MITSUBISHI ELECTRIC

Changes for the Better

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

2024

R454B

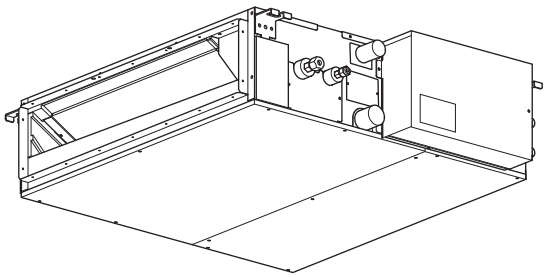
SERVICE MANUAL

Series SEZ Ceiling Concealed

Model name

<Indoor unit>

SEZ-AD09NL
SEZ-AD12NL
SEZ-AD15NL
SEZ-AD18NL



INDOOR UNIT

CONTENTS

1. SAFETY PRECAUTION

MEANINGS OF SYMBOLS DISPLAYED ON THE UNIT

 Refrigerant Safety Group A2L	**WARNING** (Risk of fire)	This unit uses 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.
	Read the OPERATION MANUAL carefully before operation.	
	Service personnel are required to carefully read the OPERATION MANUAL and INSTALLATION MANUAL before operation.	
	Further information is available in the OPERATION MANUAL, INSTALLATION MANUAL, and the like.	

1-1. ALWAYS OBSERVE FOR SAFETY

Before obtaining access to terminal, all supply circuits must be disconnected.

1-2. CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R454B

Do not use the existing refrigerant piping.

The old refrigerant and lubricant in the existing piping contains a large amount of chlorine which may cause the lubricant deterioration of the new unit.

Make sure that the inside and outside of refrigerant piping is clean and it has no contaminants such as sulfur, oxides, dirt, shaving particles, etc., which are hazard to refrigerant cycle. In addition, use pipes with specified thickness.

Contamination inside refrigerant piping can cause deterioration of refrigerant oil, etc.

Store the piping indoors, and keep both ends of the piping sealed until just before brazing. (Leave elbow joints, etc. in their packaging.)

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

The refrigerant oil applied to flare and flange connections must be ester oil, ether oil or alkylbenzene oil in a small amount.

If large amount of mineral oil enters, that can cause deterioration of refrigerant oil, etc.

Charge refrigerant from liquid phase of gas cylinder.

If the refrigerant is charged from gas phase, composition change may occur in refrigerant and the efficiency will be lowered.

Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.

Use a vacuum pump with a reverse flow check valve.

Vacuum pump oil may flow back into refrigerant cycle and that can cause deterioration of refrigerant oil, etc.

Use the following tools specifically designed for use with R454B refrigerant.

The following tools are necessary to use R454B refrigerant.

Tools for R454B	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

Handle tools with care.

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of refrigerant will change and the efficiency will be lowered.

Use the specified refrigerant only.

Never use any refrigerant other than that specified.
Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of.
Correct refrigerant is specified on name plate of outdoor unit.
If other refrigerant (R22, etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil, etc.
We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

<1> Warning for service

(1) **Do not alter the unit.**

(2) **For installation and relocation work, follow the instructions in the Installation Manual and use tools and pipe components specifically made for use with refrigerant specified in the outdoor unit installation manual.**

(3) **Ask a dealer or an authorized technician to install, relocate and repair the unit.**

(4) **This unit should be installed in rooms which exceed the floor space specified in outdoor unit installation manual. Refer to outdoor unit installation manual.**

(5) **Install the indoor unit at least 2.5 m above floor or grade level.**

(6) **All field joints shall be accessible for inspection prior to being covered or enclosed.**

(7) **If the air conditioner is installed in a small room or closed room, measures must be taken to prevent the refrigerant concentration in the room from exceeding the safety limit in the event of refrigerant leakage. Should the refrigerant leak and cause the concentration limit to be exceeded, hazards due to lack of oxygen in the room may result.**

(8) **Keep gas-burning appliances, electric heaters, and other fire sources (ignition sources) away from the location where installation, repair, and other air conditioner work will be performed.**
If refrigerant comes into contact with a flame, poisonous gases will be released.

(9) **When installing or relocating, or servicing the air conditioner, use only the specified refrigerant written on outdoor unit to charge the refrigerant lines.**
Do not mix it with any other refrigerant and do not allow air to remain in the lines.
If air is mixed with the refrigerant, then it can be the cause of abnormal high pressure in the refrigerant line, and may result in an explosion and other hazards.

(10) **After installation has been completed, check for refrigerant leaks. If refrigerant leaks into the room and comes into contact with the flame of a heater or portable cooking range, poisonous gases will be released.**

(11) **When a FLAMMABLE REFRIGERANT is used, alloys used indoors to join refrigerant containing connections shall have a melting point (liquidus temperature) greater than 427°C [801°F].**

(12) **When performing brazing work, be sure to ventilate the room sufficiently. Make sure that there are no hazardous or flammable materials nearby.**
When performing the work in a closed room, small room, or similar location, make sure that there are no refrigerant leaks before performing the work.
If refrigerant leaks and accumulates, it may ignite or poisonous gases may be released.

(13) **Do not install the unit in places where refrigerant may build-up or places with poor ventilation such as a semibasement or a sunken place in outdoor: Refrigerant is heavier than air, and inclined to fall away from the leak source.**

(14) **Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.**

(15) **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).**

(16) **Do not pierce or burn.**

(17) **Be aware that refrigerants may not contain an odour.**

(18) **Pipe-work shall be protected from physical damage.**

(19) **The installation of pipe-work shall be kept to a minimum.**

(20) **Compliance with national gas regulations shall be observed.**

(21) **Keep any required ventilation openings clear of obstruction.**

(22) **Servicing shall be performed only as recommended by the manufacturer.**

(23) **The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.**

(24) **Maintenance, service and repair operations shall be performed by authorized technician with required qualification.**

<2> Cautions for service

(1) **Perform service after recovering the refrigerant left in unit completely.**

(2) **Do not release refrigerant in the air.**

(3) **After completing service, charge the cycle with specified amount of refrigerant.**

(4) **When performing service, install a filter drier simultaneously.**
Be sure to use a filter drier for new refrigerant.

<3> Additional refrigerant charge

When charging directly from cylinder

- Check that cylinder for R454B on the market is syphon type.
- Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)

<4> Cautions for unit using R454B refrigerant

Basic work procedures are the same as those for conventional units using refrigerant R410A. However, pay careful attention to the following points.

(1) Information on servicing

(1-1) Checks to the area

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized.

For repair to the REFRIGERATING SYSTEM, (1-2) to (1-6) shall be completed prior to conducting work on the system.

(1-2) 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.

(1-3) 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.

(1-4) 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 toxic or 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.

(1-5) Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand.

Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

(1-6) No ignition sources

No person carrying out work in relation to a REFRIGERATING 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.

(1-7) 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.

(1-8) Checks to the refrigerating equipment

Where electrical components are being changed, they 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 actual REFRIGERANT CHARGE 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.
- marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
- refrigerating 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.

(1-9) 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: this shall be done in a safe manner to avoid possibility of sparking.
- that no live electrical components and wiring are exposed while charging, recovering or purging the system.
- that there is continuity of earth bonding.

(2) Repairs to sealed components

Sealed electrical components shall be replaced.

(3) Repair to intrinsically safe components

Intrinsically safe components must be replaced.

(4) Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.

The check shall also take into account the effects of aging or continual vibration from sources such as compressors

or fans.

(5) 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.

The following leak detection methods are deemed acceptable for all refrigerant systems.

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 the copper pipe-work.

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. Removal of refrigerant shall be according to (6).

(6) Removal and evacuation

When breaking into the refrigerant circuit to make repairs - or for any other purpose -conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration.

The following procedure shall be adhered to:

- safely remove refrigerant following local and national regulations;
- evacuate
- purge the circuit with inert gas
- evacuate
- continuously flush or purge with inert gas when using flame to open circuit
- open the circuit

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes.

For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times.

Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen 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 oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

(7) 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 in an appropriate position according to the instructions.
- Ensure that the REFRIGERATING 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 REFRIGERATING 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.

(8) Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. 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 prior to re-use of recovered 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 recovery takes place.
g) Start the recovery machine and operate in accordance with 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 REFRIGERATING SYSTEM unless it has been cleaned and checked.

(9) Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant.

The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there

are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

(10) 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 is 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 the flammable refrigerant.

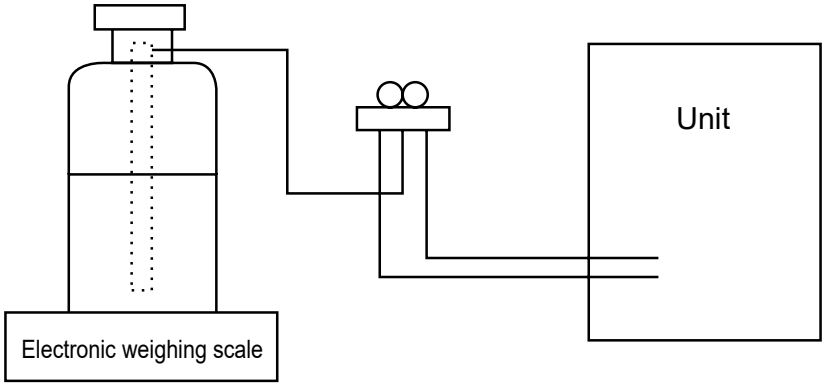
If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation 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 compressor body shall not be heated by an open flame or other ignition sources to accelerate this process.

When oil is drained from a system, it shall be carried out safely.



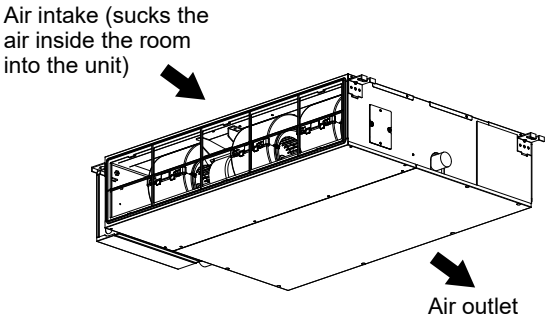
<5> Service tools

Use the below service tools as exclusive tools for R454B refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	· Only for R454B
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 768.7 PSIG [5.3 MPa.G] or over.
②	Charge hose	· Only for R454B
		· Use pressure performance of 738.2 PSIG [5.09 MPa.G] or over.
③	Electronic weighing scale	—
④	Gas leak detector	· Use the detector for R454B.
⑤	Adaptor for reverse flow check	· Attach on vacuum pump.
⑥	Refrigerant charge base	—
⑦	Refrigerant cylinder	· Only for R454B · Cylinder with syphon
⑧	Refrigerant recovery equipment	—

2. PART NAMES AND FUNCTIONS

• Indoor Unit



3. SPECIFICATION

INDOOR UNIT	Service Ref.				**SEZ-AD09NL**
	Power supply (phase, cycle, voltage)				1 phase, 60Hz, 208/230V
		Max. Fuse Size		A	15
		Min. Circuit Ampacity		A	0.95
	External finish				Galvanized sheets
	Heat exchanger				Plate fin coil
	Fan	Fan (drive) × No.			Sirocco fan × 2
		Fan motor output		kW	0.096
		Fan motor		F.L.A	0.76
		Airflow (Low Middle High)		m^3/min (CFM)	5.5-7.0-9.0 (194-247-317)
		External static pressure		Pa (in.WG)	5-15-35-50 (0.02-0.06-0.14-0.20)
	Operation control & Thermostat				Remote controller & built-in
	Sound pressure level (Low Middle High)		5Pa (0.02 in.WG)	dB (A)	22-25-29
			15Pa (0.06 in.WG)		23-26-30
			35Pa (0.14 in.WG)		24-28-31
			50Pa (0.20 in.WG)		25-29-33
	Field drain pipe O.D			mm (in.)	32 (1-1/4)
	Dimensions		W	mm (in.)	790 (31-1/8)
			D	mm (in.)	700 (27-9/16)
			H	mm (in.)	200 (7-7/8)
	Weight			kg (lbs)	19 (42)

INDOOR UNIT	Service Ref.				**SEZ-AD12NL**
	Power supply (phase, cycle, voltage)				1 phase, 60Hz, 208/230V
		Max. Fuse Size		A	15
		Min. Circuit Ampacity		A	1.05
	External finish				Galvanized sheets
	Heat exchanger				Plate fin coil
	Fan	Fan (drive) × No.			Sirocco fan × 2
		Fan motor output		kW	0.096
		Fan motor		F.L.A	0.84
		Airflow (Low Middle High)		m^3/min (CFM)	7.0-9.0-11.0 (247-317-388)
		External static pressure		Pa (in.WG)	5-15-35-50 (0.02-0.06-0.14-0.20)
	Operation control & Thermostat				Remote controller & built-in
	Sound pressure level (Low Middle High)		5Pa (0.02 in.WG)	dB (A)	23-28-33
			15Pa (0.06 in.WG)		23-28-33
			35Pa (0.14 in.WG)		24-29-34
			50Pa (0.20 in.WG)		25-31-35
	Field drain pipe O.D			mm (in.)	32 (1-1/4)
	Dimensions		W	mm (in.)	990 (39-1/16)
			D	mm (in.)	700 (27-9/16)
			H	mm (in.)	200 (7-7/8)
	Weight			kg (lbs)	22.5 (50)

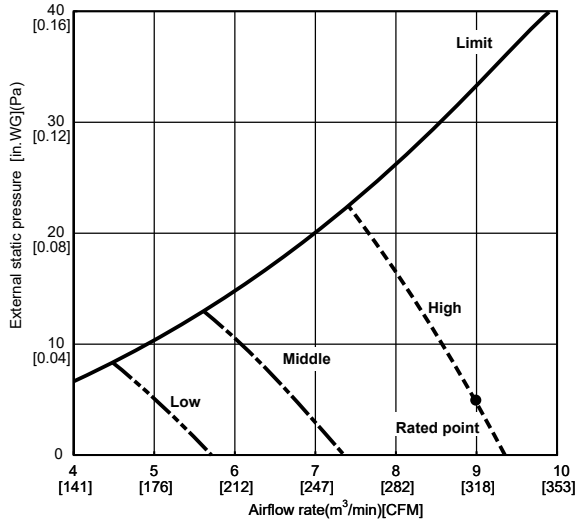
INDOOR UNIT	Service Ref.				**SEZ-AD15NL**
	Power supply (phase, cycle, voltage)				1 phase, 60Hz, 208/230V
		Max. Fuse Size		A	15
		Min. Circuit Ampacity		A	1.35
	External finish				Galvanized sheets
	Heat exchanger				Plate fin coil
	Fan	Fan (drive) × No.			Sirocco fan × 3
		Fan motor output		kW	0.096
		Fan motor		F.L.A	1.08
		Airflow (Low Middle High)		m^3/min (CFM)	10.0-12.5-15.0 (353-441-529)
		External static pressure		Pa (in.WG)	5-15-35-50 (0.02-0.06-0.14-0.20)
	Operation control & Thermostat				Remote controller & built-in
	Sound pressure level (Low Middle High)		5Pa (0.02 in.WG)	dB (A)	29-33-36
			15Pa (0.06 in.WG)		30-34-37
			35Pa (0.14 in.WG)		31-35-38
			50Pa (0.20 in.WG)		32-36-39
	Field drain pipe O.D			mm (in.)	32 (1-1/4)
	Dimensions		W	mm (in.)	990 (39-1/16)
			D	mm (in.)	700 (27-9/16)
			H	mm (in.)	200 (7-7/8)
	Weight			kg (lbs)	23.5 (52)

INDOOR UNIT	Service Ref.				**SEZ-AD18NL**
	Power supply (phase, cycle, voltage)				1 phase, 60Hz, 208/230V
		Max. Fuse Size		A	15
		Min. Circuit Ampacity		A	1.38
	External finish				Galvanized sheets
	Heat exchanger				Plate fin coil
	Fan	Fan (drive) × No.			Sirocco fan × 4
		Fan motor output		kW	0.096
		Fan motor		F.L.A	1.10
		Airflow (Low Middle High)		m^3/min (CFM)	12.0-15.0-18.0 (423-529-635)
		External static pressure		Pa (in.WG)	5-15-35-50 (0.02-0.06-0.14-0.20)
	Operation control & Thermostat				Remote controller & built-in
	Sound pressure level (Low Middle High)		5Pa (0.02 in.WG)	dB (A)	29-33-37
			15Pa (0.06 in.WG)		30-34-38
			35Pa (0.14 in.WG)		31-35-39
			50Pa (0.20 in.WG)		32-36-40
	Field drain pipe O.D			mm (in.)	32 (1-1/4)
	Dimensions		W	mm (in.)	1190 (46-7/8)
			D	mm (in.)	700 (27-9/16)
			H	mm (in.)	200 (7-7/8)
	Weight			kg (lbs)	27 (60)

4. FAN PERFORMANCE AND CORRECTED AIR FLOW

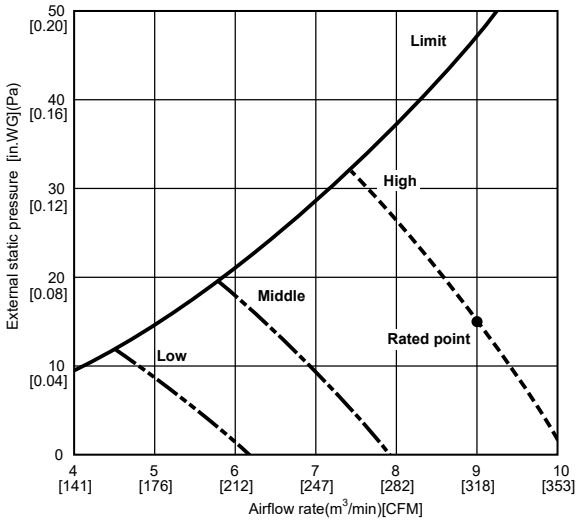
SEZ-AD09NL

(External static pressure 0.02[in.WG](5Pa)) 208/230V 60Hz



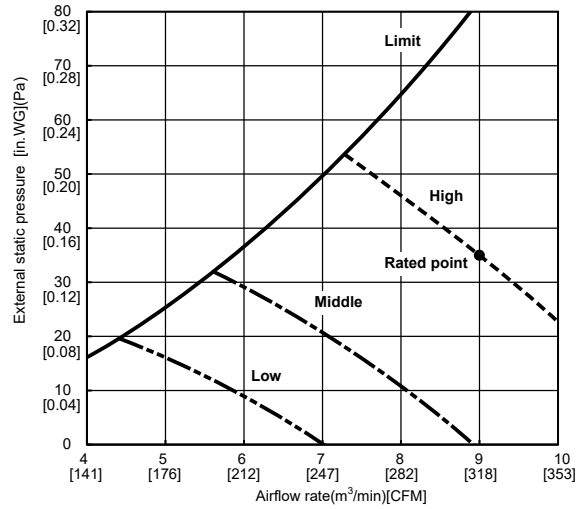
SEZ-AD09NL

(External static pressure 0.06[in.WG](15Pa)) 208/230V 60Hz



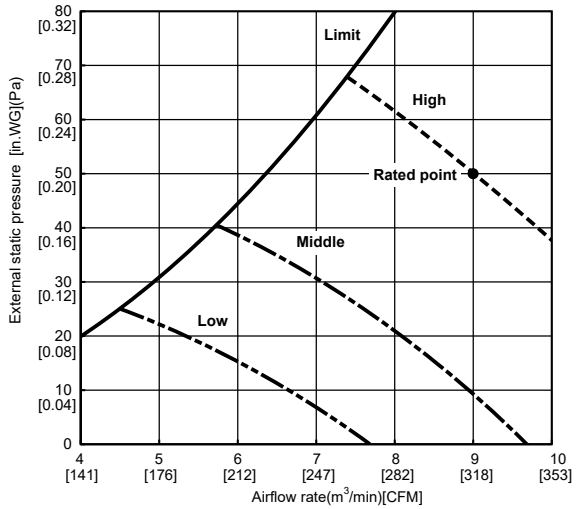
SEZ-AD09NL

(External static pressure 0.14[in.WG](35Pa)) 208/230V 60Hz



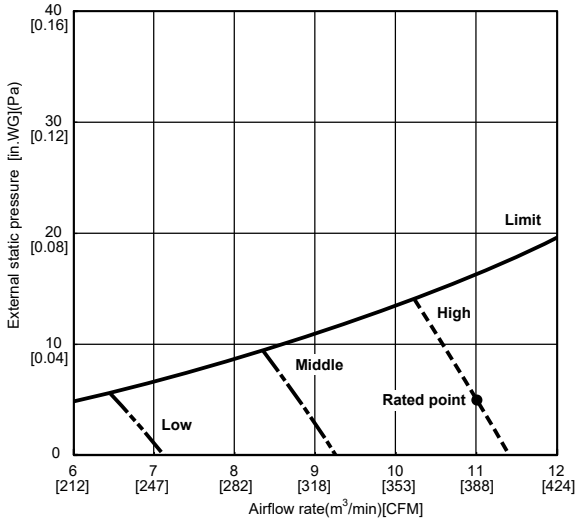
SEZ-AD09NL

(External static pressure 0.20[in.WG](50Pa)) 208/230V 60Hz



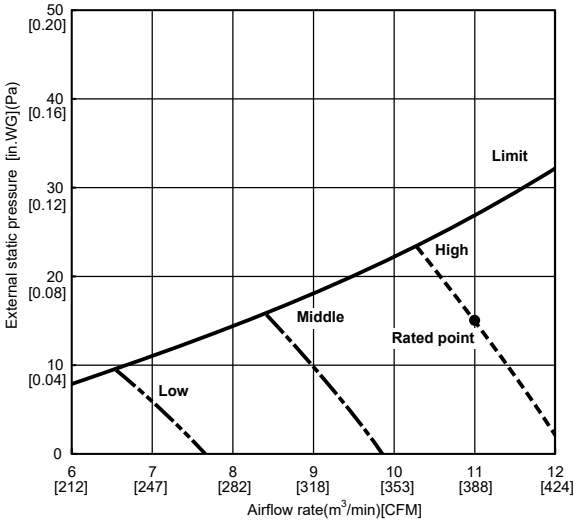
SEZ-AD12NL

(External static pressure 0.02[in.WG](5Pa)) 208/230V 60Hz



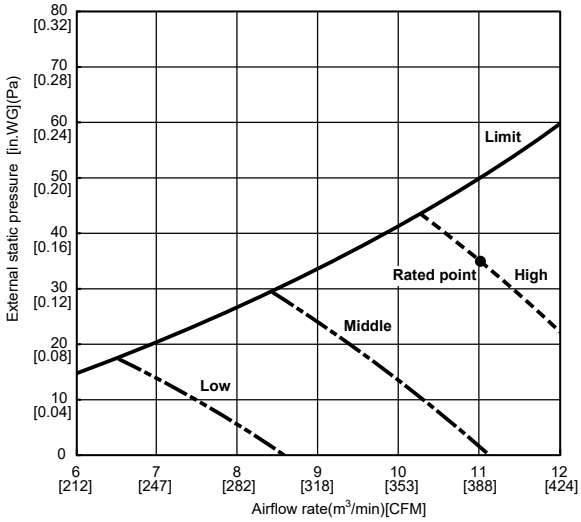
SEZ-AD12NL

(External static pressure 0.06[in.WG](15Pa)) 208/230V 60Hz



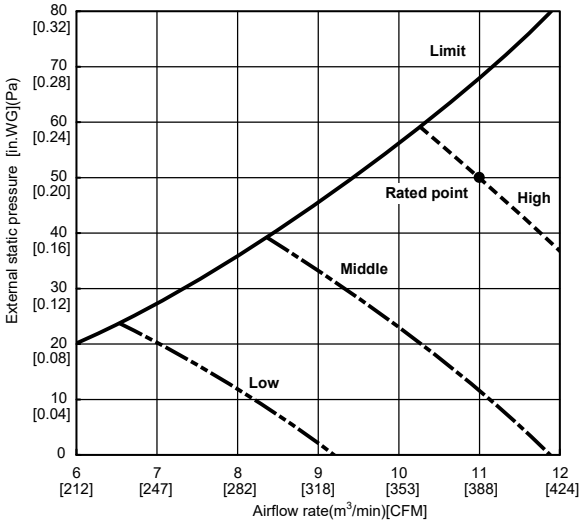
SEZ-AD12NL

(External static pressure 0.14[in.WG](35Pa)) 208/230V 60Hz



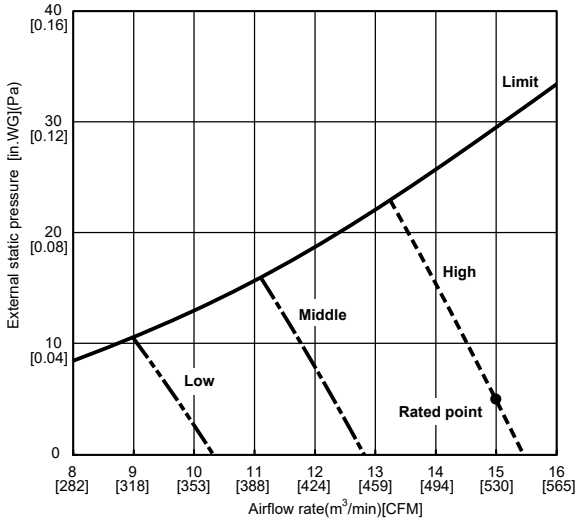
SEZ-AD12NL

(External static pressure 0.20[in.WG](50Pa)) 208/230V 60Hz



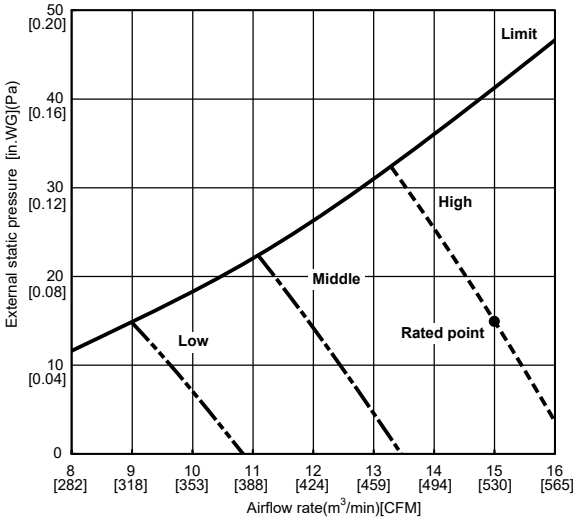
SEZ-AD15NL

(External static pressure 0.02[in.WG](5Pa)) 208/230V 60Hz



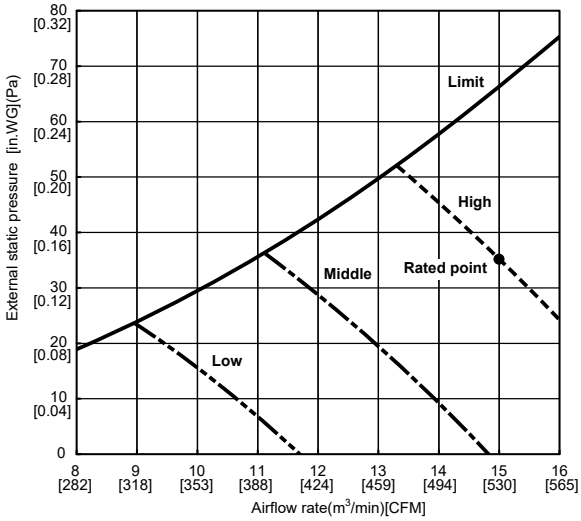
SEZ-AD15NL

(External static pressure 0.06[in.WG](15Pa)) 208/230V 60Hz



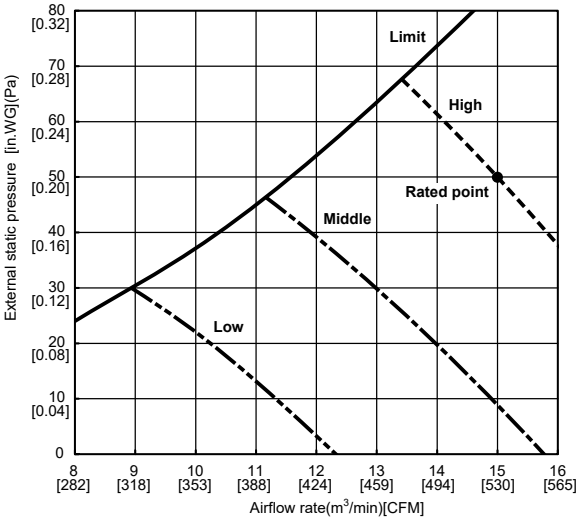
SEZ-AD15NL

(External static pressure 0.14[in.WG](35Pa)) 208/230V 60Hz



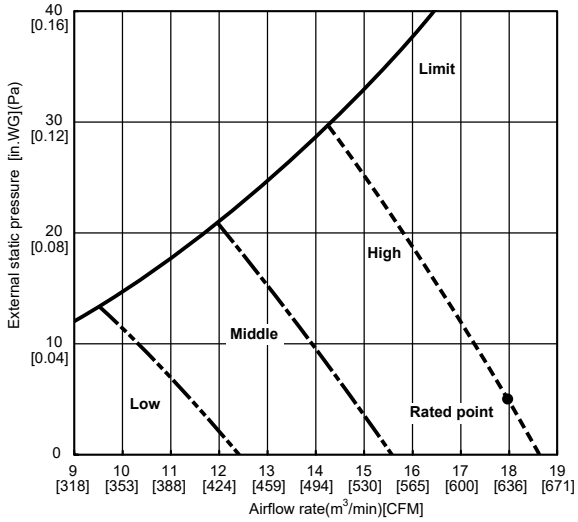
SEZ-AD15NL

(External static pressure 0.20[in.WG](50Pa)) 208/230V 60Hz



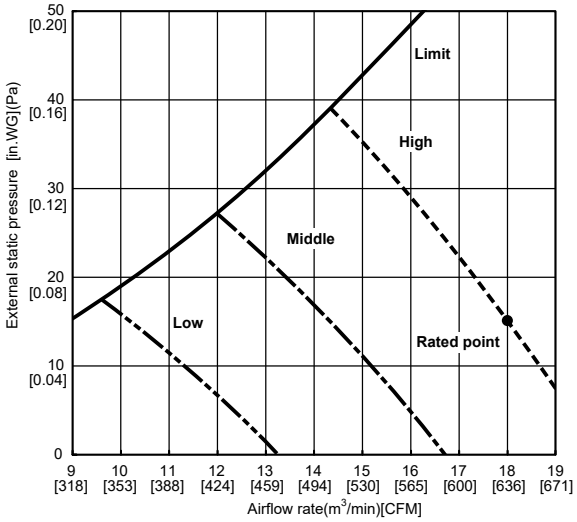
SEZ-AD18NL

(External static pressure 0.02[in.WG](5Pa)) 208/230V 60Hz



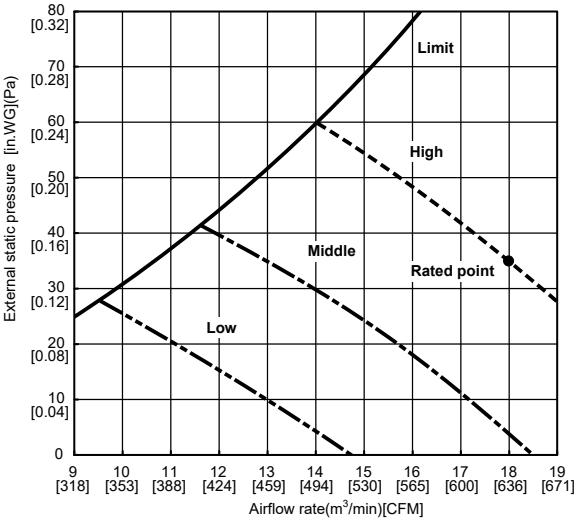
SEZ-AD18NL

(External static pressure 0.06[in.WG](15Pa)) 208/230V 60Hz



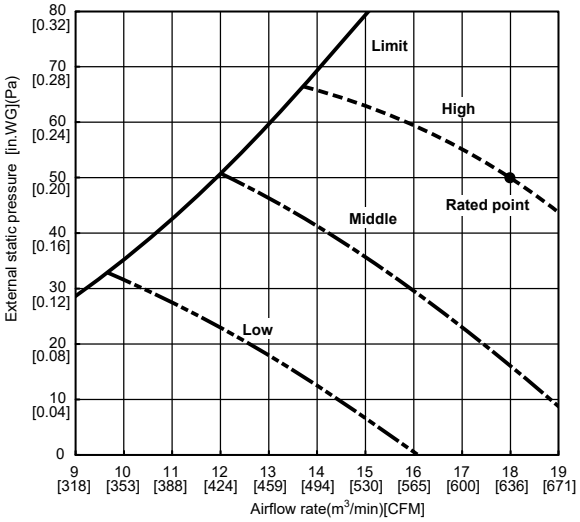
SEZ-AD18NL

(External static pressure 0.14[in.WG](35Pa)) 208/230V 60Hz



SEZ-AD18NL

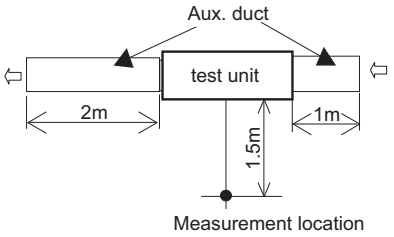
(External static pressure 0.20[in.WG](50Pa)) 208/230V 60Hz



5. SOUND PRESSURE LEVELS

5-1. Sound pressure level

Ceiling concealed

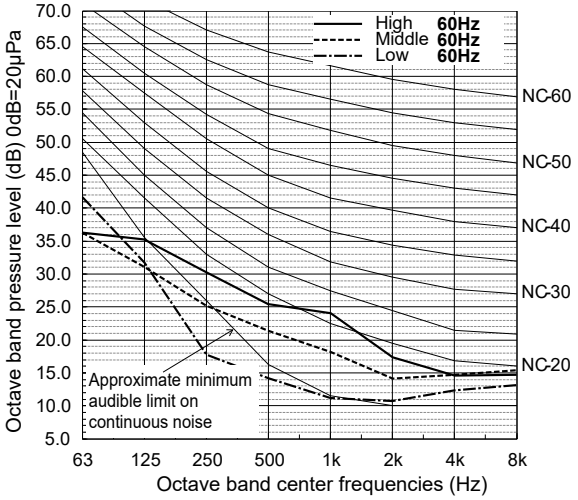


5-2. NC curves

SEZ-AD09NL

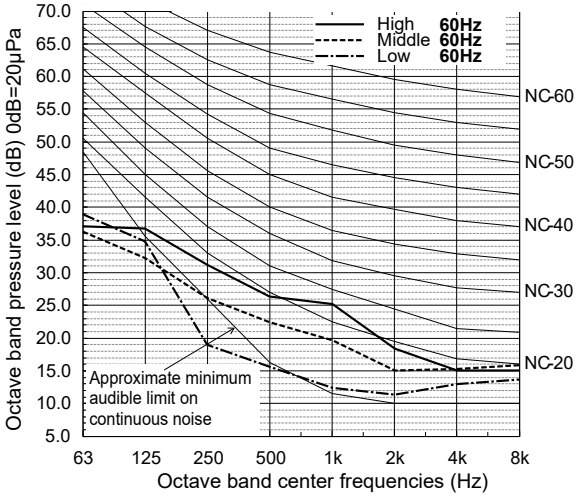
External Static Pressure: 5Pa [0.02in.WG]

Power Source: 208-230V



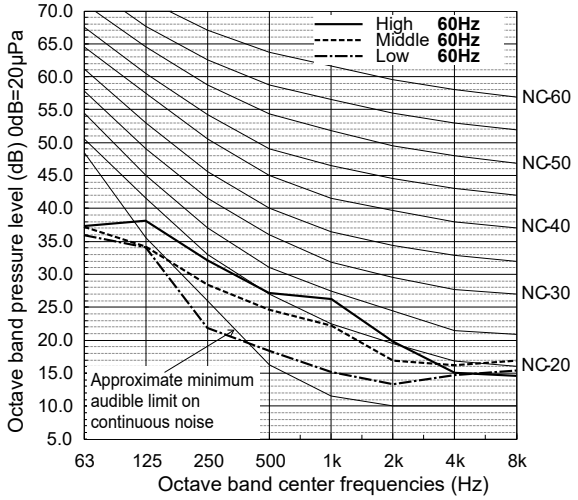
External Static Pressure: 15Pa [0.06in.WG]

Power Source: 208-230V



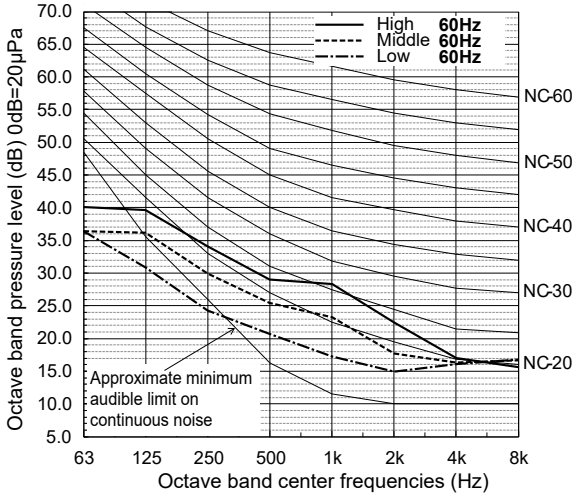
External Static Pressure: 35Pa [0.14in.WG]

Power Source: 208-230V



External Static Pressure: 50Pa [0.20in.WG]

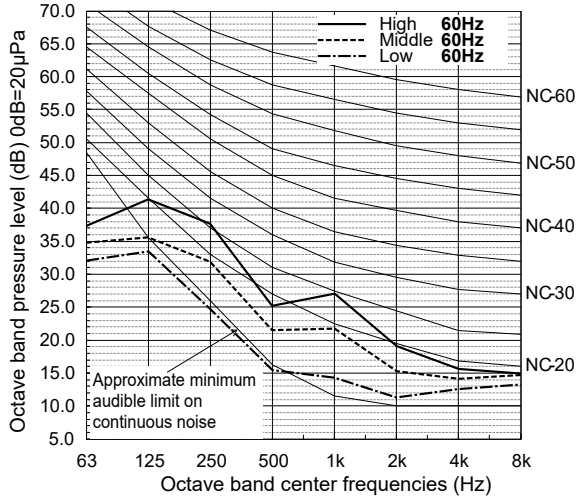
Power Source: 208-230V



SEZ-AD12NL

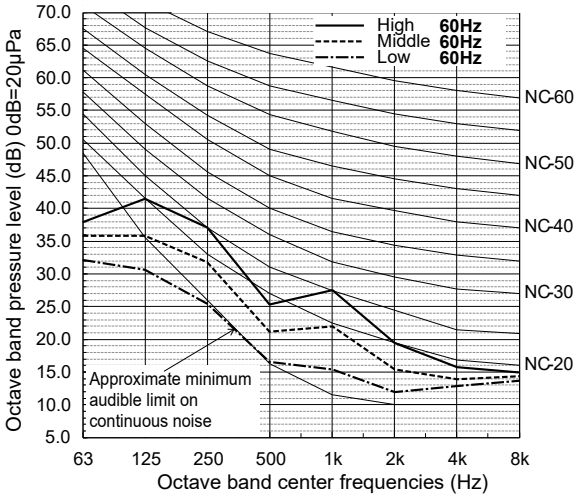
External Static Pressure: 5Pa [0.02in.WG]

Power Source: 208-230V



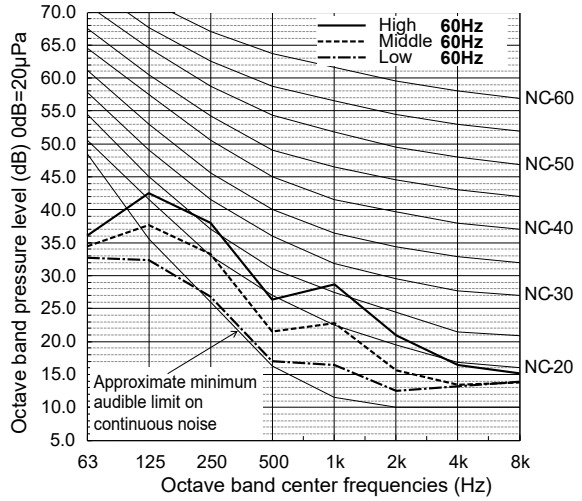
External Static Pressure: 15Pa [0.06in.WG]

Power Source: 208-230V



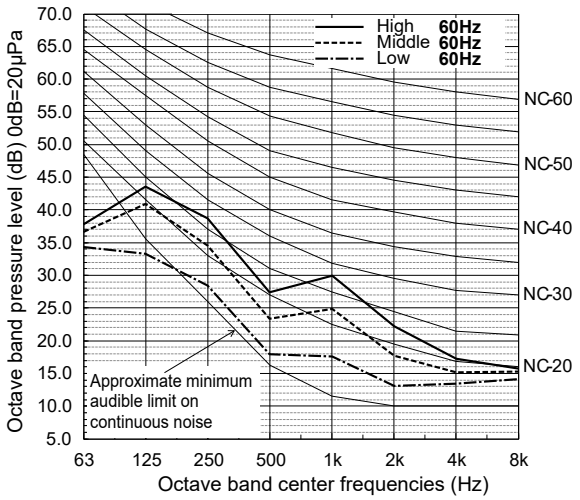
External Static Pressure: 35Pa [0.14in.WG]

Power Source: 208-230V



External Static Pressure: 50Pa [0.20in.WG]

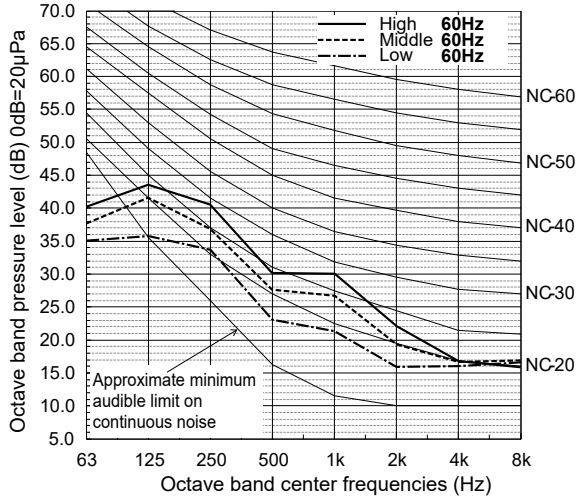
Power Source: 208-230V



SEZ-AD15NL

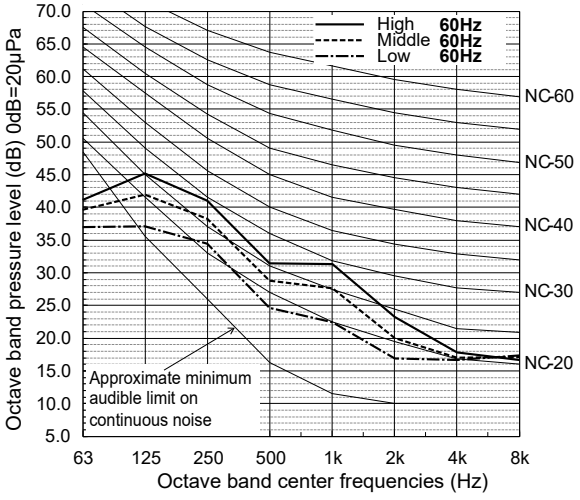
External Static Pressure: 5Pa [0.02in.WG]

Power Source: 208-230V



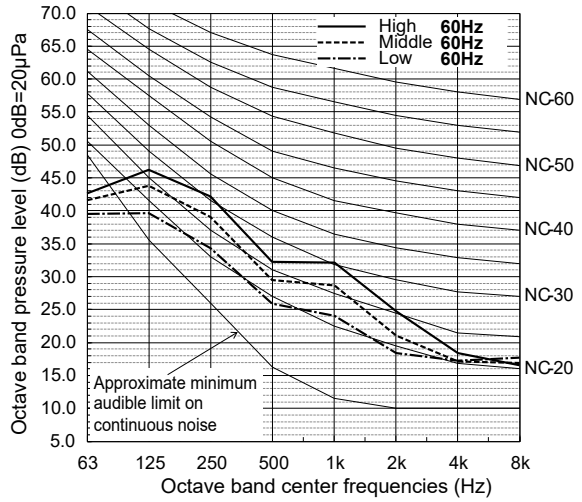
External Static Pressure: 15Pa [0.06in.WG]

Power Source: 208-230V



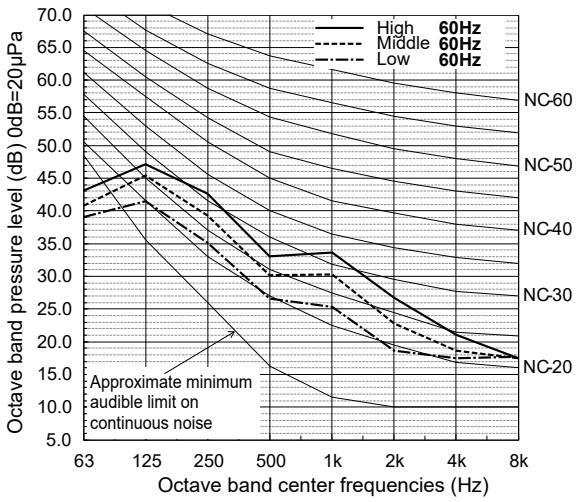
External Static Pressure: 35Pa [0.14in.WG]

Power Source: 208-230V



External Static Pressure: 50Pa [0.20in.WG]

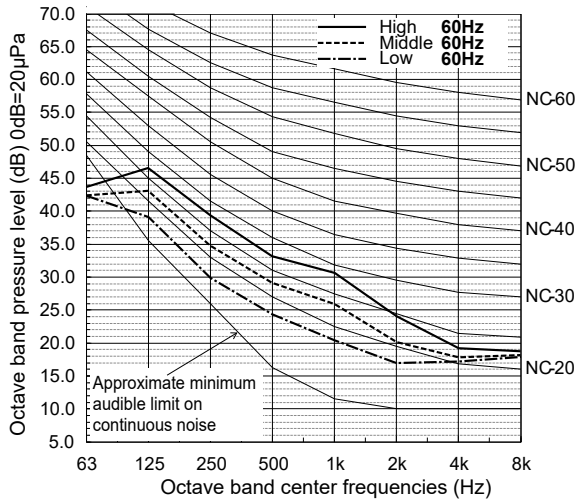
Power Source: 208-230V



SEZ-AD18NL

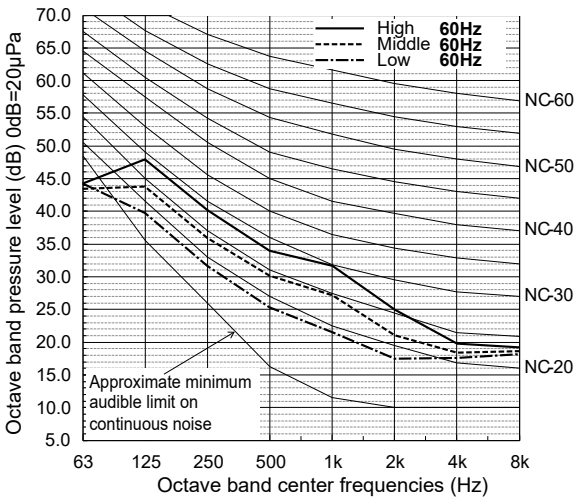
External Static Pressure: 5Pa [0.02in.WG]

Power Source: 208-230V



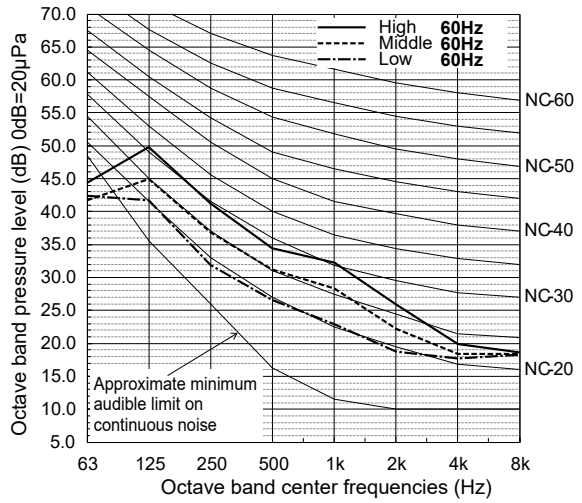
External Static Pressure: 15Pa [0.06in.WG]

Power Source: 208-230V



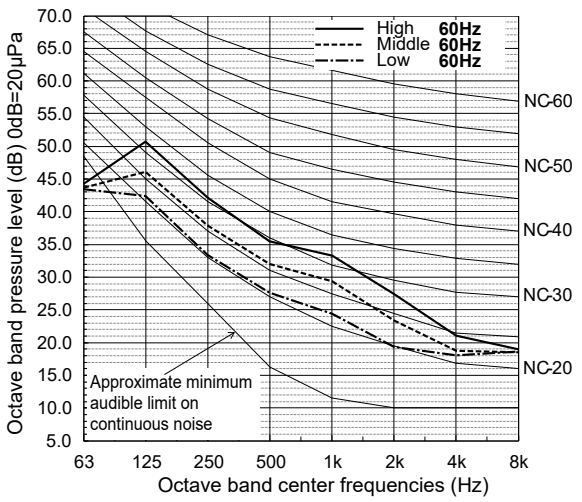
External Static Pressure: 35Pa [0.14in.WG]

Power Source: 208-230V



External Static Pressure: 50Pa [0.20in.WG]

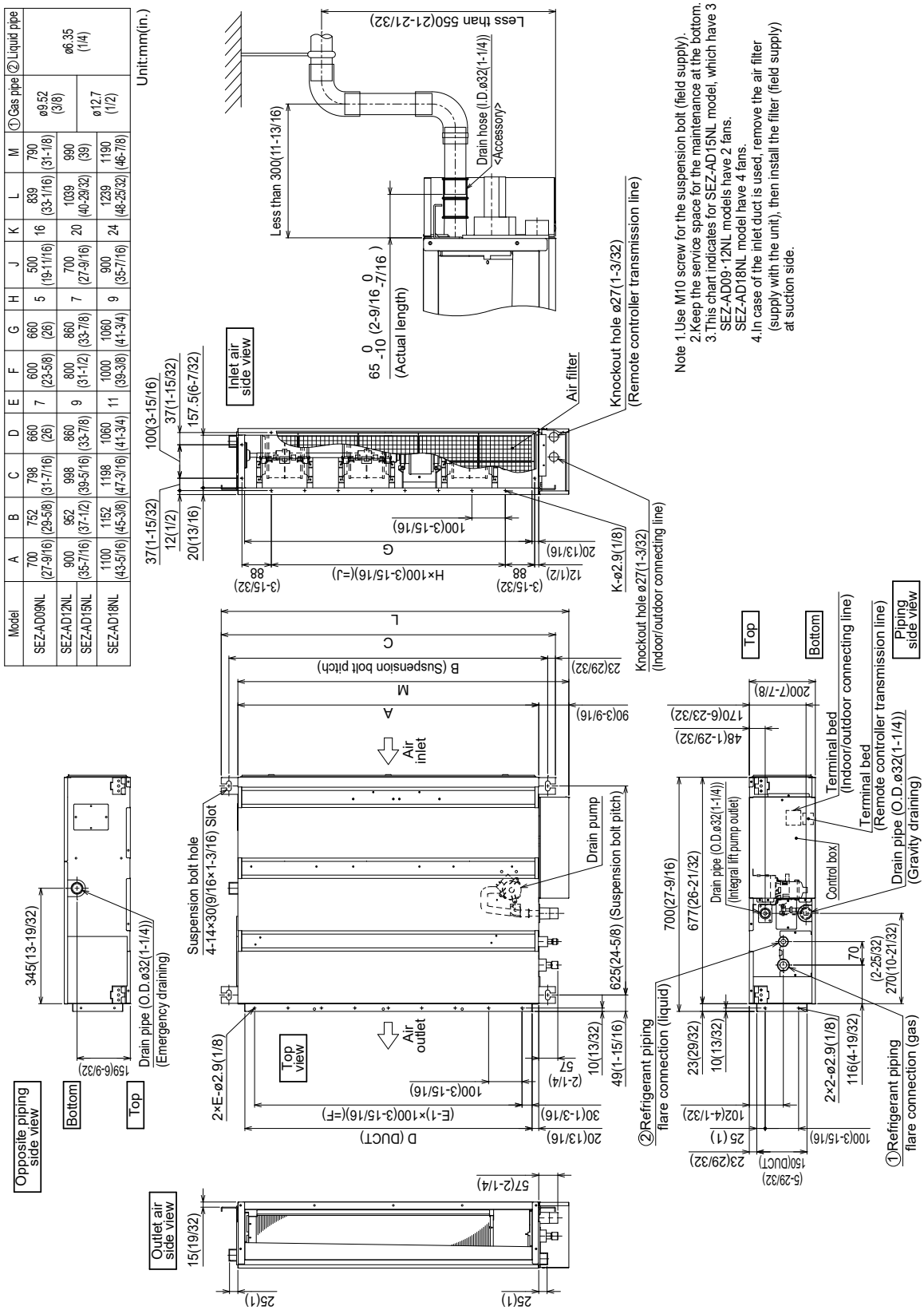
Power Source: 208-230V



6. OUTLINES & DIMENSIONS

INDOOR UNIT

SEZ-AD09, 12, 15,18NL



Model	N	P	Q	R
SEZ-AD09NL	700 (27-9/16)	50~150 (1-31/32~5-29/32)	800 (31-1/2)	1300 (51-3/16)
SEZ-AD12NL SEZ-AD15NL	900 (35-7/16)	150~250 (5-29/32~9-27/32)	1000 (39-3/8)	1500 (59-1/16)
SEZ-AD18NL	1100 (43-5/16)	250~350 (9-27/32~13-25/32)	1200 (47-1/4)	1700 (66-15/16)

Unit:mm(in.)

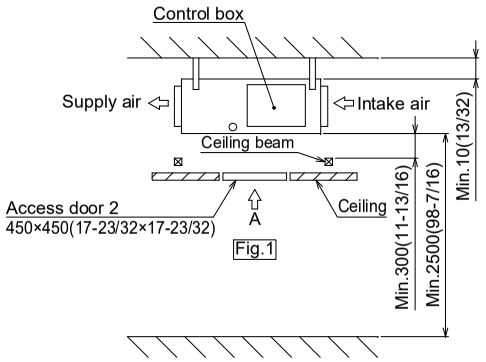


Fig.1

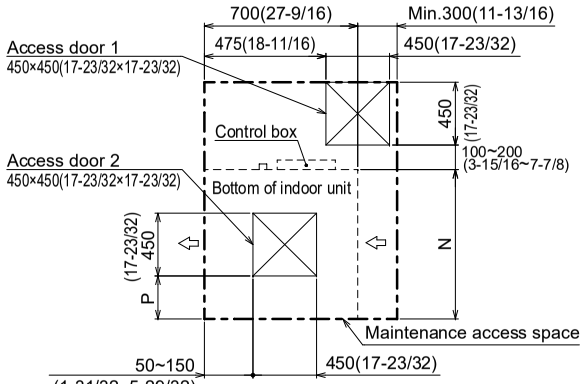


Fig.2 (Viewed from the direction of the arrow A)

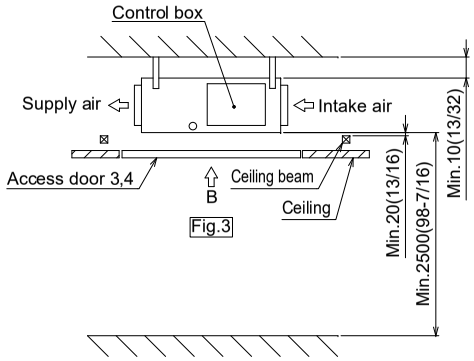


Fig.3

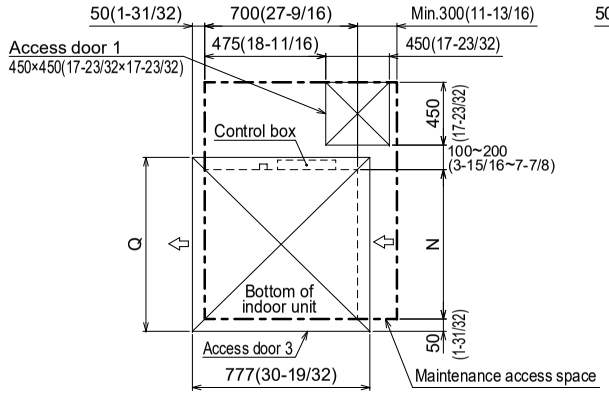


Fig.4 (Viewed from the direction of the arrow B)

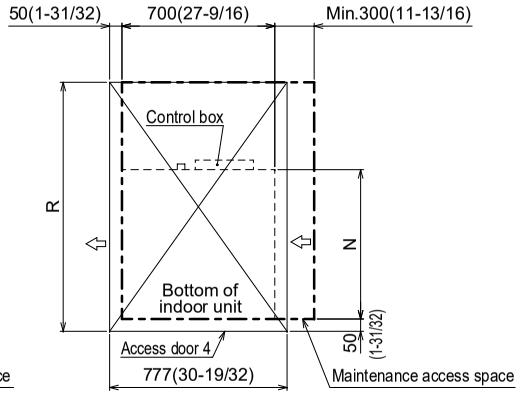


Fig.5 (Viewed from the direction of the arrow B)

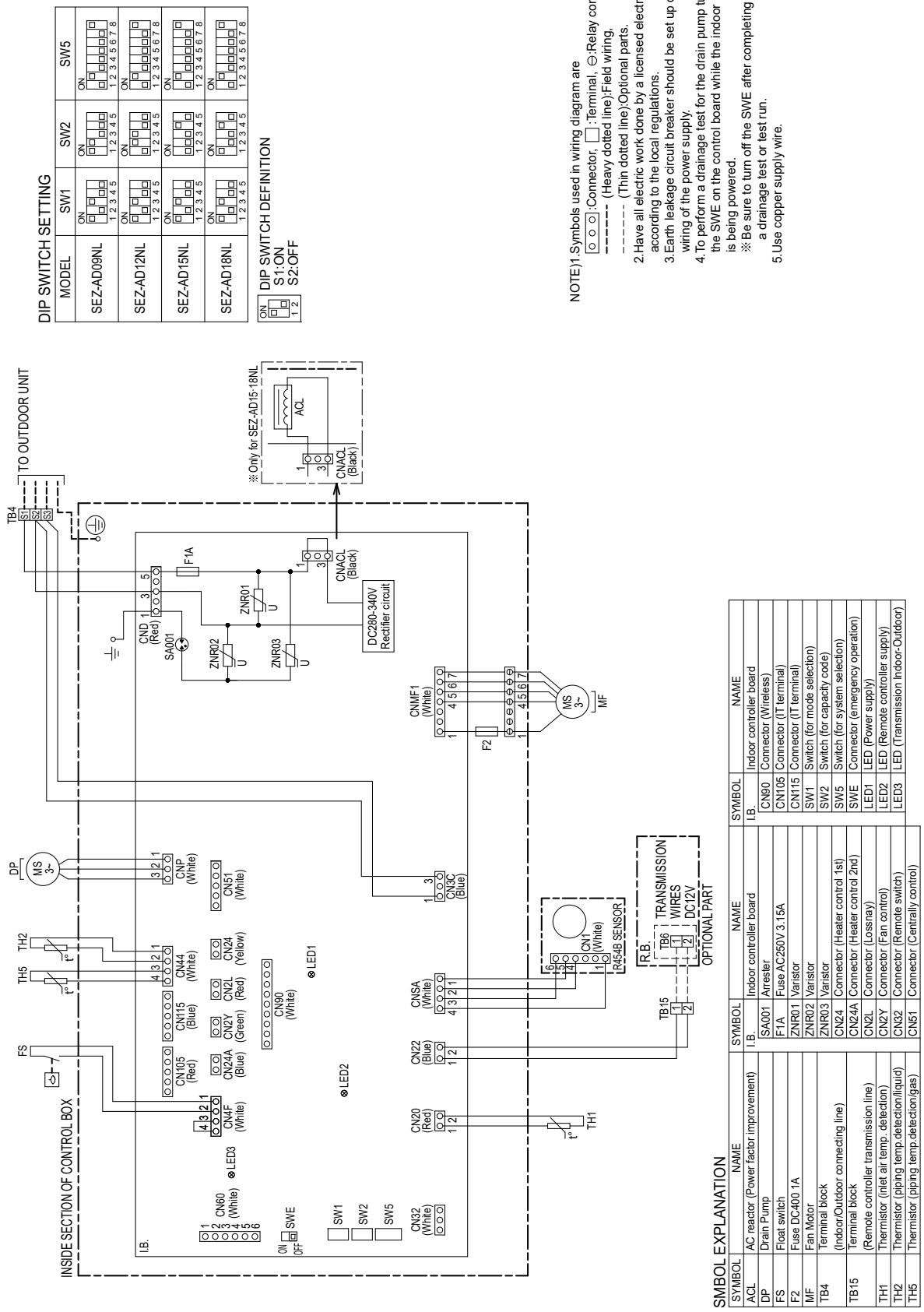
[Maintenance access space]
Secure enough access space to allow for the maintenance, inspection, and replacement of the motor, fan, drain pump, heat exchanger, and control box in one of the following ways.
Select an installation site for the indoor unit so that its maintenance access space will not be obstructed by beams or other objects.

(1) When a space of 300mm(11-13/16) or more is available below the unit between the unit and the ceiling. (Fig.1)
· Create access door 1 and 2 (450×450mm(17-23/32×17-23/32) each) as shown in Fig.2.
(Access door 2 is not required if enough space is available below the unit for a maintenance worker to work in.)

(2) When a space of less than 300mm(11-13/16) is available below the unit between the unit and the ceiling.
(At least 20mm(13/16) of space should be left below the unit as shown in Fig.3.)
· Create access door 1 diagonally below the control box and access door 3 below the unit as shown in Fig.4.
or
· Create access door 4 below the control box and the unit as shown in Fig.5.

7. WIRING DIAGRAM

SEZ-AD09, 12, 15,18NL

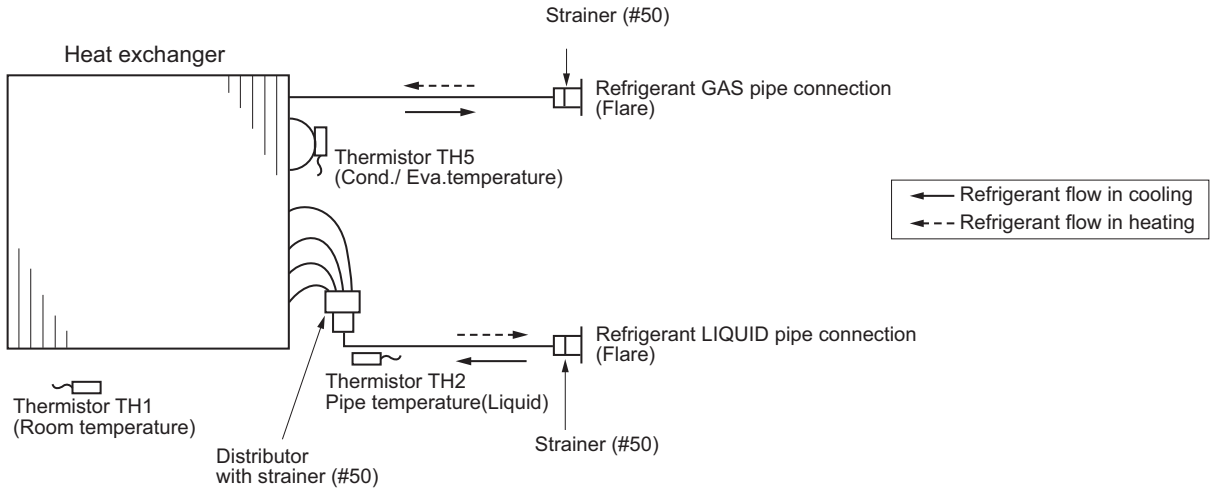


SMBOL EXPLANATION

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
ACL	AC reactor (Power factor improvement)	I.B.	Indoor controller board	I.B.	Indoor controller board
DP	Drain Pump	SA001	Arrester	CN90	Connector (Wireless)
FS	Float switch	F1A	Fuse AC250V 3.15A	CN105	Connector (IT terminal)
F2	Fuse DC400 1A	ZNR01	Varistor	CN115	Connector (IT terminal)
MF	Fan Motor	ZNR02	Varistor	SW1	Switch (for mode selection)
TB4	Terminal block (Indoor/Outdoor connecting line)	ZNR03	Varistor	SW2	Switch (for capacity code)
		CN24	Connector (Heater control 1st)	SW5	Switch (for system selection)
TB15	Terminal block (Remote controller transmission line)	CN24A	Connector (Heater control 2nd)	SWE	Connector (emergency operation)
		CN2L	Connector (Lossnay)	LED1	LED (Power supply)
TH1	Thermistor (inlet air temp. detection)	CN2Y	Connector (Fan control)	LED2	LED (Remote controller supply)
TH2	Thermistor (piping temp.detection/liquid)	CN32	Connector (Remote switch)	LED3	LED (Transmission Indoor-Outdoor)
TH5	Thermistor (piping temp.detection/gas)	CN51	Connector (Centrally control)		

8. REFRIGERANT SYSTEM DIAGRAM

SEZ-AD09, 12, 15, 18NL



9. HEATER CONTROL

9-1. CAUTIONS RERATED TO HEATER

- Exercise caution when using any auxiliary heat source and follow all third party manufacturer instructions and safety guidelines for installation and usage.
- Any auxiliary heat source connected to this unit via the CN24 connection must have an independent temperature control mechanism. Failure to install and maintain such temperature control mechanism may void the warranty for this unit.
- Mitsubishi Electric shall not bear any warranty obligation or other liability for any damage or loss in connection with such third party auxiliary heaters.

9-2. CONTROL SPECIFICATIONS AND FUNCTION SETTING

- Table 1 shows the mode setting for the field-installed heater.

Table. 1 [Function Table]
Select unit numbers 01 to 03 or all units (AL [wired remote controller] / 07 [IR wireless remote controller])

Mode (function) No.		Factory Setting	Mode	Heater Operation In Error	Heater Operation During Defrost	Heater Operation During Refrigerant Leakage	Fan Control When Heater ON
Wired remote controller							
11 (111)	23 (123)						
1	1	●	No Heater Present				
2	1	-	Heater Available / Disable heater during Defrost and Error	OFF	OFF	OFF	High
2	2	-	Heater Available / Enable heater and fan during Defrost and Error	ON *1	ON	OFF *2	High

Default setting: No.11: 1, No.23: 1

*1 Heater On signal can not be output in the following cases for safety reasons.
E4, E5: Communication error
A0 to A8: M-NET error
P1: Inlet thermistor error
E6, E7: Indoor/Outdoor unit communication error (In case of SW5-5: OFF)

*2 Heater will not operate during the following error.
Error code: FL (1521), FH (5558)

• Table 2 shows how the field-installed heater is controlled.

Table. 2 [Heater Control Table]

Mode Change	Condition				
EH1 ON	(To -T_{RA}) > 2.7 ° F [1.5 °C]	AND	T_{RA} has not increased by 0.9 °F [0.5°C] in X min		
EH2 ON	(To -T_{RA}) > 2.7 ° F [1.5 ° C]	AND	T_{RA} has not increased by 0.9 °F [0.5°C] in 8 min	AND	EH1 ON for > 8 min
EH1 OFF	(To -T_{RA}) ≤ 0.9 °F [0.5° C]				
EH2 OFF					

KEY
- EH1: Electric Heater 1
- EH2: Electric Heater 2
- To: Set point temperature
- T_{RA}: Return Air temperature
- X: Time delay (Selectable. Default is 20 min. Selectable to 1, 5, 10, 15, or 25 min)

• Table 3 shows how the time delay is selected

Table. 3 [Time Delay Selection Table]

Request Code*1	Action*3
390	Monitor Time Delay Setting
391	Set Time Delay to 10 minutes
392	Set Time Delay to 15 minutes
393	Set Time Delay to 20 minutes*2
394	Set Time Delay to 25 minutes
395	Set Time Delay to 5 minutes
396	Set Time Delay to 1 minute

Notes:
1. Both main and sub unit should be set in the same setting.
2. Every time replacing indoor controller board for serving, the function should be set again.
3. Stop the air-conditioner operation before changing the heater ON delay time.

*1 Time delay can only be selected with MA controller. If use of a non-MA controller is desired, the time delay must first be selected with the MA controller. Then the non-MA controller can be attached and used.

*2 The default time delay setting is 20 minutes.

*3 All delay times are approximate.It takes a few minutes to turn heater ON after the heater ON delay time has passed.

• Chart 1 and Table 4 show an example of heater operation.

Chart 1 [Heater Operation Example]

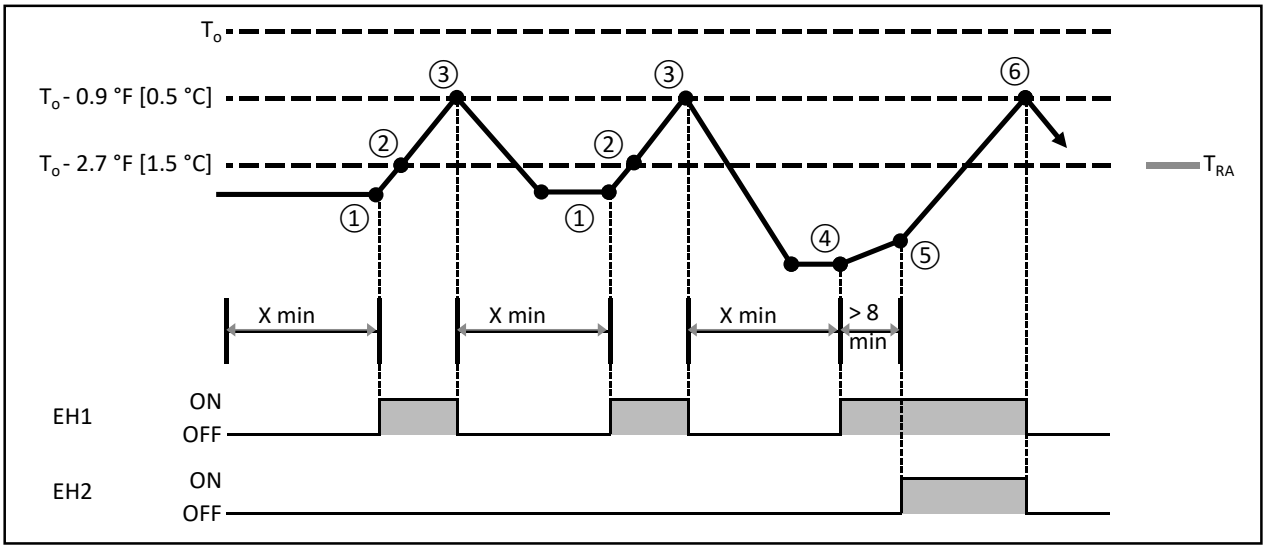


Table. 4 [Heater Operation Example]

Step	Condition			Result
①	(To -T_{RA}) > 2.7 °F [1.5 °C]	AND	T_{RA} has not increased by 0.9 °F [0.5°C] in X min	EH1 ON
②	(To -T_{RA}) < 2.7 °F [1.5 °C]	AND	T_{RA} increasing faster than 0.9 °F [0.5°C] in 8 min	EH2 not ON
③	(To -T_{RA}) < 0.9 °F [0.5°C]			EH1 OFF
④	(To -T_{RA}) > 2.7 °F [1.5 °C]	AND	T_{RA} has not increased by 0.9 °F [0.5°C] in X min	EH1 ON
⑤	(To -T_{RA}) > 2.7 °F [1.5 °C]	AND	T_{RA} not increasing faster than 0.9 °F [0.5°C] in 8 min	EH2 ON
⑥	(To -T_{RA}) < 0.9 °F [0.5°C]			EH1 OFF EH2 OFF

9-3. FAN CONTROL

By setting the Mode No. 11 in the Function Table in section 9-2 and using fan control connector on the optional parts PAC-YU25HT, the following patterns of fan control will become possible when [DEFROST] or [ERROR] is displayed.

Fan control patterns when [DEFROST] or [ERROR] is displayed

	Heater is installed in the duct.	No heater is installed in the duct.
Use of fan control connector (PAC-YU25HT)	Unused*	Used
Heater is off.	Fan OFF	Fan OFF
Heater is on.	Fan ON (High)	Fan OFF

While the heater is on, the fan will operate at high speed regardless of the fan setting on the remote controller.

*** If a heater is installed in the duct, do not use fan control connector. By doing so, the fan will turn off when the heater is on, which may result in fire.**

9-4. PAC-YU25HT (OPTIONAL PARTS) INSTALLATION

The following section describes installation of the External Heater Adapter that connects to SEZ-AD-NL series indoor unit. This products is the special wiring parts to drive an electric heater with the air conditioner.

(1) Parts list

♦Check that the following parts are included in the package.

1) External output cable (with a yellow connector).....2 in total
   Two types of cables with different connectors are included.
2) Fan control connector..... 3 in total
   White: 1
   Green: 2 (2 types)

(2) Connection to the indoor unit

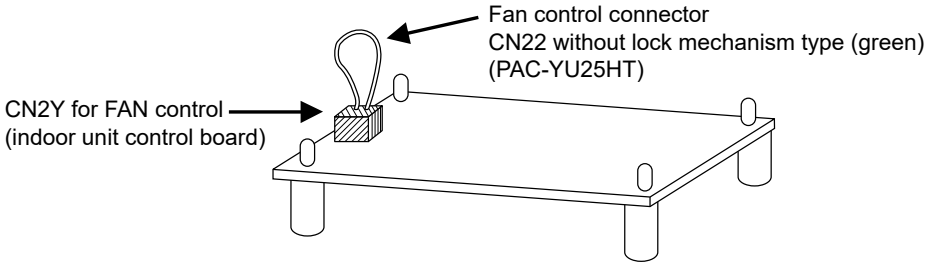
♦Use the cables that fit the connectors on the indoor unit control board.

External output cable (with a yellow connector)

This cable is used to connect a relay circuit for an interlocked operation with either an electric or a panel heater. Select the heater output pattern (1st = CN24 or 2nd = CN24A) to use, and connect the cable to the connector on the indoor unit control board that corresponds to the selection.

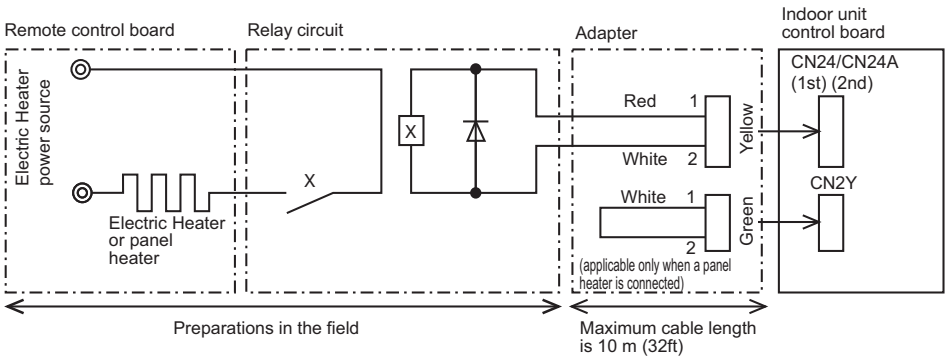
1) Fan control connector (with a green connector)
   This connector is used to perform an interlocked operation with a panel heater. Depending on the indoor unit control board specification, connect the cable to CN2Y as appropriate

<Image>



(3) Locally procured wiring

♦A basic connection method is shown below.



♦For relay X, use the specifications given below.

Operation coil

Rated voltage: 12VDC

Power consumption: 0.9W or less

* Use the diode that is recommended by the relay manufacturer at both ends of the relay coil.

♦The length of the electrical wiring for the PAC-YU25HT is 2 meters (6-1/2 ft.)

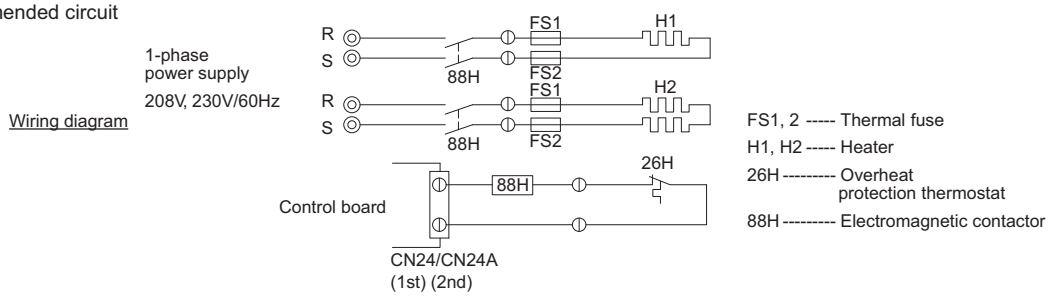
♦To extend this length, use sheathed 2-core cable.

Control cable type: CVV, CVS, CPEV or equivalent.

Cable size: 0.5 mm^2 ~ 1.25 mm^2 (16 to 22 AWG)

Don't extend the cable more than 10 meters (32ft)

Recommended circuit



(4) Wiring restrictions

♦Keep the length of the cable connecting to the circuit board of the indoor unit shorter than 10 meters (32ft).

♦Longer than 10 meters (32ft) could cause improper operation.

♦Use a transit relay when extending wiring such as remote wiring.

10. TROUBLESHOOTING

10-1. CAUTIONS ON TROUBLESHOOTING

(1) Before troubleshooting, check the followings:

1 Check the power supply voltage.

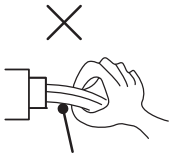
2 Check the indoor/outdoor connecting wire for mis-wiring.

(2) Take care the followings during servicing.

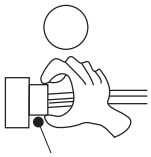
1 Before servicing the air conditioner, be sure to turn off the remote controller first to stop the main unit, and then turn off the breaker.

2 When removing the indoor controller board, hold the edge of the board with care NOT to apply stress on the components.

3 When connecting or disconnecting the connectors, hold the housing of the connector. DO NOT pull the lead wires.



Lead wires



Housing point

10-2. SELF-CHECK FUNCTION

• Refer to the installation manual that comes with each remote controller for details.

[Output pattern A] Errors detected by indoor unit

Wireless remote controller	Wired remote controller	Symptom	Remark
Beeper sounds/ OPERATION INDICATOR lamp blinks (Number of times)	Check code		
1	P1	Intake sensor error	
2	P2, P9	Pipe (liquid or 2-phase pipe) sensor error	
3	E6, E7	Indoor/outdoor unit communication error	
4	P4	Float switch connector open	
5	P5	Drain pump error	
	PA	Forced compressor error	
6	P6	Freezing (during cooling operation)/Overheating protection operation (during heating operation)	
7	EE	Assembly error (system error)	
8	P8	Pipe temperature error	
9	E4, E5	Communication error between wired remote controller and indoor unit	
10	—	—	
11	PB(Pb)	Indoor unit fan motor error	
12	FB(Fb)	Indoor unit control system error (memory error, etc.)	
	FL	Refrigerant leakage	
	FH	Refrigerant sensor error	
14	PL	Refrigerant circuit abnormal	
No sound	E0, E3	Remote controller transmission error	
No sound	E1, E2	Remote controller control board error	
No sound	— — — —	No corresponding	

[Output pattern B] Errors detected by unit other than indoor unit (outdoor unit, etc.)
Note: The supported check codes may vary depending on the connected outdoor unit.

Wireless remote controller	Wired remote controller	Symptom	Remark
Beeper sounds/ OPERATION INDICATOR lamp blinks (Number of times)	Check code		
1	E9	Indoor/outdoor unit communication error	For details, check the LED display of the outdoor controller board.
2	UP	Compressor overcurrent interruption	
3	U3, U4	Open/short of outdoor unit thermistors	
4	UF	Compressor overcurrent interruption (When compressor locked)	
5	U2	Abnormal high discharging temperature/49C worked/insufficient refrigerant	
6	U1, Ud	Abnormal high pressure (63H worked)/Overheating protection operation	
7	U5	Abnormal temperature of heat sink	
8	U8	Outdoor unit fan protection stop	
9	U6	Compressor overcurrent interruption/Abnormal of power module	
10	U7	Abnormality of super heat due to low discharge temperature	
11	U9, UH	Abnormality such as overvoltage or voltage shortage and abnormal synchronous signal to main circuit/Current sensor error	
12	—	—	
13	—	—	
14	Others	Other errors (Refer to the technical manual for the outdoor unit.)	
	FL	Refrigerant leakage or Refrigerant sensor error caused by other rooms	

Notes:

1. If the beeper does not sound again after the initial 2 beeps to confirm the self-check start signal was received and the OPERATION INDICATOR lamp does not come on, there are no error records.
2. If the beeper sounds 3 times continuously “beep, beep, beep (0.4 + 0.4 + 0.4 seconds)” after the initial 2 beeps to confirm the self-check start signal was received, the specified refrigerant address is incorrect.

• On wireless remote controller
The continuous buzzer sounds from receiving section of indoor unit.
Blink of operation lamp
• On wired remote controller
Check code displayed in the LCD.

Continued to the next page

● If the unit cannot be operated properly after test run, refer to the following table to find the cause.

<table>
<tr><td colspan="3">Symptom</td><td rowspan="2">Cause</td></tr>
<tr><td colspan="2">Wired remote controller</td><td>LED 1, 2 (PCB in outdoor unit)</td></tr>
<tr><td>Please Wait</td><td>For about 3 minutes after power-on</td><td>After LED 1, 2 are lit, LED 2 is turned off, then only LED 1 is lit.
(Correct operation)</td><td>• For about 3 minutes following power-on, operation of the remote controller is not possible due to system startup. (Correct operation)</td></tr>
<tr><td>Please Wait → Check code</td><td rowspan="2">Subsequent to about 3 minutes after power-on</td><td>Only LED 1 is lit.
→ LED 1, 2 blink.</td><td>• Connector for the outdoor unit’s protection device is not connected.
• Reverse or open phase wiring for the outdoor unit’s power terminal block (L1, L2, GR).</td></tr>
<tr><td>Display messages do not appear even when operation switch is turned ON (operation lamp does not light up).</td><td>Only LED 1 is lit.
→ LED 1 blinks twice,
LED 2 blinks once.</td><td>• Incorrect wiring between indoor and outdoor units (incorrect polarity of S1, S2, S3)
• Remote controller wire short</td></tr>
</table>

On the wireless remote controller with condition above, following phenomena take place.
• No signals from the remote controller can be received.
• Operation lamp is blinking.
• The buzzer makes a short ping sound.

Note:
Operation is not possible for about 30 seconds after cancellation of function selection. (Correct operation)

For description of each LED (LED1, 2, 3) provided on the indoor controller, refer to the following table.

LED1 (power for microprocessor)	Indicates whether control power is supplied. Make sure that this LED is always lit.
LED2 (power for remote controller)	Indicates whether power is supplied to the remote controller. This LED lights only in the case of the indoor unit which is connected to the outdoor unit refrigerant addresses “0”.
LED3 (communication between indoor and outdoor units)	Indicates state of communication between the indoor and outdoor units. Make sure that this LED is always blinking.

AUTO RESTART FUNCTION

Indoor controller board

This model is equipped with the AUTO RESTART FUNCTION.
When the indoor unit is controlled with the remote controller, the operation mode, set temperature, and the fan speed are memorized by the indoor controller board.
The auto restart function sets to work the moment the power has restored after power failure, then, the unit will restart automatically.
Set the AUTO RESTART FUNCTION using the wireless remote controller. (Mode no.1).

10-3. SELF-DIAGNOSIS ACTION TABLE

Note: Errors to be detected in outdoor unit, such as codes starting with F, U or E (excluding E0 to E7), are not covered in this document. Please refer to the outdoor unit's service manual for the details.

Check code	Abnormal point and detection method	Cause	Countermeasure
P1	**Room temperature thermistor (TH1)** ① The unit is in 3-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after 3 minutes. (The unit returns to normal operation, if it has been reset normally.) ② Constantly detected during cooling, drying and heating operation Short: 90°C [194°F] or more Open: -40°C [-40°F] or less	① Defective thermistor characteristics ② Contact failure of connector (CN20) on the indoor controller board (Insert failure) ③ Breaking of wire or contact failure of thermistor wiring ④ Defective indoor controller board	①–③ Check resistance value of thermistor. 0°C [32°F]...15.0 kΩ 10°C [50°F].....9.6 kΩ 20°C [68°F].....6.3 kΩ 30°C [86°F].....4.3 kΩ 40°C [104°F].....3.0 kΩ If you put force on (draw or bend) the lead wire with measuring resistance value of thermistor, breaking of wire or contact failure can be detected. ② Check contact failure of connector (CN20) on the indoor controller board. Refer to "10-5.TEST POINT DIAGRAM". Turn the power back on and check restart after inserting connector again. ④ Check room temperature display on remote controller. Replace indoor controller board if there is abnormal difference with actual room temperature. Turn the power off, and on again to operate after checking.
P2	**Pipe temperature thermistor/Liquid (TH2)** ① The unit is in 3-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after 3 minutes. (The unit returns to normal operation, if it has been reset normally.) ② Constantly detected during cooling, drying, and heating (except defrosting) operation. Short: 90°C [194°F] or more Open: -40°C [-40°F] or less	① Defective thermistor characteristics ② Contact failure of connector (CN44) on the indoor controller board (Insert failure) ③ Breaking of wire or contact failure of thermistor wiring ④ Defective refrigerant circuit is causing thermistor temperature of 90°C [194°F] or more or -40°C [-40°F] or less. ⑤ Defective indoor controller board	①–③ Check resistance value of thermistor. For characteristics, refer to (P1) above. ② Check contact failure of connector (CN44) on the indoor controller board. Refer to "10-5.TEST POINT DIAGRAM". Turn the power on and check restart after inserting connector again. ④ Check pipe <liquid> temperature with remote controller in test run mode. If pipe <liquid> temperature is extremely low (in cooling mode) or high (in heating mode), refrigerant circuit may have defect. ⑤ Check pipe <liquid> temperature with remote controller in test run mode. If there is extreme difference with actual pipe <liquid> temperature, replace indoor controller board. Turn the power off, and on again to operate after checking.
P4	**Contact failure of drain float switch (CN4F)** • Extract when the connector of drain float switch is disconnected. (③ and ④ of connector CN4F is not short-circuited.) • Constantly detected during operation	① Contact failure of connector (Insert failure) ② Defective indoor controller board	① Check contact failure of float switch connector. Turn the power on again and check after inserting connector again. ② Operate with connector (CN4F) short-circuited. Replace indoor controller board if abnormality reappears.
P5	**Drain overflow protection operation** ① Suspected abnormality, if drain float switch is detected to be underwater for 1 minute and 30 seconds continuously with drain pump on. Compressor and indoor fan will be turned off. ② Drain pump is abnormal if the condition above is detected during suspensive abnormality. ③ Constantly detected during drain pump operation	① Malfunction of drain pump ② Defective drainage Clogged drain pump Clogged drain pipe ③ Defective drain float switch Catch of the drain float switch or malfunction of moving parts cause drain float switch to be detected under water (Switch on) ④ Defective indoor controller board	① Check if drain-up machine works. ② Check drain function. ③ Remove drain float switch connector CN4F and check if it is short (Switch on) with the moving part of float switch UP, or OPEN with the moving part of float switch down. Replace float switch if it is short with the moving part of float switch down. ④ Replace indoor controller board if it is short-circuited between ③–④ of the drain float switch connector CN4F and abnormality reappears. It is not abnormal if there is no problem about the above-mentioned ①–④. Turn the power off, and on again to operate after check.

Check code	Abnormal point and detection method	Cause	Countermeasure
P5	**Drain pump lock protection operation** ① Suspected abnormality, if drain pump stops for 5 seconds continuously with drain pump on. Drain pump will be restarted after turning off for 10 seconds. ② Drain pump is abnormal if the condition above is detected 4 times during operation.	① Malfunction of drain pump ② Clogged drain pump ③ Disconnected drain pump ④ Defective indoor controller board	①② Check if drain pump works. ③ Check if connector (CNP) is connected. ④ Turn the emergency operation switch (SWE) on and check the voltage between CNP ①–③. • Replace drain pump if the output is 13 VDC. • Replace indoor controller board if the output is under 13 VDC.
P6	**Freezing/overheating protection is operating** ① Freezing protection (Cooling mode) The unit is in 6-minute resume prevention mode if pipe <liquid or condenser/evaporator> temperature stays under -15°C [5°F] for 3 minutes after the compressor started. Abnormal if it stays under -15°C [5°F] for 3 minutes again within 16 minutes after 6-minute resume prevention mode. ② Overheating protection (Heating mode) The units is in 6-minute resume prevention mode if pipe <condenser/evaporator> temperature is detected as over 70°C [158°F] after the compressor started. Abnormal if the temperature of over 70°C [158°F] is detected again within 30 minutes after 6-minute resume prevention mode.	(Cooling or drying mode) ① Clogged filter (reduced airflow) ② Short cycle of air path ③ Low-load (low temperature) operation out of the tolerance range ④ Defective indoor fan motor • Fan motor is defective. • Indoor controller board is defective. ⑤ Defective outdoor fan control ⑥ Overcharge of refrigerant ⑦ Defective refrigerant circuit (clogging) (Heating mode) ① Clogged filter (reduced airflow) ② Short cycle of air path ③ Overload (high temperature) operation out of the tolerance range ④ Defective indoor fan motor • Fan motor is defective. • Indoor controller board is defective. ⑤ Defective outdoor fan control ⑥ Overcharge of refrigerant ⑦ Defective refrigerant circuit (restriction) ⑧ Bypass circuit of outdoor unit is defective.	(Cooling or drying mode) ① Check cleanliness of the filter. ② Remove blockage. ④ Refer to "10-8. DC FAN MOTOR (FAN MOTOR/INDOOR CONTROLLER BOARD)". ⑤ Check outdoor fan motor. ⑥⑦ Check operating condition of refrigerant circuit. (Heating mode) ① Check cleanliness of the filter. ② Remove blockage. ④ Refer to "10-8. DC FAN MOTOR (FAN MOTOR/INDOOR CONTROLLER BOARD)". ⑤ Check outdoor fan motor. ⑥–⑧ Check operating condition of refrigerant circuit.
P8	**Pipe temperature** <Cooling mode> Detected as abnormal when the pipe temperature is not in the cooling range 3 minutes after compressor start and 6 minutes after the liquid or condenser/evaporator pipe is out of cooling range. Note 1: It takes at least 9 minutes to detect. Note 2: Abnormality P8 is not detected in drying mode. Cooling range: -3°C [-5.4°F] (TH−TH1) TH: Lower temperature between liquid pipe temperature (TH2) and condenser/evaporator temperature (TH5) TH1: Intake temperature <Heating mode> When 10 seconds have passed after the compressor starts operation and the hot adjustment mode has finished, the unit is detected as abnormal when condenser/evaporator pipe temperature is not in heating range within 20 minutes. Note 3: It takes at least 27 minutes to detect abnormality. Note 4: It excludes the period of defrosting (Detection restarts when defrosting mode is over) Heating range: -3°C [5.4°F] (TH5−TH1)	① Slight temperature difference between indoor room temperature and pipe <liquid or condenser/evaporator> temperature thermistor • Shortage of refrigerant • Disconnected holder of pipe <liquid or condenser/evaporator> thermistor • Defective refrigerant circuit ② Reverse connection of extension pipe (on plural units connection) ③ Reverse wiring of indoor/outdoor unit connecting wire (on plural units connection) ④ Defective detection of indoor room temperature and pipe <condenser/evaporator> temperature thermistor ⑤ Stop valve is not opened completely.	①–④ Check pipe <liquid or condenser/evaporator> temperature with room temperature display on remote controller and outdoor controller circuit board. Pipe <liquid or condenser/evaporator> temperature display is indicated by setting SW2 of outdoor controller circuit board as follows. *1 (Conduct temperature check with outdoor controller circuit board after connecting 'A-Control Service Tool (PAC-SK52ST)'.) ②③ Check converse connection of extension pipe or converse wiring of indoor/outdoor unit connecting wire.

Check code	Abnormal point and detection method	Cause	Countermeasure
P9	**Pipe temperature thermistor/Condenser/ Evaporator (TH5)** ① The unit is in 3-minute resume protection mode if short/open of thermistor is detected. Abnormal if the unit does not get back to normal within 3 minutes. (The unit returns to normal operation, if it has been reset normally.) ② Constantly detected during cooling, drying, and heating operation (except defrosting) Short: 90°C [194°F] or more Open: -40°C [-40°F] or less	① Defective thermistor characteristics ② Contact failure of connector (CN44) on the indoor controller board (Insert failure) ③ Breaking of wire or contact failure of thermistor wiring ④ Temperature of thermistor is 90°C [194°F] or more or -40°C [-40°F] or less caused by defective refrigerant circuit. ⑤ Defective indoor controller board	①–③ Check resistance value of thermistor. For characteristics, refer to (P1). ② Check contact failure of connector (CN44) on the indoor controller board. Refer "10-5. TEST POINT DIAGRAM". Turn the power on and check restart after inserting connector again. ④ Operate in test run mode and check pipe <condenser/evaporator> temperature with outdoor controller circuit board. If pipe <condenser/evaporator> temperature is extremely low (in cooling mode) or high (in heating mode), refrigerant circuit may have defect. ⑤ Operate in test run mode and check pipe <condenser/evaporator> temperature with outdoor control circuit board. If there is extreme difference with actual pipe <condenser/evaporator> temperature replace indoor controller board. There is no abnormality if none of the above comes within the unit. Turn the power off and on again to operate. *1 (In case of checking pipe temperature with outdoor controller circuit board, be sure to connect A-control service tool (PAC-SK52ST).)
PL	**Abnormal refrigerant circuit** During Cooling, Drying, or Auto Cooling operation, the following conditions are regarded as failures when detected for 1 second. a) The compressor continues to run for 30 or more seconds. b) The liquid pipe temperature (TH2) or the condenser/evaporator temperature (TH5) is 75°C [167°F] or more. **<u>These detected errors will not be cancelled until the power source is reset.</u>**	① Abnormal operation of 4-way valve ② Disconnection of or leakage in refrigerant pipes ③ Air into refrigerant piping ④ Abnormal operation (no rotation) of indoor fan · Defective fan motor · Defective indoor control board ⑤ Defective refrigerant circuit (restriction)	① **<u>When this error occurs, be sure to replace the 4-way valve.</u>** ② Check refrigerant pipes for disconnection or leakage. ③ After the recovery of refrigerant, vacuum dry the whole refrigerant circuit. ④ Refer to section "10-8. DC FAN MOTOR (FAN MOTOR/INDOOR CONTROLLER BOARD)". ⑤ Check refrigerant circuit for operation. **<u>To avoid entry of moisture or air into refrigerant circuit which could cause abnormal high pressure, purge air in refrigerant circuit or replace refrigerant.</u>**
E0 or E4 (6831 or 6834)	**Remote controller transmission error(E0)/ signal receiving error(E4)** ① Abnormal if main or sub remote controller cannot receive any transmission normally from indoor unit of refrigerant address “0” for 3 minutes. (Check code : E0) ② Abnormal if sub-remote controller could not receive for any signal for 2 minutes. (Check code: E0) ① Abnormal if indoor controller board cannot receive normally any data from remote controller board or from other indoor controller board for 3 minutes. (Check code: E4) ② Indoor controller board cannot receive any signal from remote controller for 2 minutes. (Check code: E4)	① Contact failure at transmission wire of remote controller ② All remote controllers are set as “sub” remote controller. In this case, E0 is displayed on remote controller, and E4 is displayed at LED (LED1, LED2) on the outdoor controller circuit board. ③ Miswiring of remote controller ④ Defective transmitting/receiving circuit of remote controller ⑤ Defective transmitting/receiving circuit of indoor controller board of refrigerant address “0” ⑥ Noise has entered into the transmission wire of remote controller.	① Check disconnection or looseness of indoor unit or transmission wire of remote controller. ② Set one of the remote controllers “main”, if there is no problem with the action above. ③ Check wiring of remote controller. • Total wiring length: max. 500 m (Do not use cables with 3 cores or more. Do not use shielded wires.) • The number of connecting indoor units: max. 16 units • The number of connecting remote controller: max. 2 units When two units are connected, the total wiring length shall not exceed 200 m. If the cause of trouble is not in above ①–③, ④ Diagnose remote controllers. a) When “OK” is displayed, remote controllers have no problem. Turn the power off, and on again to check. If abnormality generates again, replace indoor controller board. b) When “NG” is displayed, replace remote controller. c) When “E3” or “ERC” is displayed, noise may be causing abnormality.

Check code	Abnormal point and detection method	Cause	Countermeasure
E3 or E5 (6832 or 6833)	**Remote controller transmission error(E3)/ signal receiving error(E5)** ① Abnormal if remote controller could not find blank of transmission path for 6 seconds and could not transmit. (Check code: E3) ② Remote controller receives transmitted data at the same time, compares the data, and when detecting it, judges different data to be abnormal 30 continuous times. (Check code: E3) ① Abnormal if indoor controller board could not find blank of transmission path.(Check code: E5) ② Indoor controller board receives transmitted data at the same time, compares the data, and when detecting it, judges different data to be abnormal 30 continuous times. (Check code: E5)	① 2 remote controllers are set as "main." (In case of 2 remote controllers) ② Remote controller is connected with 2 indoor units or more. ③ Repetition of refrigerant address ④ Defective transmitting/receiving circuit of remote controller ⑤ Defective transmitting/receiving circuit of indoor controller board ⑥ Noise has entered into transmission wire of remote controller.	① Set a remote controller to main, and the other to sub. ② Remote controller is connected with only one indoor unit. ③ The address changes to a separate setting. ④–⑥ Diagnose remote controller. a) When "OK" is displayed, remote controllers have no problem. Turn the power off, and on again to check. When becoming abnormal again, replace indoor controller board. b) When "NG" is displayed, replace remote controller. c) When "E3" or "ERC" is displayed, noise may be causing abnormality.
E6	**Indoor/outdoor unit communication error (Signal receiving error)** ① Abnormal if indoor controller board cannot receive any signal normally for 6 minutes after turning the power on. ② Abnormal if indoor controller board cannot receive any signal normally for 3 minutes. ③ Consider the unit abnormal under the following condition: When 2 or more indoor units are connected to one outdoor unit, indoor controller board cannot receive a signal for 3 minutes from outdoor controller circuit board, a signal which allows outdoor controller circuit board to transmit signals.	① Contact failure, short circuit or, miswiring (converse wiring) of indoor/outdoor unit connecting wire ② Defective transmitting/receiving circuit of indoor controller board ③ Defective transmitting/receiving circuit of indoor controller board ④ Noise has entered into indoor/ outdoor unit connecting wire.	① Check disconnection or looseness of indoor/ outdoor unit connecting wire of indoor unit or outdoor unit. Check all the units in case of twin indoor unit system. ②–④ Turn the power off, and on again to check. If abnormality generates again, replace indoor controller board or outdoor controller circuit board. Note: Other indoor controller board may have defect in case of twin indoor unit system.
E7	**Indoor/outdoor unit communication error (Transmitting error)** Abnormal if "1" receiving is detected 30 times continuously though indoor controller board has transmitted "0".	① Defective transmitting receiving circuit of indoor controller board ② Noise has entered into power supply. ③ Noise has entered into outdoor control wire.	①–③ Turn the power off, and on again to check. If abnormality generates again, replace indoor controller board.
FB (Fb)	**Indoor controller board** Abnormal if data cannot be normally read from the nonvolatile memory of the indoor controller board.	① Defective indoor controller board	① Replace indoor controller board. *The check code in the parenthesis indicates PAR-42MAAUB model.
FH	**Refrigerant sensor error** Abnormal if refrigerant sensor cannot detect errors normally.	① The refrigerant sensor mounted on the indoor unit does not work. ② The refrigerant sensor is not connected properly or the wire is broken.	• While the error is being displayed, the indoor unit fan continues operating. • Ventilate the room well, make sure that there is no ignition source, and then turn off the power. ①② Check the connection of some parts such as connectors and turn the power on again. When the error has not been cleared, replace the refrigerant sensor.

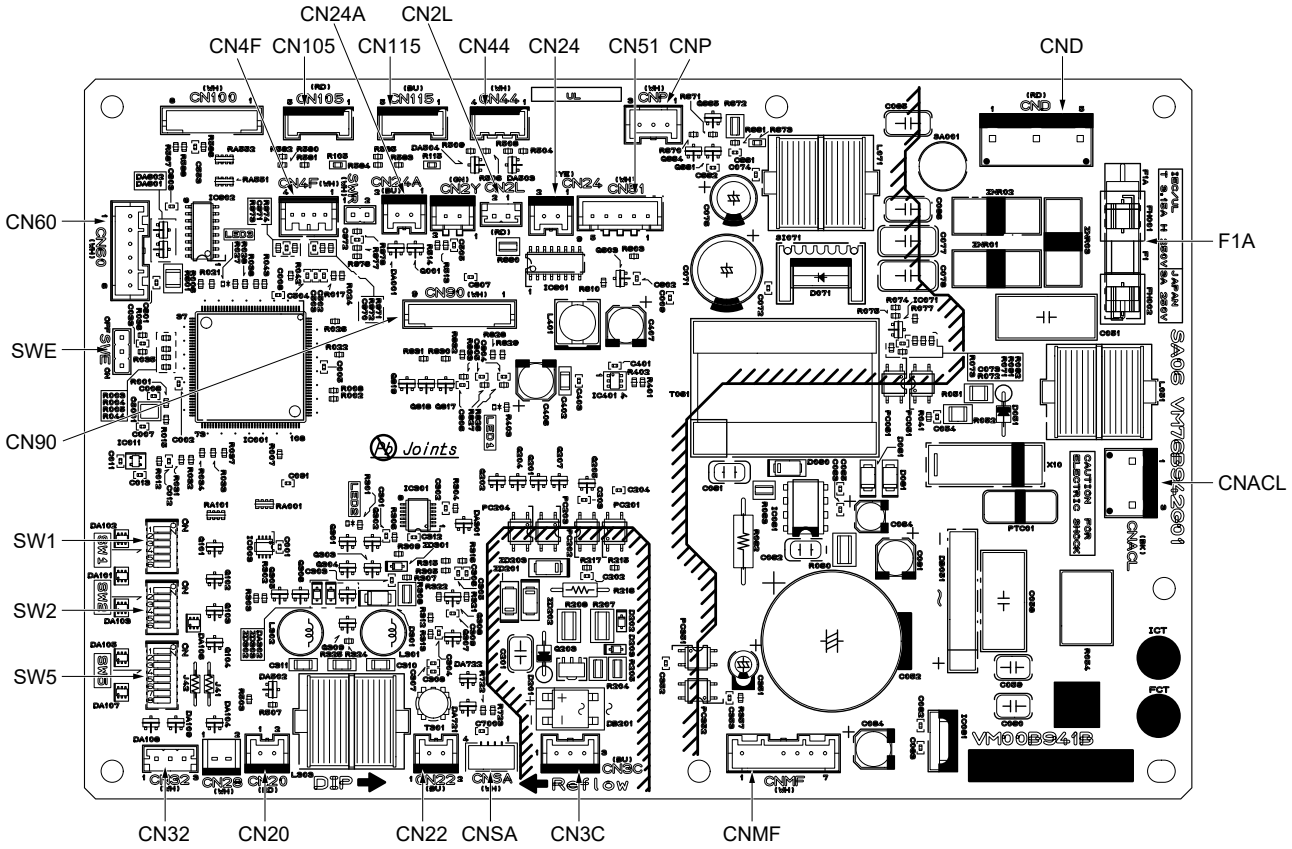
FL	**Refrigerant leakage** Abnormal if refrigerant leakage detected by a refrigerant sensor.	① Refrigerant leaks from the piping or the heat exchanger in the indoor unit. ② The following items are used around the indoor unit. • Spray (LP gas including Freon, and whose main ingredient is propane and butane) • Aerosol insecticide (including ethanol) • Air spray painting (including dichloromethane) • Charcoal (charcoal fire) • Chemicals (such as ethanol) ③ Refrigerant leaks from piping or heat exchangers, or sensor errors in indoor units in other rooms.	• While the error is being displayed, the indoor unit fan continues operating. • Ventilate the room well, make sure that there is no ignition source, and then turn off the power. • Check the indoor unit to detect the part where refrigerant leaks. • Repair the part where refrigerant leaks. • Turn on the power again. • Replace the refrigerant sensor if the problem is not fixed.
E1 or E2 (6201 or 6202)	**Remote controller control board** ① Abnormal if data cannot be normally read from the nonvolatile memory of the remote controller control board.(Check code: E1) ② Abnormal if the clock function of remote controller cannot be normally operated. (Check code: E2)	① Defective remote controller	① Replace remote controller.
PA	**Forced compressor stop** **(due to water leakage abnormality)** ① The unit has a water leakage abnormality when the following conditions, a) and b), are satisfied while the above-mentioned detection is performed. a) The intake temperature subtracted with liquid pipe temperature detects to be less than −10°C [14°F] for a total of 30 minutes. (When the drain float switch is detected to be NOT soaked in the water, the detection record of a) and b) will be cleared.) b) Drain float switch detects to be in the water for more than 15 minutes. Note: Once the water leakage abnormality is detected, abnormality state will not be released until the main power is reset.	① Drain pump trouble ② Drain defective · Drain pump clogging · Drain pipe clogging ③ Open circuit of float switch ④ Contact failure of float switch connector ⑤ Dew condensation on float switch · Drain water trickles down lead wire · Drain water ripples due to filter being clogged ⑥ Extension piping connection difference at twin, triple or quadruple system ⑦ Miswiring of indoor/outdoor connecting at twin, triple, quadruple system ⑧ Room temperature thermistor/ liquid pipe temperature thermistor detection is defective.	① Check the drain pump. ② Check whether water can be drained. ③ Check the resistance of the float switch. ④ Check the connector contact failure. ⑤ Check the float switch lead wire mounted. Check the filter cleanliness. ⑥ Check the piping connection. ⑦ Check the indoor/outdoor connecting wires. ⑧ Check the room temperature display of remote controller. Check the indoor liquid pipe temperature display of outdoor controller board.
PB(Pb)	**Fan motor trouble**	① Defective fan motor ② Defective indoor controller board ③ Contact failure of fan motor connector	①-③ Refer to "10-8. DC FAN MOTOR (FAN MOTOR/INDOOR CONTROLLER BOARD)".

10-4. TROUBLESHOOTING BY INFERIOR PHENOMENA

Phenomena	Cause	Countermeasure
(1) LED2 on indoor controller board is off.	• When LED1 on indoor controller board is also off. ① Power supply of rated voltage is not supplied to outdoor unit.	① Check the voltage of outdoor power supply terminal block (L1, L2). • When 208/230 V is not detected, check the power wiring to outdoor unit and the breaker. • When 208/230 VAC is detected, check ② (below).
	② Defective outdoor controller circuit board	② Check the voltage between outdoor terminal block S1 and S2. • When 208/230 VAC is not detected, —check the fuse on outdoor controller circuit board. —check the wiring connection. • When 208/230 VAC is detected, check ③ (below).
	③ Power supply of 208/230 V is not supplied to indoor unit.	③ Check the voltage between indoor terminal block S1 and S2. • When 208/230 VAC is not detected, check indoor/outdoor unit connecting wire for miswiring. • When 208/230 VAC is detected, check ④ (below).
	④ Defective indoor controller board	④ Check the wiring connection between TB4 and CN01. Check the fuse on indoor controller board. If no problems are found, indoor controller board is defective.
	• When LED1 on indoor controller board is lit. ① Mis-setting of refrigerant address for outdoor unit (There is no unit corresponding to refrigerant address “0”.) *1	① Check the setting of refrigerant address for outdoor unit. Set the refrigerant address to “0”. (For grouping control system under which 2 or more outdoor units are connected, set one of the units to “0”.) Set refrigerant address using SW1 (3-6) on outdoor controller circuit board.*1
(2) LED2 on indoor controller board is blinking.	• When LED1 on indoor controller board is also blinking. Connection failure of indoor/outdoor unit connecting wire • When LED1 is lit	Check indoor/outdoor unit connecting wire for connection failure.
	① Miswiring of remote controller wires Under twin indoor unit system, 2 or more indoor units	① Check the connection of remote controller wires in case of twin triple indoor unit system. When 2 or more indoor units are wired in one refrigerant system, connect remote controller wires to one of those units.
	② Refrigerant address for outdoor unit is wrong or not set. Under grouping control system, there are some units whose refrigerant address is 0. *1	② Check the setting of refrigerant address in case of grouping control system. If there are some units whose refrigerant addresses are 0 in one group, set one of the units to 0 using SW1 (3-6) on outdoor controller circuit board. *1
	③ Short-cut of remote controller wires ④ Defective remote controller	③④ Remove remote controller wires and check LED2 on indoor controller board. • When LED2 is blinking, check the condition of the remote controller wires, to see if they are shorted. • When LED2 is lit, connect remote controller wires again and: if LED2 is blinking, remote controller is defective; if LED2 is lit, connection failure of remote controller terminal block, etc. has returned to normal.
(3) Receiver for wireless remote controller	① Weak batteries of wireless remote controller	① Replace batteries of wireless remote controller.
	② Contact failure of connector (CNB) on wireless remote controller board (Insert failure) ③ Contact failure of connector (CN90) on indoor controller board (Insert failure) ④ Contact failure of connector between wireless remote controller board and indoor controller board	②–④ Check contact failure of each connector. If no problems are found of connector, replace indoor controller board. When the same trouble occurs even if indoor controller board is replaced, replace wireless remote controller board.

10-5. TEST POINT DIAGRAM

10-5-1. Indoor controller board



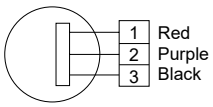
SWE	Emergency operation
SW1	for mode selection
SW2	for capacity code
SW5	for system selection
CN32	Remote switch
CN20	Thermistor (Inlet temperature)
CN22	Remote controller transmission line
CNSA	Refrigerant gas sensor
CN3C	Connect to the terminal block
CNMF1	Fan motor output 1 - 4 : 294 - 325 VDC 5 - 4 : 15 VDC 6 - 4 : 0 - 6.5 VDC 7 - 4 : Stop 0 or 15 VDC Run 7.5 VDC (0 - 15 pulse)
CNACL	ACL (only for SEZ-AD18NL)
F1A	Fuse (400 VDC 1 A)
CND	Power supply voltage (208/230 VAC)

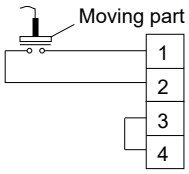
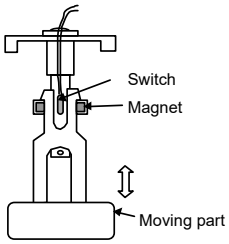
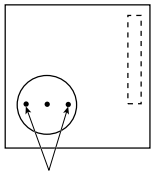
CN4F	Float switch
CN115	IT terminal
CN105	IT terminal
CN24	Heater control 1st (12VDC)
CN24A	Heater control 2nd (12VDC)
CN2L	LOSSNAY
CN44	Thermistor (liquid/gas temperature)
CN90	Wireless remote controller
CN51	Centralized control
CNP	Drain-up mechanism output (13 VDC (Between 1 and 3.))

(*1)

V_{FG}	Voltage on the (-) side of PC352 and C084 (Same with the voltage between 7 (+) and 4 (-) of CNMF)
V_{CC}	Voltage between the C084 pins 15 VDC (Same with the voltage between 5 (+) and 4 (-) of CNMF)
V_{SP}	Voltage between the C351 pins 0 VDC (with the fan stopped) 1 - 6.5 VDC (with the fan in operation) (Same with the voltage between 6 (+) and 4 (-) of CNMF)

10-6. TROUBLE CRITERION OF MAIN PARTS

<table>
<tr><th>Part name</th><th>Check method and criterion</th></tr>
<tr><td>Room temperature thermistor (TH1)
Pipe temperature thermistor/liquid (TH2)
Condenser/evaporator temperature thermistor (TH5)</td><td>Measure the resistance with a tester.
(Part temperature 10°C (50˚F) ~ 30°C (86˚F))
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3 kΩ~9.6 kΩ</td><td>Opened or short-circuited</td></tr></table></td></tr>
<tr><td>Drain pump (DP)
 
</td><td>① Check if the drain float switch works properly.
② Check if the drain pump works and drains water properly in cooling operation.
③ If no water drains, confirm that the check code P5 will not be displayed 10 minutes after the operation starts.
Note: The drain pump for this model is driven by the internal DC motor of controller board, so it is not possible to measure the resistance between the terminals.

Normal
Red–Black: Input 13 VDC → The motor starts to rotate.
Purple–Black: Abnormal (check code P5) if it outputs 0–13 V square wave (5 pulses/rotation), and the number of rotation is not normal.</td></tr>
<tr><td>Drain float switch (FS)
 
</td><td>Measure the resistance between the terminals with a tester.
<table><tr><th>State of moving part</th><th>Normal</th><th>Abnormal</th></tr><tr><td>UP</td><td>Short</td><td>Other than short</td></tr><tr><td>DOWN</td><td>Open</td><td>Other than open</td></tr></table> 
</td></tr>
<tr><td>Refrigerant sensor</td><td>Measure the resistance between the terminals with a multimeter.
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>Below 10 Ω</td><td>Open (10 Ω or more)</td></tr></table>After turning off the indoor unit breaker and leaving it for 5 minutes, measure the resistance value between the sensor terminals.
< Back side of the sensor >
 
Measure the both sides of the sensor pin.</td></tr>
</table>

10-7. Thermistor

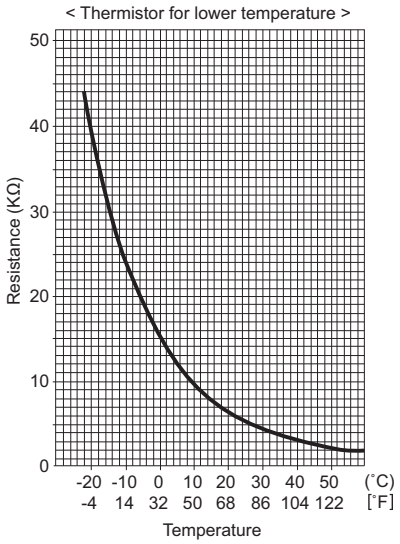
<Thermistor Characteristic graph>

Thermistor for lower temperature	Room temperature thermistor (TH1) Pipe temperature thermistor (TH2) Condenser/evaporator temperature thermistor (TH5)

Thermistor R_0=15kΩ ± 3%
Fixed number of B=3480kΩ ± 2%

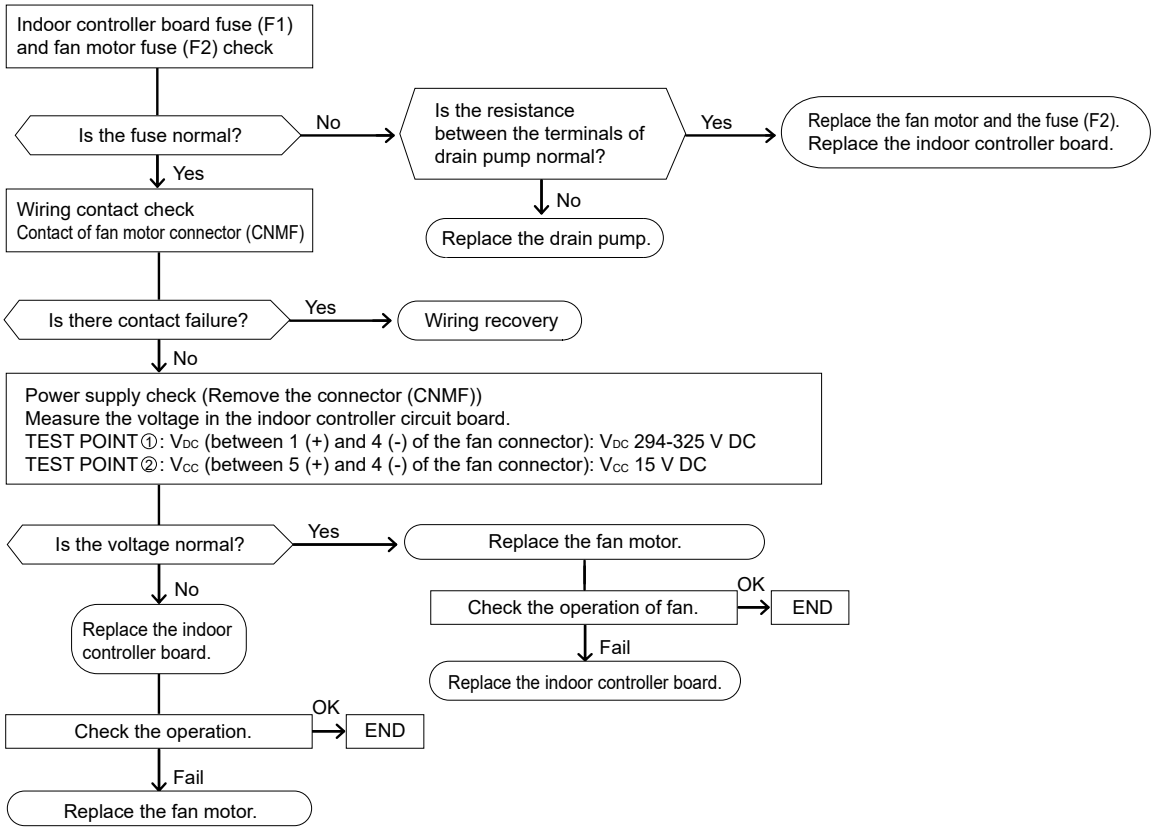
$$Rt=15\exp\{3480(\frac{1}{273+t}-\frac{1}{273})\}$$

0°C	(32˚F)	15kΩ
10°C	(50˚F)	9.6kΩ
20°C	(68˚F)	6.3kΩ
25°C	(77˚F)	5.2kΩ
30°C	(86˚F)	4.3kΩ
40°C	(104˚F)	3.0kΩ



10-8. DC FAN MOTOR (FAN MOTOR/INDOOR CONTROLLER BOARD)

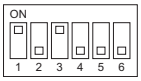
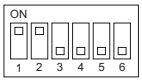
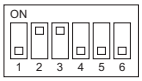
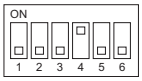
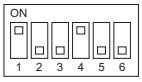
1. CAUTION
   - A high voltage is applied to the connector for connection to the fan motor (CNMF).
   - Do not unplug the connector CNMF with the unit energized to avoid damage to the indoor control board and fan motor.
2. Troubleshooting
   - Symptom: Indoor unit fan does not run.

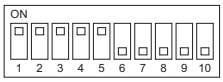


10-9. FUNCTIONS OF DIP SWITCH AND JUMPER WIRE

Each function is controlled by the dip switch and the jumper wire on control p.c. board.
SW1 and SW2 are equipped only for service parts.
Model setting and capacity setting are memorized in the nonvolatile memory of the control p.c. board of the unit.

(Marks in the table below) Jumper wire (○: Short ×: Open)

<table>
<tr><th>Jumper wire</th><th>Functions</th><th>Setting by the dip switch and jumper wire</th><th>Remarks</th></tr>
<tr><td>SW1</td><td>Model settings</td><td>For service board
  </td><td></td></tr>
<tr><td>SW2</td><td>Capacity settings</td><td>
<table>
<tr><th>MODELS</th><th>Service board</th></tr>
<tr><td>SEZ-AD09NL</td><td>  </td></tr>
<tr><td>SEZ-AD12NL</td><td>  </td></tr>
<tr><td>SEZ-AD15NL</td><td>  </td></tr>
<tr><td>SEZ-AD18NL</td><td>  </td></tr>
</table>
</td><td></td></tr>
<tr><td>J41
J42</td><td>Pair number setting with wireless remote controller</td><td>
<table>
<tr><th rowspan="2">Wireless remote controller setting</th><th colspan="2">Control PCB setting</th></tr>
<tr><th>J41</th><th>J42</th></tr>
<tr><td>0</td><td>○</td><td>○</td></tr>
<tr><td>1</td><td>×</td><td>○</td></tr>
<tr><td>2</td><td>○</td><td>×</td></tr>
<tr><td>3 ~ 9</td><td>×</td><td>×</td></tr>
</table>
</td><td><Settings at time of factory shipment>
Wireless remote controller: 0
Control PCB: ○ (for both J41 and J42)
Four pair number settings are supported.
The pair number settings of the wireless remote controller and indoor control PCB (J41/J42) are given in the table on the left.
('×' in the table indicates the jumper line is disconnected.)</td></tr>
</table>



The figure at left shows that the switches 1 through 5 are set to ON and 6 through 10 are set to OFF.

11. DISASSEMBLY PROCEDURE

Exercise caution when removing heavy parts.

1. Control box

1. Removing the control box cover
   (1) Remove the two fixing screws on the cover (A) to remove it.
   • Tighten screws to a torque of 2.0±0.2 N·m.

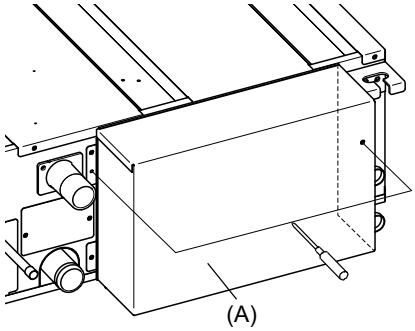


Fig. 1

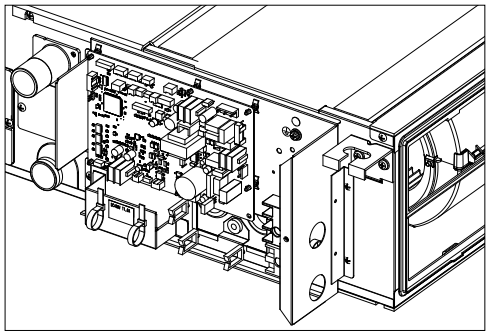


Fig. 2

2. Thermistor (Intake air)

1. Remove the control box cover according to the procedure in section 1.
   (1) Pull out thermistor (B) on the control box.

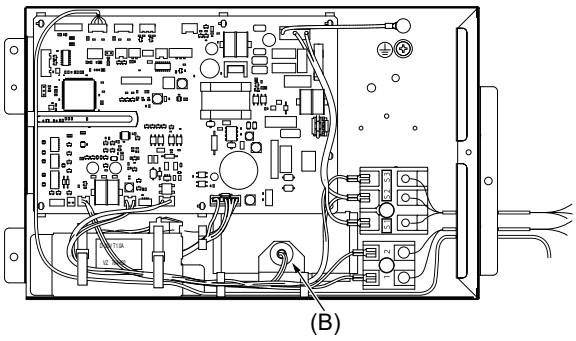


Fig. 3

Exercise caution when removing heavy parts.

3. R454B sensor

1. Remove the control box cover according to the procedure in section 1, and remove the remove the R454B sensor connector from CNSA terminal explained in section 10-5-1.
2. Removing the filter and the bottom plate
   (1) Push up the tab on the filter in the direction of arrow (a), and pull out the filter in the direction of the arrow 1.
   (2) Remove the fixing screws on the bottom plate (C) to remove it.
   • Tighten screws to a torque of 1.4±0.2 N·m.

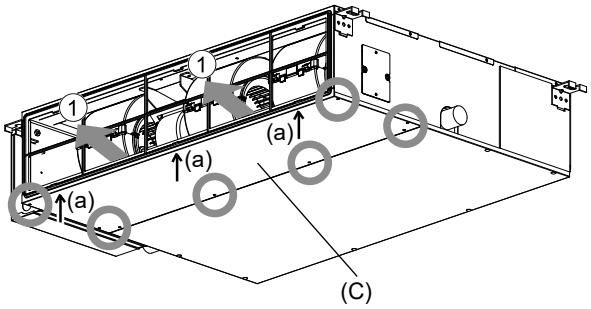


Fig. 4

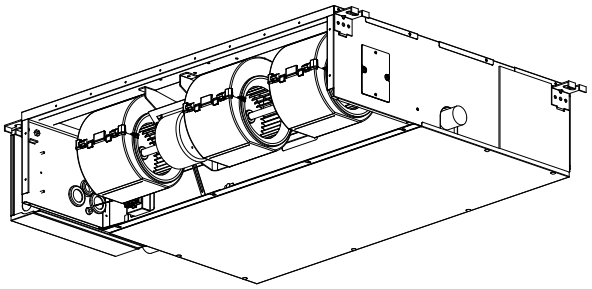


Fig. 5

3. Remove the fixing screw (D) of R454B sensor cover.

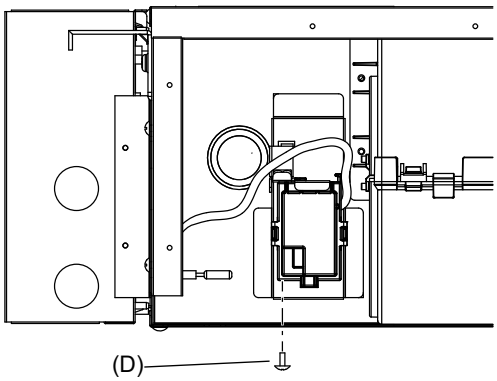


Fig. 6

4. Remove the R454B sensor.

Note
• The refrigerant sensor shall only be replaced with manufacturer approved sensor.

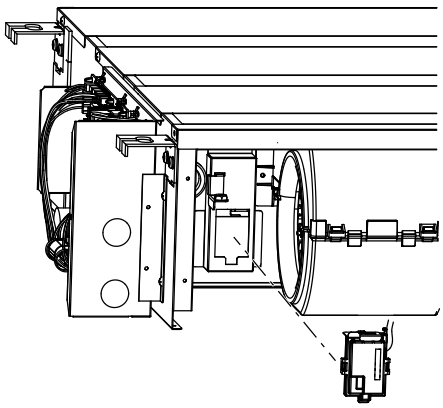


Fig. 7

Exercise caution when removing heavy parts.

4. Drain pan

1. Removing the filter and the bottom plate
   (1) Push up the tab on the filter in the direction of arrow (a), and pull out the filter in the direction of the arrow 1.
   (2) Remove the fixing screws on the bottom plate (E), (F) to remove it.

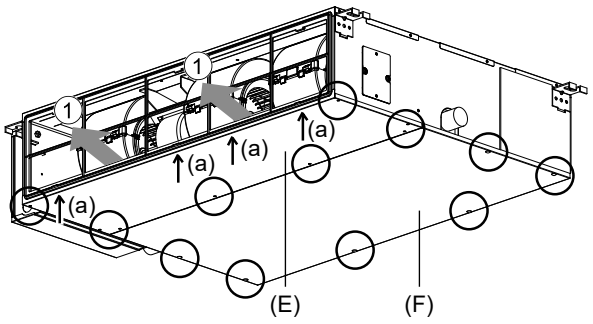


Fig. 8

2. Removing the drain pan
   (1) Pull out the drain pan in the direction of the arrow 2.

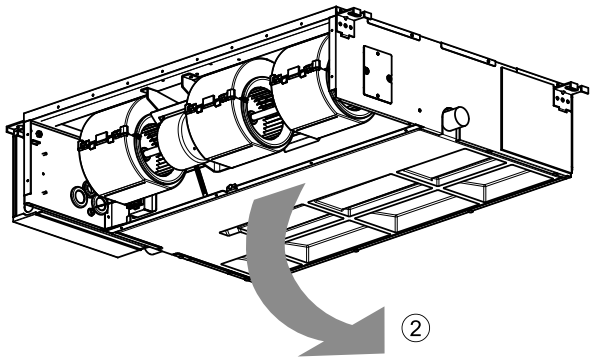


Fig. 9

Note
- Drain the water out of the drain pan before removing it.
- To avoid dew condensation, use insulated screws in the places marked with circles in Fig.10.

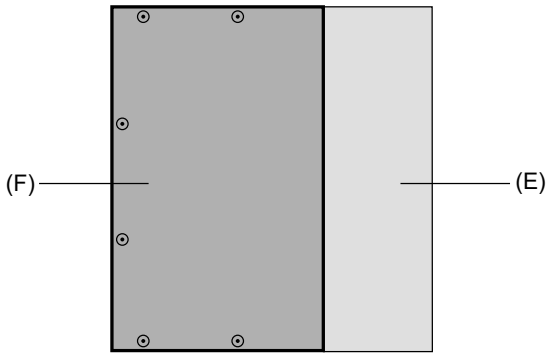
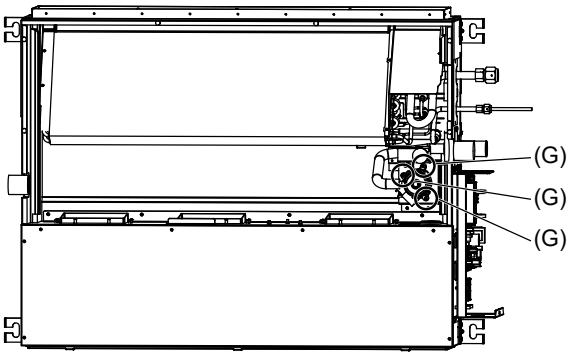


Fig. 10

Exercise caution when removing heavy parts.

5. Drain pump

1. Remove the control box cover according to the procedure in section 1, and remove the drain pump connector.
2. Remove the bottom plate and drain pan according to the procedure in section 4.
3. Remove the drain pump.
   (1) Remove the fixing screws (G) of drain pump.
   (2) Remove the drain pump.



Bottom view

Fig. 11

6. Thermistor (Condenser/evaporator) (Liquid pipe)

1. Remove the drain pan according to the procedure in section 4.
2. Removing the Heat exchanger cover
   (1) Remove the four fixing screws on the heat exchanger cover (H) to remove it.
   • Tighten screws to a torque of 1.4±0.2 N·m.

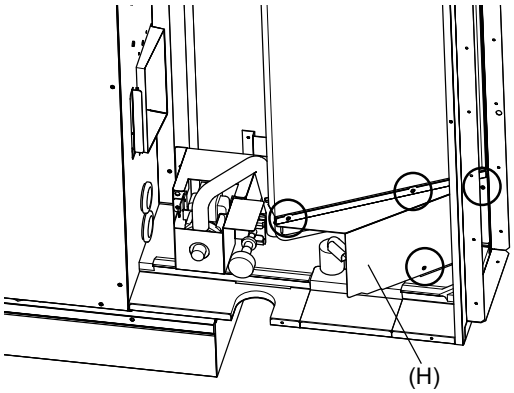


Fig. 12

3. Removing the thermistors
   (1) Remove the thermistors (J) from the thermistor holders (K) on the copper tube.

   Thermistor size
   Liquid pipe: ø3/8 inch (ø8 mm)
   Condenser/evaporator: ø1/4 inch (ø6 mm)

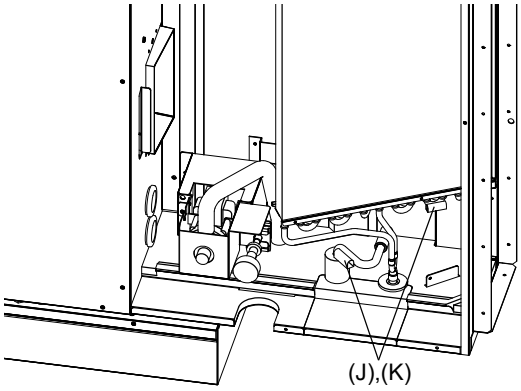


Fig. 13

Exercise caution when removing heavy parts.

7. Fan and fan motor

1. Removing the filter and the bottom plate
   (1) Push up the tab on the filter in the direction of arrow (a), and pull out the filter in the direction of the arrow 1.
   (2) Remove the fixing screws on the bottom plate (L) to remove it.
   • Tighten screws to a torque of 1.4±0.2 N·m.

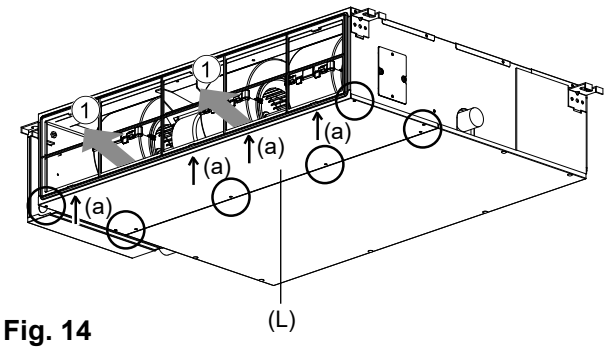


Fig. 14

2. Removing the fan casing (bottom half)
   (1) Squeeze the tabs on the fan casing to remove it in the direction of arrow 2.

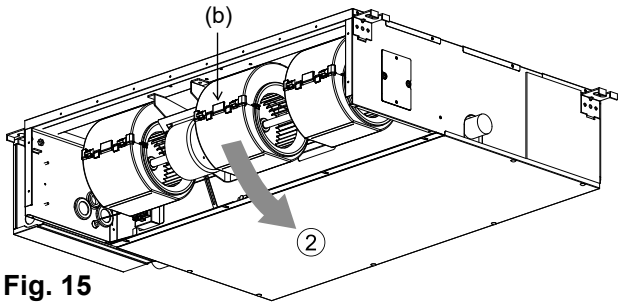


Fig. 15

3. Removing the motor cable
   (1) Remove the motor cable through the rubber bush.

4. Removing the fan motor and the Sirocco fan
   (1) Remove the two motor fixing screws to remove the motor and the Sirocco fan in the direction of arrow 3.
   • Tighten screws to a torque of 3.5±0.2 N·m.

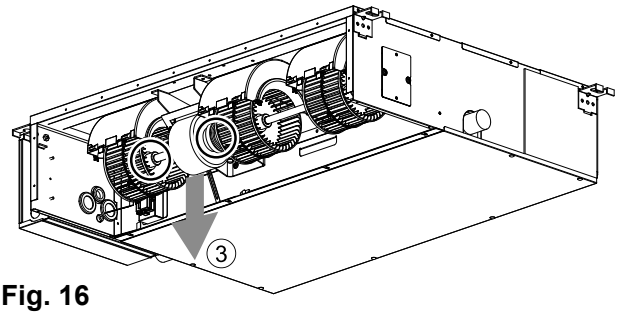


Fig. 16

   (2) Remove the four fan case fixing screws to take the top half of the fan casing off.
   • Tighten screws to a torque of 1.4±0.2 N·m.

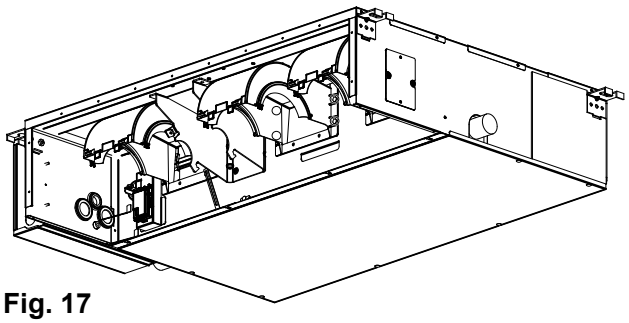


Fig. 17

Exercise caution when removing heavy parts.

8. Heat exchanger

1. Remove the drain pan according to the procedure in section 4.
2. Remove the heat exchanger cover according to the procedure in section 6-2.
3. Removing the cover
   (1) Remove the two fixing screws on the cover (M) to remove it.
   • Tighten screws to a torque of 2.0±0.2 N·m.

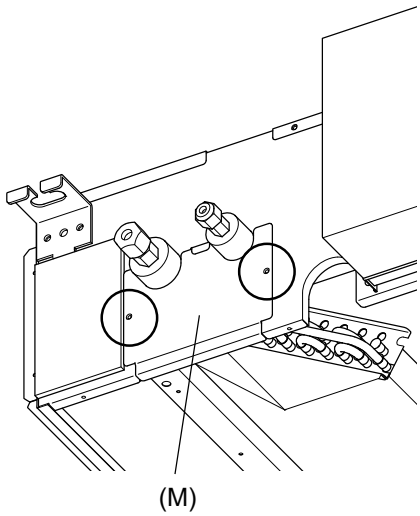


Fig. 18

4. Removing the Heat exchanger
   (1) Remove the fixing screws on the heat exchanger (N) to remove it.
   • Tighten screws to a torque of 1.4±0.2 N·m.

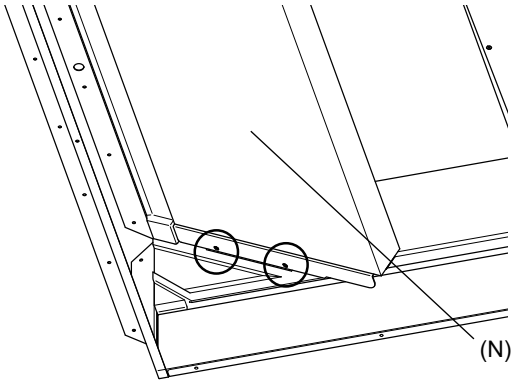


Fig. 19

12. INSPECTION AND MAINTENANCE

12-1. GUIDELINE FOR PREVENTIVE MAINTENANCE

The following maintenance intervals indicate the estimated intervals of parts replacement and repair to be required as a result of periodic inspections. They do not necessarily mean that replacement is required at the maintenance intervals. The maintenance intervals do not indicate the warranty period.

Parts	Inspection interval	Maintenance interval*
Motor (Fan, drain pump)	1 year	20,000 hours
Bearing		15,000 hours
Electrical box		25,000 hours
Heat exchanger		5 years
Electronic expansion valve		20,000 hours
Sensor (Thermistor, refrigerant sensor, etc)		5 years
Drain pan		8 years

- The table above shows the main parts. Check the maintenance contract for details.
- This maintenance interval is an estimated period until the day when the maintenance should be conducted to use the product safely for a long time.
  Make use of the table above for maintenance planning (such as planning budget for maintenance inspection cost).
  Depending on the contents of the maintenance contract, the actual inspection and maintenance intervals may shorter than those in the table above.
- The maintenance and inspection items may differ depending on maintenance providers.
  Please check with your maintenance provider when concluding a maintenance contract.

*The following usage conditions are assumed.

- Normal use without frequent START/STOPs (The number of START/STOPs is assumed to be less than 6 times per hour in normal use)
- Operating hours are assumed to be 10 hours per day/2500 hours per year.

When the equipment is used under the following conditions, the maintenance interval may be shortened.

- When equipment is used in an environment where temperature and humidity are high or change dramatically
- When equipment is used in an environment where power supply fluctuations (the distortion of voltage, frequency, and waveform) are large (only within the allowable range)
- When equipment is used in an environment where the equipment may receive vibration or mechanical shock
- When equipment is used in an environment where dust, salt, toxic gases such as sulfur dioxide and hydrogen sulfide, and oil mist are present
- When equipment starts/stops frequently and operates for long periods (24-hour air-conditioning operation)

12-2. RECOMMENDED PARTS INSPECTION INTERVAL

Parts	Inspection interval	Maintenance interval	Inspection items	Criteria	Measures
Long-life filter	1 year	5 years	• Visual check for dirt or torn.	• Filter element is seen through. • No torn or deformation.	• Clean the filter if it is dirty. • Replace the filter if it is torn.
High-performance filter		1 year	• Check for clogging. • Check the appearance.	• No notable clogging in a short period of time. • No deformation or damage.	• Replace the filter if it is clogged. • Replace the filter if it is deformed or damaged. • Replace the filter periodically.
Smoothing capacitor		10 years	• Check the appearance of electrolytic capacitors.	• No liquid leakage, deformation, or sleeve (outer film) shrinkage.	Replace the electrolytic capacitor if there is leakage, deformation, or shrinkage of the sleeve (outer film).
Fuse		10 years	• Check the appearance.	No deformation or discoloration.	• Replace the fuse if the circuit is cut off.
Motor (Fan, drain pump)		20,000 hours	• Auditory check for operating sounds. • Measure the insulation resistance.	• No abnormal sounds. • Insulation resistance must be 1 MΩ or above.	• Replace the fan motor if an insulation problem is found.
Bearing		15,000 hours	• Fill oil periodically.	• No abnormal sound.	• Periodically replace the parts.
Electrical box		25,000 hours	• Check the insulation resistance of the circuit (500 V) • Check for loose terminals and connectors.	• Insulation resistance must be 1 MΩ or above. • No loose connections. • No accumulated foreign objects. • No error display.	• Clean with a brush if dust accumulation is found. • Replace the electrical part if the insulation resistance is 1 MΩ or below. • Tighten the loose terminals and reconnect the connectors.
Heat exchanger		5 years	• Check for clogging, contamination, and damage.	No clogging, contamination, or damage.	Perform cleaning.
Electronic expansion valve		20,000 hours	• Operation check using operation data.	Temperature must change in proportion to the valve position. (Check the temperature variation with the centralized controller.)	Replace the valve if the operation data show an operation failure due to valve problems.
Sensor (Thermistor, refrigerant sensor, etc)		5 years	• Check for breakage and deterioration of the cables, and for disconnection of the connectors. • Measure the insulation resistance.	• No breakage or deterioration of the cables or disconnected connectors. • Insulation resistance must be 1 MΩ or above.	Replace the sensor if the cable is broken, short-circuited, or severely deteriorated, or an insulation problem is found.
Drain pan		8 years	• Check for clogging and drain water flow. • Check for coating's peeling or separation.	• No drain clogging. • No abnormal rust or hole.	• Clean the drain pan and check that the drain pan is tilted properly. • Replace the drain pan depending on the repairing coating or conditions.

- The table above shows the main parts. Check the maintenance contract for details.
- This maintenance interval is an estimated period until the day when the maintenance should be conducted to use the product safely for a long time.
  Make use of the table above for maintenance planning (such as planning budget for parts replacement cost).
- The inspection intervals depend on the usage and environment.
  The inspection intervals do not indicate the warranty period.
- The maintenance and inspection items may differ depending on maintenance providers. Please check with your maintenance provider when concluding a maintenance contract.
- Repairs outside the warranty period will be charged, even if periodic inspections have been performed at the recommended intervals.

MITSUBISHI ELECTRIC CORPORATION

www.MitsubishiElectric.com

HWE24090

New publication effective Oct. 2024
Specifications subject to change without notice