MITSUBISHI ELECTRIC

SPLIT-TYPE AIR CONDITIONERS

Revision A:
• MUZ-HX09/12NL-U1 have been added.
•12. DISASSEMBLY INSTRUCTIONS has been corrected.
OBD953 is void.

OUTDOOR UNIT
TECHNICAL & SERVICE MANUAL

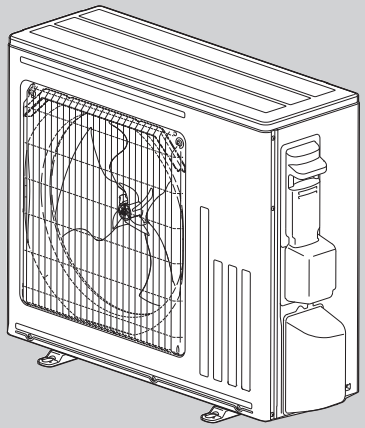
HFC utilized R454B

No. OBD953
REVISED EDITION-A

Models

MUZ-HX09NL - U1
MUZ-HX12NL - U1
MUZ-HX18NL - U1
MUZ-HX24NL - U1

lutdoor unit technical & service manual
MSZ-HX•NL Series (OBD952)
Indoor unit service manual
MSZ-HX•NL Series (OBH952)
Outdoor unit service manual
MUZ-HX•NL Series (OBH953)



MUZ-HX18NL

CONTENTS

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 in the manuals and on the spec labels provided with our products.
We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

<Preparation before the repair service>

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the air conditioner, turn off the power-supply breaker and pull the power plug.
- Discharge the capacitor before the work involving the electric parts.

<Precautions during the repair service>

- Do not perform the work involving the electric parts with wet hands.
- Do not pour water into the electric parts.
- Do not touch the refrigerant.
- Do not touch the hot or cold areas in the refrigeration cycle.
- When the repair or the inspection of the circuit needs to be done without turning off the power, exercise great caution not to touch the live parts.

⚠ WARNING

- **When the refrigerant circuit has a leak, do not execute pump down with the compressor.**
- **When pumping down the refrigerant, stop the compressor before disconnecting the refrigerant pipes. The compressor may burst if air etc. get into it.**
- **When opening or closing the valve below freezing temperatures, refrigerant may spurt out from the gap between the valve stem and the valve body, resulting in injuries.**

Revision A:

• MUZ-HX09/12NL-U1 have been added.
•12. DISASSEMBLY INSTRUCTIONS has been corrected.

1 TECHNICAL CHANGES

MUZ-HX09NL-U1
MUZ-HX12NL-U1
MUZ-HX18NL-U1
MUZ-HX24NL-U1

1. New model

2 SERVICING PRECAUTIONS FOR UNITS USING REFRIGERANT R454B

Servicing precautions for units using refrigerant R454B

WARNING

This unit uses a flammable refrigerant.
If refrigerant leaks and comes in contact with fire or heating part, it will create harmful gas and there is risk of fire.

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
The appliance should not be stored in a room with continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
Do not pierce or burn.
Be aware that refrigerants may not contain an odor.
- Maintenance, service and repair operations shall be performed by authorized technician with required qualification.
- Servicing shall be performed only by methods recommended by the manufacturer.
- Refrigerant piping shall be protected from physical damage.
- Field installed piping should be kept to a minimum.
- Compliance with national gas regulations shall be observed.
- All field joints shall be accessible for inspection prior to being covered or enclosed.

⚠ WARNING

- The mounting height of indoor unit shall be 5.9 ft (1.8 m) or more from the floor. Up to 7.5 ft (2.3 m) is recommended.
- The unit shall be installed in rooms exceed the minimum room area (A_{min}) determined by total refrigerant amount (M).

M			A_{min}	
[kg]	[lbs, oz]		[m^2]	[ft^2]
0.5	1	1	1.9	21
0.6	1	5	2.3	25
0.7	1	8	2.6	28
0.8	1	12	3.0	33
0.9	1	15	3.4	37
1.0	2	3	3.8	41
1.1	2	6	4.1	45
1.2	2	10	4.5	49
1.3	2	13	4.9	53
1.4	3	1	5.2	56
1.5	3	4	5.6	61
1.6	3	8	6.0	65

M			A_{min}	
[kg]	[lbs, oz]		[m^2]	[ft^2]
1.7	3	11	6.3	68
1.8	3	15	6.8	74
1.9	4	3	7.2	78
2.0	4	6	7.6	82
2.1	4	10	7.9	86
2.2	4	13	8.3	90
2.3	5	1	8.7	94
2.4	5	4	9.1	98
2.5	5	8	9.4	102
2.6	5	11	9.8	106
2.7	5	15	10.2	110
2.8	6	2	10.6	115

1. REFRIGERANT PIPE NITROGEN PRESSURE TEST METHOD

(1) Connect the testing tools.
- Make sure the stop valves are closed and do not open them.
- Add pressure to the refrigerant lines through the service port of the stop valve for GAS.

(2) Do not add pressure to the specified pressure all at once; add pressure little by little.
1. Pressurize to 0.5 MPa (73 psig, 5 kgf/cm^2G), wait 5 minutes, and make sure the pressure does not decrease.
2. Pressurize to 1.5 MPa (218 psig, 15 kgf/cm^2G), wait 5 minutes, and make sure the pressure does not decrease.
3. Pressurize to 4.15 MPa (601 psig, 41.5 kgf/cm^2G) and measure the surrounding temperature and refrigerant pressure.

(3) If the specified pressure holds for 24 Hours and does not decrease, the pipes have passed the test and there are no leaks.
- If the surrounding temperature changes by 1°F (0.5°C), the pressure will change by about 1 psig (0.007 MPa). Make the necessary corrections.

(4) If the pressure decreases in steps (2) or (3), there is a gas leak. Look for the source of the gas leak.

2. Additional refrigerant charge

Additional refrigerant charge

Refrigerant for the indoor units and the extended piping is not included in the outdoor unit when the unit is shipped from the factory. Therefore, charge each refrigerant piping system with additional refrigerant at the installation site. In addition, in order to carry out service, enter the size and length of each liquid pipe and additional refrigerant charge amounts in the spaces provided on the “Refrigerant amount” plate on the outdoor unit.

NOTE:

- When the unit is stopped, charge the unit with the additional refrigerant through the liquid stop valve after the pipe extensions and indoor units have been vacuumized.
- When the unit is operating, add refrigerant to the gas check valve using a safety charger. Do not add liquid refrigerant directly to the check valve.

Refrigerant adjustment

Model	**MSZ-HX09/12/18NL**	**MSZ-HX24NL**
Chargeless pipe length A	25 ft (7.5 m)	50 ft (15 m)
Refrigerant adjustment B	0.22 oz/ft (20 g/m)	
Additional refrigerant	Pipe length up to A : No need Pipe length exceeds A : B×(pipe length - A)	

3. Cautions for the 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.

■ Information on servicing

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, 2 to 6 below shall be completed prior to conducting work on the system.

2. Work procedure
Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapour being present while the work is being performed.

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.

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.

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.

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.

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

8. Checks to the 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.

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.

■ **Repairs to sealed components**
Sealed electrical components shall be replaced.

■ **Repair to intrinsically safe components**
Intrinsically safe components must be replaced.

■ **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.

■ **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 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; and
• 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.

■ **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.

■ **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.

- Become familiar with the equipment and its operation.
- Isolate system electrically.
- 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.
- Pump down refrigerant system, if possible.
- If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- Make sure that cylinder is situated on the scales before recovery takes place.
- Start the recovery machine and operate in accordance with instructions.
- Do not overfill cylinders (no more than 80 % volume liquid charge).
- Do not exceed the maximum working pressure of the cylinder, even temporarily.
- 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.
- Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

■ **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.

■ **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.

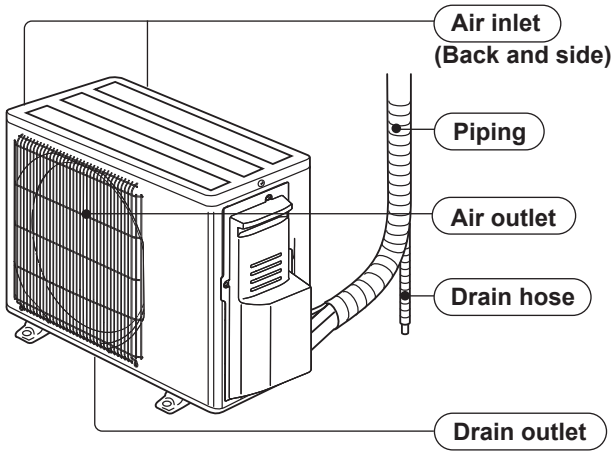
The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

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.

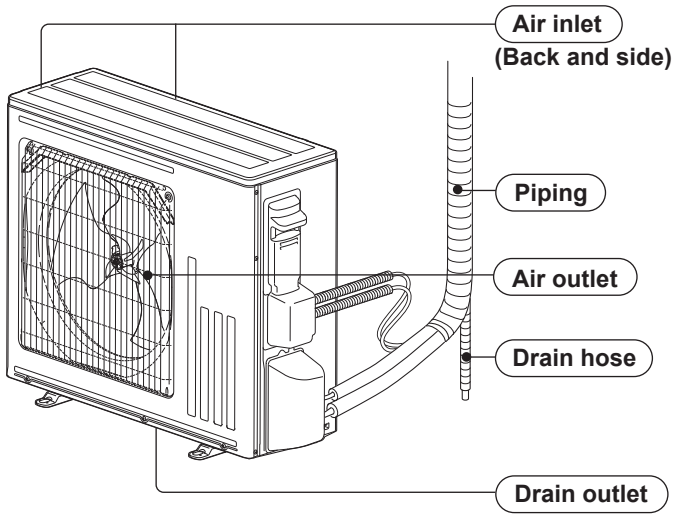
The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

3 PART NAMES AND FUNCTIONS

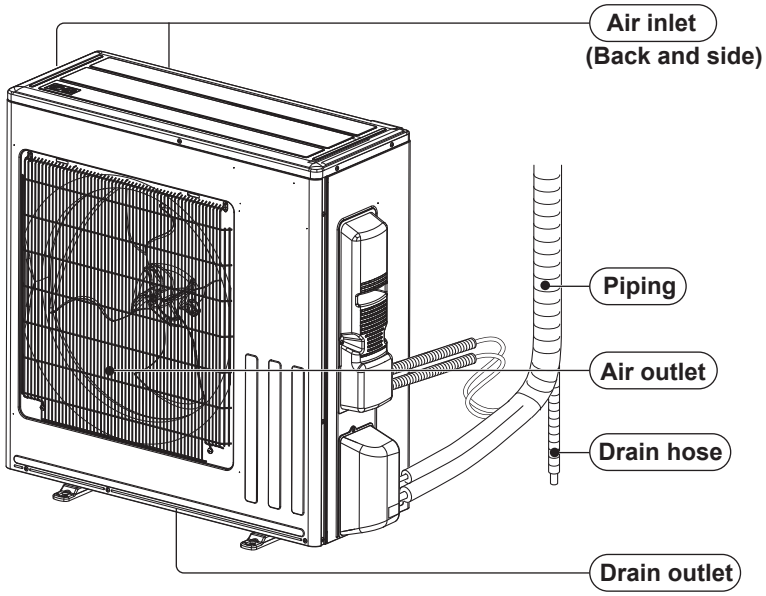
MUZ-HX09NL
MUZ-HX12NL



MUZ-HX18NL



MUZ-HX24NL



4 SPECIFICATION

Outdoor unit model			MUZ-HX09NL	MUZ-HX12NL	MUZ-HX18NL
Capacity Rated (Minimum–Maximum)	Cooling *1	Btu/h	9,000 (3,600–11,000)	12,000 (3,600–13,400)	17,200 (5,800–18,000)
	Heating 47 *1	Btu/h	10,900 (4,000–13,000)	12,200 (4,500–15,500)	18,000 (5,400–20,800)
Capacity Rated (Maximum)	Heating 17 *2	Btu/h	6,800 (7,200)	7,800 (9,000)	11,400 (15,000)
Power consumption Rated (Minimum–Maximum)	Cooling *1	W	720 (240–1,100)	960 (230–1,430)	1,370 (350–2,330)
	Heating 47 *1	W	900 (280–1,400)	990 (250–2,140)	1,590 (330–2,630)
Power consumption Rated (Maximum)	Heating 17 *2	W	820 (1,230)	900 (1,670)	1,260 (1,980)
EER2 *1 [SEER2] *3	Cooling		12.50 [20.0]	12.50 [20.0]	12.55 [20.0]
HSPF2 Region IV *4	Heating		10.0	10.0	9.5
COP	Heating		3.55	3.61	3.32
Power factor	Cooling	%	89	94	97
	Heating	%	91	95	97
Power supply	V, phase, Hz		208/230, 1, 60	208/230, 1, 60	208/230, 1, 60
Max. fuse size (time delay)		A	15	20	20
Min. circuit ampacity		A	10	16	16
Fan motor	F.L.A	A	0.71	0.71	0.74
Compressor	Model		KRB073FATMC	SRB140FQHMC SRB140FQHMT	SRB140FQHMC SRB140FQHMT
	R.L.A	A	5.6	9.4	9.8
	L.R.A	A	7	11.7	12.2
	Refrigeration oil	fl oz. (L) (Model)	9.1 (0.27)/(RM68EH)	11.8 (0.35)/(RM68EH)	11.8 (0.35)/(RM68EH)
Refrigerant control			Linear expansion valve	Linear expansion valve	Linear expansion valve
Sound level *1	Cooling	dB(A)	46	49	49
	Heating	dB(A)	50	51	51
Airflow High–Med.–Low	Cooling	CFM	1,141–1,031–1,031	1,166–1,166–469	1,816–1,321–626
	Heating	CFM	1,196–1,141–794	1,152–1,152–739	1,415–1,321–553
Fan speed High–Med.–Low	Cooling	rpm	850–770–770	910–910–410	1,060–790–420
	Heating	rpm	890–850–600	900–900–600	840–790–380
Defrost method			Reverse cycle	Reverse cycle	Reverse cycle
Dimensions	W	in.	31-1/2	31-1/2	31-1/2
	D	in.	11-1/4	11-1/4	11-1/4
	H	in.	21-5/8	21-5/8	28-1/8
Weight		lb.	65	81	90
External finish			Munsell 3Y 7.8/1.1	Munsell 3Y 7.8/1.1	Munsell 3Y 7.8/1.1
Remote controller			Wireless type	Wireless type	Wireless type
Control voltage (by built-in transformer)		V DC	12–24	12–24	12–24
Refrigerant piping			Not supplied	Not supplied	Not supplied
Refrigerant pipe size (Min. wall thickness)	Liquid	in.	1/4 (0.0315)	1/4 (0.0315)	1/4 (0.0315)
	Gas	in.	3/8 (0.0315)	3/8 (0.0315)	1/2 (0.0315)
Connection method	Indoor		Flared	Flared	Flared
	Outdoor		Flared	Flared	Flared
Between the indoor & outdoor units	Height difference	ft.	40	40	40
	Piping length	ft.	65	65	65
Refrigerant charge (R454B)			1 lbs. 6 oz	2 lbs. 2 oz	2 lbs. 8 oz

NOTE: Test conditions are based on AHRI 210/240.

*1: Rating conditions (Cooling) — Indoor: 80˚FDB, 67˚FWB, Outdoor: 95˚FDB, (75˚FWB)
(Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 47˚FDB, 43˚FWB

*2: Rating conditions (Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 17˚FDB, 15˚FWB

*3: Test condition (Refer to page 11.)

*4: Test condition (Refer to page 11.)

Outdoor unit model			**MUZ-HX24NL**
Capacity Rated (Minimum – Maximum)	Cooling *1	Btu/h	22,400 (5,800 – 22,400)
	Heating 47 *1	Btu/h	26,000 (6,200 – 26,000)
Capacity Rated (Maximum)	Heating 17 *2	Btu/h	17,200 (18,500)
Power consumption Rated (Minimum – Maximum)	Cooling *1	W	1,910 (380 – 2,200)
	Heating 47 *1	W	2,500 (370 – 2,500)
Power consumption Rated (Maximum)	Heating 17 *2	W	1,900 (3,060)
EER2 *1 [SEER2] *3	Cooling		11.75 [20.0]
HSPF2 Region IV *4	Heating		9.5
COP	Heating		3.05
Power factor	Cooling	%	95
	Heating	%	97
Power supply	V, phase, Hz		208/230, 1, 60
Max. fuse size (time delay)		A	25
Min. circuit ampacity		A	23
Fan motor	F.L.A	A	0.74
Compressor	Model		SRB172FQHMC SRB172FQHMT
	R.L.A	A	13.8
	L.R.A	A	17.2
	Refrigeration oil	fl oz. (L) (Model)	14.5 (0.43)/(RM68EH)
Refrigerant control			Linear expansion valve
Sound level *1	Cooling	dB(A)	54
	Heating	dB(A)	55
Airflow High – Med. – Low	Cooling	CFM	2,202 – 1,934 – 838
	Heating	CFM	1,934 – 1,934 – 1,281
Fan speed High – Med. – Low	Cooling	rpm	900 – 800 – 400
	Heating	rpm	800 – 800 – 560
Defrost method			Reverse cycle
Dimensions	W	in.	33-1/16
	D	in.	13
	H	in.	34-5/8
Weight		lb.	115
External finish			Munsell 3Y 7.8/1.1
Remote controller			Wireless type
Control voltage (by built-in transformer)		V DC	12 – 24
Refrigerant piping			Not supplied
Refrigerant pipe size (Min. wall thickness)	Liquid	in.	1/4 (0.0315)
	Gas	in.	1/2 (0.0315)
Connection method	Indoor		Flared
	Outdoor		Flared
Between the indoor & outdoor units	Height difference	ft.	50
	Piping length	ft.	100
Refrigerant charge (R454B)			3 lbs.

NOTE: Test conditions are based on AHRI 210/240.

*1: Rating conditions (Cooling) — Indoor: 80˚FDB, 67˚FWB, Outdoor: 95˚FDB, (75˚FWB)
(Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 47˚FDB, 43˚FWB

*2: Rating conditions (Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 17˚FDB, 15˚FWB

*3: Test condition (Refer to page 11.)

*4: Test condition (Refer to page 11.)

Test condition

*3, *4

AHRI 210/240	Mode	Test	Indoor air condition (°F)		Outdoor air condition (°F)	
			Dry bulb	Wet bulb	Dry bulb	Wet bulb
	SEER (Cooling)	"A-Full" Cooling Steady State at rated compressor speed	80	67	95	75
		"B-Full" Cooling Steady State at rated compressor speed	80	67	82	65
		"B-Low" Cooling Steady State at minimum compressor speed	80	67	82	65
		"F-Low" Cooling Steady State at minimum compressor speed	80	67	67	53.5
		"E-Int" Cooling Steady State at intermediate compressor speed *5	80	67	87	69
	HSPF (Heating)	"H1-Nom" Heating Steady State at rated compressor speed	70	60	47	43
		"H3-Full" Heating at rated compressor speed	70	60	17	15
		"H0-Low" Heating Steady State at minimum compressor speed	70	60	62	56.5
		"H1-Low" Heating Steady State at minimum compressor speed	70	60	47	43
		"H2-Int" Heating at intermediate compressor speed *5	70	60	35	33

*5: At intermediate compressor speed
= ("Rated compressor speed" - "minimum compressor speed") / 3 + "minimum compressor speed".

OPERATING RANGE

(1) POWER SUPPLY

	Rated voltage	Guaranteed voltage (V)
Outdoor unit	208/230 V 1 phase 60 Hz	Min. 187 208 230 Max. 253

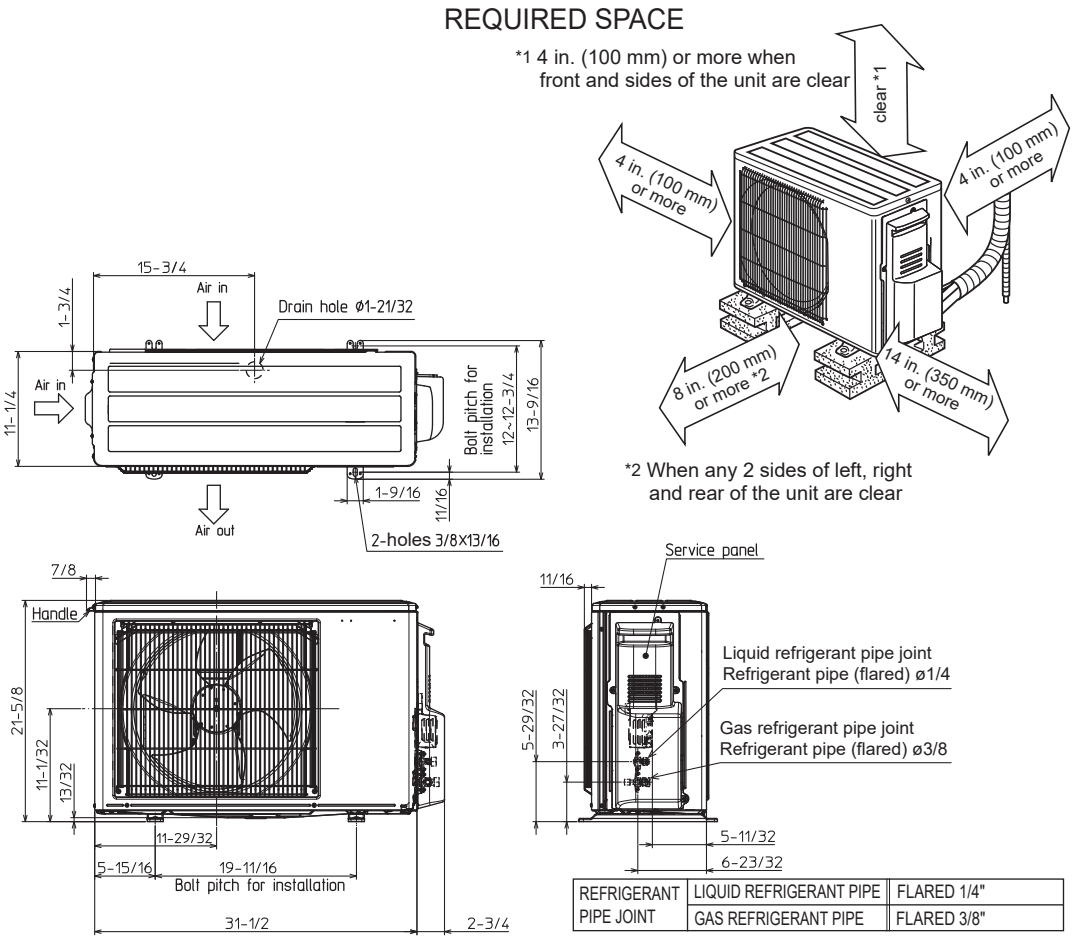
(2) OPERATION

Mode	Condition	Intake air temperature (°F)	
		Outdoor	
		DB	WB
Cooling	Standard temperature	95	—
	Maximum temperature	115	—
	Minimum temperature	14	—
	Maximum humidity	—	
Heating	Standard temperature	47	43
	Maximum temperature	75	65
	Minimum temperature	-5	-6

5 OUTLINES AND DIMENSIONS

MUZ-HX09NL MUZ-HX12NL

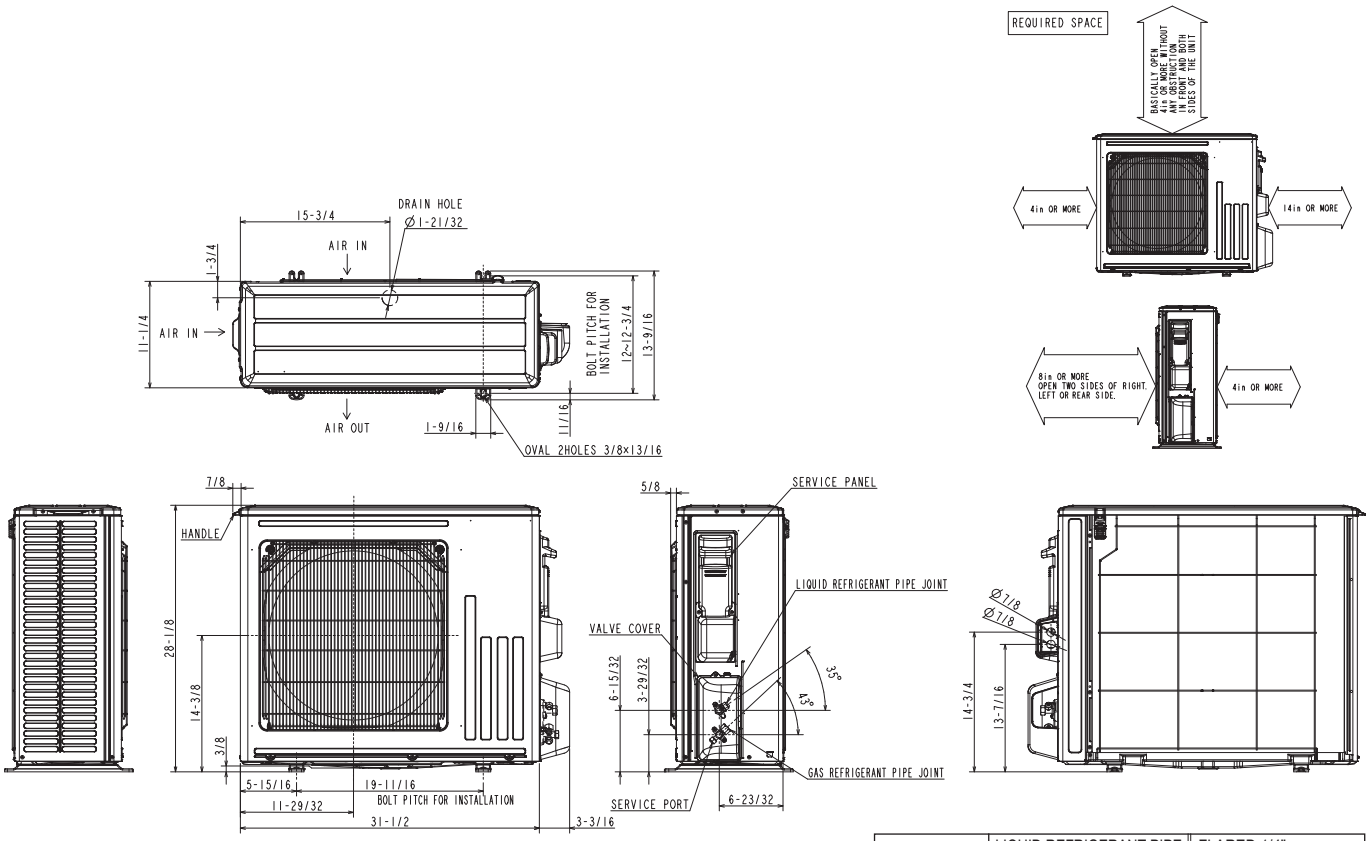
Unit: inch



REFRIGERANT PIPE JOINT	LIQUID REFRIGERANT PIPE	FLARED 1/4"
	GAS REFRIGERANT PIPE	FLARED 3/8"

MUZ-HX18NL

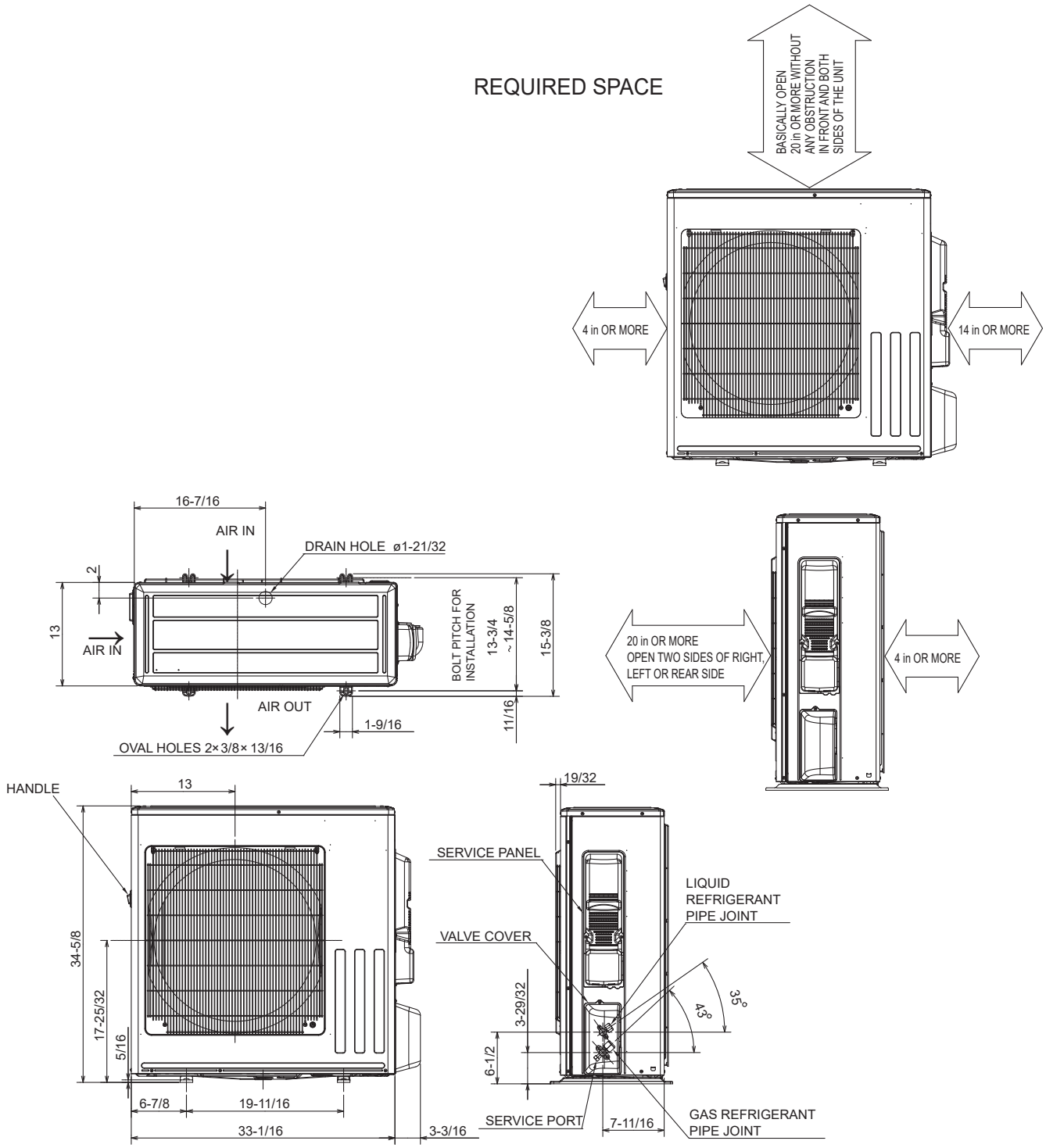
Unit: inch



REFRIGERANT PIPE JOINT	LIQUID REFRIGERANT PIPE	FLARED 1/4"
	GAS REFRIGERANT PIPE	FLARED 1/2"

MUZ-HX24NL

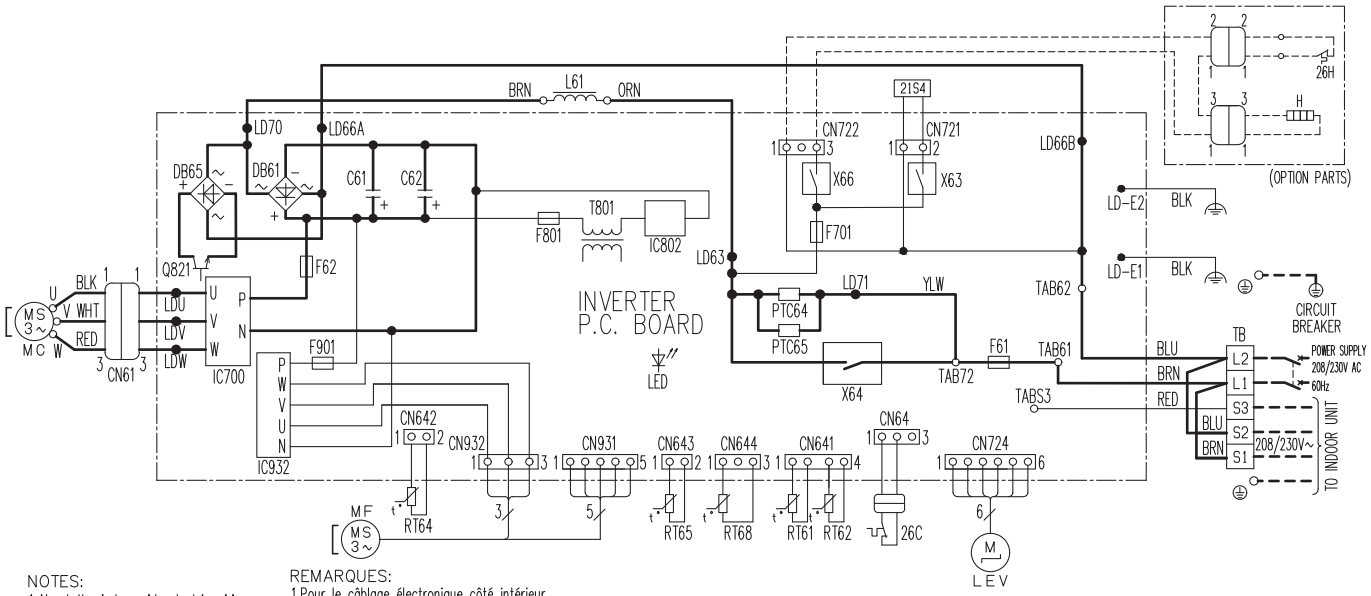
Unit: inch



REFRIGERANT PIPE JOINT	LIQUID REFRIGERANT PIPE	FLARED 1/4″
	GAS REFRIGERANT PIPE	FLARED 1/2″

6 WIRING DIAGRAM

MUZ-HX09NL MUZ-HX12NL

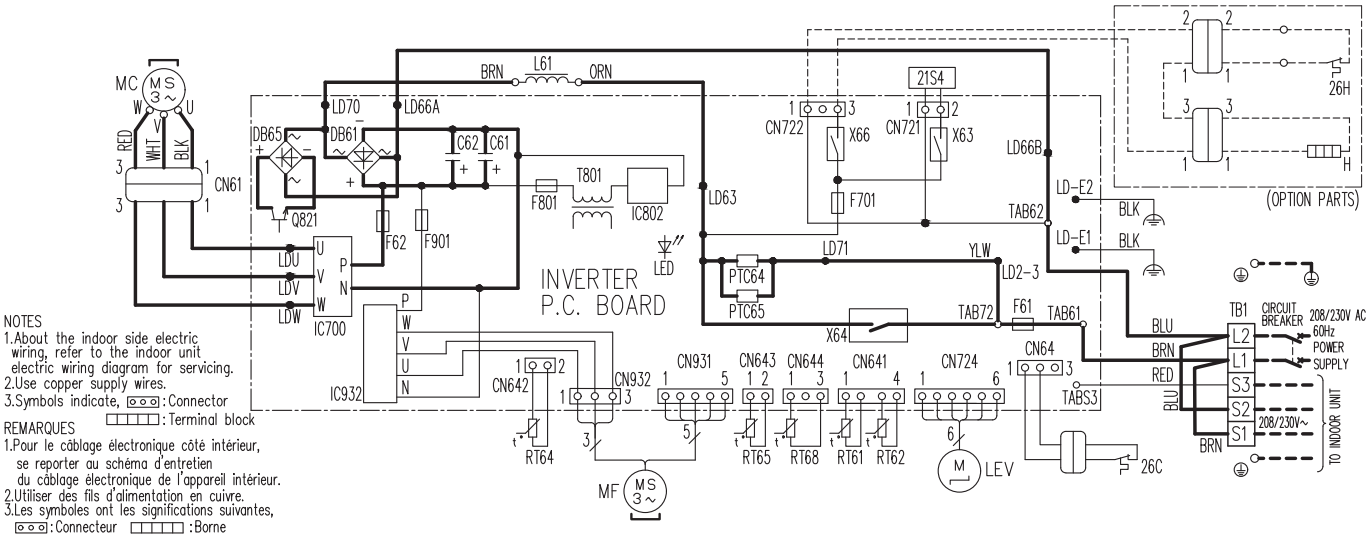


NOTES:
1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2. Use copper supply wires.
3. Symbols indicate, ▭: Terminal block, ⊙⊙⊙: Connector

REMARQUES:
1. Pour le câblage électronique côté intérieur, se reporter au schéma d'entretien du câblage électronique de l'appareil interieur.
2. Utiliser des fils d'alimentation en cuivre.
3. Les symboles ont les significations suivantes, ▭: Borne, ⊙⊙⊙: Connecteur

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CN61	CONNECTOR	LEV	EXPANSION VALVE COIL	RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR
C61,C62	SMOOTHING CAPACITOR	L61	REACTOR		
DB61,DB65	DIODE MODULE	MC	COMPRESSOR	TB	TERMINAL BLOCK
F61	FUSE (25A 250V)	MF	FAN MOTOR	T801	TRANSFORMER
F62	FUSE (15A 250V)	PTC64,PTC65	CIRCUIT PROTECTION	X63,X64,X66	RELAY
F701,F801,F901	FUSE (T3.15AL250V)	Q821	SWITCHING POWER TRANSISTOR	21S4	REVERSING VALVE COIL
H	DEFROST HEATER (OPTION PARTS)	RT61	DEFROST THERMISTOR	26C	COMPRESSOR PROTECTOR
IC700,IC932	POWER MODULE	RT62	DISCHARGE TEMP. THERMISTOR	26H	HEATER PROTECTOR (OPTION PARTS)
IC802	POWER DEVICE	RT64	FIN TEMP. THERMISTOR		
LED	LED	RT65	AMBIENT TEMP. THERMISTOR		

MUZ-HX18NL

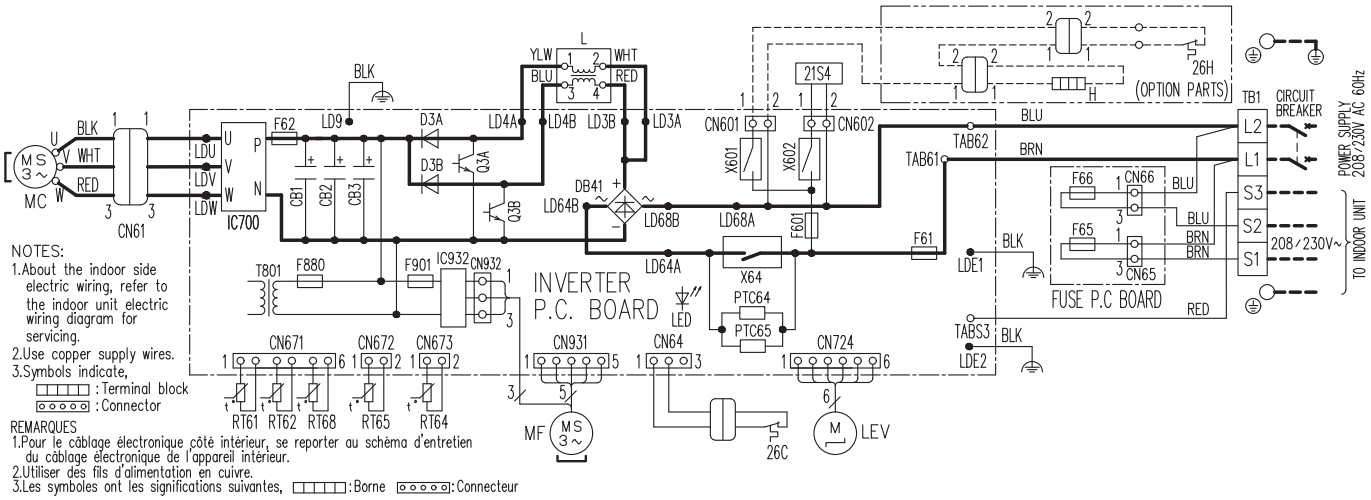


NOTES
1.About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2.Use copper supply wires.
3.Symbols indicate, ⊡⊡⊡: Connector
⊡⊡⊡⊡: Terminal block

REMARQUES
1.Pour le câblage électronique côté intérieur, se reporter au schéma d'entretien du câblage électronique de l'appareil intérieur.
2.Utiliser des fils d'alimentation en cuivre.
3.Les symboles ont les significations suivantes,
⊡⊡⊡: Connecteur ⊡⊡⊡⊡: Borne

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CN61	CONNECTOR	LEV	EXPANSION VALVE COIL	RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR
C61, C62	SMOOTHING CAPACITOR	L61	REACTOR		
DB61, DB65	DIODE MODULE	MC	COMPRESSOR	TB1	TERMINAL BLOCK
F61	FUSE (25A 250V)	MF	FAN MOTOR	T801	TRANSFORMER
F62	FUSE (15A 250V)	PTC64, PTC65	CIRCUIT PROTECTION	X63, X64, X66	RELAY
F701, F801, F901	FUSE (T3.15AL250V)	Q821	SWITCHING POWER TRANSISTOR	21S4	REVERSING VALVE COIL
H	DEFROST HEATER (OPTION PARTS)	RT61	DEFROST THERMISTOR	26C	COMPRESSOR PROTECTOR
IC700, IC932	POWER MODULE	RT62	DISCHARGE TEMP. THERMISTOR	26H	HEATER PROTECTOR (OPTION PARTS)
IC802	POWER DEVICE	RT64	FIN TEMP. THERMISTOR		
LED	LED	RT65	AMBIENT TEMP. THERMISTOR		

MUZ-HX24NL

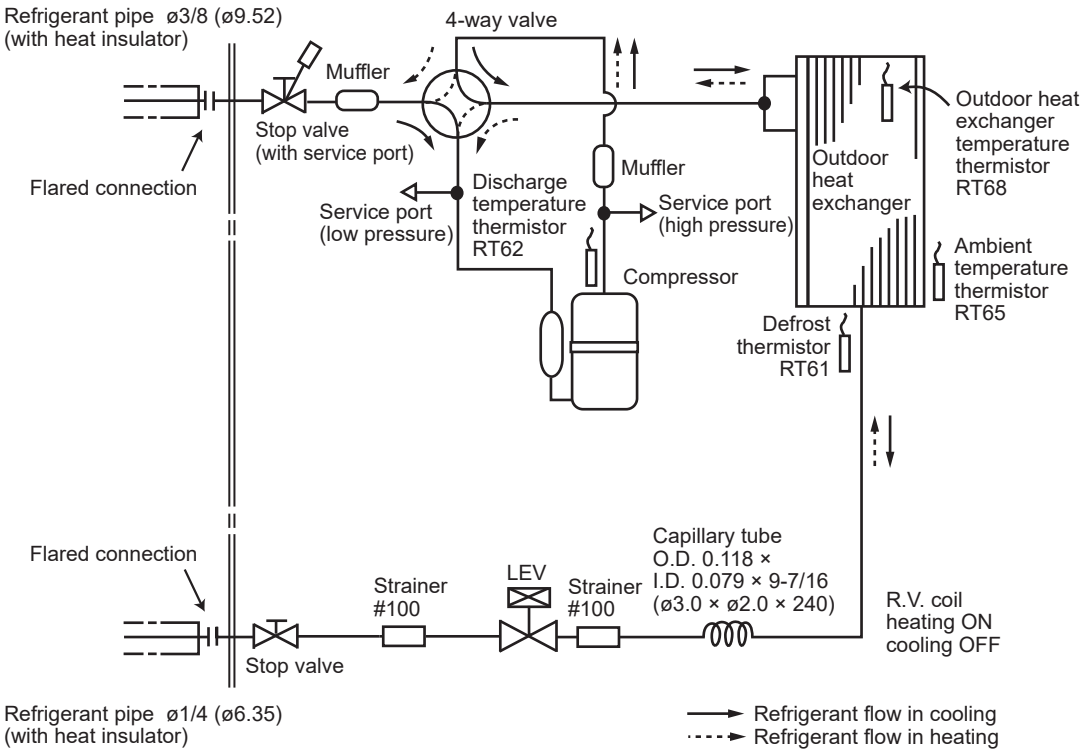


SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CB1,CB2,CB3	SMOOTHING CAPACITOR	L	REACTOR	RT65	AMBIENT TEMP. THERMISTOR
CN61	CONNECTOR	LED	LED	RT68	OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR
DB41	DIODE MODULE	LEV	EXPANSION VALVE COIL		
D3A,D3B	DIODE	MC	COMPRESSOR	TB1	TERMINAL BLOCK
F61	FUSE (25A 250V)	MF	FAN MOTOR	T801	TRANSFORMER
F62	FUSE (15A 250V)	PTC64,PTC65	CIRCUIT PROTECTION	X64,X601,X602	RELAY
F65,F66	FUSE (T6.3AL250V)	Q3A,Q3B	SWITCHING POWER TRANSISTOR	21S4	REVERSING VALVE COIL
F601,F880,F901	FUSE (T3.15AL250V)	RT61	DEFROST TEMP. THERMISTOR	26C	COMPRESSOR PROTECTOR
H	DEFROST HEATER (OPTION PARTS)	RT62	DISCHARGE TEMP. THERMISTOR	26H	HEATER PROTECTOR (OPTION PARTS)
IC700,IC932	POWER MODULE	RT64	FIN TEMP. THERMISTOR		

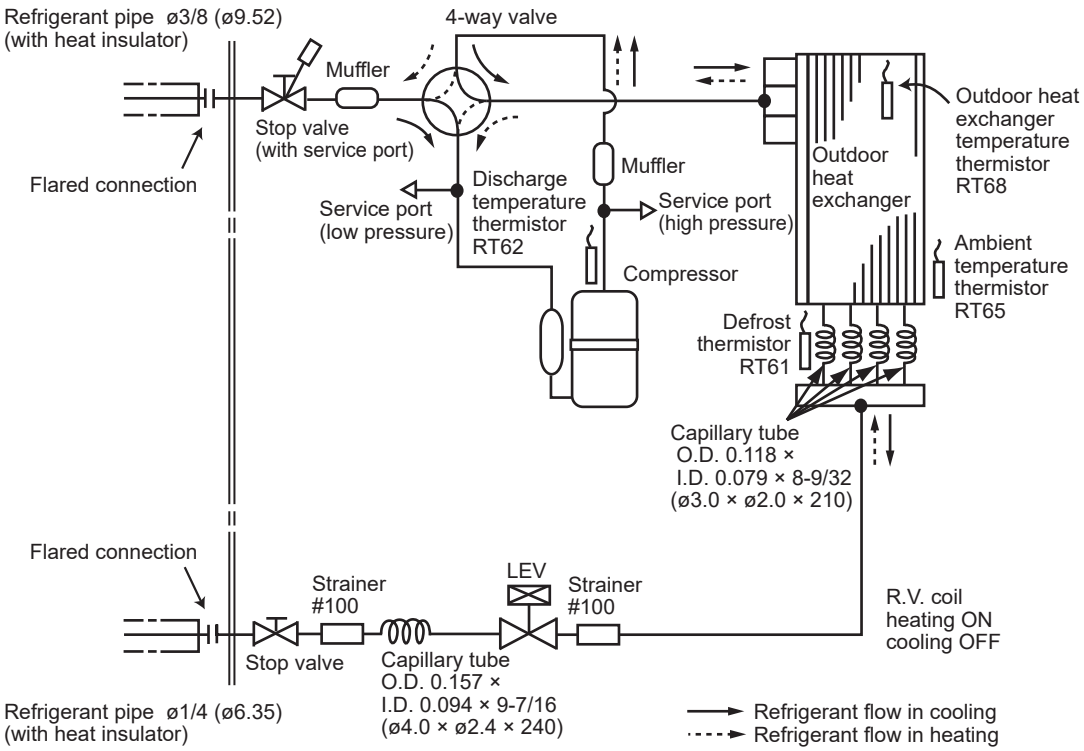
7 REFRIGERANT SYSTEM DIAGRAM

MUZ-HX09NL

Unit: Inch (mm)

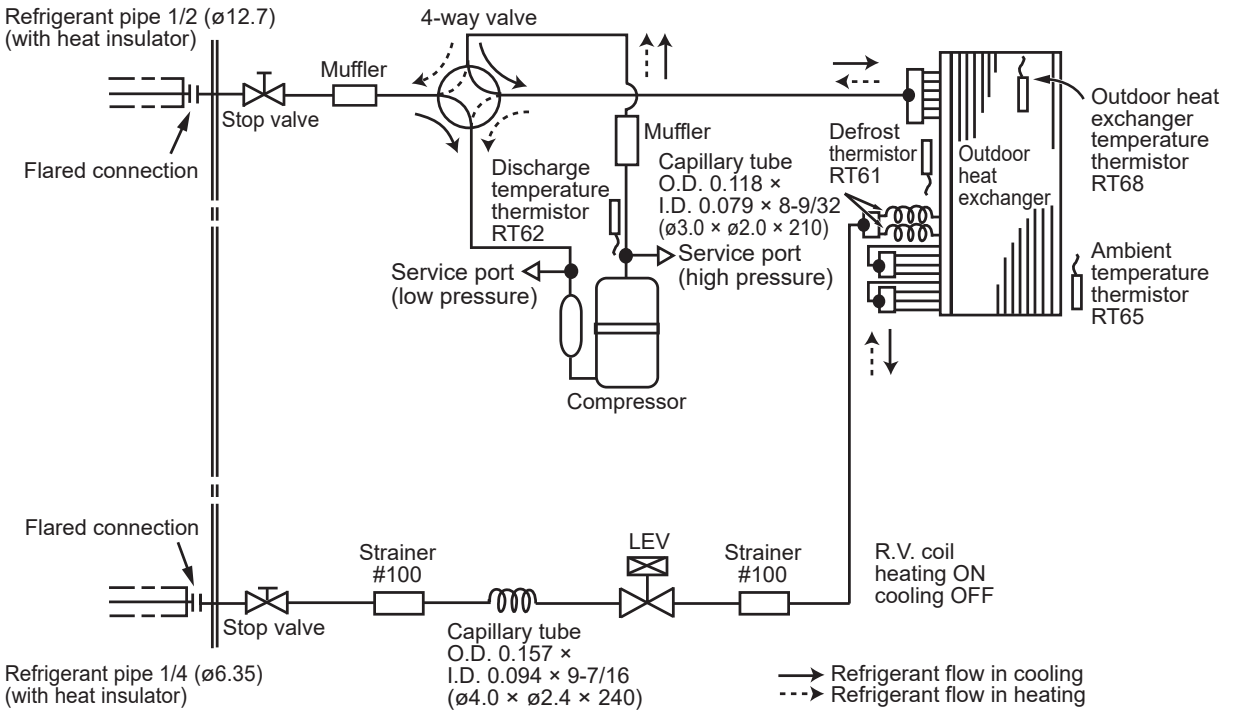


MUZ-HX12NL

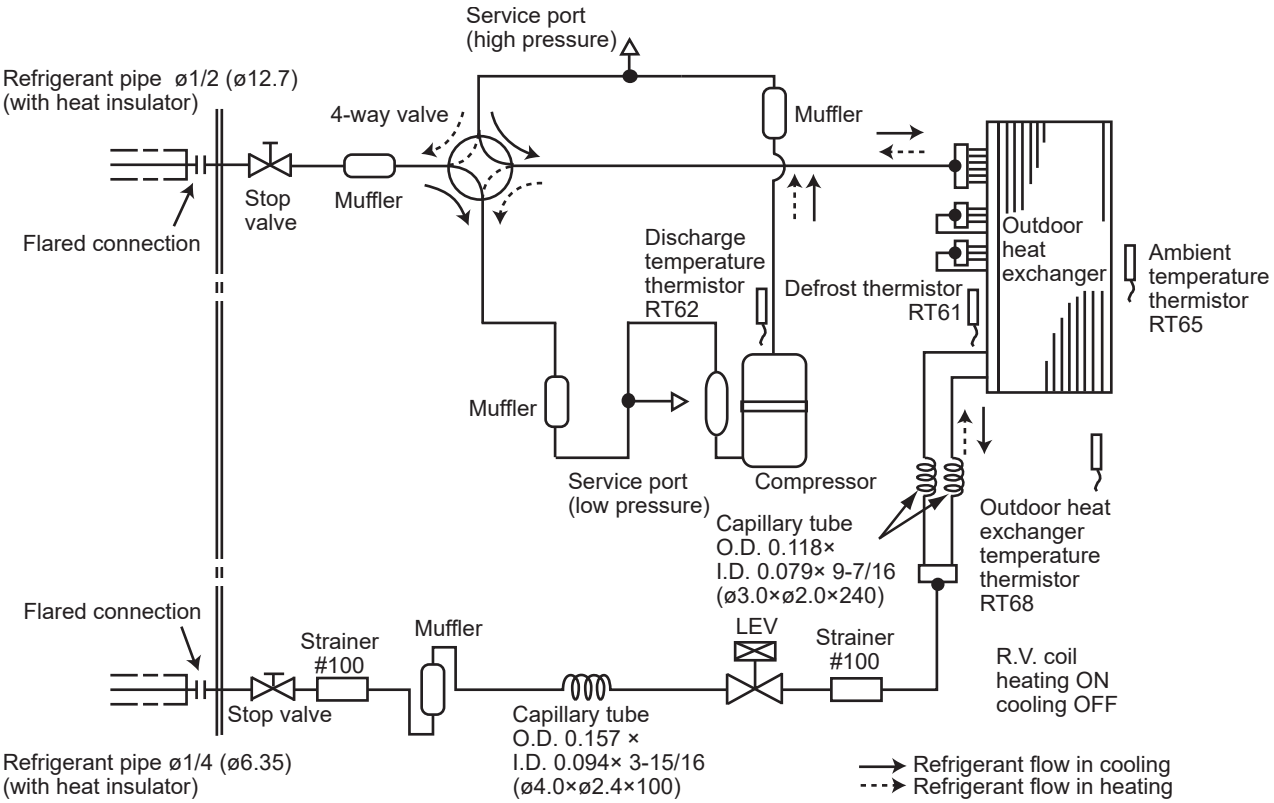


MUZ-HX18NL

Unit: Inch (mm)

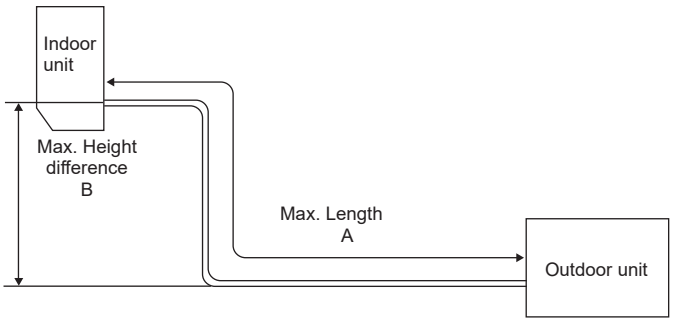


MUZ-HX24NL



MAX. REFRIGERANT PIPING LENGTH and MAX. HEIGHT DIFFERENCE

Model	Refrigerant piping: ft.		Piping size O.D: in.	
	Max. Length A	Max. Height difference B	Gas	Liquid
MUZ-HX09NL MUZ-HX12NL	65	40	3/8	1/4
MUZ-HX18NL	65	40	1/2	1/4
MUZ-HX24NL	100	50	1/2	1/4



8 DATA

MUZ-HX09NL MUZ-HX12NL MUZ-HX18NL MUZ-HX24NL

8-1. PERFORMANCE DATA

1) COOLING CAPACITY

Model	Indoor air IWB (˚F)	Outdoor intake air DB temperature (˚F)											
		75				85				95			
		TC	SHC	SHF	TPC	TC	SHC	SHF	TPC	TC	SHC	SHF	TPC
MUZ-HX09NL	71	11.0	7.4	0.67	0.64	10.3	6.9	0.67	0.70	9.7	6.5	0.67	0.76
	67	10.4	8.4	0.80	0.60	9.7	7.8	0.80	0.67	9.0	7.2	0.80	0.72
	63	9.8	9.2	0.93	0.58	9.1	8.5	0.93	0.64	8.5	7.9	0.93	0.69
MUZ-HX12NL	71	14.7	9.2	0.63	0.85	13.7	8.6	0.63	0.94	12.9	8.1	0.63	1.01
	67	13.9	10.6	0.76	0.81	13.0	9.8	0.76	0.89	12.0	9.1	0.76	0.96
	63	13.1	11.7	0.89	0.77	12.1	10.8	0.89	0.85	11.3	10.1	0.89	0.92
MUZ-HX18NL	71	21.1	13.6	0.65	1.22	19.7	12.7	0.65	1.34	18.5	12.0	0.65	1.44
	67	20.0	15.6	0.78	1.15	18.6	14.5	0.78	1.27	17.2	13.4	0.78	1.37
	63	18.7	17.1	0.91	1.10	17.4	15.9	0.91	1.21	16.2	14.8	0.91	1.31
MUZ-HX24NL	71	27.4	16.4	0.60	1.70	25.6	15.3	0.60	1.86	24.1	14.4	0.60	2.01
	67	26.0	19.0	0.73	1.60	24.2	17.7	0.73	1.77	22.4	16.4	0.73	1.91
	63	24.4	21.1	0.86	1.53	22.6	19.5	0.86	1.69	21.1	18.2	0.86	1.82

Model	Indoor air IWB (˚F)	Outdoor intake air DB temperature (˚F)							
		105				115			
		TC	SHC	SHF	TPC	TC	SHC	SHF	TPC
MUZ-HX09NL	71	9.0	6.0	0.67	0.80	8.3	5.5	0.67	0.83
	67	8.4	6.7	0.80	0.76	7.7	6.2	0.80	0.80
	63	7.7	7.2	0.93	0.73	7.0	6.6	0.93	0.76
MUZ-HX12NL	71	12.0	7.5	0.63	1.06	11.0	6.9	0.63	1.10
	67	11.2	8.5	0.76	1.02	10.3	7.8	0.76	1.07
	63	10.3	9.2	0.89	0.98	9.4	8.4	0.89	1.02
MUZ-HX18NL	71	17.2	11.1	0.65	1.51	15.8	10.2	0.65	1.58
	67	16.0	12.5	0.78	1.45	14.7	11.5	0.78	1.52
	63	14.7	13.4	0.91	1.40	13.4	12.3	0.91	1.45
MUZ-HX24NL	71	22.4	13.4	0.60	2.11	20.6	12.3	0.60	2.20
	67	20.8	15.2	0.73	2.02	19.2	14.0	0.73	2.12
	63	19.2	16.5	0.86	1.95	17.5	15.1	0.86	2.02

NOTE: 1. IWB : Intake air wet-bulb temperature TC : Total Capacity (×10³ Btu/h)
SHC : Sensible Heat Capacity (×10³ Btu/h) SHF : Sensible Heat Factor
TPC : Total Power Consumption (kW)
2. SHC is based on 80˚F of indoor Intake air DB temperature.
3. Data shown are estimated value. Performance may vary depending on operating conditions.

2) COOLING CAPACITY CORRECTIONS

Model	Refrigerant piping length (one way: ft.)			
	25 (std.)	40	65	100
MUZ-HX09NL	1.0	0.993	0.981	—
MUZ-HX12NL	1.0	0.987	0.967	—
MUZ-HX18NL	1.0	0.994	0.983	—
MUZ-HX24NL	1.0	0.996	0.990	0.982

3) HEATING CAPACITY CORRECTIONS

Model	Refrigerant piping length (one way: ft.)			
	25 (std.)	40	65	100
MUZ-HX09NL **MUZ-HX12NL** **MUZ-HX18NL**	1.0	0.997	0.993	—
MUZ-HX24NL	1.0	0.997	0.993	0.987

4) HEATING CAPACITY

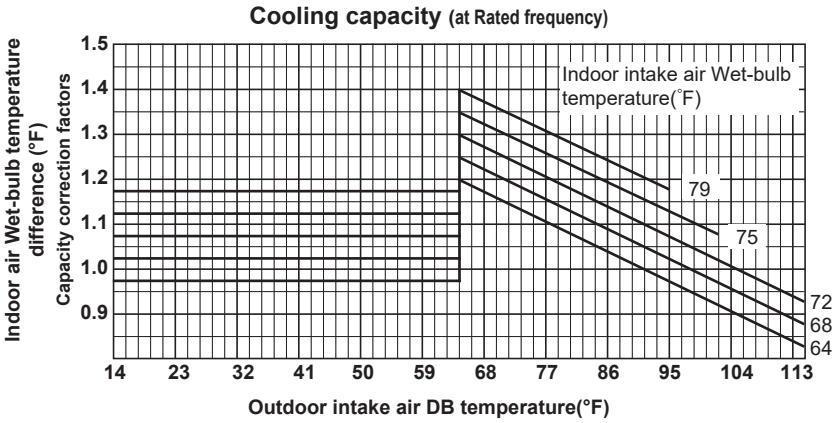
Model	Indoor air IDB (˚F)	Outdoor intake air WB temperature (˚F)													
		5		15		25		35		43		45		55	
		TC	TPC	TC	TPC	TC	TPC	TC	TPC	TC	TPC	TC	TPC	TC	TPC
MUZ-HX09NL	75	4.8	0.53	6.3	0.67	7.9	0.79	9.4	0.88	10.6	0.92	11.0	0.94	12.4	0.97
	70	5.2	0.51	6.7	0.65	8.2	0.77	9.6	0.86	10.9	0.90	11.2	0.92	12.7	0.95
	65	5.5	0.49	6.9	0.62	8.6	0.74	10.0	0.83	11.2	0.88	11.6	0.89	13.0	0.94
MUZ-HX12NL	75	5.4	0.58	7.1	0.74	8.8	0.87	10.6	0.97	11.9	1.01	12.3	1.03	13.9	1.07
	70	5.8	0.56	7.5	0.71	9.2	0.85	10.8	0.94	12.2	0.99	12.6	1.01	14.2	1.05
	65	6.1	0.53	7.7	0.68	9.6	0.82	11.2	0.92	12.6	0.97	12.9	0.98	14.5	1.03
MUZ-HX18NL	75	7.9	0.94	10.4	1.18	13.1	1.39	15.6	1.55	17.6	1.63	18.1	1.65	20.5	1.72
	70	8.6	0.90	11.1	1.14	13.5	1.36	15.9	1.51	18.0	1.59	18.5	1.62	21.0	1.69
	65	9.0	0.86	11.3	1.10	14.1	1.31	16.5	1.47	18.5	1.55	19.1	1.57	21.4	1.65
MUZ-HX24NL	75	11.4	1.48	15.1	1.86	18.9	2.19	22.5	2.44	25.4	2.56	26.1	2.60	29.6	2.70
	70	12.4	1.41	16.0	1.80	19.5	2.14	23.0	2.38	26.0	2.50	26.8	2.55	30.3	2.65
	65	13.0	1.35	16.4	1.73	20.4	2.06	23.8	2.31	26.8	2.44	27.6	2.48	30.9	2.60

NOTE: 1. IDB : Intake air dry-bulb temperature
TC : Total Capacity (x10^3 Btu/h) TPC : Total Power Consumption (kW)
2. Above data is for heating operation without any frost.
3. Data shown are estimated value. Performance may vary depending on operating conditions.

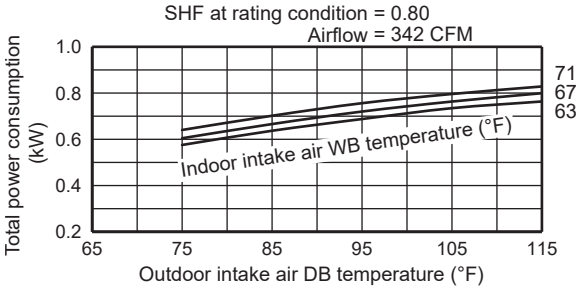
How to operate with fixed operational frequency of the compressor.

1. Press the emergency operation switch on the front of the indoor unit, and select either EMERGENCY COOL mode or EMERGENCY HEAT mode before starting to operate the air conditioner.
2. The compressor starts with operational frequency.
3. The fan speed of the indoor unit is High.
4. This operation continues for 30 minutes.
5. In order to release this operation, press the emergency operation switch twice or once, or press any button on the remote controller.

8-2. PERFORMANCE CURVE
Cooling (at Rated frequency)



MUZ-HX09NL



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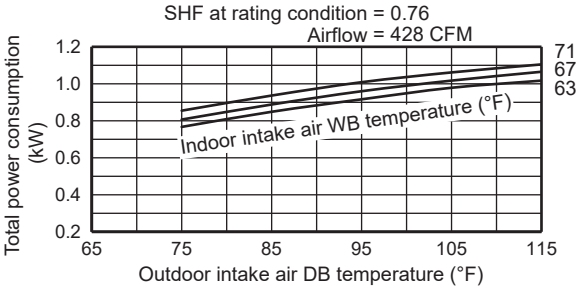

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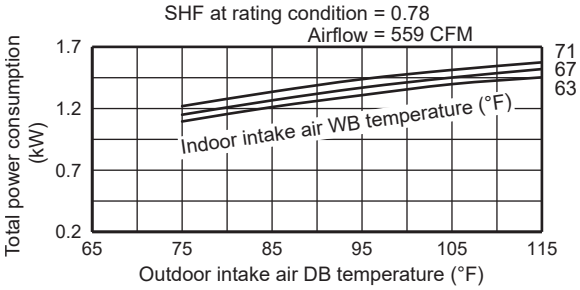

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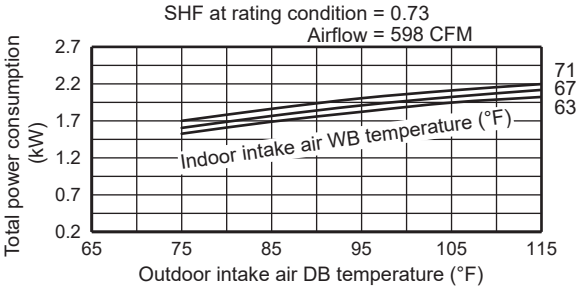
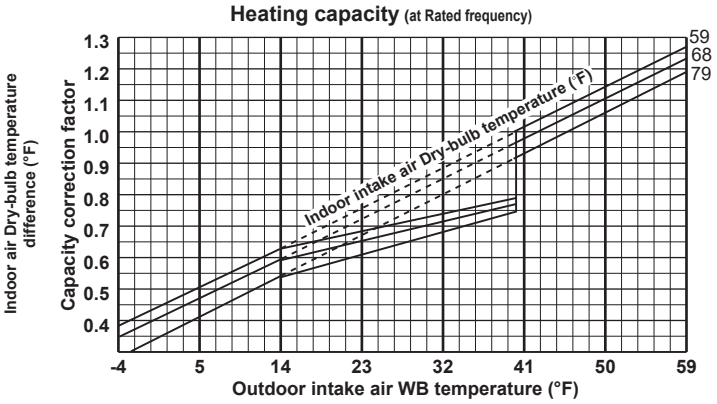


This value of frequency is not the same as the actual frequency in operating. Refer to 8-5 and 8-6 for the relationships between frequency and capacity.

NOTE: Data shown are estimated value. Performance may vary depending on operating conditions.

Heating (at Rated frequency)



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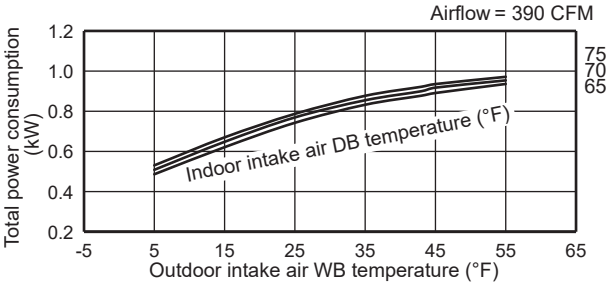
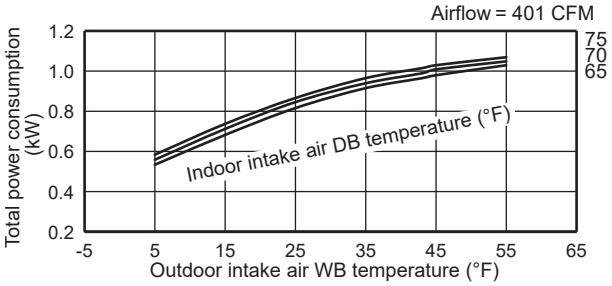
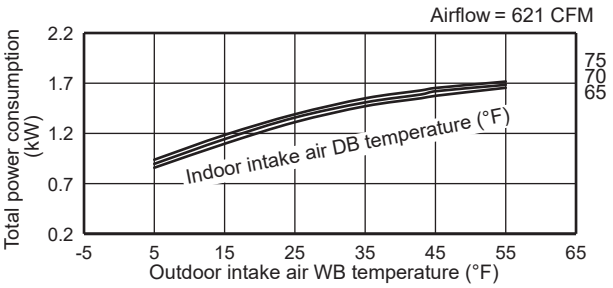


MUZ-HX12NL



MUZ-HX18NL



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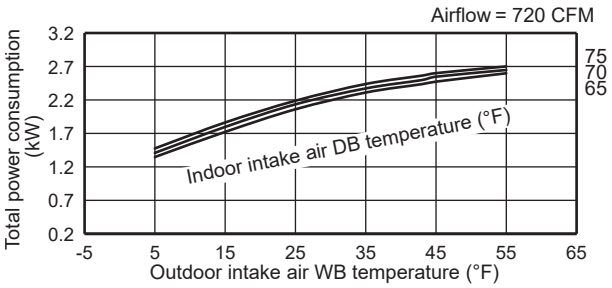


This value of frequency is not the same as the actual frequency in operating. Refer to 8-5 and 8-6 for the relationships between frequency and capacity.

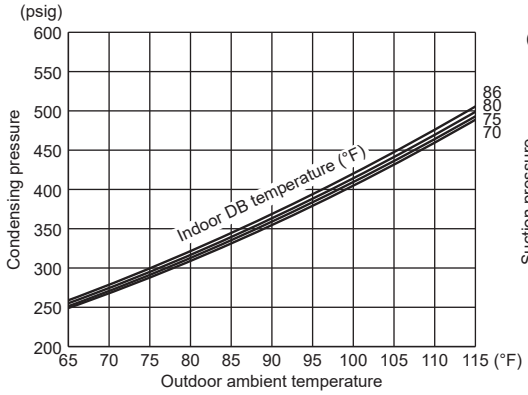
NOTE: Data shown are estimated value. Performance may vary depending on operating conditions.

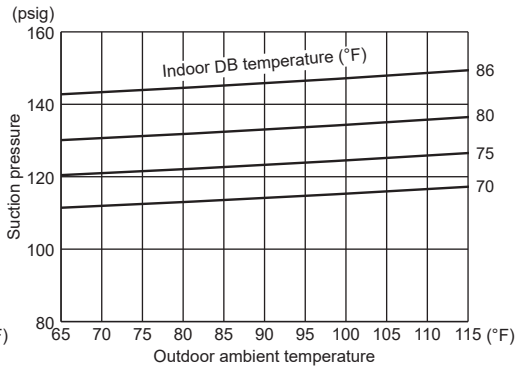
8-3. CONDENSING PRESSURE

Cooling

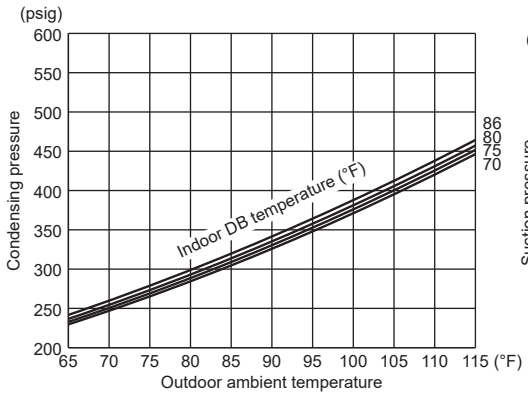
Data are based on the condition of indoor humidity 50 %.
Air flow should be set to High speed.

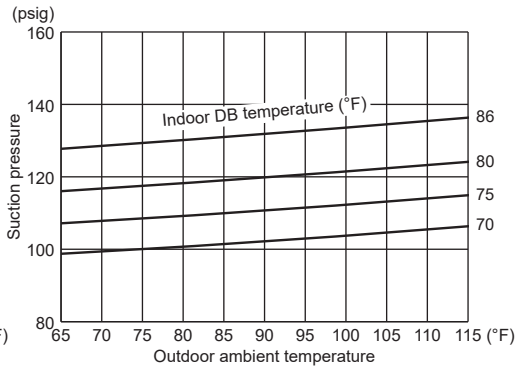
MUZ-HX09NL



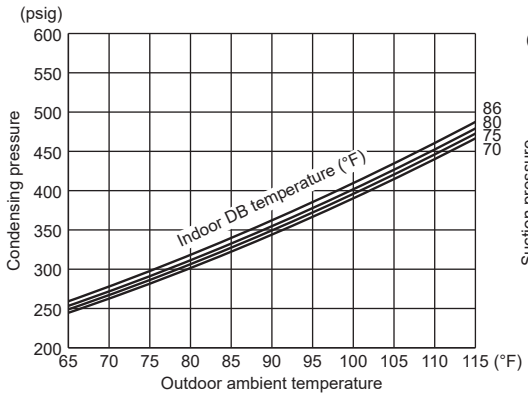


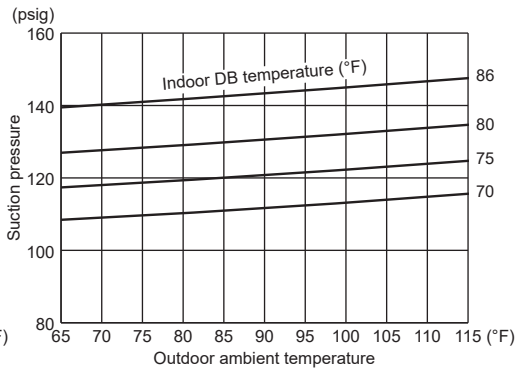
MUZ-HX12NL



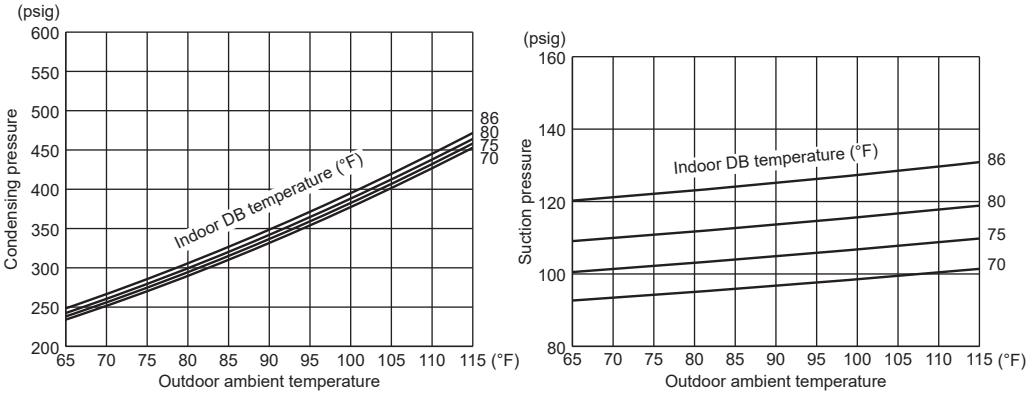


MUZ-HX18NL





MUZ-HX24NL

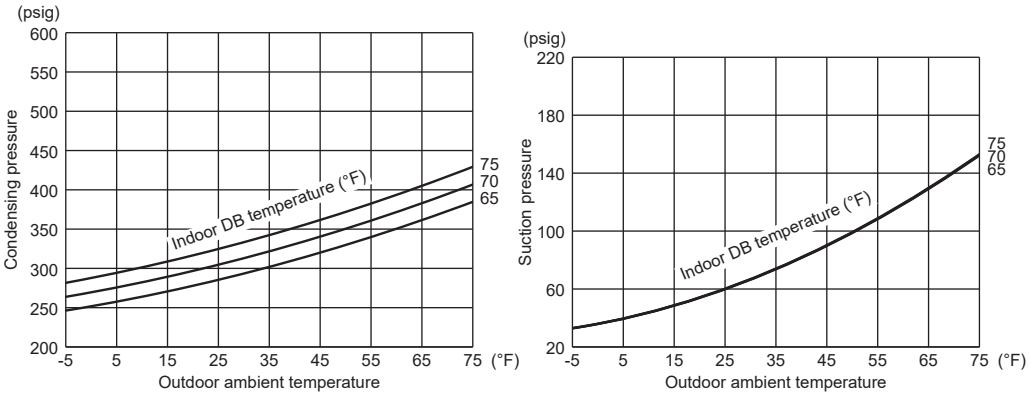


NOTE: Data shown are estimated value. Performance may vary depending on operating conditions.

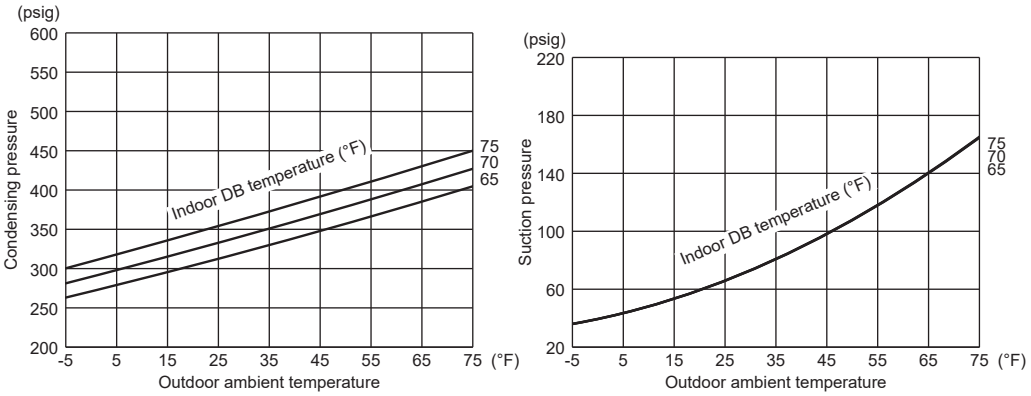
Heating

Data are based on the condition of outdoor humidity 75%.
Air flow should be set to High speed.
Data are for heating operation without any frost.

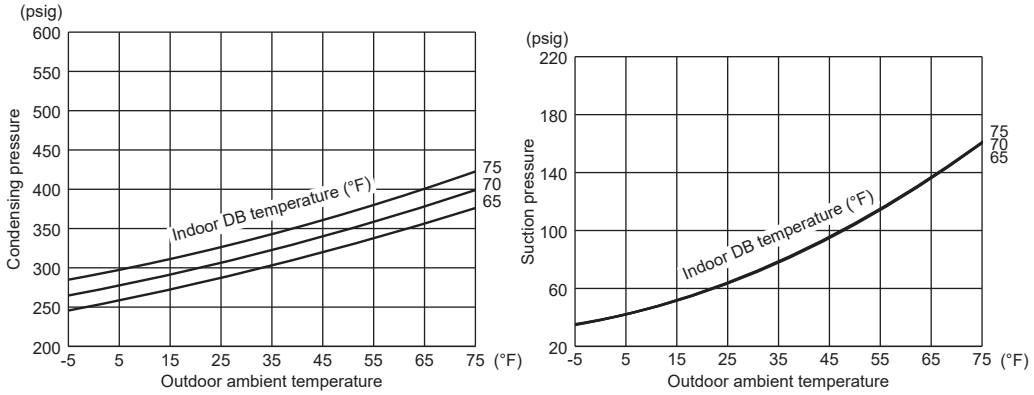
MUZ-HX09NL



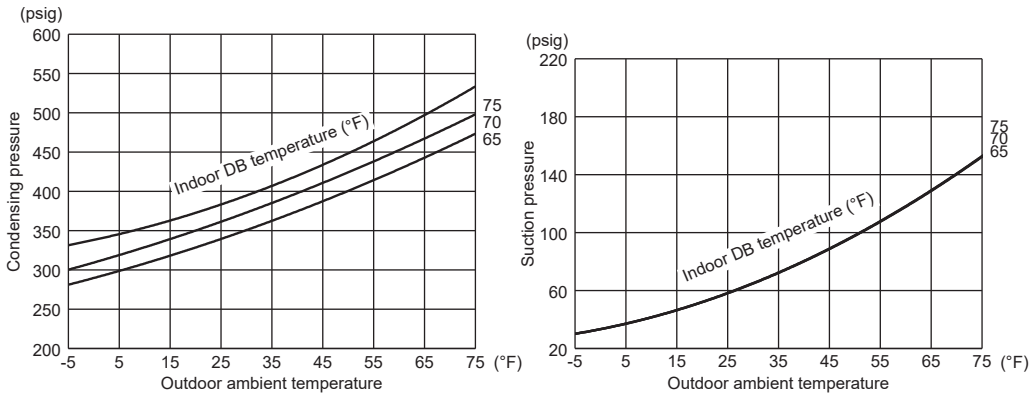
MUZ-HX12NL



MUZ-HX18NL



MUZ-HX24NL



NOTE: 1. Press the emergency operation switch on the front of the indoor unit, and select either EMERGENCY COOL mode or EMERGENCY HEAT mode before starting to operate the air conditioner.
2. The compressor starts with operational frequency.
3. The fan speed of the indoor unit is High.
4. This operation continues for 30 minutes.
5. In order to release this operation, press the emergency operation switch twice or once, or press any button on the remote controller.
6. Data shown are estimated value. Performance may vary depending on operating conditions.

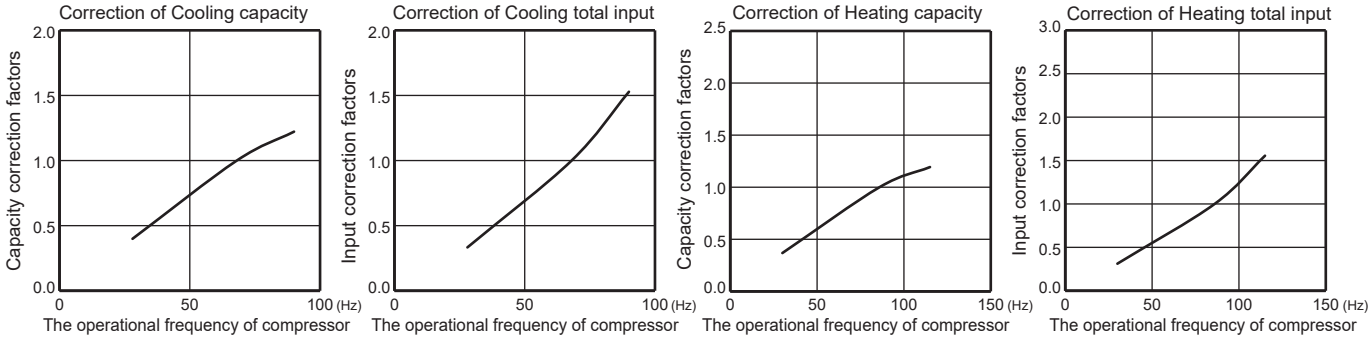
8-4. STANDARD OPERATION DATA

Model				MSZ-HX09NL		MSZ-HX12NL	
Item			Unit	COOL	HEAT	COOL	HEAT
Total	Capacity		Btu/h	9,000	10,900	12,000	12,200
	SHF		—	0.8	—	0.76	—
	Input		kW	0.72	0.9	0.96	0.99
	Rated frequency		Hz	68	86	50	48
Electrical circuit	Indoor unit			MSZ-HX09NL		MSZ-HX12NL	
	Power supply		V, phase, Hz	208/230, 1, 60		208/230, 1, 60	
	Input		kW	0.018	0.019	0.031	0.020
	Fan motor current		A	0.20/0.18	0.21/0.19	0.33/0.30	0.23/0.20
	Outdoor unit			MUZ-HX09NL		MUZ-HX12NL	
	Power supply		V, phase, Hz	208/230, 1, 60		208/230, 1, 60	
	Input		kW	0.702	0.881	0.929	0.970
	Comp. current		A	3.45/3.12	3.97/3.59	4.17/3.77	4.12/3.73
	Fan motor current		A	0.22/0.20	0.27/0.24	0.33/0.30	0.32/0.29
Refrigerant circuit	Condensing pressure		psig	390	342	360	373
	Suction pressure		psig	134	93	123	102
	Discharge temperature		°F	175	179	168	174
	Condensing temperature		°F	121	111	115	118
	Suction temperature		°F	58	40	51	36
	Comp. shell bottom temperature		°F	173	184	154	158
	Ref. pipe length		ft.	25		25	
	Refrigerant charge (R454B)			1 lbs. 6 oz		2 lbs. 2 oz	
Indoor unit	Intake air temperature	DB	°F	80	70	80	70
		WB	°F	67	60	67	60
	Discharge air temperature	DB	°F	59	99	62	99
		WB	°F	58	—	61	—
	Fan speed		rpm	980	1,000	1,160	1,020
	Airflow		CFM	342 (wet)	390	428 (wet)	401
Outdoor unit	Intake air temperature	DB	°F	95	47	95	47
		WB	°F	—	43	—	43
	Fan speed		rpm	770	850	910	900
	Airflow		CFM	1,031	1,141	1,166	1,152

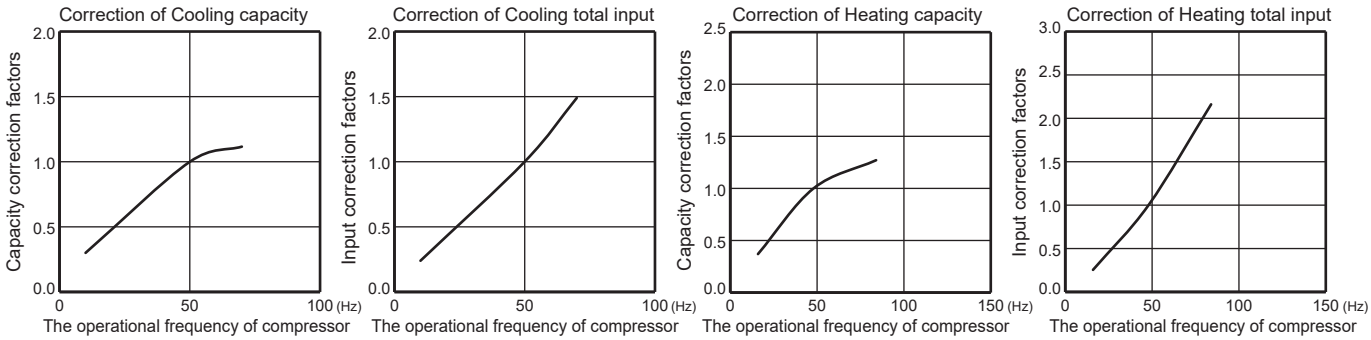
Model				MSZ-HX18NL		MSZ-HX24NL	
Item			Unit	COOL	HEAT	COOL	HEAT
Total	Capacity		Btu/h	17,200	18,000	22,400	26,000
	SHF		—	0.78	—	0.73	—
	Input		kW	1.37	1.59	1.91	2.50
	Rated frequency		Hz	67	71	77	84
Electrical circuit	Indoor unit			MSZ-HX18NL		MSZ-HX24NL	
	Power supply		V, phase, Hz	208/230, 1, 60		208/230, 1, 60	
	Input		kW	0.038	0.038	0.046	0.058
	Fan motor current		A	0.38/0.34	0.38/0.34	0.44/0.40	0.54/0.49
	Outdoor unit			MUZ-HX18NL		MUZ-HX24NL	
	Power supply		V, phase, Hz	208/230, 1, 60		208/230, 1, 60	
	Input		kW	1.332	1.552	1.864	2.442
	Comp. current		A	5.77/5.22	5.62/5.08	7.96/7.20	9.77/8.84
	Fan motor current		A	0.25/0.23	0.25/0.23	0.93/0.84	0.93/0.84
Refrigerant circuit	Condensing pressure		psig	376	339	361	412
	Suction pressure		psig	131	99	116	91
	Discharge temperature		°F	169	169	169	204
	Condensing temperature		°F	118	111	115	125
	Suction temperature		°F	54	38	46	40
	Comp. shell bottom temperature		°F	156	153	159	188
	Ref. pipe length		ft.	25		25	
	Refrigerant charge (R454B)			2 lbs. 8 oz		3 lbs.	
Indoor unit	Intake air temperature	DB	°F	80	70	80	70
		WB	°F	67	60	67	60
	Discharge air temperature	DB	°F	59	100	56	110
		WB	°F	58	—	55	—
	Fan speed		rpm	1,110	1,110	1,170	1,250
	Airflow		CFM	559 (wet)	621	597 (wet)	720
Outdoor unit	Intake air temperature	DB	°F	95	47	95	47
		WB	°F	—	43	—	43
	Fan speed		rpm	790	790	800	800
	Airflow		CFM	1,321	1,321	1,934	1,934

8-5. CAPACITY AND INPUT CORRECTION BY INVERTER OUTPUT FREQUENCY

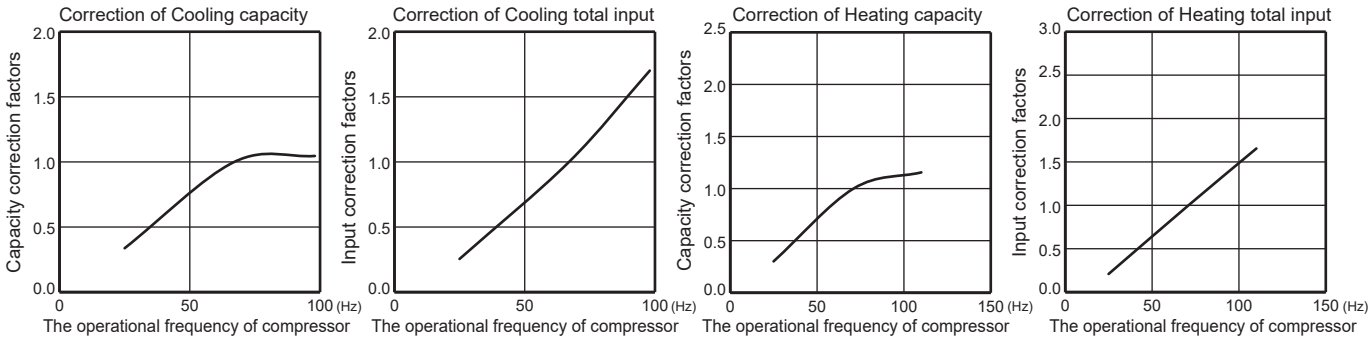
MUZ-HX09NL



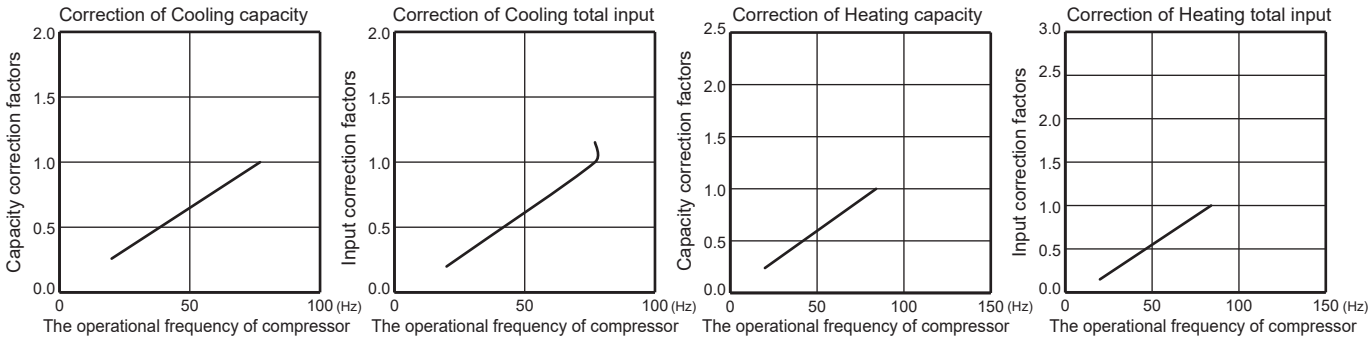
MUZ-HX12NL



MUZ-HX18NL



MUZ-HX24NL



NOTE: 1. Data shown are estimated value. Performance may vary depending on operating conditions.
2. Conditions are based on AHRI 210/240.
Rating conditions (Cooling) — Indoor: 80˚FDB, 67˚FWB, Outdoor: 95˚FDB, (75˚FWB)
(Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 47˚FDB, 43˚FWB

8-6. HOW TO OPERATE FIXED-FREQUENCY OPERATION (Test run operation)

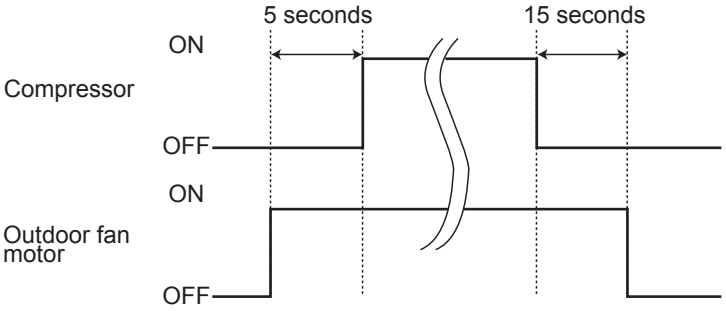
1. Press the emergency operation switch to start COOL or HEAT mode (COOL: Press once, HEAT: Press twice).
2. Test run operation starts and continues to operate for 30 minutes.
3. Compressor operates at rated frequency in COOL mode or 58 Hz **(HX09/12/24)**/55Hz **(HX18)** in HEAT mode.
4. Indoor fan operates at High speed.
5. After 30 minutes, test run operation finishes and EMERGENCY OPERATION starts (operation frequency of compressor varies).
6. To cancel test run operation (EMERGENCY OPERATION), press the emergency operation switch or any button on remote controller.

9 ACTUATOR CONTROL

MUZ-HX09NL MUZ-HX12NL MUZ-HX18NL MUZ-HX24NL

9-1. OUTDOOR FAN MOTOR CONTROL

The fan motor turns ON/OFF, interlocking with the compressor.
[ON] The fan motor turns ON 5 seconds before the compressor starts up.
[OFF] The fan motor turns OFF 15 seconds after the compressor has stopped running.

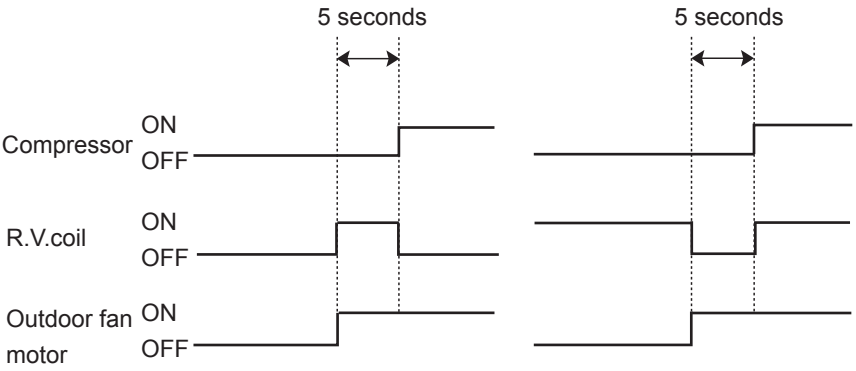


9-2. R.V. COIL CONTROL

Heating ..... ON
Cooling ..... OFF
Dry ..... OFF

NOTE: The 4-way valve reverses for 5 seconds right before startup of the compressor.

<COOL> **<HEAT>**



9-3. RELATION BETWEEN MAIN SENSOR AND ACTUATOR

Sensor	Purpose	Actuator				
		Compressor	LEV	Outdoor fan motor	R.V.coil	Indoor fan motor
Discharge temperature thermistor	Protection	○	○			
Indoor coil temperature thermistor	Cooling: Coil frost prevention	○				
	Heating: High pressure protection	○	○			
Defrost thermistor	Heating: Defrosting	○	○	○	○	○
Fin temperature thermistor	Protection	○		○		
Ambient temperature thermistor	Cooling: Low ambient temperature operation	○	○	○		
Outdoor heat exchanger temperature thermistor	Cooling: Low ambient temperature operation	○	○	○		
	Cooling: High pressure protection	○	○	○		

10 SERVICE FUNCTIONS

MUZ-HX09NL MUZ-HX12NL MUZ-HX18NL MUZ-HX24NL

10-1. CHANGE IN DEFROST SETTING

Changing defrost finish temperature

<JS> To change the defrost finish temperature, cut/solder the JS wire of the outdoor inverter P.C. board (Refer to 11-6.1.).

Jumper		Defrost finish temperature	
		MUZ-HX09/12/18NL	**MUZ-HX24NL**
JS	Soldered (Initial setting)	46°F (8°C)	50°F (10°C)
	None (Cut)	55°F (13°C)	59°F (15°C)

10-2. PRE-HEAT CONTROL SETTING

Prolonged low load operation, in which the thermostat is OFF for a long time, at low outside temperature [32°F (0°C) or less] may cause the following troubles. To prevent those troubles, activate the pre-heat control.

1) If moisture gets into the refrigerant cycle and freezes, it may interfere the startup of the compressor.
2) If liquid refrigerant collects in the compressor, a failure in the compressor may occur.

The pre-heat control turns ON when the compressor temperature is 68°F (20°C) or below. When the pre-heat control turns ON, the compressor is energized. (About 70 W)

Pre-heat control setting

<JK>

ON: To activate the pre-heat control, cut JK wire of the inverter P.C. board.

OFF: To deactivate the pre-heat control, solder JK wire of the inverter P.C. board.

(Refer to 11-6.1)

Jumper		Pre-heat control setting
JK	Soldered	Deactivated (Initial setting)
	Cut	Activated

NOTE: When the inverter P.C. board is replaced, check the jumper wires, and cut/solder them if necessary.

11 TROUBLESHOOTING

MUZ-HX09NL MUZ-HX12NL MUZ-HX18NL MUZ-HX24NL

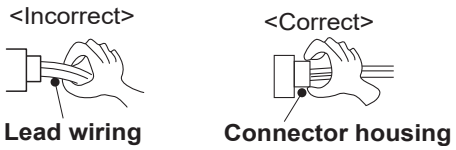
11-1. CAUTIONS ON TROUBLESHOOTING

1. Before troubleshooting, check the following

1) Check the power supply voltage.
2) Check the indoor/outdoor connecting wire for miswiring.

2. Take care of the following during servicing

1) Before servicing the air conditioner, be sure to turn OFF the main unit first with the remote controller, then after confirming the horizontal vane is closed, turn off the breaker and/or disconnect the power plug.
2) Be sure to turn OFF the power supply before removing the front panel, the cabinet, the top panel, and the electronic control P.C. board.
3) When removing the electrical parts, be careful of the residual voltage of smoothing capacitor.
4) When removing the electronic control P.C. board, hold the edge of the board with care NOT to apply stress on the components.
5) When connecting or disconnecting the connectors, hold the connector housing. DO NOT pull the lead wires.



3. Troubleshooting procedure

1) Check if the OPERATION INDICATOR lamp on the indoor unit is blinking on and off to indicate an abnormality.
   To make sure, check how many times the OPERATION INDICATOR lamp is blinking on and off before starting service work.
2) Before servicing, verify that all connectors and terminals are connected properly.
3) When the electronic control P.C. board seems to be defective, check for disconnection of the copper foil pattern and burnt or discolored components.
4) Refer to 11-2 and 11-3.

11-2. FAILURE MODE RECALL FUNCTION AND ERROR CODE DISPLAY MODE

Outline of the function

This air conditioner can memorize the failure which has occurred last time.

Even though LED indication listed on the troubleshooting check table (11-3.) disappears, the memorized failure can be recalled.

Also, error code can be checked on the display of remote controller while the left/upper operation indicator lamp on the indoor unit is blinking.

1. Flow chart of failure mode recall function for the indoor/outdoor unit

Operational procedure

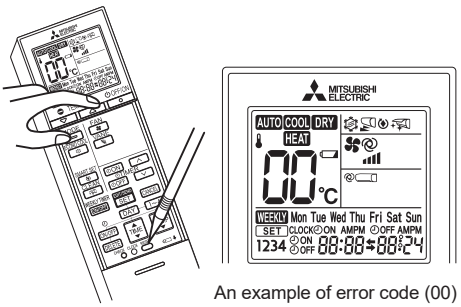
The cause of abnormality cannot be identified because the error code does not appear again.

Setting up the failure mode recall function **(Figure 1)**

Turn ON the power supply.
<Preparation of the remote controller>
① While pressing Operation select button and TEMP ⊕ button on the remote controller at the same time, press RESET button.
② First, release RESET button.
Hold down the other 2 buttons for another 3 seconds. Make sure that the indicators on the LCD display shown in Figure 1 have all appeared. (“00” is shown in the display.) Then release the buttons.

Check of OPERATION INDICATOR lamp

Check of error code on the display of remote controller



An example of error code (00)

Figure 1

Get close to the front of the indoor unit.
Press OFF/ON (stop/operate) button of the remote controller with the remote controller headed towards the indoor unit.

Did the indoor unit beep?

No → 1st → Get closer to the indoor unit, then try again.

2nd → Turn off the power of appliances such as fluorescent lamp and TV which might cause noise, then try again.
(If the battery replacement indicator lights up, replace the batteries with new ones.)

Yes *1

How many beeps?

2 times → The indoor unit is normal, but the outdoor unit might be abnormal.
There are some abnormalities that cannot be recalled with this way.
Check if the outdoor unit is abnormal according to the outdoor unit failure mode recall function. (11-2.2.)

1 time

The unit has an error.

Press TEMP ⊕ or ⊖ to change an error code.
Each press of TEMP ⊕ changes the error code shown on the remote controller in ascending order (A to Z). **(Figure 2)**
Each press of TEMP ⊖ changes the error code in descending order (Z to A).
Check the error code one by one to send the signal.

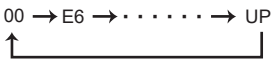


Figure 2

How many beeps?

No beeps → The diagnosis has failed. Try again.

2 times

1 time → The unit does not have the error corresponding to the error code shown on the remote controller. Continue checking.

The unit has the error corresponding to the error code.

Judgment of indoor/outdoor abnormality

Is the error code in the table of indoor unit failure mode recall function? (Refer to indoor unit service manual.)

No → The outdoor unit is abnormal.
Check the error code, and identify the abnormal point by referring to the table of outdoor unit failure mode recall function. (11-2.4.)

Yes → The indoor unit is abnormal.
Check the error code, and identify the abnormal point by referring to the table of indoor unit failure mode recall function. (Refer to indoor unit service manual.)

B (To next page)

A (To next page)

A (From previous page)

Press OFF/ON (stop/operate) button of the remote controller with the remote controller headed towards the indoor unit. *1.

Does the left/upper OPERATION INDICATOR lamp on the indoor unit blink at the interval of 0.5 seconds?

No (OFF)

The indoor unit is normal, but the outdoor unit might be abnormal.
There are some abnormalities that cannot be recalled with this way.
Check if the outdoor unit is abnormal according to the outdoor unit failure mode recall function. (11-2-2.)

NOTE: It takes up to 1 minute to indicate the outdoor unit abnormality. Even if the OPERATION INDICATOR lamp is not blinking, keep checking at least 1 minute or longer.

Yes (Blinks)

Judgment of indoor/outdoor abnormality

Before blinking, does the left/upper OPERATION INDICATOR lamp stay ON for 3 seconds?

Yes

No

The indoor unit is abnormal.
Check the blinking pattern, and identify the abnormal point by referring to the table of indoor unit failure mode recall function. (Refer to the indoor unit service manual.) Make sure to check at least 2 consecutive blinking cycles. *2

The outdoor unit is abnormal.
Check the blinking pattern, and identify the abnormal point by referring to the table of outdoor unit failure mode recall function. (11-2-4.)
Make sure to check at least 2 consecutive blinking cycles. *3

B (From previous page)

Releasing the failure mode recall function

Release the failure mode recall function by the following procedures.
Turn OFF the power supply and turn it ON again.
Press RESET button of the remote controller.

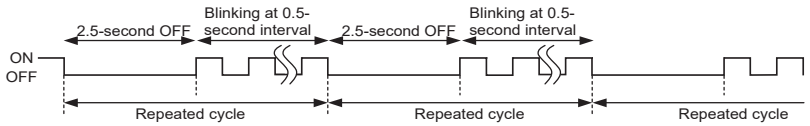
Repair the failure parts.

Deleting the memorized abnormal condition

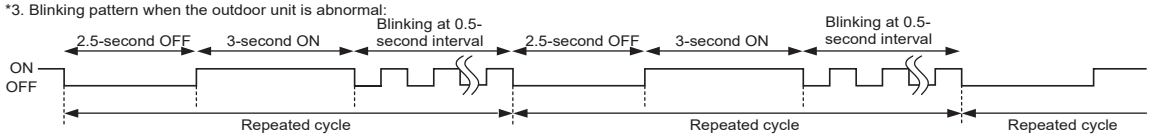
① After repairing the unit, recall the failure mode again according to “Setting up the failure mode recall function” mentioned above.
② Press OFF/ON (stop/operate) button of the remote controller with the remote controller headed towards the indoor unit.
③ Press the emergency operation switch so that the memorized abnormal condition is deleted.
④ Release the failure mode recall function according to “Releasing the failure mode recall function” mentioned above.

NOTE: 1. Make sure to release the failure mode recall function after it is set up, otherwise the unit cannot operate properly.
2. If the abnormal condition is not deleted from the memory, the last abnormal condition is kept memorized.

*1. Regardless of normal or abnormal condition, 2 short beeps are emitted once the signal is received.
*2. Blinking pattern when the indoor unit is abnormal:



*3. Blinking pattern when the outdoor unit is abnormal:



2. Flow chart of the outdoor unit failure mode recall function

Operational procedure

The outdoor unit might be abnormal.
Check if the outdoor unit is abnormal according to the following procedures.

Make sure that the remote controller is set to the failure mode recall function.

Get close to the front of the indoor unit. With the remote controller headed towards the indoor unit, press [^] button to set the indicator shown in Figure 1 to 25. *1 **(Figure 1)**

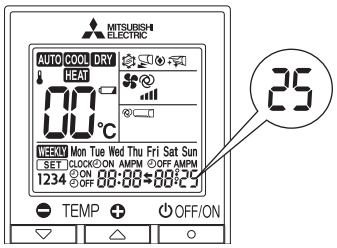


Figure 1

Check of OPERATION INDICATOR lamp

Check of error code on the display of remote controller

"00" is shown in the display. **(Figure 1)**

How many beeps?

2 times

1 time

The outdoor unit has an error.

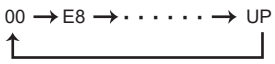


Figure 2

Press TEMP ⊕ or ⊖ to change an error code.
Each press of TEMP ⊕ changes the error code shown on the remote controller in ascending order (A to Z). **(Figure 2)**
Each press of TEMP ⊖ changes the error code in descending order (Z to A).
Check the error code one by one to send the signal.

How many beeps?

No beeps → The diagnosis has failed. Try again.

2 times

1 time → The unit does not have the error corresponding to the error code shown on the remote controller. Continue checking.

The unit has the error corresponding to the error code.

The outdoor unit is abnormal.
Check the error code, and identify the abnormal point by referring to the table of outdoor unit failure mode recall function (11-2.4.).

→ A (To next page)

Does the left/upper OPERATION INDICATOR lamp on the indoor unit blink at the interval of 0.5 seconds? *2

No (OFF) → The outdoor unit is normal.

Yes (Blinks)

The outdoor unit is abnormal.
Check the blinking pattern, and identify the abnormal point by referring to the table of outdoor unit failure mode recall function (11-2.4.).
Make sure to check at least 2 consecutive blinking cycles. *2

A (To next page)

A (From previous page)

Releasing the failure mode recall function

Release the failure mode recall function by the following procedures.
Turn OFF the power supply and turn it ON again.
Press RESET button of the remote controller.

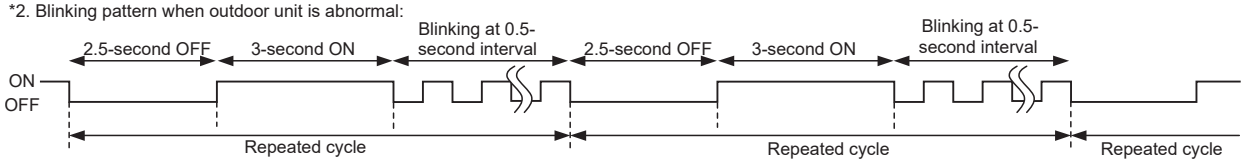
Repair the failure parts.

Deleting the memorized abnormal condition

① After repairing the unit, recall the failure mode again according to “Setting up the failure mode recall function” (11-2.1.).
② Press STOP/OPERATE (OFF/ON) button of the remote controller with the remote controller headed towards the indoor unit.
③ Press EMERGENCY OPERATION switch so that the memorized abnormal condition is deleted.
④ Release the failure mode recall function according to “Releasing the failure mode recall function” mentioned above.

NOTE: 1. Make sure to release the failure mode recall function after it is set up, otherwise the unit cannot operate properly.
2. If the abnormal condition is not deleted from the memory, the last abnormal condition is kept memorized.

*1. Regardless of normal or abnormal condition, 2 short beeps are emitted once the signal is received.
*2. Blinking pattern when outdoor unit is abnormal:



3. Flow chart of error code display mode

This explains how customers can check the error code on their own.
This is included in OPERATING INSTRUCTIONS.

Operational procedure

The remote controller is powered OFF.

Get close to the front of the indoor unit. Point the remote controller at the receiving section of the indoor unit, and keep pressing CHECK with a fine-tipped object unil the beeps. **(Figure 1)**
"00" is shown in the display. **(Figure 2)**

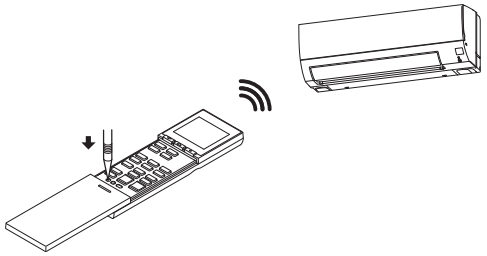


Figure 1

Did the indoor unit beep?

- No → 1st → Get closer to the indoor unit, then try again.
- No → 2nd → Turn off the power of appliances such as fluorescent lamp and TV which might cause noise, then try again. (If the battery replacement indicator lights up, replace the batteries with new ones.)
- Yes

How many beeps?

- 2 times → The indoor unit is normal, but the outdoor unit might be abnormal. There are some abnormalities that cannot be recalled with this way. Check if the outdoor unit is abnormal according to the outdoor unit failure mode recall function. (11-2.2.)
- 1 time

The unit has an error.

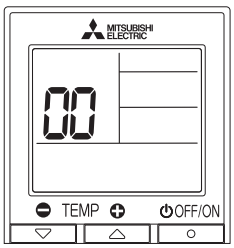


Figure 2

Press TEMP ⊕ or ⊖ to change an error code.
Each press of TEMP ⊕ changes the error code shown on the remote controller in ascending order (A to Z). **(Figure 3)**
Each press of TEMP ⊖ changes the error code in descending order (Z to A).
Check the error code one by one to send the signal.

NOTE: Even though the air conditioner operates normally, the memorized indication for the last error appears if it has not been deleted.

How many beeps?

- No beeps → The diagnosis has failed. Try again.
- 2 times
- 1 time → The unit does not have the error corresponding to the error code shown on the remote controller. Continue checking.

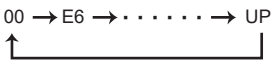


Figure 3

The unit has the error corresponding to the error code.

Refer to the error code on the table of indoor unit failure mode recall function (refer to indoor unit service manual) or the table of outdoor unit failure mode recall function (11-2.4).

4. Table of outdoor unit failure mode recall function

OPERATION INDICATOR lamp (Indoor unit)	Error code	Abnormal point (Failure mode/protection)	LED indication (Outdoor P.C. board)	Condition	Remedy	Indoor/outdoor unit failure mode recall function	Outdoor unit failure mode recall function
Not blink	00	None (Normal)	—	—	—	—	—
1-time blink 2.5 seconds OFF	E8	Indoor/outdoor communication, receiving error	—	Any signals from the inverter P.C. board cannot be received normally for 3 minutes.	• Refer to 11-5.Ⓜ "How to check miswiring and serial signal error".	○	○
	E9	Indoor/outdoor communication, receiving error	—	Although the inverter P.C. board sends signal "0", signal "1" has been received 30 consecutive times.	• Refer to 11-5.Ⓜ "How to check miswiring and serial signal error".		
	EC	Indoor/outdoor communication, start-up process abnormality	—	The start-up process of the outdoor unit does not complete for 4 minutes.	• Replace the indoor electronic control P.C. board.		
2-time blink 2.5 seconds OFF	UP	Outdoor power system	—	Overcurrent protection cut-out operates 3 consecutive times within 1 minute after the compressor gets started.	• Reconnect connectors. • Refer to 11-5.Ⓐ "How to check inverter/ compressor". • Check stop valve.	○	○
3-time blink 2.5 seconds OFF	U3	Discharge temperature thermistor	1-time blink every 2.5 seconds	Thermistor shorts or opens during compressor running.	• Refer to 11-5.Ⓖ "Check of outdoor thermistors". Defective outdoor thermistors can be identified by checking the blinking pattern of LED.	○	○
	U4	Defrost thermistor					
		Ambient temperature	2-time blink 2.5 seconds OFF				
		Fin temperature thermistor	3-time blink 2.5 seconds OFF				
		Outdoor heat exchanger temperature thermistor	—				
		P.C. board temperature thermistor	4-time blink 2.5 seconds OFF		• Replace the inverter P.C. board.		
4-time blink 2.5 seconds OFF	UF	Overcurrent	11-time blink 2.5 seconds OFF	Large current flows into power module (IC700).	• Reconnect compressor connector. • Refer to 11-5.Ⓐ "How to check inverter/ compressor". • Check stop valve.	—	○
		Compressor synchronous abnormality	12-time blink 2.5 seconds OFF	Waveform of compressor current is distorted.	• Reconnect compressor connector. • Refer to 11-5.Ⓐ "How to check inverter/ compressor".	—	○
		Compressor start-up failure protection	13-time blink 2.5 seconds OFF	Overcurrent cutoff within 10 seconds after activating the compressor.		—	○
5-time blink 2.5 seconds OFF	U2	Discharge temperature	—	Temperature of discharge temperature thermistor exceeds 116°C, compressor stops. Compressor can restart if discharge temperature thermistor reads 100°C or less 3 minutes later.	• Check refrigerant circuit and refrigerant amount. • Refer to 11-5.Ⓚ "Check of LEV".	—	○
6-time blink 2.5 seconds OFF	Ud	High pressure	—	Temperature of outdoor heat exchanger temperature thermistor exceeds 70°C in COOL mode.	• Check refrigerant circuit and refrigerant amount. • Check stop valve.	—	○
7-time blink 2.5 seconds OFF	U5	Fin temperature	7-time blink 2.5 seconds OFF	Temperature of fin temperature thermistor on the inverter P.C. board exceeds 75 – 86°C, or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 72 – 85°C.	• Check around outdoor unit. • Check outdoor unit air passage. • Refer to 11-5.Ⓘ "Check of outdoor fan motor".	—	○
	Ub	P.C. board temperature					
8-time blink 2.5 seconds OFF	U8	Outdoor fan motor	—	Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up.	• Refer to 11-5.Ⓘ "Check of outdoor fan motor". Refer to 11-5.Ⓛ "Check of inverter P.C. board".	—	○

NOTE: Blinking patterns of this mode differ from the ones of TROUBLESHOOTING CHECK TABLE (11-3.).

NOTE: Blinking patterns of this mode differ from the ones of TROUBLESHOOTING CHECK TABLE (11-3.).

OPERATION INDICATOR lamp (Indoor unit)	Error code	Abnormal point (Failure mode/protection)	LED indication (Outdoor P.C. board)	Condition	Remedy	Indoor/outdoor unit failure mode recall function	Outdoor unit failure mode recall function
9-time blink 2.5 seconds OFF	FC	Nonvolatile memory data	5-time blink 2.5 seconds OFF	Nonvolatile memory data cannot be read properly.	• Replace the inverter P.C. board.	○	○
	U6	Power module (IC700)	6-time blink 2.5 seconds OFF	The interface short circuit occurs in the output of the power module (IC700). The compressor winding shorts circuit.	• Refer to 11-5.Ⓐ "How to check inverter/ compressor".	—	○
10-time blink 2.5 seconds OFF	U7	Discharge temperature	—	Temperature of discharge temperature thermistor has been 50°C or less for 20 minutes.	• Refer to 11-5.Ⓚ "Check of LEV". • Check refrigerant circuit and refrigerant amount.	—	○
11-time blink 2.5 seconds OFF	UJ	Bus-bar voltage (DC)	8-time blink 2.5 seconds OFF	Bus-bar voltage of inverter cannot be detected normally.	• Refer to 11-5.Ⓐ "How to check inverter/ compressor".	—	○
	UH	Each phase current of compressor	9-time blink 2.5 seconds OFF	Each phase current of compressor cannot be detected normally.			
13-time blink 2.5 seconds OFF	Fd	Abnormal of wrong voltage power supply connected.	—	When 100 V power supply is connected to 200 V model.	• Check power supply voltage	○	○
14-time blink 2.5 seconds OFF *1	UE	Stop valve (Closed valve)	14-time blink 2.5 seconds OFF	• Closed valve is detected by compressor current. • An abnormality of the indoor thermistors is detected.	• Check stop valve. • Refer to "TEST POINT DIAGRAM AND VOLTAGE" on the service manual of indoor unit for the characteristics of the thermistors. (Do not start the operation again without repair to prevent hazards.)	○	○
	P8	Pipe temperature	16-time blink 2.5 seconds OFF	• The indoor coil thermistor detects an abnormal temperature. • An abnormality of the indoor thermistors is detected.	• Replace the inverter P.C. board. • Refer to "TEST POINT DIAGRAM AND VOLTAGE" on the service manual of indoor unit for the characteristics of the thermistors. (Do not start the operation again without repair to prevent hazards.)	○	○
16-time blink 2.5 seconds OFF *1	PL	Outdoor refrigerant system abnormality	1-time blink 2.5 seconds OFF	• A closed valve and air trapped in the refrigerant circuit are detected based on the temperature sensed by the indoor and outdoor thermistors and the current of the compressor. • An abnormality of the indoor thermistors is detected.	• Check for a gas leak in a connecting piping etc. • Check the stop valve. • Refer to 11-5.Ⓞ "Check of outdoor refrigerant circuit". • Refer to "TEST POINT DIAGRAM AND VOLTAGE" on the service manual of indoor unit for the characteristics of the thermistors. (Do not start the operation again without repair to prevent hazards.)	○	○

*1 There is possibility that diesel explosion may occur due to the air mixed in the refrigerant circuit.
First, ensure that there are no leakage points on the valves, flare connections, etc. that allow the air to flow into the refrigerant circuit, or no blockage points (e.g. clogged or closed valves) in the refrigerant circuit that cause an increase in pressure.
If there is no abnormal point like above and the system operates cooling mode normally, the indoor thermistor might have a problem, resulting in false detection. Check both the indoor coil thermistor and the room temperature thermistor, and replace faulty thermistor(s), if any.
NOTE: Do not start the operation again without repair to prevent hazards.

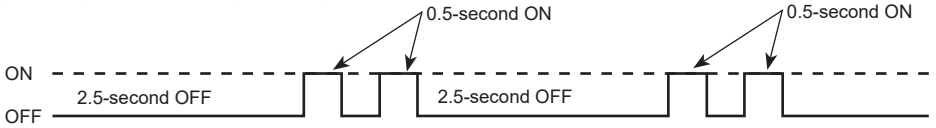
11-3. TROUBLESHOOTING CHECK TABLE

No.	Symptom	LED indication	Abnormal point/ Condition	Condition	Remedy
1	Outdoor unit does not operate.	1-time blink every 2.5 seconds	Outdoor power system	Overcurrent protection cut-out operates 3 consecutive times within 1 minute after the compressor gets started.	• Reconnect connector of compressor. • Refer to 11-5.Ⓐ “How to check inverter/compressor”. • Check stop valve.
2			Outdoor thermistors	Discharge temperature thermistor, fin temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor or ambient temperature thermistor shorts or opens during compressor running.	• Refer to 11-5.Ⓖ “Check of outdoor thermistors”.
				P.C. board temperature thermistor shorts or opens during compressor running.	• Replace inverter P.C. board.
3			Outdoor control system	Nonvolatile memory data cannot be read properly. (The left/upper lamp of the OPERATION INDICATOR lamp on the indoor unit lights up or blinks 7-time.)	• Replace inverter P.C. board.
4		6-time blink 2.5 seconds OFF	Serial signal	The communication fails between the indoor and outdoor unit for 3 minutes.	• Refer to 11-5.Ⓜ “How to check miswiring and serial signal error.
5		11-time blink 2.5 seconds OFF	Stop valve/ Closed valve	Closed valve is detected by compressor current.	• Check stop valve.
6		14-time blink 2.5 seconds OFF	Outdoor unit (Other abnormality)	Outdoor unit is defective.	• Refer to 11-2.2. “Flow chart of the detailed outdoor unit failure mode recall function”.
7		16-time blink 2.5 seconds OFF	4-way valve/ Pipe temperature	The 4-way valve does not work properly. The indoor coil thermistor detects an abnormal temperature.	• Refer to 11-5.Ⓗ “Check of R.V. coil”. • Replace the inverter P.C. board.
8		17-time blink 2.5 seconds OFF	Outdoor refrigerant system abnormality	A closed valve and air trapped in the refrigerant circuit are detected based on the temperature sensed by the indoor and outdoor thermistors and the current of the compressor.	• Check for a gas leak in a connecting piping etc. • Check the stop valve. • Refer to 11-5.Ⓞ “Check of outdoor refrigerant circuit”.
9	‘Outdoor unit stops and restarts 3 minutes later’ is repeated.	2-time blink 2.5 seconds OFF	Overcurrent protection	Large current flows into the power module (IC700).	• Reconnect connector of compressor. • Refer to 11-5.Ⓐ “How to check inverter/compressor”. • Check stop valve.
10		3-time blink 2.5 seconds OFF	Discharge temperature overheat protection	Temperature of discharge temperature thermistor exceeds 241°F (116°C), compressor stops. Compressor can restart if discharge temperature thermistor reads 212°F (100°C) or less 3 minutes later.	• Check refrigerant circuit and refrigerant amount. • Refer to 11-5.Ⓚ “Check of LEV”.
11		4-time blink 2.5 seconds OFF	Fin temperature /P.C. board temperature thermistor overheat protection	Temperature of the fin temperature thermistor on the heat sink exceeds 167 – 187°F (75 – 86°C) or temperature of P.C. board temperature thermistor on the inverter P.C.board exceeds 162 – 185°F (72 – 85°C).	• Check around outdoor unit. • Check outdoor unit air passage. • Refer to 11-5.Ⓘ “Check of outdoor fan motor”.
12		5-time blink 2.5 seconds OFF	High pressure protection	Indoor coil thermistor exceeds 158°F (70°C) in HEAT mode. Defrost thermistor exceeds 158°F (70°C) in COOL mode.	• Check refrigerant circuit and refrigerant amount. • Check stop valve.
13		8-time blink 2.5 seconds OFF	Compressor synchronous abnormality	The waveform of compressor current is distorted.	• Reconnect connector of compressor. • Refer to 11-5.Ⓐ “How to check inverter/compressor”.
14		10-time blink 2.5 seconds OFF	Outdoor fan motor	Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan startup.	• Refer to 11-5.Ⓘ “Check of outdoor fan motor. • Refer to 11-5.Ⓛ “Check of inverter P.C. board.
15		12-time blink 2.5 seconds OFF	Each phase current of compressor	Each phase current of compressor cannot be detected normally.	• Refer to 11-5.Ⓐ “How to check inverter/compressor”.
16		13-time blink 2.5 seconds OFF	Bus-bar voltage (DC)	Bus-bar voltage of inverter cannot be detected normally.	• It occurs with following case. • Instantaneous power voltage drop. (Short time power failure) • Refer to 11-5.Ⓙ “Check of power supply”. • Refer to 11-5.Ⓐ “How to check inverter/compressor”.

No.	Symptom	LED indication	Abnormal point/ Condition	Condition	Remedy
17	Outdoor unit operates.	1-time blink 2.5 seconds OFF	Deceleration of the operational frequency of the compressor by the current protection control	When the input current exceeds approximately 10A, compressor frequency lowers.	The unit is normal, but check the following. • Check if indoor filters are clogged. • Check if refrigerant is short. • Check if indoor/outdoor unit air circulation is short cycled.
18		3-time blink 2.5 seconds OFF	Deceleration of the operational frequency of the compressor by the high pressure protection	Temperature of indoor coil thermistor exceeds 131°F (55°C) in HEAT mode, compressor frequency lowers.	
			Deceleration of the operational frequency of the compressor by the overcooling prevention of the indoor heat exchanger	Indoor coil thermistor reads 46°F (8°C) or less in COOL mode, compressor frequency lowers.	
19		4-time blink 2.5 seconds OFF	Deceleration of the operational frequency of the compressor by the discharge temperature protection	Temperature of discharge temperature thermistor exceeds 232°F (111°C), compressor frequency lowers.	• Check refrigerant circuit and refrigerant amount. • Refer to 11-5.Ⓚ “Check of LEV”. • Refer to 11-5.Ⓖ “Check of outdoor thermistors”.
20		5-time blink 2.5 seconds OFF	Outside temperature thermistor protection	When the outside temperature thermistor shorts or opens, protective operation without that thermistor is performed.	• Refer to 11-5.Ⓖ “Check of outdoor thermistors”.
21	Outdoor unit operates.	7-time blink 2.5 seconds OFF	Low discharge temperature protection	Temperature of discharge temperature thermistor has been 122°F (50°C) or less for 20 minutes.	• Refer to 11-5.Ⓚ “Check of LEV”. • Check refrigerant circuit and refrigerant amount.
22		8-time blink 2.5 seconds OFF	PAM protection PAM: Pulse Amplitude Modulation	The overcurrent flows into IGBT(Q821) or the bus-bar voltage reaches 394 V or more, PAM stops and restarts.	This is not malfunction. PAM protection will be activated in the following cases: 1 Instantaneous power voltage drop. (Short time power failure) 2 When the power supply voltage is high.
23		9-time blink 2.5 seconds OFF	Inverter check mode	The connector of compressor is disconnected, inverter check mode starts.	• Check if the connector of the compressor is correctly connected. Refer to 11-5.Ⓐ “How to check inverter/compressor”.

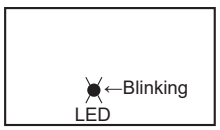
NOTE: 1. The location of LED is illustrated at the right figure. Refer to 11-6.1.
2. LED is lit during normal operation.

The blinking frequency shows the number of times the LED blinks after every 2.5-second OFF.
(Example) When the blinking frequency is “2”.

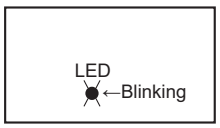


Inverter P.C. board

MUZ-HX09/12/18NL



MUZ-HX24NL

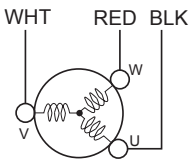
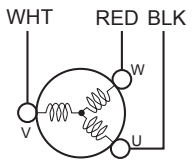
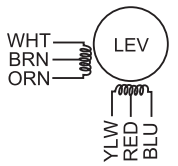


11-4. TROUBLESHOOTING CRITERION OF MAIN PARTS

MUZ-HX09NL MUZ-HX12NL MUZ-HX18NL MUZ-HX24NL

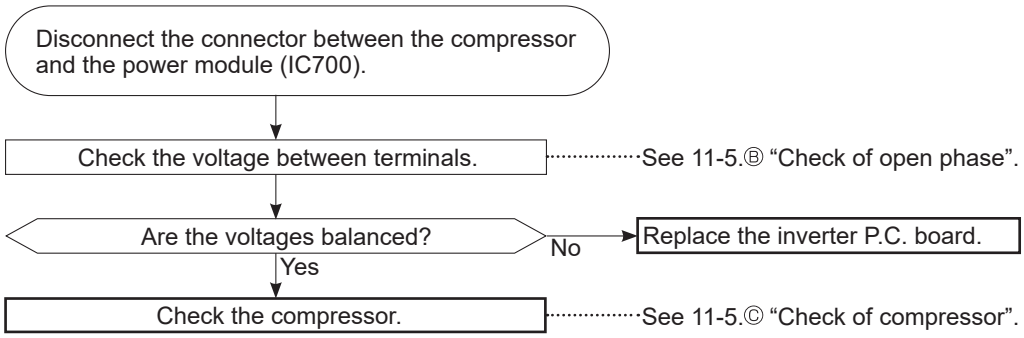
<table>
<tr><th>Part name</th><th>Check method and criterion</th><th>Figure</th></tr>
<tr><td>Defrost thermistor (RT61)
Fin temperature thermistor (RT64)
Ambient temperature thermistor (RT65)
Outdoor heat exchanger temperature thermistor (RT68)</td><td>Measure the resistance with a multimeter.

Refer to 11-6. “Test point diagram and voltage”, 1. “Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Discharge temperature thermistor (RT62)</td><td>Measure the resistance with a multimeter. Before measurement, hold the thermistor with your hands to warm it up.

Refer to 11-6. “Test point diagram and voltage”, 1. “Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Compressor</td><td>Measure the resistance between terminals using a multimeter.
[Temperature: 14 – 104°F (-10 – 40°C)]
<table><tr><th></th><th colspan="2">Normal (Ω)</th></tr><tr><th></th><th>MUZ-HX09NL</th><th>MUZ-HX12/18/24NL</th></tr><tr><td>U-V
U-W
V-W</td><td>2.21 – 2.99</td><td>1.30 – 1.77</td></tr></table></td><td>  </td></tr>
<tr><td>Outdoor fan motor</td><td>Measure the resistance between lead wires using a multimeter.
[Temperature: 14 – 104°F (-10 – 40°C)]
<table><tr><th rowspan="2">Color of lead wire</th><th colspan="2">Normal (Ω)</th></tr><tr><th>MUZ-HX09/12NL</th><th>MUZ-HX18/24NL</th></tr><tr><td>RED – BLK
BLK – WHT
WHT – RED</td><td>26 – 40</td><td>30 – 46</td></tr></table></td><td>  </td></tr>
<tr><td>R. V. coil (21S4)</td><td>Measure the resistance using a multimeter.
[Temperature: 14 – 104°F (-10 – 40°C)]
<table><tr><th>Normal (kΩ)</th></tr><tr><td>1.65 – 2.48</td></tr></table></td><td></td></tr>
<tr><td>Expansion valve coil (LEV)</td><td>Measure the resistance using a multimeter.
[Temperature: 14 – 104°F (-10 – 40°C)]
<table><tr><th>Color of lead wire</th><th>Normal (Ω)</th></tr><tr><td>BRN – ORN</td><td rowspan="4">37 – 54</td></tr><tr><td>BRN – WHT</td></tr><tr><td>RED – BLU</td></tr><tr><td>RED – YLW</td></tr></table></td><td>  </td></tr>
</table>

11-5. TROUBLESHOOTING FLOW

Ⓐ How to check inverter/compressor



Ⓑ Check of open phase

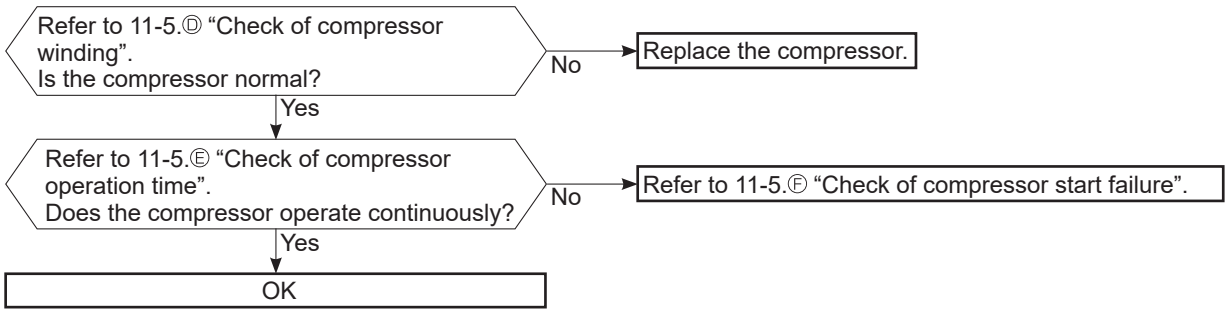
- With the connector between the compressor and the power module (IC700) disconnected, activate the inverter and check if the inverter is normal by measuring **the voltage balance** between the terminals.

Output voltage is 50 – 130 V. (The voltage may differ according to the multimeter.)

<< Operation method>>
Start cooling or heating operation by pressing the emergency operation switch on the indoor unit. (TEST RUN OPERATION: Refer to 8-6.)
<<Measurement point>>
At 3 points *Measure AC voltage between the lead wires at 3 points.
BLK (U)-WHT (V)
BLK (U)-RED (W)
WHT(V)-RED (W)

NOTE: 1. Output voltage varies according to power supply voltage.
2. Measure the voltage by analog type multimeter.
3. During this check, LED of the inverter P.C. board blinks 9 times. (Refer to 11-6.1.)

Ⓒ Check of compressor



Ⓓ Check of compressor winding

●Disconnect the connector between the compressor and the power module (IC700), and measure the resistance between the compressor terminals.

<<Measurement point>>

At 3 points *Measure the resistance between the lead wires at 3 points.
BLK-WHT
BLK-RED
WHT-RED

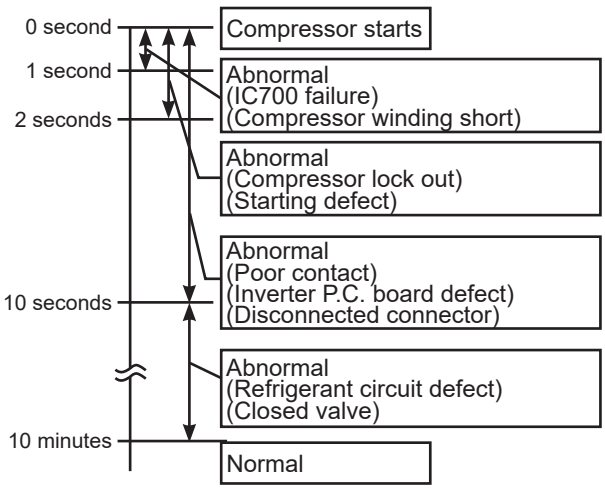
<<Judgement>>

Refer to 11-4.
0 [Ω] ·····Abnormal [short]
Infinite [Ω] ·····Abnormal [open]
NOTE: Be sure to zero the ohmmeter before measurement.

Ⓔ Check of compressor operation time

● Connect the compressor and activate the inverter. Then measure the time until the inverter stops due to overcurrent.
<<Operation method>>
Start heating or cooling operation by pressing the emergency operation switch on the indoor unit. (TEST RUN OPERATION: Refer to 8-6.)
<<Measurement>>
Measure the time from the start of compressor to the stop of compressor due to overcurrent.

<<Judgement>>



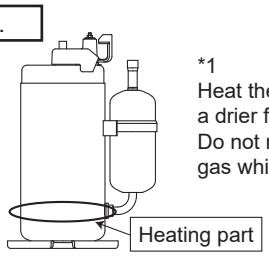
Ⓕ Check of compressor start failure

Confirm that ①~④ is normal.
•Electrical circuit check
①. Contact of the compressor connector
②. Output voltage of inverter P.C. board and balance of them (See 11-5.Ⓑ)
③. Direct current voltage between DB61(+) and (-) **(HX09/12/18)**/IC700(P) and (N) **(HX24)** on the inverter P.C. board
④. Voltage between outdoor terminal block S1-S2

Does the compressor run for 10 seconds or more after it starts?
Yes → Check the refrigerant circuit. Check the stop valve.
No

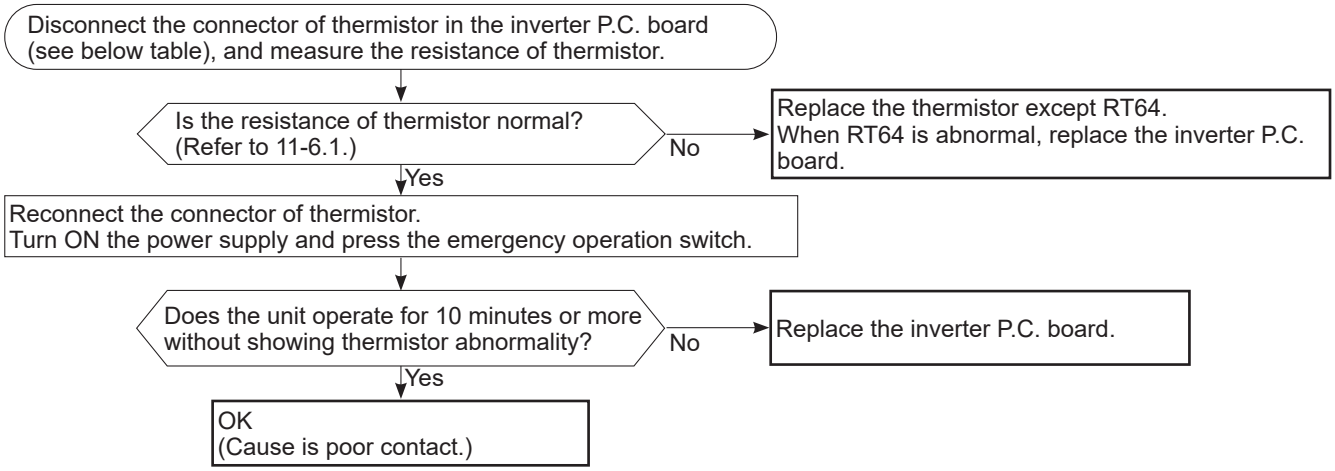
After the compressor is heated with a drier, does the compressor start? *1
No → Replace the compressor.
Yes

Compressor start failure. Activate pre-heat control. (Refer to 10-2. “PRE-HEAT CONTROL SETTING”)



*1
Heat the compressor with a drier for about 20 minutes. Do not recover refrigerant gas while heating.

Ⓖ Check of outdoor thermistors



MUZ-HX09/12/18

Thermistor	Symbol	Connector, Pin No.	Board
Defrost	RT61	Between CN641 pin1 and pin2	Inverter P.C. board
Discharge temperature	RT62	Between CN641 pin3 and pin4	
Fin temperature	RT64	Between CN642 pin1 and pin2	
Ambient temperature	RT65	Between CN643 pin1 and pin2	
Outdoor heat exchanger temperature	RT68	Between CN644 pin1 and pin3	

MUZ-HX24

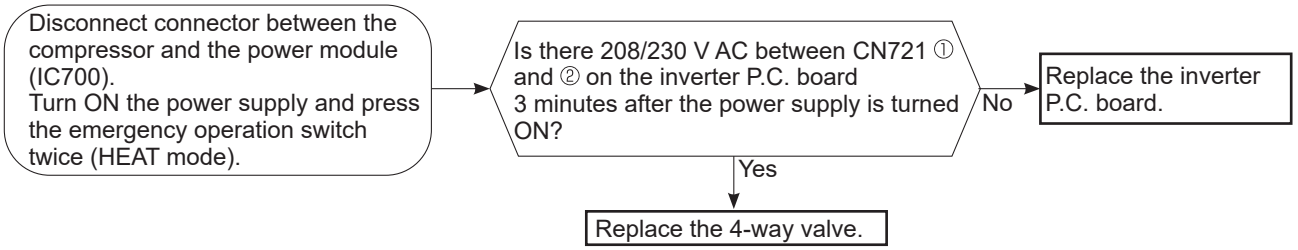
Thermistor	Symbol	Connector, Pin No.	Board
Defrost	RT61	Between CN671 pin1 and pin2	Inverter P.C. board
Discharge temperature	RT62	Between CN671 pin3 and pin4	
Fin temperature	RT64	Between CN673 pin1 and pin2	
Ambient temperature	RT65	Between CN672 pin1 and pin2	
Outdoor heat exchanger temperature	RT68	Between CN671 pin5 and pin6	

Ⓗ Check of R.V. coil

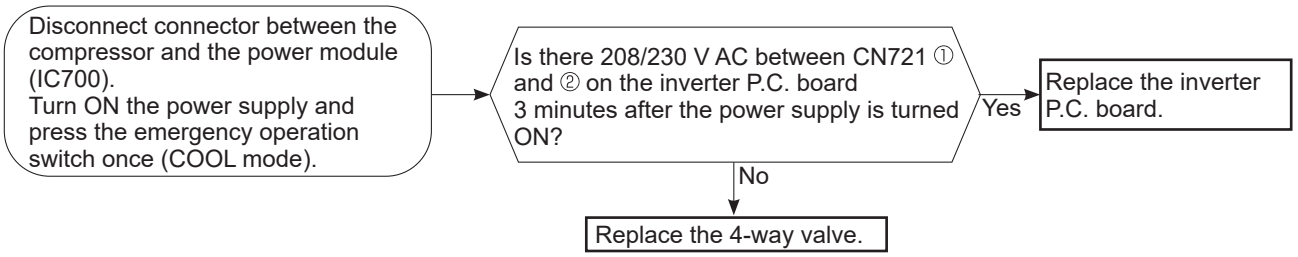
MUZ-HX09/12/18

* First of all, measure the resistance of R.V. coil to check if the coil is defective. Refer to 11-4.
* In case CN721 is disconnected or R.V. coil is open, voltage is generated between the terminal pins of the connector although no signal is being transmitted to R.V. coil.
  Check if CN721 is connected.

Unit operates in COOL mode even if it is set to HEAT mode.



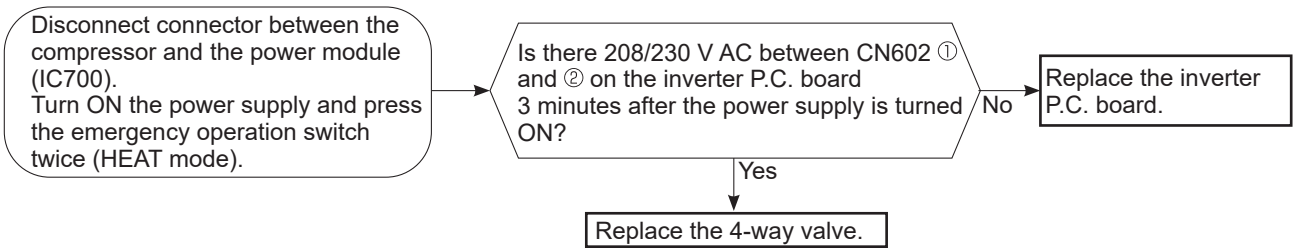
Unit operates in HEAT mode even if it is set to COOL mode.



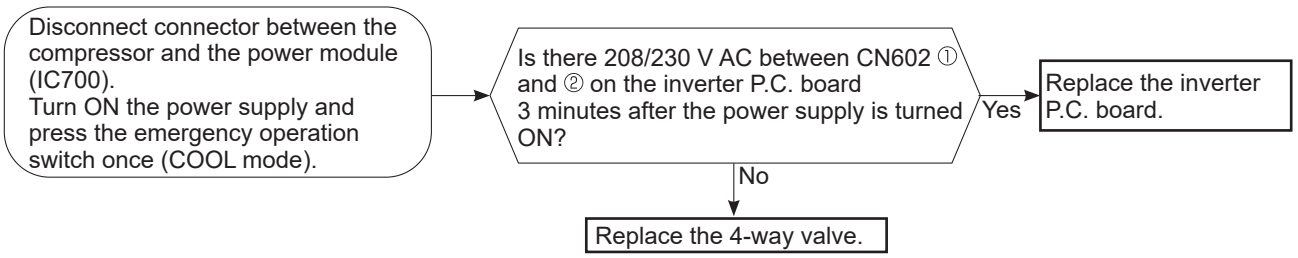
MUZ-HX24

* First of all, measure the resistance of R.V. coil to check if the coil is defective. Refer to 10-4.
* In case CN602 is disconnected or R.V. coil is open, voltage is generated between the terminal pins of the connector although no signal is being transmitted to R.V. coil.
  Check if CN602 is connected.

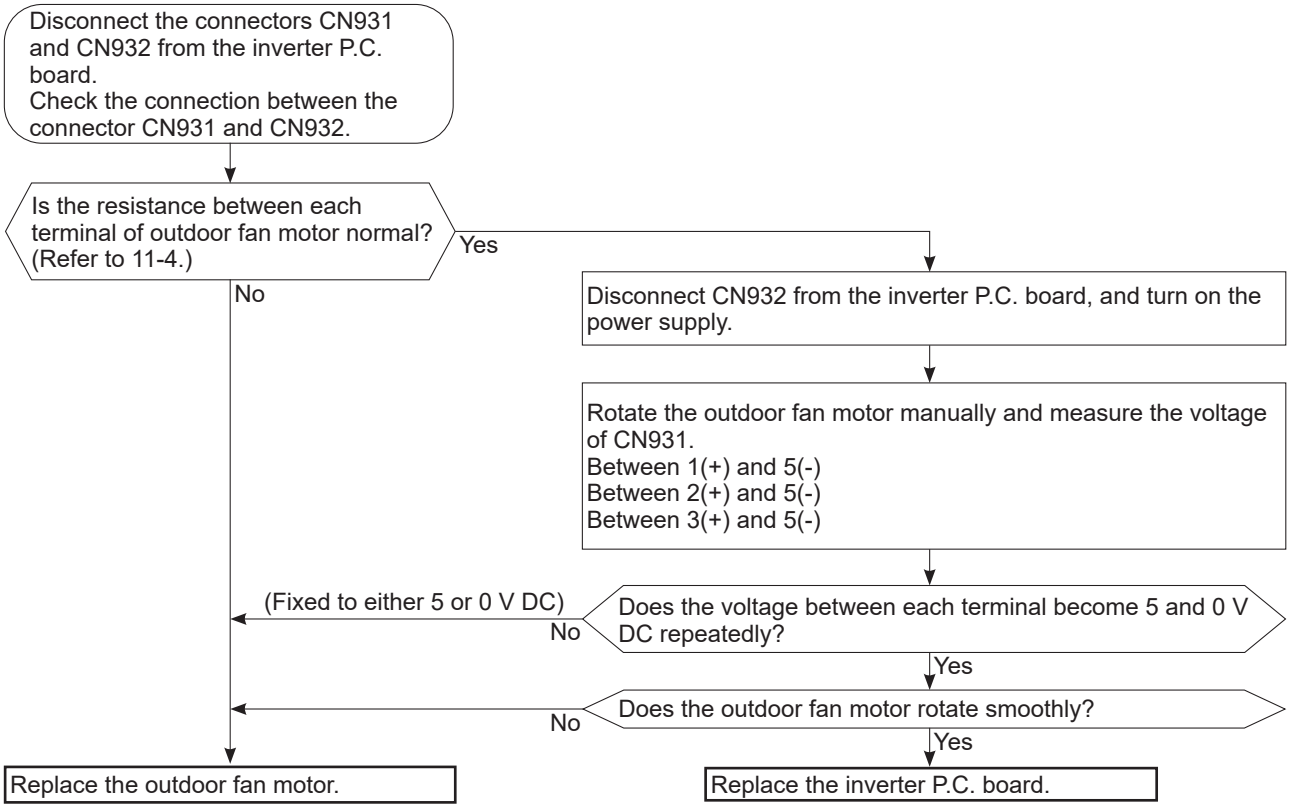
Unit operates in COOL mode even if it is set to HEAT mode.



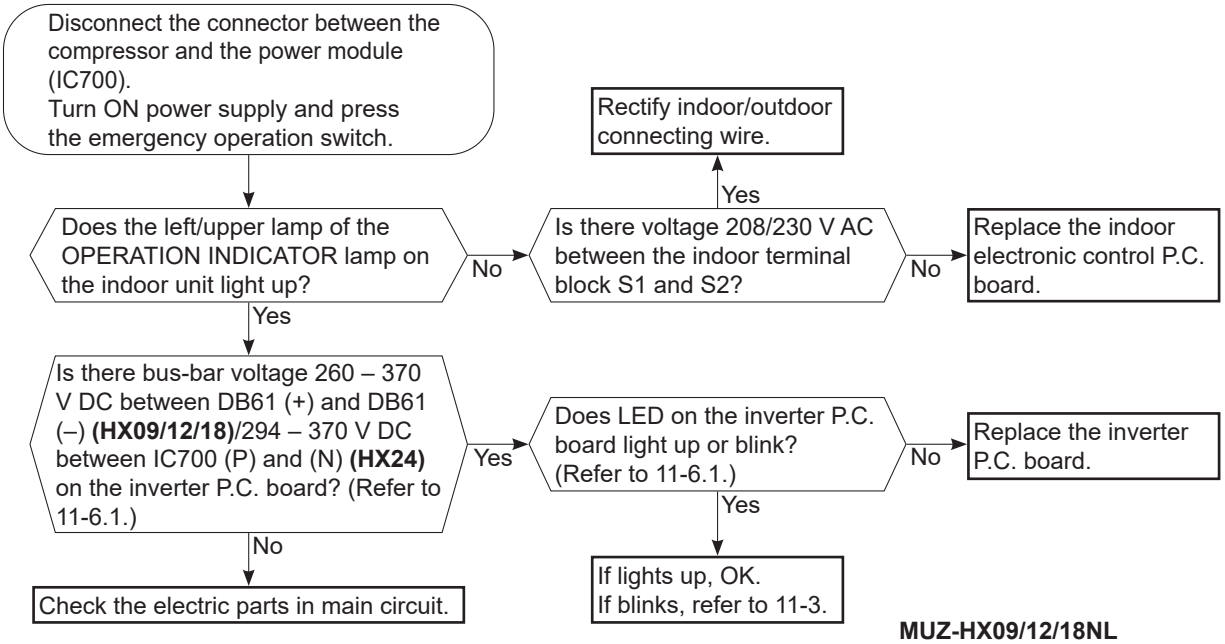
Unit operates in HEAT mode even if it is set to COOL mode.



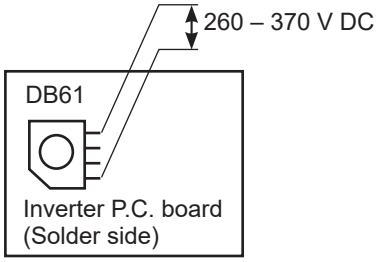
ⓘ Check of outdoor fan motor



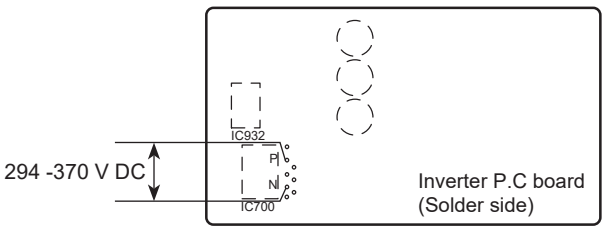
Ⓙ Check of power supply



MUZ-HX09/12/18NL

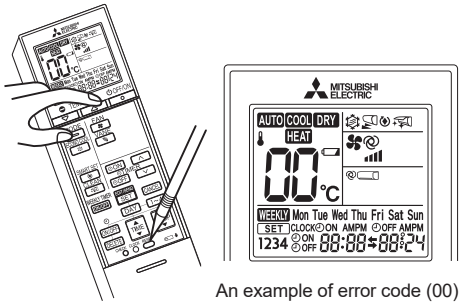


MUZ-HX24NL



Ⓚ Check of LEV (Expansion valve)

Turn ON the power supply.
<Preparation of the remote controller>
① While pressing both Operation select button and TEMP ⊕ button on the remote controller at the same time, press RESET button.
② First, release RESET button.
Hold down the other 2 buttons for another 3 seconds. Make sure that the indicators on the LCD screen shown in the right figure are all displayed. Then release the buttons.



An example of error code (00)

Press OFF/ON (stop/operate) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit. *1

Expansion valve operates in full-opening direction.

Do you hear the expansion valve "click, click·····"?
Do you feel the expansion valve vibrate when touching it ?
Yes → OK
No

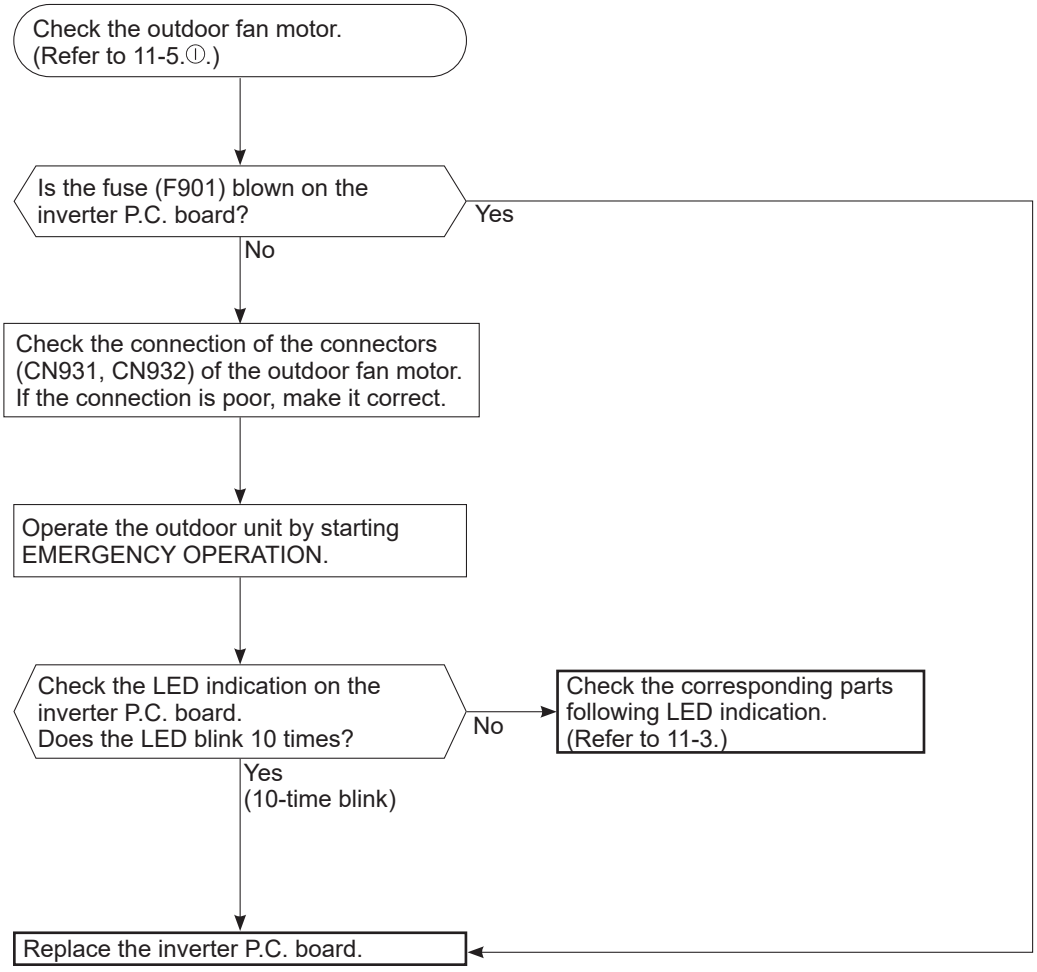
Is LEV coil properly fixed to the expansion valve?
No → Properly fix the LEV coil to the expansion valve.
Yes

Does the resistance of LEV coil have the characteristics? (Refer to 11-4.)
Yes →
Measure each voltage between connector pins of CN724 on the inverter P.C. board.
1. Pin③(-) — Pin①(+)
2. Pin④(-) — Pin①(+)
3. Pin⑤(-) — Pin①(+)
4. Pin⑥(-) — Pin①(+)
Is there about 3 – 5 V DC between each?
NOTE: Measure the voltage by an analog multimeter.
No → Replace the inverter P.C. board.
Yes → Replace the expansion valve.
No → Replace the LEV coil.

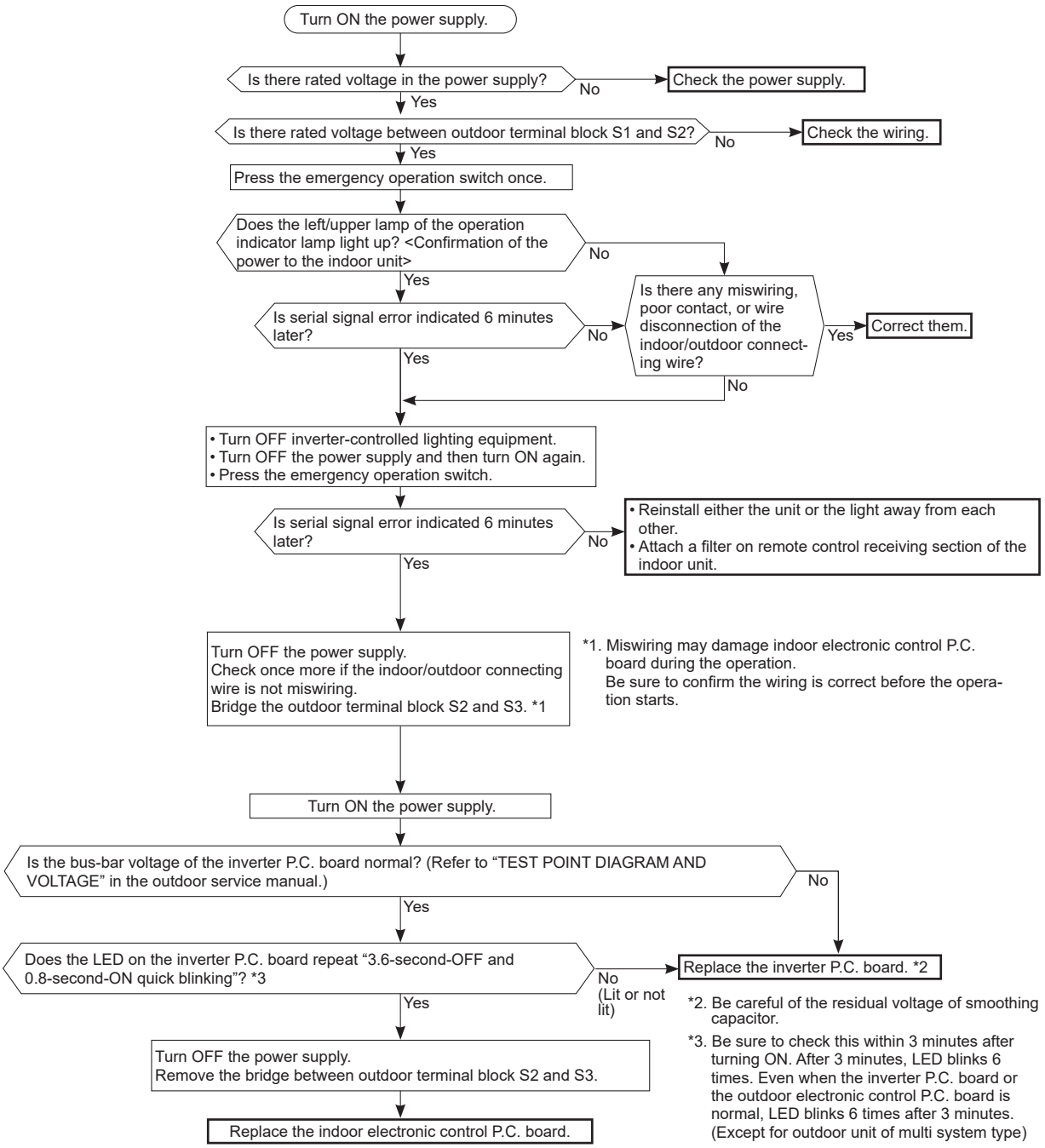
*1. Regardless of normal or abnormal condition, a short beep is emitted once the signal is received.

NOTE: After check of LEV, take the following steps.
1. Turn OFF the power supply and turn it ON again.
2. Press RESET button on the remote controller.

Ⓛ Check of inverter P.C. board

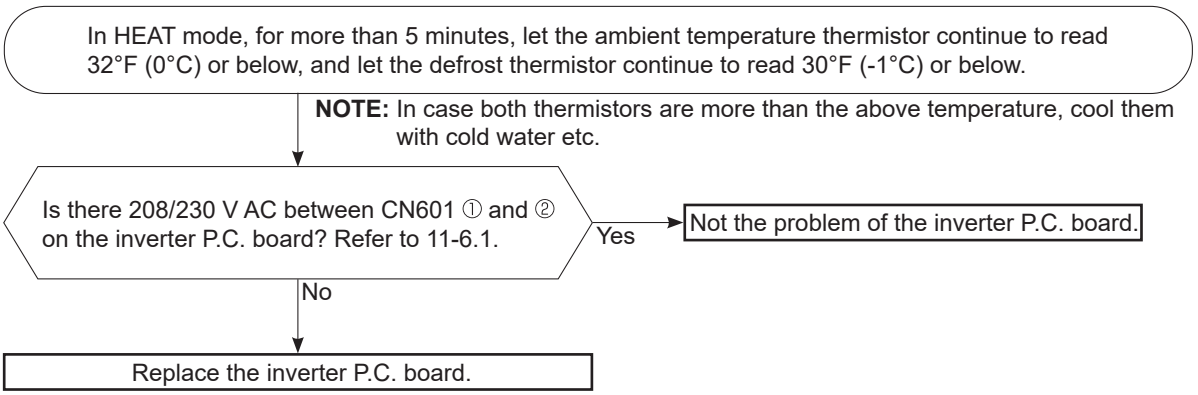


Ⓜ How to check miswiring and serial signal error

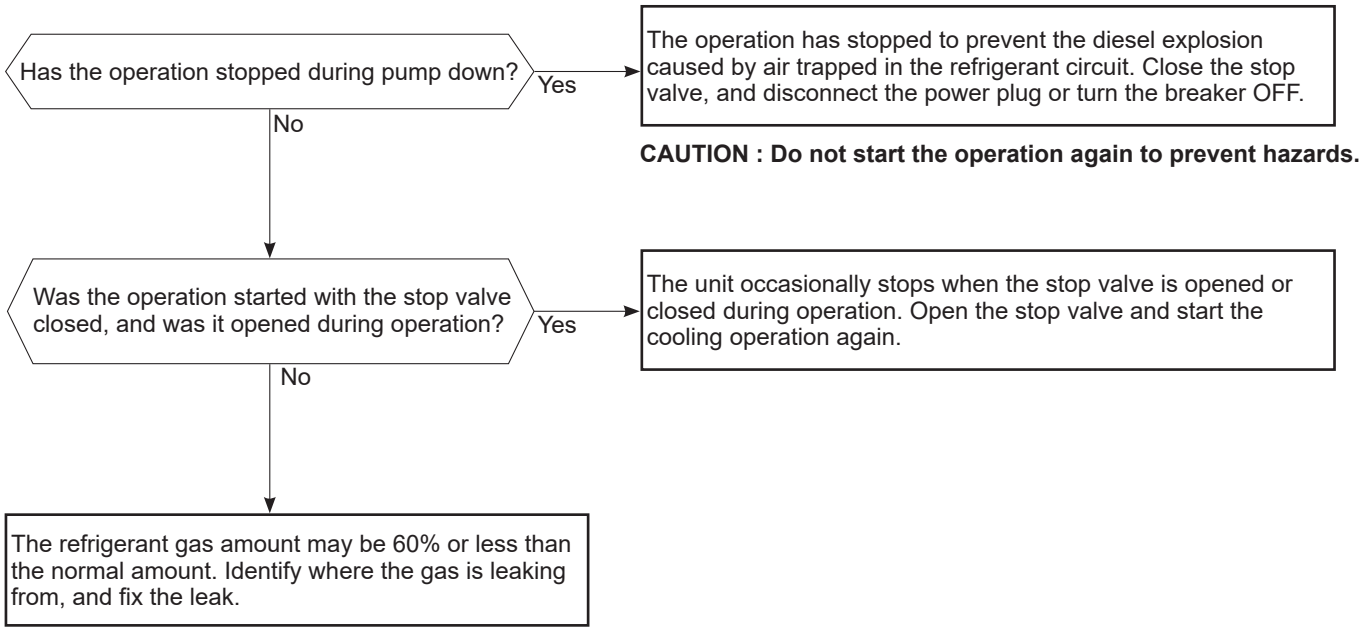


Ⓝ Check of defrost heater

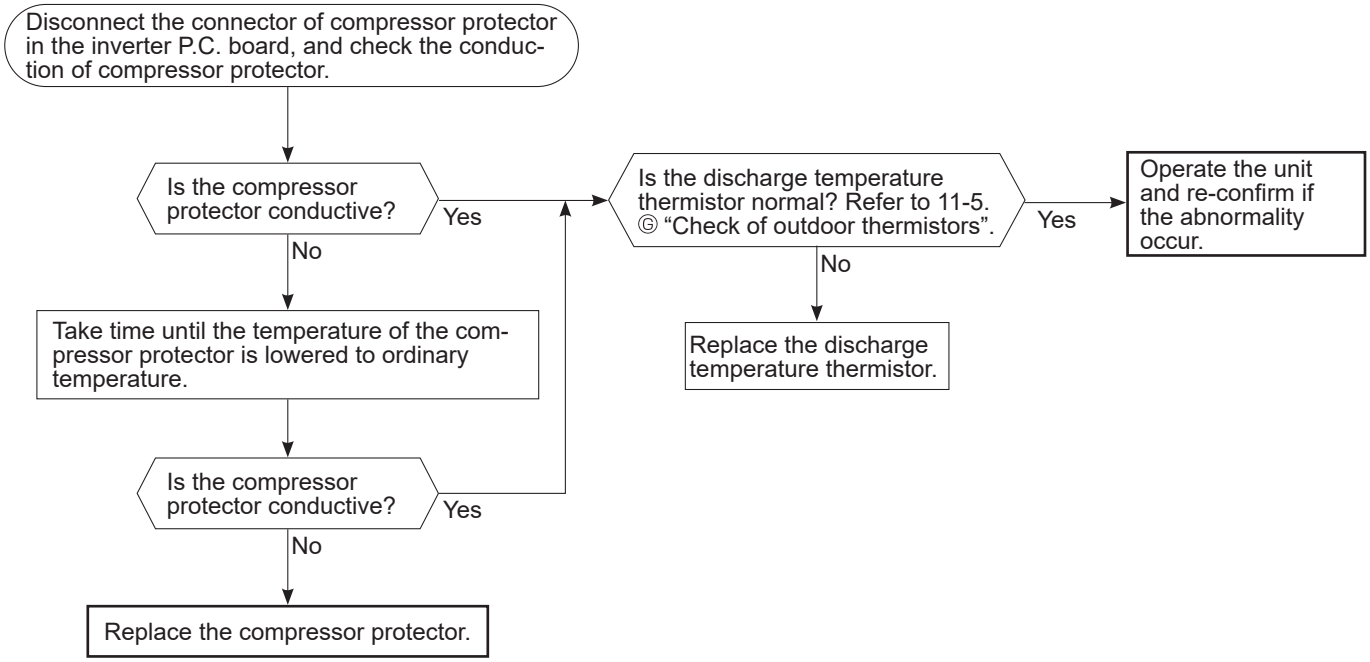
Check the following points before checking electric continuity.
1. Does the resistance of ambient temperature thermistor have the characteristics? Refer to 11-6.1.
2. Is the resistance of defrost heater normal? Refer to 11-4.
3. Does the heater protector remain conducted (not open)?
4. Are both ambient temperature thermistor and circuit of defrost heater securely connected to connectors?



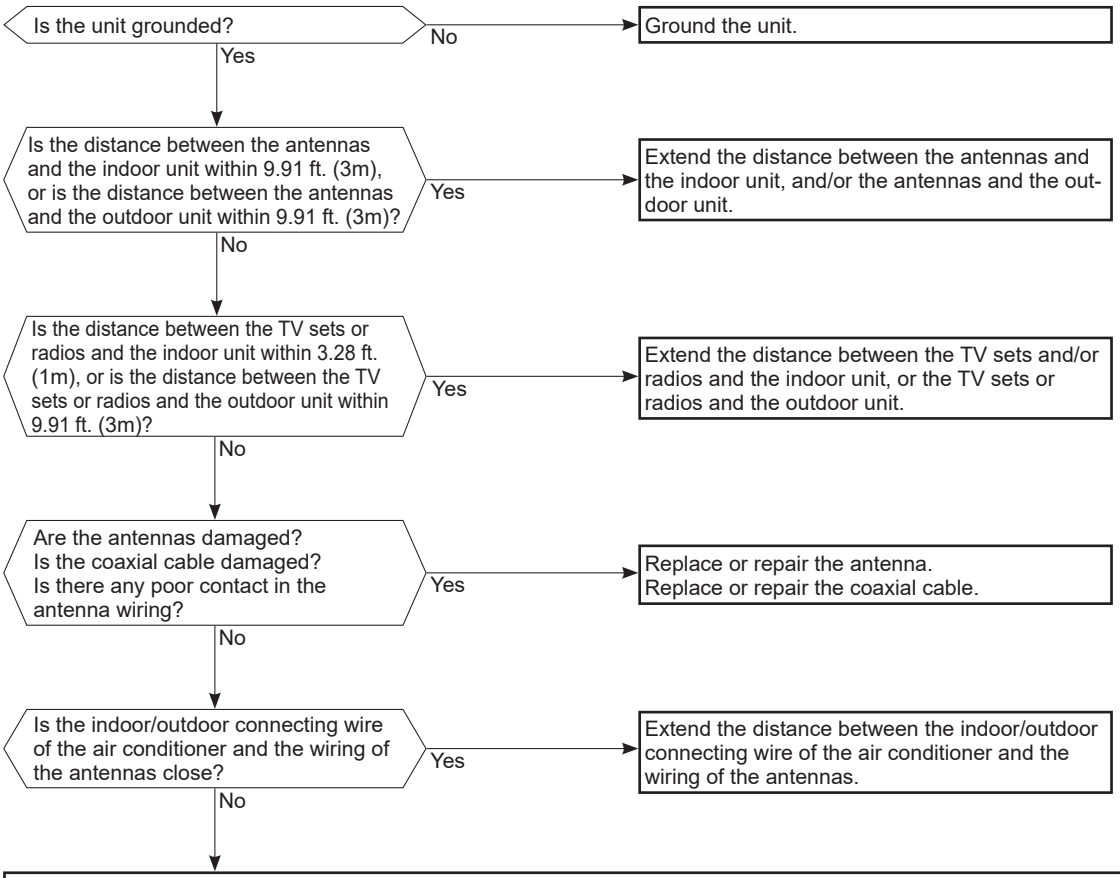
Ⓞ Check of outdoor refrigerant circuit



Ⓟ Check of compressor protector



Q Electromagnetic noise enters into TV sets or radios



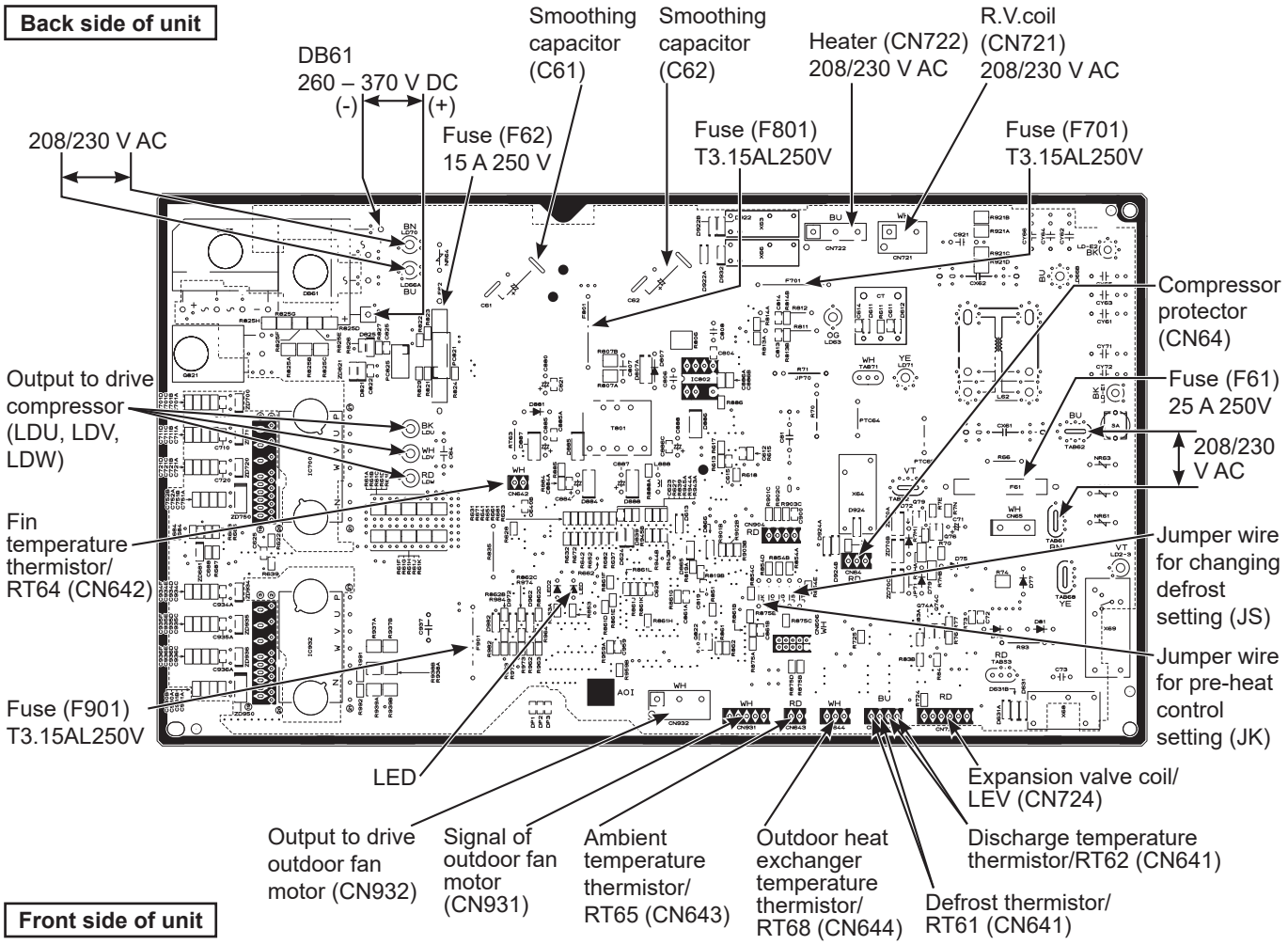
Even if all of the above conditions are fulfilled, the electromagnetic noise may enter, depending on the electric field strength or the installation condition (combination of specific conditions such as antennas or wiring).
Check the following before asking for service.

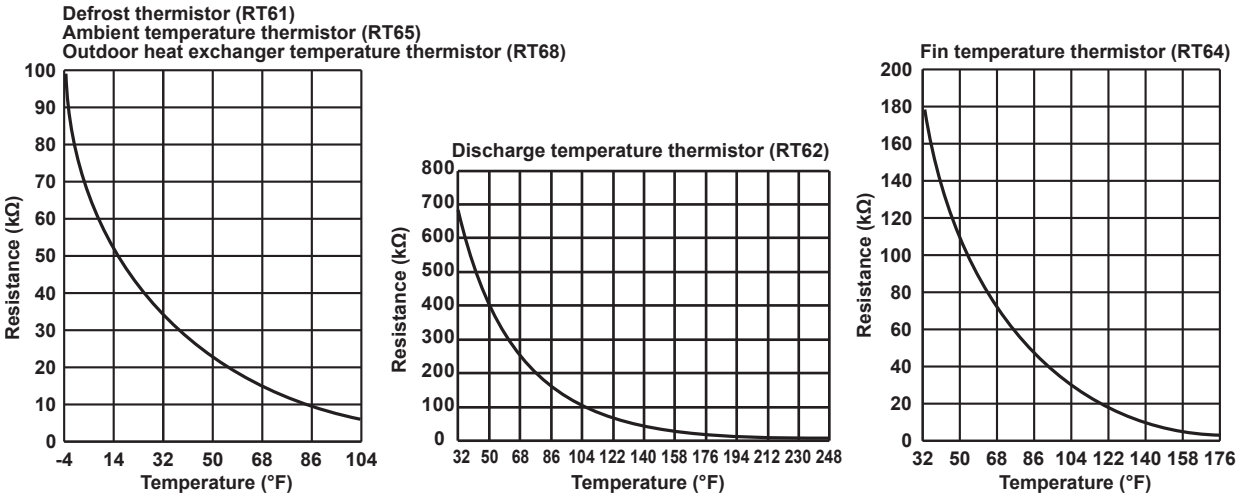
1. Devices affected by the electromagnetic noise
   TV sets, radios (FM/AM broadcast, shortwave)
2. Channel, frequency, broadcast station affected by the electromagnetic noise
3. Channel, frequency, broadcast station unaffected by the electromagnetic noise
4. Layout of:
   indoor/outdoor unit of the air conditioner, indoor/outdoor wiring, ground wire, antennas, wiring from antennas, receiver
5. Electric field intensity of the broadcast station affected by the electromagnetic noise
6. Presence or absence of amplifier such as booster
7. Operation condition of air conditioner when the electromagnetic noise enters in
   1) Turn OFF the power supply once, and then turn ON the power supply. In this situation, check for the electromagnetic noise.
   2) Within 3 minutes after turning ON the power supply, press OFF/ON (stop/operate) button on the remote controller for power ON, and check for the electromagnetic noise.
   3) After a short time (3 minutes later after turning ON), the outdoor unit starts running. During operation, check for the electromagnetic noise.
   4) Press OFF/ON (stop/operate) button on the remote controller for power OFF, when the outdoor unit stops but the indoor/outdoor communication still runs on. In this situation, check for the electromagnetic noise.

11-6. TEST POINT DIAGRAM AND VOLTAGE

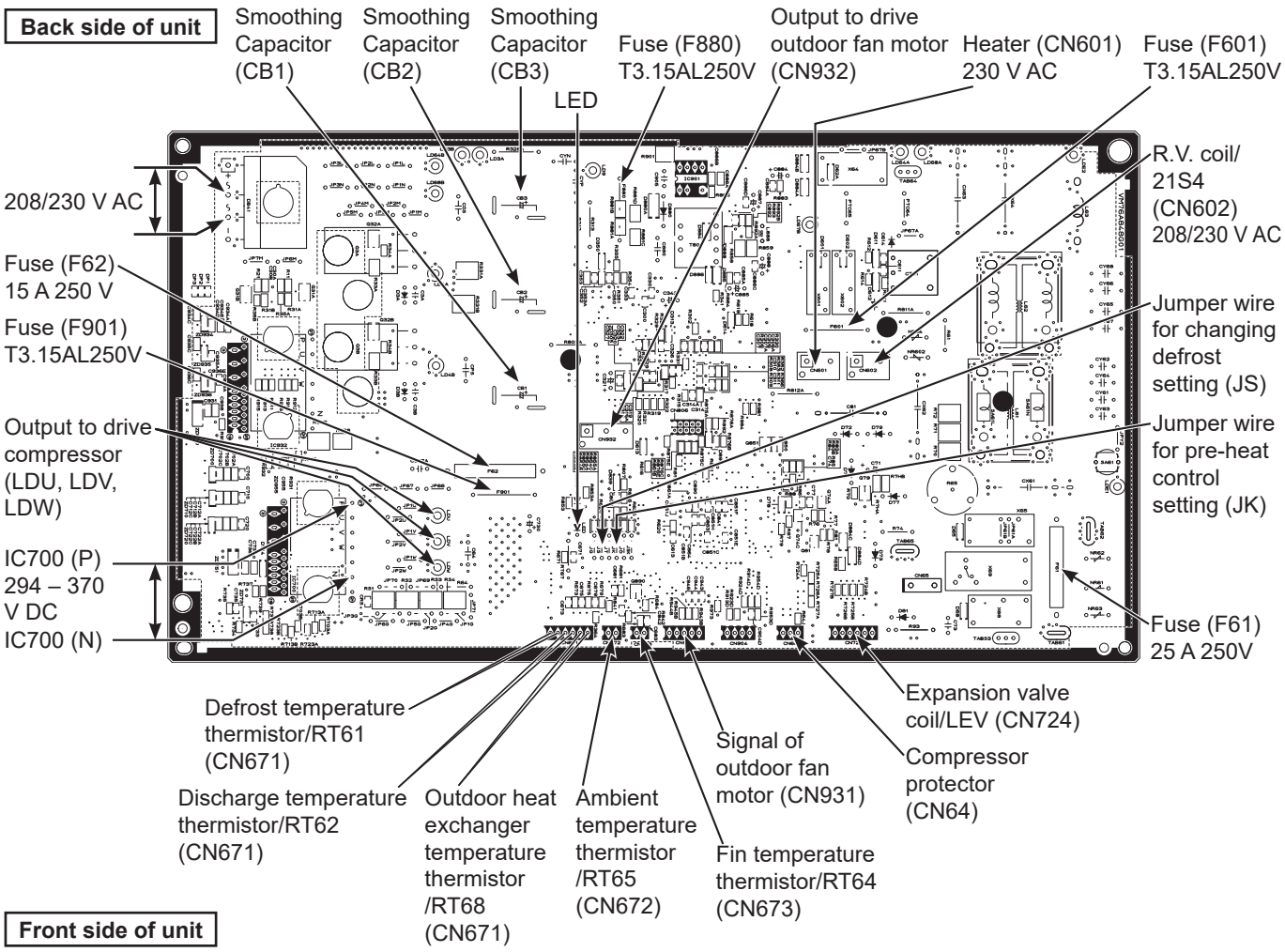
1. Inverter P.C. board

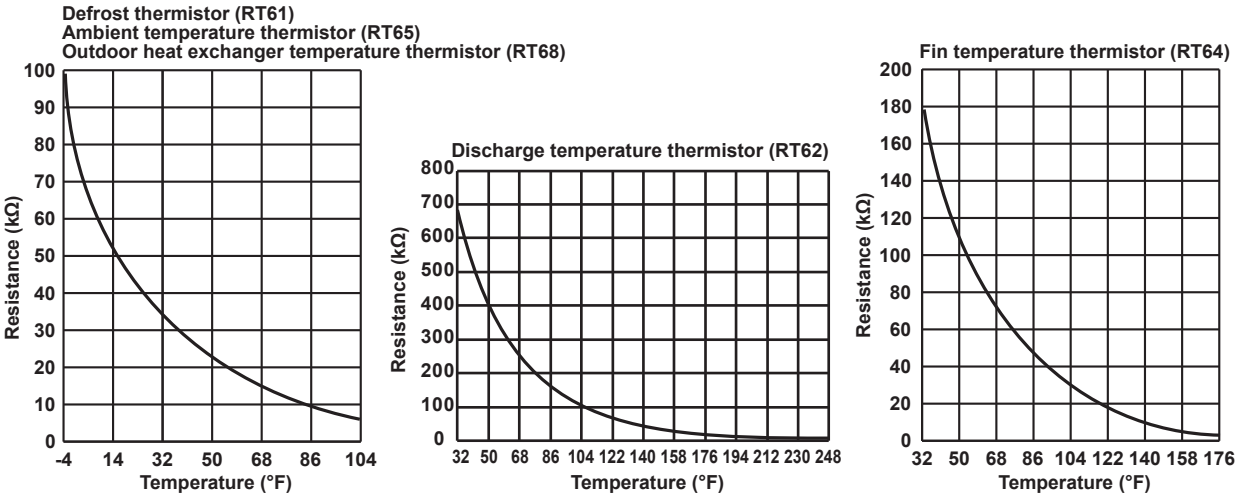
MUZ-HX09NL MUZ-HX12NL MUZ-HX18NL



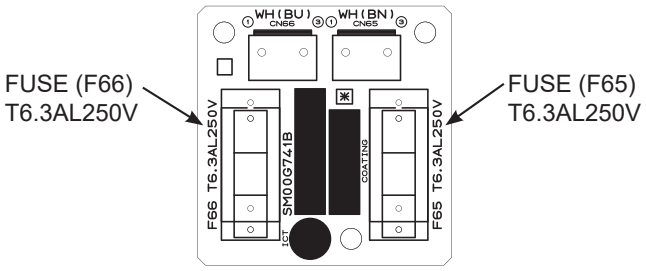


MUZ-HX24NL


Back side of unit
Smoothing Capacitor (CB1)
Smoothing Capacitor (CB2)
Smoothing Capacitor (CB3)
LED
Fuse (F880) T3.15AL250V
Output to drive outdoor fan motor (CN932)
Heater (CN601) 230 V AC
Fuse (F601) T3.15AL250V
R.V. coil/ 21S4 (CN602) 208/230 V AC
208/230 V AC
Fuse (F62) 15 A 250 V
Fuse (F901) T3.15AL250V
Output to drive compressor (LDU, LDV, LDW)
IC700 (P) 294 – 370 V DC
IC700 (N)
Jumper wire for changing defrost setting (JS)
Jumper wire for pre-heat control setting (JK)
Fuse (F61) 25 A 250V
Defrost temperature thermistor/RT61 (CN671)
Discharge temperature thermistor/RT62 (CN671)
Outdoor heat exchanger temperature thermistor /RT68 (CN671)
Ambient temperature thermistor /RT65 (CN672)
Fin temperature thermistor/RT64 (CN673)
Signal of outdoor fan motor (CN931)
Expansion valve coil/LEV (CN724)
Compressor protector (CN64)
Front side of unit


Defrost thermistor (RT61)
Ambient temperature thermistor (RT65)
Outdoor heat exchanger temperature thermistor (RT68)
Resistance (kΩ)
100
90
80
70
60
50
40
30
20
10
0
-4 14 32 50 68 86 104
Temperature (°F)
Discharge temperature thermistor (RT62)
Resistance (kΩ)
800
700
600
500
400
300
200
100
0
32 50 68 86 104 122 140 158 176 194 212 230 248
Temperature (°F)
Fin temperature thermistor (RT64)
Resistance (kΩ)
200
180
160
140
120
100
80
60
40
20
0
32 50 68 86 104 122 140 158 176
Temperature (°F)

2. Fuse P.C. board
MUZ-HX24NL

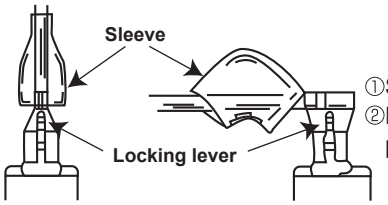


12 DISASSEMBLY INSTRUCTIONS

<Detaching method of the terminal with locking mechanism>

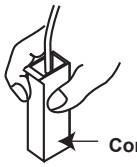
The terminal which has the locking mechanism can be detached as shown below.
There are 2 types of the terminal with locking mechanism.
The terminal without locking mechanism can be detached by pulling it out.
Check the shape of the terminal before detaching.

(1) Slide the sleeve and check if there is a locking lever or not.



①Slide the sleeve.
②Pull the terminal while pushing the locking lever.

(2) The terminal with the connector shown below has the locking mechanism.



①Hold the sleeve, and pull out the terminal slowly.

12-1. MUZ-HX09NL MUZ-HX12NL

→ : Indicates the visible parts in the photos/figures.
- - -→ : Indicates the invisible parts in the photos/figures.

NOTE: Turn OFF the power supply before disassembly.

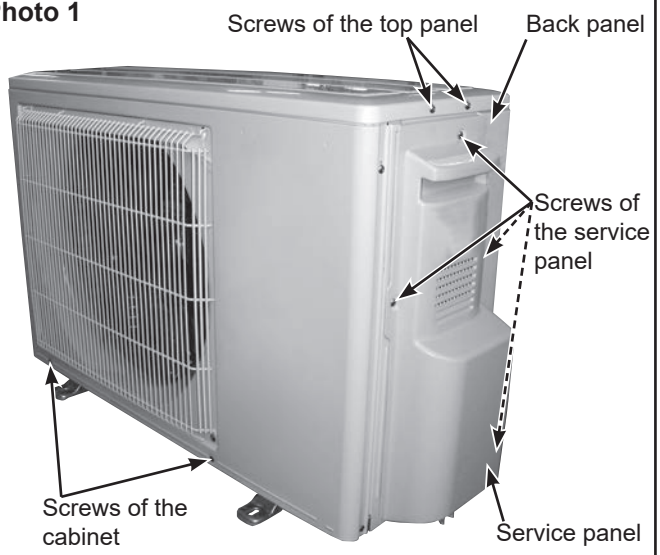
OPERATING PROCEDURE	PHOTOS/FIGURES
1. Removing the cabinet (1) Remove the screws fixing the service panel. (2) Pull down the service panel and remove it. (3) Remove the screws fixing the conduit cover. (Photo 4) (4) Remove the conduit cover. (5) Remove the screw fixing the conduit plate. (Photo 5) (6) Remove the conduit plate. (7) Disconnect the power supply wire and indoor/outdoor connecting wire. (8) Remove the screws fixing the top panel. (9) Remove the top panel. (10) Remove the screws fixing the cabinet. (11) Remove the cabinet. (12) Remove the screws fixing the back panel. (Photo 5, 6) (13) Remove the back panel. **NOTE:** If the red labels have been removed during the operation, put them back in the original position after the operation. Red labels indicate the use of flammable refrigerants. (Figure 1)	**Photo 1** 

Photo 2

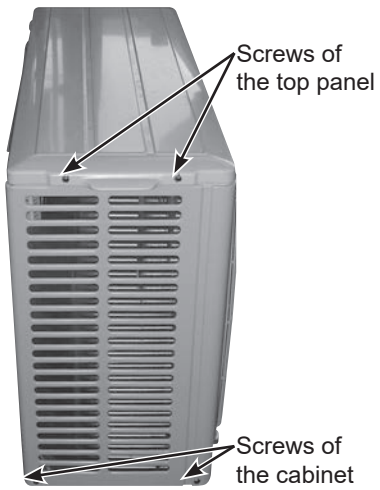


Photo 3

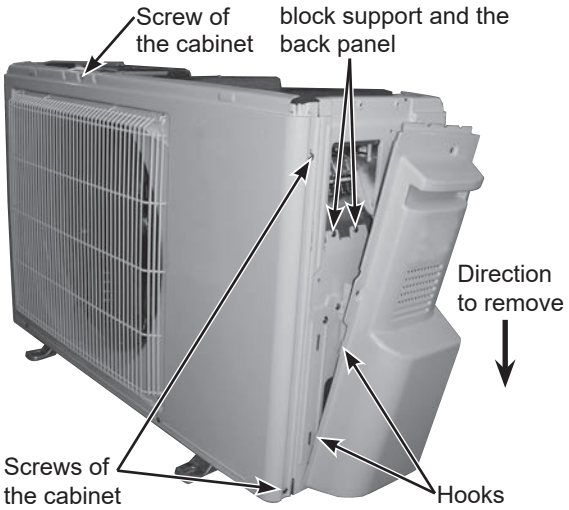
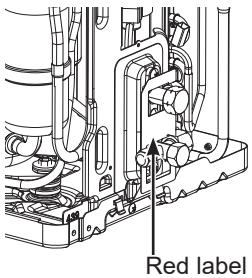
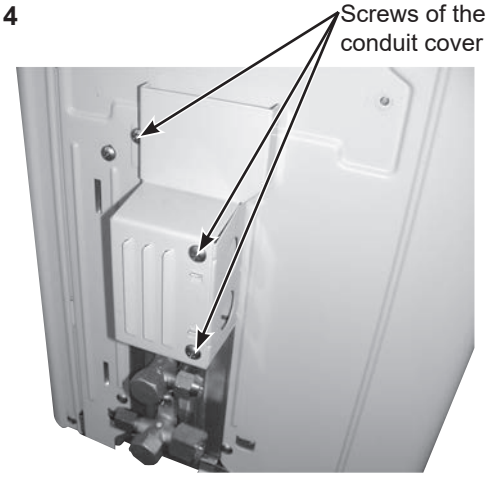
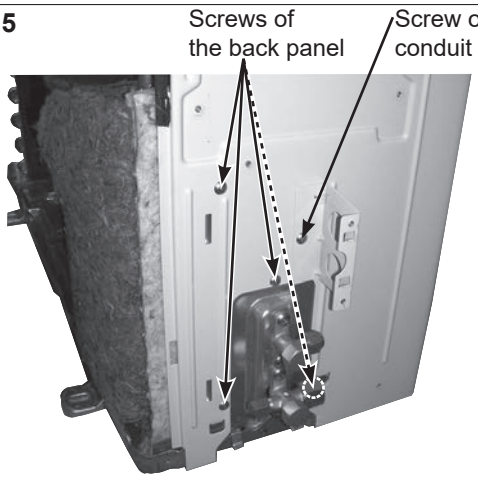
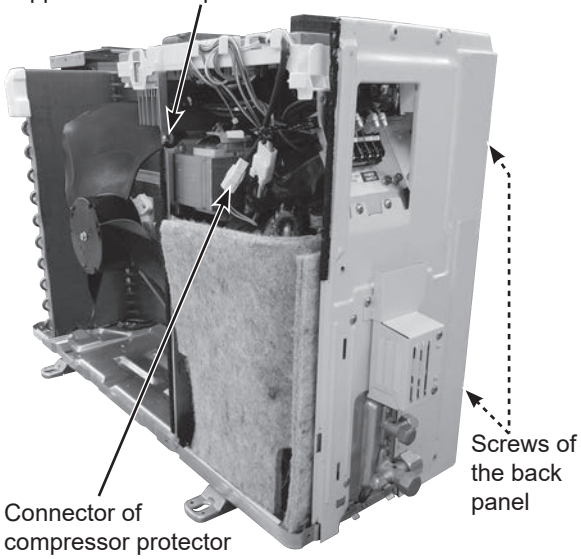


Figure 1



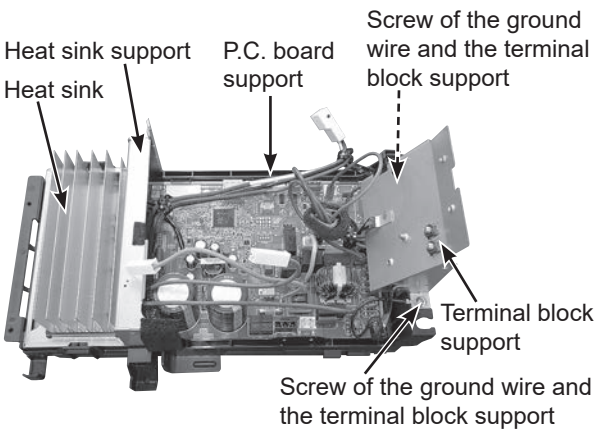
OPERATING PROCEDURE	PHOTOS/FIGURES
Photo 4  	**Photo 5** 
2. Removing the inverter assembly, inverter P.C. board (1) Remove the top panel, cabinet and service panel. (Refer to section 1.) (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN721 (R.V. coil) CN931, CN932 (Fan motor) CN641 (Defrost thermistor and discharge temperature thermistor) CN643 (Ambient temperature thermistor) CN644 (Outdoor heat exchanger temperature thermistor) CN724 (Expansion valve coil) CN64 (Compressor protector) (3) Remove the compressor connector (CN61). (4) Remove the screws fixing the heat sink support and the separator. (5) Remove the fixing screws of the terminal block support and the back panel. (6) Remove the inverter assembly. (7) Remove the screws of the ground wires and the terminal block support. (Photo 7) (8) Remove the heat sink support from the P.C. board support. (9) Remove the inverter P.C. board from the P.C. board support.	**Photo 6** 

OPERATING PROCEDURE

*** Connection procedure when attaching the inverter P.C. board (Photo 8)**

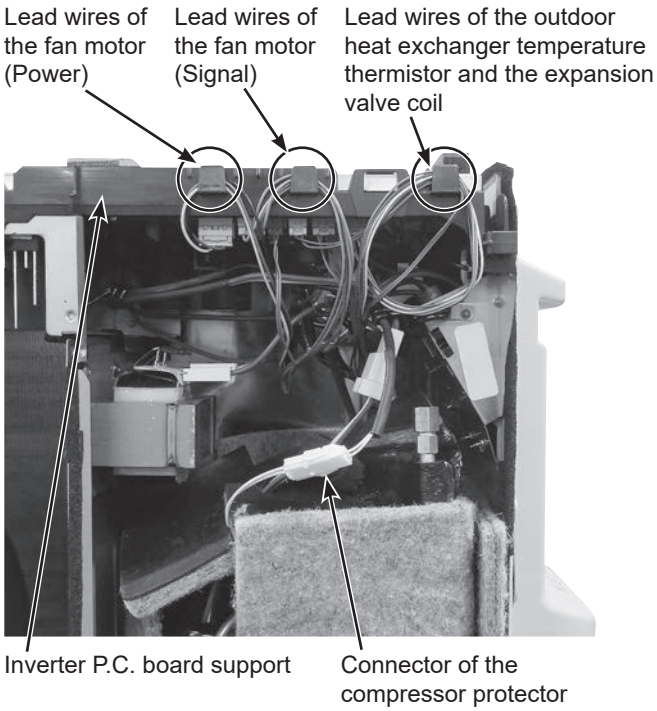
1. Connect the lead wires of the fan motor (Power) to the connector on the inverter P.C. board. Pull the lead wires toward you and put them on the left hook on the P.C. board support.
2. Connect the lead wires of the fan motor (Signal) to the connector on the inverter P.C. board. Pull the lead wires toward you and put them on the middle of the hook on the P.C. board support.
3. Connect the lead wires of the outdoor heat exchanger temperature thermistor to the connector on the inverter P.C. board. Pull the lead wires toward you and put them on the right hook on the P.C. board support.
4. Connect the lead wires of the expansion valve coil to the connector on the inverter P.C. board. Pull the lead wires toward you and put them on the right hook on the P.C. board support [so that the compressor protector lead wires are bundled up as shown in Photo 8 **(MUZ-HX12 only)]**.

Photo 7 (Inverter assembly)

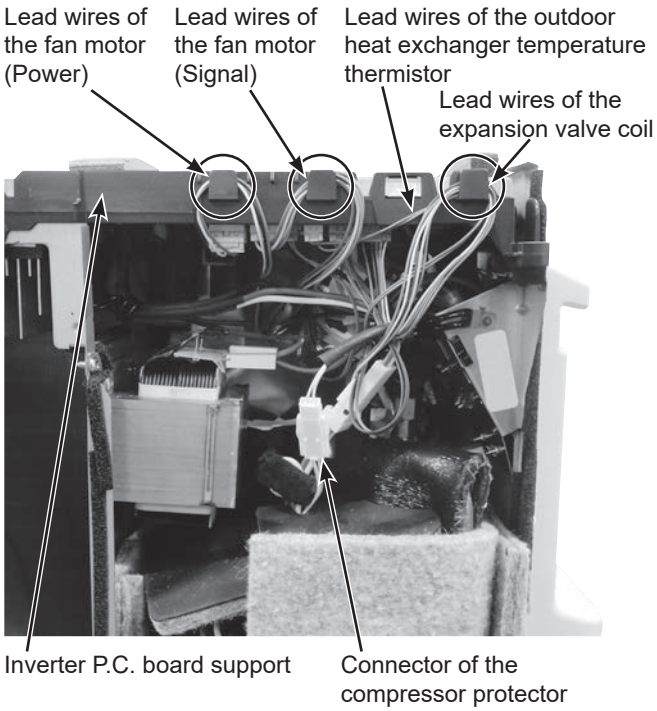


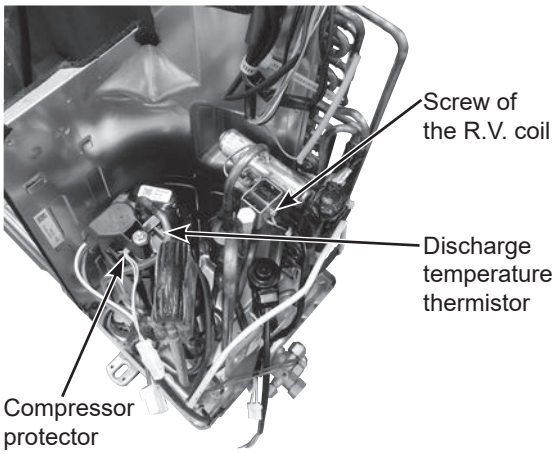
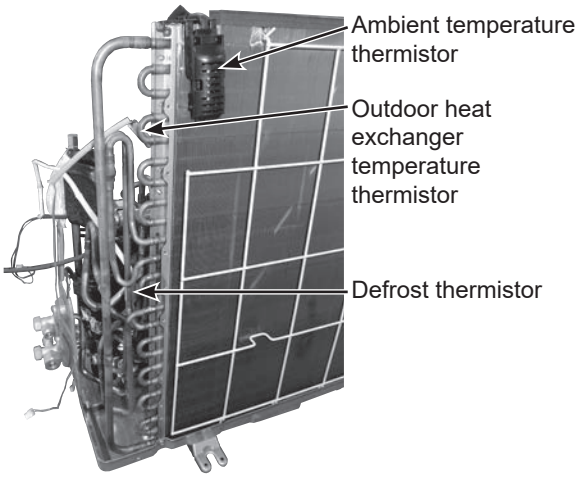
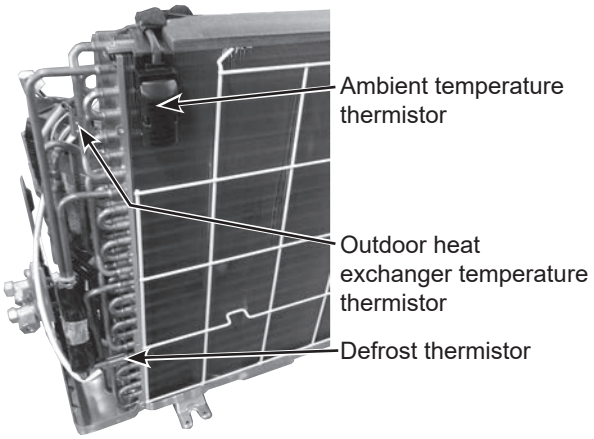
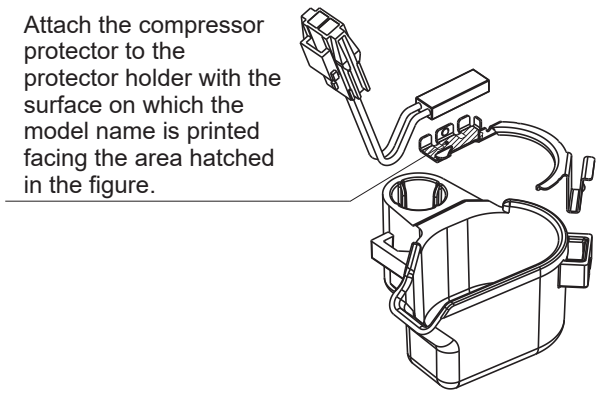
PHOTOS/FIGURES

Photo 8
MUZ-HX09NL



MUZ-HX12NL



OPERATING PROCEDURE	PHOTOS/FIGURES
3. Removing R.V. coil (1) Remove the cabinet and panels. (Refer to section 1.) (2) Disconnect the following connectors: <Inverter P.C. board> CN721 (R.V. coil) (3) Remove the R.V. coil.	**Photo 9** 
4. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor (1) Remove the top panel, cabinet and service panel. (Refer to section 1.) (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN641 (Defrost thermistor and discharge temperature thermistor) CN643 (Ambient temperature thermistor) CN644 (Outdoor heat exchanger temperature thermistor) (3) Pull out the discharge temperature thermistor from its holder. (4) Pull out the defrost thermistor from its holder. (5) Pull out the outdoor heat exchanger temperature thermistor from its holder. (6) Pull out the ambient temperature thermistor from its holder.	**Photo 10** **MUZ-HX09NL**  **MUZ-HX12NL** 
Figure 2  	

OPERATING PROCEDURE

5. Removing outdoor fan motor

(1) Remove the top panel, cabinet and service panel. (Refer to section 1.)
(2) Disconnect the following connectors:
<Inverter P.C. board>
CN931, CN932 (Fan motor)
(3) Remove the propeller fan nut.
(4) Remove the propeller fan.
(5) Remove the screws fixing the fan motor.
(6) Remove the fan motor.
NOTE: The propeller fan nut is a reverse thread.

6. Removing the compressor and 4-way valve

(1) Remove the cabinet and panels. (Refer to section 1.)
(2) Remove the inverter assembly. (Refer to section 2.)
(3) Remove the screws fixing the reactor.
(4) Remove the reactor.
(5) Remove the soundproof felt.
(6) Recover gas from the refrigerant circuit.
NOTE: Recover gas from the pipes until the pressure gauge shows 0 psig.
(7) Detach the brazed part of the suction and the discharge pipe connected with compressor.
(8) Remove the nuts fixing the compressor.
(9) Remove the compressor.
(10) Detach the brazed part of pipes connected with 4-way valve.

NOTE: If the red labels have been removed during the operation, put them back in the original position after the operation. Red labels indicate the use of flammable refrigerants. (Figure 3)

PHOTOS/FIGURES

Photo 11

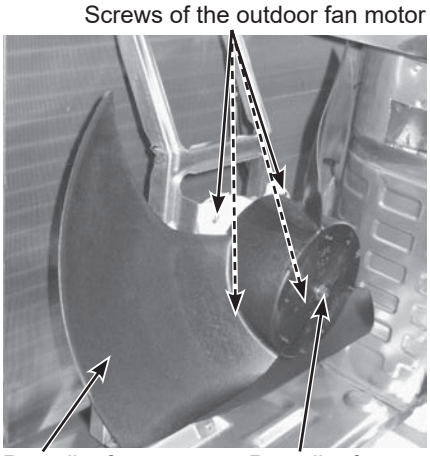


Photo 12

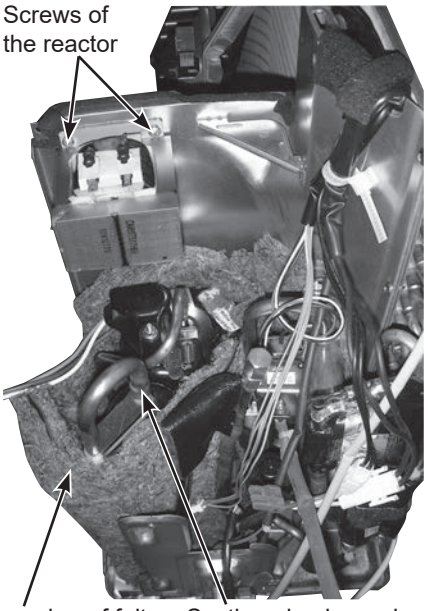


Photo 13

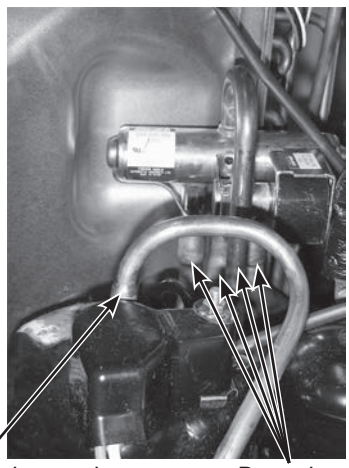
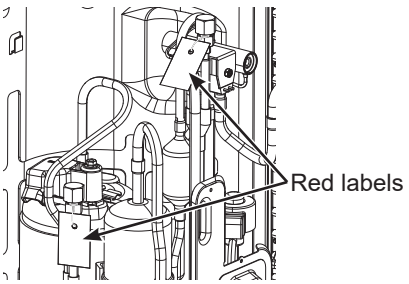


Figure 3



12-2. MUZ-HX18NL

NOTE: Turn OFF the power supply before disassembly.

OPERATING PROCEDURE

1. Removing the cabinet

(1) Remove the screws of the service panel.
(2) Remove the screws of the top panel.
(3) Remove the screw of the valve cover.
(4) Remove the service panel.
(5) Remove the top panel.
(6) Remove the valve cover.
(7) Remove the screws fixing the conduit cover. (Photo 5)
(8) Remove the conduit cover.
(9) Remove the screw fixing the conduit plate. (Photo 6)
(10) Remove the conduit plate.
(11) Disconnect the power supply cord and indoor/outdoor connecting wire.
(12) Remove the screws of the cabinet.
(13) Remove the cabinet.
(14) Remove the screws of the back panel.
(15) Remove the back panel.

NOTE: If the red labels have been removed during the operation, put them back in the original position after the operation. Red labels indicate the use of flammable refrigerants. (Figure 1)

PHOTOS/FIGURES

Photo 1

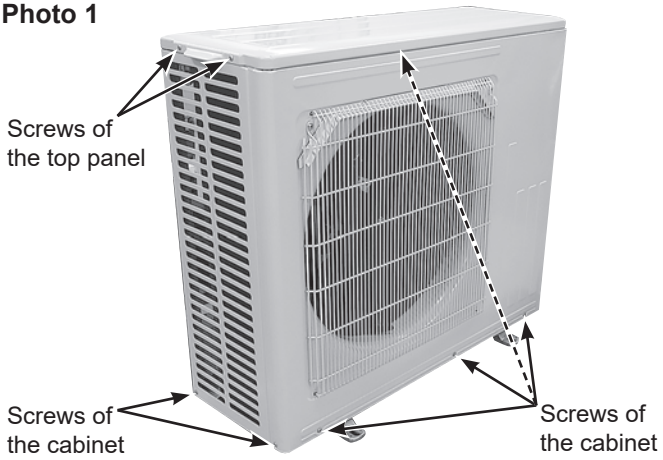


Photo 2

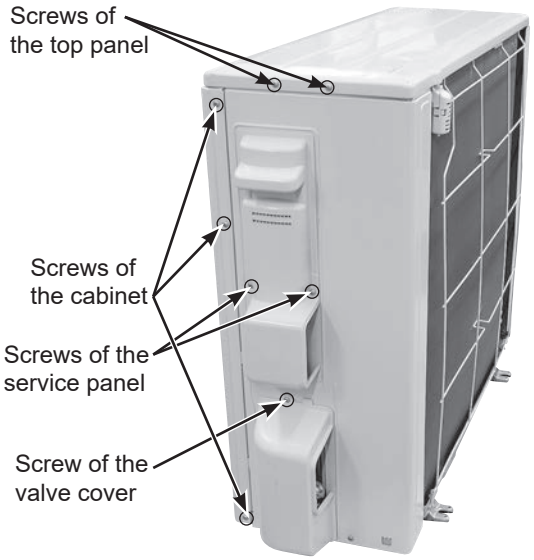


Photo 3

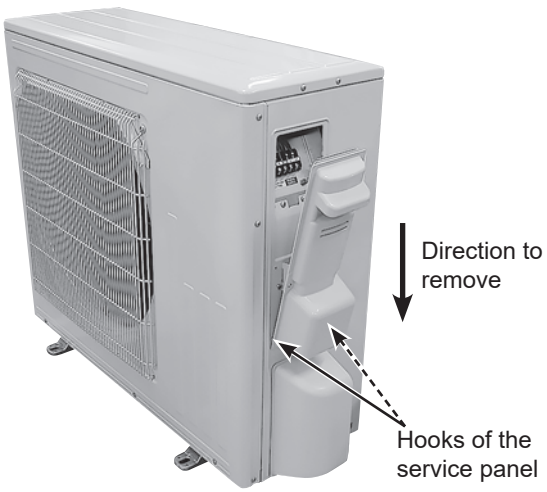


Photo 4

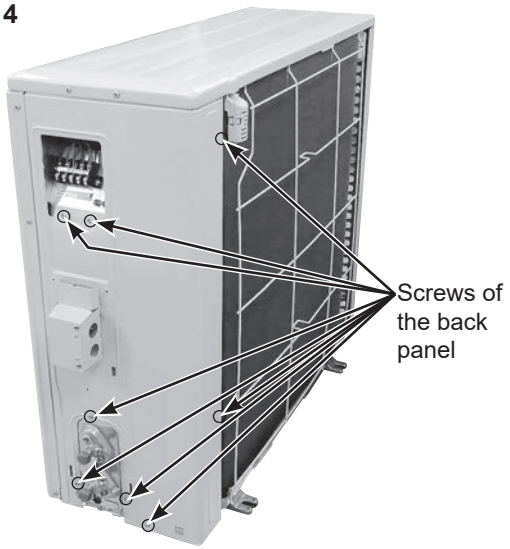
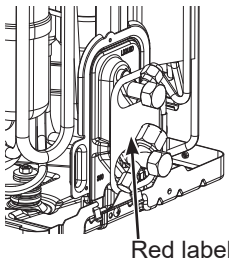
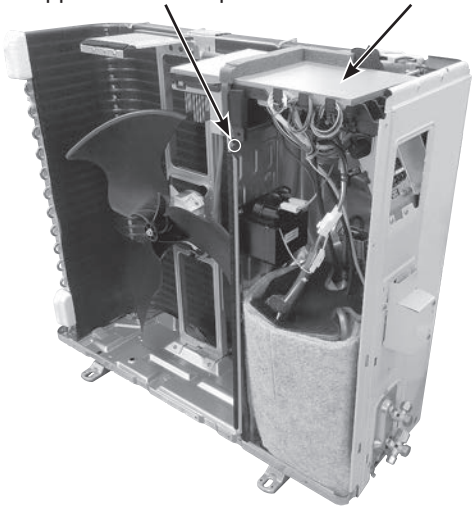


Figure 1



OPERATING PROCEDURE	PHOTOS/FIGURES
Photo 5 Screws of the conduit cover (These screws are different shape from the other screws. Do not mix them with the other screws.) 	**Photo 6** Screw of the conduit plate (This screw is different in shape from the other screws. Do not mix them with the other screws.) 
2. Removing the inverter assembly and inverter P.C. board (1) Remove the cabinet and panels (refer to section 1). (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN721 (R.V. coil) CN931, CN932 (Fan motor) CN641 (Defrost thermistor and discharge temperature thermistor) CN643 (Ambient temperature thermistor) CN644 (Outdoor heat exchanger temperature thermistor) CN724 (Expansion valve coil) CN64 (Compressor protector) (3) Remove the compressor connector (CN61). (4) Remove the screws fixing the heat sink support and the separator. (5) Remove the inverter assembly. (6) Remove the screws of the ground wires. (7) Remove the heat sink support from the P.C. board support. (Photo 8) (8) Remove the PB cover. (9) Remove the screw of the inverter P.C. board and remove the inverter P.C. board from the P.C. board support. (Photo 9)	**Photo 7** Screw of the heat sink support and the separator PB cover 

OPERATING PROCEDURE

*** Connection procedure when attaching the inverter P.C. board (Photo 9)**

1. Connect the lead wires of the heat exchanger temperature thermistor, the defrost thermistor and discharge temperature thermistor to the connector on the inverter P.C. board. Pull the lead wires toward you and put them on the center hook on the P.C. board support.
2. Connect the lead wires of the expansion valve coil to the connector on the inverter P.C. board. Pull the lead wires toward you and put them on the right hook on the P.C. board support.
3. Connect the lead wires of the ambient temperature thermistor to the connector on the inverter P.C. board. Pull the lead wires toward you and put them on the left hook on the P.C. board support so that the fan motor lead wires are bundled up as shown in Photo 10.

PHOTOS/FIGURES

Photo 8 (Inverter assembly)

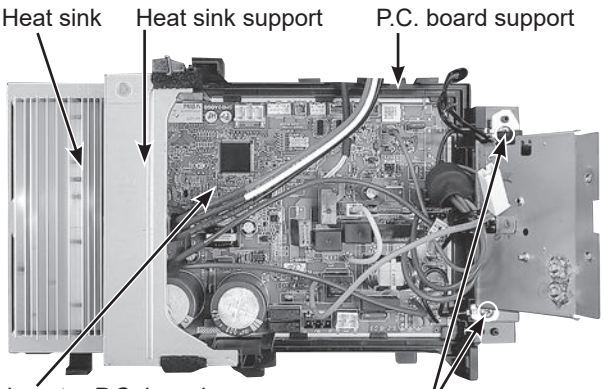


Photo 10

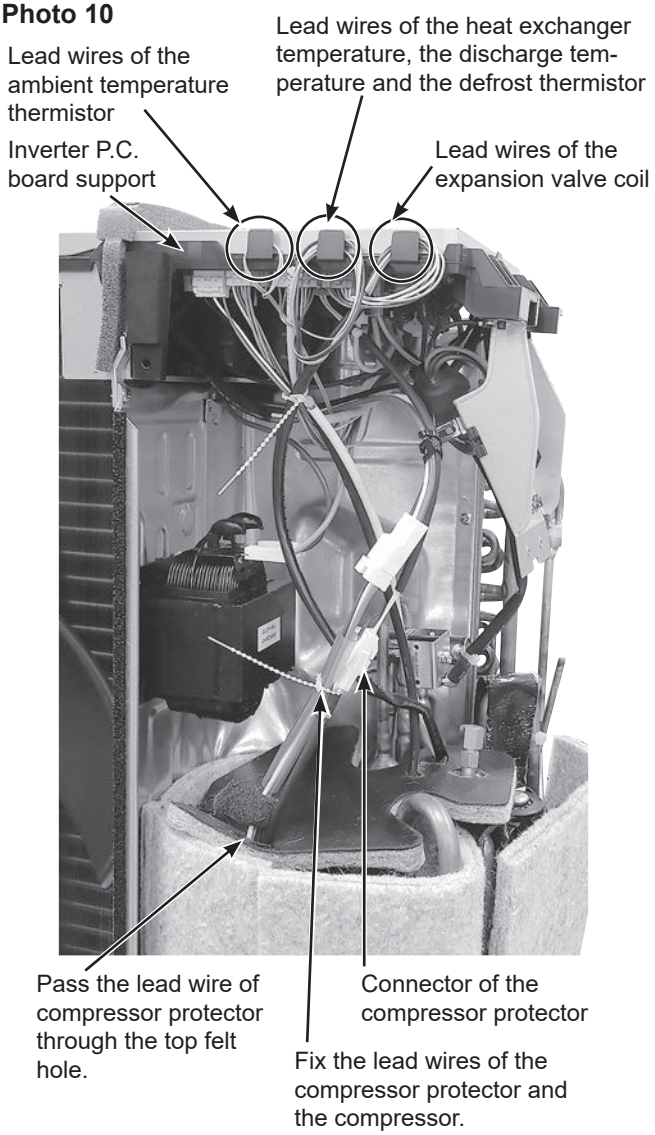
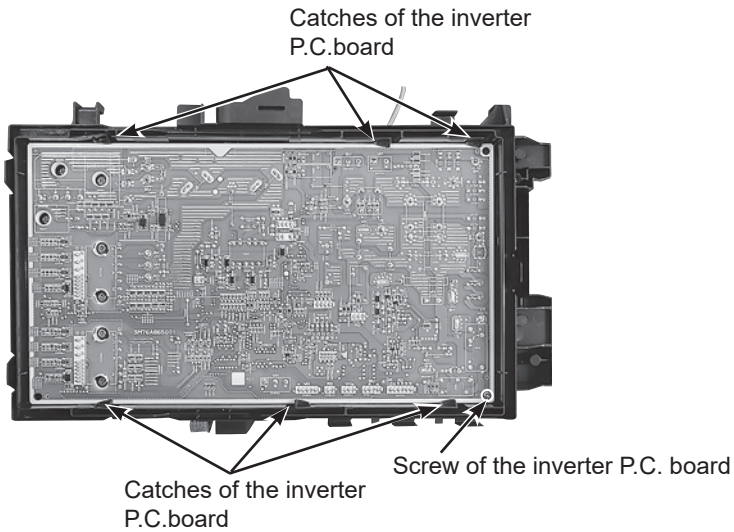
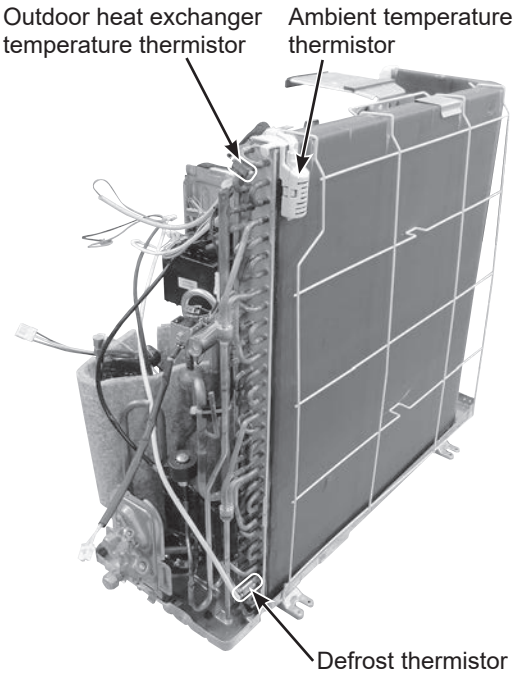
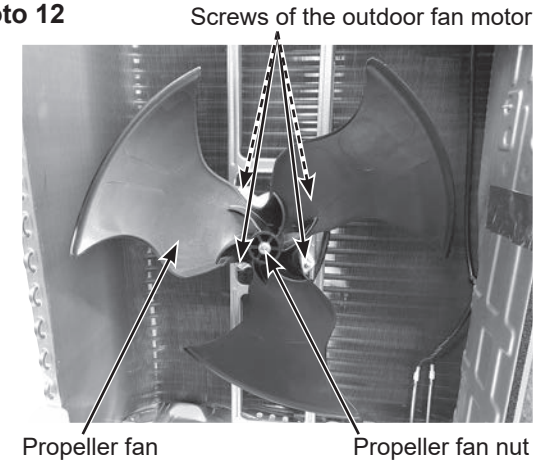


Photo 9



OPERATING PROCEDURE	PHOTOS/FIGURES
3. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor (1) Remove the cabinet and panels (refer to section 1). (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN641 (Defrost thermistor and discharge temperature thermistor) CN643 (Ambient temperature thermistor) CN644 (Outdoor heat exchanger temperature thermistor) (3) Pull out the discharge temperature thermistor from its holder. (Photo 13) (4) Pull out the defrost thermistor from its holder. (5) Pull out the outdoor heat exchanger temperature thermistor from its holder. (6) Pull out the ambient temperature thermistor from its holder.	**Photo 11** 
4. Removing outdoor fan motor (1) Remove the cabinet and panels (refer to section 1). (2) Disconnect the following connectors: <Inverter P.C. board> CN931, CN932 (Fan motor) (3) Remove the propeller fan nut. (4) Remove the propeller fan. (5) Remove the screws fixing the fan motor. (6) Remove the fan motor.	**Photo 12** 

OPERATING PROCEDURE

5. Removing R. V. coil

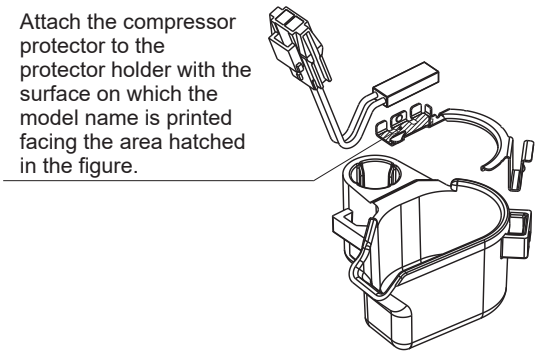
(1) Remove the cabinet and panels (refer to section 1).
(2) Disconnect the following connectors:
<Inverter P.C. board>
CN721 (R.V. coil)
(3) Remove the R.V. coil.

6. Removing the compressor and 4-way valve

(1) Remove the cabinet and panels (refer to section 1).
(2) Remove the inverter assembly (refer to section 2).
(3) Remove the screws fixing the reactor.
(4) Remove the reactor.
(5) Remove the soundproof felt.
(6) Recover gas from the refrigerant circuit.
NOTE: Recover gas from the pipes until the pressure gauge shows 0 psig.
(7) Detach the brazed part of the suction and the discharge pipe connected with compressor.
(8) Remove the compressor nuts.
(9) Remove the compressor.
(10) Detach the brazed part of pipes connected with 4-way valve.

NOTE: If the red labels have been removed during the operation, put them back in the original position after the operation. Red labels indicate the use of flammable refrigerants. (Figure 3)

Figure 2



PHOTOS/FIGURES

Photo 13

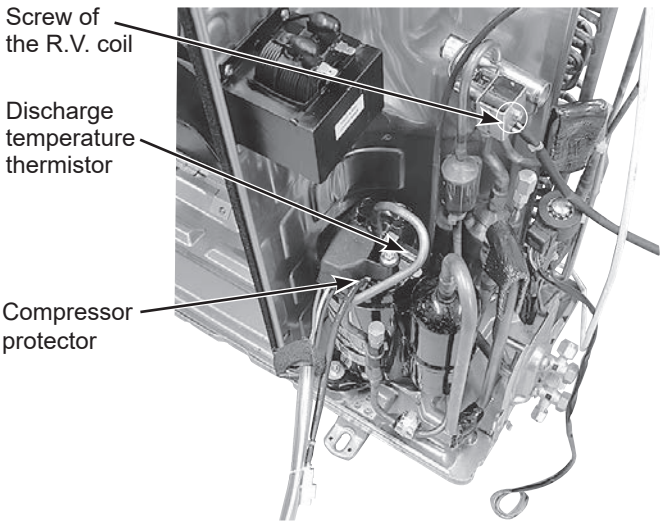


Photo 14

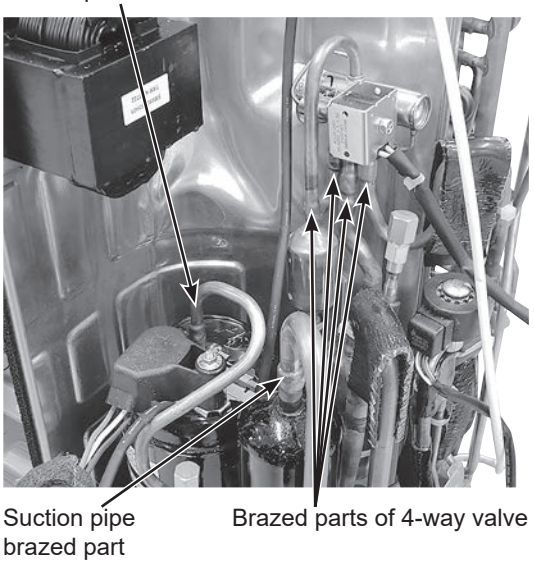
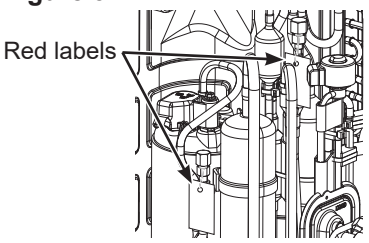


Figure 3



12-3. MUZ-HX24NL

NOTE: Turn OFF the power supply before disassembly.

OPERATING PROCEDURE

1. Removing the cabinet

(1) Remove the screws of the service panel.
(2) Remove the screws of the top panel.
(3) Remove the screw of the valve cover.
(4) Remove the service panel.
(5) Remove the top panel.
(6) Remove the valve cover.
(7) Remove the screws fixing the conduit cover. (Photo 5)
(8) Remove the conduit cover.
(9) Remove the screw fixing the conduit plate. (Photo 6)
(10) Remove the conduit plate.
(11) Disconnect the power supply and indoor/outdoor connecting wire.
(12) Remove the screws of the cabinet.
(13) Remove the cabinet.
(14) Remove the screws of the back panel.
(15) Remove the back panel.

NOTE: If the red labels have been removed during the operation, put them back in the original position after the operation. Red labels indicate the use of flammable refrigerants. (Figure 1)

PHOTOS/FIGURES

Photo 1

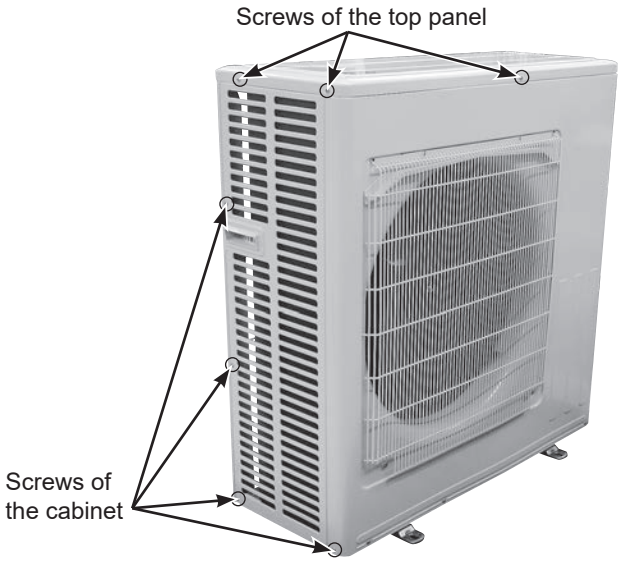


Figure 1

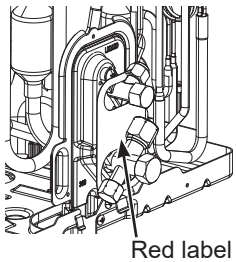


Photo 2

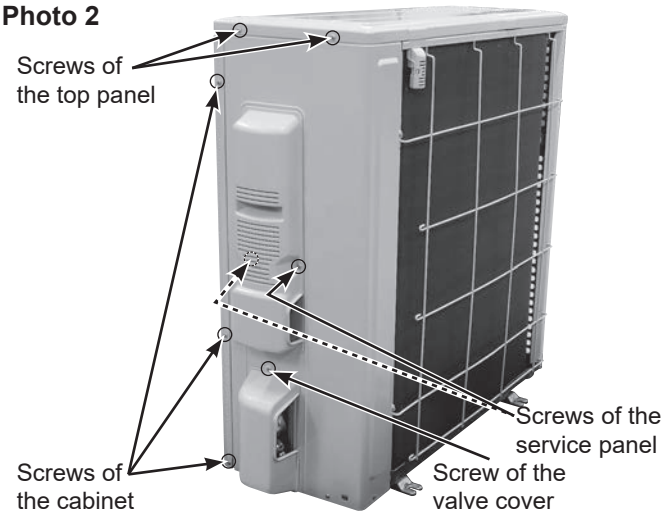


Photo 3

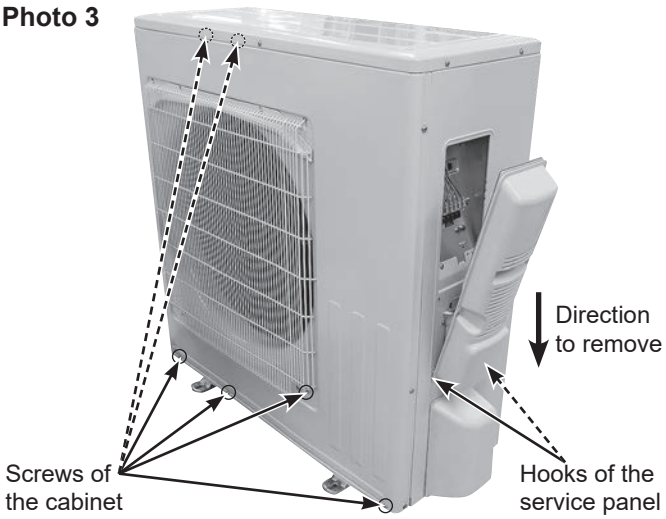
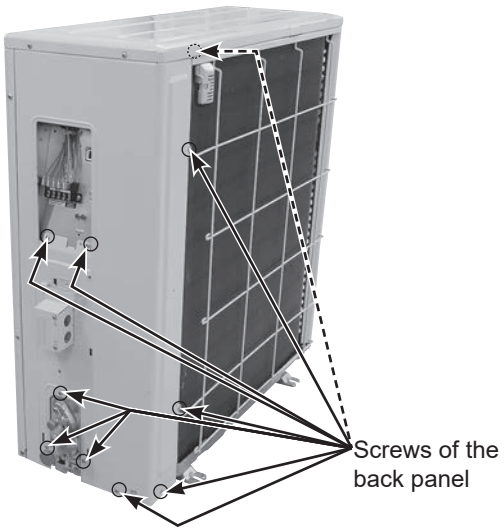
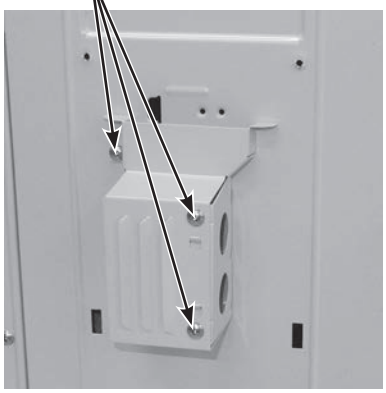
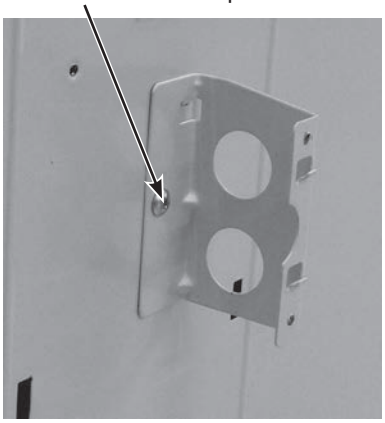
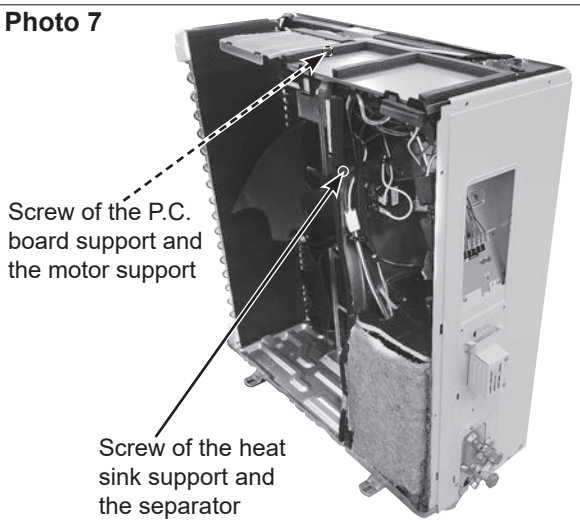
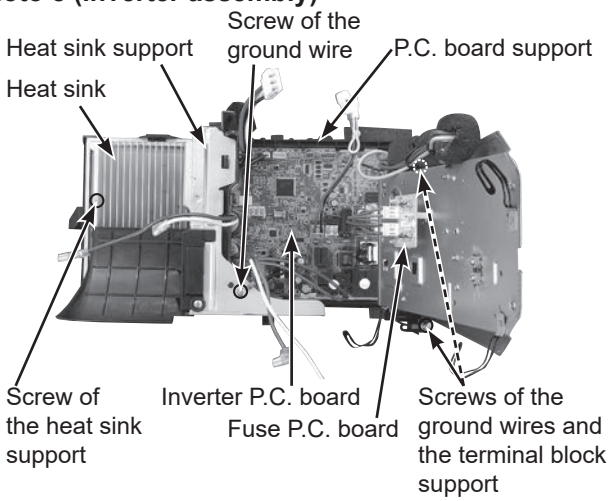


Photo 4



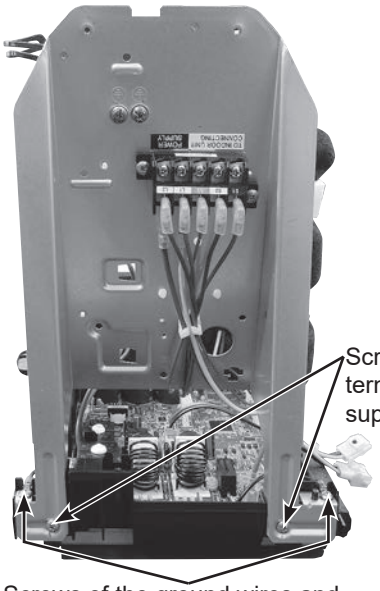
OPERATING PROCEDURE	PHOTOS/FIGURES
Photo 5 Screws of the conduit cover 	**Photo 6** Screw of the conduit plate 
2. Removing the inverter assembly, inverter P.C. board and fuse P.C. board **2-1. Removing the inverter assembly and inverter P.C. board** (1) Remove the top panel, cabinet and service panel. (Refer to section 1.) (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN602 (R.V. coil) CN931, CN932 (Fan motor) CN671 (Defrost thermistor, discharge temperature thermistor and outdoor heat exchanger temperature thermistor) CN672 (Ambient temperature thermistor) CN724 (Expansion valve coil) CN64 (Compressor protector) (3) Remove the compressor connector (CN61). (4) Remove the screws fixing the heat sink support and the separator. (5) Remove the screws fixing the P.C. board support and the motor support. (6) Remove the inverter assembly. (7) Remove the screws of the ground wires and the terminal block support. (8) Remove the screw of the heat sink support, and the heat sink support from the P.C. board support.	**Photo 7**  **Photo 8 (Inverter assembly)** 

OPERATING PROCEDURE

*** Connection procedure when attaching the inverter P.C. board (Photo 8, 9, 10, 11)**

1. Attach the heat sink support to the P.C. board support.
2. Hook the lead wires of the compressor, the reactor and the P.C. board to each hooks on the heat sink support as shown in Photo 10.
3. Connect the lead wires of the expansion valve coil to the connector on the inverter P.C. board. Pull the lead wires of the expansion valve coil toward you and put them on the left hook on the P.C. board support as shown in Photo 11.
4. Hook the lead wires of the compressor, discharge temperature thermistor, defrost thermistor and expansion valve coil to each hook and tighten the wires with the fastener as shown in Photo 11.

Photo 9



PHOTOS/FIGURES

Photo 10

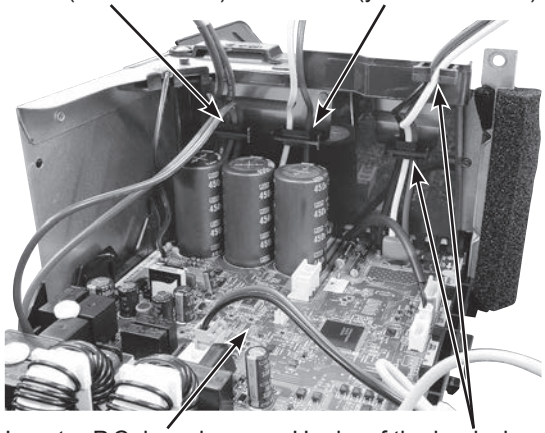
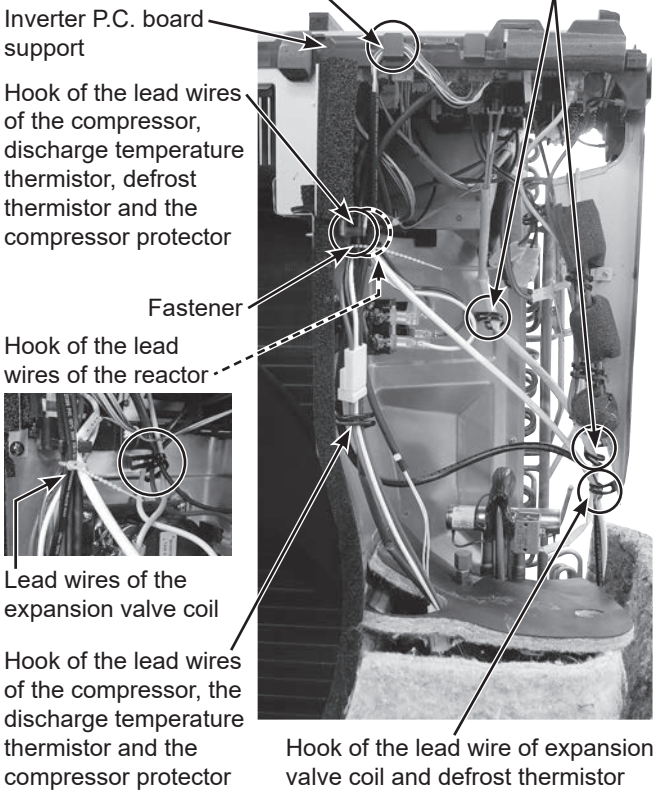
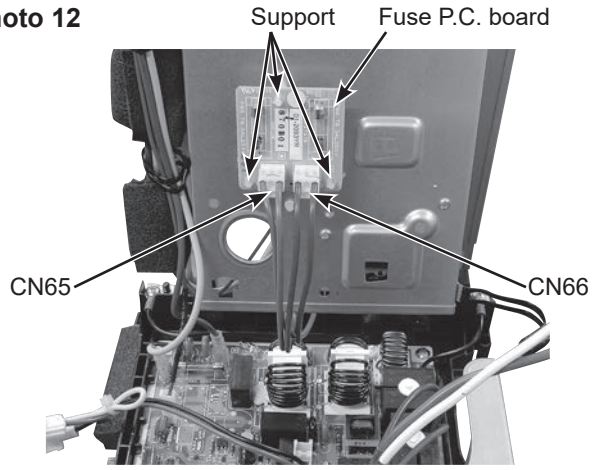
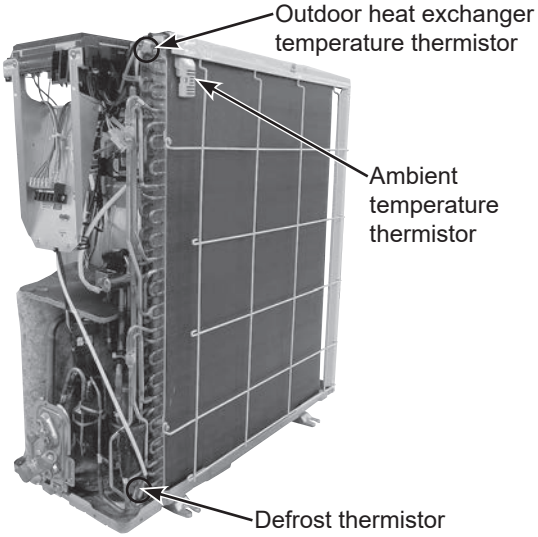
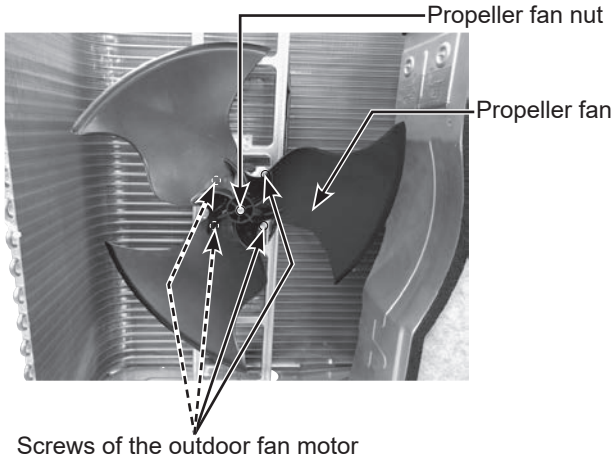
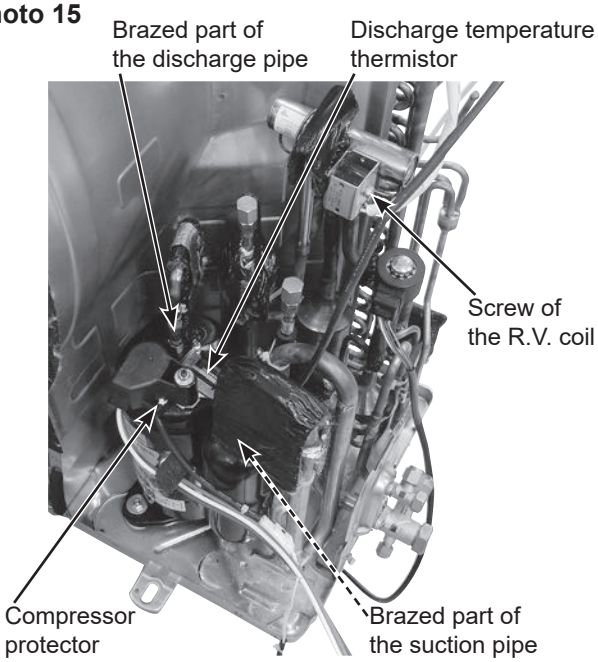
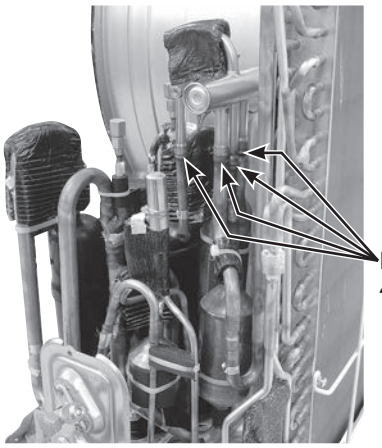
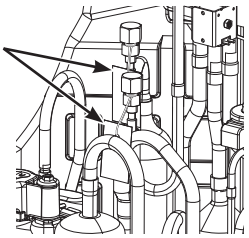
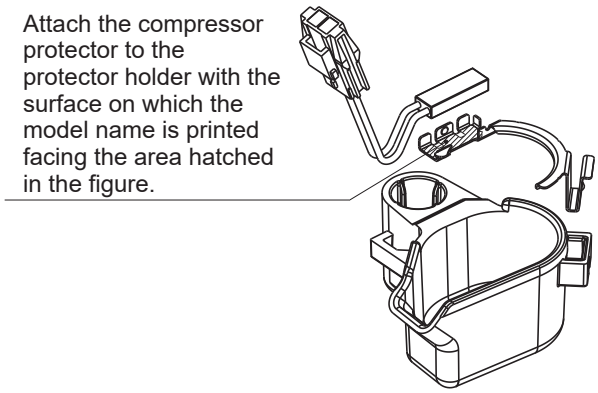


Photo 11

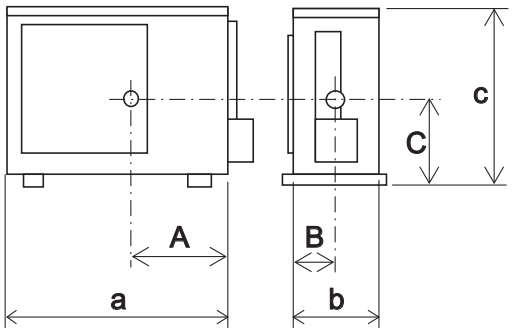


OPERATING PROCEDURE	PHOTOS/FIGURES
2-2. Removing the fuse P.C. board (1) Remove the top panel, cabinet and service panel. (Refer to section 1.) (2) Disconnect the lead wire to the reactor and the inverter P.C. board connectors. (Refer to section 2-1. (2)) (3) Remove the compressor connector (CN61). (4) Remove the screws fixing the heat sink support and the separator. (5) Remove the screws fixing the P.C. board support and the motor support. (6) Remove the fixing screws of the terminal block support and the back panel. (7) Remove the inverter assembly. (8) Remove the following disconnected connectors: <Fuse P.C. board> CN65, CN66 (Terminal block) (9) Remove the fuse P.C. board from the supports.	**Photo 12**  Pinch the stopper of the support, and push it into the hole to remove the fuse P.C. board.
3. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor (1) Remove the cabinet and panels. (Refer to section 1.) (2) Disconnect the lead wire to the reactor and the following connectors: <Inverter P.C. board> CN671 (Defrost thermistor, discharge temperature thermistor and outdoor heat exchanger temperature thermistor) CN672 (Ambient temperature thermistor) (3) Pull out the discharge temperature thermistor from its holder. (Photo 15) (4) Pull out the defrost thermistor from its holder. (5) Pull out the outdoor heat exchanger temperature thermistor from its holder. (Photo 13) (6) Pull out the ambient temperature thermistor from its holder.	**Photo 13** 

OPERATING PROCEDURE	PHOTOS/FIGURES
4. Removing outdoor fan motor (1) Remove the top panel, cabinet and service panel. (Refer to section 1.) (2) Disconnect the following connectors: <Inverter P.C. board> CN931, CN932 (Fan motor) (3) Remove the propeller fan nut. (4) Remove the propeller fan. (5) Remove the screws fixing the fan motor. (6) Remove the fan motor.	**Photo 14** 
5. Removing R. V. coil (1) Remove the cabinet and panels. (Refer to section 1.) (2) Disconnect the following connectors: <Inverter P.C. board> CN602 (R.V. coil) (3) Remove the R.V. coil.	**Photo 15** 

OPERATING PROCEDURE	PHOTOS/FIGURES
6. Removing the compressor and 4-way valve (1) Remove the cabinet and panels. (Refer to section 1.) (2) Remove the inverter assembly. (Refer to section 2.) (3) Remove the screws fixing the reactor. (4) Remove the reactor. (5) Remove the soundproof felt. (6) Recover gas from the refrigerant circuit. **NOTE:** Recover gas from the pipes until the pressure gauge shows 0 psig. (7) Detach the brazed part of the suction and the discharge pipe connected with compressor. (Photo 15) (8) Remove the compressor nuts. (9) Remove the compressor. (10) Detach the brazed parts of 4-way valve and pipe. **NOTE:** If the red labels have been removed during the operation, put them back in the original position after the operation. Red labels indicate the use of flammable refrigerants. (Figure 2)	**Photo 16**  **Figure 2**  **Figure 3** 

13 POSITION OF THE CENTER OF GRAVITY



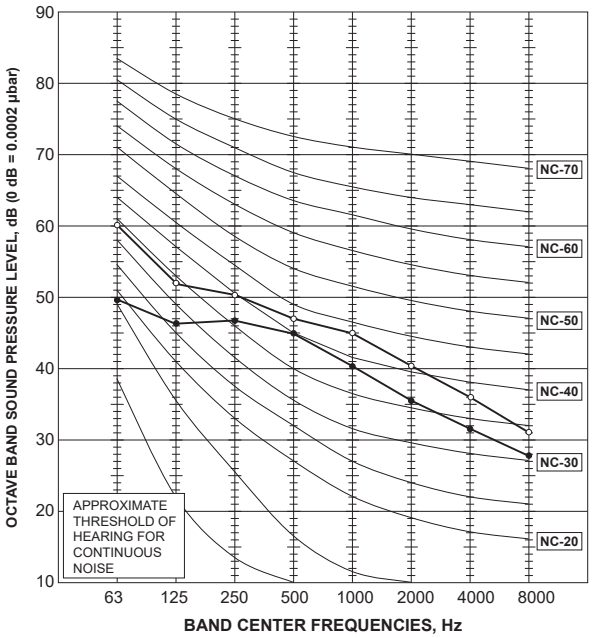
Unit: inch (mm)

Model name	A	B	C	a	b	c
MUZ-HX09NL **MUZ-HX12NL**	11-1/16 (280)	5-9/16 (140)	9-1/2 (240)	31-1/2 (800)	11-1/4 (285)	21-5/8 (550)
MUZ-HX18NL	11-13/32 (290)	5-1/2 (140)	13-3/8 (340)	31-1/2 (800)	11-1/4 (285)	28-1/8 (714)
MUZ-HX24NL	13 (330)	5-29/32 (150)	15-11/32 (390)	33-1/16 (840)	13 (330)	34-5/8 (880)

14 NOISE CRITERION CURVES

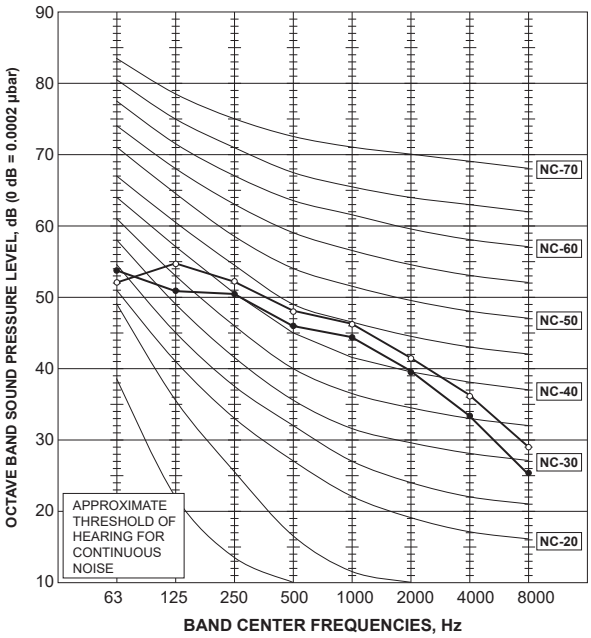
MUZ-HX09NL

NOTCH	SPL(dB(A))	LINE
COOLING	46	●——●
HEATING	50	○——○



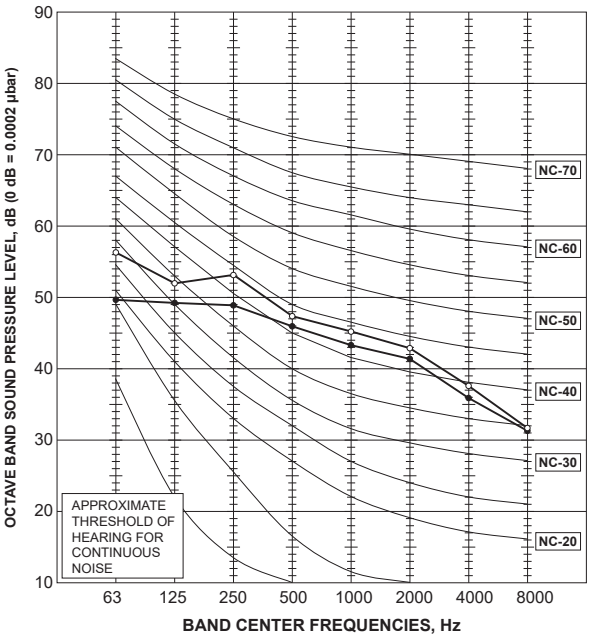
MUZ-HX12NL

NOTCH	SPL(dB(A))	LINE
COOLING	49	●——●
HEATING	51	○——○



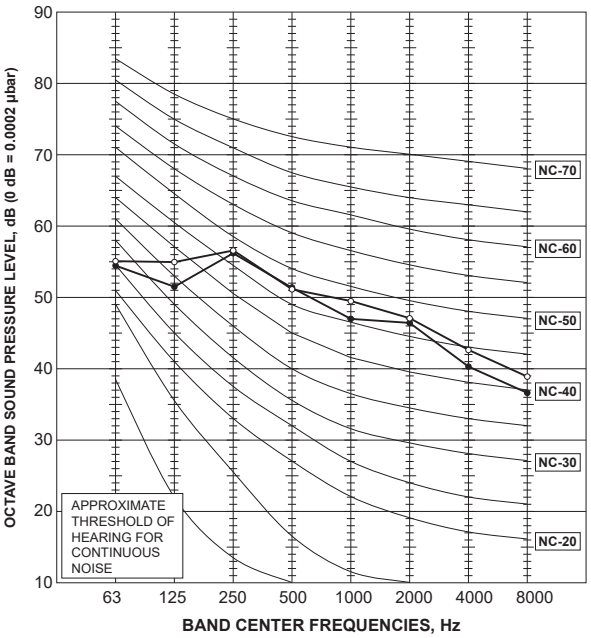
MUZ-HX18NL

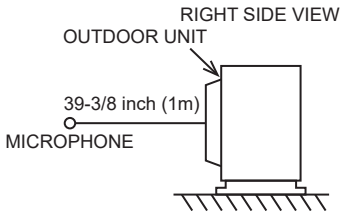
NOTCH	SPL(dB(A))	LINE
COOLING	49	●——●
HEATING	51	○——○



MUZ-HX24NL

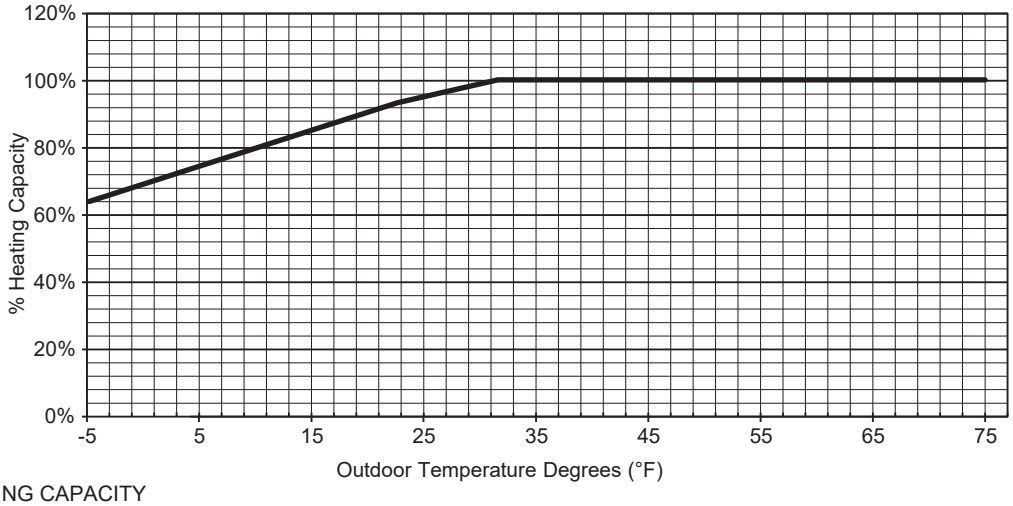
NOTCH	SPL(dB(A))	LINE
COOLING	54	●——●
HEATING	55	○——○





15 MAX. HEATING CAPACITY IN LOW AMBIENT TEMPERATURE

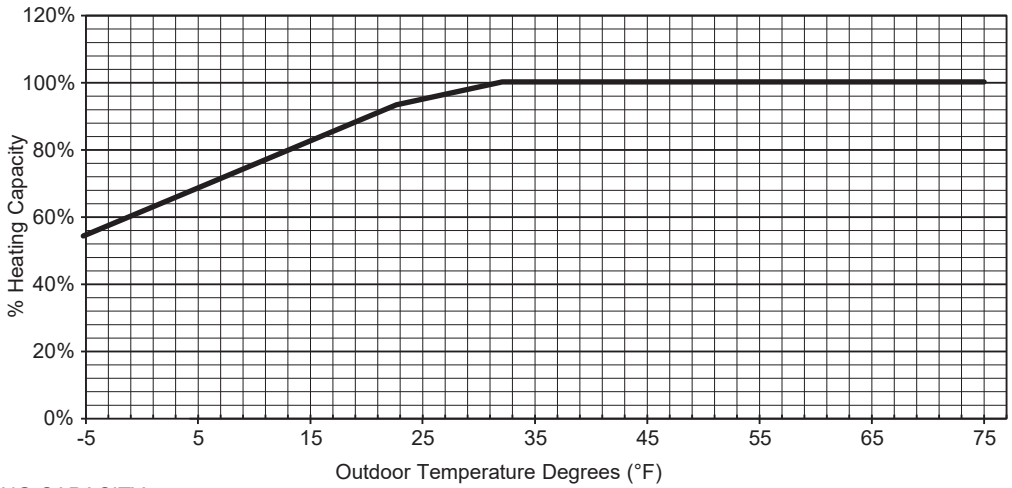
MUZ-HX09NL



HEATING CAPACITY

Outdoor Temperature Degrees (°F)	-5.0	5.0	14.0	23.0	32.0	41.0	50.0	69.8	75.0
% Heating Capacity	63%	74%	83%	93%	100%	100%	100%	100%	100%

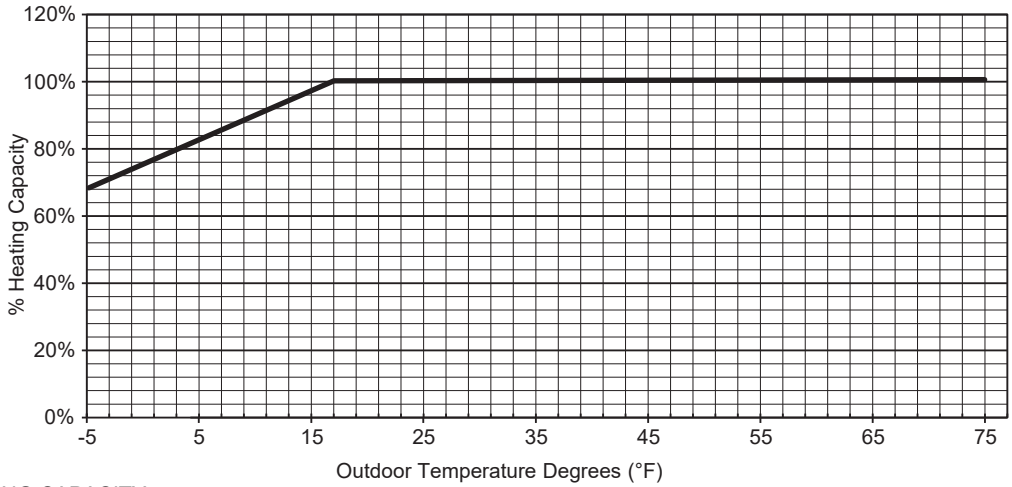
MUZ-HX12NL



HEATING CAPACITY

Outdoor Temperature Degrees (°F)	-5.0	5.0	14.0	23.0	32.0	41.0	50.0	69.8	75.0
% Heating Capacity	55%	69%	81%	94%	100%	100%	100%	100%	100%

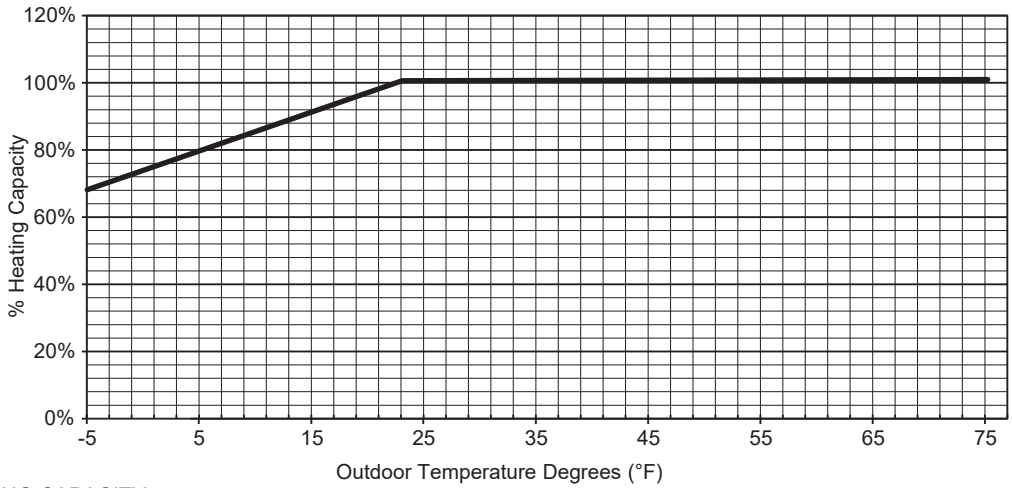
MUZ-HX18NL



HEATING CAPACITY

Outdoor Temperature Degrees (°F)	-5.0	5.0	14.0	23.0	32.0	41.0	50.0	69.8	75.0
% Heating Capacity	69%	83%	96%	100%	100%	100%	100%	100%	100%

MUZ-HX24NL



HEATING CAPACITY

Outdoor Temperature Degrees (°F)	-5.0	5.0	14.0	23.0	32.0	41.0	50.0	69.8	75.0
% Heating Capacity	68%	80%	91%	100%	100%	100%	100%	100%	100%

16 PERFORMANCE CHART

MUZ-HX09NL

CAPACITY (Btu/h): 9000 INPUT (W): 720 SHF: 0.8

INDOOR DB (°F)	INDOOR WB (°F)	OUTDOOR DB (°F)															
		70				77				81				86			
		CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.
70	64	10575	6557	0.62	576	10125	6278	0.62	605	9720	6026	0.62	634	9360	5803	0.62	662
70	68	11025	5513	0.50	605	10575	5288	0.50	641	10260	5130	0.50	655	9900	4950	0.50	684
72	64	10575	6980	0.66	576	10125	6683	0.66	605	9720	6415	0.66	634	9360	6178	0.66	662
72	68	11025	5954	0.54	605	10575	5711	0.54	641	10260	5540	0.54	655	9900	5346	0.54	684
72	72	11475	4820	0.42	626	11070	4649	0.42	666	10800	4536	0.42	684	10350	4347	0.42	713
73	64	10575	7403	0.70	576	10125	7088	0.70	605	9720	6804	0.70	634	9360	6552	0.70	662
73	68	11025	6395	0.58	605	10575	6134	0.58	641	10260	5951	0.58	655	9900	5742	0.58	684
73	72	11475	5279	0.46	626	11070	5092	0.46	666	10800	4968	0.46	684	10350	4761	0.46	713
75	64	10575	7826	0.74	576	10125	7493	0.74	605	9720	7193	0.74	634	9360	6926	0.74	662
75	68	11025	6836	0.62	605	10575	6557	0.62	641	10260	6361	0.62	655	9900	6138	0.62	684
75	72	11475	5738	0.50	626	11070	5535	0.50	666	10800	5400	0.50	684	10350	5175	0.50	713
75	75	12060	4583	0.38	655	11610	4412	0.38	691	11340	4309	0.38	713	10980	4172	0.38	749
77	64	10575	8249	0.78	576	10125	7898	0.78	605	9720	7582	0.78	634	9360	7301	0.78	662
77	68	11025	7277	0.66	605	10575	6980	0.66	641	10260	6772	0.66	655	9900	6534	0.66	684
77	72	11475	6197	0.54	626	11070	5978	0.54	666	10800	5832	0.54	684	10350	5589	0.54	713
77	75	12060	5065	0.42	655	11610	4876	0.42	691	11340	4763	0.42	713	10980	4612	0.42	749
79	64	10575	8672	0.82	576	10125	8303	0.82	605	9720	7970	0.82	634	9360	7675	0.82	662
79	68	11025	7718	0.70	605	10575	7403	0.70	641	10260	7182	0.70	655	9900	6930	0.70	684
79	72	11475	6656	0.58	626	11070	6421	0.58	666	10800	6264	0.58	684	10350	6003	0.58	713
79	75	12060	5548	0.46	655	11610	5341	0.46	691	11340	5216	0.46	713	10980	5051	0.46	749
79	79	12420	4223	0.34	691	12060	4100	0.34	727	11880	4039	0.34	749	11520	3917	0.34	770
81	64	10575	9095	0.86	576	10125	8708	0.86	605	9720	8359	0.86	634	9360	8050	0.86	662
81	68	11025	8159	0.74	605	10575	7826	0.74	641	10260	7592	0.74	655	9900	7326	0.74	684
81	72	11475	7115	0.62	626	11070	6863	0.62	666	10800	6696	0.62	684	10350	6417	0.62	713
81	75	12060	6030	0.50	655	11610	5805	0.50	691	11340	5670	0.50	713	10980	5490	0.50	749
81	79	12420	4720	0.38	691	12060	4583	0.38	727	11880	4514	0.38	749	11520	4378	0.38	770
82	64	10575	9518	0.90	576	10125	9113	0.90	605	9720	8748	0.90	634	9360	8424	0.90	662
82	68	11025	8600	0.78	605	10575	8249	0.78	641	10260	8003	0.78	655	9900	7722	0.78	684
82	72	11475	7574	0.66	626	11070	7306	0.66	666	10800	7128	0.66	684	10350	6831	0.66	713
82	75	12060	6512	0.54	655	11610	6269	0.54	691	11340	6124	0.54	713	10980	5929	0.54	749
82	79	12420	5216	0.42	691	12060	5065	0.42	727	11880	4990	0.42	749	11520	4838	0.42	770
84	64	10575	9941	0.94	576	10125	9518	0.94	605	9720	9137	0.94	634	9360	8798	0.94	662
84	68	11025	9041	0.82	605	10575	8672	0.82	641	10260	8413	0.82	655	9900	8118	0.82	684
84	72	11475	8033	0.70	626	11070	7749	0.70	666	10800	7560	0.70	684	10350	7245	0.70	713
84	75	12060	6995	0.58	655	11610	6734	0.58	691	11340	6577	0.58	713	10980	6368	0.58	749
84	79	12420	5713	0.46	691	12060	5548	0.46	727	11880	5465	0.46	749	11520	5299	0.46	770
86	64	10575	10364	0.98	576	10125	9923	0.98	605	9720	9526	0.98	634	9360	9173	0.98	662
86	68	11025	9482	0.86	605	10575	9095	0.86	641	10260	8824	0.86	655	9900	8514	0.86	684
86	72	11475	8492	0.74	626	11070	8192	0.74	666	10800	7992	0.74	684	10350	7659	0.74	713
86	75	12060	7477	0.62	655	11610	7198	0.62	691	11340	7031	0.62	713	10980	6808	0.62	749
86	79	12420	6210	0.50	691	12060	6030	0.50	727	11880	5940	0.50	749	11520	5760	0.50	770
88	64	10575	10575	1.00	576	10125	10125	1.00	605	9720	9720	1.00	634	9360	9360	1.00	662
88	68	11025	9923	0.90	605	10575	9518	0.90	641	10260	9234	0.90	655	9900	8910	0.90	684
88	72	11475	8951	0.78	626	11070	8635	0.78	666	10800	8424	0.78	684	10350	8073	0.78	713
88	75	12060	7960	0.66	655	11610	7663	0.66	691	11340	7484	0.66	713	10980	7247	0.66	749
88	79	12420	6707	0.54	691	12060	6512	0.54	727	11880	6415	0.54	749	11520	6221	0.54	770
90	64	10575	10575	1.00	576	10125	10125	1.00	605	9720	9720	1.00	634	9360	9360	1.00	662
90	68	11025	10364	0.94	605	10575	9941	0.94	641	10260	9644	0.94	655	9900	9306	0.94	684
90	72	11475	9410	0.82	626	11070	9077	0.82	666	10800	8856	0.82	684	10350	8487	0.82	713
90	75	12060	8442	0.70	655	11610	8127	0.70	691	11340	7938	0.70	713	10980	7686	0.70	749
90	79	12420	7204	0.58	691	12060	6995	0.58	727	11880	6890	0.58	749	11520	6682	0.58	770

NOTE CA: Capacity (Btu/h) SHF: Sensible heat factor DB: Dry-bulb temperature
SHC: Sensible heat capacity (Btu/h) P.C. : Power consumption (W) WB: Wet-bulb temperature

MUZ-HX09NL

CAPACITY (Btu/h): 9000 INPUT (W): 720 SHF: 0.8

INDOOR DB (°F)	INDOOR WB (°F)	OUTDOOR DB (°F)											
		95				104				115			
		CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.
70	64	8820	5468	0.62	706	8100	5022	0.62	749	7470	4631	0.62	778
70	68	9270	4635	0.50	734	8640	4320	0.50	770	8010	4005	0.50	814
72	64	8820	5821	0.66	706	8100	5346	0.66	749	7470	4930	0.66	778
72	68	9270	5006	0.54	734	8640	4666	0.54	770	8010	4325	0.54	814
72	72	9810	4120	0.42	763	9180	3856	0.42	806	8550	3591	0.42	835
73	64	8820	6174	0.70	706	8100	5670	0.70	749	7470	5229	0.70	778
73	68	9270	5377	0.58	734	8640	5011	0.58	770	8010	4646	0.58	814
73	72	9810	4513	0.46	763	9180	4223	0.46	806	8550	3933	0.46	835
75	64	8820	6527	0.74	706	8100	5994	0.74	749	7470	5528	0.74	778
75	68	9270	5747	0.62	734	8640	5357	0.62	770	8010	4966	0.62	814
75	72	9810	4905	0.50	763	9180	4590	0.50	806	8550	4275	0.50	835
75	75	10350	3933	0.38	792	9720	3694	0.38	828	9180	3488	0.38	864
77	64	8820	6880	0.78	706	8100	6318	0.78	749	7470	5827	0.78	778
77	68	9270	6118	0.66	734	8640	5702	0.66	770	8010	5287	0.66	814
77	72	9810	5297	0.54	763	9180	4957	0.54	806	8550	4617	0.54	835
77	75	10350	4347	0.42	792	9720	4082	0.42	828	9180	3856	0.42	864
79	64	8820	7232	0.82	706	8100	6642	0.82	749	7470	6125	0.82	778
79	68	9270	6489	0.70	734	8640	6048	0.70	770	8010	5607	0.70	814
79	72	9810	5690	0.58	763	9180	5324	0.58	806	8550	4959	0.58	835
79	75	10350	4761	0.46	792	9720	4471	0.46	828	9180	4223	0.46	864
79	79	10890	3703	0.34	821	10260	3488	0.34	857	9630	3274	0.34	893
81	64	8820	7585	0.86	706	8100	6966	0.86	749	7470	6424	0.86	778
81	68	9270	6860	0.74	734	8640	6394	0.74	770	8010	5927	0.74	814
81	72	9810	6082	0.62	763	9180	5692	0.62	806	8550	5301	0.62	835
81	75	10350	5175	0.50	792	9720	4860	0.50	828	9180	4590	0.50	864
81	79	10890	4138	0.38	821	10260	3899	0.38	857	9630	3659	0.38	893
82	64	8820	7938	0.90	706	8100	7290	0.90	749	7470	6723	0.90	778
82	68	9270	7231	0.78	734	8640	6739	0.78	770	8010	6248	0.78	814
82	72	9810	6475	0.66	763	9180	6059	0.66	806	8550	5643	0.66	835
82	75	10350	5589	0.54	792	9720	5249	0.54	828	9180	4957	0.54	864
82	79	10890	4574	0.42	821	10260	4309	0.42	857	9630	4045	0.42	893
84	64	8820	8291	0.94	706	8100	7614	0.94	749	7470	7022	0.94	778
84	68	9270	7601	0.82	734	8640	7085	0.82	770	8010	6568	0.82	814
84	72	9810	6867	0.70	763	9180	6426	0.70	806	8550	5985	0.70	835
84	75	10350	6003	0.58	792	9720	5638	0.58	828	9180	5324	0.58	864
84	79	10890	5009	0.46	821	10260	4720	0.46	857	9630	4430	0.46	893
86	64	8820	8644	0.98	706	8100	7938	0.98	749	7470	7321	0.98	778
86	68	9270	7972	0.86	734	8640	7430	0.86	770	8010	6889	0.86	814
86	72	9810	7259	0.74	763	9180	6793	0.74	806	8550	6327	0.74	835
86	75	10350	6417	0.62	792	9720	6026	0.62	828	9180	5692	0.62	864
86	79	10890	5445	0.50	821	10260	5130	0.50	857	9630	4815	0.50	893
88	64	8820	8820	1.00	706	8100	8100	1.00	749	7470	7470	1.00	778
88	68	9270	8343	0.90	734	8640	7776	0.90	770	8010	7209	0.90	814
88	72	9810	7652	0.78	763	9180	7160	0.78	806	8550	6669	0.78	835
88	75	10350	6831	0.66	792	9720	6415	0.66	828	9180	6059	0.66	864
88	79	10890	5881	0.54	821	10260	5540	0.54	857	9630	5200	0.54	893
90	64	8820	8820	1.00	706	8100	8100	1.00	749	7470	7470	1.00	778
90	68	9270	8714	0.94	734	8640	8122	0.94	770	8010	7529	0.94	814
90	72	9810	8044	0.82	763	9180	7528	0.82	806	8550	7011	0.82	835
90	75	10350	7245	0.70	792	9720	6804	0.70	828	9180	6426	0.70	864
90	79	10890	6316	0.58	821	10260	5951	0.58	857	9630	5585	0.58	893

NOTE CA: Capacity (Btu/h) SHF: Sensible heat factor DB: Dry-bulb temperature
SHC: Sensible heat capacity (Btu/h) P.C. : Power consumption (W) WB: Wet-bulb temperature

MUZ-HX12NL

CAPACITY (Btu/h): 12000 INPUT (W): 960 SHF: 0.76

INDOOR DB (°F)	INDOOR WB (°F)	OUTDOOR DB (°F)															
		70				77				81				86			
		CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.
70	64	14100	8178	0.58	768	13500	7830	0.58	806	12960	7517	0.58	845	12480	7238	0.58	883
70	68	14700	6762	0.46	806	14100	6486	0.46	854	13680	6293	0.46	874	13200	6072	0.46	912
72	64	14100	8742	0.62	768	13500	8370	0.62	806	12960	8035	0.62	845	12480	7738	0.62	883
72	68	14700	7350	0.50	806	14100	7050	0.50	854	13680	6840	0.50	874	13200	6600	0.50	912
72	72	15300	5814	0.38	835	14760	5609	0.38	888	14400	5472	0.38	912	13800	5244	0.38	950
73	64	14100	9306	0.66	768	13500	8910	0.66	806	12960	8554	0.66	845	12480	8237	0.66	883
73	68	14700	7938	0.54	806	14100	7614	0.54	854	13680	7387	0.54	874	13200	7128	0.54	912
73	72	15300	6426	0.42	835	14760	6199	0.42	888	14400	6048	0.42	912	13800	5796	0.42	950
75	64	14100	9870	0.70	768	13500	9450	0.70	806	12960	9072	0.70	845	12480	8736	0.70	883
75	68	14700	8526	0.58	806	14100	8178	0.58	854	13680	7934	0.58	874	13200	7656	0.58	912
75	72	15300	7038	0.46	835	14760	6790	0.46	888	14400	6624	0.46	912	13800	6348	0.46	950
75	75	16080	5467	0.34	874	15480	5263	0.34	922	15120	5141	0.34	950	14640	4978	0.34	998
77	64	14100	10434	0.74	768	13500	9990	0.74	806	12960	9590	0.74	845	12480	9235	0.74	883
77	68	14700	9114	0.62	806	14100	8742	0.62	854	13680	8482	0.62	874	13200	8184	0.62	912
77	72	15300	7650	0.50	835	14760	7380	0.50	888	14400	7200	0.50	912	13800	6900	0.50	950
77	75	16080	6110	0.38	874	15480	5882	0.38	922	15120	5746	0.38	950	14640	5563	0.38	998
79	64	14100	10998	0.78	768	13500	10530	0.78	806	12960	10109	0.78	845	12480	9734	0.78	883
79	68	14700	9702	0.66	806	14100	9306	0.66	854	13680	9029	0.66	874	13200	8712	0.66	912
79	72	15300	8262	0.54	835	14760	7970	0.54	888	14400	7776	0.54	912	13800	7452	0.54	950
79	75	16080	6754	0.42	874	15480	6502	0.42	922	15120	6350	0.42	950	14640	6149	0.42	998
79	79	16560	4968	0.30	922	16080	4824	0.30	970	15840	4752	0.30	998	15360	4608	0.30	1027
81	64	14100	11562	0.82	768	13500	11070	0.82	806	12960	10627	0.82	845	12480	10234	0.82	883
81	68	14700	10290	0.70	806	14100	9870	0.70	854	13680	9576	0.70	874	13200	9240	0.70	912
81	72	15300	8874	0.58	835	14760	8561	0.58	888	14400	8352	0.58	912	13800	8004	0.58	950
81	75	16080	7397	0.46	874	15480	7121	0.46	922	15120	6955	0.46	950	14640	6734	0.46	998
81	79	16560	5630	0.34	922	16080	5467	0.34	970	15840	5386	0.34	998	15360	5222	0.34	1027
82	64	14100	12126	0.86	768	13500	11610	0.86	806	12960	11146	0.86	845	12480	10733	0.86	883
82	68	14700	10878	0.74	806	14100	10434	0.74	854	13680	10123	0.74	874	13200	9768	0.74	912
82	72	15300	9486	0.62	835	14760	9151	0.62	888	14400	8928	0.62	912	13800	8556	0.62	950
82	75	16080	8040	0.50	874	15480	7740	0.50	922	15120	7560	0.50	950	14640	7320	0.50	998
82	79	16560	6293	0.38	922	16080	6110	0.38	970	15840	6019	0.38	998	15360	5837	0.38	1027
84	64	14100	12690	0.90	768	13500	12150	0.90	806	12960	11664	0.90	845	12480	11232	0.90	883
84	68	14700	11466	0.78	806	14100	10998	0.78	854	13680	10670	0.78	874	13200	10296	0.78	912
84	72	15300	10098	0.66	835	14760	9742	0.66	888	14400	9504	0.66	912	13800	9108	0.66	950
84	75	16080	8683	0.54	874	15480	8359	0.54	922	15120	8165	0.54	950	14640	7906	0.54	998
84	79	16560	6955	0.42	922	16080	6754	0.42	970	15840	6653	0.42	998	15360	6451	0.42	1027
86	64	14100	13254	0.94	768	13500	12690	0.94	806	12960	12182	0.94	845	12480	11731	0.94	883
86	68	14700	12054	0.82	806	14100	11562	0.82	854	13680	11218	0.82	874	13200	10824	0.82	912
86	72	15300	10710	0.70	835	14760	10332	0.70	888	14400	10080	0.70	912	13800	9660	0.70	950
86	75	16080	9326	0.58	874	15480	8978	0.58	922	15120	8770	0.58	950	14640	8491	0.58	998
86	79	16560	7618	0.46	922	16080	7397	0.46	970	15840	7286	0.46	998	15360	7066	0.46	1027
88	64	14100	13818	0.98	768	13500	13230	0.98	806	12960	12701	0.98	845	12480	12230	0.98	883
88	68	14700	12642	0.86	806	14100	12126	0.86	854	13680	11765	0.86	874	13200	11352	0.86	912
88	72	15300	11322	0.74	835	14760	10922	0.74	888	14400	10656	0.74	912	13800	10212	0.74	950
88	75	16080	9970	0.62	874	15480	9598	0.62	922	15120	9374	0.62	950	14640	9077	0.62	998
88	79	16560	8280	0.50	922	16080	8040	0.50	970	15840	7920	0.50	998	15360	7680	0.50	1027
90	64	14100	14100	1.00	768	13500	13500	1.00	806	12960	12960	1.00	845	12480	12480	1.00	883
90	68	14700	13230	0.90	806	14100	12690	0.90	854	13680	12312	0.90	874	13200	11880	0.90	912
90	72	15300	11934	0.78	835	14760	11513	0.78	888	14400	11232	0.78	912	13800	10764	0.78	950
90	75	16080	10613	0.66	874	15480	10217	0.66	922	15120	9979	0.66	950	14640	9662	0.66	998
90	79	16560	8942	0.54	922	16080	8683	0.54	970	15840	8554	0.54	998	15360	8294	0.54	1027

NOTE CA: Capacity (Btu/h) SHF: Sensible heat factor DB: Dry-bulb temperature
SHC: Sensible heat capacity (Btu/h) P.C. : Power consumption (W) WB: Wet-bulb temperature

MUZ-HX12NL

CAPACITY (Btu/h): 12000 INPUT (W): 960 SHF: 0.76

INDOOR DB (°F)	INDOOR WB (°F)	OUTDOOR DB (°F)											
		95				104				115			
		CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.
70	64	11760	6821	0.58	941	10800	6264	0.58	998	9960	5777	0.58	1037
70	68	12360	5686	0.46	979	11520	5299	0.46	1027	10680	4913	0.46	1085
72	64	11760	7291	0.62	941	10800	6696	0.62	998	9960	6175	0.62	1037
72	68	12360	6180	0.50	979	11520	5760	0.50	1027	10680	5340	0.50	1085
72	72	13080	4970	0.38	1018	12240	4651	0.38	1075	11400	4332	0.38	1114
73	64	11760	7762	0.66	941	10800	7128	0.66	998	9960	6574	0.66	1037
73	68	12360	6674	0.54	979	11520	6221	0.54	1027	10680	5767	0.54	1085
73	72	13080	5494	0.42	1018	12240	5141	0.42	1075	11400	4788	0.42	1114
75	64	11760	8232	0.70	941	10800	7560	0.70	998	9960	6972	0.70	1037
75	68	12360	7169	0.58	979	11520	6682	0.58	1027	10680	6194	0.58	1085
75	72	13080	6017	0.46	1018	12240	5630	0.46	1075	11400	5244	0.46	1114
75	75	13800	4692	0.34	1056	12960	4406	0.34	1104	12240	4162	0.34	1152
77	64	11760	8702	0.74	941	10800	7992	0.74	998	9960	7370	0.74	1037
77	68	12360	7663	0.62	979	11520	7142	0.62	1027	10680	6622	0.62	1085
77	72	13080	6540	0.50	1018	12240	6120	0.50	1075	11400	5700	0.50	1114
77	75	13800	5244	0.38	1056	12960	4925	0.38	1104	12240	4651	0.38	1152
79	64	11760	9173	0.78	941	10800	8424	0.78	998	9960	7769	0.78	1037
79	68	12360	8158	0.66	979	11520	7603	0.66	1027	10680	7049	0.66	1085
79	72	13080	7063	0.54	1018	12240	6610	0.54	1075	11400	6156	0.54	1114
79	75	13800	5796	0.42	1056	12960	5443	0.42	1104	12240	5141	0.42	1152
79	79	14520	4356	0.30	1094	13680	4104	0.30	1142	12840	3852	0.30	1190
81	64	11760	9643	0.82	941	10800	8856	0.82	998	9960	8167	0.82	1037
81	68	12360	8652	0.70	979	11520	8064	0.70	1027	10680	7476	0.70	1085
81	72	13080	7586	0.58	1018	12240	7099	0.58	1075	11400	6612	0.58	1114
81	75	13800	6348	0.46	1056	12960	5962	0.46	1104	12240	5630	0.46	1152
81	79	14520	4937	0.34	1094	13680	4651	0.34	1142	12840	4366	0.34	1190
82	64	11760	10114	0.86	941	10800	9288	0.86	998	9960	8566	0.86	1037
82	68	12360	9146	0.74	979	11520	8525	0.74	1027	10680	7903	0.74	1085
82	72	13080	8110	0.62	1018	12240	7589	0.62	1075	11400	7068	0.62	1114
82	75	13800	6900	0.50	1056	12960	6480	0.50	1104	12240	6120	0.50	1152
82	79	14520	5518	0.38	1094	13680	5198	0.38	1142	12840	4879	0.38	1190
84	64	11760	10584	0.90	941	10800	9720	0.90	998	9960	8964	0.90	1037
84	68	12360	9641	0.78	979	11520	8986	0.78	1027	10680	8330	0.78	1085
84	72	13080	8633	0.66	1018	12240	8078	0.66	1075	11400	7524	0.66	1114
84	75	13800	7452	0.54	1056	12960	6998	0.54	1104	12240	6610	0.54	1152
84	79	14520	6098	0.42	1094	13680	5746	0.42	1142	12840	5393	0.42	1190
86	64	11760	11054	0.94	941	10800	10152	0.94	998	9960	9362	0.94	1037
86	68	12360	10135	0.82	979	11520	9446	0.82	1027	10680	8758	0.82	1085
86	72	13080	9156	0.70	1018	12240	8568	0.70	1075	11400	7980	0.70	1114
86	75	13800	8004	0.58	1056	12960	7517	0.58	1104	12240	7099	0.58	1152
86	79	14520	6679	0.46	1094	13680	6293	0.46	1142	12840	5906	0.46	1190
88	64	11760	11525	0.98	941	10800	10584	0.98	998	9960	9761	0.98	1037
88	68	12360	10630	0.86	979	11520	9907	0.86	1027	10680	9185	0.86	1085
88	72	13080	9679	0.74	1018	12240	9058	0.74	1075	11400	8436	0.74	1114
88	75	13800	8556	0.62	1056	12960	8035	0.62	1104	12240	7589	0.62	1152
88	79	14520	7260	0.50	1094	13680	6840	0.50	1142	12840	6420	0.50	1190
90	64	11760	11760	1.00	941	10800	10800	1.00	998	9960	9960	1.00	1037
90	68	12360	11124	0.90	979	11520	10368	0.90	1027	10680	9612	0.90	1085
90	72	13080	10202	0.78	1018	12240	9547	0.78	1075	11400	8892	0.78	1114
90	75	13800	9108	0.66	1056	12960	8554	0.66	1104	12240	8078	0.66	1152
90	79	14520	7841	0.54	1094	13680	7387	0.54	1142	12840	6934	0.54	1190

NOTE CA: Capacity (Btu/h) SHF: Sensible heat factor DB: Dry-bulb temperature
SHC: Sensible heat capacity (Btu/h) P.C. : Power consumption (W) WB: Wet-bulb temperature

MUZ-HX18NL

CAPACITY (Btu/h): 17200 INPUT (W): 1370 SHF: 0.78

INDOOR DB (°F)	INDOOR WB (°F)	OUTDOOR DB (°F)															
		70				77				81				86			
		CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.
70	64	20210	12126	0.60	1096	19350	11610	0.60	1151	18576	11146	0.60	1206	17888	10733	0.60	1260
70	68	21070	10114	0.48	1151	20210	9701	0.48	1219	19608	9412	0.48	1247	18920	9082	0.48	1302
72	64	20210	12934	0.64	1096	19350	12384	0.64	1151	18576	11889	0.64	1206	17888	11448	0.64	1260
72	68	21070	10956	0.52	1151	20210	10509	0.52	1219	19608	10196	0.52	1247	18920	9838	0.52	1302
72	72	21930	8772	0.40	1192	21156	8462	0.40	1267	20640	8256	0.40	1302	19780	7912	0.40	1356
73	64	20210	13743	0.68	1096	19350	13158	0.68	1151	18576	12632	0.68	1206	17888	12164	0.68	1260
73	68	21070	11799	0.56	1151	20210	11318	0.56	1219	19608	10980	0.56	1247	18920	10595	0.56	1302
73	72	21930	9649	0.44	1192	21156	9309	0.44	1267	20640	9082	0.44	1302	19780	8703	0.44	1356
75	64	20210	14551	0.72	1096	19350	13932	0.72	1151	18576	13375	0.72	1206	17888	12879	0.72	1260
75	68	21070	12642	0.60	1151	20210	12126	0.60	1219	19608	11765	0.60	1247	18920	11352	0.60	1302
75	72	21930	10526	0.48	1192	21156	10155	0.48	1267	20640	9907	0.48	1302	19780	9494	0.48	1356
75	75	23048	8297	0.36	1247	22188	7988	0.36	1315	21672	7802	0.36	1356	20984	7554	0.36	1425
77	64	20210	15360	0.76	1096	19350	14706	0.76	1151	18576	14118	0.76	1206	17888	13595	0.76	1260
77	68	21070	13485	0.64	1151	20210	12934	0.64	1219	19608	12549	0.64	1247	18920	12109	0.64	1302
77	72	21930	11404	0.52	1192	21156	11001	0.52	1267	20640	10733	0.52	1302	19780	10286	0.52	1356
77	75	23048	9219	0.40	1247	22188	8875	0.40	1315	21672	8669	0.40	1356	20984	8394	0.40	1425
79	64	20210	16168	0.80	1096	19350	15480	0.80	1151	18576	14861	0.80	1206	17888	14310	0.80	1260
79	68	21070	14328	0.68	1151	20210	13743	0.68	1219	19608	13333	0.68	1247	18920	12866	0.68	1302
79	72	21930	12281	0.56	1192	21156	11847	0.56	1267	20640	11558	0.56	1302	19780	11077	0.56	1356
79	75	23048	10141	0.44	1247	22188	9763	0.44	1315	21672	9536	0.44	1356	20984	9233	0.44	1425
79	79	23736	7596	0.32	1315	23048	7375	0.32	1384	22704	7265	0.32	1425	22016	7045	0.32	1466
81	64	20210	16976	0.84	1096	19350	16254	0.84	1151	18576	15604	0.84	1206	17888	15026	0.84	1260
81	68	21070	15170	0.72	1151	20210	14551	0.72	1219	19608	14118	0.72	1247	18920	13622	0.72	1302
81	72	21930	13158	0.60	1192	21156	12694	0.60	1267	20640	12384	0.60	1302	19780	11868	0.60	1356
81	75	23048	11063	0.48	1247	22188	10650	0.48	1315	21672	10403	0.48	1356	20984	10072	0.48	1425
81	79	23736	8545	0.36	1315	23048	8297	0.36	1384	22704	8173	0.36	1425	22016	7926	0.36	1466
82	64	20210	17785	0.88	1096	19350	17028	0.88	1151	18576	16347	0.88	1206	17888	15741	0.88	1260
82	68	21070	16013	0.76	1151	20210	15360	0.76	1219	19608	14902	0.76	1247	18920	14379	0.76	1302
82	72	21930	14035	0.64	1192	21156	13540	0.64	1267	20640	13210	0.64	1302	19780	12659	0.64	1356
82	75	23048	11985	0.52	1247	22188	11538	0.52	1315	21672	11269	0.52	1356	20984	10912	0.52	1425
82	79	23736	9494	0.40	1315	23048	9219	0.40	1384	22704	9082	0.40	1425	22016	8806	0.40	1466
84	64	20210	18593	0.92	1096	19350	17802	0.92	1151	18576	17090	0.92	1206	17888	16457	0.92	1260
84	68	21070	16856	0.80	1151	20210	16168	0.80	1219	19608	15686	0.80	1247	18920	15136	0.80	1302
84	72	21930	14912	0.68	1192	21156	14386	0.68	1267	20640	14035	0.68	1302	19780	13450	0.68	1356
84	75	23048	12907	0.56	1247	22188	12425	0.56	1315	21672	12136	0.56	1356	20984	11751	0.56	1425
84	79	23736	10444	0.44	1315	23048	10141	0.44	1384	22704	9990	0.44	1425	22016	9687	0.44	1466
86	64	20210	19402	0.96	1096	19350	18576	0.96	1151	18576	17833	0.96	1206	17888	17172	0.96	1260
86	68	21070	17699	0.84	1151	20210	16976	0.84	1219	19608	16471	0.84	1247	18920	15893	0.84	1302
86	72	21930	15790	0.72	1192	21156	15232	0.72	1267	20640	14861	0.72	1302	19780	14242	0.72	1356
86	75	23048	13829	0.60	1247	22188	13313	0.60	1315	21672	13003	0.60	1356	20984	12590	0.60	1425
86	79	23736	11393	0.48	1315	23048	11063	0.48	1384	22704	10898	0.48	1425	22016	10568	0.48	1466
88	64	20210	20210	1.00	1096	19350	19350	1.00	1151	18576	18576	1.00	1206	17888	17888	1.00	1260
88	68	21070	18542	0.88	1151	20210	17785	0.88	1219	19608	17255	0.88	1247	18920	16650	0.88	1302
88	72	21930	16667	0.76	1192	21156	16079	0.76	1267	20640	15686	0.76	1302	19780	15033	0.76	1356
88	75	23048	14751	0.64	1247	22188	14200	0.64	1315	21672	13870	0.64	1356	20984	13430	0.64	1425
88	79	23736	12343	0.52	1315	23048	11985	0.52	1384	22704	11806	0.52	1425	22016	11448	0.52	1466
90	64	20210	20210	1.00	1096	19350	19350	1.00	1151	18576	18576	1.00	1206	17888	17888	1.00	1260
90	68	21070	19384	0.92	1151	20210	18593	0.92	1219	19608	18039	0.92	1247	18920	17406	0.92	1302
90	72	21930	17544	0.80	1192	21156	16925	0.80	1267	20640	16512	0.80	1302	19780	15824	0.80	1356
90	75	23048	15673	0.68	1247	22188	15088	0.68	1315	21672	14737	0.68	1356	20984	14269	0.68	1425
90	79	23736	13292	0.56	1315	23048	12907	0.56	1384	22704	12714	0.56	1425	22016	12329	0.56	1466

NOTE CA: Capacity (Btu/h) SHF: Sensible heat factor DB: Dry-bulb temperature
SHC: Sensible heat capacity (Btu/h) P.C. : Power consumption (W) WB: Wet-bulb temperature

MUZ-HX18NL

CAPACITY (Btu/h): 17200 INPUT (W): 1370 SHF: 0.78

INDOOR DB (°F)	INDOOR WB (°F)	OUTDOOR DB (°F)											
		95				104				115			
		CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.
70	64	16856	10114	0.60	1343	15480	9288	0.60	1425	14276	8566	0.60	1480
70	68	17716	8504	0.48	1397	16512	7926	0.48	1466	15308	7348	0.48	1548
72	64	16856	10788	0.64	1343	15480	9907	0.64	1425	14276	9137	0.64	1480
72	68	17716	9212	0.52	1397	16512	8586	0.52	1466	15308	7960	0.52	1548
72	72	18748	7499	0.40	1452	17544	7018	0.40	1534	16340	6536	0.40	1589
73	64	16856	11462	0.68	1343	15480	10526	0.68	1425	14276	9708	0.68	1480
73	68	17716	9921	0.56	1397	16512	9247	0.56	1466	15308	8572	0.56	1548
73	72	18748	8249	0.44	1452	17544	7719	0.44	1534	16340	7190	0.44	1589
75	64	16856	12136	0.72	1343	15480	11146	0.72	1425	14276	10279	0.72	1480
75	68	17716	10630	0.60	1397	16512	9907	0.60	1466	15308	9185	0.60	1548
75	72	18748	8999	0.48	1452	17544	8421	0.48	1534	16340	7843	0.48	1589
75	75	19780	7121	0.36	1507	18576	6687	0.36	1576	17544	6316	0.36	1644
77	64	16856	12811	0.76	1343	15480	11765	0.76	1425	14276	10850	0.76	1480
77	68	17716	11338	0.64	1397	16512	10568	0.64	1466	15308	9797	0.64	1548
77	72	18748	9749	0.52	1452	17544	9123	0.52	1534	16340	8497	0.52	1589
77	75	19780	7912	0.40	1507	18576	7430	0.40	1576	17544	7018	0.40	1644
79	64	16856	13485	0.80	1343	15480	12384	0.80	1425	14276	11421	0.80	1480
79	68	17716	12047	0.68	1397	16512	11228	0.68	1466	15308	10409	0.68	1548
79	72	18748	10499	0.56	1452	17544	9825	0.56	1534	16340	9150	0.56	1589
79	75	19780	8703	0.44	1507	18576	8173	0.44	1576	17544	7719	0.44	1644
79	79	20812	6660	0.32	1562	19608	6275	0.32	1630	18404	5889	0.32	1699
81	64	16856	14159	0.84	1343	15480	13003	0.84	1425	14276	11992	0.84	1480
81	68	17716	12756	0.72	1397	16512	11889	0.72	1466	15308	11022	0.72	1548
81	72	18748	11249	0.60	1452	17544	10526	0.60	1534	16340	9804	0.60	1589
81	75	19780	9494	0.48	1507	18576	8916	0.48	1576	17544	8421	0.48	1644
81	79	20812	7492	0.36	1562	19608	7059	0.36	1630	18404	6625	0.36	1699
82	64	16856	14833	0.88	1343	15480	13622	0.88	1425	14276	12563	0.88	1480
82	68	17716	13464	0.76	1397	16512	12549	0.76	1466	15308	11634	0.76	1548
82	72	18748	11999	0.64	1452	17544	11228	0.64	1534	16340	10458	0.64	1589
82	75	19780	10286	0.52	1507	18576	9660	0.52	1576	17544	9123	0.52	1644
82	79	20812	8325	0.40	1562	19608	7843	0.40	1630	18404	7362	0.40	1699
84	64	16856	15508	0.92	1343	15480	14242	0.92	1425	14276	13134	0.92	1480
84	68	17716	14173	0.80	1397	16512	13210	0.80	1466	15308	12246	0.80	1548
84	72	18748	12749	0.68	1452	17544	11930	0.68	1534	16340	11111	0.68	1589
84	75	19780	11077	0.56	1507	18576	10403	0.56	1576	17544	9825	0.56	1644
84	79	20812	9157	0.44	1562	19608	8628	0.44	1630	18404	8098	0.44	1699
86	64	16856	16182	0.96	1343	15480	14861	0.96	1425	14276	13705	0.96	1480
86	68	17716	14881	0.84	1397	16512	13870	0.84	1466	15308	12859	0.84	1548
86	72	18748	13499	0.72	1452	17544	12632	0.72	1534	16340	11765	0.72	1589
86	75	19780	11868	0.60	1507	18576	11146	0.60	1576	17544	10526	0.60	1644
86	79	20812	9990	0.48	1562	19608	9412	0.48	1630	18404	8834	0.48	1699
88	64	16856	16856	1.00	1343	15480	15480	1.00	1425	14276	14276	1.00	1480
88	68	17716	15590	0.88	1397	16512	14531	0.88	1466	15308	13471	0.88	1548
88	72	18748	14248	0.76	1452	17544	13333	0.76	1534	16340	12418	0.76	1589
88	75	19780	12659	0.64	1507	18576	11889	0.64	1576	17544	11228	0.64	1644
88	79	20812	10822	0.52	1562	19608	10196	0.52	1630	18404	9570	0.52	1699
90	64	16856	16856	1.00	1343	15480	15480	1.00	1425	14276	14276	1.00	1480
90	68	17716	16299	0.92	1397	16512	15191	0.92	1466	15308	14083	0.92	1548
90	72	18748	14998	0.80	1452	17544	14035	0.80	1534	16340	13072	0.80	1589
90	75	19780	13450	0.68	1507	18576	12632	0.68	1576	17544	11930	0.68	1644
90	79	20812	11655	0.56	1562	19608	10980	0.56	1630	18404	10306	0.56	1699

NOTE CA: Capacity (Btu/h) SHF: Sensible heat factor DB: Dry-bulb temperature
SHC: Sensible heat capacity (Btu/h) P.C. : Power consumption (W) WB: Wet-bulb temperature

MUZ-HX24NL

CAPACITY (Btu/h): 22400 INPUT (W): 1910 SHF: 0.73

INDOOR DB (°F)	INDOOR WB (°F)	OUTDOOR DB (°F)															
		70				77				81				86			
		CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.
70	64	26320	14476	0.55	1528	25200	13860	0.55	1604	24192	13306	0.55	1681	23296	12813	0.55	1757
70	68	27440	11799	0.43	1604	26320	11318	0.43	1700	25536	10980	0.43	1738	24640	10595	0.43	1815
72	64	26320	15529	0.59	1528	25200	14868	0.59	1604	24192	14273	0.59	1681	23296	13745	0.59	1757
72	68	27440	12897	0.47	1604	26320	12370	0.47	1700	25536	12002	0.47	1738	24640	11581	0.47	1815
72	72	28560	9996	0.35	1662	27552	9643	0.35	1767	26880	9408	0.35	1815	25760	9016	0.35	1891
73	64	26320	16582	0.63	1528	25200	15876	0.63	1604	24192	15241	0.63	1681	23296	14676	0.63	1757
73	68	27440	13994	0.51	1604	26320	13423	0.51	1700	25536	13023	0.51	1738	24640	12566	0.51	1815
73	72	28560	11138	0.39	1662	27552	10745	0.39	1767	26880	10483	0.39	1815	25760	10046	0.39	1891
75	64	26320	17634	0.67	1528	25200	16884	0.67	1604	24192	16209	0.67	1681	23296	15608	0.67	1757
75	68	27440	15092	0.55	1604	26320	14476	0.55	1700	25536	14045	0.55	1738	24640	13552	0.55	1815
75	72	28560	12281	0.43	1662	27552	11847	0.43	1767	26880	11558	0.43	1815	25760	11077	0.43	1891
75	75	30016	9305	0.31	1738	28896	8958	0.31	1834	28224	8749	0.31	1891	27328	8472	0.31	1986
77	64	26320	18687	0.71	1528	25200	17892	0.71	1604	24192	17176	0.71	1681	23296	16540	0.71	1757
77	68	27440	16190	0.59	1604	26320	15529	0.59	1700	25536	15066	0.59	1738	24640	14538	0.59	1815
77	72	28560	13423	0.47	1662	27552	12949	0.47	1767	26880	12634	0.47	1815	25760	12107	0.47	1891
77	75	30016	10506	0.35	1738	28896	10114	0.35	1834	28224	9878	0.35	1891	27328	9565	0.35	1986
79	64	26320	19740	0.75	1528	25200	18900	0.75	1604	24192	18144	0.75	1681	23296	17472	0.75	1757
79	68	27440	17287	0.63	1604	26320	16582	0.63	1700	25536	16088	0.63	1738	24640	15523	0.63	1815
79	72	28560	14566	0.51	1662	27552	14052	0.51	1767	26880	13709	0.51	1815	25760	13138	0.51	1891
79	75	30016	11706	0.39	1738	28896	11269	0.39	1834	28224	11007	0.39	1891	27328	10658	0.39	1986
79	79	30912	8346	0.27	1834	30016	8104	0.27	1929	29568	7983	0.27	1986	28672	7741	0.27	2044
81	64	26320	20793	0.79	1528	25200	19908	0.79	1604	24192	19112	0.79	1681	23296	18404	0.79	1757
81	68	27440	18385	0.67	1604	26320	17634	0.67	1700	25536	17109	0.67	1738	24640	16509	0.67	1815
81	72	28560	15708	0.55	1662	27552	15154	0.55	1767	26880	14784	0.55	1815	25760	14168	0.55	1891
81	75	30016	12907	0.43	1738	28896	12425	0.43	1834	28224	12136	0.43	1891	27328	11751	0.43	1986
81	79	30912	9583	0.31	1834	30016	9305	0.31	1929	29568	9166	0.31	1986	28672	8888	0.31	2044
82	64	26320	21846	0.83	1528	25200	20916	0.83	1604	24192	20079	0.83	1681	23296	19336	0.83	1757
82	68	27440	19482	0.71	1604	26320	18687	0.71	1700	25536	18131	0.71	1738	24640	17494	0.71	1815
82	72	28560	16850	0.59	1662	27552	16256	0.59	1767	26880	15859	0.59	1815	25760	15198	0.59	1891
82	75	30016	14108	0.47	1738	28896	13581	0.47	1834	28224	13265	0.47	1891	27328	12844	0.47	1986
82	79	30912	10819	0.35	1834	30016	10506	0.35	1929	29568	10349	0.35	1986	28672	10035	0.35	2044
84	64	26320	22898	0.87	1528	25200	21924	0.87	1604	24192	21047	0.87	1681	23296	20268	0.87	1757
84	68	27440	20580	0.75	1604	26320	19740	0.75	1700	25536	19152	0.75	1738	24640	18480	0.75	1815
84	72	28560	17993	0.63	1662	27552	17358	0.63	1767	26880	16934	0.63	1815	25760	16229	0.63	1891
84	75	30016	15308	0.51	1738	28896	14737	0.51	1834	28224	14394	0.51	1891	27328	13937	0.51	1986
84	79	30912	12056	0.39	1834	30016	11706	0.39	1929	29568	11532	0.39	1986	28672	11182	0.39	2044
86	64	26320	23951	0.91	1528	25200	22932	0.91	1604	24192	22015	0.91	1681	23296	21199	0.91	1757
86	68	27440	21678	0.79	1604	26320	20793	0.79	1700	25536	20173	0.79	1738	24640	19466	0.79	1815
86	72	28560	19135	0.67	1662	27552	18460	0.67	1767	26880	18010	0.67	1815	25760	17259	0.67	1891
86	75	30016	16509	0.55	1738	28896	15893	0.55	1834	28224	15523	0.55	1891	27328	15030	0.55	1986
86	79	30912	13292	0.43	1834	30016	12907	0.43	1929	29568	12714	0.43	1986	28672	12329	0.43	2044
88	64	26320	25004	0.95	1528	25200	23940	0.95	1604	24192	22982	0.95	1681	23296	22131	0.95	1757
88	68	27440	22775	0.83	1604	26320	21846	0.83	1700	25536	21195	0.83	1738	24640	20451	0.83	1815
88	72	28560	20278	0.71	1662	27552	19562	0.71	1767	26880	19085	0.71	1815	25760	18290	0.71	1891
88	75	30016	17709	0.59	1738	28896	17049	0.59	1834	28224	16652	0.59	1891	27328	16124	0.59	1986
88	79	30912	14529	0.47	1834	30016	14108	0.47	1929	29568	13897	0.47	1986	28672	13476	0.47	2044
90	64	26320	26057	0.99	1528	25200	24948	0.99	1604	24192	23950	0.99	1681	23296	23063	0.99	1757
90	68	27440	23873	0.87	1604	26320	22898	0.87	1700	25536	22216	0.87	1738	24640	21437	0.87	1815
90	72	28560	21420	0.75	1662	27552	20664	0.75	1767	26880	20160	0.75	1815	25760	19320	0.75	1891
90	75	30016	18910	0.63	1738	28896	18204	0.63	1834	28224	17781	0.63	1891	27328	17217	0.63	1986
90	79	30912	15765	0.51	1834	30016	15308	0.51	1929	29568	15080	0.51	1986	28672	14623	0.51	2044

NOTE CA: Capacity (Btu/h) SHF: Sensible heat factor DB: Dry-bulb temperature
SHC: Sensible heat capacity (Btu/h) P.C. : Power consumption (W) WB: Wet-bulb temperature

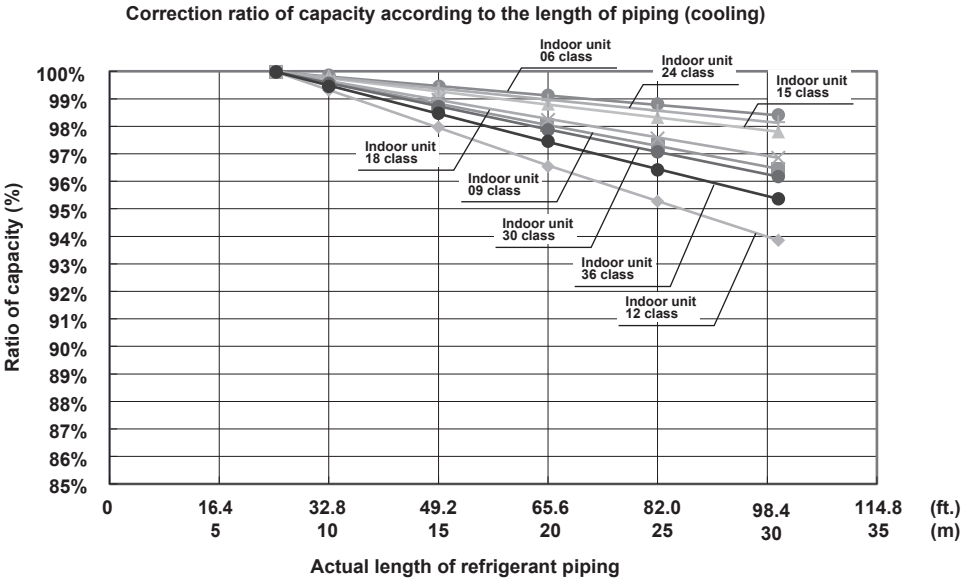
MUZ-HX24NL

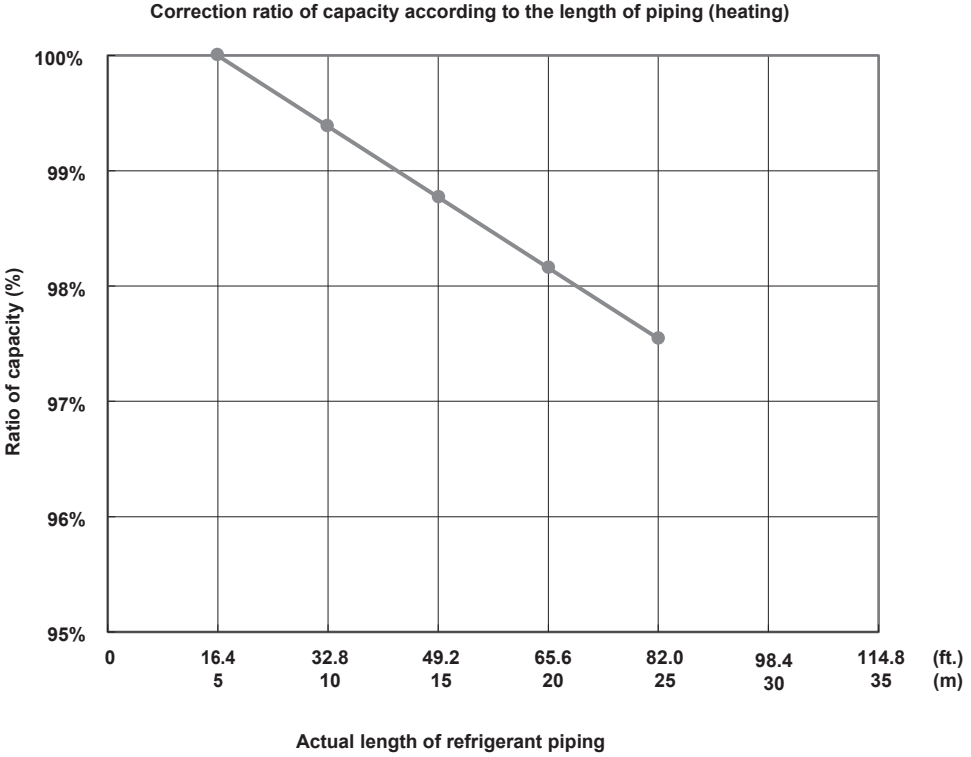
CAPACITY (Btu/h): 22400 INPUT (W): 1910 SHF: 0.73

INDOOR DB (°F)	INDOOR WB (°F)	OUTDOOR DB (°F)											
		95				104				115			
		CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.	CA	SHC	SHF	P.C.
70	64	21952	12074	0.55	1872	20160	11088	0.55	1986	18592	10226	0.55	2063
70	68	23072	9921	0.43	1948	21504	9247	0.43	2044	19936	8572	0.43	2158
72	64	21952	12952	0.59	1872	20160	11894	0.59	1986	18592	10969	0.59	2063
72	68	23072	10844	0.47	1948	21504	10107	0.47	2044	19936	9370	0.47	2158
72	72	24416	8546	0.35	2025	22848	7997	0.35	2139	21280	7448	0.35	2216
73	64	21952	13830	0.63	1872	20160	12701	0.63	1986	18592	11713	0.63	2063
73	68	23072	11767	0.51	1948	21504	10967	0.51	2044	19936	10167	0.51	2158
73	72	24416	9522	0.39	2025	22848	8911	0.39	2139	21280	8299	0.39	2216
75	64	21952	14708	0.67	1872	20160	13507	0.67	1986	18592	12457	0.67	2063
75	68	23072	12690	0.55	1948	21504	11827	0.55	2044	19936	10965	0.55	2158
75	72	24416	10499	0.43	2025	22848	9825	0.43	2139	21280	9150	0.43	2216
75	75	25760	7986	0.31	2101	24192	7500	0.31	2197	22848	7083	0.31	2292
77	64	21952	15586	0.71	1872	20160	14314	0.71	1986	18592	13200	0.71	2063
77	68	23072	13612	0.59	1948	21504	12687	0.59	2044	19936	11762	0.59	2158
77	72	24416	11476	0.47	2025	22848	10739	0.47	2139	21280	10002	0.47	2216
77	75	25760	9016	0.35	2101	24192	8467	0.35	2197	22848	7997	0.35	2292
79	64	21952	16464	0.75	1872	20160	15120	0.75	1986	18592	13944	0.75	2063
79	68	23072	14535	0.63	1948	21504	13548	0.63	2044	19936	12560	0.63	2158
79	72	24416	12452	0.51	2025	22848	11652	0.51	2139	21280	10853	0.51	2216
79	75	25760	10046	0.39	2101	24192	9435	0.39	2197	22848	8911	0.39	2292
79	79	27104	7318	0.27	2177	25536	6895	0.27	2273	23968	6471	0.27	2368
81	64	21952	17342	0.79	1872	20160	15926	0.79	1986	18592	14688	0.79	2063
81	68	23072	15458	0.67	1948	21504	14408	0.67	2044	19936	13357	0.67	2158
81	72	24416	13429	0.55	2025	22848	12566	0.55	2139	21280	11704	0.55	2216
81	75	25760	11077	0.43	2101	24192	10403	0.43	2197	22848	9825	0.43	2292
81	79	27104	8402	0.31	2177	25536	7916	0.31	2273	23968	7430	0.31	2368
82	64	21952	18220	0.83	1872	20160	16733	0.83	1986	18592	15431	0.83	2063
82	68	23072	16381	0.71	1948	21504	15268	0.71	2044	19936	14155	0.71	2158
82	72	24416	14405	0.59	2025	22848	13480	0.59	2139	21280	12555	0.59	2216
82	75	25760	12107	0.47	2101	24192	11370	0.47	2197	22848	10739	0.47	2292
82	79	27104	9486	0.35	2177	25536	8938	0.35	2273	23968	8389	0.35	2368
84	64	21952	19098	0.87	1872	20160	17539	0.87	1986	18592	16175	0.87	2063
84	68	23072	17304	0.75	1948	21504	16128	0.75	2044	19936	14952	0.75	2158
84	72	24416	15382	0.63	2025	22848	14394	0.63	2139	21280	13406	0.63	2216
84	75	25760	13138	0.51	2101	24192	12338	0.51	2197	22848	11652	0.51	2292
84	79	27104	10571	0.39	2177	25536	9959	0.39	2273	23968	9348	0.39	2368
86	64	21952	19976	0.91	1872	20160	18346	0.91	1986	18592	16919	0.91	2063
86	68	23072	18227	0.79	1948	21504	16988	0.79	2044	19936	15749	0.79	2158
86	72	24416	16359	0.67	2025	22848	15308	0.67	2139	21280	14258	0.67	2216
86	75	25760	14168	0.55	2101	24192	13306	0.55	2197	22848	12566	0.55	2292
86	79	27104	11655	0.43	2177	25536	10980	0.43	2273	23968	10306	0.43	2368
88	64	21952	20854	0.95	1872	20160	19152	0.95	1986	18592	17662	0.95	2063
88	68	23072	19150	0.83	1948	21504	17848	0.83	2044	19936	16547	0.83	2158
88	72	24416	17335	0.71	2025	22848	16222	0.71	2139	21280	15109	0.71	2216
88	75	25760	15198	0.59	2101	24192	14273	0.59	2197	22848	13480	0.59	2292
88	79	27104	12739	0.47	2177	25536	12002	0.47	2273	23968	11265	0.47	2368
90	64	21952	21732	0.99	1872	20160	19958	0.99	1986	18592	18406	0.99	2063
90	68	23072	20073	0.87	1948	21504	18708	0.87	2044	19936	17344	0.87	2158
90	72	24416	18312	0.75	2025	22848	17136	0.75	2139	21280	15960	0.75	2216
90	75	25760	16229	0.63	2101	24192	15241	0.63	2197	22848	14394	0.63	2292
90	79	27104	13823	0.51	2177	25536	13023	0.51	2273	23968	12224	0.51	2368

NOTE CA: Capacity (Btu/h) SHF: Sensible heat factor DB: Dry-bulb temperature
SHC: Sensible heat capacity (Btu/h) P.C. : Power consumption (W) WB: Wet-bulb temperature

17 CAPACITY CORRECTION RATIO CURVE FOR PIPING LENGTH





The length intended for the capacity calculation, which counts the length of refrigerant piping and the number of bends, is called actual length.

Length of refrigerant piping (ft.) + (Number of bends × 0.984 ft.) = Actual length of refrigerant piping (ft.)
[Length of refrigerant piping (m) + (Number of bends × 0.3 m) = Actual length of refrigerant piping (m)]

18 PART LOAD CAPACITY CHART

MUZ-HX09NL

1) COOLING

Rated
Q(Btu/h): 9000
W: 720

Indoor W.B.			71°F / 21.7°C						67°F / 19.4°C						63°F / 17.2°C					
Outdoor D.B.			Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.
(°F)	(°C)																			
115	46.1	Q(Btu/h)	9940	8280	7560	5080	2720	3250	9410	7700	7160	4810	2570	3080	8840	7020	6720	4520	2410	2890
		W	1300	830	930	570	200	280	1220	800	880	530	190	270	1170	760	840	500	190	260
110	43.3	Q(Btu/h)	10370	8640	7890	5320	2830	3400	9820	8040	7470	5030	2680	3220	9230	7360	7020	4730	2520	3020
		W	1280	820	910	560	200	270	1200	780	860	520	190	260	1150	750	820	490	190	250
105	40.6	Q(Btu/h)	10810	9000	8210	5540	2950	3530	10230	8370	7780	5240	2790	3350	9610	7700	7310	4930	2620	3140
		W	1250	800	890	550	190	260	1170	760	840	510	180	250	1120	730	800	480	180	240
100	37.8	Q(Btu/h)	11220	9340	8530	5750	3070	3670	10620	8690	8080	5440	2900	3480	9980	8080	7590	5120	2730	3260
		W	1210	780	870	540	190	260	1140	740	820	500	180	250	1090	710	780	480	180	240
95	35.0	Q(Btu/h)	11620	9680	8840	5950	3170	3800	11000	9000	8370	5630	3000	3600	10340	8460	7860	5290	2820	3380
		W	1170	760	840	520	180	250	1100	720	790	480	170	240	1050	690	750	460	170	230
90	32.2	Q(Btu/h)	12090	10000	9190	6190	3300	3960	11440	9360	8710	5860	3120	3750	10750	8780	8180	5510	2930	3520
		W	1130	730	810	490	180	240	1060	700	760	460	170	230	1010	670	730	440	170	220
85	29.4	Q(Btu/h)	12550	10310	9540	6420	3430	4100	11880	9720	9040	6080	3240	3890	11160	9090	8490	5720	3040	3650
		W	1090	700	770	470	170	230	1020	670	730	440	160	220	980	640	700	420	160	210
80	26.7	Q(Btu/h)	13020	10670	9900	6670	3550	4260	12320	10080	9380	6310	3360	4040	11580	9450	8810	5930	3160	3790
		W	1030	670	740	450	160	220	970	640	700	420	150	210	930	610	670	400	150	200
75	23.9	Q(Btu/h)	13480	11030	10250	6900	3680	4410	12760	10440	9710	6530	3480	4180	11990	9810	9120	6140	3270	3920
		W	980	640	700	430	150	210	920	600	660	400	140	200	880	580	630	380	140	190
70	21.1	Q(Btu/h)	13940	11410	10600	7140	3810	4560	13200	10800	10040	6760	3600	4320	12400	10150	9430	6360	3380	4050
		W	940	610	670	410	150	200	880	570	630	380	140	190	840	550	600	360	140	180
65	18.3	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
60	15.6	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
55	12.8	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
50	10.0	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
45	7.2	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
40	4.4	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
35	1.7	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
30	-1.1	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
25	-3.9	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
20	-6.7	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340
15	-9.4	Q(Btu/h)	11910	9750	9000	5950	3050	3710	11280	9230	8520	5630	2880	3510	10600	8670	8000	5300	2700	3290
		W	1200	780	900	620	320	380	1120	730	850	570	300	360	1070	700	810	540	300	340

* It may not reach the above capacities in low ambient temperatures.

MUZ-HX09NL

2) HEATING

Rated
Q(Btu/h): 10900
W: 900

Indoor D.B.			78.8°F / 26.0°C						70°F / 21.1°C						59°F / 15.0°C					
Outdoor W.B.			Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.
(°F)	(°C)																			
65	18.3	Q(Btu/h)	16240	13620	12150	8190	4090	4240	16900	14170	12640	8520	4260	4410	17560	14720	13130	8850	4430	4580
		W	1590	1020	1190	800	400	410	1510	970	1130	760	380	390	1430	920	1070	720	360	370
60	15.6	Q(Btu/h)	15370	12880	11490	7750	3880	4020	16030	13440	11990	8090	4050	4190	16690	14000	12490	8430	4220	4360
		W	1580	1010	1180	800	400	410	1500	960	1120	760	380	390	1420	910	1060	720	360	370
55	12.8	Q(Btu/h)	14470	12130	10820	7300	3650	3770	15150	12700	11330	7640	3820	3950	15830	13270	11840	7980	3990	4130
		W	1560	1000	1170	790	390	400	1480	950	1110	750	370	380	1400	900	1050	710	350	360
50	10.0	Q(Btu/h)	13580	11390	10170	6850	3430	3540	14270	11970	10680	7200	3600	3720	14960	12550	11190	7550	3770	3900
		W	1540	990	1150	770	390	400	1460	940	1090	730	370	380	1380	890	1030	690	350	360
45	7.2	Q(Btu/h)	12700	10650	9490	6400	3200	3310	13390	11230	10010	6750	3370	3490	14080	11810	10530	7100	3540	3670
		W	1510	970	1130	760	380	390	1430	920	1070	720	360	370	1350	870	1010	680	340	350
43	6.1	Q(Btu/h)	12310	10320	9200	6210	3110	3210	13000	10900	9720	6560	3280	3390	13690	11480	10240	6910	3450	3570
		W	1470	950	1110	750	370	380	1400	900	1050	710	350	360	1330	850	990	670	330	340
40	4.4	Q(Btu/h)	11580	9860	8660	5850	2930	3030	12260	10440	9170	6190	3100	3210	12940	11020	9680	6530	3270	3390
		W	1440	940	1090	740	370	380	1370	890	1030	700	350	360	1300	840	970	660	330	340
35	1.7	Q(Btu/h)	10840	9080	8110	5470	2740	2830	11510	9650	8610	5810	2910	3010	12180	10220	9110	6150	3080	3190
		W	1400	910	1040	700	350	360	1330	860	990	660	330	340	1260	810	940	620	310	320
30	-1.1	Q(Btu/h)	9740	8360	7290	4920	2460	2540	10390	8920	7780	5250	2620	2710	11040	9480	8270	5580	2780	2880
		W	1380	860	1020	700	350	360	1310	820	970	660	330	340	1240	780	920	620	310	320
25	-3.9	Q(Btu/h)	8650	7630	6470	4360	2170	2250	9270	8180	6930	4670	2330	2410	9890	8730	7390	4980	2490	2570
		W	1360	810	1020	700	350	360	1290	770	970	660	330	340	1220	730	920	620	310	320
20	-6.7	Q(Btu/h)	7640	6900	5710	3850	1920	1980	8240	7440	6160	4150	2070	2140	8840	7980	6610	4450	2220	2300
		W	1330	750	990	660	340	350	1260	710	940	630	320	330	1190	670	890	600	300	310
15	-9.4	Q(Btu/h)	6620	6160	4940	3340	1670	1730	7200	6700	5380	3630	1820	1880	7780	7240	5820	3920	1970	2030
		W	1300	680	970	650	330	340	1230	650	920	620	310	320	1160	620	870	590	290	300
10	-12.2	Q(Btu/h)	6760	5390	5050	3410	1710	1760	7450	5940	5570	3760	1880	1940	8140	6490	6090	4110	2050	2120
		W	1310	610	980	660	340	350	1240	580	930	630	320	330	1170	550	880	600	300	310
5	-15.0	Q(Btu/h)	6860	4610	5130	3460	1730	1790	7700	5180	5760	3880	1940	2010	8540	5750	6390	4300	2150	2230
		W	1320	540	980	660	340	350	1250	510	930	630	320	330	1180	480	880	600	300	310
0	-17.8	Q(Btu/h)	6130	4330	4570	3090	1550	1600	7060	4990	5270	3560	1780	1840	7990	5650	5970	4030	2010	2080
		W	1330	770	990	660	340	350	1260	730	940	630	320	330	1190	690	890	600	300	310
-4	-20.0	Q(Btu/h)	5420	4050	4050	2740	1370	1420	6420	4800	4800	3240	1620	1680	7420	5550	5550	3740	1870	1940
		W	1330	990	990	660	340	350	1260	940	940	630	320	330	1190	890	890	600	300	310

* Above data is for heating operation without any frost.

MUZ-HX12NL

1) COOLING

Rated
Q(Btu/h): 12000
W: 960

Indoor W.B.			71°F / 21.7°C						67°F / 19.4°C						63°F / 17.2°C					
Outdoor D.B.			Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.
(°F)	(°C)																			
115	46.1	Q(Btu/h)	12110	11040	9590	6940	4430	3250	11460	10260	9080	6570	4200	3080	10770	9360	8530	6170	3940	2890
		W	1680	1100	1280	860	460	270	1590	1070	1210	810	430	260	1510	1020	1140	770	400	250
110	43.3	Q(Btu/h)	12640	11520	10010	7240	4630	3400	11960	10710	9480	6860	4390	3220	11240	9810	8910	6440	4120	3020
		W	1650	1080	1250	840	450	260	1560	1050	1190	790	420	250	1480	1000	1130	750	390	240
105	40.6	Q(Btu/h)	13170	12000	10430	7540	4820	3530	12460	11160	9880	7140	4570	3350	11710	10260	9290	6710	4290	3140
		W	1610	1060	1220	820	430	250	1520	1020	1160	770	410	240	1440	980	1100	730	390	230
100	37.8	Q(Btu/h)	13660	12450	10820	7830	5000	3670	12930	11580	10250	7410	4740	3480	12160	10770	9630	6960	4450	3260
		W	1570	1040	1190	800	420	250	1480	990	1130	750	400	240	1410	950	1070	710	380	230
95	35.0	Q(Btu/h)	14160	12900	11210	8110	5180	3800	13400	12000	10620	7680	4910	3600	12600	11280	9980	7210	4610	3380
		W	1510	1010	1150	780	410	240	1430	960	1090	730	390	230	1360	920	1030	690	370	220
90	32.2	Q(Btu/h)	14730	13320	11670	8440	5390	3960	13940	12480	11050	7990	5110	3750	13110	11700	10390	7510	4800	3520
		W	1460	980	1110	760	400	230	1380	930	1050	710	380	220	1310	890	990	680	360	210
85	29.4	Q(Btu/h)	15290	13740	12110	8760	5590	4100	14470	12960	11470	8290	5300	3890	13600	12120	10780	7790	4970	3650
		W	1400	940	1060	720	380	220	1320	890	1010	680	360	210	1250	850	960	650	340	200
80	26.7	Q(Btu/h)	15860	14220	12570	9080	5800	4260	15010	13440	11900	8600	5500	4040	14110	12600	11190	8080	5160	3790
		W	1330	900	1020	690	370	210	1260	850	970	650	350	200	1200	810	920	620	330	190
75	23.9	Q(Btu/h)	16420	14700	13010	9410	6010	4410	15540	13920	12320	8910	5700	4180	14610	13080	11580	8370	5350	3920
		W	1270	850	970	650	350	200	1200	810	920	610	330	190	1140	770	870	580	310	180
70	21.1	Q(Btu/h)	16990	15210	13450	9740	6210	4560	16080	14400	12740	9220	5890	4320	15120	13530	11970	8660	5530	4050
		W	1210	810	920	620	330	190	1140	770	870	580	310	180	1080	730	820	550	290	170
65	18.3	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
60	15.6	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
55	12.8	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
50	10.0	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
45	7.2	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
40	4.4	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
35	1.7	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
30	-1.1	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
25	-3.9	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
20	-6.7	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190
15	-9.4	Q(Btu/h)	14520	12990	10990	7270	3730	2080	13740	12300	10410	6880	3540	1970	12920	11560	9780	6460	3320	1850
		W	1410	940	1070	730	370	210	1330	890	1010	680	350	200	1260	840	950	640	330	190

* It may not reach the above capacities in low ambient temperatures.

MUZ-HX12NL

2) HEATING

Rated
Q(Btu/h): 12200
W: 990

Indoor D.B.			78.8°F / 26.0°C						70°F / 21.1°C						59°F / 15.0°C					
Outdoor W.B.			Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.
(°F)	(°C)																			
65	18.3	Q(Btu/h)	19360	15240	14520	9680	4830	3680	20150	15860	15110	10070	5030	3830	20940	16480	15700	10460	5230	3980
		W	2430	1130	1820	1210	600	450	2310	1070	1730	1150	570	430	2190	1010	1640	1090	540	410
60	15.6	Q(Btu/h)	18320	14420	13740	9150	4570	3480	19110	15040	14330	9550	4770	3630	19900	15660	14920	9950	4970	3780
		W	2410	1120	1800	1200	600	450	2290	1060	1710	1140	570	430	2170	1000	1620	1080	540	410
55	12.8	Q(Btu/h)	17250	13580	12940	8630	4320	3290	18060	14210	13550	9030	4520	3440	18870	14840	14160	9430	4720	3590
		W	2390	1110	1790	1190	590	450	2270	1050	1700	1130	560	430	2150	990	1610	1070	530	410
50	10.0	Q(Btu/h)	16200	12740	12150	8100	4050	3090	17020	13390	12770	8510	4260	3250	17840	14040	13390	8920	4470	3410
		W	2350	1090	1760	1180	590	450	2230	1030	1670	1120	560	430	2110	970	1580	1060	530	410
45	7.2	Q(Btu/h)	15140	11920	11360	7580	3790	2890	15970	12570	11980	7990	4000	3050	16800	13220	12600	8400	4210	3210
		W	2300	1060	1730	1150	570	430	2180	1010	1640	1090	540	410	2060	960	1550	1030	510	390
43	6.1	Q(Btu/h)	14680	11550	11000	7330	3660	2790	15500	12200	11620	7740	3870	2950	16320	12850	12240	8150	4080	3110
		W	2250	1040	1700	1140	570	430	2140	990	1610	1080	540	410	2030	940	1520	1020	510	390
40	4.4	Q(Btu/h)	13800	11050	10350	6900	3450	2630	14610	11690	10950	7300	3650	2780	15420	12330	11550	7700	3850	2930
		W	2200	1030	1650	1110	560	420	2090	980	1570	1050	530	400	1980	930	1490	990	500	380
35	1.7	Q(Btu/h)	12920	10170	9690	6460	3230	2460	13720	10800	10290	6860	3430	2610	14520	11430	10890	7260	3630	2760
		W	2140	990	1600	1070	540	410	2030	940	1520	1020	510	390	1920	890	1440	970	480	370
30	-1.1	Q(Btu/h)	11740	9360	8800	5870	2930	2230	12520	9980	9390	6260	3130	2380	13300	10600	9980	6650	3330	2530
		W	2040	950	1540	1020	520	390	1940	900	1460	970	490	370	1840	850	1380	920	460	350
25	-3.9	Q(Btu/h)	10560	8540	7920	5280	2640	2020	11320	9150	8490	5660	2830	2160	12080	9760	9060	6040	3020	2300
		W	1940	900	1440	970	480	370	1840	850	1370	920	460	350	1740	800	1300	870	440	330
20	-6.7	Q(Btu/h)	9420	7720	7060	4710	2350	1800	10160	8330	7620	5080	2540	1940	10900	8940	8180	5450	2730	2080
		W	1850	820	1390	930	460	360	1760	780	1320	880	440	340	1670	740	1250	830	420	320
15	-9.4	Q(Btu/h)	8270	6890	6200	4130	2070	1570	9000	7500	6750	4500	2250	1710	9730	8110	7300	4870	2430	1850
		W	1760	750	1320	870	430	330	1670	710	1250	830	410	310	1580	670	1180	790	390	290
10	-12.2	Q(Btu/h)	7980	6030	5990	3990	2000	1520	8800	6650	6600	4400	2200	1680	9620	7270	7210	4810	2400	1840
		W	1660	670	1240	830	420	320	1580	640	1180	790	400	300	1500	610	1120	750	380	280
5	-15.0	Q(Btu/h)	7660	5170	5740	3830	1910	1460	8600	5800	6450	4300	2150	1640	9540	6430	7160	4770	2390	1820
		W	1560	590	1170	780	390	290	1480	560	1110	740	370	280	1400	530	1050	700	350	270
0	-17.8	Q(Btu/h)	7330	4570	5500	3670	1830	1400	8450	5270	6340	4230	2110	1610	9570	5970	7180	4790	2390	1820
		W	1490	700	1120	750	370	280	1410	660	1060	710	350	270	1330	620	1000	670	330	260
-4	-20.0	Q(Btu/h)	7010	4000	5250	3500	1760	1330	8300	4740	6220	4150	2080	1580	9590	5480	7190	4800	2400	1830
		W	1400	800	1050	700	350	260	1330	760	1000	660	330	250	1260	720	950	620	310	240

* Above data is for heating operation without any frost.

MUZ-HX18NL

1) COOLING

Rated
Q(Btu/h): 17200
W: 1370

Indoor W.B.			71°F / 21.7°C						67°F / 19.4°C						63°F / 17.2°C					
Outdoor D.B.			Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.
(°F)	(°C)																			
115	46.1	Q(Btu/h)	16250	15820	12630	8860	5240	5240	15390	14710	11960	8390	4960	4960	14460	13420	11240	7880	4660	4660
		W	2740	1580	1980	1180	420	420	2590	1520	1860	1110	390	390	2460	1450	1770	1060	380	380
110	43.3	Q(Btu/h)	16970	16510	13190	9250	5470	5470	16070	15360	12490	8760	5180	5180	15100	14070	11740	8230	4860	4860
		W	2670	1550	1940	1150	410	410	2530	1490	1820	1090	380	380	2400	1430	1730	1040	370	370
105	40.6	Q(Btu/h)	17680	17200	13740	9630	5690	5690	16740	16000	13010	9120	5390	5390	15730	14710	12220	8570	5060	5060
		W	2610	1510	1890	1120	400	400	2470	1450	1780	1060	370	370	2340	1400	1690	1010	360	360
100	37.8	Q(Btu/h)	18340	17850	14260	10000	5920	5920	17370	16600	13500	9470	5600	5600	16320	15440	12680	8900	5260	5260
		W	2530	1480	1840	1090	380	380	2400	1410	1730	1030	360	360	2280	1360	1640	980	350	350
95	35.0	Q(Btu/h)	19010	18490	14770	10360	6130	6130	18000	17200	13990	9810	5800	5800	16910	16170	13150	9220	5450	5450
		W	2460	1440	1790	1060	370	370	2330	1370	1680	1000	350	350	2210	1310	1600	950	340	340
90	32.2	Q(Btu/h)	19770	19090	15370	10770	6370	6370	18720	17890	14550	10200	6030	6030	17590	16770	13670	9580	5660	5660
		W	2380	1390	1720	1030	360	360	2250	1320	1620	970	340	340	2140	1260	1540	920	330	330
85	29.4	Q(Btu/h)	20530	19690	15960	11190	6610	6610	19440	18580	15110	10590	6260	6260	18270	17370	14200	9950	5880	5880
		W	2280	1340	1650	990	340	340	2160	1270	1550	930	320	320	2050	1210	1470	890	310	310
80	26.7	Q(Btu/h)	21290	20380	16550	11610	6870	6870	20160	19270	15670	10990	6500	6500	18940	18060	14720	10320	6100	6100
		W	2180	1280	1570	940	330	330	2060	1210	1480	890	310	310	1950	1160	1410	850	300	300
75	23.9	Q(Btu/h)	22050	21070	17140	12020	7110	7110	20880	19950	16230	11380	6730	6730	19620	18750	15250	10690	6320	6320
		W	2070	1220	1500	890	310	310	1960	1150	1410	840	290	290	1860	1100	1340	800	280	280
70	21.1	Q(Btu/h)	22810	21800	17730	12430	7350	7350	21600	20640	16790	11770	6960	6960	20300	19400	15780	11060	6540	6540
		W	1960	1160	1430	850	300	300	1860	1090	1340	800	280	280	1770	1040	1270	760	270	270
65	18.3	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
60	15.6	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
55	12.8	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
50	10.0	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
45	7.2	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
40	4.4	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
35	1.7	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
30	-1.1	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
25	-3.9	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
20	-6.7	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620
15	-9.4	Q(Btu/h)	19480	18620	14710	9760	4980	4980	18450	17630	13930	9240	4720	4720	17340	16570	13090	8680	4440	4440
		W	2620	1550	2010	1330	690	690	2490	1460	1880	1250	640	640	2370	1390	1780	1190	620	620

* It may not reach the above capacities in low ambient temperatures.

MUZ-HX18NL

2) HEATING

Rated
Q(Btu/h): 18000
W: 1590

Indoor D.B.			78.8°F / 26.0°C						70°F / 21.1°C						59°F / 15.0°C					
Outdoor W.B.			Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.
(°F)	(°C)																			
65	18.3	Q(Btu/h)	25980	22480	19610	13000	6620	5910	27040	23400	20410	13530	6890	6150	28100	24320	21210	14060	7160	6390
		W	2990	1810	2270	1510	770	680	2840	1720	2150	1430	730	650	2690	1630	2030	1350	690	620
60	15.6	Q(Btu/h)	24580	21270	18550	12300	6260	5590	25640	22190	19350	12830	6530	5830	26700	23110	20150	13360	6800	6070
		W	2970	1800	2240	1490	760	670	2820	1710	2130	1410	720	640	2670	1620	2020	1330	680	610
55	12.8	Q(Btu/h)	23150	20030	17470	11580	5890	5260	24230	20970	18290	12120	6170	5510	25310	21910	19110	12660	6450	5760
		W	2940	1780	2210	1460	750	660	2790	1690	2100	1390	710	630	2640	1600	1990	1320	670	600
50	10.0	Q(Btu/h)	21730	18810	16400	10870	5540	4950	22830	19760	17230	11420	5820	5200	23930	20710	18060	11970	6100	5450
		W	2890	1750	2190	1450	740	660	2740	1660	2080	1380	700	630	2590	1570	1970	1310	660	600
45	7.2	Q(Btu/h)	20310	17580	15330	10170	5180	4630	21420	18540	16170	10720	5460	4880	22530	19500	17010	11270	5740	5130
		W	2820	1710	2130	1410	720	640	2680	1620	2020	1340	680	610	2540	1530	1910	1270	640	580
43	6.1	Q(Btu/h)	19700	17040	14860	9850	5010	4470	20800	18000	15690	10400	5290	4720	21900	18960	16520	10950	5570	4970
		W	2770	1680	2100	1390	710	630	2630	1590	1990	1320	670	600	2490	1500	1880	1250	630	570
40	4.4	Q(Btu/h)	18530	16290	13980	9270	4720	4210	19610	17240	14800	9810	5000	4460	20690	18190	15620	10350	5280	4710
		W	2710	1650	2030	1350	680	610	2570	1570	1930	1280	650	580	2430	1490	1830	1210	620	550
35	1.7	Q(Btu/h)	17330	15000	13080	8670	4420	3940	18410	15930	13890	9210	4690	4190	19490	16860	14700	9750	4960	4440
		W	2630	1590	1990	1320	670	600	2500	1510	1890	1250	640	570	2370	1430	1790	1180	610	540
30	-1.1	Q(Btu/h)	16630	13800	12550	8330	4240	3790	17740	14720	13390	8880	4520	4040	18850	15640	14230	9430	4800	4290
		W	2490	1520	1860	1240	630	570	2360	1440	1770	1180	600	540	2230	1360	1680	1120	570	510
25	-3.9	Q(Btu/h)	15930	12600	12010	7960	4050	3620	17070	13500	12870	8530	4340	3880	18210	14400	13730	9100	4630	4140
		W	2330	1430	1760	1170	600	540	2210	1360	1670	1110	570	510	2090	1290	1580	1050	540	480
20	-6.7	Q(Btu/h)	14870	11390	11230	7440	3790	3380	16040	12290	12110	8030	4090	3650	17210	13190	12990	8620	4390	3920
		W	2210	1320	1660	1110	560	500	2100	1250	1580	1050	530	470	1990	1180	1500	990	500	440
15	-9.4	Q(Btu/h)	13780	10170	10400	6890	3510	3130	15000	11070	11320	7500	3820	3410	16220	11970	12240	8110	4130	3690
		W	2090	1200	1570	1030	530	470	1980	1140	1490	980	500	450	1870	1080	1410	930	470	430
10	-12.2	Q(Btu/h)	12520	8900	9440	6260	3180	2840	13800	9810	10410	6900	3510	3130	15080	10720	11380	7540	3840	3420
		W	2130	1070	1610	1070	550	480	2020	1020	1530	1020	520	460	1910	970	1450	970	490	440
5	-15.0	Q(Btu/h)	11220	7610	8470	5610	2860	2560	12600	8550	9510	6300	3210	2870	13980	9490	10550	6990	3560	3180
		W	2160	950	1630	1090	550	480	2050	900	1550	1030	520	460	1940	850	1470	970	490	440
0	-17.8	Q(Btu/h)	10160	6740	7670	5090	2590	2310	11710	7770	8840	5860	2980	2660	13260	8800	10010	6630	3370	3010
		W	2190	1190	1650	1100	560	500	2080	1130	1570	1040	530	470	1970	1070	1490	980	500	440
-4	-20.0	Q(Btu/h)	9130	5890	6890	4570	2330	2080	10810	6980	8160	5410	2760	2460	12490	8070	9430	6250	3190	2840
		W	2210	1430	1660	1110	560	500	2100	1360	1580	1050	530	470	1990	1290	1500	990	500	440

* Above data is for heating operation without any frost.

MUZ-HX24NL

1) COOLING

Rated
Q(Btu/h): 22400
W: 1910

Indoor W.B.			71°F / 21.7°C						67°F / 19.4°C						63°F / 17.2°C					
Outdoor D.B.			Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.
(°F)	(°C)																			
115	46.1	Q(Btu/h)	20230	20610	15230	10240	4980	5240	19150	19150	14420	9690	4710	4960	18000	17470	13550	9110	4430	4660
		W	2590	2200	1870	1170	420	450	2440	2120	1760	1100	390	420	2320	2020	1670	1050	380	390
110	43.3	Q(Btu/h)	21110	21510	15910	10690	5200	5470	19990	19990	15060	10120	4920	5180	18790	18310	14150	9510	4630	4860
		W	2530	2160	1830	1150	410	440	2390	2070	1730	1080	380	410	2270	1990	1640	1030	370	380
105	40.6	Q(Btu/h)	22000	22400	16570	11130	5410	5690	20830	20830	15690	10540	5120	5390	19580	19150	14740	9910	4820	5060
		W	2470	2110	1790	1110	400	430	2330	2020	1690	1050	370	400	2220	1950	1600	1000	360	380
100	37.8	Q(Btu/h)	22830	23240	17200	11560	5620	5920	21620	21620	16280	10940	5320	5600	20320	20110	15300	10280	5000	5260
		W	2400	2060	1740	1080	380	410	2270	1970	1640	1020	360	390	2160	1890	1550	970	350	370
95	35.0	Q(Btu/h)	23660	24080	17820	11970	5820	6130	22400	22400	16870	11330	5510	5800	21050	21060	15850	10650	5180	5450
		W	2330	2010	1680	1050	370	400	2200	1910	1590	990	350	380	2090	1820	1510	940	340	360
90	32.2	Q(Btu/h)	24610	24870	18540	12450	6050	6370	23300	23300	17550	11790	5730	6030	21900	21840	16490	11080	5390	5660
		W	2250	1940	1620	1020	360	390	2120	1840	1530	960	340	370	2020	1760	1450	910	330	350
85	29.4	Q(Btu/h)	25550	25650	19240	12930	6290	6610	24190	24190	18220	12240	5950	6260	22740	22620	17120	11500	5600	5880
		W	2160	1860	1560	980	340	370	2040	1770	1470	920	320	350	1940	1690	1390	880	310	330
80	26.7	Q(Btu/h)	26500	26550	19960	13400	6520	6870	25090	25090	18900	12690	6170	6500	23580	23520	17760	11930	5800	6100
		W	2070	1780	1490	930	330	360	1950	1690	1410	880	310	340	1860	1610	1340	840	300	320
75	23.9	Q(Btu/h)	27440	27440	20670	13880	6750	7110	25980	25980	19570	13140	6390	6730	24420	24420	18390	12350	6010	6320
		W	1960	1700	1420	880	310	340	1850	1600	1340	830	290	320	1760	1530	1270	790	280	300
70	21.1	Q(Btu/h)	28390	28390	21380	14370	6980	7350	26880	26880	20240	13600	6610	6960	25270	25270	19020	12780	6220	6540
		W	1850	1620	1350	840	300	320	1750	1520	1270	790	280	300	1660	1450	1200	750	270	280
65	18.3	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
60	15.6	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
55	12.8	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
50	10.0	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
45	7.2	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
40	4.4	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
35	1.7	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
30	-1.1	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
25	-3.9	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
20	-6.7	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520
15	-9.4	Q(Btu/h)	24250	24250	18260	12280	5990	6300	22960	22960	17290	11620	5670	5970	21580	21580	16250	10920	5340	5610
		W	2240	1960	1700	1150	570	600	2120	1840	1600	1080	530	560	2010	1760	1510	1030	510	520

* It may not reach the above capacities in low ambient temperatures.

MUZ-HX24NL

2) HEATING

Rated
Q(Btu/h): 26000
W: 2500

Indoor D.B.			78.8°F / 26.0°C						70°F / 21.1°C						59°F / 15.0°C					
Outdoor W.B.			Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.	Max.	Rated	75%	50%	25%	Min.
(°F)	(°C)																			
65	18.3	Q(Btu/h)	32480	32480	24360	16240	8120	7730	33800	33800	25350	16900	8450	8050	35120	35120	26340	17560	8780	8370
		W	2840	2840	2130	1410	710	670	2700	2700	2020	1340	670	640	2560	2560	1910	1270	630	610
60	15.6	Q(Btu/h)	30720	30720	23040	15370	7690	7320	32050	32050	24040	16030	8020	7640	33380	33380	25040	16690	8350	7960
		W	2820	2820	2110	1410	710	670	2680	2680	2000	1340	670	640	2540	2540	1890	1270	630	610
55	12.8	Q(Btu/h)	28940	28940	21710	14470	7230	6890	30290	30290	22720	15150	7570	7210	31640	31640	23730	15830	7910	7530
		W	2790	2790	2100	1400	710	670	2650	2650	1990	1330	670	640	2510	2510	1880	1260	630	610
50	10.0	Q(Btu/h)	27170	27170	20370	13570	6790	6460	28540	28540	21400	14260	7130	6790	29910	29910	22430	14950	7470	7120
		W	2740	2740	2050	1370	680	650	2600	2600	1950	1300	650	620	2460	2460	1850	1230	620	590
45	7.2	Q(Btu/h)	25400	25400	19040	12700	6350	6050	26780	26780	20080	13390	6700	6380	28160	28160	21120	14080	7050	6710
		W	2690	2690	2020	1350	670	640	2550	2550	1920	1280	640	610	2410	2410	1820	1210	610	580
43	6.1	Q(Btu/h)	24620	24620	18460	12300	6150	5860	26000	26000	19490	12990	6500	6190	27380	27380	20520	13680	6850	6520
		W	2630	2630	1970	1310	650	620	2500	2500	1870	1240	620	590	2370	2370	1770	1170	590	560
40	4.4	Q(Btu/h)	23160	23530	17370	11580	5790	5520	24510	24900	18380	12260	6130	5840	25860	26270	19390	12940	6470	6160
		W	2570	2600	1930	1290	640	610	2440	2470	1830	1220	610	580	2310	2340	1730	1150	580	550
35	1.7	Q(Btu/h)	21660	21660	16240	10830	5410	5160	23010	23010	17250	11500	5750	5480	24360	24360	18260	12170	6090	5800
		W	2510	2510	1890	1250	620	590	2380	2380	1790	1190	590	560	2250	2250	1690	1130	560	530
30	-1.1	Q(Btu/h)	20720	19930	15550	10360	5190	4940	22100	21260	16580	11050	5530	5270	23480	22590	17610	11740	5870	5600
		W	2760	2380	2080	1380	680	650	2620	2260	1970	1310	650	620	2480	2140	1860	1240	620	590
25	-3.9	Q(Btu/h)	19760	18200	14820	9870	4940	4700	21180	19500	15880	10580	5290	5040	22600	20800	16940	11290	5640	5380
		W	3010	2250	2250	1510	760	730	2860	2140	2140	1430	720	690	2710	2030	2030	1350	680	650
20	-6.7	Q(Btu/h)	18390	16460	13800	9200	4600	4380	19840	17750	14880	9920	4960	4720	21290	19040	15960	10640	5320	5060
		W	3120	2080	2340	1560	780	740	2960	1970	2220	1480	740	700	2800	1860	2100	1400	700	660
15	-9.4	Q(Btu/h)	17000	14690	12750	8510	4250	4050	18500	15990	13880	9260	4630	4410	20000	17290	15010	10010	5010	4770
		W	3220	1900	2410	1610	810	770	3060	1800	2290	1530	770	730	2900	1700	2170	1450	730	690
10	-12.2	Q(Btu/h)	16640	12850	12480	8320	4150	3950	18350	14170	13760	9170	4580	4360	20060	15490	15040	10020	5010	4770
		W	3170	1700	2380	1580	790	750	3010	1610	2260	1500	750	710	2850	1520	2140	1420	710	670
5	-15.0	Q(Btu/h)	16210	11000	12160	8100	4050	3860	18200	12350	13650	9100	4550	4330	20190	13700	15140	10100	5050	4800
		W	3120	1490	2340	1560	780	740	2960	1410	2220	1480	740	700	2800	1330	2100	1400	700	660
0	-17.8	Q(Btu/h)	15700	13170	11780	7860	3930	3740	18090	15170	13570	9050	4530	4310	20480	17170	15360	10240	5130	4880
		W	3140	2330	2360	1580	790	750	2980	2210	2240	1500	750	710	2820	2090	2120	1420	710	670
-4	-20.0	Q(Btu/h)	15180	15180	11380	7590	3800	3620	17980	17980	13480	8990	4500	4290	20780	20780	15580	10390	5200	4960
		W	3160	3160	2370	1580	790	750	3000	3000	2250	1500	750	710	2840	2840	2130	1420	710	670

* Above data is for heating operation without any frost.

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