



Installation Instructions

Part Nos. 30HX-900---008, 30GX-900---004
 (60 Hz — 115-v Control)

Part Nos. 30HX-900---009, 30GX-900---005
 (50 or 60 Hz — 230-v Control)

CONTENTS

	Page
SAFETY CONSIDERATIONS	1
INTRODUCTION	1
INSTALLATION	1-6
Step 1 — Examine Package Contents	1
Step 2 — Install Piping	2
• REMOVE MINIMUM LOAD PORT PLUGS AND INSTALL FITTINGS	
• INSTALL PIPING	
• INSTALL BALL AND SOLENOID VALVES	
• CONNECT PIPING	
Step 3 — Dehydrate and Recharge Circuit	3
Step 4 — Install Control Wiring	4
• 30HX UNITS	
• 30GX UNITS	
• ALL UNITS	
Step 5 — Configure Unit for Minimum Load Control	6
Step 6 — Test Minimum Load Relay Outputs	6
Step 7 — Adjust Setting of Minimum Load Ball Valve	6

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 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

Be sure power to equipment is shut off before performing maintenance or service.

IMPORTANT: When removing refrigerant, use an approved refrigerant recovery device. Do not vent refrigerant into the atmosphere.

INTRODUCTION

The minimum load control accessory allows 30HX and 30GX chillers to have their capacities decreased below the standard fully unloaded condition. The accessory provides more precise control of leaving fluid temperature during light load conditions.

The 30GX and 30HX chillers have a dual-circuit design. Each minimum load control accessory package contains the items required for both circuits. Because of an automatic lead/lag feature on the chillers, the accessory should be installed on both circuits.

INSTALLATION

Step 1 — Examine Package Contents — Package includes solenoid valves, ball valves, Swagelok® connectors, and instructions. The kit for 30GX units also contains a junction box, junction box cover, and conduit. Examine each item. If any part is damaged or missing, file a claim immediately with the shipper. See Table 1 for accessory package contents and field-supplied material.

Table 1 — Accessory Package Contents and Field-Supplied Material

ACCESSORY PACKAGE COMPONENTS	ACCESSORY PART NUMBER			
	30HX-900---008	30HX-900---009	30GX-900---004	30GX-900---005
Solenoid Valve	(2) EF23JX212	(2) EF23JX231	(2) EF23JX212	(2) EF23JX231
Ball Valve	(2) EP71BA201	(2) EP71BA201	(2) EP71BA201	(2) EP71BA201
Swagelok Connector	(4) DC09CA307	(4) DC09CA307	(2) DC09CA307	(2) DC09CA307
Junction Box	—	—	HX30FZ001	HX30FZ001
Junction Box Cover	—	—	HX38ZZ001	HX38ZZ001
Watertight Conduit	—	—	99CD2121AC028	99CD2121AC028
FIELD SUPPLIED MATERIAL — REQUIRED PARTS (Ordered Separately)				
5/8-in. OD Copper Tubing, Wiring, Conduit, Thread Sealant, Electrical Supplies			Field Supplied	

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Step 2 — Install Piping

⚠ WARNING

Shut off all power to the unit, then lock out and safety-tag all disconnects before proceeding with installation.

⚠ WARNING

Remove refrigerant charge from circuits using an approved refrigerant recovery device before proceeding with installation.

NOTE: The units have 2 circuits. Perform all of the following piping installation procedures on both A and B circuits.

REMOVE MINIMUM LOAD PORT PLUGS AND INSTALL FITTINGS — Plugs must be removed from these ports and replaced with Swagelok® fittings. Note that plugs were factory-installed with Loctite® refrigerant-compatible sealant. Fittings should be installed with similar sealant on threads.

30GX — Cut plug end off of minimum load port braze nipple on discharge line, located between oil separator and condenser. Remove plug from minimum load port on cooler shell. See Fig. 1. Using thread sealant, install Swagelok fitting in minimum load port on cooler. Port on nipple in discharge line is reserved for a brazed connection.

30HX — Remove plugs from minimum load ports on the cooler shell and the condenser shell (30HXC) or oil separator (30HXA). See Fig. 2. Using thread sealant, install Swagelok fittings in minimum load ports.

INSTALL PIPING — On 30GX units, install field-supplied $\frac{5}{8}$ -in. OD copper tubing between the Swagelok fitting on the cooler shell and the braze nipple on the discharge line. On 30HX units, install field-supplied $\frac{5}{8}$ -in. OD copper tubing between the fittings on the cooler shell and condenser (30HXC) or oil separator (30HXA). Do not tighten fittings or braze tubing yet.

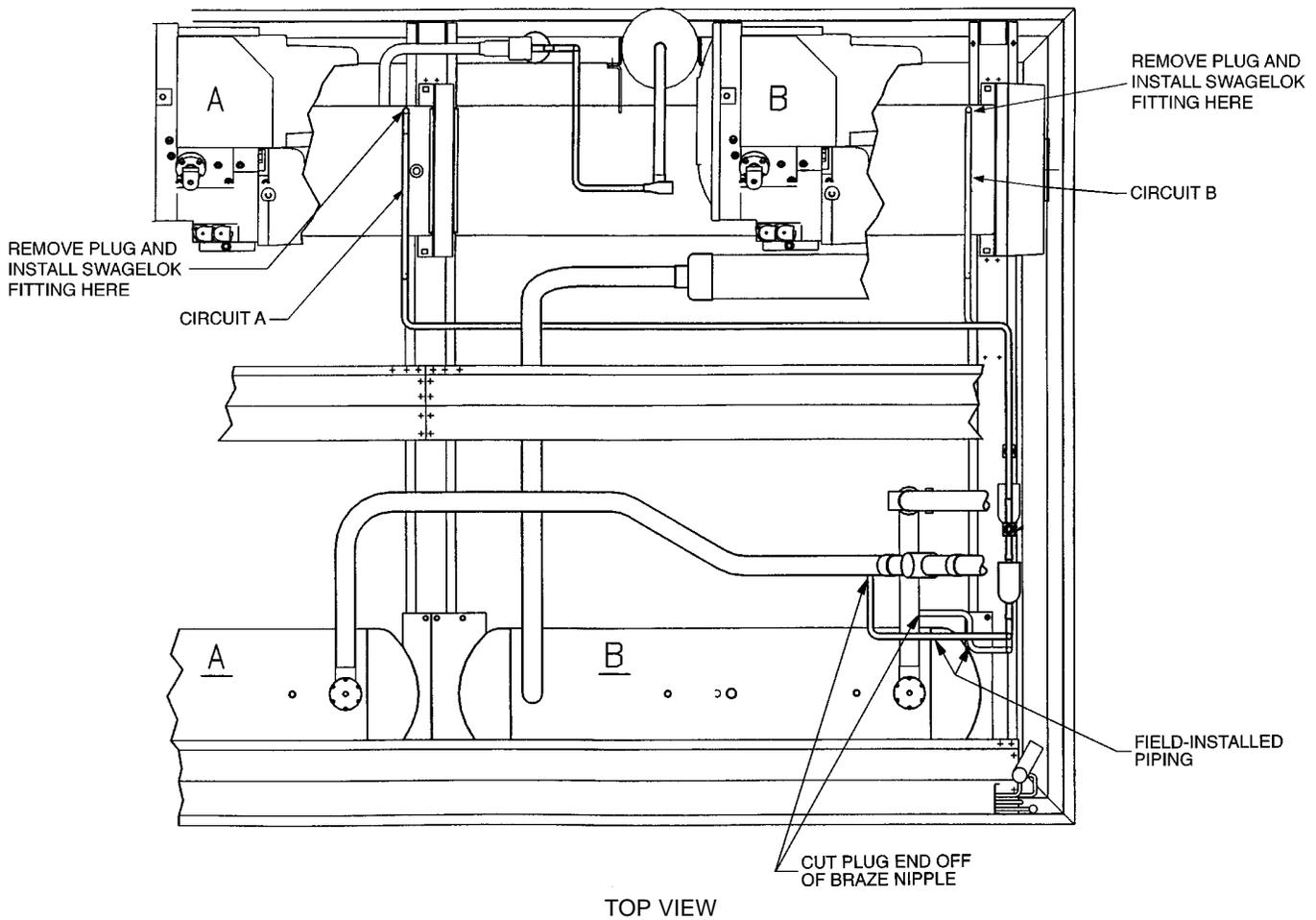


Fig. 1 — Installing Fittings, 30GX (Typical)

INSTALL BALL AND SOLENOID VALVES — Using good piping practice, braze ball valve and solenoid valve into $\frac{5}{8}$ -in. minimum load piping. Fig. 2 shows a typical 30HX installation and Fig. 3 shows a typical 30GX installation, including valve locations and orientation. Ensure that ball valve is fully open, and that both the ball and solenoid valve are protected from excess heat during brazing process. Wrap wet cloths around valve bodies during brazing to prevent damage to the valves from heat.

IMPORTANT: When installing solenoid valve, make sure that flow direction arrow on valve body points towards the cooler. The minimum load control will not function correctly if this valve is installed backwards.

CONNECT PIPING — Check the ends of the tubes where they will be inserted into the Swagelok® fittings. To avoid leaks, tube ends must be round and free of burrs, nicks, and grooves.

Insert tube ends into fittings as far as they will go. When tube bottoms out, tighten the compression nut finger-tight while holding the fitting body. Use backup wrench to hold fitting body and tighten compression nut another $1\frac{1}{4}$ turns.

IMPORTANT: Do NOT overtighten the fittings. Overtightening the fittings can deform the tube ends and cause leaks.

30GX UNITS ONLY — Using good brazing practice, braze the $\frac{5}{8}$ -in. minimum load tubing to the copper nipple on the discharge line (minimum load port) between the condenser coil and oil separator. See Fig. 1 and 3.

Step 3 — Dehydrate and Recharge Circuit

— When piping has been completed, leak test the assembly. If one of the Swagelok fittings leaks, slowly tighten the compression nut until the leak stops. If this does not fix the leak, the connection must be reinstalled using a new ferrule and backup ring in the fitting. Contact your Carrier representative for assistance in locating these parts.

After leak testing, evacuate, dehydrate, and recharge the circuit using an approved refrigerant recovery device. Correct type and amount of refrigerant are listed on unit nameplate and in base unit documentation.

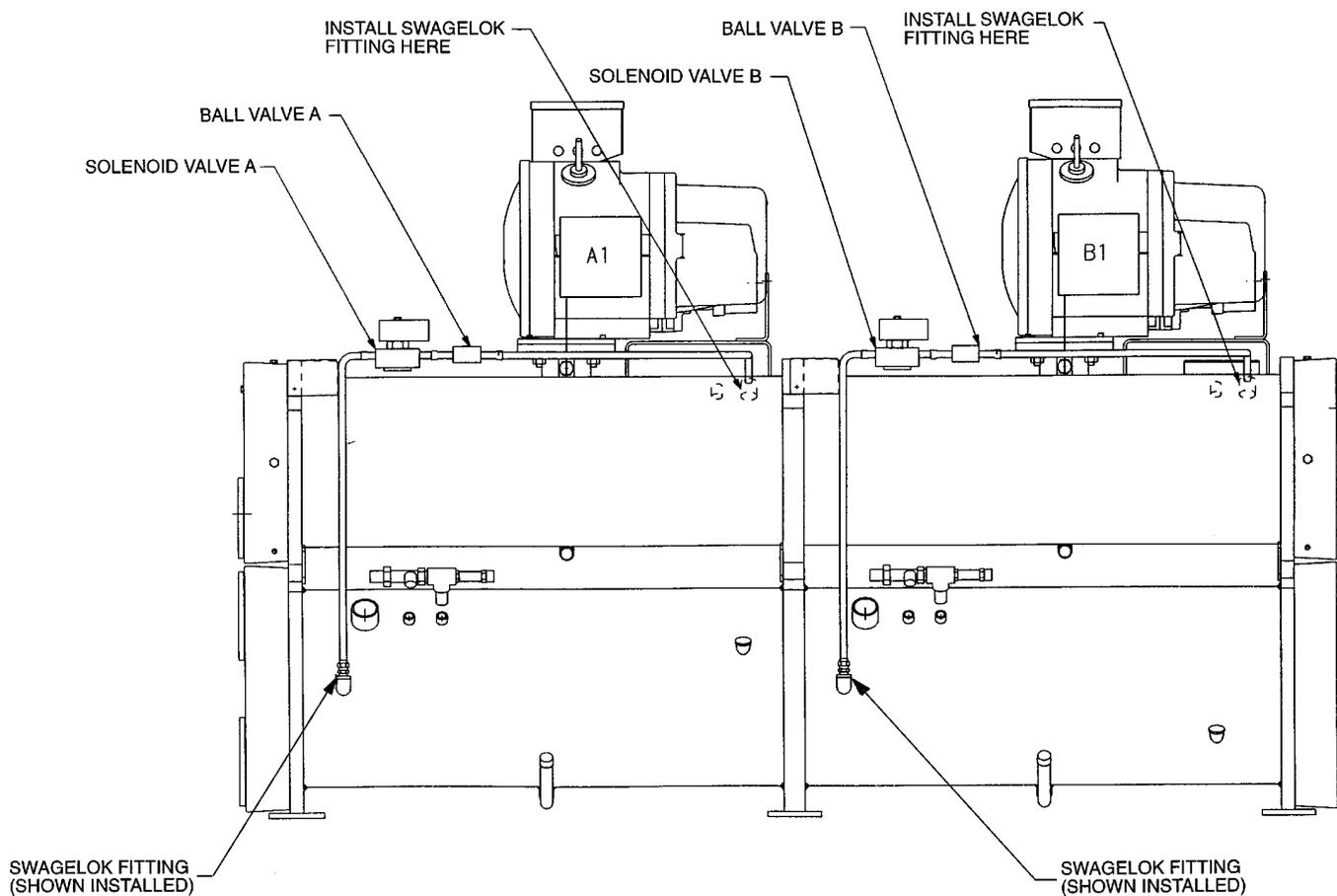


Fig. 2 — Installing Fittings and Valves, 30HX (Typical)

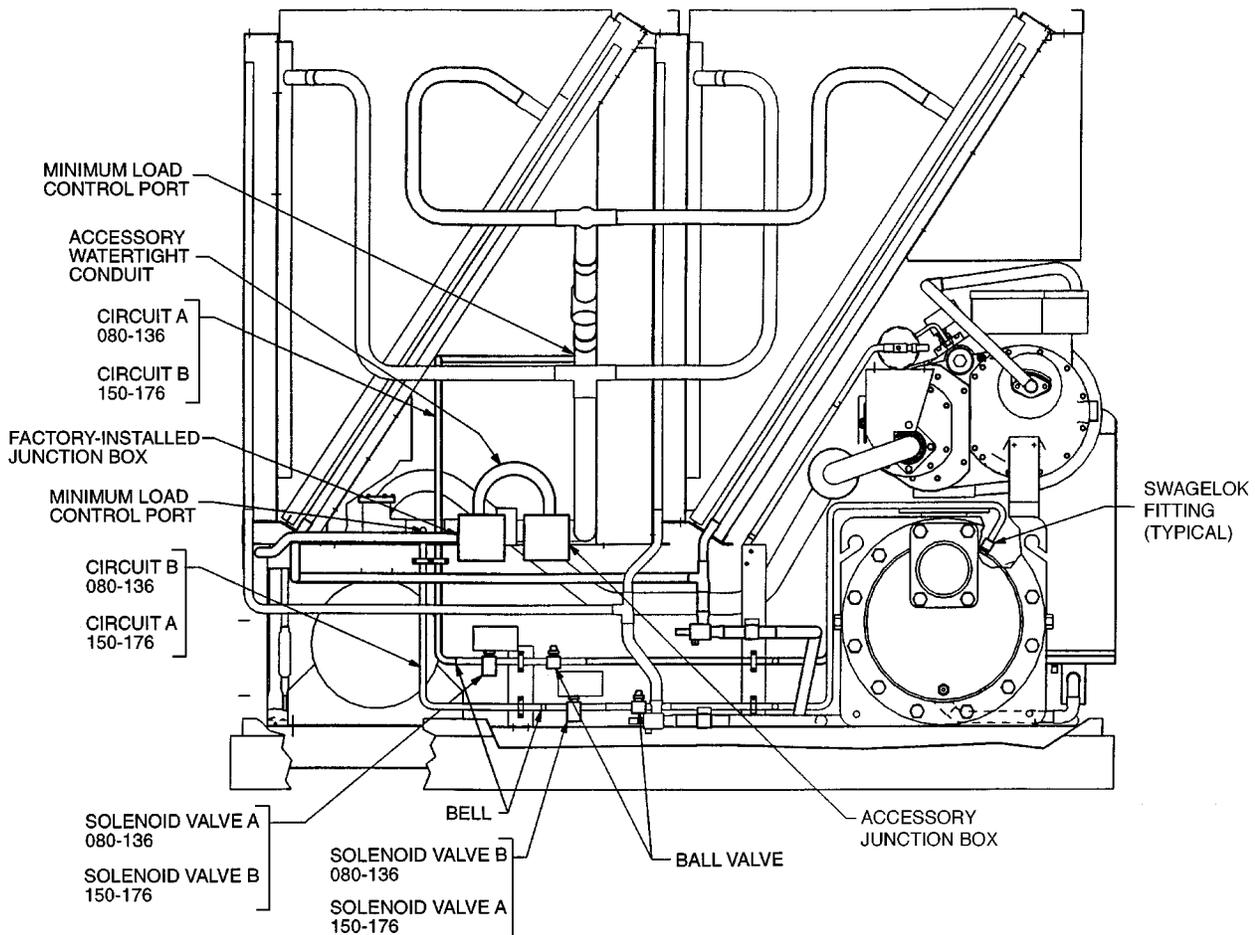


Fig. 3 — Installing Valves, 30GX

Step 4 — Install Control Wiring

⚠ WARNING

Be sure all power to the unit is off before proceeding.
Lock out and safety-tag all disconnects.

Wires between field-installed components and unit control box must be enclosed in field-supplied conduit. Follow all local codes and NEC (National Electrical Code, U.S.A.). Wire size must be no. 16 AWG (American Wire Gage) (1.5 mm²) minimum. See Fig. 4 for field wiring.

30HX UNITS — Remove the screws holding the right-side access panel to the unit control box. Remove the right-side access panel and store in a safe area.

Route wires through field-supplied conduit and attach the conduit to the unit control box, using a suitable conduit fitting and one of the available 7/8-in. knockout openings. Attach the other end of the conduit to the solenoid valve, using a suitable fitting. Repeat for the other circuit.

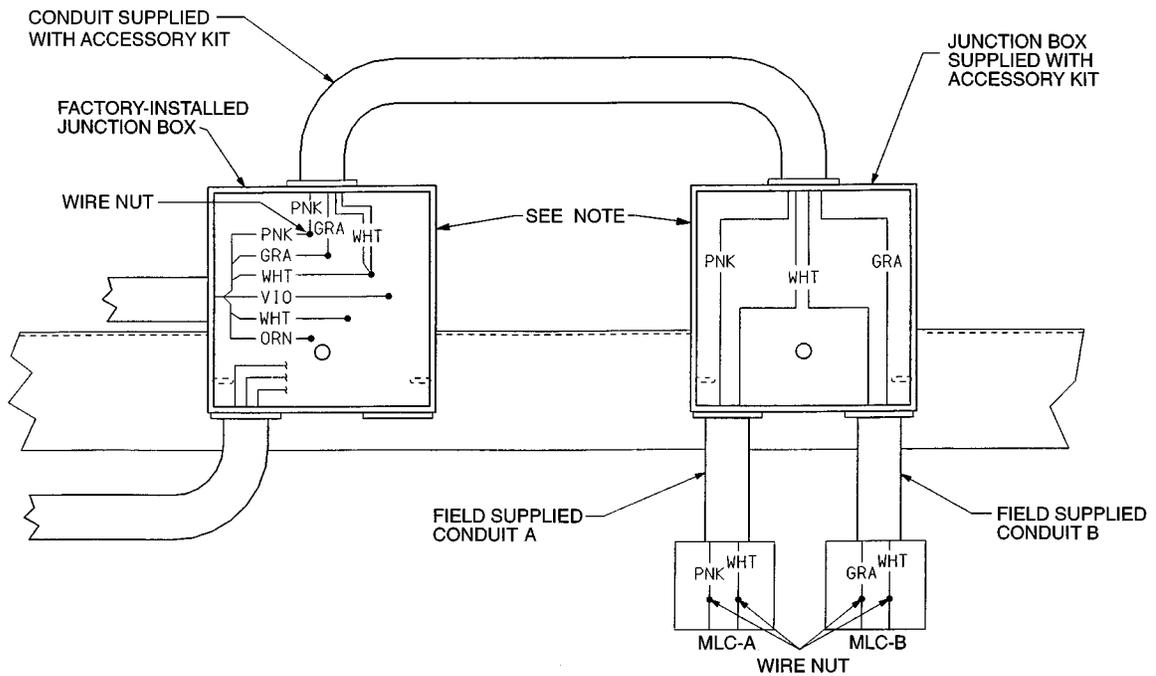
30GX UNITS — Install the accessory junction box included with this kit in the position shown on the 30GX chiller in Fig. 3. Route the waterproof conduit included with this kit between the accessory junction box and the factory-installed junction box. See Fig. 3 and 4. Route field-supplied conduits from the solenoid valves to the accessory junction box.

ALL UNITS — Using good wiring practice, connect a white wire from the solenoid valve on circuit A to a white wire from the solenoid valve on circuit B. Connect both wires to the white wire in the factory-installed junction box (30GX), or unit wiring harness labelled “MLC-A & B” (30HXA, HXC).

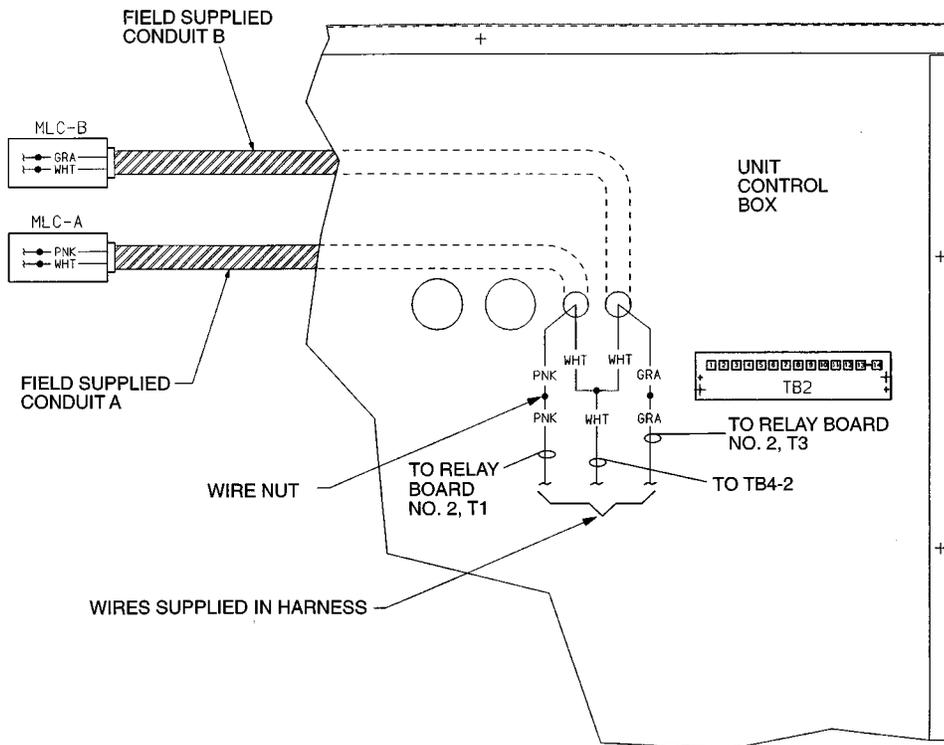
Connect a pink wire from the solenoid valve on circuit A to the pink wire in the factory-installed junction box (30GX), or unit wiring harness labelled MLC-A (30HXA, HXC).

Connect a gray wire from the solenoid valve on circuit B to the gray wire in the factory-installed junction box (30GX), or unit wiring harness labelled MLC-B (30HXA, HXC).

Figure 4 shows the correct wiring for the minimum load control and the location of the wiring connection points on the chiller.



30GX080-176



30HX076-271

LEGEND

MLC — Minimum Load Control
 TB — Terminal Block

NOTE: See Fig. 3 for locations of junction boxes on unit.

Fig. 4 — Minimum Load Control Wiring

Step 5 — Configure Unit for Minimum Load Control

— Once the piping installation and wiring installation are complete, the chiller must be configured for minimum load control operation. This may be done using the unit keypad (HSIO-2). Set the LOCAL/OFF switch in the OFF position.

1. Press **2** **SHVC** on the keypad.
2. Press the down arrow **↓** until the display reads:
MIN. LOAD VALVE SELECT
DISABLE
3. To enable the minimum load valve feature, press **1** **ENTR**.
4. The display may read as follows. (If not, skip to Step 7.)
PASSWORD PROTECTED FUNCTION
ENTER PASSWORD
5. Press **1** **1** **1** **1** **ENTR**.
6. The HSIO-2 again displays the following:
MIN. LOAD VALVE SELECT
DISABLE
7. Press **1** **ENTR**. The display changes to:
MIN. LOAD VALVE SELECT
ENABLE

The chiller is now configured for minimum load valve control.

Step 6 — Test Minimum Load Relay Outputs

— After the accessory components are installed and the unit is recharged and reconfigured, test the operation of the relay and solenoid valve using the Quick Test software function. Test Circuit A as follows (the LOCAL/OFF switch must be in the OFF position):

1. Press **1** **TEST** on the HSIO-2 keypad.
2. Press the down arrow **↓** until the display reads:
MIN. LOAD VALVE A
RELAY IS OFF
3. Press **1** **ENTR**.
4. The display may read as follows. (If not, skip to Step 7.)
PASSWORD PROTECTED FUNCTION
ENTER PASSWORD
5. Press **1** **1** **1** **1** **ENTR**.
6. The HSIO-2 again displays the following:
MIN. LOAD VALVE A
RELAY IS OFF
7. Press **1** **ENTR** to energize the relay. The display reads:
MIN. LOAD VALVE A
RELAY IS ON
An audible click will be heard. Verify that the solenoid valve for Circuit A is energized.

8. Press **0** **ENTR** to turn off the minimum load valve relay for Circuit A.

To check the operation of the solenoid valve on Circuit B, follow the same procedure as the preceding, but enter **2** **TEST** in Step 1, instead of **1** **TEST**. The display screens will be for Circuit B instead of A.

After testing is complete, recheck all electrical connections for proper location and tightness. For 30HX units, replace and secure the access panels for the unit control box. For 30GX units, secure the junction box covers to the junction boxes.

Step 7 — Adjust Setting of Minimum Load Ball Valve

— Before the installation is complete, the minimum load ball valve must be adjusted to suit the application. Calibrate one circuit at a time as follows:

1. Adjust the ball valve so that it is approximately half open.
2. Operate the chiller in Manual Control mode, with one circuit operating, and all compressor loaders deenergized.

NOTE: Operation of the chiller in Manual Control mode is described in the Controls, Start-Up, Operation, and Troubleshooting Guide that is included with the 30GX,HX Ecologic™ chillers.

3. Record the cooler ΔT (the difference between cooler entering fluid temperature and cooler leaving fluid temperature) at this fully unloaded condition.
4. Use the Manual Control feature to enable the minimum load valve for the circuit that is operating.
5. Observe and record the cooler ΔT with the minimum load valve energized.
6. Adjust the minimum load ball valve until the cooler temperature difference reading from Step 5 is equal to half of the temperature difference reading from Step 3.
7. Open the ball valve to decrease the temperature difference or close the ball valve to increase the temperature difference (ΔT). When the valve is adjusted correctly, the difference between cooler entering and leaving fluid temperatures when the minimum load control is energized must be at least half of the temperature difference when the minimum load control is deenergized. For example, if the difference between the cooler entering and leaving water temperature is 3° F with the valve deenergized, then the difference between cooler entering and leaving water temperature must be at least 1.5° F with the valve energized.

Once the outputs have been tested and the ball valve adjusted, the installation is complete.

