

Installation Instructions

Part No: 30RC70004101, 30RC70006401, 30MP70000201, 30MP70000401

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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 safetyalert symbol: \triangle . 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.

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.

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.

GENERAL

The standard Carrier Controller software provided on all 30RC/ 30MP chillers and 38RC condensing units are programmed to accept various options to modify the unit operation. The Energy Management Module (EMM) board is required for 4 to 20 mA, 2 or 3-step demand limit control, chilled water temperature reset by space temperature, Ice Mode, LWT (leaving water temperature) for Primary/Secondary chiller control, and Ventilation fan output (30MP only). Chilled water temperature reset by return water or cooler (delta T does not require the addition of this accessory). See Table 1 for EMM functions. The following functions are available with the EMM board:

- Chilled Water Temperature Reset Resets the chilled water set point under less than full load capacity conditions by the following method:
 - Space Temperature: A field-supplied space temperature sensor is required.
- Demand Limit Limits the capacity of the machine from unit capacity by the following methods:
- 4 to 20 mA Input: A field-supplied signal generator is required.
- 2 or 3-Step Switch Control: A field-supplied dry contact switch is required.
- Ice Done Control Switch Signals the machine to exit the Ice Build mode and enter an unoccupied time period. A field-supplied dry contact switch is required.
- Dual Chiller LWT Sensor input to allow for control of two chillers by the primary/secondary chiller logic.
- Cooling Setpoint 4-20 mA input for controlling LWT setpoint.
- Ventilation Fan Output Activates ventilation fan for indoor units (30MP units only).

The EMM board can be configured with the Carrier Controller module. See "EMM Board Wiring" on page 3. for detailed configurations.

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.

Package Contents

Refer to Table 2 for package contents, part numbers and usage. If any of the components are damaged, file a claim with the shipping company and notify your Carrier representative.

Table	1 —	EMM	Functions
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MODE	INPUT/OUTPUT FUNCTION			
	Demand Limit, 2 or 3-Step			
	Demand Limit, 4-20 mA			
	Ice Done			
INPUIS	Dual Chiller LWT (Leaving Water Temperature)			
	Space Temperature Thermistor			
	Cooling Set Point, 4-20 mA			
OUTPUTS	Ventilation Fan			

INSTALLATION

- 1. Disconnect unit power. Follow proper lockout/tag-out procedures.
- 2. Locate the control panel enclosure. See Fig. 1-3 for control panel layout and location for installation of CIOB/EMM board. See Fig. 4 for address configuration. Dual circuit units have two CIOB/EMM boards. The B circuit CIOB board serves the EMM functions.

NOTE: Dual circuit units do not require an additional board. For these units skip Step 3 and 4, continue to Step 5.

- 3. Install CIOB/EMM board in the location shown using the screws included in the accessory package. The board will be mounted on top of the existing CIOB/EMM board. The board may be left loose during wiring for easier access to connections while attaching harness plugs.
- 4. Install TB6 in the location shown in Fig. 1 or 2 as applicable using the screws included in the accessory package. For 30RC and 38RC units, TB6 should have harness already attached as shown in Table 3. Correct connections should be verified.
- 5. Use harnesses provided in kit to make connections below. See Tables 2 and 3, and markings on harness for correct termination.
 - a. 30RC and 38RC Units:

Use harness connected to TB6 to make connections from CIOB-B to TB6. Follow markings on harness to connect plugs to CIOB.

Use a three-wire harness to make LEN communication connection between CIOB-A and CIOB-B.

NOTE: This is only required for single circuit units.

Find CIOB-B J15 in main chiller harness and connect to CIOB-B for 24-v power.

NOTE: This is only required for single circuit units.

b. 30MP Units:

Use harness to make connections from CIOB-B to TB6. Follow markings on harness to connect plugs to CIOB. Use three-wire harness to make LEN communication connection between CIOB-A and CIOB-B.

NOTE: This is only required for single circuit units.

Find CIOB-B J15 in main chiller harness and connect to CIOB-B for 24-v power.

Table 2 - 30RC/MP Accessory Package Contents and Usage

ACCESSORY KIT NO.	UNIT SIZE	PART NO.	QTY	DESCRIPTION
	30RC 010-030 38RCS 025-050	30RCHSCACE-A00	1	EMM Communications Harness (10-30 Ton)
		30RCHSCACE-A10	1	EMM Harness (10-30 Ton)
		KA56MC085	6	Standoff HEX 6-32
30RC70004101		AU27AS081	6	No. 6 Star-tooth Lock Washer
		AC41AB080	6	6-32 x .380 in. L Screw
		00PPG000585700	1	CIOB Circuit Board
		30-5ASI	1	Kit Instructions
208070006404	30RC 035-060	30RCHMCACE-A00	1	EMM Harness (35-60 Ton)
30RC70006401	38RCD 025-060	30-5ASI	1	Kit Instructions
		HA-MP-221592	7	Wire Harness, TB6
		HA-MP-221619	1	Wire Harness, CIOB-B
	30MP ^a	NSYTRV24D	1	Screw Terminal, TB6
		NSYTRACE24	1	Terminal Block End Cover
30MB70000304		NSYTRABPV5	1	Terminal Block Marking Strip
30WP70000201		NSYTRAABV35	6	Terminal Block End Clamp
		A6X10004434	6	Stand Off
		YK-021-18604-000	1	Screw
		00PPG000585700	1	CIOB Circuit Board
		30-5ASI	1	Kit Instructions
30MP70000401	30MP 033	HA-MP-221592	1	Wire Harness, TB6
		NSYTRV24D	7	Screw Terminal, TB6
		NSYTRACE24	1	Terminal Block End Cover
		NSYTRABPV5	1	Terminal Block Marking Strip
		NSYTRAABV35	1	Terminal Block End Clamp
		30-5ASI	1	Kit Instructions

NOTE(S):

a. Except 30MP 033 units. See accessory kit number 30MP70000401.

Table 3 — EMM Board Wiring

UNIT SIZE	WIRING HARNESS	CIOB-B CONNECTION	WIRE COLOR	CONNECTION LOCATION
		CIOB-B J40-1	RED	TB6-12
		CIOB-B J40-2	BLK	TB6-13
		CIOB-B J41-1	RED	TB6-14
		CIOB-B J41-2	BLK	TB6-15
		CIOB-B J9-1	RED	TB6-10
		CIOB-B J9-2	BLK	TB6-11
	30RCHSCACE-A10	CIOB-B J1-5	GRY	TB6-7
	(Includes TB6)	CIOB-B J1-6	PNK	TB6-5
30RC 010-030 38RCS 025-050		CIOB-B J1-7	GRY	TB6-4
		CIOB-B J1-8	PNK	TB6-3
		CIOB-B J21-1	RED	TB6-8
		CIOB-B J21-3	BLK	TB6-9
		CIOB-B J34-1	PNK	TB6-1
		CIOB-B J34-2	GRY	TB6-2
		CIOB-B J12-1	RED	CIOB-A J13-1
	30RCHSCACE-A00	CIOB-B J12-2	WHT	CIOB-A J13-2
		CIOB-B J12-3	BLK	CIOB-A J13-3
		CIOB-B J40-1	RED	TB6-12
		CIOB-B J40-2	BLK	TB6-13
		CIOB-B J41-1	RED	TB6-14
		CIOB-B J41-2	BLK	TB6-15
		CIOB-B J9-1	RED	TB6-10
		CIOB-B J9-2	BLK	TB6-11
30RC 035-060	30RCHMCACE-A00	CIOB-B J1-5	GRY	TB6-7
38RCD 025-060	(Includes TB6)	CIOB-B J1-6	PNK	TB6-5
		CIOB-B J1-7	GRY	TB6-4
		CIOB-B J1-8	PNK	TB6-3
		CIOB-B J21-1	RED	TB6-8
		CIOB-B J21-3	BLK	TB6-9
		CIOB-B J34-1	PNK	TB6-1
		CIOB-B J34-2	GRY	TB6-2
	HA-MP-221592	EMM-J34-2	PNK	TB6-1
		EMM-J34-1	GRY	TB6-2
		EMM-J1-1	PNK	TB6-3
30MP		EMM-J1-2	GRY	TB6-4
		EMM-J1-3	PNK	TB6-5
		EMM-J1-4	GRY	TB6-7
		EMM-J20-3	BRN	TB6-8
		EMM-J20-2	RED	TB6-9
		EMM-J41-2	BLK	TB6-14
		EMM-J41-1	WHT	TB6-15
		EMM-J40-2	BLK	TB6-12
		EMM-J40-1	WHT	TB6-13
		EMM-J9-2	RED	TB6-10
		FMM-J9-1	BLK	TB6-11



TB — Terminal Block

Fig. 1 — CIOB/EMM Board Mounting Location (30RC010-030, 38RCS025-030)



CIOB — Carrier Input/Output

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- RRB Reverse Rotation Board/Phase Monitor
- CHR Evaporator Heater Relay

Fig. 2 - CIOB/EMM Board Location (30RC035-060, 38RC040-060)



LEGEND

СВ	—	Circuit Breaker
ССВ	—	Compressor Circuit Breaker
CCN	—	Carrier Comfort Network
CIOB	—	Carrier Input/Output Board
СР	—	Compressor Protector/Overload
CHR	—	Evaporator Heater Relay
EMM	—	Energy Management Module
GRD	—	Ground
RRB	—	Reverse Rotation Board/Phase Monitor

TB — Terminal Block

Fig. 3 – CIOB/EMM Board Location (30MP Units)

Configuration (All Unit Sizes)

The controls must be configured to recognize the EMM accessory. The Carrier Controller display may be used to do this. See the Energy Management Module (EMM) section in the *Controls, Start-Up, Operation, Service and Troubleshooting* guide for configuration information. The Carrier Controller must be set up to communicate with the EMM module (*Main Menu* \rightarrow *Configuration* \rightarrow *Menu* \rightarrow *Factory Parameters/Enable Option* \rightarrow *13A or* 4A = Yes).

Temperature Reset

Care should be taken when interfacing with other control systems due to possible power supply differences such as a full wave bridge versus a half wave rectification. Connection of control devices with different power supplies may result in permanent damage. Carrier Controller controls incorporate power supplies with half wave rectification. A signal isolation device should be utilized if the signal generator incorporates a full wave bridge rectifier.

SPACE TEMPERATURE

A field-supplied 10K thermistor can be used to provide leaving fluid temperature reset. The thermistor must be connected to TB6-12,13. See Fig. 5 or 6. See the *Controls, Start-Up, Operation, Service and Troubleshooting* guide for configuration information.

NOTE: If CIOB-B was added, set the board address using the DIP switches per Fig 4.



Fig. 4 — CIOB-B/EMM Address

Demand Limit

4 TO 20 mA SIGNAL

A field-supplied and generated, externally powered 4 to 20 mA signal can be used to provide a demand limit signal for chiller capacity reduction. The signal must be connected to TB6-10, 11 (positive, negative). See Fig. 5 or 6. See the *Controls, Start-Up, Operation, Service and Troubleshooting* guide for configuration information.

Care should be taken when interfacing with other control systems due to possible power supply differences such as a full wave bridge versus a half wave rectification. Connection of control devices with different power supplies may result in permanent damage. The Carrier Controller controls incorporate power supplies with half wave rectification. A signal isolation device should be utilized if the signal generator incorporates a full wave bridge rectifier.

SWITCH CONTROLLED

A field-supplied set of dry contacts can be used to provide up to three steps of chiller capacity reduction. The three steps are achieved through two sets of dry contacts. The contacts for demand limit switch 1 must be connected to TB6-5,7 and are on the standard unit. The contacts for demand limit switch 2 must be connected to TB6-3,4. See Fig. 5. The position of these contacts will allow for up to three steps of demand limit according to the following:

	AMOUNT OF CAPACITY REDUCTION				
CONTACT	None	Switch Limit Setpoint 1	Switch Limit Setpoint 2	Switch Limit Setpoint 3	
Switch 1	Open	Close	Open	Close	
Switch 2	Open	Open	Close	Close	

NOTE: Refer to the Controls, Start-Up, Ope	eration, Service and
Troubleshooting guide for configuration inform	mation.

Ice Mode

A field-supplied set of dry contacts can be used to provide an ice done switch (TB6-1,2) to the controls. See Fig. 5. With ice mode configuration enabled and ice done switch contact open, a brine chiller will be able to operate as desired during off peak times in conjunction with an ice storage system. Operation in ice mode ends when the contact closes. Refer to the *Controls, Start-Up, Operation, Service and Troubleshooting* guide supplied with the chiller for more information on the correct configuration of this option.

Dual Chiller Leaving Water Temperature (LWT)

For two chillers configured for primary/secondary operation in parallel, this input allows for measurement of a mixed water temperature from both chillers. A 5k thermistor is connected across TB6-14 and 15. *See Controls, Start-Up, Service, and Trouble-shooting guide* supplied with chiller for more information on configuring primary/secondary chillers.

Cooling Setpoint (4 to 20 mA)

A field-supplied and generated, externally powered 4 to 20 mA signal can be used to provide the LWT setpoint to the chiller. *See Controls, Start-Up, Service, and Troubleshooting guide* supplied with chiller for details on configuration for LWT setpoint control.

Ventilation Output

On 30MP chillers this output will close when the ventilation interlock input is open for 5 seconds or when a refrigerant leak detector senses a leak over the specified rate. Output is to start ventilation fans to evacuate the indoor space of any leaked refrigerant.



Fig. 5 – 30RC EMM/CIOB-B Board Wiring (35-60 Ton Units Only)



Fig. 6 – 30MP EMM/CIOB-B Board Wiring (033 Size Unit Only)

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