

MANUFACTURED FOR: MITSUBISHI ELECTRIC US, INC.

Thermostat Interface Installation Manual

PAC-US446CN-1

Table of Contents

1. Supplied Parts	1
2. Safety Precautions	1
3. Wire Terminal Connections	3
4. DIP Switch Settings	5
5. Hardware Installation	8
6. Additional Notes	8
7. Usage with PAA Step 1 unit	9
8. Usage with PAA A2L Step 2 unit	11

1. Supplied Parts

Check that the box includes the following parts in addition to this installation manual:

- 1 x Thermostat Interface (TI) PAC-US446CN-1
- 1 x PAA unit accessory cable

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 it 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 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.**
Shorting 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 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 a location, it may result in deformation or device malfunction.
- **Do not immerse the device in water.**
Doing so may lead to electric shock or malfunctions.

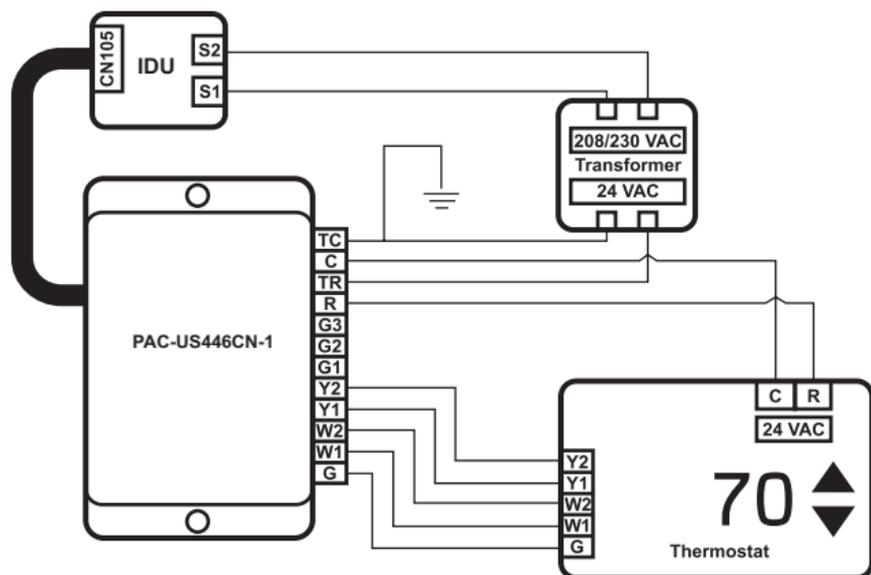
3. Wire Terminal Connections

⚠ Note: Configure the Thermostat for use with a conventional system. Do not configure for heat pump or any variation using O/B signals.

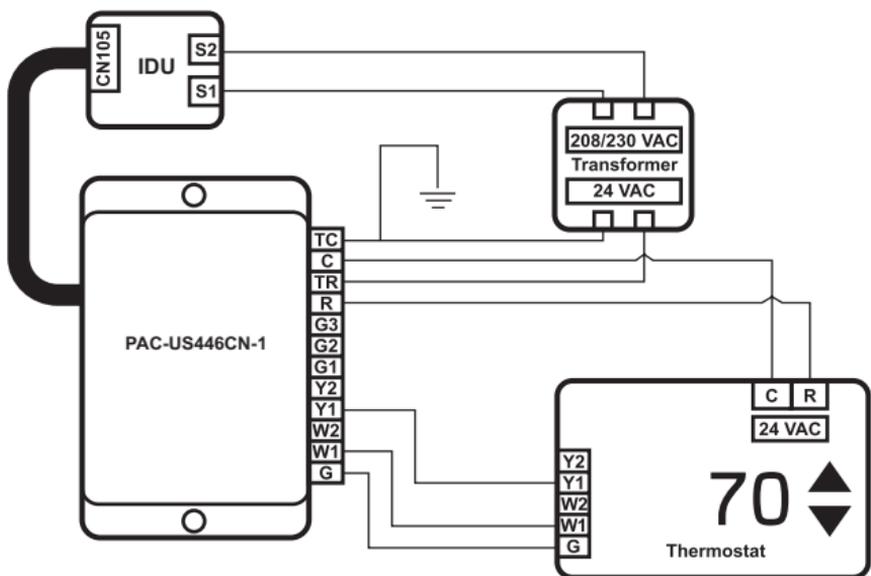
TI terminal	Description
TC	C: common (in)
C	C: common (out)
TR	R: 24 VAC (in)
R	R: 24 VAC (out)
G3	High fan speed
G2	Medium fan speed
G1	Low fan speed
Y2	Stage 2 cooling
Y1	Stage 1 cooling
W2	Stage 2 heating
W1	Stage 1 heating
G	Fan mode

1. The Thermostat Interface (TI) supports 20-30 VAC thermostat signals.
2. Use 18 AWG thermostat wire for all connections.
3. During cooling or heating operation, the fan speed is automatically set to Low, Medium, or High based on the amount of change in room temperature over time. When set point has been met, the fan either turns off (default) or is set to a fixed speed based on the SW1-1, SW1-2, and SW2-5 DIP switch settings.
4. When G1/G2/G3 is energized, the fan operates at a fixed Low/Med/High speed. Manual fan speed control is not available when G is energized, or after setpoint has been met if SW1-1 is turned ON.
5. When Y1/W1 is energized, the system operates in Stage 1 Cooling/Heating (default). System capacity is adjusted every 5 minutes based on the change in room temperature. If SW1-1 is turned ON, the system continuously operates at 100% capacity in Cooling/Heating until setpoint has been met.
6. When Y2/W2 is energized, the system is set to Stage 2 Cooling/Heating and continuously operates at 100% capacity until setpoint has been met.
7. When Cooling/Heating operation ends, the compressor will turn off and the indoor fan will operate based on the SW1-1 DIP switch setting. If SW1-1 is turned OFF (default), the fan will either turn off or run in low speed for 2 hours based on the SW1-2 and SW2-5 settings. After 2 hours, the fan will turn off unless G is energized. If SW1-1 is turned on, the fan will turn off unless G is energized.
8. When G is energized, the unit is set to Fan mode and the fan is locked to High speed. Fan speed cannot be manually adjusted by G1/G2/G3 during this time. If G and Y/W are energized simultaneously, the Y/W signal will override the G signal and set the system to Cooling/Heating operation.

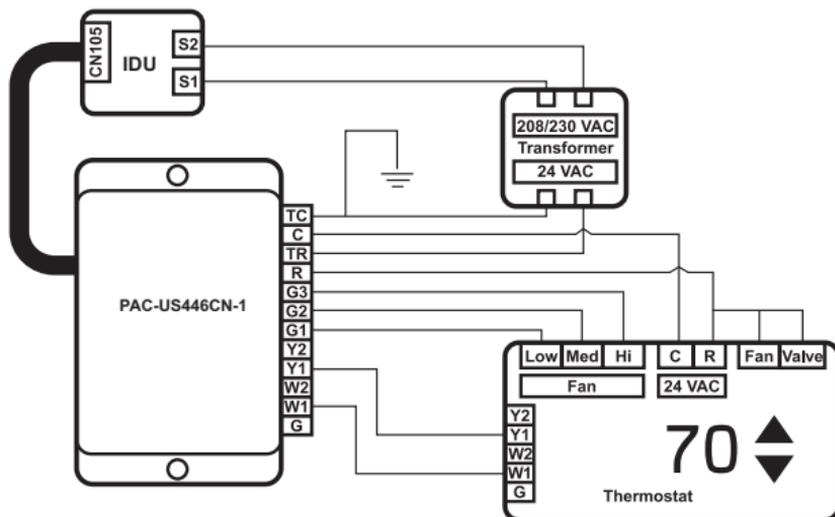
Example 1: Two-stage cooling and heating



Example 2: Single-stage cooling and heating



Example 3: Single-stage cooling and heating with fan speed control

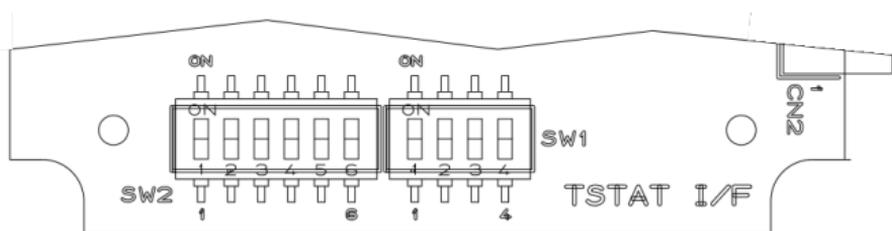


4. DIP Switch Settings

4.1. DIP Switch Settings Overview

Advanced 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 removing the four screws on the back of the case.

- DIP switches should be configured before connecting to the indoor unit
- DIP switches SW1-1 and SW2-2 work for all models
- DIP switches SW1-2, SW2-2, SW2-3, SW2-4 and SW2-5 work for models that begin with: SEZ, SLZ, SVZ, PAA, PCA, PEAD, PKA, PLA, PVA
- PAA DIP switch settings can be found in sections 6-7 on pages 9-14



Note: Factory default is OFF for all switches.

4.2. DIP Switch Configuration

SW1-1: Thermo-OFF Time Delay

Choose how the system should operate when set point has been met and the thermostat is no longer calling for cooling or heating.

SW1-1	Setting Description
OFF	<p>For 2 hours, the indoor unit monitors the indoor air temp and automatically cools/heats the space to maintain the room temp $\pm 1^{\circ}\text{F}$</p> <p>The fan will run in Low speed or turn off between cycles based on the SW1-2 and SW2-5 settings. Manual fan speed control via G1/G2/G3 is available during this time, Fan mode via G is not.</p> <p>The 2-hour timer will reset upon a new call for cool or heat.</p>
ON	<p>The indoor unit turns off once the thermostat is no longer calling for cool or heat. Fan mode via G is available during this time, manual fan speed control via G1/G2/G3 is not. If the thermostat calls for cool or heat while G is energized, Fan mode will be overridden and the system will be placed in cool/heat mode.</p> <p>This setting is not recommended for installations in climate zones 5-7 (see ASHRAE 90.1 / IECC Climate Map)</p>

SW2-6: Fixed or Variable Capacity

Choose whether to operate the system at a fixed or variable capacity when the thermostat calls for Stage 1 cooling (Y1) or Stage 1 heating (W1).

SW2-6	Setting Description
OFF	<p>The system operates at a variable capacity for more efficient operation. Compressor frequency and indoor fan speed are adjusted every 5 minutes based on the change in room temp. If the room temp does not change, the system continues operating at the current rate until set point is met.</p>
ON	<p>The system operates at full capacity when the thermostat calls for cool or heat. Compressor frequency and fan speed are both fixed to their highest setting. Operates similarly to a conventional HVAC system.</p>

SW1-2: Fan Operation in Cooling Thermo-OFF

Choose whether the fan should turn off or keep running after set point has been met.

SW1-2	Fan Speed	Notes
OFF	Off (default)	Recommended for ducted units and humid climates
ON	Low	Recommended for dry climates and constant airflow

SW2-5: Fan Operation in Heating Thermo-OFF

Choose whether the fan should turn off or keep running after set point has been met.

SW2-5	Fan Speed	Notes
OFF	Off (default)	Recommended for ducted units and single-zone systems Not recommended for multi-zone systems
ON	Low	Do not choose this setting if the outdoor unit model number begins with: MXZ-SM, PUHY, PURY

SW2-1, SW2-2, SW2-3: Static Pressure Settings

Choose the static pressure setting for this indoor unit.

By default, the DIP switches are all turned OFF. If left in the OFF position, the indoor unit will use the default static pressure setting. Default settings are highlighted **bold**.

Indoor Unit Models	Static Pressure Settings (in. w.c.)	DIP Switch Settings		
		SW2-1	SW2-2	SW2-3
SEZ	0.02	ON	OFF	ON
	0.06	ON	OFF	OFF
	0.14	OFF	ON	OFF
	0.20	ON	ON	OFF
PEAD	0.14	OFF	ON	OFF
	0.20	ON	ON	OFF
	0.28	ON	OFF	ON
	0.40	OFF	ON	ON
	0.60	ON	ON	ON
SVZ / PVA Upflow Horizontal	0.30	ON	OFF	OFF
	0.50	OFF	ON	OFF
	0.80	ON	ON	OFF
SVZ / PVA Downflow	0.30	ON	OFF	ON
	0.50	OFF	ON	ON
	0.80 *	ON	ON	ON

* Downflow static pressure for PVA-A42 models is 0.70 in. w.c.

SW2-4: Backup Heat and Vane Direction Settings

Choose the backup heat or vane direction settings for this indoor unit.

Indoor Model	Setting Description	SW2-4
SEZ	Enable CN24 at 4.5 °F below set point	OFF
SLZ	Enable CN24 at 1.8 °F below set point	ON
SVZ	Disable CN24 during Defrost and error states	OFF
PVA PEAD	Enable CN24 during Defrost and error states	ON
PLA	Swing: Vanes move back and forth at a constant rate	OFF
	Wave: Vanes move back and forth at a variable rate	ON
PCA	Not supported	OFF
PKA	Swing: Vanes move back and forth at a constant rate	ON

5. Hardware Installation

5.1. Installing the Thermostat Interface

Make sure that all DIP switch settings have been configured before connecting to the indoor unit. See Section 4 for more information on configuring DIP switches.

1. Mount the TI to a solid surface using the screws provided in the box or with double-sided tape approved for use within the anticipated ambient temperature.
2. Install a 24 VAC transformer (optional METUS part: VPL24-210)
3. Power off the indoor unit
4. Connect the TI cable to the CN105 connector on the indoor unit control board
5. Connect the thermostat wire to the TI terminals

5.2. Temperature sensing

The indoor unit temp sensor is used when calculating cooling and heating rates of change.

6. Additional Notes

1. Auto recovery is always enabled after a power outage
2. MA controllers can be used to monitor the indoor unit's operation status and configure advanced indoor unit settings
3. MA controllers cannot be used to control mode, set point, or fan speed. The TI will override any active commands sent from another controller.
4. Indoor units can be grouped by connecting one thermostat to multiple TI devices. This can be achieved by running the wires in a daisy-chain between each TI.
5. Set point range is based on the indoor unit model type. The set point range can be found in the indoor unit Operation Manual.

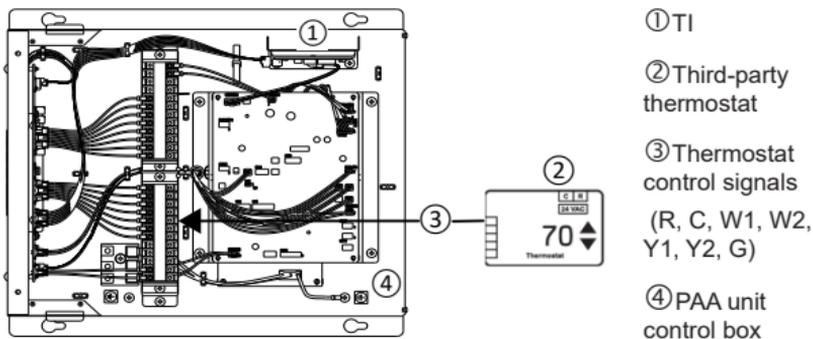
7. Usage with PAA Step 1 unit

The TI must be installed in the PAA unit control box if a third-party 24 VAC thermostat is used to control the PAA unit. Previous Thermostat Interface PAC-US444CN-1 is not compatible with the PAA unit. This manual only describes installation of TI.

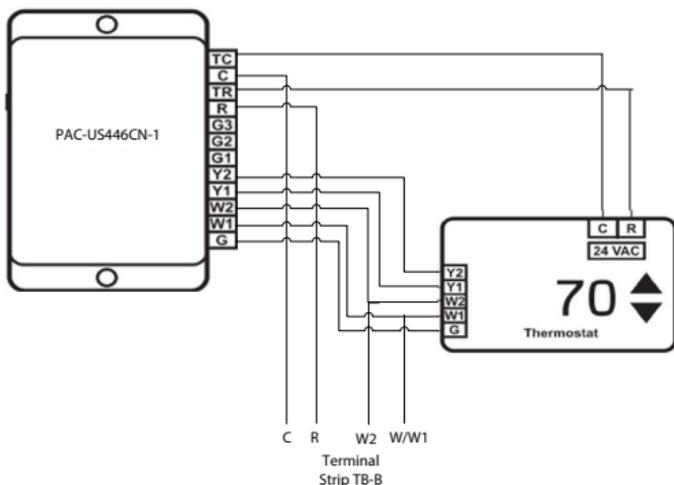
7.1. How to install Thermostat Interface in PAA unit control box

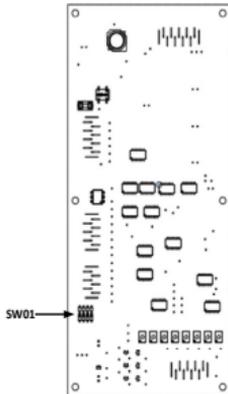
Make sure power supply is off.

1. Use M3-0.5 x 12 mm metric socket cap head screws and 3 mm nuts, or equivalent (field supplied), to attach the TI to the top of the protruding metal bracket in the control box (see image below). Ensure the TI is securely attached to the bracket.



2. Connect the TI to the CN105 connector on the control board.
3. Wire the TI, thermostat, and control box TB-B terminal strip as shown in the image.





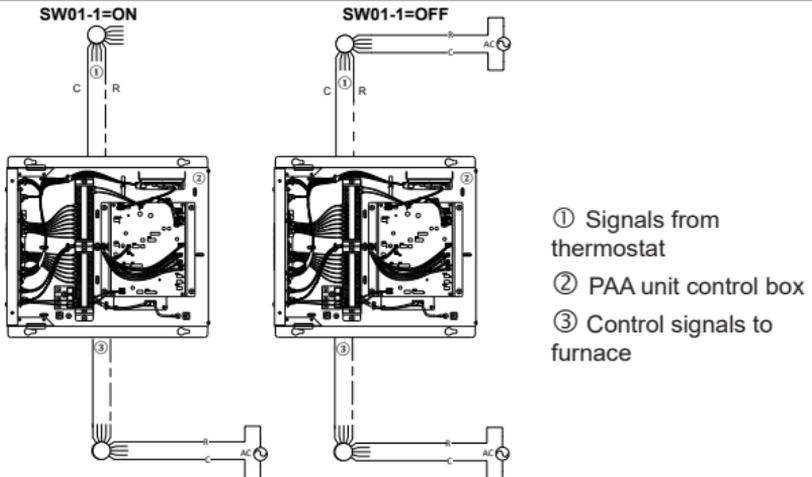
DIP switch SW01 on the relay board is located as indicated in the image and has 4 switches that change the configuration.

Thermostat power supply

The thermostat may receive power from the furnace transformer or may have a separate power supply. An example of when it might have its own power supply is when using a damper control system as dampers typically require more power than the furnace transformer can supply.

SW01-1: Determines whether to allow the thermostat to provide its own power or allow the furnace to supply power to the thermostat in Emergency and Normal operation modes according to the following table:

SW01-1	Result
OFF	Electronically disconnects the R line from the furnace to the auxiliary control equipment and allows the auxiliary equipment to provide its own power.
ON	Electronically routes the R line from the furnace through the PAA unit control box to the thermostat terminals if connections within the PAA unit control box provide operating power to the thermostat in Emergency and Normal operation modes (default).



SW01-4: Determines Emergency and Test mode operations according to the following table:

SW01-4	Result
OFF	Thermostat (or non-adjustable thermostat, if used) controls the heat and fan signals applied to the furnace during Emergency operation modes (default).
ON	Test mode operation

For information about the non-adjustable thermostat and Test mode operation, refer to the PAA unit installation manual.

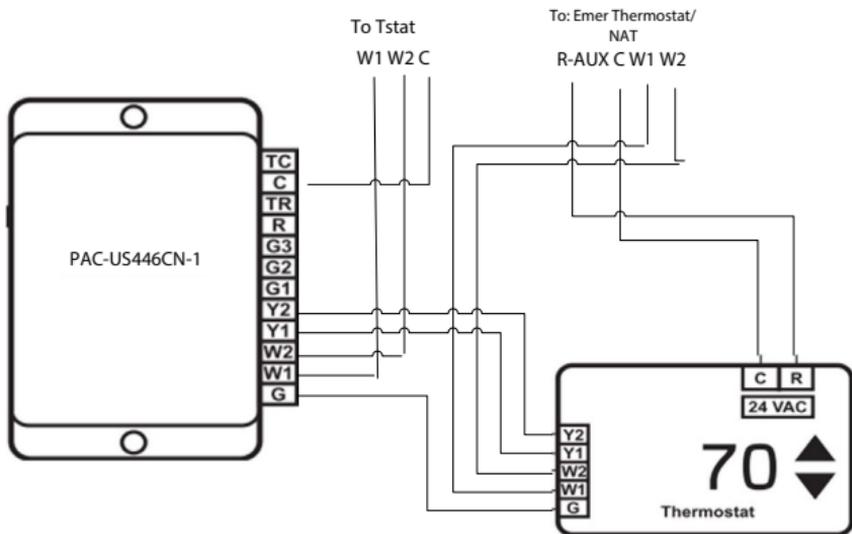
Thermostat Interface DIP switch settings for PAA unit only

SW2-1, SW2-2, SW2-3: Adjust the PAA unit Modes 8 and 10 settings according to the following table to select the Economic Balance Point.

DIP switch position on TI			Indoor unit settings			Outdoor Unit (Extended outdoor air temperature)
SW2-1	SW2-2	SW2-3	Mode 8	Mode 10	Balance Point	
ON	OFF	OFF	1	1	-13° C (9° F)	-24° C (-11° F)
ON	OFF	ON	1	2	-10° C (14° F)	-13° C (9° F)
OFF	ON	OFF	2	1	Furnace Only	Furnace Only
OFF	ON	ON	2	2	-7° C (19° F)	-10° C (14° F)
ON	ON	OFF	3	1	-3° C (27° F)	-3° C (27° F)
ON	ON	ON	3	2	0° C (32° F) (default)	0° C (32° F) (default)

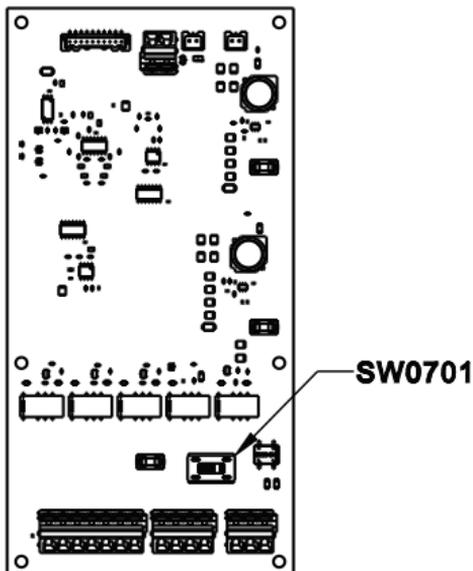
8. Usage with PAA A2L Step 2 unit

The PAC-US446CN-1 Thermostat Interface must be installed in the PAA A2L Step 2 unit control box if a third-party thermostat is used to control the PAA unit. Previous versions of the Thermostat Interface, PAC-US444CN-1 and PAC-US445CN-1, are not compatible with the PAA A2L Step 2 unit.



- ① TI
- ② Third- party conventional thermostat
- ③ Wiring from thermostat to Furnace Interface Board and Thermostat Interface (R, C, W1, and W2 to FIB and the rest to TI)
- ④ Cable from TI that plugs into CN105.

Relay board SW701 switch settings

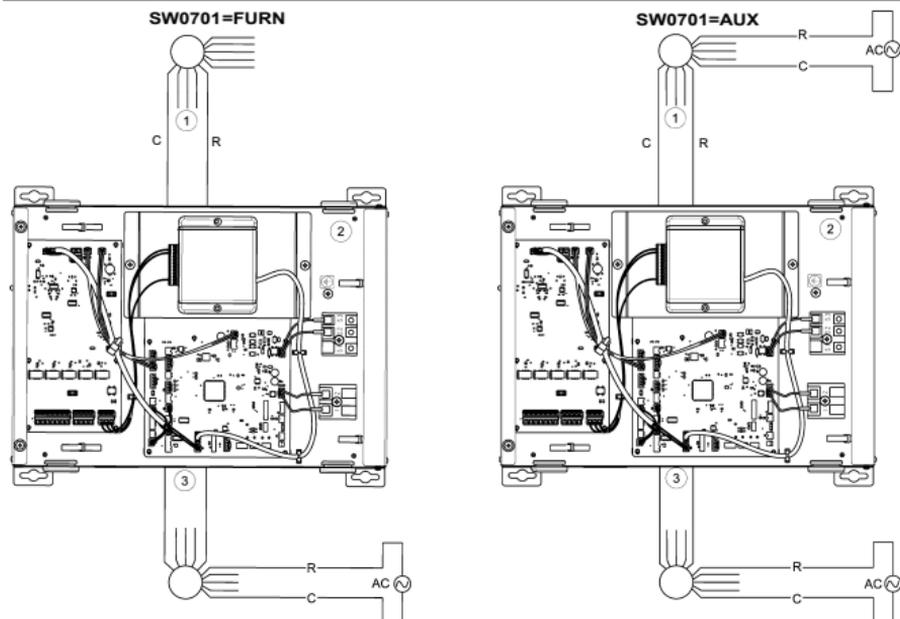


Thermostat power supply

The thermostat may receive power from the furnace transformer or may have a separate power supply. An example of when it might have its own power supply is when using a damper control system as dampers typically require more power than the furnace transformer can supply.

SW0701: Determines whether to allow the thermostat to provide its own power or allow the furnace to supply power to the thermostat in Emergency and Normal operation modes according to the following table:

SW0701	Result
AUX	Electronically disconnects the R line from the furnace to the auxiliary control equipment and allows the auxiliary equipment to provide its own power.
FURN	Electronically routes the R line from the furnace through the PAA unit control box to the thermostat terminals if connections within the PAA unit control box provide operating power to the thermostat in Emergency and Normal operation modes (default).



- ① Signals from thermostat
- ② PAA unit control box
- ③ Control signals to furnace

DIP switch position on TI				Indoor unit settings			Economic Balance Point
SW 1-4	SW 2-1	SW 2-2	SW 2-3	Mode 14	Mode 8	Mode 10	
OFF	ON	OFF	OFF	1	1	1	-13° C/9° F
OFF	ON	OFF	ON	1	1	2	-10° C/14° F
OFF	OFF	ON	OFF	1	2	1	Furnace Only
OFF	OFF	ON	ON	1	2	2	-5° C/23° F
OFF	ON	ON	OFF	1	3	1	0° C/32° F
OFF	ON	ON	ON	1	3	2	5° C/41° F (default)
ON	ON	OFF	OFF	2	1	1	-25° C/-13° F
ON	ON	OFF	ON	2	1	2	-15° C/5° F
ON	OFF	ON	OFF	2	2	1	Furnace Only
ON	OFF	ON	ON	2	2	2	-10° C/14° F
ON	ON	ON	OFF	2	3	1	-5° C/23° F
ON	ON	ON	ON	2	3	2	0° C/32° F

SW1-3 determines if in economic balance point only mode is turned on (meaning no capacity balance point).

SW01-3	Result
OFF	Sets Mode 9 = 1(default), no impact
ON	Sets Mode 9 = 2, placing PAA A2L into Economy Balance Point only mode. This setting overrides any setting done with time delay mode.

This device is designed and intended for use in the residential environment.
 MEUS DOC# MD-1622-K002 Ver. 1, June 2025

PA79L194H01