



SPLIT-TYPE AIR CONDITIONERS  
Models  
**MS-GA80VB**  
**MSH-GA80VB**  
**MSH-GA60VB**  
[FLARE CONNECTION TYPE]

Series



When installing an MSX series outdoor unit, refer to the MS and MSH type manual for indoor unit set up.

## 1. THE FOLLOWING SHOULD ALWAYS BE OBSERVED FOR SAFETY

- Please provide an exclusive circuit for the air conditioner and do not connect other electrical appliances to it.
- Please report to your supply authority or obtain their consent before connecting this equipment to the power supply system.
- Be sure to read "THE FOLLOWING SHOULD ALWAYS BE OBSERVED FOR SAFETY" before installing the air conditioner.
- Be sure to observe the cautions specified here as they include important items related to safety.
- The indications and meanings are as follows.

### WARNING

Could lead to death, serious injury, etc.

### CAUTION

Could lead to serious injury in particular environments when operated incorrectly

- After reading this manual, be sure to keep it together with the OPERATING INSTRUCTIONS in a handy place on the customer's site.

### WARNING

- Do not install the unit by yourself (customer). Incomplete installation could cause injury due to fire, electric shock, the unit falling or leakage of water. Consult the dealer from whom you purchased the unit or special installer.

- Install the unit securely in a place which can bear the weight of the unit. When installed in an insufficient strong place, the unit could fall causing injury.
- Use the specified wires to connect the indoor and outdoor units securely and attach the wires firmly to the terminal block connecting sections so the stress of the wires is not applied to the sections.

- Incomplete connecting and using could cause fire.

- Do not use intermediate connection of the power cord or the extension cord and do not connect many devices to one AC outlet.

- It could cause a fire or an electric shock due to defective contact, defective insulation, exceeding the permissible current, etc.

- Check that the refrigerant gas does not leak after installation has completed.

- If refrigerant gas leaks indoors, and comes into contact with the fire of a fan heater, space heater, stove, etc., harmful substances will be generated.

- Perform the installation securely referring to the installation manual. Incomplete installation could cause a personal injury due to fire, electric shock, the unit falling or leakage of water, etc.

- Perform electrical work according to the installation manual and be sure to use an exclusive circuit.

- If the capacity of the power circuit is insufficient or there is incomplete electrical work, it could result in a fire or an electric shock.

- Attach the electrical cover to the indoor unit and the service panel to the outdoor unit securely.

- If the electrical cover in the indoor unit and/or the service panel in the outdoor unit are not attached securely, it could result in a fire or an electric shock due to dust, water, etc.

- Be sure to use the part provided or specified parts for the installation work.

- The use of defective parts could cause an injury or leakage of water due to a fire, an electric shock, the unit falling, etc.

- Be sure to cut off the main power in case of setting up the indoor electronic control P.C. board or wiring works.

- It could cause an electric shock.

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

- When installing or relocating the unit, make sure that no substance other than the specified refrigerant (R410A) enters the refrigerant circuit. Any presence of foreign substance such as air can cause abnormal pressure rise or an explosion.

## 3. INSTALLATION DIAGRAM & ACCESSORIES

### FLARED CONNECTIONS

- This unit has flared connections on both indoor and outdoor sides.
- Remove the outdoor units valve cover, then connect the pipe.
- Refrigerant pipes are used to connect the indoor and outdoor units.
- Be careful not to crush or bend the pipe in pipe bending.

Limits	MSH-GA60	MSH-GA80
Pipe length	25 m max.	30 m max.
Height difference	10 m max.	15 m max.
No. of bends	10 max.	

- Refrigerant adjustment... If pipe length exceeds 7 m, additional refrigerant (R410A) charge is required for the length of 7 m.

- (The outdoor unit is charged with refrigerant for pipe length up to 7 m.)

Pipe length	Exceeding 7 m	Additional charge is required. (Refer to the table below.)
Refrigerant to be added	MS-GA80	55 g/m × (refrigerant piping length (m) - 7)
	MSH-GA80	55 g/m × (refrigerant piping length (m) - 7)
	MSH-GA60	20 g/m × (refrigerant piping length (m) - 7)

### ACCESSORIES

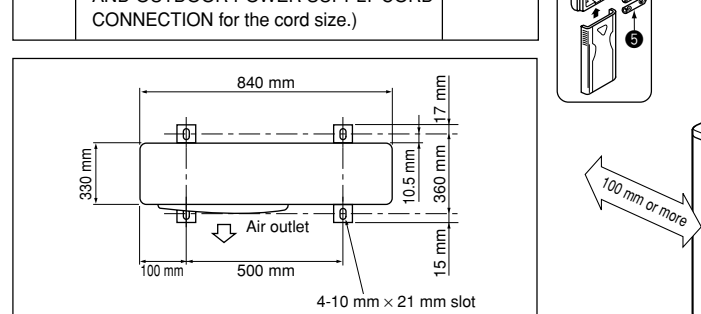
Check the following parts before installation.

Indoor units	
● Installation plate	1
● Installation plate fixing screw 4 × 25 mm	7
● Remote controller holder	1
● Fixing screw for 3.5 × 16 mm (Black)	2
● Battery (AAA) for remote controller	2
● Wireless remote controller	1
● Felt tape (Used for left or left-rear piping)	1

Outdoor unit: MUH type	
● Drain socket	1
● Drain cap #33	2

### PART TO BE PROVIDED AT YOUR SITE

Optional extension pipe	
● Indoor/outdoor unit connecting wire (2-core 1.0 mm <sup>2</sup> -2.0 mm <sup>2</sup> )	1
● Extension pipe	1
● Wall hole sleeve	1
● Wall hole cover	1
● Pipe fixing band (The quantity depends on the pipe length)	2 to 5
● Fixing screw for 3.5 × 20 mm (The quantity depends on the pipe length)	2 to 5
● Piping tape	1
● Putty	1
● Drain hose (or soft PVC, hose, 15 mm inner dia. or hard PVC pipe VP16)	1
● Refrigeration oil	1
● Power supply cord (See the table 5 INDOOR/OUTDOOR WIRE CONNECTION AND OUTDOOR POWER SUPPLY CORD CONNECTION for the cord size.)	1



Note: When operating the air conditioner in low outside temperature, be sure to follow the instructions described below.

- Never install the outdoor unit in a place where its air inlet/outlet side may be exposed directly to wind.
- To prevent exposure to wind, install the outdoor unit with its air inlet side facing the wall.
- To prevent exposure to wind, it is recommended to install a baffle board on the air outlet side of the outdoor unit.

### CAUTION

- Earth the unit.

- Do not connect the earth to a gas pipe, water pipe, lightning rod or telephone earth. Defective earthing could cause an electric shock.

- Do not install the unit in a place where an inflammable gas leaks.

- If an explosion and accumulation in the area surrounding the unit, it could cause an explosion.

- Install an earth leakage breaker depending on the installation place (Where it is built).

- If an earth leakage breaker is not installed, it could cause an electric shock.

- Perform the drainage/piping work securely according to the installation manual.

- If there is a defect in the drainage-piping work, water could drop from the unit and household goods could be wet and damaged.

- Fasten a flare nut with a torque wrench as specified in this manual.

- When fastened too tight, a flare nut may broken after a long period and cause a leakage of refrigerant.

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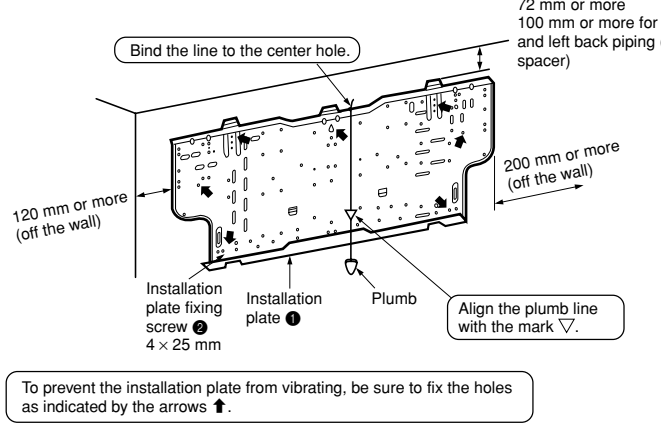
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## 4. INDOOR UNIT INSTALLATION

### 4-1 FIXING OF INSTALLATION PLATE

- Find a structural material (such as a stud) in the wall and fix installation plate horizontally.



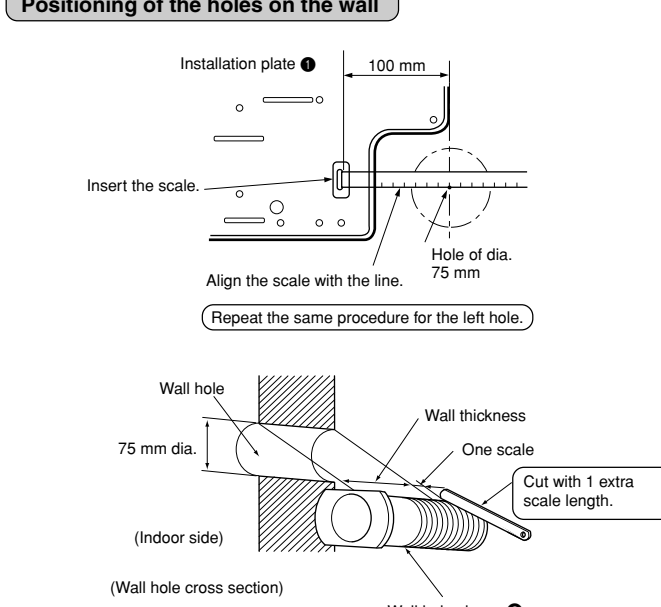
When bolts recessed in the concrete wall are to be utilized, secure the installation plate using 11 × 20 × 11 × 25 oval hole (450 mm pitch).

If the recessed bolt is too long, change it for a shorter one available in the market.

### 4-2 WALL HOLE DRILLING

- Determine the wall hole position.
- Drill a 75 mm hole to that outside can be lower than inside.
- Insert the wall hole sleeve.

### Positioning of the holes on the wall



Be sure to use wall hole sleeve to prevent the outdoor connecting wires from contacting with metal part in the wall and to prevent damage by rat in case the wall is hollow.

It is advisable to make a piping loop near outdoor unit so as to reduce vibration transmitted from there.

CAUTION

- Avoid the following places for installation where air conditioner trouble is liable to occur.

- Where flammable gas could leak.
- Where there is much machine oil.
- Salty places such as the seaside.
- Where sulfide gas is generated such as a hot spring.
- Where there is high-frequency or wireless equipment.

2-2 OUTDOOR UNIT

- Where it is not exposed to strong wind.
- Where airflow is good and dustless.
- Where it is not exposed to rain and direct sunshine.
- Where neighbours are not annoyed by operation sound or hot air.
- Where rigid wall or support is available to prevent the increase of operation sound or vibration.
- Where there is no risk of combustible gas leakage.
- Where it is at least 1 m or more away from your TV and radio. Operation of the air conditioner interferes with radio or TV reception in areas where reception is weak. An amplifier may be required for the affected device.
- Where it is at least 3 m away from the antenna of TV set or radio. Operation of the air conditioner interferes with radio or TV reception in areas where reception is weak. An amplifier may be required for the affected device.
- Please install it in an area not affected by snowfall or blowing snow. In areas with heavy snow, please install a canopy, a pedestal and other space baffle boards.

Note: It is advisable to make a piping loop near outdoor unit so as to reduce vibration transmitted from there.

CAUTION

- Place of mounting.
- Where it is easy to operate and easily visible.
- Where children can not touch.

- Mounting.

- Select a position about 1.2 m above the floor, check that signals from the remote controller are surely received by the indoor unit from that position (bump or beep receiving tone sounds). After that, attach remote controller holder to a pillar and wall and the wireless remote controller.

- In rooms where inverter type fluorescent lamps are used, the signal from the wireless remote controller may not be received.

## 4-3 CONNECTING WIRE SPECIFICATIONS

- Use special room air conditioning circuit.

Power supply cord length (Lead to left/Lead to right)	1 m 2 m
Indoor/outdoor unit connecting wire Specification	Table 2-core 1.0 mm <sup>2</sup> , in conformity with Design 245 IEC 57.
Power supply cord	Green/Yellow: Ground Blue: N Brown: L

- Take out power supply cord from the left or right bottom corner of the indoor unit.

- Connect to the power switch which has a gap of 3 mm or more when open to interrupt the source power phase. (When the power switch is shut off, it must interrupt all phases.)

- When the power switch is shut off, it must interrupt all phases. (Rated Voltage/Frequency: 230 V/50 Hz) (Input capacity Main switch/Fuse: 10 A) (This plug has to be the one meets the Standards.)

- Replace the fuse and electrical cover securely.

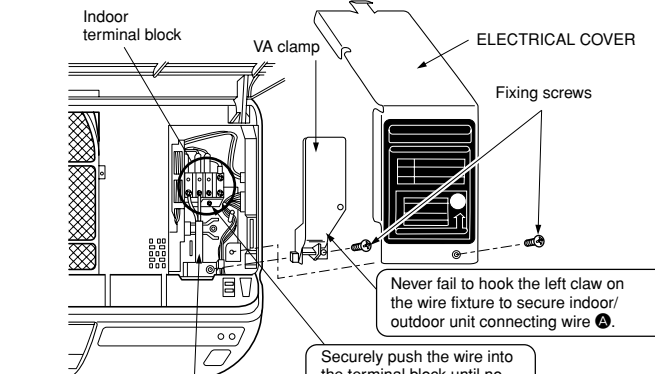
- Never cut the indoor and outdoor unit connecting wire and connect it to other wires. It may cause a fire.

- Do not bundle the spare wire, but put it as shown below.

4-4 INDOOR AND OUTDOOR CONNECTING WIRE CONNECTION

- You can connect indoor/outdoor lead wire without removing the front panel.

- Open the front panel.
- Remove one screw holding the electrical cover, then remove the cover.
- Remove the VA clamp and the cord clamp.
- Pass the indoor/outdoor unit connecting wire from the back of the indoor unit and process the end of the wire, then connect it to the terminal block.
- Replace the fuse and electrical cover securely.



Indoor/outdoor unit connecting wire

- Use the indoor/outdoor unit connecting wire that meets the Standards to connect the indoor and outdoor units and fix the wire to the terminal block securely so that no external force is conveyed to the connecting section of the terminal block.

- Incomplete connection or fraying of the wire could result in a fire.

- Attach the electrical cover securely. If it is attached incorrectly, it could result in a fire or an electric shock due to dust, water, etc.

MS Type and MSH Type

- Loosen terminal screw.
- Indoor terminal block
- Indoor/outdoor unit connecting wire 2-core 1.0 mm<sup>2</sup>
- Outdoor terminal block
- Lead wire

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