LAC (Low Ambient Cooling) KIT
Installation manual

V1SNWK01

- Thank you for purchasing this Lennox Product.
- Before operating this unit, please read this manual carefully and retain it for future reference.

LENNOX Powered by SAMSUNG

Contents

Safety Information

California Proposition 65 Warning (US)

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

⚠ **WARNING**

Before installation, maintenance, and cleaning, be sure to cut off the power supply.

The installation shall be conducted by the dealer or qualified personnel.

- If installed by a unqualified person, it may cause leaks, electric shock, or fire.

Be sure to install the product by following the instructions in this manual.

- If not installed properly, it may cause leaks, electric shock, or fire.

The LAC KIT manufacturer does not assume any responsibility for losses or damages caused by careless installation or installation by a unqualified person.

For installation, be sure to use the provided parts and the specified parts and tools.

- If the specified tools are not used, it may cause a fall of the product, leaks, electric shock, or fire.

If the power cable is damaged, be sure to let the cable replaced by the manufacturer, service engineer, or person with equivalent qualification.

Safety Information

The electrical work shall be conducted by the qualified personnel after following Technical Standards for Electrical Equipment, Extension Regulations, and Installation Manual. Additionally, be sure to follow the electrical specifications.

- The voltage drop, lack of voltage supply, inadvertent power work, and use of unspecified wires may cause electric shock or fire.

When wiring the power connection between LAC KIT and outdoor units, the lines must be fixed not to allow movement of structures such as cover of electrical unit. In addition, be sure to fix the cover of electrical unit onto the product.

- If the cover of electrical unit is not securely fixed, it may cause heating of connectors, electric shock, or fire.

For wiring, be sure to use the specified lines and firmly fix them not to allow any external force to the connectors.

- Insecure connection and fixing may cause heating or fire.

Be cautious not to exceed the power limit of LAC KIT or supply power less than the minimum voltage.

- Damage or dysfunction of any electrical part may cause product failure.

Be sure to use the power cable made of copper and use only the rated parts.

Then check the wiring status.

- It may cause fire due to heating.

⚠ CAUTION

Be sure to conduct ground work.

- The ground wire shall not contact the following: gas pipes, water pipes, lightning rod, and telephone grounding wire.
- An incomplete grounding may cause electric shock.

Be sure to place the power and communication lines of LAC KIT at least 1 m apart from other electronic devices and at least 2 m apart from the lightning rod's down conductor.

- Note that noise may occur even in the distance over 1 m depending on the radio interference status.

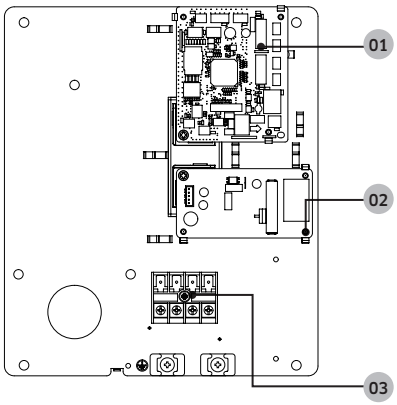
Do not install the product in the following places:

- The place is filled with mineral oil, scattering oil, or steam (e.g. kitchen): Heated resin parts may cause fall of the product or leaks.
- The place generates corrosive gases such as sulfur dioxide (e.g. Room with vents): Corrosion of copper pipes and joints may cause refrigerant leak.
- There is equipment that generates electromagnetic waves: Abnormal operation may be resulted due to malfunction of the controller.
- Flammable gases may leak, carbon fiber dust or flammable gas is floating, and volatile matters such as thinner and gasoline are used: Leak gas may reside in the main valve, which may cause a fire.
- In the place, an indoor unit may be corroded. (e.g. shore, spa, etc.)
- The place is directly affected by external factors (temperature, humidity, dust, etc.).

※ Installation-related claims caused by non-compliance with above requirements are on your own responsibility. (Service cost must be paid by you.)

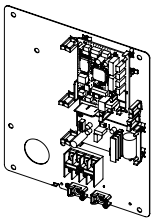
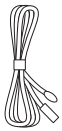
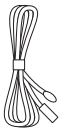
Part Names and Components

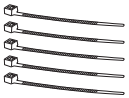
Assy Control Kit



01 MAIN PBA
02 SMPS PBA
03 TERMINAL BLOCK

Components

Name	Body	Communication Cable	Power Cable
Amount	1	1	1
Shape			

Name	Cable Tie	Installation Manual	Grounding Screw	Connection Cable
Amount	5	1	1	2
Shape				

Installing LAC (Low Ambient Cooling) KIT

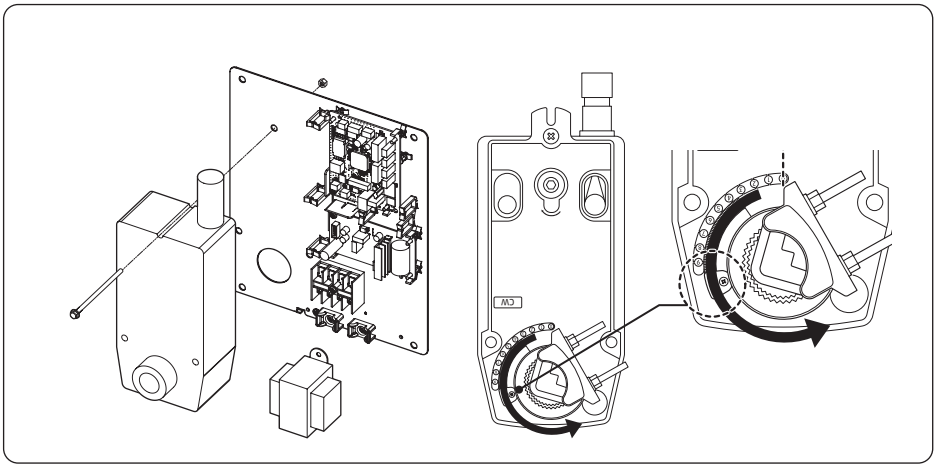
※ Before installation on field, it must be assembled.

Assembling the Assy Control Kit and Low Ambient Damper

1. Connect the actuator to TRANS.
   - Place the actuator and TRANS on the Assy controller kit as shown in the figure and then fix them on the plate with bolts, nuts, and screws.

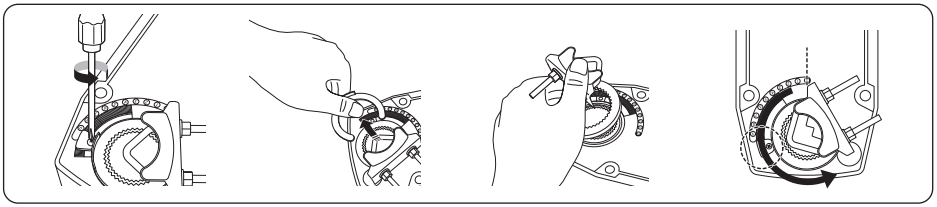
Note

- Assemble them with the same alignment and rotation for the actuator as the figure below. If its alignment and rotation are not correct, it may cause malfunction.



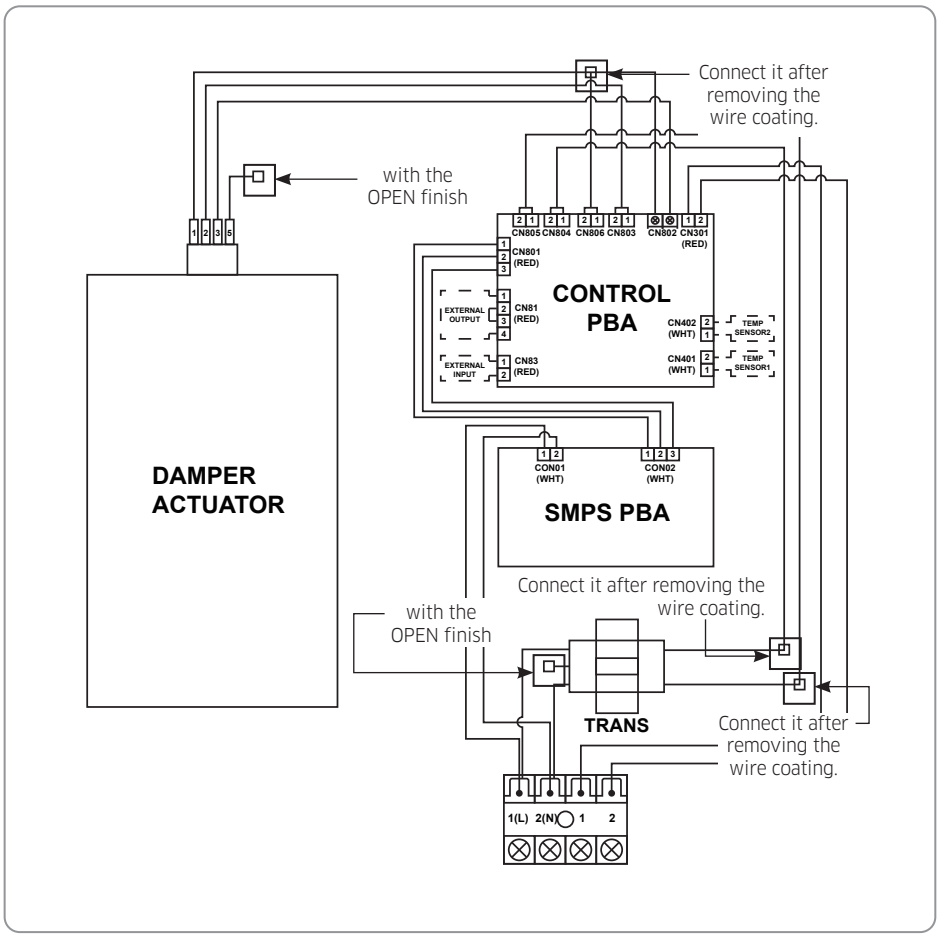
Note

- The direction of the actuator can be changed as follows:



Installing LAC (Low Ambient Cooling) KIT

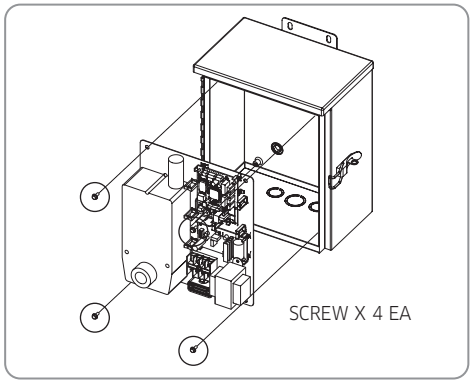
2. Connect the actuator to TRANS.

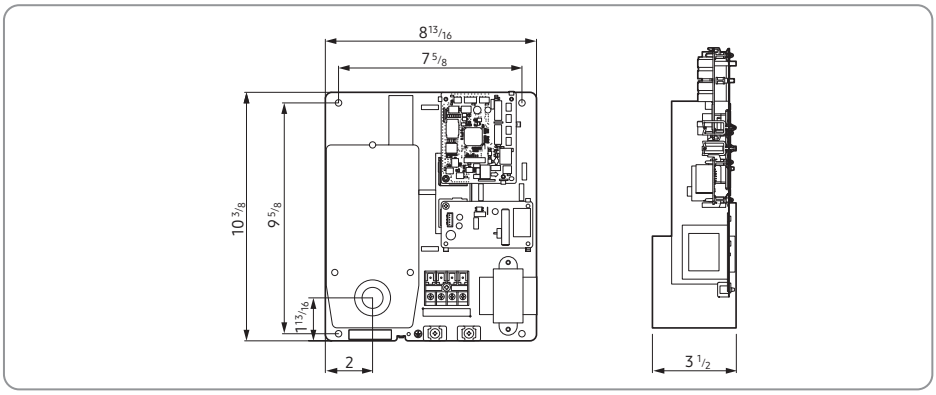


3. Assemble the control box and the control kit.

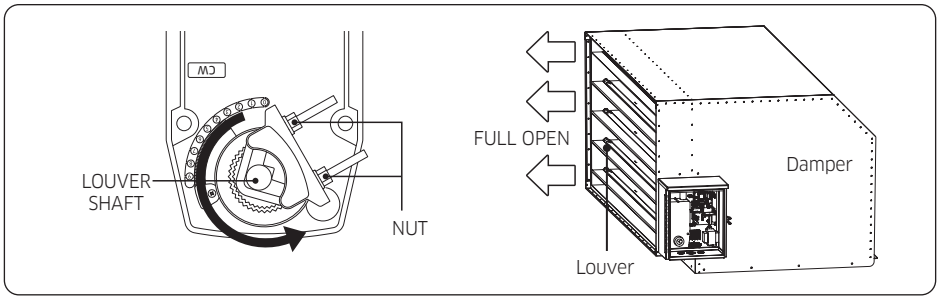
<Control box specification determinants>

- The control kit must be taken into the control box. (Check the fitting holes.)
- The UL certification must be acquired.
- When the louver actuator shaft enters into the box, prevent water penetration. (Use a bushing and such.)
- When assembling the control kit, use the boss with12 mm or above in size.
  (The heat transfer distance between the control kit and control box must be 12 mm or above.)





4. Assemble the damper and Assy control box.



WARNING

- When assembling the damper and Assy control box, be sure to fix the shaft and actuator (Nut x2) in the louver in fully open state.

Installing LAC (Low Ambient Cooling) KIT

Construction of outdoor unit and LAC KIT

Components of LAC KIT for the Outdoor Unit

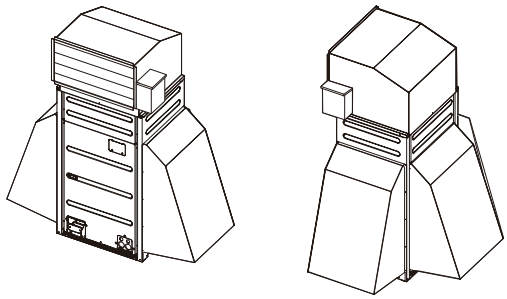
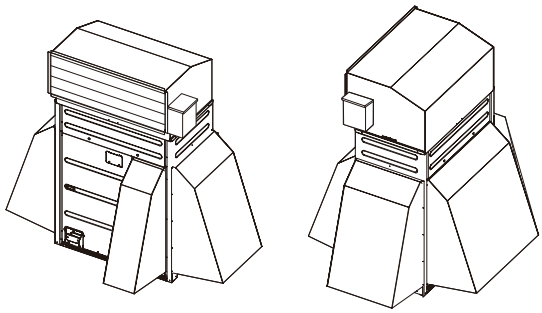
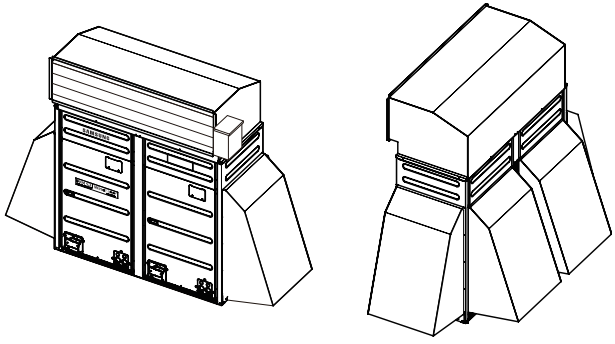
Model Number	Position Type
LACH-SL-B	Low Ambient Cooling Hood - Left(VRF Small, VRF Large, VRF X-Large Chassis)
LACH-SR-B	Low Ambient Cooling Hood - Right(VRF Small, VRF Large, VRF X-Large Chassis)
LACH-R1-B	Low Ambient Cooling Hood - Rear 1 (VRF Small Chassis, VRF X-Large Chassis)
LACH-R2-B	Low Ambient Cooling Hood - Rear 2 (VRF Large Chassis)
LACH-F1-B	Low Ambient Cooling Hood - Front 1 (VRF Large Chassis)
LACH-1-B	LAC KIT Damper - 1 (VRF Small Chassis) (Low Ambient Cooling Hood - 1 VRF Small Chassis)
LACH-2-B	LAC KIT Damper - 2 (VRF Large Chassis) (Low Ambient Cooling Hood - 2 (VRF Large Chassis)
LACH-3-B	LAC KIT Damper - 3 (VRF X-Large Chassis) (Low Ambient Cooling Hood - 3 (VRF X-Large Chassis)

Required Model Number per chassis	Model Number				
	Left	Right	Back	Front	Top
VRF Small chassis	LACH-SL-B	LACH-SR-B	LACH-R1-B	-	LACH-1-B
VRF Large chassis	LACH-SL-B	LACH-SR-B	LACH-R2-B	LACH-F1-B	LACH-2-B
VRF X-Large chassis	LACH-SL-B	LACH-SR-B	LACH-R1-B	-	LACH-3-B

⚠ CAUTION

- When installing the components in the outdoor unit, be careful for screws not to touch the heat exchanger pin.

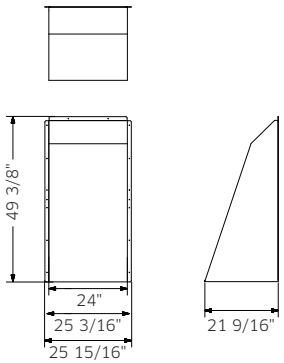
The fully assembly apperance

Classfication	VRF Small type
Appearance	
	VRF Large type
	
	VRF X-Large type
	

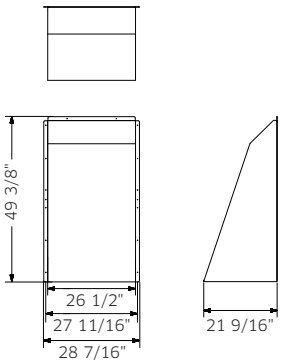
Installing LAC (Low Ambient Cooling) KIT

(Unit: inch)

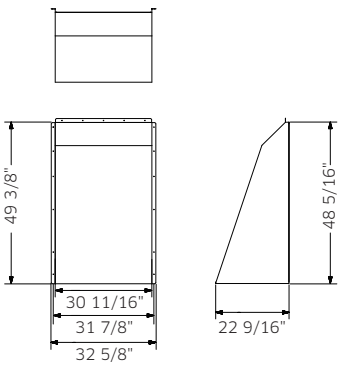
LACH-SL-B



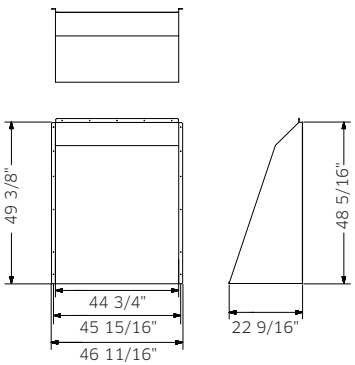
LACH-SR-B



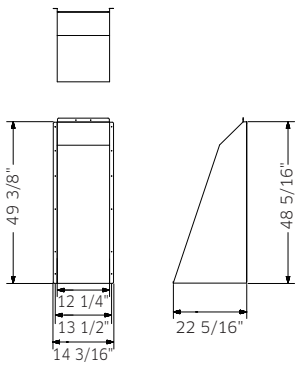
LACH-R1-B



LACH-R2-B

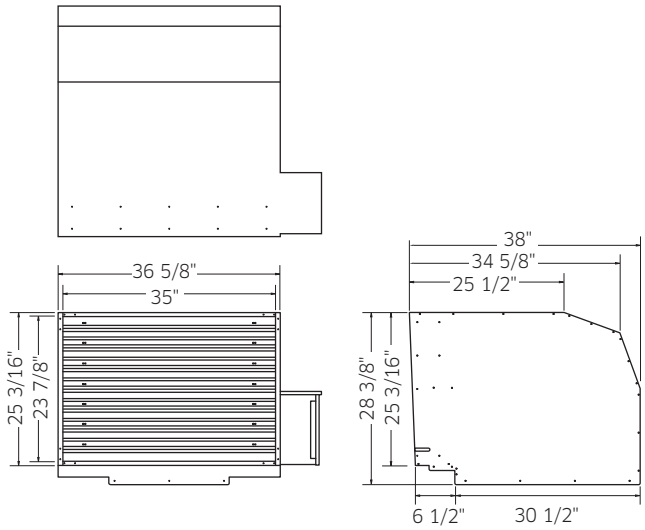


LACH-F1-B

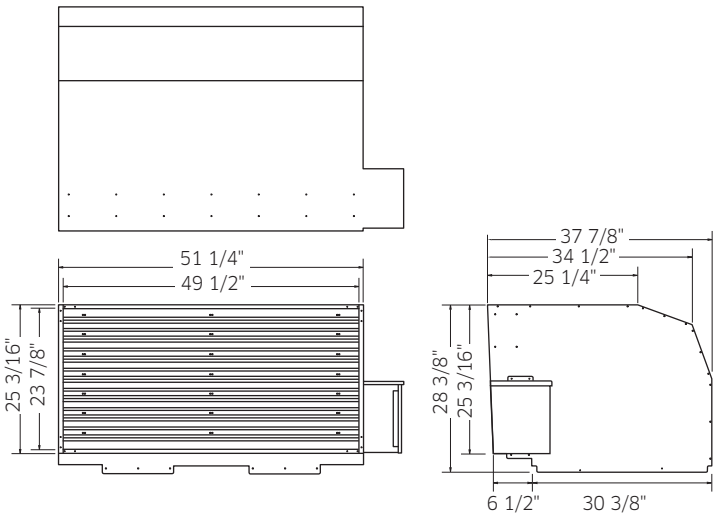


(Unit: inch)

LAC KIT Damper-1 (VRF Small type)
(Low Ambient Cooling Hood-1 (VRF Small type)



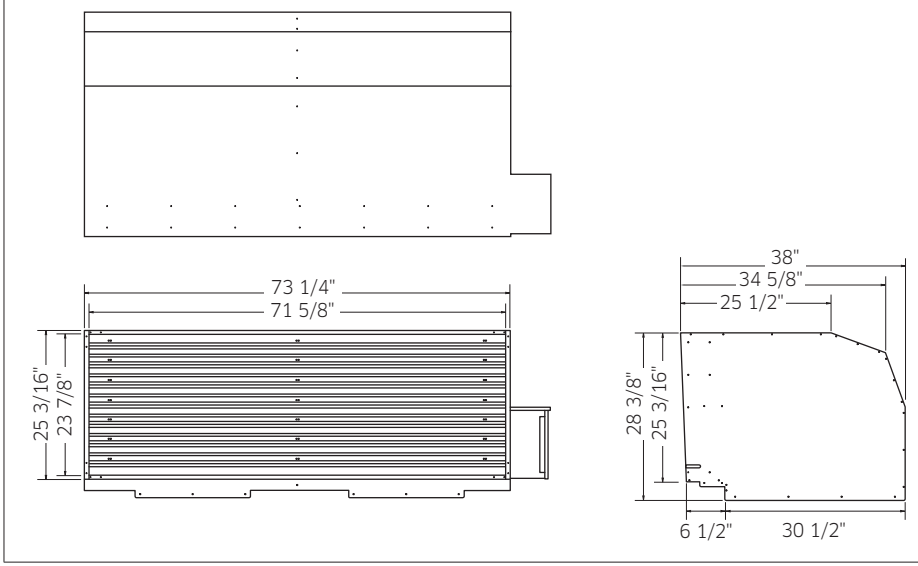
LAC KIT Damper-2 (VRF Large type)
(Low Ambient Cooling Hood-2 (VRF Large type)



Installing LAC (Low Ambient Cooling) KIT

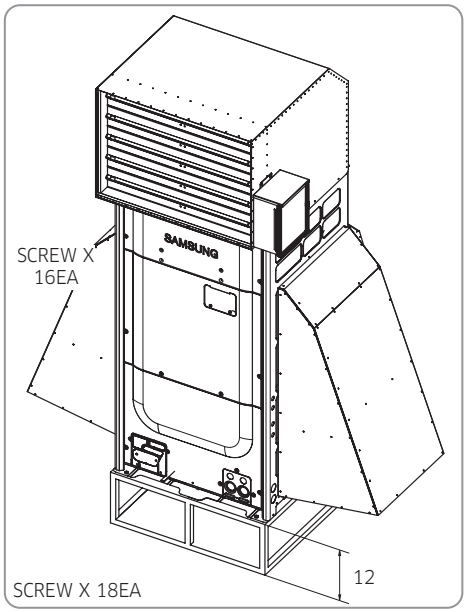
(Unit: inch)

LAC KIT Damper-1 (VRF X-Large type)
(Low Ambient Cooling Hood-1 (VRF X-Large type)

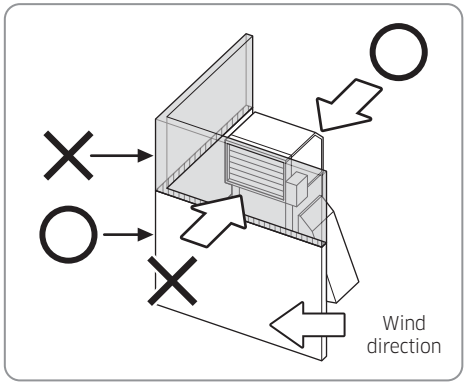


Installation Environment for LAC KIT

1. Keep the height of the frame and foundation 12" or above.



2. Remove any obstacles that screen the damper outlet.
3. Align the damper outlet with the main wind direction. (In case of head wind, the performance can be lowered.)

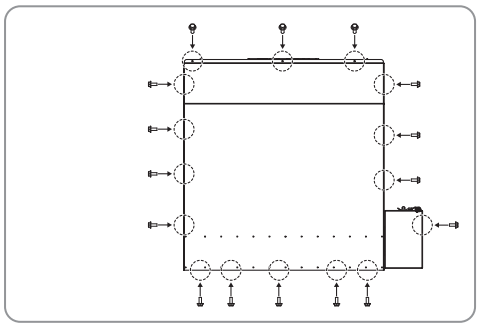


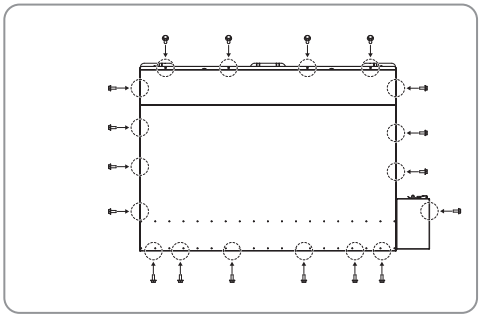
Installing LAC (Low Ambient Cooling) KIT

How to Install the LAC KIT Damper

1. In order to install the damper, use the lift or crane. Otherwise, at least 2 people are required for installation.
2. Before installation, remove the guard fan from the outdoor unit.
3. When connecting the damper to the outdoor unit, fasten screws in all marked places (34 sites).

TOP VIEW

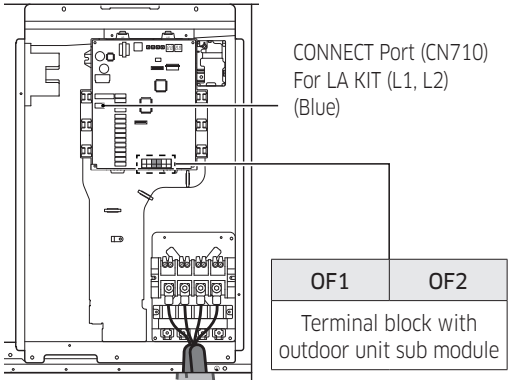




Connecting the LAC KIT to the Outdoor Unit

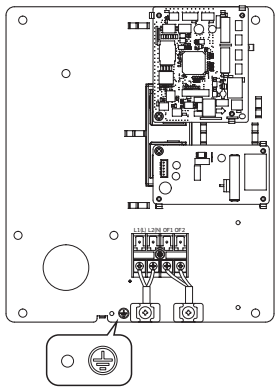
Connecting the outdoor unit

Connect the main PBA to power supplies (L1, L2) and then connect the communication cable through OF1 and OF2.

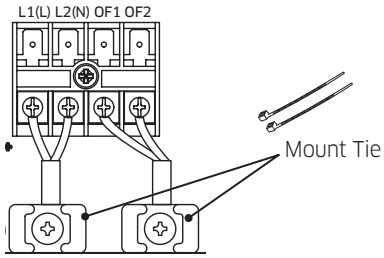


Installing LAC (Low Ambient Cooling) KIT

Connecting the kit



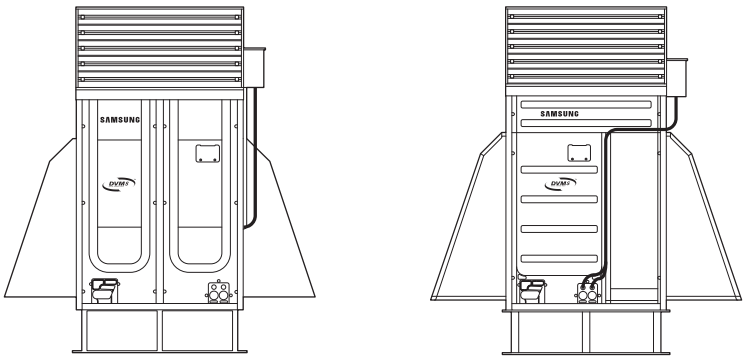
Perform ground work between the outdoor unit and LAC KIT.



As shown in the figure, connect the wire from the outdoor unit to the kit terminal block and then fix the wire onto the mount tie by using the provided cable tie.

Extracting the power and communication cables

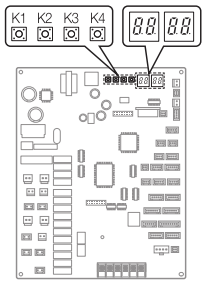
- Be sure to extract the power and communication cables through the cover (knockout) at the lower right of the front panel or through the knockout hole on the right of the cabinet.
- Extract the communication cable through the outlet (knockout) at the lower right of the side or front panel.
- Install the power and communication cables separately by securing with cable protection conduit.
- Fix the cable protection conduit onto the outdoor knockout tubes by using the CD connector and bushing. At this time, use the insulation bushing.



Configuring the options of the outdoor unit for installation of LAC KIT

When installing LAC KIT, be sure to enable the LAC KIT function for the outdoor unit.
When installing the modules, enable the function on the main outdoor unit.

Configuring key functions of the outdoor unit



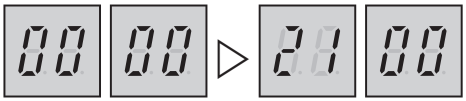
Installation with an aid of tact switch and configuration of options

- Configuring the options

1. Press and hold K2 to enter the setup. (Available in operation stop status)
   - The following appears. (In case of compressor cut-off setting, 1 or 2 appears in Seg4.)

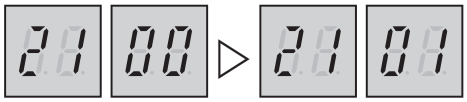
   - In Seg1 and Seg2, the number of the selected option appears.
   - In Seg3 and Seg4, the setting value of the selected option appears.

2. In the option setup menu, when you shortly press the K1 switch, the values for Seg1 and Seg2 change. You can select the desired option.
   (e.g. The value for Seg1 is 2 and the value for Seg2 is 1.)



Installing LAC (Low Ambient Cooling) KIT

3. In the desired option, if you shortly press the K2 switch, the values for Seg3 and Seg4 change. You can select the desired option.
(e.g. The value for Seg3 is 0 and the value for Seg4 is 1.)



4. After selecting an option, if you press the K2 switch for 2 seconds, all 7-segment displays blink. If you enter the tracking mode, the option setting is saved.

⚠ CAUTION

- If not normally processed as mentioned above, the option setting is not saved.
  - ※ Before entry of the mode, if you want to return to the setting, press and hold the K1 switch to cancel the setting.
  - ※ If you want to reset to the factory defaults, in the option setting mode, press and hold the K4 switch.
  - – If you press and hold the K4 switch, all the settings are reset to the factory defaults but the values are not saved yet. Only when the 7-segment display goes to the tracking mode by pressing and holding the K2 switch, the setting is saved.

Option	Entry Unit	SEG1	SEG2	SEG3	SEG4	Function	Remarks
LAC KIT Setup	Main	2	1	0	0	Not applied (Factor default settings)	In case of installation of LAC KIT (Low Ambient Cooling)
				0	1	Applied	

Cautions for LAC KIT

- If the option is not set, an error occurs so normal operation may not be possible.
- When the cooling operation is stopped due to E428 error, chek for LAC KIT failure or communication error between the outdoor unit and LAC KIT.
- In case of using LA KIT option, AI High Pressure Control is restricted.

Features of LAC KIT

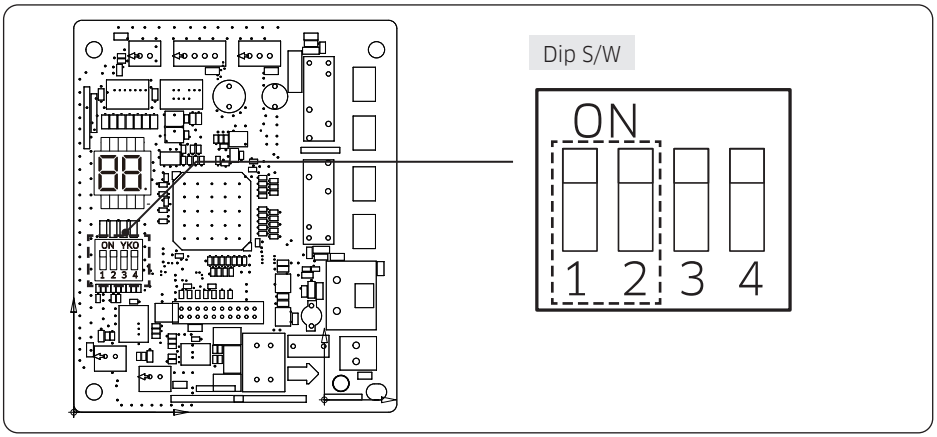
- If LAC KIT is installed, the cooling operation is possible up to -13°F.
- For more information about cooling performance of LAC KIT, see the following table:

Performance Correction	Outdoor Temperature (°F, DB)			
	Less than 23	Less than 99	Less than 107	Greater than 107
Correction Factor	1.00	1.00	0.95	0.90

※ Capacity Correction = Cooling Capacity x Correction Factor

Setting the address

Upon installation of LAC KIT, set the address for the connected outdoor.



- Prior to power supply to the outdoor unit, set the switches. When address recognition is impossible after power supply, press the Reset button (K3 switch) on the outdoor unit.

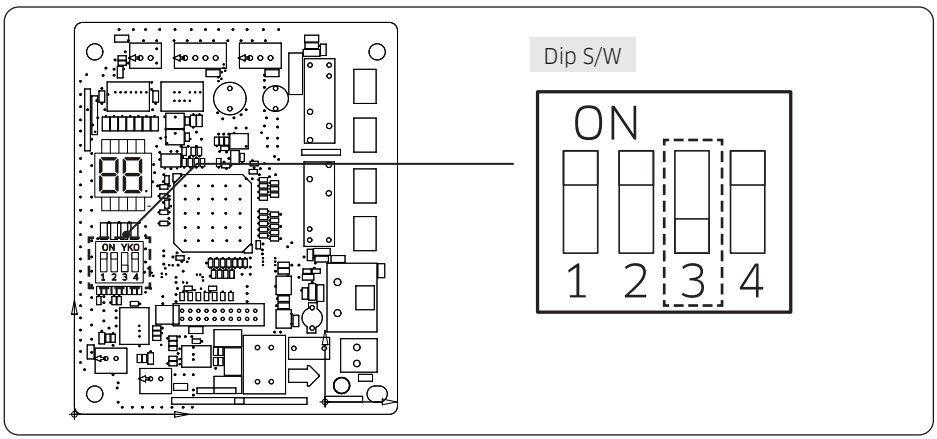
Dip S/W		Function	Remarks	7-Segment
#1	#2			
ON (Default)	ON (Default)	Outdoor unit address: No.1	Connection to Main outdoor unit	C8
ON	OFF	Outdoor unit address: No.2	Connection to Sub1 outdoor unit	C9
OFF	ON	Outdoor unit address: No.3	Connection to Sub2 outdoor unit	CA
OFF	OFF	Outdoor unit address: No.4	Connection to Sub3 outdoor unit	Cb

- After setup, check the LAC KIT 7-segment display for normal address setup.

Installing LAC (Low Ambient Cooling) KIT

Inspection after installation of LAC KIT

Check for normal operation.



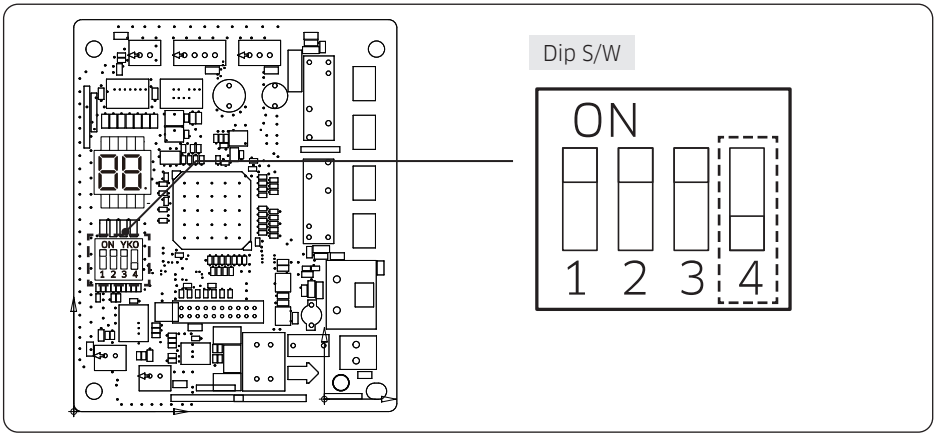
- Before power supply to the outdoor unit, set the dip switches. (Dip S/W #3 OFF)

Dip S/W #3	Function	Remarks
ON (Default)	Not applied	Inspection not applied
OFF	Applied	Inspection applied

- Inspection activity
  - Upon power supply to LAC KIT, the louver is automatically moved to Full Close and then Full Open (original status). (1 cycle for 3 minutes)
- Checks
  - LAC KIT operation
  - Clearance in Full Close
  - Outdoor unit's address on the 7-segment display and LAC KIT address matching

※ Louver clearance in Full Close
  - In Full Close, if the clearance is over 1/4 inch, performance degradation may occur.
  - In case of over 1/4 inch, unfasten nuts and then reinstall the product referencing Page 9.

Checking the version of LAC KIT



- To see the version of LAC KIT, change to the dip switch #4.

Dip S/W #4	Function	Remarks
ON → OFF	Display of the LAC KIT version	The version is displayed 5 times in the order of year, month, and date. ex) 16 / 08 / 01
OFF → ON		

• Error code

Error code	Description	Error Handling	7-Segment
E203	Communication error between LAC KIT and outdoor unit	Upon LAC KIT 7-Segment Error Display Error, the state is changed to LAC KIT Full Open.	E2 ↔ 03

※ In case of E203 Error

– Check the communication cable connection status between the outdoor unit and LAC KIT.





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