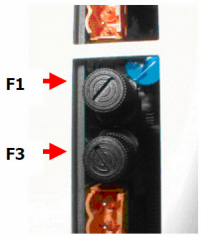
MP3000/3000A CONTROLLER CHECK/REPLACEMENT

- **Check both 2 amp fuses (F1 and F3)**
  - Ensure the two fuses are in good condition and not open circuit
  - Fuse part number: 44-6777

  NOTE: The F1 and F3 fuses provide different circuit protection between the MP3000 and MP3000a controllers

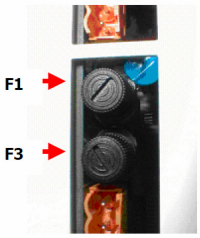
Back View of Controller

MP3000



F1 = 28V power supply
F3 = Battery Charger

MP3000a



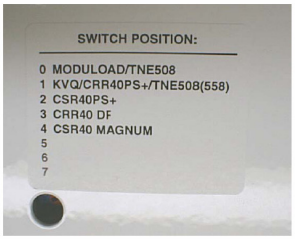
F1 = 28V power supply
F3 = 28V power supply

An internal 'auto reset' circuit now protects the Battery Charger.

- **Flashload latest released version of software**
  - Verify controller has latest released version installed
  - Check on NAD Info Central for latest release

MP3000/MP3000A MRB (MAIN RELAY BOARD) CHECK/REPLACEMENT

- **Check unit type selector switch (MP3000)**
  - Ensure selector dip switch is set to correct model type

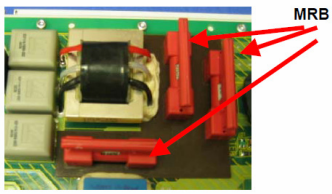


- **Check unit type selection in 'CONFIGURATION' menu (MP3000a)**
  - Ensure selection is set to correct model type

MAIN MENU CONFIGURATION 2004.02.18 – 15.30

CONT ID	TKCU1234567
CTRL TYPE	**40' MAGNUM**
IN RANGE	1.5°C
ECONOMY MAX	0.2°C

- **Check all cables and connections from controller to main relay board**
  - Ensure they are connected properly
  - If keypad related, check keypad connection to controller
- **Check all 20A fuses on the MRB**
  - Fuse part number: 504-970



- **If voltage / current readings in the 'DATA' menu are excessively high / low:**
  - Disconnect humidity sensor and re-check
  - If this corrects the problem, humidity sensor may be defective

There are three separate voltage outputs from the transformer:

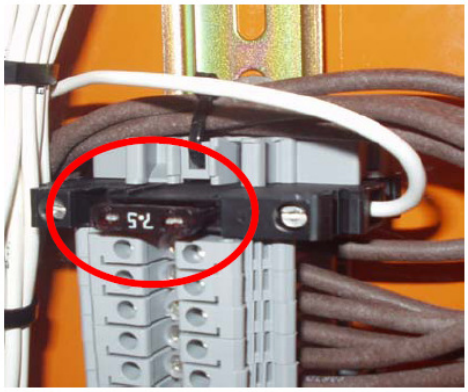
- 29 V (wires X1 and X2) for: Compressor contactor and valve solenoids
- 28 V (wires 3 and 4) for: Supply power for the controller
- 40 V (wires 5 and 6) for: Supply power for Main Relay Board (MRB)

Symptom: MP3000 controller power up, but unit will not start

- **Check for CB2 Open Circuit (nominal 29 V)**
  - Push bottom circuit breaker on the side of the control box next to the ON / OFF switch
  - ATO type fuse in control box – check for continuity with ohm meter
  - Check for output voltage of transformer, wires X1 and X2
  - Check voltage at connector J17, pin #1 (wire X2) and pin #2 (wire 1)

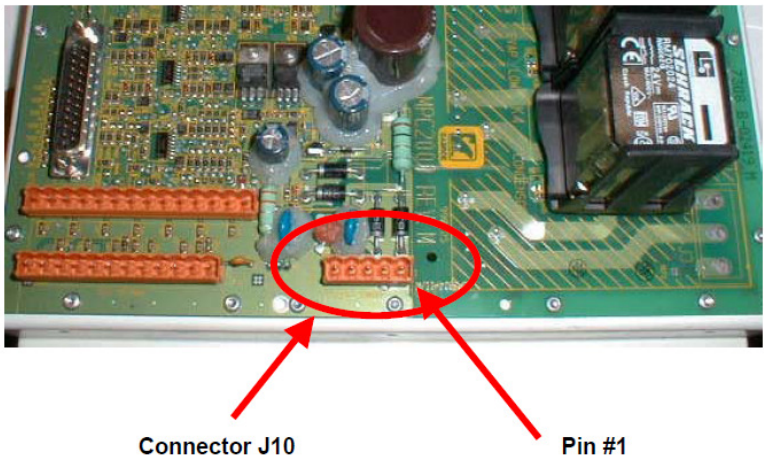
Units built **before** April 2002 (032XXXXXXX)
CB2 – Control box near ON / OFF switch

Units built **after** April 2002 (042XXXXXXX)
ATO type fuse Inside control box



Symptom: MRB has power, but MP3000 controller will not power up

- **Check for 28 VAC Supply to MRB**
  - Check for output voltage of transformer, wires #3 and #4
  - Check for voltage at ON / OFF switch. Wire #7
  - Check voltage at connector J10, pin #2 (wire 4) and pin #3 (wire 7)



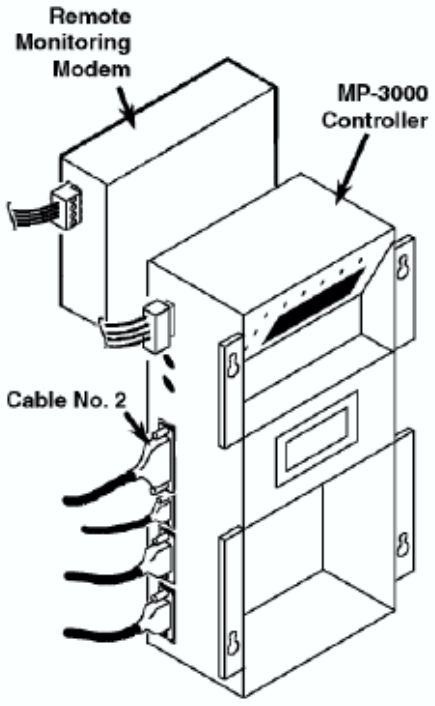
Symptom: MP3000 controller has power, but MRB will not power up

- **Check for 40 VAC supply to MRB**
  - Check for output voltage of transformer, wires #5 and #6
  - Check voltage at connector J10, pin #4 (wire 5) and pin #5 (wire 6)

Manual Emergency Mode Operation or Replacement of MP-3000 Controllers

This is to remind all personnel that they **MUST ALWAYS** disconnect the unit power cord from the power supply before attempting to disconnect or replace a MP-3000 controller.

WARNING: The unit will automatically start and operate if 460/380V power is present at the main relay board and Cable No. 2 is disconnected from the controller. To prevent personal injury from rotating machinery or dangerous electrical shock from high voltage controls, disconnect the supply power to the unit. Then proceed to replace the controller or prepare the unit for manual emergency mode operation.



MP-3000 Controller

Manual Emergency Mode Operation

In the event of an emergency situation where a failure of the controller occurs, a manual emergency mode function can be used to operate the unit. However, the unit must be manually cycled ON and OFF using the unit 460/380V main circuit breaker. This is because manual control disconnects both the controller and Unit On/Off switch from the main relay board.

NOTE: On CSR units, both the 460/380V main circu breaker and the Unit On/Off switch must be used to cycle the unit ON and OFF. The Unit On/Off switch must be ON to operate the scroll compressor.

Manual control offers a selection of six operating positions. Refer to the Manual Control decal in the unit control box or the unit Maintenance Manual to set the J501 Jumper for the desired unit operating mode.

NOTE: CRR units and CSR units use different J501 Jumper positions to provide cooling on emergency mode operation.

The unit must be cycled ON and OFF manually to maintain the desired temperature. Use the 460/380V main circuit breaker to start and stop the unit. Monitor container temperature with an external thermometer.

NOTE: The unit cooling capacity on Chill loads can be reduced by almost closing the suction service valve when Cool 1 is selected. If the compressor overheats, select Cool 2.

1. To select Manual Control, turn the unit On/Off switch to OFF.
2. Turn the unit 460/380V main circuit breaker OFF. Then disconnect the unit power cord from the power supply.

   WARNING: The unit will automatically start and operate if 460/380V power is present at the main relay board when the controller is disconnected. To prevent personal injury from rotating machinery or dangerous electrical shock from high voltage controls, disconnect the supply power to the unit before preparing the unit for manual emergency mode operation.

3. Disconnect cable no. 2 from the controller and main relay board (see electrical schematic). The main relay board will now control the unit based on the manual control setting.

   NOTE: You MUST check 2-pin plug location on J501 connections of main relay board to ensure correct unit operation.

4. If necessary, remove 2-pin plug from J501 (see decal on main relay board) and re-locate based on the unit operating mode required. Refer to the Manual Control decal in the unit control box.
5. Connect the unit power cord to the proper power supply.
6. Start the unit by turning the unit 460/380V main circuit breaker ON.

   NOTE: On CSR units, both the 460/380V main circuit breaker and the Unit On/Off switch must be used to cycle the unit ON and OFF. The Unit On/Off switch must be ON to operate the scroll compressor.

7. Check for correct rotation of condenser fan. Condenser air should be blowing out from the center of the grille. If the fan is running backwards, the power supply phase must be changed.

Reversing Power Phase on CRR Units

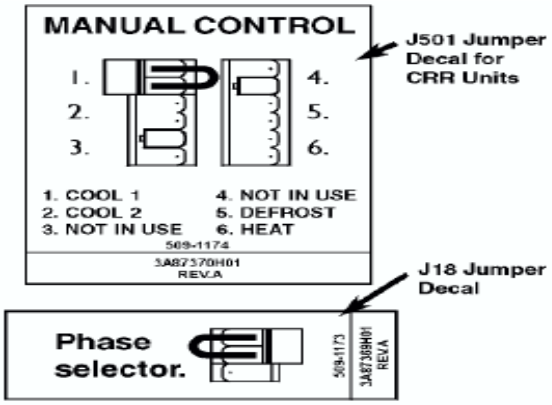
On CRR units, use Jumper J18 to reverse the power phase.

1. Turn the unit 460/380V main circuit breaker OFF.
2. Disconnect unit power cord from power supply.
3. Relocate the phase selector terminal plug from J18 (see decal on main relay board). Relocate from A to B (B to A) as required.
4. Connect unit power cord to proper power supply.
5. Start the unit again by turning the unit 460/380V main circuit breaker ON. Check condenser airflow again to confirm correct fan rotation.

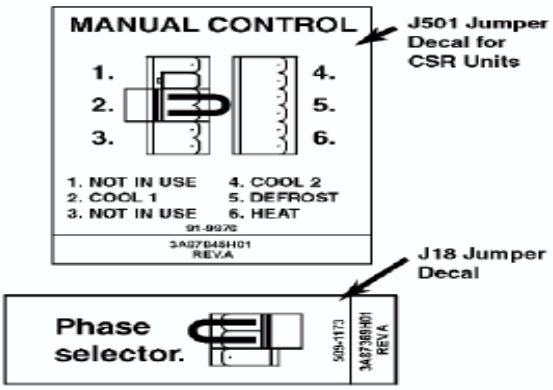
Reversing Power Phase on CSR Units

On CSR units, use incoming power cable leads to reverse the power phase. This is recommended on CSR units because the Jumper J18 does not reverse power to the scroll compressor. Using the incoming power cable leads therefore protects against the possibility that the compressor will be out of phase with the condenser and evaporator fans when the unit is plugged into new power supply.

1. Turn the unit 460/380V main circuit breaker OFF.
2. Disconnect unit power cord from power supply.
3. Relocate the position of the white and black incoming power cord leads at the 460/380V main circuit breaker.
4. Connect unit power cord to proper power supply.
5. Start the unit again by turning the unit 460/380V main circuit breaker ON and the unit On/Off switch ON. Check condenser airflow again to confirm correct fan rotation.



CRR Decals for Manual Emergency Control



CSR Decals for Manual Emergency Control

Thermoking CRR-40-119/172 & 800, MPC2000/3000A controller/MRB

*Check all the fuses
→ including (1pce X 2Amp) fuse from controller,
→3pcs x20A fuses on MRB(Main Relay Board)
→1pceX 7.5A fuse (ATO fuse).

MRB side

* ground wire from transformer (X2) to MRB at J1, controller(ground wire located between "X2" on the transformer and the screw of
the transformer leg).

*Check power supply outlet of CB, inlet and outlet of transformer.

* Check MRB as below.
- Check 440VAC power supply to J1, J2 at MRB.
- Check for output voltage 40VAC of transformer, wires #5 and #6
- Check for 40VAC supply to MRB, voltage at connector J10, pin #4 (wire 5) and pin #5 (wire 6).

* Check schrack relays coils/contact/pins and loose connection

* Check relay base(relay socket), for any sign of burn/over heating/short circuit

* Check MRB for any sign of burn/over heating

******<u>If compressor light "ON" on the controller display and compressor do not start, check:</u>**

→High pressure switch and all earth connections associated with compressor circuit(29VAC control circuit), often you will find a loose connection especially where earth connection from control transformer.
→ compressor contactor coil , inlet/outlet contacts of compressor contactor are good /energize or not.

→Check contact for "High Pressure Cut Out switch (HPCO)" → Compressor relay coil-(CC1/CC2 -A2) to (X2)/transformer leg X2. Also , check condenser fan is operational or not.

→Check contact for Low Pressure Cut Out switch (LPCO)→
If LPCO does not use with pressure transducer option for Magnum, then need jumper J19-7 and J19-8).

→scroll jumper (no.51) on MRB if properly and correctly connected at (J11-10, J11-12 for Magnum scroll)

→Check contact for "over heat switch" →J19 (26) and (27) (**if applicable, otherwise, need jumper J19-5 and J19-6 for Magnum).

→compressor motor internal thermal overload protection if open or not

→compressor shut down on compressor over temperature

→ insulation resistance of Compressor motor or mechanical damage

<u>Controller side:</u>

*Check power to MP controller if available, check (2 A) fuse at controller.

*data communication cables to controller and tighten properly.

* Check ground wire at controller for proper connection.

*If a replacement controller was removed from another unit, check the small dial located on the back of the controller for the correct software selection. Current active software settings for dial positions are:

• Position 0: All TNE 508 units with Moduload compressor • Position 1: All CRR-40/TNE 508 units with KVQ valve • Position 2: All CSR20 PS, CSR40SL PS and CSR40 PS units with a stepper motor valve • Position 7: Unit testing and service only.

***For example; If unit is using KVQ valve and CRR -40, dial should be in position" 1", otherwise, please turn "dial" to change correct position.

*Upon changing new controller(from other unit or which is not brand new one) , ensure controller needs set "auto configuration" must be "on ". Please ensure to power completely "off" from CB when changing new controller, select(main menu->Data->Data logger->configuration->Auto config.->ON), enter communication cables are properly fitted , tightened lock screws.

Changing container ID upon new controller replacement

----> The correct container ID must be change in new controller upon replacement as below,

Password could be seen in Thermoking CRR40-119/magnum manual as below.

• Password for Configuration changes is "A":
Press F2 key, "A" key, F4 key and then EXIT key.

Auto Configuration: View display on or off value (factory default = off). Set value to " on "to automatically configure unit to installed components. See "Automatic Configuration of Spare Parts Controller" for additional information at Page -106 in Magnum Manual.

Viewing or Setting Functions

With the UNIT ON/OFF switch ON and the LCD display showing the standard display (set point):
1. Press the F2 or F3 key to enter the Main menu.
2. Press the F2 or F3 key to scroll through Main menu until [CONFIGURATIONS] appears in LCD display.
3. Press the F4 key to access the Configurations screen. Configurations screen appears with cursor in the [CONTAINER-ID] menu line.
4. Press the F2 or F3 key to scroll cursor to view or reset the desired function:
Container ID: Sets the container identification number. Enter up to 11 characters (numbers or letters).