## **TOSHIBA**

### Model name:

MCY-MUG0401HSW-E MCY-MUG0501HSW-E MCY-MUG0601HSW-E



# **Engineering Data Book**

## **Outdoor units**



Notice: Toshiba is committed to continuously improving its products to ensure the highest quality and reliability standards, and to meet local regulations and market requirements. All features and specifications are subject to change without prior notice.

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### **Precautions for safety**

The manufacturer shall not assume any liability for the damage caused by not observing the description of this manual.

### **↑** WARNING

- Before starting to install the air conditioner, read through the Installation Manual carefully, and follow the instructions to install the air conditioner. Otherwise, falling down of the unit may occur, or the unit may cause noise, vibration or water leakage.
- Only a qualified installer or qualified service person is allowed to do installation work. If installation is carried out by an
  unqualified individual, a fire, electric shocks, injury, water leakage, noise and/or vibration may result.
   If using separately sold products, make sure to use Toshiba specified products only. Using unspecified products may cause
  fire, electric shock, water leak or other failure.
- Do not use any refrigerant different from the one specified for complement or replacement.
   Otherwise, abnormally high pressure may be generated in the refrigeration cycle, which may result in a failure or explosion of the product or an injury to your body.
- Before opening the service panel of the outdoor unit, set the circuit breaker to the OFF position. Failure to set the circuit
  breaker to the OFF position may result in electric shocks through contact with the interior parts. Only a qualified installer or
  qualified service person is allowed to remove the service panel of the outdoor unit and do the work required.
- Before carrying out the installation, maintenance, repair or removal work, be sure to set the circuit breakers for both the indoor and outdoor units to the OFF position. Otherwise, electric shock may result.
- Place a "Work in progress" sign near the circuit breaker while the installation, maintenance, repair or removal work is being carried out. There is a danger of electric shocks if the circuit breaker is set to ON by mistake.
- Only a qualified installer or qualified service person is allowed to undertake work at heights using a stand of 50 cm or more or to remove the intake grille of the indoor unit to undertake work.
- · Wear protective gloves and safety work clothing during installation, servicing and removal.
- Do not touch the aluminium fin of the outdoor unit. You may injure yourself if you do so. If the fin must be touched for some reason, first put on protective gloves and safety work clothing, and then proceed.
- Do not climb onto or place objects on top of the outdoor unit. You may fall or the objects may fall off of the outdoor unit and result in injury.
- When working at height, put a sign in place so that no-one will approach the work location before proceeding with the work. Parts or other objects may fall from above, possibly injuring a person below. Also, be sure that workers put on helmets.
- When cleaning the filter or other parts of the outdoor unit, set the circuit breaker to OFF without fail, and place a "Work in progress" sign near the circuit breaker before proceeding with the work.
- The refrigerant used by this air conditioner is the R32.
- You shall ensure that the air conditioner is transported in stable condition. If you find any part of the product broken, contact your dealer.
- Do not disassemble, modify or move the product yourself. Doing so may cause fire, electric shock, injury or water leaks.
- This appliance is intended to be used by expert or trained users in shops, in light industry, or for commercial use by lay
  persons.
- · We do not take any responsibility on the local design.

### Selection of installation location

- Due to the use of the mildly flammable refrigerant R32, there are safety and legal installation conditions for installing equipment such as indoor units, outdoor units, and Shut-off Valve units. Install each unit according to the section "Installation of R32 Refrigerant Model".
- Do not install in a location where flammable gas may leaks are possible. If the gas should leak and accumulate around the unit, it may ignite and cause a fire.
- · When transporting the air conditioner, wear shoes with protective toe caps, protective gloves and other protective clothing.
- When transporting the air conditioner, do not take hold of the bands around the packing carton. You may injure yourself if the bands should break.
- Install the indoor unit at least 2.5 m above the floor level since otherwise the users may injure themselves or receive electric shocks if they poke their fingers or other objects into the indoor unit while the air conditioner is running.
- Do not place any combustion appliance in a place where it is directly exposed to the wind of air conditioner, otherwise it may cause imperfect combustion.
- Do not install outdoor units where the operation sound may cause a disturbance. (Especially at the boundary line with a neighbour, install the air conditioner while considering the noise.)

### Installation

- Follow the instructions in the Installation Manual to install the air conditioner. Failure to follow these instructions may cause the product to fall down or topple over or give rise to noise, vibration, water leakage or other failure.
- The designated bolts (M10) and nuts (M10) for securing the outdoor unit must be used when installing the unit.
- Install the outdoor unit property in a location that is durable enough to support the weight of the outdoor unit. Insufficient durability may cause the outdoor unit to fall, which may result in injury.
- Install the unit in the prescribed manner for protection against strong wind and earthquake. Incorrect installation may result in the unit falling down, or other accidents.
- · Be sure to fix the screws back which have been removed for installation or other purposes.

### Refrigerant piping

- Install the refrigerant pipe securely during the installation work before operating the air conditioner. If the compressor is
  operated with the valve open and without refrigerant pipe, the compressor sucks air and the refrigeration cycles is over
  pressurized, which may cause a injury.
- Tighten the flare nut with a torque wrench in the specified manner. Excessive tighten of the flare nut may cause a crack in the flare nut after a long period, which may result in refrigerant leakage.
- Ventilate the air if the refrigerant gas leaks during installation. If the leaked refrigerant gas comes into contact with fire, toxic gas may be produced.
- After the installation work, confirm that refrigerant gas does not leak. If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, it may ignite the R32 refrigerant and so noxious gas may be generated.
   For prevention, Install according to the section "Installation of R32 refrigerant model".
- When the air conditioner has been installed or relocated, follow the instructions in the Installation Manual and purge the air completely so that no gases other than the refrigerant will be mixed in the refrigerating cycle. Failure to purge the air completely may cause the air conditioner to malfunction.
- · Nitrogen gas must be used for the airtight test.
- · The charge hose must be connected in such a way that it is not slack.
- If refrigerant gas leaked during the installation work, ventilate the room immediately. If the leaked refrigerant gas comes in contact with fire, it may ignite the R32 refrigerant and so noxious gas may be generated. For prevention, install according to the section "Precautions of equipment using R32 refrigerant".



### **Electrical wiring**

- Only a qualified installer or quailed service person is allowed to carry out the electrical work of the air conditioner.
   Under no circumstances must this work be done by an unqualified individual since failure to carry out the work properly may result in electric shocks and/or electrical leaks.
- When connecting the electrical wires, repairing the electrical parts or undertaking other electrical jobs, wear gloves to provide
  protection for electricians and from heat, insulating shoes and clothing to provide protection from electric shocks. Failure to
  wear this protective gear may result in electric shocks.
- When executing address setting, test run, or troubleshooting through the checking window on the electrical control box, put on insulated heat-proof gloves, insulated shoes and other clothing to provide protection from electric shock. Otherwise you may receive an electric shock. Use wiring that meets the specifications in the Installation Manual and the stipulations in the local regulations and laws.
- · Use of wiring which does not meet the specifications may give rise to electric shocks, electrical leakage, smoking and/or a fire.
- · Check that the product is properly earthed. (grounding work) Incomplete earthing may cause electric shock.
- Do not connect the earth line to a gas pipe, water pipe, lightning conductor, or a telephone earth line.
- · After completing the repair or relocation work, check that the ground wires are connected properly.
- Install a circuit breaker that meets the specifications in the installation manual and the stipulations in the local regulations and laws.
- · Install the circuit breaker where it can be easily accessed by the agent.
- · When installing the circuit breaker outdoors, install one which is designed to be used outdoors.
- Under no circumstances must the power cable be extended. Connection trouble in the places where the cable is extended
  may give rise to smoking and/or a fire.
- Electrical wiring work shall be conducted according to law and regulation in the community and installation manual. Failure to do so may result in electrocution or short circuit.
- Do not supply power from the power terminal block equipped on the outdoor unit to another outdoor unit. Capacity overflow may occur on the terminal block and may result in fire.
- When carrying out electric connection, use the wire specified in the Installation Manual and connect and fix the wires securely to prevent them applying external force to the terminals. Improper connection or fixing may result in fire.

## **↑** CAUTION

### This air conditioner adopts the HFC refrigerant (R32) which does not destroy the ozone layer.

- R32 refrigerant has a high working pressure and is apt to be affected by impurities such as water, oxidizing membrane, and
  oils. Therefore, during installation work, be careful that water, dust, previous refrigerant, refrigerating machine oil, or other
  substances do not enter the R32 refrigeration cycle.
- Special tools for R32 or R410A refrigerant are required for installation.
- · For connecting pipes, use new and clean piping materials, and make sure that water and/or dust does not enter.

### To Disconnect the Appliance from Main Power Supply.

• This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

### Do not wash air conditioners with pressure washers.

· Electric leaks may cause electric shocks or fires.

Since the mildly flammable refrigerant R32 is used, for the installation conditions and safety precautions for indoor units, outdoor units, Shut-off Valve units, etc., refer to the following "Precautions for using R32 refrigerant" and do the installation works.



### Precautions for using R32 refrigerant

Make sure installation, servicing, maintenance and repair comply with instructions from TOSHIBA and with applicable legislation (for example, national gas regulation) and are executed only by authorised people.

These safety cautions describe important matters concerning safety to prevent injury to users or other people and damages to property. Please read Safety caution after understanding the contents below (meanings of indications), and be sure to follow the description;

### Meanings of symbols displayed on the unit

i	Further informatike.	tion is available in the OWNER'S MANUAL, INSTALLATION MANUAL, and the								
		ervice personnel are required to carefully read the OWNER'S MANUAL and INSTALLATION IANUAL before operation.								
	Read the OWN	lead the OWNER'S MANUAL carefully before operation.								
	WARNING (Risk of fire)	This mark is for R32 refrigerant only. In case that refrigerant type is R32, this unit uses a flammable refrigerant. If refrigerant leaks and comes in contact with fire or heating part, it will create harmful gas and there is risk of fire.								

### **↑** WARNING

- Models that use refrigerant R32 and R410A have a different charging port thread diameter to prevent erroneous charging with refrigerant R22 and for safety.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacture.
- The appliance 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 odor.
- The manufacturer may provide other suitable examples or may provide addition information about the refrigerant odor.

## **⚠** CAUTION

When a flammable refrigerant is used, all appearance shall be charged with refrigerant location or charged on site as recommended by the manufacturer.

A part of an appliance that is charged on site, which required brazing or welding in the installation shall not be shipped with a flammable refrigerant charge. Joints made in the installation between parts of the refrigerating system, with at least one part charged, shall be made in accordance with the following.

- A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts. A vacuum valve shall be provided to evacuate the interconnecting pipe and/or any uncharged refrigerating system part.
- Refrigerant tubing shall be protected or enclosed to avoid damage. Flexible refrigerant connectors (such as connecting lines between the indoor and outdoor unit) that may be displaced during normal operations shall be protected against mechanical damage.

- Piping shall be protected from damage during installation, operation and maintenance.
- · When installing piping in the occupied space, protect the piping from accidental damage.
- · Check the piping as described in [Refrigerant piping] [Airtightness test] in the installation manual.
- · Wherever possible, protection, piping and fixtures shall be protected against the environment and weather resistance.
- · You must prepare for long-term expansion and contraction of piping.
- Indoor equipment and plumbing must be safely installed and protected from accidental rupture of equipment or plumbing from
  events such as furniture movements or home renovations.

### General (Installation space / area)

- The installation of pipe-work shall be kept to a minimum.
- · Pipe-work shall be protected from physical damage.
- · The compliance with national gas regulations shall be observed.
- The mechanical connections shall be accessible for maintenance purposes.
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.
- When disposing of the product is used, be based on national regulations with properly processed. The servicing shall be
  performed only as recommended by the manufacturer.
- · Where the appliance using flammable refrigerants is installed, Be aware that;
  - The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
  - The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater).
  - The appliance shall be stored so as to prevent mechanical damage from occurring.
- Equipment piping in the occupied space shall be installed in such a way to protect against accidental damage in operation and service.
- · Precautions shall be taken to avoid excessive vibration or pulsation to refrigerating piping.
- Protection devices, piping and fittings shall be protected as far as possible against adverse environmental effects, for example, the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris.
- · Provision shall be made for expansion and contraction of long runs of piping.
- Piping in refrigerating systems shall be so designed and installed to minimize the likelihood hydraulic shock damaging the system.
- Solenoid valves shall be correctly positioned in the piping to avoid hydraulic shock.
- · Install the system according to this IM and avoid the likelihood hydraulic shock damaging the system.
- Solenoid valves shall not block in liquid refrigerant unless adequate relief is provided to the refrigerant system low pressure side
- · Install the system according to this IM so that it does not shut off in the liquid refrigerant.
- Steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation.
- Flexible pipe elements shall be protected against mechanical damage, excessive stress by torsion, or other forces. They should be checked for mechanical damage annually.
- The indoor equipment and pipes shall be securely mounted and guarded such that accidental rupture of equipment cannot occur from such events as moving furniture or reconstruction activities.
- Where safety shut off valves are specified, the minimum room area may be determined based on the maximum amount of refrigerant that can be leaked as determined in installation Manual.



- Where safety shut off valves are specified, the location of the valve in the refrigerating system relative to the occupied spaces shall be as described Installation Manual.
- When installing the system that uses flammable refrigerant in a non-ventilated space, it shall be installed in the large space or with safety equipments as designated below, so as to prevent the refrigerant from staying and causing a fire or explosion by the refrigerant leak.
- The total refrigerant charge in the system cannot exceed the requirements for minimum floor area of the smallest room that is served. For minimum floor area requirements for indoor units, see the Installation and Owner's Manual of the outdoor unit.
- When connecting to an outdoor unit of the R32 refrigerant and using a leak detector, always turn on the power of the indoor unit after installation except during service in order to detect refrigerant leakage and take safety measures.
- · Precautions shall be taken to avoid excessive vibration or pulsation to refrigerating piping.
- Only mechanical fittings can be used. (Example: Brazing + flame connection)
- Refrigerating systems shall use only permanent joints indoors except for site-made joints directly connecting the indoor unit to the refrigerant piping, or factory made mechanical joints in compliance with ISO 14903.

#### Unventilated area

· The appliance shall be stored so as to prevent mechanical damage from occurring.

### Information on servicing

#### 1. Check to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that risk of
ignition is minimized. For repair to the refrigerating system, the precautions in item 2 to 6 shall be complied with prior to
conducting work on the system.

### 2. Work procedure

- Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapour being present while the work is being performed.
- When connecting to an outdoor unit of R32 refrigerant and using a leak detector, the fan may automatically operate even if the air conditioner is stopped when a refrigerant leak is detected. Be careful not to get injured by the fan.
- All installers and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

### 3. General work area

- · All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.
- · Work in confined spaces shall be avoided.
- · The area around the workspace shall be sectioned off.
- Ensure that the conditions within the area have been made safe by control of flammable material.
- Only equipment approved by the manufacturer shall be used for duct work.

### 4. Checking for presence of refrigerant

- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non sparking, adequately sealed or intrinsically safe.

### 5. Presence of fire extinguisher

- If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing
  equipment shall be available on hand.
- · Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

### 6. No ignition sources

- No person carrying out work in relation to a refrigeration system which involves exposing any pipe work shall use any sources
  of ignition in such a manner that it may lead to the risk of fire or explosion.
- All possible ignition sources including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space.
- Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.
- · Make sure that the exhaust port of the vacuum pump is not close to the ignition source and that ventilation is possible.

#### 7. Ventilated area

- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.
- · A degree of ventilation shall continue during the period that the work is carried out.
- The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

### 8. Checks to the refrigeration equipment

- Where electrical components are being changed, installer shall be fit for the purpose and to the correct specification.
- At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.
- The following checks shall be applied to installations using flammable refrigerants.
  - The charge size is in accordance with the room size within which the refrigerant containing parts are installed.
  - The ventilation machinery and outlets are operating adequately and are not obstructed.
  - If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
  - Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
  - Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance
    which may corrode refrigerant containing components, unless the components are constructed of materials which are
    inherently resistant to being corroded or are suitably protected against being so corroded.

### 9. Checks to electrical devices

- · Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures.
- If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily
  dealt with.
- If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.
- · Initial safety checks shall include:
  - That capacitors are discharged to avoid possibility of sparking.
  - That there no live electrical components and wiring are exposed while charging, recovering or purging the system.
  - That there is continuity of earth bonding.

### 10. Repairs to sealed components

- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc.
- If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
- · Ensure that apparatus is mounted securely.
- Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
- · Replacement parts shall be in accordance with the manufacturer's specifications.

### NOTE

The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

### 11. Repair to intrinsically safe components

- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.
- Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere.
- The test apparatus shall be at the correct rating.
- Replace components only with parts specified by the manufacturer.
- Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

### 12. Cabling

- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.
- · Check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

### 13. Detection of flammable refrigerants

- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks.
- A halide torch (or any other detector using a naked flame) shall not be used.
- Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- · Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25% maximum) is confirmed.
- Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode containing chlorine.
- If a leak is suspected, all naked flames shall be removed/extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

### 14. Leak detection methods

- Electronic leak detectors shall be used to detect flammable refrigerants leak, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25% maximum) is confirmed.
- Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipework.
- If a leak is suspected, all naked flames shall be removed / extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.
- · Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

#### 15. Removal and evacuation

- When breaking into the refrigerant circuit to make repairs or for any other purpose, Conventional procedures shall be used.
   However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:
  - remove refrigerant;
  - purge the circuit with inert gas;
  - evacuate;
  - purge again with inert gas;
  - open the circuit by cutting or brazing.
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- The system shall be "Flushed" with OFN to render the unit safe.
- This process may need to be repeated several times.
- Compressed air or oxygen shall not be used for purging refrigerant systems.
- Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system.
- When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- This operation is absolutely vital if brazing operations on the pipe work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any ignition sources and that ventilation available.

### 16. Charging procedures

- · In addition to conventional charging procedures, the following requirements shall be followed.
  - Ensure that contamination of different refrigerants does not occur when using charging equipment.
  - Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
  - Cylinders shall be kept upright.
  - Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
  - Label the system when charging is complete (if not already).
  - Extreme care shall be taken not to overfill the refrigeration system.
- · Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas.
- · The system shall be leak tested on completion of charging but prior to commissioning.
- A follow up leak test shall be carried out prior to leaving the site.

### 17. Decommissioning

- Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its
  details.
- It is recommended good practice that all refrigerants are recovered safely.
- Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required to reuse of reclaimed refrigerant.
- · It is essential that electrical power is available before the task is commenced.
  - a) Become familiar with the equipment and its operation.
  - b) Isolate system electrically.
  - c) Before attempting the procedure ensure that:
    - Mechanical handling equipment is available, if required, for handling refrigerant cylinders:
    - All personal protective equipment is available and being used correctly;
    - The recovery process is supervised at all times by a competent person:
    - Recovery equipment and cylinders conform to the appropriate standards.
  - d) Pump down refrigerant system, if possible.
  - e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
  - f) Make sure that cylinder is situated on the scales before recover takes place.
  - g) Start the recovery machine and operate in accordance with manufacturer's instructions.
  - h) Do not overfill cylinders. (No more than 80% volume liquid charge.)
  - i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
  - j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
  - k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

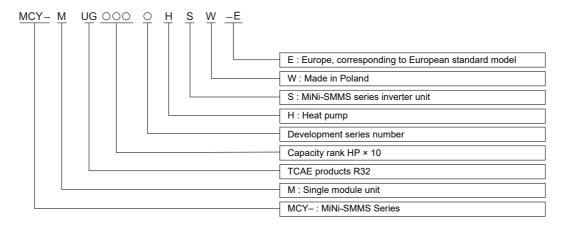
#### 18. Labelling

- Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant.
- The label shall be dated and signed.
- Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

### 19. Recovery

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all
  refrigerants are removed safely.
- · When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.
- Ensure that the correct number of cylinders for holding the total system charge are available.
- All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).
- Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order.
- · Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriated refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order.
- · Hoses shall be complete with leak-free disconnect couplings and in good condition.
- Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release.
- · Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged.
- Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant.
- The evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- · When oil is drained from a system, it shall be carried out safely.
- Do not use the unit until it is confirmed that the portion from which the refrigerant leaked is repaired.
- When installing, relocating, or servicing the air conditioner, use only the specified refrigerant (R32) to charge the refrigerant lines. Do not mix it with any other refrigerant and do not allow air to remain in the lines.

### 1-1. Allocation standard of model name



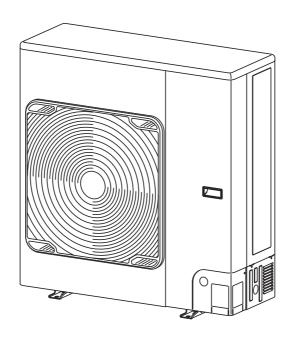
## 1-2. Summary of system equipments

### 1-2-1. Outdoor units

Corresponding HP	Inverter unit								
Corresponding HF	4HP	5HP	6HP						
Model name	MCY-MUG0401HSW-E	MCY-MUG0501HSW-E	MCY-MUG0601HSW-E						
Cooling capacity (kW)*1	12.1	14.0	15.5						
Heating capacity (kW)*1	12.1	14.0	15.5						
No. of connectable indoor units	8	10	13						

\*1 Rated conditions

Cooling : Indoor air temperature 27 °C DB / 19 °C WB. Outdoor air temperature 35 °C DB. Heating : Indoor air temperature 20 °C DB. Outdoor air temperature 7 °C DB / 6 °C WB.



## 1-2-2. Indoor units

FCU Type	Appearance	Model Name	Capacity rank	Capacity Code	Cooling Capacity(kW)	Heating Capacity(kW)	PMV Kit
		MMU-UP0091H-E	009 type	1.00	2.8	3.2	Available
		MMU-UP0121H-E	012 type	1.25	3.6	4.0	Available
		MMU-UP0151H-E	015 type	1.70	4.5	5.0	Available
		MMU-UP0181H-E	018 type	2.00	5.6	6.3	Available
Smart 4-Way Air		MMU-UP0241H-E	024 type	2.50	7.1	8.0	Available
Discharge Cassette Type		MMU-UP0271H-E	027 type	3.00	8.0	9.0	Available
		MMU-UP0301H-E	030 type	3.20	9.0	10.0	Available
		MMU-UP0361H-E	036 type	4.00	11.2	12.5	-
		MMU-UP0481H-E	048 type	5.00	14.0	16.0	-
		MMU-UP0561H-E	056 type	6.00	16.0	18.0	-
		MMU-UP0091HP-E	009 type	1.00	2.8	3.2	Available
		MMU-UP0121HP-E	012 type	1.25	3.6	4.0	Available
		MMU-UP0151HP-E	015 type	1.70	4.5	5.0	Available
		MMU-UP0181HP-E	018 type	2.00	5.6	6.3	Available
4-Way Air Discharge		MMU-UP0241HP-E	024 type	2.50	7.1	8.0	Available
Cassette Type		MMU-UP0271HP-E	027 type	3.00	8.0	9.0	Available
		MMU-UP0301HP-E	030 type	3.20	9.0	10.0	Available
		MMU-UP0361HP-E	036 type	4.00	11.2	12.5	-
		MMU-UP0481HP-E	048 type	5.00	14.0	16.0	-
		MMU-UP0561HP-E	056 type	6.00	16.0	18.0	-
		MMU-UP0051MH-E	005 type	0.60	1.7	1.9	Available
		MMU-UP0071MH-E	007 type	0.80	2.2	2.5	Available
Compact 4-way	13	MMU-UP0091MH-E	009 type	1.00	2.8	3.2	Available
Cassette Type		MMU-UP0121MH-E	012 type	1.25	3.6	4.0	Available
		MMU-UP0151MH-E	015 type	1.70	4.5	5.0	Available
		MMU-UP0181MH-E	018 type	2.00	5.6	6.3	Available
		MMU-UP0071WH-E	007 type	0.80	2.2	2.5	Available
		MMU-UP0091WH-E	009 type	1.00	2.8	3.2	Available
		MMU-UP0121WH-E	012 type	1.25	3.6	4.0	Available
		MMU-UP0151WH-E	015 type	1.70	4.5	5.0	Available
		MMU-UP0181WH-E	018 type	2.00	5.6	6.3	Available
2-Way Air Discharge Cassette Type		MMU-UP0241WH-E	024 type	2.50	7.1	8.0	Available
,		MMU-UP0271WH-E	027 type	3.00	8.0	9.0	Available
		MMU-UP0301WH-E	030 type	3.20	9.0	10.0	Available
		MMU-UP0361WH-E	036 type	4.00	11.2	12.5	-
		MMU-UP0481WH-E	048 type	5.00	14.0	16.0	-
		MMU-UP0561WH-E	056 type	6.00	16.0	18.0	-
		MMU-UP0031YHP-E	003 type	0.30	0.9	1.3	Available
		MMU-UP0051YHP-E	005 type	0.60	1.7	1.9	Available
		MMU-UP0071YHP-E	007 type	0.80	2.2	2.5	Available
		MMU-UP0091YHP-E	009 type	1.00	2.8	3.2	Available
		MMU-UP0121YHP-E	012 type	1.25	3.6	4.0	Available
1-Way Air Discharge		MMU-UP0151YHP-E	015 type	1.70	4.5	5.0	Available
Cassette Type		MMU-UP0181YHP-E	018 type	2.00	5.6	6.3	Available
		MMU-UP0241YHP-E	024 type	2.50	7.1	8.0	Available
		MMU-UP0271YHP-E	027 type	3.00	8.0	9.0	Available
		MMU-UP0151SH-E	015 type	1.70	4.5	5.0	Available
		MMU-UP0181SH-E	018 type	2.00	5.6	6.3	Available
		MMU-UP0241SH-E	024 type	2.50	7.1	8.0	Available

## 1 System overview

FCU Type	Appearance	Model Name	Capacity rank	Capacity Code	Cooling Capacity(kW)	Heating Capacity(kW)	PMV Kit
		MMD-UP0051BHP-E	005 type	0.60	1.7	1.9	Available
		MMD-UP0071BHP-E	007 type	0.80	2.2	2.5	Available
		MMD-UP0091BHP-E	009 type	1.00	2.8	3.2	Available
		MMD-UP0121BHP-E	012 type	1.25	3.6	4.0	Available
	40%	MMD-UP0151BHP-E	015 type	1.70	4.5	5.0	Available
Conceeled Dust Time		MMD-UP0181BHP-E	018 type	2.00	5.6	6.3	Available
Concealed Duct Type		MMD-UP0241BHP-E	024 type	2.50	7.1	8.0	Available
		MMD-UP0271BHP-E	027 type	3.00	8.0	9.0	Available
		MMD-UP0301BHP-E	030 type	3.20	9.0	10.0	Available
		MMD-UP0361BHP-E	036 type	4.00	11.2	12.5	-
		MMD-UP0481BHP-E	048 type	5.00	14.0	16.0	_
		MMD-UP0561BHP-E	056 type	6.00	16.0	18.0	-
		MMD-UP0051SPHY-E	005 type	0.60	1.7	1.9	Available
		MMD-UP0071SPHY-E	007 type	0.80	2.2	2.5	Available
		MMD-UP0091SPHY-E	009 type	1.00	2.8	3.2	Available
		MMD-UP0121SPHY-E	012 type	1.25	3.6	4.0	Available
Slim Duct Type		MMD-UP0151SPHY-E	015 type	1.70	4.5	5.0	Available
		MMD-UP0181SPHY-E	018 type	2.00	5.6	6.3	Available
		MMD-UP0241SPHY-E	024 type	2.50	7.1	8.0	Available
		MMD-UP0271SPHY-E	027 type	3.00	8.0	9.0	Available
		MMD-UP0181HP-E	018 type	2.00	5.6	6.3	Available
		MMD-UP0241HP-E	024 type	2.50	7.1	8.0	Available
Concealed Duct High		MMD-UP0271HP-E	027 type	3.00	8.0	9.0	Available
Static Pressure Type		MMD-UP0361HP-E	036 type	4.00	11.2	12.5	_
		MMD-UP0481HP-E	048 type	5.00	14.0	16.0	_
		MMD-UP0561HP-E	056 type	6.00	16.0	18.0	_
		MMC-UP0151HP-E	015 type	1.70	4.5	5.0	Available
		MMC-UP0181HP-E	018 type	2.00	5.6	6.3	Available
		MMC-UP0241HP-E	024 type	2.50	7.1	8.0	Available
Ceiling Type		MMC-UP0271HP-E	027 type	3.00	8.0	9.0	Available
0 71		MMC-UP0361HP-E	036 type	4.00	11.2	12.5	_
		MMC-UP0481HP-E	048 type	5.00	14.0	16.0	_
		MMC-UP0561HP-E	056 type	6.00	16.0	18.0	_
		MMK-UP0031HP-E	003 type	0.30	0.9	1.3	Available
		MMK-UP0051HP-E	005 type	0.60	1.7	1.9	Available
		MMK-UP0071HP-E	007 type	0.80	2.2	2.5	Available
		MMK-UP0091HP-E	009 type	1.00	2.8	3.2	Available
		MMK-UP0121HP-E	012 type	1.25	3.6	4.0	Available
High-wall Type		MMK-UP0151HP-E	015 type	1.70	4.5	5.0	Available
, ,, <sub>F</sub> -		MMK-UP0181HP-E	018 type	2.00	5.6	6.3	Available
		MMK-UP0241HP-E	024 type	2.50	7.1	8.0	Available
		MMK-UP0271HP-E	027 type	3.00	8.0	9.0	Available
		MMK-UP0301HP-E	030 type	3.20	9.0	10.0	Available
		MMK-UP0361HP-E	036 type	4.00	11.2	12.5	_
		MMK-UP0031HPL-E	000 type	0.30	0.9	1.3	Available
		MMK-UP0051HPL-E	005 type	0.60	1.7	1.9	Available
		MMK-UP0071HPL-E	003 type 007 type	0.80	2.2	2.5	Available
1646 47	and the same of th	MMK-UP0091HPL-E	007 type 009 type	1.00	2.8	3.2	Available
High-wall Type (without PMV)		MMK-UP0121HPL-E	009 type 012 type	1.25	3.6	4.0	Available
,		MMK-UP0151HPL-E	012 type 015 type	1.70	4.5	5.0	Available
		MMK-UP0181HPL-E		2.00	5.6	6.3	Available
			018 type				
		MMK-UP0241HPL-E	024 type	2.50	7.1	8.0	Available

## 1-2-3. Branching joints and headers

Name	Model name	Appearance	Remarks
Y-shape branching joint	RBM-BY55E	449	
4-branching header	RBM-HY1043E	HERR	
8-branching header	RBM-HY1083E	EFE	

### 1-2-4. PMV Kits

Name	Model name	Appearance	Remarks
PMV Kits	RBM-PMV0361U-E	Towns 1995 State	
	RBM-PMV0901U-E	Marianes.	

### 1-2-5. Remote controllers

Name	Model Name	Remarks
	RBC-AMSU**-ES	-EN : English, Italian, Polish, Greece, Russian, Turkish
Wired remote controller	RBC-AMSU**-EN	-ES : English, Spanish, Portuguese, French, Dutch, German
	RBC-AMTU**-E	
	RBC-ASCU**-E	
	RBC-AXU**U-E	For 4-way Air Discharge Cassette (HP)
	RBC-AXU**UM-E	For Compact 4-way Cassette
Wireless remote controller kit	RBC-AXU**UW-E	For 2-way Air Discharge Cassette
Wireless remote controller kit	RBC-AXU**C-E	For Ceiling, 1-way Air Discharge Cassette (SH)
	RBC-AX33UYP-E	For 1-way Air Discharge Cassette (YHP 1.7-3.0HP)
	TCB-AXU31-E	For Other unit
64 Central remote controller	TCB-SC640U-E	

## 1-2-6. Optional PCB of outdoor unit

Name	Model Name	Remarks
Power peak-cut control board	TCB-PCDM4E	
External master ON/OFF control board	TCB-PCMO4E	
Output control board	TCB-PCIN4E	

## 1 System overview

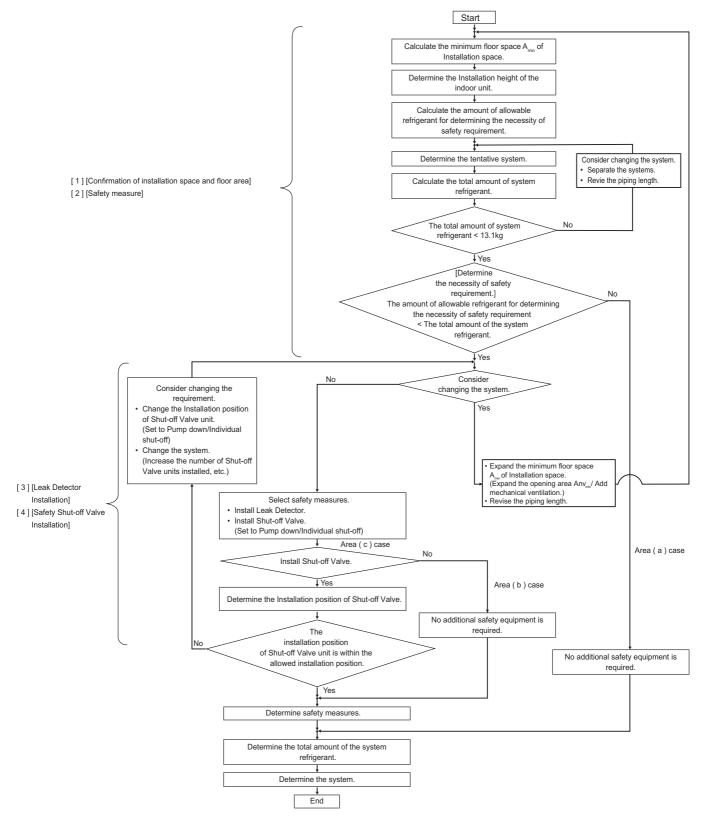
### 1-2-7. Controls

Name	Model Name	Remarks
Touch Screen Controller	BMS-CT5121E	
Touch Screen Controller	BMS-CT2560U-E	
Smart manager	BMS-SM1280HTLE	
Smart manager with data analyzer	BMS-SM1281ETLE	
Energy Monitoring Relay Interface	BMS-IFWH5E	
Digital I/O Relay Interface	BMS-IFDD03E	
LonWorks LN Interface	TCB-IFLN642TLE	
Modbus Interface	BMS-IFMB1280U-E	
Analog Interface	TCB-IFCB640TLE	
BN Interface	BMS-IFBN640U-E	

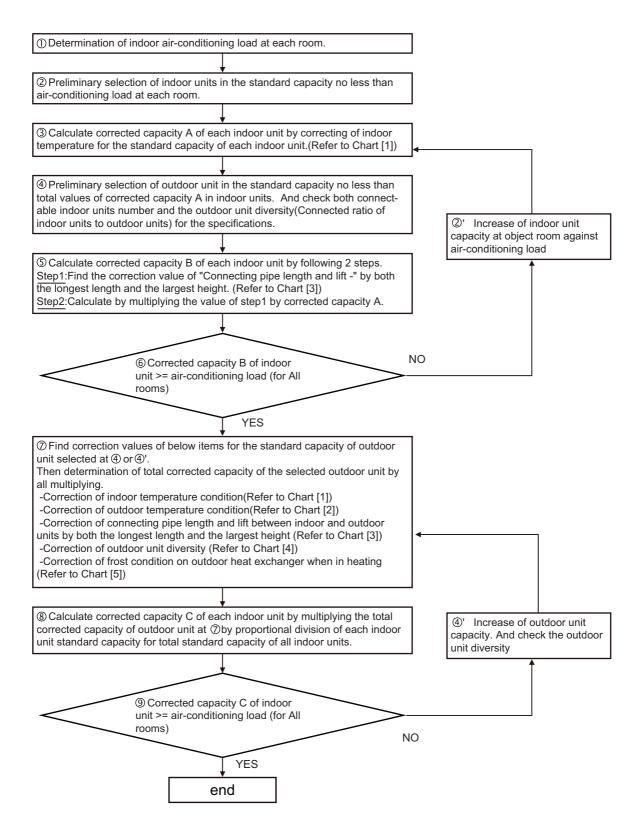
## 1-2-8. Safety equipments

Name	Model Name	Remarks					
	RBM-SV1121HUPE	SV unit type	Maximum number of connectable indoor units				
SV unit (Shut-off Valve unit)		1121 type	6				
	RBM-SV1801HUPE	1801 type	10				
Leak Detector	TCB-LD1UPE						
Battery kit	TCB-BT1UPE						

## 2-1. Selection flow of safety equipments



### 2-2. Selection flow chart



### 2-3. Combination conditions for indoor unit and outdoor unit

Indoor unit can connect 80 % to 130 % of Outdoor unit capacity.

### 2-3-1. For indoor unit, the capacity code is decided for each capacity rank.

Ī	Capacity	rank type	003	005	007	009	010	012	014	015	017	018	020	024	027	030	036	048	056
Ī	Capacity code	<b>Equivalent to HP</b>	0.3	0.6	0.8	1.0	1.1	1.3	1.5	1.7	1.85	2.0	2.25	2.5	3.0	3.2	4.0	5.0	6.0

### NOTE:

Capacity rank: Correspondence to Btu/h. Capacity code: Correspondence to Horsepower.

## 2-3-2. For outdoor unit, maximum No. of connectable indoor units and total capacity code of indoor units are decided.

Outdoor unit	Capacity code of outdoor unit	No. of connectable indoor units	Total capacity code of indoor units		
MCY-MUG0401HSW-E	4	2 to 8	3.2 to 5.2		
MCY-MUG0501HSW-E	5	2 to 10	4.0 to 6.5		
MCY-MUG0601HSW-E	6	2 to 13	4.8 to 7.8		

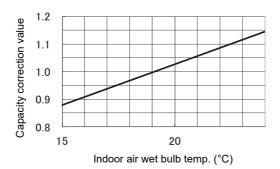
<sup>\*</sup>When only 003 type (0.3HP) indoor units are connected, refer to the table below.

Outdoor unit	Outdoor unit Capacity code of outdoor unit		Total capacity code of indoor units		
MCY-MUG0401HSW-E	4	4 to 8	1.2 to 2.4		
MCY-MUG0501HSW-E	5	4 to 10	1.2 to 3.0		
MCY-MUG0601HSW-E	6	4 to 13	1.2 to 3.9		

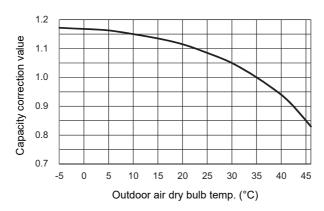
## Cooling / heating capacity characteristics

## 2-4-1. Correction charts for cooling capacity calculation

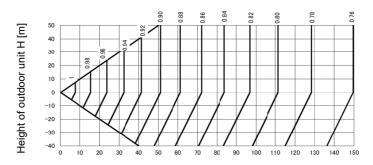
### [1] Capacity correction value vs. indoor air wet bulb temperature



### [2] Capacity correction value vs. outdoor air dry bulb temperature

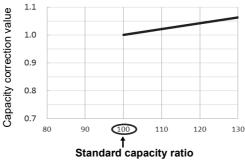


### [3] Capacity correction value vs. connecting pipe length and lift difference between indoor and outdoor units



Pipe length (Equivalent length) L [m]

### [4]\* Correction of outdoor unit diversity

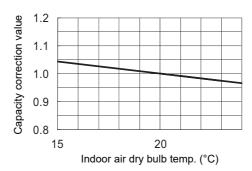


Indoor units total capacity ratio (%)

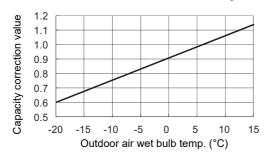
<sup>\*:</sup> Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

### 2-4-2. Correction charts for heating capacity calculation

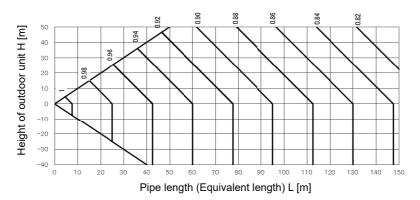
### [1] Capacity correction value vs. indoor air dry bulb temperature



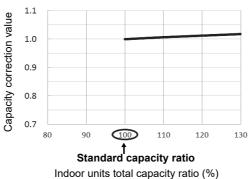
### [2] Capacity correction value vs. outdoor air wet bulb temperature



## [3] Capacity correction value vs. connecting pipe length and lift difference between indoor and outdoor units



### [4]\* Correction of outdoor unit diversity



Indoor units total capacity ratio (%

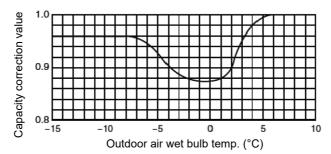
<sup>\*:</sup> Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

### 2-4-3. Capacity correction in case of frost on the outdoor heat exchanger in heating

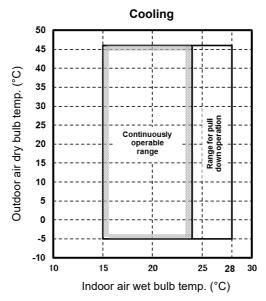
Correct the heating capacity when frost was found on the outdoor heat exchanger.

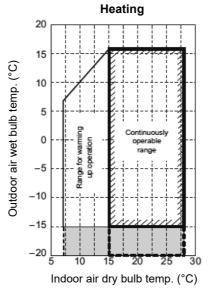
Heating capacity = Capacity after correction of outdoor unit x Correction value of capacity resulted from frost (Capacity after correction of outdoor unit: Heating capacity calculated in the above item 2.)

### [5] capacity correction in case of frost on the outdoor heat exchanger



## 2-5. Operational temperature range





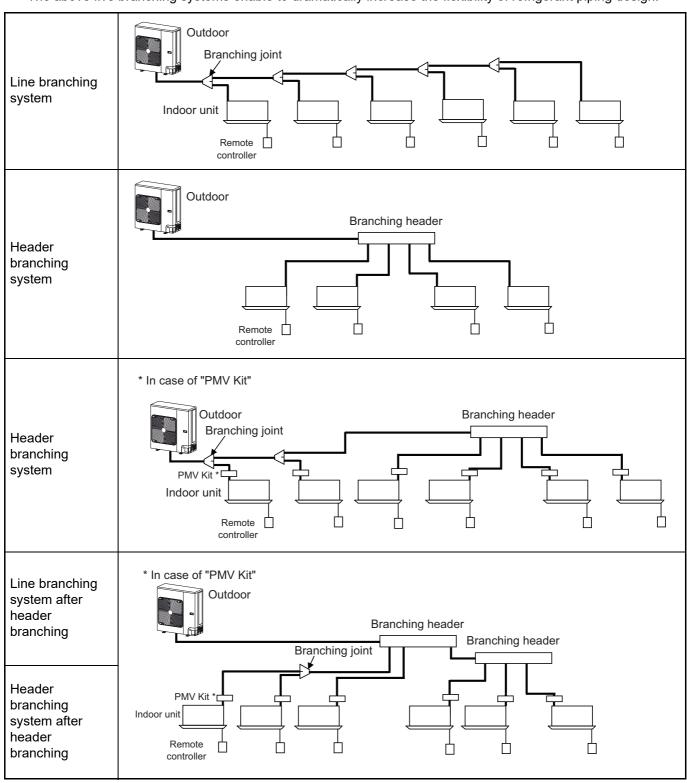
The unit will operate down to an outdoor temperature of -20 °C, however considerable performance decrease will be expected below -15 °C. Therefore please consider installation location/surroundings and system design when expected to operate between -15 °C and -20 °C.

## Refrigerant piping design

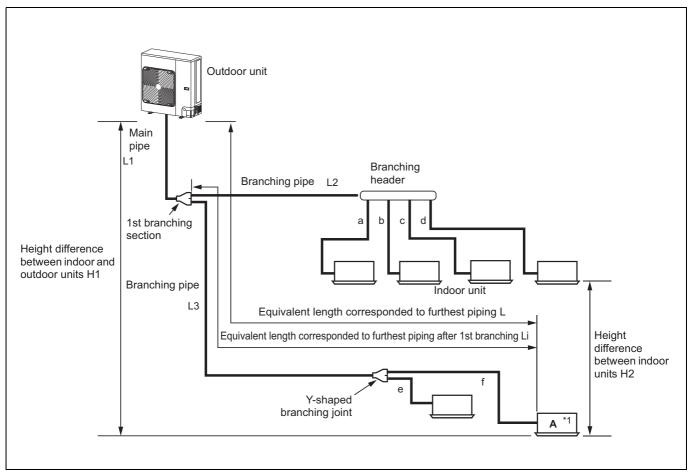
## 3-1. Free branching system

- [1] Line branching system
- [2] Header branching system
- [3] Header branching system after line branching
- [4] Line branching system after header branching
- [5] Header branching system after header branching

The above five branching systems enable to dramatically increase the flexibility of refrigerant piping design.



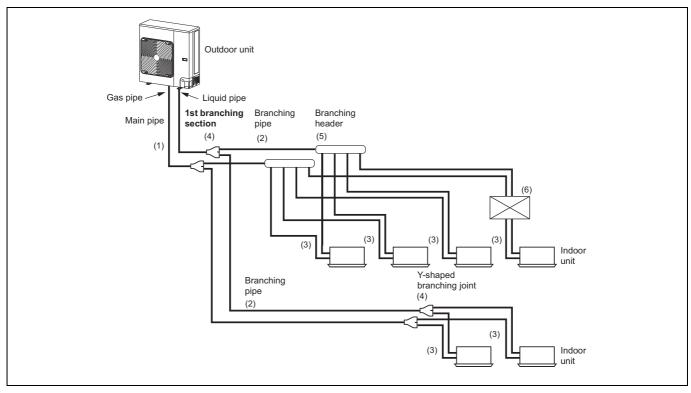
## 3-2. Allowable length / height difference of refrigerant piping



			Allowable value	Piping section
	Total extension of pipe (Liquid pipe, real length)		300 m	L1 + L2 + L3 + a + b + c + d + e + f
	Furthest piping length <b>L</b> (*1)	Real length	120 m	L1 + L3 + f
Dina Langth	Futurest piping length L (1)	Equivalent length	150 m	LITESTI
Pipe Length	Max. equivalent length of main pipe		80 m	L1
	Max. equivalent length of furthest piping from 1st	branching Li (*1)	40 m	L3 + f
	Max. real length of indoor unit connecting pipe		15 m	a, b, c, d, e, f
	Height between indoor and outdoor units <b>H1</b>	Upper outdoor unit	50 m	_
Height Difference	Height between indoor and outdoor units HT	Lower outdoor unit	40 m	_
	Height between indoor units H2		15 m	_

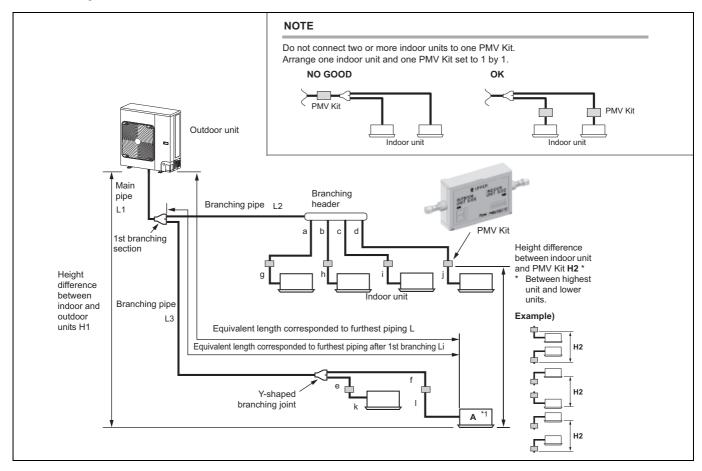
<sup>\*1</sup> Furthest indoor unit from 1st branch to be named "A"

## 3-3. Selection of refrigerant piping



No.	Piping parts	Name		Selection	n of pipe size				Remarks				
			Size of main pipe										
	Outdoor unit		Outdoor	r unit capacity typ	e	Gas pip		d pipe	Same as connecting pipe				
(1)	1st branching	Main pipe		0401 type		15.9		.5	size of the outdoor unit.				
	section			0501 type		15.9	_	.5					
				0601 type		15.9	9	.5					
			Pipe size between branching sections						Pipe size differs based on the				
	Branching section			des of indoor uni stream side	ts at down	Gas pir	oe Liquid	d pipe	total capacity code value of indoor units at the				
(2)	<b>↓</b>	Branching pipe	Equivalent to HI	P Equivalen	t to capacity		·   •		downstream side. If the total value exceeds the capacity				
	Branching section		Below 2.4	Belo	ow 6.6	12.7	9	.5	code of the outdoor unit,				
			2.4 or more	6.6 d	r more	15.9	9	.5	apply the capacity code of the				
			*When exceed the ma	in pipe size, use th	e same size a	s the main	pipe.		outdoor unit.				
	Connecting pipe size of indoor unit												
	Branching section	Indoor unit	С	Capacity rank Gas pipe Liquid pip									
(3)	<b>↓</b>	connecting pipe	00	05 to 012 type		9.5	6.	.4					
	Indoor unit	connecting pipe	014 to 018 type			12.7	6	.4					
			02	15.9	9	.5							
			Selection of branching	ng section (Y-sha	ped branching	g joint)							
(4)	Branching section	Y-shaped branching joint				Model	name						
	_	branching joint	Y-shape bi	ranch joint		RBM-B	Y55E						
			Selection of branchi	ng section (Branc	hing header)								
(5)	Danashia a sastia a	Branching					Model name						
(5)	Branching section	header	Duna shina ha a d	For 4	branches	R	BM-HY1043I	E					
			Branching heade	For 8	B branches	R	BM-HY1083I	E					
			Selection of Shut-off	Valve unit									
(6)	Shut-off Valve unit	Shut-off Valve	Total capacity code of indoor units at downstream side	Model name	Gas pipe		Maximum no	table					
			capacity (HP)										
			Below 4.0	RBM-SV1121H		9.5	6						
			4.0 or more	RBM-SV1801H	UPE 15.9	9.5	10						

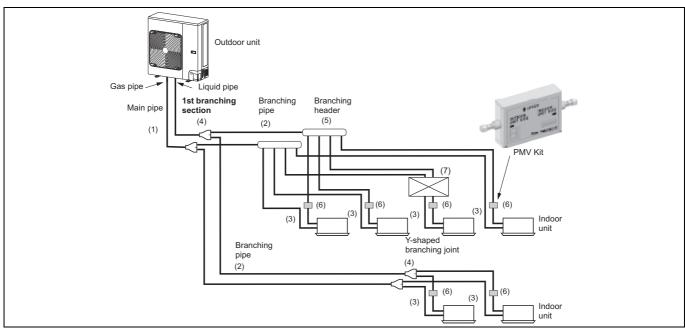
## 3-4. Allowable length / height difference of refrigerant piping with PMV Kit



			Allowable value	Piping section
	Total extension of pipe (Liquid pipe, real length)		250 m	L1+L2+L3+a+b+c+d+e+f+g+h+i +j+k+l
	Furthest piping length L (*1)	Real length	100 m	L1 + L3 + f + l
	Futurest piping length L (1)	Equivalent length	130 m	
Pipe Length	Max. equivalent length of main pipe		70 m	L1
	Max. equivalent length of furthest piping from 1s	st branching Li (*1)	30 m	L3 + f + I
	Max. real length of indoor unit connecting pipe		15 m	a + g, b + h, c + i, d + j, e + k, f + l
	Real length between PMV Kit and indoor unit		2 m or more Below 10 m	g, h, i, j, k, l
	Height between indoor and outdoor units <b>H1</b>	Upper outdoor unit	50 m	_
Height Difference	Treight between indoor and outdoor units <b>n</b> i	Lower outdoor unit	40 m	_
2	Height between indoor unit and PMV Kit H2		15 m	_

<sup>\*1</sup> Furthest indoor unit from 1st branch to be named "A"

## 3-5. Selection of refrigerant piping with PMV Kit



No.	Piping parts	Name		Selection of	of pipe size				Remarks
			Size of main pipe						
	Outdoor unit		Outdoor	unit capacity type		Gas pi	na I	iquid pipe	
(1)	<b>↓</b>	Main pipe		0401 type		15.9		9.5	Same as connecting pipe
,	1st branching section	''		0501 type		15.9		9.5	size of the outdoor unit.
	00011011			0601 type		15.9		9.5	
			Pipe size between bra	nching sections					Pipe size differs based on the
	Branching section		Total capacity cod	es of indoor units ream side	at down	Gas pi	pe L	iquid pipe	total capacity code value of indoor units at the
(2)	<b>↓</b>	Branching pipe	Equivalent to HP	Equivalent to	capacity	Cuo p.	-	.qu.u p.po	downstream side. If the total value exceeds the capacity
	Branching section		Below 2.4	Below	6.6	12.7		9.5	code of the outdoor unit,
			2.4 or more	6.6 or n	nore	15.9		9.5	apply the capacity code of the
			*When exceed the mair	n pipe size, use the	same size a	s the main	pipe.		outdoor unit.
			Connecting pipe size of	of indoor unit					
	Branching section	Indoor unit	Ca	pacity rank	iquid pipe				
(3)	, , , , , , , , , , , , , , , , , , ,	connecting pipe	005	005 to 012 type 014 to 018 type				6.4	
	Indoor unit	J				12.7		6.4	
			024	024 to 056 type 15.9 9.5					
			Selection of branching						
(4)	Branching section	Y-shaped branching joint				Model	name		
		branching joint	Y-shape bra	nch joint		RBM-E	Y55E		
			Selection of branching	section (Branchir	ng header)				
(=)		Branching					Model n	ame	
(5)	Branching section	header	Dunashina haadaa	For 4 b	ranches	F	RBM-HY	1043E	
			Branching header	For 8 b	ranches	F	RBM-HY	1083E	
			Selection of PMV Kit						
			Indoor unit ca	pacity type		Model	name		
(6)	PMV Kit	PMV Kit	003 to 01	4 type		RBM-PMV	/0361U-E		
			015 to 03	4 type		RBM-PM√	/0901U-E		
			* PMV kit can be connec	ted less than 034 ty	pe FCU.				
			Selection of Shut-off V	alve unit					
		Shut-off Valve	Total capacity code of indoor units at downstream side	Model name	Gas			ım number nnectable	
(7)	Shut-off Valve unit	unit	Equivalent to capacity (HP)		pipe	pipe		or units	
1			Below 4.0	RBM-SV1121HUF	E 15.9	9.5		6	
			4.0 or more	RBM-SV1801HUF	PE 15.9	9.5		10	
L			1	•		·			

### 3-6. Charging requirement with additional refrigerant

After finishing vacuuming, exchange the vacuum pump with a refrigerant canister and start additional charging of refrigerant.

### Refrigerant amount charged in factory

Outdoor unit type	MUG0401	MUG0501	MUG0601		
Charging amount (kg)	2.4	2.4	2.4		

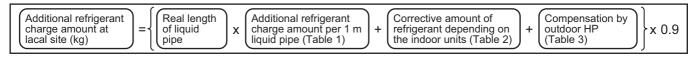
### Calculation of additional refrigerant charge amount

Refrigerant charge amount factory default does not include the refrigerant for pipes at the local site. For refrigerant to be charged in pipes at the local site, calculate the amount and charge it additionally.

### NOTE

When the additional refrigerant amount indicates minus as the result of calculation, it is not necessary to subtract any refrigerant.

### **Calculating formula**



### Table 1

Liquid pipe diameter (mm)	6.4	9.5
Additional refrigerant amount /1 m liquid pipe (kg/m)	0.025	0.055

### Table2

		Capacity rank	003	005	007	800	009	011	012	013	015	017	018	020	024	027	030	034	036	042	048	056
		Capacity rank (Equivalent to HP)	0.3	0.6	0.8	0.9	1.0	1.1	1.25	1.5	1.7	1.85	2.0	2.25	2.5	3.0	3.2	3.6	4.0	4.5	5.0	6.0
		MMU-UP****H*	-	-	-	-	0.4	•	0.4		1.2	-	1.2	-	1.2	1.2	1.2	-	1.2	-	1.2	1.2
	4-way casette	MMU-UP****HP*	-	-	-	-	0.4	-	0.4	-	0.8	-	8.0	-	0.8	0.8	8.0	0.8	1.2	1.2	1.2	1.2
		MMU-UP***MH*	-	0.3	0.4	-	0.4	-	0.4	-	0.6	-	0.6	-	-	-	-	-	-	-	-	-
	2-way casette	MMU-UP***WH*	-	-	0.4	-	0.4	-	0.4	-	0.5	-	0.7	-	0.7	0.7	0.7	-	1.1	-	1.1	1.1
l	1-way casette	MMU-UP***YH*	0.4	0.4	0.4	-	0.4	-	0.4		0.4	-	0.4	-	0.5	0.5	-	-	-	-	-	-
Indoor unit model	1-way caselle	MMU-UP****SH*	-	-	-	-		-	-		0.5	-	0.5	-	0.6	-	-	-	-	-	-	-
name		MMD-UP***BH*	-	0.5	0.5	-	0.5	-	0.5	-	0.5	-	0.5	-	0.7	0.7	0.7	0.7	1.1	1.1	1.1	1.1
	Duct	MMD-UP****SPH*	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.7	0.7	0.7	-	-	-	-	-	-
		MMD-UP****H*	-	-	-	-		-	-		-	-	0.7	-	0.7	0.7	-	-	1.1	-	1.1	1.1
	Under-ceiling	MMC-UP****H*	-	-	-	-	•	-	-	-	-	-	0.6	-	0.6	8.0	8.0	-	1.2	-	1.2	1.2
	High wall	MMK-UP***H*	0.3	0.3	0.3	-	0.3	-	0.3	-	0.7	-	0.7	-	0.7	0.9	0.9	-	0.9	-	-	-
	nigii wali	MMK-UP***DH*	-	0.3	0.3	-	0.3	-	0.3	-	0.4	-	0.4	-	-	-	-	-	-	-	-	-

(kg)

### Table 3

Outdoor unit capacity type	MCY-	MUG0401	MUG0501	MUG0601
Compensation by outdoor HP (kg)		-1.6	-1.6	-1.6

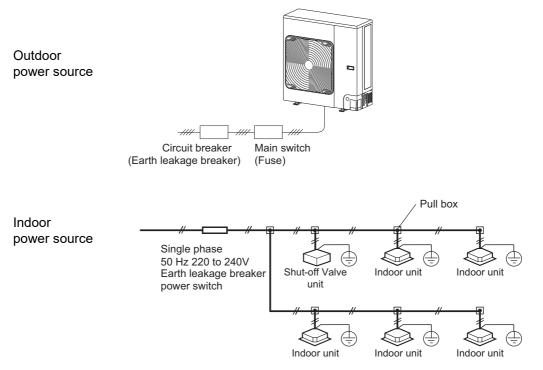
# MiNi-SMMS Data book Wiring design

### 4-1. General

- The appliance shall be installed in a accordance with national wiring regulations.

  Capacity shortages of the power circuit or an incomplete installation may cause an electric shock or fire.
- Perform wiring of power supply complying with the rules and regulations of the local electric company.
- Never connect AC voltage power to the control wiring terminal block (Uv,Uh); otherwise the unit may break down.
- Be sure that electric wiring does not come into contact with high-temperature parts of piping; otherwise the coating of cables may melt and cause an accident.
- · Locate wiring system for the control and refrigerant piping system in the same line.
- Do not turn on the power supply of the indoor units until vacuuming of the refrigerant pipe has finished.
- For the wiring of power to indoor units and that between indoor and outdoor units, follow the instructions in the installation manual of each indoor unit.

## 4-2. Electrical wiring design



Determine the wire size for the indoor unit according to the number of connected indoor units downstream.

## 4-3. Outdoor unit power supply

### **Electrical characteristics**

Model name	Normal Voltage	Voltage	Range	Compressor	Fan Mortor	Power Supply		
Woder name	(V-Ph-Hz)	Min	Max	kW	kW	MCA	MOCP	
MCY-MUG0401HSW-E	220 to 240 - 1 - 50	198	264	3.75	$0.100 \times 1$	23.5	32.0	
MCY-MUG0501HSW-E	220 to 240 - 1 - 50	198	264	3.75	$0.100 \times 1$	26.5	32.0	
MCY-MUG0601HSW-E	220 to 240 - 1 - 50	198	264	3.75	$0.100 \times 1$	28.0	32.0	

MCA: Minimum Circuit Ampacity

MOCP: Maximum Overcurrent Protection (Amps)

## 4-4. Indoor unit power supply

Electric characteristics for 50Hz outdoor units

Туре	Model name	Nominal Voltage		Range	Fan N			Supply
.,,,,,		(V-Ph-Hz)	Min	Max	kW	FLA	MCA	MOCP
	MMU-UP0091H-E	230-1-50	198	264	0.060	0.20	0.25	15
	MMU-UP0121H-E	230-1-50	198	264	0.060	0.20	0.0	15
	MMU-UP0151H-E	230-1-50	198	264	0.130	0.22	0.28	15
Smart 4-Way Air	MMU-UP0181H-E	230-1-50	198	264	0.130	0.29	0.36	15
Discharge Cassette	MMU-UP0241H-E	230-1-50	198	264	0.130	0.42	0.52	15
Type	MMU-UP0271H-E	230-1-50	198	264	0.130	0.53	0.66	15
- 7	MMU-UP0301H-E	230-1-50	198	264	0.130	0.66	0.83	15
	MMU-UP0361H-E	230-1-50	198	264	0.130	1.03	1.29	15 15
	MMU-UP0481H-E MMU-UP0561H-E	230-1-50 230-1-50	198 198	264 264	0.130 0.130	1.06 1.07	1.32 1.33	15
	MMU-UP0091HP-E	230-1-50	198	264	0.060	0.63	0.79	15
	MMU-UP0121HP-E	230-1-50	198	264	0.060	0.63	0.79	15
	MMU-UP0151HP-E	230-1-50	198	264	0.060	0.80	1.00	15
	MMU-UP0181HP-E	230-1-50	198	264	0.060	0.80	4.00	15
4-Way Air Discharge	MMU-UP0241HP-E	230-1-50	198	264	0.060	0.87	1.09	15
Cassette Type	MMU-UP0271HP-E	230-1-50	198	264	0.060	0.87	1.09	15
Cassette Type	MMU-UP0301HP-E	230-1-50	198	264	0.060	0.87	1.09	15
	MMU-UP0361HP-E	230-1-50	198	264	0.130	1.15	1.44	15
	MMU-UP0481HP-E	230-1-50	198	264	0.130	1.15	1.44	15
	MMU-UP0561HP-E	230-1-50	198	264	0.130	1.15	1.44	15
	MMU-UP0051MH-E	230-1-50	198	264	0.060	0.18	0.23	15
	MMU-UP0071MH-E	230-1-50	198	264	0.060	0.26	0.33	15
Compact 4-way	MMU-UP0091MH-E	230-1-50	198	264	0.060	0.28	0.35	15
Cassette Type	MMU-UP0121MH-E	230-1-50	198	264	0.060	0.29	0.36	15
Cassolio Type	MMU-UP0151MH-E	230-1-50	198	264	0.060	0.32	0.40	15
	MMU-UP0181MH-E	230-1-50	198	264	0.060	0.53	0.66	15
	MMU-UP0071WH-E	230-1-50	198	264	0.060	0.24	0.30	15
	MMU-UP0091WH-E	230-1-50	198	264	0.060	0.24	0.30	15
	MMU-UP0121WH-E	230-1-50	198	264	0.060	0.24	0.30	15
	MMU-UP0151WH-E	230-1-50	198	264	0.094	0.25	0.31	15
O Ain Dia ah anna	MMU-UP0181WH-E	230-1-50	198	264	0.094	0.32	0.40	15
2-way Air Discharge	MMU-UP0241WH-E	230-1-50	198	264	0.094	0.43	0.54	15
Cassette Type	MMU-UP0271WH-E	230-1-50	198	264	0.094	0.43	0.54	15
	MMU-UP0301WH-E	230-1-50	198	264	0.094	0.50	0.63	15
	MMU-UP0361WH-E	230-1-50	198	264	0.139	0.58	0.73	15
	MMU-UP0481WH-E	230-1-50	198	264	0.139	0.65	0.81	15
	MMU-UP0561WH-E	230-1-50	198	264	0.139	0.89	1.11	15
	MMU-UP0031YHP-E	230-1-50	198	264	0.030	0.32	0.40	15
	MMU-UP0051YHP-E	230-1-50	198	ı 264	0.030	0.32	0.40	ı 15
	MMU-UP0071YHP-E	230-1-50	198	264	0.030	0.32	0.40	15
	MMU-UP0091YHP-E	230-1-50	198	264	0.030	0.32	0.40	15
	MMU-UP0121YHP-E	230-1-50	198	ı 264	0.030	0.32	0.40	ı 15
1-way Air Discharge	MMU-UP0151YHP-E	230-1-50	198	264	0.042		0.70	15
Cassette Type	MMU-UP0181YHP-E	230-1-50	198	264	0.042	0.58	0.73	15
	MMU-UP0241YHP-E	230-1-50	198	ı 264	0.059		1.00	
	MMU-UP0271YHP-E	230-1-50	198	264	0.059	0.80	1.00	15
	MMU-UP0151SH-E	230-1-50	198	264	0.094	0.39	0.49	15
	MMU-UP0181SH-E	230-1-50	198	264	0.094	0.41	0.51	15
	MMU-UP0241SH-E	230-1-50	198	264	0.094	0.62	0.78	15
	MMD-UP0051BHP-E	230-1-50	198	264	0.150	0.75	0.94	15
	MMD-UP0071BHP-E	230-1-50	198	264	0.150	0.75	0.94	15
	MMD-UP0091BHP-E	230-1-50	198	264	0.150	0.75	0.0.	15
	MMD-UP0121BHP-E	230-1-50	198	264	0.150	0.75	0.94	15
	MMD-UP0151BHP-E	230-1-50	198	264	0.150	1.24	1.55	15
Concealed Duct Type	MMD-UP0181BHP-E	230-1-50	198	264	0.150		1.55	15
	MMD-UP0241BHP-E	230-1-50	198	264	0.150	1.58	1.98	15
	MMD-UP0271BHP-E	230-1-50	198	264	0.150	1.58	1.98	15
	MMD-UP0301BHP-E	230-1-50	198	264	0.150	1.78	2.23	15
	MMD-UP0361BHP-E	230-1-50	198	264	0.250	2.19	2.74	15
	MMD-UP0481BHP-E	230-1-50	198	264	0.250	2.66	3.33	15
	MMD-UP0561BHP-E	230-1-50	198	264	0.250	2.66	3.33	15

Time	Model name Nominal Voltage Voltage Rang		Range	Fan N	Motor	Power Supply		
Type	Model name	(V-Ph-Hz)	Min	Max	kW	FLA	MCA	MOCP
	MMD-UP0051SPHY-E	230-1-50	198	264	0.050	0.41	0.51	15
	MMD-UP0071SPHY-E	230-1-50	198	264	0.050	0.46	0.57	15
	MMD-UP0091SPHY-E	230-1-50	198	264	0.050	0.48	0.60	15
Clima Durat Tura	MMD-UP0121SPHY-E	230-1-50	198	264	0.050	0.51	0.63	15
Slim Duct Type	MMD-UP0151SPHY-E	230-1-50	198	264	0.094	0.54	0.67	15
	MMD-UP0181SPHY-E	230-1-50	198	264	0.094	0.61	0.76	15
	MMD-UP0241SPHY-E	230-1-50	198	264	0.094	0.80	1.00	15
	MMD-UP0271SPHY-E	230-1-50	198	264	0.095	0.85	1.06	15
	MMD-UP0181HP-E	230-1-50	198	264	0.250	1.43	1.79	15
Concealed Duct	MMD-UP0241HP-E	230-1-50	198	264	0.250	1.55	1.94	15
-	MMD-UP0271HP-E	230-1-50	198	264	0.250	1.86	2.33	15
High Static	MMD-UP0361HP-E	230-1-50	198	264	0.350	2.02	2.53	15
Pressure Type	MMD-UP0481HP-E	230-1-50	198	264	0.350	2.57	3.21	15
	MMD-UP0561HP-E	230-1-50	198	264	0.350	3.25	4.06	15
	MMC-UP0151HP-E	230-1-50	198	264	0.094	0.42	0.53	15
	MMC-UP0181HP-E	230-1-50	198	264	0.094	0.42	0.53	15
	MMC-UP0241HP-E	230-1-50	198	264	0.094	0.75	0.94	15
Ceiling Type	MMC-UP0271HP-E	230-1-50	198	264	0.094	0.75	0.94	15
	MMC-UP0361HP-E	230-1-50	198	264	0.139	0.89	1.11	15
	MMC-UP0481HP-E	230-1-50	198	264	0.139	0.89	1.11	15
	MMC-UP0561HP-E	230-1-50	198	264	0.139	0.89	1.11	15
	MMK-UP0031HP-E	230-1-50	198	264	0.030	0.16	0.21	15
	MMK-UP0051HP-E	230-1-50	198	264	0.030	0.16	0.21	15
	MMK-UP0071HP-E	230-1-50	198	264	0.030	0.17	0.21	15
	MMK-UP0091HP-E	230-1-50	198	264	0.030	0.18	0.23	15
	MMK-UP0121HP-E	230-1-50	198	264	0.030	0.20	0.25	15
High Wall Type	MMK-UP0151HP-E	230-1-50	198	264	0.042	0.30	0.38	15
	MMK-UP0181HP-E	230-1-50	198	264	0.042	0.33	0.41	15
	MMK-UP0241HP-E	230-1-50	198	264	0.042	0.48	0.60	15
	MMK-UP0271HP-E	230-1-50	198	264	0.061	0.66	0.83	15
	MMK-UP0301HP-E	230-1-50	198	264	0.061	0.66	0.83	15
	MMK-UP0361HP-E	230-1-50	198	264	0.061	0.66	0.83	15
	MMK-UP0031HPL-E	230-1-50	198	264	0.030	0.16	0.21	15
	MMK-UP0051HPL-E	230-1-50	198	264	0.030	0.16	0.21	15
	MMK-UP0071HPL-E	230-1-50	198	264	0.030	0.17	0.21	15
High Wall Type	MMK-UP0091HPL-E	230-1-50	198	264	0.030	0.18	0.23	15
(Without PMV)	MMK-UP0121HPL-E	230-1-50	198	264	0.030	0.20	0.25	15
, ,	MMK-UP0151HPL-E	230-1-50	198	264	0.042	0.30	0.38	15
	MMK-UP0181HPL-E	230-1-50	198	264	0.042	0.33	0.41	15
	MMK-UP0241HPL-E	230-1-50	198	264	0.042	0.48	0.60	15

### For Indoor Unit power supply (Must be independent from the outdoor unit power supply)

Item	Power supply wiring			
Model	Wire	Field fuse		
All models of indoor units	2.0 mm <sup>2</sup> (AWG#14) Max.20 m	3.5 mm² (AWG#12) Max.50 m	15 A	

### NOTE:

The above connecting lengths stated in the table indicate the length from the isolator to the outdoor unit. When the power supply of the indoor units are connected in parallel, it is assumed that no more than a 2 % voltage drop will occur. If the connecting length is to exceed the stated lengths, select a suitable wire in accordance with the local wiring standards.

### 4-5. Shut-off Valve unit

### Electrical characteristics

Type	Model name	Normal Voltage	Voltage Range		Power Supply	
Туре	Woder Hame	(V-Ph-Hz)	Min	Max	MCA	MOCP
Shut-off Valve unit	RBM-SV1121HUPE	230-1-50	198	264	0.30	15
Silut-oil valve unit	RBM-SV1801HUPE	230-1-50	198	264	0.30	15

### • For Shut-off Valve unit power supply (Must be independent from the outdoor unit power supply)

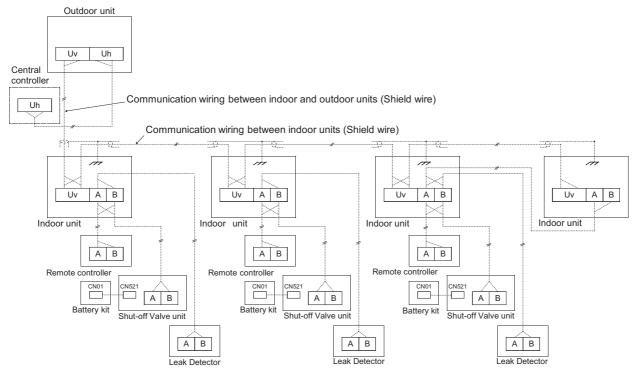
Item	Power supply wiring		
Model	Wire size	Field fuse	
Shut-off Valve unit	2.5 mm² (AWG#13) Max.50 m	15 A	

### NOTE:

This circuit must be protected with the required safety devices like a main switch, a slow blow fuse on each phase and an earth leakage circuit breaker. When using residual current operated circuit breakers, be sure to use a high-speed type (0.1 second or less) 30 mA rated residual operating current.

## 4-6. Design of control wiring

### 4-6-1. Summary of control wiring

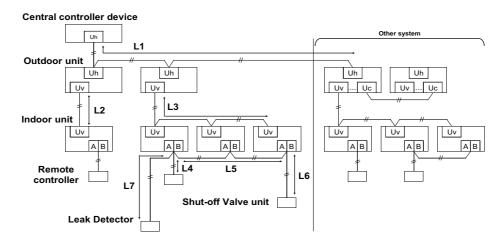


- Communication wiring and central control wiring use 2-core non-polarity wires.
- Use 2-core shield wires to prevent noise trouble.
- Connecting the closed end terminal of shield wire. (Connected to all connecting sections in each unit)
- Use 2-core non-polarity wire for remote controller, Shut-off Valve unit, Leak Detector and wiring of group control. (A, B terminals)

## 4 Wiring design

### 4-6-2. Restriction of control wiring

Keep the rule of below tables about size and length of Control wiring.



### Table-1 Uv line (L2+L3)

Wiring	2-core, non-polarity
Туре	Shield wire
Size/Length	1.0 to 1.5 mm <sup>2</sup> : Up to 1000 m

<sup>\*</sup> For communication wiring specification for other system, refer to the Installation Manual attached to the outdoor unit to be connected.

### Table-2 Uh line (L1)

Wiring	2-core, non-polarity
Type	Shield wire
Size/Length	1.0 to 1.5 mm <sup>2</sup> : Up to 1000 m 2.0 mm <sup>2</sup> : Up to 2000 m

### Table-3 Remote controller wiring, Shut-off Valve unit wiring, Leak Detector wiring

Wire	2-core, non-polarity
Size	0.5 mm <sup>2</sup> to 2.0 mm <sup>2</sup>
Size/Length	<ul> <li>Up to 300 m. (L4+L5+L6+L7)</li> <li>Up to 400 m in case of wireless remote controller in group control.</li> <li>Up to 200 m total length of communication wiring between indoor units and Shut-off Valve unit. (L5+L6)</li> <li>Up to 300 m. (L4)</li> <li>Up to 100 m. (L7)</li> </ul>

<sup>\*</sup> For Remote controller wiring, refer to the Installation Manual attached to the Remote controller to be connected.

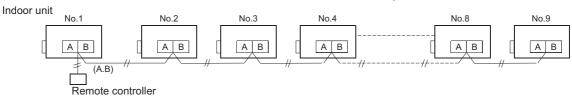
- U (v, h, c) line means of control wiring.
- Uv line: Between indoor and outdoor units.
- Uh line: Central control line.
- · Uc line: Between outdoor and outdoor units.
- \* For communication wiring specification for Shut-off Valve unit and Leak Detector, refer to the Installation Manual attached to each equipment.

### 4-6-3. Group control through a remote controller

### For the group connections without Shut-off Valve units:

It is up to 9 units.

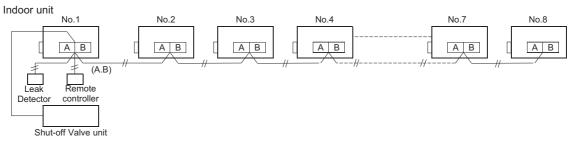
Max. number of connectable Leak Detector and Remote Controller is up to 2 units.



### For the group connections with a Shut-off Valve units:

It is up to 8 units.

Max. number of connectable Leak Detector and Remote Controller is up to 2 units.



## MiNi-SMMS Data book Outdoor unit

## 5-1. Specifications

Outdoor unit type	Outdoor unit mo	del name				MCY-MUG0401HSW-E	MCY-MUG0501HSW-E	MCY-MUG0601HSW-E	
Capacity code									
Heating Capacity(Nates.)				4	5	6			
Heating Capacity(Max.)	Cooling Capacity (*1) kW								
Power supply									
Running current   A   14.2/13.07.3.1   17.81/17.016.3   20.319.4/18.6	Heating Capacity(							-	
Cooling									
Cooling									
EER		Caaling							
SEER (Etp lot6/21)		Cooling			70				
Rectinal characteristics   Heating (Nominal) (*1)   Heating (Rated.)   Proved consumption   RW   2.38   2.95   3.38   95   95   95   95   95   95   95   9				(Ern lo	t6/21)				
Electrical characteristics   Chomman   (*1)									
Peating   Prover factor   %   91   93   95									
Running current	(Nominal) (*1)	(Rated.)	COP			5.08	4.75	4.61	
Healing   Heal			SCOP	(Erp lo	t6/21)	5.21	4.93		
Max								19.9/19.1/18.3	
Starting Current				mption					
Starting Current		(Max.)			%	-			
Height mm   1050   10		01 11 0							
Unit		Starting Curre							
Depth		Linit							
		Offic							
Packing   Width   mm	Dimension								
Depth		Packing							
Total Weight		doking							
Appearance   Color   Packed unit		Unit	- D 0 P						
Silky shade	Total Weight								
Type	Annaaranaa/Calar	-\				Silky shade	Silky shade	Silky shade	
Motor output	Appearance(Color	r)				(Munsell 1Y8.5/0.5)	(Munsell 1Y8.5/0.5)	(Munsell 1Y8.5/0.5)	
Fan unit   Fan   Fan   Propeller fan (Quantity 1)   Propeller fan (Quant	Compressor								
Fan unit	Compressor				kW				
Near Exchanger   Finned tube   Finned tube									
Heat exchanger	Fan unit								
Refrigerant R32(Charged refrigerant amount(kg))	114	Air volume			m³/h				
High-pressure switch		haraad rafriaar	sant amazunt/lea	~//	(*2)				
Discharge temp. sensor / Suction temp. sensor / Suction temp. sensor / High-pressure sensor / Exemp. sensor / High-pressure sensor / Exemp. sensor / High-pressure sensor / Exemp. sensor /			ant amount(kţ	3))					
Protective devices	riigii-pressure swi	itcii			IVIFa				
Sensor   S									
Low-pressure sensor / Compressor case thermostat / P.C. board fuse   P.C. board fu	D44:								
Electrical specifications	Protective devices	5				Low-pressure sensor /	Low-pressure sensor /	Low-pressure sensor /	
Unit   MCA									
Specifications									
Connecting port diameter   Connecting point diameter   Connecting piping   Connecting piping   Connecting piping   Connecting piping   Connecting piping   Connecting piping   Connecting piping diameter   Connecting piping diameter   Connecting piping   Connected indoor units   Connec		Unit							
Design   Port diameter   Ciquid side(main pipe)   mm   9.5	specifications								
Connecting method   Liquid side   Flare   Fl			Liquid side(main pipe) mm						
Method   Connecting   Gas side   mm   15.8					111111				
Connecting piping diameter   Connecting piping diameter   Connecting piping diameter   Connecting piping   Connected indoor units   Connected indoor units   Sound pressure level   Cooling dB(A)   Sound pressure level   Sound pressure level   Cooling dB(A)   Sound pressure level   Cooling dB(A)   Sound pressure level   Sound pressure level   Cooling dB(A)   Sound pressure level   Sound pressure level   Cooling dB(A)   Sound pressure level   Sound pressur	Refrigerant								
Diping diameter   Liquid side   mm   9.5   9.5   9.5   9.5	piping				mm				
diameter									
Total extension of piping   m   300   300   300   300   300   Max. No. of connected indoor units   8   10   13   13   13   15   15   15   15   15			Liquid side	id side m		9.5	9.5	9.5	
Connectable FCU diversity         80% - 130%         80% - 130%         80% - 130%           Sound pressure level         Cooling dB(A) 52 53 53 54           Night operation (*6) (Sound reduction) control         Cooling dB(A) 50/47/44 50/47/44 50/47/44         50/47/44 50/47/44           Sound power level         Cooling dB(A) 69 70 71         71           Night operation (*6) (Sound reduction) control         Cooling dB(A) 68/66/61 68/66/61         68/66/61 68/66/61           Night operation (*6) (Sound reduction) control         Cooling dB(A) 68/66/61 68/66/61         68/66/61           Operation temperature range         Cooling Cooling         CDB         -5 to 46         -5 to 46	Total extension of		•		m	300	300	300	
Cooling   dB(A)   52   53   54     Heating   dB(A)   54   55   56     Night operation (*6) (Sound reduction) control     Sound power level   Cooling   dB(A)   69   70   71     Night operation (*6) (Sound reduction) control     Cooling   dB(A)   69   70   71     Heating   dB(A)   71   72   73     Night operation (*6) (Sound reduction) control     Heating   dB(A)   68/66/61   68/66/61     Heating   dB(A)   68/66/61   68/66/61     Heating   dB(A)   68/66/61   68/66/61     Heating   dB(A)   68/66/61   68/66/61     Cooling   dB(A)   68/66/61     Cooli									
Heating   dB(A)   54   55   56     Night operation (*6) (Sound reduction) control   Heating   dB(A)   50/47/44   50/47/44   50/47/44     Sound power level   Cooling   dB(A)   69   70   71     Night operation (*6) (Sound reduction) (Sound reduction) control   Heating   dB(A)   68/66/61   68/66/61     Night operation (*6) (Sound reduction) control   Heating   dB(A)   68/66/61   68/66/61     Heating   dB(A)   68/66/61   68/66/61   68/66/61     Heating   dB(A)   68/66/61   68/66/61     Heating   dB(A)   68/66/61   68/66/61     Operation temperature range   Cooling   CDB   -5 to 46   -5 to 46									
Heating   dB(A)   54   55   56     Night operation (*6)   Cooling   dB(A)   50/47/44   50/47/44   50/47/44     Countrol   Heating   dB(A)   50/47/44   50/47/44   50/47/44     Sound power level   Cooling   dB(A)   69   70   71     Night operation (*6)   Cooling   dB(A)   68/66/61   68/66/61     Cooling   dB(A)   68/66/61   68/66/61     Heating   dB(A)   68/66/61   68/66/61     Cooling   dB(A)   68/66/61     Cooling   dB(A)	Sound pressure le	evel			dB(A)	52			
(Sound reduction)   Heating   dB(A)   50/47/44   50/47/44   50/47/44   50/47/44   50/47/44   Sound power level   Cooling   dB(A)   69   70   71   T2   73   T3   T4   T5   T5   T5   T5   T5   T5   T5									
Control   Heating   dB(A)   50/47/44   50/	(Sound reduction) Footbook		tion)	\ ' <del></del>					
Heating   dB(A)   71   72   73     To a control			' Heating						
Heating   dB(A)	Night operation (*6) (Sound reduction) control Heating dB								
(Sound reduction) control         Heating         dB(A)         68/66/61         68/66/61         68/66/61           Operation temperature range         Cooling         CDB         -5 to 46         -5 to 46         -5 to 46									
Control   Heating   dB(A)   68/60/61   68/60/61   68/60/61			reduction) Heating						
						68/66/61	68/66/61	68/66/61	
Heating   CWB   -20 to 15.5   -20 to 15.5   -20 to 15.5	Operation temperature range Cooling								
	Sporation temper	atare range	Heating		CWB	-20 to 15.5	-20 to 15.5	-20 to 15.5	

<sup>(\*1)</sup> Rated conditions Cooling : Indoor 27 degC Dry Bulb /19 degC Wet Bulb , Outdoor 35 degC Dry Bulb. Heating: Indoor 20 degC Dry Bulb, Outdoor 7 degC Dry Bulb / 6 degC WetBulb.

The standard pipe means that equivalent piping length of 7.5m and standard 0m piping height difference.

(\*2) The source voltage must not fluctuate more than ±10%.

<sup>(\*3)</sup> The amount dose not consider extra piping length.

<sup>(\*3)</sup> The amount dose not consider extra piping length.

Refrigerant must be added on site in accordance with the actual piping length.

(\*4) Select wire size base on the larger value of MCA.

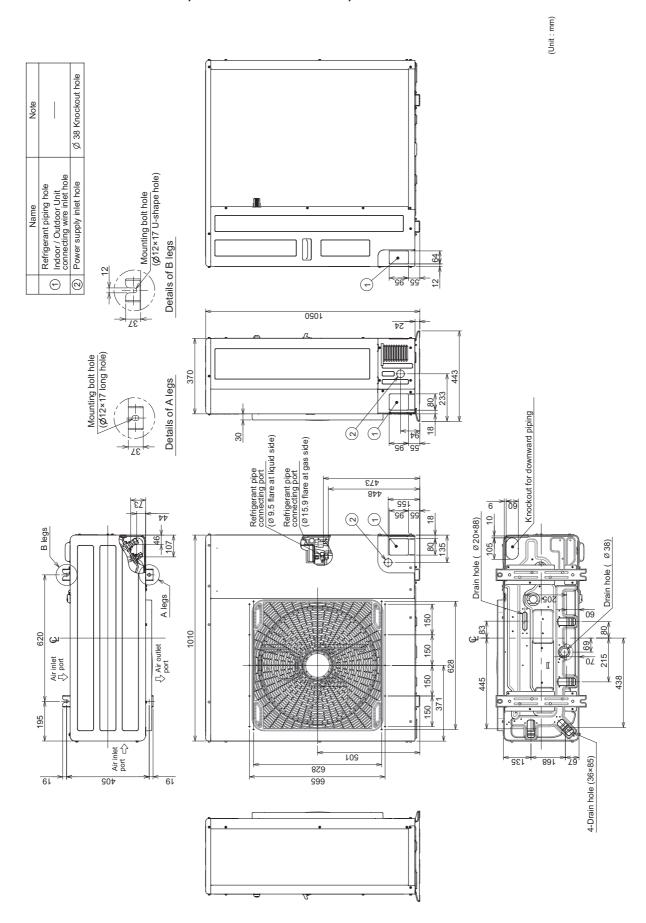
(\*5) MOCP:Maximum overcurrent protection (Amps)

(\*6) Need to prepare for optional control P.C. board. Setting of sound power level is set by outdoor unit DN Code. For details, refer to [5-7. Optional printed circuit board (PCB) of outdoor unit].



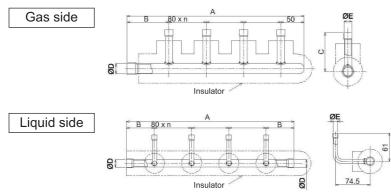
### 5-2. Dimensional drawing

MCY-MUG0401HSW-E, MCY-MUG0501HSW-E, MCY-MUG0601HSW-E



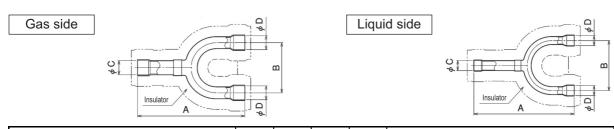
### 5-3. Branch header / branch joint

### Branch header RBM-HY1043E, HY1083E



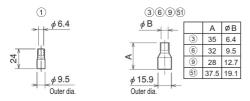
Мо	del	Α	В	С	øD	øΕ	n	Accessory socket Qty
RBM-HY1043E	Gas side	380	90	83.6	22.2	15.9	3	⑥ x 4, ⑨ x 4, ⑭ x 1, ⑱ x 1, ⑰ x 1
NDW-III 1043E	Liquid side	360	60	-	15.9	9.5	3	① x 4, ⑥ x 1, ⑨ x 1
RBM-HY1083E	Gas side	700	90	83.6	22.2	15.9	7	⑥ x 8, ⑨ x 8, ⑭ x 1, ⑱ x 1, ⑰ x 1
INDIVI-ITI 1003L	Liquid side	680	60	-	15.9	9.5	7	① x 8, ⑥ x 1, ⑨ x 1

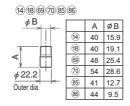
### Y-shape branch joint RBM-BY55E

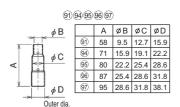


Mo	del	Α	В	øС	øD	Accessory socket Qty
BY55E	Gas side	160	80	15.9	15.9	9 x 1, 6 x 2, 9 x 2
BIOOL	Liquid side	130	70	9.5	9.5	① x 2

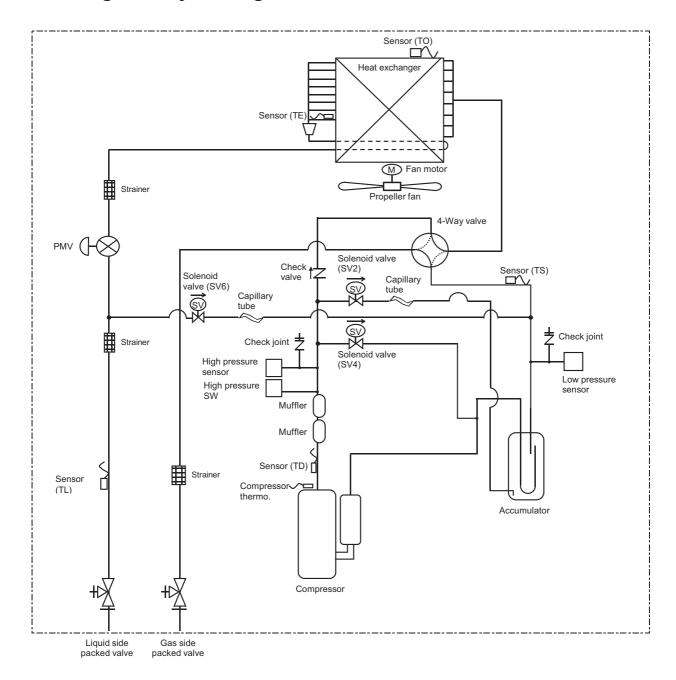
#### Accessory socket







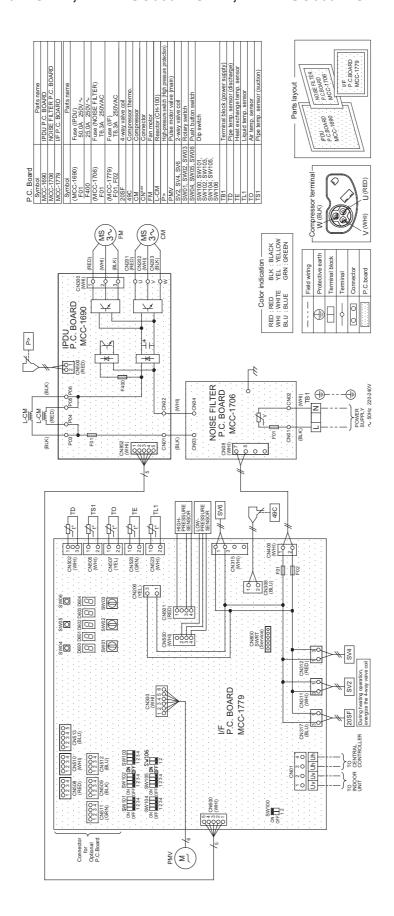
## 5-4. Refrigerant cycle diagram





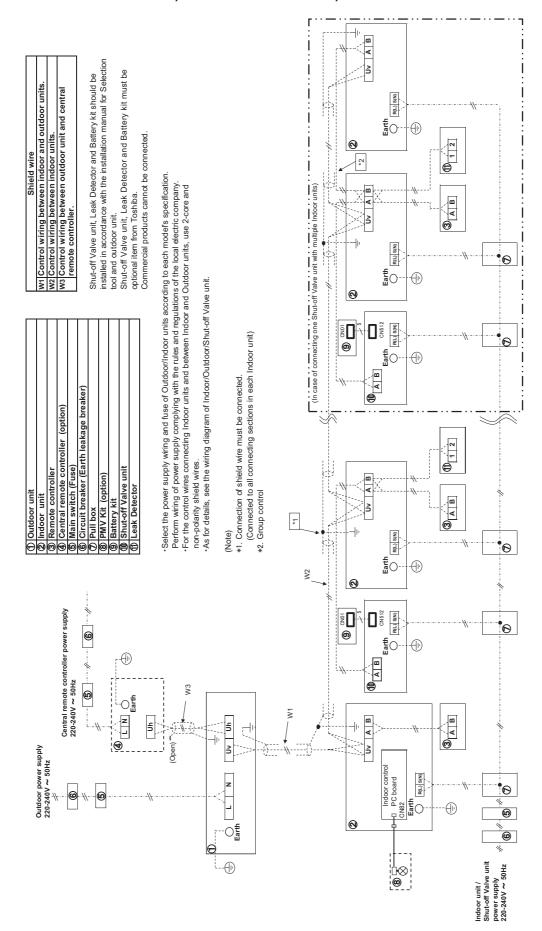
### 5-5. Wiring diagram

MCY-MUG0401HSW-E, MCY-MUG0501HSW-E, MCY-MUG0601HSW-E



### 5-6. Connecting diagram

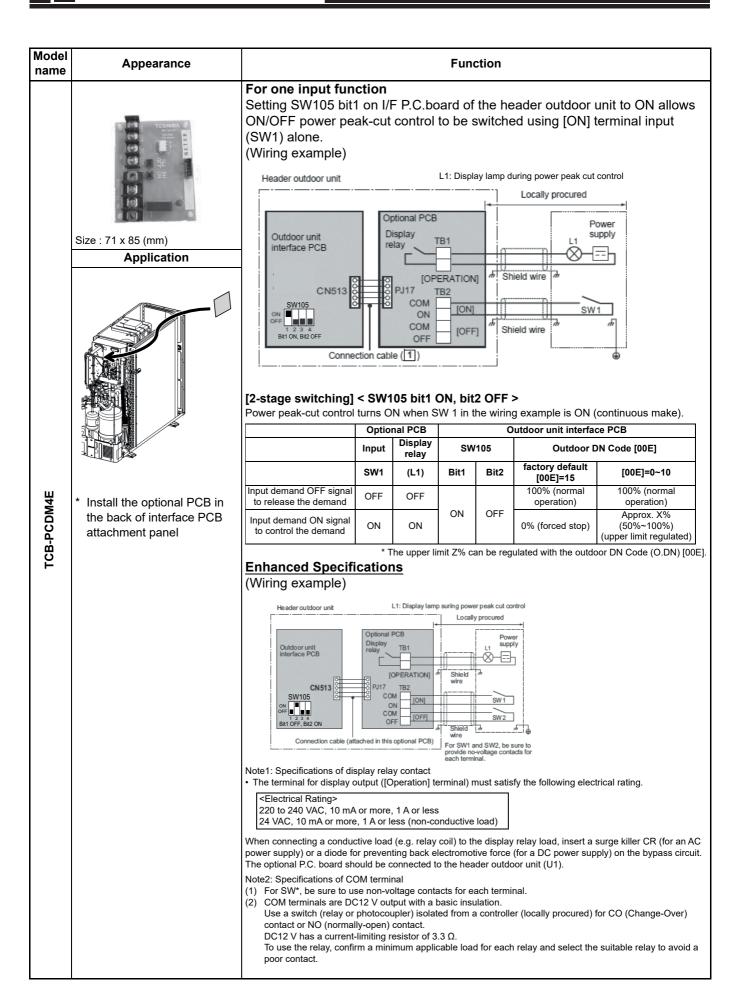
### MCY-MUG0401HSW-E, MCY-MUG0501HSW-E, MCY-MUG0601HSW-E



### 5-7. Optional printed circuit board (PCB) of outdoor unit

#### Model **Appearance Function** name [1] Power peak-cut Control Purpose: Limiting air conditioning performance with external signals and decreasing the peak power consumption. The upper limit capacity of the outdoor unit is restricted based on the outdoor power peak selected setting. **Standard Specifications** (Wiring example) L1: Display lamp during power peak cut control Header outdoor unit Locally procured Size: 71 x 85 (mm) Optional PCB Power Display supply **Application** Outdoor unit interface PCB [OPERATION] Shield COM SW105 ON ON OFF ISW1 COM [OFF] OFF Shield Connection cable (attached in this optional PCB) wire For SW1 and SW2, be sure to provide no-voltage contacts for each terminal. The input signals of SW1 and SW2 may be pulse input (100 msec or more) or continuous make. Do not turn on [SW1] and [SW2] simultaneously. [2-stage switching] < SW105 bit1 OFF, bit2 OFF > Optional PCB Outdoor unit interface PCB Display SW105 Outdoor DN Code [00E] Input relay factory default SW1 SW2 Bit2 [00E]=0~10 (L1) Bit1 **ICB-PCDM4E** [00E]=15 Install the optional PCB in Input demand OFF signal 100% (normal 100% (normal OFF the back of interface PCB OFF ON to release the demand operation) operation) attachment panel OFF OFF Approx. X% Input demand ON signal OFF ON 0% (forced stop) (50%~100%) to control the demand (upper limit regulated) \* The upper limit Z% can be regulated with the outdoor DN Code (O.DN) [00E] Outdoor unit DN Code (O.DN) X [00E] 0 100% 95% 90% 3 85% 4 80% 75% 70% 65% 8 60% a 55% 10 50% 15 (factory default) Note1: Specifications of display relay contact The terminal for display output ([Operation] terminal) must satisfy the following electrical rating. <Electrical Rating> 220 to 240 VAC, 10 mA or more, 1 A or less 24 VAC, 10 mA or more, 1 A or less (non-conductive load) When connecting a conductive load (e.g. relay coil) to the display relay load, insert a surge killer CR (for an AC power supply) or a diode for preventing back electromotive force (for a DC power supply) on the bypass circuit. The optional P.C. board should be connected to the header outdoor unit (U1). Note2: Specifications of COM terminal (1) For SW\*, be sure to use non-voltage contacts for each terminal. COM terminals are DC12 V output with a basic insulation. Use a switch (relay or photocoupler) isolated from a controller (locally procured) for CO (Change-Over) contact or NO (normally-open) contact. DC12 V has a current-limiting resistor of 3.3 $\Omega_{\cdot}$ To use the relay, confirm a minimum applicable load for each relay and select the suitable relay to avoid a

poor contact.





Model name	Appearance					F	unctio	on					
		[4-stage switch Power peak-cut							exar	cample is ON (continuous make).			
				Optional PCB				(	Outo	loor unit interfac	e PCB		
				Inp		ut Display relay		SW105		Outdoor DN Code [**]			
				SW1	SW2	(L1)	Bit1	Bit2		ctory default E]=15, [00F]=8, [010]=4	[00E]=X, [00F]= [010]=Z	=Y,	
		Input demand OFI to release the de		OFF	OFF	OFF			1	00% (normal operation)	100% (norma operation)	al	
			Input demand ON signal to control the demand		OFF	ON			,	Approx. 80% (upper limit regulated)	Approx. Z% (50%~100%) (upper limit regula	)	
		Input demand ON to control the de		OFF	ON	ON	OFF	ON	,	Approx. 60% (upper limit regulated)	Approx. Y% (50%~100%) (upper limit regula	)	
M4E			Input demand ON signal to control the demand		ON	ON			09	% (forced stop)	Approx. X% (50%~100%) (upper limit regula	)	
CD		* The upper limit X%, Y%, Z% can be regulated with the outdoor DN Code (O.DN) [00											
TCB-PCDM4E		Outdoor DN Code (O.DN) [00E]	DN Code (O.DN) X		DN Co	utdoor de (O.DI 00F]	N)	Υ		Outdoor DN Code (O.DN) [010]	z		
		0	100			0		100%		0	100%		
		1	959	%		1		95%		1	95% 90%		
		2	909			2		90%		2			
		3	859			3		85%		3	85%		
		4	809			4		80%		4 (factory default)			
		5	75°			5 6		75% 70%		5 6	75% 70%		
		7	659	-		7		65%	-	7	65%		
		8	609		8 (fact	ory defau		60%	4 )	8	60%		
		9	55°		o (lacti	9	/	55%	$+$ $\parallel$	9	55%		
		10	500		-	10		50%	1	10	50%		
		15 (factory default)	0% (forced	6		15		0% (forced stop)		15	0% (forced stop)		



#### Power peak-cut control by power consumption

Peak cut control by power consumption can be set with Outdoor DN CODE (O.DN) [009].

Peak cut control by power consumption adjusts the outdoor unit output so that the power consumption does not exceed the upper limit control value.

- [1] Setting "Outdoor DN [009] = 1" changes the control method to peak cut control by power consumption. (Setting "Outdoor DN [009] = 0" returns the control method to normal peak cut control.)
- [2] Check Outdoor DN [00A] to [00D] to make sure that upper power limit reference values for cooling and heating are registered.

Outdoor unit DN Code (O.DN) [00C], [00D] Cooling upper limit power standard setting Ex. The upper limit of cooling power consumption setting = 5.35kw

Outdoor DN Code (O.DN)	[00C]	[00D]
Value	05	35

Outdoor unit DN Code (O.DN) [00A], [00B] Heating upper limit power standard setting

Ex. The upper limit of heating power consumption setting = 4.00kw

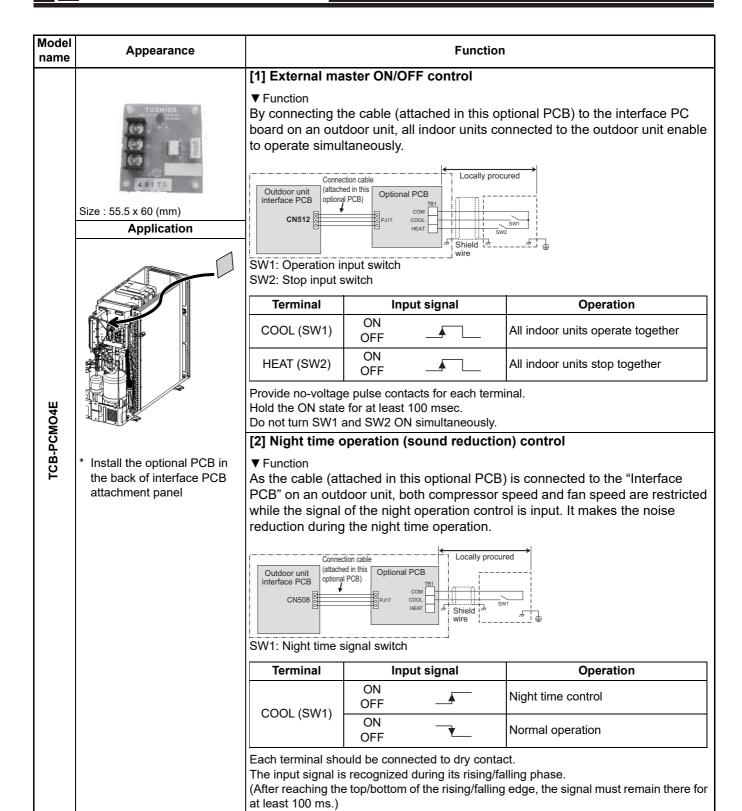
Outdoor DN Code (O.DN)	[00A]	[00B]
Value	04	00

[3] When an ON signal is input from the optional PCB, peak cut control by power consumption is enabled. The way to input the ON signal is the same as with normal peak cut control. Refer to the sections on "Standard Specifications", "For one input function" and "Enhanced Specifications".

Based on the upper power limit reference values registered in [2], the outdoor unit capacity is adjusted so that the upper limit control value set with Outdoor DN Code (O.DN) [00E], [00F], and [010] is not exceeded.

#### NOTE:

- \* To protect the cycle, peak cut control by power consumption may not be carried out. (During defrosting operation, oil recovery operation, coolant recovery operation, etc.)
- \* The value of power consumption is computed by estimation, so an error of about ±5% from the actual value occurs.
  - If you want to perform accurate peak cut control by power consumption and demand control, use a power meter and demand controller.
- \* If the desired effect cannot be obtained, e.g. if the power consumption does not go down as much as expected, make adjustment by changing the set values of power upper limit reference and coefficient α (upper limit control (%)).



#### Model **Appearance Function** name ▼ Sound reduction and approximation capacity (reference) Outdoor During low-noise mode Low-noise Capacity Outdoor unit DN dB(A) mode Cooling Heating Code[027] Cooling Heating approx. 90% approx. 90% Model 0401\* 0 Mode 1 50 50 approx. 75% Mode 2 47 47 approx. 75% Model 05013 Model 0601\* 2 Mode 3 44 44 approx. 60% approx. 60% Position of noise measuring device: 1 m from the front face of the set and 1.5 m above ground (anechoic sound) Size: 55.5 x 60 (mm) [3] Operation mode selection control **Application ▼** Function The heating/cooling mode of the system can be selected by connecting to the interface PCB of outdoor units. Locally procured Connection cable Outdoor unit interface PCB (attached in this Ontional PCB optional PCB) CN510 Shield 1/2 SW1: Cooling mode specified input switch SW2: Heating mode specified input switch Input Signal Operation: Selected operation mode Cooling (SW1) Heating (SW2) OFF ON Cooling operation only TCB-PCM04E Install the optional PCB in OFF ON Heating operation only the back of interface PCB OFF OFF Normal operation attachment panel Each terminal should be connected to dry contact. About Switching of Processing of Indoor Unit Operation State Processing of the operation state can be switched for indoor units in a mode other than the selected operation mode by setting the Outdoor DN code [008] of the header outdoor unit interface PCB. Outdoor DN Coo (O.DN) [008] Details of Processing Unallowed indoor units in a mode other than the P.C.board selection modes are not treated as priority (thermostat OFF state) COOL (SW1) HEAT (SW2) **\*** or **◊** OFF OFF O.DN [008] = 0 (factory default) OFF Thermostat OFF (Air blow operation at super-slow blow rat Follow the remote controller (Normal air blow operation) at OFF (Air blo Follow the remote controller (Normal air blow operation) Only operation modes and air blow operation selected on the P.C.board can be selected on the remote controller. When the input signal is turned ON, indoor units operated in a mode other than the P.C.board selection mode are forcibly switched to the P.C.board selection modes. Remote control COOL (SW1) HEAT (SW2 OFF OFF **★**, **♦**, **\*** or **\$** can be selected. O.DN [008]= When using the Only ★, ◊ or ★ can be selected. Indoor units in Heat mode are forcibly switched to the Cool model. ON OFF COOL remote control, (mode selection control) indicator Only 業 or can be selected. Indoor units in Cool or Dry mode are forcibly switched to the Heat mode. HEAT OFF

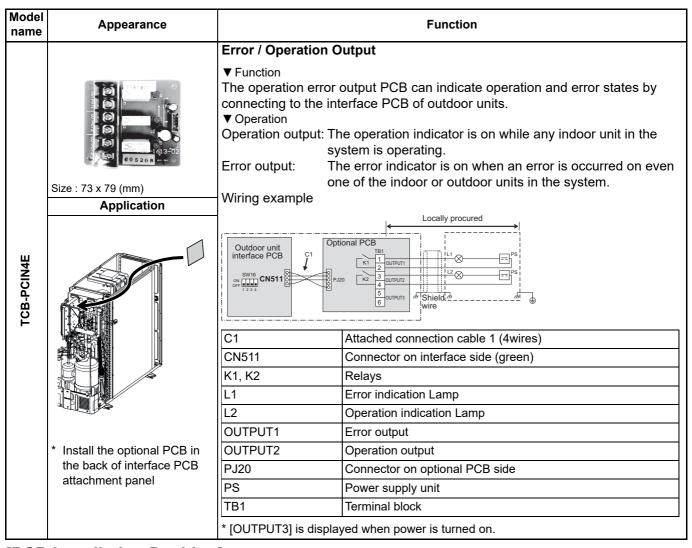
Indoor units in a mode other than the selected operation mode are forcibly switched to

The jumper lead is not switched.

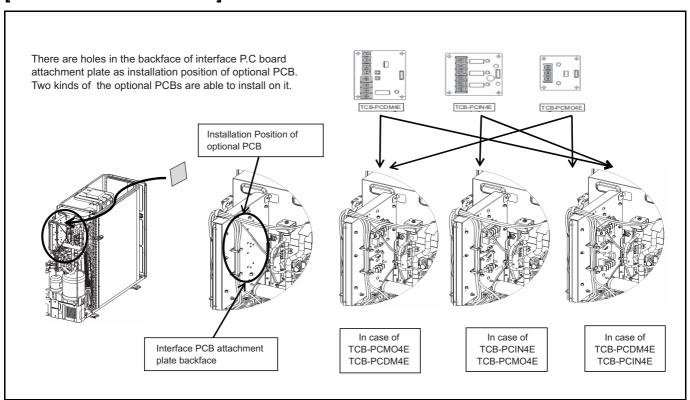
the selected operation mode.

# Outdoor unit

Model name	Appearance	Function
TCB-PCM04E		<ul> <li>Note</li> <li>(1) For SW*, be sure to use non-voltage contacts for each terminal.</li> <li>(2) COM terminals are DC12 V output with a basic insulation.</li> <li>Use a switch (relay or photocoupler) isolated from a controller (locally procured) for CO (Change-Over) contact or NO (normally-open) contact.</li> <li>DC12 V has a current-limiting resistor of 3.3 Ω.</li> <li>To use the relay, confirm a minimum applicable load for each relay and select the suitable relay to avoid a poor contact.</li> </ul>



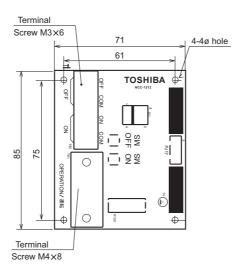
#### [PCB Installation Position]



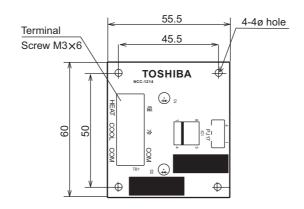


#### **Dimensions of PCB**

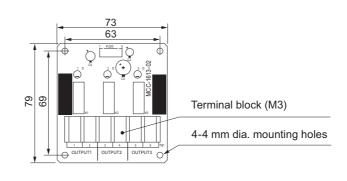
#### TCB-PCDM4E



#### TCB-PCMO4E



#### **TCB-PCIN4E**





### 5-8. Part load performance

MCY-MUG0401HSW-E (4HP, 12.1kW system)

Cooling		Compressor + Oudoor Fan Power consumption (kW)											
Outdoor Unit	Outdoor Unit	100	0%	90%		80%		70	1%	60%		50	%
Dry-Bulb (°C)	100% Cooling Capacity (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)
40	11.4	11.4	3.48	10.2	2.81	9.1	2.24	7.9	1.76	6.8	1.37	5.7	1.05
39	11.5	11.5	3.36	10.4	2.71	9.2	2.16	8.1	1.70	6.9	1.32	5.8	1.01
37	11.8	11.8	3.13	10.6	2.53	9.5	2.01	8.3	1.59	7.1	1.23	5.9	0.95
35	12.1	12.1	2.92	10.9	2.35	9.7	1.88	8.5	1.48	7.3	1.15	6.1	0.88
33	12.1	12.1	2.72	10.9	2.20	9.7	1.75	8.5	1.38	7.3	1.07	6.1	0.82
31	12.1	12.1	2.54	10.9	2.05	9.7	1.63	8.5	1.28	7.3	1.00	6.1	0.77
30	12.1	12.1	2.45	10.9	1.98	9.7	1.58	8.5	1.24	7.3	0.96	6.1	0.74
29	12.1	12.1	2.36	10.9	1.91	9.7	1.52	8.5	1.20	7.3	0.93	6.1	0.71
27	12.1	12.1	2.20	10.9	1.78	9.7	1.42	8.5	1.12	7.3	0.87	6.1	0.67
25	12.1	12.1	2.05	10.9	1.66	9.7	1.32	8.5	1.04	7.3	0.81	6.1	0.62
23	12.1	12.1	1.92	10.9	1.55	9.7	1.23	8.5	0.97	7.3	0.75	6.1	0.58
21	12.1	12.1	1.79	10.9	1.44	9.7	1.15	8.5	0.90	7.3	0.70	6.1	0.54
20	12.1	12.1	1.72	10.9	1.39	9.7	1.11	8.5	0.87	7.3	0.68	6.1	0.52
19	12.1	12.1	1.66	10.9	1.34	9.7	1.07	8.5	0.84	7.3	0.66	6.1	0.50
17	12.1	12.1	1.55	10.9	1.25	9.7	1.00	8.5	0.79	7.3	0.61	6.1	0.47
15	12.1	12.1	1.45	10.9	1.17	9.7	0.93	8.5	0.73	7.3	0.57	6.1	0.44

Heating			Compressor + Oudoor Fan Power con							r consumption (kW)				
Outdo	or Unit	Outdoor Unit	100	0%	90	1%	80%		70%		60%		50	%
Dry-Bulb (°C)	Wet-Bulb (°C)	100% Heating Capacity (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)
15.0	13.7	12.1	12.1	2.05	10.9	1.73	9.7	1.44	8.5	1.18	7.3	0.95	6.1	0.74
13.0	11.8	12.1	12.1	2.14	10.9	1.80	9.7	1.50	8.5	1.23	7.3	0.98	6.1	0.77
11.0	9.8	12.1	12.1	2.22	10.9	1.87	9.7	1.55	8.5	1.27	7.3	1.02	6.1	0.80
9.0	7.9	12.1	12.1	2.30	10.9	1.94	9.7	1.61	8.5	1.32	7.3	1.06	6.1	0.83
7.0	6.0	12.1	12.1	2.38	10.9	2.01	9.7	1.67	8.5	1.37	7.3	1.10	6.1	0.86
5.0	4.1	11.7	11.7	2.34	10.6	1.98	9.4	1.65	8.2	1.35	7.0	1.08	5.9	0.85
3.0	2.2	11.4	11.4	2.31	10.2	1.95	9.1	1.62	8.0	1.33	6.8	1.06	5.7	0.83
0.0	-0.7	10.8	10.8	2.25	9.8	1.90	8.7	1.58	7.6	1.29	6.5	1.04	5.4	0.81
-3.0	-3.7	10.3	10.3	2.20	9.3	1.85	8.2	1.54	7.2	1.26	6.2	1.01	5.1	0.79
-5.0	-5.6	9.9	9.9	2.16	8.9	1.82	7.9	1.51	7.0	1.24	6.0	1.00	5.0	0.78
-7.0	-7.6	9.6	9.6	2.12	8.6	1.79	7.7	1.49	6.7	1.22	5.7	0.98	4.8	0.77
-10.0	-10.5	9.0	9.0	2.07	8.1	1.74	7.2	1.45	6.3	1.19	5.4	0.95	4.5	0.75
-14.5	-15.0	8.2	8.2	1.98	7.4	1.67	6.6	1.39	5.7	1.14	4.9	0.91	4.1	0.72

TC : Total Capacity PI : Power Input

Indoor air temperature conditions : 20.0 °C dry-bulb

All indoor unit operation



### MCY-MUG0501HSW-E (5HP, 14.0kW system)

Cooling		Compressor + Oudoor Fan Power consumption (kW)											
Outdoor Unit	Outdoor Unit	10	0%	90	90%		80%		)%	60%		50	)%
Dry-Bulb (°C)	100% Cooling Capacity (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)
40	13.2	13.2	4.44	11.9	3.59	10.6	2.86	9.2	2.25	7.9	1.75	6.6	1.34
39	13.3	13.3	4.29	12.0	3.46	10.7	2.76	9.3	2.17	8.0	1.69	6.7	1.30
37	13.7	13.7	4.00	12.3	3.23	10.9	2.57	9.6	2.03	8.2	1.58	6.8	1.21
35	14.0	14.0	3.73	12.6	3.01	11.2	2.40	9.8	1.89	8.4	1.47	7.0	1.13
33	14.0	14.0	3.48	12.6	2.80	11.2	2.24	9.8	1.76	8.4	1.37	7.0	1.05
31	14.0	14.0	3.24	12.6	2.61	11.2	2.08	9.8	1.64	8.4	1.28	7.0	0.98
30	14.0	14.0	3.13	12.6	2.52	11.2	2.01	9.8	1.58	8.4	1.23	7.0	0.94
29	14.0	14.0	3.02	12.6	2.44	11.2	1.94	9.8	1.53	8.4	1.19	7.0	0.91
27	14.0	14.0	2.82	12.6	2.27	11.2	1.81	9.8	1.43	8.4	1.11	7.0	0.85
25	14.0	14.0	2.62	12.6	2.12	11.2	1.69	9.8	1.33	8.4	1.03	7.0	0.79
23	14.0	14.0	2.45	12.6	1.97	11.2	1.57	9.8	1.24	8.4	0.96	7.0	0.74
21	14.0	14.0	2.28	12.6	1.84	11.2	1.47	9.8	1.16	8.4	0.90	7.0	0.69
20	14.0	14.0	2.20	12.6	1.78	11.2	1.42	9.8	1.12	8.4	0.87	7.0	0.67
19	14.0	14.0	2.13	12.6	1.72	11.2	1.37	9.8	1.08	8.4	0.84	7.0	0.64
17	14.0	14.0	1.98	12.6	1.60	11.2	1.28	9.8	1.00	8.4	0.78	7.0	0.60
15	14.0	14.0	1.85	12.6	1.49	11.2	1.19	9.8	0.94	8.4	0.73	7.0	0.56

Heating				Compressor + Oudoor Fa					Power consumption (kW)					
Outdo	or Unit	Outdoor Unit	100	0%	90	1%	80	80%		1%	60%		50	1%
Dry-Bulb (°C)	Wet-Bulb (°C)	100% Heating Capacity (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)
15.0	13.7	14.0	14.0	2.55	12.6	2.16	11.2	1.81	9.8	1.49	8.4	1.20	7.0	0.93
13.0	11.8	14.0	14.0	2.65	12.6	2.25	11.2	1.88	9.8	1.55	8.4	1.24	7.0	0.97
11.0	9.8	14.0	14.0	2.75	12.6	2.33	11.2	1.95	9.8	1.61	8.4	1.29	7.0	1.01
9.0	7.9	14.0	14.0	2.85	12.6	2.42	11.2	2.02	9.8	1.66	8.4	1.34	7.0	1.04
7.0	6.0	14.0	14.0	2.95	12.6	2.51	11.2	2.10	9.8	1.72	8.4	1.39	7.0	1.08
5.0	4.1	13.6	13.6	2.91	12.2	2.47	10.9	2.07	9.5	1.70	8.2	1.37	6.8	1.07
3.0	2.2	13.2	13.2	2.86	11.9	2.43	10.5	2.03	9.2	1.67	7.9	1.34	6.6	1.05
0.0	-0.7	12.5	12.5	2.79	11.3	2.37	10.0	1.99	8.8	1.63	7.5	1.31	6.3	1.02
-3.0	-3.7	11.9	11.9	2.72	10.7	2.31	9.5	1.94	8.3	1.59	7.1	1.28	6.0	1.00
-5.0	-5.6	11.5	11.5	2.68	10.3	2.27	9.2	1.90	8.0	1.56	6.9	1.26	5.7	0.98
-7.0	-7.6	11.1	11.1	2.63	10.0	2.23	8.9	1.87	7.8	1.54	6.6	1.24	5.5	0.97
-10.0	-10.5	10.4	10.4	2.56	9.4	2.18	8.3	1.82	7.3	1.50	6.3	1.20	5.2	0.94
-14.5	-15.0	9.5	9.5	2.46	8.5	2.09	7.6	1.75	6.6	1.44	5.7	1.15	4.7	0.90

TC : Total Capacity PI : Power Input

Indoor air temperature conditions : 20.0 °C dry-bulb

All indoor unit operation



### MCY-MUG0601HSW-E (6HP, 15.5kW system)

Cooling		Compressor + Oudoor Fan Power consumption (kW)											
Outdoor Unit	Outdoor Unit	10	0%	90	90%		80%		1%	60%		50	)%
Dry-Bulb (°C)	100% Cooling Capacity (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)
40	14.5	14.5	5.11	13.1	4.17	11.6	3.36	10.2	2.66	8.7	2.08	7.3	1.59
39	14.8	14.8	4.93	13.3	4.03	11.8	3.24	10.3	2.57	8.9	2.00	7.4	1.54
37	15.1	15.1	4.60	13.6	3.76	12.1	3.02	10.6	2.40	9.1	1.87	7.6	1.43
35	15.5	15.5	4.29	14.0	3.50	12.4	2.82	10.9	2.23	9.3	1.74	7.8	1.34
33	15.5	15.5	4.00	14.0	3.27	12.4	2.63	10.9	2.08	9.3	1.62	7.8	1.25
31	15.5	15.5	3.73	14.0	3.04	12.4	2.45	10.9	1.94	9.3	1.51	7.8	1.16
30	15.5	15.5	3.60	14.0	2.94	12.4	2.37	10.9	1.87	9.3	1.46	7.8	1.12
29	15.5	15.5	3.47	14.0	2.84	12.4	2.28	10.9	1.81	9.3	1.41	7.8	1.08
27	15.5	15.5	3.24	14.0	2.65	12.4	2.13	10.9	1.69	9.3	1.32	7.8	1.01
25	15.5	15.5	3.02	14.0	2.47	12.4	1.98	10.9	1.57	9.3	1.23	7.8	0.94
23	15.5	15.5	2.81	14.0	2.30	12.4	1.85	10.9	1.47	9.3	1.14	7.8	0.88
21	15.5	15.5	2.62	14.0	2.14	12.4	1.72	10.9	1.37	9.3	1.07	7.8	0.82
20	15.5	15.5	2.53	14.0	2.07	12.4	1.67	10.9	1.32	9.3	1.03	7.8	0.79
19	15.5	15.5	2.45	14.0	2.00	12.4	1.61	10.9	1.27	9.3	0.99	7.8	0.76
17	15.5	15.5	2.28	14.0	1.86	12.4	1.50	10.9	1.19	9.3	0.93	7.8	0.71
15	15.5	15.5	2.13	14.0	1.74	12.4	1.40	10.9	1.11	9.3	0.86	7.8	0.66

Heating			Compressor + Oudoor Fan Power consumption (kW)											
Outdo	or Unit	Outdoor Unit	100	0%	90	1%	80%		70%		60%		50	1%
Dry-Bulb (°C)	Wet-Bulb (°C)	100% Heating Capacity (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)	TC (kW)	PI (kW)
15.0	13.7	15.5	15.5	2.90	14.0	2.46	12.4	2.05	10.9	1.68	9.3	1.35	7.8	1.05
13.0	11.8	15.5	15.5	3.01	14.0	2.56	12.4	2.13	10.9	1.75	9.3	1.40	7.8	1.09
11.0	9.8	15.5	15.5	3.13	14.0	2.65	12.4	2.21	10.9	1.81	9.3	1.45	7.8	1.13
9.0	7.9	15.5	15.5	3.24	14.0	2.75	12.4	2.29	10.9	1.88	9.3	1.50	7.8	1.17
7.0	6.0	15.5	15.5	3.36	14.0	2.85	12.4	2.38	10.9	1.95	9.3	1.56	7.8	1.21
5.0	4.1	15.0	15.0	3.31	13.5	2.81	12.0	2.34	10.5	1.92	9.0	1.54	7.5	1.19
3.0	2.2	14.6	14.6	3.26	13.1	2.76	11.7	2.31	10.2	1.89	8.8	1.51	7.3	1.18
0.0	-0.7	13.9	13.9	3.18	12.5	2.70	11.1	2.25	9.7	1.84	8.3	1.48	6.9	1.15
-3.0	-3.7	13.2	13.2	3.10	11.9	2.63	10.6	2.19	9.2	1.80	7.9	1.44	6.6	1.12
-5.0	-5.6	12.7	12.7	3.05	11.5	2.58	10.2	2.16	8.9	1.77	7.6	1.41	6.4	1.10
-7.0	-7.6	12.3	12.3	3.00	11.0	2.54	9.8	2.12	8.6	1.74	7.4	1.39	6.1	1.08
-10.0	-10.5	11.6	11.6	2.92	10.4	2.47	9.2	2.06	8.1	1.69	6.9	1.35	5.8	1.05
-14.5	-15.0	10.5	10.5	2.80	9.4	2.37	8.4	1.98	7.3	1.62	6.3	1.30	5.2	1.01

TC : Total Capacity PI : Power Input

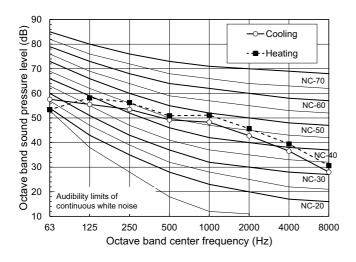
Indoor air temperature conditions : 20.0  $^{\circ}\text{C}$  dry-bulb

All indoor unit operation

### 5-9. Sound pressure level data

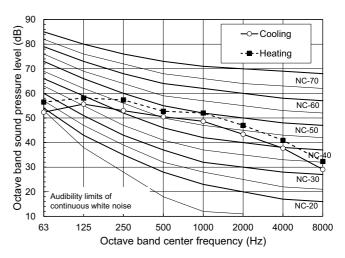
#### MCY-MUG0401HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Sound pressure level (db(A))	52	54



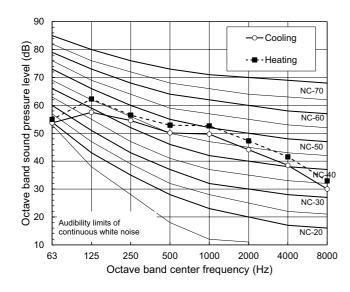
#### MCY-MUG0501HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Souria pressure level (ub(A))	53	55

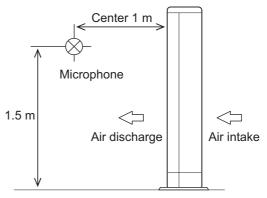


#### MCY-MUG0601HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Sound pressure level (db(A))	54	56



#### [Measuring location]



### [Conditions]

#### Cooling

Outdoor temperature: 35 °C DB, 24 °C WB Indoor air temperature: 27 °C DB, 19 °C WB

#### Heating

Outdoor temperature: 7 °C DB, 6 °C WB Indoor air temperature: 20 °C DB

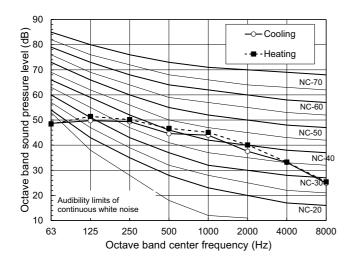
This sound pressure level are measured in an anechoic chamber in accordance.



### Night operation (sound reduction) control 1

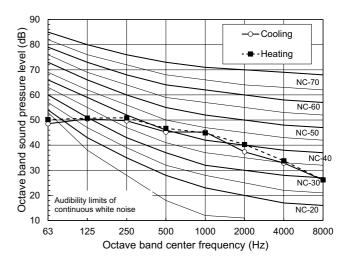
#### MCY-MUG0401HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Sound pressure level (db(A))	50	50



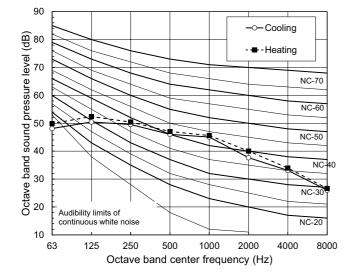
#### MCY-MUG0501HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Sound pressure level (db(A))	50	50



#### MCY-MUG0601HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Sound pressure level (db(A))	50	50

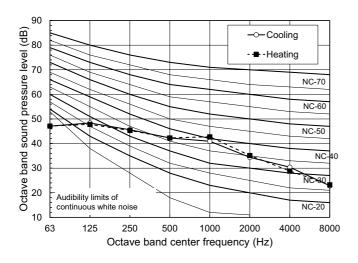




### Night operation (sound reduction) control 2

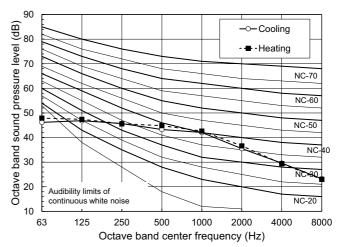
#### MCY-MUG0401HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Souria pressure level (ub(A))	47	47



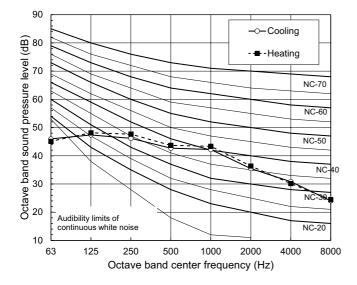
#### MCY-MUG0501HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Sound pressure level (db(A))	47	47



#### MCY-MUG0601HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Sourid pressure level (db(A))	47	47

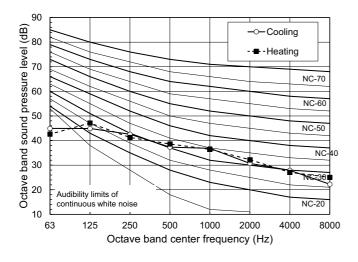




### Night operation (sound reduction) control 3

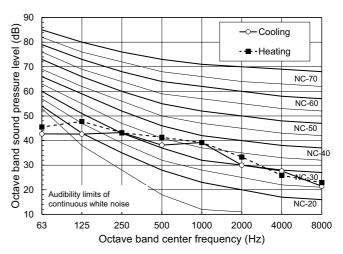
#### MCY-MUG0401HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Souria pressure level (ub(A))	44	44



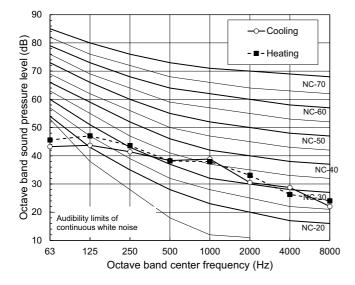
#### MCY-MUG0501HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Sound pressure level (db(A))	44	44



#### MCY-MUG0601HSW-E

Sound pressure level (dB(A))	Cooling	Heating
Sourid pressure level (db(A))	44	44





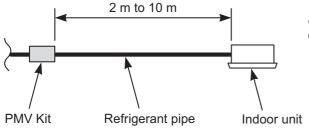
#### 5-10. PMV Kit

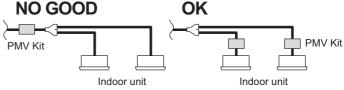
PMV-Kit (RBM-PMV0361U-E, RBM-PMV0901U-E) shall be required for quieter place application as an optional to reduce refrigerant sound especially in oil retrieval control or in transient operation as start up.

#### 5-10-1. Selection

Model name	Indoor unit capacity type	Diameter of refrigerant pipe	
RBM-PMV0361U-E	003 to 014 type	ø6.4	
RBM-PMV0901U-E	015 to 018 type	ø6.4	
KDIVI-FIVIVU9010-E	020 to 034 type	ø9.5	

### Allowable length of refrigerant piping

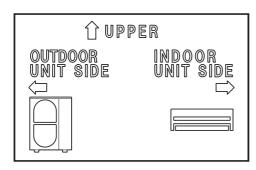




#### Note)

Do not connect two or more indoor units to one PMV Kit. Arrange one indoor unit and one PMV Kit set to 1 by 1.

Label



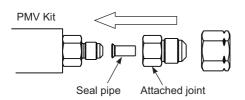
• Connecting direction of refrigerant pipe
When connecting pipes, be careful of direction of the
main unit. Be sure to install the main unit so that
[☆ UPPER] mark in the label directs upward.
For connection of the refrigerant pipes, follow the
arrow mark in the label and connect pipes after
confirming directions of indoor unit and outdoor unit.

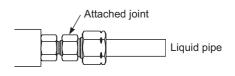
#### Piping material and dimensions

Model name	Indoor unit capacity type	Diameter of refrigerant pipe	Notes
RBM-PMV0361U-E	003 to 014 type	ø6.4	
	015 to 018 type	ø6.4	Attached joint Attached joint
RBM-PMV0901U-E	020 to 034 type	ø9.5	

### **CAUTION**

When connecting ø9.5 refrigerant pipes, be sure to insert a seal pipe between PMV main unit and the joint. If the seal pipe is not inserted, refrigerant leakage is caused.

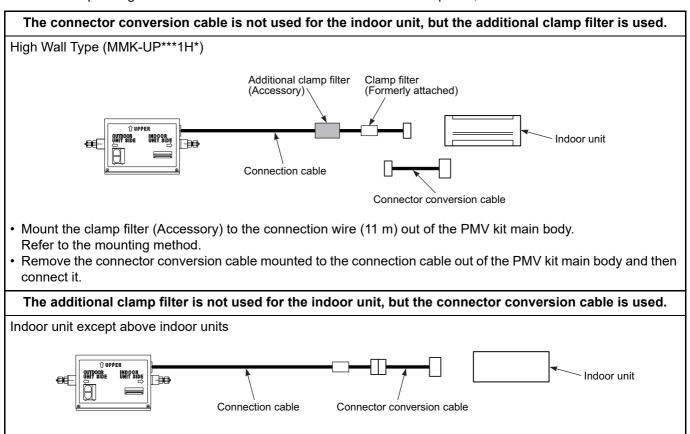




#### 5-10-2. Wiring connections

For this product, the connector conversion cable and additional clamp filter (Accessory) are used according to the indoor unit to be connected.

For the corresponding unit and how to use the conversion cable and clamp filter, refer to the installation manual.

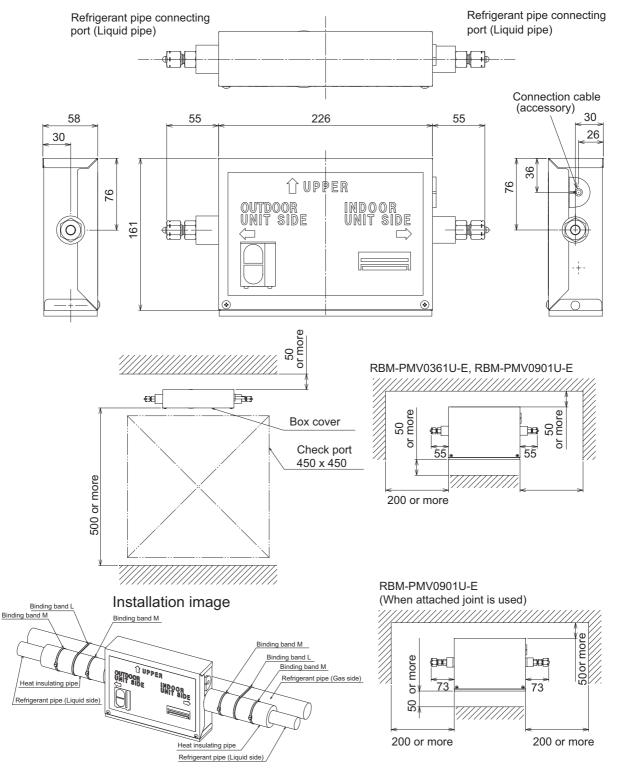




### 5-10-3. Dimensional drawing

PMV Kit

#### RBM-PMV0361U-E, RBM-PMV0901U-E



Note: All dimensions are in mm.



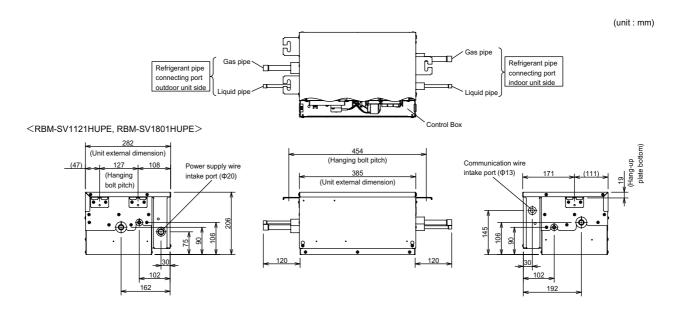
# 5-11. Dimen sional drawing of optional units 5-11-1. SV unit

#### Specifications (Shut-off Valve)

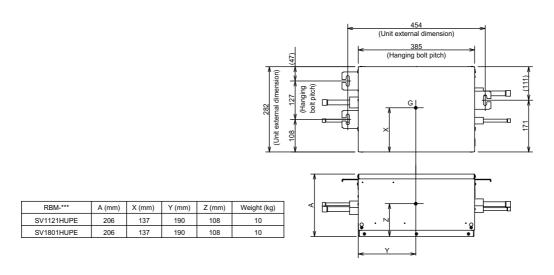
Model Name		RBM-SV1121HUPE	RBM-SV1801HUPE
Power supply		220-240V 1phase 50Hz , 220V 1phase 60Hz	
Connectable indoor unit capacity (HP)		Below 4.0	4.0 to below 6.4
Connectable indoor units		6	10
Dimension	Height (mm)	206	206
	Width (mm)	385	385
	Depth (mm)	282	282
Total Weight (Kg)		10	10
Connecting port dia. (Indoor unit side)	Liquid side (mm)	Ø9.5	Ø9.5
	Gas side (mm)	Ø15.9	Ø15.9
Connecting port dia. (Outdoor unit side)	Liquid side (mm)	Ø9.5	Ø9.5
	Gas side (mm)	Ø15.9	Ø15.9
Connection		Blaze connection	

External view (Shut-off Valve)

#### RBM-SV1121HUPE, RBM-SV1801HUPE

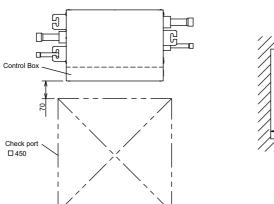


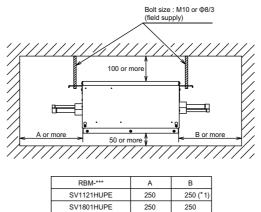
#### Center of gravity (Shut-off Valve)





#### Installation space (Shut-off Valve)





(\*1) In cace of using the attached pipe (accessory) 350mm

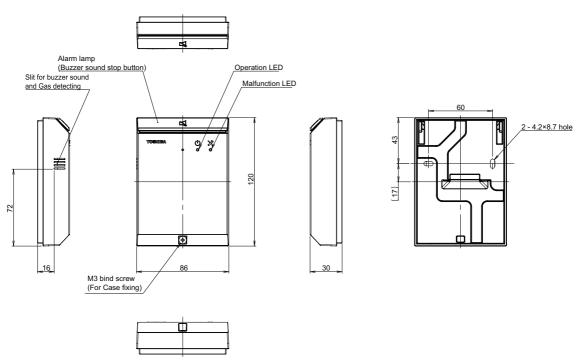
### 5-11-2. Leak detector

#### TCB-LD1UPE

#### External view

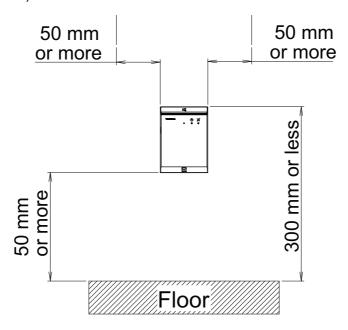
(unit: mm)

(unit:mm)





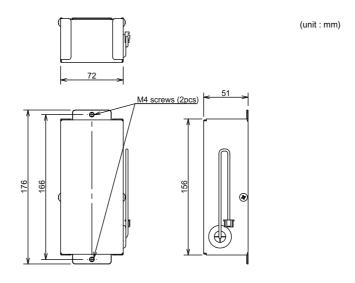
Installation space (Leak detector)



### 5-11-3. Battery kit

TCB-BT1UPE

External view



Installation space (Battery kit)

