



Installation Instructions

Part No.: 00EFN900000300A

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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 technicians should install, start up, and service this equipment.

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

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

▲ WARNING

Be sure power to equipment is shut off before performing maintenance or service. Lock out and safety-tag all disconnects. Be aware that there may be more than one disconnect. Serious personal injury from electric shock could result.

GENERAL

The standard *ComfortLink*TM control software provided on all 30RB chillers, is programmed to accept various accessory temperature reset options that reset the leaving chilled water temperature (LCWT). The energy management module (EMM) accessory is required for 2-step or 4 to 20 mA demand limit control. Chilled water temperature reset (by return water or cooler delta T) and outdoor-air temperature reset do NOT require the addition of this accessory.

The following additional features are supported by this accessory:

- temperature reset by space temperature
- temperature reset by 4 to 20 mA field-supplied signal
- occupancy override by field-supplied switch input
- remote chiller lockout by field-supplied switch input

- unoccupied operation for ice making through field-supplied switch input
- 0 to 10 vdc analog output indicating percent total chiller running capacity
- 24 vac discrete output signal for field-supplied relay indication of shutdown status
- 24 vac discrete output signal for field-supplied relay indication of running status

INSTALLATION

Examine the package contents for correct part numbers. If any of the components are damaged, file a claim with the shipping company and notify a Carrier representative. See Table 1.

Table 1 — Accessory Package Contents

DESCRIPTION	PART NO.	QUANTITY
Energy Management Board	00PSN500038300	1
Terminal Block (TB6)	HY84FE029	1
Wiring Harness	SF703002 (30RB080-120, 208/230 v; 30RB130-300, all voltages)	1
Wiring Harness	SF703003 (30RB060,070 all voltages; 30RB080-120, 380, 460, 575 v)	1
Terminal Block Mounting Screws, no. 8	—	2
EMM Board Mounting Spacers	—	6
Harness Assembly, EMM Board to TB6	—	4
TB6 Mounting Bracket and Hardware	—	1

1. Disconnect unit power.
2. Locate the main base board in the control panel end of the chiller.
3. The energy management module board is installed over a pattern of six holes through which the main base board is mounted. Remove the screws shown in Fig. 1 and save for later use.
4. Thread the spacers into the six mounting locations. Place the EMM board over the spacer holes and insert the screws saved from Step 3. The board should be installed with the power connection plug (J1) facing in the same direction as the main base board (see Fig. 2).
5. Remove the cover from the adjacent Panduit router and locate the wire labeled EMM-J1. Plug in the 2-pin power plug for the EMM board.
6. Locate the 6-pin communication connector J9 on Fan Board 1. Find the three wires that go back to the main base board connector, J9B. Remove this plug from the base board and connect to the EMM board at connector J9A. Using the harness supplied with the accessory, connect the cable marked EMM-J9B to the base board connector J9B.

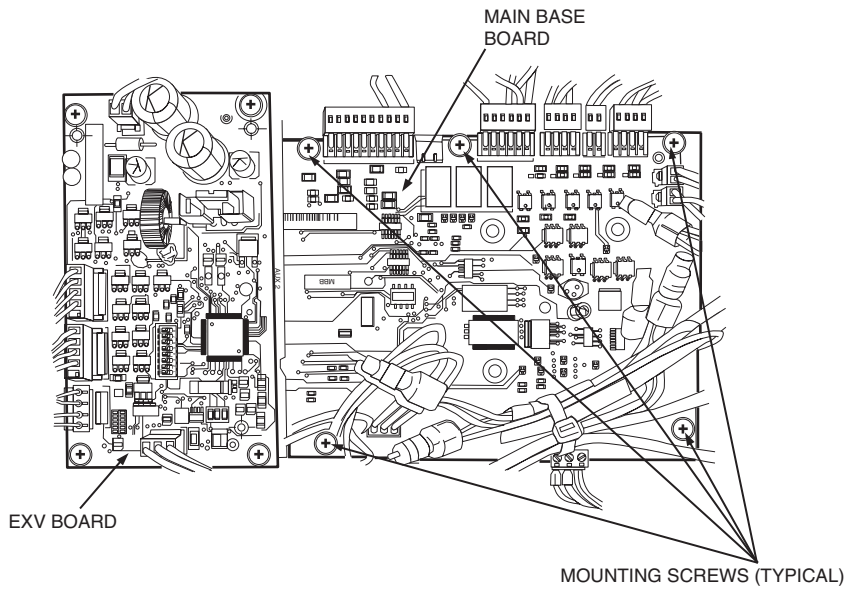


Fig. 1 — Location Above Main Base Board for EMM Mounting

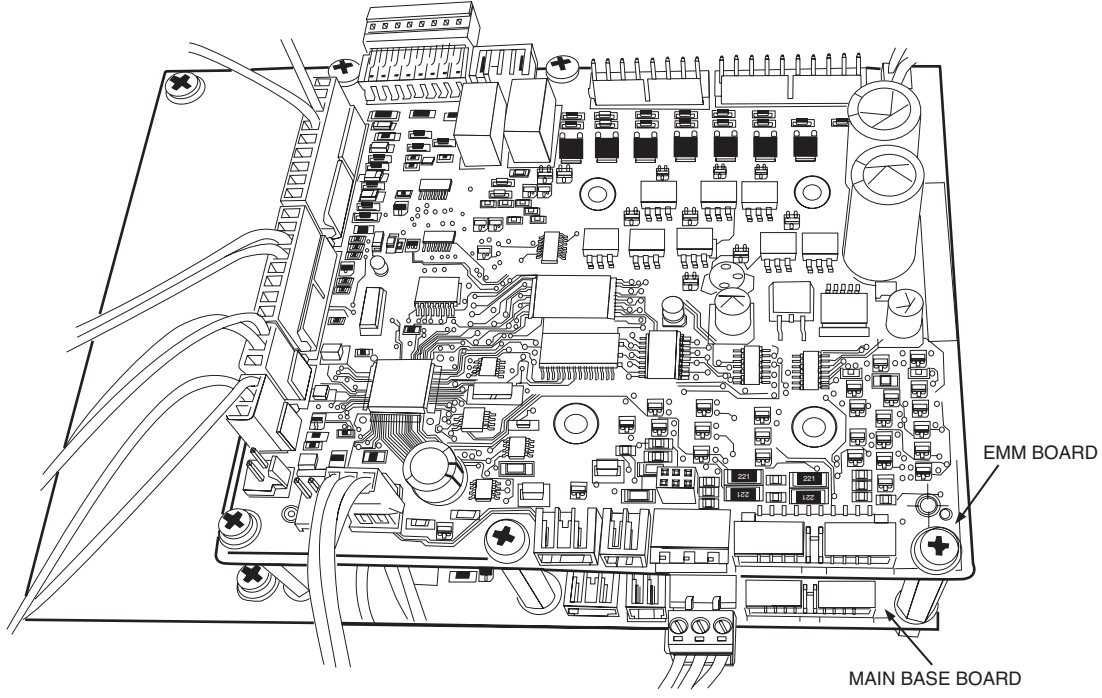


Fig. 2 — EMM Mounted Over Main Base Board

- Connect the remaining EMM board cables supplied to connect to J4, J5, J6, J7A and J7B on the EMM board.
- Locate terminal block TB5 (field connection) in the control panel. For sizes 30RB130-300 (380, 460 and 575-v) and sizes 30RB080-300 (208/230-v), use the bracket and hardware supplied to mount the bracket above TB5 and mount the terminal block (TB6) supplied to the bracket. See Fig. 3. For sizes 30RB060-120 (380, 460 and 575-v)

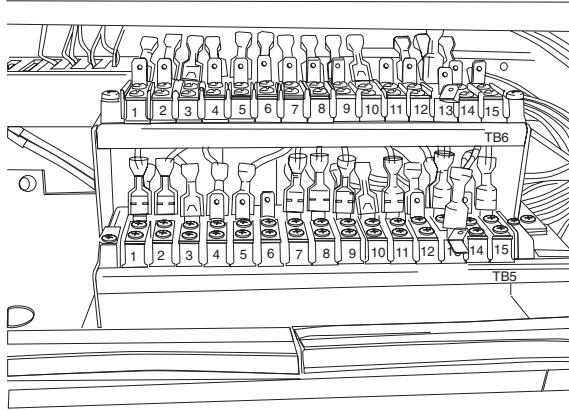


Fig. 3 — TB6 in Fan Box Above TB5

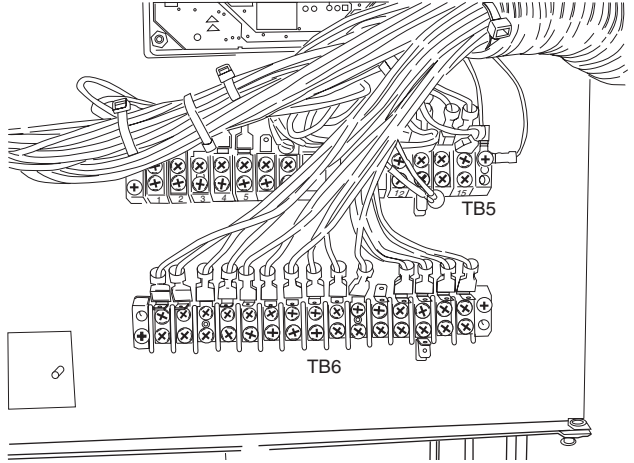


Fig. 4 — TB6 On Display Panel Below TB5

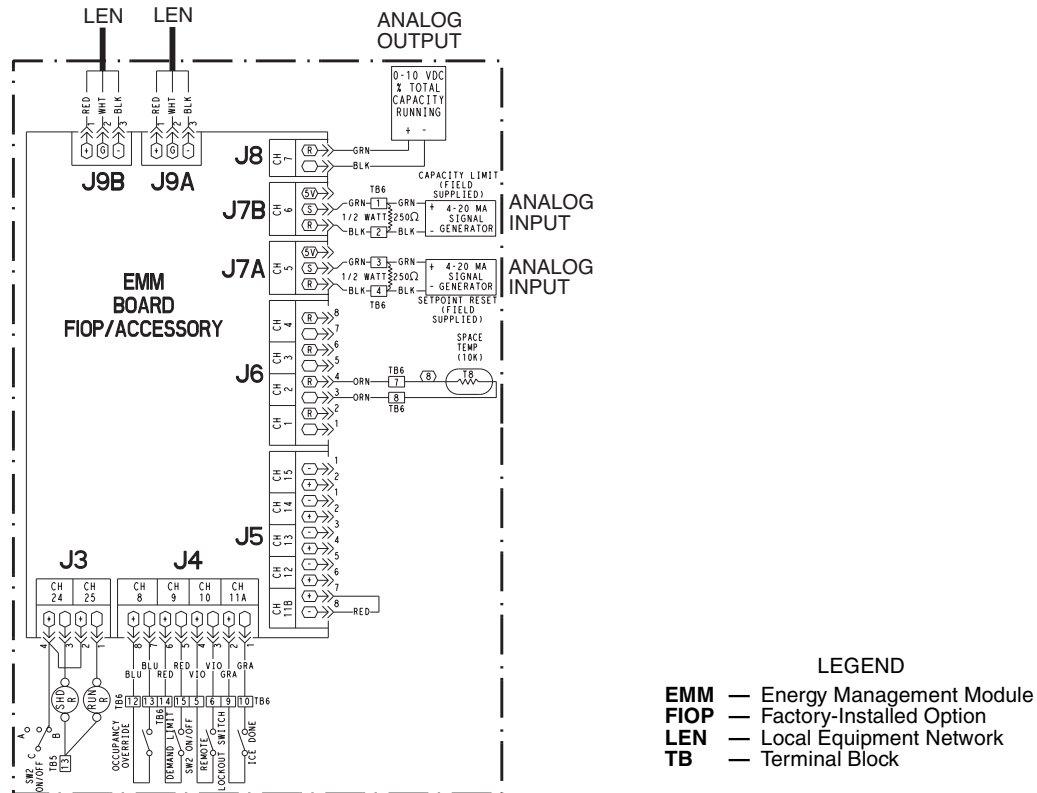


Fig. 5 — EMM Board Wiring

- and sizes 30RB060,070 (208/230-v), remove the thumb-screw holding the display bracket and mount the TB6 terminal block to the back of the panel below TB5. See Fig. 4. In both cases, make sure the jumpers between terminals TB6-5,6 and TB6-13,14 have been removed.
- Connect the other ends of the harness from Step 7, marked TB6-1 through 15, to the TB6 terminal block. See Fig. 5.

Configuration (All Sizes) — The control must be configured to recognize the EMM board. The factory-installed Scrolling Marquee display may be used to do this. With the Scrolling Marquee display, press **ESCAPE** until the screen shows one of the top level mode LED descriptions. Use the arrow keys to select the Configuration mode LED. Press **ENTER** then the down arrow key, then **ENTER** again and TYPE is displayed. Press the down arrow key until EMM is displayed. Press **ENTER** and the display will show PASS then WORD. Use the arrow key to change the first one to a zero, then press **ENTER** four times to confirm the password. Use the arrow keys as needed if the password is different than 0111. The NO value will now be flashing. Press the up arrow key to change the value to YES and **ENTER** to accept the change. Press **ESCAPE** twice and cycle the control power before continuing. Password entry will be required again before changing any other parameters.

Temperature Reset

4 TO 20 mA — A field-supplied and generated, externally powered 4 to 20 mA signal can be used to provide leaving fluid temperature reset. The signal must be connected to TB6-3,4 (positive, negative). A field-supplied 1/2 watt, 250-ohm resistor must also be connected across terminals TB6-3,4. This is a simple linear function which requires only four configuration changes. Follow the example in Table 2 to enable the function and configure the reset temperature and reset values for an 8° F (4.4° C) reset at a full 20 mA signal.

The configuration is now complete. In this example, if the cooling set point (*CSP.I*) is set to 44 F (6.7 C), the control will linearly reset the control point (*CTPT*) based on the 4 to 20 mA

signal. There will be no reset for a 4 mA signal. If the reset signal was 20 mA, the *CTPT* would be changed to 52 F (11.1 C). Similarly, a 12 mA reset signal would reset *CTPT* to 48 F (8.9 C). The actual 4 to 20 mA reset signal seen by the control can be viewed by accessing *Inputs* → *GEN.I* → *RSET*.

SPACE TEMPERATURE — A field-supplied 10K thermistor can be used to provide leaving fluid temperature reset. The thermistor must be connected to TB6-7,8. This is a simple linear function that requires only four configuration changes. Follow the example in Table 3 to enable the function and configure the reset temperature and reset values for a 10 F (–12.2 C) reset at a conditioned space temperature of 60 F (15.6 C) and no reset at 75 F (23.9 C).

In this example, if the cooling set point (*CSP.I*) is set to 44 F (6.7 C), the control will linearly reset the control point (*CTPT*) based on the space temperature. There will be no reset for temperatures at or above 75 F (23.9 C). If the space temperature was 60 F (15.6 C) or less, the *CTPT* would be changed to 54 F (12.2 C). Similarly, a space temperature of 67.5 F (19.7 C) would reset *CTPT* to 49 F (9.4 C). The actual space temperature seen by the control can be viewed by accessing *Temperatures* → *UNIT* → *SPT*.

OUTDOOR AIR TEMPERATURE OR COOLER DELTA T — Factory-installed thermistors are standard for all 30RB units, which will allow leaving fluid temperature reset by outdoor air temperature or cooler delta T. No additional field-installed sensors are required. These are simple linear functions that require only four configuration changes. Refer to the Controls, Start-Up, Operation, Service and Troubleshooting guide for configuration information.

Table 2 — Menu Configuration of 4 to 20 mA Temperature Reset

MODE (RED LED)	KEYPAD ENTRY	SUBMODE	KEYPAD ENTRY	ITEM	DISPLAY	ITEM EXPANSION	COMMENTS
CONFIGURATION	ENTER	DISP					
	▼	UNIT					
	▼	SERV					
	▼	OPTN					
	▼	RSET	ENTER	CRST	0	COOLING RESET TYPE	
			ENTER		0		FLASHING '0'
			▲		3		SELECT '3'
			ENTER		3		CHANGE ACCEPTED
	ESCAPE	RSET					
	ESCAPE						
SETPOINTS	ENTER	COOL	ENTER	CSP.1			
			▼	CSP.2			
			▼	CSP.3			
			▼	CRV1	0.0	CURRENT NO RESET VAL	
			ENTER	CRV1	0.0		FLASHING '0.0'
			▲		4.0		SELECT '4.0'
			ENTER		4.0		CHANGE ACCEPTED
			▼	CRV2	0.0	CURRENT FULL RESET VAL	
			ENTER	CRV2	0.0		FLASHING '0.0'
			▼		20.0		SELECT '20.0'
			ENTER		20.0		CHANGE ACCEPTED
			▼	CRT1			
			▼	CRT2			
			▼	CRO1			
			▼	CRO2			
			▼	CRS1			
			▼	CRS2			
			▼	DGRC	0.0	DEGREES COOL RESET	
			ENTER	DGRC	0.0		FLASHING '0.0'
			▲		8.0		SELECT '8.0'
			ENTER		8.0		CHANGE ACCEPTED

Table 3 — Menu Configuration of Space Temperature Reset

MODE (RED LED)	KEYPAD ENTRY	SUBMODE	KEYPAD ENTRY	ITEM	DISPLAY	ITEM EXPANSION	COMMENTS
CONFIGURATION	ENTER	DISP					
	▼	UNIT					
	▼	SERV					
	▼	OPTN					
	▼	RSET	ENTER	CRST	0	COOLING RESET TYPE	
			ENTER		0		FLASHING '0'
			▲		4		SELECT '4'
			ENTER		4		CHANGE ACCEPTED
	ESCAPE	RSET					
	ESCAPE						
SETPOINTS	ENTER	COOL	ENTER	CSP.1			
			▼	CSP.2			
			▼	CSP.3			
			▼	CRV.1			
			▼	CRV.2			
			▼	CRT.1			
			▼	CRT.2			
			▼	CRO.1			
			▼	CRO.2			
			▼	CRS.1	14.0	SPACE T NO RESET TEMP	
			ENTER	CRS.1	14.0		FLASHING '14.0'
			▲	CRS.1	60.0		SELECT '60.0'
			ENTER	CRS.1	60.0		CHANGE ACCEPTED
			▼	CRS.2	14.0	SPACE T FULL RESET TEMP	
			ENTER	CRS.2	14.0		FLASHING '14.0'
			▲	CRS.2	75.0		SELECT '75.0'
			ENTER	CRS.2	75.0		CHANGE ACCEPTED
			▼	DGRC	0.0	DEGREES COOL RESET	
			ENTER	DGRC	0.0		FLASHING '0.0'
			▲		10.0		SELECT '10.0'
			ENTER		10.0		CHANGE ACCEPTED

Demand Limit

4 TO 20 mA — 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 TB6-1, 2 (positive, negative). A field-supplied 1/2-watt, 250 ohm resistor must also be connected across terminals TB6-1,2. This is a simple linear function which requires only four configuration changes. Follow the example in Table 4 to enable the function and configure the capacity limit.

Four to 20 mA values must be entered for 0% and 100% capacity reduction.

In this example, if the control receives a 12 mA signal, the chiller capacity will be limited to 50%. There will be no Demand Limit for a 4 mA signal. If the reset signal was 20 mA, the chiller would be stopped and left in a ready to run mode. The actual 4 to 20 mA demand limit signal seen by the control can be viewed by accessing *Inputs* → *GEN.I* → *DMND*.

Table 4 — Menu Configuration of 4 to 20 mA Demand Limit

MODE (RED LED)	KEYPAD ENTRY	SUBMODE	KEYPAD ENTRY	ITEM	DISPLAY	ITEM EXPANSION	COMMENTS
CONFIGURATION	ENTER	DISP					
	▼	UNIT					
	▼	SERV					
	▼	OPTN					
	▼	RSET	ENTER	CRST			
			▼	HRST			
			▼	DMDC	0	DEMAND LIMIT SELECT	
			ENTER	DMDC	0		FLASHING '0'
			▲		2		SELECT '2'
			ENTER		2		CHANGE ACCEPTED
			▼	DMMX	0.0	MA FOR 100% DEMAND LIM	
			ENTER	DMMX	0.0		FLASHING '0.0'
			▲		20.0		SELECT '20.0'
			ENTER		20.0		CHANGE ACCEPTED
			▼	DMZE	0.0	MA FOR 0% DEMAND LIMIT	
			ENTER	DMZE	0.0		FLASHING '0.0'
			▲		4.0		SELECT '4.0'
			ENTER		4.0		CHANGE ACCEPTED

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 step 1 must be connected to TB5-5,14. The contacts for step 2 must be connected to TB6-14,15. The position of these contacts will allow for up to three steps of demand limit according to the following:

CONTACT	AMOUNT OF CAPACITY REDUCTION			
	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

Follow the example in Table 5 to enable the function and configure the step demand limit for 80%, 60%, and 25% capacity limit based on the switch position described above.

In this example, when switch 1 is closed and switch 2 is open, the maximum chiller capacity will be reduced to 80%. When switch 1 is open and switch 2 is closed, the maximum chiller capacity will be reduced to 60%. Similarly, when both switches are closed, the maximum chiller capacity will be reduced to 25%. The actual positions of switches 1 and 2 seen by the control can be viewed by accessing the items *Inputs* → *GEN.I* → *DLS1* or *DLS2*.

Additional EMM Functions

INPUTS — A field-supplied set of dry contacts can be used to provide an occupancy override signal (TB6-12,13), remote chiller lockout (TB6-5,6) or ice done signal (TB6-9,10) to the controls. The occupancy override switch can be used to put the chiller in an occupied mode during a normally scheduled unoccupied mode of operation. The remote chiller lockout function will disable the chiller when closed. With the ice mode configuration enabled and this 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 these options.

OUTPUTS — One analog and two discrete outputs are available from the EMM board. A 0 to 10 vdc analog output is available to linearly indicate the current total chiller running capacity. Connection for this output signal is made at two wires from plug J8. There are also 24 vac discrete outputs available from plug J3 (follow the wiring shown in Fig. 5). The shutdown relay output is turned on if the chiller is completely shut down. The running relay output is turned on if the chiller capacity is anything greater than 0%. All three of these outputs are to assist with remote monitoring of chiller operation.

Table 5 — Menu Configuration of Switch Controlled Demand Limit

MODE (RED LED)	KEYPAD ENTRY	SUBMODE	KEYPAD ENTRY	ITEM	DISPLAY	ITEM EXPANSION	COMMENTS
CONFIGURATION	ENTER	DISP					
	▼	UNIT					
	▼	SERV					
	▼	OPTN					
	▼	RSET	ENTER	CRST	0	COOLING RESET TYPE	
			▼	HRST			
			▼	DMDC	0	DEMAND LIMIT SELECT	
			ENTER	DMDC	0		FLASHING '0'
	ESCAPE	RSET	▲		1		SELECT '1'
	ESCAPE		ENTER		1		CHANGE ACCEPTED
SETPOINTS	ENTER	COOL	ENTER				
	▼	HEAT					
	▼	MISC	ENTER	DLS1	100%		
			ENTER	DLS1	100%		FLASHING '100'
			▼		80%		SELECT '80'
			ENTER		80%		CHANGE ACCEPTED
			▼	DLS2	100%		
			ENTER	DLS2	100%		FLASHING '100'
			▼		60%		SELECT '60'
			ENTER		60%		CHANGE ACCEPTED
			▼	DLS3	100%		
			ENTER	DLS3	100%		FLASHING '100'
			▼		25%		SELECT '25'
			ENTER		25%		CHANGE ACCEPTED