 | 280 - 650 |
| | Diameter - (No.) in. | (3) 24 | (3) 24 | (3) 24 |
| | Number of blades | 3 | 3 | 3 |
| | Total Air volume - cfm | 5160 - 10,250 | 7100 - 10,250 | 7100 - 10,250 |
| Indoor Coil | Net face area (total) - sq. ft. | 13.54 | 13.54 | 13.54 |
| | Tube diameter - in. | 3/8 | 3/8 | 3/8 |
| | Number of rows | 4 | 4 | 4 |
| | Fins per inch | 14 | 14 | 14 |
| | Drain connection - Number and size | (1) 1 in. NPT coupling | | |
| | Expansion device type | Dual-Flow Thermal Expansion Valve System Dual with Flow Control Balance port, removable head | | |
| Indoor Blower | Nominal motor output | 3.75 HP (ECM) | 3.75 HP (ECM) | 3.75 HP (ECM) |
| | Blower wheel nominal diameter x width - in. | (1) 22 x 9 | (1) 22 x 9 | (1) 22 x 9 |
| Filters | Type of filter | Disposable | | |
| | Number and size - in. | (4) 20 x 25 x 2 | | |
| Electrical characteristics | | 208/230V or 460V - 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 certified and tested according to AHRI Standard 340/360.

## SPECIFICATIONS - BELT DRIVE MODELS

| | | | | |
|---|---|---|---|---|
| General Data | Nominal Tonnage | 7.5 Ton | 10 Ton | 12.5 Ton |
| | Model Number | LCH094U4M | LCH122U4M | LCH152U4M |
| | Efficiency Type | Ultra | Ultra | Ultra |
| | Blower Type | MSAV (Multi-Stage Air Volume) Belt Drive | MSAV (Multi-Stage Air Volume) Belt Drive | MSAV (Multi-Stage Air Volume) Belt Drive |
| Cooling Performance | Gross Cooling Capacity - Btuh | 93,700 | 119,000 | 141,900 |
| | [1] Net Cooling Capacity - Btuh | 92,000 | 116,000 | 136,000 |
| | AHRI Rated Air Flow - cfm | 2800 | 3600 | 4000 |
| | Total Unit Power - kW | 6.9 | 8.8 | 11.3 |
| | [1] EER (Btuh/Watt) | 13.4 | 12.6 | 12.0 |
| | [2] IEER (Btuh/Watt) | 20.7 | 19.2 | 18.1 |
| | Refrigerant Type | R-410A | R-410A | R-410A |
| Refrigerant Charge | Circuit 1 | 29 lbs. 0 oz. | 29 lbs. 0 oz. | 29 lbs. 0 oz. |
| Electric Heat Available | | 7.5, 15, 22.5, 30, 45 kW | 15, 22.5, 30, 45, 60 kW | |
| Compressor Type (number) | | Tandem Scroll (2) | Tandem Scroll (2) | Tandem Scroll (2) |
| Outdoor Coils | Net face area (total) - sq. ft. | 40.8 | 40.8 | 40.8 |
| | Number of rows | 2 | 2 | 2 |
| | Fins per inch | 20 | 20 | 20 |
| Outdoor Coil Fans | Motor - (No.) hp | (3) 1/3 ECM | (3) 1/3 ECM | (3) 1/3 ECM |
| | Motor rpm | 520 - 900 | 640 - 900 | 640 - 900 |
| | Total Motor watts | 160 - 650 | 280 - 650 | 280 - 650 |
| | Diameter - (No.) in. | (3) 24 | (3) 24 | (3) 24 |
| | Number of blades | 3 | 3 | 3 |
| | Total Air volume - cfm | 5160 - 10,250 | 7100 - 10,250 | 7100 - 10,250 |
| Indoor Coil | Net face area (total) - sq. ft. | 13.54 | 13.54 | 13.54 |
| | Tube diameter - in. | 3/8 | 3/8 | 3/8 |
| | Number of rows | 4 | 4 | 4 |
| | Fins per inch | 14 | 14 | 14 |
| | Drain connection - Number and size | (1) 1 in. NPT coupling | | |
| | Expansion device type | Dual-Flow Thermal Expansion Valve System Dual with Flow Control Balance port, removable head | | |
| [3] Indoor Blower and Drive Selection | Nominal motor output | 2 hp, 3 hp, 5 hp | | |
| | Motor - Drive kit number | 2 hp<br>**Kit 1** 590-890 rpm (std. and high efficiency)<br>**Kit 2** 800-1105 rpm (std. and high efficiency)<br>**Kit 3** 795-1195 rpm (std. and high efficiency)<br>3 hp<br>**Kit 4** 730-970 rpm (std. efficiency)<br>**Kit 5** 940-1200 rpm (std. efficiency)<br>**Kit 6** 1015-1300 rpm (std. efficiency)<br>**Kit 7** 730-970 rpm (high efficiency)<br>**Kit 8** 940-1200 rpm (high efficiency)<br>**Kit 9** 1015-1300 rpm (high efficiency)<br>5 hp<br>**Kit 10** 900-1135 rpm (std. efficiency)<br>**Kit 11** 1040-1315 rpm (std. efficiency)<br>**Kit 12** 1125-1425 rpm (std. efficiency) | | |
| | Blower wheel nominal diameter x width - in. | (1) 15 X 15 | (1) 15 X 15 | (1) 15 X 15 |
| Filters | Type of filter | Disposable | | |
| | Number and size - in. | (4) 20 x 25 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 certified and 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.

## BLOWER DATA - DIRECTPLUS™ (DIRECT DRIVE) - ALL ULTRA MODELS

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY (NO HEAT SECTION) WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.

FOR ALL UNITS ADD:

1 − Wet indoor coil air resistance of selected unit.
2 − Any factory installed options air resistance (heat section, economizer, etc.)
3 − Any field installed accessories air resistance (duct resistance, diffuser, etc.)
See page 18 for wet coil and option/accessory air resistance data.

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT (Maximum Static Pressure - 2.0 in. w.g.)

094 Models - 7.5 kW - 1750 cfm
All Models - 15 kW, 22.5 kW, 30 kW, 45 kW - 2750 cfm
122 and 152 Models - 60 kW - 3500 cfm

| Total Air Volume cfm | Total Static Pressure - in. w.g. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | | 0.4 | | 0.6 | | 0.8 | | 1.0 | | 1.2 | | 1.4 | |
| | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts |
| 1750 | 711 | 188 | 771 | 279 | 836 | 366 | 905 | 453 | 975 | 544 | 1044 | 640 | 1109 | 737 |
| 2000 | 752 | 242 | 812 | 332 | 876 | 420 | 944 | 510 | 1011 | 606 | 1075 | 709 | 1138 | 812 |
| 2250 | 799 | 300 | 860 | 389 | 923 | 479 | 988 | 575 | 1052 | 678 | 1113 | 787 | 1171 | 896 |
| 2500 | 853 | 362 | 914 | 453 | 976 | 548 | 1038 | 650 | 1097 | 761 | 1154 | 877 | 1209 | 990 |
| 2750 | 914 | 434 | 974 | 529 | 1033 | 629 | 1091 | 739 | 1146 | 858 | 1199 | 979 | 1250 | 1098 |
| 3000 | 980 | 513 | 1037 | 614 | 1092 | 720 | 1146 | 837 | 1198 | 961 | 1247 | 1088 | 1295 | 1215 |
| 3250 | 1048 | 598 | 1101 | 705 | 1153 | 819 | 1203 | 941 | 1251 | 1071 | 1298 | 1206 | 1343 | 1343 |
| 3500 | 1116 | 693 | 1166 | 809 | 1214 | 931 | 1261 | 1060 | 1307 | 1198 | 1351 | 1341 | 1395 | 1489 |
| 3750 | 1185 | 806 | 1232 | 931 | 1277 | 1063 | 1322 | 1201 | 1365 | 1348 | 1407 | 1499 | 1448 | 1657 |
| 4000 | 1254 | 937 | 1299 | 1072 | 1341 | 1214 | 1383 | 1363 | 1424 | 1518 | 1464 | 1679 | 1503 | 1844 |
| 4250 | 1324 | 1089 | 1366 | 1234 | 1406 | 1386 | 1445 | 1545 | 1484 | 1708 | 1522 | 1876 | 1559 | 2046 |
| 4500 | 1395 | 1262 | 1433 | 1417 | 1471 | 1579 | 1508 | 1745 | 1544 | 1913 | 1581 | 2084 | 1616 | 2256 |
| 4750 | 1465 | 1455 | 1501 | 1619 | 1536 | 1787 | 1571 | 1957 | 1606 | 2128 | 1641 | 2299 | 1675 | 2470 |
| 5000 | 1534 | 1666 | 1568 | 1834 | 1602 | 2004 | 1635 | 2174 | 1668 | 2345 | 1701 | 2514 | 1735 | 2682 |
| 5250 | 1603 | 1887 | 1635 | 2055 | 1667 | 2224 | 1699 | 2392 | 1731 | 2559 | 1763 | 2724 | - - - | - - - |
| 5500 | 1671 | 2110 | 1702 | 2275 | 1733 | 2441 | 1764 | 2605 | - - - | - - - | - - - | - - - | - - - | - - - |
| 5750 | 1738 | 2325 | 1768 | 2488 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |

| Total Air Volume cfm | Total Static Pressure - in. w.g. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.6 | | 1.8 | | 2.0 | | 2.2 | | 2.4 | | 2.6 | |
| | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts | RPM | Watts |
| 1750 | 1172 | 833 | 1231 | 932 | 1287 | 1039 | 1340 | 1156 | 1391 | 1283 | 1442 | 1426 |
| 2000 | 1197 | 913 | 1253 | 1019 | 1306 | 1135 | 1357 | 1261 | 1407 | 1398 | 1457 | 1547 |
| 2250 | 1227 | 1003 | 1280 | 1117 | 1330 | 1242 | 1379 | 1378 | 1428 | 1525 | 1477 | 1680 |
| 2500 | 1261 | 1103 | 1311 | 1226 | 1360 | 1361 | 1407 | 1507 | 1454 | 1663 | 1501 | 1826 |
| 2750 | 1299 | 1219 | 1347 | 1350 | 1394 | 1494 | 1440 | 1649 | 1485 | 1813 | 1530 | 1982 |
| 3000 | 1342 | 1346 | 1388 | 1487 | 1432 | 1640 | 1476 | 1803 | 1520 | 1973 | 1563 | 2146 |
| 3250 | 1388 | 1485 | 1432 | 1638 | 1475 | 1800 | 1517 | 1969 | 1558 | 2143 | 1600 | 2319 |
| 3500 | 1437 | 1643 | 1479 | 1805 | 1519 | 1975 | 1560 | 2148 | 1600 | 2325 | 1640 | 2502 |
| 3750 | 1489 | 1821 | 1528 | 1990 | 1567 | 2164 | 1605 | 2340 | 1645 | 2517 | 1685 | 2693 |
| 4000 | 1541 | 2014 | 1579 | 2187 | 1616 | 2364 | 1654 | 2540 | 1693 | 2715 | 1732 | 2887 |
| 4250 | 1596 | 2218 | 1632 | 2393 | 1668 | 2569 | 1705 | 2742 | 1743 | 2913 | - - - | - - - |
| 4500 | 1652 | 2429 | 1687 | 2603 | 1722 | 2775 | 1759 | 2944 | - - - | - - - | - - - | - - - |
| 4750 | 1709 | 2641 | 1743 | 2811 | 1778 | 2979 | - - - | - - - | - - - | - - - | - - - | - - - |
| 5000 | 1768 | 2850 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| 5250 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| 5500 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| 5750 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |

## BLOWER DATA - BELT DRIVE - 7.5 TON (092 / 094 / 102)

BELT DRIVE BLOWER − BASE UNIT

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY (NO HEAT SECTION) WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.

FOR ALL UNITS ADD:
1 − Wet indoor coil air resistance of selected unit.
2 − Any factory installed options air resistance (heat section, economizer, etc.)
3 − Any field installed accessories air resistance (duct resistance, diffuser, etc.)
Then determine from blower table blower motor output required.
See page 18 for blower motors and drives.
See page 18 for wet coil and option/accessory air resistance data.

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT (Maximum Static Pressure - 2.0 in. w.g.)

7.5 kW, 15 kW, 22.5 kW, 30 kW and 45 kW - 2800 cfm

| Total Air Volume cfm | Total Static Pressure − in. w.g. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | | 0.4 | | 0.6 | | 0.8 | | 1.0 | | 1.2 | | 1.4 | | 1.6 | | 1.8 | | 2.0 | | 2.2 | | 2.4 | | 2.6 | |
| | 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 |
| 1750 | 481 | 0.21 | 549 | 0.4 | 618 | 0.57 | 688 | 0.7 | 758 | 0.82 | 824 | 0.93 | 885 | 1.08 | 941 | 1.23 | 991 | 1.39 | 1038 | 1.54 | 1082 | 1.68 | 1124 | 1.82 | 1166 | 1.95 |
| 2000 | 493 | 0.29 | 561 | 0.47 | 629 | 0.64 | 700 | 0.77 | 768 | 0.9 | 832 | 1.02 | 892 | 1.17 | 946 | 1.33 | 995 | 1.49 | 1041 | 1.66 | 1085 | 1.81 | 1126 | 1.97 | 1167 | 2.12 |
| 2250 | 507 | 0.37 | 574 | 0.56 | 643 | 0.72 | 712 | 0.86 | 779 | 0.99 | 842 | 1.13 | 900 | 1.28 | 953 | 1.44 | 1001 | 1.61 | 1045 | 1.78 | 1088 | 1.95 | 1128 | 2.12 | 1168 | 2.3 |
| 2500 | 521 | 0.46 | 588 | 0.64 | 657 | 0.81 | 727 | 0.95 | 792 | 1.09 | 853 | 1.24 | 909 | 1.4 | 960 | 1.57 | 1007 | 1.74 | 1050 | 1.93 | 1091 | 2.11 | 1130 | 2.29 | 1170 | 2.48 |
| 2750 | 537 | 0.56 | 604 | 0.74 | 674 | 0.91 | 743 | 1.06 | 806 | 1.21 | 865 | 1.36 | 920 | 1.53 | 969 | 1.71 | 1014 | 1.89 | 1055 | 2.08 | 1095 | 2.27 | 1133 | 2.47 | 1172 | 2.66 |
| 3000 | 554 | 0.67 | 622 | 0.86 | 692 | 1.02 | 760 | 1.18 | 822 | 1.34 | 878 | 1.5 | 931 | 1.68 | 979 | 1.86 | 1021 | 2.06 | 1061 | 2.26 | 1099 | 2.46 | 1136 | 2.65 | 1174 | 2.85 |
| 3250 | 572 | 0.78 | 641 | 0.98 | 712 | 1.15 | 778 | 1.32 | 838 | 1.49 | 892 | 1.66 | 943 | 1.84 | 989 | 2.03 | 1030 | 2.24 | 1068 | 2.45 | 1105 | 2.65 | 1141 | 2.85 | 1178 | 3.06 |
| 3500 | 592 | 0.9 | 663 | 1.12 | 733 | 1.3 | 798 | 1.47 | 855 | 1.65 | 907 | 1.83 | 956 | 2.02 | 1000 | 2.22 | 1039 | 2.44 | 1076 | 2.65 | 1111 | 2.86 | 1146 | 3.07 | 1183 | 3.27 |
| 3750 | 614 | 1.04 | 687 | 1.28 | 756 | 1.47 | 818 | 1.65 | 872 | 1.83 | 923 | 2.02 | 970 | 2.22 | 1011 | 2.43 | 1049 | 2.65 | 1084 | 2.87 | 1118 | 3.09 | 1152 | 3.29 | 1189 | 3.51 |
| 4000 | 639 | 1.22 | 713 | 1.48 | 780 | 1.66 | 838 | 1.83 | 890 | 2.02 | 939 | 2.22 | 984 | 2.44 | 1023 | 2.66 | 1059 | 2.89 | 1093 | 3.11 | 1126 | 3.33 | 1160 | 3.54 | 1197 | 3.77 |
| 4250 | 667 | 1.43 | 741 | 1.69 | 805 | 1.86 | 859 | 2.02 | 909 | 2.22 | 956 | 2.45 | 998 | 2.68 | 1036 | 2.92 | 1070 | 3.15 | 1103 | 3.37 | 1135 | 3.59 | 1169 | 3.81 | 1207 | 4.05 |

## BLOWER DATA - BELT DRIVE - 10 AND 12.5 TON (120 / 122 / 150 / 152)

BELT DRIVE BLOWER − BASE UNIT

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY (NO HEAT SECTION) WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.

FOR ALL UNITS ADD:
1 − Wet indoor coil air resistance of selected unit.
2 − Any factory installed options air resistance (heat section, economizer, etc.)
3 − Any field installed accessories air resistance (duct resistance, diffuser, etc.)
Then determine from blower table blower motor output required.
See page 18 for blower motors and drives.
See page 18 for wet coil and option/accessory air resistance data.

**MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT (Maximum Static Pressure - 2.0 in. w.g.)**

15 kW, 22.5 kW, 30 kW and 45 kW - 2800 cfm

60 kW - 4000 cfm

| Total Air Volume cfm | Total Static Pressure − in. w.g. | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | | 0.4 | | 0.6 | | 0.8 | | 1.0 | | 1.2 | | 1.4 | | 1.6 | | 1.8 | | 2.0 | | 2.2 | | 2.4 | | 2.6 | |
| | 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 |
| 2000 | 497 | 0.25 | 558 | 0.44 | 624 | 0.6 | 694 | 0.74 | 764 | 0.85 | 830 | 0.99 | 889 | 1.16 | 943 | 1.34 | 994 | 1.52 | 1045 | 1.71 | 1096 | 1.89 | 1146 | 2.08 | 1197 | 2.27 |
| 2250 | 511 | 0.34 | 573 | 0.52 | 638 | 0.68 | 708 | 0.82 | 776 | 0.94 | 839 | 1.09 | 896 | 1.26 | 948 | 1.45 | 998 | 1.64 | 1048 | 1.83 | 1098 | 2.01 | 1149 | 2.2 | 1200 | 2.4 |
| 2500 | 527 | 0.44 | 589 | 0.62 | 654 | 0.78 | 723 | 0.91 | 789 | 1.05 | 850 | 1.21 | 904 | 1.39 | 955 | 1.58 | 1003 | 1.77 | 1052 | 1.96 | 1101 | 2.14 | 1152 | 2.33 | 1203 | 2.53 |
| 2750 | 545 | 0.55 | 606 | 0.72 | 672 | 0.88 | 740 | 1.03 | 804 | 1.17 | 861 | 1.34 | 914 | 1.53 | 962 | 1.72 | 1010 | 1.92 | 1057 | 2.10 | 1105 | 2.29 | 1154 | 2.47 | 1206 | 2.68 |
| 3000 | 564 | 0.66 | 626 | 0.84 | 692 | 1.01 | 759 | 1.16 | 819 | 1.32 | 874 | 1.49 | 924 | 1.68 | 971 | 1.88 | 1017 | 2.08 | 1063 | 2.26 | 1110 | 2.44 | 1158 | 2.63 | 1208 | 2.83 |
| 3250 | 585 | 0.79 | 648 | 0.98 | 714 | 1.14 | 778 | 1.31 | 836 | 1.48 | 887 | 1.66 | 935 | 1.86 | 981 | 2.06 | 1026 | 2.26 | 1071 | 2.45 | 1117 | 2.63 | 1163 | 2.80 | 1213 | 3.00 |
| 3500 | 607 | 0.93 | 672 | 1.13 | 737 | 1.31 | 798 | 1.48 | 852 | 1.66 | 901 | 1.85 | 948 | 2.05 | 993 | 2.26 | 1037 | 2.46 | 1081 | 2.65 | 1125 | 2.83 | 1171 | 3.01 | 1221 | 3.21 |
| 3750 | 632 | 1.10 | 698 | 1.31 | 762 | 1.50 | 819 | 1.67 | 869 | 1.86 | 915 | 2.05 | 961 | 2.25 | 1005 | 2.47 | 1049 | 2.68 | 1092 | 2.88 | 1136 | 3.05 | 1181 | 3.24 | 1231 | 3.45 |
| 4000 | 660 | 1.30 | 726 | 1.52 | 787 | 1.70 | 838 | 1.87 | 885 | 2.06 | 930 | 2.26 | 974 | 2.48 | 1018 | 2.71 | 1062 | 2.93 | 1105 | 3.12 | 1149 | 3.30 | 1194 | 3.49 | 1245 | 3.72 |
| 4250 | 691 | 1.53 | 755 | 1.75 | 810 | 1.91 | 857 | 2.07 | 901 | 2.27 | 945 | 2.50 | 990 | 2.74 | 1034 | 2.98 | 1077 | 3.20 | 1120 | 3.39 | 1163 | 3.58 | 1210 | 3.79 | 1262 | 4.03 |
| 4500 | 724 | 1.78 | 783 | 1.98 | 831 | 2.12 | 874 | 2.28 | 917 | 2.50 | 962 | 2.75 | 1006 | 3.02 | 1051 | 3.27 | 1094 | 3.49 | 1137 | 3.70 | 1181 | 3.89 | 1228 | 4.11 | 1281 | 4.38 |
| 4750 | 757 | 2.05 | 809 | 2.20 | 851 | 2.33 | 891 | 2.51 | 935 | 2.76 | 980 | 3.05 | 1025 | 3.33 | 1070 | 3.59 | 1113 | 3.82 | 1156 | 4.03 | 1201 | 4.24 | 1249 | 4.47 | 1303 | 4.75 |
| 5000 | 787 | 2.31 | 831 | 2.43 | 870 | 2.57 | 910 | 2.78 | 954 | 3.06 | 1000 | 3.38 | 1046 | 3.68 | 1091 | 3.95 | 1135 | 4.19 | 1178 | 4.40 | 1224 | 4.62 | 1272 | 4.86 | 1325 | 5.13 |
| 5250 | 814 | 2.55 | 852 | 2.66 | 889 | 2.83 | 930 | 3.09 | 975 | 3.41 | 1023 | 3.76 | 1070 | 4.08 | 1115 | 4.35 | 1159 | 4.59 | 1203 | 4.81 | 1248 | 5.03 | 1297 | 5.27 | 1350 | 5.53 |
| 5500 | 835 | 2.78 | 871 | 2.91 | 909 | 3.13 | 952 | 3.44 | 999 | 3.81 | 1049 | 4.18 | 1096 | 4.51 | 1142 | 4.79 | 1186 | 5.03 | 1229 | 5.24 | 1275 | 5.46 | 1324 | 5.69 | - - - | - - - |
| 5750 | 854 | 3.01 | 890 | 3.19 | 930 | 3.48 | 977 | 3.86 | 1027 | 4.27 | 1078 | 4.66 | 1126 | 4.99 | 1171 | 5.26 | 1214 | 5.49 | 1258 | 5.70 | - - - | - - - | - - - | - - - | - - - | - - - |
| 6000 | 871 | 3.26 | 910 | 3.53 | 955 | 3.90 | 1006 | 4.34 | 1060 | 4.80 | 1111 | 5.19 | 1158 | 5.51 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| 6250 | 890 | 3.57 | 934 | 3.94 | 985 | 4.41 | 1041 | 4.91 | 1096 | 5.38 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |

## BLOWER DATA ALL MODELS

FACTORY INSTALLED BELT DRIVE KIT SPECIFICATIONS

| Motor Efficiency | Nominal hp | Drive Kit Number | RPM Range |
|---|---|---|---|
| Standard & High | 2 | 1 | 590 - 890 |
| Standard & High | 2 | 2 | 800 - 1105 |
| Standard & High | 2 | 3 | 795 - 1195 |
| Standard | 3 | 4 | 730 - 970 |
| Standard | 3 | 5 | 940 - 1200 |
| Standard | 3 | 6 | 1015 - 1300 |
| High | 3 | 7 | 730 - 970 |
| High | 3 | 8 | 940 - 1200 |
| High | 3 | 9 | 1015 - 1300 |
| Standard | 5 | 10 | 900 - 1135 |
| Standard | 5 | 11 | 1040 - 1315 |
| Standard | 5 | 12 | 1125 - 1425 |

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. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

POWER EXHAUST FAN PERFORMANCE

| Return Air System Static Pressure | Air Volume Exhausted |
|---|---|
| in. w.g. | cfm |
| 0 | 3175 |
| 0.05 | 2955 |
| 0.10 | 2685 |
| 0.15 | 2410 |
| 0.20 | 2165 |
| 0.25 | 1920 |
| 0.30 | 1420 |
| 0.35 | 1200 |

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

| Air Volume cfm | Wet Indoor Coil | | Electric Heat | Economizer | Filters | | Return Air Adaptor Plate |
|---|---|---|---|---|---|---|---|
| | 094 | 122, 152 | | | MERV 8 | MERV 13 | |
| 1750 | 0.04 | 0.04 | 0.03 | 0.05 | 0.01 | 0.03 | 0.00 |
| 2000 | 0.05 | 0.05 | 0.03 | 0.06 | 0.01 | 0.03 | 0.00 |
| 2250 | 0.06 | 0.06 | 0.04 | 0.08 | 0.01 | 0.04 | 0.00 |
| 2500 | 0.07 | 0.07 | 0.04 | 0.11 | 0.01 | 0.05 | 0.00 |
| 2750 | 0.08 | 0.08 | 0.05 | 0.12 | 0.02 | 0.05 | 0.00 |
| 3000 | 0.10 | 0.09 | 0.06 | 0.13 | 0.02 | 0.06 | 0.02 |
| 3250 | 0.11 | 0.10 | 0.06 | 0.15 | 0.02 | 0.06 | 0.02 |
| 3500 | 0.12 | 0.11 | 0.09 | 0.15 | 0.03 | 0.07 | 0.04 |
| 3750 | 0.14 | 0.13 | 0.09 | 0.15 | 0.03 | 0.08 | 0.07 |
| 4000 | 0.15 | 0.14 | 0.09 | 0.19 | 0.04 | 0.08 | 0.09 |
| 4250 | 0.17 | 0.15 | 0.13 | 0.19 | 0.04 | 0.09 | 0.11 |
| 4500 | 0.19 | 0.17 | 0.14 | 0.22 | 0.04 | 0.09 | 0.12 |
| 4750 | 0.20 | 0.18 | 0.17 | 0.25 | 0.05 | 0.10 | 0.16 |
| 5000 | 0.22 | 0.20 | 0.20 | 0.29 | 0.06 | 0.10 | 0.18 |
| 5250 | 0.24 | 0.22 | 0.22 | 0.32 | 0.06 | 0.11 | 0.19 |
| 5500 | 0.25 | 0.23 | 0.25 | 0.34 | 0.07 | 0.12 | 0.22 |
| 5750 | 0.27 | 0.25 | 0.31 | 0.45 | 0.07 | 0.12 | 0.25 |
| 6000 | 0.29 | 0.27 | 0.33 | 0.52 | 0.08 | 0.13 | 0.27 |

## BLOWER DATA ALL MODELS

CEILING DIFFUSERS AIR RESISTANCE - in. w.g.

| Unit Size | RTD11 Step-Down Diffuser | | | | FD11 Flush Diffuser |
|---|---|---|---|---|---|
| | Air Volume cfm | 2 Ends Open | 1 Side, 2 Ends Open | All Ends & Sides Open | |
| 094 Models | 2400 | 0.21 | 0.18 | 0.15 | 0.14 |
| | 2600 | 0.24 | 0.21 | 0.18 | 0.17 |
| | 2800 | 0.27 | 0.24 | 0.21 | 0.20 |
| | 3000 | 0.32 | 0.29 | 0.25 | 0.25 |
| | 3200 | 0.41 | 0.37 | 0.32 | 0.31 |
| | 3400 | 0.50 | 0.45 | 0.39 | 0.37 |
| | 3600 | 0.61 | 0.54 | 0.48 | 0.44 |
| | 3800 | 0.73 | 0.63 | 0.57 | 0.51 |
| 122 Models | 3600 | 0.36 | 0.28 | 0.23 | 0.15 |
| | 3800 | 0.40 | 0.32 | 0.26 | 0.18 |
| | 4000 | 0.44 | 0.36 | 0.29 | 0.21 |
| | 4200 | 0.49 | 0.40 | 0.33 | 0.24 |
| | 4400 | 0.54 | 0.44 | 0.37 | 0.27 |
| | 4600 | 0.60 | 0.49 | 0.42 | 0.31 |
| | 4800 | 0.65 | 0.53 | 0.46 | 0.35 |
| | 5000 | 0.69 | 0.58 | 0.50 | 0.39 |
| | 5200 | 0.75 | 0.62 | 0.54 | 0.43 |
| 152 Models | 4200 | 0.22 | 0.19 | 0.16 | 0.10 |
| | 4400 | 0.28 | 0.24 | 0.20 | 0.12 |
| | 4600 | 0.34 | 0.29 | 0.24 | 0.15 |
| | 4800 | 0.40 | 0.34 | 0.29 | 0.19 |
| | 5000 | 0.46 | 0.39 | 0.34 | 0.23 |
| | 5200 | 0.52 | 0.44 | 0.39 | 0.27 |
| | 5400 | 0.58 | 0.49 | 0.43 | 0.31 |
| | 5600 | 0.64 | 0.54 | 0.47 | 0.35 |
| | 5800 | 0.70 | 0.59 | 0.51 | 0.39 |

CEILING DIFFUSER AIR THROW DATA

| Model No. | Air Volume | [1] Effective Throw Range | |
|---|---|---|---|
| | | RTD11 Step-Down | FD11 Flush |
| | cfm | ft. | ft. |
| 094 Models | 2600 | 24 - 29 | 19 - 24 |
| | 2800 | 25 - 30 | 20 - 28 |
| | 3000 | 27 - 33 | 21 - 29 |
| | 3200 | 28 - 35 | 22 - 29 |
| | 3400 | 30 - 37 | 22 - 30 |
| 122 Models | 3600 | 25 - 33 | 22 - 29 |
| | 3800 | 27 - 35 | 22 - 30 |
| | 4000 | 29- 37 | 24 - 33 |
| | 4200 | 32 - 40 | 26 - 35 |
| | 4400 | 34 - 42 | 28 - 37 |
| 152 Models | 5600 | 39 - 49 | 28 - 37 |
| | 5800 | 42 - 51 | 29 - 38 |
| | 6000 | 44 - 54 | 40 - 50 |
| | 6200 | 45 - 55 | 42 - 51 |
| | 6400 | 46 - 55 | 43 - 52 |
| | 6600 | 47 - 56 | 45 - 56 |

[1] Throw is the horizontal or vertical distance an air stream 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 — 7.5 TON

7.5 TON HIGH EFFICIENCY (R-410A) — LCH092H4

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [1] Voltage - 60hz | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | | | | |
| Compressor 1 | Rated Load Amps | 11.6 | | | 5.5 | | | 4.7 | | | | | |
| | Locked Rotor Amps | 86 | | | 37 | | | 34 | | | | | |
| Compressor 2 | Rated Load Amps | 11.6 | | | 5.5 | | | 4.7 | | | | | |
| | Locked Rotor Amps | 86 | | | 37 | | | 34 | | | | | |
| Outdoor Fan Motors (2) | Full Load Amps (total) | 2.4 (4.8) | | | 1.3 (2.6) | | | 1 (2) | | | | | |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | | | | |
| Service Outlet 115V GFI (amps) | | 15 | | | 15 | | | 20 | | | | | |
| Indoor Blower Motor | Horsepower | 2 | 3 | 5 | 2 | 3 | 5 | 2 | 3 | 5 | | | |
| | Full Load Amps | 7.5 | 10.6 | 16.7 | 3.4 | 4.8 | 7.6 | 2.7 | 3.9 | 6.1 | | | |
| [2] Maximum Overcurrent Protection | Unit Only | 45 | 50 | 60 | 20 | 25 | 30 | 20 | 20 | 25 | | | |
| | With (1) 0.33 HP Power Exhaust | 50 | 50 | 60 | 25 | 25 | 30 | 20 | 20 | 25 | | | |
| [3] Minimum Circuit Ampacity | Unit Only | 39 | 42 | 49 | 19 | 20 | 24 | 16 | 17 | 20 | | | |
| | With (1) 0.33 HP Power Exhaust | 41 | 44 | 52 | 20 | 22 | 25 | 17 | 18 | 21 | | | |

### ELECTRIC HEAT DATA

| Electric Heat Voltage | | | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 7.5 kW | 45 | 45 | 50 | 50 | 60 | 60 | 20 | 25 | 30 | 20 | 20 | 25 |
| | | 15 kW | [4]50 | 60 | 60 | 60 | [4]60 | 70 | 30 | 30 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]70 | 80 | [4]80 | 90 | [4]80 | 90 | 40 | 40 | 45 | 35 | 35 | 35 |
| | | 30 kW | [4]90 | 100 | [4]100 | 110 | [4]100 | 125 | 50 | 60 | 60 | 40 | 45 | 45 |
| | | 45 kW | 150 | 150 | 150 | 150 | [4]150 | 175 | 80 | 80 | 80 | 60 | 60 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 7.5 kW | 39 | 39 | 42 | 42 | 49 | 49 | 19 | 20 | 24 | 16 | 17 | 20 |
| | | 15 kW | 49 | 55 | 53 | 59 | 60 | 66 | 27 | 29 | 33 | 22 | 23 | 26 |
| | | 22.5 kW | 69 | 78 | 72 | 81 | 80 | 89 | 39 | 40 | 44 | 31 | 32 | 35 |
| | | 30 kW | 88 | 100 | 92 | 104 | 100 | 112 | 50 | 52 | 55 | 40 | 41 | 44 |
| | | 45 kW | 127 | 145 | 131 | 149 | 139 | 157 | 72 | 74 | 78 | 58 | 60 | 62 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 7.5 kW | 50 | 50 | 50 | 50 | 60 | 60 | 25 | 25 | 30 | 20 | 20 | 25 |
| | | 15 kW | 60 | 60 | [4]60 | 70 | 70 | 70 | 30 | 35 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]80 | 90 | [4]80 | 90 | [4]90 | 100 | 40 | 45 | 45 | 35 | 35 | 40 |
| | | 30 kW | [4]100 | 110 | [4]100 | 110 | [4]110 | 125 | 60 | 60 | 60 | 45 | 45 | 45 |
| | | 45 kW | 150 | 150 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 80 | 60 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 7.5 kW | 41 | 41 | 44 | 44 | 52 | 52 | 20 | 22 | 25 | 17 | 18 | 21 |
| | | 15 kW | 52 | 58 | 56 | 62 | 63 | 69 | 29 | 31 | 34 | 23 | 25 | 27 |
| | | 22.5 kW | 72 | 81 | 75 | 84 | 83 | 92 | 40 | 42 | 45 | 32 | 34 | 36 |
| | | 30 kW | 91 | 103 | 95 | 107 | 103 | 115 | 51 | 53 | 57 | 41 | 43 | 45 |
| | | 45 kW | 130 | 148 | 134 | 152 | 142 | 160 | 74 | 76 | 79 | 59 | 61 | 64 |

### ELECTRICAL ACCESSORIES

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disconnect | 7.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 30 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 45 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |

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 — 8.5 TON

8.5 TON HIGH EFFICIENCY (R-410A) — LCH102H4

| [1] Voltage - 60hz | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Compressor 1 | Rated Load Amps | 11 | | | 5.5 | | | 4.7 | | |
| | Locked Rotor Amps | 86 | | | 37 | | | 34 | | |
| Compressor 2 | Rated Load Amps | 11 | | | 5.5 | | | 4.7 | | |
| | Locked Rotor Amps | 86 | | | 37 | | | 34 | | |
| Outdoor Fan Motors (2) | Full Load Amps (total) | 2.4 (4.8) | | | 1.3 (2.6) | | | 1 (2) | | |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | |
| Service Outlet 115V GFI (amps) | | 15 | | | 15 | | | 20 | | |
| Indoor Blower Motor | Horsepower | 2 | 3 | 5 | 2 | 3 | 5 | 2 | 3 | 5 |
| | Full Load Amps | 7.5 | 10.6 | 16.7 | 3.4 | 4.8 | 7.6 | 2.7 | 3.9 | 6.1 |
| [2] Maximum Overcurrent Protection | Unit Only | 45 | 50 | 60 | 20 | 25 | 30 | 20 | 20 | 25 |
| | With (1) 0.33 HP Power Exhaust | 50 | 50 | 60 | 25 | 25 | 30 | 20 | 20 | 25 |
| [3] Minimum Circuit Ampacity | Unit Only | 38 | 41 | 48 | 19 | 20 | 24 | 16 | 17 | 20 |
| | With (1) 0.33 HP Power Exhaust | 40 | 43 | 51 | 20 | 22 | 25 | 17 | 18 | 21 |

ELECTRIC HEAT DATA

| Electric Heat Voltage | | | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 7.5 kW | 45 | 45 | 50 | 50 | 60 | 60 | 20 | 25 | 30 | 20 | 20 | 25 |
| | | 15 kW | [4] 50 | 60 | 60 | 60 | [4] 60 | 70 | 30 | 30 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4] 70 | 80 | [4] 80 | 90 | [4] 80 | 90 | 40 | 40 | 45 | 35 | 35 | 35 |
| | | 30 kW | [4] 90 | 100 | [4] 100 | 110 | [4] 100 | 125 | 50 | 60 | 60 | 40 | 45 | 45 |
| | | 45 kW | 150 | 150 | 150 | 150 | [4] 150 | 175 | 80 | 80 | 80 | 60 | 60 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 7.5 kW | 38 | 38 | 41 | 41 | 48 | 48 | 19 | 20 | 24 | 16 | 17 | 20 |
| | | 15 kW | 49 | 55 | 53 | 59 | 60 | 66 | 27 | 29 | 33 | 22 | 23 | 26 |
| | | 22.5 kW | 69 | 78 | 72 | 81 | 80 | 89 | 39 | 40 | 44 | 31 | 32 | 35 |
| | | 30 kW | 88 | 100 | 92 | 104 | 100 | 112 | 50 | 52 | 55 | 40 | 41 | 44 |
| | | 45 kW | 127 | 145 | 131 | 149 | 139 | 157 | 72 | 74 | 78 | 58 | 60 | 62 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 7.5 kW | 50 | 50 | 50 | 50 | 60 | 60 | 25 | 25 | 30 | 20 | 20 | 25 |
| | | 15 kW | 60 | 60 | [4] 60 | 70 | 70 | 70 | 30 | 35 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4] 80 | 90 | [4] 80 | 90 | [4] 90 | 100 | 40 | 45 | 45 | 35 | 35 | 40 |
| | | 30 kW | [4] 100 | 110 | [4] 100 | 110 | [4] 110 | 125 | 60 | 60 | 60 | 45 | 45 | 45 |
| | | 45 kW | 150 | 150 | [4] 150 | 175 | [4] 150 | 175 | 80 | 80 | 80 | 60 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 7.5 kW | 40 | 40 | 43 | 43 | 51 | 51 | 20 | 22 | 25 | 17 | 18 | 21 |
| | | 15 kW | 52 | 58 | 56 | 62 | 63 | 69 | 29 | 31 | 34 | 23 | 25 | 27 |
| | | 22.5 kW | 72 | 81 | 75 | 84 | 83 | 92 | 40 | 42 | 45 | 32 | 34 | 36 |
| | | 30 kW | 91 | 103 | 95 | 107 | 103 | 115 | 51 | 53 | 57 | 41 | 43 | 45 |
| | | 45 kW | 130 | 148 | 134 | 152 | 142 | 160 | 74 | 76 | 79 | 59 | 61 | 64 |

ELECTRICAL ACCESSORIES

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disconnect | 7.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 30 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 45 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |

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 — 10 TON

10 TON HIGH EFFICIENCY (R-410A) — LCH120H4

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [1] Voltage - 60hz | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | | | | |
| Compressor 1 | Rated Load Amps | 16 | | | 7.8 | | | 5.7 | | | | | |
| | Locked Rotor Amps | 110 | | | 52 | | | 38.9 | | | | | |
| Compressor 2 | Rated Load Amps | 16 | | | 7.8 | | | 5.7 | | | | | |
| | Locked Rotor Amps | 110 | | | 52 | | | 38.9 | | | | | |
| Outdoor Fan Motors (2) | Full Load Amps (total) | 2.4 (4.8) | | | 1.3 (2.6) | | | 1 (2) | | | | | |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | | | | |
| Service Outlet 115V GFI (amps) | | 15 | | | 15 | | | 20 | | | | | |
| Indoor Blower Motor | Horsepower | 2 | 3 | 5 | 2 | 3 | 5 | 2 | 3 | 5 | | | |
| | Full Load Amps | 7.5 | 10.6 | 16.7 | 3.4 | 4.8 | 7.6 | 2.7 | 3.9 | 6.1 | | | |
| [2] Maximum Overcurrent Protection | Unit Only | 50 | 50 | 60 | 30 | 30 | 35 | 20 | 20 | 25 | | | |
| | With (1) 0.33 HP Power Exhaust | 50 | 60 | 70 | 30 | 30 | 35 | 20 | 20 | 25 | | | |
| [3] Minimum Circuit Ampacity | Unit Only | 43 | 46 | 53 | 24 | 26 | 29 | 16 | 18 | 20 | | | |
| | With (1) 0.33 HP Power Exhaust | 46 | 49 | 56 | 26 | 27 | 30 | 17 | 19 | 21 | | | |

### ELECTRIC HEAT DATA

| Electric Heat Voltage | | | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 15 kW | [4] 50 | 60 | 60 | 60 | [4] 60 | 70 | 30 | 30 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4] 70 | 80 | [4] 80 | 90 | [4] 80 | 90 | 40 | 40 | 45 | 35 | 35 | 35 |
| | | 30 kW | [4] 90 | 100 | [4] 100 | 110 | [4] 100 | 125 | 50 | 60 | 60 | 40 | 45 | 45 |
| | | 45 kW | 150 | 150 | 150 | 150 | [4] 150 | 175 | 80 | 80 | 80 | 60 | 60 | 70 |
| | | 60 kW | [4] 150 | 175 | [4] 150 | 175 | [4] 150 | 175 | 80 | 80 | 90 | 70 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 15 kW | 49 | 55 | 53 | 59 | 60 | 66 | 27 | 29 | 33 | 22 | 23 | 26 |
| | | 22.5 kW | 69 | 78 | 72 | 81 | 80 | 89 | 39 | 40 | 44 | 31 | 32 | 35 |
| | | 30 kW | 88 | 100 | 92 | 104 | 100 | 112 | 50 | 52 | 55 | 40 | 41 | 44 |
| | | 45 kW | 127 | 145 | 131 | 149 | 139 | 157 | 72 | 74 | 78 | 58 | 60 | 62 |
| | | 60 kW | 135 | 154 | 139 | 158 | 146 | 166 | 77 | 79 | 82 | 62 | 63 | 66 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 60 | 60 | [4] 60 | 70 | 70 | 70 | 30 | 35 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4] 80 | 90 | [4] 80 | 90 | [4] 90 | 100 | 40 | 45 | 45 | 35 | 35 | 40 |
| | | 30 kW | [4] 100 | 110 | [4] 100 | 110 | [4] 110 | 125 | 60 | 60 | 60 | 45 | 45 | 45 |
| | | 45 kW | 150 | 150 | [4] 150 | 175 | [4] 150 | 175 | 80 | 80 | 80 | 60 | 70 | 70 |
| | | 60 kW | [4] 150 | 175 | [4] 150 | 175 | [4] 150 | 175 | 80 | 80 | 90 | 70 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 52 | 58 | 56 | 62 | 63 | 69 | 29 | 31 | 34 | 23 | 25 | 27 |
| | | 22.5 kW | 72 | 81 | 75 | 84 | 83 | 92 | 40 | 42 | 45 | 32 | 34 | 36 |
| | | 30 kW | 91 | 103 | 95 | 107 | 103 | 115 | 51 | 53 | 57 | 41 | 43 | 45 |
| | | 45 kW | 130 | 148 | 134 | 152 | 142 | 160 | 74 | 76 | 79 | 59 | 61 | 64 |
| | | 60 kW | 138 | 157 | 142 | 161 | 149 | 169 | 79 | 80 | 84 | 63 | 64 | 67 |

### ELECTRICAL ACCESSORIES

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disconnect | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 30 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 45 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 60 kW | [5] N/A | [5] N/A | [5] N/A | [5] N/A | [5] N/A | [5] N/A | 54W56 | 54W56 | [5] N/A | 54W56 | 54W56 | 54W56 |

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.

[5] Disconnect must be field furnished.

## ELECTRICAL/ELECTRIC HEAT DATA — 12.5 TON

12.5 TON HIGH EFFICIENCY (R-410A) — LCH150H4

| [1] Voltage - 60hz | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Compressor 1 | Rated Load Amps | 19.6 | | | 8.2 | | | 6.6 | | |
| | Locked Rotor Amps | 136 | | | 66.1 | | | 55.3 | | |
| Compressor 2 | Rated Load Amps | 22.4 | | | 10.6 | | | 7.7 | | |
| | Locked Rotor Amps | 149 | | | 75 | | | 54 | | |
| Outdoor Fan Motors (2) | Full Load Amps | 3.2 | | | 1.7 | | | 1.5 | | |
| | (total) | (6.4) | | | (3.4) | | | (3) | | |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | |
| Service Outlet 115V GFI (amps) | | 15 | | | 15 | | | 20 | | |
| Indoor Blower Motor | Horsepower | 2 | 3 | 5 | 2 | 3 | 5 | 2 | 3 | 5 |
| | Full Load Amps | 7.5 | 10.6 | 16.7 | 3.4 | 4.8 | 7.6 | 2.7 | 3.9 | 6.1 |
| [2] Maximum Overcurrent Protection | Unit Only | 80 | 80 | 90 | 35 | 35 | 40 | 25 | 30 | 30 |
| | With (1) 0.33 HP Power Exhaust | 80 | 80 | 90 | 35 | 40 | 40 | 30 | 30 | 30 |
| [3] Minimum Circuit Ampacity | Unit Only | 62 | 65 | 71 | 28 | 30 | 33 | 22 | 23 | 25 |
| | With (1) 0.33 HP Power Exhaust | 64 | 67 | 73 | 30 | 31 | 34 | 23 | 24 | 26 |

ELECTRIC HEAT DATA

| Electric Heat Voltage | | | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 15 kW | 70 | 70 | 80 | 80 | 80 | 80 | 30 | 30 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]70 | 80 | [4]80 | 90 | [4]80 | 90 | 40 | 40 | 45 | 35 | 35 | 35 |
| | | 30 kW | [4]90 | 100 | [4]100 | 110 | [4]100 | 125 | 50 | 60 | 60 | 40 | 45 | 45 |
| | | 45 kW | 150 | 150 | 150 | 150 | [4]150 | 175 | 80 | 80 | 80 | 60 | 60 | 70 |
| | | 60 kW | [4]150 | 175 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 90 | 70 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 15 kW | 58 | 58 | 61 | 61 | 67 | 67 | 27 | 29 | 33 | 22 | 23 | 26 |
| | | 22.5 kW | 69 | 78 | 72 | 81 | 80 | 89 | 39 | 40 | 44 | 31 | 32 | 35 |
| | | 30 kW | 88 | 100 | 92 | 104 | 100 | 112 | 50 | 52 | 55 | 40 | 41 | 44 |
| | | 45 kW | 127 | 145 | 131 | 149 | 139 | 157 | 72 | 74 | 78 | 58 | 60 | 62 |
| | | 60 kW | 135 | 154 | 139 | 158 | 146 | 166 | 77 | 79 | 82 | 62 | 63 | 66 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 70 | 70 | 80 | 80 | 80 | 80 | 30 | 35 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]80 | 90 | [4]80 | 90 | [4]90 | 100 | 40 | 45 | 45 | 35 | 35 | 40 |
| | | 30 kW | [4]100 | 110 | [4]100 | 110 | [4]110 | 125 | 60 | 60 | 60 | 45 | 45 | 45 |
| | | 45 kW | 150 | 150 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 80 | 60 | 70 | 70 |
| | | 60 kW | [4]150 | 175 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 90 | 70 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 60 | 60 | 64 | 64 | 70 | 70 | 29 | 31 | 34 | 23 | 25 | 27 |
| | | 22.5 kW | 72 | 81 | 75 | 84 | 83 | 92 | 40 | 42 | 45 | 32 | 34 | 36 |
| | | 30 kW | 91 | 103 | 95 | 107 | 103 | 115 | 51 | 53 | 57 | 41 | 43 | 45 |
| | | 45 kW | 130 | 148 | 134 | 152 | 142 | 160 | 74 | 76 | 79 | 59 | 61 | 64 |
| | | 60 kW | 138 | 157 | 142 | 161 | 149 | 169 | 79 | 80 | 84 | 63 | 64 | 67 |

ELECTRICAL ACCESSORIES

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disconnect | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 30 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 45 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 60 kW | [5] N/A | [5] N/A | [5] N/A | [5] N/A | [5] N/A | [5] N/A | 54W56 | 54W56 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 |

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.

[5] Disconnect must be field furnished.

## ELECTRICAL/ELECTRIC HEAT DATA — 7.5 TON

DIRECTPLUS™ (DIRECT DRIVE) — LCH094U4E

| [1] Voltage - 60hz | | | 208/230V - 3 Ph | 460V - 3 Ph | 575V - 3 Ph |
|---|---|---|---|---|---|
| Compressor 1 | Rated Load Amps | | 13.1 | 6.1 | 4.4 |
| | Locked Rotor Amps | | 83.1 | 41 | 33 |
| Compressor 2 | Rated Load Amps | | 13.1 | 6.1 | 4.4 |
| | Locked Rotor Amps | | 83.1 | 41 | 33 |
| Outdoor Fan Motors (3) | Full Load Amps (total) | | 2.8 (8.4) | 1.4 (4.2) | 1.1 (3.3) |
| Power Exhaust (1) 0.33 HP | Full Load Amps | | 2.4 | 1.3 | 1 |
| Service Outlet 115V GFI (amps) | | | 15 | 15 | 20 |
| Indoor Blower Motor | Horsepower | | 3.75 | 3.75 | 3.75 |
| | Full Load Amps | | 8.8 | 4.3 | 3.4 |
| [2] Maximum Overcurrent Protection | Unit Only | | 50 | 25 | 20 |
| | With (1) 0.33 HP Power Exhaust | | 60 | 25 | 20 |
| [3] Minimum Circuit Ampacity | Unit Only | | 47 | 23 | 17 |
| | With (1) 0.33 HP Power Exhaust | | 50 | 24 | 18 |

| ELECTRIC HEAT DATA | | | | | | |
|---|---|---|---|---|---|---|
| Electric Heat Voltage | | | 208V | 240V | 480V | 600V |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 7.5 kW | 50 | 50 | 25 | 20 |
| | | 15 kW | 60 | 60 | 30 | 25 |
| | | 22.5 kW | [4] 70 | 80 | 40 | 35 |
| | | 30 kW | [4] 90 | 110 | 60 | 45 |
| | | 45 kW | 150 | 150 | 80 | 60 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 7.5 kW | 47 | 47 | 23 | 17 |
| | | 15 kW | 51 | 57 | 28 | 23 |
| | | 22.5 kW | 70 | 79 | 40 | 32 |
| | | 30 kW | 90 | 102 | 51 | 41 |
| | | 45 kW | 129 | 147 | 74 | 59 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 7.5 kW | 60 | 60 | 25 | 20 |
| | | 15 kW | 60 | 60 | 30 | 25 |
| | | 22.5 kW | [4] 80 | 90 | 45 | 35 |
| | | 30 kW | [4] 100 | 110 | 60 | 45 |
| | | 45 kW | 150 | 150 | 80 | 60 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 7.5 kW | 50 | 50 | 24 | 18 |
| | | 15 kW | 54 | 60 | 30 | 24 |
| | | 22.5 kW | 73 | 82 | 41 | 33 |
| | | 30 kW | 93 | 105 | 53 | 42 |
| | | 45 kW | 132 | 150 | 75 | 60 |

| ELECTRICAL ACCESSORIES | | | | | |
|---|---|---|---|---|---|
| Disconnect | 7.5 kW | 54W56 | 54W56 | 54W56 | 54W56 |
| | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 |
| | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 |
| | 30 kW | 54W57 | 54W57 | 54W56 | 54W56 |
| | 45 kW | 54W57 | 54W57 | 54W56 | 54W56 |

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 — 10 TON

DIRECTPLUS™ (DIRECT DRIVE) — LCH122U4E

| [1] Voltage - 60hz | | | 208/230V - 3 Ph | 460V - 3 Ph | 575V - 3 Ph |
|---|---|---|---|---|---|
| Compressor 1 | Rated Load Amps | | 16 | 7.8 | 5.7 |
| | Locked Rotor Amps | | 110 | 52 | 38.9 |
| Compressor 2 | Rated Load Amps | | 16 | 7.8 | 5.7 |
| | Locked Rotor Amps | | 110 | 52 | 38.9 |
| Outdoor Fan Motors (3) | Full Load Amps (total) | | 2.8 (8.4) | 1.4 (4.2) | 1.1 (3.3) |
| Power Exhaust (1) 0.33 HP | Full Load Amps | | 2.4 | 1.3 | 1 |
| Service Outlet 115V GFI (amps) | | | 15 | 15 | 20 |
| Indoor Blower Motor | Horsepower | | 3.75 | 3.75 | 3.75 |
| | Full Load Amps | | 8.8 | 4.3 | 3.4 |
| [2] Maximum Overcurrent Protection | Unit Only | | 60 | 30 | 25 |
| | With (1) 0.33 HP Power Exhaust | | 70 | 35 | 25 |
| [3] Minimum Circuit Ampacity | Unit Only | | 54 | 27 | 20 |
| | With (1) 0.33 HP Power Exhaust | | 56 | 28 | 21 |

| ELECTRIC HEAT DATA | | | | | | |
|---|---|---|---|---|---|---|
| Electric Heat Voltage | | | 208V | 240V | 480V | 600V |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 15 kW | 60 | 60 | 30 | 25 |
| | | 22.5 kW | [4] 70 | 80 | 40 | 35 |
| | | 30 kW | [4] 90 | 110 | 60 | 45 |
| | | 45 kW | 150 | 150 | 80 | 60 |
| | | 60 kW | [4] 150 | 175 | 80 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 15 kW | 54 | 57 | 28 | 23 |
| | | 22.5 kW | 70 | 79 | 40 | 32 |
| | | 30 kW | 90 | 102 | 51 | 41 |
| | | 45 kW | 129 | 147 | 74 | 59 |
| | | 60 kW | 137 | 156 | 78 | 62 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 70 | 70 | 35 | 25 |
| | | 22.5 kW | [4] 80 | 90 | 45 | 35 |
| | | 30 kW | [4] 100 | 110 | 60 | 45 |
| | | 45 kW | 150 | 150 | 80 | 60 |
| | | 60 kW | [4] 150 | 175 | 80 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 56 | 60 | 30 | 24 |
| | | 22.5 kW | 73 | 82 | 41 | 33 |
| | | 30 kW | 93 | 105 | 53 | 42 |
| | | 45 kW | 132 | 150 | 75 | 60 |
| | | 60 kW | 140 | 159 | 80 | 64 |

| ELECTRICAL ACCESSORIES | | | | | | |
|---|---|---|---|---|---|---|
| Disconnect | | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 |
| | | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 |
| | | 30 kW | 54W57 | 54W57 | 54W56 | 54W56 |
| | | 45 kW | 54W57 | 54W57 | 54W56 | 54W56 |
| | | 60 kW | N/A | N/A | 54W57 | 54W56 |

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 — 12.5 TON

DIRECTPLUS™ (DIRECT DRIVE) — LCH152U4E

| [1] Voltage - 60hz | | | 208/230V - 3 Ph | 460V - 3 Ph | 575V - 3 Ph |
|---|---|---|---|---|---|
| Compressor 1 | Rated Load Amps | | 19.6 | 8.2 | 6.6 |
| | Locked Rotor Amps | | 136 | 66.1 | 55.3 |
| Compressor 2 | Rated Load Amps | | 19.6 | 8.2 | 6.6 |
| | Locked Rotor Amps | | 136 | 66.1 | 55.3 |
| Outdoor Fan Motors (3) | Full Load Amps (total) | | 2.8 (8.4) | 1.4 (4.2) | 1.1 (3.3) |
| Power Exhaust (1) 0.33 HP | Full Load Amps | | 2.4 | 1.3 | 1 |
| Service Outlet 115V GFI (amps) | | | 15 | 15 | 20 |
| Indoor Blower Motor | Horsepower | | 3.75 | 3.75 | 3.75 |
| | Full Load Amps | | 8.8 | 4.3 | 3.4 |
| [2] Maximum Overcurrent Protection | Unit Only | | 80 | 35 | 25 |
| | With (1) 0.33 HP Power Exhaust | | 80 | 35 | 25 |
| [3] Minimum Circuit Ampacity | Unit Only | | 62 | 27 | 22 |
| | With (1) 0.33 HP Power Exhaust | | 64 | 29 | 23 |

| ELECTRIC HEAT DATA | | | | | | |
|---|---|---|---|---|---|---|
| Electric Heat Voltage | | | 208V | 240V | 480V | 600V |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 15 kW | 80 | 80 | 35 | 25 |
| | | 22.5 kW | 80 | 80 | 40 | 35 |
| | | 30 kW | [4] 90 | 110 | 60 | 45 |
| | | 45 kW | 150 | 150 | 80 | 60 |
| | | 60 kW | [4] 150 | 175 | 80 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 15 kW | 62 | 62 | 28 | 23 |
| | | 22.5 kW | 70 | 79 | 40 | 32 |
| | | 30 kW | 90 | 102 | 51 | 41 |
| | | 45 kW | 129 | 147 | 74 | 59 |
| | | 60 kW | 137 | 156 | 78 | 62 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 80 | 80 | 35 | 25 |
| | | 22.5 kW | [4] 80 | 90 | 45 | 35 |
| | | 30 kW | [4] 100 | 110 | 60 | 45 |
| | | 45 kW | 150 | 150 | 80 | 60 |
| | | 60 kW | [4] 150 | 175 | 80 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 64 | 64 | 30 | 24 |
| | | 22.5 kW | 73 | 82 | 41 | 33 |
| | | 30 kW | 93 | 105 | 53 | 42 |
| | | 45 kW | 132 | 150 | 75 | 60 |
| | | 60 kW | 140 | 159 | 80 | 64 |

| ELECTRICAL ACCESSORIES | | | | | | |
|---|---|---|---|---|---|---|
| Disconnect | | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 |
| | | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 |
| | | 30 kW | 54W57 | 54W57 | 54W56 | 54W56 |
| | | 45 kW | 54W57 | 54W57 | 54W56 | 54W56 |
| | | 60 kW | N/A | N/A | 54W57 | 54W56 |

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 — 7.5 TON

BELT DRIVE — LCH094U4M

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [1] Voltage - 60hz | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | | | | |
| Compressor 1 | Rated Load Amps | 13.1 | | | 6.1 | | | 4.4 | | | | | |
| | Locked Rotor Amps | 83.1 | | | 41 | | | 33 | | | | | |
| Compressor 2 | Rated Load Amps | 13.1 | | | 6.1 | | | 4.4 | | | | | |
| | Locked Rotor Amps | 83.1 | | | 41 | | | 33 | | | | | |
| Outdoor Fan Motors (3) | Full Load Amps (total) | 2.8 (8.4) | | | 1.4 (4.2) | | | 1.1 (3.3) | | | | | |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | | | | |
| Service Outlet 115V GFI (amps) | | 15 | | | 15 | | | 20 | | | | | |
| Indoor Blower Motor | Horsepower | 2 | 3 | 5 | 2 | 3 | 5 | 2 | 3 | 5 | | | |
| | Full Load Amps | 7.5 | 10.6 | 16.7 | 3.4 | 4.8 | 7.6 | 2.7 | 3.9 | 6.1 | | | |
| [2] Maximum Overcurrent Protection | Unit Only | 50 | 60 | 70 | 25 | 25 | 30 | 20 | 20 | 25 | | | |
| | With (1) 0.33 HP Power Exhaust | 60 | 60 | 70 | 25 | 30 | 30 | 20 | 20 | 25 | | | |
| [3] Minimum Circuit Ampacity | Unit Only | 46 | 49 | 56 | 22 | 23 | 26 | 16 | 18 | 20 | | | |
| | With (1) 0.33 HP Power Exhaust | 48 | 51 | 58 | 23 | 25 | 28 | 17 | 19 | 21 | | | |

ELECTRIC HEAT DATA

| Electric Heat Voltage | | | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 7.5 kW | 50 | 50 | 60 | 60 | 70 | 70 | 25 | 25 | 30 | 20 | 20 | 25 |
| | | 15 kW | [4]50 | 60 | 60 | 60 | 70 | 70 | 30 | 30 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]70 | 80 | [4]80 | 90 | [4]80 | 90 | 40 | 40 | 45 | 35 | 35 | 35 |
| | | 30 kW | [4]90 | 100 | [4]100 | 110 | [4]100 | 125 | 50 | 60 | 60 | 40 | 45 | 45 |
| | | 45 kW | 150 | 150 | 150 | 150 | [4]150 | 175 | 80 | 80 | 80 | 60 | 60 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 7.5 kW | 46 | 46 | 49 | 49 | 56 | 56 | 22 | 23 | 26 | 16 | 18 | 20 |
| | | 15 kW | 49 | 55 | 53 | 59 | 60 | 66 | 27 | 29 | 33 | 22 | 23 | 26 |
| | | 22.5 kW | 69 | 78 | 72 | 81 | 80 | 89 | 39 | 40 | 44 | 31 | 32 | 35 |
| | | 30 kW | 88 | 100 | 92 | 104 | 100 | 112 | 50 | 52 | 55 | 40 | 41 | 44 |
| | | 45 kW | 127 | 145 | 131 | 149 | 139 | 157 | 72 | 74 | 78 | 58 | 60 | 62 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 7.5 kW | 60 | 60 | 60 | 60 | 70 | 70 | 25 | 30 | 30 | 20 | 20 | 25 |
| | | 15 kW | 60 | 60 | [4]60 | 70 | 70 | 70 | 30 | 35 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]80 | 90 | [4]80 | 90 | [4]90 | 100 | 40 | 45 | 45 | 35 | 35 | 40 |
| | | 30 kW | [4]100 | 110 | [4]100 | 110 | [4]110 | 125 | 60 | 60 | 60 | 45 | 45 | 45 |
| | | 45 kW | 150 | 150 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 80 | 60 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 7.5 kW | 48 | 48 | 51 | 51 | 58 | 58 | 23 | 25 | 28 | 17 | 19 | 21 |
| | | 15 kW | 52 | 58 | 56 | 62 | 63 | 69 | 29 | 31 | 34 | 23 | 25 | 27 |
| | | 22.5 kW | 72 | 81 | 75 | 84 | 83 | 92 | 40 | 42 | 45 | 32 | 34 | 36 |
| | | 30 kW | 91 | 103 | 95 | 107 | 103 | 115 | 51 | 53 | 57 | 41 | 43 | 45 |
| | | 45 kW | 130 | 148 | 134 | 152 | 142 | 160 | 74 | 76 | 79 | 59 | 61 | 64 |

ELECTRICAL ACCESSORIES

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disconnect | 7.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 30 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 45 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |

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 — 10 TON

BELT DRIVE — LCH122U4M

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [1] Voltage - 60hz | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | | | | |
| Compressor 1 | Rated Load Amps | 16.5 | | | 7.2 | | | 5.5 | | | | | |
| | Locked Rotor Amps | 110 | | | 52 | | | 38.9 | | | | | |
| Compressor 2 | Rated Load Amps | 16 | | | 7.8 | | | 5.7 | | | | | |
| | Locked Rotor Amps | 110 | | | 52 | | | 38.9 | | | | | |
| Outdoor Fan Motors (3) | Full Load Amps | 2.8 | | | 1.4 | | | 1.1 | | | | | |
| | (total) | (8.4) | | | (4.2) | | | (3.3) | | | | | |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | | | | |
| Service Outlet 115V GFI (amps) | | 15 | | | 15 | | | 20 | | | | | |
| Indoor Blower Motor | Horsepower | 2 | 3 | 5 | 2 | 3 | 5 | 2 | 3 | 5 | | | |
| | Full Load Amps | 7.5 | 10.6 | 16.7 | 3.4 | 4.8 | 7.6 | 2.7 | 3.9 | 6.1 | | | |
| [2] Maximum Overcurrent Protection | Unit Only | 60 | 70 | 70 | 30 | 30 | 35 | 20 | 25 | 25 | | | |
| | With (1) 0.33 HP Power Exhaust | 70 | 70 | 80 | 30 | 35 | 35 | 25 | 25 | 25 | | | |
| [3] Minimum Circuit Ampacity | Unit Only | 53 | 56 | 62 | 25 | 26 | 29 | 19 | 20 | 23 | | | |
| | With (1) 0.33 HP Power Exhaust | 55 | 59 | 65 | 26 | 28 | 31 | 20 | 21 | 24 | | | |

### ELECTRIC HEAT DATA

| Electric Heat Voltage | | | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 15 kW | 60 | 60 | 70 | 70 | 70 | 70 | 30 | 30 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]70 | 80 | [4]80 | 90 | [4]80 | 90 | 40 | 40 | 45 | 35 | 35 | 35 |
| | | 30 kW | [4]90 | 100 | [4]100 | 110 | [4]100 | 125 | 50 | 60 | 60 | 40 | 45 | 45 |
| | | 45 kW | 150 | 150 | 150 | 150 | [4]150 | 175 | 80 | 80 | 80 | 60 | 60 | 70 |
| | | 60 kW | [4]150 | 175 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 90 | 70 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 15 kW | 53 | 55 | 56 | 59 | 62 | 66 | 27 | 29 | 33 | 22 | 23 | 26 |
| | | 22.5 kW | 69 | 78 | 72 | 81 | 80 | 89 | 39 | 40 | 44 | 31 | 32 | 35 |
| | | 30 kW | 88 | 100 | 92 | 104 | 100 | 112 | 50 | 52 | 55 | 40 | 41 | 44 |
| | | 45 kW | 127 | 145 | 131 | 149 | 139 | 157 | 72 | 74 | 78 | 58 | 60 | 62 |
| | | 60 kW | 135 | 154 | 139 | 158 | 146 | 166 | 77 | 79 | 82 | 62 | 63 | 66 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 70 | 70 | 70 | 70 | 80 | 80 | 30 | 35 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]80 | 90 | [4]80 | 90 | [4]90 | 100 | 40 | 45 | 45 | 35 | 35 | 40 |
| | | 30 kW | [4]100 | 110 | [4]100 | 110 | [4]110 | 125 | 60 | 60 | 60 | 45 | 45 | 45 |
| | | 45 kW | 150 | 150 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 80 | 60 | 70 | 70 |
| | | 60 kW | [4]150 | 175 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 90 | 70 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 55 | 58 | 59 | 62 | 65 | 69 | 29 | 31 | 34 | 23 | 25 | 27 |
| | | 22.5 kW | 72 | 81 | 75 | 84 | 83 | 92 | 40 | 42 | 45 | 32 | 34 | 36 |
| | | 30 kW | 91 | 103 | 95 | 107 | 103 | 115 | 51 | 53 | 57 | 41 | 43 | 45 |
| | | 45 kW | 130 | 148 | 134 | 152 | 142 | 160 | 74 | 76 | 79 | 59 | 61 | 64 |
| | | 60 kW | 138 | 157 | 142 | 161 | 149 | 169 | 79 | 80 | 84 | 63 | 64 | 67 |

### ELECTRICAL ACCESSORIES

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disconnect | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 30 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 45 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 60 kW | N/A | N/A | N/A | N/A | N/A | N/A | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 |

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.

[5] Disconnect must be field furnished.

## ELECTRICAL/ELECTRIC HEAT DATA — 12.5 TON

BELT DRIVE — LCH152U4M

| [1] Voltage - 60hz | | 208/230V - 3 Ph | | | 460V - 3 Ph | | | 575V - 3 Ph | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Compressor 1 | Rated Load Amps | 19.6 | | | 8.2 | | | 6.6 | | |
| | Locked Rotor Amps | 136 | | | 66.1 | | | 55.3 | | |
| Compressor 2 | Rated Load Amps | 19.6 | | | 8.2 | | | 6.6 | | |
| | Locked Rotor Amps | 136 | | | 66.1 | | | 55.3 | | |
| Outdoor Fan Motors (3) | Full Load Amps (total) | 2.8 (8.4) | | | 1.4 (4.2) | | | 1.1 (3.3) | | |
| Power Exhaust (1) 0.33 HP | Full Load Amps | 2.4 | | | 1.3 | | | 1 | | |
| Service Outlet 115V GFI (amps) | | 15 | | | 15 | | | 20 | | |
| Indoor Blower Motor | Horsepower | 2 | 3 | 5 | 2 | 3 | 5 | 2 | 3 | 5 |
| | Full Load Amps | 7.5 | 10.6 | 16.7 | 3.4 | 4.8 | 7.6 | 2.7 | 3.9 | 6.1 |
| [2] Maximum Overcurrent Protection | Unit Only | 70 | 80 | 80 | 30 | 35 | 35 | 25 | 25 | 30 |
| | With (1) 0.33 HP Power Exhaust | 80 | 80 | 90 | 35 | 35 | 35 | 25 | 25 | 30 |
| [3] Minimum Circuit Ampacity | Unit Only | 60 | 64 | 70 | 27 | 28 | 31 | 21 | 23 | 25 |
| | With (1) 0.33 HP Power Exhaust | 63 | 66 | 72 | 28 | 29 | 32 | 22 | 24 | 26 |

ELECTRIC HEAT DATA

| Electric Heat Voltage | | | 208V | 240V | 208V | 240V | 208V | 240V | 480V | 480V | 480V | 600V | 600V | 600V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat | 15 kW | 70 | 70 | 80 | 80 | 80 | 80 | 30 | 35 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]70 | 80 | [4]80 | 90 | [4]80 | 90 | 40 | 40 | 45 | 35 | 35 | 35 |
| | | 30 kW | [4]90 | 100 | [4]100 | 110 | [4]100 | 125 | 50 | 60 | 60 | 40 | 45 | 45 |
| | | 45 kW | 150 | 150 | 150 | 150 | [4]150 | 175 | 80 | 80 | 80 | 60 | 60 | 70 |
| | | 60 kW | [4]150 | 175 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 90 | 70 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat | 15 kW | 60 | 60 | 64 | 64 | 70 | 70 | 27 | 29 | 33 | 22 | 23 | 26 |
| | | 22.5 kW | 69 | 78 | 72 | 81 | 80 | 89 | 39 | 40 | 44 | 31 | 32 | 35 |
| | | 30 kW | 88 | 100 | 92 | 104 | 100 | 112 | 50 | 52 | 55 | 40 | 41 | 44 |
| | | 45 kW | 127 | 145 | 131 | 149 | 139 | 157 | 72 | 74 | 78 | 58 | 60 | 62 |
| | | 60 kW | 135 | 154 | 139 | 158 | 146 | 166 | 77 | 79 | 82 | 62 | 63 | 66 |
| [2] Maximum Overcurrent Protection | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 80 | 80 | 80 | 80 | 90 | 90 | 35 | 35 | 35 | 25 | 25 | 30 |
| | | 22.5 kW | [4]80 | 90 | [4]80 | 90 | [4]90 | 100 | 40 | 45 | 45 | 35 | 35 | 40 |
| | | 30 kW | [4]100 | 110 | [4]100 | 110 | [4]110 | 125 | 60 | 60 | 60 | 45 | 45 | 45 |
| | | 45 kW | 150 | 150 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 80 | 60 | 70 | 70 |
| | | 60 kW | [4]150 | 175 | [4]150 | 175 | [4]150 | 175 | 80 | 80 | 90 | 70 | 70 | 70 |
| [3] Minimum Circuit Ampacity | Unit+ Electric Heat and (1) 0.33 HP Power Exhaust | 15 kW | 63 | 63 | 66 | 66 | 72 | 72 | 29 | 31 | 34 | 23 | 25 | 27 |
| | | 22.5 kW | 72 | 81 | 75 | 84 | 83 | 92 | 40 | 42 | 45 | 32 | 34 | 36 |
| | | 30 kW | 91 | 103 | 95 | 107 | 103 | 115 | 51 | 53 | 57 | 41 | 43 | 45 |
| | | 45 kW | 130 | 148 | 134 | 152 | 142 | 160 | 74 | 76 | 79 | 59 | 61 | 64 |
| | | 60 kW | 138 | 157 | 142 | 161 | 149 | 169 | 79 | 80 | 84 | 63 | 64 | 67 |

ELECTRICAL ACCESSORIES

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disconnect | 15 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 22.5 kW | 54W56 | 54W56 | 54W56 | 54W56 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 30 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 45 kW | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 | 54W56 |
| | 60 kW | N/A | N/A | N/A | N/A | N/A | N/A | 54W57 | 54W57 | 54W57 | 54W56 | 54W56 | 54W56 | 54W56 |

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.

[5] Disconnect must be field furnished.

## ELECTRIC HEAT CAPACITIES

| Volts Input | 7.5 kW | | | 15 kW | | | 22.5 kW | | | 30 kW | | | 45 kW | | | 60 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 | kW Input | Btuh Output | No. of Stages |
| 208 | 5.6 | 19,100 | 1 | 11.3 | 38,600 | 1 | 16.9 | 57,700 | 2 | 22.5 | 76,800 | 2 | 33.8 | 115,300 | 2 | 45.0 | 153,600 | 2 |
| 220 | 6.3 | 21,500 | 1 | 12.6 | 43,000 | 1 | 18.9 | 64,500 | 2 | 25.2 | 86,000 | 2 | 37.8 | 129,000 | 2 | 50.4 | 172,000 | 2 |
| 230 | 6.9 | 23,600 | 1 | 13.8 | 47,100 | 1 | 20.7 | 70,700 | 2 | 27.5 | 93,900 | 2 | 41.3 | 141,000 | 2 | 55.1 | 188,000 | 2 |
| 240 | 7.5 | 25,600 | 1 | 15.0 | 51,200 | 1 | 22.5 | 76,800 | 2 | 30.0 | 102,400 | 2 | 45.0 | 153,600 | 2 | 60.0 | 204,800 | 2 |
| 440 | 6.9 | 21,500 | 1 | 12.6 | 43,000 | 1 | 18.9 | 64,500 | 2 | 25.2 | 86,000 | 2 | 37.8 | 129,000 | 2 | 50.4 | 172,000 | 2 |
| 460 | 6.9 | 23,600 | 1 | 13.8 | 47,100 | 1 | 20.7 | 70,700 | 2 | 27.5 | 93,900 | 2 | 41.3 | 141,000 | 2 | 55.1 | 188,000 | 2 |
| 480 | 7.5 | 25,600 | 1 | 15.0 | 51,200 | 1 | 22.5 | 76,800 | 2 | 30.0 | 102,400 | 2 | 45.0 | 153,600 | 2 | 60.0 | 204,800 | 2 |
| 550 | 6.3 | 21,500 | 1 | 12.6 | 43,000 | 1 | 18.9 | 64,500 | 2 | 25.2 | 86,000 | 2 | 37.8 | 129,000 | 2 | 50.4 | 172,000 | 2 |
| 575 | 6.9 | 23,600 | 1 | 13.8 | 47,100 | 1 | 20.7 | 70,700 | 2 | 27.5 | 93,900 | 2 | 41.3 | 141,000 | 2 | 55.1 | 188,000 | 2 |
| 600 | 7.5 | 25,600 | 1 | 15.0 | 51,200 | 1 | 22.5 | 76,800 | 2 | 30.0 | 102,400 | 2 | 45.0 | 153,600 | 2 | 60.0 | 204,800 | 2 |

## PARTS ARRANGEMENT - 092H, 102H, 120H, 150S, 150H

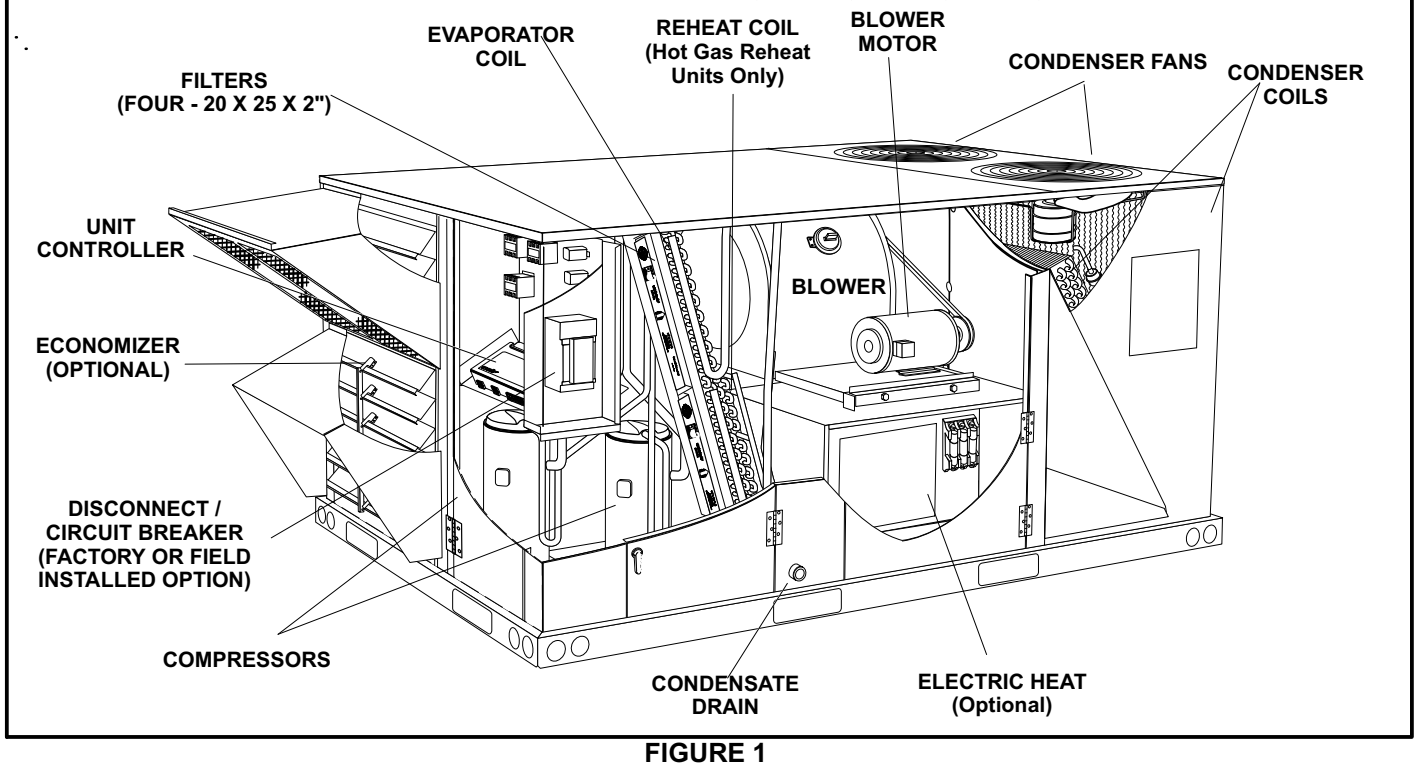



**FIGURE 1**

## PARTS ARRANGEMENT 094U, 122U, 152U

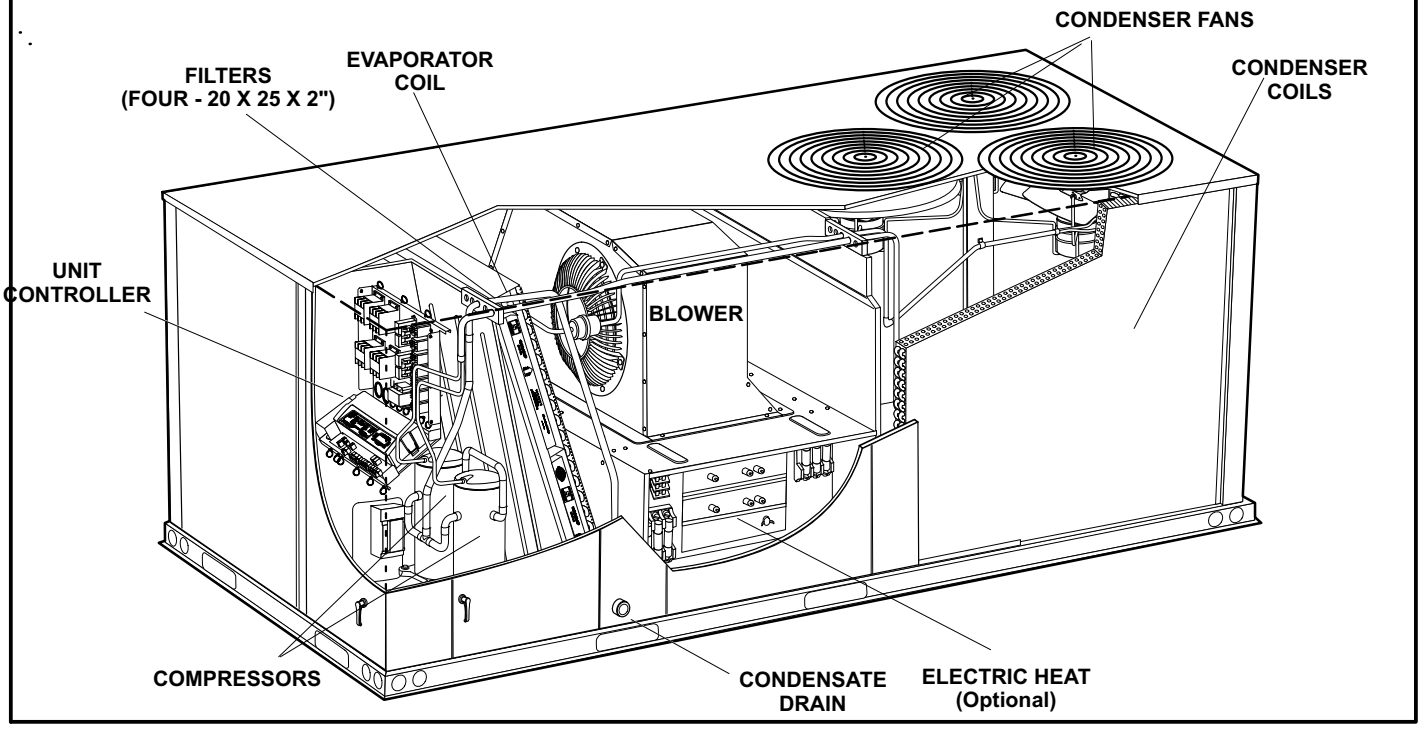



**FIGURE 2**

## CONTROL BOX PARTS ARRANGEMENT - Standard & High Efficiency Units

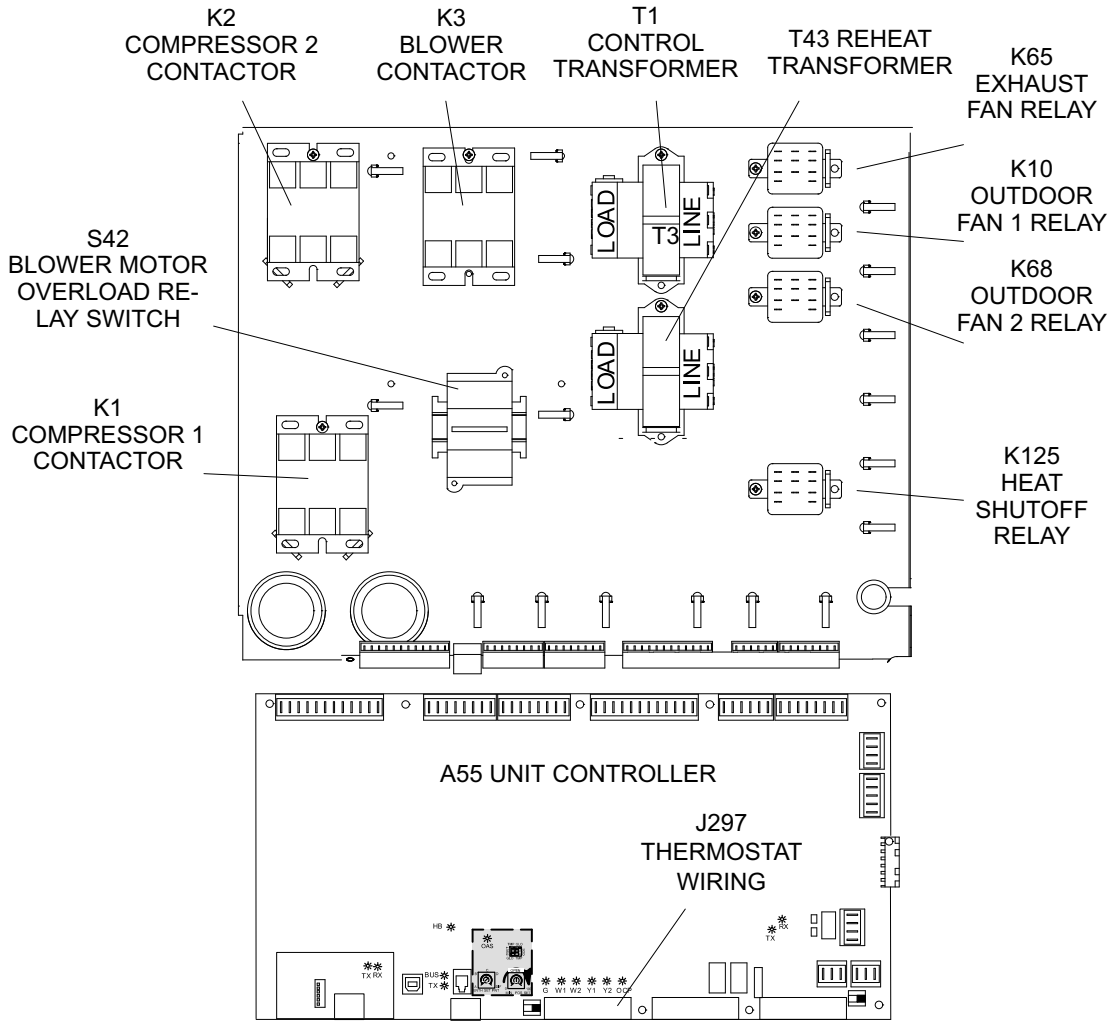



**FIGURE 3**

## CONTROL BOX PARTS ARRANGEMENT - Ultra High Efficiency Units

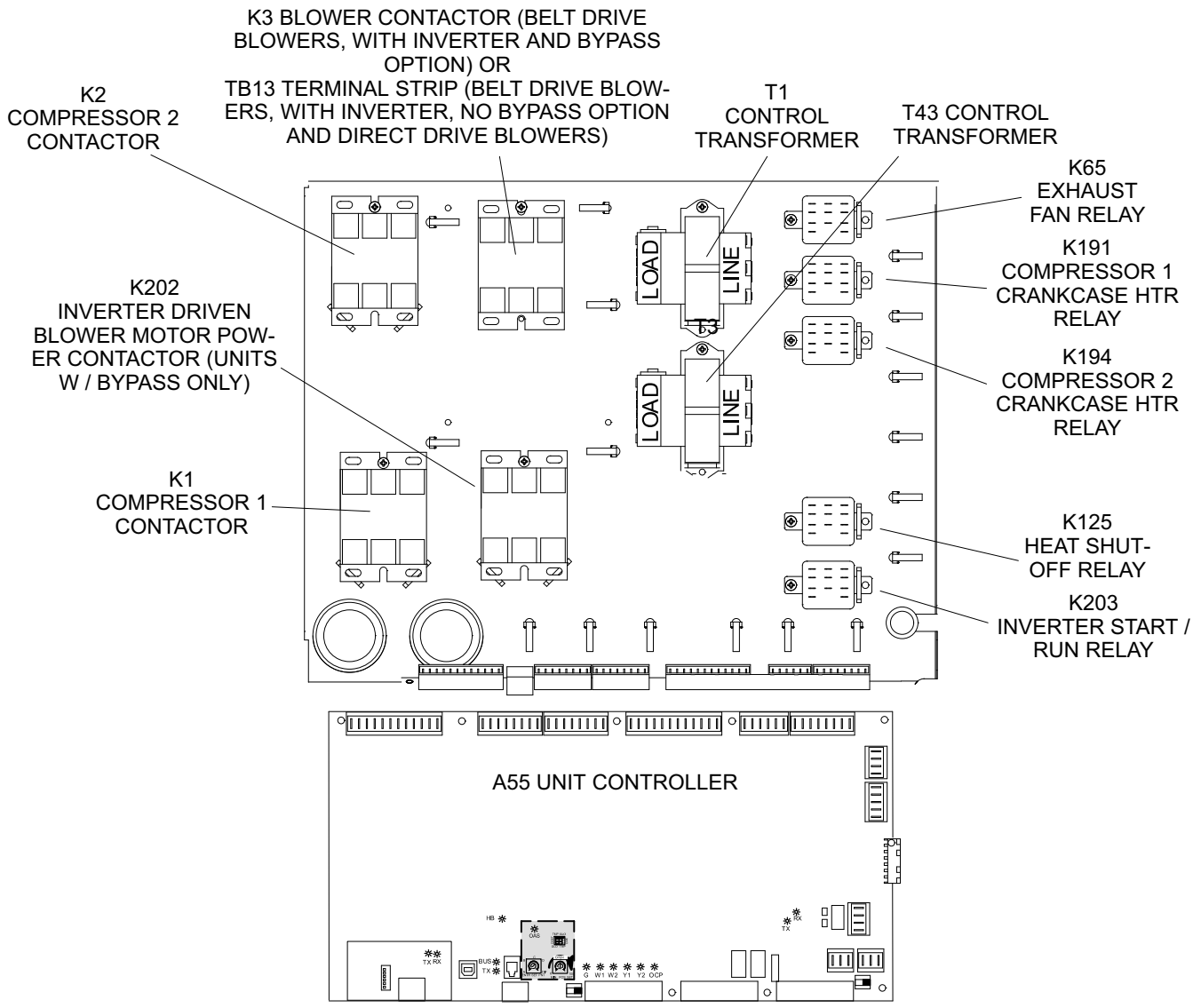



**FIGURE 4**

## I-UNIT COMPONENTS

All 7.5 through 12.5 ton (38.1 through 70.3 kW) units are configure to order units (CTO). The LCH unit components are shown in figure 1. All units come standard with hinged unit panels. All L1, L2, and L3 wiring is color coded; L1 is red, L2 is yellow, and L3 is blue.

### A-Control Box Components

**⚠ 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.**

LCH standard and high efficiency units control box components are shown in figure 3. Ultra units control box components are shown in figure 4. The control box is located in the upper portion of the compressor compartment.

### 1-Disconnect Switch S48 (Optional)

All units may be equipped with an optional disconnect switch S48. Other factory or field installed optional circuit breakers may be used, such as CB10. S48 and CB10 are toggle 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 primary voltage taps as shown in figure 5, while 460 (G) and 575 (J) voltage transformers use a single primary voltage tap.

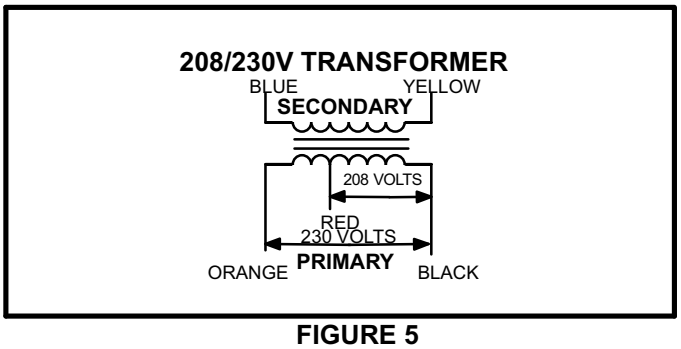



**FIGURE 5**

### 3-Outdoor Fan Capacitors C1, C2 (non-Ultra units)

Fan capacitors C1 and C2 370V / 10 MFD capacitors are used to assist in the start up of condenser fans B4 and B5.

### 4-Compressor Contactor K1, K2

All compressor contactors are three-pole, double-break contactors with 24VAC coils. In all LCH units, K1 and K2 (both energized by A55) energize compressors B1 and B2. On CE M-volt units, contactor is CE approved by manufacturer (Siemens). See figure 6.

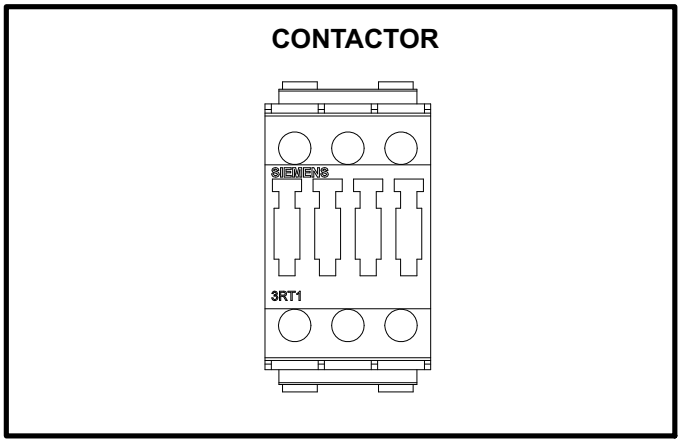



**FIGURE 6**

### 5-Blower Contactor K3

K3 is used in units with a constant blower speed or a staged blower which is not equipped with a bypass option. K3 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 A55 Unit Controller. On M-volt CE units, the contactor is CE approved by manufacturer (Siemens). See figure 6.

### 6-Outdoor Fan Relay K10, K68 (non-Ultra units)

Outdoor fan relays K10 and K68 are DPDT relays with a 24VAC coil. In all LCH units K10 and K68 energize condenser fans B4 and B5.

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

Power exhaust relay K65 is a N.O. DPDT relay with a 24VAC coil. K65 is used in all LCH units equipped with the optional power exhaust dampers. K65 is energized by the economizer control panel (A56), after the economizer dampers reach 50% open (adjustable in ECTO). When K65 closes, the exhaust fans B10 and B11 are energized.

### 8-Unit Controller A55

The Unit Controller provides all unit control functions, unit status information, unit diagnostics, programmable parameters and USB verification and profile sharing. Use the Unit Controller keypad and display to navigate through menus. Software is also available to access the Unit Controller. Refer to the Unit Controller guide provided with the unit. Thermostat wires are connected to J297 on the Unit Controller.

## 9-Compressor Overload Relays S176, S177 (M-volt CE units)

Relays are wired in series with the appropriate compressor contactor and monitor the current flow to the compressor motor. When the relay senses an overload condition, N.C. contacts open to de-energize the compressor. Relays are manufactured by Siemens; see figure 7.

## 10-Variable Frequency Drive A96 (optional)

Units may be 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 as shown in Belt Drive Supply Air Inverter section. The VFD is located below the Unit Controller.

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

Contactor is used in VFD units equipped with a VFD bypass option. The three-pole 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 VFD 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-VFD Controller (GP board) A133 (VFD units)

M2 and earlier versions of Unit Controller only. The GP board A133 controls and monitors the status of the VFD A96. The board sends the signal to start the VFD forward rotation and also sends a 0-10VDC signal to the VFD to control the speed of the blower rotation. A133 also reports VFD malfunctions to the A55.

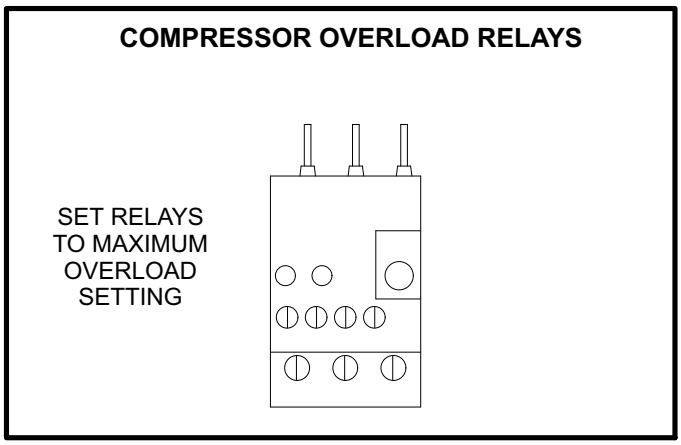


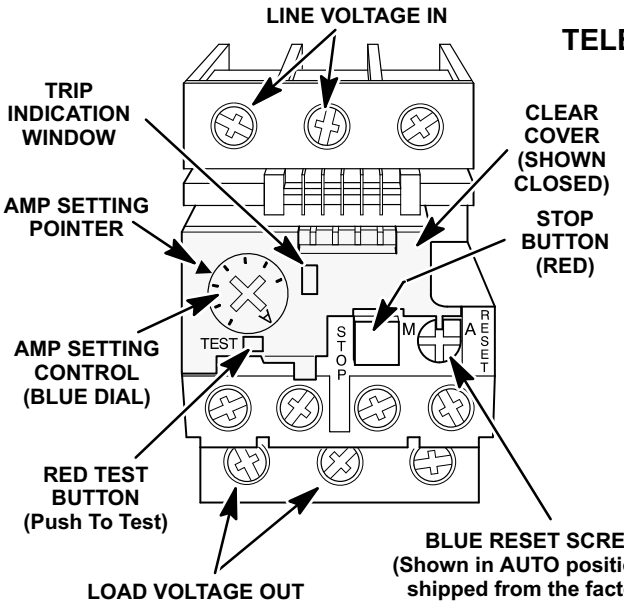

**FIGURE 7**

## 14-Blower Motor Overload Relay S42

Two hp high efficiency blower motors and M-volt unit blower motors are equipped with an overload relay. High efficiency blower motors and M-volt unit blower motors manufactured before Dec. 19, 2010, are equipped with the relay.

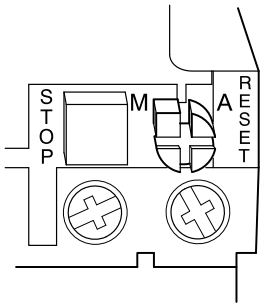
The relay (S42) is connected in line with the blower motor to monitor the current flow to the motor. When the relay senses an overload condition, a set of normally closed contacts open to de-energize the blower. Units will be equipped with a relay manufactured by Telemecanique figure 8 or Siemens figure 9.

## TELEMECANIQUE OVERLOAD RELAY




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

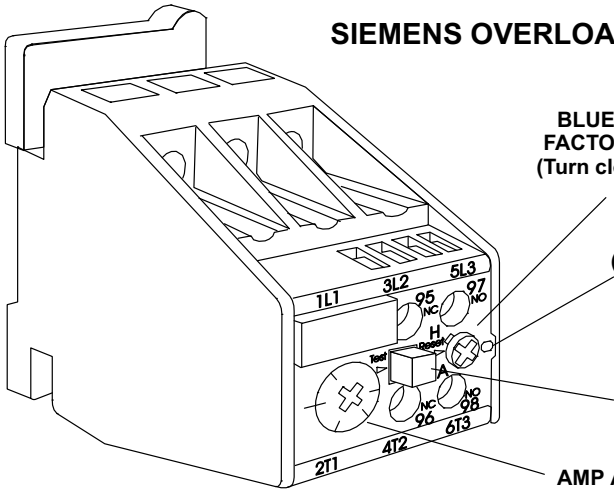
Lift clear cover and turn adjustment screw counterclockwise. Reset screw will pop out when pointer is in M (manual position). Close cover to lock reset screw into position.




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 8**

## 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 9**

## PLUMBING, COMPRESSOR AND REFRIGERANT CIRCUITS DETAIL
## Standard Efficiency / Fin Tube Coil

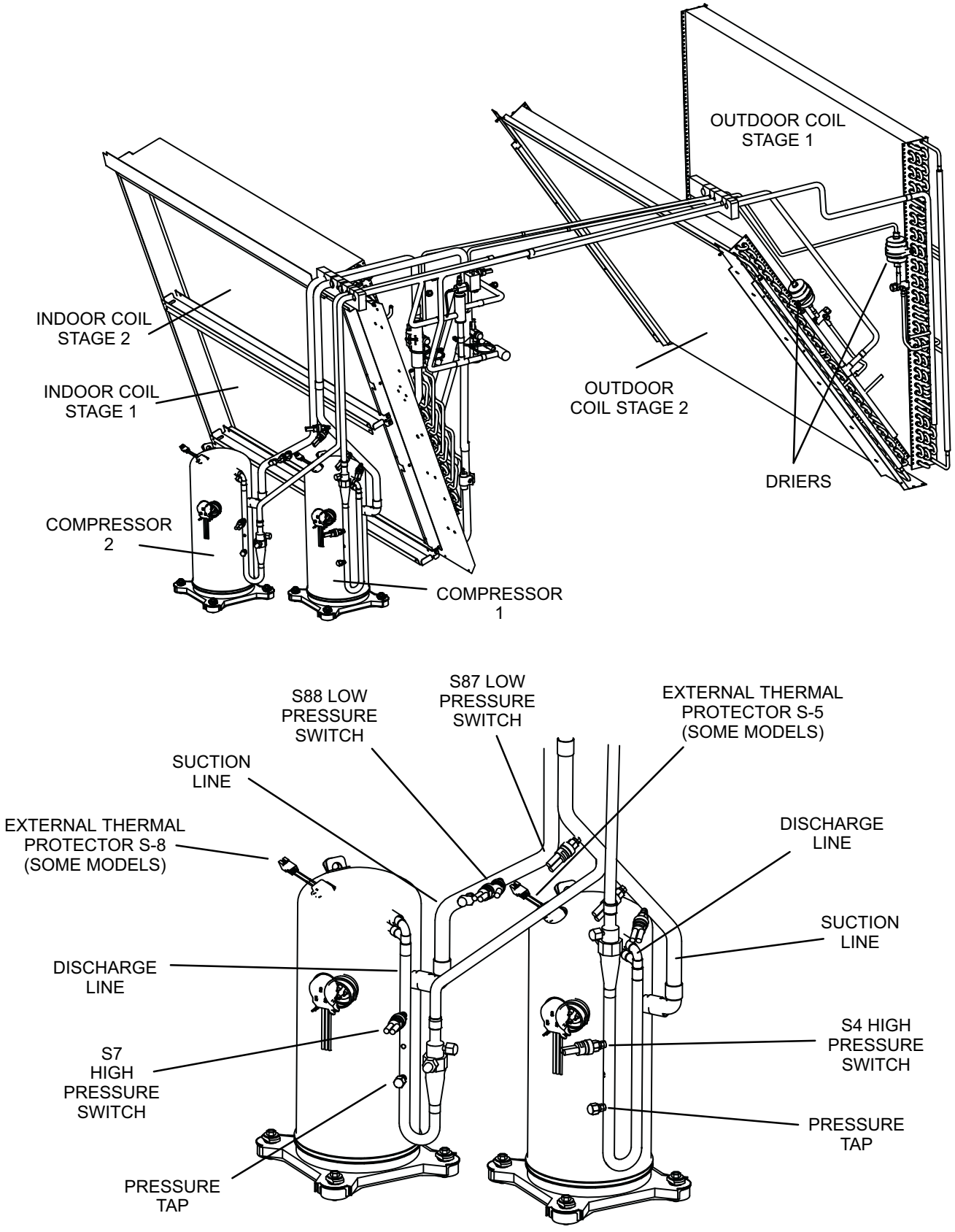
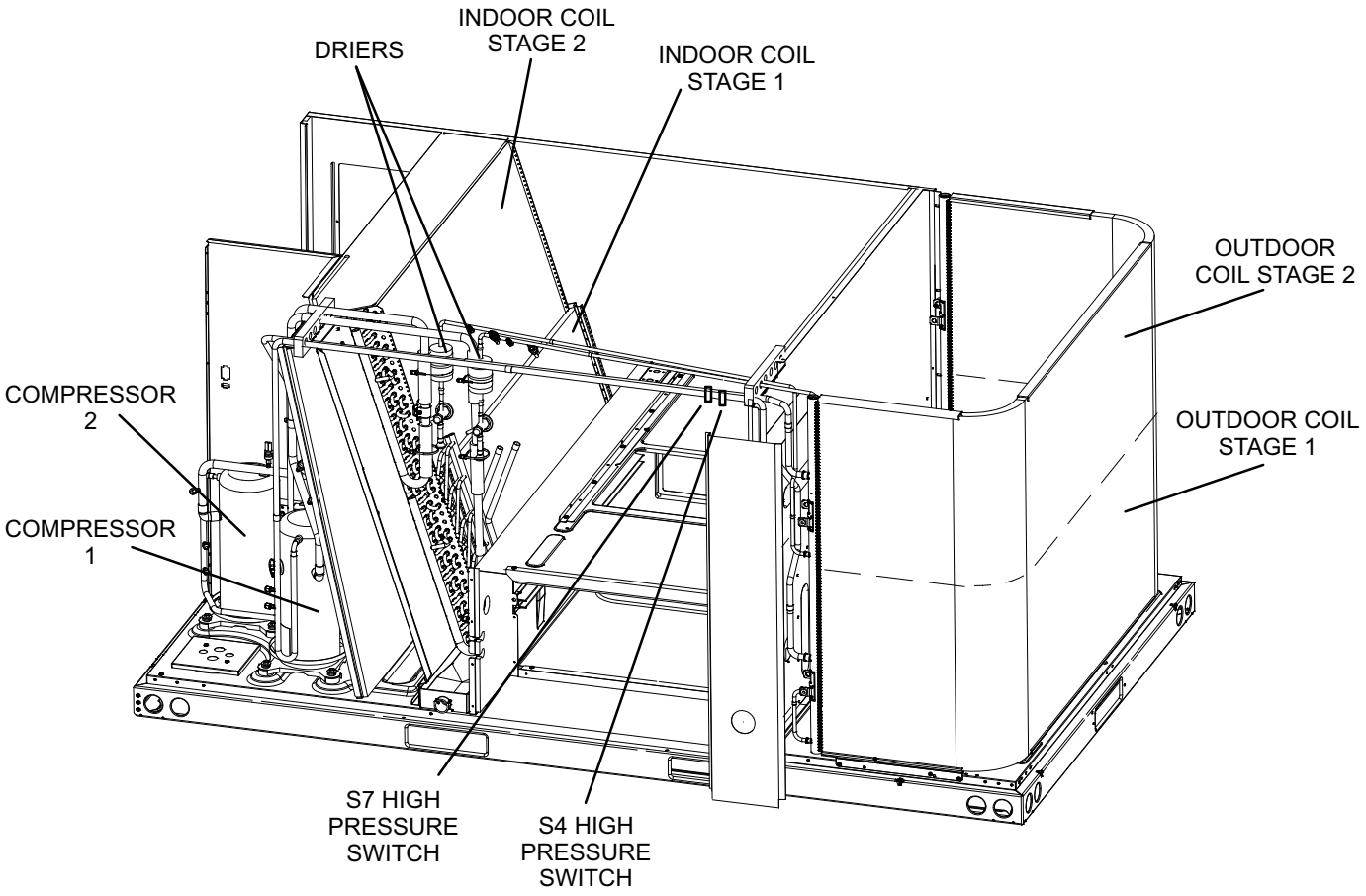



**FIGURE 10**

## PLUMBING, COMPRESSOR AND REFRIGERANT CIRCUITS DETAIL
## High Efficiency All-Aluminum Outdoor Coil



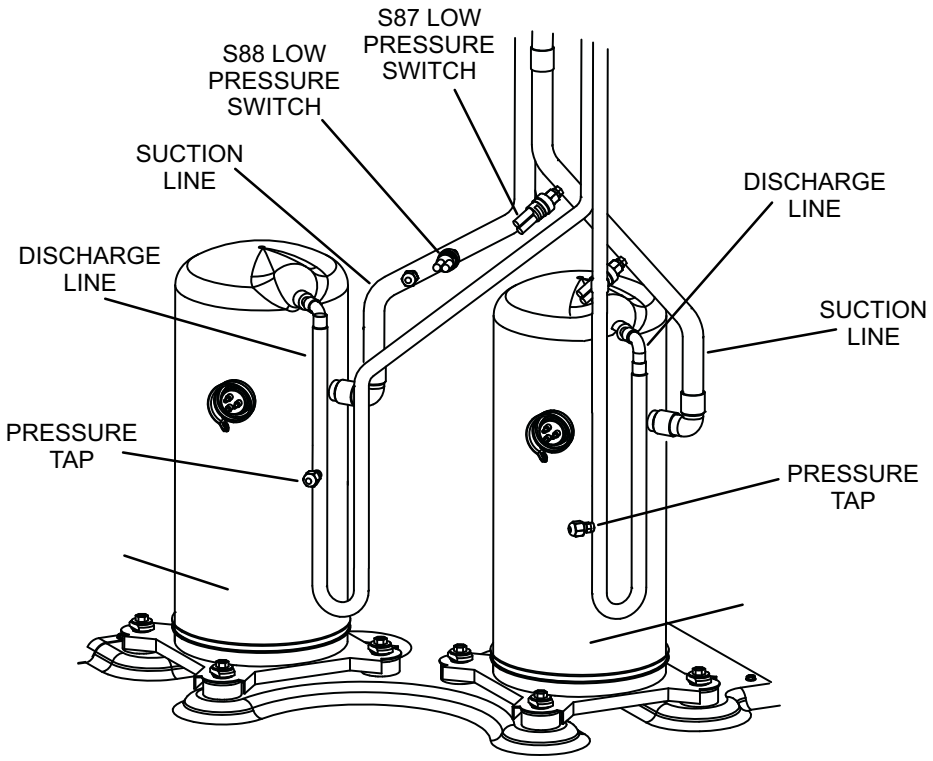




**FIGURE 11**

## PLUMBING, COMPRESSOR AND REFRIGERANT CIRCUITS DETAIL
## Ultra High Efficiency Units With Fin/Tube Coil

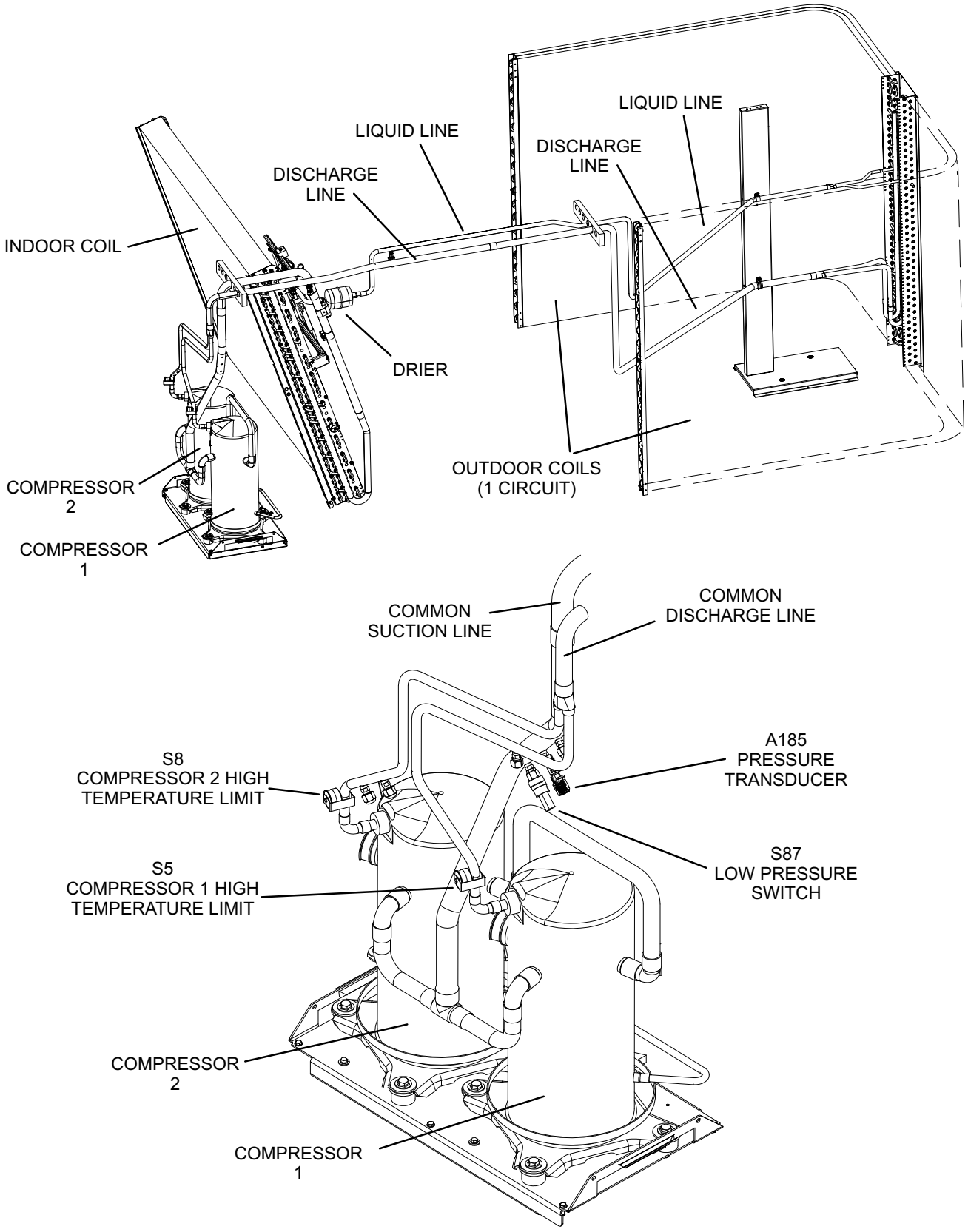



**FIGURE 12**

## B-Cooling Components

Standard and high efficiency units use independent cooling circuits consisting of separate compressors, condenser coils and evaporator coils. See figure 10 or 11. Ultra high efficiency units use a common cooling circuit consisting of two compressors in parallel, two condenser coils in parallel, and one evaporator coil. See figure 12. On standard and high efficiency units, two draw-through type condenser fans are used. On ultra high efficiency units, three draw-through type condenser fans are used. Standard and high efficiency units are equipped with belt-drive blowers which draw air across the evaporator during unit operation. Ultra high efficiency units are equipped with either a belt-drive blower or a drive drive blower which draws air across the evaporator during unit operation.

On standard and high efficiency units, the evaporators are slab type and are stacked. Each evaporator uses a thermostatic expansion valve as the primary expansion device. Ultra high efficiency units are equipped with a single slab style evaporator. The evaporator uses two thermostatic expansions valves. Evaporators are 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. Additional protection is provided by low ambient switches and freezestats. Ultra high efficiency units are also equipped with a suction line pressure transducer and compressor sump thermistors (temperature sensors) for added compressor reliability.

Cooling may be supplemented by a factory- or field-installed economizer.

### 1-Compressors B1, B2

Standard and high efficiency units are equipped with two scroll compressors and two independent cooling circuits. Ultra efficiency units are equipped with two scroll compressors and one common cooling circuit. 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 cover over terminals. Disconnect power before removing protective cover. Discharge capacitors before servicing unit. Failure to follow these precautions could cause electrical shock resulting in injury or death.**

Each compressor is energized by a corresponding compressor contactor.

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

If Interlink 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-Thermal Protectors

Some compressors have S-5 and S-8 thermal protectors located on top of the compressor. The protectors open at 248 ± 9°F and close at 169 ± 18°F.

### 3-Crankcase Heaters HR1, HR2

All LCH units use insertion type heaters. Heater HR1 is installed around compressor B1 and heater HR2 is installed around compressor B2. Crankcase heater wattage varies by compressor manufacturer.

### 4-High Pressure Switches S4, S7

The high pressure switch is an auto-reset SPST N.C. switch which opens on a pressure rise. All units are equipped with this switch. On fin/tube outdoor coils, the switch is located in the compressor discharge line. On all-aluminum outdoor coils, the switch is located on the liquid line in the blower section. Switches are wired in series with the compressor contactor coil.

On standard and high efficiency units, S4 (first circuit) and S7 (second circuit) are wired in series with the respective compressor contactor coils. On ultra high efficiency units, only S4 is used. S4 is located on the common compressor discharge line and is wired to both compressor contactors via the A55 Unit Controller.

*All-Aluminum Coil Units -*

When discharge pressure rises to 610 ± 15 psig (4206 ± 103 kPa) (indicating a problem in the system) the switch opens and the respective compressor is de-energized (the economizer can continue to operate). When discharge pressure drops to 475 ± 15 psig (3275 ± 103 kPa) the pressure switch will close.

*Fin/Tube Coil Units -*

On standard and high efficiency units, when discharge pressure rises to 640 ± 10 psig (4413 ± 69 kPa) (indicating a problem in the system) the switch opens and the respective compressor is de-energized (the economizer can continue to operate). When discharge pressure drops to 475 ± 20 psig (3275 ± 138 kPa) the pressure switch will close.

On ultra high efficiency units, BOTH compressors are de-energized or energized at the pressures listed in the previous paragraph.

The A55 Unit Controller 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.

## 5-Low Ambient Switches S11, S84

The low ambient switch is an auto-reset SPST N.O. pressure switch which allows mechanical cooling operation at low outdoor temperatures. On standard and high efficiency units, the switches are located in each liquid line prior to the indoor coil section. On ultra high efficiency units, S11 (only) is located on the common liquid line prior to the indoor coil section.

On standard and high efficiency units, S11 and S84 are wired to the A55 Unit Controller which cycles outdoor fans via K10 (outdoor fan 1) and K68 (outdoor fan 2). On ultra high efficiency units, S11 is wired to the A55 Unit Controller which cycles outdoor fan 1 (outdoor fans 2 and 3 are de-energized during low ambient operation).

When liquid pressure rises to 450 ± 10 psig (3102 ± 69 kPa), the switch closes and the condenser fan is energized. When discharge pressure in one refrigerant circuit drops to 240 ± 10 psig (1655 ± 69 kPa), the switch opens and the condenser fan in that refrigerant circuit is de-energized. This intermittent fan operation results in higher evaporating temperature allowing the system to operate without icing the evaporator coil and losing capacity.

## 6-Low Pressure Switches S87, S88

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.

On standard and high efficiency units, S87 (compressor one) and S88 (compressor two) are wired to A55 Unit Controller. On ultra high efficiency units, S87 (only) is located on the common suction line and is wired to A55 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 first thermostat demand, before the compressor is locked out. The control is reset by breaking and remaking the thermostat demand or manually resetting the control.

When suction pressure drops to 40 $\pm$ 5 psig (276 ± 34 kPa), (indicating low pressure), the switch opens and the compressor is de-energized. The switch automatically resets when pressure in the suction line rises to 90 $\pm$ 5 psig (620 ± 34 kPa) due to many causes such as refrigerant being added.

## 7-Service Valve (optional)

LCH units may be equipped with service valves located in the discharge and liquid lines. The service valves are manually operated valves used for service operation.

## 8-Filter Drier

LCH 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.

## 9-Freezestats S49 and S50

Standard and high efficiency units are equipped with a low temperature switch (freezestat) located on the return bend of each evaporator coil. S49 (first circuit) and S50 (second circuit) are located on the corresponding evaporator coils. Ultra high efficiency units are equipped with S49 only which is located on the return bend of the common evaporator coil.

Each freezestat is wired to the A55 Unit Controller. Each freezestat is a SPST N.C. auto-reset switch which opens at 29°F $\pm$ 3°F (-1.7°C $\pm$ 1.7°C) on a temperature drop and closes at 58°F $\pm$ 4°F (14.4°C $\pm$ 2.2°C) on a temperature rise. To prevent coil icing, freezestats open during compressor operation to temporarily disable the respective compressor until the coil warms sufficiently to melt any accumulated frost.

If the freezestats are tripping frequently due to coil icing, check the unit charge, airflow and filters before allowing unit back in operation. Make sure to eliminate conditions which might promote evaporator ice buildup.

## 10-Condenser Fans B4, B5

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.

**Ultra High Efficiency Units Only**

Ultra high efficiency units are equipped with electronically commutated condenser fan motors (ECM). The ECM motors are wired directly to 230VAC power but do not operate until a pulse width modulated (PWM) control signal is sent from the A55 Unit Controller. The PWM signal determines the condenser fan speed. All three fans will operate in low speed with a Y1 demand; all three fans will operate in high speed with a Y2 demand.

Both low and high voltage plugs are located at the top of the blower compartment in the indoor section of the unit. Condenser fan motors B4, B5 and B21 high voltage plugs are J86, J87 and J88 respectively. Low voltage plugs are J336, J337 and J338 respectively. Refer to wiring markings to identify plugs. Use figure 13 to identify fan motors.

If an ECM fan is not operating:

1 Check to make sure high voltage is present before checking low voltage.

2 Read the voltage at the appropriate high voltage fan motor plug (J86, J87, or J88) using the VAC meter setting.

3 If high voltage is present, check the low voltage plug (J336, J337, or J338) for a signal from the Unit Controller. Use either the duty cycle (%) or a VDC meter setting.

*Note - The VDC reading may fluctuate and is normal for a PWM signal.*

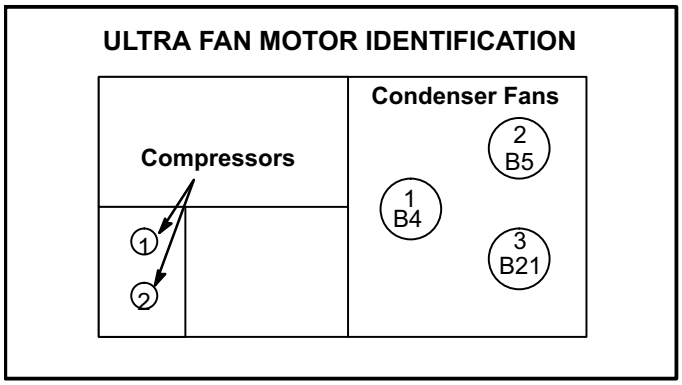



**FIGURE 13**

## 11-Temperature Sensors RT37 and RT38

Ultra high efficiency units are equipped with a temperature sensor (thermistor) located on the back of each compressor underneath the crankcase heater. The A55 Unit Controller uses input from RT37 (compressor 1), RT38 (compressor 2) and A185 pressure transducer to calculate sump superheat for each compressor. The Unit Controller uses this information to optimize system reliability.

Verify the sensor value using the menu path:

MAIN MENU > DATA > IN/OUTPUTS > SENSORS > LOCAL

Sensors should read within +/- 5 degrees of actual compressor sump temperature. Make sure the sensor is making sufficient contact with the compressor shell.

## 12-Pressure Transducer A185

Ultra high efficiency units are equipped with a pressure transducer located on the common suction line. The Unit Controller uses the input from the transducer, RT37 and RT38 to calculate sump superheat for each compressor. The Unit Controller uses this information to optimize system reliability.

Verify the sensor value using the menu path:

MAIN MENU > DATA > IN/OUTPUTS > SENSORS > LOCAL

A185 should read within +/- 10 psi of actual suction pressure.

## C-Blower Compartment

**STANDARD BLOWER ASSEMBLY**

**TO INCREASE BELT TENSION**

1- Loosen four bolts securing motor mounting base to frame.

2- Turn adjusting bolt to the right, or clockwise, to move the motor away from the blower housing.

*IMPORTANT - Gap between end of frame and motor mounting base should be equal at both ends, i.e. parallel along gap.*

3- Tighten four bolts securing motor mounting base to frame.

4- Relieve tension on two adjusting bolts.

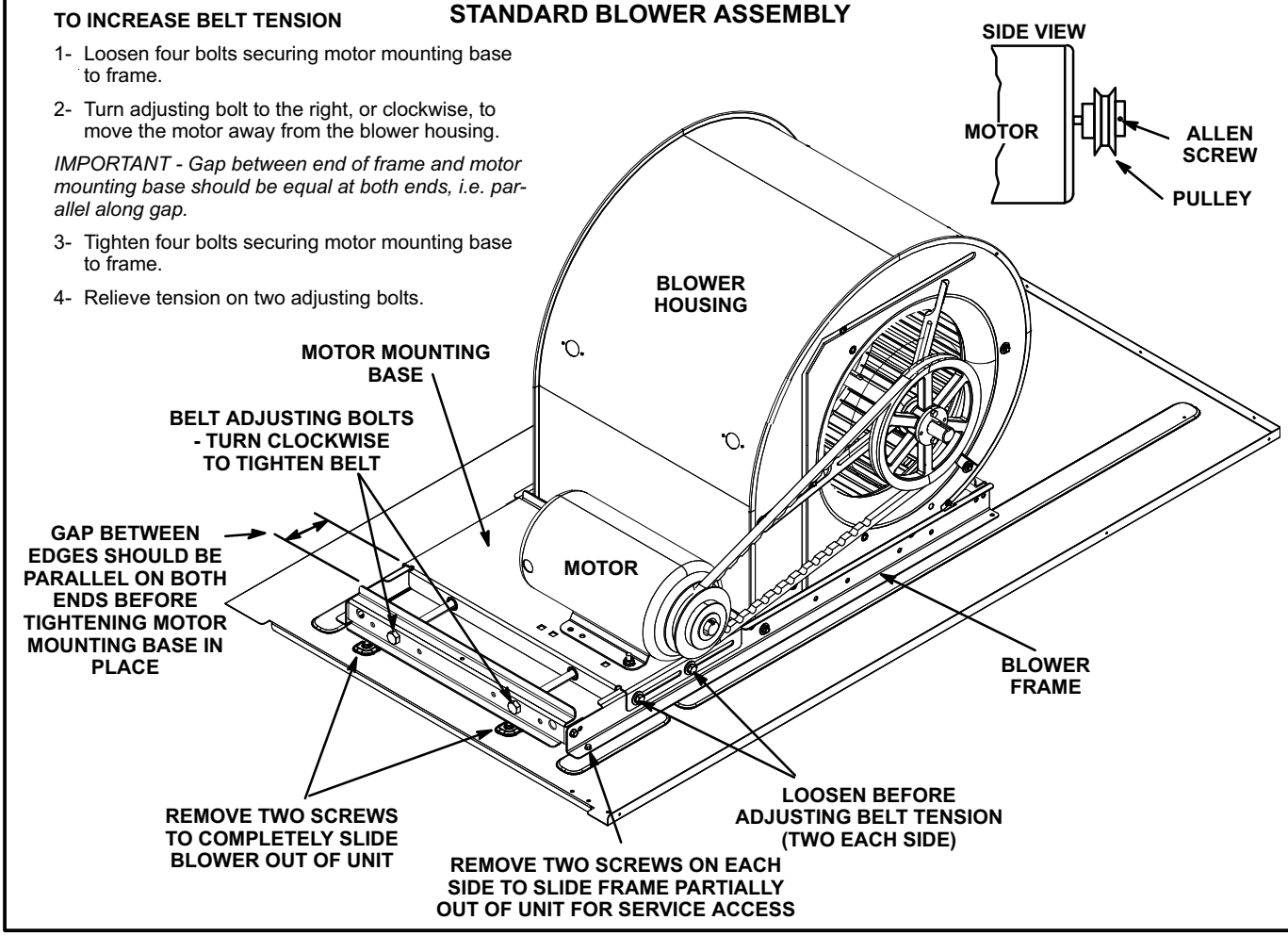



**FIGURE 14**

**TENSIONER BLOWER ASSEMBLY (VIEW SHOWN WITHOUT BELT)**

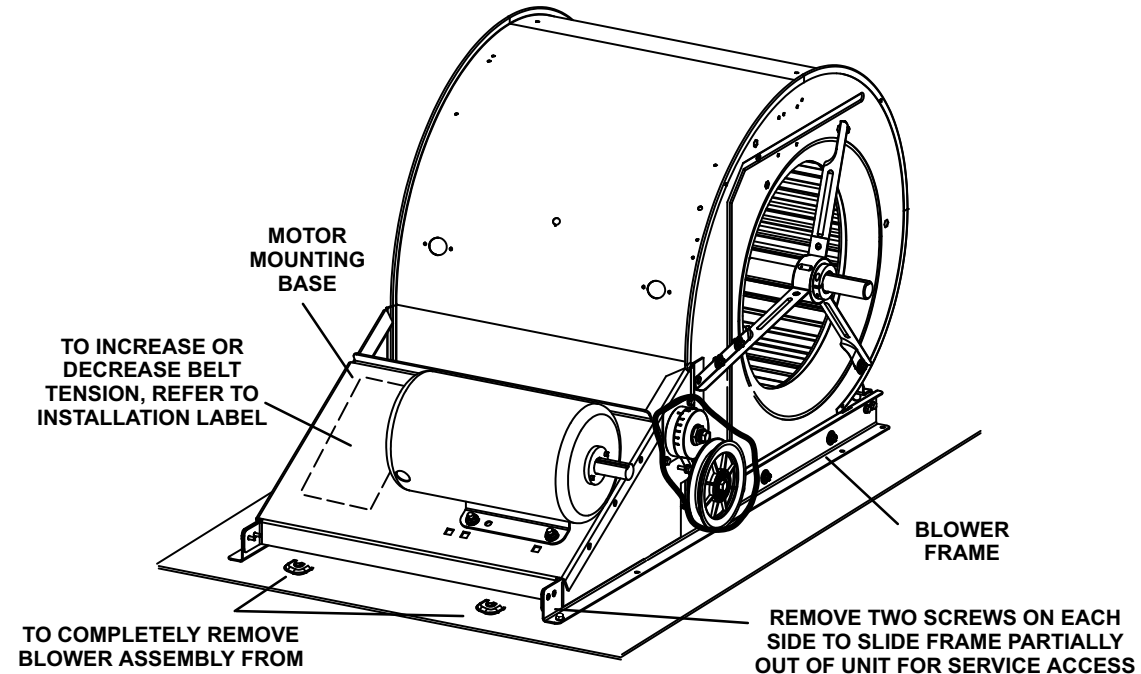



**FIGURE 15**

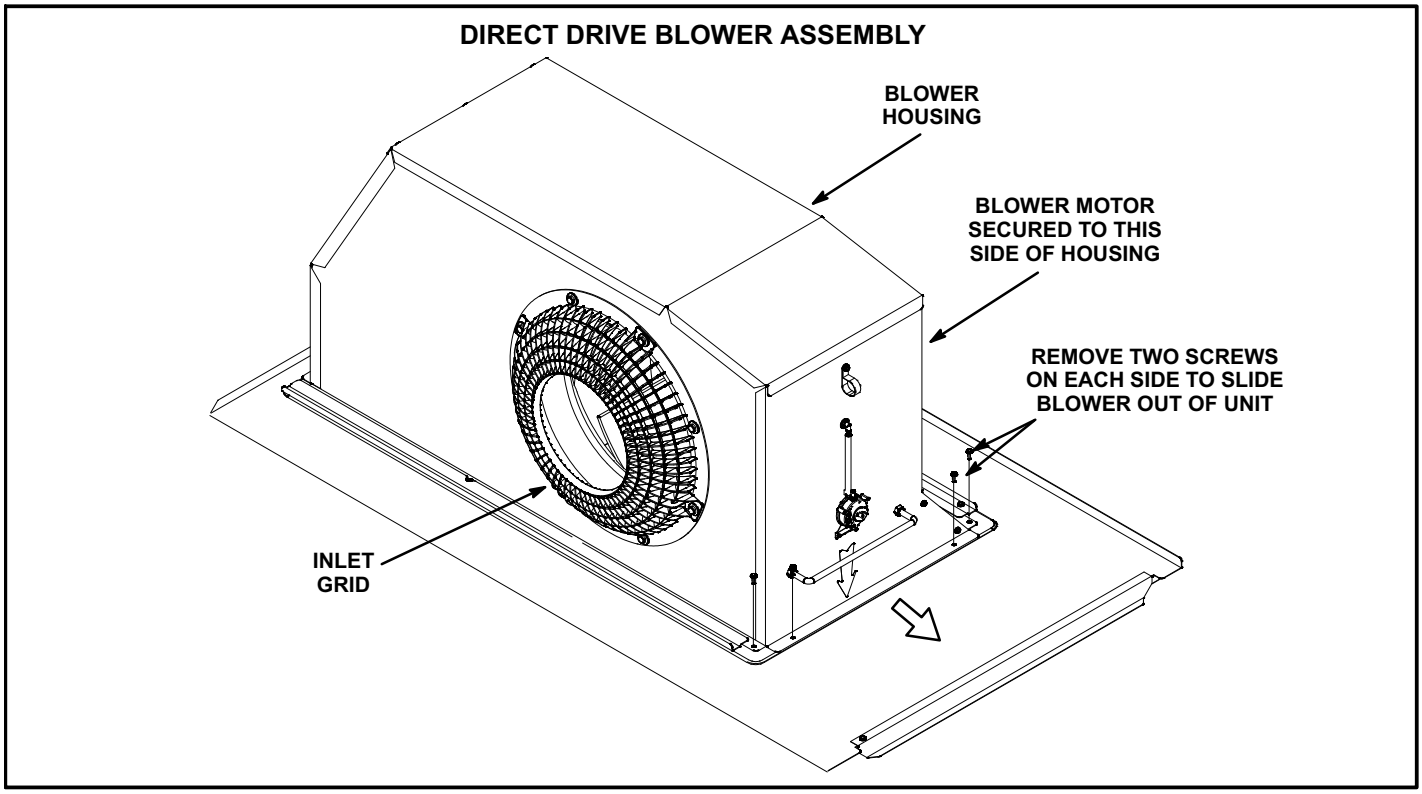



**FIGURE 16**

The blower compartment is located between the evaporator coil and the condenser coil section. The blower assembly is secured to a sliding frame which allows the blower motor assembly to be pulled out of the unit. See figure 14. 15, or 16.

*Belt Drive Blowers*

1 Loosen the reusable wire tie which secures the blower wiring to the blower motor mounting plate.

2 Remove and retain screws on either side of sliding frame. Pull frame toward outside of unit.

3 Slide frame back into original position when finished servicing. Reattach the blower wiring in the previous location on the blower motor base using the wire tie.

4 Replace retained screws on either side of the sliding frame.

*Direct Drive Blowers*

1 Loosen the reusable wire tie which secures the controls and high voltage blower wiring to the blower housing.

2 Remove and retain screws in front and on either side of blower housing. Pull frame toward outside of unit.

3 Slide frame back into original position when finished servicing. Reattach the blower wiring in the previous location on the blower housing using the wire tie.

4 Replace retained screws in front and on either side of the blower housing.

## 1-Blower Wheels

Belt drive blowers are equipped with one 15 in. x 15 in. (381 mm x 381 mm) blower wheel. Ultra high efficiency units may be equipped with an optional direct drive blower assembly with a backward inclined blower wheel.

## 2-Indoor Blower Motor B3

Belt driven blowers use three-phase single-speed blower motors. CFM adjustments are made by adjusting the motor pulley (sheave). Ultra high efficiency units may be equipped with an optional direct drive blower assembly with a three-phase, variable speed, direct drive blower motor.

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

**VFD / Direct Drive Units -** The blower rotation will always be correct on VFD units. Checking blower rotation is not a valid method of determining voltage phasing for incoming power. To check for proper voltage phasing, measure compressor suction and discharge pressures. Make sure suction pressure decreases and discharge pressure increases on start-up.

**VFD / Direct Drive Units and Units Equipped With Optional Factory-Installed Voltage or Phase Detection** - The Unit Controller checks the incoming power during start-up (A55 P299-1 and P269-2). If the voltage, phase, or frequency is incorrect, the Unit Controller will display an

alarm and the unit will not start. If line voltage is corrected, the Unit Controller will energize the unit after five (default) minutes. While line voltage is continually checked by the Unit Controller, the voltage phasing is not. If one or more phases is interrupted, power to one or more transformers is interrupted and the unit is shut down by either the Unit Controller or the corresponding transformer.

*Note - Optional phase/voltage detection is set at the factory and is enabled by the Unit Controller internal logic. If an after market device is installed, refer to the device manufacturer's literature.*

On units equipped with Unit Controller firmware version 7.06 and earlier:

Voltage, phase and frequency are checked on start-up

### *Blower Operation*

*NOTE-The following is a generalized procedure and does not apply to all thermostat control systems.*

1 Blower operation is dependent on the thermostat control system option that has been installed in the units. Refer to operation sequence of the control system installed for detailed descriptions of blower operation.

2 Generally, blower operation is set at the thermostat fan switch. With the fan switch in "ON" position and the **OCP** input is **"ON"**, the blower operates continuously. With the fan switch in "AUTO" position, the blower cycles with demand.

3 In most cases, the blower and entire unit will be off when the system switch is in the "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 VFD motors should rotate in the correct direction; verify scroll compressor rotation separately. Contact technical support if the VFD blower is rotating incorrectly.

### *Determining Unit Air Volume*

*IMPORTANT - VFD 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 Supply Air Inverter Start-Up section to set blower CFM for all modes once the motor pulley is set.*

*IMPORTANT - Direct drive variable blower unit CFM is determined by the Unit Controller. Refer to the Direct Drive Variable Speed Start-Up section.*

1 The following measurements must be made with a dry indoor coil. Run blower 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 17.

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

3 Refer to blower tables in BLOWER DATA (table of contents) in the front of this manual. Use static pressure and RPM readings to determine unit air volume. Apply accessory air resistance tables when installing units with any of the optional accessories listed.

4 *Standard Blowers -*
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 1.

*Tensioner Blowers -*
Refer to label on motor base. See figure 15.

**TABLE 1**
**MINIMUM AND MAXIMUM PULLEY ADJUSTMENT**

| Belt | Minimum Turns Open | Maximum Turns Open |
|---|---|---|
| A Section | 0 | 5 |
| B Section | 1* | 6 |

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

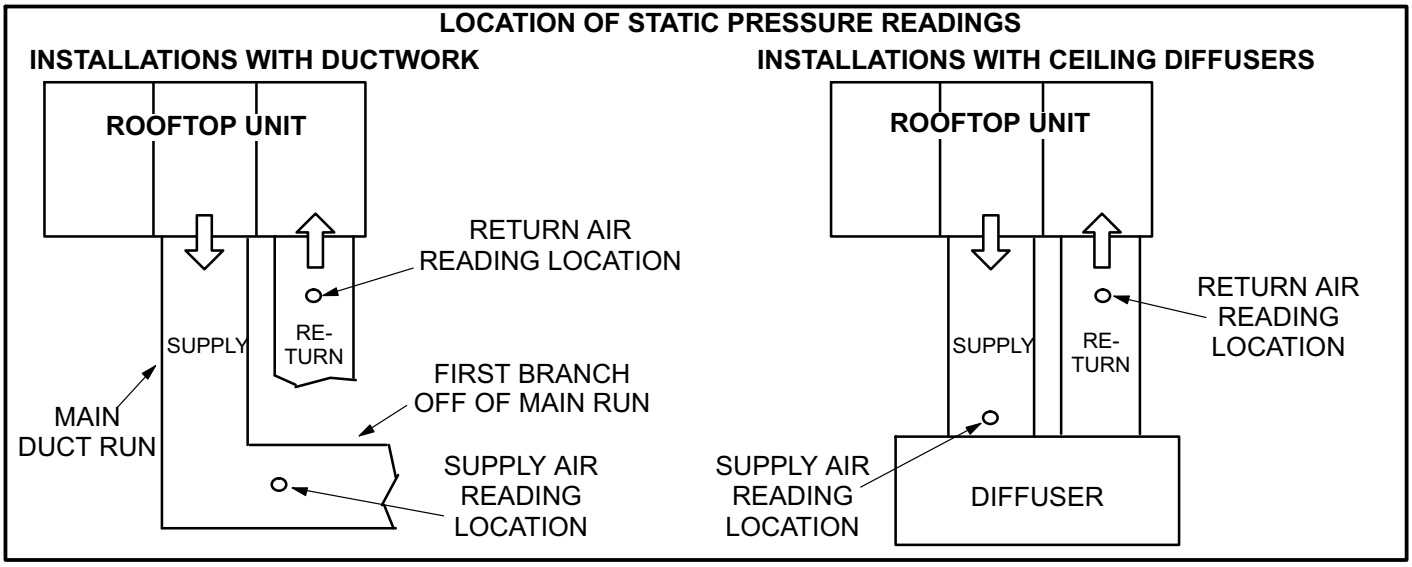



**FIGURE 17**

### *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 in the pulley grooves. Make sure blower and motor pulleys are aligned as shown in figure 18.

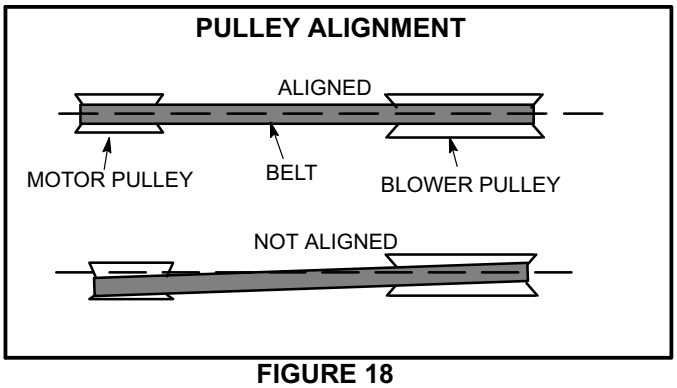



**FIGURE 18**

1 Loosen four bolts securing motor base to mounting frame. See figure 14 or 15.

2 *To increase belt tension -*
Turn both adjusting bolts to the right, or clockwise, to move the motor outward and tighten the belt. This increases the distance between the blower motor and the blower housing.

*To loosen belt tension -*
Turn the adjusting bolt to the left, or counterclockwise to loosen belt tension.

*IMPORTANT - Align edges of blower motor base and mounting frame base parallel before tightening four bolts on the side of base. Motor shaft and blower shaft must be parallel.*

3 Tighten bolts on side of base.

### *Check Belt Tension*

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

1 Measure span length X. See figure 19.

2 Apply perpendicular force to center of span (X) with enough pressure to deflect belt 1/64" for every inch of span length or 1.5mm per 100mm of span length.

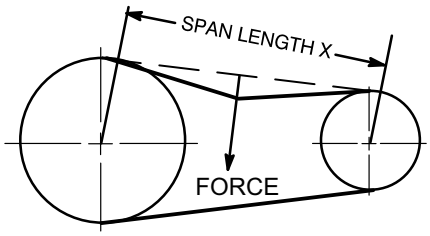
Example: Deflection distance of a 40" span would be 40/64" or 5/8".

Example: Deflection distance of a 400mm span would be 6mm.

3 Measure belt deflection force. For a new 2 and 3hp belt, the deflection force should be 5.0-7.0 lbs. (35-48kPa). For a new 5hp belt, the deflection force should be 7-10lbs. (48-69kPa).

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

**MEASURE BELT TENSION**




**DEFLECTION 1/64" PER INCH OF SPAN OR 1.5mm PER 100mm OF SPAN**

**FIGURE 19**

### F-Field-Furnished Blower Drives

For field-furnished blower drives, use the the blower tables in the BLOWER TABLES section of this manual to determine BHP, RPM and drive kit required. Reference table 2 for drive component manufacturer's numbers.

**TABLE 2**
**MANUFACTURER'S NUMBERS**

| Drive No. | DRIVE COMPONENTS | | | | | |
|---|---|---|---|---|---|---|
| | Motor Pulley | | Blower Pulley | | Belt | |
| | Supplier No. | OEM Part No. | Supplier No. | OEM Part No. | Supplier No. | OEM Part No. |
| A01 | 1VP34x7/8 | 31K6901 | AK54 x 1 | 100244-19 | A40 | 100245-17 |
| A02 | 1VP34x7/8 | 31K6901 | AK49 x 1 | 100244-18 | A39 | 100245-16 |
| A03 | 1VP34x7/8 | 31K6901 | AK44 x 1 | 100244-16 | A39 | 100245-16 |
| A05 | 1VP34x7/8 | 31K6901 | AK41 x 1 | 100244-15 | A39 | 100245-16 |
| A06 | 1VP44x7/8 | P-8-1488 | AK51 x 1 | 18L2201 | A41 | 100245-18 |
| A07 | 1VP50x7/8 | P-8-2187 | AK54 x 1 | 100244-19 | AX43 | 73K8201 |
| AA01 | 1VP34x7/8 | 31K6901 | AK69 x 1 | 37L4701 | AX51 | 13H0101 |
| AA02 | 1VP40x7/8 | 79J0301 | BK80H[1] | 100788-03 | A53 | P-8-4951 |
| AA03 | 1VP40x7/8 | 79J0301 | AK59 x 1 | 31K6801 | A50 | 100245-29 |
| AA04 | 1VP44x7/8 | P-8-1488 | AK59 x 1 | 31K6801 | AX51 | 13H0101 |
| A01T[2] | 1VP34x7/8 | 31K6901 | AK54 x 1 | 100244-19 | A41 | 100245-18 |
| A02T[2] | 1VP34x7/8 | 31K6901 | AK49 x 1 | 100244-18 | A40 | 100245-17 |
| A03T[2] | 1VP34x7/8 | 31K6901 | AK44 x 1 | 100244-16 | A40 | 100245-17 |
| A05T[2] | 1VP34x7/8 | 31K6901 | AK41 x 1 | 100244-15 | A41 | 100245-18 |
| A06T[2] | 1VP44x7/8 | P-8-1488 | AK51 x 1 | 18L2201 | A41 | 100245-18 |
| A07T[2] | 1VP50x7/8 | P-8-2187 | AK54 x 1 | 100244-19 | AX43 | 73K8201 |
| AA01T[2] | 1VP34x7/8 | 31K6901 | AK69 x 1 | 37L4701 | A50 | 100245-29 |
| AA02T[2] | 1VP40x7/8 | 79J0301 | BK80H* | 100788-03 | A52 | 100245-30 |
| AA03T[2] | 1VP40x7/8 | 79J0301 | AK59 x 1 | 31K6801 | A49 | 100245-32 |
| AA04T[2] | 1VP44x7/8 | P-8-1488 | AK59 x 1 | 31K6801 | A50 | 100245-29 |

NOTES: [1] Requires split taper bushing, Browning no. H1; OEM no. 100073-04 [2] Includes tension assembly, Fenner no. FS0590; OEM no. 101994-02

## D-Electric Heat Components

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

Electric heat is shown in figure 20. All electric heat sections consist of electric heating elements exposed directly to the air stream.

**1-Heating Elements HE1, HE2**

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.

**2-Contactors K15, K16**

Contactors K15 and K16 are three-pole double-break contactors located on the electric heat vestibule. All contactors are equipped with a 24VAC coil and are energized by the A55 Unit Controller. Contactors energize the first and only stage of heating elements. On M-volt units, contactors are CE approved by manufacturer (Siemens). See figure 6.

**3-Primary Limit Switch S15**

S15 is a SPST N.C. auto-reset switch located on the back panel of the electric heat section below the heating elements. The switch is wired in series with the first stage contactor coil. When S15 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 switch is factory-set to open at 200°F ± 5°F (93.3°C ± 2.8°C) on a temperature rise and automatically reset at 160°F ± 6°F (71.1°C ± 3.3°C) on a temperature fall. The switch is not adjustable.

**4-High Temperature Thermostat S19**

S19 is a SPST N.C. auto-reset thermostat located on the back panel of the electric heat section below the heating elements. The thermostat is wired in series with the first stage contactor coil. When either S15 or S19 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 thermostat is factory-set to open at 170°F ± 5°F (76.7°C ± 2.8°C) on a temperature rise and automatically reset at 130°F ± 6°F (54.4°C ± 3.3°C) on a temperature fall. The thermostat is not adjustable.

**5-High Temperature Limits S20, S158**

Limits are SPST N.C. manual-reset thermostats. Like the primary temperature limit, S20 is wired in series with the first-stage contactor coil (K15). When S20 opens, heating elements (HE1, HE2) are de-energized. S158 is wired in series with the second-stage contactor coil (K16). When S158 opens, heating elements (HE1, HE2) are de-energized. When the contactors are de-energized, first-stage and all subsequent stages of heat are de-energized. The thermostat is factory-set to open at 220°F ± 6°F (104°C ± 3.3°C) on a temperature rise and can be manually reset when temperature falls below 160°F (71.0°C).

**6-Terminal Strip TB2**

Terminal strip TB2 is used for single point power installations only. TB2 distributes L1, L2 and L3 power to TB3. Units with multi-point power connection do not use TB2.

**7-Terminal Strip TB3**

Electric heat line voltage connections are made to terminal strip TB3, located in the upper left corner of the electric heat vestibule. TB3 distributes power to the electric heat components.

**8-Fuse F3 and F42**

Fuses are housed in a fuse block which holds three fuses. Each fuse is connected in series with each leg of electric heat. Figure 20 and table 3 show the fuses used with each electric heat section. For simplicity, the service manual labels the fuses F3 - 1, 2 and F42 - 1, 2.

**9-Unit Fuse Block F4**

Three line voltage fuses provide short circuit and ground fault protection to all cooling components in units equipped with electric heat. The fuses are rated in accordance with the amperage of the cooling components. On M-volt CE units, fuses are equipped with fuse covers..

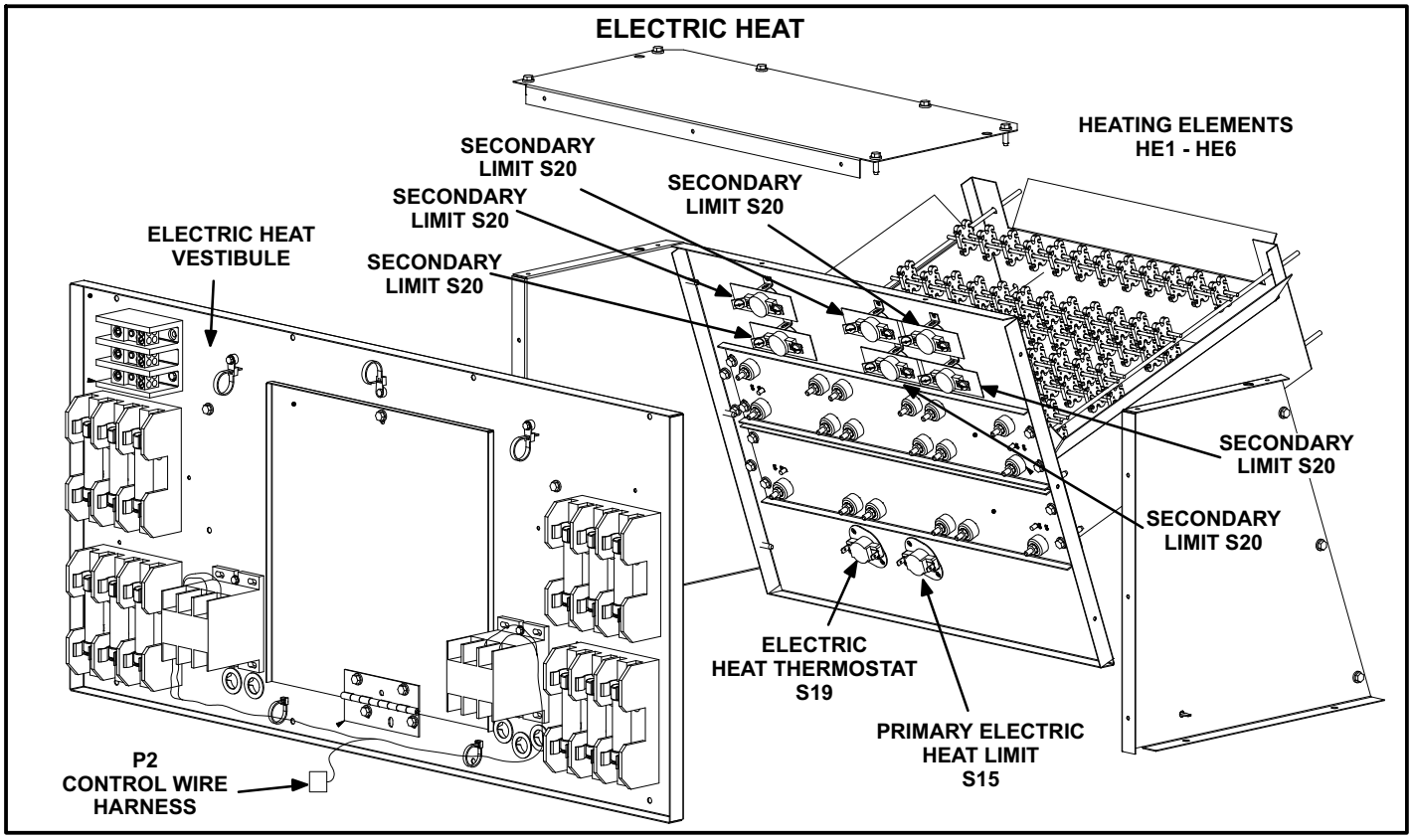



**FIGURE 20**

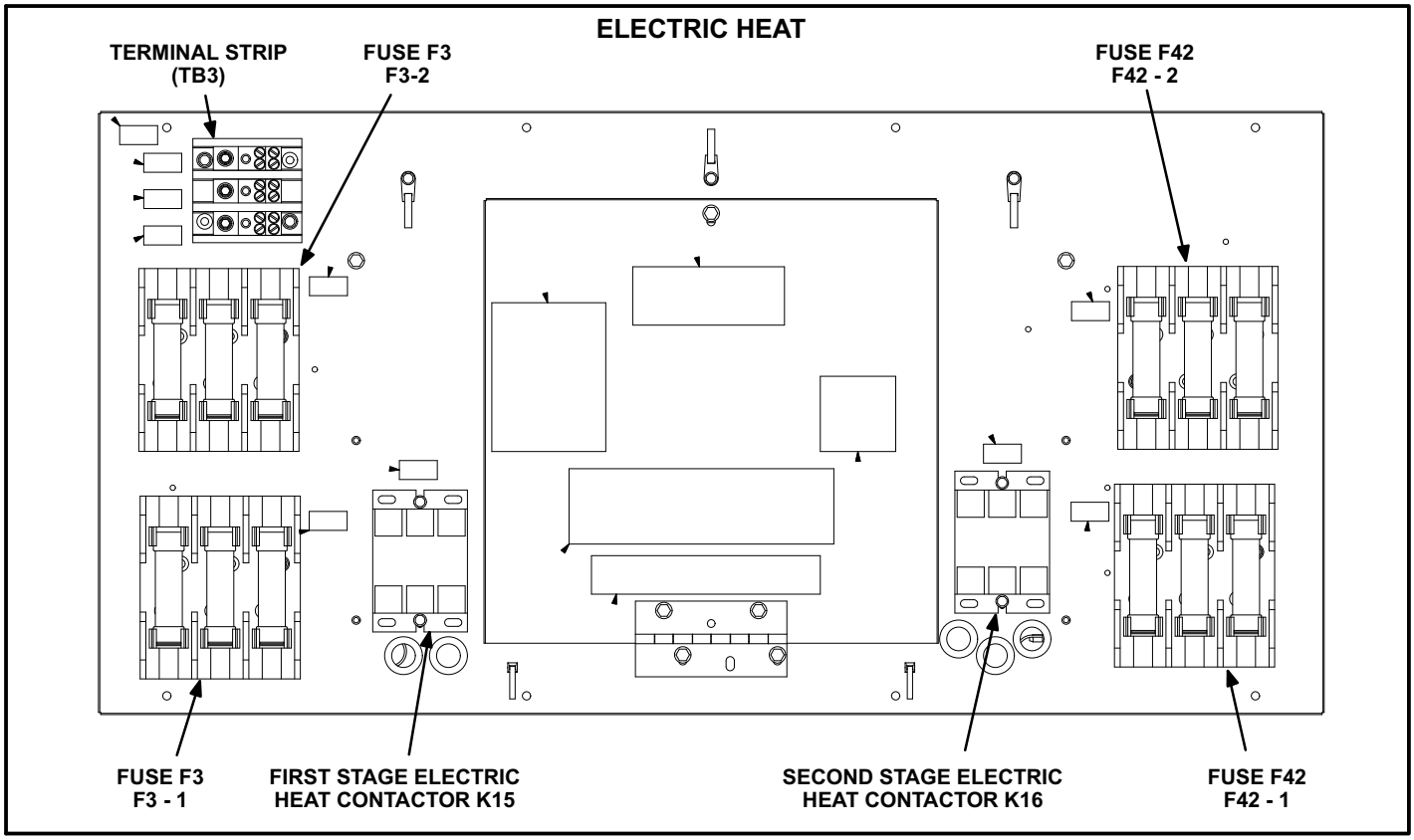



**FIGURE 21**

**TABLE 3**

| ELECTRIC HEAT SECTION FUSE RATING | | | | | |
|---|---|---|---|---|---|
| EHA QUANTITY & SIZE | VOLTAGES | FUSE (3 each) | | | |
| | | F3 - 1 | F3 - 2 | F42 - 1 | F42 - 2 |
| EHO075-1, 7.5 | 208/230 | - | 25 Amp 250V | - | - |
| | 460 | - | 15 Amp 600V | - | - |
| | 575 | - | 10 Amp 600V | - | - |
| EHO150-1, 15 | 208/230 | - | 50 Amp 250V | - | - |
| | 460 | - | 25 Amp 600V | - | - |
| | 575 | - | 20 Amp 600V | - | - |
| EHO225-1, 22.5 | 208/230 | 50 Amp 250V | - | 25 Amp 250V | - |
| | 460 | 25 Amp 600V | - | 15 Amp 600V | - |
| | 575 | 20 Amp 600V | - | 10 Amp 600V | - |
| EHO300-1, 30 | 208/230 | 50 Amp 250V | - | 50 Amp 250V | - |
| | 460 | 25 Amp 600V | - | 25 Amp 600V | - |
| | 575 | 20 Amp 600V | - | 20 Amp 600V | - |
| EHO450-1, 45 | 208/230 | 50 Amp 250V | - | 60 Amp 250V | 60 Amp 250V |
| | 460 | 25 Amp 600V | - | 50 Amp 600V | - |
| | 575 | 20 Amp 600V | - | 40 Amp 600V | - |
| EHO600-1, 60 | 208/230 | 60 Amp 250V | 60 Amp 250V | 60 Amp 250V | 60 Amp 250V |
| | 460 | 50 Amp 600V | - | 50 Amp 600V | - |
| | 575 | 40 Amp 600V | - | 40 Amp 600V | - |
| EHO057-1, 5.7 | 384 | - | 15 Amp 600V | - | - |
| EHO115-1, 15 | 384 | - | 25 Amp 600V | - | - |
| EHO172-1, 17.2 | 384 | 25 Amp 600V | - | 15 Amp 600V | - |
| EHO230-1, 23.0 | 384 | 25 Amp 600V | - | 25 Amp 600V | - |
| EHO345-1, 34.5 | 384 | 25 Amp 600V | - | 40 Amp 600V | - |
| EHO459-1, 45.9 | 384 | 40 Amp 600V | - | 40 Amp 600V | - |

## II-PLACEMENT AND INSTALLATION

Make sure the unit is installed in accordance with the installation instructions and all applicable codes. See accessories section for conditions requiring use of the optional roof mounting frame (C1CURB10).

## III-CHARGING

**⚠ WARNING**

**Refrigerant can be harmful if it is inhaled. Refrigerant must be used and recovered responsibly.**

**Failure to follow this warning may result in personal injury or death.**

**⚠ IMPORTANT**

**Units equipped with a Hot Gas Reheat system MUST be charged in standard cooling mode.**

### A-Refrigerant Charge and Check - All-Aluminum Coil 092H, 102H, 120H, 150S, 150H Units

**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 60°F (15°C). In temperatures below 60°F (15°C), the charge **must** be weighed into the system.*

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

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

1 Make sure outdoor coil is clean. Attach gauge manifolds and operate unit at full CFM in cooling mode with econo-

mizer disabled until system stabilizes (approximately five minutes). Make sure all outdoor air dampers are closed.

2 Check each system separately with all stages operating. Compare the normal operating pressures (see tables 4 - 7) to the pressures obtained from the gauges. Check unit components if there are significant differences.

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

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

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

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

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

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

7 Example LCH092 Circuit 1: At 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 96°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

**TABLE 4**

| LGH/LCH092H Normal Operating Pressures - All-Aluminum - TXV | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 110 | 234 | 112 | 273 | 115 | 317 | 116 | 367 | 119 | 428 | 121 | 503 |
| | 118 | 236 | 120 | 275 | 123 | 319 | 125 | 369 | 127 | 426 | 130 | 497 |
| | 136 | 240 | 139 | 278 | 142 | 320 | 145 | 369 | 147 | 422 | 150 | 483 |
| | 157 | 248 | 159 | 284 | 163 | 325 | 166 | 373 | 168 | 424 | 171 | 482 |
| Circuit 2 | 112 | 232 | 115 | 269 | 117 | 313 | 118 | 371 | 120 | 441 | 122 | 523 |
| | 119 | 237 | 122 | 273 | 125 | 316 | 128 | 367 | 129 | 431 | 132 | 508 |
| | 134 | 243 | 139 | 279 | 143 | 320 | 146 | 370 | 149 | 424 | 151 | 488 |
| | 155 | 253 | 156 | 287 | 161 | 328 | 165 | 376 | 169 | 427 | 172 | 487 |

**TABLE 5**

| LGH/LCH102H Normal Operating Pressures - All-Aluminum - TXV | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 234 | 113 | 273 | 115 | 316 | 117 | 365 | 119 | 419 | 121 | 480 |
| | 120 | 236 | 121 | 275 | 124 | 317 | 126 | 365 | 128 | 417 | 130 | 476 |
| | 139 | 241 | 142 | 279 | 144 | 321 | 147 | 367 | 148 | 420 | 151 | 476 |
| | 156 | 251 | 160 | 287 | 164 | 328 | 168 | 374 | 171 | 424 | 175 | 480 |
| Circuit 2 | 113 | 233 | 116 | 273 | 118 | 317 | 120 | 371 | 122 | 439 | 125 | 530 |
| | 122 | 233 | 124 | 273 | 126 | 317 | 128 | 369 | 131 | 428 | 134 | 502 |
| | 137 | 242 | 142 | 278 | 145 | 320 | 148 | 369 | 150 | 426 | 153 | 489 |
| | 155 | 251 | 159 | 288 | 164 | 328 | 168 | 375 | 171 | 429 | 174 | 488 |

**TABLE 6**

| LCH120H All-Aluminum Coil Normal Operating Pressures - TXV | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 251 | 113 | 290 | 112 | 331 | 116 | 383 | 117 | 439 | 120 | 520 |
| | 120 | 254 | 123 | 293 | 124 | 338 | 126 | 388 | 127 | 441 | 129 | 510 |
| | 139 | 264 | 142 | 303 | 144 | 345 | 147 | 393 | 146 | 445 | 148 | 510 |
| | 155 | 278 | 160 | 314 | 164 | 357 | 167 | 403 | 169 | 456 | 173 | 512 |
| Circuit 2 | 110 | 251 | 111 | 287 | 111 | 329 | 114 | 388 | 117 | 454 | 120 | 538 |
| | 119 | 249 | 120 | 291 | 122 | 336 | 124 | 389 | 126 | 447 | 128 | 520 |
| | 139 | 259 | 142 | 297 | 143 | 337 | 145 | 390 | 144 | 444 | 149 | 514 |
| | 155 | 274 | 160 | 307 | 164 | 349 | 166 | 393 | 169 | 448 | 170 | 510 |

**TABLE 7**

| LCH150S All-Aluminum Coil Normal Operating Pressures - TXV | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 259 | 113 | 301 | 115 | 345 | 114 | 396 | 117 | 456 | 120 | 526 |
| | 121 | 264 | 122 | 303 | 124 | 351 | 125 | 398 | 128 | 455 | 130 | 524 |
| | 140 | 274 | 142 | 313 | 145 | 357 | 146 | 405 | 148 | 460 | 151 | 525 |
| | 159 | 285 | 163 | 327 | 165 | 369 | 166 | 413 | 171 | 471 | 174 | 532 |
| Circuit 2 | 111 | 253 | 113 | 290 | 115 | 334 | 114 | 381 | 117 | 440 | 120 | 523 |
| | 122 | 255 | 122 | 294 | 124 | 336 | 125 | 385 | 127 | 440 | 130 | 520 |
| | 140 | 263 | 142 | 302 | 144 | 345 | 145 | 391 | 147 | 445 | 150 | 510 |
| | 159 | 274 | 163 | 314 | 165 | 355 | 165 | 397 | 170 | 455 | 172 | 513 |

**B-Refrigerant Charge and Check - Fin/Tube Coil - TXV LCH092H, 102H, 120H, 150S, 150H**

**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 60°F (15°C). In temperatures below 60°F (15°C) , the charge **must** be weighed into the system.*

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

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

1 Attach gauge manifolds and operate unit in cooling mode with economizer disabled until system stabilizes (approximately five minutes). Make sure outdoor air dampers are closed.

2 Check each system separately with all stages operating.

3 Use a thermometer to accurately measure the outdoor ambient temperature.

4 Apply the outdoor temperature to tables 8 through 17 to determine normal operating pressures. Pressures are listed for sea level applications at 80°F dry bulb and 67°F wet bulb return air.

5 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. **Correct any system problems before proceeding.**

6 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.

7 Use the following approach method along with the normal operating pressures to confirm readings.

**TABLE 8**
**LCH092H Fin/Tube Coil - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| 65°F | 235 | 137 | 262 | 137 |
| 75 °F | 272 | 139 | 298 | 141 |
| 85 °F | 312 | 142 | 338 | 144 |
| 95 °F | 357 | 146 | 380 | 146 |
| 105 °F | 407 | 149 | 428 | 149 |
| 115 °F | 460 | 154 | 477 | 153 |

**TABLE 9**
**LCH092H Fin/Tube Coil Hot Gas Reheat - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| 65 °F | 242 | 134 | 262 | 139 |
| 75 °F | 279 | 137 | 297 | 143 |
| 85 °F | 319 | 140 | 338 | 146 |
| 95 °F | 364 | 143 | 379 | 148 |
| 105 °F | 414 | 146 | 427 | 151 |
| 115 °F | 467 | 151 | 476 | 155 |

**TABLE 10**
**LCH102H Fin/Tube Coil - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| 65 °F | 241 | 139 | 273 | 141 |
| 75 °F | 277 | 141 | 307 | 144 |
| 85 °F | 318 | 143 | 348 | 147 |
| 95 °F | 362 | 145 | 389 | 149 |
| 105 °F | 411 | 148 | 437 | 151 |
| 115 °F | 464 | 150 | 486 | 152 |

**TABLE 11**
**LCH102H Fin/Tube Coil Hot Gas Reheat - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| 65 °F | 249 | 137 | 272 | 142 |
| 75 °F | 285 | 139 | 306 | 145 |
| 85 °F | 327 | 141 | 347 | 148 |
| 95 °F | 370 | 143 | 389 | 150 |
| 105 °F | 420 | 146 | 436 | 152 |
| 115 °F | 473 | 148 | 485 | 154 |

**TABLE 12**
**LCH120H Fin/Tube Coil - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| **65° F** | 259 | 137 | 283 | 139 |
| **75° F** | 297 | 140 | 321 | 142 |
| **85° F** | 338 | 143 | 360 | 144 |
| **95° F** | 382 | 146 | 406 | 146 |
| **105° F** | 431 | 149 | 453 | 148 |
| **115° F** | 486 | 151 | 505 | 151 |

**TABLE 13**
**LCH120H Fin/Tube Coil Hot Gas Reheat - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| **65° F** | 266 | 134 | 281 | 139 |
| **75° F** | 303 | 137 | 310 | 141 |
| **85° F** | 344 | 140 | 358 | 143 |
| **95° F** | 391 | 143 | 403 | 145 |
| **105° F** | 443 | 146 | 450 | 146 |
| **115° F** | 499 | 149 | 497 | 148 |

**TABLE 14**
**LCH150S Fin/Tube Coil - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| **65° F** | 275 | 140 | 298 | 139 |
| **75° F** | 312 | 142 | 335 | 141 |
| **85° F** | 354 | 143 | 374 | 142 |
| **95° F** | 398 | 146 | 419 | 146 |
| **105° F** | 449 | 149 | 465 | 148 |
| **115° F** | 500 | 151 | 514 | 150 |

**TABLE 15**
**LCH150S Fin/Tube Coil Hot Gas Reheat - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| **65° F** | 280 | 136 | 296 | 136 |
| **75° F** | 319 | 141 | 335 | 141 |
| **85° F** | 360 | 142 | 376 | 143 |
| **95° F** | 407 | 144 | 420 | 144 |
| **105° F** | 455 | 147 | 466 | 147 |
| **115° F** | 510 | 150 | 518 | 150 |

**TABLE 16**
**LGH/LCH150H Fin/Tube - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| 65°F | 276 | 131 | 275 | 125 |
| 75°F | 317 | 133 | 314 | 128 |
| 85°F | 357 | 136 | 363 | 131 |
| 95°F | 399 | 139 | 408 | 136 |
| 105°F | 450 | 142 | 457 | 140 |
| 115°F | 502 | 145 | 509 | 142 |

**TABLE 17**
**LGH/LCH150H Fin/Tube Hot Gas Reheat - TXV**

| Outdoor Coil Entering Air Temp | CIRCUIT 1 | | CIRCUIT 2 | |
|---|---|---|---|---|
| | Discharge ±10 psig | Suction ±5 psig | Discharge ±10 psig | Suction ±5 psig |
| 65° F | 296 | 135 | 286 | 135 |
| 75° F | 334 | 137 | 318 | 136 |
| 85° F | 378 | 139 | 364 | 138 |
| 95° F | 422 | 142 | 409 | 140 |
| 105° F | 470 | 144 | 458 | 142 |
| 115° F | 520 | 147 | 509 | 146 |

**C-Charge Verification - Approach Method - AHRI Testing (Fin/Tube Coil Continued)**

1 Using the same thermometer, compare liquid temperature to outdoor ambient temperature.

Approach Temperature = Liquid temperature (at condenser outlet) minus ambient temperature.

2 Approach temperature should match values in table 18. An approach temperature greater than value shown indicates an undercharge. An approach temperature less than value shown indicates an overcharge.

3 The approach method is not valid for grossly over or undercharged systems. Use tables 8 through 17 as a guide for typical operating pressures.

**TABLE 18**
**APPROACH TEMPERATURE - FIN/TUBE COIL - TXV**

| Unit | Liquid Temp. Minus Ambient Temp. | |
|---|---|---|
| | 1st Stage | 2nd Stage |
| **092** | 6°F ± 1 (3.3°C ± 0.5) | 7°F ± 1 (3.9°C ± 0.5) |
| **102** | 6°F ± 1 (3.3°C ± 0.5) | 9°F ± 1 (5.0°C ± 0.5) |
| **120 & 150** | 6°F ± 1 (3.3°C ± 0.5) | 10°F±1 (5.6°C ± 0.5) |
| **150H** | 4°F ± 1 (2.2°C ± 0.5) | 6°F±1 (3.3°C ± 0.5) |
| **092, 120 & 150 Hot Gas Reheat** | 6°F ± 1 (3.3°C ± 0.5) | 8°F ± 1 (4.4°C ± 0.5) |
| **102 Hot Gas Reheat** | 6°F ± 1 (3.3°C ± 0.5) | 9°F ± 1 (5.0°C ± 0.5) |

**D-Refrigerant Charge and Check - Fin/Tube Coil & RFC**

**LCH150S**

**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 60°F (15°C). In temperatures below 60°F (15°C), the charge **must** be weighed into the system.*

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

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

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

2 Check each system separately with all stages operating. Compare the normal operating pressures (see table 19) to the pressures obtained from the gauges. Check unit components if there are significant differences.

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

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

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

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

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

6 Continue the process until measured liquid temperature agrees with the target liquid temperature. Do not

go below the target liquid temperature when adjusting charge. Note that suction pressure can change as charge is adjusted.

7 Example LCH150 Circuit 1: At 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 96°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

**TABLE 19**

| LCH150S Normal Operating Pressures - Fin/Tube - RFC | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 108 | 253 | 112 | 295 | 114 | 338 | 117 | 384 | 119 | 438 | 122 | 501 |
| | 114 | 255 | 119 | 296 | 122 | 342 | 125 | 390 | 127 | 444 | 129 | 501 |
| | 119 | 257 | 129 | 303 | 136 | 348 | 141 | 403 | 145 | 460 | 149 | 522 |
| | 125 | 264 | 136 | 308 | 146 | 358 | 155 | 413 | 161 | 470 | 167 | 530 |
| Circuit 2 | 108 | 273 | 111 | 314 | 114 | 356 | 117 | 400 | 119 | 451 | 121 | 508 |
| | 115 | 277 | 119 | 318 | 122 | 362 | 125 | 409 | 128 | 460 | 129 | 512 |
| | 124 | 284 | 131 | 327 | 137 | 372 | 141 | 422 | 145 | 474 | 147 | 532 |
| | 131 | 289 | 140 | 334 | 148 | 382 | 155 | 434 | 160 | 486 | 163 | 541 |

**E-Refrigerant Charge and Check - Fin/Tube Coil & TXV**

**LCH094U, 122U, 152U**

**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. This unit is equipped with solenoid valves which do not allow refrigerant flow between the high side and the low side when the unit is de-energized. When reclaiming/ evacuating the system, make sure refrigerant/vacuum is pulled from both the suction and discharge lines. When adding nameplate charge, add 1/3 to the suction line and 2/3 to the discharge line.*

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

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

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

1 Attach gauge manifolds and operate unit in cooling mode with economizer disabled until system stabilizes (approximately five minutes). Make sure outdoor air dampers are closed.

2 Make sure both compressors are operating.

3 Use a thermometer to accurately measure the outdoor ambient temperature.

4 Apply the outdoor temperature to tables 20 through 22 to determine normal operating pressures. Pressures are listed for sea level applications at 80°F dry bulb and 67°F wet bulb return air.

5 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. **Correct any system problems before proceeding.**

6 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.

7 Use the following approach method along with the normal operating pressures to confirm readings.

**TABLE 20**
**LCH094U**

| Outdoor Coil Entering Air Temp | Discharge ±10 psig | Suction ±5 psig |
|---|---|---|
| **65° F** | 238 | 136 |
| **75° F** | 273 | 141 |
| **85° F** | 313 | 143 |
| **95° F** | 361 | 146 |
| **105° F** | 396 | 149 |
| **115° F** | 448 | 152 |

**TABLE 21**
**LCH122U**

| Outdoor Coil Entering Air Temp | Discharge ±10 psig | Suction ±5 psig |
|---|---|---|
| **65° F** | 250 | 134 |
| **75° F** | 288 | 138 |
| **85° F** | 331 | 141 |
| **95° F** | 378 | 143 |
| **105° F** | 412 | 144 |
| **115° F** | 463 | 147 |

**TABLE 22**
**LCH152U**

| Outdoor Coil Entering Air Temp | Discharge ±10 psig | Suction ±5 psig |
|---|---|---|
| **65° F** | 266 | 129 |
| **75° F** | 305 | 132 |
| **85° F** | 346 | 134 |
| **95° F** | 391 | 138 |
| **105° F** | 443 | 141 |
| **115° F** | 498 | 143 |

**F-Charge Verification - Approach Method - AHRI Testing (Fin/Tube Coil Continued)**

1 Using the same thermometer, compare liquid temperature to outdoor ambient temperature.

Approach Temperature = Liquid temperature (at condenser outlet) minus ambient temperature.

2 Approach temperature should match values in table 23. An approach temperature greater than value shown indicates an undercharge. An approach temperature less than value shown indicates an overcharge.

3 The approach method is not valid for grossly over or undercharged systems. Use tables20 through22 as a guide for typical operating pressures.

**TABLE 23**
**APPROACH TEMPERATURE - 094, 122, 152**

| Unit | Liquid Temp. Minus Ambient Temp. |
|---|---|
| | Full Load (Both Compressors) |
| **094** | 5°F ± 1 (2.8°C ± 0.5) |
| **122, 152** | 4°F ± 1 (2.2°C ± 0.5) |

## IV-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-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 Startup See figures 22, 23 or 24 for 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.*

*LCH092H, 102H, 120H and 150S, 150H (Figure 22 or 23)*

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

2 First-stage thermostat demand will energize compressor 1 and condenser fans 1 and 2. Second-stage thermostat demand will energize compressor 2.

3 Units contain two refrigerant circuits or stages.

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

*LCH094U, 122U and 152U (Figure 24)*

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

2 First-stage thermostat demand will energize compressor 1 and condenser fans 1, 2 and 3 on low speed.. Second-stage thermostat demand will energize compressor 2 and condenser fans 1, 2 and 3 on high speed.

3 Units contain one common (tandem) refrigerant circuit.

4 Refrigerant circuit is charged with refrigerant. See unit rating plate for correct amount of charge.

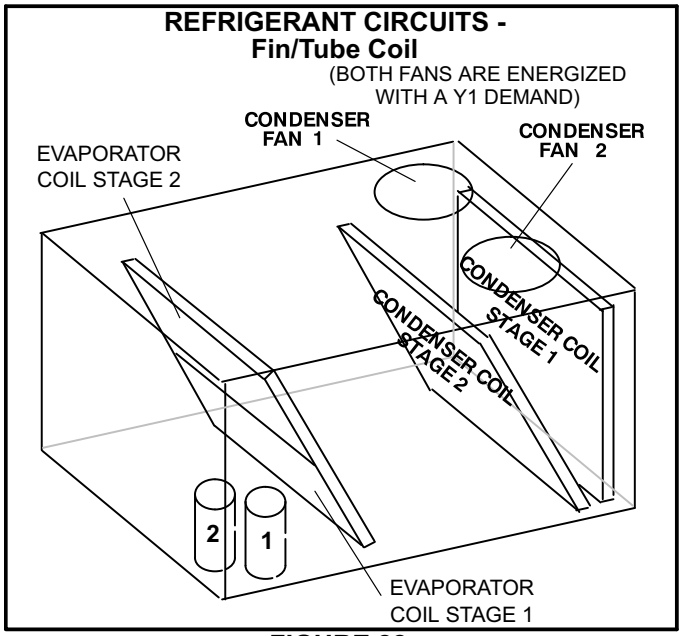



**FIGURE 22**

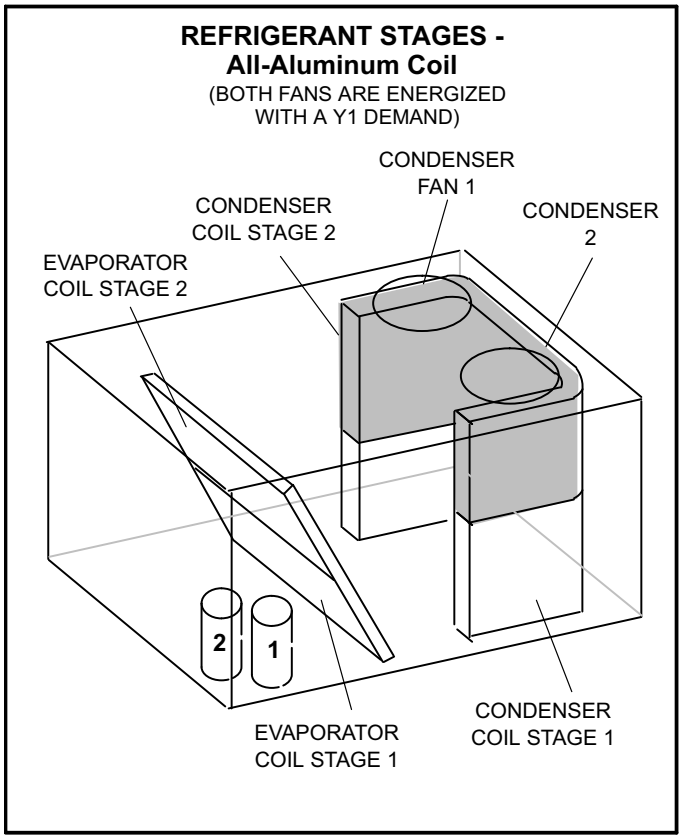



**FIGURE 23**

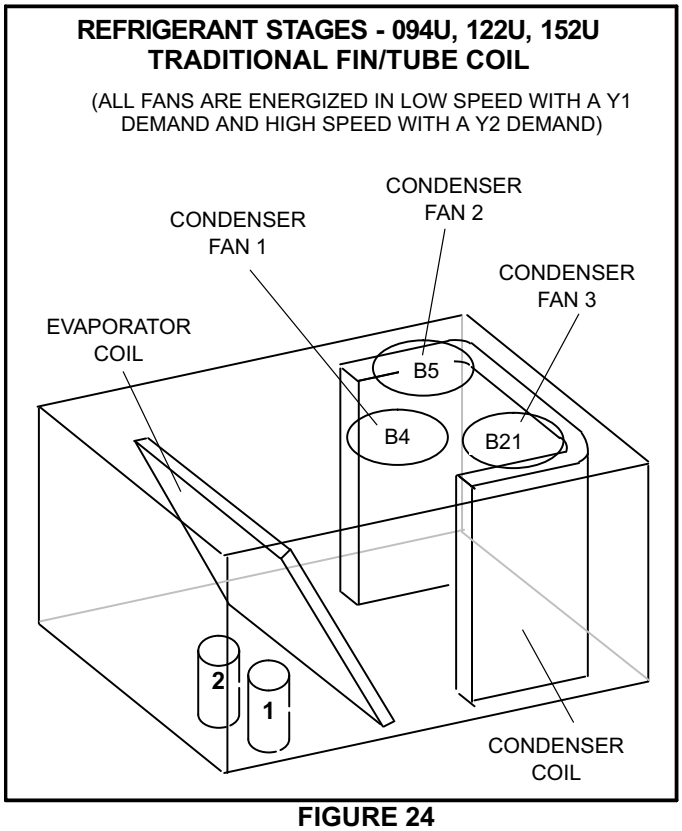



**FIGURE 24**

## V- SYSTEMS SERVICE CHECKS

### A-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____

## VI-ACCESSORIES

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

### A-Mounting Frames

When installing units on a combustible surface for downflow discharge applications, the C1CURB roof mounting frame is used. The roof mounting frames are recommended in all other applications but not required. If the LCH units are not mounted on a flat (roof) surface, they MUST be supported under all edges and under the middle of the unit to prevent sagging. The units MUST be mounted level within 1/16" per linear foot or 5mm per meter in any direction.

The assembled C1CURB mounting frame is shown in figure 25. 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 26. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

### B-Transitions

Optional supply/return transitions C1DIFF30B is available for use with the LCH 7.5 ton units and C1DIFF31B is available for the 8.5 and 10 ton units, utilizing optional C1CURB roof mounting frames. LCH 12.5 ton units will use C1DIFF32B with C1CURB roof mounting frame. Transition must be installed in the C1CURB mounting frame before mounting the unit to the frame. Refer to the manufacturer's instructions included with the transition for detailed installation procedures.

### C-C1DAMP Outdoor Air Dampers (all units)

C1DAMP consists of a set of dampers which may be manually C1DAMP10B-2 or motor C1DAMP20B-1 operated to allow up to 25 percent outside air into the system at all times (see figure 27 or 28). Either air damper can be installed in LCH 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.

### D-Supply and Return Diffusers (all units)

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

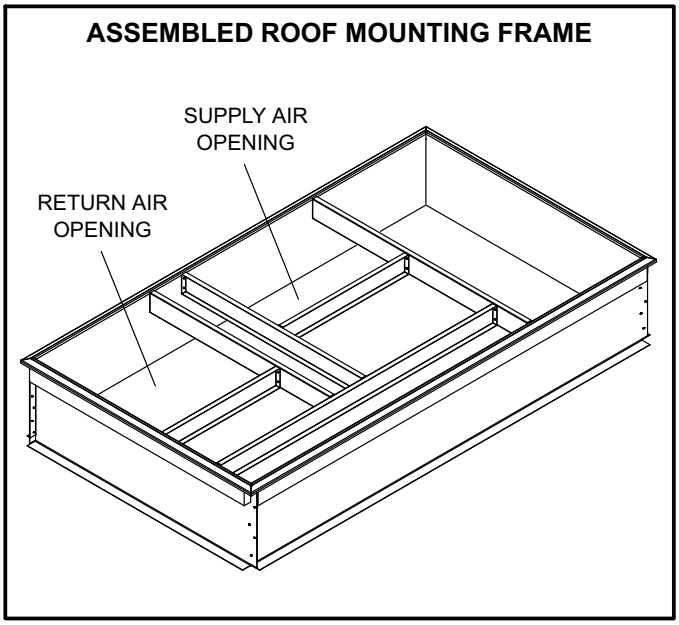



FIGURE 25

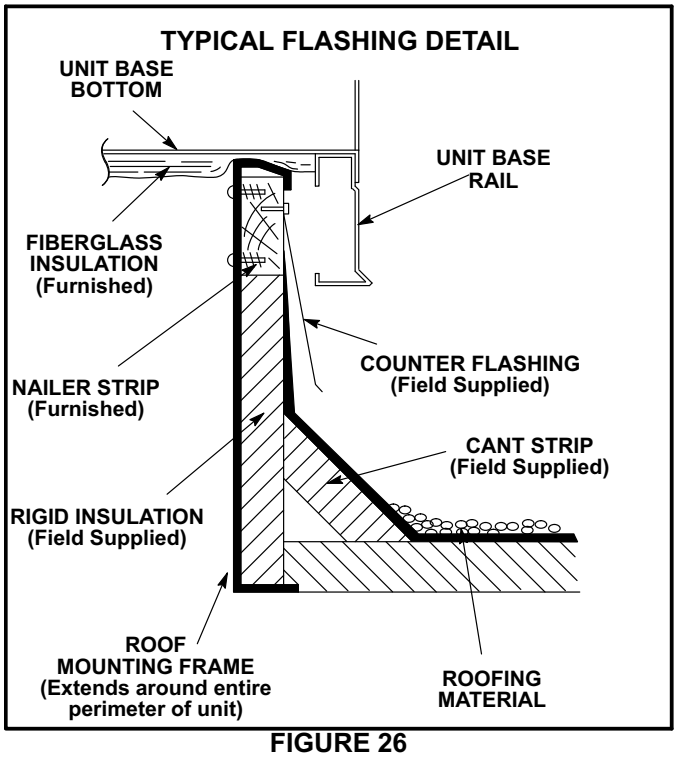



FIGURE 26

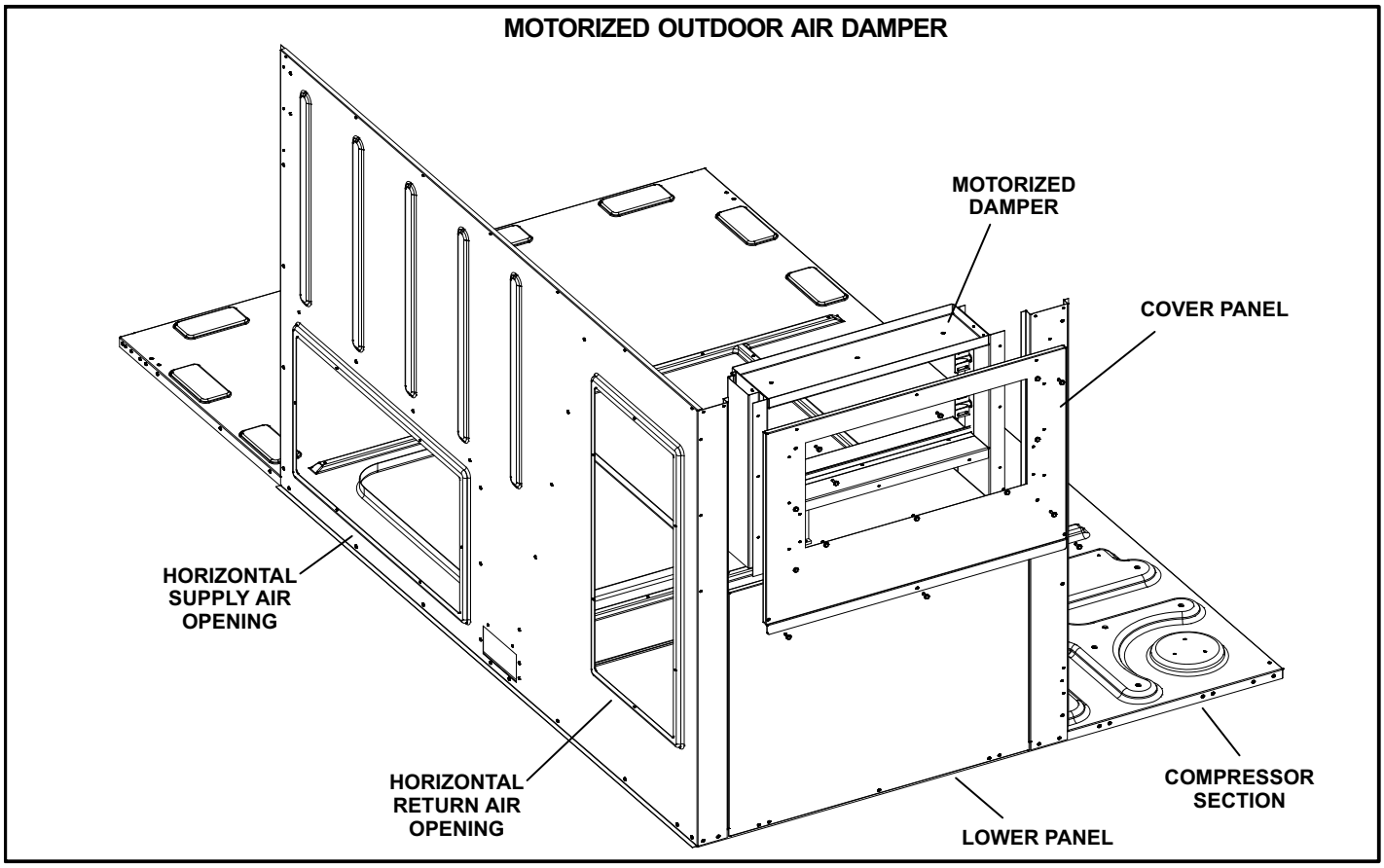



FIGURE 27

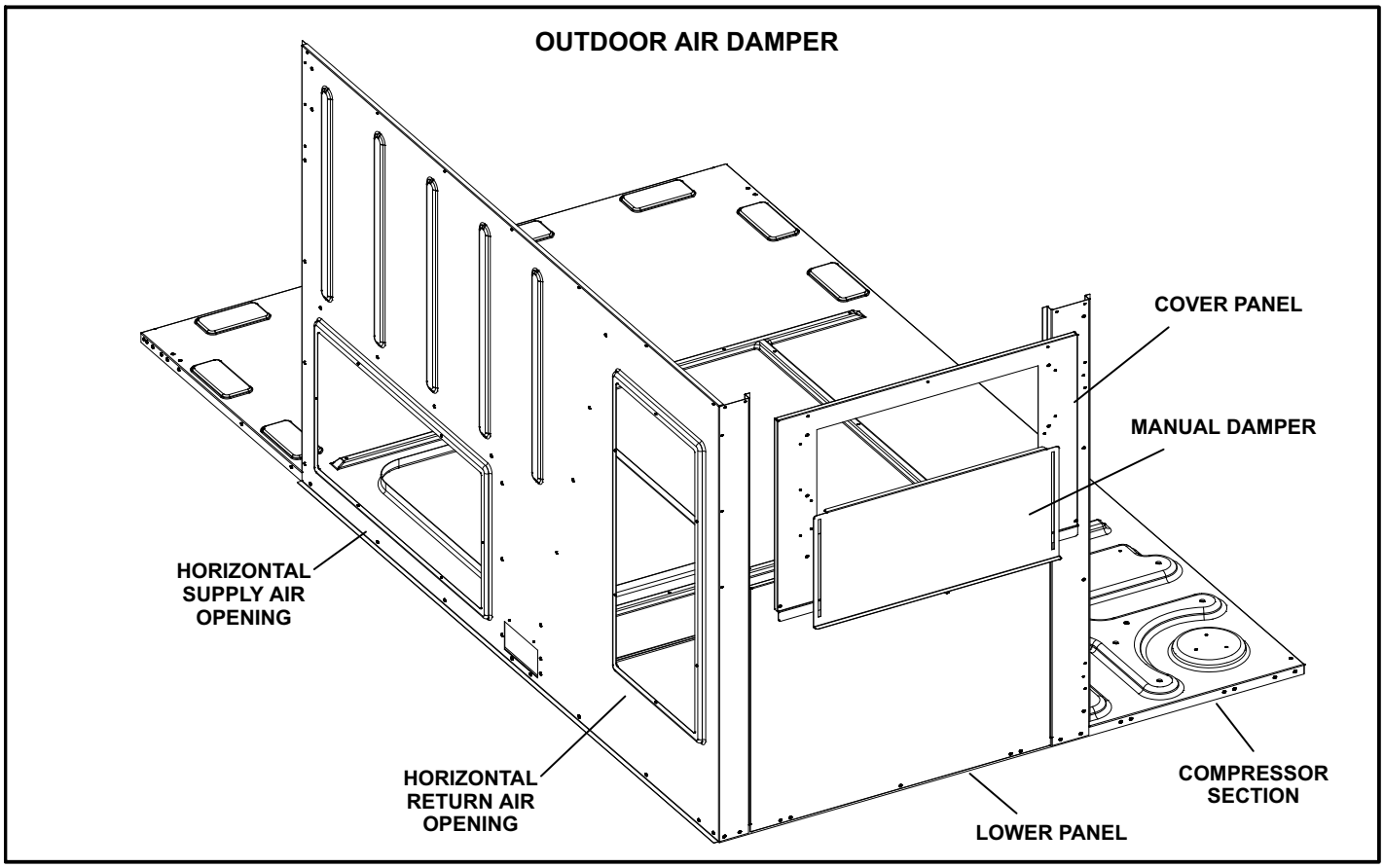



**FIGURE 28**

## E-Economizer E1ECON15 (standard) or E1ECON17 (high performance)

*The following is a brief description of standard economizer E1ECON15. For more detail on this or high performance economizer E1ECON17 see economizer installation instruction*.

The optional E1ECON15 economizer can be used with downflow and horizontal air discharge applications. See figure 29. The economizer uses outdoor air for free cooling when outdoor temperature and/or humidity is suitable. The economizer is controlled by the A55 Unit Controller.

### Free Cooling Mode

The Unit Controller will allow free cooling in one of five modes. Each mode uses different combinations of sensors to determine outdoor air suitability. See table 24 for modes. Temperature offset is the default free cooling mode.

*NOTE - All free cooling modes of operation will modulate dampers to 55° F (13° C) supply / discharge air.*

### Unit Controller Settings

On early versions, switches are located on the Unit Controller to adjust settings. On newer versions, the display and keypad on the Unit Controller are used to navigate through menus to adjust settings. Some versions require a configuration ID be entered to enable the economizer. Refer to economizer installation instructions and Unit Controller installation and application manuals.

**TABLE 24**
**ECONOMIZER MODES AND SETPOINT**

| Free Cooling Mode | Free Cooling Setpoint | Field-Provided Sensors | Dampers will modulate to 55°F (default, parameter 159) discharge air (RT6) when outdoor air is suitable: | Input Ranges |
|---|---|---|---|---|
| TEMP | OFFSET | None Needed | Outdoor air temperature (RT17) is less than return air temperature (RT16) by at least the OFFSET value (10°F default; parameter 161). | 0-40°F |
| TEMP | OAT STPT | None Needed | Outdoor air temperature (RT17) is less than the OAT STPT value (75°F default; parameter 160). | 41-75°F |
| Remote | Remote | Energy Management System** | Either of the TEMP modes can be used when a network OAS signal is provided by an energy management or building control system, via BACnet, LonTalk, or L Connection. The network can command OAS, NOT OAS, or AUTO. AUTO returns to local control of OAS, which is the selected TEMP mode. | NA |
| ENTH | DIFF OFFSET | (Two) C7400 | Outdoor air enthalpy* (A7) is less than return air enthalpy (A62) by at least the OFFSET value (1mA = 2°F default; parameter 163). | 0mA-4mA |
| ENTH | ODE STPT | C7400 | Outdoor air enthalpy (A7) is less than free cooling setpoint (12mA = 75°F default, parameter 162). | 12-19mA |
| GLOBAL | GLOBAL | 24VAC Input Signal | Global input is energized by (P297-9). This setting is also used for outdoor air damper applications. Global input also brings on the blower. (This mode is NOT used when OAS signal is provided via network connection. GLO is only used when a 24VAC signal is used to energize the P297-9 GLO input.) | NA |

*Enthalpy includes effects of both temperature and humidity.

**Energy management systems may require additional field-provided sensors; refer to manufacturer's instructions.

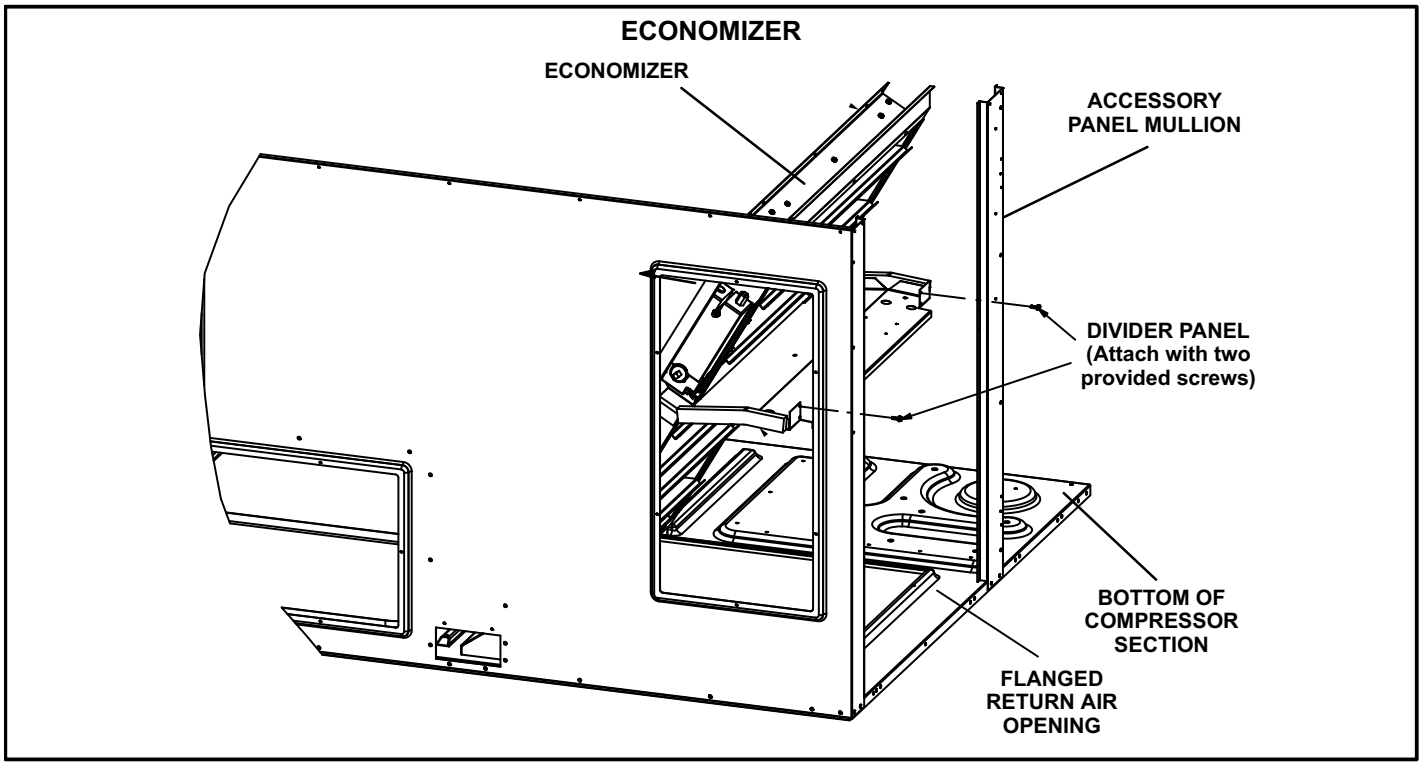



**FIGURE 29**

## F-Gravity Exhaust Dampers

LAGEDH03/15 dampers (figure 30) are used in downflow and horizontal air discharge applications. Horizontal 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 LCH units.

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.

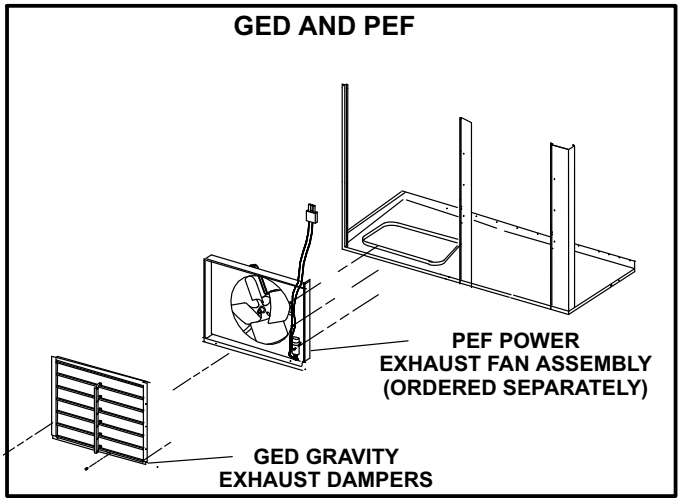



**FIGURE 30**

## G-K1PWRE10B Power Exhaust Fans

Power exhaust fans are used in downflow applications only. Fan requires optional down flow gravity exhaust dampers and economizer. Power exhaust fans provide exhaust air pressure relief and also run when return air dampers are closed and supply air blowers are operating. Figure 31 shows the location of the LAPEF. See installation instructions for more detail.

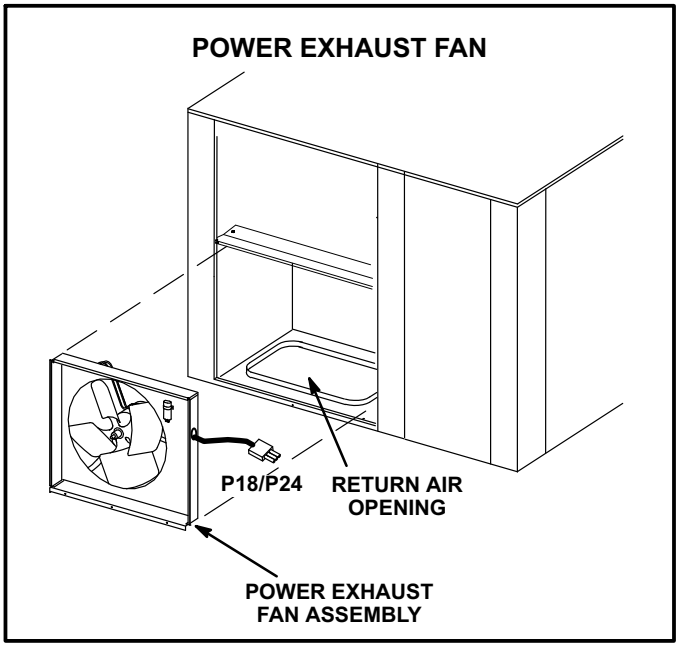



**FIGURE 31**

## H-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.

## I-Smoke Detectors A17 and A64

Photoelectric smoke detectors are a factory installed option. The smoke detectors can be installed in the supply air section (A64), return air section (A17), or in both the supply and return air section. Wiring for the smoke detectors are shown on the temperature control section (C2) wiring diagram in back of this manual.

## J-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 .14" W.C. (34.9 Pa) The switch is mounted on the upper left hand corner of the blower deck. Wiring for the blower proving switch is shown on the temperature control section (C2) wiring diagram in back of this manual.

## K-Dirty Filter Switch S27

The dirty filter switch senses static pressure increase indicating a dirty filter condition. The switch is N.O. and closes at 1" W.C. (248.6 Pa) The switch is mounted on the top filter channel corner. Wiring for the dirty filter switch is shown on the temperature control section (C2) wiring diagram in back of this manual.

## L-Indoor Air Quality ($CO_2$) Sensor A63

The indoor air quality sensor monitors $CO_2$ levels and reports the levels to the A55 Unit Controller. The board adjusts the economizer dampers according to the $CO_2$ levels. The sensor is mounted next to the indoor thermostat or in the return air duct. Refer to the indoor air quality sensor installation instructions for proper adjustment. Wiring for the indoor air quality switch is shown on the temperature control section (C2) wiring diagram in back of this manual.

## M-Drain Pan Overflow Switch S149 (optional)

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

## N-Factory Installed-Hot Gas Reheat (option)

### 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 valve, L14, routes hot discharge gas from the compressor to the reheat coil. Return air pulled across the evaporator coil is cooled and dehumidified; the reheat coil adds heat to supply air. See figure 32 for reheat refrigerant routing and figure 33 for standard cooling refrigerant routing.

### L14 Reheat Coil Solenoid Valve

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

### Reheat Setpoint

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

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

### Check-Out

Test 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 Select Unit Controller *Service - Test.*

*The blower and compressor 1 (reheat) should be operating. Reheat mode will be appear on the Unit Controller display.*

4 Deselect Unit Controller *Service - Test.*

*Compressor 1 (reheat) and blower should de-energize.*

### Default Reheat Operation

**TABLE 25**
**Reheat Operation - Two Cooling Stages - Default**

| T'stat and Humidity Demands | Operation |
|---|---|
| Reheat Only | Compressor 1 Reheat |
| Reheat & Y1 | Compressor 1 Reheat & Compressor 2 Cooling* |
| Reheat & Y1 & Y2 | Compressor 1 Cooling & Compressor 2 Cooling** |

*If there is no reheat demand and outdoor air is suitable, free cooling will operate.

**If there is no reheat demand and outdoor air is suitable, free cooling and compressor 1 will operate.

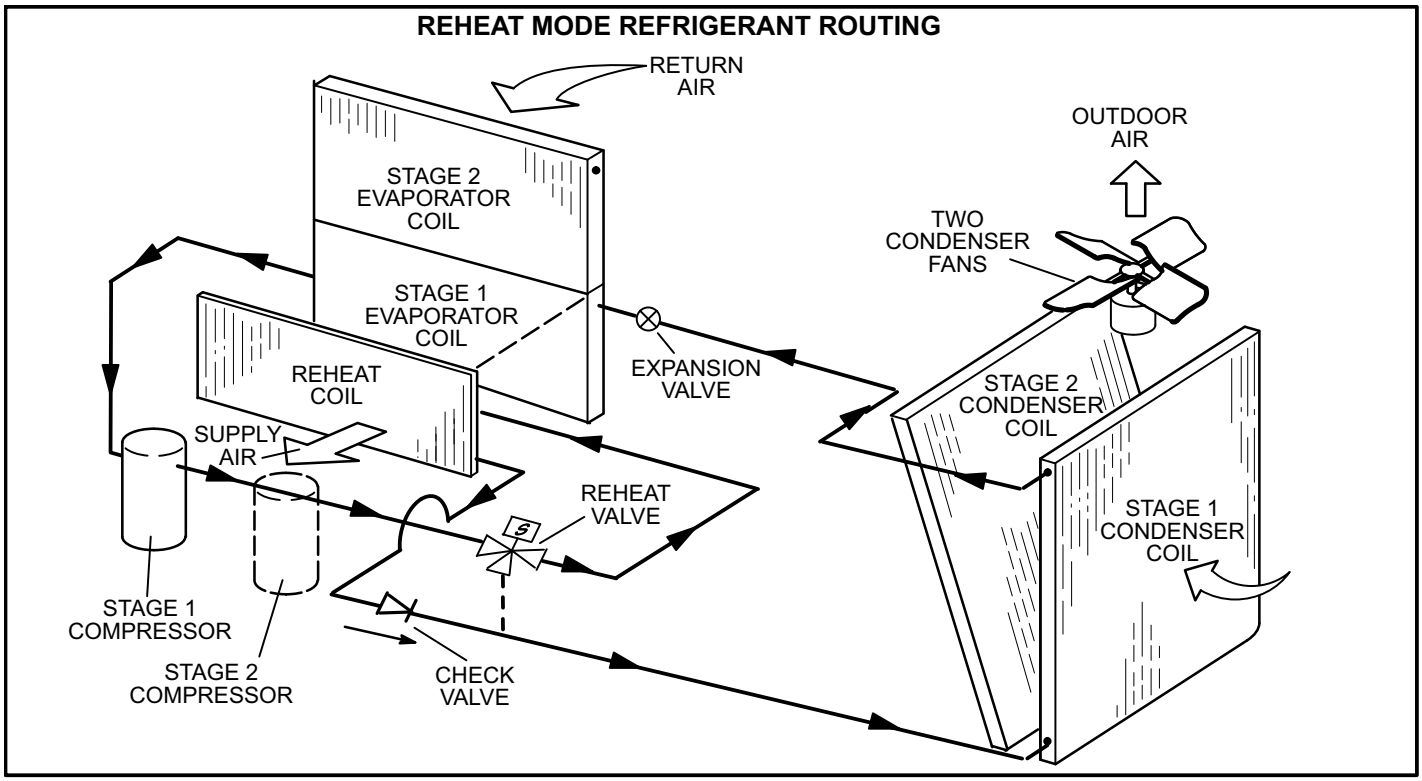



**FIGURE 32**

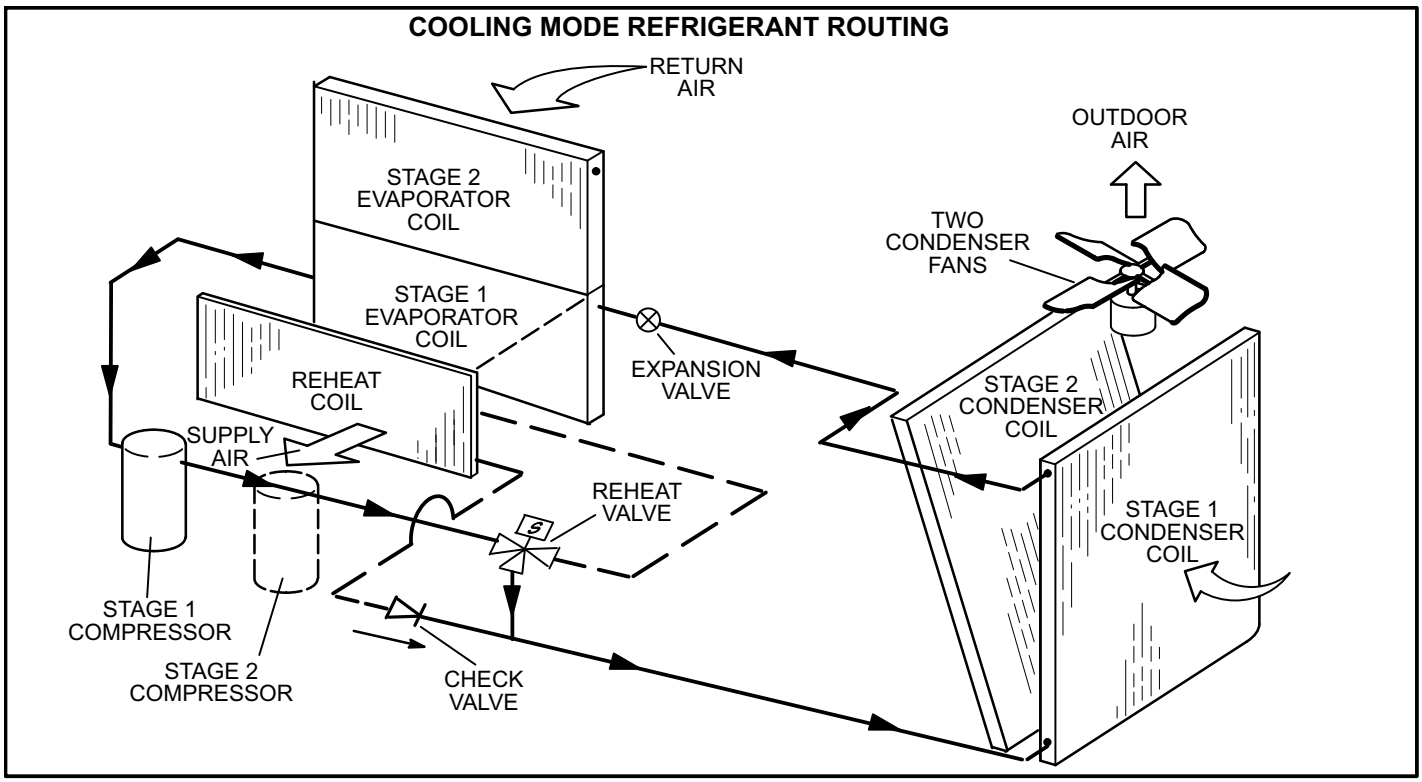



**FIGURE 33**

## VII-Belt Drive Supply Air Inverter

***NOTE -*** *Units equipped a Variable Frequency Drive (VFD) are designed to operate on balanced, three-phase power. Operating units on unbalanced three-phase power will reduce the reliability of all electrical components in the unit. Unbalanced power is a result of the power delivery system supplied by the local utility company. Factory-installed inverters are sized to drive blower motors with an equivalent current rating using balanced three-phase power. If unbalanced three-phase power is supplied; the installer must replace the existing factory-installed inverter with an inverter that has a higher current rating to allow for the imbalance. Refer to the installation instructions for additional information and available replacements*.

The supply air inverter or variable frequency drive (VFD), is located in the compressor compartment. The VFD stages the amount of supply airflow according to the number of compressors operating.

The amount of airflow for each stage is set in the Unit Controller when the unit is initially commissioned. Each value is recorded on a label on the inside of the compressor access panel. Settings can also be read on the Unit Controller display. Use one of the following menus.

M2 Unit Controllers:

*Data > Status > Blower*

M3 Unit Controllers:

DATA > ADVANCED STATUS > BLOWER > BLOWER STATUS

Use figure 34 to determine whether the VFD should be providing a staged output to the blower motor.

**⚠WARNING**

**ELECTRICAL SHOCK HAZARD.**

**Failure to follow instructions exactly could result in serious injury or death.**

**VFD HOLDS A POTENTIALLY LETHAL CHARGE UP TO 10 MINUTES AFTER POWER HAS BEEN DISCONNECTED. Do not open VFD cover until 10 minutes AFTER power source has been disconnected and power lamp has turned off.**

**Read manual provided by VFD manufacturer. Carefully review and follow all safety warnings in that manual also.**

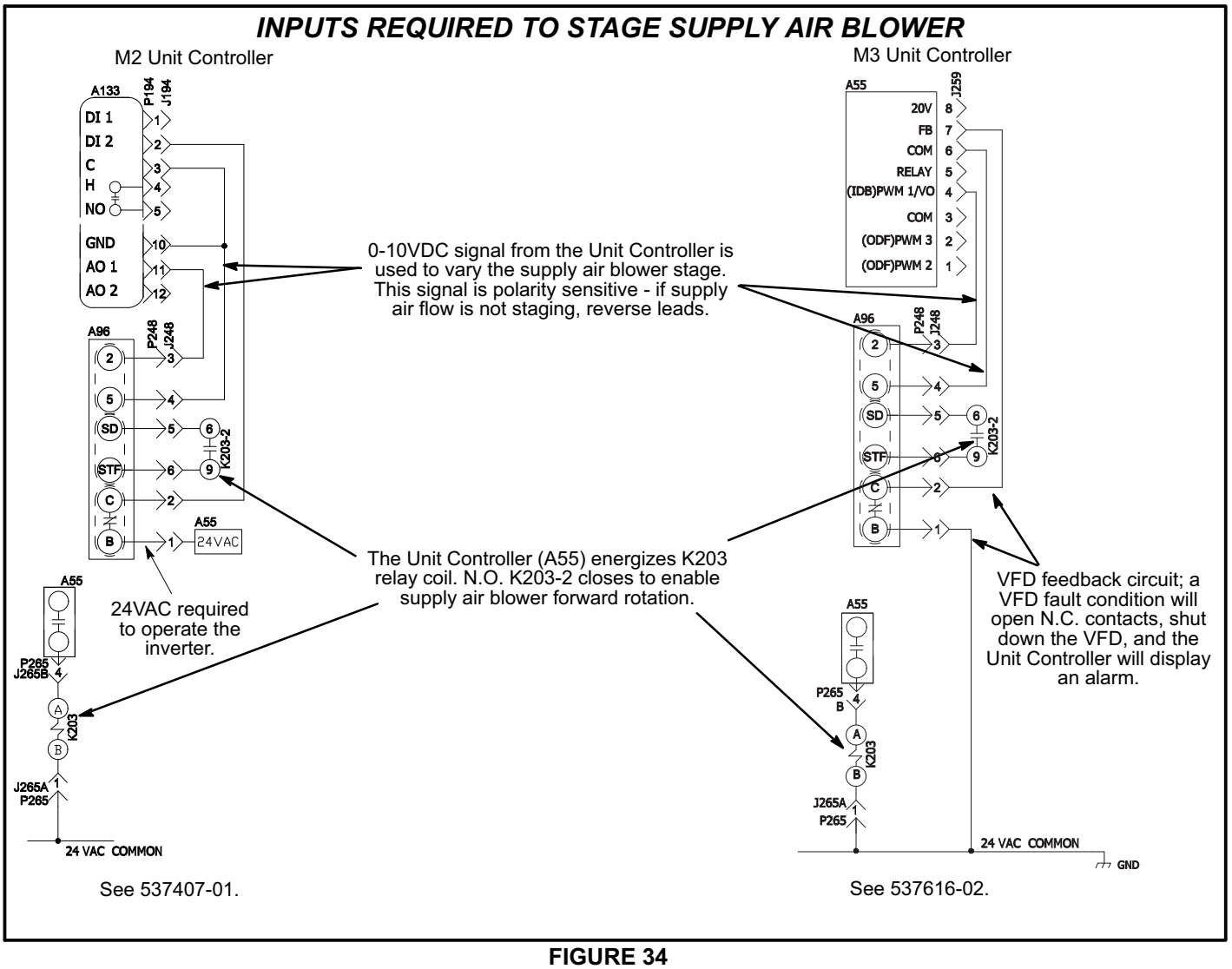



**FIGURE 34**

ADJUST CFM

If a test and balance contractor has not commissioned the unit, use this section to set supply air CFM.

**A-Design Specifications**

Use table 26 to fill in field-provided, design specified blower CFM.

**B-Set Maximum CFM**

Use table 26 to determine highest blower CFM for appropriate unit. Adjust the blower pulley to deliver that amount of CFM with only the blower operating. See section 1-UNIT COMPONENTS; C-Blower Compartment; *Determining Unit CFM*.

**TABLE 26**
**Blower CFM Design Specifications**

| Blower Speed | Design Specified CFM |
|---|---|
| Heating | |
| Cooling High | |
| Cooling Low | |
| Ventilation | |

**C-Enter Design Specifications Into Controller**

Use the following menu to enter the blower design specified CFM into the Unit Controller. Make sure blower CFM is within limitations shown in table 27. Refer to the Unit Controller manual provided with unit.

M2 Unit Controller -

*Settings > Control > Guided Setup > Advanced Guided Setup > Setup Equipment >Change* MSAV™ *Settings?>Yes*

M3 Unit Controller -

*SETUP > TEST & BALANCE > BLOWER >*

**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 dampers to “Min OCP Blwr Low” when blower CFM is BELOW a “midpoint” CFM. 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 calculate the “midpoint” CFM.

**Set Minimum Position 1**

Use the following 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 bring on the corresponding blower speed and allow damper position adjustment.

M2 Unit Controller -

*Settings > Control > MSAV > Damper > Low Speed*

M3 Unit Controller -

*SETTINGS > RTU Options > EDIT PARAMETER > ENTER DATA ID - 9 > MIN DAMPER LOW BLOWER = X.X %*

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 same menu in the Unit Controller to set “Min OCP Blwr High” for the blower CFM above the “midpoint” CFM. When navigating into this menu, the Unit Controller will bring on the corresponding blower speed and allow damper position adjustment.

M2 Unit Controller -

*Settings > Control > MSAV > Damper > High Speed*

M3 Unit Controller -

*SETTINGS > RTU OPTIONS > DAMPER > MIN DAMPER POSITION BLOWER ON HIGH = X.X %*

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-VFD Bypass Option**

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

M2 Unit Controller -

*Settings > Control > MSAV > VFD Bypass >*

M3 Unit Controller -

*SETTINGS>RTU OPTIONS>BLOWER>VFD BYPASS*

To configure the unit to by-pass the VFD automatically, use the following Unit Controller menu and set to “automatic”:

M2 Unit Controller -

*Settings > Install > New M2 > MSAV VFD Bypass >*

M3 Unit Controller -

*SETUP > INSTALL > PRESS SAVE UNTIL THE MENU READS CONFIGURATION ID 1 > CHANGE CHARACTER POSITION 6TH TO “A” FOR AUTOMATIC BYPASS OPTION AND SAVE*

*Caution - Units not equipped with a VFD will be set to Settings > Control > MSAV VFD Bypass > None. The blower motor could be damaged and/or result in product or property damage if the setting is changed to automatic or manual.*

**TABLE 27**
**MINIMUM AND MAXIMUM CFM**
**092H, 102H, 120H, 150S, 150H**

| **Gas Heat Minimum CFM** | | |
|---|---|---|
| Unit | Gas Heat Size | Airflow CFM |
| LGH092-150 | Std. , Med. | 2225 |
| LGH092-150 | High | 2550 |
| **Electric Heat Minimum CFM** | | |
| Unit | Heat Size (kW) | Airflow CFM |
| LCH092-102 | 0 | 2800 |
| LCH092-150 | 7.5, 15, 22.5, 30, 45 | 2800 |
| LCH120-150 | 0, 60 | 4000 |
| **Cooling Minimum CFM - 220* CFM/ton** | | |
| Unit | Blower Speed | Airflow CFM |
| LGH/LCH092 | Low | 1650 |
| LGH/LCH102 | Low | 1870 |
| LGH/LCH120 | Low | 2200 |
| LGH/LCH150 | Low | 2750 |
| **Cooling Minimum CFM - 280* CFM/ton** | | |
| Unit | Blower Speed | Airflow CFM |
| LGH/LCH092 | High | 2100 |
| LGH/LCH102 | High | 2380 |
| LGH/LCH120 | High | 2800 |
| LGH/LCH150 | High | 3500 |
| **Smoke and Ventilation Minimum CFM - 150 CFM/ton** | | |
| Unit | Not Applicable | Airflow CFM |
| LGH/LCH092 | NA | 1125 |
| LGH/LCH102 | NA | 1275 |
| LGH/LCH120 | NA | 1500 |
| LGH/LCH150 | NA | 1875 |
| **Heating and Cooling Maximum CFM - 480 CFM/ton** | | |
| Unit | Blower Speed | Airflow CFM |
| LGH/LCH092 | High | 3600 |
| LGH/LCH102 | High | 4080 |
| LGH/LCH120 | High | 4800 |
| LGH/LCH150 | High | 6000 |

**Refer to table 29 for ultra high efficiency unit minimum CFM / ton. Ultra high efficiency units are equipped with tandem compressors which allow lower minimum airflow.*

## VIII-Direct Drive Supply Air Inverter

If a test and balance contractor has not commissioned the unit, use this section to set supply air CFM.

### A-Set Blower Speed

1 Use table 28 to fill in field-provided, design specified blower CFM.

**TABLE 28**
**Blower CFM Design Specifications**

| Blower Speed | Design Specified CFM |
|---|---|
| Heating | |
| Cooling High | |
| Cooling Low | |
| Ventilation | |

2 Use the following menu to enter the blower design specified CFM into the Unit Controller. ***Don't press "SAVE" until all CFM are entered.*** Make sure blower CFM is within limitations shown in table 29. Refer to the Unit Controller manual provided with unit.

SETUP > TEST & BALANCE > BLOWER

3 Once all four speeds are entered, the target (highest of the heating and cooling settings) CFM and default RPM will be displayed.

*Note - When units are not equipped with heat, the Blower Heat speed will not be displayed. Blower Cooling High will be the first blower speed to appear.*

4 Measure the static pressure as shown in the *Blower Start-Up* section. Use the static pressure, target CFM and blower tables to determine the RPM needed. Values in the blower table reflect the static pressures taken in locations shown in figure 17.

5 Enter the RPM and repeat the previous step until the design CFM is reached.

6 Press SAVE followed by MAIN MENU.

*Note - Once the CFM settings are saved, the Unit Controller will set all other blower CFM.*

**B-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 dampers to “Min OCP Blwr Low” when blower CFM is BELOW a “midpoint” CFM. 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 calculate the “midpoint” CFM.

**Set Minimum Position 1**

Use the following 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 bring on the corresponding blower speed and allow damper position adjustment.

*SETTINGS > RTU Options > EDIT PARAMETER > ENTER DATA ID - 9 > MIN DAMPER LOW BLOWER = X.X %*

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 same menu in the Unit Controller to set “Min OCP Blwr High” for the blower CFM above the “midpoint” CFM. When navigating into this menu, the Unit Controller will bring on the corresponding blower speed and allow damper position adjustment.

*SETTINGS > RTU OPTIONS > DAMPER > MIN DAMPER POSITION BLOWER ON HIGH = X.X %*

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.*

**TABLE 29**
**MINIMUM AND MAXIMUM CFM**
**094U4E, 122U4E, 152U4E**

| **Gas Heat Minimum CFM** | | |
|---|---|---|
| Unit | Gas Heat Size | Airflow CFM* |
| LGH094-152 | Std. , Med. | 2225 |
| LGH094-152 | High | 2550 |
| **Electric Heat Minimum CFM** | | |
| Unit | Heat Size (kW) | Airflow CFM |
| LCH094 | 7.5 | 1750 |
| LCH094 | 0, 15, 22.5, 30, 45 | 2750 |
| LCH122, 152 | 15, 22.5, 30, 45 | 2750 |
| LCH122, 152 | 0, 60 | 3500 |
| **Cooling Low Minimum CFM - 160 CFM/ton** | | |
| Unit | Blower Speed | Airflow CFM |
| LGH/LCH094 | Low | 1200 |
| LGH/LCH122 | Low | 1600 |
| LGH/LCH152 | Low | 2000 |
| **Cooling High Minimum CFM - 220 CFM/ton** | | |
| Unit | Blower Speed | Airflow CFM |
| LGH/LCH094 | High | 1650 |
| LGH/LCH122 | High | 2200 |
| LGH/LCH152 | High | 2750 |
| **Smoke and Ventilation Minimum CFM - 150 CFM/ton** | | |
| Unit | Not Applicable | Airflow CFM |
| LGH/LCH094 | NA | 1125 |
| LGH/LCH122 | NA | 1500 |
| LGH/LCH152 | NA | 1875 |
| **Heating and Cooling Maximum CFM - 480 CFM/ton** | | |
| Unit | Blower Speed | Airflow CFM |
| LGH/LCH094 | High | 3600 |
| LGH/LCH122 | High | 4800 |
| LGH/LCH152 | High | 6000 |

*Rounded to nearest 25 CFM.

## IX-Staged Supply Air Operation

This is a summary of cooling operation for both belt and direct drive blowers.

*Note - During a dehumidification demand the blower operates at the highest speed. Free cooling is locked-out during reheat operation. Refer to Hot Gas Reheat start-up and operation section for details.*

**A-Two-Stage Thermostat**

1-Economizer With Outdoor Air Suitable

Y1 Demand -
- Compressors Off
- Blower Cooling Low
- Dampers modulate

Y2 Demand -
- Compressors Off
- Blower Cooling High
- Dampers Modulate

*Note - If dampers are at maximum open for three minutes, compressor 1 is energized and blower stays on cooling high.*

2-No Economizer or Outdoor Air Not Suitable

Y1 Demand -
- Compressor 1 On (on ultra high efficiency units, one compressor will operate)
- Blower Cooling Low
- Dampers Minimum Position

Y2 Demand -
- Compressor 1 and 2 On
- Blower Cooling High
- Dampers Minimum Position

**B-Three-Stage Thermostat OR Zone Sensor**

1-Economizer With Outdoor Air Suitable

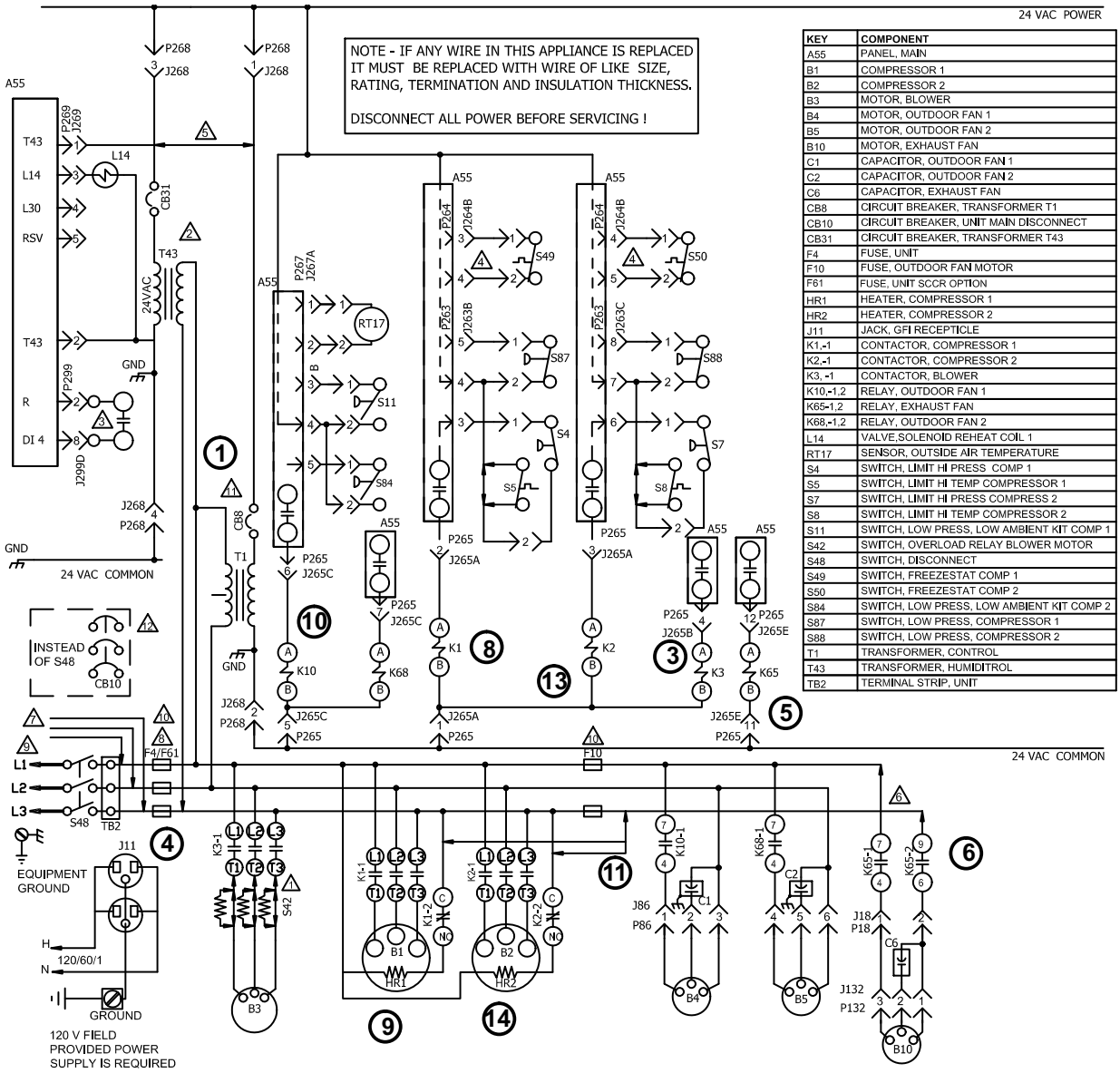
Y1 Demand -
- Compressors Off
- Blower Cooling Low
- Dampers modulate

Y2 Demand -
- Compressors Off
- Blower Cooling High
- Dampers Modulate

*Note - If dampers are at maximum open for three minutes, compressor 1 is energized and blower stays on cooling high.*

Y3 Demand -
- Compressors 1 and 2 On
- Blower Cooling High
- Dampers Maximum Open

# LCH092/102/120H - CONSTANT SUPPLY AIR, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A55 | PANEL, MAIN |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C2 | CAPACITOR, OUTDOOR FAN 2 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT BREAKER, TRANSFORMER T1 |
| CB10 | CIRCUIT BREAKER, UNIT MAIN DISCONNECT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F61 | FUSE, UNIT SCCR OPTION |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,-1 | CONTACTOR, COMPRESSOR 1 |
| K2,-1 | CONTACTOR, COMPRESSOR 2 |
| K3, -1 | CONTACTOR, BLOWER |
| K10,-1,2 | RELAY, OUTDOOR FAN 1 |
| K65-1,2 | RELAY, EXHAUST FAN |
| K68,-1,2 | RELAY, OUTDOOR FAN 2 |
| L14 | VALVE,SOLENOID REHEAT COIL 1 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S7 | SWITCH, LIMIT HI PRESS COMPRESS 2 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 1 |
| S42 | SWITCH, OVERLOAD RELAY BLOWER MOTOR |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S84 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 2 |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| S88 | SWITCH, LOW PRESS, COMPRESSOR 2 |
| T1 | TRANSFORMER, CONTROL |
| T43 | TRANSFORMER, HUMIDITROL |
| TB2 | TERMINAL STRIP, UNIT |

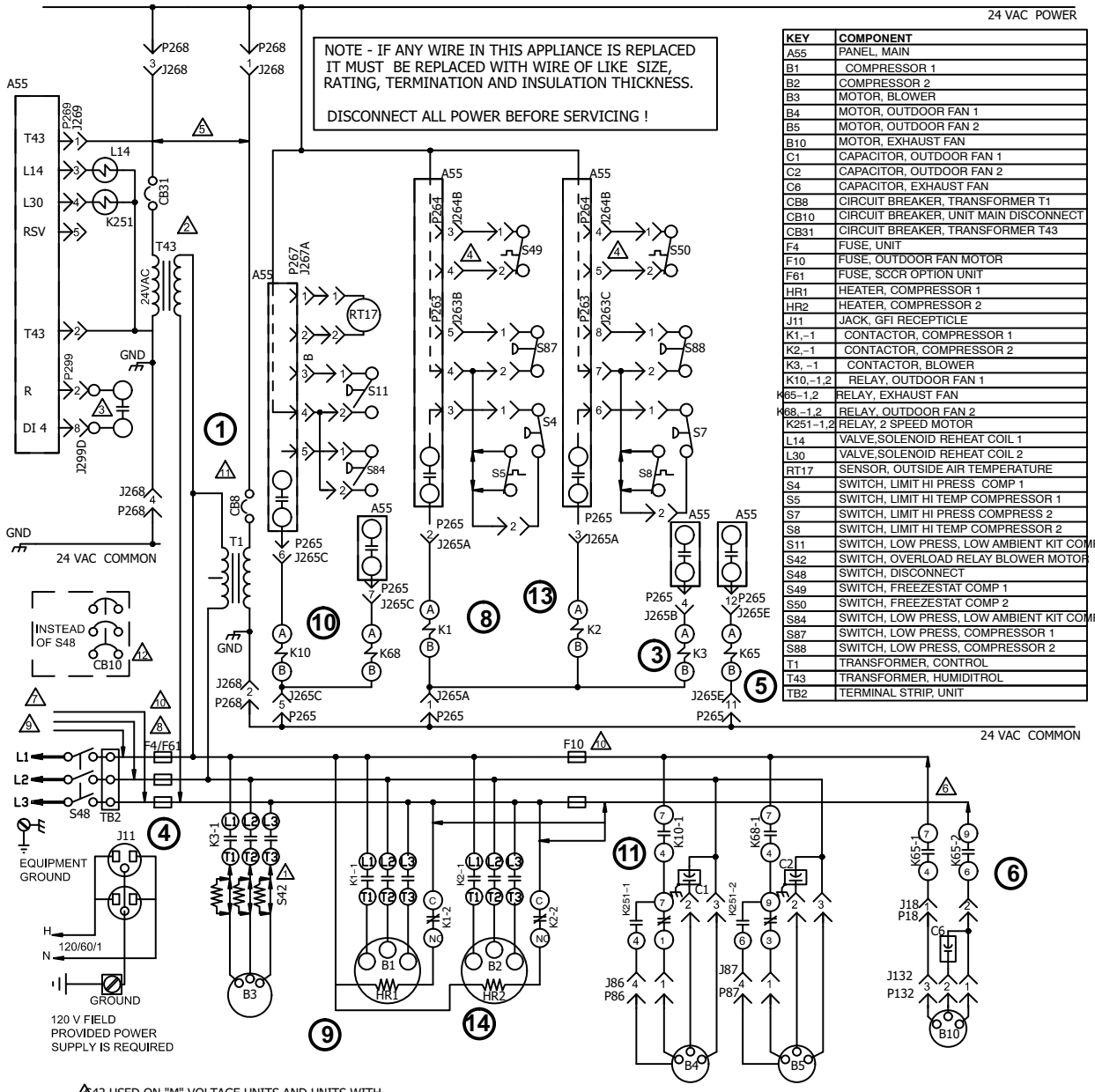
1. S42 USED ON "M" VOLTAGE UNITS AND UNITS WITH HIGH EFFICIENCY MOTORS
2. ONLY IN UNITS WITH HUMIDITROL OR PHASE AND VOLTAGE DETECTION OPTION
3. EXTERNAL HUMIDITROL CONTACTS
4. S49 AND S50 ARE PART OF 5VDC CIRCUIT
5. J268-1,-3 AND J268-2,-4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS
6. B10 IS NOT USED ON UNITS WITH ERV
7. USED ON UNITS WITH ERV SINGLE POINT POWER. SEE ERV DIAGRAM
8. USED ON LCH AND UNITS WITH ERV SINGLE POINT POWER ONLY
9. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
10. F61 AND F10 USED ON LGH UNITS WITH SCCR OPTION
11. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
12. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | EXHAUST FAN |
| 86 | OUTDOOR FAN INTERFACE |
| 132 | EXHAUST FAN MOTOR |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANSFORMER T1 POWER |
| 269 | HUMIDITROL CONTROL |
| 299 | HUMIDITROL SAFETY INTERFACE |

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| | | |
|---|---|---|
| 2018/07 | WIRING DIAGRAM<br>537625-03 | 07/18 |
| COOLING | | |
| LCH/LGH - 092H, 102H, 120H - G, J, M, Y | | |
| SECTION B | | REV 0 |
| Supersedes<br>537625-02 | New Form No.<br>537625-03 | |

# LCH150H - Y - CONSTANT SUPPLY AIR, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A55 | PANEL, MAIN |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C2 | CAPACITOR, OUTDOOR FAN 2 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT BREAKER, TRANSFORMER T1 |
| CB10 | CIRCUIT BREAKER, UNIT MAIN DISCONNECT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F61 | FUSE, SCCR OPTION UNIT |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,–1 | CONTACTOR, COMPRESSOR 1 |
| K2,–1 | CONTACTOR, COMPRESSOR 2 |
| K3, –1 | CONTACTOR, BLOWER |
| K10,–1,2 | RELAY, OUTDOOR FAN 1 |
| K65–1,2 | RELAY, EXHAUST FAN |
| K68,–1,2 | RELAY, OUTDOOR FAN 2 |
| K251–1,2 | RELAY, 2 SPEED MOTOR |
| L14 | VALVE,SOLENOID REHEAT COIL 1 |
| L30 | VALVE,SOLENOID REHEAT COIL 2 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S7 | SWITCH, LIMIT HI PRESS COMPRESS 2 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 1 |
| S42 | SWITCH, OVERLOAD RELAY BLOWER MOTOR |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S84 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 2 |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| S88 | SWITCH, LOW PRESS, COMPRESSOR 2 |
| T1 | TRANSFORMER, CONTROL |
| T43 | TRANSFORMER, HUMIDITROL |
| TB2 | TERMINAL STRIP, UNIT |

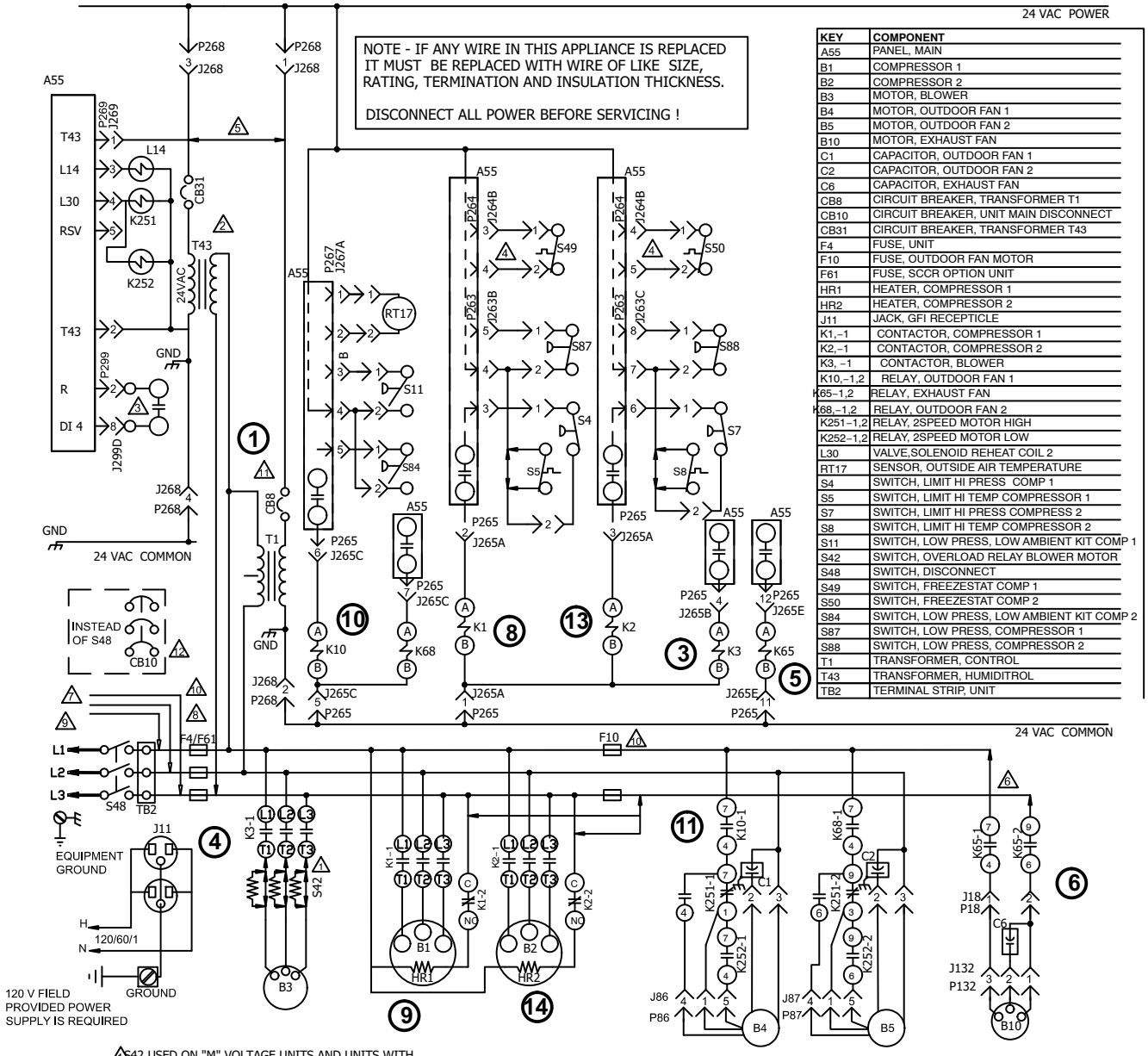
1. S42 USED ON "M" VOLTAGE UNITS AND UNITS WITH HIGH EFFICIENCY MOTORS
2. ONLY IN UNITS WITH HUMIDITROL OR PHASE AND VOLTAGE DETECTION OPTION
3. EXTERNAL HUMIDITROL CONTACTS
4. S49 AND S50 ARE PART OF 5VDC CIRCUIT
5. J268-1,-3 AND J268-2,-4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS
6. S10 IS NOT USED ON UNITS WITH ERV
7. USED ON UNITS WITH ERV SINGLE POINT POWER. SEE ERV DIAGRAM
8. USED ON LCH AND UNITS WITH ERV SINGLE POINT POWER ONLY
9. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
10. F61 & F10 USED ON LGH UNITS WITH SCCR OPTION
11. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
12. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | EXHAUST FAN |
| 86 | OUTDOOR FAN 1 |
| 87 | OUTDOOR FAN 2 |
| 132 | EXHAUST FAN MOTOR |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANSFORMER T1 POWER |
| 269 | HUMIDITROL CONTROL |
| 299 | HUMIDITROL SAFETY INTERFACE |

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| | | |
|---|---|---|
| 2018/07 | WIRING DIAGRAM<br>537897-02 | 07/18 |
| COOLING | | |
| LCH/LGH 150H - Y | | |
| | SECTION B | REV 0 |
| Supersedes<br>537897-01 | New Form No.<br>537897-02 | |

# LCH150H - G, J, M - CONSTANT SUPPLY AIR, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A55 | PANEL, MAIN |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C2 | CAPACITOR, OUTDOOR FAN 2 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT BREAKER, TRANSFORMER T1 |
| CB10 | CIRCUIT BREAKER, UNIT MAIN DISCONNECT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F61 | FUSE, SCCR OPTION UNIT |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,–1 | CONTACTOR, COMPRESSOR 1 |
| K2,–1 | CONTACTOR, COMPRESSOR 2 |
| K3, –1 | CONTACTOR, BLOWER |
| K10,–1,2 | RELAY, OUTDOOR FAN 1 |
| K65–1,2 | RELAY, EXHAUST FAN |
| K68,–1,2 | RELAY, OUTDOOR FAN 2 |
| K251–1,2 | RELAY, 2SPEED MOTOR HIGH |
| K252–1,2 | RELAY, 2SPEED MOTOR LOW |
| L30 | VALVE,SOLENOID REHEAT COIL 2 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S7 | SWITCH, LIMIT HI PRESS COMPRESS 2 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 1 |
| S42 | SWITCH, OVERLOAD RELAY BLOWER MOTOR |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S84 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 2 |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| S88 | SWITCH, LOW PRESS, COMPRESSOR 2 |
| T1 | TRANSFORMER, CONTROL |
| T43 | TRANSFORMER, HUMIDITROL |
| TB2 | TERMINAL STRIP, UNIT |

| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | EXHAUST FAN |
| 86 | OUTDOOR FAN 1 |
| 87 | OUTDOOR FAN2 |
| 132 | EXHAUST FAN MOTOR |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANSFORMER T1 POWER |
| 269 | HUMIDITROL CONTROL |
| 299 | HUMIDITROL SAFETY INTERFACE |

1. S42 USED ON "M" VOLTAGE UNITS AND UNITS WITH HIGH EFFICIENCY MOTORS
2. ONLY IN UNITS WITH HUMIDITROL OR PHASE AND VOLTAGE DETECTION OPTION
3. EXTERNAL HUMIDITROL CONTACTS
4. S49 AND S50 ARE PART OF 5VDC CIRCUIT
5. J268-1,-3 AND J268-2,-4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS
6. B10 IS NOT USED ON UNITS WITH ERV
7. USED ON UNITS WITH ERV SINGLE POINT POWER. SEE ERV DIAGRAM
8. USED ON LCH AND UNITS WITH ERV SINGLE POINT POWER ONLY
9. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
10. F61 & F10 USED ON LGH UNITS WITH SCCR OPTION
11. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
12. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

| 2018/07 | WIRING DIAGRAM | 07/18 |
|---|---|---|
| | 537898-02 | |
| COOLING | | |
| LCH/LGH 150H - G, J, M | | |
| | SECTION B | REV 0 |
| Supersedes 537898-01 | New Form No. 537898-02 | |

## LCH092/150S & H SEQUENCE OF OPERATION

**Power:**

1 Line voltage through the S48 unit disconnect, TB2 terminal block, or CB10 circuit breaker energizes the T1 transformer. T1 provides 24VAC power to A55 Unit Controller which provides 24VAC to the unit cooling, heating and blower controls.

2 Line voltage is also routed to compressor crankcase heaters, compressor contactors, the blower motor contactor, condenser fan relays and exhaust fan relays.

**Blower Operation:**

3 The A55 Unit Controller module receives a demand from thermostat terminal G. A55 energizes blower contactor K3 with 24VAC.

4 N.O. K3-1 closes, energizing blower B3.

**Economizer Operation:**

5 A55 receives a demand and energizes exhaust fan relay K65 with 24VAC at 50% outside air damper open (adjustable).

6 N.O. K65-1 and N.O. K65-2 both close, energizing exhaust fan motor B10.

**1st Stage Cooling (compressor B1)**

7 A55 receives a Y1 thermostat demand.

8 After A55 proves N.C. low pressure switch S87, N.C. freezestat S49 and N.C. high pressure switch S4, compressor contactor K1 is energized.

9 N.O. contacts K1-1 close energizing compressor B1.

10 At the same time, A55 energizes condenser fan relays K10 (when N.O. low ambient switches S11 and S84 close) and K68.

11 N.O. contacts K10-1 close energizing condenser fan B4 and N.C. contacts K10-2 open, de-energizing compressor crankcase heaters HR1 and HR2. N.O. contacts K68-1 close energizing condenser fan B5.

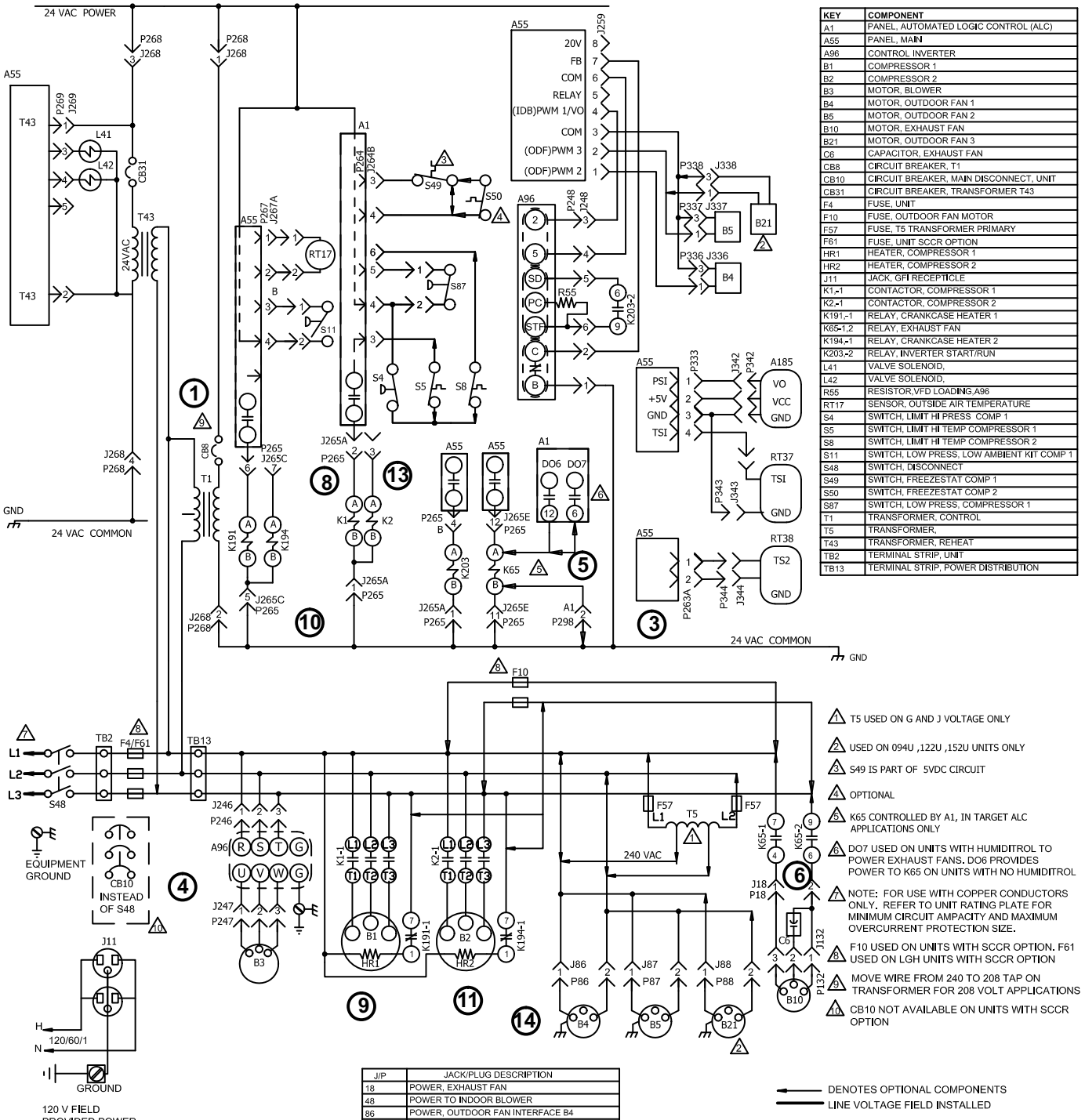
**2nd Stage Cooling (compressor B2 is energized)**

12 A55 receives a Y2 thermostat demand.

13 After A55 proves N.C. low pressure switch S88, N.C. freezestat S50 and N.C. high pressure switch S7, compressor contactor K2 is energized.

14 N.O. contacts K2-1 close energizing compressor B2.

# LCH092/152U STAGED SUPPLY AIR, NO BYPASS, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A1 | PANEL, AUTOMATED LOGIC CONTROL (ALC) |
| A55 | PANEL, MAIN |
| A96 | CONTROL INVERTER |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| B21 | MOTOR, OUTDOOR FAN 3 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT BREAKER, T1 |
| CB10 | CIRCUIT BREAKER, MAIN DISCONNECT, UNIT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F57 | FUSE, T5 TRANSFORMER PRIMARY |
| F61 | FUSE, UNIT SCCR OPTION |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,-1 | CONTACTOR, COMPRESSOR 1 |
| K2,-1 | CONTACTOR, COMPRESSOR 2 |
| K191,-1 | RELAY, CRANKCASE HEATER 1 |
| K65-1,2 | RELAY, EXHAUST FAN |
| K194,-1 | RELAY, CRANKCASE HEATER 2 |
| K203,-2 | RELAY, INVERTER START/RUN |
| L41 | VALVE SOLENOID, |
| L42 | VALVE SOLENOID, |
| R55 | RESISTOR,VFD LOADING,A96 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 1 |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| T1 | TRANSFORMER, CONTROL |
| T5 | TRANSFORMER, |
| T43 | TRANSFORMER, REHEAT |
| TB2 | TERMINAL STRIP, UNIT |
| TB13 | TERMINAL STRIP, POWER DISTRIBUTION |

1. T5 USED ON G AND J VOLTAGE ONLY
2. USED ON 094U ,122U ,152U UNITS ONLY
3. S49 IS PART OF 5VDC CIRCUIT
4. OPTIONAL
5. K65 CONTROLLED BY A1, IN TARGET ALC APPLICATIONS ONLY
6. DO7 USED ON UNITS WITH HUMIDITROL TO POWER EXHAUST FANS. DO6 PROVIDES POWER TO K65 ON UNITS WITH NO HUMIDITROL
7. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
8. F10 USED ON UNITS WITH SCCR OPTION. F61 USED ON LGH UNITS WITH SCCR OPTION
9. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
10. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | POWER, EXHAUST FAN |
| 48 | POWER TO INDOOR BLOWER |
| 86 | POWER, OUTDOOR FAN INTERFACE B4 |
| 87 | POWER, OUTDOOR FAN INTERFACE B5 |
| 88 | POWER, OUTDOOR FAN INTERFACE B21 |
| 132 | POWER, EXHAUST FAN MOTOR |
| 246 | POWER TO VFD |
| 247 | POWER, VFD TO MOTOR |
| 248 | VFD CONTROL |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANFORMER T1 POWER |
| 269 | TRANFORMER T43 POWER |
| 298 | IAQ INTERFACE |

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| | | |
|---|---|---|
| 2018/07 | WIRING DIAGRAM<br>537616-04 | 07/18 |
| COOLING -MSAV NO BYPASS | | |
| (ULTRA) LCH/LGH - 092U, 094U, 120U, 122U, 152U - Y, G, J, M | | |
| SECTION B | | REV 0 |
| Supersedes<br>537616-03 | New Form No.<br>537616-04 | |

## LCH092/152U SEQUENCE OF OPERATION

**Power:**

1 Line voltage through the S48 unit disconnect, TB2 terminal block, or CB10 circuit breaker energizes the T1 transformer. T1 provides 24VAC power to A55 Unit Controller which provides 24VAC to the unit cooling, heating and blower controls.

2 Line voltage is also routed to compressor crankcase heaters, compressor contactors, supply air inverter control, condenser fan relays and exhaust fan relays.

**Blower Operation:**

Supply Air Inverter: Refer to Supply Air Inverter or Direct Drive blower diagram and sequence of operation.

**Economizer Operation:**

3 A55 receives a demand and energizes exhaust fan relay K65 with 24VAC at 50% outside air damper open (adjustable).

4 N.O. K65-1 and N.O. K65-2 both close, energizing exhaust fan motor B10.

**1st Stage Cooling (compressor B1 or B2)**

5 A55 receives a Y1 thermostat demand.

6 After A55 proves N.C. low pressure switch S87, N.C. freezestat S49 and N.C. high pressure switch S4, compressor contactor K1 or K2 are energized. *Note - A55 logic (using input from RT37 and RT38 temperature sensors and A185 pressure transducer) determines which contactor is energized.*

7 N.O. contacts K1-1 or K2-1 close energizing compressor B1 or B2.

At the same time A55 energizes:

All three condenser fans, B4, B5 & B21, on **LOW** speed.

K191 compressor 1 crankcase heater relay when K1 is energized or K194 compressor 2 crankcase heater relay when K2 is energized (after A55 proves N.O. low ambient switch S11 is closed).

8 N.C. K191-1 compressor 1 crankcase heater contacts or N.C. K194-1 compressor 2 crankcase heater contacts open and de-energize compressor crankcase heater HR1 or HR2.

**2nd Stage Cooling (compressor B1 and B2 are energized)**

9 A55 receives a Y2 thermostat demand.

10 The K1 or K2 compressor contactor which was not energized will close.

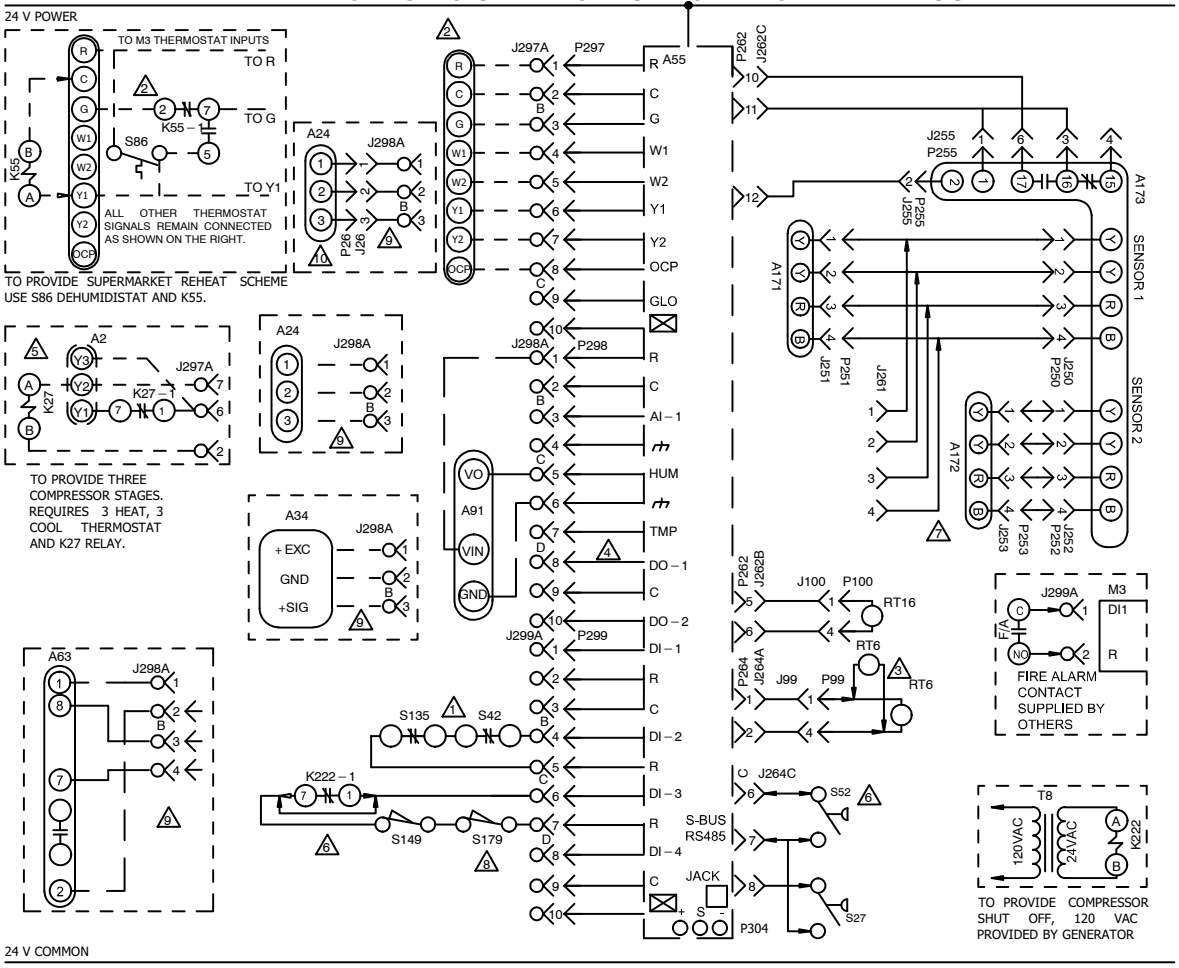
11 N.O. K1-1 or K2-1 relay contacts which were not energized will close. The corresponding B1 or B2 compressor will operate in tandem with the other compressor.

At the same time A55 energizes:

All three condenser fans, B4, B5 & B21, on **HIGH** speed.

The K191 or K194 crankcase heater relay which was not energized will close. N.C. K191-1 or K194-1 relay contacts open and de-energize the corresponding crankcase heater HR1 or HR2.

# ELECTRONIC OR ELECTROMECHANICAL THERMOSTAT




| DESCRIPTION | |
|---|---|
| KEY | COMPONENT |
| A2 | SENSOR, ELECTRONIC THERMOSTAT |
| A24 | CONTROL, OUTDOOR AIR CFM FLOW |
| A34 | DIFFERENTIAL PRESSURE TRANSDUCER |
| A55 | CONTROLBOARD, MAIN |
| A63 | SENSOR, CO2 (IAQ) OPTIONAL |
| A91 | SENSOR, HUMIDITY |
| A171 | SENSOR ONE, SMOKE, RETURN AIR |
| A172 | SENSOR TWO, SMOKE, SUPPLY AIR |
| A173 | MODULE, CONTROL SMOKE DETECTION |
| J26 | JACK, AIR FLOW CONTROL |
| J99 | JACK, RT16 RETURN AIR SENSOR |
| J100 | JACK, RT6 SUPPLY AIR SENSOR |
| J250 | JACK, SMOKE DETECTOR ONE |
| J251 | JACK, SMOKE DETECTOR ONE |
| J252 | JACK, SMOKE DETECTOR TWO |
| J253 | JACK, SMOKE DETECTOR TWO |
| J255 | JACK, MODULE, CONTROL SMOKE DETECTION |
| J261 | JACK, SUPPLY SMOKE DETECTOR JUMPER |
| J262 | JACK, ECONOMIZER |
| J264 | JACK, BLOWER DECK |
| J297 | JACK, THERMOSTAT – DDC INTERFACE |
| J298 | JACK, IAQ INTERFACE |
| J299 | JACK, SAFETY INTERFACE |
| K27, – 1 | RELAY, TRANSFER |
| K55, – 1 | RELAY, BLOWER |
| K222, – 1 | RELAY, COMPRESSOR LOCKOUT |
| P26 | PLUG, AIR FLOW CONTROL |
| P99 | PLUG, RT16 RETURN AIR SENSOR |
| P100 | PLUG, RT6 SUPPLY AIR SENSOR |
| P250 | PLUG, SMOKE DETECTOR ONE |
| P251 | PLUG, SMOKE DETECTOR ONE |
| P252 | PLUG, SMOKE DETECTOR TWO |
| P253 | PLUG, SMOKE DETECTOR TWO |
| P255 | PLUG, MODULE, CONTROL SMOKE DETECTION |
| P262 | PLUG, ECONOMIZER |
| P264 | PLUG, BLOWER DECK |
| P297 | PLUG, THERMOSTAT – DDC INTERFACE |
| P298 | PLUG, IAQ INTERFACE |
| P299 | PLUG, SAFETY INTERFACE |
| P304 | PLUG, SYS BUS |
| RT6 | SENSOR, SUPPLY AIR TEMP |
| RT16 | SENSOR, RETURN AIR TEMP |
| S27 | SWITCH, FILTER |
| S52 | SWITCH, AIRFLOW |
| S42 | SWITCH, OVERLOAD RELAY BLOWER MOTOR |
| S86 | SWITCH, DEHUMIDISTAT |
| S135 | OVERLOAD, BLOWER MOTOR SUPPLY |
| S149 | SWITCH, OVERFLOW ONE |
| S179 | SWITCH, OVERFLOW TWO |
| T8 | TRANSFORMER, 120 V GENERATOR POWERED |

DESIGNATES OPTIONAL WIRING
CLASS II FIELD WIRING

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. REMOTE LOCATION OF RT6
4. P298-8 (DO-1) IS SERVICE RELAY OUTPUT (24VAC) IF USED CONNECT TO AN INDICATOR LIGHT
5. THERMOSTAT HOOKUP FOR PROGRAMMABLE CONFIGURATION OF THE BOARD (A55).
6. PRODIGY SETTINGS MUST BE MODIFIED WHEN K222, S42, S52, S149 OR S179 ARE INSTALLED
7. CONNECT A172 SENSOR TO J261 ON SUPPLY AIR SMOKE DETECTOR ONLY
8. S179, OVERFLOW SWITCH USED ON LGH/LCH 420-600 UNITS ONLY
9. A63, A34 & A24 ARE MUTUALLY EXCLUSIVE
10. FACTORY INSTALLED OPTION FOR LGH/LCH 242-600 UNITS ONLY

| | | |
|---|---|---|
| 08/17 | WIRING DIAGRAM<br>537108-03 | 08/17 |
| ACCESSORIES | | |
| ELECTRONIC OR ELECTROMECHANICAL THERMOSTAT FOR ENERGENCE | | |
| SECTION C | | REV. 3 |
| Supersedes | New Form No.<br>537108-03 | |

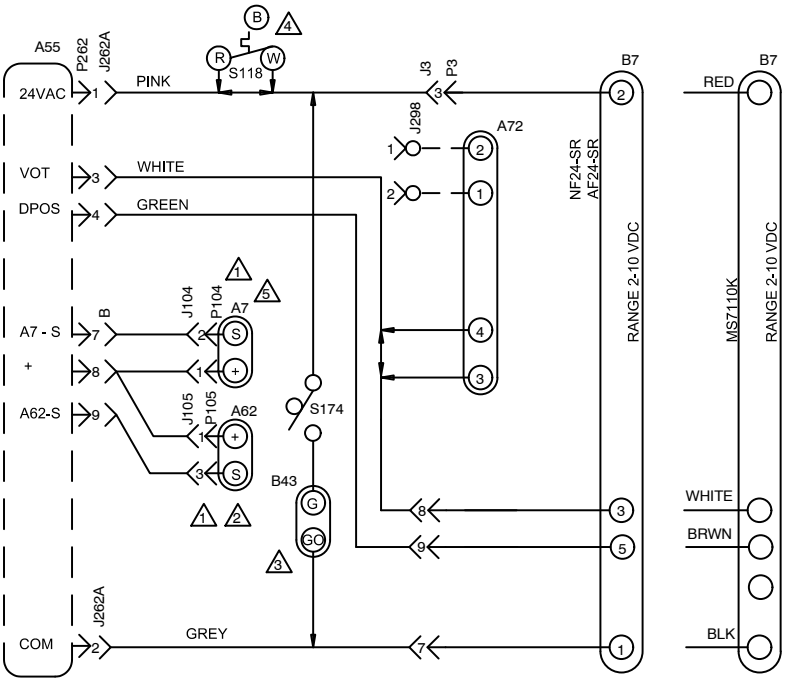
1 The A55 Unit Controller energizes the thermostat components with 24VAC via J/P297-1.

2 The A55 Unit Controller proves the optional N.O. filter switch S27 (indicates dirty filter when closed) and optional N.O. air flow switch S52 (indicates no air [i.e. broken belt] system shuts down).

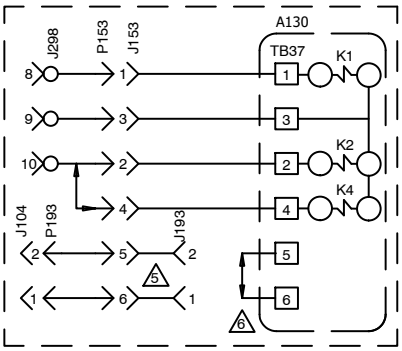
3 The A55 Unit Controller receives data from the supply and return smoke detectors A171 and A172, blower motor overload relay S42, discharge sensor RT6 and return air sensor RT16.

4 The A55 Unit Controller receives data from the electronic thermostat A2 (Y1, Y2, W1, W2, G, OCP) and the $CO_2$ sensor A63 (if economizer is used). A55 energizes the appropriate components.

# *ECONOMIZER*




| DESCRIPTION | |
|---|---|
| KEY | COMPONENT |
| A7 | SENSOR, SOLID STATE ENTHALPY |
| A130 | CONTROL, ERS |
| A55 | CONTROL, MAIN PANEL LENNOX |
| A62 | SENSOR, ENTHALPY INDOOR |
| A72 | CONTROL, REMOTE MIN POS (OPT) |
| B7 | MOTOR, DAMPER ECONOMIZER |
| B43 | MOTOR, EXHAUST DAMPER |
| J3 | JACK, UNIT ECONOMIZER |
| J104 | JACK, SENSOR OUTDOOR ENTHALPY |
| J105 | JACK, SENSOR RETURN AIR ENTHALPY |
| J153 | JACK, ENTHALPY / DAMPER MOTOR |
| J193 | JACK, ENTHALPY SENSOR |
| J298A | JACK, IAQ INTERFACE |
| J262A | JACK, DAMPER MOTOR |
| J262B | JACK, ENTHALPY SENSORS |
| P3 | PLUG, ECONOMIZER BYPASS |
| P153 | PLUG, ENTHALPY / DAMPER MOTOR |
| P193 | PLUG, ENTHALPY SENSOR |
| P262 | PLUG, ECONOMIZER OUTPUT |
| S118 | THERMOSTAT, DESICANT DEFROST |
| S174 | SWITCH, EXHAUST DAMPER |




ENERGY RECOVERY WHEEL HOOK UP

NOTE - THIS DIAGRAM USED ONLY WHEN ECONOMIZER OR MOTORIZED OUTDOOR AIR DAMPERS ARE INSTALLED.

1. DELETE A7 AND A62 ( IF USED) FOR EITHER GLOBAL ENTHALPY OR SENSIBLE TEMPERATURE CONTROL
2. FOR UNIT DIFFERENTIAL ENTHALPY CONTROL, ADD A62 RETURN AIR ENTHALPY SENSOR
3. OPTIONAL EXHAUST DAMPER ACTUATOR TO HOLD EXHAUST DAMPER CLOSED WHEN OUTSIDE AIR DAMPER IS CLOSED
4. S118 USED ON 35 TO 50 TON ENERGENCE UNITS WITH ENERGY RECOVERY WHEEL ( ERW )
5. REPOSITION A7 ENTHALPY SENSOR FROM ROOFTOP UNIT ECONOMIZER INTO INTAKE HOOD OF THE ERW ROOFTOP UNIT
6. REMOVE JUMPER WHEN INSTALLING OPTIONAL LOW AMBIENT SWITCH

DESIGNATES OPTIONAL WIRING
CLASS II FIELD WIRING

| WIRING DIAGRAM | 04/18 |
|---|---|
| ACCESSORIES | |
| ENERGENCE/STRATEGOS SERIES ECONOMIZER AND MOTORIZED OAD PIVOTING WHEEL ENERGY RECOVERYSYSTEM OPTION | |
| SECTION D | REV 3 |
| Supersedes | New Form No. 537189-01 |

**POWER:**

1 A55 Unit Controller energizes the economizer components with 24VAC.

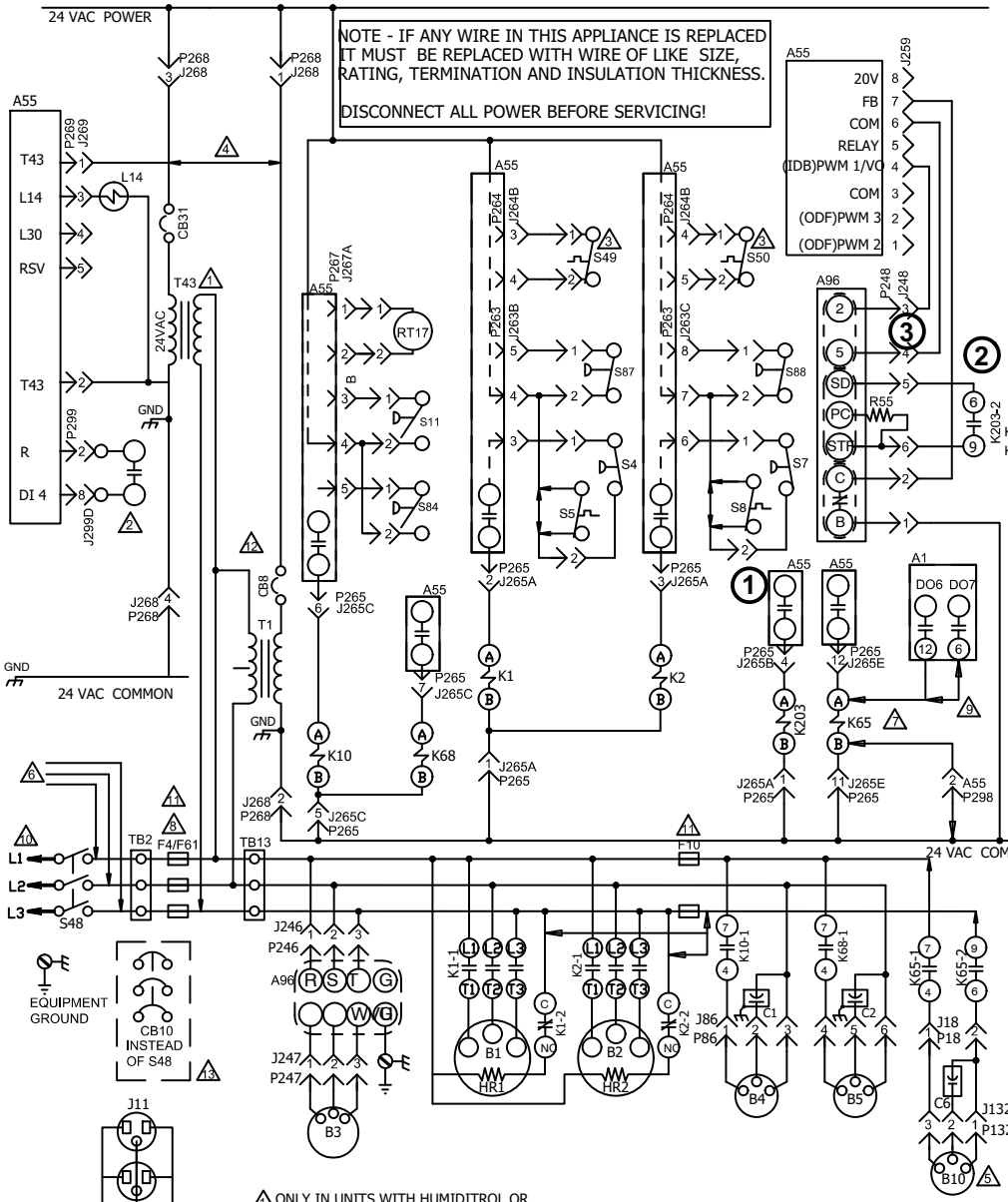
**OPERATION:**

2 The A55 Unit Controller along with outdoor enthalpy sensor A7 and indoor enthalpy sensor A62 (if differential enthalpy is used) powers the damper motor B7.

3 A55 supplies B7 with 0 - 10 VDC to control the positioning of economizer.

4 The damper actuator provides 2 to 10 VDC position feedback.

# LCH092/102/120H STAGED SUPPLY AIR, NO BYPASS, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A1 | PANEL, AUTOMATED LOGIC CONTROL (ALC) |
| A55 | PANEL, MAIN |
| A96 | CONTROL INVERTER |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C2 | CAPACITOR, OUTDOOR FAN 2 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT, BREAKER, T1 |
| CB10 | CIRCUIT BREAKER, MAIN DISCONNECT, UNIT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F61 | FUSE, SCCR OPTION UNIT |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,–1 | CONTACTOR, COMPRESSOR 1 |
| K2,–1 | CONTACTOR, COMPRESSOR 2 |
| K8, –1 | CONTACTOR, BLOWER |
| K10,–1,2 | RELAY, OUTDOOR FAN 1 |
| K65–1,2 | RELAY, EXHAUST FAN |
| K68,–1,2 | RELAY, OUTDOOR FAN 2 |
| K203,–2 | RELAY, INVERTER START/RUN |
| L14 | VALVE SOLENOID, REHEAT COIL 1 |
| R55 | RESISTOR, VFD LOADING, A96 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S7 | SWITCH, LIMIT HI PRESS COMPRESS 2 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S84 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| S88 | SWITCH, LOW PRESS, COMPRESSOR 2 |
| T1 | TRANSFORMER, CONTROL |
| T43 | TRANSFORMER, REHEAT |
| TB2 | TERMINAL STRIP, UNIT |
| TB13 | TERMINAL STRIP, POWER DISTRIBUTION |

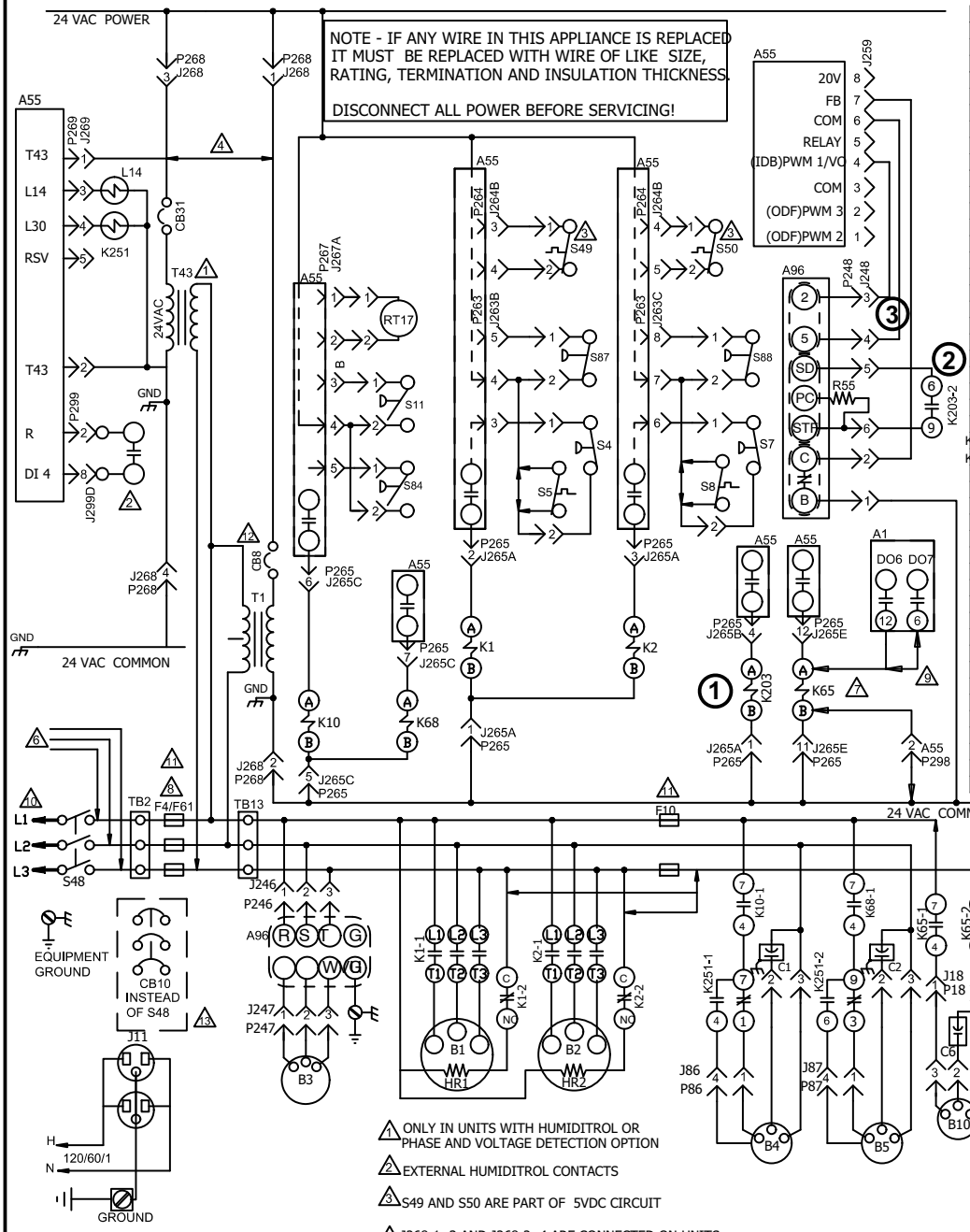
| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | POWER, EXHAUST FAN |
| 86 | POWER, OUTDOOR FAN INTERFACE |
| 132 | POWER, EXHAUST FAN MOTOR |
| 194 | GP CONTROL INPUT/OUTPUT |
| 246 | POWER TO VFD |
| 247 | POWER, VFD TO MOTOR |
| 248 | VFD CONTROL |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANFORMER T1 POWER |
| 269 | TRANFORMER T43 POWER |
| 298 | IAQ INTERFACE |
| 299 | HUMIDITROL, SAFETY |

1. ONLY IN UNITS WITH HUMIDITROL OR PHASE AND VOLTAGE DETECTION OPTION
2. EXTERNAL HUMIDITROL CONTACTS
3. S49 AND S50 ARE PART OF 5VDC CIRCUIT
4. J268-1,-3 AND J268-2,-4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS
5. B10 IS NOT USED ON UNITS WITH ERV
6. USED ON UNITS WITH ERV SINGLE POINT POWER. SEE ERV DIAGRAM
7. A65 IS CONTROLLED BY A1 ONLY IN TARGET ALC APPLICATIONS
8. USED ON LCH AND UNITS WITH ERV SINGLE POINT POWER ONLY
9. DO7 USED ON UNITS WITH HUMIDITROL TO POWER EXHAUST FANS. DO6 PROVIDES POWER TO K65 ON UNITS WITH NO HUMIDITROL
10. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
11. F61 AND F10 USED ONLGH UNITS WITH SCCR OPTION
12. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
13. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| 2018/07 | WIRING DIAGRAM | 07/18 |
|---|---|---|
| | 537626-04 | |
| COOLING -MSAV NO BYPASS | | |
| LCH/LGH - 092H,102H,120H - G,J,M,Y | | |
| | SECTION B | REV 0 |
| Supersedes 537626-03 | New Form No. 537626-04 | |

# LCH150H - Y - STAGED SUPPLY AIR, NO BYPASS, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A1 | PANEL, AUTOMATED LOGIC CONTROL (ALC) |
| A55 | PANEL, MAIN |
| A96 | CONTROL INVERTER |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C2 | CAPACITOR, OUTDOOR FAN 2 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT, BREAKER, T1 |
| CB10 | CIRCUIT BREAKER, MAIN DISCONNECT, UNIT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F61 | FUSE, SCCR OPTION UNIT |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,–1 | CONTACTOR, COMPRESSOR 1 |
| K2,–1 | CONTACTOR, COMPRESSOR 2 |
| K3, –1 | CONTACTOR, BLOWER |
| K10,–1,2 | RELAY, OUTDOOR FAN 1 |
| K65–1,2 | RELAY, EXHAUST FAN |
| K68,–1,2 | RELAY, OUTDOOR FAN 2 |
| K203,–2 | RELAY, INVERTER START/RUN |
| K251–1,2 | RELAY, 2 SPEED MOTOR |
| L14 | VALVE SOLENOID, REHEAT COIL 1 |
| R55 | RESISTOR, VFD LOADING, A96 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S7 | SWITCH, LIMIT HI PRESS COMPRESS 2 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S84 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| S88 | SWITCH, LOW PRESS, COMPRESSOR 2 |
| T1 | TRANSFORMER, CONTROL |
| T43 | TRANSFORMER, REHEAT |
| TB2 | TERMINAL STRIP, UNIT |
| TB13 | TERMINAL STRIP, POWER DISTRIBUTION |

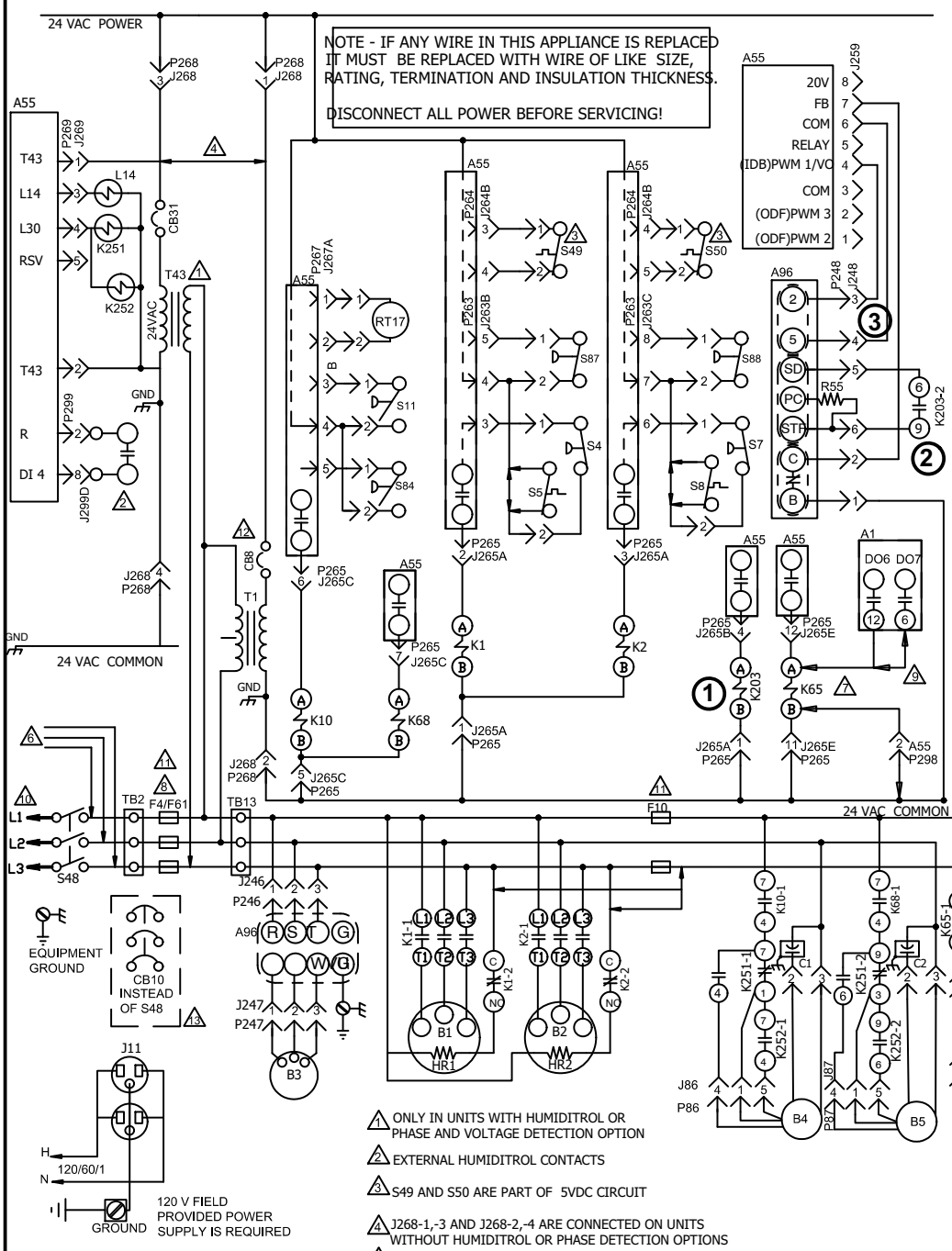
| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | POWER, EXHAUST FAN |
| 86 | POWER, OUTDOOR FAN 1 |
| 87 | POWER, OUTDOOR FAN 2 |
| 132 | POWER, EXHAUST FAN MOTOR |
| 194 | GP CONTROL INPUT/OUTPUT |
| 246 | POWER TO VFD |
| 247 | POWER, VFD TO MOTOR |
| 248 | VFD CONTROL |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANFORMER T1 POWER |
| 269 | TRANFORMER T43 POWER |
| 298 | IAQ INTERFACE |
| 299 | HUMIDITROL, SAFETY |

1. ONLY IN UNITS WITH HUMIDITROL OR PHASE AND VOLTAGE DETECTION OPTION
2. EXTERNAL HUMIDITROL CONTACTS
3. S49 AND S50 ARE PART OF 5VDC CIRCUIT
4. J268-1,-3 AND J268-2,-4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS
5. B10 IS NOT USED ON UNITS WITH ERV
6. USED ON UNITS WITH ERV SINGLE POINT POWER. SEE ERV DIAGRAM
7. K65 IS CONTROLLED BY A1 ONLY IN TARGET ALC APPLICATIONS
8. USED ON LCH AND UNITS WITH ERV SINGLE POINT POWER ONLY
9. DO7 USED ON UNITS WITH HUMIDITROL TO POWER EXHAUST FANS. DO6 PROVIDES POWER TO K65 ON UNITS WITH NO HUMIDITROL
10. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
11. F61 AND F10 USED ON LGH UNITS WITH SCCR OPTION
12. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
13. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| | | |
|---|---|---|
| 2018/07 | WIRING DIAGRAM<br>537907-02 | 07/18 |
| | COOLING -MSAV NO BYPASS | |
| | LCH/LGH - 150H - Y | |
| | SECTION B | REV 0 |
| Supersedes<br>537907-01 | New Form No.<br>537907-02 | |

# LCH150H G, J, M - STAGED SUPPLY AIR, NO BYPASS, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A1 | PANEL, AUTOMATED LOGIC CONTROL (ALC) |
| A55 | PANEL, MAIN |
| A96 | CONTROL INVERTER |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C2 | CAPACITOR, OUTDOOR FAN 2 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT, BREAKER, T1 |
| CB10 | CIRCUIT BREAKER, MAIN DISCONNECT, UNIT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F61 | FUSE, SCCR OPTION UNIT |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,–1 | CONTACTOR, COMPRESSOR 1 |
| K2,–1 | CONTACTOR, COMPRESSOR 2 |
| K3, –1 | CONTACTOR, BLOWER |
| K10,–1,2 | RELAY, OUTDOOR FAN 1 |
| K65–1,2 | RELAY, EXHAUST FAN |
| K68,–1,2 | RELAY, OUTDOOR FAN 2 |
| K203,–2 | RELAY, INVERTER START/RUN |
| K251–1,2 | RELAY, 2 SPEED MOTOR HIGH |
| K252–1,2 | RELAY, 2 SPEED MOTOR LOW |
| L14 | VALVE SOLENOID, REHEAT COIL 1 |
| R55 | RESISTOR, VFD LOADING, A96 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S7 | SWITCH, LIMIT HI PRESS COMPRESS 2 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S84 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| S88 | SWITCH, LOW PRESS, COMPRESSOR 2 |
| T1 | TRANSFORMER, CONTROL |
| T43 | TRANSFORMER, REHEAT |
| TB2 | TERMINAL STRIP, UNIT |
| TB13 | TERMINAL STRIP, POWER DISTRIBUTION |

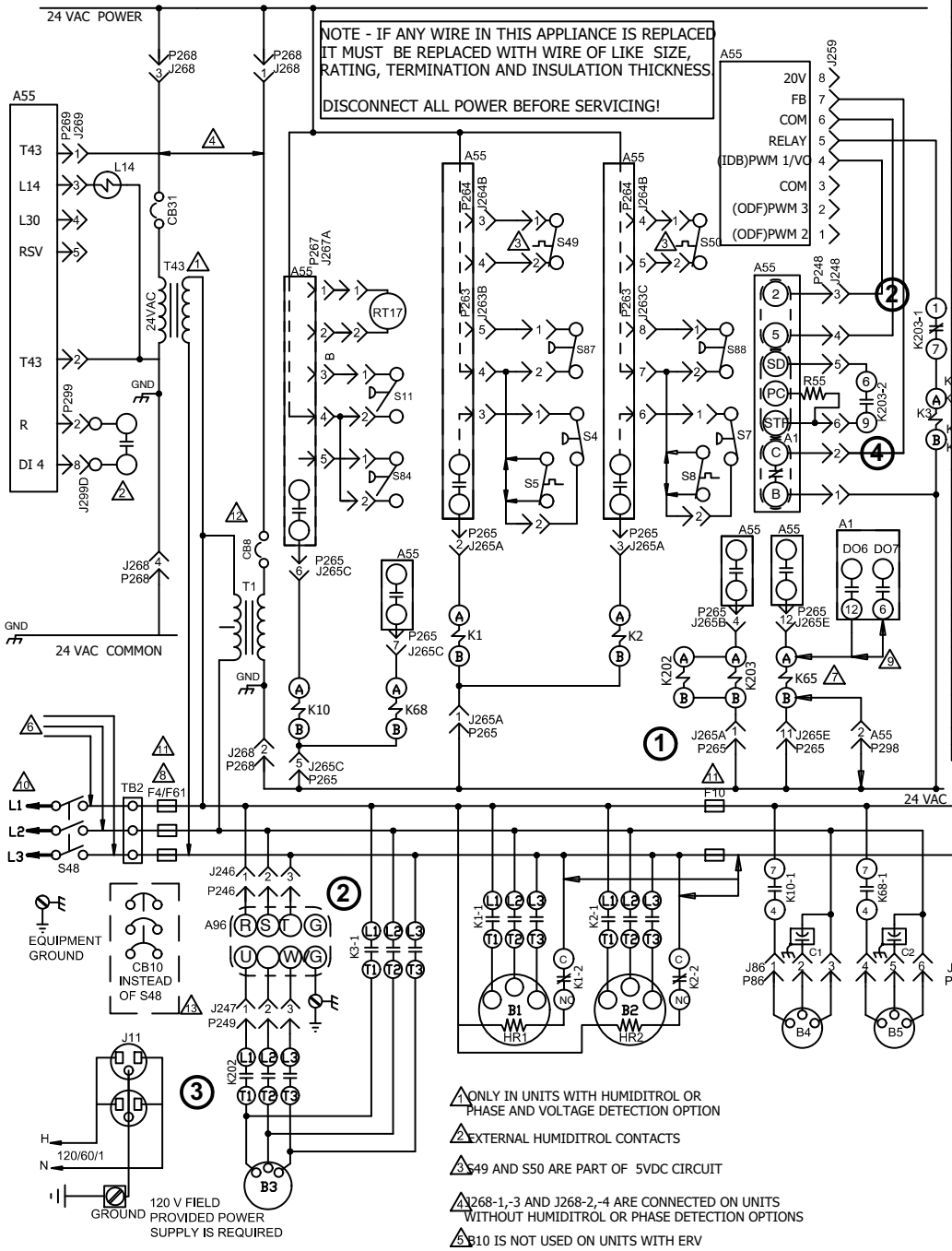
| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | POWER, EXHAUST FAN |
| 86 | POWER, OUTDOOR FAN 1 |
| 87 | POWER, OUTDOOR FAN 2 |
| 132 | POWER, EXHAUST FAN MOTOR |
| 194 | GP CONTROL INPUT/OUTPUT |
| 246 | POWER TO VFD |
| 247 | POWER, VFD TO MOTOR |
| 248 | VFD CONTROL |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANFORMER T1 POWER |
| 269 | TRANFORMER T43 POWER |
| 298 | IAQ INTERFACE |
| 299 | HUMIDITROL, SAFETY |

1. ONLY IN UNITS WITH HUMIDITROL OR PHASE AND VOLTAGE DETECTION OPTION
2. EXTERNAL HUMIDITROL CONTACTS
3. S49 AND S50 ARE PART OF 5VDC CIRCUIT
4. J268-1,-3 AND J268-2,-4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS
5. B10 IS NOT USED ON UNITS WITH ERV
6. USED ON UNITS WITH ERV SINGLE POINT POWER. SEE ERV DIAGRAM
7. K65 IS CONTROLLED BY A1 ONLY IN TARGET ALC APPLICATIONS
8. USED ON LCH AND UNITS WITH ERV SINGLE POINT POWER ONLY
9. DO7 USED ON UNITS WITH HUMIDITROL TO POWER EXHAUST FANS. DO6 PROVIDES POWER TO K65 ON UNITS WITH NO HUMIDITROL
10. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
11. F61 AND F10 USED ON LGH UNITS WITH SCCR OPTION
12. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
13. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| | | |
|---|---|---|
| 2018/07 | WIRING DIAGRAM<br>537908-02 | 07/18 |
| | COOLING -MSAV NO BYPASS | |
| | LCH/LGH -150H - G,J,M | |
| | SECTION B | REV 0 |
| Supersedes<br>537908-01 | New Form No.<br>537908-02 | |

# LCH092/102/120H STAGED SUPPLY AIR, WITH BYPASS, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A1 | PANEL, AUTOMATED LOGIC CONTROL (ALC) |
| A55 | PANEL, MAIN |
| A96 | CONTROL INVERTER |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C2 | CAPACITOR, OUTDOOR FAN 2 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT, BREAKER, T1 |
| CB10 | CIRCUIT BREAKER, MAIN DISCONNECT, UNIT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F61 | FUSE, SCCR OPTION UNIT |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,–1 | CONTACTOR, COMPRESSOR 1 |
| K2,–1 | CONTACTOR, COMPRESSOR 2 |
| K3, –1 | CONTACTOR, BLOWER |
| K10,–1,2 | RELAY, OUTDOOR FAN 1 |
| K65–1,2 | RELAY, EXHAUST FAN |
| K68,–1,2 | RELAY, OUTDOOR FAN 2 |
| K202,–1 | CONTACTOR, POWER TO MOTOR |
| K203,–2 | RELAY, INVERTER START/RUN |
| L14 | VALVE SOLENOID, REHEAT COIL 1 |
| R55 | RESISTOR, VFD LOADING, A96 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S7 | SWITCH, LIMIT HI PRESS COMPRESS 2 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S84 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| S88 | SWITCH, LOW PRESS, COMPRESSOR 2 |
| T1 | TRANSFORMER, CONTROL |
| T43 | TRANSFORMER, REHEAT |
| TB2 | TERMINAL STRIP, UNIT |

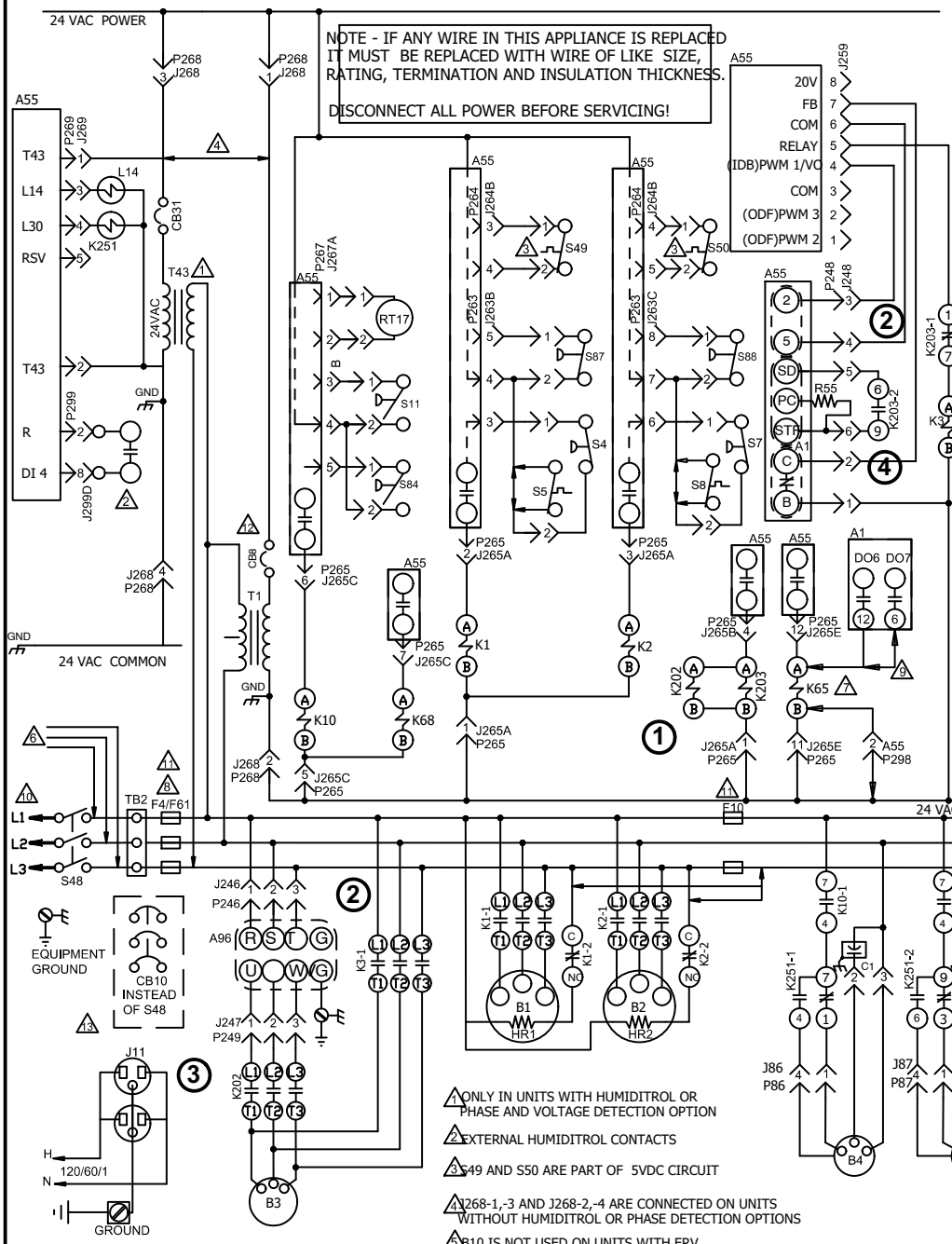
| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | POWER, EXHAUST FAN |
| 86 | POWER, OUTDOOR FAN INTERFACE |
| 132 | POWER, EXHAUST FAN MOTOR |
| 194 | GP CONTROL INPUT/OUTPUT |
| 246 | POWER TO VFD |
| 247 | POWER, VFD TO MOTOR |
| 248 | VFD CONTROL |
| 249 | POWER, CONTACTOR BYPASS |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANFORMERS T1 POWER |
| 269 | TRANFORMER T43 POWER |
| 298 | IAQ INTERFACE |
| 299 | HUMIDITROL, SAFETY |

1. ONLY IN UNITS WITH HUMIDITROL OR PHASE AND VOLTAGE DETECTION OPTION
2. EXTERNAL HUMIDITROL CONTACTS
3. S49 AND S50 ARE PART OF 5VDC CIRCUIT
4. J268-1,-3 AND J268-2,-4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS
5. B10 IS NOT USED ON UNITS WITH ERV
6. USED ON UNITS WITH ERV SINGLE POINT POWER. SEE ERV DIAGRAM
7. K65 IS CONTROLLED BY A1 ONLY IN TARGET ALC APPLICATIONS
8. USED ON LCH AND UNITS WITH ERV SINGLE POINT POWER ONLY
9. DO7 USED ON UNITS WITH HUMIDITROL TO POWER EXHAUST FANS. DO6 PROVIDES POWER TO K65 ON UNITS WITH NO HUMIDITROL
10. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
11. F61 AND F10 USED ON LGH UNITS WITH SCCR OPTION
12. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
13. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| 2018/07 | WIRING DIAGRAM | 07/18 |
|---|---|---|
| | 537627-04 | |
| COOLING -MSAV WITH BYPASS | | |
| LCH/LGH - 092H,102H,120H - G,J,M,Y | | |
| SECTION B | | REV 0 |
| Supersedes 537627-03 | New Form No. 537627-04 | |

# LCH150H - Y - STAGED SUPPLY AIR, WITH BYPASS, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A1 | PANEL, AUTOMATED LOGIC CONTROL (ALC) |
| A55 | PANEL, MAIN |
| A96 | CONTROL INVERTER |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C2 | CAPACITOR, OUTDOOR FAN 2 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT, BREAKER, T1 |
| CB10 | CIRCUIT BREAKER, MAIN DISCONNECT, UNIT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F61 | FUSE, SCCR OPTION UNIT |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,–1 | CONTACTOR, COMPRESSOR 1 |
| K2,–1 | CONTACTOR, COMPRESSOR 2 |
| K3, –1 | CONTACTOR, BLOWER |
| K10,–1,2 | RELAY, OUTDOOR FAN 1 |
| K65–1,2 | RELAY, EXHAUST FAN |
| K68,–1,2 | RELAY, OUTDOOR FAN 2 |
| K202,–1 | CONTACTOR, POWER TO MOTOR |
| K203,–2 | RELAY, INVERTER START/RUN |
| K251–1,2 | RELAY, 2 SPEED MOTOR |
| L14 | VALVE SOLENOID, REHEAT COIL 1 |
| R55 | RESISTOR, VFD LOADING, A96 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S7 | SWITCH, LIMIT HI PRESS COMPRESS 2 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S84 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| S88 | SWITCH, LOW PRESS, COMPRESSOR 2 |
| T1 | TRANSFORMER, CONTROL |
| T43 | TRANSFORMER, REHEAT |
| TB2 | TERMINAL STRIP, UNIT |

| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | POWER, EXHAUST FAN |
| 86 | POWER, OUTDOOR FAN 1 |
| 87 | POWER, OUTDOOR FAN 2 |
| 132 | POWER, EXHAUST FAN MOTOR |
| 194 | GP CONTROL INPUT/OUTPUT |
| 246 | POWER TO VFD |
| 247 | POWER, VFD TO MOTOR |
| 248 | VFD CONTROL |
| 249 | POWER, CONTACTOR BYPASS |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANFORMERS T1 POWER |
| 269 | TRANFORMER T43 POWER |
| 298 | IAQ INTERFACE |
| 2 | HUMIDITROL, SAFETY |

1 ONLY IN UNITS WITH HUMIDITROL OR PHASE AND VOLTAGE DETECTION OPTION

2 EXTERNAL HUMIDITROL CONTACTS

3 S49 AND S50 ARE PART OF 5VDC CIRCUIT

4 J268-1,-3 AND J268-2,-4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS

5 B10 IS NOT USED ON UNITS WITH ERV

6 USED ON UNITS WITH ERV SINGLE POINT POWER. SEE ERV DIAGRAM

7 K65 IS CONTROLLED BY A1 ONLY IN TARGET ALC APPLICATIONS

8 USED ON LCH AND UNITS WITH ERV SINGLE POINT POWER ONLY

9 DO7 USED ON UNITS WITH HUMIDITROL TO POWER EXHAUST FANS. DO6 PROVIDES POWER TO K65 ON UNITS WITH NO HUMIDITROL

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

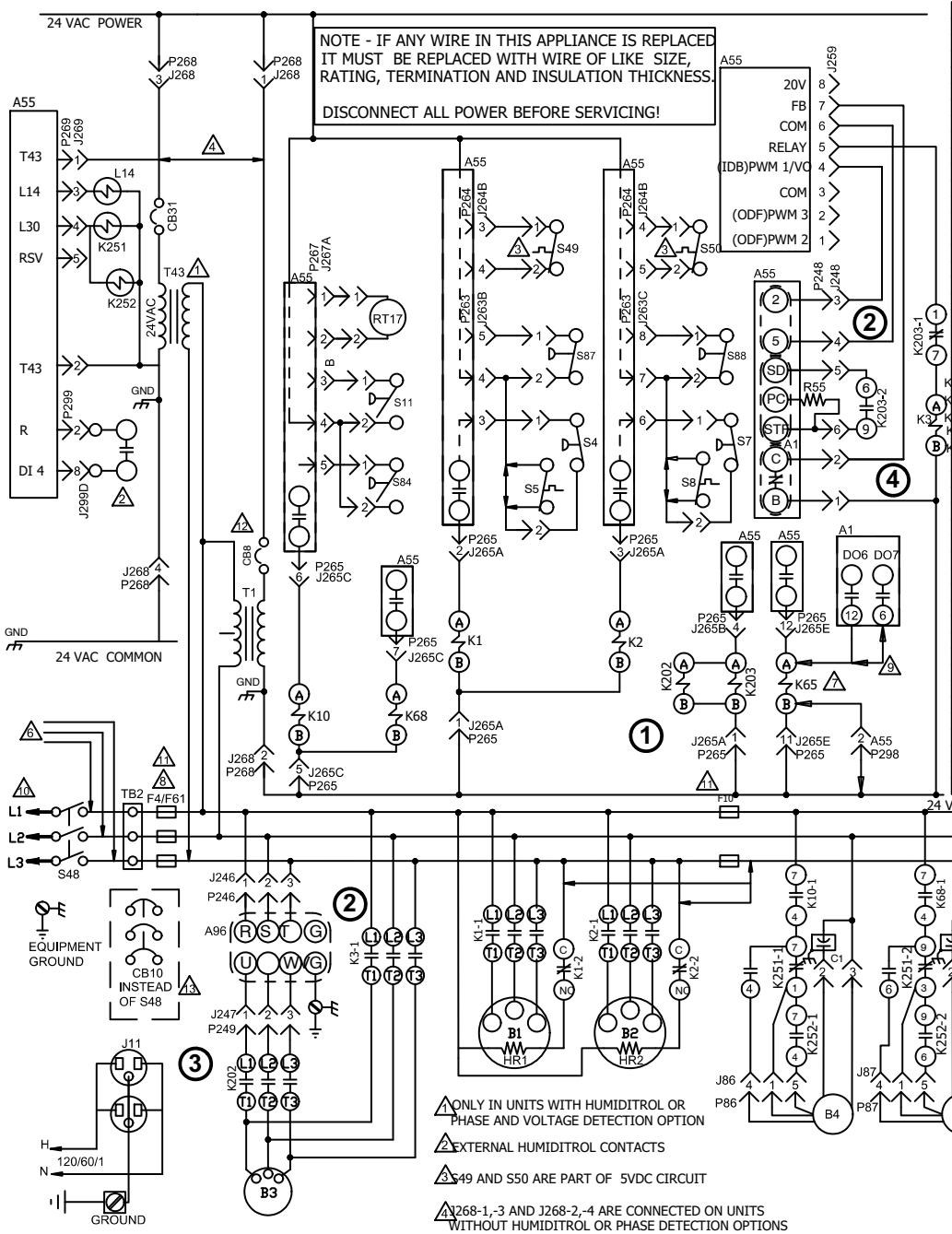
11 F61 AND F10 USED ON LGH UNITS WITH SCCR OPTION

12 MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS

13 CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

| 2018/07 | WIRING DIAGRAM | 07/18 |
|---|---|---|
| | 537909-02 | |
| | COOLING -MSAV WITH BYPASS | |
| | LCH/LGH - 150H - Y | |
| | SECTION B | REV 0 |
| Supersedes 537909-01 | New Form No. 537909-02 | |

# LCH150H - G, J, M - STAGED SUPPLY AIR, WITH BYPASS, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A1 | PANEL, AUTOMATED LOGIC CONTROL (ALC) |
| A55 | PANEL, MAIN |
| A96 | CONTROL INVERTER |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| C1 | CAPACITOR, OUTDOOR FAN 1 |
| C2 | CAPACITOR, OUTDOOR FAN 2 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT, BREAKER, T1 |
| CB10 | CIRCUIT BREAKER, MAIN DISCONNECT, UNIT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F61 | FUSE, SCCR OPTION UNIT |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,–1 | CONTACTOR, COMPRESSOR 1 |
| K2,–1 | CONTACTOR, COMPRESSOR 2 |
| K3, –1 | CONTACTOR, BLOWER |
| K10,–1,2 | RELAY, OUTDOOR FAN 1 |
| K65–1,2 | RELAY, EXHAUST FAN |
| K68,–1,2 | RELAY, OUTDOOR FAN 2 |
| K202,–1 | CONTACTOR, POWER TO MOTOR |
| K203,–2 | RELAY, INVERTER START/RUN |
| K251–1,2 | RELAY, 2 SPEED MOTOR HIGH |
| K252–1,2 | RELAY, 2 SPEED MOTOR LOW |
| L14 | VALVE SOLENOID, REHEAT COIL 1 |
| R55 | RESISTOR, VFD LOADING, A96 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S7 | SWITCH, LIMIT HI PRESS COMPRESS 2 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S84 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| S88 | SWITCH, LOW PRESS, COMPRESSOR 2 |
| T1 | TRANSFORMER, CONTROL |
| T43 | TRANSFORMER, REHEAT |
| TB2 | TERMINAL STRIP, UNIT |

120 V FIELD PROVIDED POWER SUPPLY IS REQUIRED

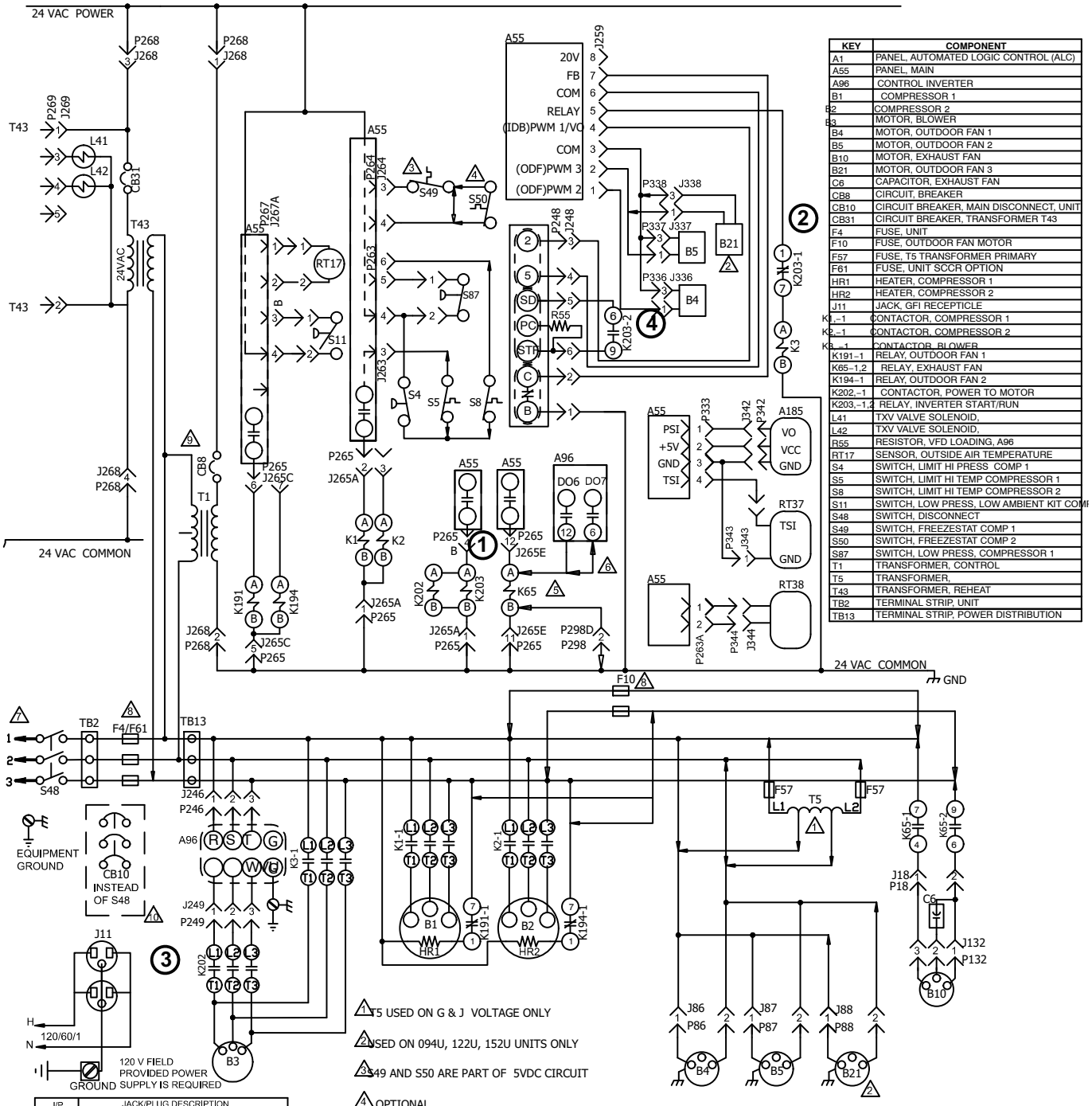
| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | POWER, EXHAUST FAN |
| 86 | POWER, OUTDOOR FAN 1 |
| 87 | POWER, OUTDOOR FAN 2 |
| 132 | POWER, EXHAUST FAN MOTOR |
| 194 | GP CONTROL INPUT/OUTPUT |
| 246 | POWER TO VFD |
| 247 | POWER, VFD TO MOTOR |
| 248 | VFD CONTROL |
| 249 | POWER, CONTACTOR BYPASS |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANFORMERS T1 POWER |
| 269 | TRANFORMER T43 POWER |
| 298 | IAQ INTERFACE |
| 299 | HUMIDITROL, SAFETY |

1. ONLY IN UNITS WITH HUMIDITROL OR PHASE AND VOLTAGE DETECTION OPTION
2. EXTERNAL HUMIDITROL CONTACTS
3. S49 AND S50 ARE PART OF 5VDC CIRCUIT
4. J268-1,-3 AND J268-2,-4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS
5. B10 IS NOT USED ON UNITS WITH ERV
6. USED ON UNITS WITH ERV SINGLE POINT POWER. SEE ERV DIAGRAM
7. K65 IS CONTROLLED BY A1 ONLY IN TARGET ALC APPLICATIONS
8. USED ON LCH AND UNITS WITH ERV SINGLE POINT POWER ONLY
9. DO7 USED ON UNITS WITH HUMIDITROL TO POWER EXHAUST FANS. DO6 PROVIDES POWER TO K65 ON UNITS WITH NO HUMIDITROL
10. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
11. F61 & F10 USED ON LGH UNITS WITH SCCR OPTION
12. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
13. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| | | |
|---|---|---|
| 2018/07 | WIRING DIAGRAM<br>537910-02 | 07/18 |
| | COOLING -MSAV WITH BYPASS | |
| | LCH/LGH - 150H - G,J,M | |
| | SECTION B | REV 0 |
| Supersedes<br>537910-01 | New Form No.<br>537910-02 | |

# LCH092-152U STAGED SUPPLY AIR, WITH BYPASS, BELT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A1 | PANEL, AUTOMATED LOGIC CONTROL (ALC) |
| A55 | PANEL, MAIN |
| A96 | CONTROL INVERTER |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| B21 | MOTOR, OUTDOOR FAN 3 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT, BREAKER |
| CB10 | CIRCUIT BREAKER, MAIN DISCONNECT, UNIT |
| CB31 | CIRCUIT BREAKER, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F57 | FUSE, T5 TRANSFORMER PRIMARY |
| F61 | FUSE, UNIT SCCR OPTION |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,-1 | CONTACTOR, COMPRESSOR 1 |
| K2,-1 | CONTACTOR, COMPRESSOR 2 |
| K3,-1 | CONTACTOR, BLOWER |
| K191-1 | RELAY, OUTDOOR FAN 1 |
| K65-1,2 | RELAY, EXHAUST FAN |
| K194-1 | RELAY, OUTDOOR FAN 2 |
| K202,-1 | CONTACTOR, POWER TO MOTOR |
| K203,-1,2 | RELAY, INVERTER START/RUN |
| L41 | TXV VALVE SOLENOID, |
| L42 | TXV VALVE SOLENOID, |
| R55 | RESISTOR, VFD LOADING, A96 |
| RT17 | SENSOR, OUTSIDE AIR TEMPERATURE |
| S4 | SWITCH, LIMIT HI PRESS COMP 1 |
| S5 | SWITCH, LIMIT HI TEMP COMPRESSOR 1 |
| S8 | SWITCH, LIMIT HI TEMP COMPRESSOR 2 |
| S11 | SWITCH, LOW PRESS, LOW AMBIENT KIT COMP |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S50 | SWITCH, FREEZESTAT COMP 2 |
| S87 | SWITCH, LOW PRESS, COMPRESSOR 1 |
| T1 | TRANSFORMER, CONTROL |
| T5 | TRANSFORMER, |
| T43 | TRANSFORMER, REHEAT |
| TB2 | TERMINAL STRIP, UNIT |
| TB13 | TERMINAL STRIP, POWER DISTRIBUTION |

| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | POWER, EXHAUST FAN |
| 86 | POWER, OUTDOOR FAN INTERFACE B4 |
| 87 | POWER, OUTDOOR FAN INTERFACE B5 |
| 88 | POWER, OUTDOOR FAN INTERFACE B21 |
| 132 | POWER, EXHAUST FAN MOTOR |
| 246 | POWER TO VFD |
| 247 | POWER, VFD TO MOTOR |
| 248 | VFD CONTROL |
| 249 | POWER, CONTACTOR BYPASS |
| 259 | BLOWER CONTROL HARNESS |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANFORMERS T1 POWER |
| 269 | TRANFORMER T43 POWER |
| 298 | IAQ INTERFACE |

1. T5 USED ON G & J VOLTAGE ONLY
2. USED ON 094U, 122U, 152U UNITS ONLY
3. S49 AND S50 ARE PART OF 5VDC CIRCUIT
4. OPTIONAL
5. K65 CONTROLLED BY A1, IN TARGET ALC APPLICATIONS ONLY
6. DO7 USED ON UNITS WITH HUMIDITROL TO POWER EXHAUST FANS. DO6 PROVIDES POWER TO K65 ON UNITS WITH NO HUMIDITROL
7. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT
8. F10 USED ON UNITS WITH SCCR OPTION. F61 USED ON LGH UNITS WITH SCCR OPTION
9. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
10. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| | | |
|---|---|---|
| 2019/02 | WIRING DIAGRAM<br>537617-04 | 02/19 |
| | COOLING -MSAV WITH BYPASS | |
| | (ULTRA) LCH/LGH - 092U, 094U, 120U, 122U, 152U - Y, G, J, M | |
| | SECTION B | REV 1 |
| Supersedes<br>537617-03 | New Form No.<br>537617-04 | |

## SUPPLY AIR INVERTER - NO BYPASS SEQUENCE OF OPERATION

**OPERATION:**

1 A55 energizes the K203 relay coil.

2 K203-2 N.O. contacts close to start A96 forward rotation signal STF.

3 Blower B3 speed is controlled by a 0-10VDC signal from A55 to A96 terminal 2. VFD output voltage can be checked between A96 terminals 2 and 5.

**A96 FAULT SEQUENCE:**

A96 will interrupt the 0-10VDC signal at terminal 2 on an internal failure. A96 will retry three times before terminals B-C open. In addition, A55 will recognize A96 B-C contacts are open and A55 will de-energize the K203 coil.

*Optional S52 Blower Proving Switch Installed -*
Refer to Blower Fault Sequence below.

## SUPPLY AIR INVERTER - WITH OPTIONAL FACTORY-INSTALLED BYPASS SEQUENCE OF OPERATION

**OPERATION:**

1 A55 energizes K202 and K203 relay coils.

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

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

4 K203-2 N.O. contacts close to start A96 forward rotation signal STF.

5 Blower B3 speed is controlled by a 0-10VDC signal from A55 PWM1/VO to A96 terminal 2. VFD output voltage can be checked between A96 terminals 2 and 5.

**A96 FAULT SEQUENCE:**

The same sequence as shown above. Note that the same alarms will be displayed whether there is an A96 internal fault, a blower component failure, or a control failure.

**BLOWER FAULT SEQUENCE**:

1 The control system initiates a blower demand.

2 After 16 seconds, if S52 remains open, A55 will shut the blower down for 5 minutes.

3 A55 will energize the blower.

4 After 16 seconds if S52 remains open, A55 will shut the blower down for another 5 minutes.

5 After the third try, A55 will shut the unit down.

*Note - The unit will remain in lockout until the failed component is fixed or A55 selection conditions are changed to: M2-SETTINGS-CONTROL-MSAV-VFD BYPASS-ENGAGE M3-RTU OPTION-BLOWER-VFD BYPASS DISENGAGED - NO (configuration ID 1 set to A=automatic bypass).*

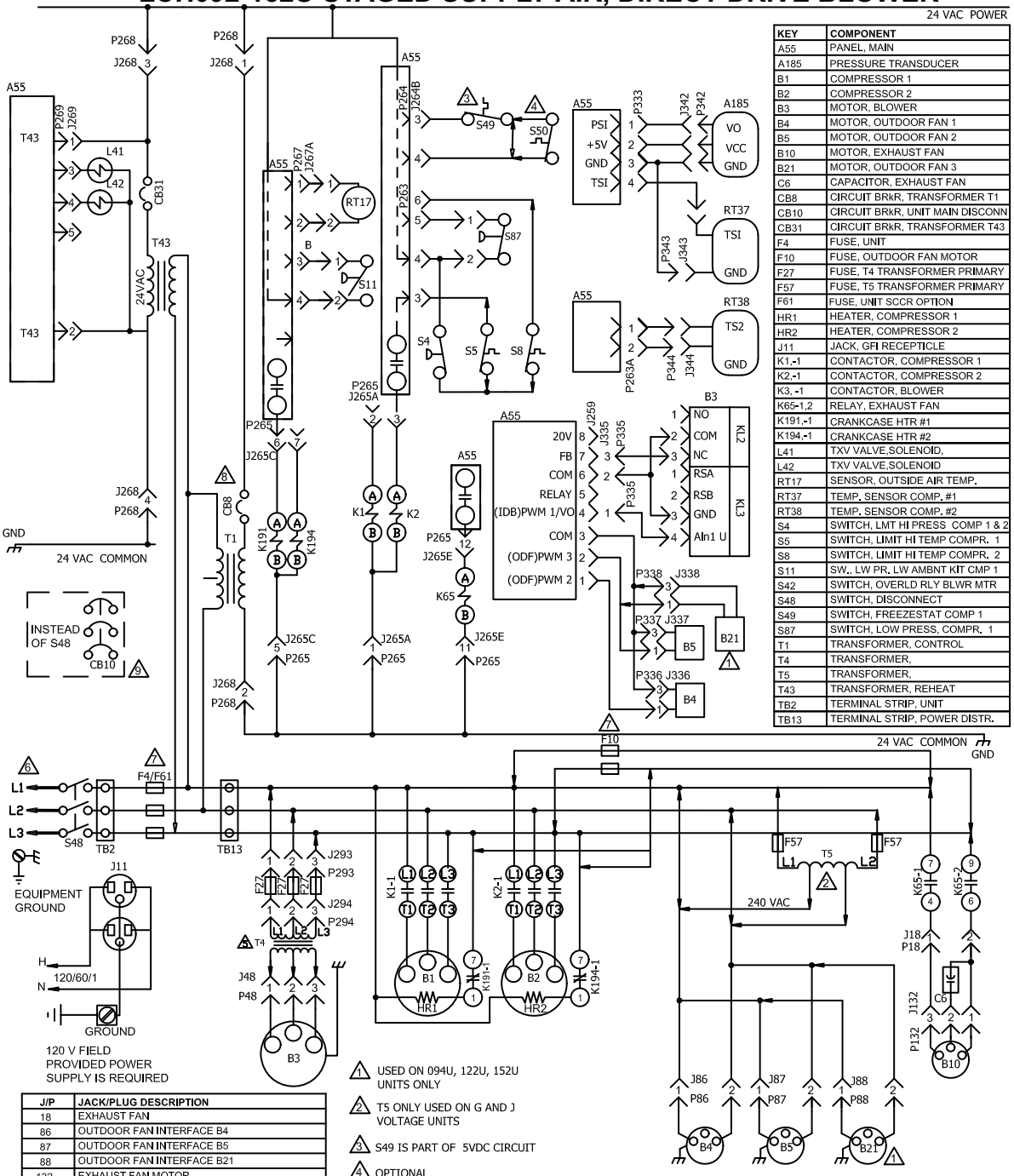
6 The VFD can be set to automatically bypass the VFD after the third start attempt. A55 selection condition must changed to:
M2-*SETTINGS-INSTALL-NEW M2-MSAV VFD BYPASS-AUTOMATIC*
*M3-RTU OPTION-BLOWER-VFD BYPASS DISENGAGED - YES (configuration ID 1 set to M=manual bypass)*

*Note - Regardless of whether the blower is started in CAV mode using the "engage" selection or the "automatic" selection, S52 will still lock out the the blower after 16 seconds.*

7 Do not immediately assume the inverter has failed. Troubleshoot the unit keeping the following in mind:

- Be sure to check multiple components and controls when troubleshooting. A blower component, inverter, or control failure will show the same alarms as an internal VFD fault condition (open A96 terminals B-C).
- If there are no thermostat wires connected to A55 terminal P297, check the control system to verify a blower demand.
- S52 is factory-installed in units equipped with the VFD bypass option. S52 is shown on the thermostat diagram.
- Make sure blower demand is continuous; if blower demand is interrupted A96 and A55 timers will reset.

# LCH092-152U STAGED SUPPLY AIR, DIRECT DRIVE BLOWER




| KEY | COMPONENT |
|---|---|
| A55 | PANEL, MAIN |
| A185 | PRESSURE TRANSDUCER |
| B1 | COMPRESSOR 1 |
| B2 | COMPRESSOR 2 |
| B3 | MOTOR, BLOWER |
| B4 | MOTOR, OUTDOOR FAN 1 |
| B5 | MOTOR, OUTDOOR FAN 2 |
| B10 | MOTOR, EXHAUST FAN |
| B21 | MOTOR, OUTDOOR FAN 3 |
| C6 | CAPACITOR, EXHAUST FAN |
| CB8 | CIRCUIT BRKR, TRANSFORMER T1 |
| CB10 | CIRCUIT BRKR, UNIT MAIN DISCONN |
| CB31 | CIRCUIT BRKR, TRANSFORMER T43 |
| F4 | FUSE, UNIT |
| F10 | FUSE, OUTDOOR FAN MOTOR |
| F27 | FUSE, T4 TRANSFORMER PRIMARY |
| F57 | FUSE, T5 TRANSFORMER PRIMARY |
| F61 | FUSE, UNIT SCCR OPTION |
| HR1 | HEATER, COMPRESSOR 1 |
| HR2 | HEATER, COMPRESSOR 2 |
| J11 | JACK, GFI RECEPTICLE |
| K1,-1 | CONTACTOR, COMPRESSOR 1 |
| K2,-1 | CONTACTOR, COMPRESSOR 2 |
| K3, -1 | CONTACTOR, BLOWER |
| K65-1,2 | RELAY, EXHAUST FAN |
| K191,-1 | CRANKCASE HTR #1 |
| K194,-1 | CRANKCASE HTR #2 |
| L41 | TXV VALVE,SOLENOID, |
| L42 | TXV VALVE,SOLENOID |
| RT17 | SENSOR, OUTSIDE AIR TEMP. |
| RT37 | TEMP. SENSOR COMP. #1 |
| RT38 | TEMP. SENSOR COMP. #2 |
| S4 | SWITCH, LMT HI PRESS COMP 1 & 2 |
| S5 | SWITCH, LIMIT HI TEMP COMPR. 1 |
| S8 | SWITCH, LIMIT HI TEMP COMPR. 2 |
| S11 | SW., LW PR. LW AMBNT KIT CMP 1 |
| S42 | SWITCH, OVERLD RLY BLWR MTR |
| S48 | SWITCH, DISCONNECT |
| S49 | SWITCH, FREEZESTAT COMP 1 |
| S87 | SWITCH, LOW PRESS, COMPR. 1 |
| T1 | TRANSFORMER, CONTROL |
| T4 | TRANSFORMER, |
| T5 | TRANSFORMER, |
| T43 | TRANSFORMER, REHEAT |
| TB2 | TERMINAL STRIP, UNIT |
| TB13 | TERMINAL STRIP, POWER DISTR. |

| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 18 | EXHAUST FAN |
| 86 | OUTDOOR FAN INTERFACE B4 |
| 87 | OUTDOOR FAN INTERFACE B5 |
| 88 | OUTDOOR FAN INTERFACE B21 |
| 132 | EXHAUST FAN MOTOR |
| 259 | ECM BLOWER MOTOR CONTROL |
| 263 | HIGH AND LOW PRESSURE SWITCHES |
| 264 | BLOWER DECK |
| 265 | CONTACTORS AND RELAYS |
| 267 | OUTDOOR FAN AREA |
| 268 | TRANSFORMER T1 POWER |
| 269 | HUMIDITROL CONTROL |
| 293 | F27,LINE SIDE |
| 294 | F27,LOAD SIDE |
| 333 | 0-5V TRANSDUCER INPUT |

1. USED ON 094U, 122U, 152U UNITS ONLY
2. T5 ONLY USED ON G AND J VOLTAGE UNITS
3. S49 IS PART OF 5VDC CIRCUIT
4. OPTIONAL
5. T4 ONLY USED J VOLTAGE UNITS
6. NOTE: FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
7. F61 AND F10 USED ON LGH UNITS WITH SCCR OPTION
8. MOVE WIRE FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
9. CB10 NOT AVAILABLE ON UNITS WITH SCCR OPTION

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

| 2018/07 | WIRING DIAGRAM | 07/18 |
|---|---|---|
| | 537618-03 | |
| COOLING | | |
| Energence Ultra EBM LCH/LGH - 092U, 094U, 120U, 122U, 152U - Y, G, J, M | | |
| SECTION B | | REV 0 |
| Supersedes 537618-02 | New Form No. 537618-03 | |

Direct Drive EBM Blower Motor: The blower speed is determined by thermostat demand and settings programmed into the A55. When A55 receives a Y1 demand, a low speed voltage output from A55 terminal 4 will energize B3 in low speed. When A55 receives a Y2 demand, a high speed voltage output from A55 terminal 4 will energize B3 in high speed. A55 output voltage can be checked between A55 terminals 4 and 6.

# DIRECT DRIVE BLOWER SEQUENCE OF OPERATION / TROUBLESHOOTING

**Blower Operation:**

1- Line voltage is routed to B3 blower motor through TB2 terminal strip, TB13 terminal strip, T4 transformer (575v units only), and J/P48 terminals 1, 2 and 3.

2- B3 blower motor runs internal diagnostics to check for proper temperature, voltage, etc. (KL2-2 and -3). This process takes approximately 10 seconds. Refer to the Failure Handling/Troubleshooting section.

3- A55 Unit Controller receives a thermostat demand. After theA55 proves (P259-7 and -6) that B3 blower motor internal relay (KL2-2 and -3) is closed, B3 blower motor is energized (0-10VDC from P259-4 to KL3-4). B3 blower motor controls are grounded through KL2-2 and -3 to A55 P259-6.

4- If configured, A55 checks S52 blower proving switch to make sure it closes within 16 seconds of the 0-10VCD signal being sent to B3 blower motor.

**Blower Fault Sequence Direct Drive Motor - No S52:**

1- Line voltage is provided to B3 blower motor.

2- After 10 seconds, the B3 blower motor internal relay does not close.

3- Alarm 186 is set by the A55 Unit Controller, de-energizing unit. If one of the “Error” failures listed in table 30 occurs (“Warning” failures will not set Alarm 186), service is required. Refer to the Failure Handling/Troubleshooting section.

4- If B3 blower motor internal relay closes continue to next step.

5- A55 sends 0-10VDC signal to B3 blower motor.

6- During B3 blower motor operation, the internal motor relay opens.

7- Alarm 186 is set by A55 and de-energizes the unit. Service is required. Refer to the Failure Handling/Troubleshooting section.

**Blower Fault Sequence Direct Drive Motor - With S52 (If Configured):**

1- A55 Unit Controller sends 0-10VDC signal to B3 blower motor.

2- After 16 seconds, if S52 blower proving switch remains open, A55 will remove 0-10VDC signal for 5 minutes.

3- A55 sends 0-10VDC signal to B3 blower motor.

4- After 16 seconds, if S52 blower proving switch remains open, A55 will remove 0-10VDC signal for another 5 minutes.

5- After the third try, A55 will de-energize the unit. Service is required.

**Failure Handling/Troubleshooting:**

1- Follow table 30 to troubleshoot possible failures that would cause Alarm 186 to set.

2- BEFORE DETERMINING THAT THE BLOWER ASSEMBLY HAS FAILED, use the A55 Unit Controller to clear delays and operate the blower.

3- Main Menu > Service > Offline > Clear Delays > Yes > Save

4- Main Menu > Service > Test > Blower

5- Observe if the blower operates or if Alarm 186 sets again.

6- If blower does not operate and Alarm 186 is set again, blower assembly must be replaced.

7- If blower assembly does operate, wait a minimum of 30 minutes to ensure Alarm 186 is not set again.

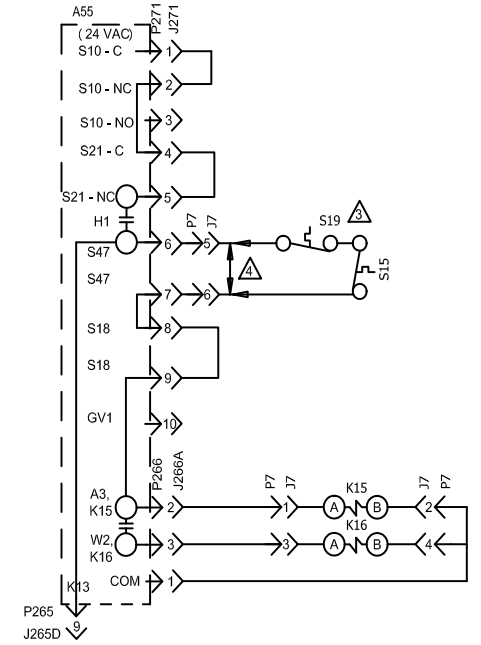
**TABLE 30**
**DIRECT DRIVE BLOWER MOTOR TROUBLESHOOTING**

| Failure | Error | Warning | Reason | Troubleshoot |
|---|---|---|---|---|
| Locked Rotor | • | | No changes in hall signals within 2000ms | Check for obstruction keeping impeller from rotating |
| Braking Mode | | • | Warning, no error code set, Motor start not possible after 20 sec | Check for secondary airflow source in the system causing the impeller to rotate backwards when off |
| Hall Error | • | | Combination of 3 hall signals gives false signal after one rotation | Measure voltage across each leg, Check electrical connections |
| Power Module Overheated | • | | Temperature > 115°C | Check operating conditions in blower compartment, Check for high motor load (current draw), Check for corrosion-free and secure electrical connections |
| Motor Overheated | • | | Motor over-temperature protector opens | |
| Gate Driver Error | • | | Internal software fault | Measure voltage across each leg, Check electrical connections |
| Phase Failure | • | | Input voltage has phase imbalance | Measure voltage across each leg, Check electrical connections, Repair low/high voltage leg(s) |
| DC Link Voltage Low | • | | Rectified DC link voltage is too low | |
| DC Link Over-voltage | • | | Rectified DC link voltage is too high | |
| Line Over-voltage | • | | Line voltage too high | |
| Line Under-voltage | • | | Line voltage too low | |
| Communication Error | • | | Internal communication failure. Not connected with master/ slave wiring | Check low voltage wiring connections |
| DC Link Voltage Low | | • | Warning, not low enough to set error code | Measure voltage across each leg, Check electrical connections, Repair low/high voltage leg(s) |
| Electronics Temp High | | • | Warning, not high enough to set error code, Temperature > 95°C | Check operating conditions in blower compartment, Check for high motor load (current draw), Check for corrosion-free and secure electrical connections |
| Power Module Temp High | | • | Warning, not high enough to set error code, Temperature > 105°C | |
| Motor Temp High | | • | Warning, not high enough to set error code, Temperature > 130°C | |

# ELECTRIC HEAT FOR LCH092/150 UNITS

| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 7 | ELECTRIC HEAT SUB BASE KIT |
| 265 | CONTACTOR RELAY |
| 266 | HEATING CONTROL |
| 271 | HEATING SENSORS STG 1 |

| KEY | DESCRIPTION |
|---|---|
| A55 | PANEL MAIN |
| F3 | FUSE, ELECTRIC HEAT 1 |
| F4 | FUSE, UNIT |
| F42 | FUSE, ELECTRIC HEAT 2 |
| F43 | FUSE, ELECTRIC HEAT 3 ,4 |
| F44 | FUSE, ELECTRIC HEAT 5 |
| 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 |
| K15-1 | CONTACTOR, ELECTRIC HEAT 1, 2 |
| K16-1 | CONTACTOR, ELECTRIC HEAT 3, 4 |
| S15 | SWITCH, LIMIT PRIMARY ELECTRIC HEAT |
| S19 | THERMOSTAT, ELECTRIC HEAT LIMIT |
| S20 | SWITCH, LIMIT SECONDARY ELEC. HEAT 1 (NO RESET) |
| S157 | SWITCH, LIMIT SECONDARY ELEC. HEAT 2 (NO RESET) |
| S158 | SWITCH, LIMIT SECONDARY ELEC. HEAT 3 (NO RESET) |
| S159 | SWITCH, LIMIT SECONDARY ELEC. HEAT 4 (NO RESET) |
| TB2 | TERMINAL STRIP, UNIT |
| TB3 | TERMINAL STRIP, ELECTRC HEAT |

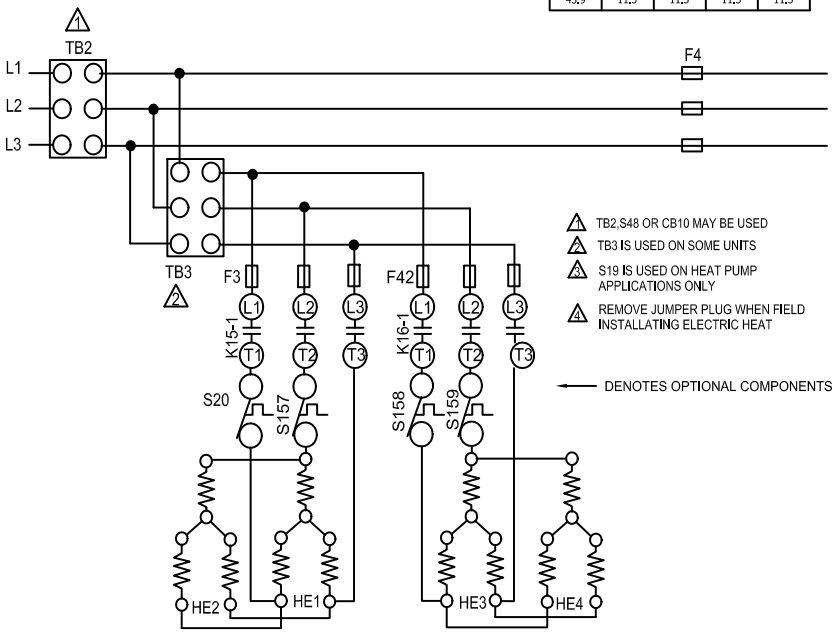



G, J VOLT UNITS

| KW | HE1 | HE2 | HE3 | HE4 |
|---|---|---|---|---|
| 7.5 | 7.5 | | | |
| 15 | 15 | | | |
| 22.5 | 15 | | 7.5 | |
| 30 | 15 | | 15 | |
| 45 | 15 | | 15 | 15 |
| 60 | 15 | 15 | 15 | 15 |

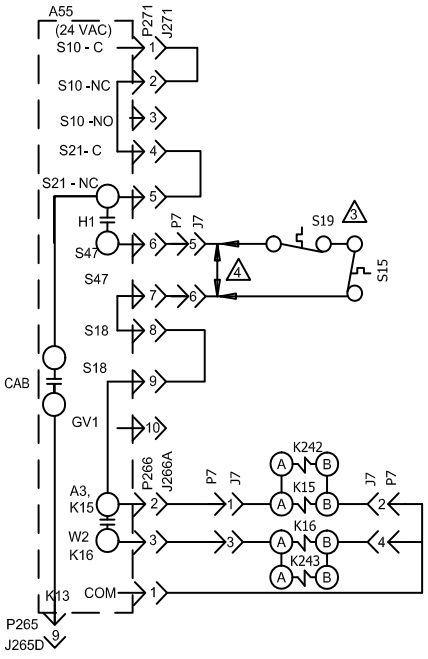
M VOLT UNITS

| KW | HE1 | HE2 | HE3 | HE4 |
|---|---|---|---|---|
| 5.7 | 5.7 | | | |
| 11.5 | 11.5 | | | |
| 17.2 | 11.5 | | 5.7 | |
| 23 | 11.5 | | 11.5 | |
| 34.5 | 11.5 | | 11.5 | 11.5 |
| 45.9 | 11.5 | 11.5 | 11.5 | 11.5 |



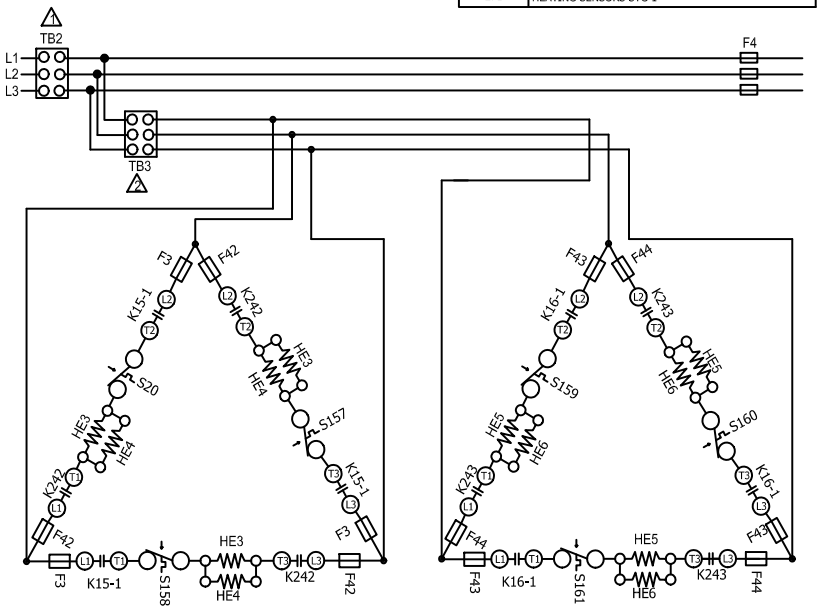

| | | |
|---|---|---|
| 09/13 | ENERGENCE B-BOX WIRING DIAGRAM<br>537664-01 | 09/13 |
| HEATING-ELECTRIC | | |
| 7.5, 15, 22.5, 30, 45, 60 - G, J<br>5.7, 11.5, 17.2, 23, 34.5, 45.9 - M | | |
| SECTION A | | REV. 0 |
| Supersedes | New Form No.<br>537664-01 | |

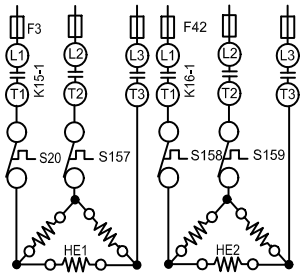
# ELECTRIC HEAT FOR LCH092/150 UNITS




| KEY | DESCRIPTION |
|---|---|
| A55 | PANEL MAIN |
| F3 | FUSE, ELECTRIC HEAT 1 |
| F4 | FUSE, UNIT |
| F42 | FUSE, ELECTRIC HEAT 2 |
| F43 | FUSE, ELECTRIC HEAT 3 ,4 |
| F44 | FUSE, ELECTRIC HEAT 5 |
| 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 |
| K15-1 | CONTACTOR, ELECTRIC HEAT 1, 2 |
| K16-1 | CONTACTOR, ELECTRIC HEAT 3, 4 |
| K242-1 | CONTACTOR, ELECTRIC HEAT 1 |
| K243-1 | CONTACTOR, ELECTRIC HEAT 2 |
| S15 | SWITCH, LIMIT PRIMARY ELECTRIC HEAT |
| S19 | THERMOSTAT, ELECTRIC HEAT LIMIT |
| S20 | SWITCH, LIMIT SECONDARY ELEC. HEAT 1 (NO RESET) |
| S157 | SWITCH, LIMIT SECONDARY ELEC. HEAT 2 (NO RESET) |
| S158 | SWITCH, LIMIT SECONDARY ELEC. HEAT 3 (NO RESET) |
| S159 | SWITCH, LIMIT SECONDARY ELEC. HEAT 4 (NO RESET) |
| S160 | SWITCH, LIMIT SECONDARY ELEC. HEAT 5 (NO RESET) |
| S161 | SWITCH, LIMIT SECONDARY ELEC. HEAT 6 (NO RESET) |
| TB2 | TERMINAL STRIP, UNIT |
| TB3 | TERMINAL STRIP, ELECTRC HEAT |

| J/P | JACK/PLUG DESCRIPTION |
|---|---|
| 7 | ELECTRIC HEAT SUB BASE KIT |
| 265 | CONTACTOR RELAY |
| 266 | HEATING CONTROL |
| 271 | HEATING SENSORS STG 1 |




| KW | HE1 | HE2 | HE3 | HE4 | HE5 | HE6 |
|---|---|---|---|---|---|---|
| 7.5 | 7.5 | | | | | |
| 15 | 15 | | | | | |
| 22.5 | 15 | 7.5 | | | | |
| 30 | 15 | 15 | | | | |
| 45 | 15 | | | | 15 | 15 |
| 60 | | | 15 | 15 | 15 | 15 |

1. TB2,S48 OR CB10 MAY BE USED
2. TB3 IS USED ON SOME UNITS
3. S19 IS USED ON HEAT PUMP APPLICATIONS ONLY
4. REMOVE JUMPER PLUG WHEN FIELD INSTALLING ELECTRIC HEAT

DENOTES OPTIONAL COMPONENTS

| | | |
|---|---|---|
| 11/14 | WIRING DIAGRAM<br>537665-01 | 11/14 |
| HEATING - ELECTRIC | | |
| ELECTRIC HEAT FOR ENERGENCE<br>7.5, 15, 22.5, 30, 45, 60 - Y | | |
| SECTION A | | REV 2 |
| Supersedes | New Form No.<br>537665-01 | |

# SEQUENCE OF OPERATION EHA7.5, 15, 22.5, 30, 45, 60 kW - G, J, M and Y

## G, J and M Voltage

1 Terminal strip TB3 is energized when the unit disconnect closes. TB3 supplies line voltage to electric heat elements HE1, HE2, HE3 and HE4. HE1 and HE2 elements are protected by F3 and HE3 and HE4 elements are protected by fuse F42.

**First Stage Heat:**

2 Heating demand initiates at W1 in the thermostat.

3 24VAC is routed through A55 Unit Controller. After A55 proves N.C. primary limit S15, contactor K15 is energized.

4- N.O. K15-1 contacts close energizing HE1 and HE2.

**Second Stage Heat:**

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

6 A second stage heating demand is received by A55 control module.

7 A55 energizes contactor K16.

8 N.O. K16-1 contacts close energizing HE3 and HE4.

## Y Voltage

1 Terminal strip TB3 is energized when the unit disconnect closes. TB3 supplies line voltage to electric heat elements HE1, HE2, HE3, HE4, HE5 and HE6.

**First Stage Heat:**

2 ***7.5 - 45 KW*** - Heating demand initiates at W1 in the thermostat.

3 24VAC is routed through A55 Unit Controller. After A55 proves N.C. primary limit S15 and S157, contactor K15 is energized.

4- N.O. K15 contacts close energizing HE1.

2 ***60KW*** - Heating demand initiates at W1 in the thermostat.

3 24VAC is routed through A55 Unit Controller. After A55 proves N.C. primary limit S157, contactor K242 is energized.

4- N.O. K242 contacts close energizing HE3 and HE4.

**Second Stage Heat:**

5 ***22.5 - 45 KW*** - With first stage heat operating, an additional heating demand initiates W2 in the thermostat.

6 A second stage heating demand is received by A55 control module. After A55 proves N.C. primary limit S58 and S159, contactor K16 is energized.

7 N.O. K16 contacts close energizing HE2 (22.5 and 30KW units only) and HE5 and HE6 (45 KW units only).

5 ***60KW*** - With first stage heat operating, an additional heating demand initiates W2 in the thermostat.

6 A second stage heating demand is received by A55 control module. After A55 proves N.C. primary limit S160 and S161, contactor K16 is energized.

7 N.O. K16 contacts close energizing HE5 and HE6.