



Installation Instructions

Part No. 30MP-900---004

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SAFETY CONSIDERATIONS

Installation of this accessory can be hazardous due to system pressures, electrical components, and equipment location (such as a roof or elevated structure). Only trained, qualified installers and service technicians should install, start-up, and service this equipment.

When installing this accessory, observe precautions in the literature, labels attached to the equipment, and any other safety precautions that apply:

- Follow all safety codes
- Wear safety glasses and work gloves
- Use care in handling and installing this accessory

It is important to recognize safety information. This is the safety-alert symbol: ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ WARNING

ELECTRIC SHOCK HAZARD

To avoid the possibility of electrical shock, open all disconnects before installing or servicing this equipment.

GENERAL

Check Package Contents

Check for damage to the parts. Accessory package 30MP-900---004 contains the thermal dispersion flow switch (Carrier part no. HR81LG020) and cable (Carrier part no. 30MP500424). If damage is found, file a claim immediately with the shipper.

The following field-supplied items are also required for installation:

- two 1/2 in. (13 mm) electrical connectors
- varnish cloth
- 1/4 in. FPT fitting may also be required for units without the condenser water manifold option/accessory

Description

This accessory condenser flow switch may be used on 30MPW017-080 liquid cooled chillers. The flow switch (see Fig. 1) is a thermal dispersion switch with a normally open contact that closes on velocity above 0.66 fps (20 cm/s).

NOTE: On some units, the fluid velocity will be less than the factory trip-point setting. In these instances, contact your local Carrier representative for the adjustment tool and procedure.

NOTE: For units with variable condenser water flow for head pressure control, this control may result in nuisance water flow switch alarms as the flow is restricted to increase head pressure. The condenser flow switch accessory is not recommended in this application.

INSTALLATION

⚠ WARNING

ELECTRIC SHOCK HAZARD

Electrical shock can cause personal injury and death. Open all disconnects before installing or servicing this equipment.

Step 1 — Disconnect Unit Electrical Power Supply

Open and tag all disconnects. Be sure all power is off before work begins.

Step 2 — Isolate the Condenser Fluid (Inlet and Outlet)

If the unit is installed with condenser water isolation valves, close both inlet and outlet valves, relieve any residual pressure and drain the isolated section.

If the unit was installed without condenser water isolation valves, the condenser section will need to be drained to install the condenser water flow switch. See Fig. 1-3 for wire routing, fitting and location of the flow switch.

Step 3 — Mount Flow Switch

⚠ CAUTION

The fluid system may be under pressure. Use caution when installing condenser flow switch or fitting.

FOR UNITS WITH MANIFOLD PIPING

The FPT fitting is factory-installed. Remove the plug from the fitting; install the flow switch with thread sealant. Be careful not to overtighten. See Fig. 1-3 fitting details and wire routing. Continue to Step 4.

⚠ CAUTION

Overtightening can cause damage to the flow switch. Maximum torque is 37 ft-lb (50 N-m).

FOR UNITS WITHOUT MANIFOLD PIPING

Mount switch in a location where shock, turbulence, and vibration are minimal. Ambient temperature must be below 160°F (71°C).

1. Determine location for mounting flow switch as follows:
 - a. Recommended installation is one flow switch per module. The switch must be located downstream of any shutoff valve.
 - b. The sensor tip must be completely immersed in the medium.
 - 1) In the case of horizontal piping mount the unit from the side, if possible.
 - 2) When the unit is to be mounted at the bottom of the pipe, it should be free from deposits.
 - 3) When the unit is to be mounted at the top of the pipe, it should be completely filled with the medium to be monitored.
 - 4) In the case of vertical piping mount the unit in a place where the medium flows upwards.
 - c. Components integrated in the pipes, bends, valves, reductions, etc. lead to turbulence of the medium. This affects the function of the flow switch. Following the guidelines below for distances between sensor and sources of interference will minimize the chances for turbulence:
 - 1) Source of turbulence (reduction/increase in pipe size, valves, elbows, etc.) to switch location should be no less than 10 pipe diameters.
 - 2) From the switch location to a source of turbulence there should be no closer than 6 pipe diameters.
 - e. Mount switch where the piping is small enough to result in a flow velocity sufficient to avoid nuisance trips. Recommended size is 2 in. IPS for 30MPW sizes 017 and 021 and 2.5 in. for 30MPW sizes 031-080.
2. Install 1/4 in. FPT fitting or 1/4 in. FPT hole in the piping within 10 ft (3 m) of the condenser inlet or outlet.
 3. Install flow switch with thread sealant. Be careful not to overtighten. See Fig. 1 for flow switch orientation.

⚠ CAUTION

Overtightening can cause damage to the flow switch. Maximum torque is 37 ft-lb (50 N-m).

Step 4 — Connect Wires to Unit Control Box

The condenser flow switch wires can be run through the cable gland in the back of the control box where the chilled water flow switch, suction, and discharge transducers are routed. See Fig. 2 for wire routing details. Typical wiring diagrams are shown in Fig. 4 and 5.

1. Connect the cable to the flow switch. Note the position of the orientation tab on the cable and switch before hand tightening. Refer to Fig. 1 and 6 for orientation tab.
2. To wire flow switch, connect switch wires, pins 2 and 4 (WHT and BLK), to TB5-1 and 2. Connect 24-v power to BLU and BRN wires, pin 1 and 3, in bottom of panel marked CNFS. See Fig. 4, 5 and 7 for typical wiring diagrams and flow switch wiring.

NOTE: Flow switch wiring is the same for all 30MPW units.

Step 5 — Open Water Lines to Condenser

Open isolation valves to restore unit to condenser loop or fill condenser loop. Check for leaks at switch. Bleed all air.

Step 6 — Restore Power to Unit

Restore unit power and check for proper operation.

The flow sensor cable is provided with (3) LEDs that indicate if 24 vac power is present and also status of the switch contacts.

With power applied to the switch, 24 vac across pins 1 and 3, the green LED is ON. One yellow LED (YEL1) will be on if 24 vac has been applied to the line side of the switch closure. These two LEDs must be ON for the switch to be operating properly. When flow is established, the second yellow LED (YEL2) will turn ON. See Fig. 8 for switch cable LED details.

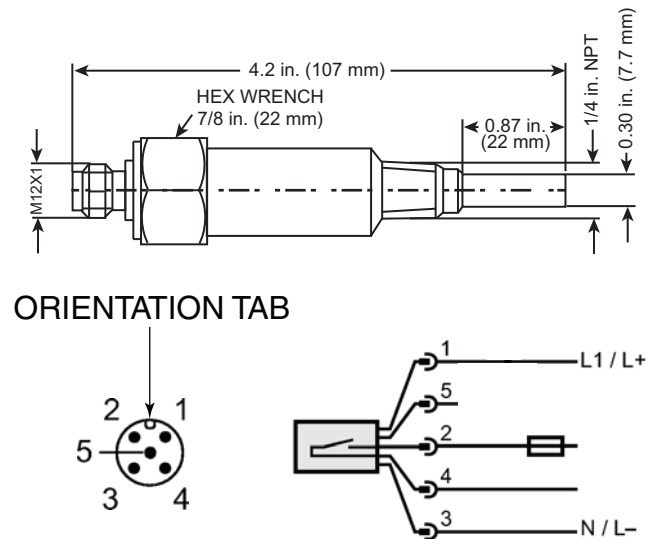


Fig. 1 — Flow Switch

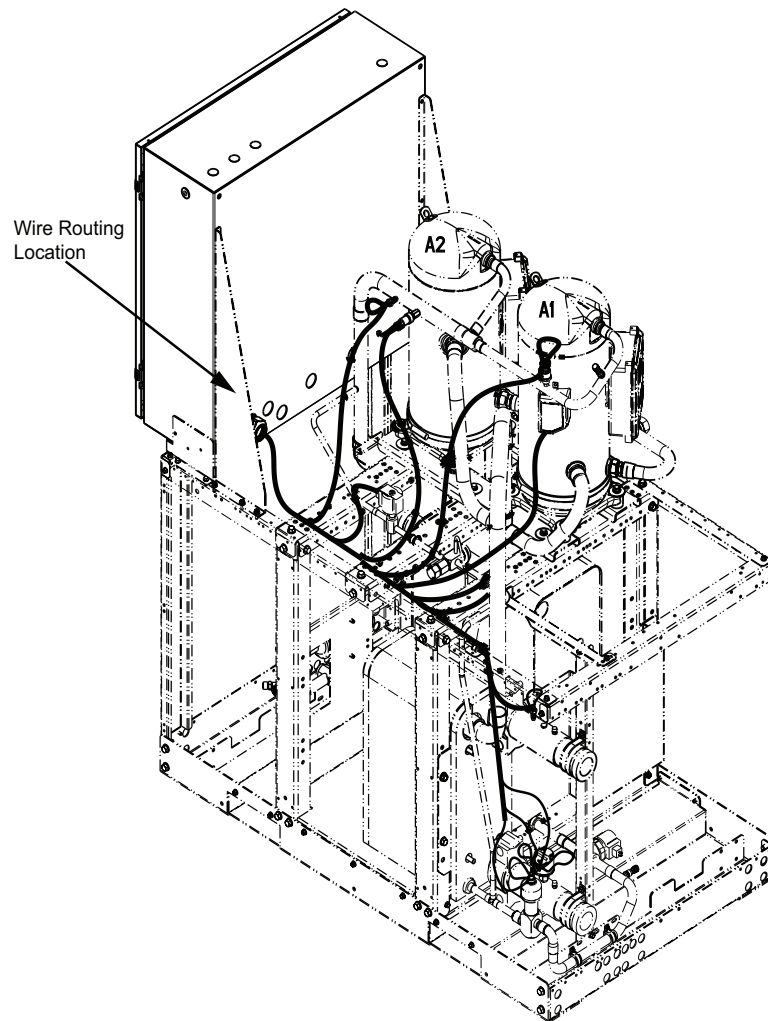


Fig. 2 — Wire Routing Location

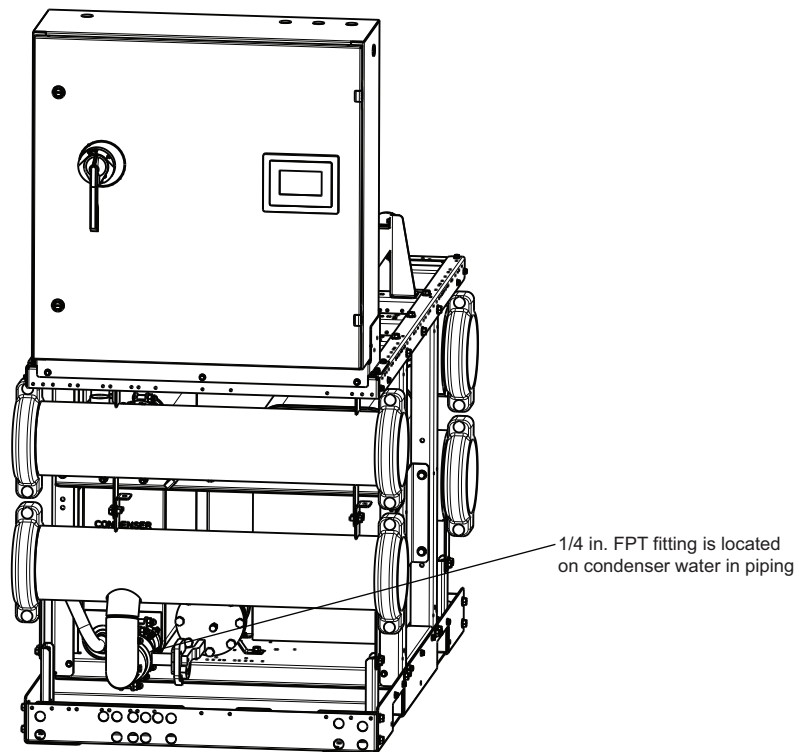
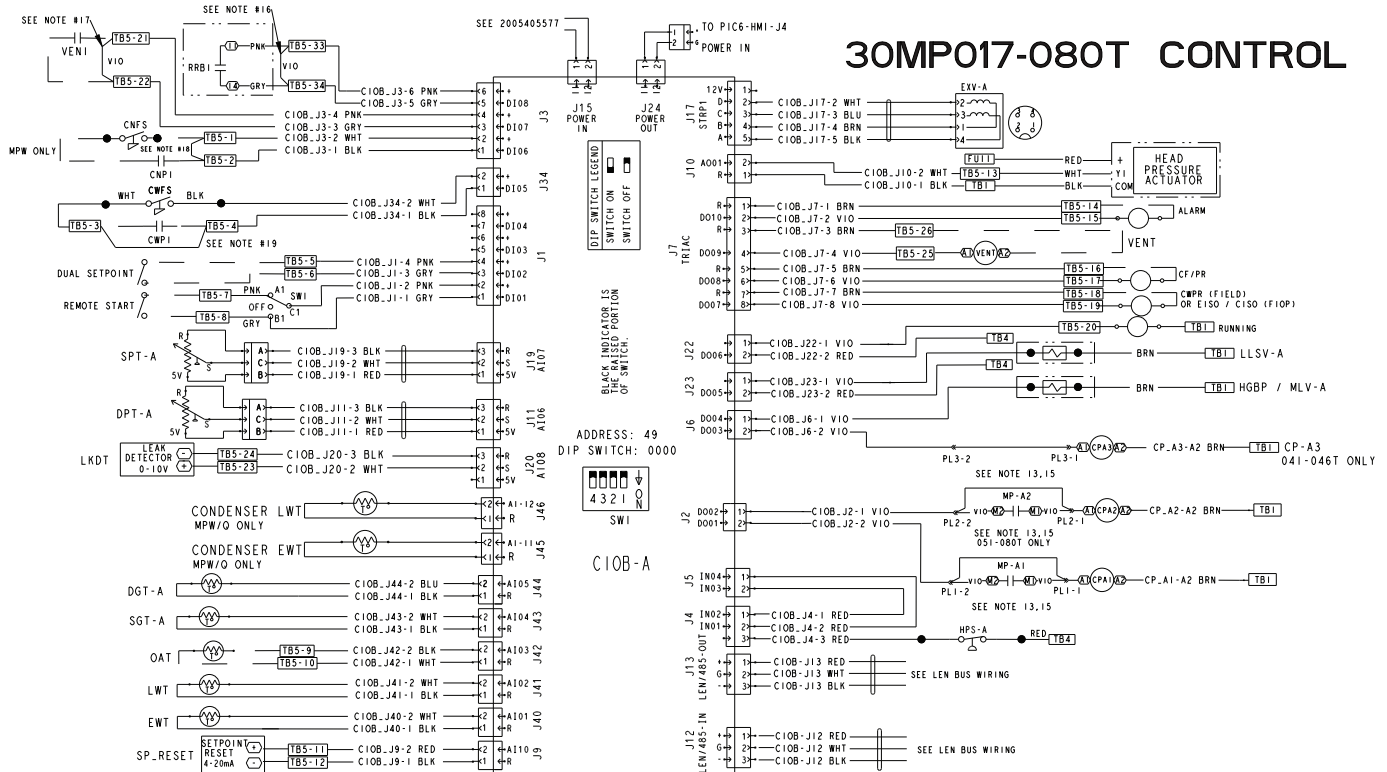


Fig. 3 — 1/4 in. FPT Fitting Location

30MP017-080T CONTROL



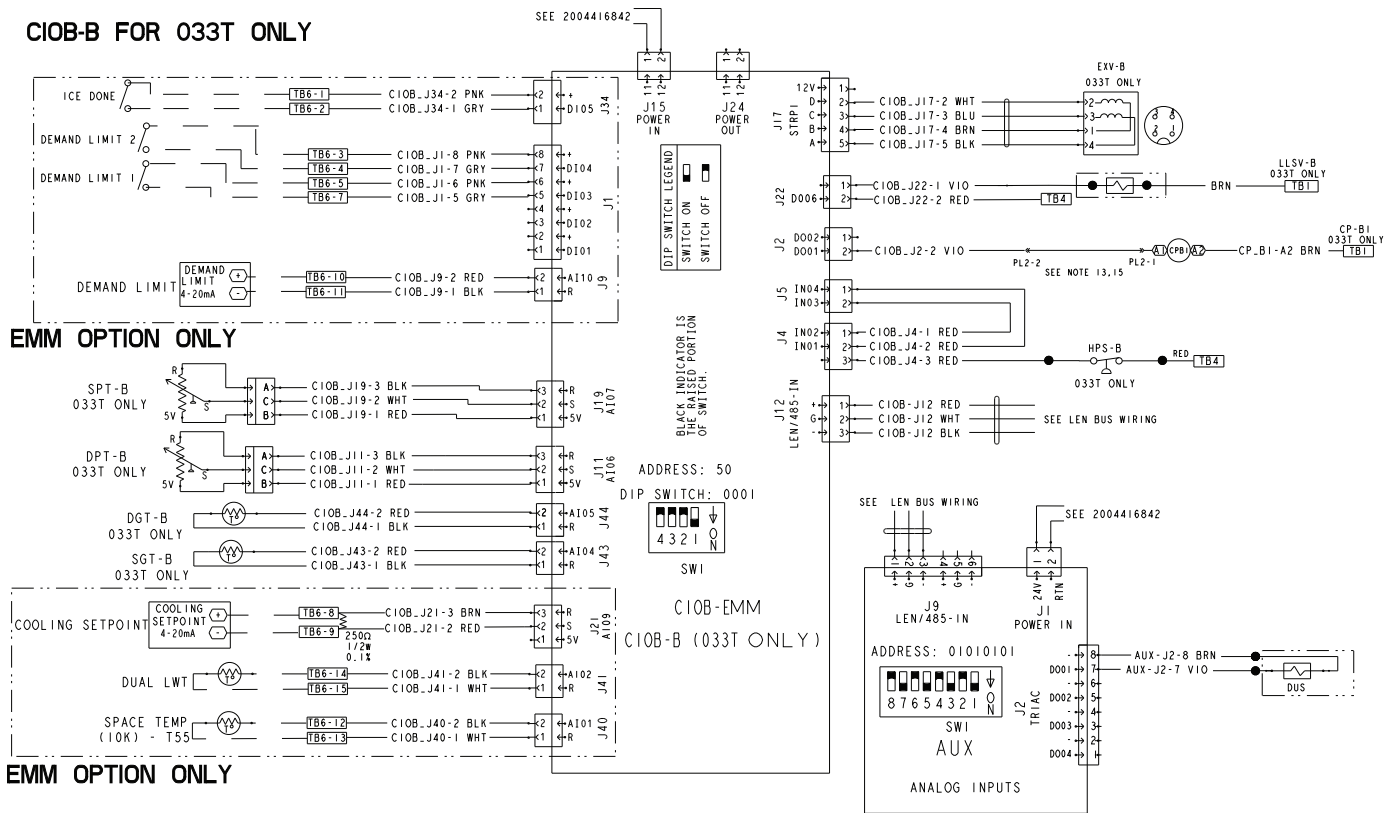
- NOTES:**
1. FIELD-SUPPLIED CONTROL CONDUCTORS TO BE AT LEAST 18AWG (AMERICAN WIRE GAGE) OR LARGER. THE CONTROL CABINET SHOULD ONLY BE USED FOR LOW VOLTAGE FIELD WIRING (50-V MAXIMUM.)
 2. EACH DIGITAL OUTPUT LOOP SHALL BE LIMITED TO A MAXIMUM OF 1A AC RMS STEADY-STAT @ 24VAC. LIGHT LOAD RELAY IS RECOMMENDED AND THE COIL VOLTAGE OF RELAY IS 24VAC. POWER SUPPLY SHALL BE PROVIDED BY CUSTOMER FUSED TRANSFORMER.
 3. EACH DISCRETE INPUT LOOP IS POWERED BY INTERNAL 24VAC POWER SUPPLY. FIELD OPTIONAL CONTACTS OR SWITCH MUST HAVE 24VAC RATING, MAX CURRENT IS 60MA. NOMINAL CURRENT IS 10MA. SWITCHES WITH GOLD PLATED BIFURCATED CONTACTS ARE RECOMMENDED.
 4. THE ANALOG INPUTS SUPPORT 5K/10K NTC THERMISTORS, 0/4-20MA SENSORS AND 5VDC SENSORS. IF 100K IS USED IT WILL REQUIRE A SOFTWARE CONVERSION TABLE TO CONVERT TO 10K. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
 5. EACH ANALOG OUTPUT LOOP SUPPORTS 0/4-20MA OR 0/2-10VDC VOLTAGE OUTPUT. THE ANALOG OUTPUT LOOP IS POWERED BY IOB BOARD. DO NOT SUPPLY EXTERNAL POWER. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
 6. DRY TYPE CONTACT, RATED SWITCHING LOAD 230VAC/5A OR 24VDC/5A.
 7. GROUND SHIELDS AT SIGNAL GENERATING DEVICES
 8. ALL FIELD INTERLOCK CONTACTS MUST HAVE A MINIMAL RATING OF 2A@24VAC SEALED.
 9. IF MOTOR PROTECTOR IS USED REMOVE JUMPER FROM ASSOCIATED TERMINAL BLOCKS
 10. IF CHILLED WATER PUMP INTERLOCK OR CONDENSER PUMP INTERLOCK IS USED REMOVE JUMPER ACROSS ASSOCIATED TERMINAL BLOCKS
 11. FACTORY INSTALLED WIRING MUST MEET REQUIREMENTS OF UL 60335/ UL 1995, ANY FIELD INSTALLED MUST ALSO FOLLOW THE APPLIANCE CODES, ALL WIRING MUST BE RATED 75 DEGREE C
 12. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED - THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASE CONDITIONS
 13. CORESENSE COMPRESSOR PROTECTION MODULE IS USED ON THE FOLLOWING UNITS:
A1 COMPRESSOR- DIGITAL OPTION- 031,033,041,046T (ALL VOLTAGES)
A1,A2 COMPRESSOR- 051,056,066,080T (ALL VOLTAGES).
JUMPER USED ON ALL OTHER COMPRESSORS.
 14. FOR FUSE REPLACEMENT TABLE REFERENCE 2003716045 SHEET 2
 15. IF MP IS USED, REMOVE THE JUMPER
 16. JUMPER TBS-33 AND TBS-34 IF PHASE MONITOR, RRB1, OPTION NOT USED
 17. JUMPER TBS-21 AND TBS-22 IF REFRIGERANT LEAK DETECTOR SYSTEM IS NOT REQUIRED. SEE INSTALLATION MANUAL FOR REQUIREMENTS.
 18. REMOVE JUMPER BETWEEN TBS-1 AND TBS-2 IF CNFS/CNPI OPTION IS USED.
 19. REMOVE JUMPER BETWEEN TBS-3 AND TBS-4 IF CWP1 OPTION IS USED.

LEGEND		ABBREVIATION LISTING	
	DENOTES TEMPERATURE SENSOR	CF	CONDENSER FAN
	DENOTES PRESSURE SENSOR	CP	COMPRESSOR
	DENOTES RELAY COIL	CWFS	CHILLER WATER FLOW SWITCH
	DENOTES SHIELDED CABLE	CWP1	CHILLED WATER PUMP INTERLOCK
	DENOTES SOLENOID	CNPI	CONDENSER PUMP INTERLOCK
	DENOTES CONTACT	CNFS	CONDENSER FLOW SWITCH
	DENOTES FLOAT SWITCH	CWP	CHILLED WATER PUMP
	DENOTES SWITCH	CWPR	CHILLED WATER PUMP RELAY
	DENOTES FIELD WIRING	CIOB	CARRIER INPUT/OUTPUT BOARD
	DENOTES INTERNAL WIRING HARNESS	DGS	DISCHARGE GAS TEMPERATURE
		DP	DISCHARGE PRESSURE
		DUS	DIGITAL UNLOAD SOLENOID
		EXV	EXPANSION VALVE
		EWT	ENTERING WATER TEMPERATURE
		EISO	EVAPORATOR ISOLATOR RELAY
		HPS	HIGH PRESSURE SWITCH
		HGBP	HOT GASBYPASS
		LLSV	LIQUID LINE SOLENOID VALVE
		LWT	LEAVING WATER TEMPERATURE
		MP	MOTOR PROTECTOR
		OAT	OUTDOOR AIR TEMPERATURE
		PR	CONDENSER PUMP RELAY
		SP	SUCTION PRESSURE
		SUCT	SUCTION TEMPERATURE
		VENI	VENTILATION INTERLOCK
		VENT	VENTILATION OUTPUT

From 2004005001 Rev E

Fig. 4 — Control Wiring Schematic (Typical), 30MP017-080

CI0B-B FOR 033T ONLY



NOTES:

1. FIELD-SUPPLIED CONTROL CONDUCTORS TO BE AT LEAST 18AWG (AMERICAN WIRE GAGE) OR LARGER. THE CONTROL CABINET SHOULD ONLY BE USED FOR LOW VOLTAGE FIELD WIRING (50-V MAXIMUM.)
2. EACH DIGITAL OUTPUT LOOP SHALL BE LIMITED TO A MAXIMUM OF 1A AC RMS STEADY-STATE @ 24VAC. LIGHT LOAD RELAY IS RECOMMENDED AND THE COIL VOLTAGE OF RELAY IS 24VAC. POWER SUPPLY SHALL BE PROVIDED BY CUSTOMER FUSED TRANSFORMER.
3. EACH DISCRETE INPUT LOOP IS POWERED BY INTERNAL 24VAC POWER SUPPLY. FIELD OPTIONAL CONTACTS OR SWITCH MUST HAVE 24VAC RATING, MAX CURRENT IS 60MA. NOMINAL CURRENT IS 10MA. SWITCHES WITH GOLD PLATED BIFURCATED CONTACTS ARE RECOMMENDED.
4. THE ANALOG INPUTS SUPPORT 5K/10K NTC THERMISTORS, 0/4-20MA SENSORS AND 5VDC SENSORS. IF 100K IS USED IT WILL REQUIRE A SOFTWARE CONVERSION TABLE TO CONVERT TO 10K. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
5. EACH ANALOG OUTPUT LOOP SUPPORTS 0/4-20MA OR 0/2-10VDC VOLTAGE OUTPUT. THE ANALOG OUTPUT LOOP IS POWERED BY IOB BOARD. DO NOT SUPPLY EXTERNAL POWER. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
6. DRY TYPE CONTACT, RATED SWITCHING LOAD 230VAC/5A OR 24VDC/5A.
7. GROUND SHIELDS AT SIGNAL GENERATING DEVICES

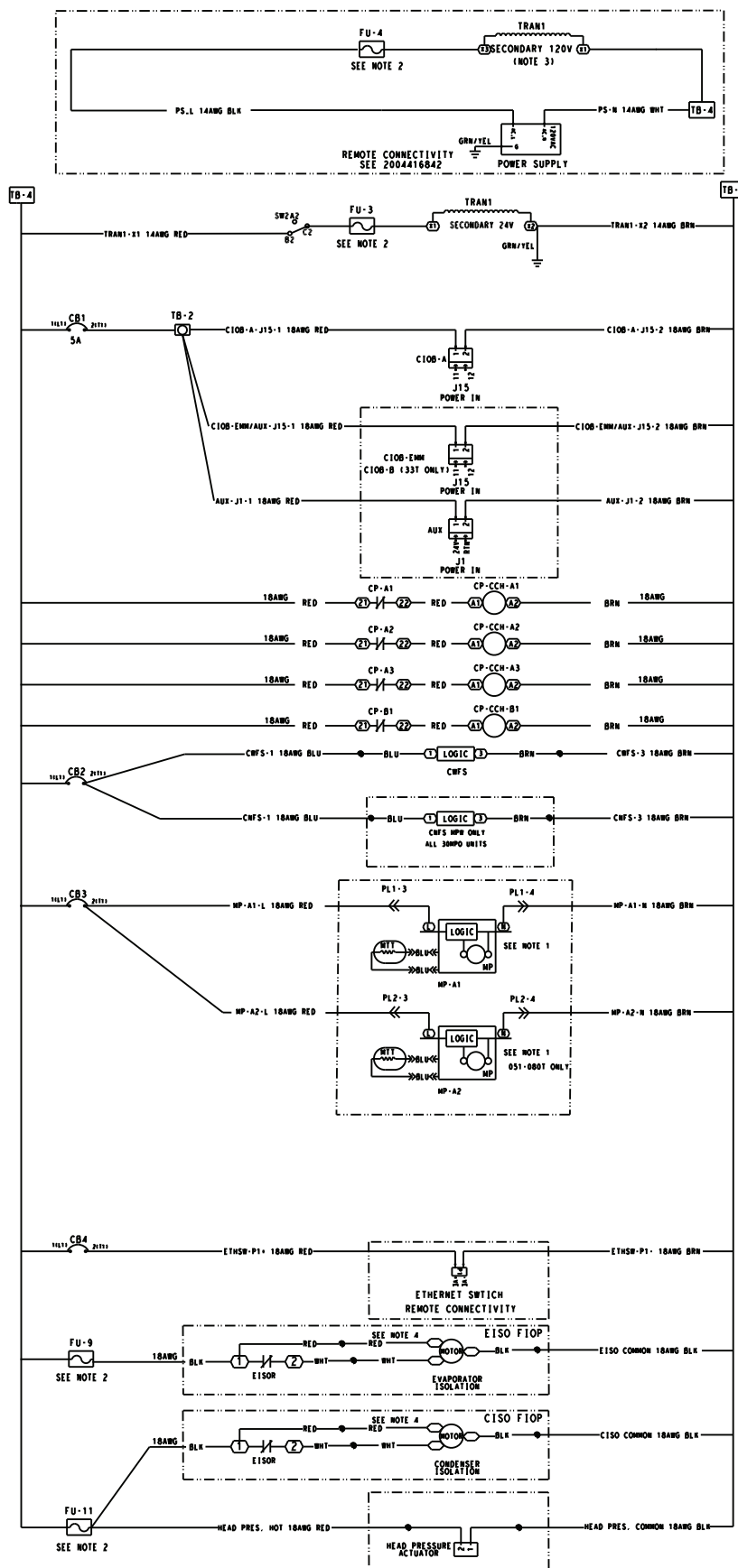
8. ALL FIELD INTERLOCK CONTACTS MUST HAVE A MINIMAL RATING OF 2A@24VAC SEALED.
9. IF MOTOR PROTECTOR IS USED REMOVE JUMPER FROM ASSOCIATED TERMINAL BLOCKS
10. IF CHILLED WATER PUMP INTERLOCK OR CONDENSER PUMP INTERLOCK IS USED REMOVE JUMPER ACROSS ASSOCIATED TERMINAL BLOCKS
11. FACTORY INSTALLED WIRING MUST MEET REQUIREMENTS OF UL 60335/ UL 1995. ANY FIELD INSTALLED WIRING MUST ALSO FOLLOW THE APPLIANCE CODES, ALL WIRING MUST BE RATED 75 DEGREE C
12. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED - THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASE CONDITIONS
13. CORESENSE COMPRESSOR PROTECTION MODULE IS USED ON THE FOLLOWING UNITS:
A1 COMPRESSOR- DIGITAL OPTION- 031,033,041,046T (ALL VOLTAGES)
A1,A2 COMPRESSOR- 051,056,066,080T (ALL VOLTAGES).
JUMPER USED ON ALL OTHER COMPRESSORS.
14. FOR FUSE REPLACEMENT TABLE REFERENCE 2003716045 SHEET 2
15. IF MP IS USED, REMOVE THE JUMPER
16. JUMPER TB5-33 AND TB5-34 IF PHASE MONITOR, RRB1, OPTION NOT USED
17. JUMPER TB5-21 AND TB5-22 IF REFRIGERANT LEAK DETECTOR SYSTEM IS NOT REQUIRED. SEE INSTALLATION MANUAL FOR REQUIREMENTS.
18. REMOVE JUMPER BETWEEN TB5-1 AND TB5-2 IF CNFS/CNPI OPTION IS USED.
19. REMOVE JUMPER BETWEEN TB5-3 AND TB5-4 IF CWPI OPTION IS USED.

LEGEND		ABBREVIATION LISTING			
	Denotes Temperature Sensor	CF	CONDENSER FAN	DGS	DISCHARGE GAS TEMPERATURE
	Denotes Pressure Sensor	CP	COMPRESSOR	DP	DISCHARGE PRESSURE
	Denotes Relay Coil	CNFS	CHILLER WATER FLOW SWITCH	DUS	DIGITAL UNLOAD SOLENOID
	Denotes Shielded Cable	CNPI	CHILLED WATER PUMP INTERLOCK	EXV	EXPANSION VALVE
	Denotes Solenoid	CNPI	CONDENSER PUMP INTERLOCK	EWI	ENTERING WATER TEMPERATURE
	Denotes Contact	CNFS	CONDENSER FLOW SWITCH	EISOR	EVAPORATOR ISOLATOR RELAY
	Denotes Float Switch	CWP	CHILLED WATER PUMP	HPS	HIGH PRESSURE SWITCH
	Denotes Switch	CWPR	CHILLED WATER PUMP RELAY	HGP	HOT GAS BYPASS
	Denotes Field Wiring	CI0B	CARRIER INPUT/OUTPUT BOARD	LLSV	LIQUID LINE SOLENOID VALVE
	Denotes Internal Wiring Harness			LWT	LEAVING WATER TEMPERATURE
				MP	MOTOR PROTECTOR
				OAT	OUTDOOR AIR TEMPERATURE
				PR	CONDENSER PUMP RELAY
				SP	SUCTION PRESSURE
				SUCT	SUCTION TEMPERATURE
				VENT	VENTILATION INTERLOCK
				VENT	VENTILATION OUTPUT

From 2004005001 Rev E

Fig. 4 — Control Wiring Schematic (Typical), 30MP017-080 (cont)

120/24 POWER



- NOTES:
1. CORESENSE COMPRESSOR PROTECTION MODULE IS USED ON THE FOLLOWING UNITS:
A1 COMPRESSOR- DIGITAL OPTION- 30MP031, 033, 041, 046T (ALL VOLTAGES)
A1,A2 COMPRESSOR- 30MP051, 056, 066, 080T (ALL VOLTAGES).
 2. FOR FUSE REPLACEMENT TABLE REFERENCE 2003716045.
 3. FOR 380V AND 575V, CONNECT TO X3 AND X4. TB4 IS NOT IN CIRCUIT.
 4. RED WIRES (POSITION 1 ON EISO OR MOTOR) ARE ONLY REQUIRED FOR 30MP051-080T.

ABBREVIATION LISTING INPUTS

AUX	AUXILIARY
CWFS	CHILLED WATER FLOW SWITCH
CNFS	CONDENSER FLOW SWITCH
CIOB	CARRIER INPUT/OUTPUT BOARD
CB	CIRCUIT BREAKER
ETHSW	ETHERNET SWITCH
FU	FUSE
MP	MOTOR PROTECTOR
SW	SWITCH
TRAN	TRANSFORMER

LEGEND

	DENOTES CIRCUIT BREAKER
	DENOTES CONTACT
	DENOTES FLOAT SWITCH
	DENOTES SWITCH
	DENOTES FIELD WIRING
	DENOTES INTERNAL WIRING HARNESS
	DENOTES TEMPERATURE SENSOR
	DENOTES PRESSURE SENSOR
	DENOTES RELAY COIL
	DENOTES SHIELDED CABLE
	DENOTES SOLENOID

30MP CONTROL POWER

2005405577 C

Fig. 5 — 24V Control Power Electrical Wiring Schematic (30MP Sizes 017-080)

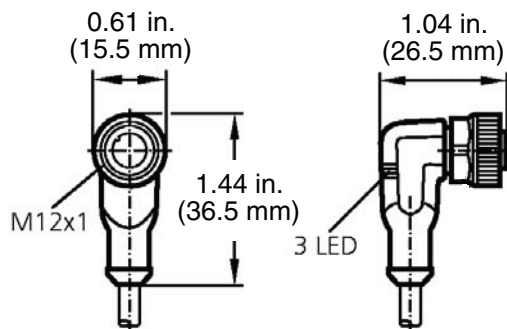
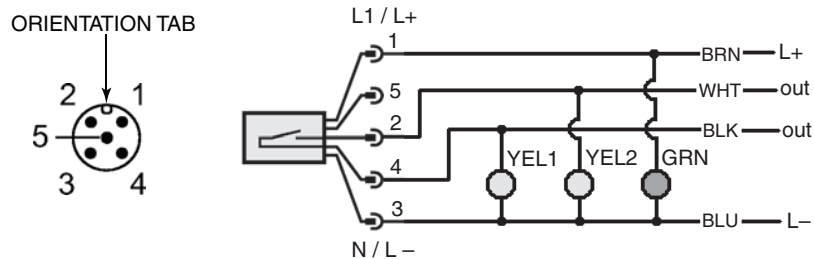
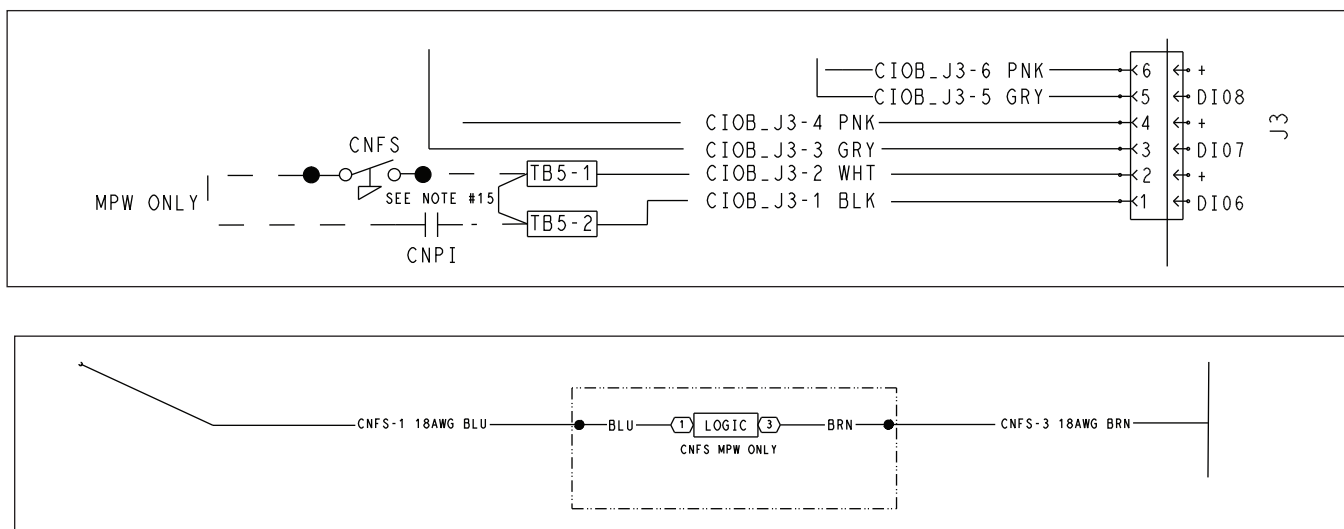


Fig. 6 — Flow Switch Cable



LEGEND

- CNFS** — Condenser Flow Switch
- CNP** — Condenser Pump Relay
- CNPI** — Condenser Pump Interlock (Optional)
- LVT** — Low Voltage Terminal Block (Optional)
- TB** — Terminal Block
- — — — — Field Wiring

NOTE: Refer to Fig. 4 for note 15.

Fig. 7 — Condenser Water Flow Switch Wiring

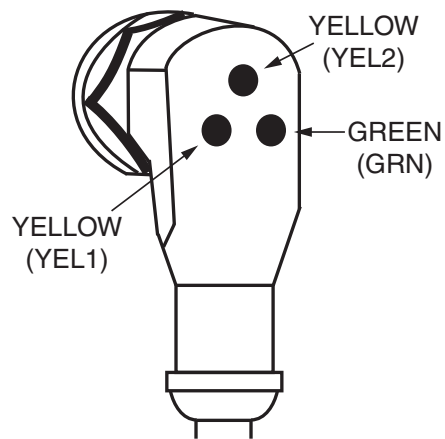


Fig. 8 — Switch Cable LEDs