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⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer (or equivalent) or service agency.

INSTALLATION/ OPERATION INSTRUCTIONS

V0STAT54P-3 Indoor Unit Non-programmable Controller

CONTROLS

507898-01

01/2019

**THIS MANUAL MUST BE LEFT WITH
THE OWNER FOR FUTURE REFER-
ENCE**

⚠ IMPORTANT

Frequent changes to operating mode may cause system malfunction. Allow at least one minute between mode changes to allow the system to stabilize.

⚠ IMPORTANT

Electrostatic discharge can affect electronic components. Take precautions to neutralize electrostatic charge by touching your hand and tools to metal prior to handling the control.

Shipping and Packing List

Package 1 of 1 contains;

- 1 – Wired Controller
- 2 – Plastic spacers
- 3 – Screws
- 1 – Installation and operation manual

General

The V0STAT54P-3 is a wired non-programmable local controller that controls up to 16 VRF indoor units. These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities having jurisdiction before installation.

Requirements

- Four-conductor, 18-gauge, stranded, shielded, polarity-sensitive cable is required for installation.
- Be sure that the indoor unit power supply has been turned off before beginning installation.
- This controller should be used only as described in this manual.
- Do not install the controller on outside walls (where there is unconditioned space on opposite side of wall) or in locations where direct sunlight may be present.

Power wiring between controller and first indoor unit:

- Minimum 18 AWG stranded shielded cable up to 164 feet (50 m).
- Ensure there are no gaps between the controller back cover and the mounting surface.
- Fill any holes in the wall behind the controller to avoid false readings from infiltration.
- Ground the shielded control wiring at the indoor unit.
- Do not use a megger to test insulation.

Communication wiring between indoor units:

- Minimum 18 AWG stranded shielded cable.

Installation

CAUTION

Clean controller using a clean, damp cloth. Do not spray cleanser on or around controller.

CAUTION

Do not install controller in areas where harmful gases containing sulfur or other damaging agents may exist or the controller may be damaged.

⚠ CAUTION

Do not operate controller with wet hands.

⚠ IMPORTANT

Read all of the information in this manual before using this controller. All wiring must conform to local and national building and electrical codes and ordinances. **This is a 12 VDC controller. Do not install on voltages higher than 12 VDC.**

- This manual provides the installation instructions for this controller. Refer to the included wiring diagrams to connect the controller to the indoor unit.
- The controller uses low voltage. Keep a minimum distance of 12" (305 mm) between low voltage control wire and high voltage power wires.

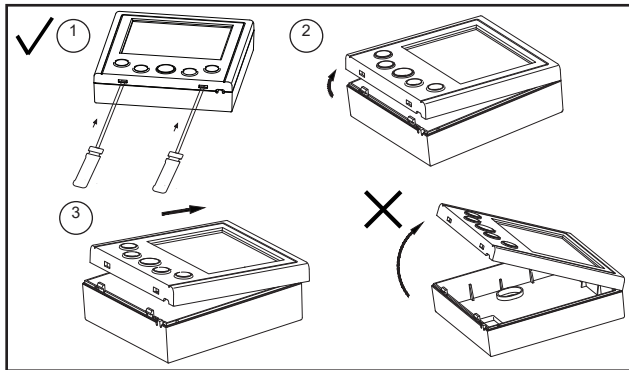


Figure 1. Remove Controller from Back Cover

1. Remove the back cover by inserting a flat head screw driver into the slots until the clips release then lifting up the bottom of the controller and sliding it toward the top of the back cover. See Figure 1. Do not lift the bottom of the controller straight up as that will damage the clips. See Figure 1.
2. Do not twist the screw driver or use the screw driver to pry up the face plate or the casing could be damaged. Use caution to avoid damaging the controller. Do not insert the screw driver in the T1 Return Air sensor hole. See Figure 2.

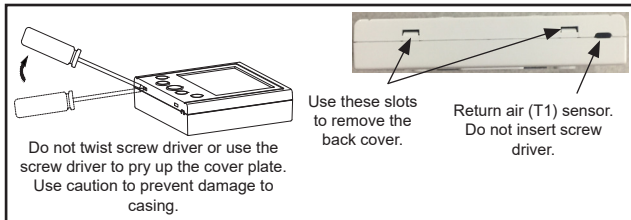


Figure 2. Do Not Damage Casing

3. Adjust the length of the two plastic spacers as needed to allow the controller to be mounted flush with the wall. **NOTE** – *Be sure to provide for future maintenance by allowing enough slack in the wiring to allow the controller to be removed from the wall if needed.* See Figure 3.

4. Attach the back cover using factory-provided screws or other fixing method as appropriate for the application. See Figure 3.

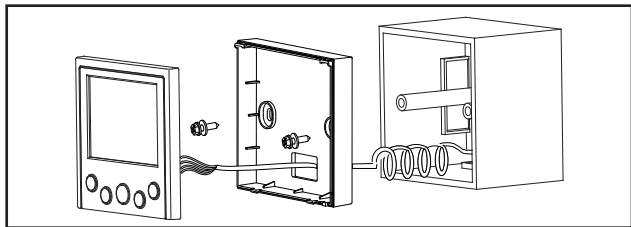


Figure 3. Installation

5. At the controller, wire the field-provided 4-conductor shielded cable to +12V/COM/HB/HA terminals of the controller. See Figure 4.

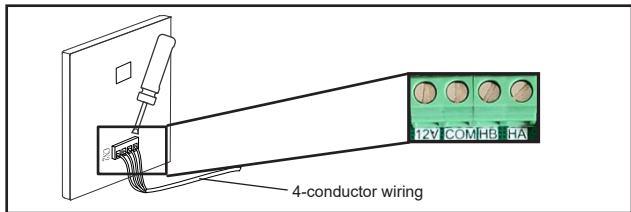


Figure 4. Connection at Controller

6. Reattach the controller to the back cover.

7. Connect the controller to one or more indoor units, up to 16. Use 4-conductor shielded cable to connect to the first indoor unit. **NOTE - Wiring is polarity sensitive.** See Figure 5.

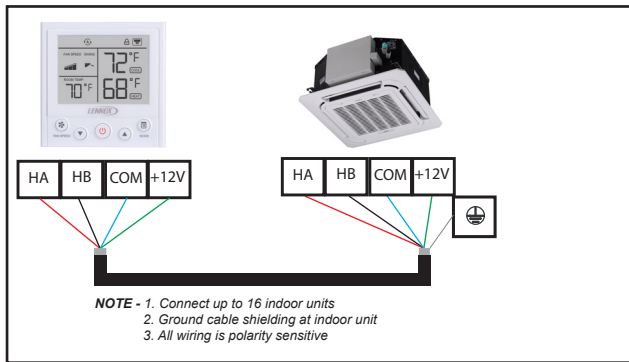


Figure 5. Wire to One Indoor Unit

⚠ CAUTION

Connect "+12V" on the controller to terminal "+12V" on the first indoor unit only. 12V connection provides power to controller; connection to multiple indoor units will damage controller and indoor unit boards.

8. Daisy chain 2-conductor control wiring to each additional indoor unit using the HB/HA terminals in the electrical control box of the indoor unit. Do not daisy chain the +12V power cable or the COM wire. See Figure 6. **NOTE - Wiring is polarity sensitive.**

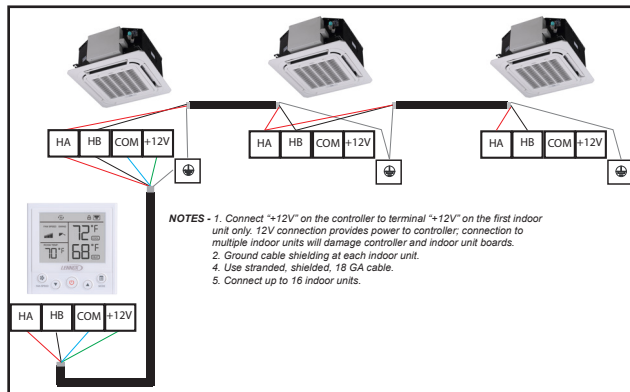


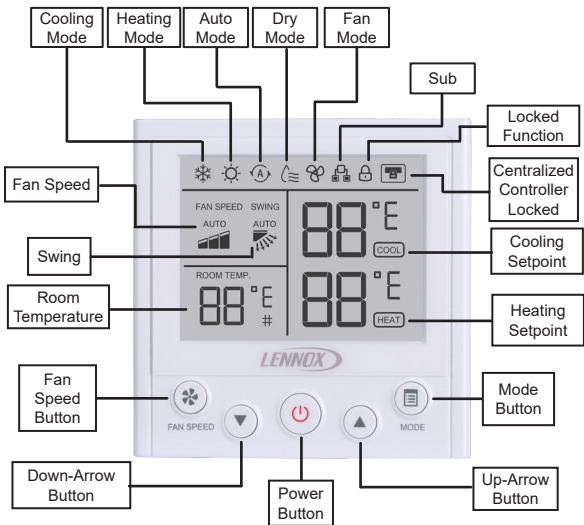
Figure 6. Wire Multiple Indoor Units

Specifications

Table 1. Specifications

Input voltage	12 VDC
Ambient temperature	23~110°F (-5~43°C)
Ambient humidity	RH40%~RH90%

Description of Buttons & Display



Operation

NOTE - Indoor units connected to a local controller may also be controlled by a centralized controller. Indoor units respond to the last command sent. It is recommended that indoor units be controlled from a single source of control, either local controller or centralized controller but not both, to avoid conflicts in commands.

After powering on the controller, wait 30 seconds for initialization. The indoor unit cannot be controlled by the controller until initialization is complete.

Start/Stop Operation

Press the power button.

- Controller ON: LED display lit.
- Controller OFF: LED display not lit.

Set Operation Mode

Press the Mode button to scroll through the mode selections.

- Cool – System operates in cooling mode.
- Heat – System operates in heating mode.
- Auto -- System operates in auto mode.
- Dry -- System operates in dehumidification mode. **NOTE** - fan speed cannot be adjusted during dry mode.
- Fan – Fan only, no heating or cooling.

To set (or change) the room temperature setting (setpoint)

Press the up-arrow & down-arrow buttons to adjust the setpoint.

When in Auto mode, separate heating and cooling setpoints can be set. Press the Mode button to switch between heating and cooling setpoints.

Louver Swing Operation

Press both the up-arrow button and the down-arrow button simultaneously to change louver auto swing operation, specified position and stop as shown in Figure 7. Do not move louvers manually; only move louvers using the louver swing function on the controller.

NOTE - Not available on all indoor unit types.



Figure 7. Louver Swing Operation

Lock Operation

Some operational functions can be locked. Use Settings No. 29~33 to lock the functions of the controller. See Table 2.

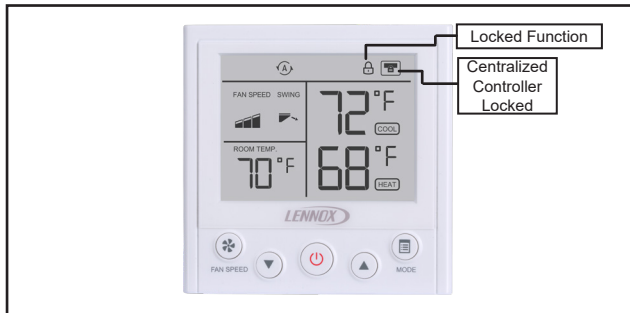


Figure 8. Function Lock Indicator

Centralized Controller Locks Controller

If a function of the indoor unit is locked by a centralized controller (e.g. mode, temperature setpoint, swing, etc.), the V0STAT54P controller will not be able to adjust that locked function. The function must be unlocked at the centralized controller before the local controller can operate it.

Controller Settings

- Press and hold the Fan speed button and the Mode button for 3 seconds to access the controller settings.
- Use Table 2 to setup the controller.
- When in Settings mode:
 - Press the Fan speed button to accept the current setting parameters and proceed to the next setting.
 - Press the Up-arrow and Down-arrow buttons to adjust parameters.
 - Press the Mode button to accept the current setting and move backwards to the previous setting.
- Press and hold the Fan speed button and the Mode button for 3 seconds to exit the setting.

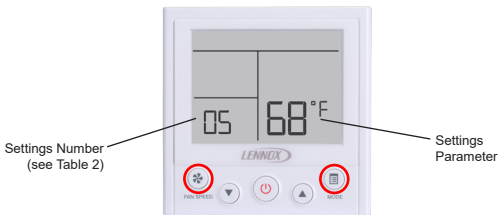


Figure 7. Controller Settings

Table 2. Controller Settings

No.	Function	Value	Description	Note
1	Power off – Memory settings for Auto Mode NOTE – When Auto mode is being used, setpoint, fan speed, and operation mode (cooling or heating) is memorized by the indoor unit.	on	on (default)	<i>When Auto mode is being used, the controller will memorize the user setting of Auto mode before powering off. When power is restored, the controller mode will be set to Auto mode.</i>
		--	off	<i>When Auto mode is being used, the controller will not memorize the user setting of Auto mode before powering off. When power is restored, the controller mode will be set to the operation mode of indoor unit (cooling or heating).</i>
2	Temperature unit	C	°C	The controller and connected indoor units will display °C.
		F	°F (default)	The controller and connected indoor units will display °F.
3	Master/Sub controller	0	Master (default)	Set the controller as Master or Sub controller.
		1	Sub	

No.	Function	Value	Description	Note
4	Maximum heating setpoint limit	62-86°F (17-30°C)	86°F (30°C) (default)	Lock the maximum heating setpoint on the controller. The Lock icon will display on the controller when this setting is set to anything other than the default.
5	Minimum cooling setpoint limit	62-86°F (17-30°C)	62°F (17°C) (default)	Lock the maximum cooling setpoint on the controller. The Lock icon will display on the controller when this setting is set to anything other than the default.
6	Indoor unit addressing	0~63		Set the indoor unit address connected to the controller. One-to-one connection of controller to indoor unit only.
7	Indoor display board - display	0	OFF	Enable/Disable the digital display of the indoor unit.
		1	Normal (Default)	
8	Indoor display board - buzzer	0	OFF	Enable/Disable the buzzer in the digital display of the indoor unit.
		1	Normal (Default)	

No.	Function	Value	Description	Note
9	Room temperature sensor location	nt	From individual indoor unit	Return air sensing takes place at the indoor unit.
		ct	From controller (default)	Return air sensing takes place at the controller.
		00~62	From # indoor unit	Return air sensing takes place at the specified indoor unit.
10	Room temperature calibration	-5°F/°C	-5°F/°C	Calibrate the room temperature by the set value.
		-4°F/°C	-4°F/°C	
		-3°F/°C	-3°F/°C	
		-2°F/°C	-2°F/°C	
		-1°F/°C	-1°F/°C	
		0°F/°C	0°F/°C (Default)	
		1°F/°C	1°F/°C	
		2°F/°C	2°F/°C	
		3°F/°C	3°F/°C	
		4°F/°C	4°F/°C	
		5°F/°C	5°F/°C	

No.	Function	Value	Description	Note
11	Setpoint Control Resolution	0	1°F/5°C (Default)	Set the setpoint resolution. Cooling/heating will begin when the room temperature is the set value above or below the setpoint.
		1	2°F/1°C	
12	Auto mode change over time	15	15 minutes (default)	Set the minimum time gap between heating and cooling changeover.
		30	30 minutes	
		60	60 minutes	
		90	90 minutes	
13	Auto mode dead band limit	3 (°F/°C)	3 (°F/°C) (Default)	Set the cooling and heating setpoint gap of auto mode.
		4 (°F/°C)	4 (°F/°C)	
		5 (°F/°C)	5 (°F/°C)	
		6 (°F/°C)	6 (°F/°C)	
		7 (°F/°C)	7 (°F/°C)	
14	Auto mode dead band limit - type	0	Minimum dead band (default)	Set the cooling and heating setpoint gap is a minimum limit value of a fixed value.
		1	Fixed dead band	

No.	Function	Value	Description	Note
15	External Static Pressure	0~25	Set value * 25 in. wg (10Pa)	Set the indoor unit external static pressure, only applies to ducted indoor units. One controller to one indoor unit connections only.
16	Draft prevention	59°F(15°C)	59°F (15°C) default	When the indoor unit is in heating, when the coil temperature is lower than the set value, the indoor unit fan will force to run low speed or stop for preventing providing cold air.
		68°F(20°C)	68°F (20°C)	
		75°F(24°C)	75°F (24°C)	
		79°F(26°C)	79°F (26°C)	
17	Indoor unit fan setting when cooling satisfied	- -	OFF (default)	Set the indoor unit fan status when cooling is satisfied.
		1	Low speed	
		2	Medium speed	
		3	High speed	
		F	Maintain last speed	

No.	Function	Value	Description	Note
18	Indoor unit fan setting when heating satisfied	--	OFF (default)	Set the indoor unit fan status when heating is satisfied.
		1	Low speed	
		2	Medium speed	
		3	High speed	
		F	Maintain last speed	
19	Reserved			
20	Reserved			
21	Reserved			
22	Auxiliary/Alternative heater installation	0	No aux/alt heat installed (default)	Set the installation scenario of the auxiliary/alternative heater.
		1	Aux/alt heat installed at Indoor unit or in duct	
		2	Other aux/alt heat installation	

No.	Function	Value	Description	Note
23	Auxiliary heat on	2°F/°C	2°F/°C	The AUX/ALT contact will close when the room temperature is set value lower than the setpoint.
		3°F/°C	3°F/°C (default)	
		4°F/°C	4°F/°C	
		5°F/°C	5°F/°C	
		6°F/°C	6°F/°C	
		7°F/°C	7°F/°C	
24	Auxiliary heat off	-4°F/°C	-4°F/°C	The AUX/ALT contact will open when the room temperature is set value higher than the setpoint.
		-3°F/°C	-3°F/°C	
		-2°F/°C	-2°F/°C	
		-1°F/°C	-1°F/°C	
		0°F/°C	0°F/°C	
		1°F/°C	1°F/°C (Default)	
		2°F/°C	2°F/°C	
		3°F/°C	3°F/°C	
		4°F/°C	4°F/°C	
25	Dehumidifier contact enabled	0	Disabled (default)	Enable/Disable the dehumidifier contact.
		1	Enabled	

No.	Function	Value	Description	Note
26	Dehumidifier contact control cut off enabled	0	Disabled (default)	Enable/Disable the dehumidifier contact control cut off.
		1	Enabled	
27	Dehumidifier contact control cut off value setting	3°F/°C	3°F/°C	Set the lowest limit for the dehumidifier contact control. When the room temperature reaches the setpoint less this set value, the dehumidifier contact will open.
		4°F/°C	4°F/°C (default)	
		5°F/°C	5°F/°C	
		6°F/°C	6°F/°C	
28	Unoccupied heating set back	54°F (12°C)	54°F (12°C)	The set back setpoint of the heating setpoint of unoccupied.
		62°F (17°C)	62°F (17°C) (default)	
		70°F (21°C)	70°F (21°C)	
29	Lock all buttons	0	Unlocked (default)	Lock/Unlock all controller buttons. Does not unlock functions locked individually.
		1	Locked	

No.	Function	Value	Description	Note
30	Lock Mode button	0	Unlocked (default)	Lock/Unlock the Mode button. When locked, the Mode button on this controller becomes disabled. The indoor unit mode cannot be changed from this controller.
		1	Locked	
31	Lock ON/OFF button	0	Unlocked (default)	Lock/Unlock the ON/OFF button. When locked, the ON/OFF button on this controller becomes disabled. The indoor unit cannot be turned on or off from this controller.
		1	Locked	
32	Lock up/down buttons	0	Unlocked (default)	Lock/Unlock up/down buttons. When locked, the up and down buttons on the controller become disabled.
		1	Locked	
33	Lock swing	0	Unlocked (default)	Lock/Unlock controller function.
		1	Locked	
34	Reset Controller	0	Unlocked (default)	Reset controller to factory default settings. Does not change indoor unit settings.
		1	Locked	

Indoor Unit Information Query

- Press the Mode button and hold for 3 seconds to enter the indoor unit query.
- Press the Up-arrow and Down-arrow buttons navigate to the next/previous the indoor unit address.
- Press the Fan speed button to view the selected indoor unit indoor information.

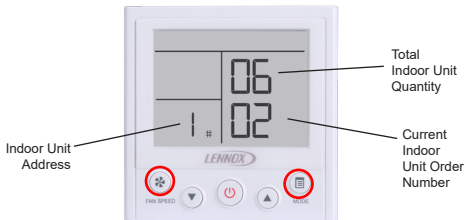


Figure 8. Indoor Unit Query

- Press the Up-arrow and Down-arrow buttons navigate to the next/previous query number.
- Press the Fan speed button again to return to the previous screen.

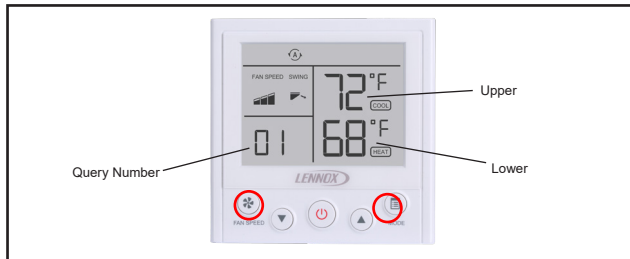


Figure 9. Indoor Unit Information

See Table 3 for details about each indoor unit information query.

Table 3. Indoor Unit Information

No	Location	Description	Value
1	Upper	Cooling setpoint	62~86°F (17~30°C)
	Lower	Heating setpoint	62~86°F (17~30°C)
2	Upper	Indoor room temperature sensor	
	Lower	T2	
3	Upper	T2A	
	Lower	T2B	
4	Upper	Indoor EXV opening (thousands+hundreds)	
	Lower	Indoor EXV opening (tens + ones)	
5	Upper	Room temperature sensor location	
	Lower	Controller room temperature sensor	
6	Upper	Contact 01#	
	Lower	Contact 01# status	
7	Upper	Contact 02#	
	Lower	Contact 02# status	
8	Upper	Contact 03#	
	Lower	Contact 03# status	

No	Location	Description	Value
9	Upper	Contact 04#	
	Lower	Contact 04# status	
10	Upper	Contact 05#	
	Lower	Contact 05# status	
11	Upper	/	
	Lower	Indoor unit type	See indoor unit type table
12	Upper	Indoor unit capacity/kbtu (thousands+hundreds)	
	Lower	Indoor unit capacity/kbtu (tens + ones)	
13	Upper	/	
	Lower	Controller software version	
14	Upper	/	
	Lower	Indoor unit software version	
15	Upper	/	
	Lower	Master indoor unit address	-- means no master indoor unit

Table 4. Indoor Unit Type

Value	Description
1	V33B - 3x3 Cassette
2	VWMB - Wall-Mounted
3	VMDB - Medium Static Pressure Ducted
5	VVCB - Vertical Air Handler
6	VHIB - High Static Pressure Ducted
7	V22B - 2x2 Compact Cassette
8	VCFB - Ceiling & Floor
9	Reserved
14	Reserved
21	Reserved

Error Code Query

- Press and hold the Mode button for 3 seconds to access the indoor unit status query.
 - Press the Mode button to access the fault code query. The last 10 fault codes are stored.
 - Press the up & down arrow buttons to scroll through the fault codes.
- NOTE** - At the fault code query screen, press Mode, Fan, Up and Down buttons and hold for 3 seconds will clear all the fault code records.

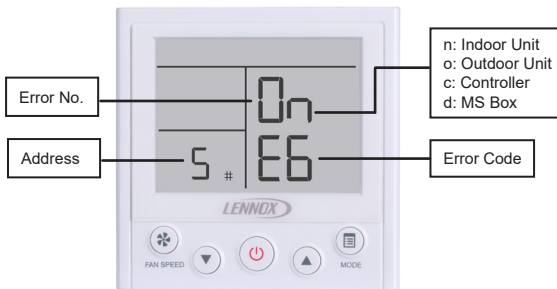


Figure 10. Error Code Query

Table 5. Indoor Unit Error Codes

Error Code	Description
FE	No address
E0	Mode conflict
E1	Communication error between indoor and main outdoor unit
E2	T1 (Room temperature sensor) malfunction
E3	T2 (Middle of evaporator sensor) malfunction
E4	T2B (Outlet of evaporator sensor) malfunction
E5	T2A (Inlet of evaporator sensor) malfunction
E6	DC fan motor error
E7	EEPROM failure
Eb	EEV malfunction
Ed	ODU fault
EE	High water alarm
A0	Emergency stop
D8	Remote off
U4	MS self-inspection error
F8	MS error

Table 6. Outdoor Unit Error Codes

Error Code	Description
E0	Communication error between outdoor units
E1	Power phase loss error
E2	Communication error between indoor and main outdoor unit
E4	Outdoor ambient temperature sensor (T4/T10) and condenser pipe temperature sensor (T3A/T3B) error
E5	Voltage error
E6	Inverter module temperature sensor error
E7	Discharge temp sensor error
E8	Incorrect ENC 1 main - sub configuration
E9	Compressor driver error
H0	Communication error between main control chip and inverter driver chip
H2	Quantity of outdoor unit decreased
H3	Quantity of outdoor unit increased
H4	Compressor inverter module protection appears three times in 60 minutes, X stands for corresponding module
H5	Low pressure protection lock out (P2 3X in 60 minutes)
H6	Compressor discharge temperature protection (P4 3X in 100 minutes)

Error Code	Description
H7	Quantity of indoor unit decreased
H8	High pressure sensor error
H9	DC fan module protection (P9 10X in 120 minutes)
Hb	Low pressure sensor error
Hd	Sub ODU error
C7	Inverter module temperature protection (1PL / 2PL 3X in 100 minutes)
F1	PTC of DC filter board error
F3	ODU subcooler outlet temperature sensor error
F5	ODU subcooler inlet temperature sensor error
F6	EEV A/B/C error (Y will be 1,2 or 3, stands for A, B, C)
F9	Communication error between low ambient cooling kit(LAC kit) and ODU PCB
P1	High pressure protection, CI/CO = 4.4/3.2 Mpa or 638/464 PSIG
P2	Low pressure protection, CI/CO = .05/.15 Mpa or 7.25/21.8 PSIG
P3	Over current protection of inverter compressor
P4	Compressor discharge temp protection, CI/CO = 120/90 C or 248/194 F
P5	Condenser high temp protection, CI/CO = 65/55 C or 149/131 F

Error Code	Description
P9	Fan module protection
PL	Temperature protection of inverter module, CI/CO = 80/60 C or 176/140 F
PP	Low compressor discharge temperature protection
L0	Compressor inverter module error (Compressor inverter module protection)
L1	Low voltage protection of DC bus (Compressor inverter module protection)
L2	Over voltage protection of DC bus (Compressor inverter module protection)
L4	Compressor module protection
L5	Low drive frequency error
L7	Incorrect phase sequence
L8	Frequency differential error
L9	Uniformed frequency error
A0	Emergency stop
A2	Power leakage protection

Table 7. Mode Selection Box Error Codes

Error Code	Description
E2	Communication error between MS box to master outdoor unit
E3	Outlet of plate exchanger(subcooler) error
E4	Inlet of plate exchanger(subcooler) error
H0	Communication error between first PCB to the other PCBs in the same MS box
LL	S1/S2 setting is not consistent to communication wiring

Table 8. Wired Controller Error Codes

Error Code	Description
F0	Communication/Address error between indoor units and wired controller
F1	Communication/Wiring error between indoor units and wired controller
E2	Controller temperature sensor error
F2	Controller EEPROM error
F8	Mode Selection Box error, check MS Box for detailed error information

Technical Support

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