

# MANUFACTURED FOR: MITSUBISHI ELECTRIC US, INC.

Thermostat Interface

## PAC-US444CN-1

INSTALLATION/INSTRUCTION MANUAL

FOR INSTALLER

Before using the device, carefully read this installation/instruction manual to ensure proper operation.

Keep this manual for future reference and give it to the technician when the device is reinstalled or repaired.

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### 1. Confirming the Supplied Parts

Check that the box includes the following part(s) in addition to this installation manual:

*PAC-US444CN-1 Thermostat Interface (1)*

### 2. Safety Precautions

- Thoroughly read the following safety precautions before use.
- Hazards that can occur from incorrect handling are classified by the symbols below:

 Warning	Incorrect handling can result in death, serious injury, etc.
 Caution	Incorrect handling can result in bodily injury and/or structure damage.

- After reading this manual, keep this manual for future reference. When the device is reinstalled or repaired, give this manual to those who provide these services. When the user changes, make sure that the new user receives this manual.

#### Warning

- **Only a dealer or qualified technician should install, relocate, reinstall, or repair the device.**  
Improper installation or repair may result in electrical shock or fire.
- **Properly install the device on a stable, load-bearing surface.**  
Device installed on an unstable surface may fall and cause injury.

- **Only use the specified cables; securely connect each so that the terminals do not bear any cable weight.**

Improperly connected or short-circuited cables may produce heat and cause a fire.

- **Do not make any modifications or alternations to the device.**

Modifications or improper repair may result in electric shock or fire. Consult your dealer for repair.

- **All electrical work should be performed by an authorized electrician according to local regulations and instructions outlined in this manual.**

Capacity shortage to the power supply circuit or improper installation may result in electrical shock or fire.

- **Properly install the device according to the instructions in this Installation/Instruction Manual.**

Improper installation may result in electric shock or fire.

### **Caution**

- **Do not install the device in a location where a flammable gas leak may occur.**

Gas may leak, collect around the device, ignite, and/or explode.

- **Do not install the device in environments where large amounts of oil (including machine), sulfidizing gas, or acidic, alkaline, chemical sprays are present.**

These types of substances may damage internal parts, cause device performance to be reduced, and cause electrical shock.

- **Do not install the device in a bathroom, kitchen, or any room where steam could form.**

Condensation may develop and cause electrical shock and/or the device to malfunction.

- **Use standard wires with the proper current capacity**

to avoid the possibility of current leak, excessive heat, and/or fire.

- **Do not touch the main circuit board; also, make sure that dust does not accumulate on the circuit board.**

- **When installing the device in a hospital, communication facility, etc., provide sufficient protection against frequency noise.**

Power generators and inverters, high-frequency medical, or radio communication equipment may interfere with the normal operation of this device. Subsequently, the device may also affect medical treatment, image broadcasting, etc., by creating frequency noise.

- **Include some slack in the power supply wires.**

Tension on the wires may cause them to excessively heat up and/or break, resulting in a fire.

- **Do not install the device in a location where there is direct sunlight or where the temperature may become greater than 40°C (104°F) or less than 0°C (32°F).**

If the device is installed in such place, it may result in deformation or malfunctions.

- **Do not immerse the device in water.**

Doing so may lead to electric shock or malfunctions.

### 3. System Configuration

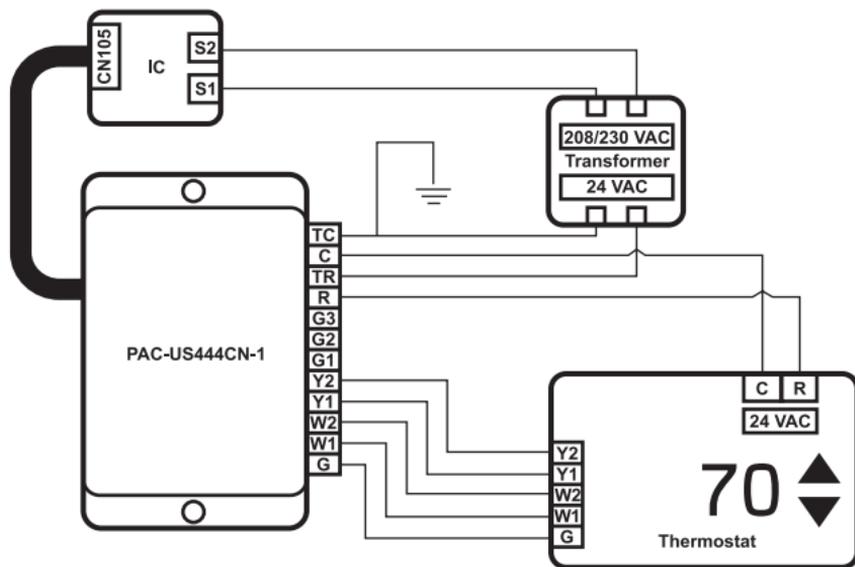
**Warning:** Thermostat should be configured for use with a conventional system (not heat pump).

**Note:** When either Y2 or W2 is left unconnected, it is recommended to set SW2-6 to the OFF position.

1. All wiring shown should be performed with 18 AWG thermostat wire.
2. Terminals on the PAC-US444CN-1 support 20-30VAC.
3. High/medium/low fan signals are optional, and may not be available on all thermostat models.
4. W2 and Y2 signals are optional, and may be omitted for single-stage thermostats.

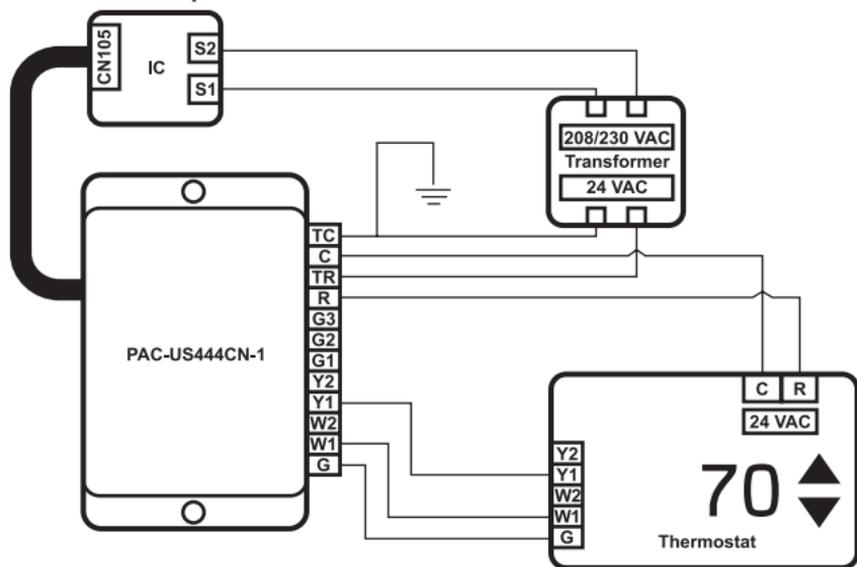
#### *Example 1: Two-stage Cooling and Heating*

**Note:** When both Y2 and W2 are connected, it is recommended to set SW2-6 to the ON position.



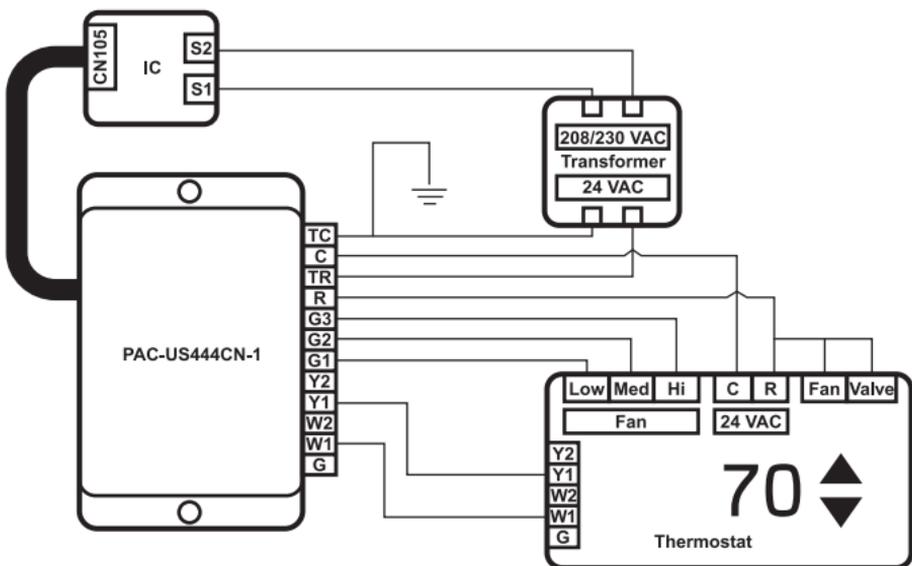
### Example 2: Single-stage Cooling and Heating

Note: When either Y2 or W2 is left unconnected, it is recommended to set SW2-6 to the OFF position.



### Example 3: Single-stage Cooling and Heating with Dedicated Fan Speed Relays

Note: When connecting only first stage signals (Y1/W1), it is recommended to set SW2-6 to the OFF position.



#### **Example 4: Single-stage Cooling with Alternate Primary Heating Source**

**Note: For this configuration, it is recommended to set SW2-6 to the OFF position.**

Follow the wiring from example 2, with the following adjustments:

1. Connect thermostat W1 to the alternate heat source.
2. Connect the thermostat W2 terminal to the PAC-US444CN-1 W1 terminal.

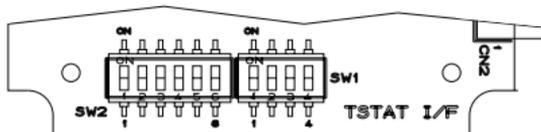
<b>Connector</b>	<b>Purpose</b>	<b>Purpose</b>
TC	Common (In)	C
C	Common (Out)	C
TR	24VAC (In)	R
R	24VAC (Out)	R
G3	Fan High	High Fan Speed
G2	Fan Medium	Medium Fan Speed
G1	Fan Low	Low Fan Speed
Y2	Y2	Stage 2 Cooling
Y1	Y1	Stage 1 Cooling
W2	W2	Stage 2 Heating
W1	W1	Stage 1 Heating
G	G	Fan

## **4. How to Install**

1. Choose a place where to install the PAC-US444CN-1. The device provides two mounting holes that can be used 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 PAC-US444CN-1 cable to the connector CN105 on the indoor unit control board.
4. Connect PAC-US444CN-1 terminals using 18 AWG wire.

### **Device Configuration**

Initial settings can be configured via the two banks of dip switches on the circuit board, SW1 and SW2. The circuit board can be accessed by unfastening the four screws on the back of the case.



## DIP Switch Definitions (Factory default is OFF for all switches):

### Delayed Off

SW1-1/2: After reaching thermostat set point, the unit will continue to run for a set period of time in order to improve efficiency. The period of time is set by adjusting SW1-1 and SW1-2 according to the following table:

SW1-1	SW1-2	Result
OFF	OFF	5 minutes (Default)
ON	OFF	10 minutes
OFF	ON	30 minutes
ON	ON	0 minutes

SW1-3/4: The indoor unit fan speed can be adjusted via the following settings:

SW1-3	SW1-4	Result
OFF	OFF	Auto (Default)
ON	OFF	Medium
OFF	ON	High
ON	ON	Custom Auto

*Note: Custom Auto provides more comfortable fan speed operation vs. the more efficient Auto (default).*

### Two-Stage Thermostat Operation

SW2-6: Adjusts indoor unit operation during stage 1 heating and stage 1 cooling according to the following table:

SW2-6	Operation during stage 1
OFF	Full capacity
ON	The capacity is adjusted so that the room temperature is adjusted (heated or cooled) at a fixed rate.

**Note: When either Y2 or W2 is left unconnected, it is recommended to set SW2-6 to the OFF position. When both Y2 and W2 are connected, it is recommended to set SW2-6 to the ON position.**

## Static Pressure Settings

SW2-1, SW2-2, SW2-3: These adjust the static pressure function settings of the indoor unit according to the following table:

DIP switch position on PAC-US444CN-1			Indoor Unit Settings			
SW2-1	SW2-2	SW2-3	Mode 8	Mode 10	Mode 23	Mode 11
OFF	OFF	OFF	Not set	Not set	Not set	Not set
OFF	OFF	ON	Not set	Not set	Not set	Not set
OFF	ON	OFF	2	1	Set by SW2-4	2
OFF	ON	ON	2	2	Set by SW2-4	2
ON	OFF	OFF	1	1	Set by SW2-4	2
ON	OFF	ON	1	2	Set by SW2-4	2
ON	ON	OFF	3	1	Set by SW2-4	2
ON	ON	ON	3	2	Set by SW2-4	2

*\*Refer to the appropriate Indoor Unit Installation Manual for Mode 8 and Mode 10 function setting definitions.*

## CN24 Operation During Defrost

SW2-4: Adjusts Mode 23 function settings according to the following table:

SW2-4	Result	Fan and CN24
OFF	Setting 2 (Default)	ON
ON	Setting 1	OFF

*\*Refer to the appropriate Indoor Unit Installation Manual for Mode 23 function setting definitions.*

## Fan Speed During Heating Mode, Thermal Off

SW2-5: Adjusts Mode 25 initial setting (fan speed in thermal off for heating) according to the following table:

SW2-5	Result
OFF	Extra low (Default)
ON	Set by Thermostat Interface

In addition, the adapter also affects the following function settings of the connected indoor unit:

Mode	When using the adapter
Mode 1 (auto recovery after power failure)	Always enabled
Mode 2 (room temperature detection location)	Unused (room temperature detected by the connected thermostat)
Mode 24 (heat offset for height)	Unused

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

### Grouping

The connection of more than one PAC-US444CN-1 to a single set of thermostat dry-contacts is not supported.

### Temperature Sensing

The PAC-US444CN-1 relies upon both the dry-contact thermostat and the indoor unit's thermistors in order to monitor room temperature. The thermostat's temperature sensing is used to set the room temperature. The indoor unit thermistor is used when calculating cooling and heating rates of change.

## 5. Usage

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 PAC-US444CN-1.

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.