



# MSB (Mode Selection Box) Installation manual

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V1MSBB01HR / V1MSBB02HR / V1MSBB04HR /  
V1MSBB06HR / V1MSBB08HR / V1MSBB12HR

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- 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 precautions

California Proposition 65 Warning (US)

 **WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

The safety information and precautions below must be kept for the safety of users and installers.

Before installing an VRF, please read this manual thoroughly to ensure that you know how to safely and efficiently install a new appliance.

※ This product uses R-410A refrigerant.

- When using R-410A, moisture or foreign substances may affect the capacity and reliability of the product. Safety precautions must be taken when installing the refrigerant pipe.
- The designing pressure of the system is 4.1MPa. Select appropriate material and thickness according to the regulations.
- R-410A is a quasi-azeotrope of two refrigerants.  
Make sure to charge with liquid phase when filling refrigerant.

※ Connect the indoor units for R-410A refrigerant. Check whether the indoor units can be connected with the product's catalogue. (When incorrect indoor units are connected, they cannot operate normally.)

※ After installation and trial operation, explain to the customer how to use the VRF and give the installation manual to the user.

※ The manufacturer is not responsible for accidents due to incorrect installation. Any claims caused by failing to keep the safety precautions are installer's responsibility. (The installer is responsible for the service cost.)

※ This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

※ If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

## WARNING

In case of not following the safety precautions, the service agent or the user may get the risk of serious wound or death.

## CAUTION

In case of not following the safety precautions, the service agent or the user may get the risk of injury or loss of property.

## FOR INSTALLATION

## WARNING

**Installation must be done by the installer or its service agent.**

► Installation by an unqualified person may cause a water leakage, electric shock or fire and so on.

**Install the unit correctly according to the installation manual.**

► An incorrect installation may cause a water leakage, electric shock or fire.

**When installing the unit in a small place, take measures in order to keep the refrigerant concentration from exceeding allowable safety limits in the event of a refrigerant leak.**

► Excessive refrigerant concentration can lead to suffocation.

**If any gas or impurities except R-410A refrigerant get into the refrigerant pipe, serious problems may occur and this may cause injury.**

**When installing the unit, only use the components and tools which are specified for the installation.**

► Using the uncertified components and tools may cause a unit fall, water leakage, electric shock, and a fire.

(Never use the components and pipe for R-22 refrigerant)

**Install the unit safely on a place that can support its weight.**

► If the place cannot support its weight, the unit may fall down and cause injury.

**Check out the safety precautions below before installing or fixing the unit.**

► Before welding the unit, you must remove all the hazardous materials around the unit that may cause an explosion and a fire.

► When refrigerant is in the product or the pipe before welding the unit, you must remove the refrigerant.

- If you weld the unit when there is refrigerant inside, the increased pressure of refrigerant may explode or break the leaking spot so that causes serious injuries.

► When welding the unit, please use nitrogen gas to prevent oxide from generating in the pipe

**Make sure to cut off all the power supply before installing, fixing, and cleaning the unit.**

**When the electric wire is damaged, you must exchange it by the manufacturer or its service agent, or a person who has the equivalent qualification.**





# Safety precautions

**When turning on the power, make sure to connect the power supply to the circuit breaker designated for indoor units. (ELCB, ELB, MCCB)**

- ▶ If you do not install the circuit breaker for MSB(ELCB, ELB, MCCB), excessive current or failure to blocking the power supply may cause electric shock, a fire.

**Make sure to connect wires thoroughly and fix them firmly so that no outer pressure of the wires would put on the terminal block.**

- ▶ If the terminal is loose, it may generate heat and cause a fire.

**Supplied power should be more or less than 2% of the rated power.**

- ▶ If the power is supplied unevenly, a life span of the storage battery shortens. If the supplied power is more than 4 % of the rated power, the unit terminates and indicates errors to protect it.

**Make sure the interior power supply shouldn't be over the maximum voltage or under the minimum voltage.**

- ▶ Otherwise, it could result in malfunction of the unit due to damaged electrical components or decreased function of components.

**Only use copper wire as the power cable and all wiring, components and materials should comply with the applicable local and national codes.**

**Make sure that all wiring is properly installed.**

- ▶ Otherwise, the unit can be heated and cause a fire.

**Never use the pipe and flare parts for R-22 refrigerant.**

**In case of a refrigerant gas leakage during installation, please ventilate the area.**

- ▶ If refrigerant gas combines with inflammable materials, toxic gases can be generated.

**The electric work must be done by service agent or qualified persons according to national wiring regulations and use only rated cable.**

- ▶ Voltage drop, shortage of power supply, improper electric work and using unapproved wires can cause an electric shock or a fire.

## FOR INSTALLATION



## CAUTION

**Make sure to earth.**

- ▶ Do not connect the earth wire to the gas pipe, lighting rod or telephone wire.
- ▶ If earthing is incomplete, electric shock or fire may occur.

**Make sure that the condensed water from the drain hose runs out properly based on this installation manual and insulate the drain pipe so that frost does not generate.**

- ▶ If the draining work is done incompletely, property damage may occur due to a leakage.

**Install the power cable and communication cable of MSB at least 1m away from the electric appliances and at least 2m away from the lightning rod.**

- ▶ However, you may hear a noise 1 meter away from the unit depending on the condition of the electric wave.

**Install MSB away from lighting apparatus using the ballast.**

- ▶ If you use the wireless remote control, it may not operate normally.

**Do not install the unit in following places.**

- ▶ The place packed with mineral oil and the place where there are lots of moisture, or arsenic acid:  
The resin parts may burn and cause the fall of the components or a refrigerant leakage.
- ▶ The place where corrosive gas such as sulfurous acid gas generates from the vent pipe or air outlet:  
The copper pipe or connection pipe may corrode and refrigerant may leak.
- ▶ The place where there is a machine that generates electromagnetic waves:  
The unit may not operate normally due to malfunction in the control system.
- ▶ The place where there is a possibility of combustible gas leakage, and where inflammable materials like thinner or gasoline is handled. The place where a carbon fiber or inflammable dust is floating in the air:  
If the gas leaks and stays around the main valve, it may result in a fire.
- ▶ The places where have a possibility of the MSB corrosion like a spa and a shore.

**When there is a possibility that the place in which MSB is installed could be the shelter of small animals, take proper measures to prevent this situation in advance.**

- ▶ If small animals contact the unit, this may result in malfunction of the unit or cause a fire and smoke. Please remind users of cleaning the place around MSB.

※ Any claims caused by failing to keep the safety precautions are installer's responsibility.  
(The installer is responsible for the service cost.)













# Preparing the installation

## Accessories

Please check if items below are included in installation accessories.

Name	Insulation (for pipe)	Insulation (for base)	Installation manual	Pattern sheet	Cable tie	Pipe socket	
						V1MSBB02HR V1MSBB01HR	V1MSBB04HR V1MSBB06HR V1MSBB08HR V1MSBB12HR
Shape						-	

\* Soundproof and soundproofing materials

Name	V1MSBP01HR
Shape	 

## Selecting the refrigerant pipe for installation

The design pressure of MSB for R-410A is about 4.1 MPa (594.6psi). For safe use of the product, please refer to the table below in selecting the installation pipe.

Outer diameter		Minimum thickness		Temper grade
mm	inch	mm	inch	
6.35	1/4	0.70	0.028	Annealed
9.52	3/8	0.70	0.028	
12.70	1/2	0.80	0.031	
15.88	5/8	1.00	0.039	
19.05	3/4	0.90	0.035	
22.22	7/8	0.90	0.035	Drawn
25.40	1	1.00	0.039	
28.58	1 1/8	1.10	0.043	
31.75	1 1/4	1.10	0.043	
34.92	1 3/8	1.21	0.048	
38.10	1 1/2	1.35	0.053	
41.28	1 5/8	1.43	0.056	
44.45	1 3/4	1.60	0.063	
50.80	2	2.00	0.079	
53.98	2 1/8	2.10	0.083	



- For pipes larger than Ø 19.05mm(3/4"), drawn type (C1220T-1/2H or C1220T-H) type copper pipe must be used. If an annealed type (C1220T-O) copper pipe is used, pipe may break due to its low pressure resistance and cause personal injury.

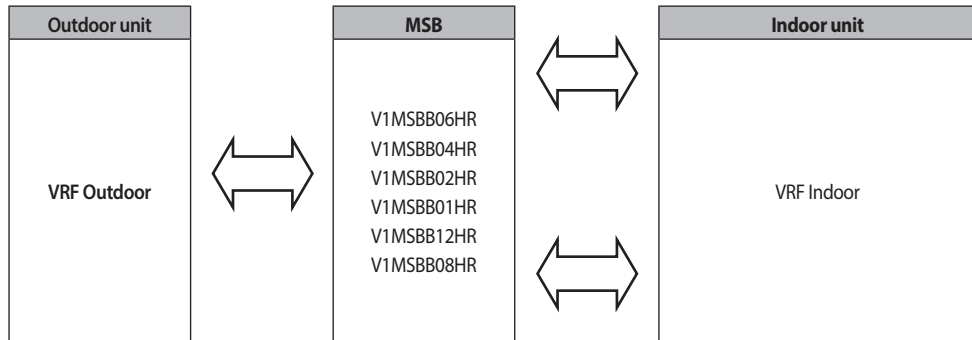




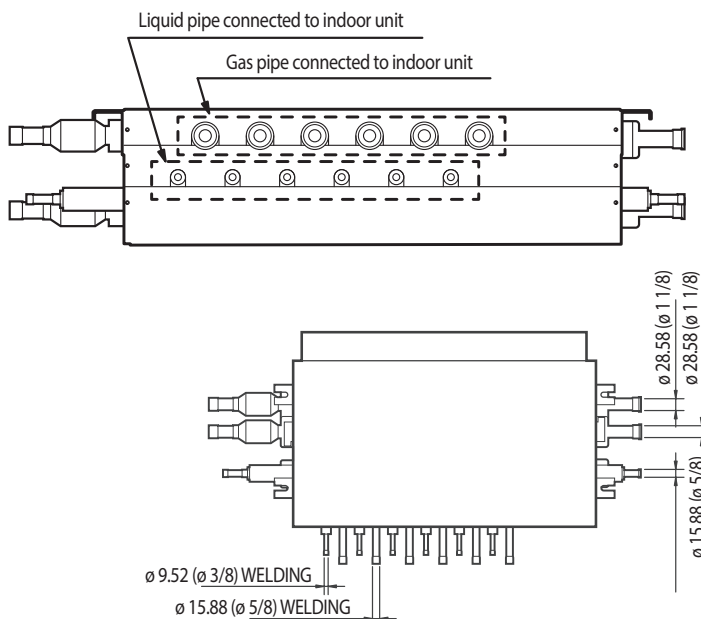
# Preparing the installation

## MSB indoor/outdoor unit compatible table

Before installing MSB, refer to the compatible table below and find the model before installation.



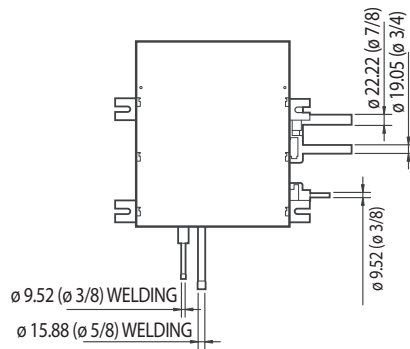
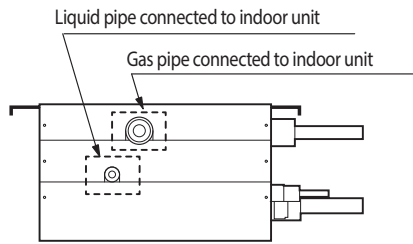
MSB Kit	Model	Description
	V1MSBB06HR	below 61.6 kW (216MBH)
	V1MSBB04HR	below 61.6 kW (216MBH)
	V1MSBB02HR	below 32 kW (108MBH)
	V1MSBB01HR	below 16 kW (54MBH)
	V1MSBB12HR	85.0 kW (290MBH)
	V1MSBB08HR	85.0 kW (290MBH)



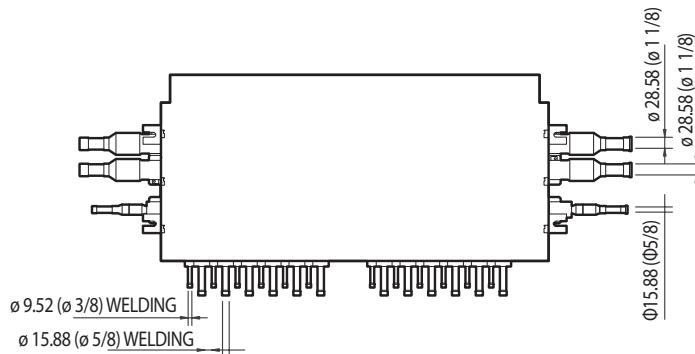
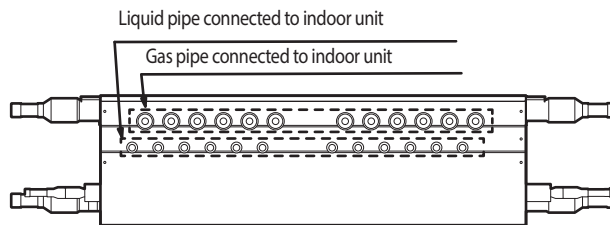
[Unit : mm(inch)]

<V1MSBB06HR, V1MSBB04HR, V1MSBB02HR>





<V1MSBB01HR>



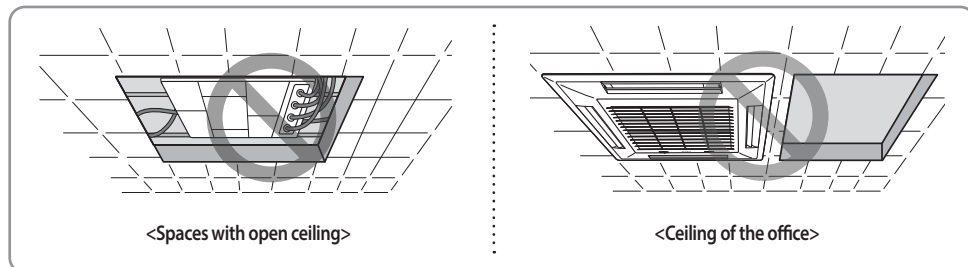
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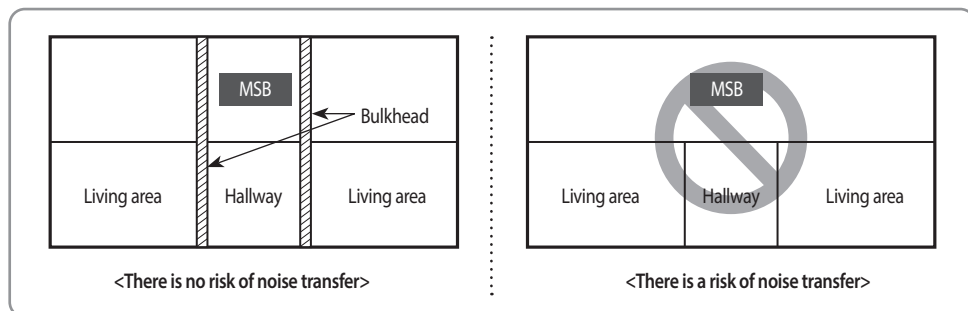


## Space requirements

1. Refrigerant noise can be generated during MSB operation. Do not install the unit in spaces that require silence, such as bedrooms, libraries, hospitals, offices etc.
2. Do not install the MSB in the ceiling of living spaces. Noise generated from the MSB may disrupt occupant comfort.



3. It is normally recommended to install MSB in a hallway but a bulkhead should be installed to minimize the noise from being transferred to living area. (Refer to the below figure)



※ Soundproof and soundproofing materials

- ▶ The place where MSB is installed and the interior walls should have a high soundproof ability. (Bricks, Concretes, Cement)
  - ▶ The ceiling where MSB is installed should be coated with quality textile that has a good soundproof function.
  - ▶ Minimize the size of the hole between the walls and the pipe connection. After the installation, block the gap to prevent noise from leaking.
4. Secure over 0.25m(0.82') of space when MSB is being fixed to the concrete of the ceiling.
  5. MSB may generate noise so don't install it too close to the ceiling textile.
  6. Each pipe hanger should be placed at 1.5m(4.92') interval to support its weight firmly. If the pipe or the hanger isn't fixed firmly, the unit may fall and cause a property damage or loss of life.
  7. When 'Low temperature cooling range expansion' option is set for constant cooling operation throughout the year, noise of the MSB may get louder during wintertime. Therefore, above installation requirements must be followed.



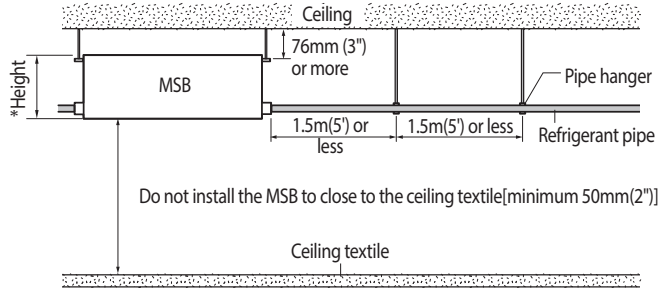




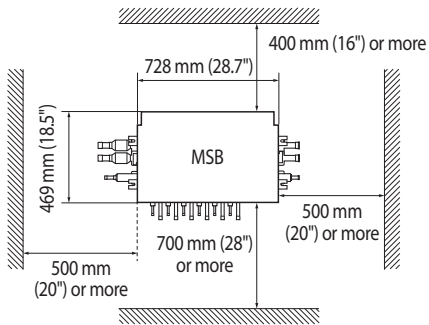
8. Select a place where the structure can support the weight of the MSB and indoor units that also have strong vibration resistance without any slope.  
If the structure is not strong enough, MSB may fall down and cause injury.

\*Height (mm)

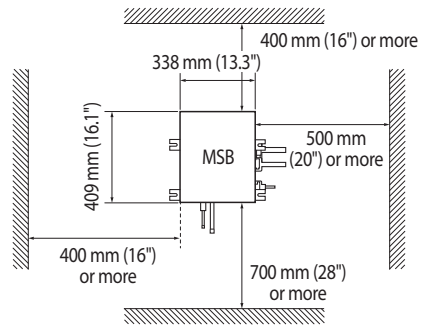
V1MSBB06HR	199
V1MSBB04HR	
V1MSBB02HR	
V1MSBB01HR	
V1MSBB12HR	
V1MSBB08HR	298



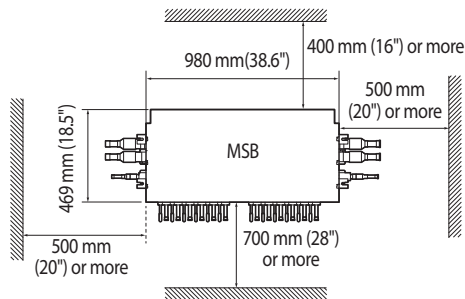
9. Select an installation location with enough space for service and repair.  
Leave enough space between adjacent walls and structures. Refer to the examples below.



<V1MSBB06HR, V1MSBB04HR, V1MSBB02HR>



<V1MSBB01HR>



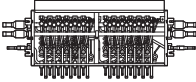
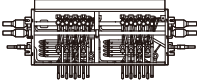
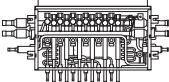
<V1MSBB12HR, V1MSBB08HR>

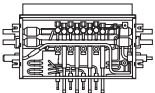
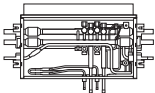





# Space requirements

## 1. MSB specification

Model	V1MSBB12HR	V1MSBB08HR	V1MSBB06HR
Exterior of MSB			
Number of connectable indoor units at one port	Up to 8 units	Up to 8 units	Up to 8 units
Maximum number of indoor units (Total)	64	64	32
The maximum capacity of the connectable indoor units at one port	16 kW (54MBH)	16 kW (54MBH)	16 kW (54MBH)
The maximum capacity of the connectable indoor units at one port (with Y-JOINT)	32.0 kW (108 MBH)	32.0 kW (108 MBH)	32.0 kW (108 MBH)
The maximum capacity of the connectable indoor units	85.0 kW (290MBH)	85.0 kW (290MBH)	61.6 kW (216MBH)
Internal EEV	Not included Cannot connect indoor unit without internal EEV		

Model	V1MSBB04HR	V1MSBB02HR	V1MSBB01HR
Exterior of MSB			
Number of connectable indoor units at one port	Up to 8 units	Up to 8 units	Up to 8 units
Maximum number of indoor units (Total)	32	16	8
The maximum capacity of the connectable indoor units at one port	16 kW (54MBH)	16 kW (54MBH)	16 kW (54MBH)
The maximum capacity of the connectable indoor units at one port (with Y-JOINT)	32.0 kW (108 MBH)	32.0 kW (108 MBH)	-
The maximum capacity of the connectable indoor units	61.6 kW (216MBH)	32.0 kW (108MBH)	16 kW (54MBH)
Internal EEV	Not included Cannot connect indoor unit without internal EEV		



CAUTION

- If the sum of the connected indoor unit capacity connected to the MSB is greater than 67.2kW (228 MBH), performance may vary depending on operating conditions.
- The incoming pipe diameters supplying refrigerant to the MSB are determined based on the sum of the connected indoor units. If these pipe diameters are different than the MSB pipe diameters, use the provided reducers to connect to the MSB. If the provided reducers are not the correct size, field supplied reducers must be used.





## 2. MSB specification

Model	V1MSBB12HR	V1MSBB08HR	V1MSBB06HR												
Example installing (Each port connection)															
Example installing (MSB series connection)															
Installing indoor units	<p>Indoor units under 16.0 kW (54 kBtu/h): Y-connector is not required</p> <p>Indoor units 16.0 kW ~ 32.0 kW (54 ~ 108 kBtu/h): Y-connectors at the gas and liquid lines are required</p> <p>If continuous cooling operation is required when outside temperature is below -5 °C (23°F), set outdoor option setting "Expand operational temperature range for cooling operation (HR only)", and use Y-connector on the liquid and gas pipes for indoor units 5.0 ~ 16 kW (18 ~ 54 kBtu/h).</p> <p>When MSBs are connected in series, the maximum capacity of all indoor units in MSB series connection is the larger value of MSB which are connected in series.</p> <p>Example: V1MSBB12HR + V1MSBB06HR → 85.0 kW (290MBH)</p>														
Using Y-connector	<p>[V1MSBB06HR, V1MSBB04HR, V1MSBB02HR, V1MSBB01HR]</p> <p>When twinning 2 adjacent ports, Y-connectors can only be connected to the port combinations noted below.</p> <p>Allowed Y-connector port combinations: A + B, C + D, E + F ports</p> <p>Y-connector port combinations that are NOT allowed: B + C port, D + E port, any non-continuous port (example: A+C)</p> <p>Set Dip Switch Settings when using Y-connector</p> <table><tr><td>S/W Option</td><td>S/W Option</td><td>S/W Option</td><td>S/W Option</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>Default</td><td>Combination of A+B port</td><td>Combination of C+D port</td><td>Combination of E+F port</td></tr></table>			S/W Option	S/W Option	S/W Option	S/W Option					Default	Combination of A+B port	Combination of C+D port	Combination of E+F port
S/W Option	S/W Option	S/W Option	S/W Option												
Default	Combination of A+B port	Combination of C+D port	Combination of E+F port												





## Space requirements

[V1MSBB12HR, V1MSBB08HR]  
When twinning 2 adjacent ports, Y-connectors can only be connected to the port combinations noted below:  
[#1-A] + [#1-B] port, [#1-C] + [#1-D] port, [#1-E] + [#1-F] port  
[#2-A] + [#2-B] port, [#2-C] + [#2-D] port, [#2-E] + [#2-F] port  
Y-connector port combinations that are NOT allowed: #1 Ports: B + C port, D + E port, any non-continuous port (example: A+C)  
#2 Ports: B + C port, D + E port, any non-continuous port (example: A+C)

Set Dip Switch Settings when using Y-connector

Using Y-connector

Dip Switch Settings when using Y-connector

S/W Option

ON

1 2 3 4

Default

S/W Option

ON

1 2 3 4

Combination of A+B port

S/W Option

ON

1 2 3 4

Combination of C+D port

S/W Option

ON

1 2 3 4

Combination of E+F port

<Section #1>

Dip Switch Settings when using Y-connector

S/W Option

ON

1 2 3 4

Default

S/W Option

ON

1 2 3 4

Combination of A+B port

S/W Option

ON

1 2 3 4

Combination of C+D port

S/W Option

ON

1 2 3 4

Combination of E+F port

<Section #2>





### 3. Preparation before installation.

- 1) Place the pattern sheet on the ceiling at the spot where you want to install the indoor unit.



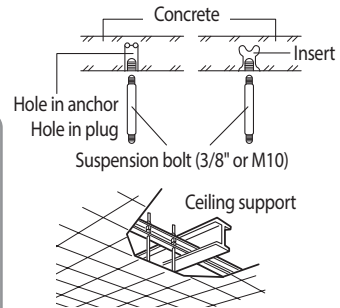
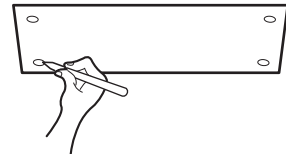
- Since the diagram is made of paper, it may shrink or stretch slightly due to temperature or humidity. For this reason, before drilling the holes maintain the correct dimensions between the markings.

- 2) Insert bolt anchors, use existing ceiling supports or construct a suitable support as shown in figure.

- 3) Install the suspension bolts depending on the ceiling type.



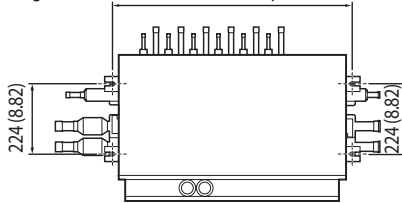
- Ensure that the ceiling is strong enough to support the weight of the unit. Before hanging the unit, test the strength of each attached suspension bolt.
- If the length of suspension bolt is more than 1.5m(4.92'), it is required to prevent vibration.
- If this is not possible, create an opening on the false ceiling in order to be able to use it to perform the required operations on the indoor unit.



### 4. Cautions about MSB installation.

- ▶ When fixing the unit at the upper place using suspension bolts, use a nut and washer to vertically fasten the unit.
- ▶ The MSB has four suspension points to secure the MSB. All four suspension points must be used.
- ▶ Take care to ensure that the unit is installed in the correct orientation. If the MSB is installed upside down, noise will be generated and the unit may be damaged.

\*Length (Between the locations of suspension bolts)

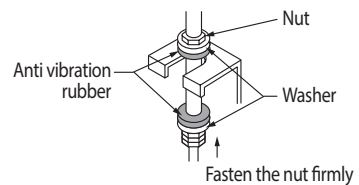


<Location and intervals of fixed suspension bolts>

\*Length

V1MSBB06HR	
V1MSBB04HR	764(30.08)
V1MSBB02HR	
V1MSBB01HR	374(14.74)
V1MSBB12HR	
V1MSBB08HR	1016(40.00)

Unit : mm (inch)



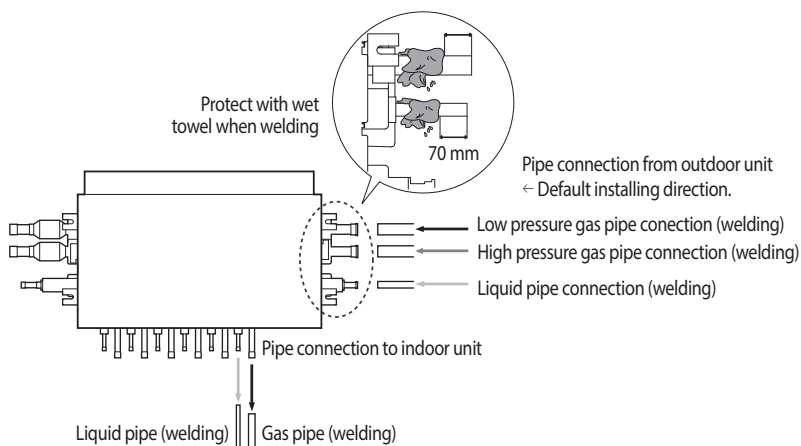
<Fixing the bolt>





## Space requirements

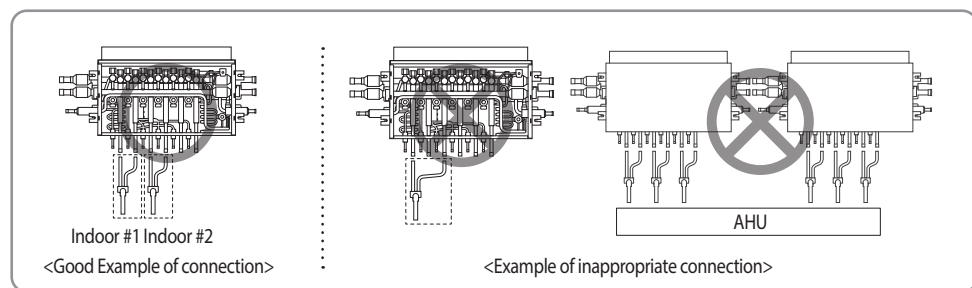
### 5. How to connect the pipe line.



- ※ When installing MSB, use the pattern sheet for installation that is provided with the product.
- ※ When welding the pipes, protect the product with the flame-proof sheet.
- ※ When connecting the MSB with outdoor units, default direction is set in the MSB.  
If installing opposite direction, weld the enclosed copper cap to each high pressure, low pressure and liquid pipes.

### 6. How to connect Y-connector

- ▶ In case of connecting one indoor with Y-Connector to MSB, Y-Connector must be connected in series.





# Refrigerant piping

## Pipe brazing instructions and cautions

### Keeping refrigerant pipe clean and dry

- ▶ To prevent foreign materials or water from entering the pipe, it is important to keep the refrigerant pipe clean, dry and sealed during installation.

Exposure place	Exposure time	Sealing type
Outside exposure	Longer than one month	Pipe pinch
	Shorter than one month	Taping
Inside exposure	-	Taping

### Brazing the pipe

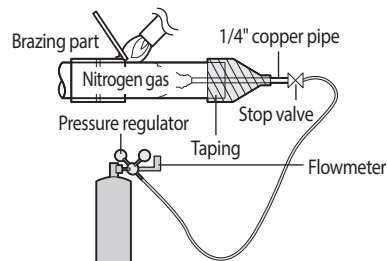
- ▶ Make sure that there is no moisture inside the pipe.
- ▶ Make sure that there are no foreign materials and impurities in the pipe.
- ▶ Make sure that there is no leak.
- ▶ Make sure to follow the instruction when brazing the pipe.

#### *The use of Nitrogen gas*

1. Use Nitrogen gas when brazing the pipes as shown in the picture.
2. If you don't use Nitrogen gas when brazing the pipes, oxide may form inside the pipe. It can cause the damage of the compressor and valves.
3. Adjust the flow rate of the nitrogen gas with a pressure regulator to maintain  $0.05\text{m}^3/\text{h}$  ( $1.77\text{ft}^3/\text{h}$ ) or less.

#### *Direction of the pipe when brazing*

- Performing the brazing of the pipe should be headed downwards or horizontally.





# Refrigerant piping

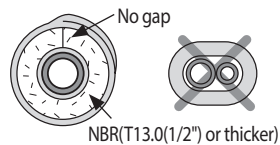
## Pipe insulating instructions and cautions

Make sure to check for gas leakage before completing the installation (hose and pipe insulation) and insulate hoses and pipes when there is no sign of leakage.

1. To avoid condensation problems, place T13.0 (1/2") or thicker Acrylonitrile Butadiene Rubber separately around each refrigerant pipe.



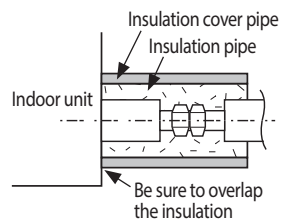
- When installing pipe insulation, make sure that the insulation seam is on the top of the pipes.



2. Wrap insulating tape around the pipes. Avoid compressing the pipe insulation while wrapping.
3. Finish wrapping insulating tape around the rest of the pipes leading to the outdoor unit.
4. Pipes and electrical cables connecting the unit with the outdoor unit must be secured to the structure with appropriate straps/hangers.



- All refrigerant connection must be accessible, in order to permit either unit maintenance or removing it completely.



- Must fit tightly against body without any gap.

5. Select the insulation of the refrigerant pipe.

- ▶ Insulate the gas side and liquid side pipe referring to the thickness according to the pipe size.
- ▶ Indoor temperature of 30°C(86°F) and humidity of 85% is the standard condition. If install in a high humidity condition, use one grade thicker insulator by referring to the table below. If installing in an unfavorable conditions, use thicker one.
- ▶ Insulator's heat-resistance temperature should be more than 120°C(248°F).

Pipe	Outer diameter		Insulator (Cooling, Heating)				Remarks
			General [30°C (86°F), 85%]		High humidity [30°C (86°F), over 85%]		
			EPDM, NBR				
	mm	inch	mm	inch	mm	inch	
Liquid pipe	6.35~9.52	1/4~3/8	9	3/8	9	3/8	Heating resisting temperature over 120°C (248°F)
	12.70~50.80	1/2~2	13	1/2	13	1/2	
Gas Pipe	6.35	1/4	13	1/2	19	3/4	
	9.52~25.4	3/8~1	19	3/4	25	1	
	28.58~44.45	1 1/8~1 3/4	19	3/4	32	1 1/4	
	50.80	2	25	1	38	1 1/2	

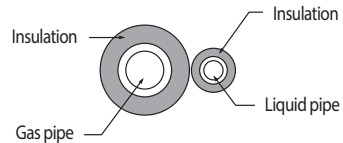






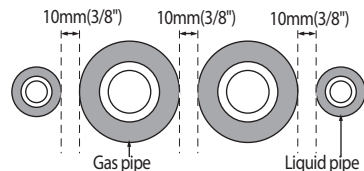
#### Refrigerant pipe before EEV kit and MSB or without EEV kit and MSB

- ▶ You can contact the gas side and liquid side pipes but the pipes should not be pressed.
- ▶ When contacting the gas side and gas side pipe, use 1 grade thicker insulator.



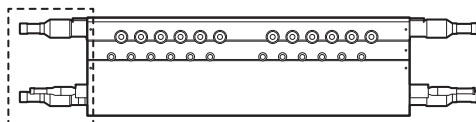
#### Refrigerant pipe after EEV kit and MSB

- ▶ Install the gas side and liquid side pipes, leave 10mm(3/8") of space.
- ▶ When contacting the gas side and liquid side pipe, use 1 grade thicker insulation.



#### Insulation for non-serial connection of MSB

- ▶ Exposed pipes should be insulated.

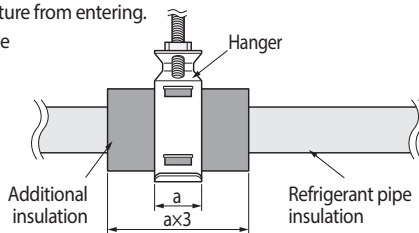


Exposed pipes on non-serial connection



CAUTION

- Prevent insulation thickness from getting thinner at the pipe hanger. Use adhesives on the seams to prevent moisture from entering.
- Wrap the refrigerant pipe with insulation tape if it is exposed to outside sunlight.
- Install the refrigerant pipe ensuring that the insulation does not get thinner on the bent part or hanger of pipe.
- Add the additional insulation if the insulation plate gets thinner.





# Wiring

## Installing the circuit breaker and wires

Power supply	MCCB	ELB	Power cable	Earth cable	Communication cable
Max : 242V Min : 198V	x [A]	x [A], 30mA 0.1 sec	0.0039inch <sup>2</sup> (2.5mm <sup>2</sup> )	0.0039inch <sup>2</sup> (2.5mm <sup>2</sup> )	0.0012~0.0023inch <sup>2</sup> (0.75~1.5mm <sup>2</sup> )

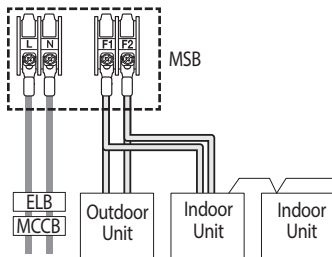
※  $x [A] \geq 1.25 \times 1.1 \times \sum A_i$

(x [A] : MCCB/ELB amperes,  $\sum A_i$  : Sum of the rated current amperes of indoors)

## Installing the wire

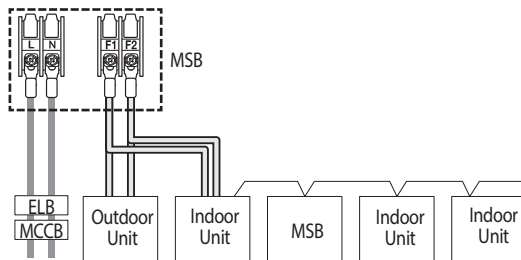
- ▶ Supply the 208-230V power to L1, L2 (L, N) of MSB separately
- ▶ Connect the communication cable from the outdoor unit to F1, F2 of MSB.
- ▶ Power Line and communication line must be connected as shown in drawing.

Case 1



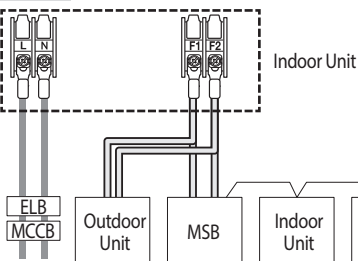
208-230V / Single Phase  
(Supply separately)

Case 2



208-230V / Single Phase  
(Supply separately)

Case 3



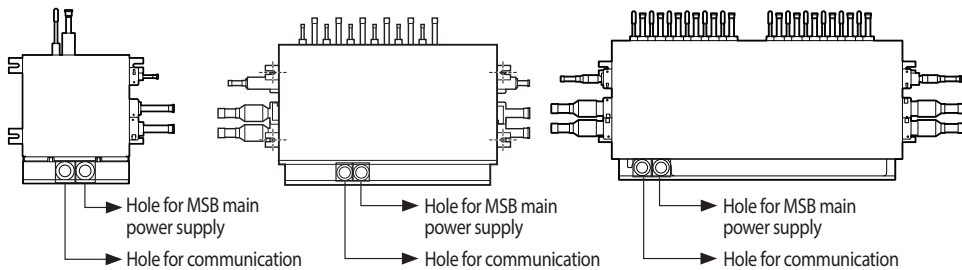
208-230V / Single Phase  
(Supply separately)



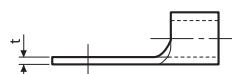
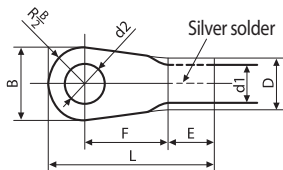
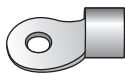


► Power line and communication line must be installed as shown in drawing

\* Hole size is  $\Phi 43.7$  mm (1.72 inches)



► Choose the compressed socket based on the cross-section of the connecting wire.



Nominal dimensions for cable [mm <sup>2</sup> (inch <sup>2</sup> )]		1.5 (0.002)		2.5 (0.003)		4 (0.006)
Nominal dimensions for screw [mm (inch)]		4 (0.157)	4 (0.157)	4 (0.157)	4 (0.157)	4 (0.157)
B	Standard dimension [mm (inch)]	6.6 (0.259)	8 (0.314)	6.6 (0.259)	8.5 (0.334)	9.5 (0.374)
	Allowance [mm (inch)]	$\pm 0.2$ (0.007)		$\pm 0.2$ (0.007)		$\pm 0.2$ (0.007)
D	Standard dimension [mm (inch)]	3.4 (0.134)		4.2 (0.165)		5.6 (0.220)
	Allowance [mm (inch)]	$+0.3$ (0.011) $-0.2$ (-0.007)		$+0.3$ (0.011) $-0.2$ (-0.007)		$+0.3$ (0.011) $-0.2$ (-0.007)
d1	Standard dimension [mm (inch)]	1.7 (0.066)		2.3 (0.090)		3.4 (0.133)
	Allowance [mm (inch)]	$+0.2$ ( $\pm 0.007$ ) 0		$+0.2$ ( $\pm 0.007$ ) 0		$+0.2$ ( $\pm 0.007$ ) 0
E	Min. [mm (inch)]	4.1 (0.161)		6 (0.236)		6 (0.236)
F	Min. [mm (inch)]	6 (0.236)		6 (0.236)		5 (0.196)
L	Max. [mm (inch)]	16 (0.629)		17.5 (0.688)		20 (0.787)
d2	Standard dimension [mm (inch)]	4.3 (0.169)		4.3 (0.169)		4.3 (0.169)
	Allowance [mm (inch)]	$+0.2$ ( $\pm 0.007$ ) 0		$+0.2$ ( $\pm 0.007$ ) 0		$+0.2$ ( $\pm 0.007$ ) 0
t	Min. [mm (inch)]	0.7 (0.027)		0.8 (0.031)		0.9 (0.035)





# Wiring

## Setting MSB address and port

※ When counting the quantity of MSBs while outdoor unit installation, one MSB is one.  
However, in the case of V1MSBB12HR and V1MSBB08HR, one MSB must be counted as two MSBs.

Process	
1. MSB address setting	<p>Set MSB address by rotary switch.</p> <p>Example&gt; If you want to set MSB address to 12, set upper rotary switch to 1 and set bottom rotary switch to 2</p> <div><div><div>MSB Address</div></div><div>Default</div></div> <div><div>MSB Address</div></div> <div>Setting MSB adress to 12</div>

Rotary switch for MSB ADDRESS

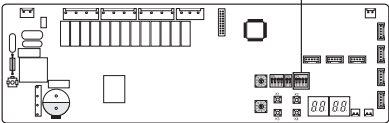
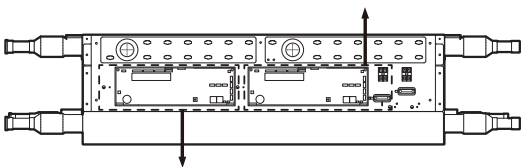
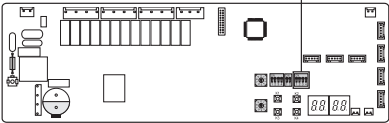


Process	
2. <b>DIP switch setting for using each port</b>	<p>Set using each port (connected to indoor unit) by DIP switch</p> <p>Example&gt; If you want to connect indoor units at A,B,C,F port, set DIP switch 1,2,3,2 to 'ON'</p> <p>DIP S/W</p> <div><div><div>ON</div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>ON</div><div>1</div><div>2</div></div></div> <p>Default</p> <div><div><div>ON</div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>ON</div><div>1</div><div>2</div></div></div> <p>Using A, B, C, F port</p> <p>DIP switch for indoor unit setting (ON: Use, OFF: Not use)</p>
3. <b>DIP switch setting for using Y-connetor</b>	<p>[V1MSBB06HR, V1MSBB04HR, V1MSBB02HR, V1MSBB01HR]</p> <p>When twinning 2 adjacent ports, Y-connectors can only be connected to the port combinations noted below.</p> <p>Allowed Y-connetor port combinations: A + B, C + D, E + F ports</p> <p>Y-connetor port combinations that are NOT allowed: B + C port, D + E port, any non-continuous port (example: A+C)</p> <p>Set Dip Switch Settings when using Y-connetor</p> <div><div><div>S/W Option</div><div><div>ON</div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>Default</div></div><div><div>S/W Option</div><div><div>ON</div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>Combination of A+B port</div></div><div><div>S/W Option</div><div><div>ON</div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>Combination of C+D port</div></div><div><div>S/W Option</div><div><div>ON</div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>Combination of E+F port</div></div></div>





## Wiring

Process	
3. DIP switch setting for using Y-connetor	<p>[V1MSBB12HR, V1MSBB08HR]</p> <p>When twinning 2 adjacent ports, Y-connectors can only be connected to the port combinations noted below: [#1-A] + [#1-B] port, [#1-C] + [#1-D] port, [#1-E] + [#1-F] port [#2-A] + [#2-B] port, [#2-C] + [#2-D] port, [#2-E] + [#2-F] port</p> <p>Y-connector port combinations that are NOT allowed: #1 Ports: B + C port, D + E port, any non-continuous port (example: A+C) #2 Ports: B + C port, D + E port, any non-continuous port (example: A+C)</p> <p>Set Dip Switch Settings when using Y-connector</p> <p>Dip Switch Settings when using Y-connector</p>  <p>S/W Option</p> <p>ON</p> <p>1 2 3 4</p> <p>Default</p> <p>S/W Option</p> <p>ON</p> <p>1 2 3 4</p> <p>Combination of A+B port</p> <p>S/W Option</p> <p>ON</p> <p>1 2 3 4</p> <p>Combination of C+D port</p> <p>S/W Option</p> <p>ON</p> <p>1 2 3 4</p> <p>Combination of E+F port</p> <p>&lt;Section #1&gt;</p>  <p>Dip Switch Settings when using Y-connector</p>  <p>S/W Option</p> <p>ON</p> <p>1 2 3 4</p> <p>Default</p> <p>S/W Option</p> <p>ON</p> <p>1 2 3 4</p> <p>Combination of A+B port</p> <p>S/W Option</p> <p>ON</p> <p>1 2 3 4</p> <p>Combination of C+D port</p> <p>S/W Option</p> <p>ON</p> <p>1 2 3 4</p> <p>Combination of E+F port</p> <p>&lt;Section #2&gt;</p>





Process

4. MSB address and port setting for indoor unit (for wireless remote controller)

Auto setting: refer to 'auto pipe pairing' in outdoor installation manual.

Manual setting :

1. Wireless remote controller

1) Enter mode to set option

2) Assign an indoor unit MSB port address by wireless remote controller

The initial setting status of indoor unit ADDRESS(MAIN/RMC/MSB port) is “0A0000-100000-200000-300000”

Option	SEG1		SEG2		SEG3		SEG4		SEG5		SEG6	
Explanation	PAGE		Mode		Setting Main address		100-digit of indoor unit address		10-digit of indoor unit		The unit digit of an indoor unit	
Indication and Details	Indication	Details	Indication	Details	Indication	Details	Indication	Details	Indication	Details	Indication	Details
	0		A	Address setting mode	0	No Main address	0~9	100-digit	0~9	10-digit	0~9	A unit digit
					1	Main address setting mode						
Option	SEG7		SEG8		SEG9		SEG10		SEG11		SEG12	
Explanation	PAGE				Setting RMC address				Group channel(*16)		Group address	
Indication and Details	Indication	Details			Indication	Details			Indication	Details	Indication	Details
	1		-		0	No RMC address	-		RMC1	0~F	RMC2	0~F
					1	RMC address setting mode						
Option	SEG13		SEG14		SEG15		SEG16		SEG17		SEG18	
Explanation	PAGE				Setting MSB PORT address		10-digit of MSB		The unit digit of MSB		PORT address	
Indication and Details	Indication	Details			Indication	Details	Indication	Details	Indication	Details	Indication	Details
			-		0	No MSB port address	0~1	10-digit	0~9	A unit digit	A~F	PORT Location
					1	MSB port address setting mode						

Example> If you want to set the indoor unit to 'A' port of MSB #1.

0A0000 – 100000 – 20101A -30000

# Wiring



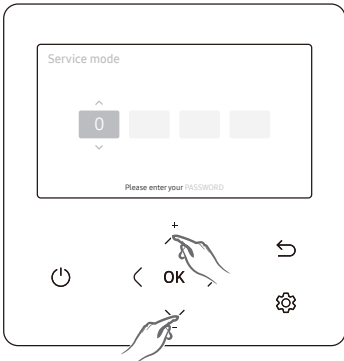
Process	
4. MSB address and port setting for indoor unit (for wired controller)	2. Wired controller
	– Setting for VSTAT02P-1 <ol style="list-style-type: none"> <li>1) Press the top right corner (hidden button) of the display for more than 3 seconds then release it. Then you can press [ + ]/[ - ] buttons and select No.3 and press [ OK ] button.</li> <li>2) Assign an indoor unit MSB port address with main menu 4, sub menu 7 (MSB address is assigned to SEG 12, Port address is assigned to SEG 4). If you want to know the detailed operation of VSTAT02P-1, refer to installation manual for VSTAT02P-1.</li> </ol>

The diagram shows a rectangular display unit with a screen and several buttons. Labels point to various parts: 'Main menu' points to the top left of the screen; 'Sub menu' points to the top right of the screen; 'Setting value' points to the top right corner of the screen; 'Page' points to the top right corner of the screen; 'Move menu' points to the bottom left of the screen; 'Move page' points to the bottom right of the screen; 'Mode' points to a button on the left; 'Fan' points to a button on the left; 'OK (3 sec)' points to a button on the right.

Main menu	Sub menu	Function	Setting value	
			value	Factory default
4	1	Target address setting	Target address of indoor unit (Example: 20 02 1F)	None
	2	Main address setting/Checking	0~4F (in hexadecimal digits)	
	3	RMC address setting/Checking	0x00~0xFE	None
	4	Basic option setting/Checking	Option code	
	5	Install option setting/Checking	Option code	None
	6	Install(2) option setting/Checking	Option code	None
	7	MSB address setting/checking Port address setting/checking	MSB address (00~15) Port address (A~F)	None





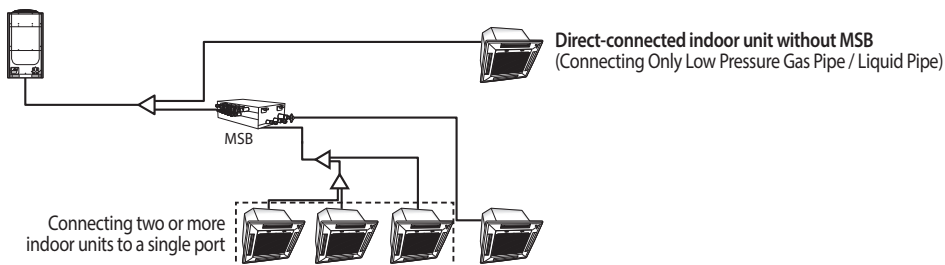
Process													
4. MSB address and port setting for indoor unit (for Programmable Wired Controller)	<div>3. Programmable Wired Controller</div> <div>– Setting for VSTAT04P-1</div> <div>1) Press the  and  buttons at the same time for more than 3 seconds. Then you can enter the password(0202) and press the OK button.</div> <div>2) Assign an indoor unit MSB port address with [Major] General → [Step1] Indoor unit/Ventilator option → [Step2] MSB port → [Step3] MSB address &amp; MSB port.</div> <div>※ For more information, please refer to the installation manual of VSTAT04P-1</div> <table><tr><th>Major</th><th>Step1</th><th>Step2</th><th>Step3</th><th>Description</th></tr><tr><td rowspan="2">General</td><td rowspan="2">Indoor unit/ Ventilator option</td><td rowspan="2">MSB port</td><td>MSB address</td><td>00 to 15</td></tr><tr><td>MSB port</td><td>A to F</td></tr></table> <div></div> <div>3. Setting by using Lennox Service Software</div> <div>Set the pipe addresses by using Add-on &gt; Change address on Lennox Service Software. (For more information, see the Lennox Service Software Help.)</div>	Major	Step1	Step2	Step3	Description	General	Indoor unit/ Ventilator option	MSB port	MSB address	00 to 15	MSB port	A to F
Major	Step1	Step2	Step3	Description									
General	Indoor unit/ Ventilator option	MSB port	MSB address	00 to 15									
			MSB port	A to F									



# Wiring



- The Direct-connected indoor unit without MSB like below picture, be sure to set their options to "Cooling only unit setting" and then connect them to a low pressure gas pipe and a liquid pipe. This indoor unit only operate to cooling mode.
- If two or more indoor units are connected to a single port, switching between cooling and heating mode does not work while in auto mode. It is recommended to select the cooling or heating mode.



## Set to Cooling Only Unit

1. Check whether power is supplied or not.
  - When the indoor unit is not plugged in, there should be additional power supply in the indoor unit.
2. The panel(display) should be connected to an indoor unit to receive option.
3. Enter mode to set option (\* Detail method of entering option mode refer to indoor unit installation manual)
4. Set the 05 series installation option at SEG3 to '2' like this '052000 - 100000 - 20000 - 30000'.

(The default setting of an indoor unit 05 series installation is '050000 - 100000 - 20000 - 30000')



- When setting the "Cooling only unit" option, be sure to set the SEG 9 (Hot water heater) of 02 Series installation to "0".
- When "Cooling only unit" option is set, heating operation is not performed when the controller (wireless remote controller, central controller) is set to the heating mode.

## Option No. : 05XXXX-1XXXXX-2XXXXX-3XXXXX

Option	SEG1		SEG2		SEG3		SEG4		SEG5		SEG6	
Explanation	PAGE		MODE		Use of Auto Change Over for HR only in Auto mode / Cooling only unit setting		(When setting SEG3) Standard heating temp. Offset		(When setting SEG3) Standard cooling temp. Offset		(When setting SEG3) Standard for mode change Heating → Cooling	
Indication and Details	Indication	Details	Indication	Details	Indication	Details	Indication	Details	Indication	Details	Indication	Details
	0		5		0	Follow product option	0	0	0	0	0	1
					1	Use Auto Change Over for HR only	1	0.5	1	0.5	1	1.5
							2	1	2	1	2	2
							3	1.5	3	1.5	3	2.5
							4	2	4	2	4	3
					2	Cooling only unit setting	5	2.5	5	2.5	5	3.5
							6	3	6	3	6	4
							7	3.5	7	3.5	7	4.5



Option	SEG7		SEG8		SEG9		SEG10	
Explanation	PAGE		(When setting SEG3) Standard for mode changing Cooling → Heating mode		(When setting SEG3) Time required for mode change		Compensation option for Long pipe or height difference between indoor units	
Indication and Details	Indication	Details	Indication	Details	Indication	Details	Indication	Details
	1		0	1	0	5 min.	0	Use default value
			1	1.5	1	7 min.	1	1) Height difference <sup>1)</sup> is more than 30m or 2) Distance <sup>2)</sup> is longer than 110m
			2	2	2	9 min.		
			3	2.5	3	11 min.		
			4	3	4	13 min.		
			5	3.5	5	15 min.	2	1) Height difference <sup>1)</sup> is 15~30m or 2) Distance <sup>2)</sup> is 50~110m
			6	4	6	20 min.		
			7	4.5	7	30 min.		

#### Key operation


※ V1MSBB12HR & V1MSBB08HR models have two PBA in the control box.

There are two sections in the MSB. So, key operation must be set differently for each section.

Display MSB status 

 Display indoor unit's address



 Solenoid valve manual control

K1 (Pushed time)	Display Contents	Display segment				Remarks
		1	2	3	4	
1	MSB address	0	Blank	0	0	MSB address 0
			Blank	0	1	MSB address 1
			Blank	0	2	MSB address 2
			Blank	1	1	MSB address 11
			Blank	1	5	MSB address 15
2	Mode switching EEV1 step	1	4	8	0	Ex) 480 steps
3	Mode switching EEV2 step	2	4	8	0	Ex) 480 steps
4	Mode switching EEV3 step	3	4	8	0	Ex) 480 steps
5	Mode switching EEV4 step	4	4	8	0	Ex) 480 steps
6	Mode switching EEV5 step	5	4	8	0	Ex) 480 steps
7	Mode switching EEV6 step	6	4	8	0	Ex) 480 steps
8	Subcooler EEV step	7	4	8	0	Ex) 480 steps
9	Subcooler-in sensor temperature	8	-	0	1	Ex) -1°C
			Blank	1	0	Ex) 10°C
10	Subcooler-out sensor temperature	9	-	0	1	Ex) -1°C
			Blank	1	0	Ex) 10°C
11	On/Off for solenoid valve A_C, A_H	A	-	<ul style="list-style-type: none"><li>*_C : Cooling solenid valve of port *</li><li>*_H : Heating solenid valve of port *</li><li>• 3rd segment : Cooling solenid valve On : 1 / Off : 0</li><li>• 4th segment : Heating solenid valve On : 1 / Off : 0</li></ul>		
12	On/Off for solenoid valve B_C, B_H	B				
13	On/Off for solenoid valve C_C, C_H	C				
14	On/Off for solenoid valve D_C, D_H	D				
15	On/Off for solenoid valve E_C, E_H	E				
16	On/Off for solenoid valve F_C, F_H	F				
17	On/Off for liquid by pass solenoid valve	G	Blank	o	n	Ex) On
			o	F	F	Ex) Off
18	Version	8	A	2	0	Ex) October 20, 2008 → 8A 20
19	End of K1 display					





## Wiring

K2 (Pushed time)	Display Contents	Display segment				Remarks
		1	2	3	4	
1	Indoor unit main address for matching with port A	A	-	0	0	Indoor unit main address of port A : 0
2	Indoor unit main address for matching with port B	B	-	0	3	Indoor unit main address of port B : 3
3	Indoor unit main address for matching with port C	C	-	0	6	Indoor unit main address of port C : 6
4	Indoor unit main address for matching with port D	D	-	0	9	Indoor unit main address of port D : 9
5	Indoor unit main address for matching with port E	E	-	1	1	Indoor unit main address of port E : 11
6	Indoor unit main address for matching with port F	F	-	1	5	Indoor unit main address of port F : 15
7	End of K2 display					

※ When two or more indoor units are connected to one port, Indoor unit addresses are sequentially displayed at 2-second intervals from the lowest address indoor unit. (After displaying all, display the first indoor unit again)

### K4 Switch (Solenoid Valve Manual Control)

- ▶ According to the push time of K4 Switch, A\_C, A\_H, ..., F\_C, F\_H, Liquid bypass solenoid valve opens in order.
- ▶ In Solenoid Valve Manual Control mode, valve operates by K4 Push time irrespective of indoor operation mode.
- ▶ In Solenoid Valve Manual Control mode, push K1 Switch makes DATA DISPLAY MODE to start and valves will operate following indoor operation mode.

K4 (Push time)	Display Contents	Display segment			
		1	2	3	4
1	A_C sol valve ON, other sol valve Off	P	A	1	0
2	A_H sol valve ON, other sol valve Off	P	A	0	1
3	B_C sol valve ON, other sol valve Off	P	B	1	0
4	B_H sol valve ON, other sol valve Off	P	B	0	1
5	C_C sol valve ON, other sol valve Off	P	C	1	0
6	C_H sol valve ON, other sol valve Off	P	C	0	1
7	D_C sol valve ON, other sol valve Off	P	D	1	0
8	D_H sol valve ON, other sol valve Off	P	D	0	1
9	E_C sol valve ON, other sol valve Off	P	E	1	0
10	E_H sol valve ON, other sol valve Off	P	E	0	1
11	F_C sol valve ON, other sol valve Off	P	F	1	0
12	F_H sol valve ON, other sol valve Off	P	F	0	1
13	Liquid b/p sol valve ON, other sol valve Off	P	S	1	0
14	sol valve Manual Control MODE end	P	Communication DATA Display		





## MSB (Mode Selection Box) Installation Checklist

Item	Check
1. If the gas leaking test has been completed or not.	
2. If MSB has been fixed securely enough to avoid the danger of vibration and falling or not.	
3. The Insulation condition of the pipe. (Refrigerant pipe, Pipe connection.)	
4. If the R-410A refrigerant has been charged or not. If the subsidiary unit for R-410A has been used or not.	
5. Checking malfunction of the wire and the communication line.	
6. If the MSB frame has been installed upside-down or not.	
7. If the wire earthing work has been done or not.	
8. If the space between sidewalls, ceiling concrete, and the ceiling Tex has been secured enough or not to install the MSB frame.	
9. If the supporting tool of the MSB pipe has been safely placed in 1.5m intervals or not.	
10. If the prescribed wire has been used or not.	
11. If the supplied power is proper or not.	
12. If the additional refrigerant is proper or not. (Refer to the installation manual of the HR outdoor unit.)	

