Rinnai

MECS™ - Pro
INSTALLATION INSTRUCTION

MUST BE INSTALLED BY AN AUTHORIZED PERSON

Inventory Code	Marketing Code	Description
REUMSBM	MECA04	MEC Pro Pack 1 MEC Pro Pack 1 (1 x master PCB and 2 x communication cables and accessories to create master unit and 1 x slave unit)
REUMSBC1	MECB04	MEC Pro Pack 2 MEC Pro Pack 2 (Communication cable and accessories to connect each extra HD Unit to Master unit. One required per extra heater)
REUMSBC2	MECC04	MEC Pro Pack 3 (Communication cable and accessories to connect multiple master PCB's. One required per extra master PCB)
REUMSBMB	MECA05	MEC Pro Pack 4 (Same as MECA04 with master PCB externally mounted in waterproof case)

Section 1: Introduction.
Section 2: What is required for where.
Section 3: Compatibility
Section 4: Installation Instructions.

Section 1 – Introduction.

Manifold Electronic Control System - M E C S
Rinnai heavy duty gas fired continuous flow water heaters can be manifolded together, (up to 25 individual water heaters), by connecting them in parallel to enable a far greater hot water flow rate than is possible with a single unit.
MECS is a totally integrated system unique to Rinnai that links each Infinity unit in the system and will turn on each unit as demand requires

The key advantages to using **MECS™** are as follows:

- Very high flow rates/volumes made possible by linking individual heaters in parallel.
- Load shared across linked heaters ensuring even wear rates.
- Inherent redundancy in the event of a failed heater (s).
- Reduced gas consumption resulting in increased economy.
- Unsurpassed water temperature consistency.

How it works.
A master communication PCB and sub-communication PCB is installed in the first water heater, all other subsequent water heaters have only the sub-communication PCB and slave cable installed.

The master communication PCB receives information about flow rates from the PCB of each unit and through the use of electronics balances the load on each unit. Intelligent programming enables Random selection of the units required to supply the flow demand means that all units share the workload evenly. All information is transmitted between the master water heater and slave water heaters via the communication cables to the slave units.
The master control also has an inbuilt fault detection system and will allocate a replacement unit should one of the heaters fail.

REUMSBM, REUMSBMB, REUMSBC1, C2 and C3

This MECS™ **Pro** System has the capability of joining up to 25 Infinity units and will replace the previous Rinnai REU-SA2M/2S and REU-SA3M/3S MECS™ systems.

Inventory Code	Marketing Code	Description
REUMSBM	MECA04	MEC Pro Pack 1 MEC Pro Pack 1 (1 x master PCB and 2 x communication cables and accessories to create master unit and 1 x slave unit)
REUMSBC1	MECB04	MEC Pro Pack 2 MEC Pro Pack 2 (Communication cable and accessories to connect each extra HD Unit to Master unit. One required per extra heater)
REUMSBC2	MECC04	MEC Pro Pack 3 (Communication cable and accessories to connect multiple master PCB's. One required per extra master PCB)
REUMSBMB	MECA05	MEC Pro Pack 4 (Same as MECA04 with master PCB externally mounted in waterproof case)

Section 2: What is required for where.

Description	Master		Slave	Joiner
Location	Internal mount	External mount		
Part Number	REUMSBM	REUMSBMB	REUMSBC1	REUMSBC2
No. of water heaters				
1	-	-	-	-
2	1	1	-	-
3	1	1	1	-
4	1	1	2	-
5	1	1	3	-
6	2	2	2	1
7	2	2	3	1
8	2	2	4	1
9	2	2	5	1
10	2	2	6	1
11	3	3	5	2
12	3	3	6	2
13	3	3	7	2
14	3	3	8	2
15	3	3	9	2
16	4	4	8	3
17	4	4	9	3
18	4	4	10	3
19	4	4	11	3
20	4	4	12	3
21	5	5	11	4
22	5	5	12	4
23	5	5	13	4
24	5	5	14	4
25	5	5	15	4

Section 3: Compatibility

	Current model	**Previous model**
HD200e	REU-VRM2632WC	**-**
HD200i	REU-VR2632FFU	REU-VM2632FFUG
HD250e	REU-VR3237WC	REU-VM3237WC

Note:

MECS™ are to be used on Commercial appliances ONLY.

Section 4 – Installation Instructions

The following pages contain installation instructions for all MECS application.

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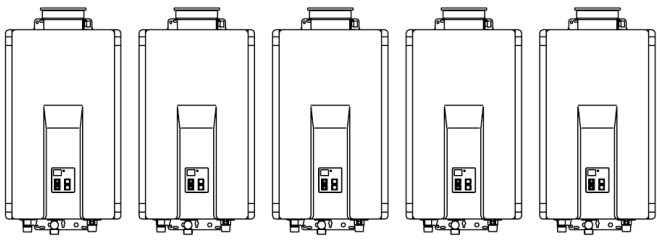
Rinnai®

Manifold Electronic Control System Installation Instructions

MSB-M
MSB-C1



Note:

- Up to 5 water heaters can be connected together using the MSB-M and MSB-C1 kits.
- When over 5 water heaters are connected together MSB-M units are connected using MSB-C2 kits.
- If multiple MSB-M are used, then at least three water heaters should be connected to each MSB-M. Ex: With 7 water heaters, one MSB-M should control 4 water heaters and the other MSB-M should control 3 water heaters.
- Please contact Rinnai if you have further questions on the applicable water heater models.

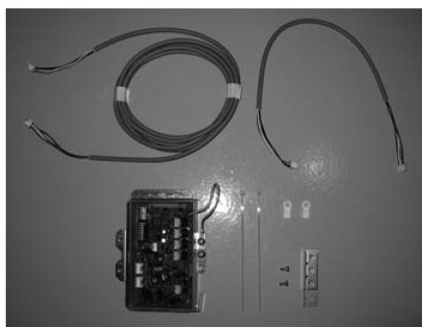
WARNING

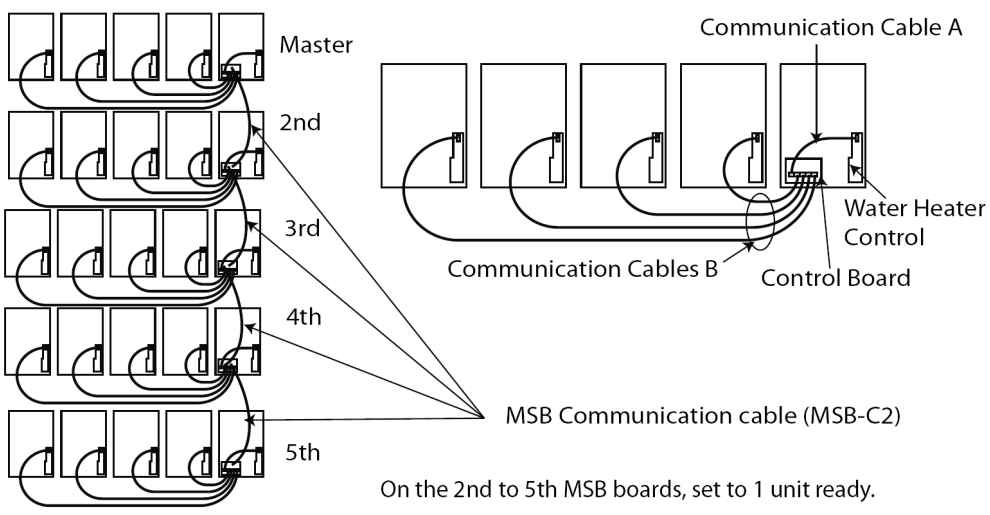
Disconnect all water heaters from their power source before carrying out the following installation procedures

NOTE: The front cover panels of each water heater must be removed prior to completing the following installation procedures.

Kit Contents

REUMSBM MSB-M (Pack A) (For wiring Units 1 and 2) Parts List		**REUMSBC1** MSB-C1 (Pack B) (For wiring Units 3, 4 and 5) Parts List	
Part	Qty	Part	Qty
Control Board	1	Communication Cable **B** (9.8 ft, 3 m)	1
Communication Cable **A** (18 in, 450 mm)	1	Cable tie bracket	2
Communication Cable **B** (9.8 ft, 3 m)	1	Cable tie	2
Cable tie bracket	2	Bracket	1
Cable tie	2	Fastening Screw	2
Instruction Sheet	1	Instruction Sheet	
Bracket	1	Note: One MSB-C1 is required for each water heater (Units 3, 4, and 5)	1
Fastening Screw	2		



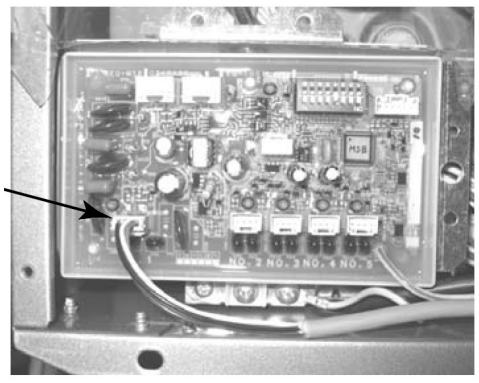


For Unit 1:

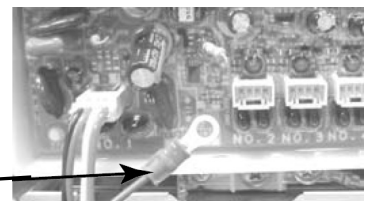
1) Remove the screw from the sheet metal reinforcement plate located at the bottom left of the water heater cabinet, and then use it to secure the Control Board to the water heater cabinet.

If installing on a **Condensing Water Heater**, refer to the additional instruction below. *

2) Attach the connector from Communication Cable **A** (18inch, 450 mm cable) to socket No. 1 on the Control Board.

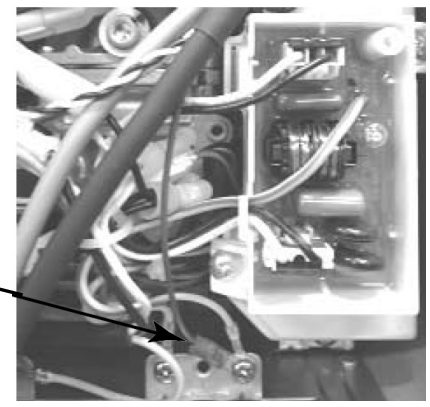


Ground wire of Communication Cable B

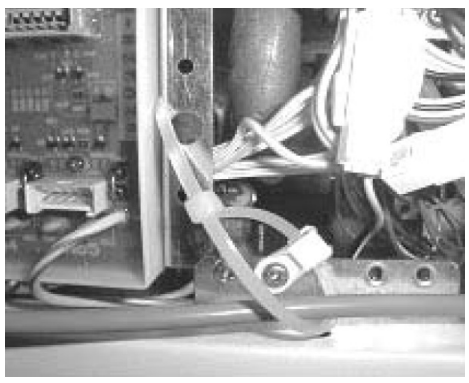


3) Fit the connector from Communication Cable **A** to the 4-pin socket located at the top of the water heater control board. Communication Cable **B** ground wire terminal should be grounded with the PCB ground wire.

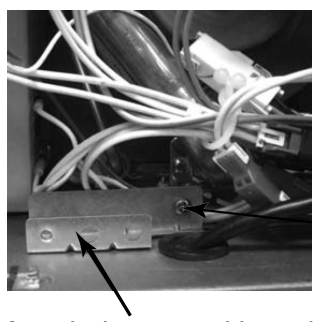
Ground wire of Communication Cable B



4) Attach the cable tie bracket to the bottom of the water heater cabinet using the existing screw. Loosely secure the cable tie through the bracket and around the communication cable. DO NOT TIGHTEN THE CABLE TIE AT THIS TIME - the Communication Cables B from the other water heaters must be secured by this cable tie.



* These **Condensing Water Heaters** require a bracket, (supplied), for the control board: RC98HPi (REU-KA3237FFUD)/RC98HPe (REU-KA3237WD) /RC80HPi (REU-KA2530FFUD)/RC80HPe (REU-KA2530WD) /REU-KM3237FFUD/REU-KM3237WD/ REU-KM2635FFUD /REU-KM2635WD
Attach the control board to this bracket with one screw as in **Step 1** above.



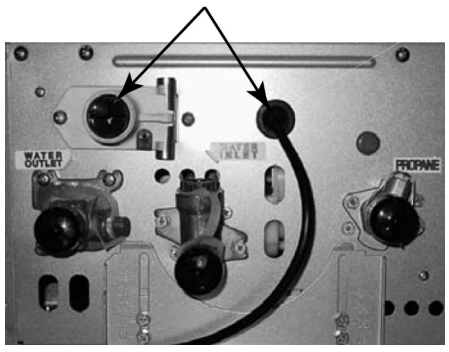
Install the bracket

Attach the control board

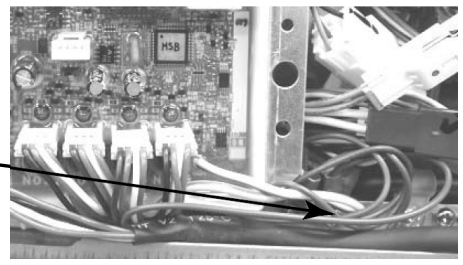
Install the bracket with one screw as shown above and continue with the rest of the installation.

For 2, 3, 4, and 5 additional Units

5) Run the 4-pin connector of Communication Cable **B** (9.8 ft, 3 m cable) up through the cable access hole in the bottom of Unit 1's cabinet.

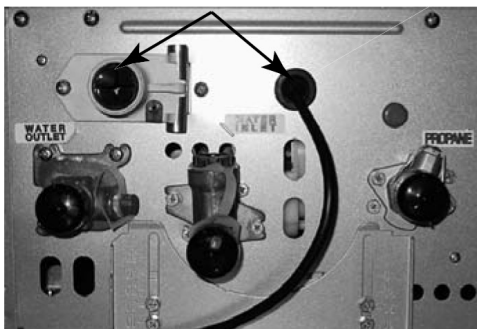


6) Fit the connector of the Communication Cable **B** to socket 2 on the Control Board. The Communication Cable **B** ground wire terminals should be grounded with the MSB ground wire.

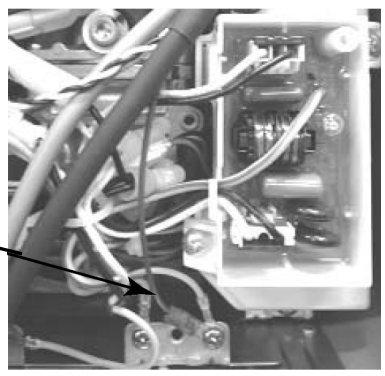


Ground wires of Communication Cable **B**

7) Run the other end of Communication Cable **B** through the cable access hole in the bottom of Unit 2's cabinet.

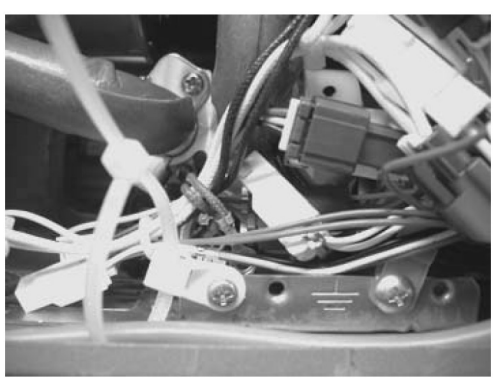


8) Fit the 4-pin connector from Communication Cable **B** to the 4-pin socket located at the top of the water heater control board of Communication Cable **B** Unit 2. ground wire terminal should be grounded with the PC board ground wire.



Ground wire of Communication Cable **B**

9) Attach the cable tie bracket to the bottom of the water heater cabinet using the existing screw. Gather all of the excess cable up into Unit 2's cabinet, and then secure it tightly to the bracket using the cable tie.



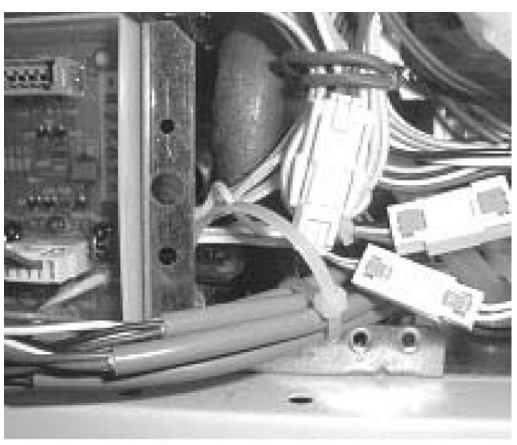
10) Repeat steps 5 to 9 f or U nits 3 , 4, and 5, as applicable.

Note: Communication Cable B for Unit 3 plugs into socket 3, Unit 4 plugs into socket 4, etc.

11) After making all of the connections to the Control Board, tighten all of the cable ties used to secure the Communication Cables.

12) Place the front cover panels back on each of the water heaters using (4) screws.

13) Restore power to the water heaters.



System Operation

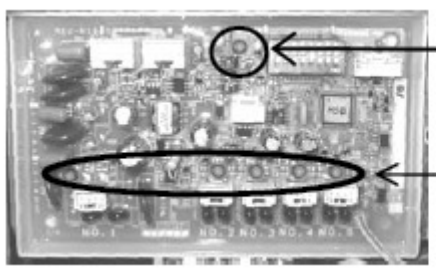
- The Control Board can electronically connect up to 25 water heaters.
- When multiple water heaters are operating, they will attempt to supply equal amounts of hot water.
- On initial water flow demand, from 1 to 3 units which can be determined by Dip SW setting of Master MSB board will open their servos valves until flow demand is determined. See Dip SW table for open water flow valve. Only the necessary number of water heaters will begin to fire to meet demand. Water heaters not firing will close their valves.
- As the default setting, 1 unit will open its servo valve until flow demand is determined
- It is recommended that the DIP switch settings on MSB boards other than the Master MSB board be set for 1 unit ready.
- When installation is complete do a test run for all units.
- After the test run, remove and clean the water filter screens on **all** units.
- The temperature setting for **all** of the connected water heaters is controlled by the temperature controllers connected to the water heater with the master MSB Board. Temperature controllers to other units will continue to provide maintenance codes for their respective units.
- If the water heaters do not use a temperature controller, the temperature settings for the water heater with the master MSB board is used.
- For proper operation, it is not recommended to connect different models together. Combining different models may result in lower or erratic performance.
- The order in which each heater operates is occasionally rotated to ensure equal usage among the entire system.

DIP Switch table for open water flow servo valve
When viewing the installed MSB board the DIP switch will be as shown below, **up-side down**.

	1 unit ready (Default)	2 Units ready	3 Units ready
Dip SW setting	No1 OFF No2 OFF	No1 ON No2 OFF	No1 ON No2 ON

NOTE: In a recirculation system. In order to increase the temperature setting it is necessary to turn off the power supply to the circulation pump, increase the temperature setting, then turn the pump back on. No additional action is necessary when decreasing the temperature setting.

Indicator lights on the Control Board indicate the status of each of the water heaters as follows;



LED 1 ~ 5	Operation
On – Solid illumination	Water flow servo is open when the water heater is in standby or working.
Flashing Slowly (1.2 sec on / 0,5 sec off)	Water flow servo valve is closed when the water heater is not operating
Flashing Quickly (0.5 sec on / 0.5 sec off)	An error is detected. A temperature controller must be connected to this unit to read the error code.
Off	No unit detected at this connection.

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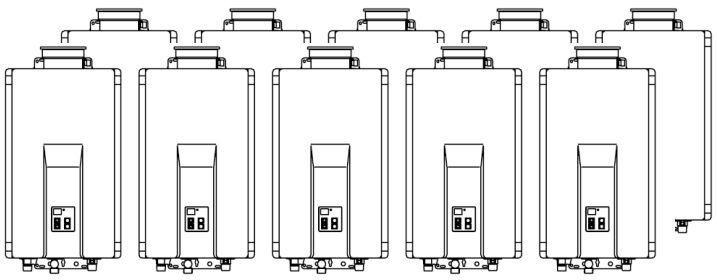
Manifold Electronic Control System Installation Instructions

MSB-C2



Note:

- Up to 5 water heaters can be connected together using the MSB-M and MSB-C1 kits.
- When over 5 water heaters are connected together MSB-M units are connected using MSB-C2 kits.
- If multiple MSB-M are used, then at least three water heaters should be connected to each MSB-M. Ex: With 7 water heaters, one MSB-M should control 4 water
  heaters and the other MSB-M should control 3 water heaters.
- Please contact Rinnai if you have further questions on the applicable water heater models.

WARNING

Disconnect all water heaters from their power source before carrying out the following installation procedures

NOTE: The front cover panels of each water heater must be removed prior to completing the following installation procedures.

Kit Components

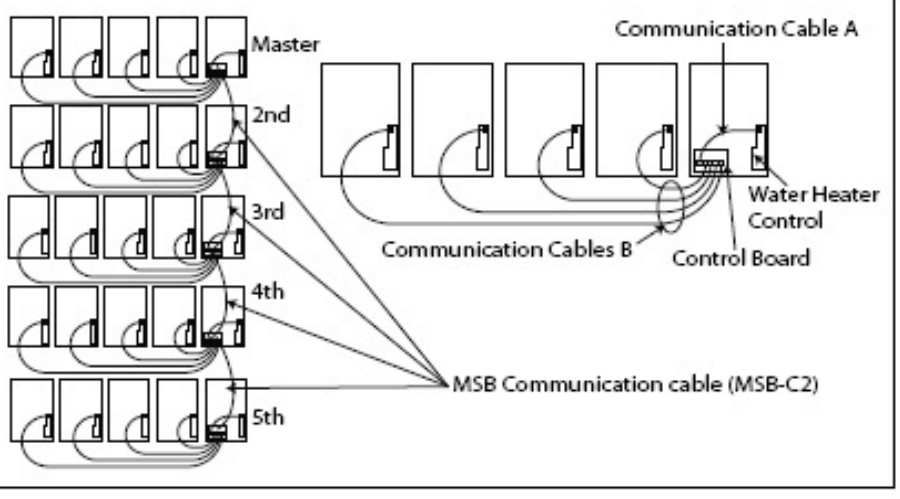
Kit Components

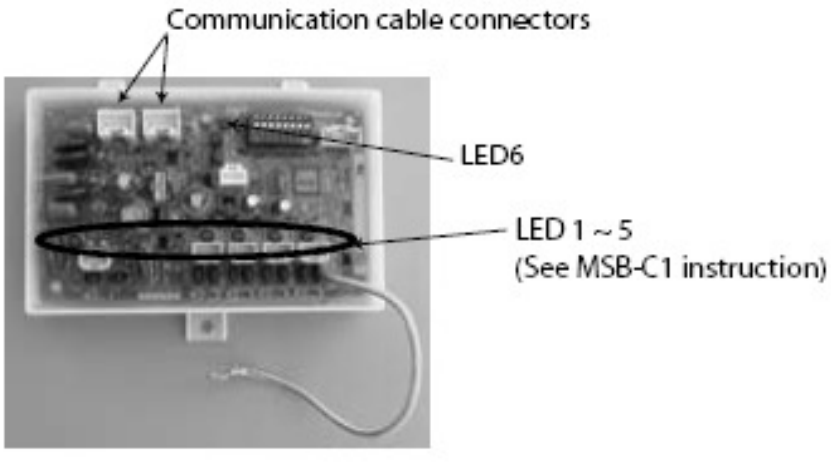
MSB-C2 (Pack C)

(For wiring MSB units)

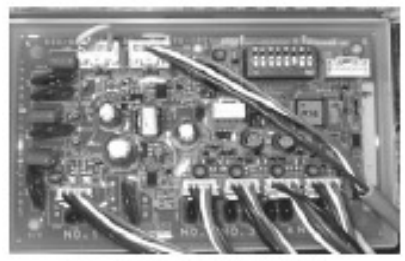
Parts List

Part	Qty
MSB Communication cable (13.1 ft, 4 m)	1
Terminal connector	2
Instruction Sheet	1



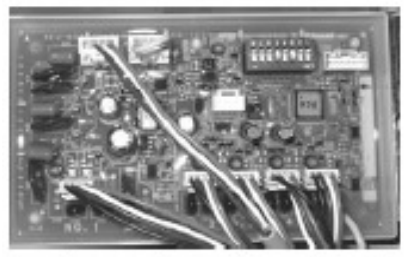


1) On the master MSB, one connector is connected to the terminal connector and the other one is connected to the MSB Communication cable.



Master MSB board

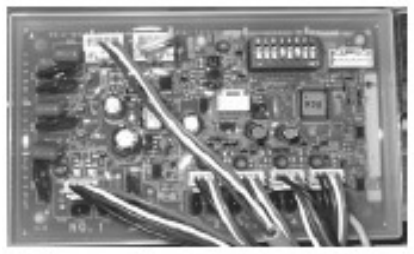
2) When 2 MSB boards are used a MSB Communication cable will be installed between the master MSB board and the second MSB. The open connector will have the Terminal connector installed on both MSB boards.



2nd MSB board

A maximum of **5** MSB boards can be connected to each other.
The terminal connection is connected on the terminal MSB which has an open connector.

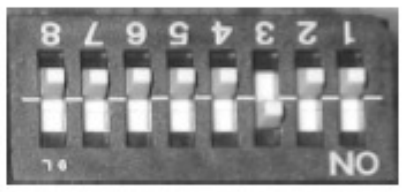
2nd to 4th MSB board



5th MSB board (Terminal MSB)

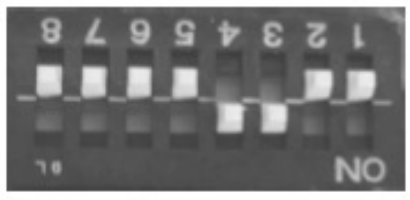
NOTE:
When viewing the installed MSB board, the dip switch will be as shown alongside, (**upside down**).

3) Set No 3 switch on the master MSB to ON. The LED light 6 should turn ON confirming the connection.

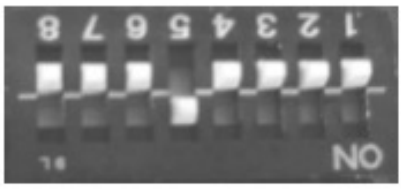


4) Set No 4 switch on the second MSB to ON. The LED light 6 should turn ON confirming the connection.

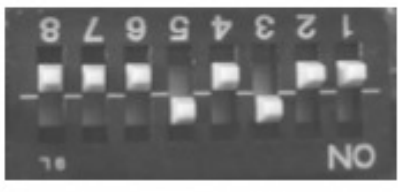
5) Set No 3 and No 4 switches on the third MSB board to ON.
The LED light 6 should turn ON confirming the connection.



6) Set the No 5 switch on the fourth MSB board to ON.
The LED light 6 should turn ON confirming the connection.



7) Set No 3 and No 5 switches on the on the fifth MSB board to ON.
The LED light 6 should turn ON confirming the connection.



Indicator light (LED 6) on the Control Board indicates the status as follows:

LED 6	Operation
On – Solid illumination	Working with multiple MSB Boards
Off	Stand alone.

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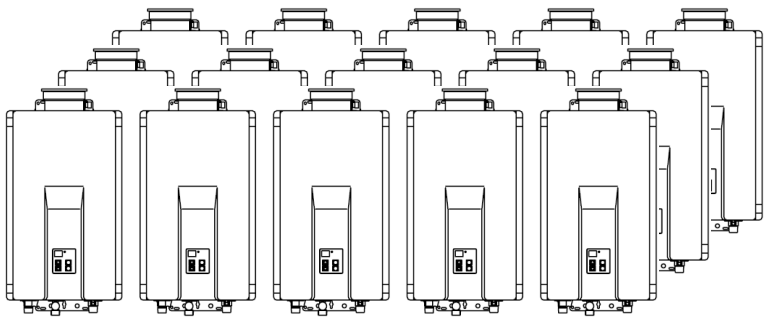
Manifold Electronic Control System Installation Instructions

MSB-C3



Note:

- Up to 5 water heaters can be connected together using the MSB-M and MSB-C3 kits.
- When over 5 water heaters are connected together, MSB-M units are connected using MSB-C2 kits.
- If multiple MSB-M are used, then at least three water heaters should be connected to each MSB-M. Ex: With 7 water heaters, one MSB-M should control 4 water heaters and the other MSB-M should control 3 water heaters.
- Please contact Rinnai if you have further questions on the applicable water heater models.

WARNING

Disconnect all water heaters from their power source before carrying out the following installation procedures

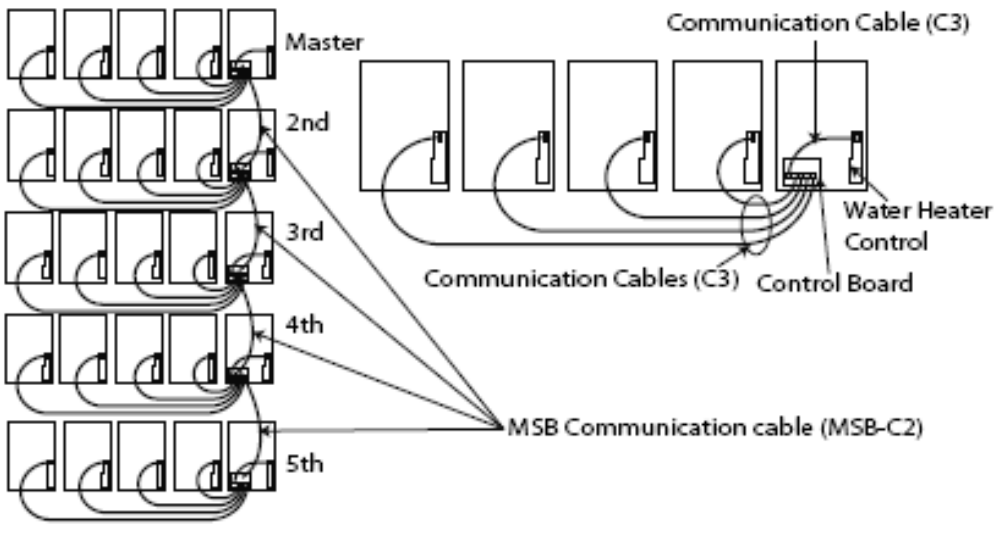
NOTE: The front cover panels of each water heater must be removed prior to completing the following installation procedures.

Kit Components

MSB-C3 (Pack D)

Parts List

Part	Qty
Communication Cable (9.8 ft, 3 m)	1
Instruction Sheet	1



For Unit 1:

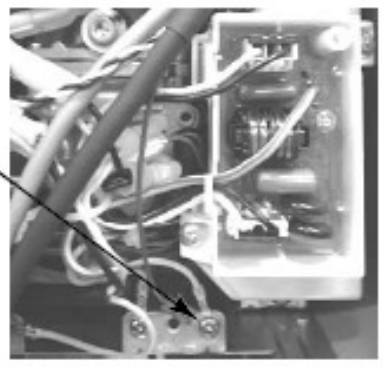
1) Remove the screw from the sheet metal reinforcement plate located at the bottom of the water heater cabinet, and then use it to secure the Control Board to the water heater cabinet.

2) Fit the connector from Communication Cable to socket No. 1 on Control Board.

Ground wire of Communication Cable **B**

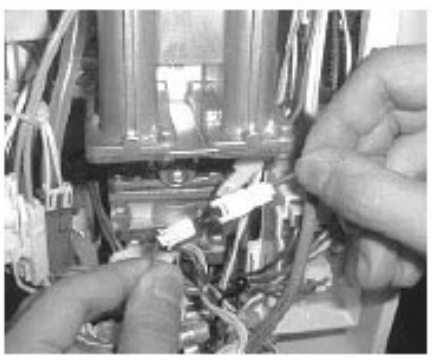
3) Fit the 4-pin connector from Communication Cable to the 4-pin socket located at the top of the water heater control board. The Communication Cable ground wire terminal should be grounded with the PC board ground wire.

Ground wire of Communication Cable **B**



4) Remove the protective cap from the 2-pin connector marked “MS” (located in the middle of the water heater wiring harness).

5) Fit the 2-pin connector from Communication Cable into the 2-pin connector marked “MS”.



6) Repeat steps 2 to 5 for Units 2 , 3, 4, and 5, as applicable.

Note: Communication Cable for Unit 2 plugs into socket 2, Unit 3 plugs into socket 3, etc.

7) After making all of the connections to the Control Board, tighten all of the cable ties used to secure the Communication Cables. Ground all the Communication Cables.

Notes: