

Chiller Module Controller Installation manual

VCTRL03P-1

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

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Safety information

California Proposition 65 Warning (US)

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

This installation manual explains how to install a chiller module controller. Please read this manual thoroughly before installing the product. (Please refer to an appropriate installation manual 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**

Contact service center for installation.

- If not, there is risk of product malfunction, water leakage, electric shock or 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.

Connect the power with rated voltage when installing.

- If not, there is risk of fire or damage to the product.

Check if the installation was done correctly according to the installation manual.

- There is risk of electric shock or fire if the product is installed incorrectly.

Make sure that all wiring work is done by qualified person complying regional standards and instructions in this manual.

- If the installation is done by unqualified person, there is risk of product malfunction, electric shock or fire caused by incorrect installation.

Do not attempt to move or re-install the product that is already installed.

- There is risk of electric shock or fire.

Do not attempt to repair, disassemble, or modify the product yourself.

- There is risk of product damage, electric shock or fire. When repair is needed, consult service center.

Contact the service center when you need to dispose the product.

Safety information



CAUTION

Do not install the product in a place where it is or might be exposed to inflammable gas leakage.

- There is risk of fire or explosion.

Do not install the product in a place where it will be exposed to oil or vapor etc.

- If the product is installed in a place where it is exposed to oil, vapor or sulphur dioxide, parts of the product may get damaged or product may function abnormally.

Make sure there is no tension to the cable during installation.

- Cable may get cut and cause fire.

Install the product in an indoor place with temperature between 32 ~ 102 °F (0 ~ 39 °C) with no direct sunlight.

- If not, there is risk of fire or product malfunction.

Do not install the product in a place where special spray or acid/alkali solution is used.

- If not, there is risk of fire or product malfunction.

Do not connect the power cable to the communication cable terminal.

- There is risk of fire.

When installing the product in hospitals or other places, make sure that the product does not interrupt with other products.

- If not, there is risk of product malfunction.

Do not allow water to enter the product.





- If not, there is risk of electric shock or fire.

Do not press the buttons with any sharp objects.

- There is risk of electric shock or damage to the parts.

Checking before the installation

Accessories

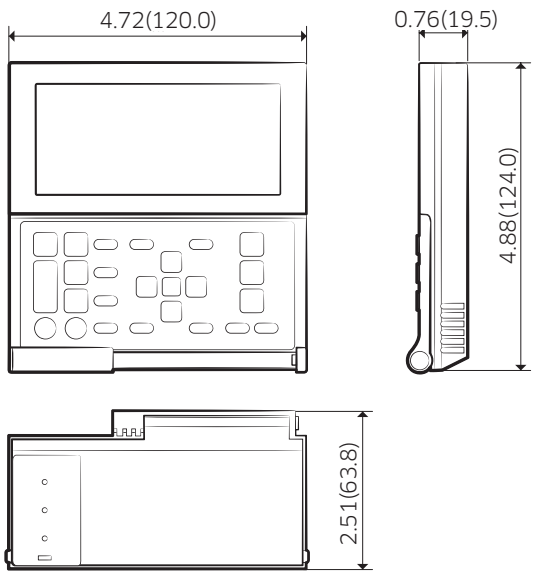
Item	Chiller Module Controller	M4xL16 screws	User manual	Installation manual
Quantity	1	4	1	1
Shape				

CAUTION

- The installation must be performed by a qualified expert.
- Before installing the chiller module controller, make sure to check if it is turned off.
- Install the chiller module controller cables in accordance with the electrical wiring rules, and allow it to pass through the inner area of the wall so that other people can't reach it.
- Install the chiller module controller only in an indoor place so that it is not exposed to water.

External dimension

[Unit : inch(mm)]

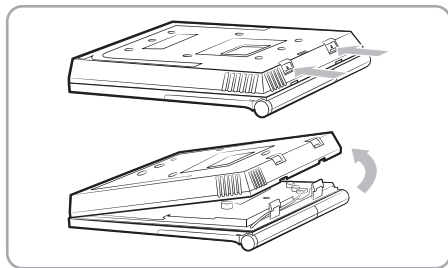


Installing the chiller module controller

Installing the chiller module controller

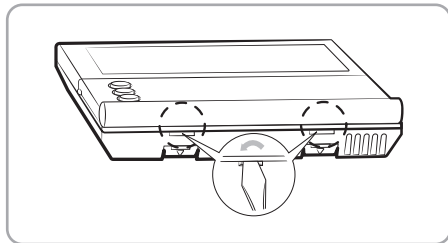
1 Disassemble the chiller module controller.

- Push a hook with one hand and push up another hook with another hand to disassemble the rear cover.



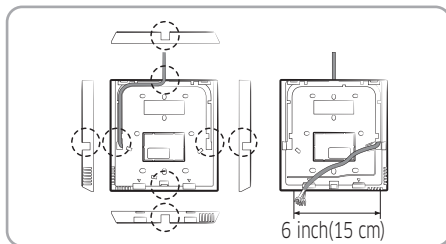
NOTE

- It might be easier to disassemble it if you put a flat-head screw driver into the square hole above the fixing hook.

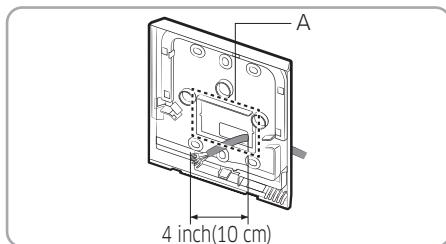


2 Arrange the power and communication cable.

- Place the cable through openings in the rear cover.



<When the cable is not concealed>



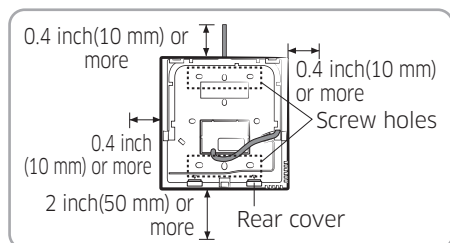
<When the cable is concealed>

NOTE

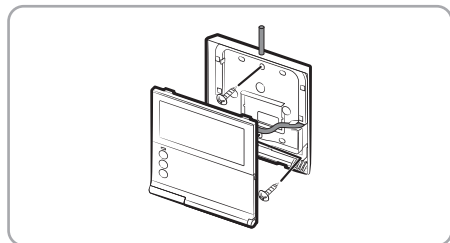
- The opening (A) can be cut and removed if you need more space.

3 Fix the rear cover.

- Before fixing the rear cover, allow 0.4 inch(10 mm) or more space for upper, left, and right sides and 2 inch(50 mm) space for bottom side.

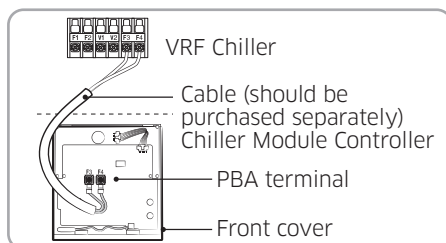


- Make sure to fit the screws into the provided screw holes.



4 Connect the power and communication cable.

- Connect the communication cable (F3, F4) to the PBA terminal on the back of the front cover in appropriate length.

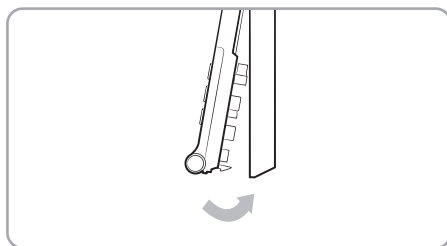


⚠ CAUTION

- Do not tighten the PBA terminal with too much force.
 - Tighten the screws for it with less than 6 N-cm tightening torque.

5 Reassemble the chiller module controller.

- Put the front cover into the upper grooves first, and then fit it by turning it downward. After assembling it, check if there is any gap because of the connection cable between the front cover and rear cover.

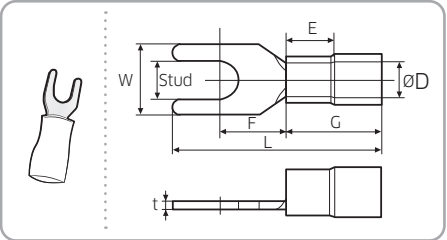


Installing the chiller module controller

⚠ CAUTION

- The power and communication wire of the chiller module controller and the power wire of VRF Chiller should be installed separately.
 - Electrical interference may cause the chiller module controller to malfunction.
- Make sure to connect the power and communication cable through a protection tube since the cable is exposed to an outdoor area.
- When installing the chiller module controller on the wall, consider of the size of the wire hole, and select a wire with a proper thickness.
- Wire for chiller module controller power and communication:
 - When installing the chiller module controller by embedding it on the wall, install it according to U-terminal cable specification.
 - If you install the chiller module controller by using two pieces of PVC wire, remove the 12 inch(30 cm) of the sheath of the cable and install it only with the two pieces of wires. (Recommended specification: AWG20)

- Specification of compressed U-terminal for connecting chiller module controller PBA





Wire range for connection		Rated size	Stud size
AWG	inch ² (mm ²)	inch ² (mm ²)	inch (mm)
22 ~ 16	0.0003 ~ 0.0025 (0.25 ~ 1.65)	0.0023 (1.5)	0.1181 (3)

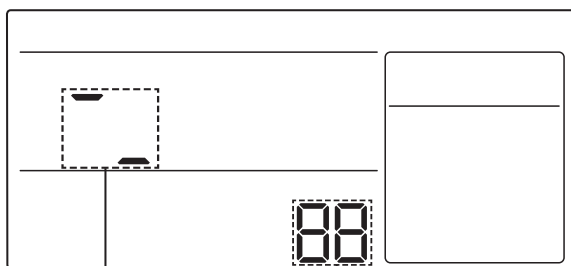
Basic size [inch(mm)]						
t	ØD	G	E	F	W	L
0.0275 (0.7)	0.1496 (3.8)	0.3937 (10.0)	0.1771 (4.5)	0.2559 (6.5)	0.2362 (6.0)	0.8346 (21.2)

- ※The maximum wiring length for power and communication: 656.17 ft (200 m)
- Tighten the fixing screws to the PCB terminal with less than 0.04 lbf·ft (6 N·cm) torque.
- If the screws are tightened with too much force, the screw thread will be damaged.

VRF Chiller Tracking

When installing the chiller module controller and then turning it on, the tracking will be performed automatically.














- To perform the tracking again, press the  +  button at the same time for more than 5 seconds.
- During the tracking, the total number of currently searched VRF Chillers will be displayed on the display.

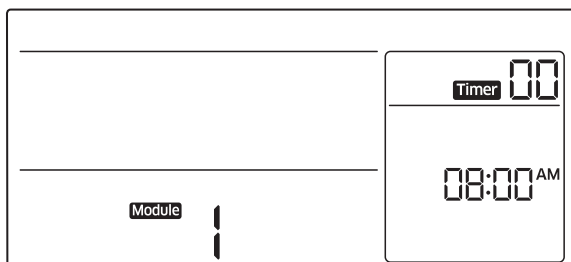


Indicates tracking
in progress

Displays the total number
of VRF Chillers currently
searched

⚠ CAUTION

- For the tracking function to be processed correctly, you have to press the center of the buttons at the same time.
- It may take about 5 minutes to complete the tracking at initial installation or when you re-set the power supplying unit setting.
- When the tracking is completed, the display will show the following.
 - Operation mode or set temperature can be set when the module/group control is on.
 -  , , , , , , , , , , ,  buttons can be used when the chiller module controller is on stand-by.

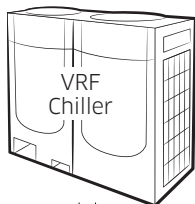


Installing the chiller module controller

Connecting the chiller module controller

Chiller Module Controller 1:1

Install one VRF Chiller to a single chiller module controller.



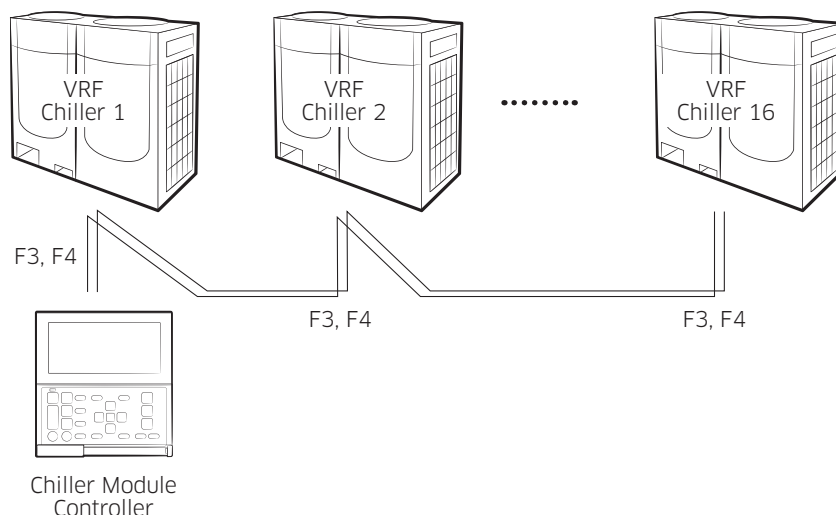
F3, F4



Chiller Module Controller

Chiller Module Controller 1:N

Install N (maximum 16) VRF Chillers to a single chiller module controller.



⚠ CAUTION

- Only a single chiller module controller can be connected to VRF Chillers.
- If you disconnect the power supply in order to repair a main unit of a module or a group, you should set another unit as a main unit.
 - When repairing the unit, disconnect the power supply and then start chiller module controller communication again.
 - When a failure of the power supplying unit for the chiller module controller leads to cutting power supply, the tracking will be performed automatically and then the chiller module controller will be powered by another unit.

Installing the chiller module controller


Restarting the chiller module controller communication

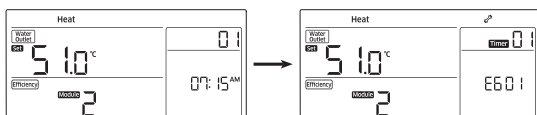
After changing the installation status (changing the number of the installed VRF Chillers or their numbers or resetting the group/module) of VRF Chillers, the chiller module controller communication must be restarted.

 +  **Press for over 5 seconds.**

- The chiller module controller communication will be restarted and tracking of the VRF Chillers connected to the chiller module controller will be performed again.

Chiller Module Controller error display

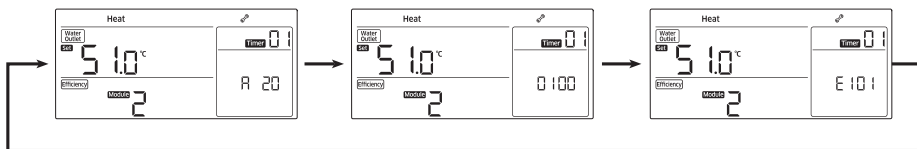
The display will show an error code of VRF Chillers connected to the chiller module controller, and  located on top part of the display and red LED will be blinking.



When an error occurs in VRF Chiller (Product group display : A)

The VRF Chiller's number for the error will be displayed, followed by the error code.

- Example) When error 101 occurs from VRF Chiller No. No. 200100 (Unit No. 01)



When an error occurs in the chiller module controller

Only the error code will be displayed.

- Example) When error 601 occurs from the Chiller Module Controller



Chiller Module Controller error codes

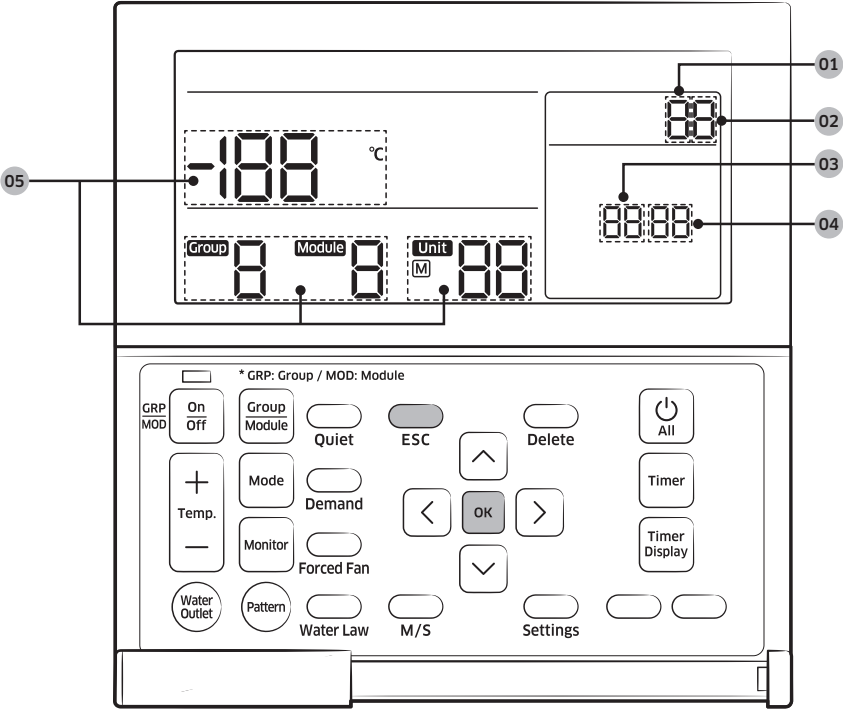
Error codes	Description
604	Communication tracking error between a chiller module controller and VRF Chillers
618	The maximum number of VRF Chiller installation is exceeded. (Maximum:16)
627	Displayed when 2 or more chiller module controllers are installed.
601	Communication error between a chiller module controller and VRF Chillers
654	Chiller module controller EEPROM Read/Wirte error

NOTE

- The module/group operation will be performed except the malfunctioned unit even though an error occurs in the module or the group.

Setting the service mode

Service mode setting



No.	Item	Description
01	Main menu	Displays a main menu value of the service mode table.
02	Sub menu	Displays a sub menu value of the service mode table.
03	Page	Displays a Page value of the service mode table.
04	Data Segment	Displays a Data value of the service mode table.
05	Synchronized segment by service mode function	Displays the data value of the Page on the left side of the LCD at the same time.

1 Start the service mode.



⚠ CAUTION

- To make it work correctly, you have to press the center of the buttons at the same time.

2 Select a main menu number.



3 Select a sub menu number.



4 Select a Page number.

- When changing a Page number, the display will show the set data value of the Page.



5 Set Data value.

- Refer to the table in "Service setting mode" for setting each data.




6 Save the data setting value.



7 Complete the service mode.




📄 NOTE

- If the current setting stage is in the main menu when pressing  button, the service mode will be completed. If not, the stage will move to the main menu.

Setting the service mode

Service setting mode

- After saving the setting, the VRF Chillers and the chiller module controller may be initialized if it is necessary.
- When entering the service mode during the tracking, you can enter the Data stage on the Main menu 4,5,6,9 (Save at VRF Chiller) but you cannot change the setting.
 - The display will show Restricted if you press  button.
 - The display shows only the collected data during the tracking.

Main menu	Sub menu	Function		Default value	Page	Data Segment	Save
1	1	Option setting/ checking	VRF Chiller cooling and heating/only cooling	0	1	0 - Cooling and heating, 1 - Only cooling	Save at Chiller module controller
			Temperature unit display (°C)/(°F)	0	2	0 - Celsius (°C), 1 - Fahrenheit (°F)	Save at Chiller module controller
	2	Option setting/ checking 2	Temperature display set temperature/ water temperature (Setting the chiller module controller's temperature display value)	1	1	0 - Set temperature 1 - current water outlet temperature (Default value)	Save at Chiller module controller
	6	Number of connected units	Number of VRF Chillers	0	1	00 ~ 16	-
	7	Setting the unit of the desired temperature (Available only when the temperature display is °C.)		0	1	0 - 1 1 - 0.5 2 - 0.1	Save at Chiller module controller

Main menu	Sub menu	Function		Default value	Page	Data Segment	Save
1	8	Setting type of time		0	1	0 - 12-hours, 1 - 24-hours	Save at Chiller module controller
	9	Check for timer IC error		0	1	0 - Normal, 1 - Error	-
	0	Initializing service mode setting value		0	1	0 - Disuse, 1 - Reset	-
2	1	Checking micom codes of the chiller module controller		-	1 ~ 3	Micom code	-
	2	Checking the version information of the chiller module controller program		-	1 ~ 3	Modified date	-
4	1	Setting VRF Chiller number/option ¹⁾	Setting a targeted VRF Chiller	View Master	1	A registered unit number	-
	4		Setting/checking basic options	Basic options of the target	1 ~ 20	Option code	Save at VRF Chiller
	5		Setting/Checking installation options	Installation options of the target	1 ~ 20	Option code	Save at VRF Chiller
	6		Setting/Checking installation options 2	Installation options 2 of the target	1 ~ 20	Option code	Save at VRF Chiller

Setting the service mode

Main menu	Sub menu	Function		Default value	Page	Data Segment	Save
5	1	Setting VRF Chiller detailed setting	Demand level ^{2)*}	-	Module number	0 - Default value (100 %) 1 - 95 % 2 - 90 % 3 - 85 % 4 - 80 % 5 - 75 % 6 - 70 % 7 - 65 % 8 - 60 % 9 - 55 % 10 - 50 % 11 - Not applied (unrestricted)	Save at VRF Chiller
	2		Quiet operation level ^{3)*}	-	Module number	0 - Default value (100 %) 1 - Level1 2 - Level2 3 - Level3	Save at VRF Chiller
	3		Standard for Water law ^{4)*}	-	Main unit number ^{5)*}	Standard for Water Law temperature 0 : Based on outdoor temperature / 1 : Based on room temperature	Save at VRF Chiller

Main menu	Sub menu	Function		Default value	Page	Data Segment	Save
5	4	VRF Chiller detailed setting	AirCool1 (for Water law)	-	Main unit number ⁵⁾ *	Outdoor temperature standard 1 (0 ~ 20 °C) (32 ~ 68 °F) in cooling mode	Save at VRF Chiller
	5		AirCool2 (for Water law)	-	Main unit number ⁵⁾ *	Outdoor temperature standard 2 (30 ~ 40 °C) (86 ~ 104 °F) in cooling mode	Save at VRF Chiller
	6		RoomCool1 (for Water law)	-	Main unit number ⁵⁾ *	Room temperature standard 1 (15 ~ 24 °C) (59 ~ 75 °F) in cooling mode	Save at VRF Chiller
	7		RoomCool2 (for Water law)	-	Main unit number ⁵⁾ *	Room temperature standard 2 (25 ~ 35 °C) (77 ~ 95 °F) in cooling mode	Save at VRF Chiller
	8		Tcool1 (for Water law)	-	Main unit number ⁵⁾ *	Cooling set temperature standard 1 (-10 ~ 25 °C) (14 ~ 77 °F) in cooling mode	Save at VRF Chiller
	9		Tcool2 (for Water law)	-	Main unit number ⁵⁾ *	Cooling set temperature standard 2 (-10 ~ 25 °C) (14 ~ 77 °F) in cooling mode	Save at VRF Chiller

Setting the service mode

Main menu	Sub menu	Function		Default value	Page	Data Segment	Save
6	1	VRF Chiller detailed setting 2	AirHeat1 (for Water law)	-	Main unit number ⁵⁾ *	Outdoor temperature standard 1 (-20 ~ 5 °C) (-4 ~ 41 °F) in heating mode	Save at VRF Chiller
	2		AirHeat2 (for Water law)	-	Main unit number ⁵⁾ *	Outdoor temperature standard 2 (10 ~ 20 °C) (50 ~ 68 °F) in heating mode	Save at VRF Chiller
	3		RoomHeat1 (for Water law)	-	Main unit number ⁵⁾ *	Room temperature standard 1 (15 ~ 24 °C) (59 ~ 75 °F) in heating mode	Save at VRF Chiller
	4		RoomHeat2 (for Water law)	-	Main unit number ⁵⁾ *	Room temperature standard 2 (25 ~ 34 °C) (77 ~ 95 °F) in heating mode	Save at VRF Chiller
	5		Theat1 (for Water law)	-	Main unit number ⁵⁾ *	Heating set temperature standard 1 (35 ~ 55 °C) (95 ~ 131 °F) in heating mode	Save at VRF Chiller

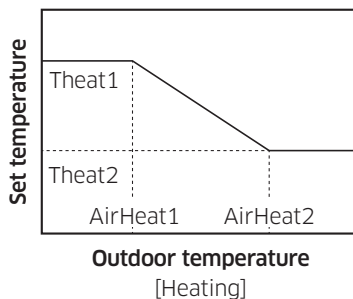
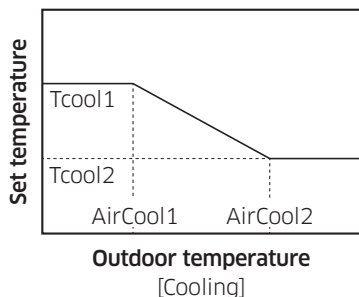
Main menu	Sub menu	Function		Default value	Page	Data Segment	Save
6	6	VRF Chiller detailed setting 2	Theat2 (for Water law)	-	Main unit number ⁵⁾ *	Heating set temperature standard 2 (35 ~ 55 °C) (95 ~ 131 °F) in heating mode	Save at VRF Chiller
	9		Operation pattern for modules (When operating standard pattern by a group) ⁶⁾ *	-	Module number	0 - Standard 1 - Rotation 2 - Efficiency	Save at VRF Chiller
9	1	Set groups/modules ⁷⁾ *	Assign modules/groups to units	- / - / unit	Unit number	Group(1 ~ 4) / module (1 ~ 8) / not set '-'	Save at VRF Chiller
	2	Set a main unit ⁷⁾ *	Set a main unit for modules	-	Module number	Unit number of the selected module	Save at VRF Chiller
	3		Set a main unit for groups	-	Group number	Unit number of the selected group	Save at VRF Chiller
	4	Device option	Use Cool storage mode	-	1	0 - Disable, 1 - Enable	Save at VRF Chiller
	5		Use Hot water mode	-	1	0 - Disable, 1 - Enable	Save at VRF Chiller
	6	Set a backup module ⁸⁾ *	Set a backup module	-	Group number	0 - Disable, 1 ~ 8 - The unit number of the selected module	Save at VRF Chiller

Setting the service mode

Main menu	Sub menu	Function		Default value	Page	Data Segment	Save
0	1	Reset	Initialize factory setting of the chiller module controller (Initialize user/service mode setting value)	0	1	0 - No use, 1 - Reset	-
	2		Initialize power master ^{9)*}	0	1	0 - No use, 1 - Reset	-
	3		Initialize VRF Chiller and chiller module controller's addressing	0	1	0 - No use, 1 - Reset	-

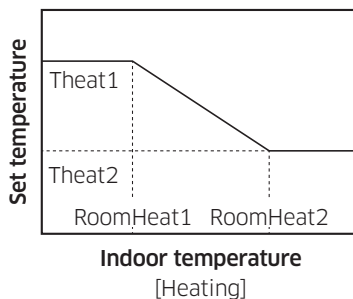
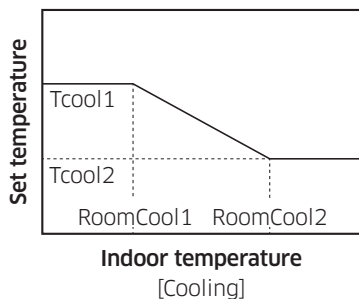
- ^{1)*} • In 4-1 menu, the units connected to the chiller module controller will be displayed. Select the unit that you want to set and then move to 4-4, 5, 6 menu.
- ^{2)*} • Set a current limit rate. If you set the value less than 100 %, performance may decrease.
- ^{3)*} • Set a level of the Quiet mode. Level3 is the lowest, performance and efficiency may decrease if the Quiet mode operates.

- 4)* • Select a standard for Water law when operating cooling or heating. Water law is to change the water outlet temperature, considering demand load changes according to outdoor or indoor temperature.
- According to outdoor temperature



NOTE

- If the unit is not a low temperature water model, the set temperature decided by the Water law control will not decrease below 41 °F (5 °C).
- According to indoor temperature (when using an external temperature sensor)



NOTE

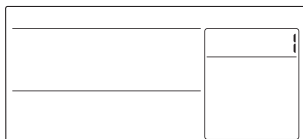
- If the unit is not a low temperature water model, the set temperature decided by the Water law control will not decrease below 41 °F (5 °C).

Setting the service mode

- 5)* • A main unit of a group or a module will be displayed.
 - When setting a group, the value for a main unit of the group must be set.
- 6)* • When setting "Standard pattern" for a group, you must set an operation pattern for each module in the group.
- 7)* • Only when completing setting a group or a module and their main units, the chiller module controller will operate properly.
 - When completing the a group or a module setting and then exiting from service mode, the chiller module controller will be initialized and the tracking will be performed again.
- 8)* • If a backup unit is selected, the unit will operate depending on the standards for VRF Chiller.
 - A backup module does not operate in the normal operation condition. If performance by operating the normal modules is not enough, the backup module will operate.
- 9)* • Power Master Reset is a setting needed to supply optimized power to the chiller module controller when multiple VRF Chillers are connected to the chiller module controller.

Setting the option (Example)

It is an example to change the temperature display unit from Fahrenheit (°F) to Celsius (°C).



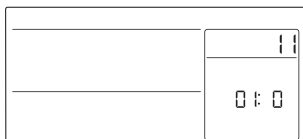
1 Start the service mode.

 +  **Press for over 3 seconds**



2 Select a desired number in the main menu.

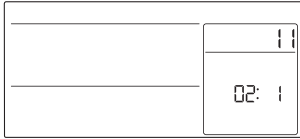
 /  ► **Select 1**



3 Select a desired number in the sub menu.

 ►  /  ► **Select 1**

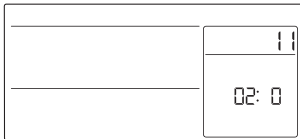
Setting the service mode



4 Select a desired number in Page

- The data value of the Page will be set at the same time.

 ►  /  ► **Select 2**



5 Set Data value.

- Setting value 0 - Celsius (°C),
setting value 1 - Fahrenheit (°F)

 ►  /  ► **Select 0**

6 Complete the option setting.

 ► 

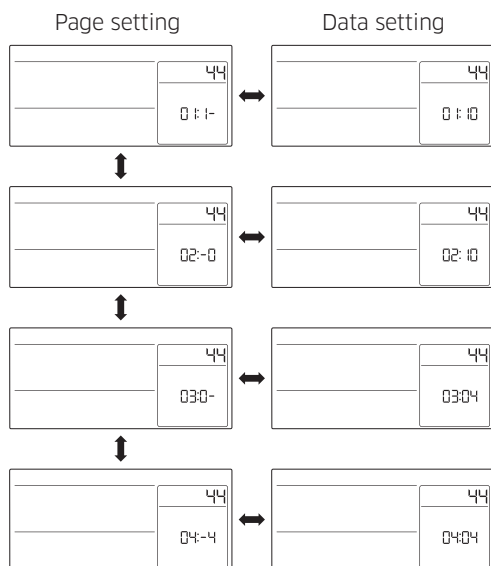
Option code

SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	SEG7	SEG8	SEG9	SEG10	SEG11	SEG12
0	X	X	X	X	X	1	X	X	X	X	X
SEG13	SEG14	SEG15	SEG16	SEG17	SEG18	SEG19	SEG20	SEG21	SEG22	SEG23	SEG24
2	X	X	X	X	X	3	X	X	X	X	X

- Each SEG will be displayed corresponding with Page.
 - SEG2 ~ SEG6 : Page1 ~ Page5
 - SEG8 ~ SEG12 : Page6 ~ Page10
 - SEG14 ~ SEG18 : Page11 ~ Page15
 - SEG20 ~ SEG24 : Page16 ~ Page20

NOTE

- SEG1, SEG7, SEG13, and SEG19 do not need to be displayed nor be set.
- SEG2 indicates a type of options so it does not need to be set but to be displayed.
- Set an option value for each Page.



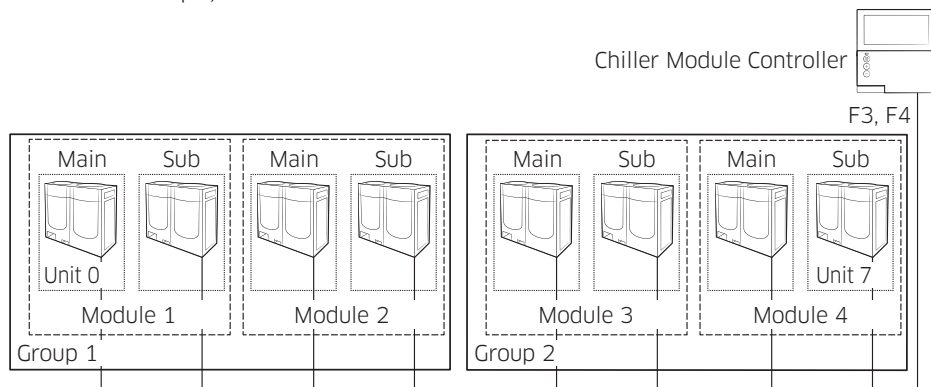
- Data value of Page1 is fixed so it will not be blinked and does not need to be changed.
- The setting value of data is displayed in hexadecimal.

Setting the service mode

Module or group operation

Module/group operation is to combine multiple units according to modules or groups of a single water pipe system and to operate them depending on working condition.

Installation example)



- A single chiller module controller can control a maximum of 16 VRF Chillers (0 ~ 15).
 - VRF Chiller can have a maximum of 8 modules (1 ~ 8) and 4 groups (1 ~ 4).
 - A maximum of 8 units can be connected to a module, and a maximum of 8 modules can be connected to a group.
- Depending on the working condition below, set modules or groups.
 - A module or a group must be connected to a single water pipe.
 - When modules are controlled by a group, the modules cannot operate themselves and the display will not show the modules during the module operation.
- You can select an operation mode, a pattern operation (according to distribution method of compressor capacity) and Quick Smart Features by each module or group.

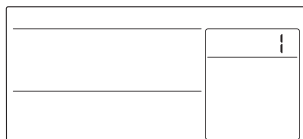
Setting module and group (Example)

It is an example to set 6 units to modules and groups.

- The example explains how to set the units to 1 group and 1 module (No.3).
- Recommended deciding and entering numbers for modules and groups of units and a main unit in advance, since you have to set numbers for modules and groups by each unit.
- Select a unit number on the DVM CHILER.
 - Refer to hydro controller option no.11 in the installation manual of VRF Chiller.

Unit No.		00	01	02	03	04	05	Service mode Table				
								Main menu	Sub menu	page	Data Seg 1	Data Seg 2
Module No.		1	1	2	2	3	3	9	1	Unit No. (00 ~ 05)	Module No. (1 ~ 3)	-
Group No.		1	1	1	1			9	1	Unit No. (00 ~ 03)	Module No. (1 ~ 3)	Group No. (1)
Setting a main	Module	○ (00)		○ (02)		○ (04)		9	2	Module No. 1 2 3	Unit No. 00 02 04	
	Group	○ (00)						9	3	Group No. 1	Unit No. 00	

Setting the service mode



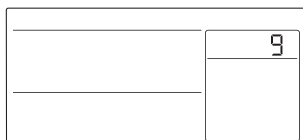
1 Start the service mode.



+



Press for over 3 seconds



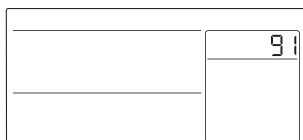
2 Select a desired number in the main menu.



/



► **Select 9**



3 Select a desired number in the sub menu.



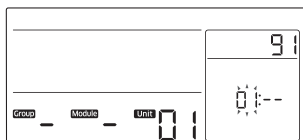
►



/



► **Select 1**



4 Select a desired number in Page

- The smallest number will be displayed among the numbers of currently connected VRF Chillers.
- The data value of the Page will be displayed on the left side of the LCD at the same time.



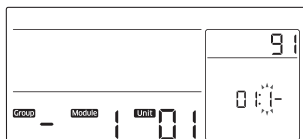
►



/



► **Select 1**



5 Set a module number (Data1).

- '-' will be displayed if the module number is not set.



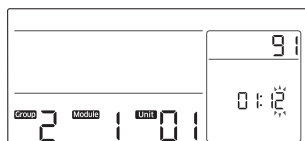
►



/



► **Select 1**



6 Set a group number (Data2).

- '-' will be displayed if the group number is not set.



7 Complete the option setting.



NOTE

- 2 or more modules must be selected for one group.
 - One module can be set as one group from the chiller module controller, but the group operation cannot be performed.
- A main unit must be set for each module and group.
 - A main unit must be set for each modules are connected to one group.
 - [M]** will be displayed on the display when selecting the main unit.
 - If there is a main unit in the module, the main unit will be displayed first when selecting the module.

