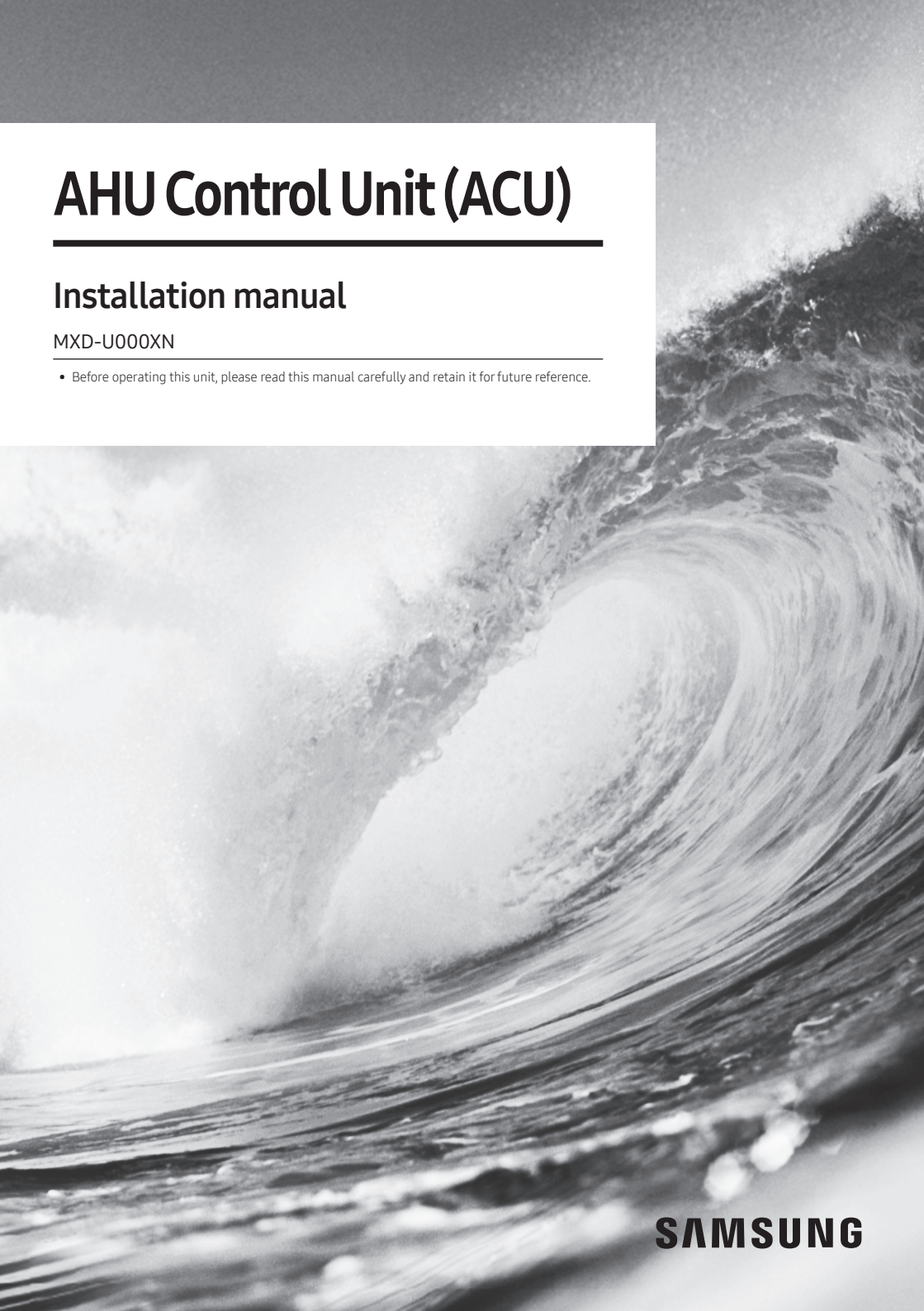
AHU Control Unit (ACU)

Installation manual

MXD-U000XN

- Before operating this unit, please read this manual carefully and retain it for future reference.



SAMSUNG

Contents

Safety Information

California Proposition 65 Warning (US)

⚠ WARNING : Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

This installation manual explains how to install a AHU Control Unit (ACU) connected to your system air conditioner. Please read this manual thoroughly before installing the product. (Please refer to appropriate installation for any optional product installation.)

⚠ WARNING

- Hazards or unsafe practices that may result in severe personal injury or death.

⚠ CAUTION

- Hazards or unsafe practices that may result in minor personal injury or property damage.

⚠ WARNING

Turn off the power before installation, service, and cleaning.

Contact a service centre for installation.

- Potential risk of malfunction, water leak, electric shock and fire.

Install the product on a hard and even place that can support its weight.

- If the place cannot support its weight, the product may fall down and it may cause product damage.

Install the product with proper power supply.

- Potential risk of fire or product damage.

Do not move or reinstall the product on your discretion.

- Potential risk of electric shock or fire.

Consult the place of purchase or a contact centre to disassemble or repair the product.

- Potential risk of malfunction, electric shock, or fire.

Check if the installation work is done correctly according to the installation manual.

- Incorrect installation may cause electric shock or fire.

The electric work must be done by qualified person according to national wiring regulations and installation guide.

- If an unauthorized person performs the installation, any resulting defects can cause malfunctions, electrical shocks, or fire accidents.

When you want to dispose your AHU Control Unit (ACU), ask the service centre.

⚠ CAUTION

Do not install the product where there's combustible gas.

- Potential risk of fire and explosion.

Do not install the product in areas exposed to oil or vapor.

- Potential risk of product damage or malfunction.

Ensure no water gets into the AHU Control Unit (ACU).

- Potential risk of electric shock or fire.

Do not put undue stress on the power cable.

- Potential risk of broken cable and fire.

Do not install the product in areas with frequent use of acid or alkali spray.

- Potential risk of electric shock or product malfunction.

Do not handle the product with sharp objects.

- Potential risk of electric shock or product damage.

Do not connect power cable to a communication terminal.

- Potential risk of fire.

Be cautious not to interfere any other electrical devices if the product is installed in a place such as hospital.

- Potential risk of product malfunction.

Safety Information

Section 15.105 Information to the user.

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception,

Section 15.21 Information to user

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that from.

Samsung gives notice of the following legal disclaimer.

Information on performance regarding the Basic Model Group(BMG) can be obtained from AHRI (Air-Conditioning, Heating, and Refrigeration Institute). Performance registered in ICM (Independent Coil Manufacturers) can be guaranteed fully by members of ICM. Partial system changes or performance changes are not provided by SAMSUNG or members of ICM. Refer to the table below for information regarding compatibility.

Allowable indoor unit coil volume

Capacity (tons)	Minimum Coil Volume [in³(l)]	Maximum Coil Volume [in³(l)]
2	91.54(1.5)	213.58(3.5)
3	122.05(2.0)	244.09(4.0)
3	152.56(2.5)	335.63(5.5)
4	152.56(2.5)	335.63(5.5)
5	183.07(3.0)	366.14(6.0)

Allowable indoor unit connections

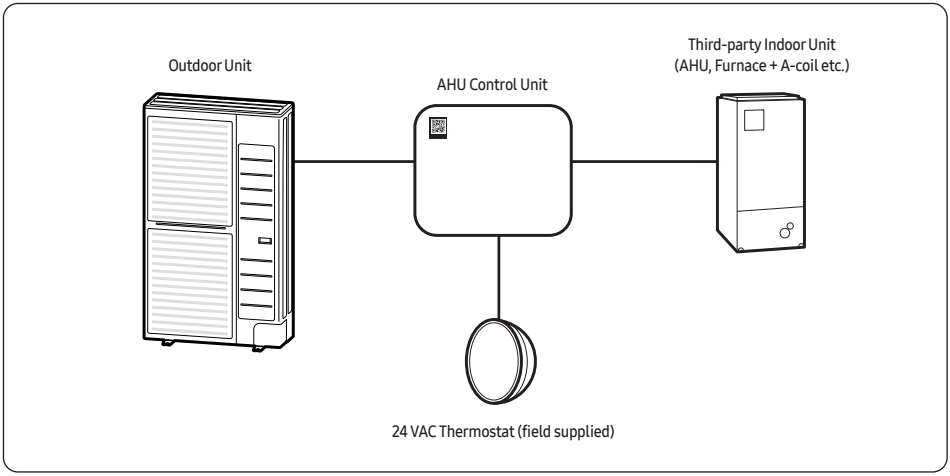
Outdoor Unit Capacities (ton)	Allowed Indoor Unit Connections (ton)	Performance (ton)	Efficiency
2	1.5	1.5	Less
	2	2	As published (AHRI)
	2.5	2	More
3	2.5	2.5	Less
	3	3	As published (AHRI)
	3.5	3	More
4	3.5	3.5	Less
	4	4	As published (AHRI)
	4.5	4	More
5	4.5	4.5	Less
	5	5	As published (AHRI)
	5.5	5	More

Before Installation

Functions of the AHU Control Unit (ACU)

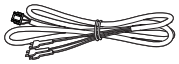
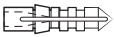
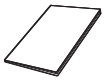
- The AHU Control Unit (ACU) controls the system based on input signals from a 24VAC thermostat.
- The AHU Control Unit (ACU) provides 24 VAC output signals for the thermostat to the third-party indoor unit. See page 8 for the circuit diagram for the AHU Control Unit (ACU).

Structure Diagram of the AHU Control Unit (ACU)

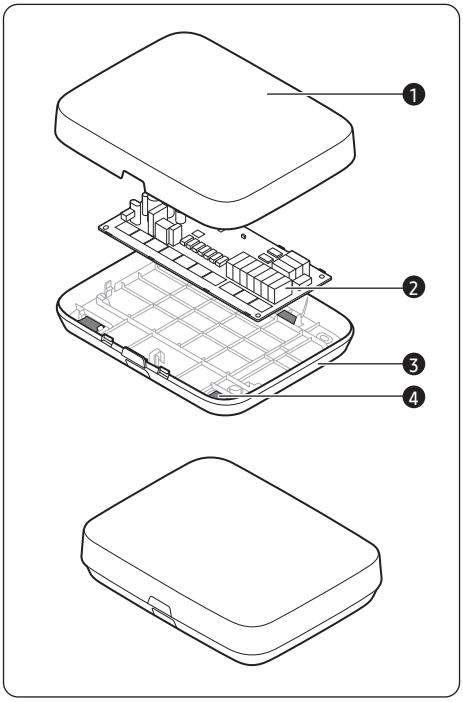


Installation

Accessories

AHU Control Unit (ACU)	Cable tie (2)
	
M4x16 screw (4)	U-ring (20)
	
Fan speed control wire (1)	Holder lock (4)
	
Installation manual (1)	Wire label (1)
	

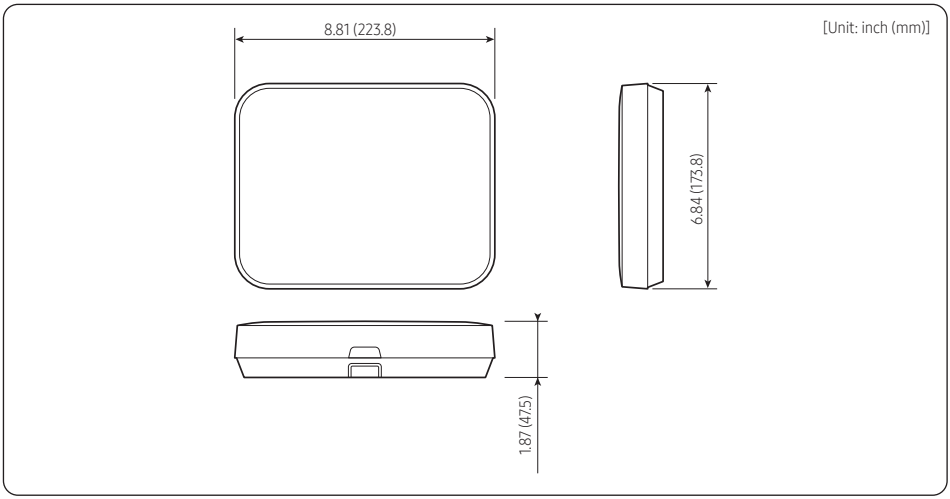
External appearance



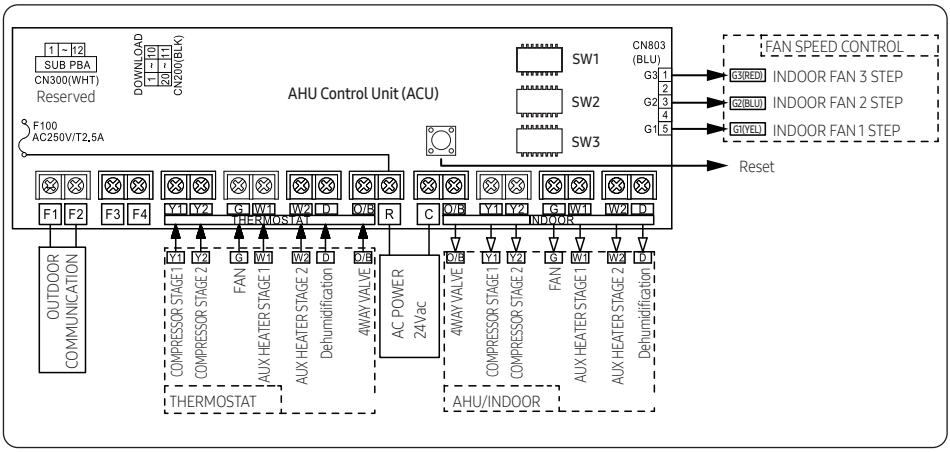
No.	Parts and components
1	Front cover (Case-top)
2	PCB
3	Rear cover (Case-bottom)
4	Magnet

Installation

External dimensions



Circuit diagram

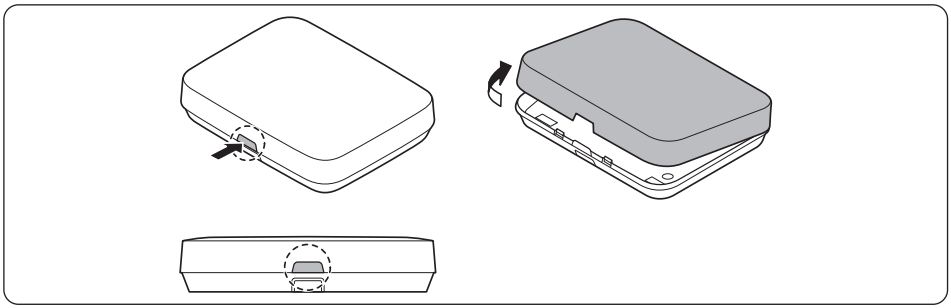


Installation

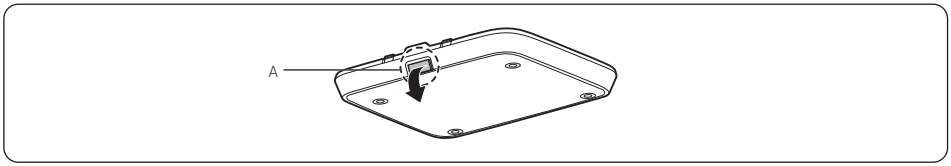
⚠ CAUTION

- The AHU Control Unit (ACU) should be installed by a qualified person, according to the relevant local wiring regulations and this installation manual.
- Turn off the power before connecting the terminals.
- Install wires according to the relevant electrical wiring regulations. Ensure that the wires are installed inside the indoor unit or on a wall near the indoor unit, to prevent access by users.
- Do not install the AHU Control Unit (ACU) outdoors.
- Do not install the AHU Control Unit (ACU) in a location with direct sunlight or a location with a risk that the AHU Control Unit (ACU) may come into contact with liquid or may be impacted.
- Close the AHU Control Unit (ACU) securely.

1 Push the middle area of the AHU Control Unit (ACU) to separate the front cover, as shown in the figure.



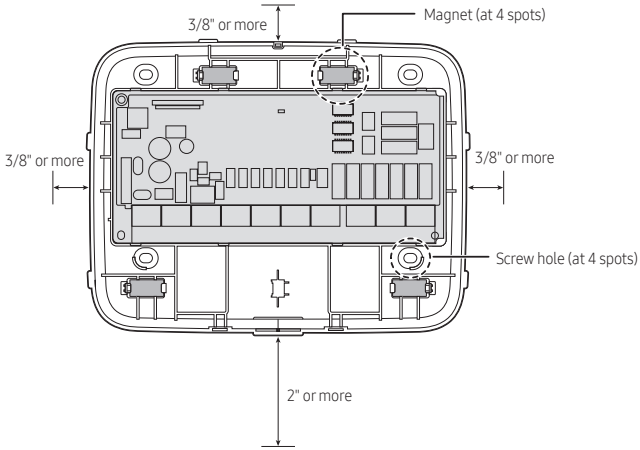
2 Before affixing the AHU Control Unit (ACU), remove area A on the rear cover as shown in the figure below. Insert wires into this opening.



Installation

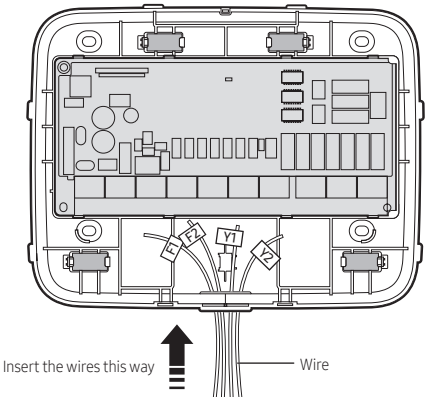
3 The magnets attached to the rear cover can be used to fix the device to the indoor unit. If the device cannot be fixed properly with the magnets, use the supplied screws to fix to the unit or a nearby structure.

- Before attaching the rear cover, ensure there are gaps of at least 3/8" along the top and the left and right sides of the device and a gap of at least 2" along the bottom.



4 Insert the wires into the device by passing them through the opening created in step 2.

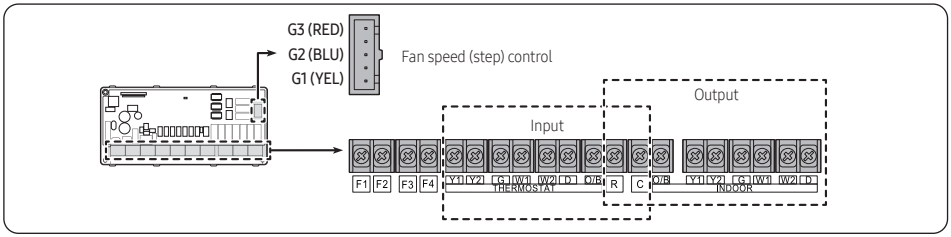
5 Use the supplied labels to label the wires before connecting to the corresponding terminals.



Label the wires at your AHU Control Unit.
Etiquete los cables de la unidad de control de la AHU.
Étiquetez les câbles sur votre unité de commande AHU.

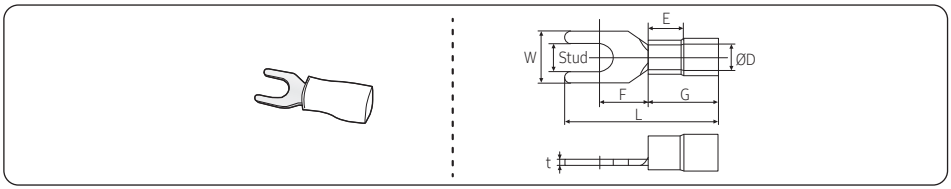
Outdoor		Thermostat		Indoor	
F1	F1	Y1	Y1	Y1	Y1
F2	F2	Y2	Y2	Y2	Y2
F3	F3	G	G	G	G
F4	F4	W1	W1	W1	W1
		W2	W2	W2	W2
		D	D	D	D
		O/B	O/B	O/B	O/B
		R	R	R	R
		C	C	C	C

6 Connect the wires to the corresponding terminal blocks. For wiring instructions, refer to wiring diagrams on page 13 to 24.



Name	Description	
Terminal Block	F1	Outdoor unit communication
	F2	Outdoor unit communication
	F3	Reserved
	F4	Reserved
	Y1	Compressor Stage 1
	Y2	Compressor Stage 2
	G	Indoor fan
	W1	Auxiliary heater Stage 1
	W2	Auxiliary heater Stage 2
	D	Dehumidification
	O/B	4-way reversing valve
	R	AC Power 24 V
	C	AC Power 24 V
Connector	G1	Fan speed (step) control, YEL
	G2	Fan speed (step) control, BLU
	G3	Fan speed (step) control, RED

Compression ring terminal specifications for connection to the AHU Control Unit (ACU) PCB.

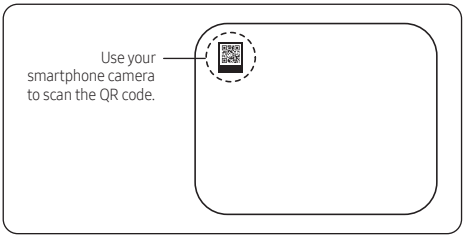


Range of Permitted Wires		Rated Size	Stud Size	Basic Size [mm (inch)]						
AWG	mm² (inch²)	mm² (inch²)	mm (inch)	t	ØD	G	E	F	W	L
22 to 16	0.25 to 1.65 (0.0003 to 0.0025)	1.5 (0.0023)	3 (0.1181)	0.7 (0.0275)	3.8 (0.1496)	10.0 (0.3937)	4.5 (0.1771)	6.5 (0.2559)	6.0 (0.2362)	21.2 (0.8346)

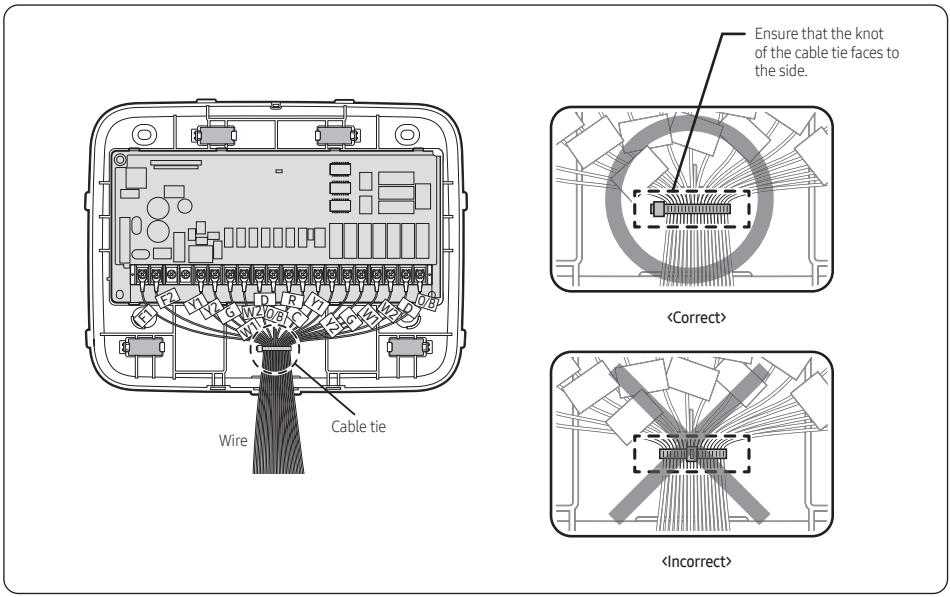
- F1, F2 communication wire: Maximum distance from outdoor unit to the ACU: 100m (328 ft)
- F1, F2 communication wires: 18 AWG solid core

Installation

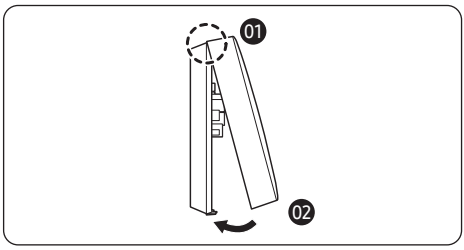
7 Set the DIP switches to fit the application requirements. Scan the QR code attached to the front cover of the AHU Control Unit (ACU) using a smartphone camera to use an on-line system configuration wizard. For further information about DIP switch settings, refer to the Option Setting on page 25 to 30.



8 Pass the supplied cable tie through the wire organizer loop, secure the wires connected to the terminal blocks. Ensure that the knot of the cable tie faces the side.



9 Align the front cover with the top of the AHU Control Unit (ACU) body, and then close the front cover.



NOTE

- After assembly, make sure that no wires are caught in the gap between the front and rear covers.

Wiring Diagram

Wiring

- The AHU Control Unit (ACU) must be powered by the same transformer as the indoor unit. If more than one transformer is used, product damage will occur.
- Maximum power consumption of the AHU Control Unit(ACU) is 3W.
- If a 1-stage thermostat is used, connect the Y output to either the Y1 or Y2 input terminal on the AHU Control Unit (ACU). Use a separate jumper wire to connect Y1 to Y2 of the AHU Control Unit (ACU).
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the AHU Control Unit (ACU).

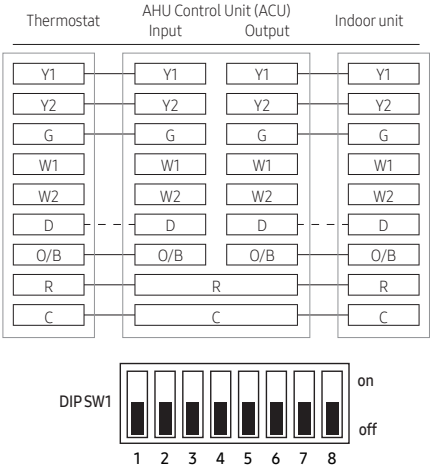
⚠ CAUTION

- Turn off the power before connecting the terminals.
- Use appropriate tools for wiring. Be sure to connect the wires tightly using a tightening torque less than the standard torque, to withstand external pressure.
- Screws on the PCB terminal must be tightened with less than a 0.53 lbf·in (6 N·cm) tightening torque. If a greater tightening torque is used, the screw thread may become damaged.
- After connecting the terminals, organize the wires properly to prevent overheating, electric shock or fire.
- Make sure that only 24 VAC is connected to the terminal blocks of the AHU Control Unit (ACU). Samsung is not responsible for any accident resulting from use of power that is not 24 VAC.

Installation

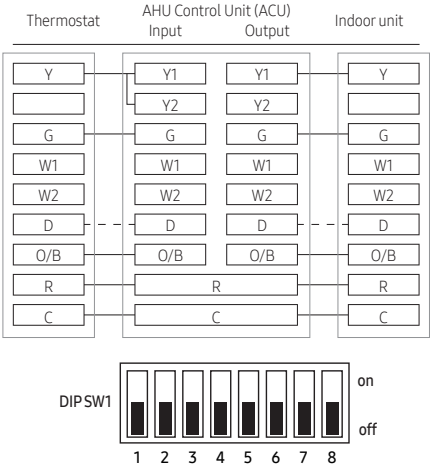
AHU with Heat Pump Configuration

2 Stage Thermostat, 2 Stage AHU



- Please review the Option Settings section for additional system option settings.
- If the system is used as a heat pump and there is no auxiliary heater, configure the thermostat as a 2 stage heat pump and configure the 4-Way reversing valve to B. If a W1 or W2 signal is input, the heat pump turns off.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

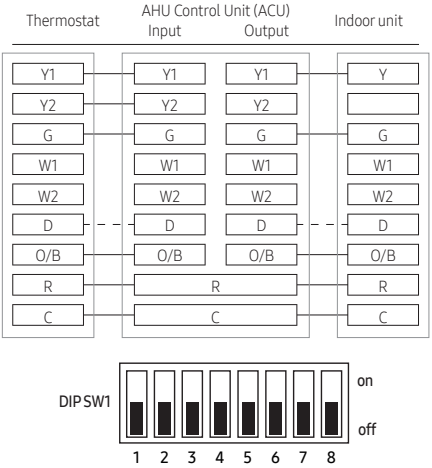
1 Stage Thermostat, 1 Stage AHU



- Please review the Option Settings section for additional system option settings.
- If the system is used as a heat pump and there is no auxiliary heater, configure the thermostat as a 1 stage heat pump and configure the 4-Way reversing valve to B. If a W1 or W2 signal is input, the heat pump turns off.
- If a single stage(1-stage) thermostat is used, connect the Y output to either the Y1 or Y2 input terminal on the AHU Control Unit (ACU). Use a separate jumper wire to connect Y1 to Y2 of the AHU Control Unit (ACU).
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

AHU with Heat Pump Configuration (continued)

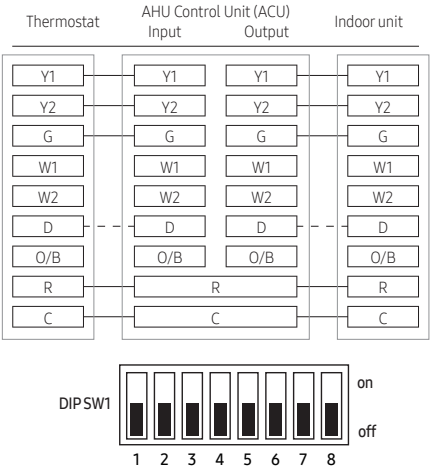
2 Stage Thermostat, 1 Stage AHU



- Please review the Option Settings section for additional system option settings.
- If the system is used as a heat pump and there is no auxiliary heater, configure the thermostat as a 2 stage heat pump and configure the 4-Way reversing valve to B. If a W1 or W2 signal is input, the heat pump turns off.
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

AHU with Cooling-only Configuration

2 Stage Thermostat, 2 Stage AHU

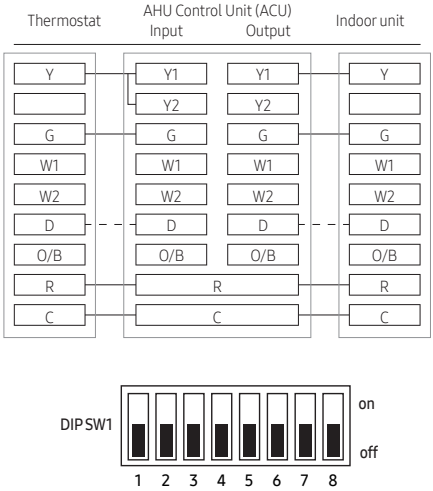


- Please review the Option Settings section for additional system option settings.
- If the system is used as cooling-only and there is no auxiliary heater, configure the thermostat as 2 stage, cooling-only system. If a W1 or W2 signal is input, the air-conditioner turns off.
- Use the key switch on the outdoor unit to select Cooling only before using the system.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

Installation

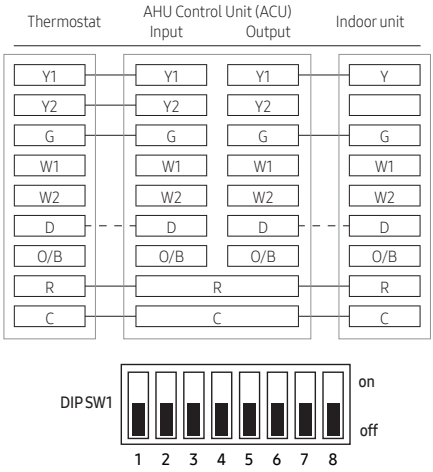
AHU with Cooling-only Configuration (continued)

1 Stage Thermostat, 1 Stage AHU



- Please review the Option Settings section for additional system option settings.
- If the system is used as cooling-only and there is no auxiliary heater, configure the thermostat as 1 stage, cooling-only system. If a W1 or W2 signal is input, the air-conditioner turns off.
- If a single stage(1-stage) thermostat is used, connect the Y output to either the Y1 or Y2 input terminal on the AHU Control Unit (ACU). Use a separate jumper wire to connect Y1 to Y2 of the AHU Control Unit (ACU).
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Use the key switch on the outdoor unit to select Cooling only before using the system.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

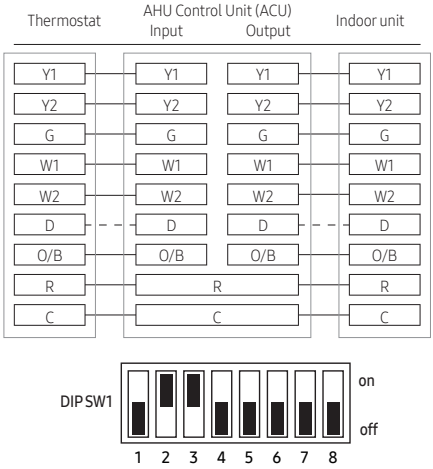
2 Stage Thermostat, 1 Stage AHU



- Please review the Option Settings section for additional system option settings.
- If the system is used as cooling-only and there is no auxiliary heater, configure the thermostat as 2 stage, cooling-only system. If a W1 or W2 signal is input, the air-conditioner turns off.
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Use the key switch on the outdoor unit to select Cooling only before using the system.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

AHU + Electric Heat with Heat Pump Configuration

2 Stage Thermostat, 2 Stage AHU

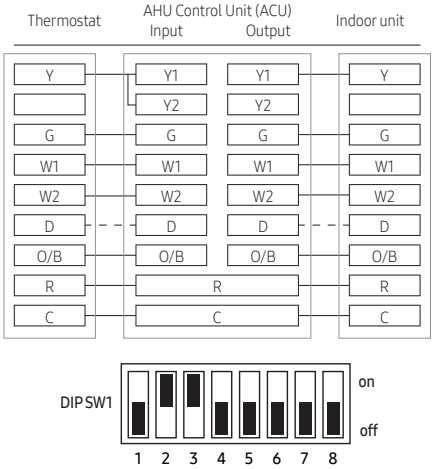


- Please review the Option Settings section for additional system option settings.
- If an auxiliary heater is installed and the heater can operate simultaneously with the heat-pump, configure the thermostat as a 2 stage heat pump and configure the 4-way reversing valve to B. If a W1 or W2 signal is input, the heat-pump and auxiliary heater can operate simultaneously.

NOTE

  - If there is a separate emergency signal, set DIP SW1-3 to Off, and connect it to the W2 input terminal in the thermostat section of the AHU Control Unit (ACU).
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

1 Stage Thermostat, 1 Stage AHU



- Please review the Option Settings section for additional system option settings.
- If an auxiliary heater is installed and the heater can operate simultaneously with the heat-pump, configure the thermostat as a 1 stage heat pump and configure the 4-way reversing valve to B. If a W1 or W2 signal is input, the heat-pump and auxiliary heater can operate simultaneously.

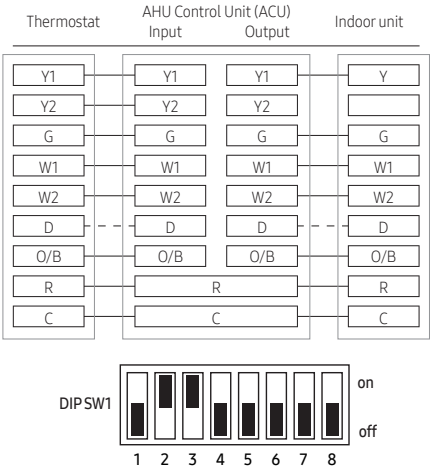
NOTE

  - If there is a separate emergency signal, set DIP SW1-3 to Off, and connect it to the W2 input terminal in the thermostat section of the AHU Control Unit (ACU).
- If a single stage(1-stage) thermostat is used, connect the Y output to either the Y1 or Y2 input terminal on the AHU Control Unit (ACU). Use a separate jumper wire to connect Y1 to Y2 of the AHU Control Unit (ACU).
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

Installation

AHU + Electric Heat with Heat Pump Configuration (continued)

2 Stage Thermostat, 1 Stage AHU



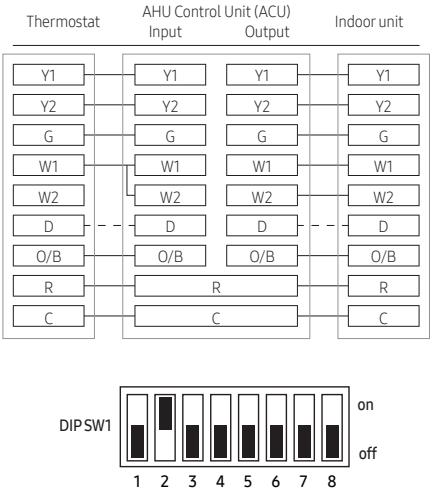
- Please review the Option Settings section for additional system option settings.
- If an auxiliary heater is installed and the heater can operate simultaneously with the heat-pump, configure the thermostat as a 2 stage heat pump and configure the 4-way reversing valve to B. If a W1 or W2 signal is input, the heat-pump and auxiliary heater can operate simultaneously.

NOTE

  - If there is a separate emergency signal, set DIP SW1-3 to Off, and connect it to the W2 input terminal in the thermostat section of the AHU Control Unit (ACU).
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

AHU + Electric Heat (emergency heat) with Heat Pump Configuration

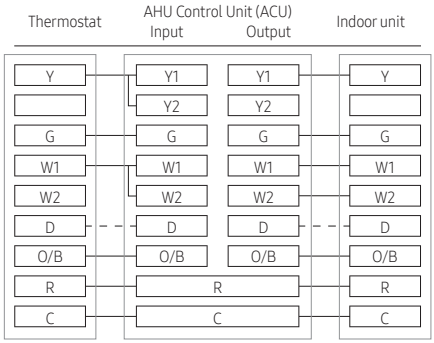
2 Stage Thermostat, 2 Stage AHU

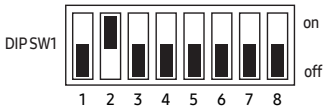


- Please review the Option Settings section for additional system option settings.
- If an auxiliary heater is installed and the heater will be used as emergency heat, configure the thermostat as follows: 2 stage heat pump, 4-way reversing valve to B, and Aux heat to Emergency Heat. If a W1 signal is input, the heat-pump and auxiliary heater turn off as the heat pump and emergency heater cannot operate simultaneously.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

AHU + Electric Heat (emergency heat) with Heat Pump Configuration (continued)

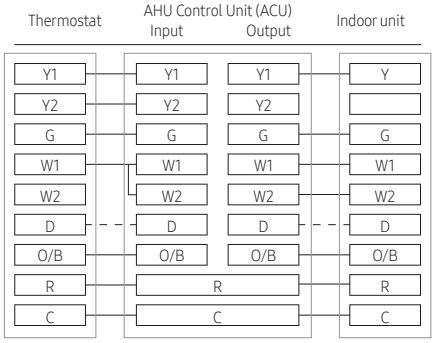
1 Stage Thermostat, 1 Stage AHU

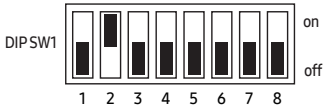




- Please review the Option Settings section for additional system option settings.
- If an auxiliary heater is installed and the heater will be used as emergency heat, configure the thermostat as follows: 1 stage heat pump, 4-way reversing valve to B, and Aux heat to Emergency Heat. If a W1 signal is input, the heat-pump and auxiliary heater turn off as the heat pump and emergency heater cannot operate simultaneously.
- If a single stage(1-stage) thermostat is used, connect the Y output to either the Y1 or Y2 input terminal on the AHU Control Unit (ACU). Use a separate jumper wire to connect Y1 to Y2 of the AHU Control Unit (ACU).
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

2 Stage Thermostat, 1 Stage AHU



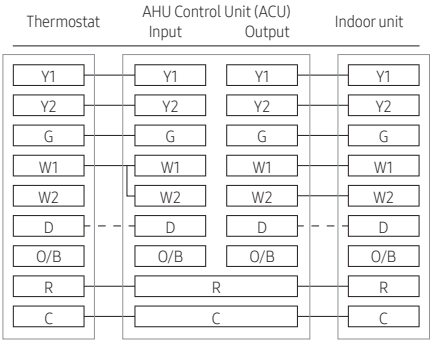


- Please review the Option Settings section for additional system option settings.
- If an auxiliary heater is installed and the heater will be used as emergency heat, configure the thermostat as follows: 2 stage heat pump, 4-way reversing valve to B, and Aux heat to Emergency Heat. If a W1 signal is input, the heat-pump and auxiliary heater turn off as the heat pump and emergency heater cannot operate simultaneously.
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

Installation

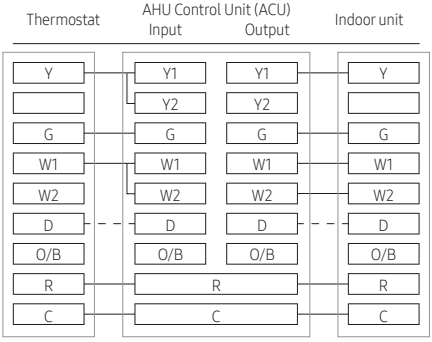
AHU + Electric Heat with Cooling-only Configuration

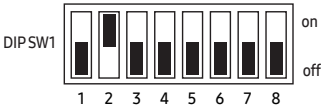
2 Stage Thermostat, 2 Stage AHU



- Please review the Option Settings section for additional system option settings.
- If the system is used as cooling-only with auxiliary heater, configure the thermostat as a 2 stage cooling-only system. If a W1 or W2 signal is input, the air conditioner and auxiliary heater turn off.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

1 Stage Thermostat, 1 Stage AHU

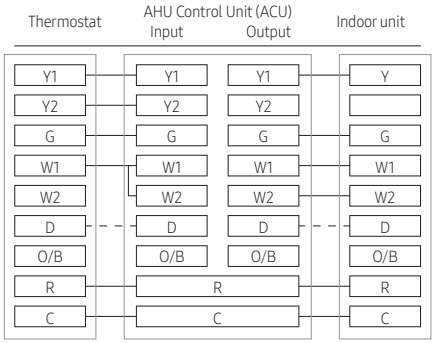




- Please review the Option Settings section for additional system option settings.
- If the system is used as cooling-only with auxiliary heater, configure the thermostat as a 1 stage cooling-only system. If a W1 or W2 signal is input, the air conditioner and auxiliary heater turn off.
- If a single stage(1-stage) thermostat is used, connect the Y output to either the Y1 or Y2 input terminal on the AHU Control Unit (ACU). Use a separate jumper wire to connect Y1 to Y2 of the AHU Control Unit (ACU).
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Use the key switch on the outdoor unit to select Cooling only before using the system.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

AHU + Electric Heat with Cooling-only Configuration (continued)

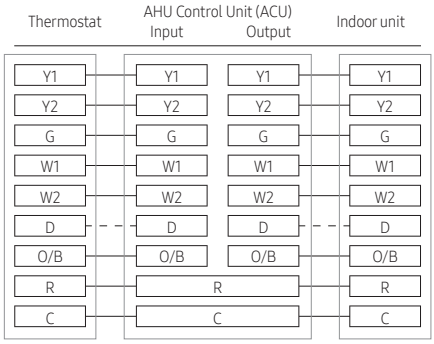
2 Stage Thermostat, 1 Stage AHU



- Please review the Option Settings section for additional system option settings.
- If the system is used as cooling-only with auxiliary heater, configure the thermostat as a 2 stage cooling-only system. If a W1 or W2 signal is input, the air conditioner and auxiliary heater turn off.
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Use the key switch on the outdoor unit to select Cooling only before using the system.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

A-Coil + Furnace with Heat Pump Configuration

2 Stage Thermostat, 2 Stage Furnace

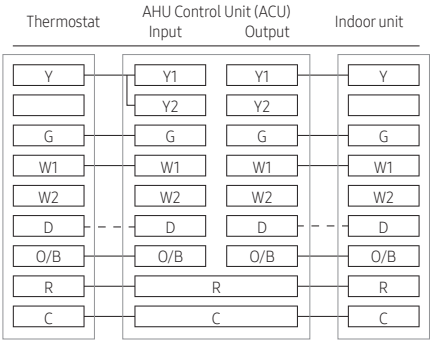


- Please review the Option Settings section for additional system option settings.
- When the system consists of an A-coil and a furnace and the outdoor unit will be configured to be used as a heat pump, configure the thermostat as follows: 2 stage heat pump, 4-way reversing valve to B, and Aux heat to Emergency Heat. If a W1 or W2 signal is input, the heat-pump turns off.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

Installation

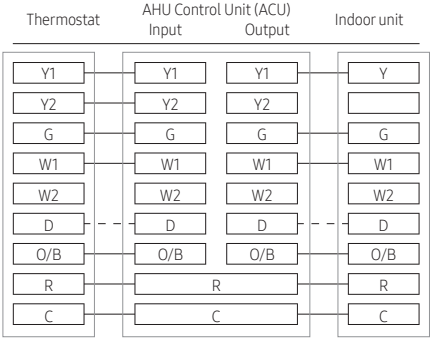
A-Coil + Furnace with Heat Pump Configuration (continued)

1 Stage Thermostat, 1 Stage Furnace



- Please review the Option Settings section for additional system option settings.
- When the system consists of an A-coil and a furnace and the outdoor unit will be configured to be used as a heat pump, configure the thermostat as follows: 1 stage heat pump, 4-way reversing valve to B, and Aux heat to Emergency Heat. If a W1 or W2 signal is input, the heat-pump turns off.
- If a single stage(1-stage) thermostat is used, connect the Y output to either the Y1 or Y2 input terminal on the AHU Control Unit (ACU). Use a separate jumper wire to connect Y1 to Y2 of the AHU Control Unit (ACU).
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

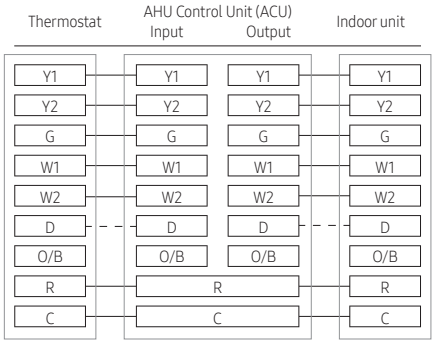
2 Stage Thermostat, 1 Stage Furnace

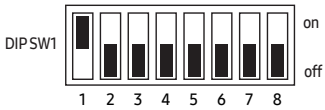


- Please review the Option Settings section for additional system option settings.
- When the system consists of an A-coil and a furnace and the outdoor unit will be configured to be used as a heat pump, configure the thermostat as follows: 2 stage heat pump, 4-way reversing valve to B, and Aux heat to Emergency Heat. If a W1 or W2 signal is input, the heat-pump turns off.
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

A-Coil + Furnace with Cooling-only Configuration

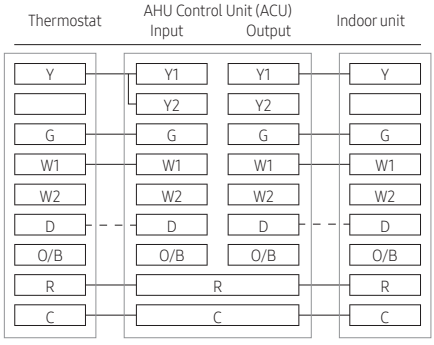
2 Stage Thermostat, 2 Stage Furnace

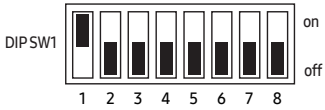




- Please review the Option Settings section for additional system option settings.
- When the system consists of an A-coil and a furnace and the outdoor unit will be configured to be used as cooling-only, configure the thermostat as follows: 2 stage cooling-only system and Aux heat to Emergency Heat. If a W1 or W2 signal is input, the air conditioner turns off.
- Use the key switch on the outdoor unit to select Cooling only before using the system.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

1 Stage Thermostat, 1 Stage Furnace

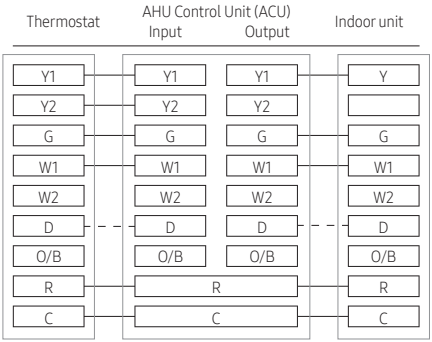


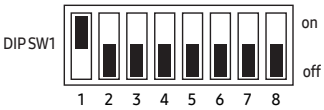


- Please review the Option Settings section for additional system option settings.
- When the system consists of an A-coil and a furnace and the outdoor unit will be configured to be used as cooling-only, configure the thermostat as follows: 1 stage cooling-only system, and Aux heat to Emergency Heat. If a W1 or W2 signal is input, the air conditioner turns off.
- If a single stage(1-stage) thermostat is used, connect the Y output to either the Y1 or Y2 input terminal on the AHU Control Unit (ACU). Use a separate jumper wire to connect Y1 to Y2 of the AHU Control Unit (ACU).
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Use the key switch on the outdoor unit to select Cooling only before using the system.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

A-Coil + Furnace with Cooling-only Configuration (continued)

2 Stage Thermostat, 1 Stage Furnace





- Please review the Option Settings section for additional system option settings.
- When the system consists of an A-coil and a furnace and the outdoor unit will be configured to be used as cooling-only, configure the thermostat as follows: 2 stage cooling-only system and Aux heat to Emergency Heat. If a W1 or W2 signal is input, the air conditioner turns off.
- If the indoor unit only has a Y input terminal, connect it to the Y1 output terminal in the Indoor section of the AHU Control Unit (ACU).
- Use the key switch on the outdoor unit to select Cooling only before using the system.
- Connection of the dehumidification (D) terminal is optional. If the thermostat and the AHU/furnace supports a dehumidification signal, the outdoor unit and AHU Control Unit (ACU) will adjust operation to optimize dehumidification.

Option settings

Thermostat settings

- Heat pump stage: It is recommended that a 2-stage thermostat be used with this device.
- O/B Reversing valve: energized on heat, Configure as B at thermostat.
- Minimum compressor downtime: 180 seconds or more
- Minimum compressor uptime: 300 seconds or more

⚠ CAUTION

- The compressor may become damaged if the settings specified above are not used. If it is not possible to configure settings from the thermostat or if the device is installed in an environment where a 1-stage thermostat turns on and off frequently, lower the target pressure setting using the outdoor unit option settings to allow the thermostat to operate for more than 5 minutes.

- To ensure smooth control, set the difference between the Stage 2 activation temperature and set temperature to 3–4 °F.

Option settings for the AHU Control Unit (ACU)

- Press and hold the K1 switch for more than 1 second to reset the device.
- After changing DIP SW setting, reset power supply or press the K1(reset) button to update the changes.
- Heat Dissipation Time: If the indoor unit or thermostat does not have a fan delay time during defrost control, cold wind prevention control, and fan off delay setting options and the motor is controlled via the G1/G2/G3 terminals, it is recommended that settings be configured as follows:

Options	Option settings	Heat dissipation time
Fan delay time during defrost control and cold wind prevention control	• DIP SW3-19: Off • DIP SW3-20: On	10 seconds
Fan off delay	• DIP SW3-21: On • DIP SW3-22: Off	30 seconds

- Auxiliary Heater simultaneous operation: If an auxiliary heater is installed and you want to operate the heater and heat pump simultaneously via the W1 terminal, set DIP SW1-2 to On. To also use the auxiliary heater via the W2 terminal, set DIP SW1-3 to On.

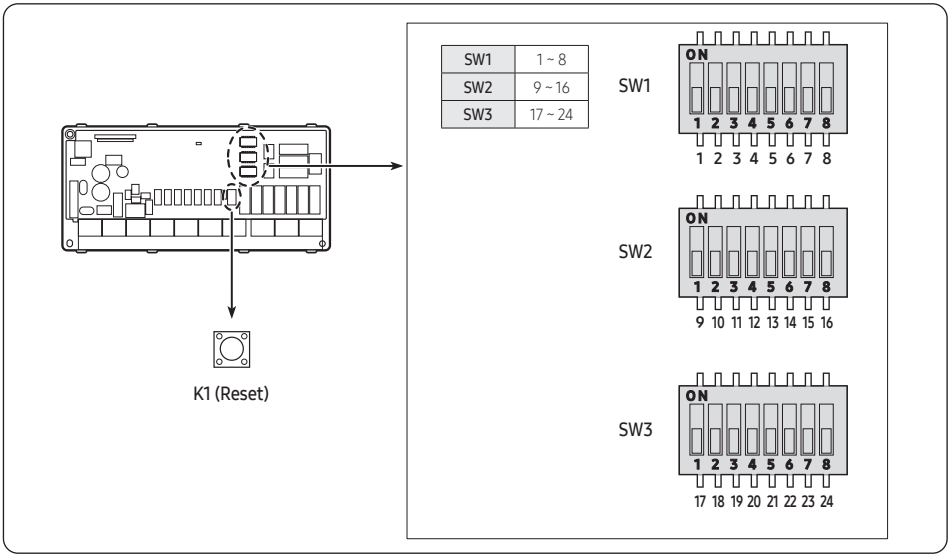
⚠ CAUTION

- If DIP SW values are not set and W1 and/or W2 signals are received at the AHU Control Unit (ACU), the heat pump stops operation.

- When configured for 3-step control (automatically adjusts the fan speed using according to the indoor load), it is recommended that a 2-stage thermostat is used. If a 1-stage thermostat is used and 3-step control (Y connection only) option is enabled, the indoor fan speed may decrease or the heat pump reaction may be delayed when the load or set temperature fluctuates.

Installation

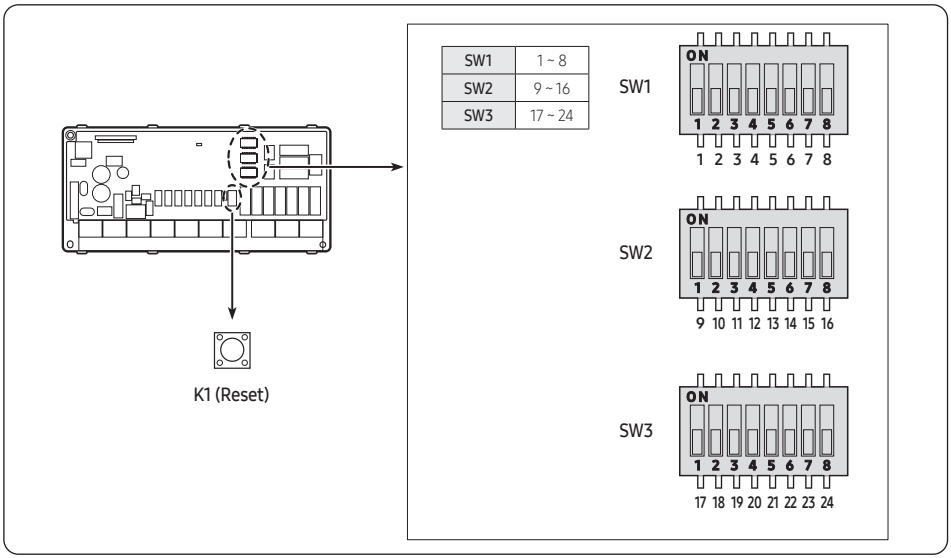
Option settings



SW1-1		System
On		Furnace with A-coil (dual fuel or cooling only)
Off		Air handling unit (Default)
SW1-2		**Auxiliary heater installed for heat pump [1)]**
On		Yes
Off		No auxiliary heat / furnace (default)
SW1-3		**Heat sources option (W2) [2)]**
On		Auxiliary heat
Off		Emergency heat (Default)
SW1-4 to 1-8		**Reserved**
SW2-9	SW2-10	**Fan step control**
On	On	Disable
Off	On	3 step fan speed control for 1 stage thermostats (Y connection only) [3)]
On	Off	3 step fan speed control for 2 stage thermostats (Y1 and Y2 connection) [4)]
Off	Off	Disable (Default)
SW2-11		**Cold wind prevention [5)]**
On		Disable
Off		Enable (Default)
SW2-12		**Fan stop control during defrost operation [6)]**
On		Disable
Off		Enable (Default)

* Refer to page 13 to 24 for Wiring diagrams.

Option settings



SW2-13		Reserved
SW2-14		Enhanced dehumidification control [7]
On		Disable
Off		Enable (Default)
SW2-15 ~ 2-16		Reserved
SW3-17 ~ 3-18		Reserved
SW3-19	SW3-20	Fan delay time during defrost control and cold wind prevention control [8]
On	On	15 seconds
Off	On	10 seconds
On	Off	5 seconds
Off	Off	0 seconds (Default)
SW3-21	SW3-22	Fan off delay [9]
On	On	90 seconds
Off	On	60 seconds
On	Off	30 seconds
Off	Off	0 seconds (Default)
SW3-23 ~ 3-24		Reserved
K1		Reset

* Refer to page 13 to 24 for Wiring diagrams.

Option setting details

NOTE

- After changing DIP SW setting, reset power supply or press the K1 (Reset) button, to update the changes.

Options	Option setting details
1) Auxiliary heater installed for heat pump SW1-2	• For heat pump applications, if an auxiliary heater is installed, set SW1-2 to On. If SW1-2 is set to Off, the W1 and W2 input/output terminals on the AHU Control Unit (ACU) are disabled. **⚠ CAUTION** • If SW1-2 is not set to On and the W1 and W2 signals of the thermostat are received at the AHU Control Unit (ACU), the heat pump will turn off and the AHU Control Unit (ACU) does not output W1 and W2 signals to the indoor unit. • If SW1-1 is set to "Furnace with A-coil (dual fuel or cooling only)", set SW1-2 to Off and connect the furnace output signal of the thermostat to W1 of the AHU Control Unit (ACU). **⚠ CAUTION** • If SW1-2 is set to Off and a signal is input to W1 of the AHU Control Unit (ACU), the heat pump stops operation.
2) Heat sources option (W2) SW1-3	• If the thermostat outputs stage 2 auxiliary heater signals, set SW1-3 to On. If the thermostat outputs an "Emergency heat" signal, set SW1-3 to Off. **⚠ CAUTION** • If SW1-1 is set to Heat-pump and SW1-2 is set to Off, there is no W2 signal input or output in the AHU Control Unit (ACU).
3) 3 step fan speed control for 1 stage thermostats (Y connection only) SW2-9 and 2-10	• This can only be turned on when a 1-stage thermostat is used. • The fan speed control logic is as follows: – High: Used during the initial stage of cooling/heating operation – Mid: When the following cycle occurs 2 times sequentially: Used when High speed is enabled and the thermostat turns off within 30 minutes after turning on within 20 minutes after turning off. – Low: When the following cycle occurs 2 times sequentially: Used when Mid speed is enabled and the thermostat turns off within 30 minutes after turning on within 20 minutes after turning off. – If cooling/heating operation if Mid/Low speed continues for more than 30 minutes, the fan speed increases by one level. • G1 (Low) / G2 (Mid) / G3 (High) signals will also be enabled simultaneously.

Options	Option setting details
4) 3 step fan speed control for 2 stage thermostats (Y1 and Y2 connection) **SW2-9 and 2-10**	• This can only be turned on when a 2-stage thermostat is used. • The fan speed control logic is as follows: – High: Used during Stage 2 operation – Mid: Used during Stage 1 operation – Low: Used when operation in Mid speed continues for 30 minutes – Fan speed changes to High if a Stage 2 signal is input during operation in Mid/ Low fan speed mode. • Stage 1 performance control logic: If the mode switches to Stage 1 from Stage 2 due to a decrease in the difference between the set temperature and indoor temperature and then the mode returns to Stage 2 due to a failure to reach the set temperature because of low performance of Stage 1, the target pressure for Stage 1 is calibrated when the mode switches to Stage 1, to increase the performance of Stage 1. • G1 (Low) / G2 (Mid) / G3 (High) signals will also be enabled simultaneously.
5) Cold wind prevention **SW2-11**	• Stops the fan until the heat exchanger warms up to prevent cold air during the initial stage of heating operation. • The fan operates if high pressure increases to 290 psi or more during the initial stage of heating operation. • When this feature is activated, the fan will remain idle for a maximum of 5 minutes. **⚠ CAUTION** • When set to enable, this feature is activated when the compressor starts operation in heating mode to keep the fan off while the compressor is operating. Once the compressor starts operation, the fan is kept off during the control regardless of whether the fan is set to non-stop from the thermostat.
6) Fan stop control during defrost operation **SW2-12**	• Prevents cold air during defrost operation by stopping the fan. • Stops fan operation when the heat pump enters defrost mode and keeps the fan stopped until the defrost operation is complete. • If this feature is set to Disable, after a defrost cycle begins the W1 output terminal on the AHU Control Unit (ACU) will continue outputting 24VAC until the defrost operation is complete. **⚠ CAUTION** • When this feature is set to Enable, it may take longer to complete defrost cycles compared to when it is set to Disable. This feature is disabled if low pressure decreases to 14 psi or lower during defrost operation or if frost is still found after a defrost cycle is complete. This issue may occur if the indoor heat exchanger size is too small for the outdoor capacity or there is a problem with the thermostatic expansion valve (TXV) calibration.

Options	Option setting details
7) Enhanced dehumidification control SW2-14	• Improves dehumidification by improving the cooling performance while dehumidification signals from the thermostat are received. • When this feature is set to Enable, the thermostat may turn off or on frequently. • A dehumidification effect can be increased by turning on this feature and the overcool feature of the thermostat simultaneously.
8) Fan delay time during defrost control and cold wind prevention control SW3-19 and 3-20	• When the fan turns off or on through "cold wind prevention control" and/or "fan stop control during defrost operation," this feature turns on the fan earlier and turns it off later than the heat exchanger and heater during the set period of time, to prevent the heat exchanger or heater from overheating and to remove residual heat in the heater. • If the indoor unit does not have this feature or if the fan is controlled via the G1/G2/G3 terminals, it is recommended that the delay time be set to 10 seconds. • If the indoor unit or thermostat has this feature and you turn on this feature, the set time is added to the default delay time.
9) Fan off delay SW3-21 and 3-22	• Operates the fan for the set period of time when operation of the indoor unit or thermostat is stopped, to remove residual heat in the heat exchanger or heater. • If the indoor unit does not have this feature or the fan is controlled via the G1/G2/G3 terminals, it is recommended that the delay time be set to 30 seconds. • If the indoor unit or thermostat has this feature and you turn on this feature, the set time is added to the default delay time.

Troubleshooting

Refer to the outdoor unit installation manual for information regarding troubleshooting.

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