

MANUFACTURED BY
MITSUBISHI ELECTRIC US, INC.

Air-Conditioners

PAA-AA/BA/CA18, 24, 30, 36, 42NL

QUICK START GUIDE

FOR INSTALLER

For use with R454B

For safe and correct use, please read this guide thoroughly before installing this product.



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1. Introduction

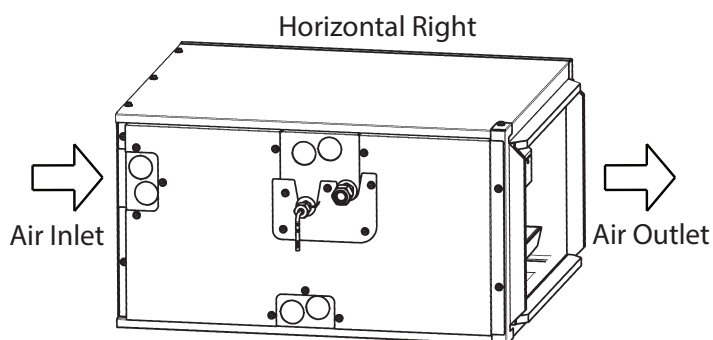
This guide provides general installation guidelines for cased-coil PAA models. For detailed instructions, always consult the PAA unit installation manual. Make sure to read and understand all safety warnings before installing this product.

2. Configuring the Coil Orientation for Installation

The PAA unit is a true multi-position product that can be installed in any orientation. The default orientation that the unit ships in is **horizontal right**. Modifications are required if orienting the coil in other positions, including relocation of the R454B leak detection sensor in the horizontal-left orientation.

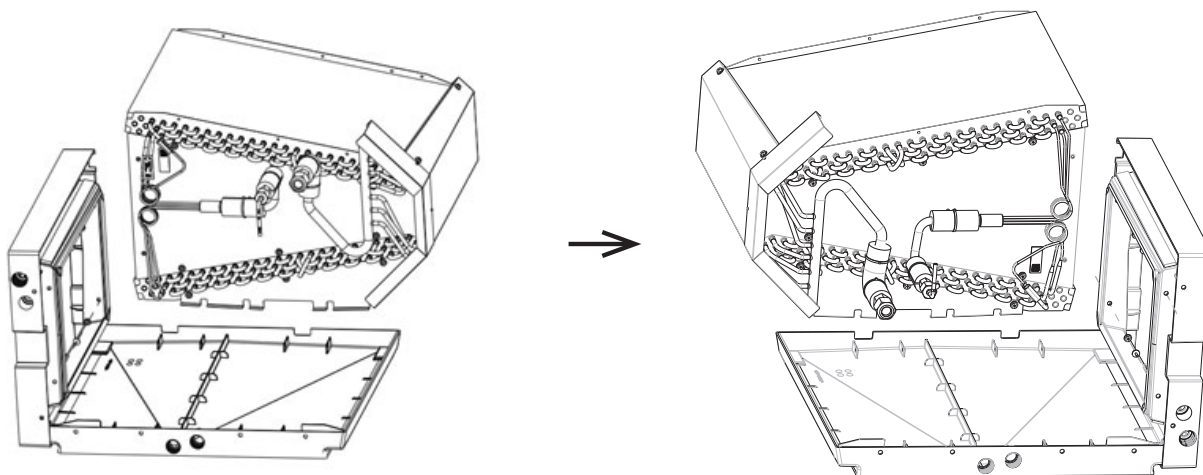
2.1. Horizontal Right

The PAA unit is shipped from the factory for horizontal right configuration, no further changes are required.



2.2. Horizontal Left

For horizontal left configurations, the side drain pan must be moved to the horizontal left position as shown below. The R454B leak detection sensor must be relocated.

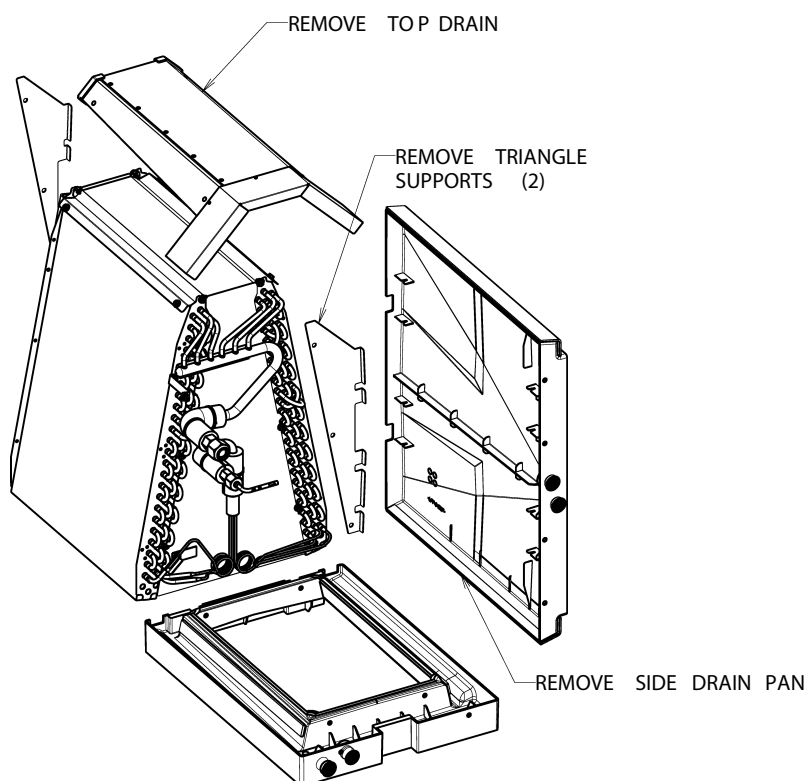


For detailed removal and assembly instructions, please refer to the "Horizontal left installation" section of the PAA unit installation manual or scan the QR code for the video link.



2.3. Upflow/Downflow

For vertical upflow/downflow configurations, the top drain and side drain pan must be removed. Removal of the top drain and side drain pan in vertical configurations ensures maximum airflow and efficiency.

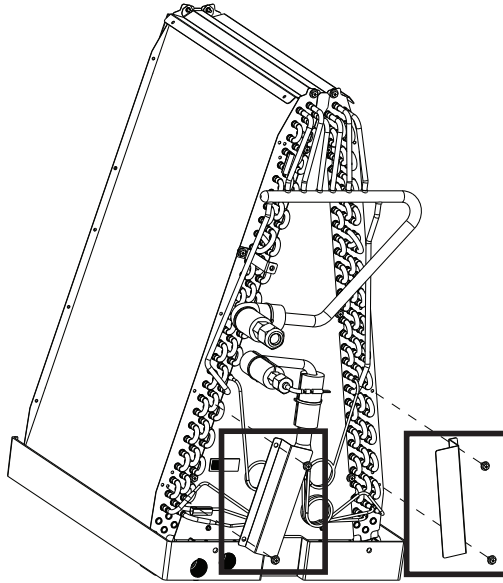


For more information on removal, refer to the "Upflow/Downflow installation" section of the PAA unit installation manual or scan the QR code for the video link.



2.3.1. Vertical Downflow (Only for 36 or 42 MBH Coils)

For vertical downflow, when installing the 36 or 42 MBH coil, the two U-bend covers provided in the accessories box must be installed on the unit.



For more information on assembly, refer to the PAA unit installation manual or scan the QR code below for the video link.



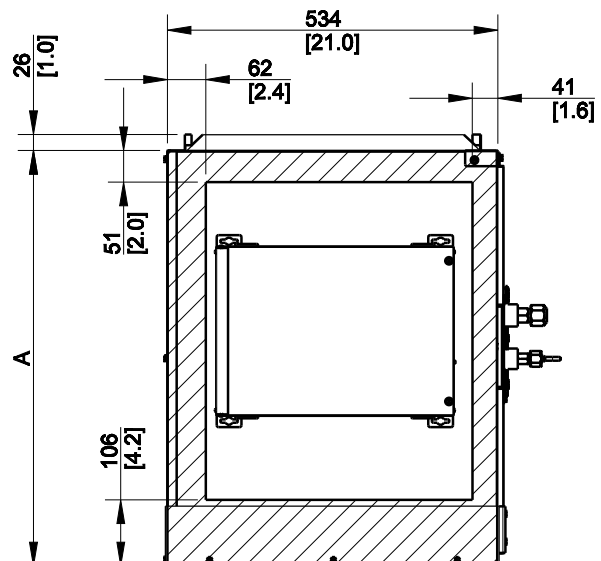
2.4. Control Box Mounting on Unit

The control box can be mounted on either the left or right side of the cased coil's cabinet. The control box should be mounted in the white area shown below. The control box should not be mounted in the hatched area.



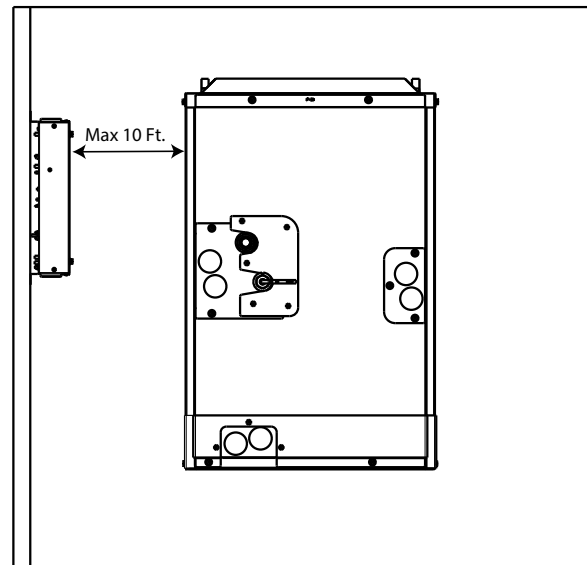
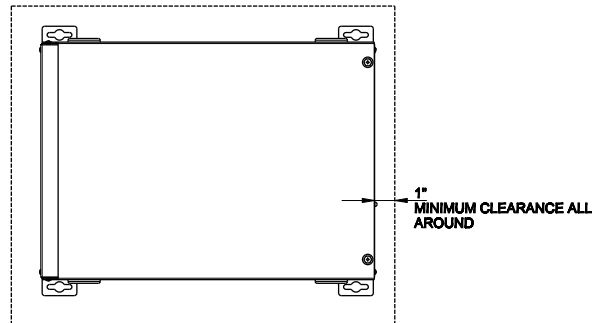
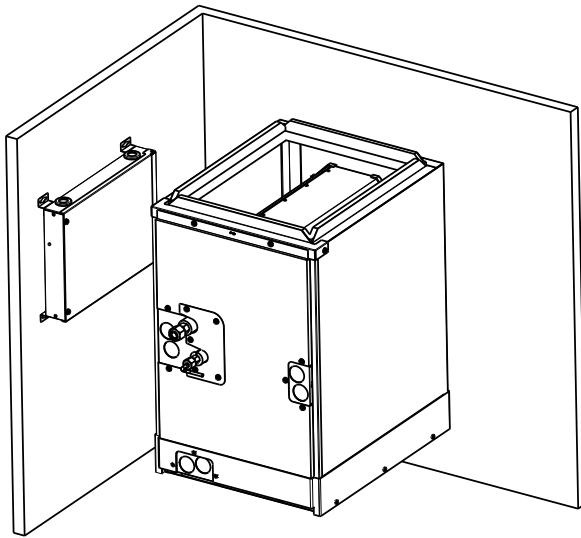
DO NOT MOUNT CONTROL BOX IN HATCHED AREA

Side view



2.5. Remote Control Box Mounting

The control box can be mounted remotely from the unit, up to 10' away due to the thermistor wire harness length limit. 1" of clearance is required around the perimeter of the control box.



3. Furnace Airflow Settings

- To maintain performance of the PAA unit, the furnace's air volume must be within the ranges stated below.
- **For optimal humidity removal, use rated airflow or less (to adjust airflow settings refer to the furnace installation manual).**

Recommended target furnace blower speeds						
Single-stage furnace	Two-stage furnace	PAA unit				
		AA/ BA18NL	AA/ BA24NL	AA/ BA30NL	BA/ CA36NL	BA/ CA42NL
G+Y	G+Y1+Y2	525 CFM	700 CFM	875 CFM	1,050 CFM	1,225 CFM
	G+Y1	345 CFM	460 CFM	575 CFM	690 CFM	805 CFM
G	G	263 CFM	350 CFM	438 CFM	525 CFM	613 CFM
Adjustments to above CFMs: Down for more humidity removal, up for more capacity and/or better air circulation.						

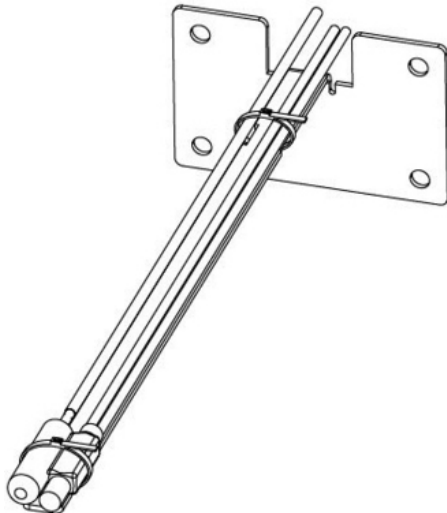
Airflow restriction table (limited to heat pump operation only)						
Airflow		PAA unit				
		AA/ BA18NL	AA/ BA24NL	AA/ BA30NL	BA/ CA36NL	BA/ CA42NL
Maximum	CMM	23.0	23.5	29.0	34.0	47.0
	CFM	812	830	1024	1201	1660
Minimum	CMM	12.0	15.6	19.8	22.7	26.5
	CFM	424	551	700	800	936

4. Required Components for Installation

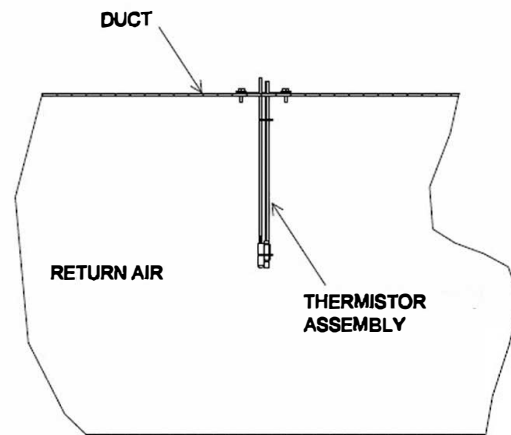
4.1. TH01 Return Air Sensor and Non-Adjustable Thermostat (NAT)

- **The use of the TH01 return air sensor is required on all installations.**
- TH01 return air sensor is provided in the accessory box and is mounted on a wiring harness (DO NOT alter the length).
- The sensor should be installed as far as possible from the furnace in the return air stream and away from any bypass duct or outside air connection. Use included mounting bracket.
- The NAT is required for backup heating control when using a Mitsubishi Electric remote controller in cases where the heat pump is inoperable.
- If using a 3rd party thermostat with the Thermostat Interface, then the NAT is not required.
- Mount NAT with TH01 sensor on the same bracket as far as possible from the furnace.

TH01 thermistor and NAT thermostat installed



TH01 thermistor and NAT thermostat installed in the return air duct work displayed below

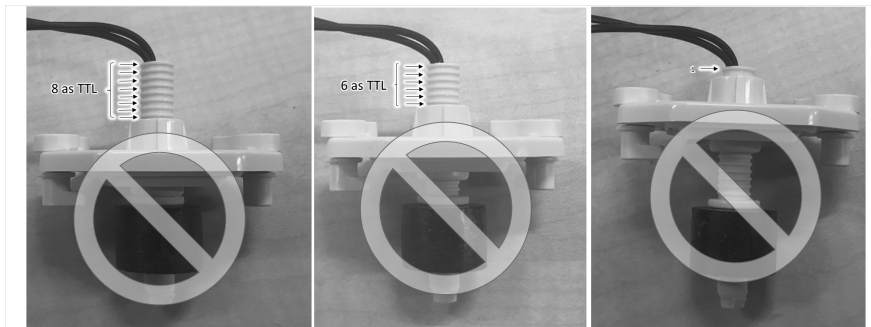
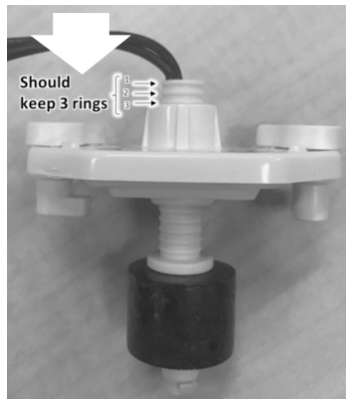
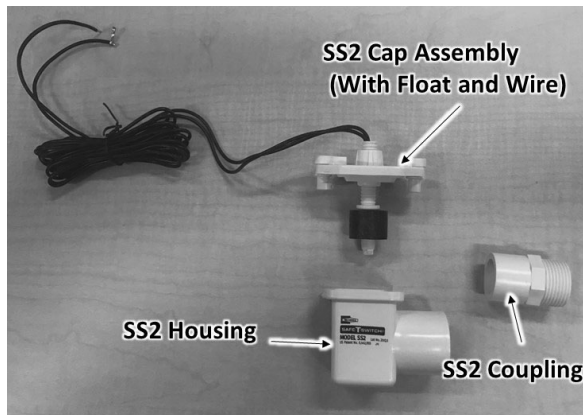


4.2. R454B Refrigerant Leak Detector

- The leak detector is factory mounted for horizontal right, vertical or downflow orientation. Horizontal left orientation requires relocation of the sensor within the cabinet.
- **The wiring harness must be plugged into CN485 to prevent an error.**

4.3. Condensate Overflow Safety Switch

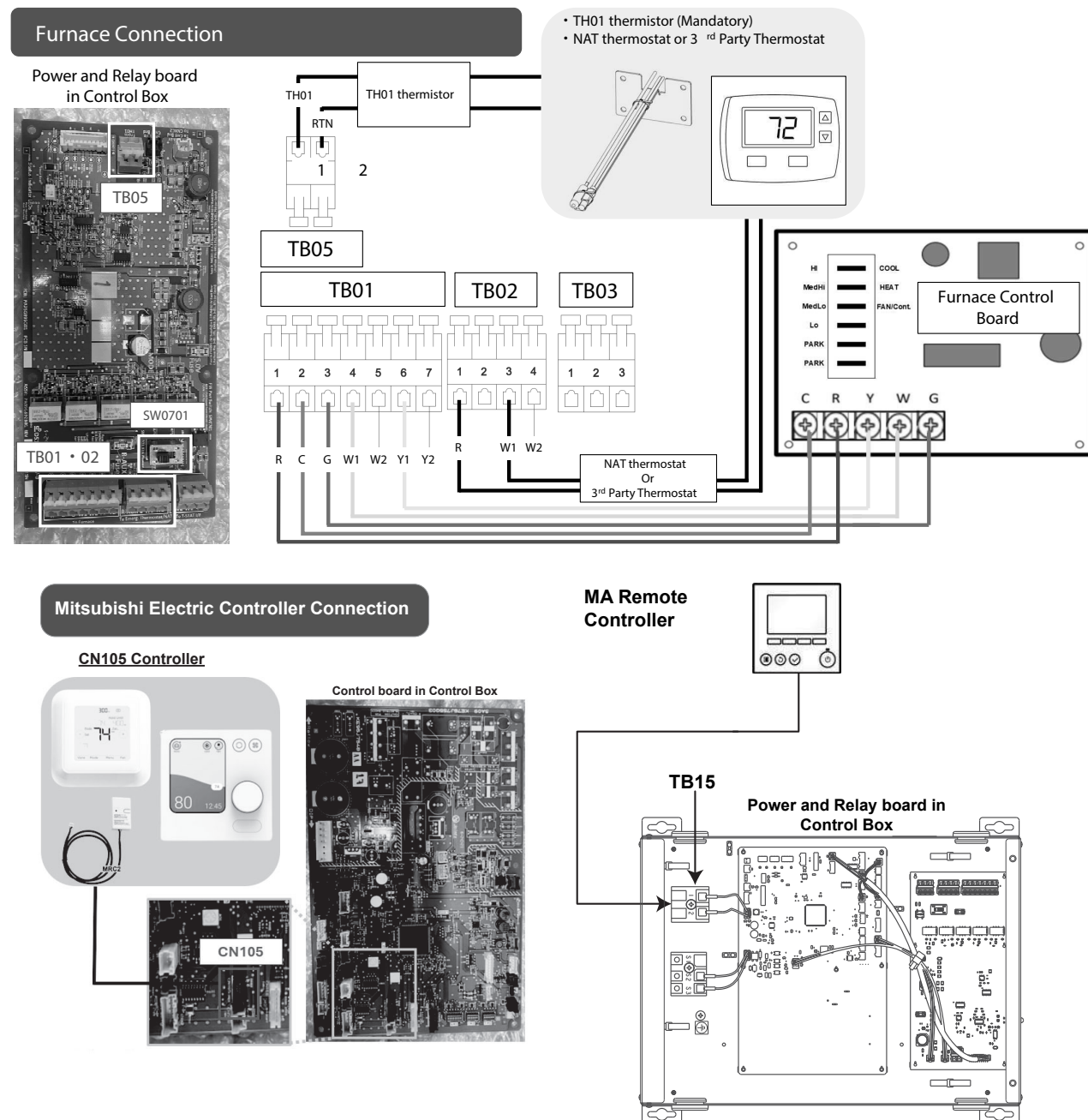
- The unit must utilize the provided float switch (SS2) and lead wire to connect to CN4F on the control board to operate without error.
- The switch is normally closed (open on error).
- 3rd party pump or float switch error outputs can be utilized and wired in series with the SS2, assuming the safety circuit is also normally closed.
- Float switch water detection level should be 3 rings high as shown below.



5. Wiring and Controls Configurations

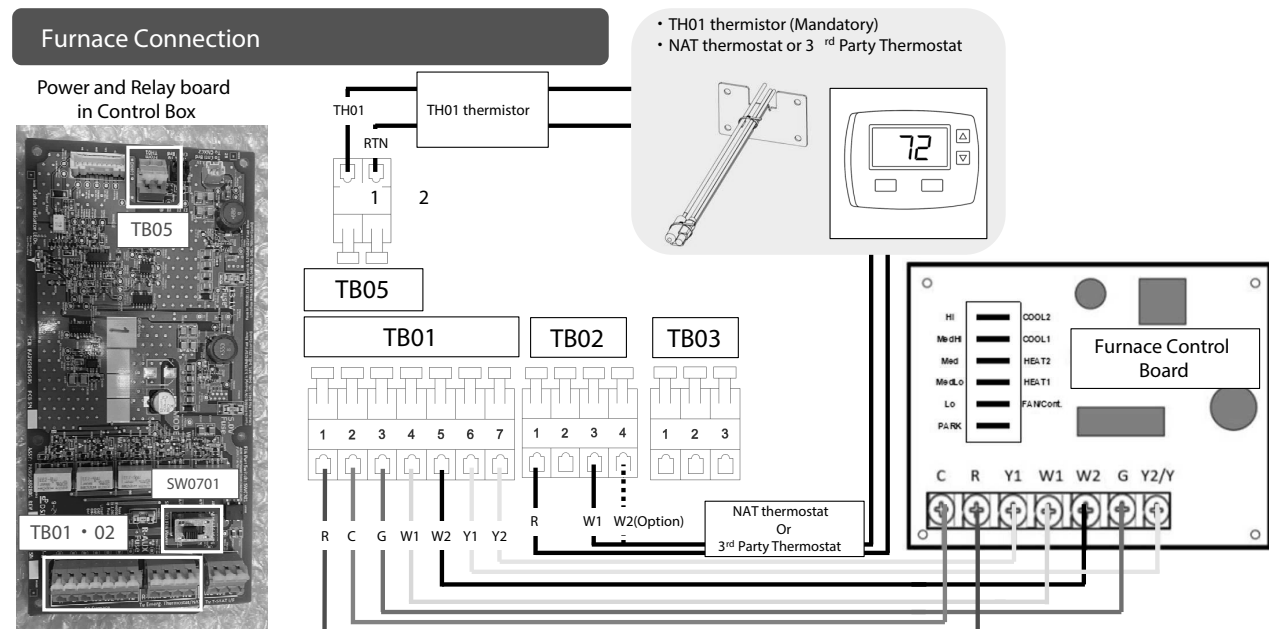
5.1. Wiring Configurations

5.1.1. Single-stage Furnace with Mitsubishi Electric Controller



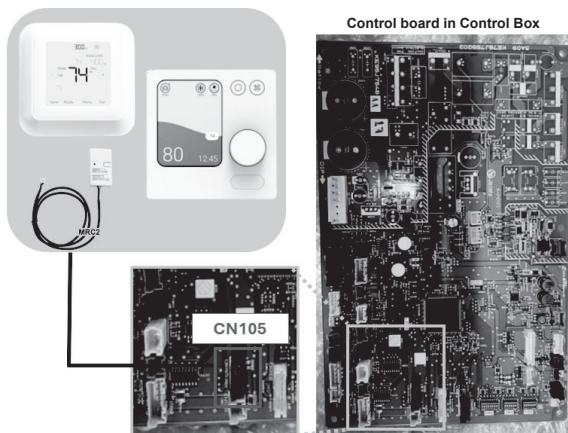
- For single-speed fan control, Mode 23 = 1 [default]
- For two-speed fan control, Mode 23* = 2 (* Power cycle the unit after changing Mode 23.)
- To sense temperature at the MA remote controller, Mode 2 = 3 (recommended setting).

5.1.2. Two-stage Furnace with Mitsubishi Electric Controller

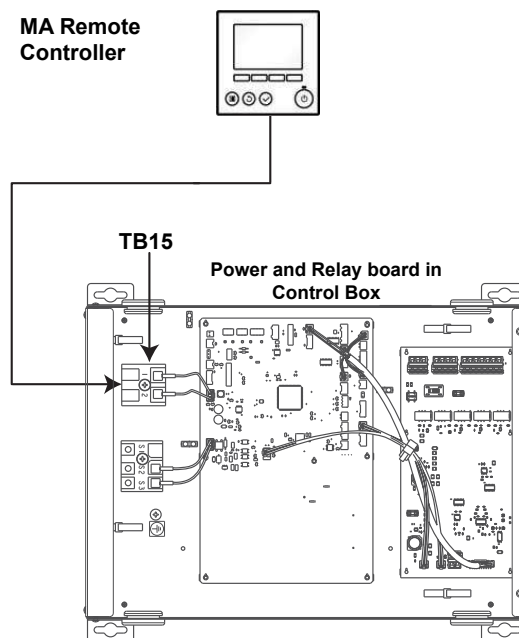


Mitsubishi Electric Controller Connection

CN105 Controller

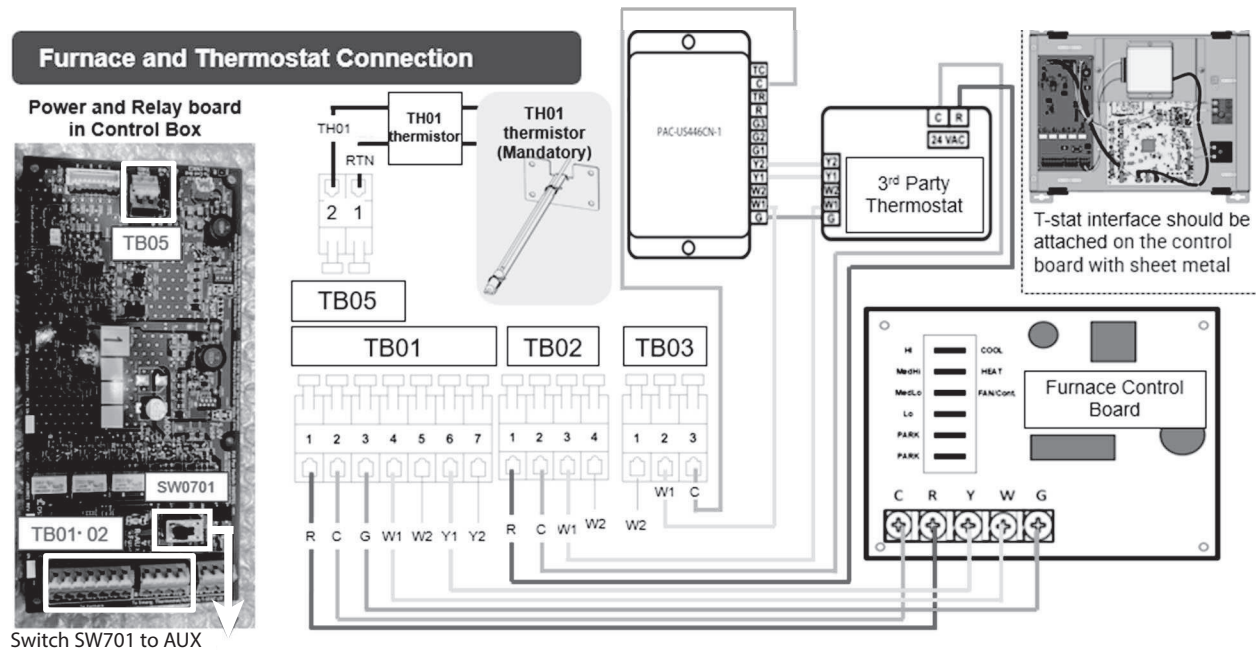


MA Remote Controller

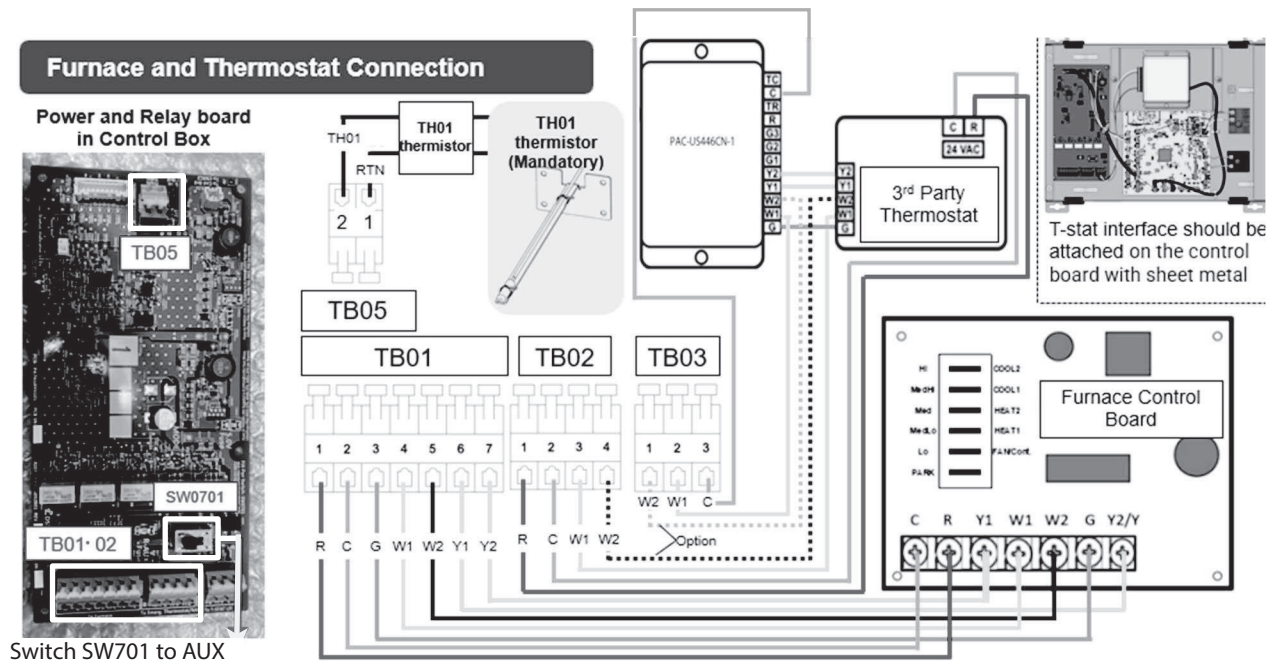


- For single-speed fan control, Mode 23 = 1 [default]
- For two-speed fan control, Mode 23* = 2 (* Power cycle the unit after changing Mode 23.)
- To sense temperature at the MA remote controller, Mode 2 = 3 (recommended setting).

5.1.3. Single-stage Furnace with 3rd Party Remote Controller



5.1.4. Two-stage Furnace with 3rd Party Remote Controller



- A Mitsubishi Electric Thermostat Interface (PAC-US446CN-1) is required when controlling the system with a 3rd party thermostat and the system settings are configured via this Thermostat Interface's DIP switches.
- The Thermostat Interface requires 24VAC to operate which can be sourced from the furnace's control board.
- If powering the Thermostat Interface with a separate 24VAC transformer (recommended with damper control systems), turn SW0701 to AUX on the PAA control board.

Important PAC-US446CN-1 DIP switch settings

SW 2-6	OFF	(Default setting) Variable capacity: When Y1 or W1 is energized, the system increases or decreases compressor frequency every few minutes based on whether the room temperature has risen or fallen. When Y2 or W2 is energized, the system operates the compressor at full capacity.
	ON	Full capacity: When Y1 or W1 is energized, the system operates at full capacity until setpoint is met. Energizing Y2 or W2 has no effect on system operation.
SW 2-4	OFF	(Default setting) 1-stage fan: The fan will run at a single fixed speed in all modes.
	ON	2-stage fan: The fan will run in 1st stage when Y1 or W1 is energized, and in 2nd stage when Y2 or W2 is energized.

5.2. Economic Balance Point

- Set Economic Balance Point (EBP) as the temperature for when to switch from heat pump to furnace operation.
- For more information about this feature, please consult the "Economic balance point" section of the PAA unit installation manual.

5.2.1. Settings When Using a Mitsubishi Electric Controller

- Set up using MA, Comfort app or MHK2 controllers
- Use Mode 14, Mode 8 and Mode 10 settings as shown in the table
- Default is set to 41° F
- Set to "Furnace only" for cooling only (PUY) models

	Function Setting for Economic Balance Point Temperature					
Economic Balance Point Temperature	Standard Heat Pump			Hyper-heating Heat Pump		
	Mode 14 Setting	Mode 8 Setting	Mode 10 Setting	Mode 14 Setting	Mode 8 Setting	Mode 10 Setting
-13° F	N/A	N/A	N/A	2	1	1
5° F	2	1	2	2	1	2
9° F	1	1	1	1	1	1
14° F	1	1	2	2	2	2
23° F	1	2	2	2	3	1
32° F	1	3	1	2	3	2
41° F (default)	1	3	2	1	3	2
Furnace only	1	2	1	2	2	1

5.2.2. Settings When Using a 3rd Party Remote Controller

- Set by DIP switches on PAC-US446CN-1
- Default is set to 41° F
- Set to “Furnace Only” for cooling only (PUY) models

Economic Balance Point Temperature	T-Stat Interface PAC-US446CN-1 DIP Switch Settings							
	Standard Heat Pump				Hyper-heating Heat Pump			
	SW 1-4	SW 2-1	SW 2-2	SW 2-3	SW 1-4	SW 2-1	SW 2-2	SW 2-3
-13° F	N/A	N/A	N/A	N/A	ON	ON	OFF	OFF
5° F	ON	ON	OFF	ON	ON	ON	OFF	ON
9° F	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
14° F	OFF	ON	OFF	ON	ON	OFF	ON	ON
23° F	OFF	OFF	ON	ON	ON	ON	ON	OFF
32° F	OFF	ON	ON	OFF	ON	ON	ON	ON
41° F (default)	OFF	ON	ON	ON	OFF	ON	ON	ON
Furnace Only	OFF	OFF	ON	OFF	ON	OFF	ON	OFF

5.3. Capacity Balance Point

- Capacity Balance Point (CBP) works in conjunction with Economic Balance Point (EBP) to switch on the furnace when the heat pump can't effectively heat the space.
- CBP ambient temperature is recorded to memory and periodically decreased until CBP = EBP .
- CBP is set when space temperature is 2.7° F below the set temperature for X number of minutes (default 19 min).
- CBP is reset by switching to any other mode and then switching back to Heat. **Use this to resolve cases when CBP is set incorrectly.**
- Time delay can be adjusted via a Mitsubishi Electric MA controller or via the Mitsubishi Electric Comfort App.

(Please note: you can adjust the initial settings via the MA controller and then disconnect it to use the other controllers if preferred, the settings will be stored in the board's memory).

Time Delay Selection Table	
Request Code ¹	Action ²
390	Monitor time delay setting
391	Set time delay to <u>19</u> minutes *(default time delay setting)
392	Set time delay to <u>44</u> minutes
393	Set time delay to <u>59</u> minutes
394	EBP-only operation

¹Time delay can only be selected with MA controller. If use of a non-MA controller is desired, the time delay must first be selected with the MA controller. Then the non-MA controller can be attached and used.

²Delay times are approximate to ± 1 minute.

5.4. Disabling Capacity Balance Point (Economic Balance Point ONLY)

- CBP operation can be disabled entirely, if desired. This is useful for certain scenarios such as frequent temperature setbacks, large temperature setbacks, testing of system operation or in cases of heat pump only operation.
- **CBP can be disabled by setting the time delay setting to Request Code 394, by setting Mode setting 9 = 2 on a Mitsubishi Electric remote controller or by setting DIP switch SW1-3 to ON on the Thermostat Interface.**
- In EBP-only mode, the furnace only turns on if there is a call for heat with the outdoor temperature below EBP or the indoor room temperature drops below 46° F while in heat mode.

Request Code Setting for MA Controller

Time Delay Selection Table	
Request Code ¹	Action ²
394	EBP-only operation

¹Time delay can only be selected with MA controller. If use of a non-MA controller is desired, the time delay must first be selected with the MA controller. Then the non-MA controller can be attached and used.

²Delay times are approximate to ± 1 minute.

Mode Setting for Mitsubishi Electric Remote Controller

Mode	Mode no.	Settings	Setting no.	Default setting
Furnace control- time delay	9	Normal operation	1	1
		Economic Balance Point (EBP)-only operation	2	

DIP Switch Setting for Thermostat Interface

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

This product is designed and intended for use in the residential and commercial environment.

MANUFACTURED BY
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