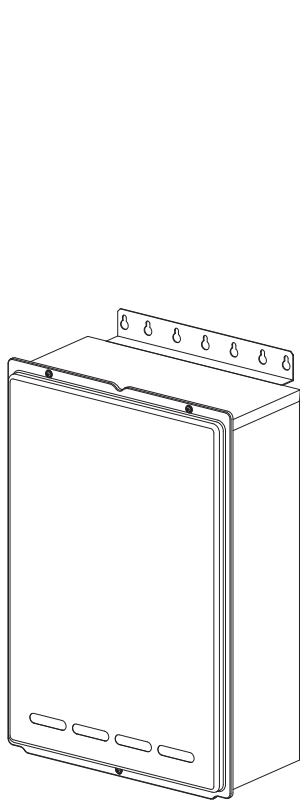


Multi-Unit Controller Installation Manual



Multi-Unit Controller
Part # 9008300005 (TM-MC02)



WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
 - Do not try to light any appliance.
 - Do not touch any electric switch, do not use any phone in your building.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

If you have any questions, please call or write to the manufacturer listed on the rating plate of your water heater

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SPECIFICATIONS

Weight		lbs. (kg)	13.2 (6.0)
Dimensions		inch	H 20.5 x W 13.8 x D 6.7
		mm	H 520 x W 350 x D 170
Electric	Supply	VAC / Hz	120 / 60
	Consumption	Operation	W / A
		Standby	W / A

INTRODUCTION

- This manual provides information necessary for the installation, operation, and maintenance of the multi-unit controller. Please read all installation instructions completely before installing this product.
- The multi-unit controller can control from 2 to 20 units of the 510U (T-D2U) models, 510C (T-D3U-CV) models, 540 (T-H3) models, 710 (T-M32) models, or 2 to 10 units of the 910 (T-M50) models.
- The multi-unit controller is also equipped with additional multiple functions; “Pump mode”, “Alarm system”, “External fan motor” and “Freeze protection for Re-circulation system”. **Refer to pages 9 through 12 for detailed information.**
- The multi-unit controller ensures that each water heater within the system operates about the same amount of time.
- The assignment of the priority water heater, which the multi-unit controller activates when flow begins, changes after 100 on/off operation cycles, or after 12 hours of operation time.
- The number of water heaters working during operation depends on the **flow rate** and the **set temperature**.



If you have any problems or questions regarding this product, consult the manufacturer or your local representative.

SAFETY GUIDELINES

Safety Definition



WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.




CAUTION

Indicates an imminently hazardous situation which, if not avoided, could result in minor or moderate injury.

General

1. Properly ground the unit in accordance with all local codes, or in the absence of local codes, with the National Electrical Codes: ANSI/NFPA 70 in the USA or CSA standard C22.1 Canadian Electrical Code Part 1 in Canada.
2. Carefully plan where you intend to install the multi-unit controller.
3. Refer to the SAFETY GUIDELINES in the installation manual of your water heater.
4. If any problem should occur, turn off the power supply in the system, then call a qualified technician or the manufacturer.
5. After installation, please make sure to hand this installation manual to the customer.




WARNING

- Do not store or use gasoline or other flammables, vapors, or liquids in the vicinity of this appliance.
- Do not use this controller if any part has been in contact with or been immersed in water. Immediately call a licensed plumber, a licensed gas fitter, or a professional service technician to replace the controller.

INSTALLATION

General

The multi-unit controller requires careful and correct installation to ensure safe, efficient operation. This manual must be followed exactly. Read the “Safety Guidelines” section above.



WARNING

- Installation and service must be performed by a qualified installer (i.e., a licensed electrician, plumber, or gas fitter), otherwise the warranty will be void. Refer to the LIMITED WARRANTY in the installation manual of your water heater.
- The installer (licensed professional) is responsible for the correct installation of the multi-unit controller and for compliance with all national, state/provincial, and local codes.
- Confirm that all of the water heaters, which are to be connected to the multi-unit controller, are of the same gas type.
- The manufacturer does not recommend installing the unit in an attic due to safety issues.


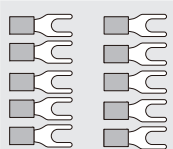
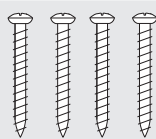

The multi-unit controller is only to be used with the following water heater models:

Model type	510U (T-D2U)	510C (T-D3U-CV)	540 (T-H3)	710 (T-M32)	910 (T-M50)
510U (T-D2U)	✓	N/A	N/A	N/A	N/A
510C (T-D3U-CV)	N/A	✓	N/A	N/A	N/A
540 (T-H3)	N/A	N/A	✓	✓ *	N/A
710 (T-M32)	N/A	N/A	✓ *	✓	N/A
910 (T-M50)	N/A	N/A	N/A	N/A	✓

*Only 540 (T-H3) and 710 (T-M32) can be combined together in a multi-unit system.

Included Accessories

Check that these items below are included with the multi-unit controller.

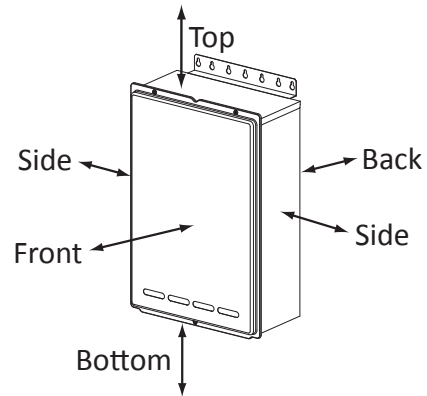
Installation manual	Fork terminals	Long screws	Temperature remote controller kit 9008172005 (TM-RE40)
 Qty: 1	 Qty: 10	 Qty: 4	 Qty: 1

Clearances

The multi-unit controller shall be located in an area to maintain the following minimum clearances around the unit:

Top	Bottom	Front	Back	Sides
1 in. (25 mm)	1 in. (25 mm)	4 in. * (102 mm)	1 in. (25 mm)	1 in. (25 mm)

*24 inches recommended for maintenance.



Electrical Connections



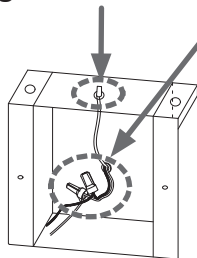
Follow the electrical code requirements of the local authority having jurisdiction. In the absence of such requirements, follow the current edition of the National Electrical Code ANSI/NFPA 70 in the U.S. or the current edition of CSA C22.1 Canadian Electrical Code Part 1 in Canada.



When servicing or replacing parts within the multi-unit controller, label all wires prior to disconnection to facilitate an easy and error-free reconnection. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

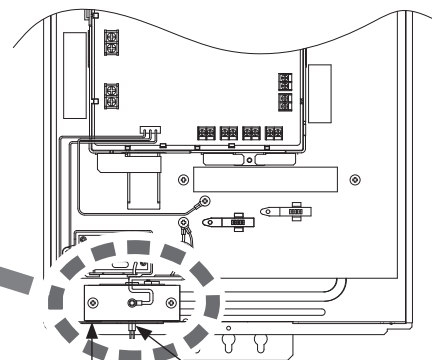
1. The multi-unit controller must be electrically grounded. Do not attach the ground wire to either the gas or the water piping of the water heater.
2. The multi-unit controller requires a **120 VAC, 60 Hz electrical power supply that is properly grounded.**
 - A proper disconnect (i.e., on/off switch, power plug, etc.) controlling the main power to the multi-unit controller must be provided for service reasons. (Must comply with local codes.)
 - Connect the power supply to the multi-unit controller exactly as shown in the diagram below.
3. A green screw is provided in the junction box to ground the connections.
4. The power cable in the junction box can be hardwired or wired to a plug-in.
5. The use of a surge protector is recommended in order to protect the multi-unit controller from power surges.

**A ground screw (green)
for ground connection**



View of electrical connections

**Connect
Power supply
120VAC, 60Hz**

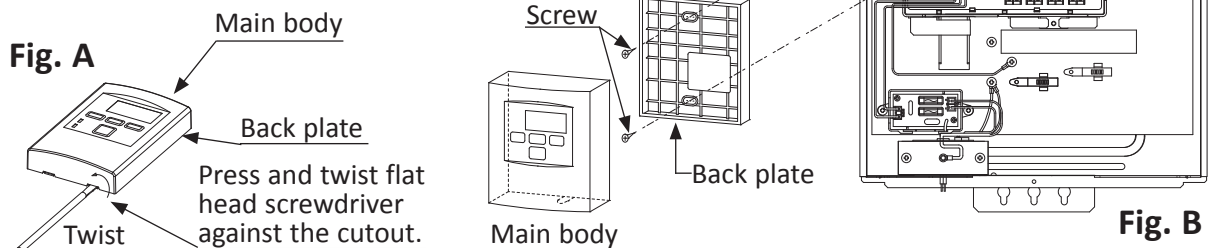


Junction box

Power cable

Temperature Remote Controller Connections

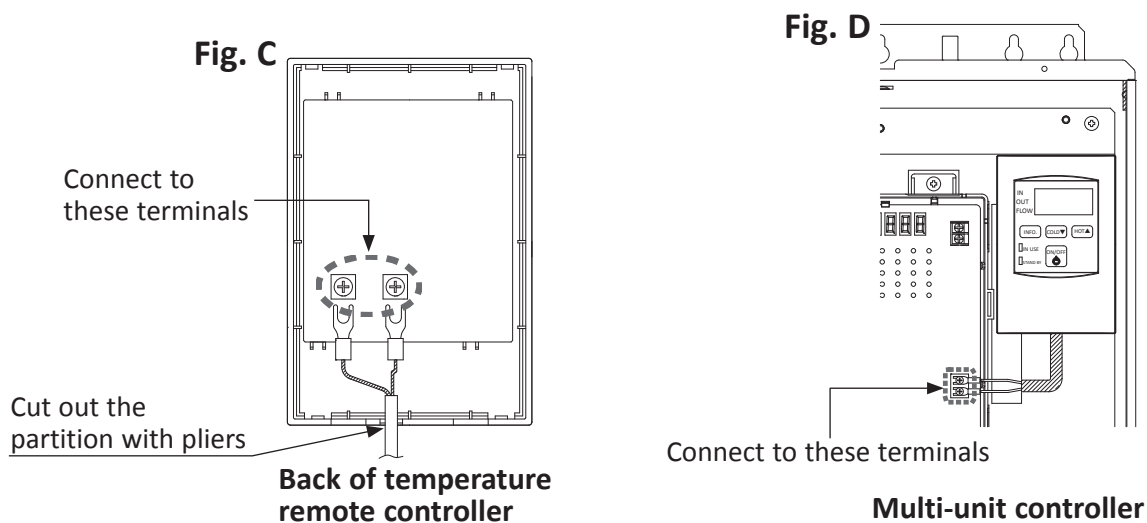
- The temperature remote controller is required for the multi-unit system.
- **Refer to the installation manual of the remote controller for more details.**
- The 9008172005 (TM-RE40) is the only temperature remote controller compatible with the 9008300005 (TM-MC02) multi-unit controller.
- Wires used for the remote controller connection must be:
 - Minimum 20 gauge wire (No polarity)
 - Maximum 400 feet (122 m) long



How to install the temperature remote controller inside the multi-unit controller

1. Disconnect the power supply from the multi-unit controller.
2. Remove the multi-unit controller's front cover.
3. Remove the **"Back plate"** from the remote controller with a flat head screwdriver. (Fig. A)
4. Attach the back plate of the temperature remote controller to the multi-unit controller with two screws as shown above. (The screws are included with the multi-unit controller.) (Fig. B)
5. Secure both fork terminals to the terminals on the back of the temperature remote controller with screws. Make sure the terminals are secure. (Fig. C)
6. Place the **"Main body"** back on the **"Back plate"** with the remote wires running out of the bottom inlet.
7. Locate the temperature remote controller terminal, pictured above (located around the middle, right-hand side of the computer board). (Fig. B)
8. Connect the remote controller's wires to the "Temperature Remote Controller's" terminal as shown in Fig. D.
9. Replace front cover securely.

***Do NOT jump or short-circuit the wires, or the computer will be damaged.**



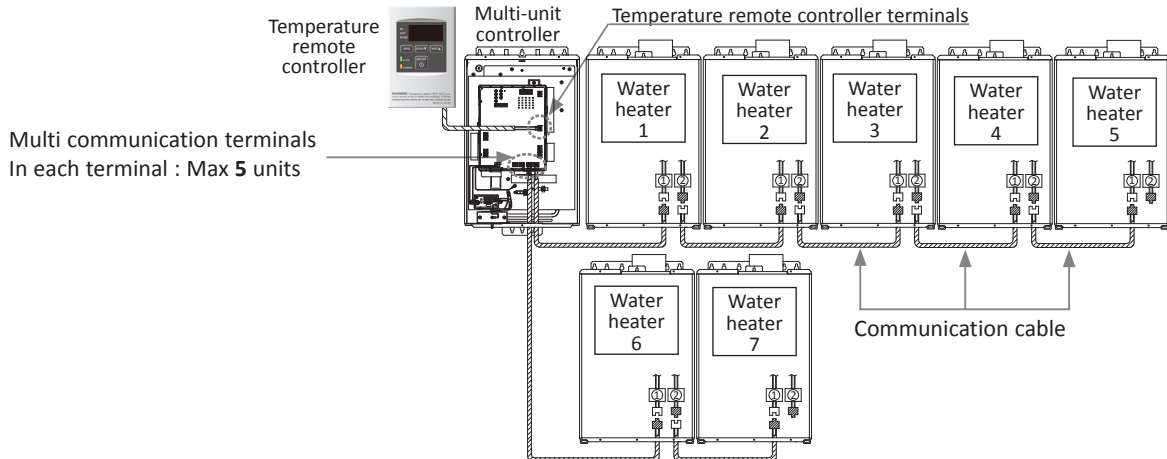
Water Heater Connections

The multi-unit controller can connect up to **20 units** of 510U (T-D2U), 510C (T-D3U-CV), 540 (T-H3), 710 (T-M32), or up to **10 units** of 910 (T-M50) with communication cables to work as a Multi-Unit System. A communication cable (gray color) comes with each water heater.

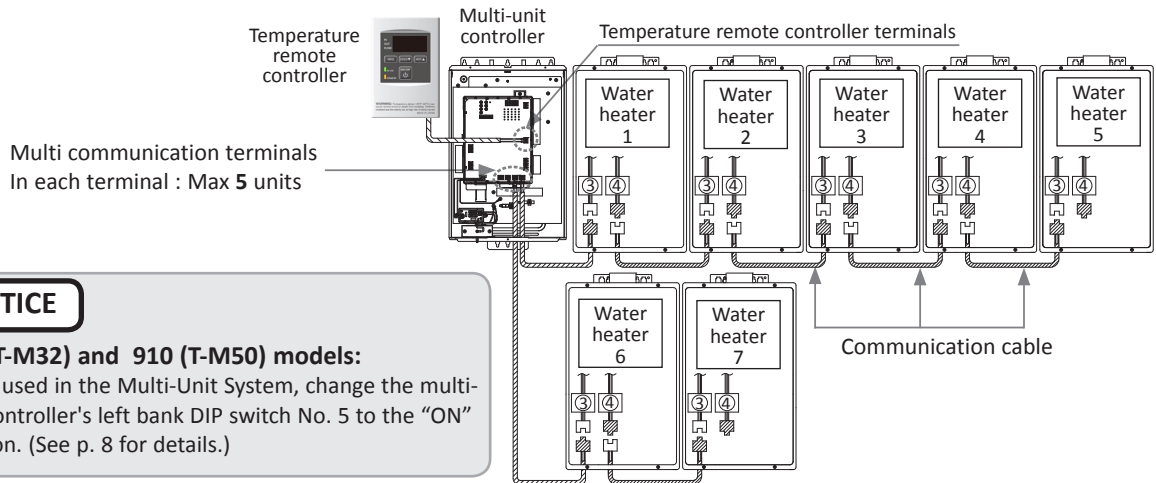
NOTICE

- There are 4 sets of multi communication terminals in the multi-unit controller. Each set of multi communication terminals will allow up to five water heaters (or four 910/T-M50s) to be connected to it. If you connect more than five water heaters (or four 910/T-M50s), the additional water heaters will not work as a part of the Multi-Unit System.
- Refer to p.4 for more details on the models that can be connected together.

- **Diagram of connections between the multi-unit controller and the 510U (T-D2U), 510C (T-D3U-CV), or 540 (T-H3)**



- **Diagram of connections between the multi-unit controller and the 710 (T-M32) model**

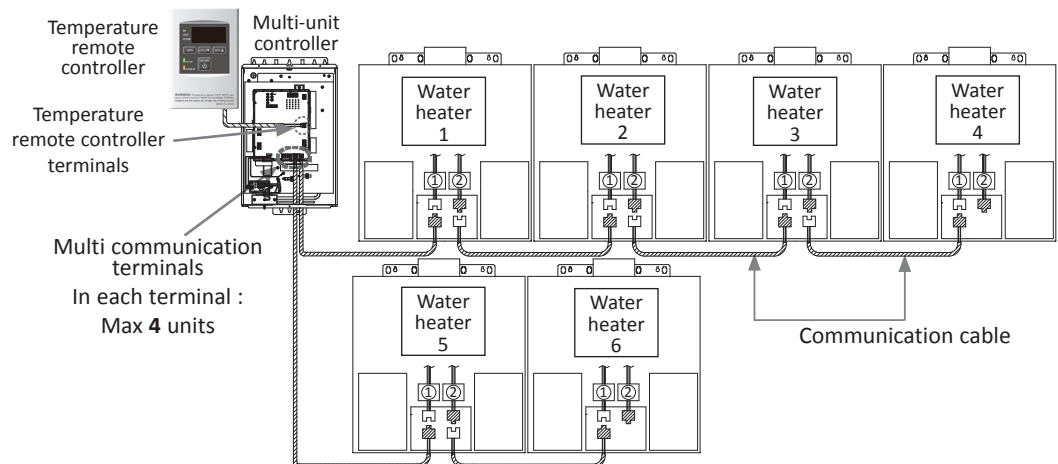


NOTICE

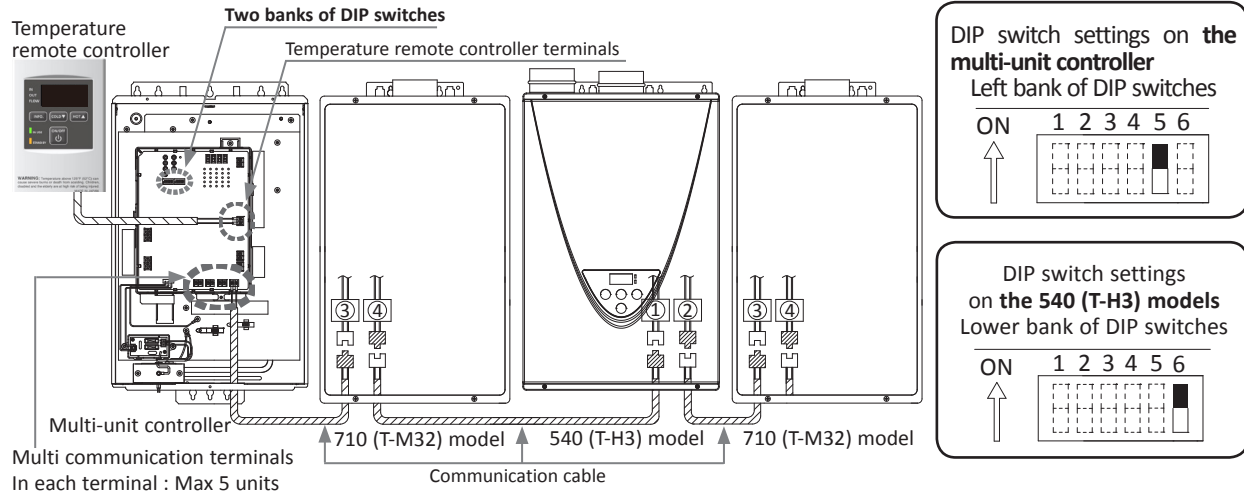
710 (T-M32) and 910 (T-M50) models:

When used in the Multi-Unit System, change the multi-unit controller's left bank DIP switch No. 5 to the "ON" position. (See p. 8 for details.)

- **Diagram of connections between the multi-unit controller and the 910 (T-M50) model**



• **Connecting 710 (T-M32) and 540 (T-H3) Models together in a Multi-Unit System***



Follow these steps when connecting 710 (T-M32) and 540 (T-H3) models to the multi-unit controller:
 1.) Change the **left bank DIP switch No. 5** on the multi-unit controller computer board to the "ON" position.
 2.) Change the **lower bank DIP switch No. 6** on the 540 (T-H3) models computer board to the "ON" position.



- The dark squares indicate the correct setting of the DIP switches.
- Turn off the power supply to the appliances before changing the DIP switch settings.

*The 710 (T-M32) Temperature Tables are applied to combinations of 710 (T-M32) and 540 (T-H3) models in a Multi-Unit System. Refer to the following tables.

The 710 (T-M32) and 910 (T-M50) models Temperature Tables

Default mode***

°F	100	105	110	115	120**	125	130	135	140**	145	150	155	160	165	170	175
°C	38	40	43	45	50**	52	55	57	60**	63	65	68	70	75	77	80

High Temperature mode***

°F	110	115	120**	125	130	135	140**	145	150	155	160	165	170	175	180	185
°C	43	45	50**	52	55	57	60**	63	65	68	70	75	77	80	82	85

Factory setting (Default): 120 °F

**To increase the set temperature from 120 °F to 125 °F and from 140 °F to 145 °F:

Simultaneously press and hold the "HOT" and "INFO" buttons on the remote controller for at least 3 seconds. The controller shows the 125 °F or 145 °F on its display. The display will blink for 10 seconds, then the setting will take effect. Repeat to increase the temperature again.

***To change the temperature mode:

- 1.) Press the ON / OFF button on the remote controller to turn its power off.
- 2.) Press the "INFO" button on the remote controller for at least 3 seconds. The controller will show "HI" (High Temperature mode) or "Lo" (Default mode) on its display.

The temperature table for models 510U (T-D2U), 510C (T-D3U-CV), and 540 (T-H3) is shown on page 14.

The default settings of DIP switches of the multi-unit controller (TM-MC02)

	No.	Default	Description	Function
Left bank	1	OFF	Two units priority	OFF: One unit will activate first on demand. / ON: Two units will activate first simultaneously on demand.
	2	OFF	Freeze protection	OFF: Deactivate freeze protection system. / ON: Activate freeze protection system. (See p. 12.)
	3	OFF	Recirculation pump control	Refer to p. 9 for more details.
	4	OFF	Temperature settings	OFF: For 510U (T-D2U), 510C (T-D3U-CV), and 540 (T-H3) models. ON: For 710 (T-M32) and 910 (T-M50) models.
	5	OFF	N/A	
	6	OFF	N/A	
Right bank	1	OFF	Pump alarm	OFF: Deactivate pump alarm system. / ON: Activate pump alarm system. (See p. 15.)
	2	OFF	N/A	
	3	OFF	N/A	
	4	OFF	N/A	
	5	OFF	N/A	
	6	OFF	N/A	

Connecting and Starting the Multi-Unit System

1. Do not power on the Multi-Unit Controller (TM-MC02) or any of the heaters until instructed to.
2. Connect the remote, 9008172005, to the TM-MC02 as instructed on p. 6.
3. Using the linking wire supplied with the heater, connect one end to the first heater's connector shown on pages 7 and 8. Connect the other end to the Multi Communication Terminal located at the bottom of the control board. Start from the right as shown in the figures on pages 7 and 8.
4. Refer to the figures on pages 7 and 8 and connect the linking wires as shown.
5. Follow step 4 for each heater. The fifth water heater (or fourth 910/T-M50) will not use ports 2 or 4. The next five water heaters (or four 910/T-M50s) use the next set of Multi Communication Terminals on the TM-MC02. Repeat steps 3, 4, and 5 until all heaters are linked.
6. Power on the TM-MC02 only. The remote will display "0000" for 20-25 seconds. Go to the next step after the "0000" has cleared. Make sure the orange Stand By LED on the remote is off. If it is on, push the ON/OFF button on the remote to turn it off.
7. Power on the first heater only. Wait until a unit number LED on the TM-MC02 lights up. (Refer to p.13.) That light corresponds to the assigned heater number. Once the red unit number LED lights up, move on to the next heater and repeat this step until all of the heaters have been powered.
8. Go to the Normal Operation section on p. 14 to activate the system.

INSTALLATION (ADDITIONAL FUNCTIONS)

Pump Control Mode

These pump control modes require the connection between the multi-unit controller and a recirculation pump using a relay. Refer to the pump connections below.

- **Recirculation control**

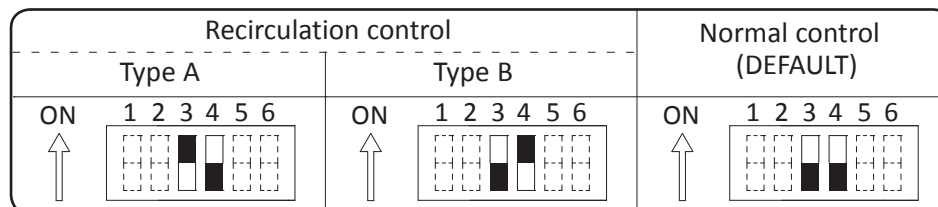
Type A : This type is normal recirculation control. The controller will activate the recirculation pump 20 minutes after the last pump operation. The system will run the pump for a minute and determine if the loop needs to be reheated. If reheat is not necessary, the pump will shut down and the controller will wait another 20 minutes.

Type B : The controller will activate the recirculation pump 10 minutes after the last pump operation. The system will run the same way as the type A except for the interval time. The interval time of the type B is 10 minutes. Although the type B needs more gas than the type A, this mode stabilizes hot water temperature in the recirculation system.

- **Normal control (Default setting)**

This mode provides no special pump control. The pump operation can only be turned ON and OFF by the temperature remote controller.

DIP switch settings for the Pump control mode -Left bank of DIP switches-



- The dark squares indicate the correct position of the DIP switches.
- Turn off the power supply to the appliance before changing the DIP switch settings.

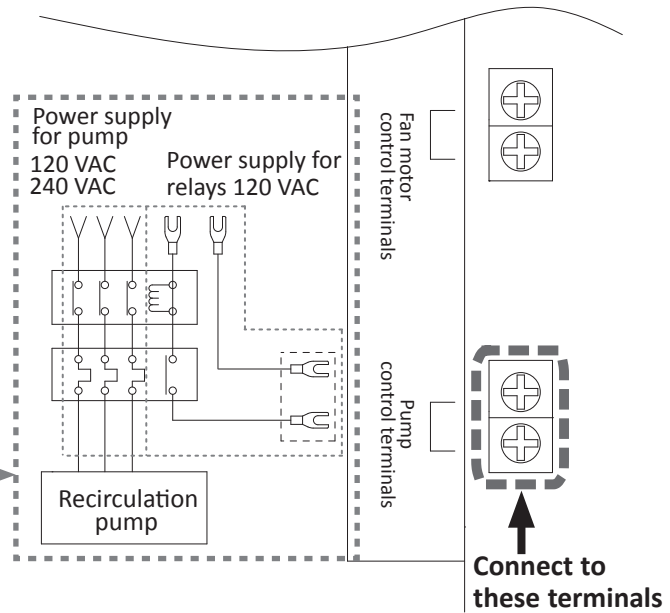
Pump Connections

Use a relay (not provided) to connect a recirculation pump to the controller's pump control terminals. Refer to the diagram on the right.

NOTE: The pump control terminals are normally open switches rated for 120 VAC and 0.5 amp max.

An external power supply and relays are required to operate the pump. Please make sure the relays are properly rated for the pump.

These components are **NOT** included with the multi-unit controller and are external to the unit. They must be acquired separately.



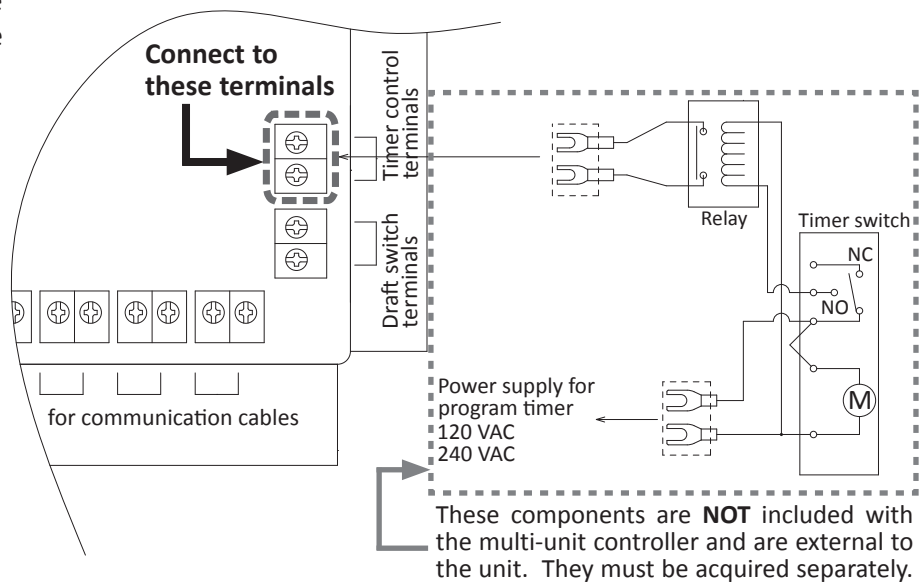
Timer Control Function

The multi-unit controller provides the ON/OFF system control by using an external timer that can set the system's ON/OFF time as needed. In this mode, the system is controlled by the timer and the temperature remote controller.*

When the timer control terminal on the multi-unit controller computer board receives the ON-signal from the timer switch, the multi-unit controller will be turned ON and the temperature remote controller will display that the system is working by illuminating the orange "Stand By" LED on the temperature remote controller. (Refer to p. 14.) When the timer control terminal receives the OFF-signal from the timer switch, the temperature remote controller turns OFF and the water heaters stop operation. The orange "Stand By" LED on the temperature remote controller will be turned off.

For example:

The timer is set ON at 8:00 am and OFF at 5:00 pm. The multi-unit system will be operational from 8:00 am till 5:00 pm. The multi-unit system will not be operational from 5:00 pm till 8:00 am.



Timer control terminals are normally open and rated for 15 VDC, 8 milliamp max.

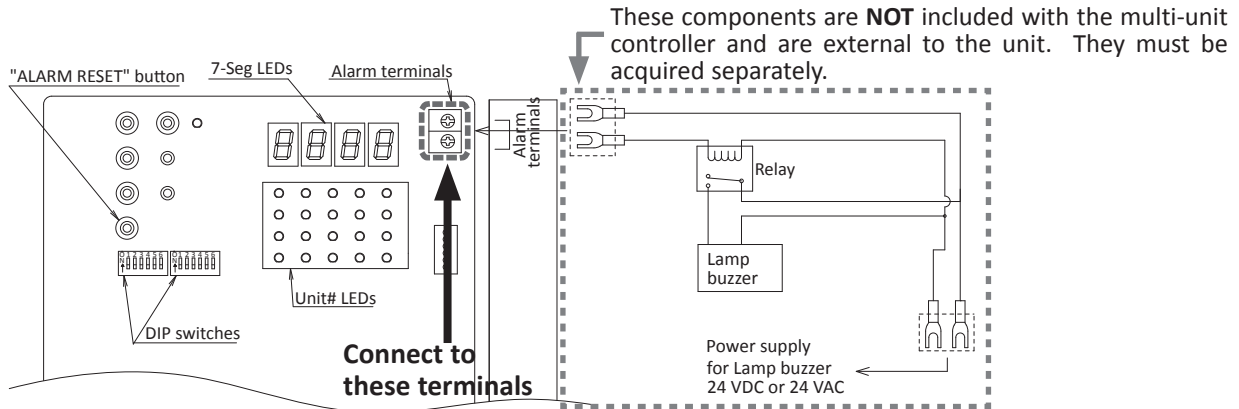
*If the freeze protection system is set to on, the system functions even when the Multi-Unit System installed with an external timer is in the OFF mode. Please refer to the Freeze Protection System (p. 12) for details.

Alarm Function

The alarm terminals allow for an external alarm device, such as a lamp or buzzer, to be activated when an error code appears. The external alarm can be connected to the alarm terminal using a relay as shown below. The alarm terminals are a normally open switch, rated for 24 volts (AC/DC) with maximum 1 amp.

How to reset the alarm function

- Turn off the temperature remote controller.
- Press the **"ALARM RESET"** button on the multi-unit controller.

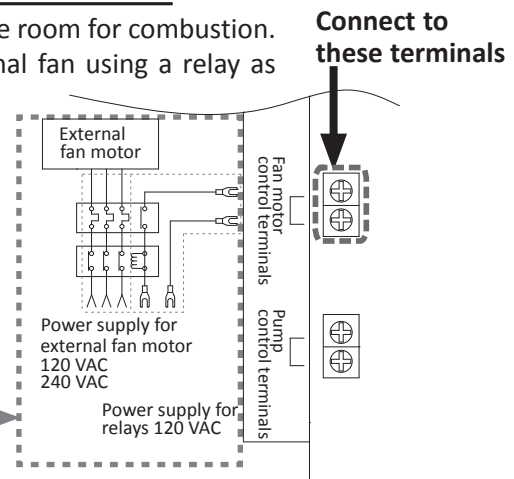


External Fan Motor Function

The external fan is needed when there is not enough air in the room for combustion. The fan motor terminals can be used to interlock an external fan using a relay as shown.

- The multi-unit controller will turn on the external fan when a water heater flow sensor detects sufficient flow to activate a heater.
- The multi-unit controller will deactivate the external fan when the water heater post purge process is complete or when the temperature remote controller is turned off.

These components are **NOT** included with the multi-unit controller and are external to the unit. They must be acquired separately.



Fan motor control terminals are normally open and rated for 120 VAC, 0.5 amp max.

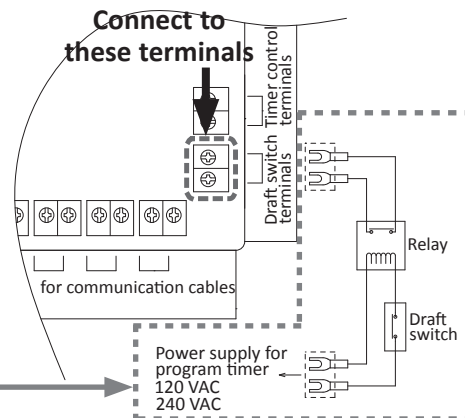
Draft switch (Optional function)

This optional function is also recommended in order to check the external fan motor to ensure that it works correctly.

The draft switch can check the condition of the external fan motor. When the external fan motor has failed, the "681" error code will appear.

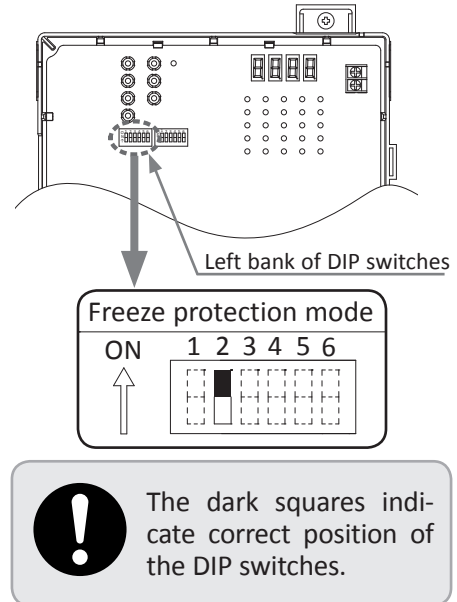
Draft switch terminals are normally open and rated for 15 VDC, 8 milliamp max.

These components are **NOT** included with the multi-unit controller and are external to the unit. They must be acquired separately.



Freeze Protection System

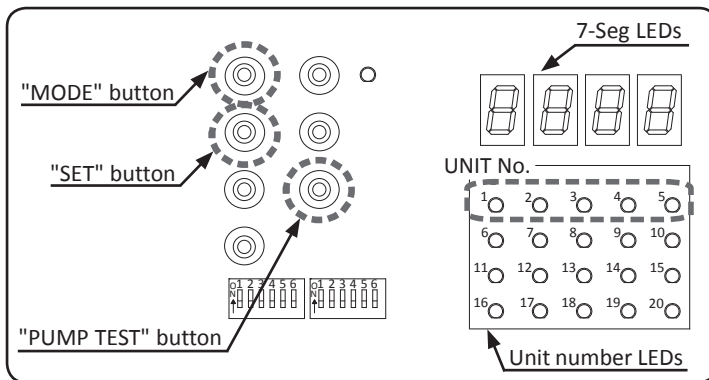
- The multi-unit controller has the freeze protection function for recirculation. When the computer board detects signs that the recirculation system may freeze from the information of each unit, it will automatically activate the recirculation pump to fire the water heaters and circulate hot water through the system. In order for this System to work, the recirculation pump must be wired to the multi-unit controller as described in the "Pump Control Mode" section on pages 9 and 10.
- This freeze protection system can protect units from freezing in temperatures as low as 5 °F (-15 °C). Each water heater also has its own freeze protection system.
- The Left Bank No.2 DIP switch controls the freeze protection system. The default setting for this feature is disabled (OFF position). Enable the freeze protection system by switching the Left Bank No.2 DIP switch to the ON position. Activate it if the unit is installed in a cold climate.
- DO NOT adjust the right bank of DIP switches.



Checking of Whole Installation

1. When water heaters and the multi-unit controller are installed properly, the "Unit number LED" on the computer board of the multi-unit controller will indicate the number of water heaters installed.

Example: If five water heaters are installed with the multi-unit controller.



- "The unit number LED" on the computer board of the multi-unit controller will indicate 1 to 5.

2. When the multi-unit controller is connected with a recirculation pump, press the "PUMP TEST" button on the computer board. If the pump does not operate, the connection between the multi-unit controller and the pump is incorrect or the computer board of the multi-unit controller has failed.

How to Reset and Assign the Numbering System

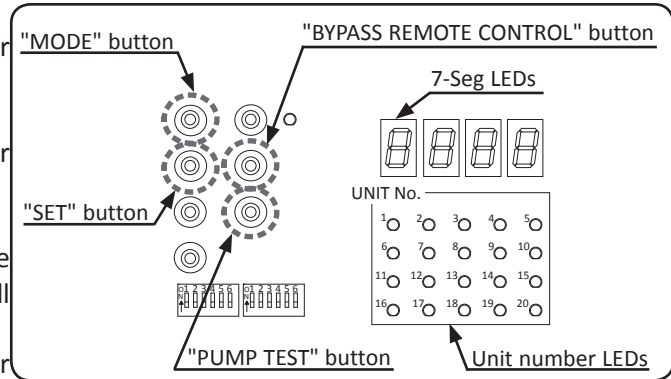
The numbering system of a multi-unit controller will automatically allocate a unit number to each water heater in the Multi-Unit System during initial system start up. The unit number will display on the water heater computer board (or temperature controller for the 510C (T-D3U-CV) and 540 (T-H3) unit) when power is turned on to the water heater. You can also determine the assigned unit number by pushing the specified button on the water heater computer board. Refer to the pictures at the bottom of page 13 for the location of this button.

Clear the unit number

The unit number from the numbering system of the multi-unit controller is assigned to each unit randomly, so they will not necessarily be in order from left to right.

The procedures on how to reset the unit number and to set it manually are on the next page.

1. Take off the front covers of the multi-unit controller and the water heaters.
2. Make sure the orange "Stand By" LED on the temperature remote controller is off. If it is on, press the on/off button to turn it off.
3. Press the "MODE" button on the computer board of the multi-unit controller.
4. 7-Seg LED will display "_0_".
5. Press the "SET" button on the computer board.
6. 7-Seg LED will display "_0_1".
7. Press the "MODE" button 9 times on the computer board. (Then the "7-Seg LED" will display "_010".)
8. Press the "SET" button on the computer board.
9. 7-Seg LED will display "FFFF".
10. Press the "BYPASS REMOTE CONTROL" button and the "PUMP TEST" button at the same time. While pressing both buttons, the "7-Seg LED" will display "_CLr". When you release the buttons, "Unit No" LED's of the multi-unit controller will turn off. Wait until the 7-Seg LED displays "0- 0".



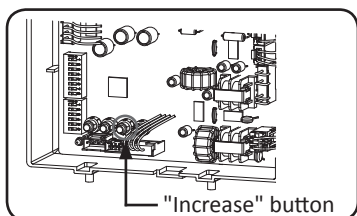
Multi-unit controller

Set the unit number for water heaters

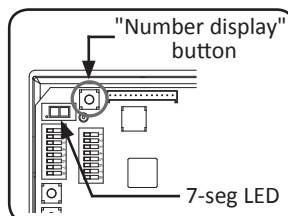
11. Disconnect all communication cables between the heaters and multi-unit controller.
12. Connect the communication cable between the water heater you want to assign unit number 1 and the next water heater you want to assign unit number 2. Repeat this from number 2 to number 3 and so on.
13. Press the "BYPASS REMOTE CONTROL" button on the computer board of the multi-unit controller while the 7-Seg LED displays "0- 0".
14. Select and set the unit number of the heater.
 - 510U (T-D2U), 510C (T-D3U-CV), and 540 (T-H3) models:
Press the "Increase" button on the water heater's computer board till the desired unit number LED on the multi-unit controller lights up.
 - 710 (T-M32) and 910 (T-M50) models:
Press the "Number display" button on the water heater's computer board till the desired unit number LED on the multi-unit controller lights up.
15. Move to the next heater and repeat step 14 until all the heaters have been assigned a unit number.
16. Press the "Alarm Reset" button once all of the unit numbers have been assigned.

Verify the unit number of each water heater

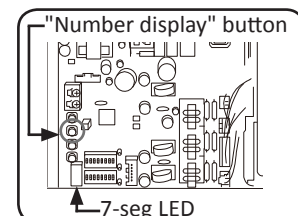
- 510U (T-D2U), 510C (T-D3U-CV), and 540 (T-H3) models:
The 510U Indoor / Outdoor (T-D2U-IN/OS), and 540 Outdoor (T-H3-OS) models need the remote controller to indicate each unit number. The 510C (T-D3U-CV) and 540 Indoor (T-H3-DV) can indicate the unit number on its display on the front cover.
Press the "Increase" button on the computer board of the water heater and then the unit number will be displayed on the remote controller or temperature controller.
- 710 (T-M32) and 910 (T-M50) models:
Press the "Number display" button on the computer board of the water heater and then the 7-Seg LED on the computer board on the unit will display the unit number.



Computer board of 510U (T-D2U), 510C (T-D3U-CV), and 540 (T-H3) models



Computer board of 710 (T-M32)



Computer board of 910 (T-M50)

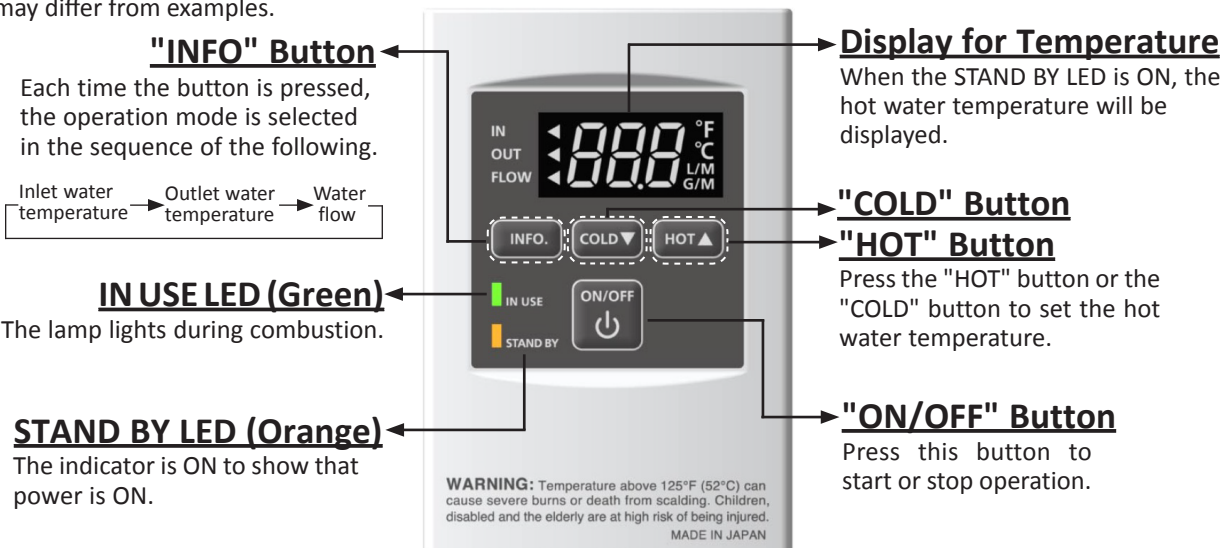
NORMAL OPERATION

1. Turn on the 120 VAC power supply to the water heaters and the multi-unit controller.
2. Press the "ON/OFF" button on the temperature remote controller in the multi-unit controller to turn the system on. This will power both the water heaters and the multi-unit controller.
3. When ON, the STAND BY LED of the temperature remote controller is lit.
4. Open a hot water tap.
5. Mix cold and hot water to get the optimum temperature water.
6. Close the hot water tap.



- The temperature controller on the front panel of the 510C (T-D3U-CV) and 540 Indoor (T-H3-DV) will not control the water heater in the multi-unit system.
- Refer to the normal operation section in the installation manual of your water heater for details.

The illustration below shows an example of the display on the temperature remote controller. The actual display may differ from examples.



The 510U (T-D2U), 510C (T-D3U-CV), and 540 (T-H3) Temperature Table

°F	100	105	110	115	120*	125	130	135	140*	145	150	155	160	165	175	185
°C	38	40	43	45	50*	52	55	57	60*	63	65	68	70	75	80	85

Factory setting (Default): 120 °F

*To increase the set temperature from 120 °F to 125 °F and from 140 °F to 145 °F:

Simultaneously press and hold the "HOT" and "INFO" buttons for at least 3 seconds. The controller shows the 125 °F or 145 °F on its display. The display will blink for 10 seconds, then the setting will take effect. Repeat to increase the temperature again.



- DO NOT set to 185 °F (85 °C) if you use your water heater in a recirculation system. This will cause damage to the heater and void the warranty.
- Temperature above 125 °F (52 °C) can cause severe burns or death from scalding. Children, disabled and the elderly are at high risk of being injured.

The temperature table for models 710 (T-M32) and 910 (T-M50) is shown on page 8.

Unit conversion

The remote controller has a function that can change units of temperature and flow rate from °F to °C and from gallon per minute to liter per minute and vice versa, please follow the procedures below:

1. Press the "ON/OFF" button on the controller in order to turn the controller on.
2. When ON, the orange LED is lit.
3. The previous set temperature will be displayed on the screen.
4. Press the "INFO" buttons for at least 3 seconds.
5. The set temperature should now be displayed in the alternate unit of measurement.

TROUBLESHOOTING - Error Code

- The multi-unit controller and water heaters have a self-diagnostic function for safety and convenience when troubleshooting.
- If there is a problem with the installation, the unit will display a numerical error code on the temperature remote controller. The unit number LED of the multi-unit controller will light up to show the source of the problem.
- Consult the following chart for the description of each error code.

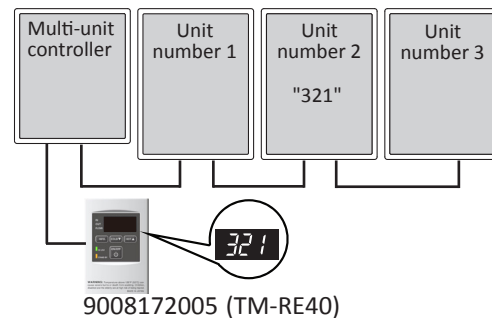
Example: Water heater number 2 has the "321" error code

- **Multi-unit controller:** When the unit has this error code, the #2 unit number LED will flash to inform which water heater is under an abnormal condition.
- **Temperature remote controller:** "321" and "2" will intermittently flash on the display. It shows that unit number 2 has the error.
- **Water heater:** "321" will intermittently flash on the display. The green LED on the computer board will blink two times, repetitively.

The following list of error codes will display on the temperature remote control when the multi-unit controller or a water heater goes into error. Refer to the water heater installation manual or the maintenance sheet on the inside cover of the heater for a complete list of error codes specific to the water heater model.



Refer to the error codes in your water heater installation manual for details.



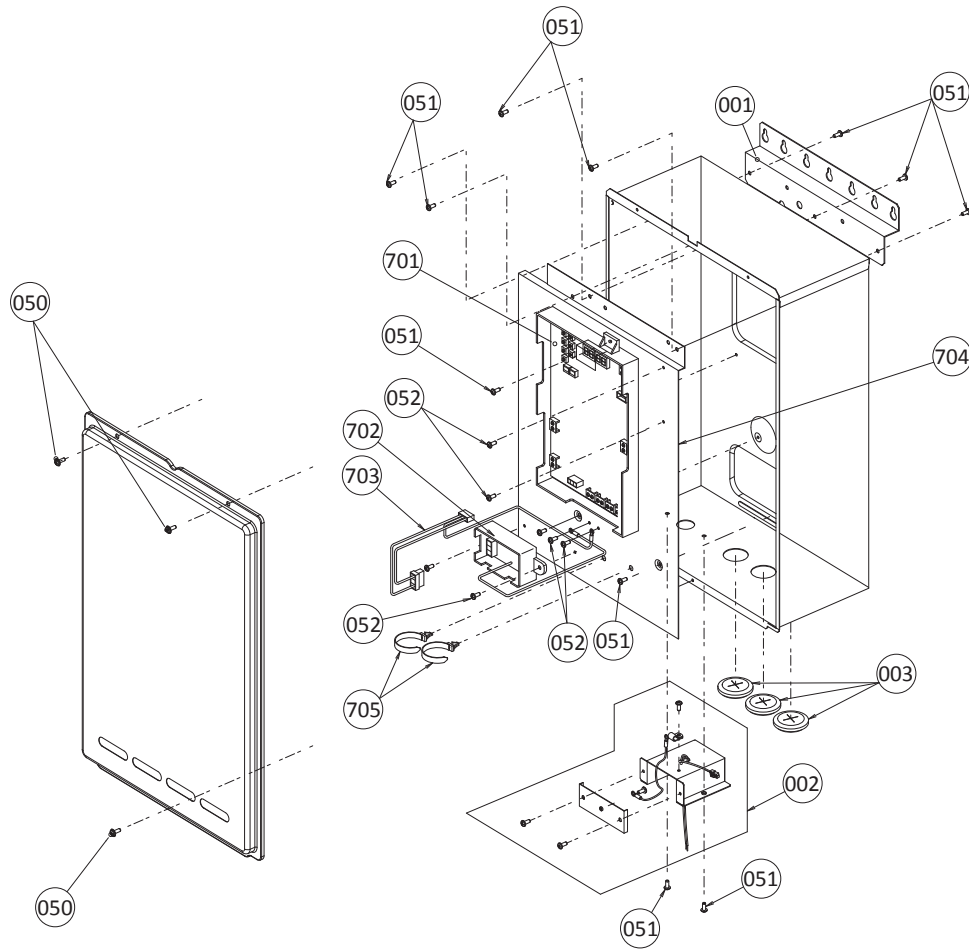
Error code	Malfunction description	Error code	Malfunction description	Error code	Malfunction description
031 MC	Incorrect DIP switch setting	391 WH	Air-fuel ratio rod failure	681 MC	Abnormal external fan motor
101 WH	Warning for the "991" error code	441 MC	Flow sensor failure	701 WH	Computer board fault
111 WH	Ignition failure	510 WH	Abnormal main gas valve	721 WH	False flame detection
121 WH	Loss of flame	551 WH	Abnormal gas solenoid valve	741 MC	Miscommunication between multi-unit controller and temperature remote controller
311 WH	Outlet thermistor failure or heat exchanger thermistor failure	611 WH	Fan motor fault	751 WH	Miscommunication between multi-unit controller and temperature controller
321 WH	Inlet thermistor failure	631 MC	Abnormal external pump	761 MC	Miscommunication in multi-unit system
331 WH	Outlet thermistor failure	651 WH	Flow adjustment valve fault	991 WH	Imperfect combustion
341 WH	Exhaust thermistor failure	661 WH	Bypass valve fault		

*The **MC** and **WH** in the table above mean the multi-unit controller and water heater, respectively.

The following are diagnostic of error codes caused by the multi-unit controller.

- **031:** Check the DIP switch setting on the computer board of water heaters.
- **441:** Check the flow sensor. Check the filter. Check the water supply for water heaters.
- **631:** Check the recirculation pump. Change the No. 1 DIP switch (right bank) to the "ON" position to activate the external pump alarm function. (Refer to p. 8.)
- **681:** Check the external fan motor.
- **741:** Check the communication cable between the multi-unit controller and the temperature remote controller.
- **761:** Check the communication cable between the multi-unit controller and water heater.

COMPONENTS DIAGRAM & PARTS LIST



Item number	Description	Part number	
		9008300005 model	TM-MC02 model
001	Bracket	319143-184	EKJ09
002	Junction box	N/A	EM430
003	Rubber bushing	319143-334	EX00B
050	Screw M4×12 (W/Washer)	319143-025	EW000
051	Screw M4×10 (Coated)	319143-026	EW002
052	Screw M4x10	319143-060	EW003
701	Computer board	320273-550	EK232
702	Surge box	320273-128	EK280
703	120 VAC wire	320273-551	EK235
704	PCB fixing plate	320273-552	EK238
705	Cable strap	N/A	EW022