

Air-Conditioners For Building Application

INDOOR UNIT

CMB-WM350F-AA, CMB-WM500F-AA
CMB-WM108V-BB, CMB-WM1016V-BB

INSTALLATION MANUAL

For safe and correct use, please read this installation manual thoroughly before installing the air-conditioner unit.

INSTALLATIONSHANDBUCH

Zum sicheren und ordnungsgemäßen Gebrauch der Klimageräte das Installationshandbuch gründlich durchlesen.

MANUEL D'INSTALLATION

Veuillez lire le manuel d'installation en entier avant d'installer ce climatiseur pour éviter tout accident et vous assurer d'une utilisation correcte.

INSTALLATIEHANDLEIDING

Voor een veilig en juist gebruik moet u deze installatiehandleiding grondig doorlezen voordat u de airconditioner installeert.

MANUAL DE INSTALACIÓN

Para un uso seguro y correcto, lea detalladamente este manual de instalación antes de montar la unidad de aire acondicionado.

MANUALE DI INSTALLAZIONE

Per un uso sicuro e corretto, leggere attentamente questo manuale di installazione prima di installare il condizionatore d'aria.

ΕΓΧΕΙΡΙΔΙΟ ΟΔΗΓΙΩΝ ΕΓΚΑΤΑΣΤΑΣΗΣ

Για ασφάλεια και σωστή χρήση, παρακαλείστε διαβάσετε προσεκτικά αυτό το εγχειρίδιο εγκατάστασης πριν αρχίσετε την εγκατάσταση της μονάδας κλιματισμού.

MANUAL DE INSTALAÇÃO

Para segurança e utilização correctas, leia atentamente este manual de instalação antes de instalar a unidade de ar condicionado.

INSTALLATIONSMANUAL

Læs venligst denne installationsmanual grundigt, før De installerer airconditionanlægget, af hensyn til sikker og korrekt anvendelse.

INSTALLATIONSHANDBOK

Läs den här installationshandboken noga innan luftkonditioneringsenheten installeras, för säker och korrekt användning.

MONTAJ ELKİTABI

Emniyetli ve doğru biçimde nasıl kullanılacağını öğrenmek için lütfen klima cihazını monte etmeden önce bu elkitabını dikkatle okuyunuz.

РЪКОВОДСТВО ЗА МОНТАЖ

За безопасна и правилна употреба, моля, прочетете внимателно това ръководство преди монтажа на климатизатора.

PODRECZNIK INSTALACJI

W celu bezpiecznego i poprawnego korzystania należy przed zainstalowaniem klimatyzatora dokładnie zapoznać się z niniejszym podręcznikiem instalacji.

INSTALLASJONSHÅNDBOK

For sikker og riktig bruk, skal du lese denne installasjonshåndboken nøye før du installerer klimaanlegget.

РУКОВОДСТВО ПО УСТАНОВКЕ

Для осторожного и правильного использования прибора необходимо тщательно ознакомиться с данным руководством по установке до выполнения установки кондиционера.

PRIRUČKA K INSTALACI

V zájmu bezpečného a správného používání si před instalací klimatizační jednotky důkladně pročtěte tuto příručku k instalaci.

NÁVOD NA INŠTALÁCIU

Pre bezpečné a správne použitie si pred inštalovaním klimatizačnej jednotky, prosím, starostlivo prečítajte tento návod na inštaláciu.

TELEPÍTÉSI KÉZIKÖNYV

A biztonságos és helyes használatához, kérjük, olvassa el alaposan ezt a telepítési kézikönyvet, mielőtt telepítené a légkondicionáló egységet.

PRIROČNIK ZA NAMESTITEV

Za varno in pravilno uporabo pred namestitvijo klimatske naprave skrbno preberite priročnik za namestitev.

MANUAL CU INSTRUCȚIUNI DE INSTALARE

Pentru o utilizare corectă și sigură, vă rugăm să citiți cu atenție acest manual înainte de a instala unitatea de aer condiționat.

PRIRUČNIK ZA UGRADNJU

Radi sigurne i ispravne uporabe, temeljito pročítajte ovaj priručnik prije ugradnje klimatizacijskog uređaja.

安装手册

为了安全和正确地使用本空调器，请在安装前仔细阅读本安装手册。

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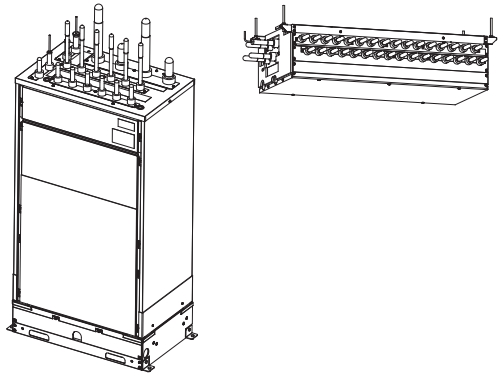
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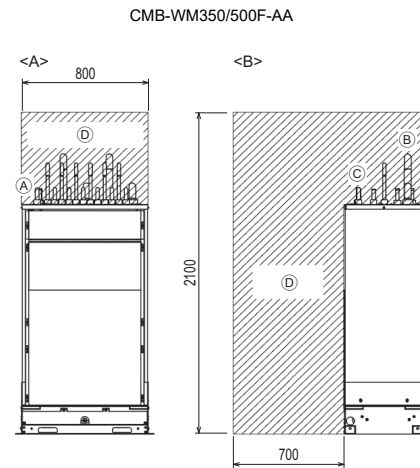
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2 **2.2** **2.3**

[Fig. 2.2.1]



[Fig. 2.3.1]

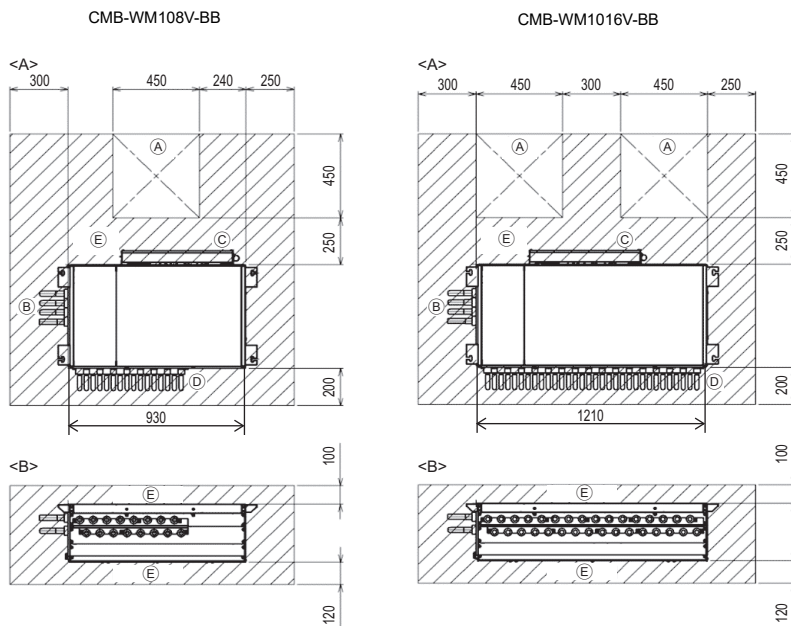


<A> Front view
 Right side view
(Unit: mm)

- (A) Side of outdoor unit piping
- (B) Side of Sub-HBC piping
- (C) Side of indoor unit piping
- (D) Service space

*1 Dimensions with which pipe connection can be handled at site

[Fig. 2.3.2]



<A> Top view
 Front view
(Unit: mm)

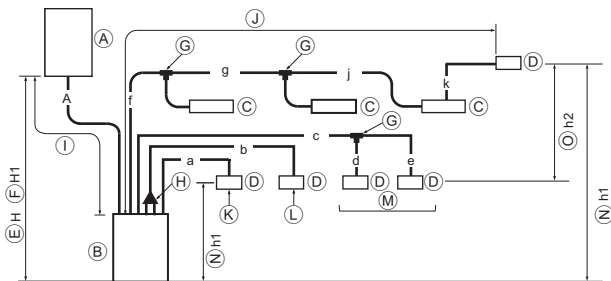
- (A) Inspection hole
- (B) Side of Main-HBC piping
- (C) Control box
- (D) Side of indoor unit piping
- (E) Service space

*1 Dimensions with which pipe connection can be handled at site

2.4

[Fig. 2.4.1]

CMB-WM350F-AA + CMB-WM108V-BB
(CMB-WM500F-AA) (CMB-WM1016V-BB)



- (A) Outdoor unit
- (B) Main-HBC
- (C) Sub-HBC
- (D) Indoor unit
- (E) Less than H=50 m (when the outdoor unit is higher than HBC)
- (F) Less than H1=40 m (when the outdoor unit is lower than HBC)
- (G) Branch joint (field supply)
- (H) Junction pipe (field supply)
- (I) Less than 110 m
- (J) Less than 60 m
- (K) Connecting indoor unit less than 80
- (L) Connecting indoor unit more than 100
- (M) Up to three units for 1 branch port
- (N) Total capacity: less than 80 (but in same mode, cooling/heating)
- (O) Less than 15 m

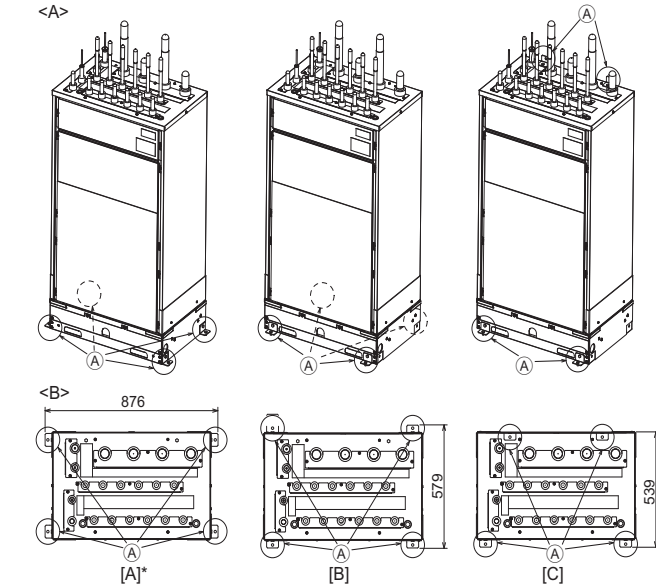
Notes:

*1 Indoor units that are connected to the same branch joint cannot be simultaneously operated in different operation modes.

(Unit: m)

	Item	Piping portion	Allowable value	
Pipe Lengths	Between outdoor unit and HBC (refrigerant piping work)	A	110 or less	
	Water piping work between indoor units and HBC	f + g + j + k	60 or less	
Difference of elevation	Between indoor and outdoor units	Above outdoor unit	H	50 or less
		Below outdoor unit	H1	40 or less
	Between indoor units and HBC	h1	15 or less	
	Between indoor units	h2	15 or less	

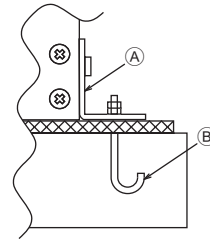
[Fig. 3.2.1]



<A> Front view
 [A] Left and right side
 [B] Front and back side
 [A] L shape plate

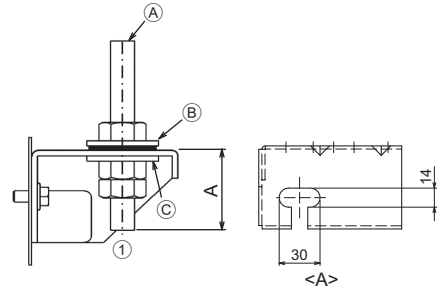
 Top view
 * Initial position
 [C] Front and top side

[Fig. 3.2.2]



(A) L shape plate
 (B) M10 anchor bolt. (field-supplied)

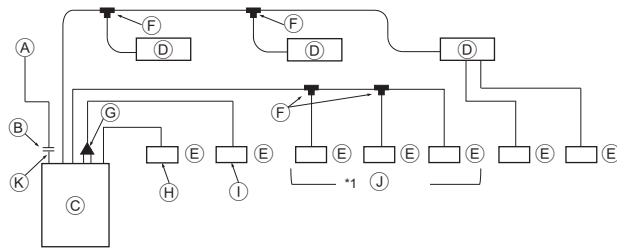
[Fig. 3.2.3]



① Hanging method
 A: Min. 30 mm
 (A) Hanging bolt $\phi 10$ (field supply)
 (B) Washer with cushion (accessory)
 * Attach the cushion facing down.
 (C) Washer without cushion (accessory)
 <A> Top view

[Fig. 4.1.2]

		HBC		
Unit model		Model name		
Outdoor unit side	PURY-(E)M200	(HBC) CMB-WM350F-AA	High pressure side	Low pressure side
	PURY-(E)M250		$\phi 15.88$ (Brazing)	$\phi 19.05$ (Brazing)
	PURY-(E)M300		$\phi 15.88$ (Brazing)	$\phi 22.2$ (Brazing)
	PURY-(E)M350		$\phi 15.88$ (Brazing)	$\phi 22.2$ (Brazing)
	PURY-(E)M400	(HBC) CMB-WM500F-AA	$\phi 15.88$ (Brazing)	$\phi 28.58$ (Brazing)
	PURY-(E)M450		$\phi 19.05$ (Brazing)	$\phi 28.58$ (Brazing)
	PURY-(E)M500		$\phi 19.05$ (Brazing)	$\phi 28.58$ (Brazing)
	PURY-(E)M500		$\phi 19.05$ (Brazing)	$\phi 28.58$ (Brazing)



(A) To outdoor unit
 (B) End connection (brazing)
 (C) Main-HBC
 (D) Sub-HBC
 (E) Indoor unit
 (F) Branch joint (field supply)
 (G) Junction pipe (field supply)
 (H) Connecting indoor unit less than 80
 (I) Connecting indoor unit more than 100
 (J) Up to three units for 1 branch port; total capacity: below 80 (but in same mode, cooling/heating)
 (K) Joint (field supply)

Note:
 • Be sure to use non-oxidative brazing.

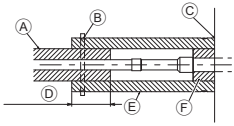
[Fig. 4.2.1]



- Ⓐ Cut here
- Ⓑ Remove brazed cap

4.3

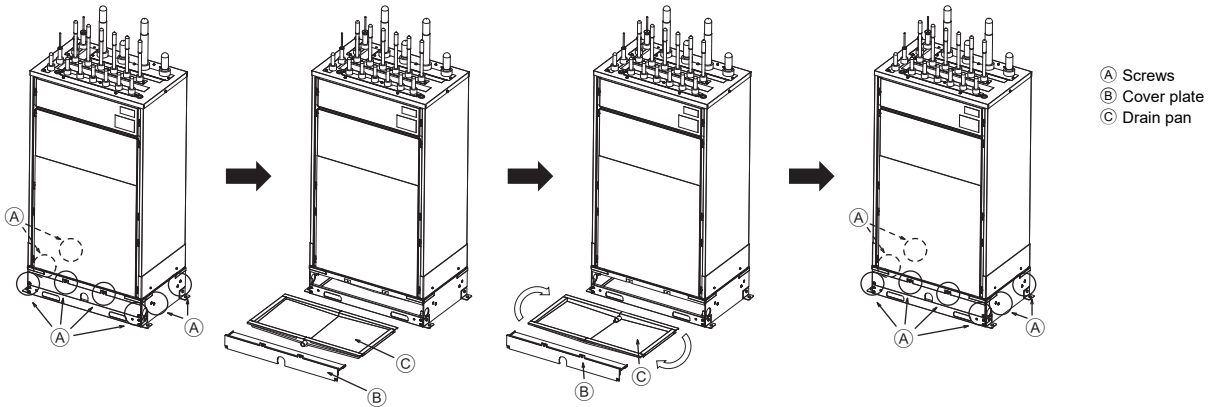
[Fig. 4.3.1]



- Ⓐ Locally procured insulating material for pipes
- Ⓑ Bind here using band or tape.
- Ⓒ Do not leave any opening.
- Ⓓ Lap margin: more than 40 mm
- Ⓔ Insulating material (field supply)
- Ⓕ Unit side insulating material

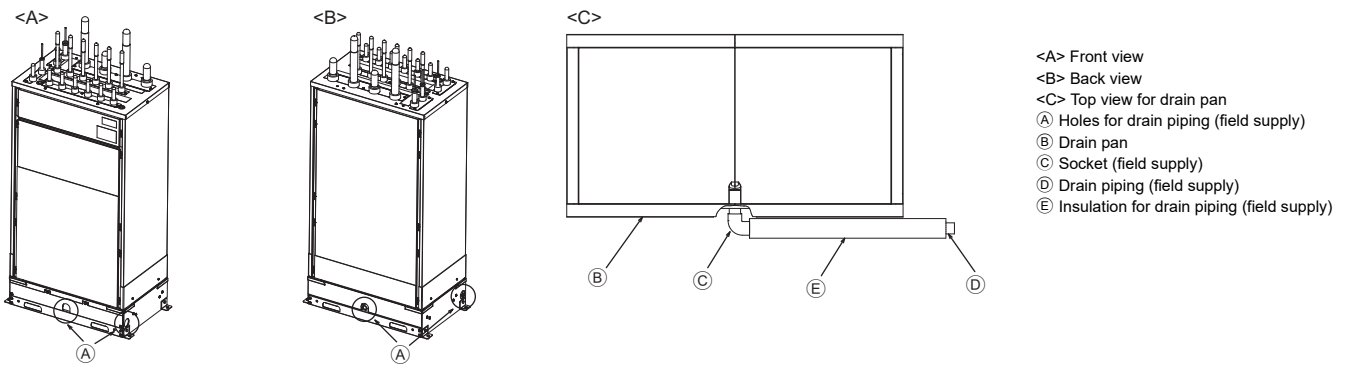
4.5

[Fig. 4.5.1]



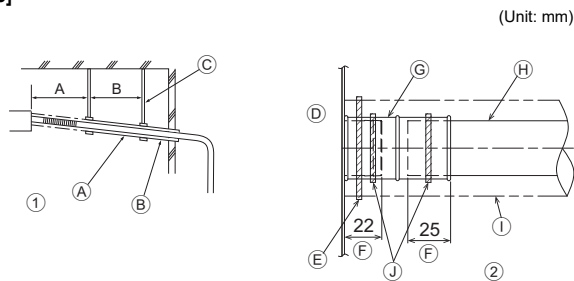
- Ⓐ Screws
- Ⓑ Cover plate
- Ⓒ Drain pan

[Fig. 4.5.2]



- <A> Front view
- Back view
- <C> Top view for drain pan
- Ⓐ Holes for drain piping (field supply)
- Ⓑ Drain pan
- Ⓒ Socket (field supply)
- Ⓓ Drain piping (field supply)
- Ⓔ Insulation for drain piping (field supply)

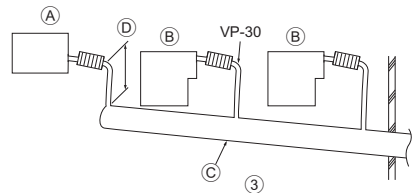
[Fig. 4.5.3]



(Unit: mm)

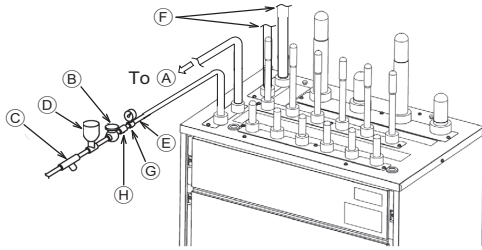
- A: 25 cm
- B: 1.5 – 2 m
- Ⓐ Downward gradient of more than 1/100
- Ⓑ Insulating material
- Ⓒ Supporting bracket
- Ⓓ Sub-HBC
- Ⓔ Tie band (accessory)
- Ⓕ Insertion margin
- Ⓖ Drain hose (accessory)
- Ⓗ Drain pipe (O.D. ø32 PVC TUBE, field supply)
- Ⓙ Insulating material (field supply)
- Ⓚ Tie band (accessory)

[Fig. 4.5.4]



- Ⓐ Sub-HBC
- Ⓑ Indoor unit
- Ⓒ Collecting pipe
- Ⓓ Please ensure this length is at least 100 mm.

[Fig. 5.1.1]



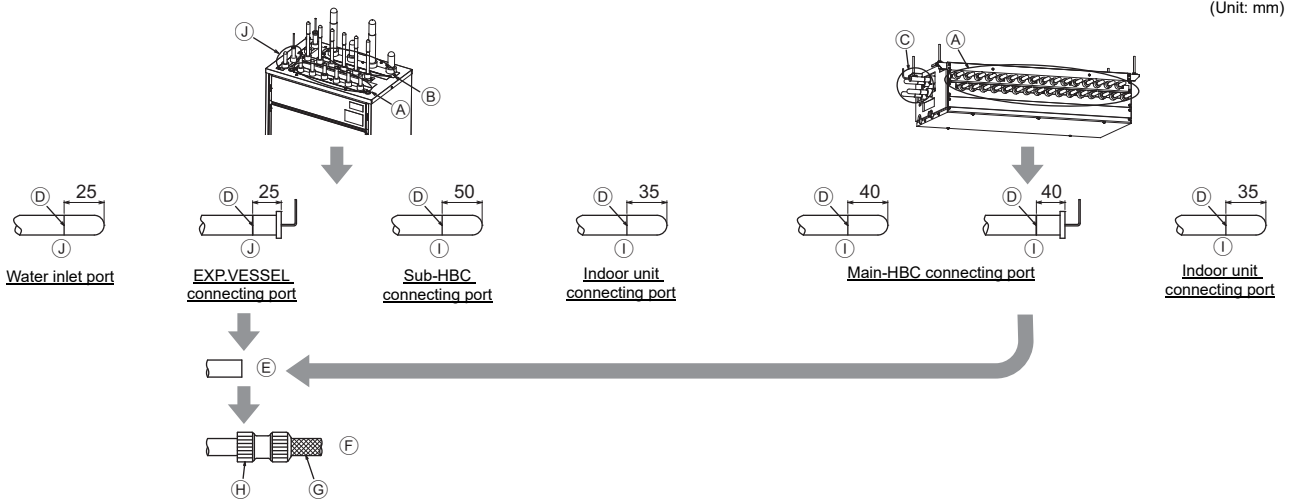
Example of HBC installation (*1)

- (A) Expansion vessel (field supply)
- (B) Shutoff valve (field supply)
- (C) Strainer (field supply)
- (D) Pressure reducing valve (field supply)
- (E) Water inlet
- (F) Refrigerant pipes
- (G) Pressure gauge (field supply)
- (H) Check valve (field supply)

Note:

- *1. Connect the pipes to the water pipes according to the local regulations.
- *2. Remove the water pipes on the point of outside shutoff valve after finishing supply water.

[Fig. 5.1.2]

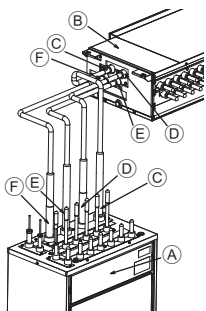


- (A) Indoor unit connection
- (B) Sub-HBC connection
- (C) Main-HBC connection
- (D) Cutting point
- (E) Cut the piping at the cutting point
- (F) Field pipe connection (field supply)
- (G) Field pipe
- (H) Pipe connection (field supply)
- (I) Indoor unit and Sub-HBC connecting port
- (J) Water inlet (EXP. VESSEL)

Note:

- Remove burr after cutting the piping to prevent entering the pipe connection. Check that there is no crack at the edge of the piping.

[Fig. 5.1.3]

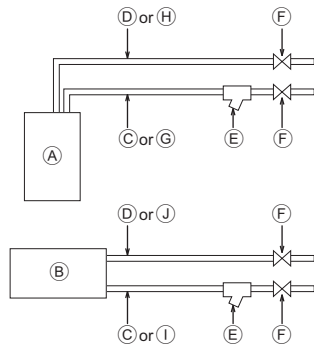


- (A) Main-HBC
- (B) Sub-HBC
- (C) From Sub-HBC "port B" to Main-HBC "port B"
- (D) From Main-HBC "port A" to Sub-HBC "port A"
- (E) From Main-HBC "port C" to Sub-HBC "port C"
- (F) From Sub-HBC "port D" to Main-HBC "port D"

Note:

- See [Fig. 5.1.5] when connecting valves to the on-site water pipe.

[Fig. 5.1.4]



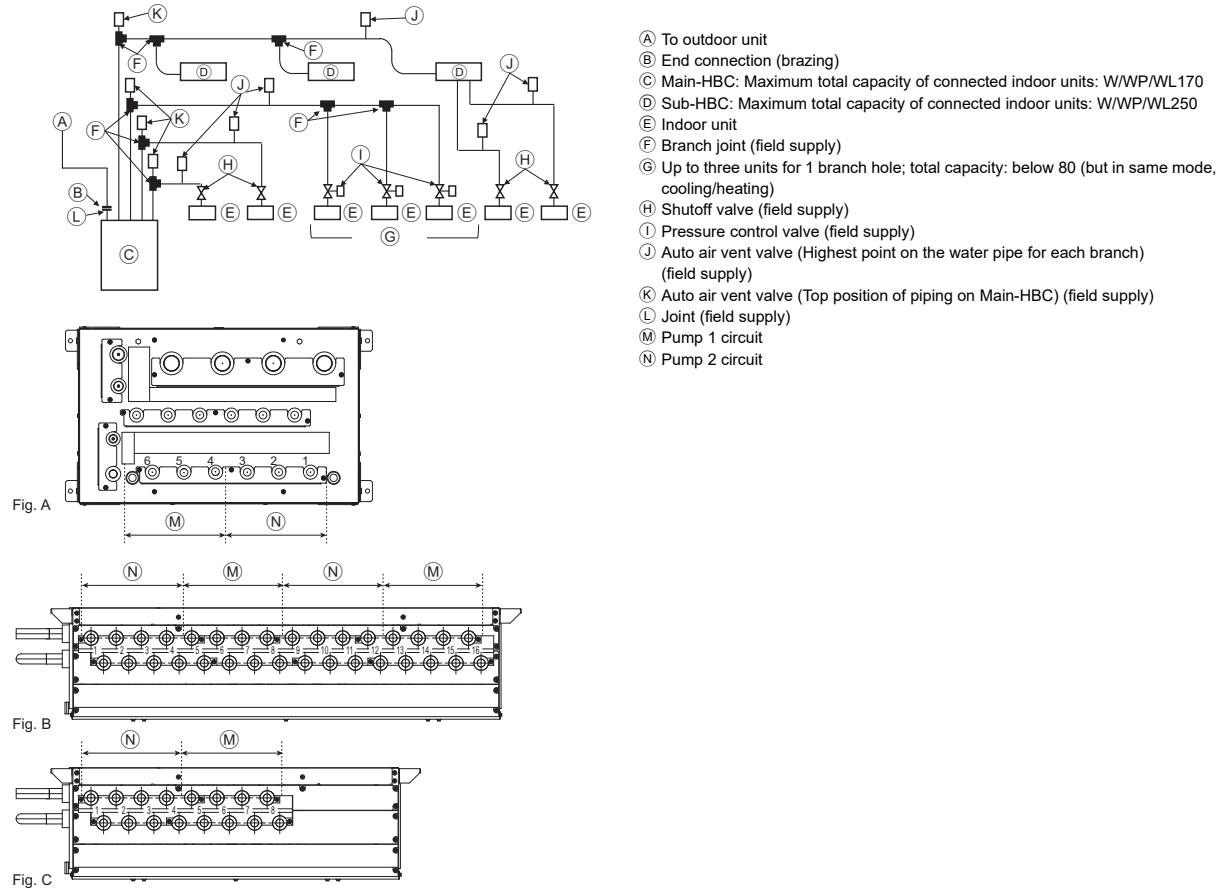
- (A) Main-HBC
- (B) Sub-HBC
- (C) Water pipe: From indoor unit
- (D) Water pipe: To indoor unit
- (E) Strainer (60 mesh or more) (field supply)
- (F) Shut off valve (field supply)
- (G) Water pipe: From Sub-HBC
- (H) Water pipe: To Sub-HBC
- (I) Water pipe: From Main-HBC
- (J) Water pipe: To Main-HBC

[Fig. 5.1.5]

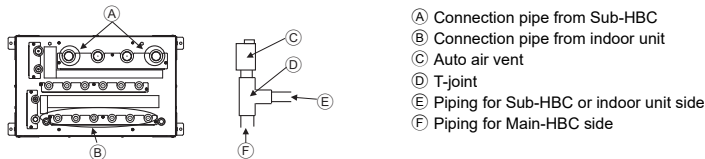
Total down-stream indoor unit capacity	Pipe size between Main-HBC and Sub-HBC *1 Pipe size between Main-HBC and indoor unit *1 Pipe size between Sub-HBC and indoor unit *1		
	Max 20 m *2	Max 40 m *2	Max 60 m *2
W/WP/WL10	I.D. ≥ 12 mm	I.D. ≥ 12 mm	I.D. ≥ 12 mm
W/WP/WL11 - W/WP/WL15	I.D. ≥ 12 mm	I.D. ≥ 12 mm	I.D. ≥ 15.5 mm
W/WP/WL16 - W/WP/WL25	I.D. ≥ 15.5 mm	I.D. ≥ 15.5 mm	I.D. ≥ 15.5 mm
W/WP/WL26 - W/WP/WL32	I.D. ≥ 15.5 mm	I.D. ≥ 19.9 mm	I.D. ≥ 19.9 mm
W/WP/WL33 - W/WP/WL50	I.D. ≥ 19.9 mm	I.D. ≥ 19.9 mm	I.D. ≥ 19.9 mm
W/WP/WL51 - W/WP/WL63	I.D. ≥ 19.9 mm	I.D. ≥ 25.2 mm	I.D. ≥ 25.2 mm
W/WP/WL64 - W/WP/WL80	I.D. ≥ 25.2 mm	I.D. ≥ 25.2 mm	I.D. ≥ 25.2 mm
W/WP/WL81 - W/WP/WL100	I.D. ≥ 25.2 mm	I.D. ≥ 25.2 mm	I.D. ≥ 32.6 mm
W/WP/WL101 - W/WP/WL150	I.D. ≥ 32.6 mm	I.D. ≥ 32.6 mm	I.D. ≥ 32.6 mm
W/WP/WL151 - W/WP/WL250	I.D. ≥ 32.6 mm	I.D. ≥ 32.6 mm	I.D. ≥ 39.6 mm
W/WP/WL251 - W/WP/WL300	I.D. ≥ 32.6 mm	I.D. ≥ 39.6 mm	I.D. ≥ 50.8 mm
W/WP/WL301 - W/WP/WL750	I.D. ≥ 50.8 mm	I.D. ≥ 50.8 mm	I.D. ≥ 50.8 mm

*1 When connecting CMB-WM108/1016V-AA and CMB-WM108/1016V-BB, refer to the installation manual for CMB-WM108/1016V-AA about pipe size.

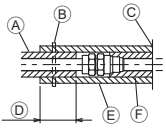
*2 Piping length from Main-HBC to the farthest indoor unit



[Fig. 5.1.6]

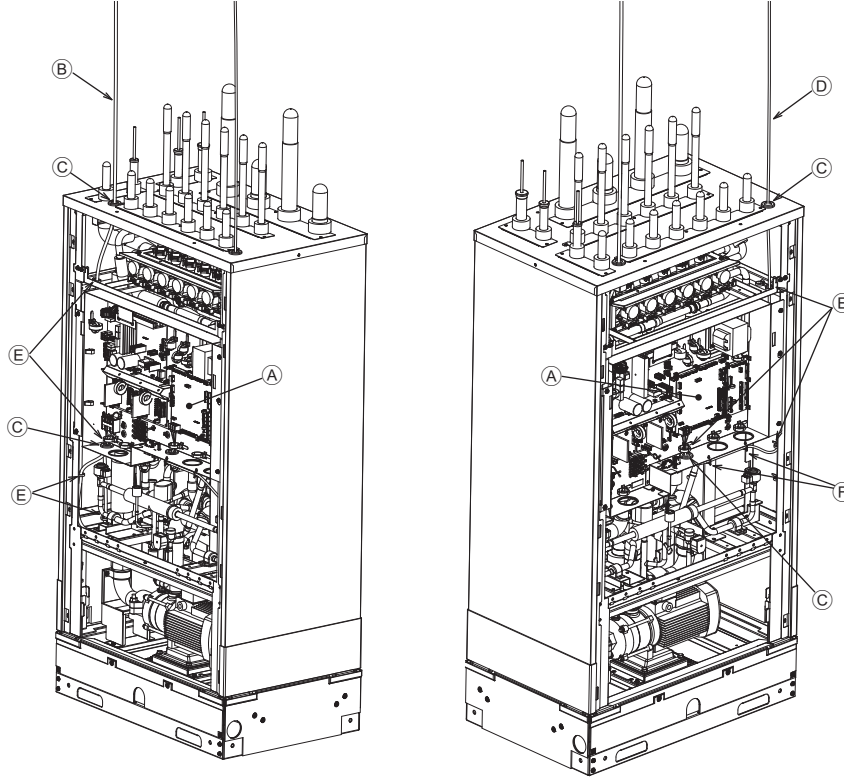


[Fig. 5.2.1]



- (A) Locally procured insulating material for pipes
- (B) Bind here using band or tape.
- (C) Do not leave any opening.
- (D) Lap margin: more than 40 mm
- (E) Insulating material (field supply)
- (F) Unit side insulating material

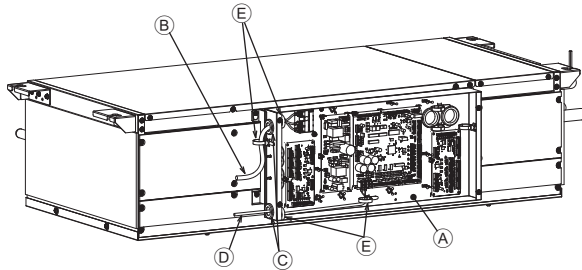
[Fig. 6.0.1]



CMB-WM350F-AA, CMB-WM500F-AA

- (A) Control box
- (B) Power source wiring
- (C) ø21 hole (closed rubber bushing)
- (D) Transmission wiring
- (E) Cable strap
- (F) Wire saddle

[Fig. 6.0.2]



CMB-WM108V-BB, CMB-WM1016V-BB

- (A) Control box
- (B) Power source wiring
- (C) ø21 hole (closed rubber bushing)
- (D) Transmission wiring
- (E) Clip cables here

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1. Safety precautions

1.1. Before installation and electric work

- ▶ **Before installing the unit, make sure you read all the “Safety precautions”.**
- ▶ **The “Safety precautions” provide very important points regarding safety. Make sure you follow them.**

Symbols used in the text

Warning:


Describes precautions that should be observed to prevent danger of injury or death to the user.


Caution:


Describes precautions that should be observed to prevent damage to the unit.

Symbols used in the illustrations

 : Indicates an action that must be avoided.

 : Indicates that important instructions must be followed.

 : Indicates a part which must be grounded.

 : Beware of electric shock. (This symbol is displayed on the main unit label.)
<Color: Yellow>

Warning:

Carefully read the labels affixed to the main unit.

HIGH VOLTAGE WARNING:

- **Control box houses high-voltage parts.**
- **When opening or closing the front panel of the control box, do not let it come into contact with any of the internal components.**
- **Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes.**

Warning:

- **Ask the dealer or an authorized technician to install the air conditioner.**
 - Improper installation by the user may result in water leakage, electric shock, or fire.
- **Install the unit at a place that can withstand its weight.**
 - Failure to do so may cause the unit to fall down, resulting in injuries and damage to the unit.
- **Use the specified cables for wiring. Make the connections securely so that the outside force of the cable is not applied to the terminals.**
 - Inadequate connection and fastening may generate heat and cause a fire.
- **Prepare for earthquakes and install the unit at the specified place.**
 - Improper installation may cause the unit to fall down and result in injury and damage to the unit.
- **Always use accessories specified by Mitsubishi Electric.**
 - Ask an authorized technician to install the accessories. Improper installation by the user may result in water leakage, electric shock, or fire.
- **Never repair the unit. If the air conditioner must be repaired, consult the dealer.**
 - If the unit is repaired improperly, water leakage, electric shock, or fire may result.
- **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.**
- **If refrigerant gas leaks during installation work or service, ventilate the room.**
 - If the refrigerant gas comes into contact with a flame, poisonous gases will be released and/or explosions may result.
- **Install the air conditioner according to this Installation Manual.**
 - If the unit is installed improperly, water leakage, electric shock, or fire may result.
- **Do not modify or adjust safety protection devices.**
 - Shorting of pressure or temperature switches to force operation may lead to damage, fire, explosions etc...
 - Do not change the set values as this may lead to damage, fire, explosions etc...
 - Use of any product except that specified by this company may lead to damage, fire, explosions etc...
- **Do not spray water on electrical parts.**
 - This could lead to shorting, fire, smoke, electrical shock, unit failure etc...
- **Do not create a situation where the refrigeration circuit is sealed yet incomplete with oil or refrigerant in the system.**
 - This may result in an explosion.
- **Do not touch electrical components during or directly after operation.**
 - This may lead to burns.
- **Put covers on control and terminal boxes.**
 - Shock due to ingress of dust, water, smoke, fire etc. may result.
 - During refrigerant recovery or purge, fire may result.
- **Do not operate with guards or panels removed.**
 - Injury due to rotating parts, electric shock due to high voltage or burns due to high temperatures may result.
- **Do not sit, ride or place objects on the unit.**
 - Injury due to the unit falling may result.
- **Use the appropriate safety gear.**
 - High voltages may result in electric shock.
 - Hot parts may result in burns.
- **Recover the refrigerant in the unit.**
 - Reuse the refrigerant or have it disposed of by a specialist.
 - Release of refrigerant may damage the environment.
- **Clear the piping work of remnant gas and oil.**
 - Failure to do so could lead to an eruption of flames and burns if the piping work is heated.
- **Vacuum dry the refrigerant piping work. Do not replace with a refrigerant that has not been specified.**
 - This could lead to explosions, fire.
- **Do not touch the onsite piping work ends.**
 - This could damage the piping work leading to refrigerant leaks and oxygen deficiency.
- **Have all electric work done by a licensed electrician according to “Electric Facility Engineering Standard” and “Interior Wire Regulations” and the instructions given in this manual and always use a dedicated power supply.**
 - If the power source capacity is inadequate or electric work is performed improperly, electric shock and fire may result.
- **Securely install the cover of control box.**
 - If the cover is not installed properly, dust or water may enter the outdoor unit and fire or electric shock may result.
- **When installing and moving the air conditioner to another site, do not charge it with a refrigerant different from the refrigerant specified on the unit.**
 - If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.
- **If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit if the refrigerant should leak.**
 - Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, hazards due to lack of oxygen in the room could result.
- **When moving and reinstalling the air conditioner, consult the dealer or an authorized technician.**
 - If the air conditioner is installed improperly, water leakage, electric shock, or fire may result.

- **After completing installation work, make sure that refrigerant gas is not leaking.**
 - If the refrigerant gas leaks and is exposed to a fan heater, stove, oven, or other heat source, it may generate noxious gases and/or explosions may result.
- **Do not reconstruct or change the settings of the protection devices.**
 - If the pressure switch, thermal switch, or other protection device is shorted or operated forcibly, or parts other than those specified by Mitsubishi Electric are used, fire or explosion may result.
- **To dispose of this product, consult your dealer.**
- **The installer and system specialist shall secure safety against leakage according to local regulation or standards.**
 - Choose the appropriate wire size and the switch capacities for the main power supply described in this manual if local regulations are not available.
- **Pay special attention to the place of installation, such as basement, etc. where refrigeration gas can accumulate, since refrigerant is heavier than the air.**
- **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.**
- **This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.**
- **This appliance is not accessible to general public.**
 - This appliance shall be installed at secured location with restricted access.
- **The unit shall be properly stored to prevent mechanical damage.**

1.2. Precautions for devices that use R32 refrigerant

⚠ Caution:

- **Do not use existing refrigerant piping.**
 - The old refrigerant and refrigerant oil in the existing piping contain a large amount of chlorine which may cause the refrigerant oil of the new unit to deteriorate.
 - R32 is high-pressure refrigerant and can cause the existing piping to burst.
- **Use refrigerant piping made of phosphorus deoxidized copper and copper alloy seamless pipes and tubes. In addition, be sure that the inner and outer surfaces of the pipes are clean and free of hazardous sulphur, oxides, dust/dirt, shaving particles, oils, moisture, or any other contaminant.**
 - Contaminants on the inside of the refrigerant piping may cause the refrigerant residual oil to deteriorate.
- **Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing. (Store elbows and other joints in a plastic bag.)**
 - If dust, dirt, or water enters the refrigerant cycle, deterioration of the oil and compressor failure may result.
- **Apply a small amount of ester oil, ether oil, or alkyl benzene to flares. (for indoor unit)**
 - Infiltration of a large amount of mineral oil may cause the refrigerant oil to deteriorate.
- **Do not use a refrigerant other than R32.**
 - If another refrigerant (R22, etc.) is mixed with R32, the chlorine in the refrigerant may cause the refrigerant oil to deteriorate.
- **Use a vacuum pump with a reverse flow check valve.**
 - The vacuum pump oil may flow back into the refrigerant cycle and cause the refrigerant oil to deteriorate.
- **Do not use the following tools that are used with conventional refrigerants. (Gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, refrigerant recovery equipment)**
 - If the conventional refrigerant and refrigerant oil are mixed in the R32, the refrigerant may deteriorate.
 - If water is mixed in the R32, the refrigerant oil may deteriorate.
 - Since R32 does not contain any chlorine, gas leak detectors for conventional refrigerants will not react to it.
- **Refrigerant R32 is flammable. Do not use a naked-flame type detector.**
- **Do not use a charging cylinder.**
 - Using a charging cylinder may cause the refrigerant to deteriorate.
- **Do not use antioxidant or leak-detection additive.**
- **Be especially careful when managing the tools.**
 - If dust, dirt, or water gets into the refrigerant cycle, the refrigerant may deteriorate.

1.3. Before installation

⚠ Caution:

- **Do not install the unit where combustible gas may leak.**
 - If the gas leaks and accumulates around the unit, an explosion may result.
- **Do not use the air conditioner where food, pets, plants, precision instruments, or artwork are kept.**
 - The quality of the food, etc. may deteriorate.
- **Do not use the air conditioner in special environments.**

- Oil, steam, sulfuric smoke, etc. can significantly reduce the performance of the air conditioner or damage its parts.
- **When installing the unit in a hospital, communication station, or similar place, provide sufficient protection against noise.**
 - Sound pressure level does not exceed 70 dB(A). However, inverter equipment, private power generator, high-frequency medical equipment, or radio communication equipment may cause the air conditioner to operate erroneously, or fail to operate. On the other hand, the air conditioner may affect such equipment by creating noise that disturbs medical treatment or image broadcasting.
- **Do not install the unit on or over things that are subject to water damage.**
 - When the room humidity exceeds 80 % or when the drain pipe is clogged, condensation may drip from the indoor unit or HBC. Perform collective drainage work together with the outdoor unit, as required.
- **Do not install the unit where corrosive gas may be generated.**
 - Doing so can corrode the pipes, resulting in refrigerant leakage and fire.
- **Check that markings of the unit are not illegible.**
 - Illegible warning or caution markings may cause damage to the unit, resulting in injury.

1.4. Before installation (relocation) - electrical work

⚠ Caution:

- **Ground the unit.**
 - Do not connect the ground wire to gas or water pipes, lightning rods, or telephone ground lines. Improper grounding may result in electric shock.
- **Install the power cable so that tension is not applied to the cable.**
 - Tension may cause the cable to break and generate heat and cause a fire.
- **Install a leak circuit breaker, as required.**
 - If a leak circuit breaker is not installed, electric shock may result.
- **Use power line cables of sufficient current carrying capacity and rating.**
 - Cables that are too small may leak, generate heat, and cause a fire.
- **Use only a circuit breaker and fuse of the specified capacity.**
 - A fuse or circuit breaker of a larger capacity, or the use of substitute simple steel or copper wire may result in a general unit failure or fire.
- **Do not wash the air conditioner units.**
 - Washing them may cause an electric shock.
- **Be careful that the installation base is not damaged by long use.**
 - If the damage is left uncorrected, the unit may fall and cause personal injury or property damage.
- **Install the drain piping according to this Installation Manual to ensure proper drainage. Wrap thermal insulation around the pipes to prevent condensation.**
 - Improper drain piping may cause water leakage causing damage to furniture and other possessions.
- **Be very careful about transporting the product.**
 - One person should not carry the product. Its weight is in excess of 20 kg.
 - Some products use PP bands for packaging. Do not use any PP bands as a means of transportation. It is dangerous.
- **Safely dispose of the packing materials.**
 - Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
 - Tear apart and throw away plastic packaging bags so that children will not play with them. If children play with a plastic bag which has not been torn apart, they face the risk of suffocation.

1.5. Before starting the test run

⚠ Caution:

- **Turn on the power at least 12 hours before starting operation.**
 - Starting operation immediately after turning on the main power switch can result in irreversible damage to internal parts. Keep the power switch turned on during the operational season.
- **Do not touch the switches with wet fingers.**
 - Touching a switch with wet fingers can result in an electric shock.
- **Do not touch the refrigerant pipes during and immediately after operation.**
 - During and immediately after operation, the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes.
- **Do not operate the air conditioner with the panels and guards removed.**
 - Rotating, hot, or high-voltage parts can cause injuries.
- **Do not turn off the power immediately after stopping operation.**
 - Always wait at least 5 minutes before turning off the power. Otherwise, drainage water leakage or mechanical failure of sensitive parts may occur.
- **Check for refrigerant leaks before service.**
 - If the refrigerant leaks, fire may result.

2. Selecting an installation site

2.1. About the product

- This unit uses R32-type refrigerant.
- Indoor units that are all WP, all W, or all WL models are connectable to the HBC.
- Piping for systems using R32 may be different from that for systems using conventional refrigerant because the design pressure in systems using R32 is higher. Refer to the Data Book for more information.
- Some of the tools and equipment used for installation with systems that use other types of refrigerant cannot be used with the systems using R32. Refer to the Data Book for more information.
- Do not use the existing piping, as it contains chlorine, which is found in conventional refrigerating machine oil and refrigerant. This chlorine will deteriorate the refrigerant machine oil in the new equipment. The existing piping must not be used as the design pressure in systems using R32 is higher than that in the systems using other types of refrigerant and the existing pipes may burst.

2.2. Installation site

- Install the unit in a place not exposed to rain. The HBC is designed to be installed indoors.
 - Install the unit with adequate space around it for servicing.
 - Do not install the unit in a place that would result in the piping length restrictions being exceeded.
 - Check for refrigerant leaks before service.
 - If the refrigerant leaks, fire may result.
 - Install or store the unit in a place not exposed to direct radiant heat from other heat sources or naked flame or other ignition sources.
 - Do not install the unit in any oily steamy place or near any machine that generates high frequencies. Doing so may cause a risk of fire, erroneous operation or condensation.
 - Depending on the operation conditions, HBC unit generates noise caused by valve actuation, refrigerant flow, and pressure changes even when operating normally. Therefore install the unit in places such as machinery rooms.
 - Install indoor unit and HBC at least 5 m away from each other when installed in a space with low background noise, e.g., hotel rooms.
 - Allow enough space and access to ensure water piping, refrigerant piping and electrical wiring can be easily connected.
 - Avoid places exposed to the generation, inflow, accumulation or leakage of flammable and sulfuric gases.
 - Ensure a downward gradient of at least 1/100 for drain piping.
 - Properly install the unit on a stable, load-bearing surface.
- 1. For hanging from the ceiling [Fig. 2.2.1] (P.2)**
- Provide 2 inspection holes 450 mm square in the ceiling surface as shown in [Fig. 2.3.2] (P.2).
 - Install the unit in a suitable location (such as in the ceiling of a corridor or in the bathroom etc) away from places regularly occupied. Avoid installing in the center of a room.
 - Ensure hanging bolts are of sufficient pull out strength.

⚠ Warning:

Be sure to install the unit in a place that can sustain the entire weight. If there is a lack of strength, it may cause the unit to fall down, resulting in an injury.

⚠ Caution:

- Be sure to install the unit horizontally. Install the HBC level (less than 1° tilt to downward), so that the drain pan can function correctly.
- Install the HBC in an environment where the temperature is always above 0°C.

2.3. Securing installation and service space

1. Installation

(This is a reference view showing the least installation space.)

[Fig. 2.3.1] (P.2)

- | | |
|-------------------------------|--------------------------|
| <A> Front view | Right side view |
| Ⓐ Side of outdoor unit piping | Ⓑ Side of Sub-HBC piping |
| Ⓒ Side of indoor unit piping | Ⓓ Service space |
- *1 Dimensions with which pipe connection can be handled at site

[Fig. 2.3.2] (P.2)

- | | |
|-------------------|------------------------------|
| <A> Top view | Front view |
| Ⓐ Inspection hole | Ⓑ Side of Main-HBC piping |
| Ⓒ Control box | Ⓓ Side of indoor unit piping |
| Ⓔ Service space | |
- *1 Dimensions with which pipe connection can be handled at site

2.4. Checking the installation site

Check that the difference of elevation between indoor and outdoor units and the length of refrigerant piping are within the following limitations.

1. CMB-WM350F-AA + CMB-WM108V-BB (CMB-WM500F-AA) (CMB-WM1016V-BB)

[Fig. 2.4.1] (P.2)

- | | |
|--|--|
| Ⓐ Outdoor unit | Ⓑ Main-HBC |
| Ⓒ Sub-HBC | Ⓓ Indoor unit |
| Ⓔ Less than H=50 m (when the outdoor unit is higher than HBC) | Ⓕ Less than 60 m |
| Ⓕ Less than H1=40 m (when the outdoor unit is lower than HBC) | Ⓖ Junction pipe (field supply) |
| Ⓖ Branch joint (field supply) | Ⓗ Less than 60 m |
| Ⓗ Less than 110 m | Ⓙ Connecting indoor unit more than 100 |
| Ⓙ Connecting indoor unit less than 80 | Ⓚ Up to three units for 1 branch port |
| Ⓚ Total capacity: less than 80 (but in same mode, cooling/heating) | |
| Ⓚ Less than 15 m | Ⓛ Less than 15 m |

(Unit: m)

	Item	Piping portion	Allowable value	
Pipe Lengths	Between outdoor unit and HBC (refrigerant piping work)	A	110 or less	
	Water piping work between indoor units and HBC	f + g + j + k	60 or less	
Difference of elevation	Between indoor and outdoor units	Above outdoor unit	H	50 or less
		Below outdoor unit	H1	40 or less
	Between indoor units and HBC	h1	15 or less	
	Between indoor units	h2	15 or less	

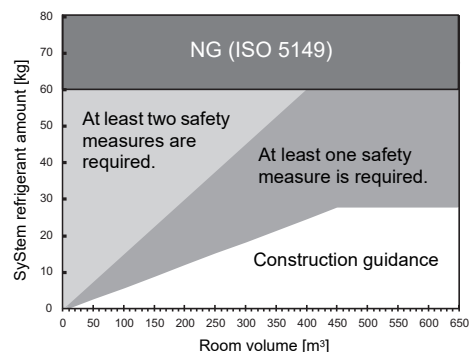
Notes:

- *1 Indoor units that are connected to the same branch joint cannot be simultaneously operated in different operation modes.

⚠ Warning:

(When R32 refrigerant is used)

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The unit shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.)
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- The unit shall be installed, operated and stored in a room with a floor area according to the following figure.
- When installing an HBC, take safety measures in accordance with the European Standard, based on the system refrigerant amount and the room volume as shown in the figure below. (The installation restrictions can be simply found by using the flowchart provided on the "Safety handling for R32" document.)



Notes:

- Refer to the outdoor unit manual about additional refrigerant amount of HBC and maximum amount of system refrigerant.
- Be sure to protect pipings from physical damage.

3. Installing the HBC

3.1. Checking the accessories with the HBC

The following items are supplied with each HBC.

		Model name
		CMB-WM350F-AA CMB-WM500F-AA
Item	Qty	
① Installation manual	1	
② Air vent manual	1	
③ Manual piping layout	1	

		Model name
		CMB-WM108V-BB CMB-WM1016V-BB
Item	Qty	
① Socket	1	
② Tie band	3	
③ Washer with cushion	4	
④ Washer without cushion	4	
⑤ Installation manual	1	
⑥ Air vent manual	1	

3.2. Installing HBC

Changing position of L shape plate for Main-HBC

When changing position of L shape plates for fixing Main-HBC, remove the screws for L shape plates, and place them to a place [A], [B], or [C] in the drawing.

[Fig. 3.2.1] (P.3)

- | | |
|-------------------------|------------------------|
| <A> Front view | Top view |
| [A] Left and right side | * Initial position |
| [B] Front and back side | [C] Front and top side |
| Ⓐ L shape plate | |

Installing Main-HBC

- Fix L shape plate on the ground or wall by bolt.
- Vibration may be transmitted to the installation area and noise and vibration may be generated from the floor and walls, depending on the conditions. Provide ample vibration proofing (cushion pads, cushion frame, etc.).
- When connecting the drain piping from behind the unit, change the orientation of the drain pan before installing the unit. (Refer to 4.5.Drain piping work.)

[Fig. 3.2.2] (P.3)

- | | |
|-----------------|------------------------------------|
| Ⓐ L shape plate | Ⓑ M10 anchor bolt (field-supplied) |
|-----------------|------------------------------------|

- Required specification for M10 anchor bolt: Tensile strength of 5.6 kN or more to withstand the short-term load caused by earthquakes.

- Be sure to install the HBC horizontally. Install the HBC level (less than 1° tilt to downward), so that the drain pan can function correctly.

Installing hanging bolts for Sub-HBC

Install locally procured hanging bolts (threaded rod) following the procedure given in the figure. The hanging bolt size is $\phi 10$ (M10 screw).

To hang the unit, use a lifting machine to lift and pass it through the hanging bolts. The suspension bracket has an oval hole. Use a large diameter washer.

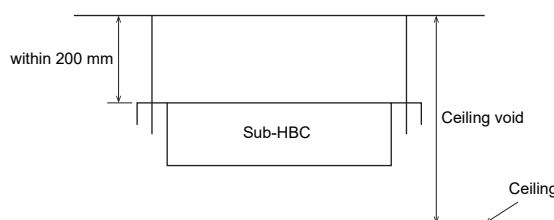
[Fig. 3.2.3] (P.3)

- ① Hanging method
 - A: Min. 30 mm
- Ⓐ Hanging bolt $\phi 10$ (field supply)
- Ⓑ Washer with cushion (accessory)
 - * Attach the cushion facing down.
- Ⓒ Washer without cushion (accessory)
 - <A> Top view

- Be sure to install the HBC horizontally. Check using a level. If the controller is installed at an angle, drain water may leak out. If the unit is slanted, loosen the fixing nuts on the hanging brackets to adjust its position. Install the HBC level (less than 1° tilt to downward), so that the drain pan can function correctly.

⚠ Caution:

- Be sure to install the unit horizontally. Install the HBC level (less than 1° tilt to downward), so that the drain pan can function correctly.
- Install the Sub-HBC with the hanging length within 200 mm [7-7/8 in] or shorter.



Product weight

Unit model	Net weight
CMB-WM350F-AA	196 kg
CMB-WM500F-AA	209 kg
CMB-WM108V-BB	40 kg
CMB-WM1016V-BB	53 kg

4. Connecting refrigerant pipes and drain pipes

4.1. Connecting refrigerant pipes

- Be sure to use non-oxidative brazing where necessary. If you do not use non-oxidative brazing, it may clog the pipes. When brazing the outdoor unit connecting port of HBC, supply nitrogen gas into the pipe between the outdoor unit and HBC.
- After completing pipe connection, support the pipes to ensure that load is not imparted to the HBC's end connections.
- When using mechanical couplings, use the ones that meet ISO14903.
- Support the on-site pipes near the HBC at 0.5-meter intervals or less, and at 2-meter intervals or less in other areas.

⚠ Warning:

When installing and moving the unit, do not charge it with refrigerant other than the refrigerant R32 specified on the unit.

- Mixing of a different refrigerant, air, etc. may cause the refrigerant cycle to malfunction and result in severe damage.

⚠ Caution:

- Use refrigerant piping made of phosphorus deoxidized copper and copper alloy seamless pipes and tubes. In addition, be sure that the inner and outer surfaces of the pipes are clean and free of hazardous sulphur, oxides, dust/dirt, swarf, oils, moisture, or any other contaminants.
 - R32 is high-pressure refrigerant and can cause the existing piping to burst.
- Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing. (Store elbows and other joints in a plastic bag.)
 - If dust, dirt, or water enters the refrigerant cycle, deterioration of the oil and compressor failure may result.

- Infiltration of a large amount of mineral oil may cause the refrigerant oil to deteriorate.

- Do not vent R32 into the atmosphere.

1. Size of HBC's end connection piping

[Fig. 4.1.2] (P.3)

		HBC	
Unit model	Model name	High pressure side	Low pressure side
Outdoor unit side	PURY-(E)M200	$\phi 15.88$ (Brazing)	$\phi 19.05$ (Brazing)
	PURY-(E)M250	$\phi 15.88$ (Brazing)	$\phi 22.2$ (Brazing)
	PURY-(E)M300	$\phi 15.88$ (Brazing)	$\phi 22.2$ (Brazing)
	PURY-(E)M350	$\phi 15.88$ (Brazing)	$\phi 28.58$ (Brazing)
	PURY-(E)M400	$\phi 19.05$ (Brazing)	$\phi 28.58$ (Brazing)
	PURY-(E)M450	$\phi 19.05$ (Brazing)	$\phi 28.58$ (Brazing)
	PURY-(E)M500	$\phi 19.05$ (Brazing)	$\phi 28.58$ (Brazing)

- Ⓐ To outdoor unit
- Ⓑ End connection (brazing)
- Ⓒ Main-HBC
- Ⓓ Sub-HBC
- Ⓔ Indoor unit
- Ⓕ Branch joint (field supply)
- Ⓖ Junction pipe (field supply)
- Ⓖ Connecting indoor unit less than 80
- Ⓗ Connecting indoor unit more than 100
- Ⓙ Up to three units for 1 branch port; total capacity: below 80 (but in same mode, cooling/heating)
- Ⓚ Joint (field supply)

Note:

- **Be sure to use non-oxidative brazing.**

4.2. Refrigerant piping work

After connecting the refrigerant pipes of the outdoor units with the outdoor units' stop valves remained fully closed, evacuate vacuum from the outdoor units' stop valve service ports.

After completing the above, open the outdoor units' stop valves. This connects the refrigerant circuit (between outdoor and HBC) completely.

How to handle stop valves is described on each outdoor unit.

Notes:

- **Have a fire extinguisher nearby before brazing work.**
- **Provide no-smoking signs at the brazing workplace.**
- **After pipe connection, be sure to check that there is no gas leakage, using a leak detector or soap-and-water solution.**
- **Before brazing the refrigerant piping, always wrap the piping on the main body, and the thermal insulation piping, with damp cloths to prevent heat shrinkage and burning the thermal insulation tubing.** Take care to ensure that the flame does not come into contact with the main body itself.
- **Do not use leak-detection additives.**
- **Straight run of pipe connecting twinning pipe is 500 mm or more.**
- **Piping work shall be kept to a minimum.**
- **The pipes shall be protected from physical damage.**

⚠ Warning:

Do not mix anything other than the specified refrigerant R32 into the refrigerating cycle when installing or moving. Mixing air may cause the refrigerating cycle to reach abnormally high temperature, resulting in burst pipes.

⚠ Caution:

Cut the tip of the outdoor unit piping, remove the gas, and then remove the brazed cap.

[Fig. 4.2.1] (P.4)

- Ⓐ Cut here
- Ⓑ Remove brazed cap

4.3. Insulating pipes

Be sure to add insulation work to piping by covering high-temperature pipe and low-temperature pipe separately with enough thickness heat-resistant polyethylene foam, so that no gap is observed in the joint between the HBC and insulating material, and insulating materials themselves. When insulation work is insufficient, there is a possibility of condensation. Pay special attention to insulation work in the ceiling plenum.

[Fig. 4.3.1] (P.4)

- Ⓐ Locally procured insulating material for pipes
- Ⓑ Bind here using band or tape.
- Ⓒ Do not leave any opening.
- Ⓓ Lap margin: more than 40 mm
- Ⓔ Insulating material (field supply)
- Ⓕ Unit side insulating material

- Insulation materials for the pipes to be added on site must meet the following specifications:

Thickness	Outdoor unit - HBC	High-pressure pipe	10 mm or more
		Low-pressure pipe	20 mm or more
Temperature Resistance	100°C min.		

- Installation of pipes in a high-temperature high-humidity environment, such as the top floor of a building, may require the use of insulation materials thicker than the ones specified in the chart above.
- When certain specifications presented by the client must be met, ensure that they also meet the specifications on the chart above.
- The brazed connections must be covered with insulation, with its seam facing upward and fastened with the bands.

4.4. Additional refrigerant charge

Notes:

- **Charge refrigerant in a liquid state.**
- **Do not use a charging cylinder when charging refrigerant.**
 - The use of a charging cylinder may change the composition of the refrigerant and lead to a performance drop.

The table below summarizes the factory-charged amount of refrigerant, the maximum amount of refrigerant to be added on site, and the maximum total amount of refrigerant in the system.

[kg (oz)]

Unit model	Factory-charged amount	Maximum amount to be added on site	Maximum total amount in the system
M200YNW	5.2 (184)	13.5 (477)	18.7 (660)
M250YNW	5.2 (184)	13.5 (477)	18.7 (660)
M300YNW	5.2 (184)	15.5 (547)	20.7 (731)
M350YNW	8.0 (283)	15.5 (547)	23.5 (829)
M400YNW	8.0 (283)	19.5 (688)	27.5 (971)
M450YNW	10.8 (381)	19.5 (688)	30.3 (1069)
M500YNW	10.8 (381)	19.5 (688)	30.3 (1069)

Unit model	Factory-charged amount	Maximum amount to be added on site	Maximum total amount in the system
EM200YNW	5.2 (184)	13.5 (477)	18.7 (660)
EM250YNW	5.2 (184)	13.5 (477)	18.7 (660)
EM300YNW	5.2 (184)	15.5 (547)	20.7 (731)
EM350YNW	8.0 (283)	15.5 (547)	23.5 (829)
EM400YNW	8.0 (283)	19.5 (688)	27.5 (971)
EM450YNW	10.8 (381)	19.5 (688)	30.3 (1069)
EM500YNW	10.8 (381)	19.5 (688)	30.3 (1069)

Both refrigerant overcharge and undercharge will cause problems. Charge the system with the proper amount of refrigerant.

Record the added refrigerant amount on the label attached to the control box panel for future servicing.

Calculation of the amount of additional refrigerant

- **The amount of refrigerant to be added depends on the size and the total length of the high-pressure piping and liquid piping.**
- **Calculate the amount of refrigerant to be charged according to the formula below.**
- **Round up the calculation result to the nearest 0.1 kg (0.1 oz).**
- **The refrigerant does not need to be added for the indoor units in a Hybrid City Multi system.**

■ (E)M200 to 500YNW (R32 refrigerant)

(1) Units "m" and "kg"

<Formula>

- When the piping length from the outdoor unit to the farthest HBC is 10 m (32 ft) or shorter

$$\text{Amount of additional charge (kg)} = \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{2}2.2 total length} \\ \text{\times 0.23 (kg/m)} \end{matrix} + \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{1}9.05 total length} \\ \text{\times 0.16 (kg/m)} \end{matrix} + \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{1}5.88 total length} \\ \text{\times 0.11 (kg/m)} \end{matrix}$$

Outdoor unit model	Amount (kg)	HBC model	Amount (kg)
(E)M200	1.0	350F	5.6
(E)M250	1.0	500F	5.6
(E)M300	0		
(E)M350	0		
(E)M400	0		
(E)M450	0		
(E)M500	0		

* Amount of refrigerant to be charged for single-module units

- When the piping length from the outdoor unit to the farthest HBC is longer than 10 m (32 ft)

$$\text{Amount of additional charge (kg)} = \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{2}2.2 total length} \\ \text{\times 0.19 (kg/m)} \end{matrix} + \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{1}9.05 total length} \\ \text{\times 0.13 (kg/m)} \end{matrix} + \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{1}5.88 total length} \\ \text{\times 0.09 (kg/m)} \end{matrix}$$

Outdoor unit model	Amount (kg)	HBC model	Amount (kg)
(E)M200	1.0	350F	5.6
(E)M250	1.0	500F	5.6
(E)M300	0		
(E)M350	0		
(E)M400	0		
(E)M450	0		
(E)M500	0		

* Amount of refrigerant to be charged for single-module units

<Example>

Outdoor unit model: PURY-EM300YNW-A1
Main-HBC model: CMB-WM350F-AA
Sub-HBC model: CMB-WM108V-BB x 3

* Refer to the pipe connection examples in [Fig. 2.4.1] (P.2).
A: $\text{\textcircled{1}5.88}$; 18 m

The total length of the high-pressure piping and liquid piping in each case is as follows:

$\text{\textcircled{1}5.88}$ total length: 18 (A)

Therefore, when the piping length from the outdoor unit to the farthest HBC is longer than 10 m (32 ft),

$$\begin{aligned} \text{Amount of additional charge} &= (18 \times 0.09) + 5.6 \\ &= 7.3 \text{ kg (Fractions are rounded up.)} \end{aligned}$$

(2) Units "ft" and "oz"

<Formula>

- When the piping length from the outdoor unit to the farthest HBC is 10 m (32 ft) or shorter

$$\text{Amount of additional charge (oz)} = \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{7}8 total length} \\ \text{\times 2.48 (oz/ft)} \end{matrix} + \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{3}4 total length} \\ \text{\times 1.73 (oz/ft)} \end{matrix} + \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{5}8 total length} \\ \text{\times 1.19 (oz/ft)} \end{matrix}$$

Outdoor unit model	Amount (oz)	HBC model	Amount (oz)
(E)M200	36	350F	198
(E)M250	36	500F	198
(E)M300	0		
(E)M350	0		
(E)M400	0		
(E)M450	0		
(E)M500	0		

* Amount of refrigerant to be charged for single-module units

- When the piping length from the outdoor unit to the farthest HBC is longer than 10 m (32 ft)

$$\text{Amount of additional charge (oz)} = \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{7}8 total length} \\ \text{\times 2.05 (oz/ft)} \end{matrix} + \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{3}4 total length} \\ \text{\times 1.36 (oz/ft)} \end{matrix} + \begin{matrix} \text{High-pressure pipe} \\ \text{\textcircled{5}8 total length} \\ \text{\times 0.97 (oz/ft)} \end{matrix}$$

Outdoor unit model	Amount (oz)	HBC model	Amount (oz)
(E)M200	36	350F	198
(E)M250	36	500F	198
(E)M300	0		
(E)M350	0		
(E)M400	0		
(E)M450	0		
(E)M500	0		

* Amount of refrigerant to be charged for single-module units

<Example>

Outdoor unit model: PURY-EM300YNW-A1
Main-HBC model: CMB-WM350F-AA
Sub-HBC model: CMB-WM108V-BB x 3

* Refer to the pipe connection examples in [Fig. 2.4.1] (P.2).
A: $\text{\textcircled{5}8}$; 59 ft

The total length of the high-pressure piping and liquid piping in each case is as follows:

$\text{\textcircled{5}8}$ total length: 59 (A)

Therefore, when the piping length from the outdoor unit to the farthest HBC is longer than 10 m (32 ft),

$$\begin{aligned} \text{Amount of additional charge} &= (59 \times 0.97) + 198 \\ &= 255.3 \text{ oz (Fractions are rounded up.)} \end{aligned}$$

4.5. Drain piping work

1. Drain piping work for Main-HBC

- When routing the drain piping from the front or side of the unit, the drain pan does not need to be reoriented.
- When connecting the drain piping from behind the unit, change the orientation of the drain pan before installing the unit.

[Fig. 4.5.1] (P.4)

- Remove the screws.
- Remove the cover plate, and then remove the drain pan.
- Change the orientation of the drain pan so that the drainage hole of the drain pan is in the rear of the unit.
- Screw down the drain pan and the cover plate.

Ⓐ Screws	Ⓑ Cover plate
Ⓒ Drain pan	

- Sufficient space (over 150 mm) is required on each side of the unit to remove the screws. If it is difficult to leave sufficient space, change the orientation of the drain pan before installing the unit.

[Fig. 4.5.2] (P.4)

- | | |
|--|-------------------------------|
| <A> Front view | Back view |
| <C> Top view for drain pan | |
| Ⓐ Holes for drain piping (field supply) | Ⓑ Drain pan |
| Ⓒ Socket (field supply) | Ⓓ Drain piping (field supply) |
| Ⓔ Insulation for drain piping (field supply) | |

- Use a socket to connect the drain piping to the drainage hole of the drain pan.
- Route the drain piping through the holes for drain piping.
- Seal the joint between the drainage hole of the drain pan and the socket with a silicone sealant.
- Bond the socket and the drain piping with a PVC adhesive.
- Ensure that the drain piping is downward (sloped gradient of more than 1/100) to the drainage hole.
- Do not use any odor trap around the discharge port.

2. Drain piping work for Sub-HBC

- Ensure that the drain piping is downward (sloped gradient of more than 1/100) to the Main-HBC (discharge) side. If it is impossible to take any downward pitch, use an optionally available drain-up mechanism to obtain a downward pitch of more than 1/100.
- Ensure that any cross-wise drain piping is less than 20 m. If the drain piping is long, support it with metal brackets to prevent it from bending, warping, or vibrating.

- Connect the supplied drain hose to the discharge port on the unit body. Use hard vinyl chloride pipes VP-25 (ø32) for drain piping (②). Tighten the supplied drain hose onto the discharge port using the supplied hose band. (For this, do not use any adhesive because the drain hose will need to be removed for servicing at a later date.)

- Do not use any odor trap around the discharge port.

[Fig. 4.5.3] (P.4)

- | | |
|--|--|
| A: 25 cm | B: 1.5 – 2 m |
| Ⓐ Downward gradient of more than 1/100 | Ⓒ Supporting bracket |
| Ⓑ Insulating material | Ⓓ Tie band (accessory) |
| Ⓓ Sub-HBC | Ⓔ Drain hose (accessory) |
| Ⓕ Insertion margin | Ⓕ Drain pipe (O.D. ø32 PVC TUBE, field supply) |
| Ⓖ Drain pipe (O.D. ø32 PVC TUBE, field supply) | Ⓖ Tie band (accessory) |
| Ⓗ Insulating material (field supply) | |

- As shown in ③, install a collecting pipe about 10 cm below the drain ports and give it a downward pitch of more than 1/100. This collecting pipe should be of VP-30.

[Fig. 4.5.4] (P.4)

- | | |
|---|-------------------|
| Ⓐ Sub-HBC | Ⓒ Collecting pipe |
| Ⓑ Indoor unit | |
| Ⓓ Please ensure this length is at least 100 mm. | |

3. Drain piping work for Main-HBC and Sub-HBC

- Set the end of drain piping in a place without any risk of odor generation.
- Do not put the end of drain piping into any drain where ionic gases are generated.
- Drain piping may be installed in any direction. However, please be sure to observe the above instructions.

4. Discharge test

After completing drain piping work, open the HBC panel, and test drain discharge using a small amount of water. Also, check to see that there is no water leakage from the connections.

5. Insulating drain pipes

Provide sufficient insulation to the drain pipes just as for refrigerant pipes.

⚠ Caution:

Be sure to provide drain piping with heat insulation in order to prevent excess condensation. Without drain piping, water may leak from the unit causing damage to your property.

5. Connecting water piping work

Please observe the following precautions during installation.

5.1. Important notes on water piping work installation

- The design pressure of the HBC water system is 0.6MPa.
- Use water pipe-work with a design pressure of at least 1.0MPa.
- When performing a water leak check, please do not allow the water pressure to go above 0.3MPa.
- Perform a pressure test on the field-installed water pipes at a pressure equal to 1.5 times the design pressure. Before performing a pressure test, isolate the pipes from HBC and indoor units.
- Please connect the water piping work of each indoor unit to the connect port on the HBC. Failure to do so will result in incorrect running.
- Please list the indoor units on the naming plate in the HBC unit with addresses and end connection numbers.
- Use the reverse-return method to insure proper pipe resistance to each unit.
- Provide some joints and valves around inlet/outlet of each unit for easy maintenance, checkup, and replacement.
- Install a suitable air vent on the water pipe. After flowing water through the pipe, vent any excess air.**
- Secure the pipes with metal fitting, positioning them in locations to protect pipes against breakage and bending.
- Do not confuse the water intake and outlet piping especially when connecting the HBC and the Sub-HBC. (Error code 5102 will appear on the remote controller if a test run is performed with the pipe-work installed incorrectly (inlet connected to outlet and vice versa).)
- This unit doesn't include a heater to prevent freezing within tubes. If the water flow is stopped on low ambient, drain the water out.
- The unused knockout holes should be closed and the refrigerant pipes, water pipes, power source and transmission wires access holes should be filled with putty.
- Install water pipe so that the water flow rate will be maintained.
- Wrap sealing tape as follows.
 - Wrap the joint with sealing tape following the direction of the threads (clockwise), do not wrap the tape over the edge.
 - Overlap the sealing tape by two-thirds to three-fourths of its width on each

turn. Press the tape with your fingers so that it is tight against each thread.

- Do not wrap the 1.5th through 2nd farthest threads away from the pipe end.
- Hold the pipe on the unit side in place with a spanner when installing the pipes or strainer. Tighten screws to a torque of 40 N·m.
 - If there is a risk of freezing, carry out a procedure to prevent it.
 - Please use copper or plastic pipes for the water circuit. Do not use steel or stainless steel piping work. Furthermore, when using copper pipe-work, use a non-oxidative brazing method. Oxidation of the pipe-work will reduce the pump life.
 - Add water pressure gauge to see if the water pressure in HBC is correct or not.
 - Be sure to braze the water pipes after covering a wet cloth to the insulation pipes of the units in order to prevent them from burning and shrinking by heat.** (There are some plastic parts in HBC.)
 - Install the unit so that external force is not applied to the water pipes.**
 - After filling the pipes with water, immediately perform debris removal operation and air vent operation.**

Example of HBC installation

[Fig. 5.1.1] (P.5)

- | | |
|-----------------------------------|--|
| Ⓐ Expansion vessel (field supply) | Ⓑ Shutoff valve (field supply) |
| Ⓒ Strainer (field supply) | Ⓓ Pressure reducing valve (field supply) |
| Ⓔ Water inlet | Ⓕ Refrigerant pipes |
| Ⓖ Pressure gauge (field supply) | Ⓖ Check valve (field supply) |

Note:

- Connect the pipes to the water pipes according to the local regulations.
- Remove the water pipes on the point of outside shutoff valve after finishing supply water.

[Fig. 5.1.2] (P.5)

- | | |
|---|--|
| Ⓐ Indoor unit connection | Ⓑ Sub-HBC connection |
| Ⓒ Main-HBC connection | Ⓓ Cutting point |
| Ⓔ Cut the piping at the cutting point | Ⓕ Field pipe connection (field supply) |
| Ⓖ Field pipe | Ⓖ Pipe connection (field supply) |
| Ⓗ Indoor unit and Sub-HBC connecting port | |
| Ⓖ Water inlet (EXP. VESSEL) | |

Note:

- Remove burr after cutting the piping to prevent entering the pipe connection.
Check that there is no crack at the edge of the piping.

[Fig. 5.1.3] (P.5)

- Ⓐ Main-HBC
- Ⓑ Sub-HBC
- Ⓒ From Sub-HBC "port B" to Main-HBC "port B"
- Ⓓ From Main-HBC "port A" to Sub-HBC "port A"
- Ⓔ From Main-HBC "port C" to Sub-HBC "port C"
- Ⓕ From Sub-HBC "port D" to Main-HBC "port D"

Note:

- See [Fig. 5.1.5] when connecting valves to the on-site water pipe.
- Make sure the water pipes on site are clean and free of foreign substances.
- If the absence of foreign substances cannot be confirmed, before running a debris removal operation, install a strainer at the Main-HBC inlet (piping from the indoor unit ports and Sub-HBC) and at the Sub-HBC inlet (piping from the indoor unit ports and the Main-HBC) to filter out foreign substances and protect the HBC components from failures.

[Fig. 5.1.4] (P.5)

- Ⓐ Main-HBC
- Ⓑ Sub-HBC
- Ⓒ Water pipe: From indoor unit
- Ⓓ Water pipe: To indoor unit
- Ⓔ Strainer (60 mesh or more) (field supply)
- Ⓕ Shut off valve (field supply)
- Ⓖ Water pipe: From Sub-HBC
- Ⓗ Water pipe: To Sub-HBC
- Ⓙ Water pipe: From Main-HBC
- Ⓚ Water pipe: To Main-HBC

- Connect the water pipes of each indoor unit to the same (correct) end connection numbers as indicated on the indoor unit connection section of each HBC. If connected to wrong end connection numbers, there will be no normal operation.

- List indoor unit model names in the name plate on the HBC control box (for identification purposes), and HBC end connection numbers and address numbers in the name plate on the indoor unit side.

In case of using cover caps for unused end connections, please use dezincification resistant brass (DZR) (field supply). Not using the rubber end caps will lead to water leakage.

- Expansion vessel
 - Install an expansion vessel to accommodate expanded water.
 - Please install expansion vessel at same height level of HBC.
- Expansion vessel selection criteria:
- Water containment volume of the HBC

(Unit: L)

Unit model	Water volume
CMB-WM350F-AA	20
CMB-WM500F-AA	24
CMB-WM108V-BB	5
CMB-WM1016V-BB	9

* For indoor units, refer to the installation manual for each indoor unit.

- The maximum water temperature is 60°C.
- The minimum water temperature is 5°C.
- The circuit protection valve set pressure is 370-620 kPa.
- The circulation pump head pressure is 0.24 MPa.
- The design pressure of the expansion vessel is the charged water pressure (the reading of the pressure gauge).
- Tank volume of expansion vessel is as follows:
 $Tank\ volume = \epsilon \times G / (1 - (P_{supply} + 0.1) / 0.29) \times 1.2$
 $\epsilon = \text{The expansion coefficient of water}$
 (= 0.0171)

* Please choose ϵ for using antifreeze solution on the type and temperature range used.

$$\epsilon = \text{Max density} / \text{Min density} - 1$$

$$G [L] = (\text{HBC} [L] + \text{Indoor unit} [L] + \text{Pipe} [L]) \times 1.1$$

Psupply: Water supply pressure [MPa]

- Leakproof the water piping work, valves and drain piping work. Leakproof all the way to, and include pipe ends so that condensation cannot enter the insulated piping work.
- Apply caulking around the ends of the insulation to prevent condensation getting between the piping work and insulation.
- Add a drain valve so that the unit and piping work can be drained.
- Ensure there are no gaps in the piping work insulation. Insulate the piping work right up to the unit.
- Ensure that the gradient of the drain pan piping work is such that discharge can only blow out.
- Water pipe size depends on the indoor unit capacity and the piping length.

[Fig. 5.1.5] (P.6)

Total down-stream indoor unit capacity	Pipe size between Main-HBC and Sub-HBC *1 Pipe size between Main-HBC and indoor unit *1 Pipe size between Sub-HBC and indoor unit *1		
	Max 20 m *2	Max 40 m *2	Max 60 m *2
W/WP/WL10	I.D. ≥ 12 mm	I.D. ≥ 12 mm	I.D. ≥ 12 mm
W/WP/WL11 - W/WP/WL15	I.D. ≥ 12 mm	I.D. ≥ 12 mm	I.D. ≥ 15.5 mm
W/WP/WL16 - W/WP/WL25	I.D. ≥ 15.5 mm	I.D. ≥ 15.5 mm	I.D. ≥ 15.5 mm
W/WP/WL26 - W/WP/WL32	I.D. ≥ 15.5 mm	I.D. ≥ 19.9 mm	I.D. ≥ 19.9 mm
W/WP/WL33 - W/WP/WL50	I.D. ≥ 19.9 mm	I.D. ≥ 19.9 mm	I.D. ≥ 19.9 mm
W/WP/WL51 - W/WP/WL63	I.D. ≥ 19.9 mm	I.D. ≥ 25.2 mm	I.D. ≥ 25.2 mm
W/WP/WL64 - W/WP/WL80	I.D. ≥ 25.2 mm	I.D. ≥ 25.2 mm	I.D. ≥ 25.2 mm
W/WP/WL81 - W/WP/WL100	I.D. ≥ 25.2 mm	I.D. ≥ 25.2 mm	I.D. ≥ 32.6 mm
W/WP/WL101 - W/WP/WL150	I.D. ≥ 32.6 mm	I.D. ≥ 32.6 mm	I.D. ≥ 32.6 mm
W/WP/WL151 - W/WP/WL250	I.D. ≥ 32.6 mm	I.D. ≥ 32.6 mm	I.D. ≥ 39.6 mm
W/WP/WL251 - W/WP/WL300	I.D. ≥ 32.6 mm	I.D. ≥ 39.6 mm	I.D. ≥ 50.8 mm
W/WP/WL301 - W/WP/WL750	I.D. ≥ 50.8 mm	I.D. ≥ 50.8 mm	I.D. ≥ 50.8 mm

*1 When connecting CMB-WM108/1016V-AA and CMB-WM108/1016V-BB, refer to the installation manual for CMB-WM108/1016V-AA about pipe size.

*2 Piping length from Main-HBC to the farthest indoor unit.

- Ⓐ To outdoor unit
- Ⓑ End connection (brazing)
- Ⓒ Main-HBC: Maximum total capacity of connected indoor units: W/WP/WL170
- Ⓓ Sub-HBC: Maximum total capacity of connected indoor units: W/WP/WL250
- Ⓔ Indoor unit
- Ⓕ Branch joint (field supply)
- Ⓖ Up to three units for 1 branch hole; total capacity: below 80 (but in same mode, cooling/heating)
- Ⓗ Shutoff valve (field supply)
- Ⓙ Pressure control valve (field supply)
- Ⓚ Auto air vent valve (Highest point on the water pipe for each branch) (field supply)
- Ⓛ Auto air vent valve (Top position of piping on Main-HBC) (field supply)
- Ⓜ Joint (field supply)
- Ⓝ Pump 1 circuit
- Ⓞ Pump 2 circuit

Note:

***1. To connect multiple indoor units to a port**

- Maximum total capacity of connected indoor units: W/WP/WL80
- Maximum number of connectable indoor units: 3 units
- Branch joints are field-supplied.
- All the indoor units that are connected to the same port must be in the same group and perform the Thermo-ON/OFF operation simultaneously.
- The room temperatures of all the indoor units in the group need to be monitored via the connected remote controller.
- When connecting a W/WP/WL71 through 125 model indoor unit to an HBC, the pipes that connect the unit to the same set of HBC ports cannot be branched out to connect additional units.
- Selection of water piping
Select the size according to the total capacity of indoor units to be installed down-stream.
- Do not connect multiple indoor units to the same port when operating each of them in different modes (cooling, heating, stop, and thermo-OFF). The indoor units connected to the same port must be set to operate in the same mode. Set them to the same group to make them run/stop in the same mode all together. Alternatively, enable the thermo setting on the remote controller, or set the common thermostat (optional) to run/stop the units in the same mode based on the representative temperature.
- When multiple indoor units are connected to a single port, install a pressure control valve in the pipe to equalize the pressure of all indoor units.
- Pressure control valves are required for the "WP-type" and "WL-type without the optional valve kit" indoor units only, and not for the "W-type" and "WL-type with the optional valve kit" indoor units.

***2. Connecting W/WP/WL100 or 125 indoor units to an HBC**

- When connecting W/WP/WL100 or 125 indoor units to an HBC, connect each unit to two sets of two ports on the HBC, using two junction pipes (Y-joints).
- Connect an increaser (20A-to-32A) to the merged side of each junction pipe.
- When the junction pipes are connected to Main-HBC, the branched sides of the junction pipes cannot be connected to the ports "3 and 4" at the same time. (See Fig. A.)

- When the junction pipes are connected to 16 Sub-HBC ports, the branched sides of the junction pipes cannot be connected to the ports "4 and 5," "8 and 9," or "12 and 13" at the same time. (See Fig. B.)
- When the junction pipes are connected to 8 Sub-HBC ports, the branched sides of the junction pipes cannot be connected to the ports "4 and 5" at the same time. (See Fig. C.)
- When a W/WP/WL100 or a 125 model indoor unit is connected to an HBC, the pipes that connect the unit to the same set of HBC ports cannot be branched out to connect additional units.

*3. Selecting the port for indoor unit connection

- The table below shows the ports for connecting the units that belong to Group 1 and Group 2.

	Group 1	Group 2
CMB-WM350/500F-AA	Ports from 1 to 3	Ports from 4 to 6
CMB-WM108V-BB	Ports from 1 to 4	Ports from 5 to 8
CMB-WM1016V-BB	Ports from 1 to 4	Ports from 5 to 8
	Ports from 9 to 12	Ports from 13 to 16

10. Please refer to the [Fig. 5.1.6] when installing auto air vent valves.

[Fig. 5.1.6] (P.6)

- Ⓐ Connection pipe from Sub-HBC
- Ⓑ Connection pipe from indoor unit
- Ⓒ Auto air vent
- Ⓓ T-joint
- Ⓔ Piping for Sub-HBC or indoor unit side
- Ⓕ Piping for Main-HBC side

11. Use formula $0.1 \text{ [MPa]} < 0.01 + 0.01 \times A < 0.16 \text{ [MPa]}$ for the supply pressure range to be used.

(A: Head pressure (m) between the HBC and the highest indoor unit)

If the supply pressure is greater than 0.16 MPa, use a pressure reducing valve to keep the pressure within the range.

If the head pressure is unknown, set it to 0.16 MPa.

12. Before performing a pressure test on the pipes in the water circuit, be sure to install a shutoff valve on the inlet/outlet water pipes of the indoor units.

13. Please do not use a corrosion inhibitor in the water system.

14. **When installing the HBC unit in an environment which may drop below 0°C, please add antifreeze solution (Propylene Glycol only) to the circulating water according to the local regulations.**

5.2. Water pipe insulation

1. Be sure to add insulation work to water piping by covering water piping work separately with enough thickness heat-resistant polyethylene, so that no gap is observed in the joint between indoor unit and insulating material, and insulating materials themselves. When insulation work is insufficient, there is a possibility of condensation, etc. Pay special attention to insulation work in the ceiling plenum.

[Fig. 5.2.1] (P.7)

- Ⓐ Locally procured insulating material for pipes
- Ⓑ Bind here using band or tape.
- Ⓒ Do not leave any opening.
- Ⓓ Lap margin: more than 40 mm
- Ⓔ Insulating material (field supply)
- Ⓕ Unit side insulating material

- Insulation materials for the pipes to be added on site must meet the following specifications:

Thickness	HBC - indoor unit	20 mm or more
	HBC - Sub-HBC	20 mm or more

- This specification is based on copper for water piping. When using plastic piping work, choose a thickness based on the plastic pipe performance.
 - Installation of pipes in a high-temperature high-humidity environment, such as the top floor of a building, may require the use of insulation materials thicker than the ones specified in the chart above.
 - When certain specifications presented by the client must be met, ensure that they also meet the specifications on the chart above.
2. Apply insulation to the indoor unit piping work, strainer, shutoff valve, and pressure reducing valve.

5.3. Water treatment and quality control

To preserve water quality, use the closed type of water circuit. When the circulating water quality is poor, the water heat exchanger can develop scale, leading to a reduction in heat-exchange power and possible corrosion. Pay careful attention to water processing and water quality control when installing the water circulation system.

- Removing of foreign objects or impurities within the pipes.
 - During installation, make sure that foreign objects, such as welding fragments, sealant particles, or rust, do not enter the pipes.
- Water Quality Processing
 - ① Depending on the quality of the cold-temperature water used in the air conditioner, the copper piping of the heat exchanger may corrode. Regular water quality processing is recommended.
 - If a water supply tank is installed, keep air contact to a minimum, and keep the level of dissolved oxygen in the water no higher than 1mg/l.

② Water quality standard

Items		Low to mid-range temperature water system		Tendency	
		Recirculating water [20<T<60°C] [68<T<140°F]	Make-up water	Corrosive	Scale-forming
Standard items	pH (25°C) [77°F]	7.0 ~ 8.0	7.0 ~ 8.0	○	○
	Electric conductivity (mS/m) (25°C) [77°F]	30 or less	30 or less	○	○
	(μs/cm) (25°C) [77°F]	[300 or less]	[300 or less]		
	Chloride ion (mg Cl/l)	50 or less	50 or less	○	
	Sulfate ion (mg SO ₄ ²⁻ /l)	50 or less	50 or less	○	
	Acid consumption (pH4.8) (mg CaCO ₃ /l)	50 or less	50 or less		○
	Total hardness (mg CaCO ₃ /l)	70 or less	70 or less		○
Reference items	Calcium hardness (mg CaCO ₃ /l)	50 or less	50 or less		○
	Ionic silica (mg SiO ₂ /l)	30 or less	30 or less		○
	Iron (mg Fe/l)	1.0 or less	0.3 or less	○	○
	Copper (mg Cu/l)	1.0 or less	0.1 or less	○	
	Sulfide ion (mg S ²⁻ /l)	not to be detected	not to be detected	○	
	Ammonium ion (mg NH ₄ ⁺ /l)	0.3 or less	0.1 or less	○	
	Residual chlorine (mg Cl/l)	0.25 or less	0.3 or less	○	
	Free carbon dioxide (mg CO ₂ /l)	0.4 or less	4.0 or less	○	
	Ryzner stability index	6.0 ~ 7.0	-	○	○

Reference : Guideline of Water Quality for Refrigeration and Air Conditioning Equipment. (JRA GL02E-1994)

- ③ Consult with a specialist about water quality control methods and calculations before using anti-corrosive solutions.

6. Electrical work

- ▶ Consult all related regulations and power companies beforehand.

Warning:

Electrical work should be handled by qualified electrical engineers in accordance with all related regulations and attached instruction manuals. Special circuits should also be used. If there is a lack of power capacity or a deficiency in electrical work, it may cause a risk of electric shock or fire.

- ▶ Connect all wires securely.

- Fix power source wiring to control box by using buffer bushing for tensile force (PG connection or the like).

[Fig. 6.0.1] (P.7)

- | | |
|------------------------------------|-----------------------|
| Ⓐ Control box | Ⓑ Power source wiring |
| Ⓒ ø21 hole (closed rubber bushing) | Ⓓ Transmission wiring |
| Ⓔ Cable strap | Ⓕ Wire saddle |

[Fig. 6.0.2] (P.7)

- | | |
|------------------------------------|-----------------------|
| Ⓐ Control box | Ⓑ Power source wiring |
| Ⓒ ø21 hole (closed rubber bushing) | Ⓓ Transmission wiring |
| Ⓔ Clip cables here | |

- ▶ Never connect the power cable to the terminal board for control cables. (Otherwise it may be broken.)
- ▶ Be sure to wire between the control wire terminal boards for indoor unit, outdoor unit and HBC/Sub-HBC.

Use non-polarized 2-wire as transmission cables.

Use 2-core shielding cables (CVVS, CPEVS) of more than 1.25 mm² in diameter as transmission cables.

The switch capacity of the main power to HBC/Sub-HBC and the wire size are as follows:

Switch (A)		Molded case circuit breaker	Earth leakage breaker	Wire size
Capacity	Fuse			
16	16	20 A	20 A 30 mA 0.1 s or less	1.5 mm ²

- For other detailed information, refer to the outdoor unit installation manual.
- Use a power cable with a maximum outer diameter of 17 mm and a maximum bending radius of 25 mm.
- Power supply cords of appliances shall not be lighter than design 60245 IEC 53 or 60227 IEC 53.
- A switch with at least 3 mm contact separation in each pole shall be provided by the Air conditioner installation.

Caution:

Do not use anything other than the correct capacity fuse and breaker. Using fuse, conductor or copper wire with too large capacity may cause a risk of malfunction or fire.

Ensure that the outdoor units are put to the ground. Do not connect the earth cable to any gas pipe, water pipe, lightning rod or telephone earth cable. Incomplete grounding may cause a risk of electric shock.

7. Setting addresses and operating units

The address switch of each HBC/Sub-HBC is set to "000" when shipped from the factory.

- Set the address switch to an address that equals the lowest address of the indoor units that are connected to the HBC/Sub-HBC plus 50.

- ▶ Assign the HBC address that equals the lowest address of the indoor units that are connected to the HBC/Sub-HBC plus 50. However, if the address overlaps any other units' addresses, assign the address that equals the next lowest address plus 50.
- Please refer to the outdoor unit installation manual.

8. Test run

8.1. Before starting the test run

Before starting the test run, please check the following:

- ▶ After installing, piping and wiring the indoor units and HBC, check to see again that there is no refrigerant leakage, water leakage, the indoor unit inlet and outlet piped backwards, and no slack on power and control cables.
- ▶ Use a 500 V tester to check that there is an insulation resistance of more than 1.0 MΩ between the power terminal block and the ground. If it is less than 1.0 MΩ, do not operate the unit.
- When water has been supplied to the water piping work, purge the system of air. The details of air purging can be found separately in the water circuit maintenance manual.

Caution:

- Never measure the insulation resistance of the terminal block for any control cables.
- Incomplete purging of the air in the system, closing of the valves upstream or down stream of the pump etc. may cause the pump to operate with no water flow and thus lead to pump failure.
- Ensure that the power is off when replacing a pump. Do not remove or attach the pump connector with the power on. Otherwise pump will break. After turning off the power, wait 10 minutes before commencing work.

8.2. Debris removal operation

This operation removes the debris that may have been introduced during installation from the water circuit.

Perform this operation after completion of the following.

- Water piping work *1
- Air-tightness test of water piping
- Electrical work
- Refrigerant piping work *2
- Evacuation of refrigerant circuits *2
- Refrigerant charging *2

*1. **Install an automatic air vent valve at the highest point of each branch pipe from the HBC (in two places at the highest point of the return pipe from the Sub-HBC, and in six places at the highest point of the return pipes from indoor units). (See Figure 1.)**

Failure to install air vent valves may leave air in the water circuit and damage the pump.

*2. Debris removal operation can be performed before completing the refrigerant piping work, evacuation of refrigerant circuits, and refrigerant charging.



Figure. 1 Automatic air vent valve

1. Preparation for debris removal operation

1. DIP SW settings

[Main-HBC]

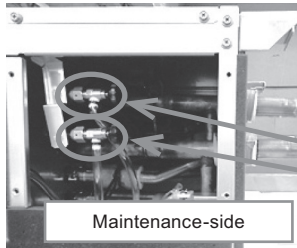
Turn on DIP SW001-1. (Water circuit valve setting (valve open when stopped))

Turn on DIP SW001-2. (Nullification of the drain overflow error for 9 hours) *Applicable when a Sub-HBC (CMB-WM**V-BB) is connected.

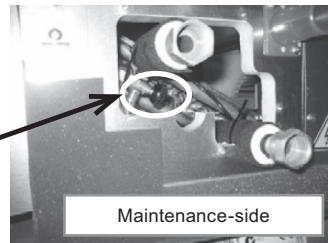
2. Turn on the breaker for each unit, and then open the manual air vent valves on the Sub-HBC and the indoor units. (The Main-HBC does not have a manual air vent valve.)

* Note that, if the manual air vent valves are opened too much, a large amount of water may blast out and overflow from the drain pan.

(If there are air vent valves on the field-installed pipes, open the valves as well.)

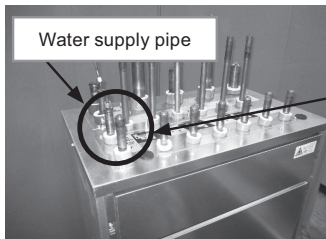


Sub-HBC (CMB-WM**V-BB)



Indoor unit (Example: PEFY-WP-VMA-E)

3. Supply water from the water supply pipe on the HBC.



Connection of water supply pipe

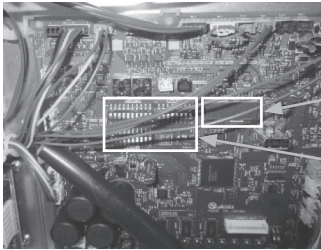
Install a non-return valve to prevent water in the unit from flowing back to the water supply pipe, or remove the water supply hose after the debris removal operation.

4. Check that water is coming out of the manual air vent valve on each unit, and perform the debris removal operation.

2. Debris removal operation

[When an outdoor unit is connected, and refrigerant piping work, evacuation of refrigerant circuits, and refrigerant charging have been completed]

1. Turn on DIP SW002-1 if there is a possibility that the debris may have been introduced into the water circuits during piping work on site. (Refer to the flowchart below for debris removal operation for details.)
Use DIP SW002-1 to start the debris removal operation. (Each manual air vent valve must stay open.)



Control board (LED, DIP SW positions)

2. Debris removal operation will be completed in 40 minutes, and the LED on the control board will indicate "Air0." The LED indication will change to "Air1," "Air2," and "AirE" in order. Then, the water pump inside the HBC will stop.
3. Stop the water supply, and check that no water is coming out of the manual air vent valves. Then, turn off DIP SW002-1.

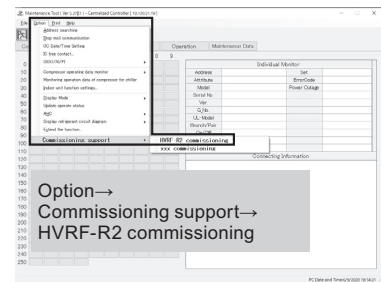
[When no outdoor units are connected, or refrigerant piping work, evacuation of refrigerant circuits, and refrigerant charging have not been completed (when performing debris removal operation for the water circuits only)]

The following must be completed before performing debris removal operation.

- Assign M-NET addresses to the HBC and the indoor units.
 - Have a computer ready with the MN converter and the Maintenance Tool (Ver. 5.43 or later) installed.
 - Have a power-supply device (PAC-SC51KUA) ready.
- * While the debris removal operation is being performed, no other functions of the Maintenance Tool are available for use.
1. Follow the procedures below after connecting the MN converter and starting up the Maintenance Tool. (Manuals are accessible from the Maintenance Tool.)

<Debris removal operation procedure (without connection to an outdoor unit)>

- ① Select Option → Commissioning support → HVRF-R2 commissioning.
- ② A confirmation window will appear. Check the message, and press Next to proceed.
* Manuals are accessible from the confirmation window.
- ③ After the units are searched for, a sign that indicates the completion of preparation will appear. Turn on DIP SW002-1 of the Main-HBC to start the operation.



Maintenance Tool window
(Debris removal operation without connection to an outdoor unit)

2. The LED on the control board will indicate "Air1," "Air2," and "AirE" in order, and the pump will stop after a while.
The progress of the debris removal operation will appear on the service LED of the Main-HBC and on the Maintenance Tool window.
3. Stop the water supply, and check that no water is coming out of the manual air vent valves. Then, turn off DIP SW002-1.

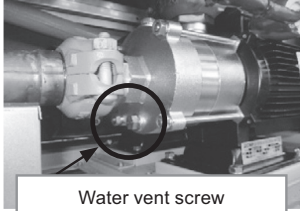
[The rest of the procedures are the same for performing debris removal operation with connection to an outdoor unit (refrigerant piping work, evacuation of refrigerant circuits, and refrigerant charging have been completed) and without connection to an outdoor unit (refrigerant piping work, evacuation of refrigerant circuits, and refrigerant charging have not been completed)]

4. Turn on DIP SW002-6.

Close the field-installed manual on-off valve at each branch and on the pipe connected to the Sub-HBC.

Then, slowly turn the water vent screw of the two water pumps at the lower part inside the HBC. **(Maximum of two turns)**

* **Note that, if the water vent screws are turned too much, a large amount of water may blast out and overflows from the drain pan.**



Water vent screw
(Maximum of two turns)

Water pump (water vent screw position)

5. Slowly open the strainer inside the HBC (on the maintenance side).

* Note that, if it is opened fast, water may blast out.

Remove the strainer, and clean its inside.



Strainer maintenance

6. Slowly open the strainer on the far side inside the HBC. Remove it in the same way as the other strainer, and clean its inside.

After cleaning and re-fitting the strainer, turn off DIP SW002-6.

7. Make sure the strainers are re-installed properly.

Flowchart for debris removal operation (Turn on DIP SW002-1.)

Air 1 Intermittent operation of water pump (20 min) The operation is performed to discharge air from the water circuits. [Air1]



Air 2 Water supply to all indoor units (20 min) Debris in the pipe will accumulate into the strainer by supplying water to all indoor units. [Air2] → [AirE]

- (1) The operation can be forced to stop by turning on DIP SW002-4.
- (2) If it is found during any step that air has not been discharged to the desired degree, repeat the air discharge operation from the beginning.
- (3) If an error sign "Err" appears on the LED on the circuit board of the HBC, turn off the breaker, turn it back on, and repeat the air discharge operation from the beginning.

3. Final step

Turn off DIP SW 001-1 and 001-2 after completion of debris removal operation.

8.3. Air vent operation

This operation removes the air from the water circuit after water is supplied to it. Perform this operation after completion of the following. *1

- Water piping work *2
- Air-tightness test of water piping
- Electrical work
- Refrigerant piping work *3
- Air-tightness test of refrigerant piping *3
- Evacuation of refrigerant circuits *3
- Refrigerant charging *3

*1. Perform air vent operation after completion of water- and refrigerant-piping work, air-tightness tests, electrical work, evacuation of refrigerant circuits, refrigerant charging, and debris removal operation (shown on previous pages).

*2. **Install an automatic air vent valve at the highest point of each branch pipe from the HBC (in two places at the highest point of the return pipe from the Sub-HBC, and in six places at the highest point of the return pipes from indoor units). (See Figure 1.)**

Failure to install air vent valves may leave air in the water circuit and damage the pump.

*3. Air vent operation can be performed before completing the refrigerant piping work, air-tightness test of refrigerant piping, evacuation of refrigerant circuits, and refrigerant charging.

In this case, **perform an air vent operation again after refrigerant piping work, air-tightness test of refrigerant piping, evacuation of refrigerant circuits, and refrigerant charging have been completed**, because the initial air vent operation may not be able to remove all dissolved oxygen in the water circuit.

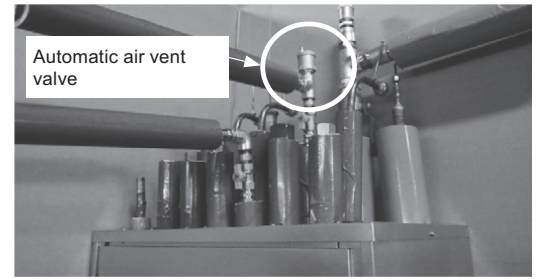


Figure 1. Automatic air vent valve

1. Preparation for air vent operation

1. DIP SW settings

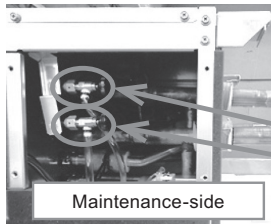
[Main-HBC]

Turn on DIP SW001-1. (Water circuit valve setting (valve open when stopped))

Turn on DIP SW001-2. (Nullification of the drain overflow error for 9 hours). *Applicable when a Sub-HBC (CMB-WM**V-BB) is connected.

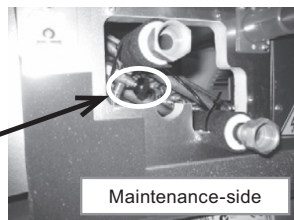
2. Turn on the breaker for each unit, and then open the manual air vent valves on the Sub-HBC and the indoor units. (The Main-HBC does not have an manual air vent valve.)

* Note that, if the manual air vent valves are opened too much, a large amount of water may blast out and overflow from the drain pan. (If there are air vent valves on the field-installed pipes, open the valves as well.)



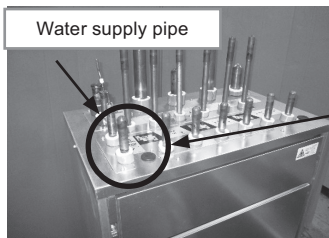
Sub-HBC (CMB-WM**V-BB)

Manual air vent valve



Indoor unit (Example: PEFY-WP-VMA-E)

3. Supply water from the water supply pipe on the HBC.



Connection of water supply pipe

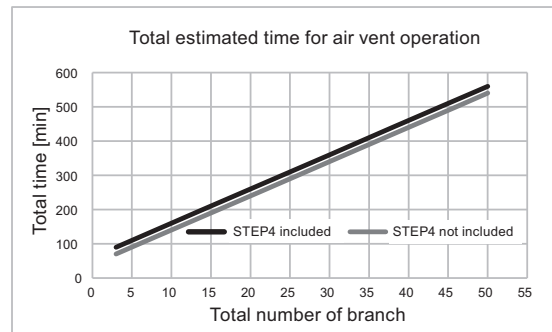
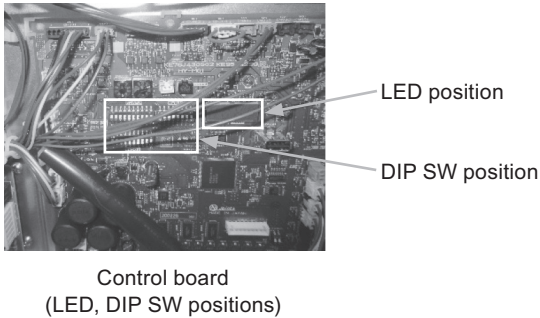
Install a non-return valve to prevent water in the unit from flowing back to the water supply pipe, or remove the water supply hose after the air vent operation.

4. Check that water is coming out of the manual air vent valve on each unit, and perform the air vent operation.

2. Air vent operation

[When an outdoor unit is connected, and refrigerant piping work, air-tightness test of refrigerant piping, evacuation of refrigerant circuits, and refrigerant charging have been completed]

1. Turn on DIP SW002-3 of the Main-HBC.
2. The LED on the control board indicates "Air1," "Air2," "Air3," "Air 4," and "AirE" in order, and the pump will stop after a while. See the figure below for the approximate time it takes to complete an air vent operation.



Time required for air vent operation

3. Turn off DIP SW002-3.
4. Close all manual air vent valves.
5. Stop the water supply.

[When no outdoor units are connected, or refrigerant piping work, air-tightness test of refrigerant piping, evacuation of refrigerant circuits, and refrigerant charging have not been completed (when performing air vent operation for the water circuits only)]

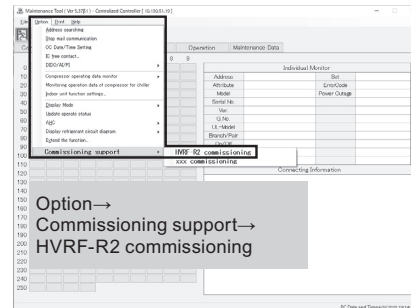
The following must be completed before performing air vent operation.

- Assign M-NET addresses to the HBC and the indoor units.
 - Have a computer ready with the MN converter and the Maintenance Tool (Ver. 5.43 or later) installed.
 - Have a power-supply device (PAC-SC51KUA) ready.
- * While the air vent operation is being performed, no other functions of the Maintenance Tool are available for use.

1. Follow the procedures below after connecting the MN converter and starting up the Maintenance Tool. (Manuals are accessible from the Maintenance Tool.)

<Air vent operation procedure (without connection to an outdoor unit)>

- ① Select Option → Commissioning support → HVRF-R2 commissioning.
- ② A confirmation window will appear. Check the message, and press Next to proceed.
* Manuals are accessible from the confirmation window.
- ③ After the units are searched for, a sign that indicates the completion of preparation will appear. Turn on DIP SW002-3 of the Main-HBC to start the operation.



Maintenance Tool window
(Air vent operation without connection to an outdoor unit)

2. The LED on the control board will indicate "Air1," "Air2," "Air3" and "AirE" in order, and the pump will stop after a while. The progress of the air vent operation will appear on the service LED of the Main-HBC and on the Maintenance Tool.
3. Stop the water supply, and check that no water is coming out of the manual air vent valves. Then, turn off DIP SW002-3.
4. Close all manual air vent valves.
5. Stop the water supply.

* Before setting the DIP SW, make sure that the service LED of the Main-HBC is not indicating any error.

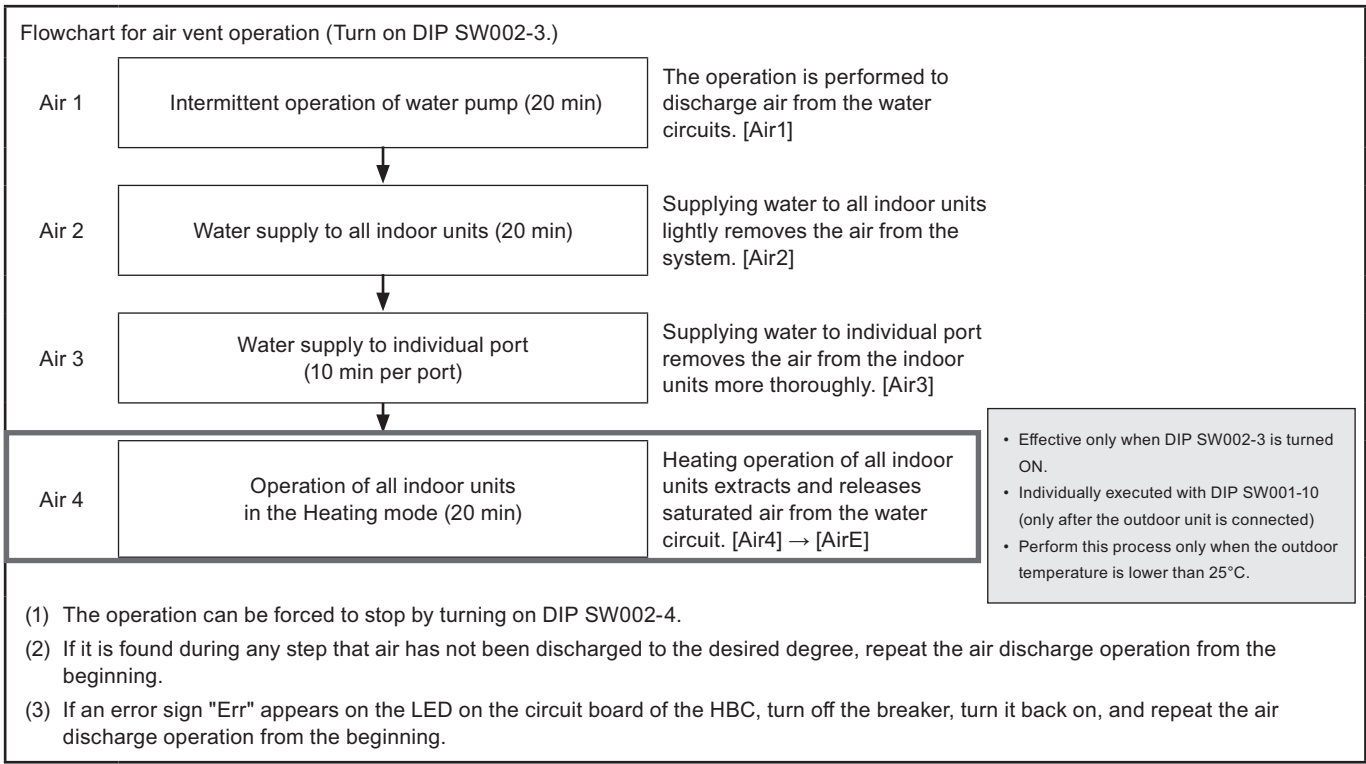
* Debris removal operation or air vent operation cannot be executed from the Maintenance Tool.

* An air vent operation using warm water cannot be performed to remove dissolved oxygen (Air4) from the water circuit without connection to an outdoor unit.

After connecting the outdoor unit (refrigerant circuit), perform an air vent operation again to remove all air from the circuit.

Any air left in the water circuit may damage the pump.


(Air4 operation alone can be performed by turning on DIP SW001-10 after connecting the outdoor unit (refrigerant circuit).)



3. Final step

Turn off DIP SW 001-1 and 001-2 after completion of air vent operation.

Date of manufacture is indicated in format «yyyy.mm» in the «YEAR OF MANUFACTURE» field on the nameplate.

					
HBC CONTROLLER MODEL					
SERVICE REF.					
UNIT RATING	~	V	220	230	240
FREQUENCY	Hz		50/60	50/60	50/60
RATED INPUT	(Cooling)	kW			
RATED CURRENT	(Cooling)	A			
RATED INPUT	(Heating)	kW			
RATED CURRENT	(Heating)	A			
REFRIGERANT R32 ALLOWABLE PRESSURE(Ps) 4.15MPa (41.5bar) MAXIMUM WATER PRESSURE 0.6MPa WEIGHT kg IP CODE IP20 YEAR OF MANUFACTURE _____					
MANUFACTURER: MITSUBISHI ELECTRIC CORPORATION AIR-CONDITIONING & REFRIGERATION SYSTEMS WORKS 5-66,TEBIRA,6-CHOME,WAKAYAMA CITY, JAPAN					
SERIAL No. _____ MADE IN JAPAN					

IT	*a	nome o marchio, numero di iscrizione nel registro delle imprese e sede del fabbricante;
	*b	identificativo del modello del prodotto;
	*c	se il motore è considerato esente dalla specifica di efficienza ai sensi dell'articolo 2, paragrafo 2, del presente regolamento, la ragione per cui è considerato esente. a) motori completamente integrati in un prodotto (ad esempio in un cambio, una pompa, un ventilatore o un compressore) per i quali non è possibile collaudare le prestazioni energetiche autonomamente dal prodotto, anche disponendo di uno scudo e di un cuscinetto anteriore provvisori; il motore deve condividere componenti comuni (a parte i connettori come i bulloni) con l'unità azionata (per esempio, un asse o un alloggiamento) e non è progettato in modo da poter essere interamente separato dall'unità azionata e funzionare in maniera indipendente. Il processo di separazione rende il motore inoperante;
*d	la ragione per cui	
LV	*a	ražotāja nosaukums vai preču zīme, uzņēmuma reģistrācijas numurs un adrese;
	*b	ražojuma modeļa identifikators;
	*c	ja motoru uzskata par atbrīvotu no efektivitātes prasības atbilstoši šīs regulas 2. panta 2. punktam, norāda konkrētu šāda atbrīvojuma iemeslu. a) motori, kuri pilnībā integrēti ražojumā (piemēram, iekārtā, sūkņi, ventilatorā vai kompresorā) un kuru energoefektivitāti nevar testēt neatkarīgi no ražojuma pat tad, ja tiek izmantots pagaidu gultņa vairogs un piedziņas gala gultnis; motoram ir jābūt kopīgām sastāvdaļām (izņemot tādas savienotājus kā skrūves) ar darbināmo vienību (piem., vārpsta vai korpusu) un tas nedrīkst būt konstruēts tā, lai motoru varētu pilnībā atdalīt no darbināmās vienības un tas darbotos neatkarīgi. Atdalīšanas procesa sekas ir tādas, ka motors kļūst nedarbināms;
*d	konkrētu iemeslu	
LT	*a	gamintojo pavadinimas arba prekės ženklas, komercinis registracijos numeris ir adresas;
	*b	gaminio modelio žymuo;
	*c	jeigu pagal šio reglamento 2 straipsnio 2 dalį laikoma, kad varikliai efektyvumo reikalavimas netaikomas, konkreiti priežastis, dėl kurios laikoma, kad reikalavimas netaikomas. a) gaminį (pvz., pavarą, siurbli, ventiliatorių ar kompresorių) visiškai įmontuotiems varikliams, kurių energijos vartojimo efektyvumo neįmanoma išbandyti atskirai nuo to gaminių, net su laikinu guolio dangčiu ir pavarinės pusės (D pusės) guoliu; variklis su varomuoju bloku turi turėti bendrą (be jungiamųjų detalių, pvz., varžtų) komponentų (pvz., veleną arba korpusą) ir neturi būti suprojektuotas taip, kad visą variklį nuo varomojo bloko būtų galima atskirti ir nepriklausomai valdyti. Atskirtas variklis turi neveikti;
*d	konkreiti priežastis	
HU	*a	a gyártó neve vagy védjegye, cégjegyzékszám és címe;
	*b	a termék típusszáma;
	*c	amennyiben a motor mentesül az e rendelet 2. cikke (2) bekezdése szerinti hatékonyági követelmények teljesítése alól: a mentesülés konkrét oka. a) egy adott termékbe (például fogaskerekes áttételbe, szivattyúba, ventilátorba vagy kompresszorba) teljesen beépített motorok, és amelyek energiateljesítményét nem lehet a termékől függetlenül vizsgálni, még ideiglenes végső árnycékolással és hajlításlánc-csapágyzással sem; a motornak közös alkotóelemeken (leszámítva a csatlakozóelemeket, mint például csavarokat) kell osztoznia a meghajtott egységgel (például tengely vagy ház) és nem szabad oly módon tervezni, hogy teljesen elválasztható legyen a meghajtott egységtől és függetlenül működhessen. Az elválasztás következményeképpen a motornak működéséktelelenné kell válnia;
*d	konkrét oka	
MT	*a	l-isem tal-manifattur jew il-marka kummerċjali, in-numru ta' reġistrazzjoni kummerċjali u l-inidirizz;
	*b	l-identifikatur tal-mudell tal-prodott;
	*c	jekk il-mutur jitgħes bhala eżenti mir-rekwiżit tal-effiċjenza skont l-Artikolu 2(2) ta' dan ir-Regolament, ir-raġuni speċifika għaliex huwa meqjus bhala eżenti. a) il-muturi kompletament integrati fi prodott (pereżempju f'taġħmir, pompa, fann jew kompressur) u li l-prestazzjoni enerġetika tagħhom ma listax tiġi ttestjata indipendentement mill-prodott, anke fil-każ li jkollhom end-shield bearing u drive-end bearing temporanji; il-mutur għandu jkollu komponenti komuni (minbarra konnetturi bħal boltijiet) mal-unità motorizzata (pereżempju, xaft jew housing) u ma għandux ikun iddisinjat b'tali mod li l-mutur ikun jista' jiġi sseparat kompletament mill-unità motorizzata u jithaddem indipendentement. Il-proċess ta' sseparazzjoni għandu jwassal biex il-mutur ma jibqax jaħdem;
*d	ir-raġuni speċifika għaliex	
NL	*a	naam of handelsmerk van de fabrikant, handelsregisternummer en adres;
	*b	typeaanduiding van het product;
	*c	vermelding of de motor wordt beschouwd als vrijgesteld van de eisen inzake efficiëntie overeenkomstig artikel 2, lid 2, van deze verordening en de specifieke reden waarom de motor als vrijgesteld wordt beschouwd. a) motoren die volledig in een product zijn geïntegreerd (bijvoorbeeld in een versnelling, een pomp, een ventilator of een compressor) en waarvan de energieprestaties niet onafhankelijk van dat product kunnen worden getest, zelfs niet met een tijdelijk lagerschild en tijdelijke aandrijfkop; de motor moet (verbindingen zoals bouten daargelaten) gemeenschappelijke onderdelen hebben met de aangedreven eenheid (zoals een as of behuizing) en mag niet zo zijn ontworpen dat de motor volledig van de aangedreven eenheid kan worden gescheiden en onafhankelijk kan werken. Het scheidingsproces leidt ertoe dat de motor niet werkt;
*d	de specifieke reden waarom	
PL	*a	nazwa lub znak towarowy producenta, numer rejestru handlowego i adres;
	*b	identyfikator modelu produktu;
	*c	informacja, czy silnik jest wyłączony z wymogu dotyczącego efektywności zgodnie z art. 2 ust. 2 niniejszego rozporządzenia oraz konkretny powód jego wyłączenia. a) silniki stanowiące integralną część produktu (np. przekładni zębatej, pompy, wentylatora lub sprężarki), których charakterystyka energetyczna nie może być sprawdzona niezależnie od produktu, nawet przy zapewnieniu tymczasowego łożyska od strony tarczy i od strony napędu; taki silnik musi posiadać wspólne komponenty (oprócz elementów łączących, takich jak śruby) z napędzanym urządzeniem (np. wał lub obudowę) i nie może być zaprojektowany w sposób umożliwiający jego całkowite oddzielenie od napędzanego urządzenia i niezależną eksploatację. Proces oddzielenia powoduje, że silnik staje się niezdatny do działania;
*d	konkretny powód	
PT	*a	Marca comercial ou nome, número de registo comercial e endereço do fabricante;
	*b	Identificador de modelo do produto;
	*c	Se for considerado isento de requisitos de eficiência nos termos do artigo 2.o, n.o 2, do presente regulamento, a razão específica pela qual se considera o motor isento. a) Motores completamente integrados em produtos (por exemplo numa engrenagem, numa bomba, numa ventoinha ou num compressor) e cujo desempenho energético não possa ser ensaiado de forma independente do produto, mesmo com a instalação temporária de uma tampa e de uma chumaceira do lado de acionamento. O motor partilha componentes (além dos conectores, tais como parafusos) com a unidade móvel (por exemplo um veio ou a caixa) e não foi concebido de modo a poder ser completamente separado da unidade móvel e funcionar de forma independente. Se for separado, o motor deixa de funcionar;
*d	razão específica pela	
RO	*a	denumirea producătorului sau marca comercială, numărul de înregistrare la Registrul Comerțului și adresa;
	*b	identificatorul modelului produsului;
	*c	în cazul în care motorul este considerat ca fiind exceptat de la cerința de eficiență în conformitate cu articolul 2 alineatul (2) din prezentul regulament, motivul specific pentru care se consideră că este exceptat. a) motoare complet integrate într-un produs (de exemplu, într-un anghrenaj cu roți dințate, într-o pompă, într-un ventilator sau într-un compresor) și a căror performanță energetică nu poate fi încercată independent de produs, nici chiar în cazul utilizării temporare a unui dispozitiv de protecție și a unui rulment în zona de antrenare; motorul trebuie să utilizeze componente comune (cu excepția unor conectori precum buleanele) cu unitatea acționată (de exemplu, un ax sau o carcasă) și nu trebuie să fie proiectat în așa fel încât motorul să poată fi separat în întregime de unitatea acționată și să funcționeze independent. Procesul de separare are drept urmare faptul că motorul devine nefuncțional;
*d	motivul specific pentru care	
SK	*a	názov alebo ochranná známka výrobcu, identifikačné číslo podniku a adresa;
	*b	identifikačný kód modelu výrobku;
	*c	ak sa motor považuje za oslobodený od požiadavky na účinnosť podľa článku 2 ods. 2 tohto nariadenia, konkrétny dôvod, prečo sa považuje za oslobodený. a) motory úplne integrované do výrobku (napríklad do prevodovky, čerpadla, ventilátora alebo kompresora), ktorých energetická účinnosť sa nedá skúšať nezávisle od výrobku, aj keď je k dispozícii dočasné ložisko ložiskového štítu a ložisko na strane pohonu; motor musí mať spoločné komponenty (okrem spájajúcich dielov ako sú napr. skrutky) s hnanou jednotkou (napríklad hriadeľ alebo kryt) a nesmie byť konštruovaný tak, aby sa celý motor mohol oddeliť od hnanej jednotky a fungovať nezávisle. Dôsledkom procesu oddelenia musí byť znefunkčnenie motora;
*d	konkrétny dôvod	
SL	*a	naziv proizvajalca ali blagovna znamka, številka vpisa v register gospodarskih družb in naslov;
	*b	identifikacijska oznaka modela izdelka;
	*c	če se šteje, da je motor izzet iz zahtev glede izkoristka v skladu s členom 2(2) te uredbe, poseben razlog, zakaj se šteje kot izzet. a) motorji, ki so v celoti vgrajeni v izdelek (na primer v gonilo, črpalko, ventilator ali kompresor) in katerih energetske učinkovitosti ni mogoče preskusiti ločeno od zadevnega izdelka, tudi če je na voljo začasen ložajski štít in ležaj pogonske strani; motor mora imeti skupne sestavne dele (poleg veznih elementov, kot so vijaki) z gnano enoto (na primer gredjo ali ohišjem) in ne sme biti zasnovan tako, da je motor popolnoma ločljiv od gnane enote in lahko obratuje neodvisno. Postopek ločitve povzroči nedelovanje motorja;
*d	poseben razlog	
FI	*a	valmistajan nimi tai tavaramerkki, kauppakeskinumero ja osoite;
	*b	tuotteen mallitunniste;
	*c	jos katsotaan, että moottori voidaan vapauttaa hyötysuhdevaatimuksesta tämän asetuksen 2 artiklan 2 kohdan mukaisesti, syy vapautukseen. a) tuotteeseen (kuten vaihteistoon, pumppuun, puhaltimeen tai kompressoriin) kokonaisuudessaan rakenteellisesti integroidut moottorit, joiden energiatehokkuutta ei voida testata erillään kyseisestä tuotteesta, ei edes käytettäessä väliaikaista laakerikiilpeä ja käyttöäänä laakeria; moottorilla on oltava käytettävän laitteen kanssa yhteisiä komponentteja (liitoskappaleiden, kuten pulttien, lisäksi) (kuten akseli tai kotelot), eikä moottoria saa suunnitella sellaiseksi, että se voidaan irrottaa kokonaisuudessaan käytettävästä laitteesta ja se voi käydä itsenäisesti. Moottorin on tuluttava irrotettaessa toimintakyvyttömäksi;
*d	syy vapautukseen	
SV	*a	Tillverkarens namn eller varumärke, organisationsnummer och adress.
	*b	Produktens modellbeteckning.
	*c	Om motorn betraktas som undantagen från effektivitetskrav i enlighet med artikel 2.2 i denna förordning; det särskilda skälet till att den betraktas som undantagen. a) Motorer som är fullständigt integrerade i en produkt (t.ex. tillsammans med en utväxling eller i en pump, fläkt eller kompressor) och vars energiprestanda inte kan provas fristående från produkten, även med provisorisk användning av en lagerköld och lager vid den drivande axeländen; motorn ska ha gemensamma komponenter (utöver anslutningsdon som t.ex. bultar) med den enhet som drivs (t.ex. en axel eller ett hölje) och får inte vara konstruerad på ett sådant sätt att motorn i sin helhet kan separeras från den enhet som drivs och därefter fungera självständigt. Separering ska få till följd att motorn blir obrukbar.
*d	särskilda skälet	

This product is designed and intended for use in the residential,
commercial and light-industrial environment.

The product at hand is
based on the following
EU regulations:

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive
2014/30/EU
- Pressure Equipment Directive 2014/68/EU
- Machinery Directive 2006/42/EC

Please be sure to put the contact address/telephone number on
this manual before handing it to the customer.

MITSUBISHI ELECTRIC CORPORATION

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