

INSTALLATION / INSTRUCTION MANUAL

Read prior to installing/operating device. Keep this manual for future reference.

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1. Supplied Parts

RMF-CA100-V1 Thermostat Interface (1)
RMF-CA100 Manual (1)

2. Safety Precautions

WARNING - INCORRECT HANDLING CAN RESULT IN ELECTRICAL INJURY, DEVICE MALFUNCTION AND DAMAGE

THOROUGHLY READ THE FOLLOWING SAFETY PRECAUTIONS BEFORE EACH USE OF THIS PRODUCT (THE “DEVICE”).

- **Do not expose the device to, or immerse the device in, water.** Doing so could lead to electrical shock to a person, device malfunction or device damage.
- Do not install the device in a bathroom, kitchen, or any room where steam could form. Condensation could develop on or around the device and cause electrical shock to a person, device malfunction and device damage.
- Do not install the device in a location where a gas leak could occur.
- Do not expose the device to heat or radiation, including direct sunlight, or install the device in a location where the temperature could be greater than 40°C (104°F) or less than 0°C (32°F). Doing any of these things could result in device deformation or device malfunction.
- Always ensure the device is installed in an area without exposure to high frequency noise.
- Power generators, inverters, and high-frequency or radio communication equipment may interfere with the operation of this device.
- All electrical work should be performed by a qualified technician and in accordance with applicable laws and the instructions outlined in this manual.
- Use standard wiring with the proper current capacity to avoid current leak, excessive heat, and fire.
- Use only specified cables and wiring; securely connect each so that the terminals do not bear any weight.
- Include slack in the power supply wiring. Tension in the wiring may cause it to excessively heat up and break, which could result in a fire.
- Improperly connected or short-circuited cables or wiring may produce heat and cause device malfunction, device damage, and fire.
- Capacity shortage to the power supply circuit or improper installation may result in electrical shock or fire.
- Do not modify or alter this device or cable in any manner whatsoever.

3. Installation

Thermostat may be configured for use with a conventional system. For mode settings please refer to WWW.MITSUBISHITECHINFO.CA website M & P Series Indoor Unit Function Mode Setting chart in Application / Misc section

- Make all connections with **18 AWG** thermostat wire.
- Wire connection terminals support 20-30VAC.
- High/medium/low fan signals (**G1, G2, G3**) are optional, and may not be available on all thermostat models.
- **Auxiliary heat control is not controlled by the RMF-CA100. Auxiliary heat control remains with Mitsubishi CN24 connector on compatible indoor units.**

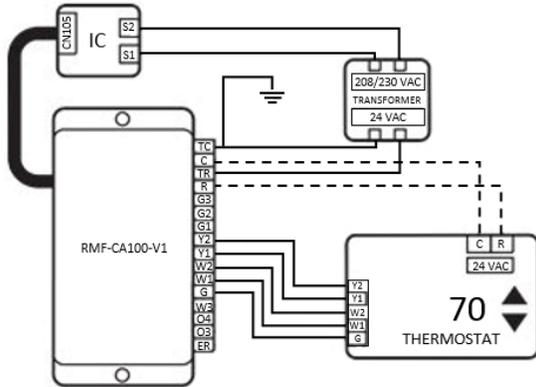
MODE SELECTION

1. Select 1 or 2 stage thermostat operation using dipswitch 1-1:

OFF position (default)	In the OFF position RMF-CA100 configures for 2 stage heating and cooling thermostats (Y1, Y2 & W1, W2)
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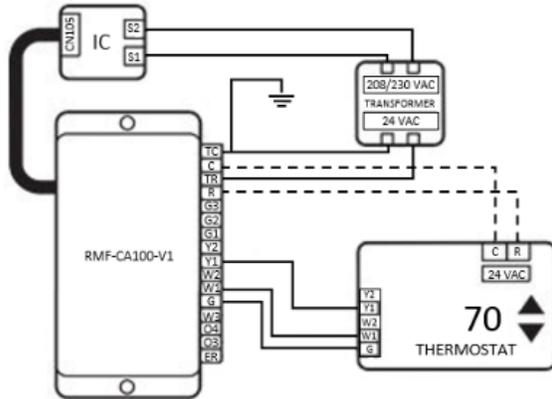
ON position	In ON position product is configured for use with single stage heating / cooling thermostats (Y1, W1)
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Example 1: Two-Stage Cooling and Heating - Dipswitch 1-1 set to OFF position (default position) RMF-CA100 operates in dual stage heat / cool mode using thermostat signals W1, W2, Y1, Y2, and fan signal (G). G1, G2 and G3 are available but not required.



RMF-CA100 Connector Pin Layout		
Pin	Signal	Description
1	TC	Common (In) Transformer
2	C	Common (Out) To Thermostat
3	TR	24 VAC Transformer
4	R	24 VAC to Thermostat
5	G3	High Fan
6	G2	Medium Fan
7	G1	Low Fan
8	Y2	Stage 2 Cooling
9	Y1	Stage 1 Cooling
10	W2	Stage 2 Heat
11	W1	Stage 1 Heat
12	G	Fan
13	W3	NOT SUPPORTED
14	O4	
15	O3	
16	ER	Error Output (Out)

Example 2: Single-Stage Operation- Dipswitch 1-1 set to ON position If Y2 or W2 is left unconnected or is unavailable from the thermostat set SW1-1 to the ON position. This configures single stage operation of RMF-CA100 simulating multiple stage operation using temperature differential based on W1 / Y1 call and run time.



DIPSWITCH BANK 1

#	Input	Description (Default OFF position)
1	SW1-1	If ON enable single stage heat / cool operation, default OFF (dual stage W1, W2 & Y1, Y2) operation
2	SW1-2	Unused N/A
3	SW1-3	Assuming the system is not in TEST MODE the fan speed is defined by SW1-3 and SW1-4 in stage 1 heat mode when G1, G2 and G3 are inactive:
4	SW1-4	LOW: SW1-3 is OFF , SW1-4 is OFF (default) MEDIUM: SW1-3 is OFF , SW1-4 is ON HIGH: SW1-3 is ON , SW1-4 is OFF QUIET: SW1-3 is ON , SW1-4 is ON
5	SW1-5	Simulated 2 nd stage heat / cool mode during single stage operation is defined by continuous Y1 / W1 call time: a) 20 Minute continuous call: SW1-5 OFF , SW1-6 OFF (DEFAULT) b) 10 Minute continuous call: SW1-5 OFF , SW1-6 ON c) 15 Minute continuous call: SW1-5 ON , SW1-6 OFF d) 25 Minute continuous call: SW1-5 ON , SW1-6 ON
6	SW1-6	

DIPSWITCH BANK 2 NOT USED

4. System Configuration

Mode	RMF-CA100
Mode 1 (auto recovery after power failure)	Recommend to enable; default disabled
Mode 2 (room temperature detection location)	Unused (room temperature detected by the connected thermostat)
Mode 24 (heat offset for height)	Unused

1. Choose a place where to install the RMF-CA100. The device provides two mounting holes to mechanically affix the case to a solid surface. Double-sided tape may be used to affix the device. When using tape, ensure that the tape is approved for use within the anticipated operating temperature ranges.
2. Install the transformer, as necessary, per building code and manufacturer's installation instructions.
3. Connect the RMF-CA100 cable to the connector CN105 on the indoor unit control board.
4. Connect RMF-CA100 terminals using 18 AWG wire.

Device Configuration

Initial settings can be configured via the dipswitches on the circuit board, SW1 and SW2 (not used). The circuit board can be accessed by unfastening the four screws on the back of the case.

Additional request codes not addressed by the thermostat interface may be configured by temporarily connecting an MA remote controller.

Grouping

The connection of more than one RMF-CA100 to a single thermostat is not supported.

Temperature Sensing

The RMF-CA100 relies upon both the dry-contact thermostat and the indoor unit's thermistors in order to monitor room temperature. The thermostat senses room temperature and establishes set temp. The Mitsubishi Electric indoor unit's return air thermistor is used for cooling and heating calculation.

5. Operator Instructions

Operate the third-party thermostat per the manufacturer's instructions. During normal operation, the connection of Mitsubishi remote controllers (e.g. MA/ME) is not supported, as they will interfere with the correct operation of the RMF-CA100.

Notes:

1. The indoor unit will limit the internal temperature control set point based on the indoor unit specification.
2. Fan signals **G1, G2, G3**, when energized, take precedence over **SW1-3&4**.
3. Only fan speeds available on the IDU can be set by the Thermostat Interface.
4. The G signal is used only for operating the IDU in ventilation mode when all cooling and heating signals are disabled.
5. When all cooling and signals are disabled, energizing G will place the IDU into ventilation mode.

Display

The RMF-CA100 has 2-line/16-character LCD display and 4 buttons to navigate the menus. There are four buttons on the RMF-CA100: UP, DOWN, OK & MENU

Using these buttons will allow navigating through menus and system configuration.

Operator Instructions: Menu Screen

Default Screen: The following operator instructions involve the use of the LCD screen and tactile buttons.

Main Screen:

This screen will display the current **OPERATION MODE** and the current **FAN SPEED**.

The default screen will display the **MODE** on line 1 and will display the **FAN** speed on line 2.

Screen example:

MODE:	HEAT
FAN:	HIGH

Mode display is dependent on the current state of operation (defined in MENU section below).

1. If the state of operation is stage 1 heating or stage 2 heating, the **MODE** will display **HEAT**.
2. If the state of operation is stage 1 cooling or stage 2 cooling, the **MODE** will display **COOL**.
3. If the state of operation is Input Error state, the LCD will display **MODE: INPUT-ERR**.

4. If the state of operation is No Call state:
 - a. If 1 hour has not elapsed since exit heat mode (thermal off), the MODE display **HTG HOLD** (heating hold).
 - b. If **G1** thermo input is **ON**, the LCD display reads **MODE: FAN G1 FAN: LOW**
 - c. If **G2** thermo input is **ON**, the LCD display reads **MODE: FAN G2 FAN: MED**
 - d. If **G3** thermo input is **ON**, the LCD display reads **MODE: FAN G3 FAN: HIGH**
 - e. If **G** thermo input is **ON**, and if **G1 G2 & G3** are **OFF**, the LCD display reads **MODE: FAN G FAN: LOW**
 - i. **G fan speed is a mode item and can be changed using the MENU – FAN SPEED submenu**
 - f. If **G1, G2, G3**, and **G** thermo inputs are off, the LCD display reads **MODE: NO CALL FAN: OFF**.
5. If the system is operating in test mode the mode displays **HEAT TEST** or **COOL TEST** depending on selecting operating mode.

Mode Options: Menu Screen

The menu screen displays the different menu options that are available. The menu screen is accessed by pressing the MENU button. To return to the default screen, press the MENU button again. The menu screen will display different configuration options:

- ERROR HISTORY
- MODE SETTINGS
 - o MODE OPTIONS
 - o FAN SPEED
- TEST SETTINGS
 - o NO TEST
 - o HEAT TEST
 - o COOL TEST
- TIME SETTINGS
 - o SET DATE
 - o SET TIME
- THERMO INPUT
- FW VERSION

Sub menu options are accessed using the **UP/DOWN** buttons then pressing **OK** once the submenu is selected. To return to the main menu screen, press the MENU button again.

Screen Example:



Operator Instructions: Screens – Error History Screen

The error history screen displays the saved error codes (latest errors displayed first). This screen displays up to 10 errors before overwriting. **UP/DOWN** button is used to navigate between saved errors. Each screen displays the error page (one of 10), the error code, and the time/date

Screen example:



Operator Instructions: Screens – Mode Setting Screen

The mode setting screen is accessed by navigating to the **MODE SETTINGS** menu after pressing the menu button. This allows the operator to configure **MODE** settings.

The **MODE SETTINGS** screen will display all 28 configuration modes and G-fan speed submenu.

To the right of each mode, the mode value is displayed. This will either be 1, 2, or 3. If the mode is unavailable to this unit, the mode will not be displayed.

Example – mode 3 is available, mode 4 is not. Mode 3 currently is set to 1, Mode 4 is unavailable and Mode 5 is set to 3.



Pressing the **OK** button will select a mode to modify. Upon pressing the OK button, the **MODE SETTING** will be selected. Pressing **UP/DOWN** will navigate between mode options 1, 2, or 3. Pressing **OK** will save the selection, and return back to navigating **MODE SETTINGS**. Pressing the **MENU** button will cancel the mode selection and return to navigating the **MODE SETTINGS** screen.

To exit the **MODE SETTINGS** screen, press the **MENU** button.

A confirmation screen will appear to save setting. The operator can select **Y** or **N** via the **UP/DOWN/OK** button.



Operator Instructions: Screens – Test Settings

There are three menu options available in the **TEST SETTINGS** mode. While in **TEST SETTING** mode, pressing **MENU** button returns system to normal operation. After 1 hour in **HEAT TEST** or **COOL TEST** mode the system automatically exits test mode and returns to default screen and returns to normal operation. **THIS SETTING IS COMPLETELY UNIQUE TO RMF-CA100 AND SEPARATE FROM DIAGNOSTIC EQUIPMENT TEST MODES**

NO TEST: Selecting **NO TEST** returns to default screen.

HEAT TEST: Firmware ignores thermostat inputs and commands HVAC to enter **HEAT OPERATION MODE** with **FAN SPEED** set to **HIGH**, **SET TEMP** to 27°C

COOL TEST: Firmware ignores thermostat inputs and commands HVAC to enter **COOL OPERATION MODE** with **FAN SPEED** set to **HIGH**, **SET TEMP** to 16°C

Screens – Time Screen

The time screen is accessed by navigating to the **TIME MODE** submenu from the main menu. The time screen is used to set the Date and Time.

The TIME MODE will display two options:

- SET DATE
- SET TIME



The **UP/DOWN** buttons will navigate between up the two modes. Pressing the **OK** button will select a mode to modify.

For the SET DATE mode, the following submenus are displayed:

- YEAR: Year range from 2018 to 2050.
- MONTH: Ranges from 0 to 12.
- DAY : Ranges from 1 to 30 or 31 depending on the month.

For the SET TIME MODE, the following submenus are displayed:

- HOUR: Ranges from 1 to 12, or 0 to 23.
- MINUTE: Range from 0 to 59.

For each submenu, the **UP/DOWN** buttons are used to navigate between settings, the **OK** button is used to select the setting, and the **MENU** button is used to exit.

A confirmation screen will appear to save setting. The operator can select **Y** or **N** via the UP/DOWN/OK button.



Selecting **N**, discards the changes.

Selecting **Y**, saves the settings, then sends the operation commands out to the HVAC unit.

Operator Instructions: Screens – Thermo Input

THERMO INPUT screen displays state of six thermostat inputs: **W1, W2, Y1, Y2, G, G1, G2, G3**. This option is designed to assist in troubleshooting and confirming signals are being received by the RMF-CA100 interface.

0 = No signal received. 1 = Receiving signal. The following is an example of the Thermo Input screen when all the inputs are inactive:



MULTI-POSITION AIRHANDLING UNIT KEY MODE SETTING / FUNCTION TABLE					
Mode	Settings	Mode (Function) #	Setting #	Initial Setting	Check
Power Failure Auto Restart	Disabled	01	1	1	
	Enable		2		
Indoor Temperature Detecting	Indoor Unit Operating Average	02	1	1	
	Set By Indoor Unit's remote Controller		2		
	Remote Controller's Internal Sensor		3		
LOSSNAY Connectivity	Not Supported	03	1	1	
	Supported (indoor unit is not equipped with outdoor air intake)		2		
	Supported (indoor unit is equipped with outdoor air intake)		3		
Power Voltage	240V (230V)	04	1	1	
	220V (208V)		2		
Filter Sign	100 Hr.	07	1	1	
	2500 H2.		2		
	"No filter sign indicator"		3		
Humidifer Control	Heat operation & Thermo On	16	1	1	
	Heat Operation		2		
Heater Control	Heater Not Present	11	1	1	
	Aux Heater Present		2		
Heater Control During Defrost and Error	Disable Heeater During Defrost and Error	23	1	1	
	Enable Heeater During Defrost and Error		2		

The air handler is equipped with an adjustable static pressure setting. The available settings are shown in the table below.

Model	Available ESP [in. WG]		
	0.30	0.50	0.80
PVA-A12	0.30	0.50	0.80
PVA-A18	0.30	0.50	0.80
PVA-A24	0.30	0.50	0.80
PVA-A30	0.30	0.50	0.80
PVA-A36	0.30	0.50	0.80
PVA-A42	0.30	0.50	0.80*

*PVA-A42 in Downflow External Static pressure: 0.70

The air handler will be set to 0.50 ESP from the factory.

Vertical, Horizontal Left, Horizontal Right External Static Pressure Setting

External Static Pressure	Setting No. of Mode/Function 08/108	Setting No. of Mode/Function 10/110 (Factory Setting)
0.3 in. WG [75Pa]	1	1
0.5 in. WG [125Pa] (Factory Setting)	2	1
0.8 in. WG [200Pa]	3	1

Downflow External Static Pressure Setting

External Static Pressure	Setting No. of Mode/Function 08/108	Setting No. of Mode/Function 10/110
0.3 in. WG [75Pa]	1	2
0.5 in. WG [125Pa] (Factory Setting)	2	2
0.8 in. WG [200Pa]*	3	2

*PVA-A42 in Downflow External Static pressure: 0.70