



Installation Instructions

Part No: 09RC70000101 - 09RC70001601

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SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location.

Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

Untrained personnel can perform basic maintenance functions, such as cleaning coils. All other operations should be performed by trained service personnel. Qualified installers and service technicians are required to have been trained on the following topics when installing and servicing air-conditioning equipment with A2L refrigerant such as R-32 and R-454B:

1. Explosive potential of A2L refrigerants
2. Potential ignition sources
3. Safety measures for unventilated and ventilated rooms or enclosures
4. Refrigerant detectors
5. Concept of sealed components and sealed enclosures according to IEC 60079-15:2010
6. Correct work procedures for the following:
 - a. Commissioning
 - b. Maintenance
 - c. Repair
 - d. Decommissioning
 - e. Disposal

See Controls and Troubleshooting Guide for complete guidelines.

When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

1. Follow all safety codes.
2. Keep quenching cloth and fire extinguisher nearby when brazing.
3. Wear safety glasses and work gloves.
4. Use care in handling, rigging, and setting bulky equipment.

IMPORTANT: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with these instructions, may cause radio interference. It has been tested and found to comply with the limits of a Class A computing device pursuant to International Standard in North America EN 61000-2/3, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

⚠ WARNING

This system uses A2L refrigerant (R-32 and R-454B) which has higher pressure than R-22 and other refrigerants. No other refrigerant can be used in this system. Failure to use gauge set, hoses, and recovery systems designed to handle refrigerants R-32 and R-454B may result in equipment damage or personal injury. Refer to chiller installation instructions for guidelines on proper A2L refrigerant handling and equipment used for A2L refrigerant. If unsure about equipment, consult the equipment manufacturer.

⚠ WARNING

This product can expose you to chemicals including lead and lead components, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

⚠ CAUTION

DO NOT re-use compressor oil or any oil that has been exposed to the atmosphere. Dispose of oil per local codes and regulations. DO NOT leave refrigerant system open to air any longer than the actual time required to service the equipment. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed. Failure to follow these procedures may result in damage to equipment.

⚠ WARNING

DO NOT USE TORCH to remove any component. System contains oil and refrigerant under pressure.

To remove a component, wear protective gloves and goggles and proceed as follows:

- a. Shut off electrical power to unit.
- b. Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
- c. Traces of vapor should be displaced with nitrogen and the work area should be well ventilated. Refrigerant in contact with an open flame produces toxic gases.
- d. Cut component connection tubing with tubing cutter and remove component from unit. Use a pan to catch any oil that may come out of the lines and as a gauge for how much oil to add to the system.
- e. Carefully un-sweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Failure to follow these procedures may result in personal injury or death.

GENERAL

This book contains instructions for the installation of the Greenspeed® Variable Speed Fan Control.

NOTE: For 080-145 fixed speed fan option, 8 pole fan motors are supplied. Using a 6 pole motor will provide more airflow at high ambient temperature. See Table 1 for 6 pole fan motor part number if replacing 8 pole motors with 6 pole fan motors is desired.

Table 1 — 6 Pole Fan Motor Carrier Part Numbers

| UNIT | FAN QTY | 230V | 380V | 460V | 575V |
|------|---------|-----------|-----------|-----------|-----------|
| 080T | 4 | | | | |
| 095T | 5 | | | | |
| 115T | 6 | HD58CH230 | HD58CH380 | HD58CH460 | HD58CH575 |
| 130T | 7 | | | | |
| 145T | 8 | | | | |

The Greenspeed accessory uses a variable frequency drive (VFD) to control the speed of the condenser fans. All fans will operate at the same speed for single circuit units, sizes 020-035. Dual circuit units, sizes 050-060 and 080-145, have a separate VFD for each circuit. The VFD is controlled by a transducer at the discharge gas line. The VFD controls to a preset pressure. This pressure value, parameter 20-21, depends on the refrigerant used. Typically the fan speed will increase with high ambient temperature to reduce head pressure, and the fan speed will decrease for lower ambient temperatures.

This accessory will also allow the unit to run down to -20°F (-29°C) ambient with the addition of the wind baffle accessory. At low ambient conditions, high winds can have a detrimental effect on head pressure control. The wind baffles prevent wind from blowing across the condenser coil to alleviate this issue.

IMPORTANT: Wind baffles are required for ambient temperatures below 35°F (2°C) if wind velocity is anticipated to be greater than 5 mph (8 kph).

Inspect Shipment

Inspect contents of the accessory package before installing. File a claim with the shipping company if there is shipping damage. Contact your local Carrier Representative if any parts are missing. See Table 2 for Greenspeed accessory usage. See Table 3 for accessory package contents.

Table 2 — Greenspeed® Accessory Usage

| UNIT SIZES | PART NO. | QTY | VOLTAGE |
|------------|--------------|-----|---------|
| 020-035 | 09RC70000101 | 1 | 575 |
| | 09RC70000201 | 1 | 460 |
| | 09RC70000301 | 1 | 208/230 |
| 050-060 | 09RC70000101 | 2 | 575 |
| | 09RC70000201 | 2 | 460 |
| | 09RC70000301 | 2 | 208/230 |
| 080 | 09RC70000401 | 1 | 230 |
| | 09RC70000501 | 1 | 380-460 |
| | 09RC70000601 | 1 | 575 |
| 095 | 09RC70000701 | 1 | 230 |
| | 09RC70000501 | 1 | 380-460 |
| | 09RC70000601 | 1 | 575 |
| 115 | 09RC70000801 | 1 | 230 |
| | 09RC70000901 | 1 | 380-460 |
| | 09RC70001001 | 1 | 575 |
| 130 | 09RC70001101 | 1 | 230 |
| | 09RC70001201 | 1 | 380-460 |
| | 09RC70001301 | 1 | 575 |
| 145 | 09RC70001401 | 1 | 230 |
| | 09RC70001501 | 1 | 380-460 |
| | 09RC70001601 | 1 | 575 |

Table 3 – Accessory Package Contents

| ACCESSORY | UNIT SIZE | VOLTAGE | PART NUMBER | QTY | DESCRIPTION |
|---------------------|-----------|----------|----------------|-----|----------------------------|
| 09RC70000101 | 020-060 | 575 | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK30WA467 | 1 | VFD, 575-v |
| | | | 09RCHADBFV-A00 | 1 | Harness, Greenspeed Single |
| | | | 09RCHADBFV-A10 | 1 | Harness, Greenspeed Dual |
| | | | HY10JK015 | 3 | Fuse, 15A JKS-15 |
| | | | JT60030 | 3 | Fuse Holder Class J |
| | | | HY26EA023 | 1 | DIN Rail - 2" Long |
| | | | AL04AU166 | 2 | No. 8 .50"L Trilobe |
| | | | HN61ZP032 | 1 | SPDT RT Relay |
| | | | HY11TC032 | 1 | Relay Socket |
| | | | XBAES35N | 2 | DIN Rail End Stop |
| | | | AU02AG131 | 4 | Washer, Flat No. 10 Z |
| | | | AU27AS131 | 4 | Washer, Star No. 10 |
| | | | AL04AU238 | 4 | No. 10 .75"L Trilobe |
| | | | HK05ZZ010 | 1 | Transducer |
| HY76TB162 | 10 | Wire Tie | | | |
| 09RC70000201 | 020-060 | 460 | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK30WA460 | 1 | VFD, 380/460-v |
| | | | 09RCHADBFV-A00 | 1 | Harness, Greenspeed Single |
| | | | 09RCHADBFV-A10 | 1 | Harness, Greenspeed Dual |
| | | | HY10JK015 | 3 | Fuse, 15A JKS-15 |
| | | | JT60030 | 3 | Fuse Holder Class J |
| | | | HY26EA023 | 1 | DIN Rail - 2" Long |
| | | | AL04AU166 | 2 | No. 8 .50"L Trilobe |
| | | | HN61ZP032 | 1 | SPDT RT Relay |
| | | | HY11TC032 | 1 | Relay Socket |
| | | | XBAES35N | 2 | DIN Rail End Stop |
| | | | AU02AG131 | 4 | Washer, Flat No. 10 Z |
| | | | AU27AS131 | 4 | Washer, Star No. 10 |
| | | | AL04AU238 | 4 | No. 10 .75"L Trilobe |
| | | | HK05ZZ010 | 1 | Transducer |
| HY76TB162 | 10 | Wire Tie | | | |
| 09RC70000301 | 020-060 | 208/230 | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK30WA393 | 1 | VFD, 230-v |
| | | | 09RCHADBFV-A00 | 1 | Harness, Greenspeed Single |
| | | | 09RCHADBFV-A10 | 1 | Harness, Greenspeed Dual |
| | | | HY10JK015 | 3 | Fuse, 15A JKS-15 |
| | | | JT60030 | 3 | Fuse Holder Class J |
| | | | HY26EA023 | 1 | DIN Rail - 2" Long |
| | | | AL04AU166 | 2 | No. 8 .50"L Trilobe |
| | | | HN61ZP032 | 1 | SPDT RT Relay |
| | | | HY11TC032 | 1 | Relay Socket |
| | | | XBAES35N | 2 | DIN Rail End Stop |
| | | | AU02AG131 | 4 | Washer, Flat No. 10 Z |
| | | | AU27AS131 | 4 | Washer, Star No. 10 |
| | | | AL04AU238 | 4 | No. 10 .75"L Trilobe |
| | | | HK05ZZ010 | 1 | Transducer |
| HY76TB162 | 10 | Wire Tie | | | |

Table 3 – Accessory Package Contents (cont)

| ACCESSORY | UNIT SIZE | VOLTAGE | PART NUMBER | QTY | DESCRIPTION |
|----------------|-----------|-------------------------------------|----------------|----------|--------------------------------------|
| 09RC70000401 | 080 | 230 | HK30WA395 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 09RCHLAAF-CA30 | 2 | Cable, Power Input to Fan Fuse |
| | | | 30RCHAAANP-A60 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAANP-A90 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK040 | 6 | Fuse, 40A |
| | | | HY11MR060 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| HY76TB162 | 10 | Wire Tie | | | |
| 09RC70000501 | 080, 095 | 380-460 | HK30WA462 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAANP-A50 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAANP-A80 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK025 | 6 | Fuse, 25A |
| | | | HY11MR038 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU166 | 10 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| | | | HY76TB162 | 10 | Wire Tie |
| | | | 09RC70000601 | 080, 095 | 575 |
| HR89ZZ006 | 1 | VFD Display Panel | | | |
| HK05ZZ010 | 2 | Discharge Pressure Transducer | | | |
| 30RCHAAANP-A50 | 2 | Cable, Fan Fuse to Fan VFD | | | |
| 30RCHAAANP-A80 | 2 | Cable, Fan VFD to Fan TB | | | |
| 09RCHLAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL | | | |
| 09RCHLAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK | | | |
| HY10JK025 | 6 | Fuse, 25A | | | |
| HY11MR038 | 2 | Fuse Holder | | | |
| HN61ZP032 | 2 | Relay | | | |
| HY11TC032 | 2 | Socket Relay | | | |
| 1323580-CH | 2 | Terminal Block | | | |
| AL04AU306 | 8 | Tri-lobe Screw, 1/4-20, 0.5" Length | | | |
| AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length | | | |
| XBAES35N | 4 | Din Rail, Stop/End | | | |
| AT56AB171 | 6 | Nut, Lock, 1/4-20 | | | |
| HY76TB162 | 10 | Wire Tie | | | |

Table 3 – Accessory Package Contents (cont)

| ACCESSORY | UNIT SIZE | VOLTAGE | PART NUMBER | QTY | DESCRIPTION |
|--------------|-----------|---------|-----------------|-----|--------------------------------------|
| 09RC70000701 | 095 | 230 | HK30WA395 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAAANP-A60 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAAANP-A90 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK040 | 6 | Fuse, 40A |
| | | | HY11MR060 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| | | | HY76TB162 | 10 | Wire Tie |
| 09RC70000801 | 115 | 230 | HK30WA396 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAAANP-A60 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAAANP-A90 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK040 | 6 | Fuse, 40A |
| | | | HY11MR060 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| | | | HY76TB162 | 10 | Wire Tie |
| 09RC70000901 | 115 | 380-460 | HK30WA463 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAAANP-A50 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAAANP-A80 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK030 | 6 | Fuse, 30A |
| | | | HY11MR038 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| | | | HY76TB162 | 10 | Wire Tie |

Table 3 – Accessory Package Contents (cont)

| ACCESSORY | UNIT SIZE | VOLTAGE | PART NUMBER | QTY | DESCRIPTION |
|--------------|-----------|----------|-----------------|-----|--------------------------------------|
| 09RC70001001 | 115 | 575 | HR46JZ015 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAAANP-A50 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAAANP-A80 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK025 | 6 | Fuse, 25A |
| | | | HY11MR038 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU306 | 8 | Tri-lobe Screw, 1/4-20, 0.5" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| HY76TB162 | 10 | Wire Tie | | | |
| 09RC70001101 | 130 | 230 | HK30WA396 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAAANP-A60 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAAANP-A90 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK060 | 6 | Fuse, 60A |
| | | | HY11MR060 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| HY76TB162 | 10 | Wire Tie | | | |
| 09RC70001201 | 130 | 380-460 | HK30WA463 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAAANP-A60 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAAANP-A90 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK030 | 6 | Fuse, 30A |
| | | | HY11MR038 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| HY76TB162 | 10 | Wire Tie | | | |

Table 3 – Accessory Package Contents (cont)

| ACCESSORY | UNIT SIZE | VOLTAGE | PART NUMBER | QTY | DESCRIPTION |
|--------------|-----------|-------------------|----------------|-----|--------------------------------------|
| 09RC70001301 | 130 | 575 | HR46JZ015 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAANP-A50 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAANP-A80 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK025 | 6 | Fuse, 25A |
| | | | HY11MR038 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| HY76TB162 | 10 | Wire Tie | | | |
| 09RC70001401 | 145 | 230 | HR46JZ016 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 09RCHLAAF-CA10 | 1 | Cable, Power Input to Fan Fuse |
| | | | 30RCHAAANP-A70 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAANP-AA0 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK060 | 6 | Fuse, 60A |
| | | | HY11MR060 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| AT56AB171 | 6 | Nut, Lock, 1/4-20 | | | |
| HY76TB162 | 10 | Wire Tie | | | |
| 09RC70001501 | 145 | 380-460 | HR46JZ014 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAANP-A60 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAANP-A90 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK030 | 6 | Fuse, 30A |
| | | | HY11MR038 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| HY76TB162 | 10 | Wire Tie | | | |

Table 3 — Accessory Package Contents (cont)

| ACCESSORY | UNIT SIZE | VOLTAGE | PART NUMBER | QTY | DESCRIPTION |
|--------------|-----------|----------|-----------------|-----|--------------------------------------|
| 09RC70001601 | 145 | 575 | HR46JZ018 | 2 | VFD |
| | | | HR89ZZ006 | 1 | VFD Display Panel |
| | | | HK05ZZ010 | 2 | Discharge Pressure Transducer |
| | | | 30RCHAAANP-A50 | 2 | Cable, Fan Fuse to Fan VFD |
| | | | 30RCHAAANP-A80 | 2 | Cable, Fan VFD to Fan TB |
| | | | 09RCHLAAAFV-A00 | 1 | Cable, GRNSPD, OFM CTRL |
| | | | 09RCHLAAAFV-A10 | 1 | Cable, GRNSPD, OFM, VFD LINK |
| | | | HY10JK025 | 6 | Fuse, 25A |
| | | | HY11MR038 | 2 | Fuse Holder |
| | | | HN61ZP032 | 2 | Relay |
| | | | HY11TC032 | 2 | Socket Relay |
| | | | 1323580-CH | 2 | Terminal Block |
| | | | AL04AU308 | 8 | Tri-lobe Screw, 1/4-20, 0.75" Length |
| | | | AL04AU166 | 2 | Tri-lobe Screw, 8-32, 0.5" Length |
| | | | XBAES35N | 4 | Din Rail, Stop/End |
| | | | AT56AB171 | 6 | Nut, Lock, 1/4-20 |
| HY76TB162 | 10 | Wire Tie | | | |

INSTALLATION

Step 1 — Install Wind Baffle Accessory Kit

If the chiller is expected to run in ambient temperatures below 35°F (2°C) and winds above 5 mph (8 kph) are expected, a wind baffle accessory kit is required. Part numbers that require the wind baffle accessory kit are:

- 30RA-900---065 (sizes 020, 035)
- 30RA-900---066 (sizes 020, 030, 050, 060)
- 30RC70003301 (sizes 080, 095, 115, 130, 145)

NOTE: Unit sizes 035-060 require two kits.

Step 2 — Mount the VFD

1. Verify the drive nameplate rating versus the unit nameplate rating for correct voltage range.
2. Disconnect all power from unit before proceeding.
3. VFD will mount in the control panel. Refer to Fig. 1 for VFD mounting location for 09RC020-060 units and Fig. 2 for 09RC080-145 units. Mount the VFD in the panel using the no. 10 screws, flat washer, and star washer.
4. For 020-060 size units, mount the din rail with no. 8 screws at the fan relay (FR). Add the relay, relay socket, and din rail stops to the din rail.
5. For 080-145 units, din rail should already be installed. Add the relay, relay socket, and din rail stops to the din rail.
6. Replace existing fuses and fuse blocks with ones supplied in the kit.

CAUTION

Internal refrigerant tubing is under high pressure. Do not damage piping while mounting VFD assembly. Serious injury may occur.

Step 3 — Wiring

Control panel arrangements are shown in Fig. 1 and 2. Fan identification is shown in Fig. 3, transducer location is shown in Fig. 4 and 5, and transducer wire routing is shown in Fig. 6 and 7. Power schematics are shown in Fig. 8-10.

1. Install and connect the wire harness per the markings on the wires and the schematic, Fig. 8 for sizes 020-060 and Fig. 10

for sizes 080-145. There are two harnesses included in the kit. Use the single harness for 020-035 size units and the dual harness for 050, 060, and 080-145 size units. Refer to “Special Wiring Instructions for 09RC050, 09RC060, and 09RC080-145 Single Circuit Applications” below to convert dual circuit units to a single circuit conversion.

2. For 020-60T size units, move fan power wires from the load side of fan contactor, 21, 22, 23, to the load side of VFD, U,V,W. Verify motors are correctly wired to the VFDs as per Fig. 8. For 080-145T size units, move the fan power wires from the load side of fan contactor, T1, T2, T3, to load side of VFD, U,V,W. Verify motors are correctly wired to the VFDs as per Fig. 10. Reference Fig. 3 for fan number identification.
3. Move fan power wires from the load side of fan contactor, 21, 22, 23, to the load side of VFD, U,V,W. Reference Fig. 3 for fan number identification. For 080-145T size units, move the fan power wires from the load side of fan contactor, T1, T2, T3, to load side of VFD, U,V,W.
4. Replace fan cycling pressure switch with transducer from kit on discharge gas line.
5. Route transducer cable, DPT, through bottom of panel to transducer. See Fig. 6 and 7 for transducer wire routing.
6. Use included wire ties to restrain wires in panel and route transducer cable. Ensure cable does not touch copper lines.

SPECIAL WIRING INSTRUCTIONS FOR 09RC050, 09RC060, AND 09RC080-145 SINGLE CIRCUIT APPLICATIONS

In this application the two drives will run in a Primary/Secondary configuration. Only Circuit A transducer will be used. Circuit B drive will mirror the operation of A. Three wires must be added between the VFDs for Primary/Secondary operation.

1. Make the following connections:
 VFD-A-18 to VFD-B-18
 VFD-A-42 to VFD-B-53
 VFD-A-55 to VFD-B-55
2. Disconnect FR-B from VFD-B.
3. Use TB-1 and TB-2 only for control input. See Fig. 8 and 10 power schematics for reference.
4. Load parameters from Table 5 into VFD-B, the secondary VFD.

Step 4 — Setup

1. Once all wiring is terminated and all covers are back in place, power up the unit.
2. Set the parameters on the VFD as shown in Table 4 for 020-035 unit sizes, 050-060 dual circuit units, and 080-145 unit

sizes. For 050-060 and 080-145 single circuit units, set VFD-A per Table 4 and VFD-B per Table 5. Refer to VFD manual on method for setting parameters.

Unit is now ready for operation. Refer to special wiring instructions.

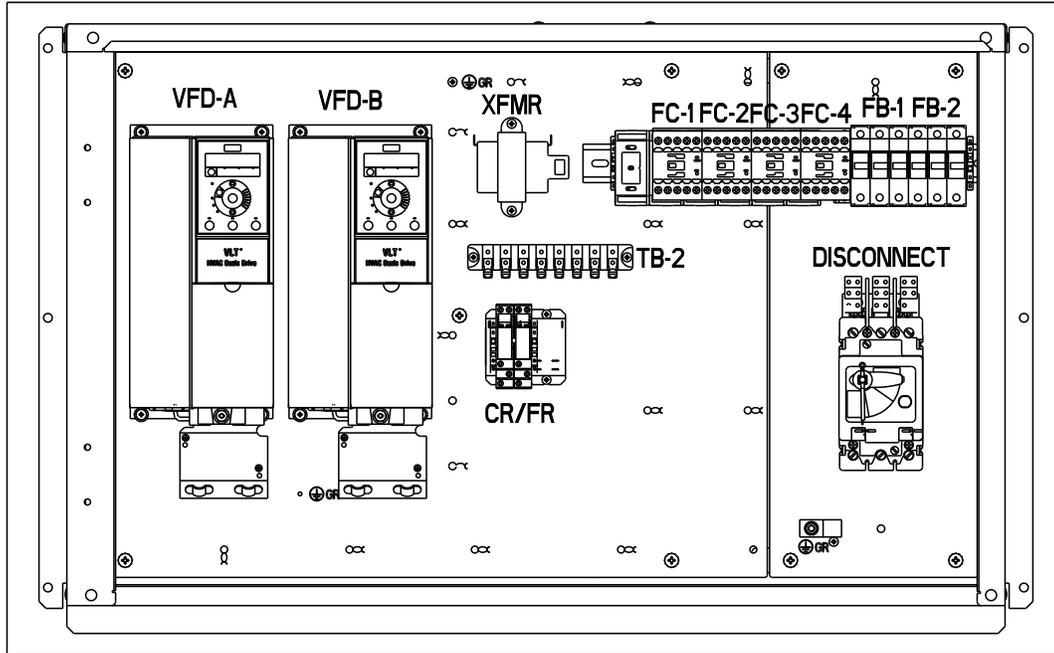


Fig. 1 — Control Panel Arrangement, 09RC020-060

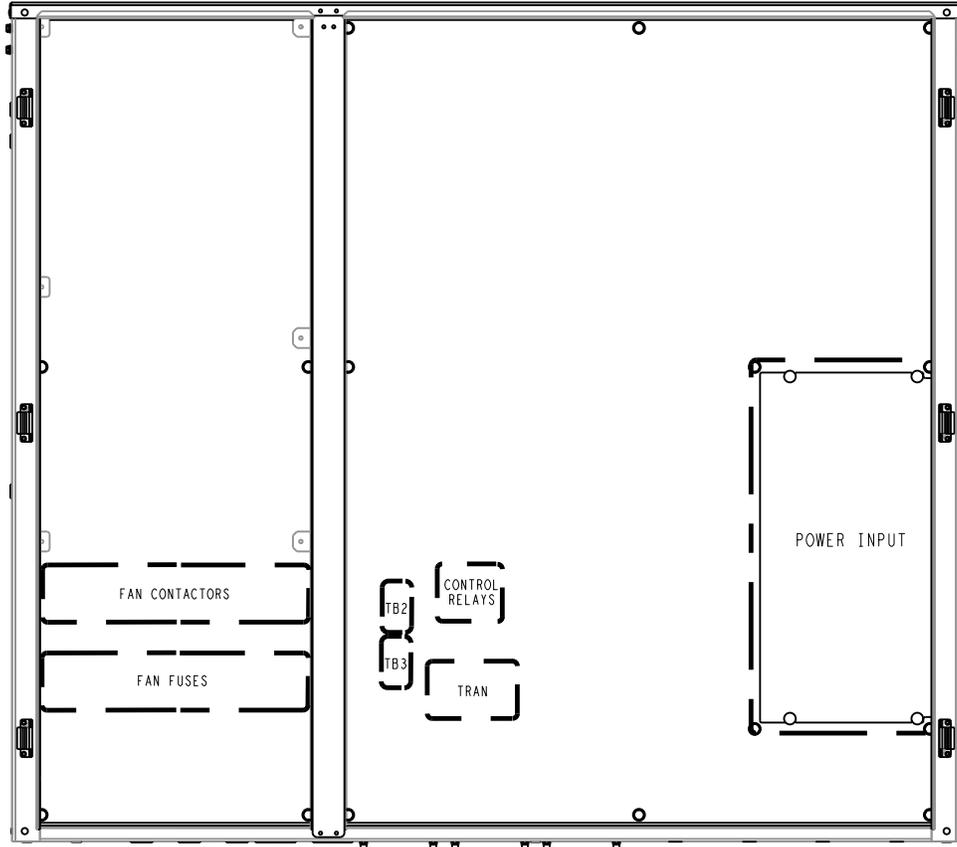
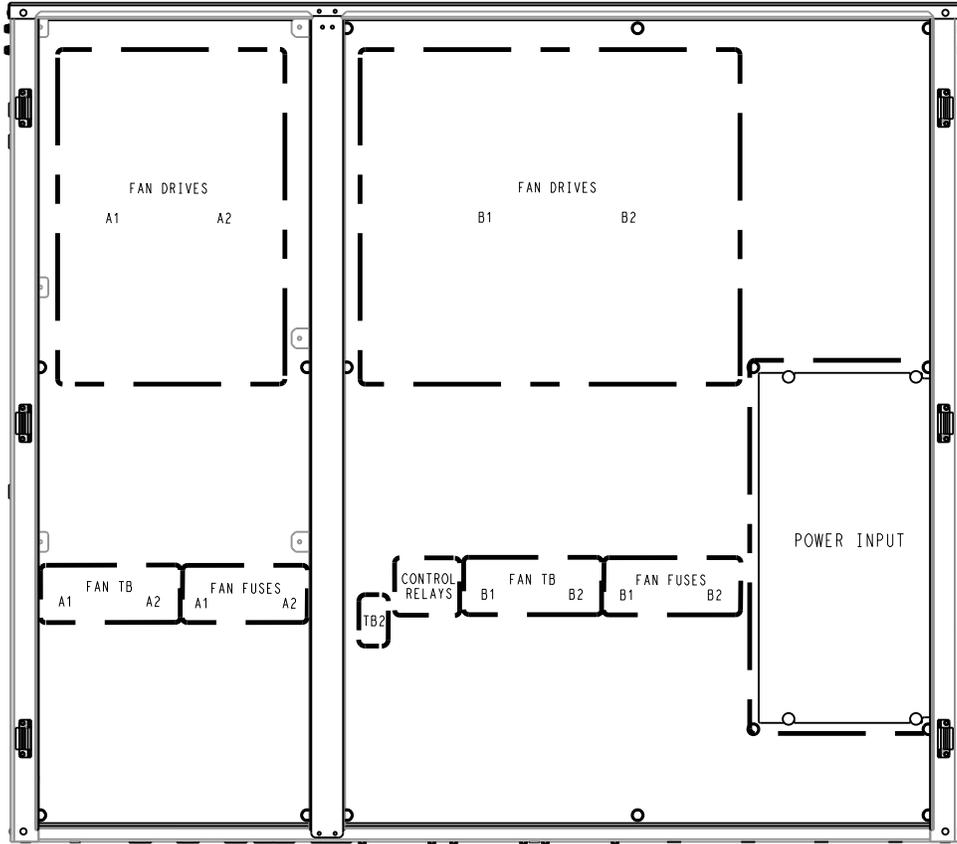
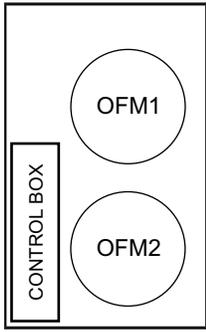
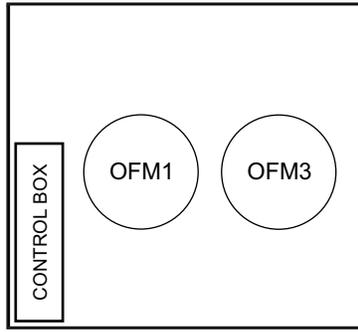


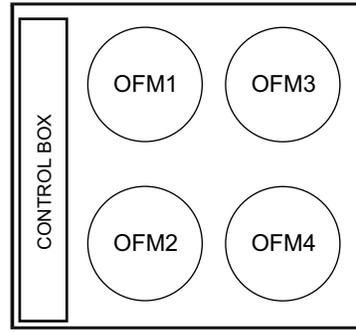
Fig. 2 — Control Panel Arrangement, 09RC080-145



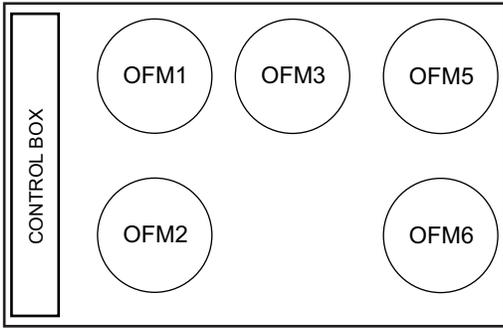
Top View
Sizes 020-030



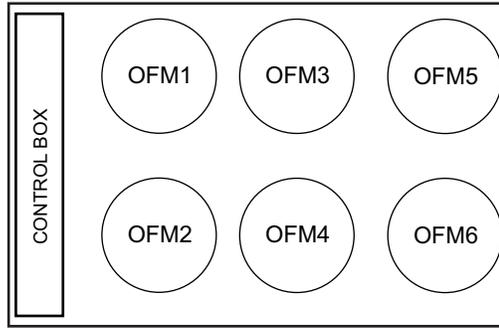
Top View
Size 035



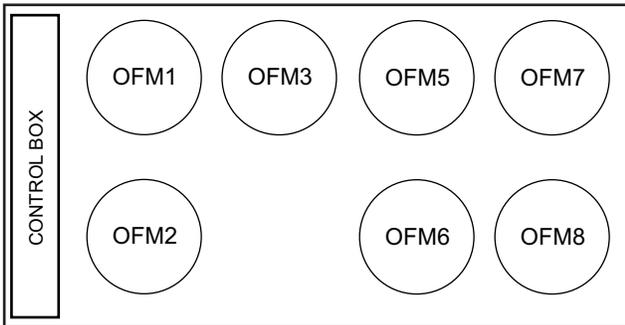
Top View
Sizes 050-080



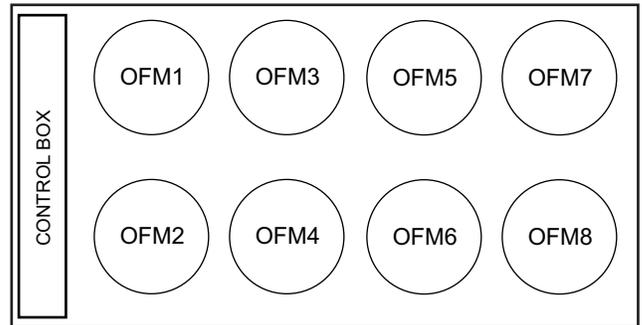
Top View
Size 095



Top View
Size 115

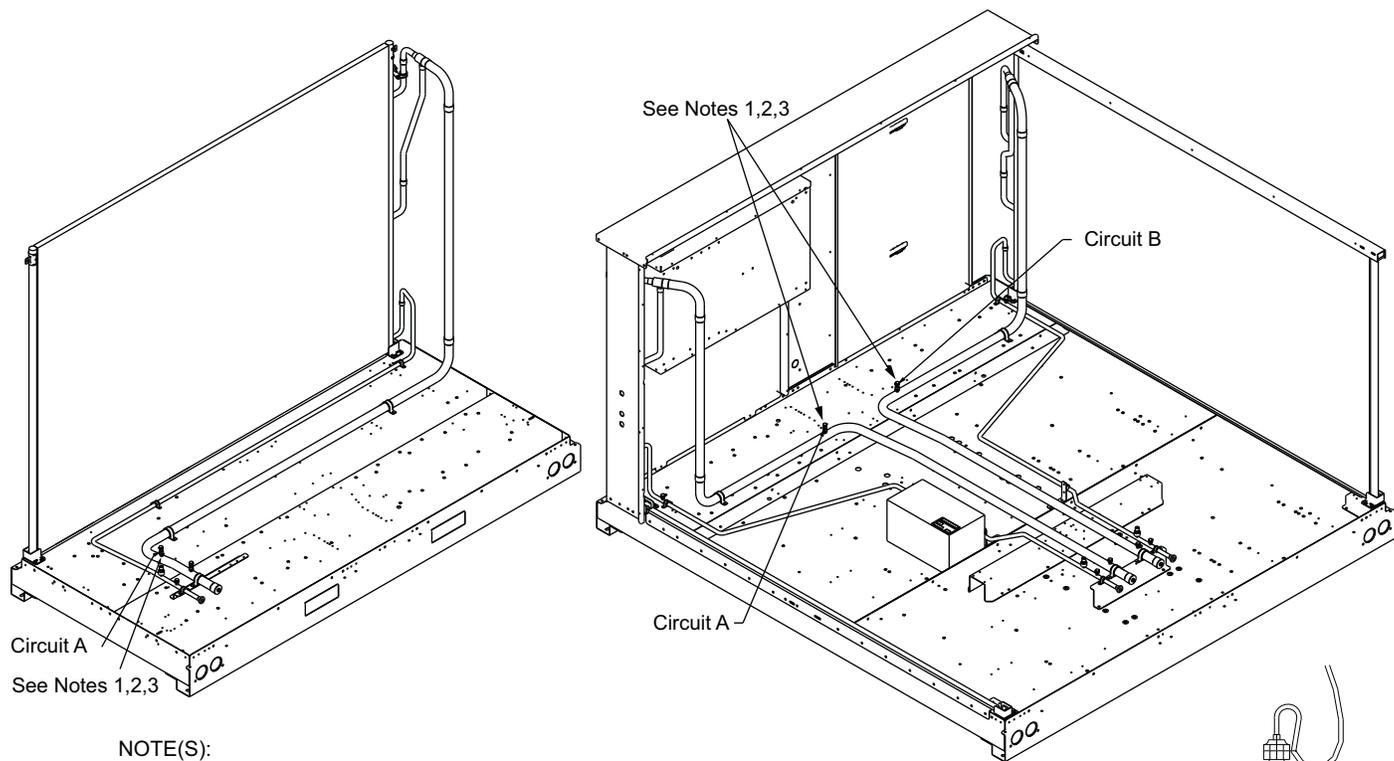


Top View
Size 130



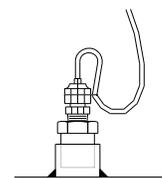
Top View
Size 145

Fig. 3 – Fan Identification



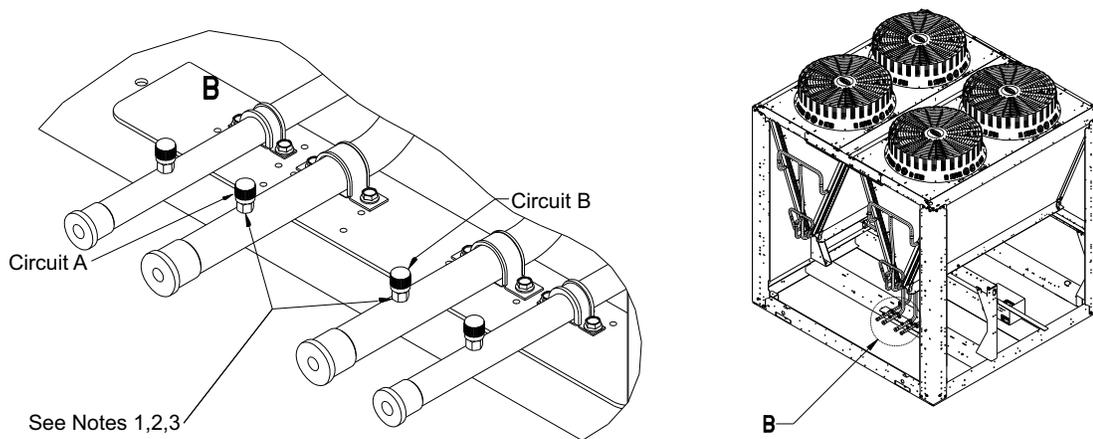
NOTE(S):

1. Replace fixed speed fan cycling pressure switch with Greenspeed pressure transducer option.
2. Apply torque of 10 ft-lb to tighten the pressure transducer.
3. Loop cable and secure with wire tie as shown to form strain relief.
Be sure to create a large enough loop and secure with wire tie to form strain relief, so that there is no stress on the transducer harness connection.



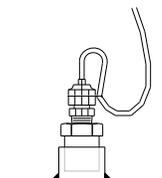
Sensor Loop Detail
Typical All Units
See Note 3

Fig. 4 – Transducer Location, 09RC020-060



NOTE(S):

1. Replace fixed speed fan cycling pressure switch with Greenspeed pressure transducer option.
2. Apply torque of 10 ft-lb to tighten the pressure transducer.
3. Loop cable and secure with wire tie as shown to form strain relief.
Be sure to create a large enough loop and secure with wire tie to form strain relief, so that there is no stress on the transducer harness connection.



Sensor Loop Detail
Typical All Units
See Note 3

Fig. 5 – Transducer Location, 09RC080-145

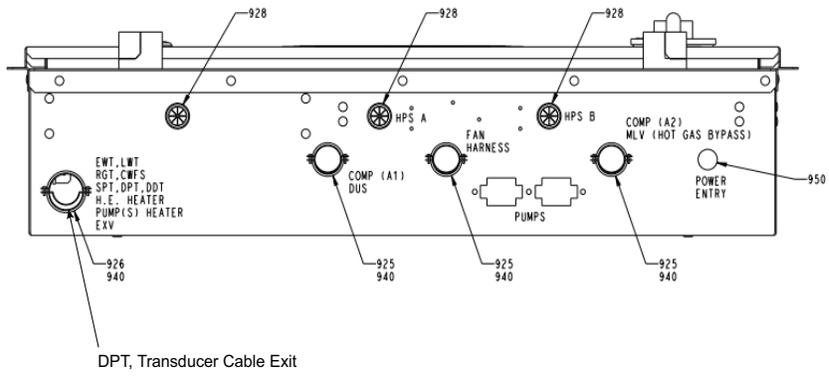


Fig. 6 — Transducer Wire Routing, 09RC020-060

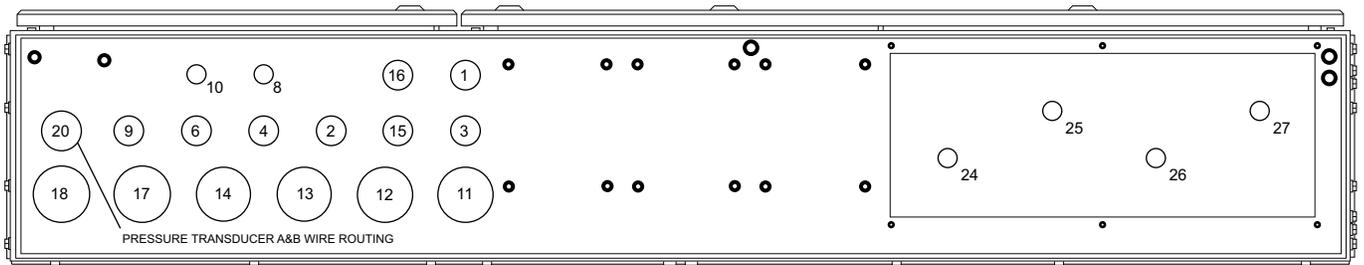
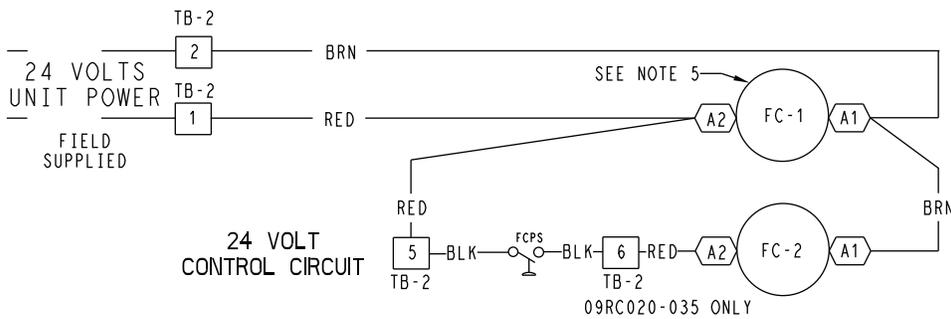
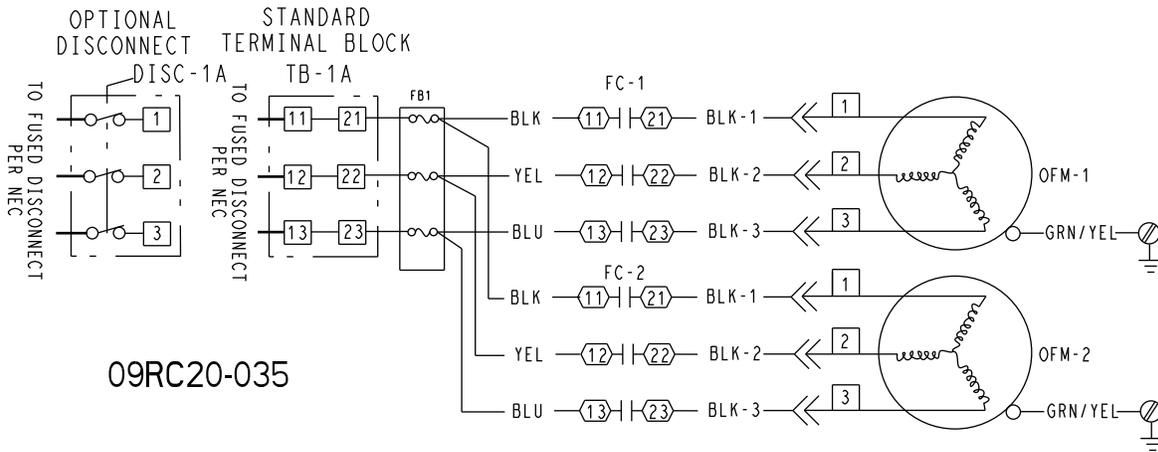
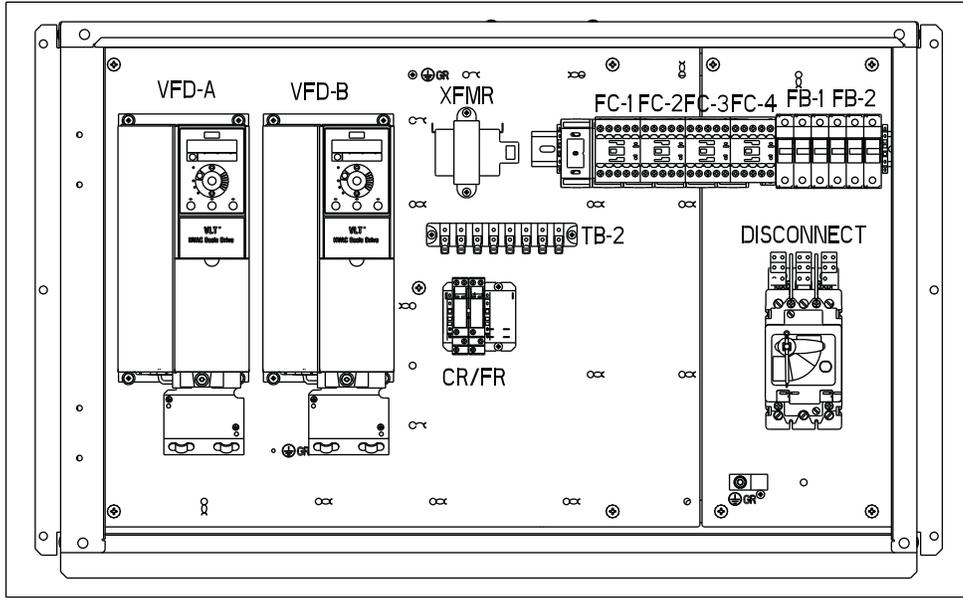


Fig. 7 — Transducer Wire Routing, 09RC080-145

09RC020-060 POWER SCHEMATIC & COMPONENT ARRANGEMENT

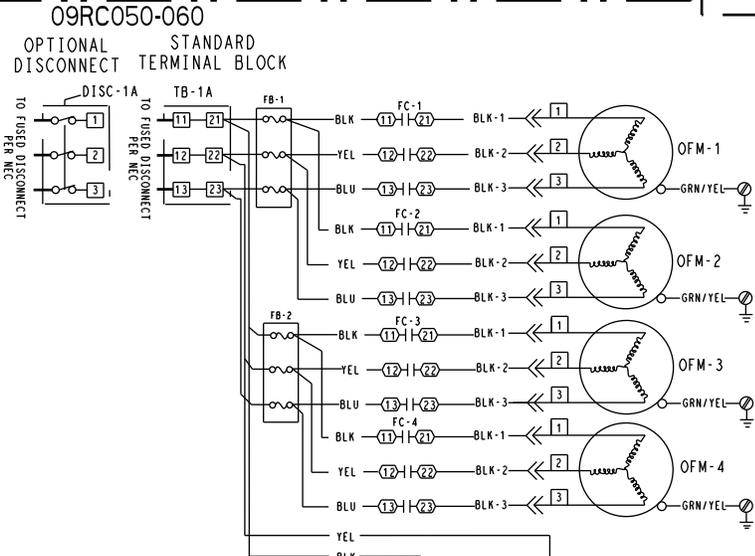
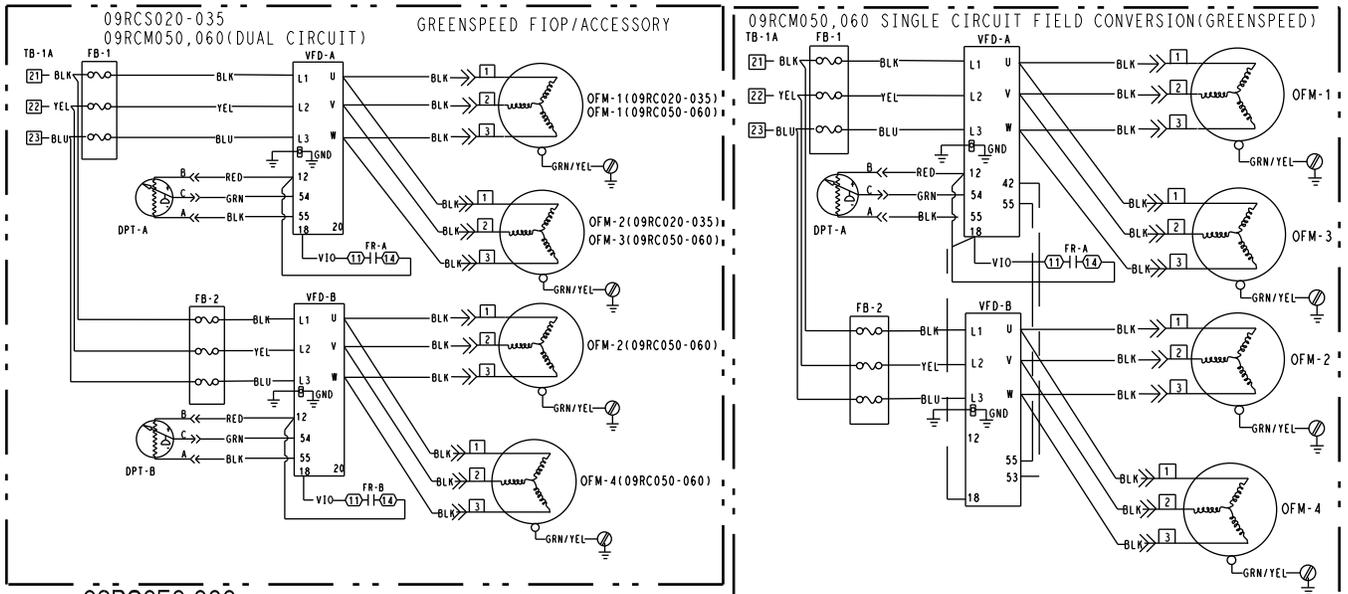


NOTES:

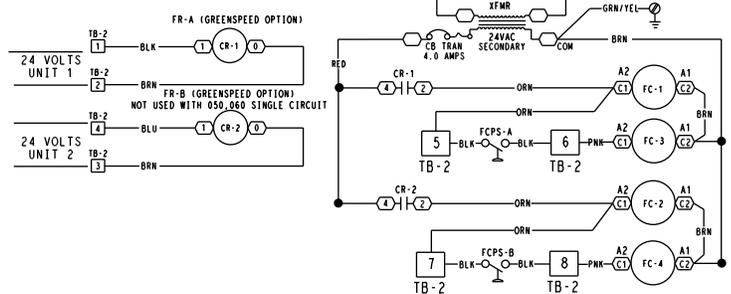
1. FACTORY WIRING IS IN ACCORDANCE WITH UL 60335-2-40 STANDARDS. ANY FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
2. USE 75°C MIN WIRE FOR FIELD POWER SUPPLY.
3. FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASE CONDITIONS.
4. FOR 500 SERIES UNIT OPERATION AT 208-3-60V LINE VOLTAGE, TRAN1 PRIMARY CONNECTION MUST BE MOVED TO TERMINAL MARKED 208.
5. FOR UNITS WITH LOW AMBIENT FIOP/ACCESSORY, FAN CONTACTOR FC1 IS REPLACED WITH FAN RELAY FR-A.
6. UNITS ARE SUPPLIED WITH (2) R-32 FCPS. REFER TO INSTALLATION INSTRUCTIONS FOR PROPER INSTALLATION AND ALTERNATE REFRIGERANT APPLICATIONS.

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Fig. 8 — Power Schematic, 09RC020-060



- LEGEND:**
- CB - CIRCUIT BREAKER
 - CR - CONTROL RELAY
 - DPT - DISCHARGE PRESSURE TRANSDUCER
 - FC - FAN CONTACTOR
 - FCPS - FAN CYCLING PRESSURE SWITCH
 - FIOP - FACTORY INSTALLED OPTION
 - FB - FUSE BLOCK
 - FR - FAN RELAY
 - OFM - OUTDOOR FAN MOTOR
 - TB - TERMINAL BLOCK
 - XFMR - TRANSFORMER
 - PS - POWER SUPPLY
 - DISC - DISCONNECT
 - - - FIELD WIRING
 - — — FACTORY WIRING
 - · · · · FIOP/ACCESSORY



| VOLTS | FB-1/FB-2 | |
|----------|----------------|------------|
| | W/O GREENSPEED | GREENSPEED |
| 208/230V | FNQ-R-15 | JKS-15 |
| 380V | FNQ-R-10 | JKS-15 |
| 460V | FNQ-R-10 | JKS-15 |
| 575V | FNQ-R-10 | JKS-15 |

FOR UNITS W/O GREENSPEED, USE TIME DELAY FUSES ONLY, FNQ-R.

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Fig. 8 — Power Schematic, 09RC020-060 (cont)

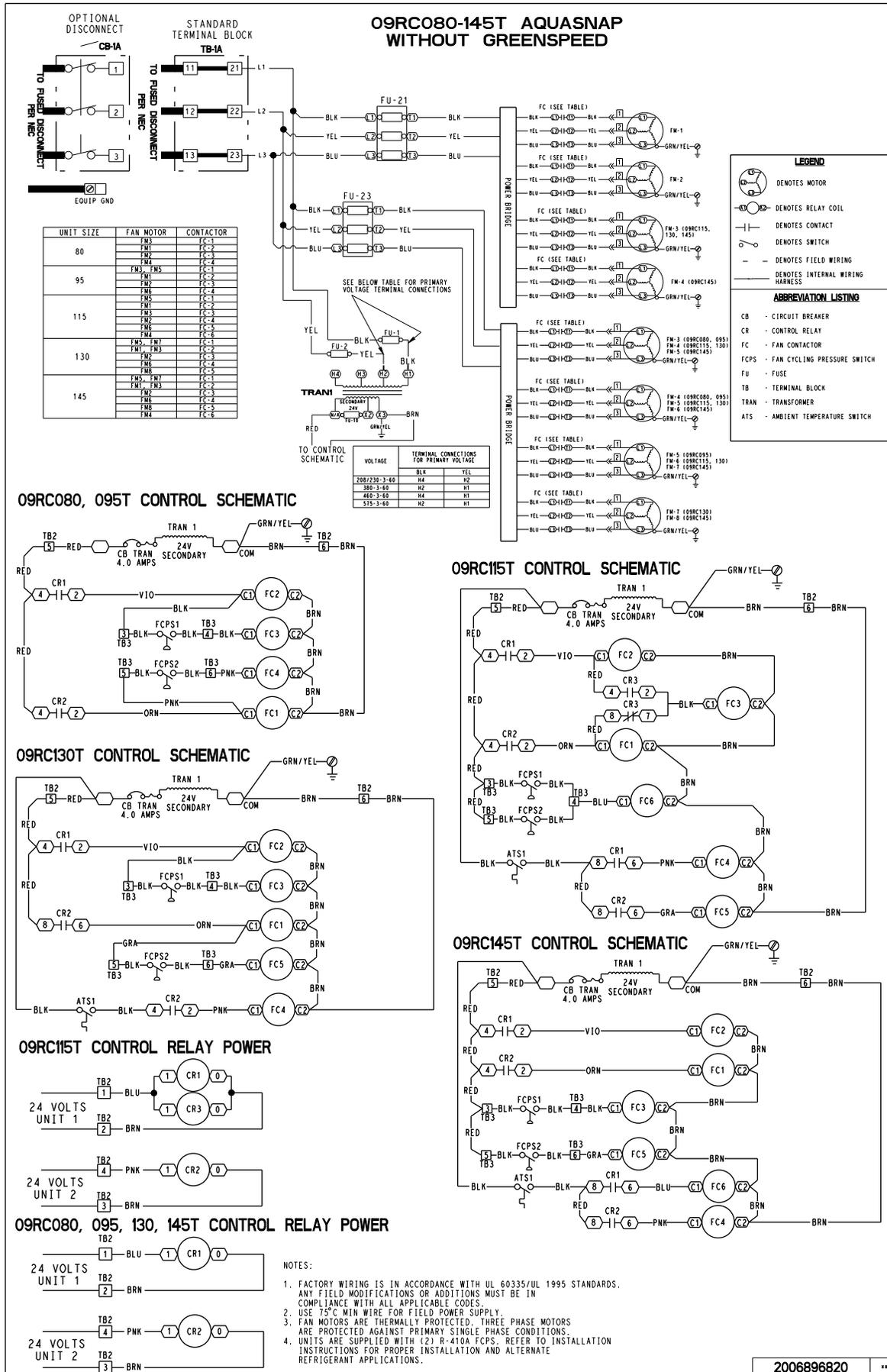


Fig. 9 — Power Schematic, 09RC080-145 without Greenspeed

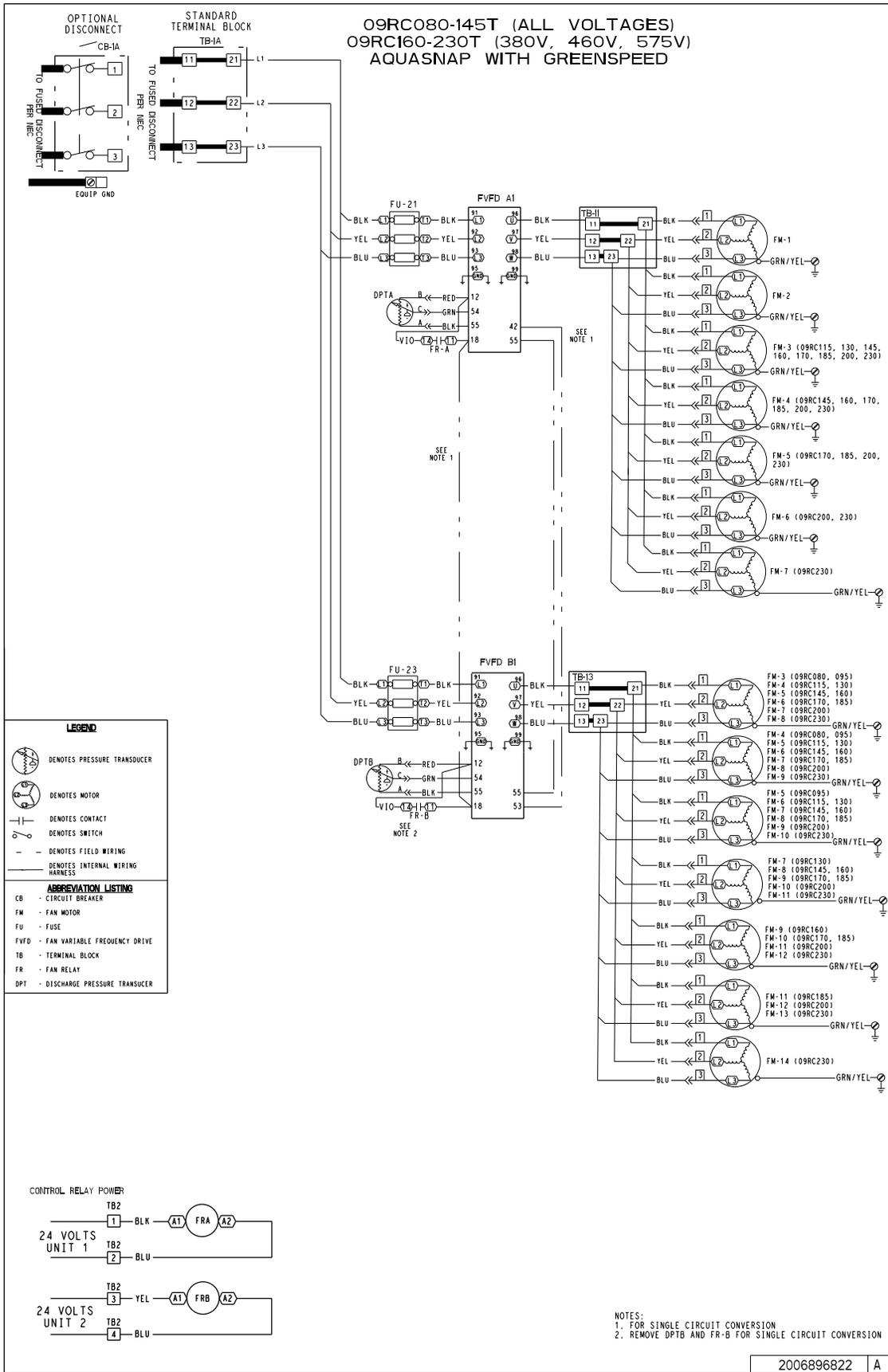


Fig. 10 — Power Schematic, 09RC080-145 with Greenspeed

Table 4 – VFD Parameter Settings

| PARAMETER | FUNCTION | FACTORY SETTING | UNIT | NOTES |
|------------------------|------------------------------------|---|------|----------------------------------|
| 0-03 | Regional Settings | North America | | Default settings for 60 Hz mains |
| 1-00 | Configuration Mode | [3] Process Closed Loop | | |
| 1-01 | Motor Control Principle | [1] VVC+ | | |
| 1-03 | Torque Characteristics | [1] Variable Torque | | |
| 1-22 | Motor Voltage | Voltage Code Specific | V | Motor Nameplate |
| 1-23 | Motor Frequency | Voltage Code Specific | Hz | Motor Nameplate |
| 1-24 | Motor Current | Voltage Code Specific | A | Motor Nameplate |
| 1-25 | Motor Nominal Speed | 850 (8 pole motor) 1140 (6 pole motor) | rpm | Motor Nameplate |
| 1-39 | Motor Poles | 4 | | Enter the number of motor poles. |
| 3-02 | Minimum Reference | 0 | | |
| 3-03 | Maximum Reference | 667 | | |
| 3-15 | Reference 1 Source | [0] No function | | Select speed reference resource. |
| 3-16 | Reference 2 Source | [0] No function | | Select speed reference resource. |
| 3-17 | Reference 3 Source | [11] Local bus reference | | Select speed reference resource. |
| 3-41 | Ramp 1 Ramp Up Time | 15 | s | Load dependent |
| 3-42 | Ramp 1 Ramp Down Time | 20 | s | Load dependent |
| 4-12 | Motor Speed Low Limit [Hz] | 0 | Hz | Motor speed limits |
| 4-14 | Motor Speed High Limit [Hz] | 60 | Hz | Motor speed limits |
| 4-18 | Current Limit | 110 | % | |
| 4-19 | Max Output Frequency | 62 | Hz | Safety limit |
| 5-10 | Terminal 18 Digital Input | [8] Start | | |
| 5-11 | Terminal 19 Digital Input | [0] No operation | | |
| 5-12 | Terminal 27 Digital Input | [0] No operation | | |
| 6-20 | Terminal 54 Low Voltage | 0.5 | V | Transducer scaling |
| 6-21 | Terminal 54 High Voltage | 4.5 | V | Transducer scaling |
| 6-24 | Terminal 54 Low Ref./Feedb. Value | 14.5 | | Transducer scaling |
| 6-25 | Terminal 54 High Ref./Feedb. Value | 667 | | Transducer scaling |
| 6-90 | Terminal 42 Mode | [1] 4-20 mA | | Signal to Secondary Drive |
| 6-91 | Terminal 42 Analog Output | [100] Output Frequency | | Signal to Secondary Drive |
| 6-92 | Terminal 42 Digital Output | [0] No Operation | | |
| 6-93 | Terminal 42 Output Min Scale | 0 | % | |
| 6-94 | Terminal 42 Output Max Scale | 60 | % | |
| 20-00 | Feedback 1 Source | [2] Analog Input 54 | | Transducer Signal |
| 20-01 | Feedback 1 Conversion | [0] Linear | | Feedback Source |
| 20-20 | Feedback Function | [3] Minimum | | Feedback Source |
| 20-21 | Setpoint 1 | 330 for R-32, R-410A, R-454B 90 for R-1234z_9, R-515b 124 for R-513A, R-134a 196 for R-22 | | Setpoint |
| 20-81 | Reverse PID | [1] Inverse | | |
| 20-83 | PI Start Speed | 0 | Hz | |
| 20-84 | On Reference Bandwidth | 0 | % | |
| 20-93 | PI Proportional Gain | 10 | | |
| 20-94 | PI Integral Time | 40 | s | |
| 208/230-v 60 Hz | | | | |
| 1-22 | Motor Voltage | 208 | V | Motor Nameplate |
| 1-23 | Motor Frequency | 60 | Hz | Motor Nameplate |
| 1-24 | Motor Current | 09RC020-230: 6.6 x the number of motors in each VFD (8 pole motor). 09RC080-230: 12.7 x the number of motors in each VFD (6 pole motor). | A | Motor Nameplate |
| 380-v 60 Hz | | | | |
| 1-22 | Motor Voltage | 380 | V | Motor Nameplate |
| 1-23 | Motor Frequency | 60 | Hz | Motor Nameplate |
| 1-24 | Motor Current | 09RC020-230: 3.7 x the number of motors in each VFD (8 pole motor). 09RC080-230: 7 x the number of motors in each VFD (6 pole motor). | A | Motor Nameplate |
| 380-v 50 Hz | | | | |
| 1-22 | Motor Voltage | 380 | V | Motor Nameplate |
| 1-23 | Motor Frequency | 50 | Hz | Motor Nameplate |
| 1-24 | Motor Current | 09RC020-230: 3.7 x the number of motors in each VFD (8 pole motor). 09RC080-230: 7 x the number of motors in each VFD (6 pole motor). | A | Motor Nameplate |
| 460-v 60 Hz | | | | |
| 1-22 | Motor Voltage | 460 | V | Motor Nameplate |
| 1-23 | Motor Frequency | 60 | Hz | Motor Nameplate |
| 1-24 | Motor Current | 09RC020-230: 3.1 x the number of motors in each VFD (8 pole motor). 09RC080-230: 5.8 x the number of motors in each VFD (6 pole motor). | A | Motor Nameplate |
| 575-v 60 Hz | | | | |
| 1-22 | Motor Voltage | 575 | V | Motor Nameplate |
| 1-23 | Motor Frequency | 60 | Hz | Motor Nameplate |
| 1-24 | Motor Current | 09RC020-230: 2.5 x the number of motors in each VFD (8 pole motor). 09RC080-230: 4.6 x the number of motors in each VFD (6 pole motor). | A | Motor Nameplate |

Table 5 – Secondary VFD Parameter Settings (09RCM050, 060, and 09RC080-145 Single Circuit)

| PARAMETER+G2:K30 | FUNCTION | FACTORY SETTING | UNIT | NOTES |
|------------------|--------------------------------------|---|------|-----------------------------------|
| 0-03 | Regional Settings | North America | | Default settings for 60 Hz mains. |
| 1-00 | Configuration Mode | [0] Open | | |
| 1-01 | Motor Control Principle | [1] VVC+ | | |
| 1-03 | Torque Characteristics | [1] Variable Torque | | |
| 1-22 | Motor Voltage | Voltage Code Specific | V | Motor Nameplate |
| 1-23 | Motor Frequency | Voltage Code Specific | Hz | Motor Nameplate |
| 1-24 | Motor Current | Voltage Code Specific | A | Motor Nameplate |
| 1-25 | Motor Nominal Speed | 850 (8 pole motor) 1140 (6 pole motor) | rpm | Motor Nameplate |
| 1-39 | Motor Poles | 4 | | Enter the number of motor poles. |
| 3-02 | Minimum Reference | 0 | | |
| 3-03 | Maximum Reference | 60 | | |
| 3-15 | Reference 1 Source | [1] Analog Input | | Signal from Primary Drive |
| 3-16 | Reference 2 Source | [0] No function | | Select speed reference resource. |
| 3-17 | Reference 3 Source | [11] Local bus reference | | Select speed reference resource. |
| 3-41 | Ramp 1 Ramp Up Time | 5 | s | Load dependent |
| 3-42 | Ramp 1 Ramp Down Time | 5 | s | Load dependent |
| 4-12 | Motor Speed Low Limit [Hz] | 0 | Hz | Motor speed limits |
| 4-14 | Motor Speed High Limit [Hz] | 60 | Hz | Motor speed limits |
| 4-18 | Current Limit | 110 | % | |
| 4-19 | Max Output Frequency | 62 | Hz | Safety limit |
| 5-10 | Terminal 18 Digital Input | [8] Start | | |
| 5-11 | Terminal 19 Digital Input | [0] No operation | | |
| 5-12 | Terminal 27 Digital Input | [0] No operation | | |
| 6-12 | Terminal 53 Low Current | 4 | mA | |
| 6-13 | Terminal 53 High Current | 20 | mA | |
| 6-14 | Terminal 53 Low Ref./Feedback Value | 0 | Hz | |
| 6-15 | Terminal 53 High Ref./Feedback Value | 60 | Hz | Signal from Primary Drive |
| 6-16 | Terminal 53 Filter Time Constant | 0.01 | s | |
| 6-19 | Terminal 53 Mode | [0] Current Mode | | Signal from Primary Drive |

