

Installation Instructions

Part No: 30RA-900---053

SAFETY CONSIDERATIONS

Installation of this accessory can be hazardous due to system pressures, electrical components, and equipment locations (such as a roof or elevated structure).

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

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

- Follow all safety codes.
- Wear safety glasses and work gloves.
- Use care in handling equipment.

⚠ WARNING

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

⚠ 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:

- Shut off electrical power to unit.
- Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
- 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.
- 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 gage for how much oil to add to the system.
- 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 control accessory reduces 30RAP, 30MPA and 30MPW chiller capacities below the standard lowest capacity step. This capacity reduction provides more precise control of leaving fluid temperature during light load conditions.

IMPORTANT: The hot gas bypass accessory cannot be used on units with the digital scroll compressor option. The hot gas bypass accessory also cannot be used on 30MPA, 30MPW, or 30RAP units with the medium temperature brine option.

The minimum load valve (MLV) of the hot gas bypass accessory limits the amount of refrigerant which can be bypassed from the condenser without impacting oil return. See Fig. 1.

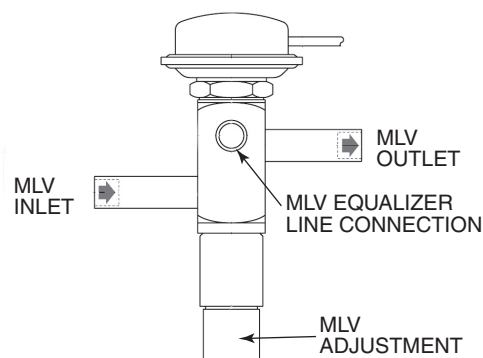


Fig. 1 — Minimum Load Valve (MLV) Connections

INSTALLATION

Examine the components for the correct part numbers. If the components are damaged, file a claim with the shipping company and notify your Carrier representative.

This hot gas bypass kit contains the following:

- Minimum load valve, part no. EA52DS422 1/2-in. ODF (outside diameter, female) copper connection (see Fig. 1)
- Solenoid valve, part no. EF23VS184 1/2-in. ODF copper connection
- Solenoid coil, part no. EF19XS016
- Bracket, part no. 38AP504253 (For use on 30RAP only)
- Hot gas bypass piping clamp, 1/2-in. dia., part no. KA66TA050
- Suction piping clamp, 1 5/8-in. dia., part no. KA66AA155
- Two sheet metal screws, 1/4-14 x 5/8-in.
- Installation instructions

The following material must be field supplied:

- Approximately 10 ft of 1/2-in. OD copper tubing
- Approximately 5 ft of 1/4-in. OD copper tubing
- Standard 1/2-in. OD copper elbows
- Standard 1/2-in. OD copper couplings

Install the MLV and Solenoid Valve

1. Remove refrigerant charge from the circuit using an approved refrigerant recovery device before proceeding with this installation.
2. Locate the factory-supplied stub between the expansion device and cooler and the discharge stub on the discharge line. Locate the stub for the equalizer line on the suction line (30RAP, 30MPA, and 30MPW050-071), or the thermostatic expansion valve (TXV) (30MPA and 30MPW016-045). It is needed for controlling the MLV. See Fig. 2 and 3 (30RAP), Fig. 4 and 5 (30MPW016-045), or Fig. 6 (30MPA and 30MPW050-071).
3. Cut the closed stubs on the discharge and cooler inlet. Prior to brazing both the Hot Gas Bypass Valve and Solenoid Valve, be sure to provide overheating protection to the devices by wrapping in a wet rag. Install a 1/2-in. copper line as shown in Fig. 2 and 3 (30RAP), Fig. 4 and 5 (30MPW016-045), or Fig. 6 (30MPA and 30MPW050-071). Connect the MLV outlet to the stub between the expansion device and cooler with 1/2-in. copper tubing. Connect 4 to 6-in. of 1/2-in. OD copper tube to the MLV inlet and then connect the solenoid valve to the end of that piping. In between the solenoid valve and the discharge stub, install the amount of 1/2-in. OD copper tube and 1/2-in. OD copper elbows necessary to connect the valve and stub together. The refrigerant flow will come from the discharge stub and into the stub between the expansion device and cooler. See Fig. 2 and 3 (30RAP), Fig. 4 and 5 (30MPW016-045), or Fig. 6 (30MPA and 30MPW050-071).

IMPORTANT: For 30MP032 units, the minimum load valve piping must only be connected to refrigerant circuit A. The only discharge and liquid stubs available for connection are located on circuit A. Do not connect the minimum load valve piping at any other location.

IMPORTANT: The MLV and solenoid valve are direction specific and must have their arrows (printed on valves) pointing toward the cooler.

4. **30RAP:** Connect the MLV equalizer line to the stub on the suction line. Cut the line and install the 1/4-in. copper coupling to create a through connection. Use this open connection to connect the MLV equalizer line using 1/4-in. OD copper tubing. See Fig. 1, 2, 3, and 7.
Connect the sheet metal bracket to the suction and equalizer piping using the clamps and screws provided. See Fig. 2 and 3.
30MPA and 30MPW: Connect the MLV equalizer line to the tee in the TXV equalizer for 30MPW016-045. Cut the line and install the 1/4-in. copper coupling to create a through connection. Use this open connection to connect the MLV equalizer line using 1/4-in. OD copper tubing. See Fig. 1, 4, and 8. For 30MPA and 30MPW050-071, connect the MLV equalizer line to the tube stub in on the suction line.
5. When piping is completed, leak test the assembly. Then evacuate, dehydrate, and recharge the circuit using approved refrigeration practices. Be sure to use the correct type and amount of refrigerant listed in the nameplate data and base unit documentation.

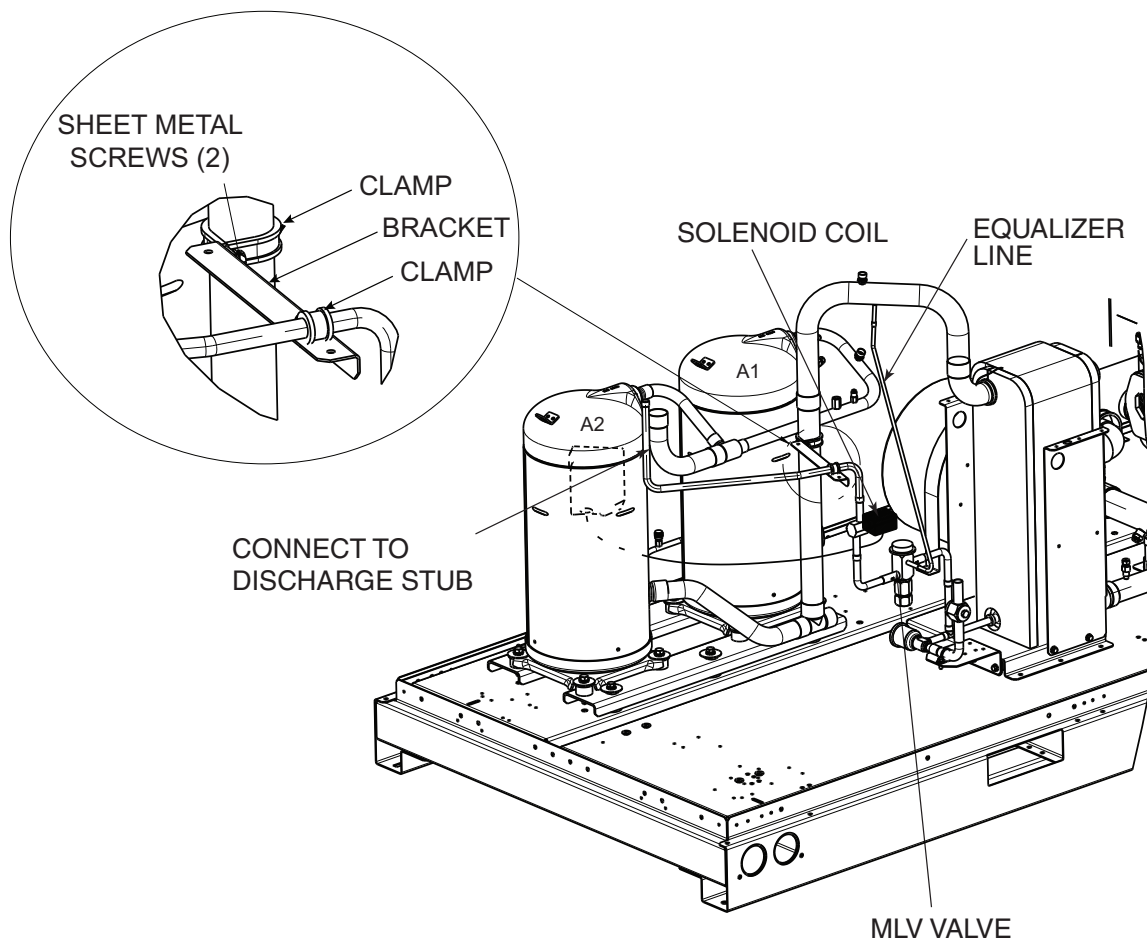


Fig. 2 — 30RAP Base Unit Connection Locations (Sizes 011-030)

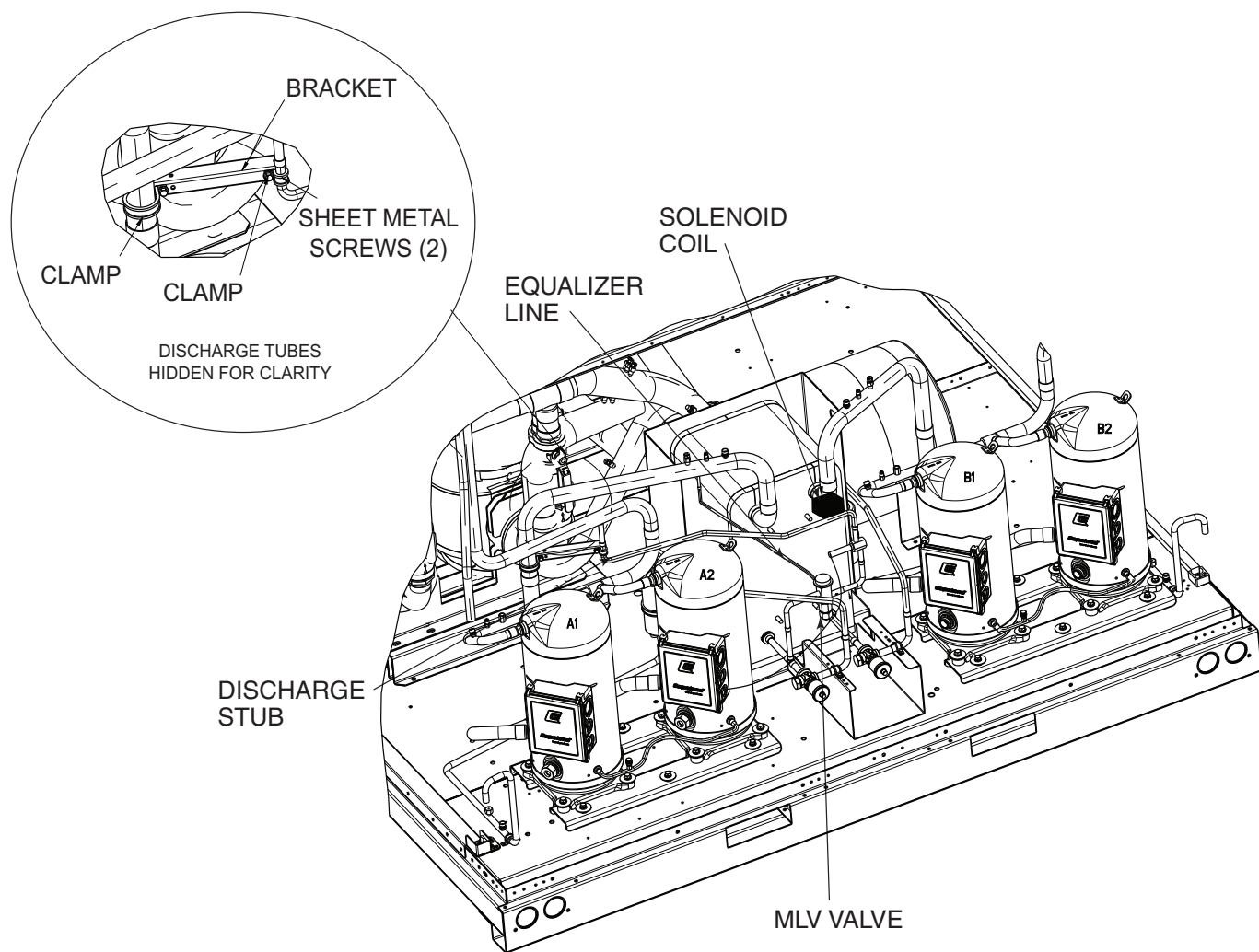


Fig. 3 — 30RAP Base Unit Connection Locations (Sizes 035-060)

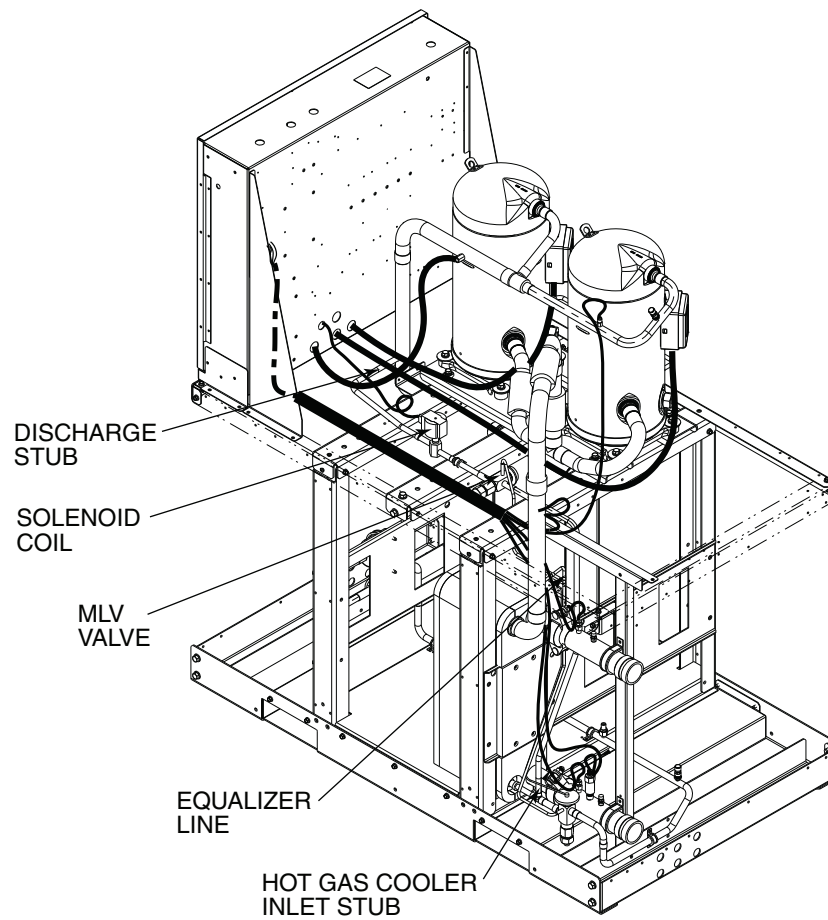


Fig. 4 — 30MPA and 30MPW Connection Location (Typical — Sizes 016-030, 040-045 Shown)

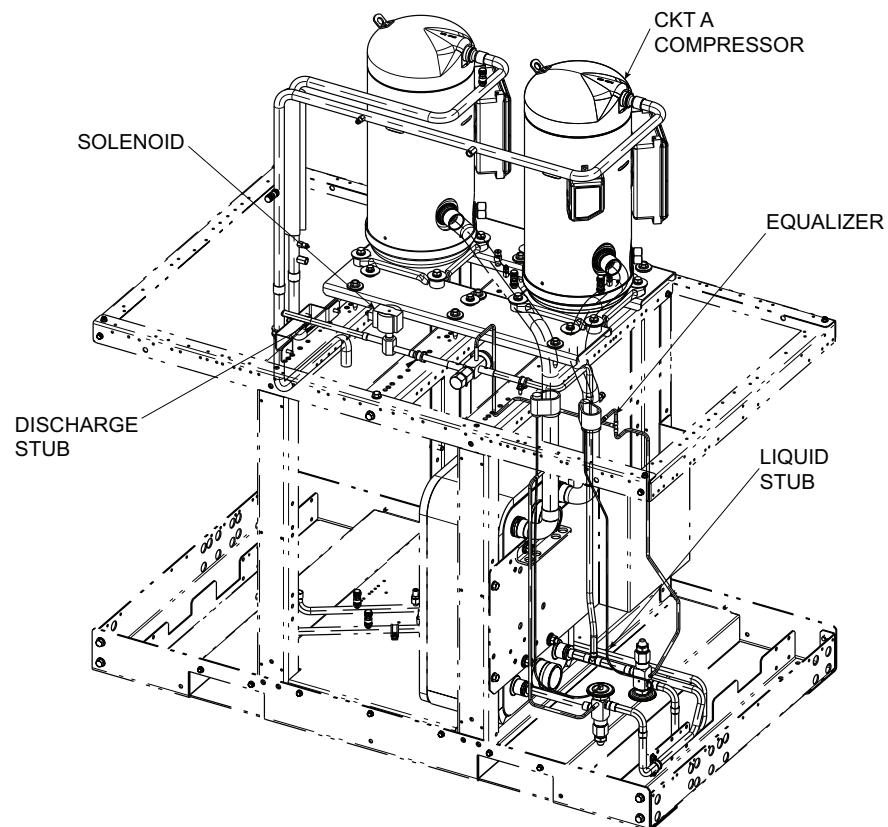


Fig. 5 — 30MPW016-045 Connection Location (Typical - Size 032 Shown)

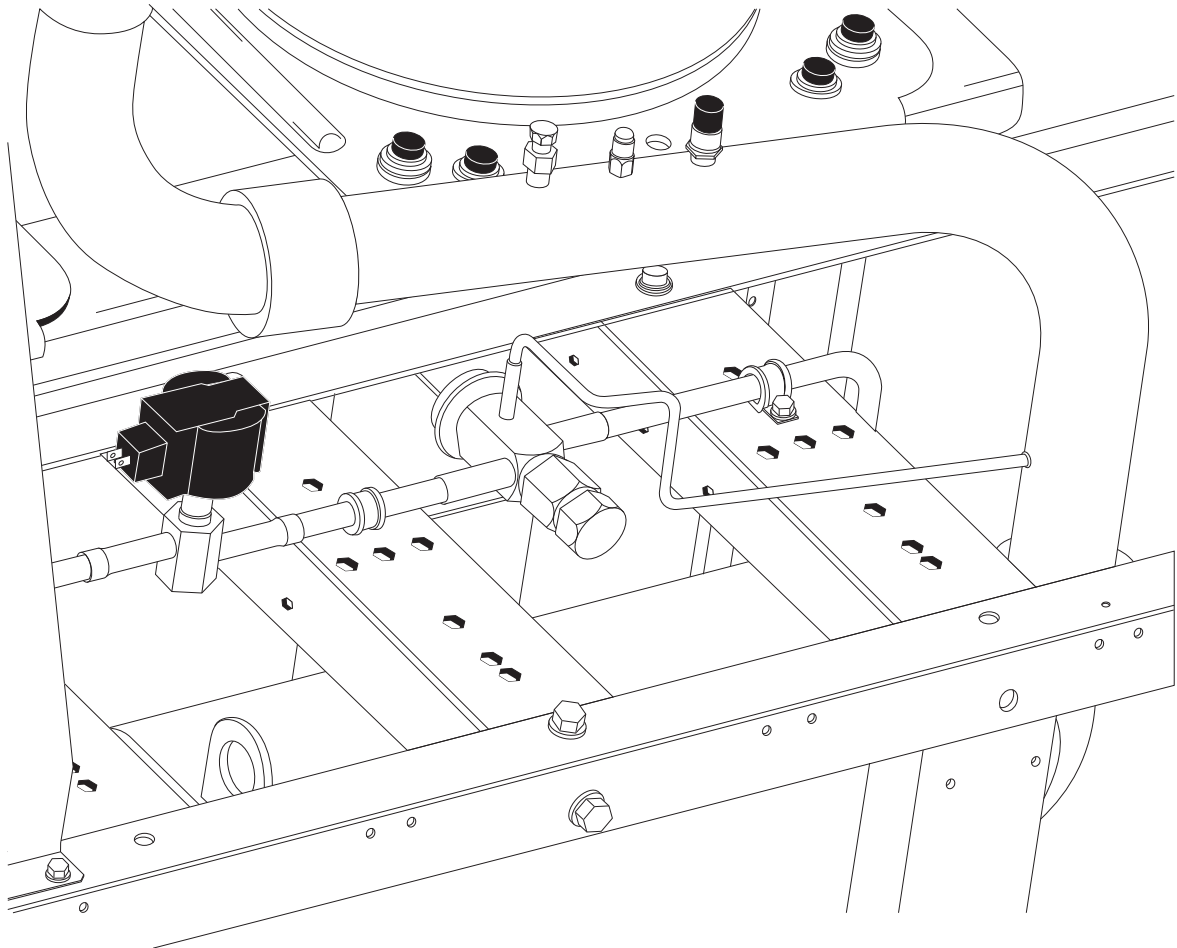


Fig. 6 — 30MPA and 30MPW050-071 Connection Location (Typical - Size 060 Shown)

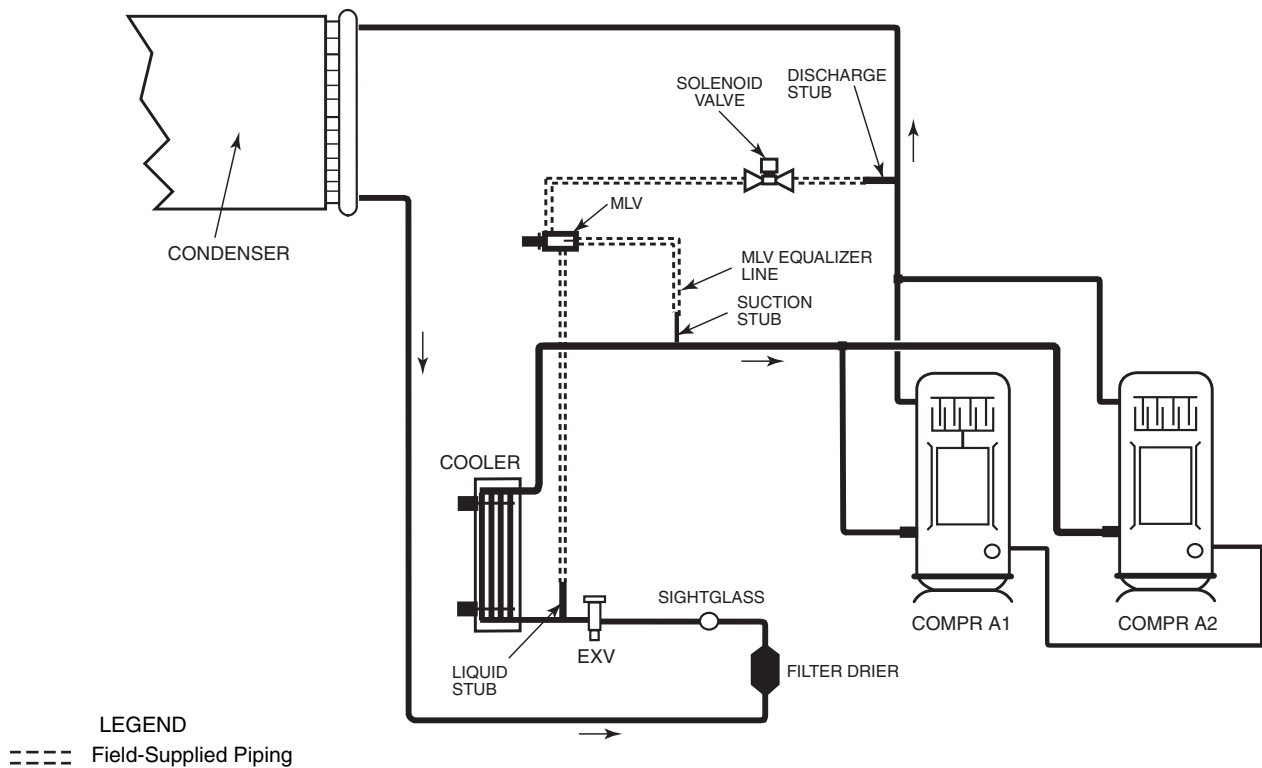


Fig. 7 — 30RAP Minimum Load Valve (MLV) Installation Piping

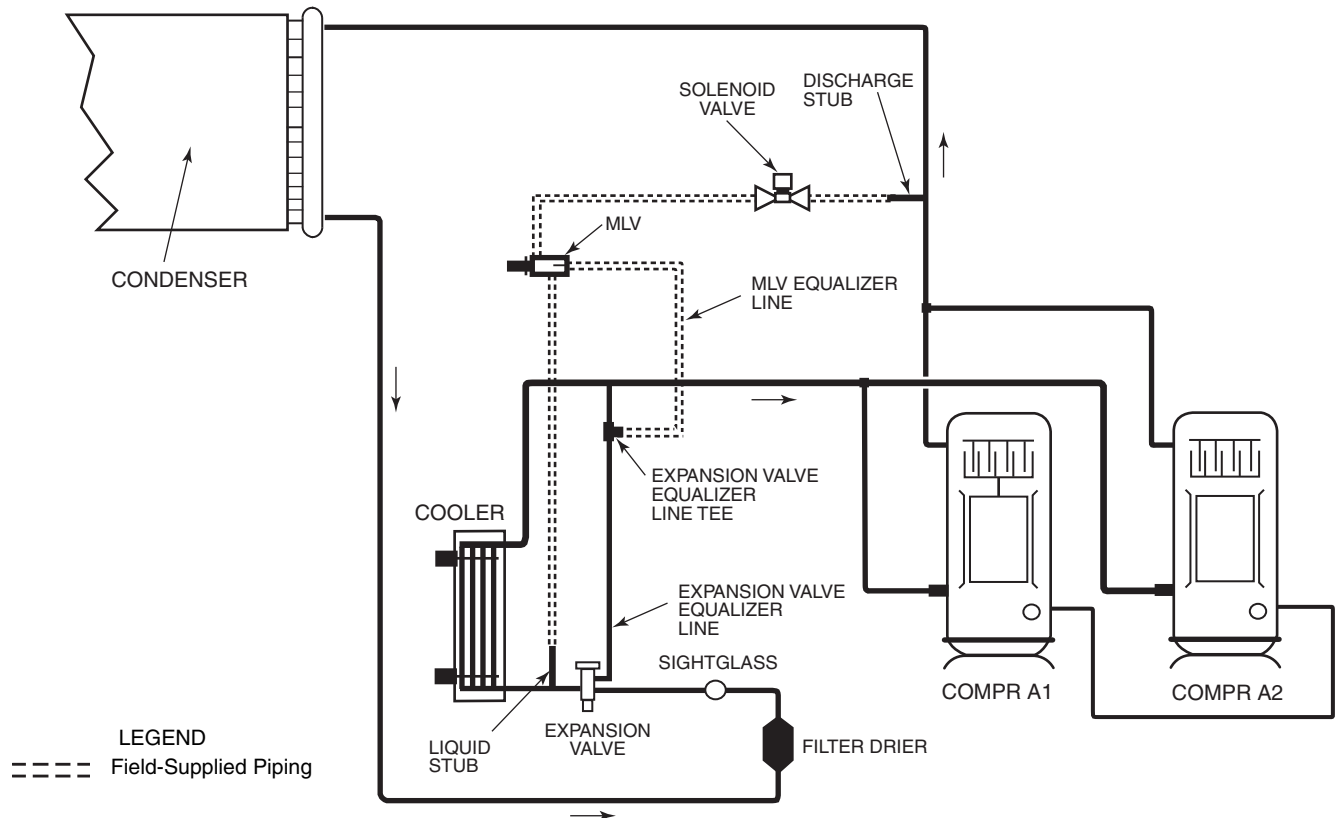


Fig. 8 — 30MPA, 30MPW Minimum Load Valve (MLV) Installation Piping

Install Control Wiring

30RAP

1. Install solenoid coil in locations shown in Fig. 2 and 3.
2. Locate the capped ends of the gray and brown wires in compressor A2 compressor junction box. See Fig. 9.
3. Cut off the capped ends, strip the wires back 1/2-in., and wire the solenoid coil(s) to the MLV terminals. See Fig. 10.

30MPA, 30MPW

1. Install solenoid coil in location shown in Fig. 4.
2. Locate the gray and brown wires labeled MLVA in the unit control panel.
3. Cut off the capped ends, strip the wires back 1/2-in., and wire the solenoid coil(s) to the MLV terminals. See Fig. 11.

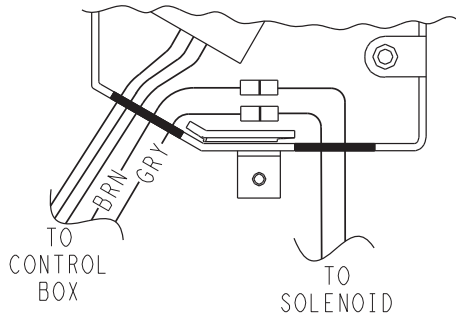


Fig. 9 — Compressor Junction Box (30RAP)

Configure Unit for Minimum Load Control

The control must be configured for the minimum load control operation. Use the scrolling marquee display to configure the system.

1. Set the Enable/Off/Remote switch to OFF position.
2. Press **[ESCAPE]** until the screen is blank and use the arrow key to select the Configuration mode LED.
3. Press **[ENTER]**, then use the arrow keys to select the sub-mode 'OPT1', then press the **[ENTER]** key.
4. Press the **▼** key until 'MLV.S' is displayed.
5. Press the **[ENTER]** key twice. The words 'PASS' and 'WORD' will flash.
6. Press 1 1 1 1, then the **[ENTER]** key so that 'NO' flashes.
7. Use **▼ ▲** to change to 'YES' and press **[ENTER]**.
8. Return the Enable/Off/Remote switch to the proper position.

The chiller is now configured for MLV control.

Test Minimum Load Relay Output

Use the scrolling marquee display, the instructions given in the Controls, Start-Up, Operation Service and Troubleshooting manual, and the Service Test mode to verify proper operation of the solenoid(s). Illuminate the Service Test LED, enable the Test mode using the 'TEST' sub-mode and enter the 'CMPA' sub-mode to test the output 'MLV.'

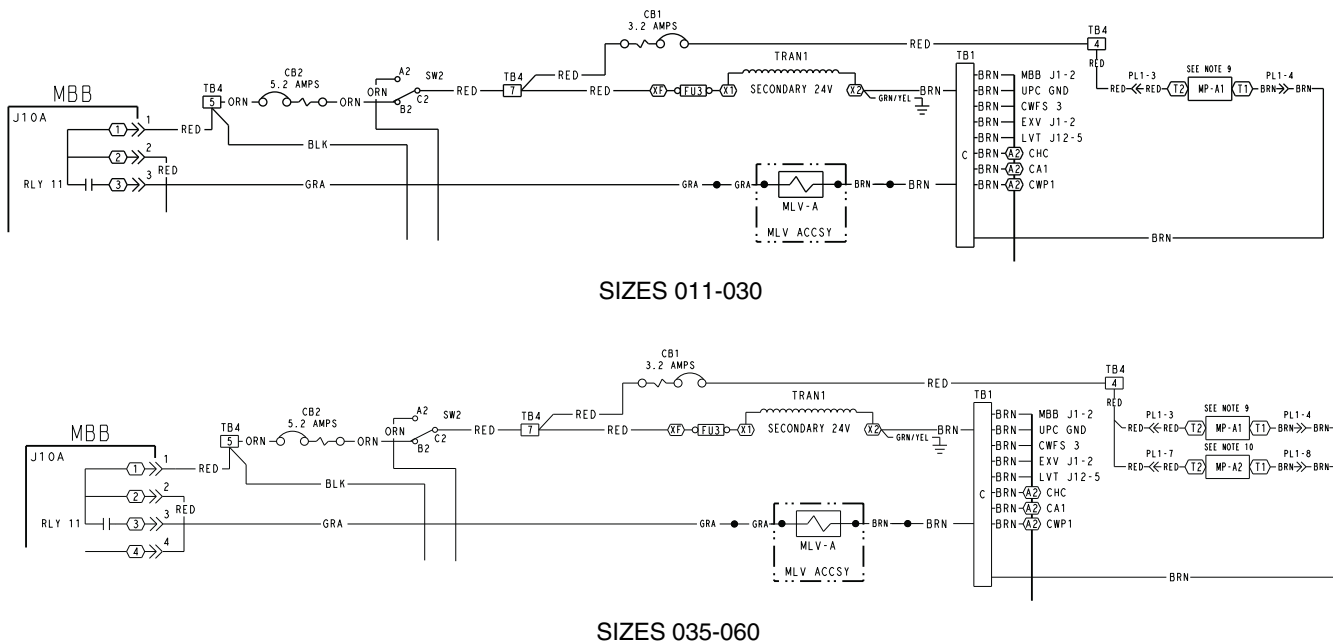


Fig. 10 — Solenoid Coil Wiring (30RAP)

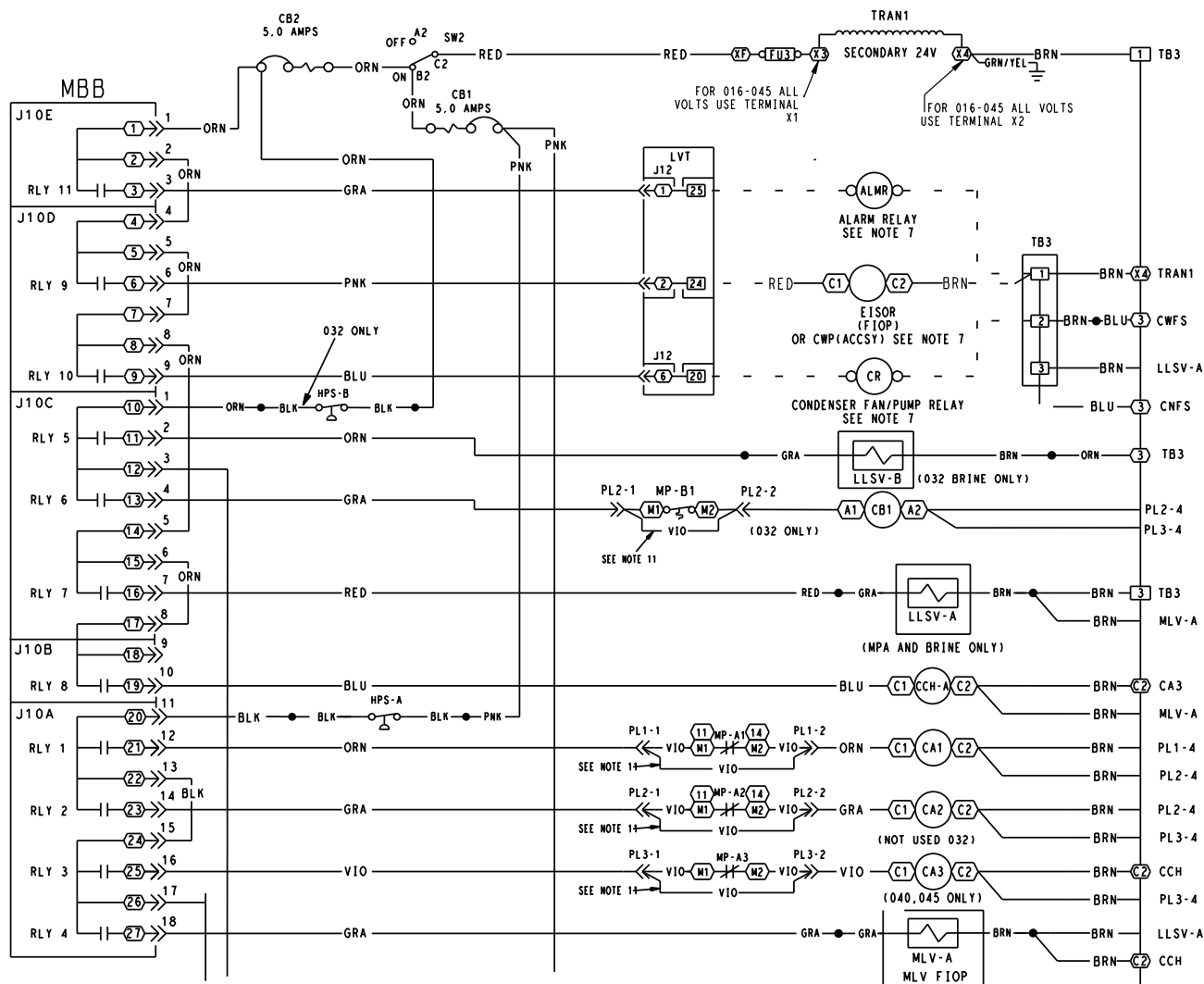


Fig. 11 — Solenoid Coil Wiring (30MPA, 30MPW)

NOTE: Under normal operation, relay 11 on the 30RAP main base board and relay 4 on the 30MPA, 30MPW main base board will be energized only when the lead compressor is on.

Once the outputs have been tested, the installation is complete.

MLV Operation

The MLV responds to changes in suction pressure. See Fig. 1. When the evaporating pressure is above the valve setting, the valve remains closed. As the suction pressure drops below the valve setting, the valve responds and begins to open. The valve opens in proportion to the change in suction pressure. As the suction pressure continues to drop, the valve continues to open until the limit of the valve stroke is reached.

In typical applications, the pressure change is not sufficient to open the valve to the limit of the stroke. The amount of pressure

change required to move the valve from the point at which it is closed to the point at which it is considered open varies widely depending on the evaporator temperature. For this reason, MLV capacity reduction is a function of allowable evaporator temperature change from closed position to the opening setting, which for most applications is a 6°F (3.3°C) change in evaporator temperature.

MLV Adjustment

The MLV utilizes a spring assembly which can be fixed at the desired pressure setting (opening pressure). This setting will not be affected by other factors such as ambient temperature or hot gas temperature. The MLV has an adjustment range of 95 to 115 psig (655 to 793 kPa). The standard factory setting for this valve is 105 psig (724 kPa).