

TECHNICAL & SERVICE MANUAL

<Outdoor unit>

[Model Name]

MXZ-SM36NAM

MXZ-SM48NAM

MXZ-SM60NAM

MXZ-SM36NAMHZ

MXZ-SM42NAMHZ

MXZ-SM48NAMHZ

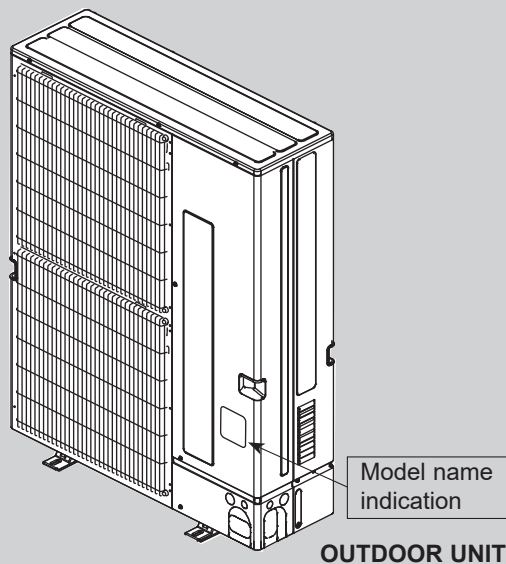
[Service Ref.]

MXZ-SM36NAM-U1
MXZ-SM48NAM-U1
MXZ-SM60NAM-U1
MXZ-SM36NAMHZ-U1
MXZ-SM42NAMHZ-U1
MXZ-SM48NAMHZ-U1

Revision:

- Some descriptions have been revised in REVISED EDITION-B.

OCH789A is void.



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PARTS CATALOG (OCB789)

1-1. ALWAYS OBSERVE FOR SAFETY

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

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.
- Discharge the condenser 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 refrigerating 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.
- 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.

1-2. CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R410A

Use new refrigerant pipes.

Avoid using thin pipes.

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

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

Follow the instructions below to prevent abrasive components contained in sandpaper and cutting tools from entering the refrigerant circuit because those components can cause failures of the compressor and valves.

- To deburr pipes, use a reamer or other deburring tools, not sandpaper.
- To cut pipes, use a pipe cutter, not a grinder or other tools that use abrasive materials.
- When cutting or deburring pipes, do not allow cutting chips or other foreign matters to enter the pipes.
- If cutting chips or other foreign matters enter pipes, wipe them off the inside of the pipes.

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

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

Use a vacuum pump with a reverse flow check valve.

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

Use the following tools specifically designed for use with R410A refrigerant.

The following tools are necessary to use R410A refrigerant.

Tools for R410A	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

Handle tools with care.

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

Do not use a charging cylinder.

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

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

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

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

Charge refrigerant from liquid phase of gas cylinder.

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

Do not use refrigerant other than R410A.

If other refrigerant (R22, etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil, etc.

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.

Do not pump down the system when a gas leak has been detected.

The intake of air or other gases causes abnormally high pressure in the refrigeration cycle, which may cause explosion or injury.

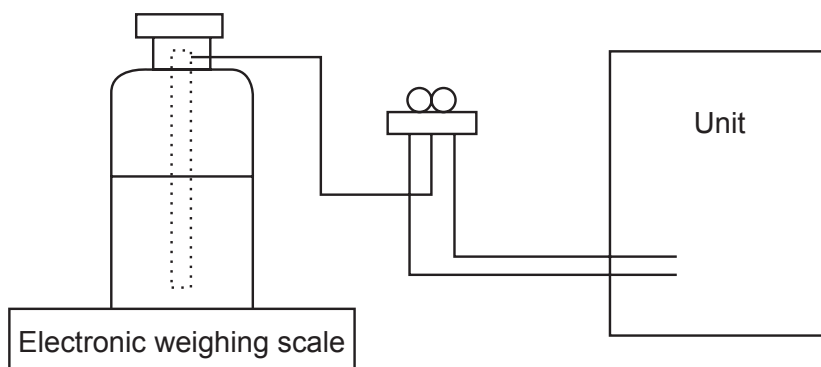
[1] Cautions for service

- (1) Perform service after recovering the refrigerant left in unit completely.
- (2) Do not release refrigerant in the air.
- (3) After completing service, charge the cycle with specified amount of refrigerant.
- (4) If moisture or foreign matter might have entered the refrigerant piping during service, ensure to remove them.

[2] Additional refrigerant charge

When charging directly from cylinder

- (1) Check that cylinder for R410A on the market is a syphon type.
- (2) Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



[3] Service tools

Use the below service tools as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
1	Gauge manifold	· Only for R410A
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 768.7 PSIG [5.3 MPa.G] or over.
2	Charge hose	· Only for R410A
		· Use pressure performance of 738.2 PSIG [5.09MPa.G] or over.
3	Electronic weighing scale	—
4	Gas leak detector	· Use the detector for R134a, R407C or R410A.
5	Adaptor for reverse flow check	· Attach on vacuum pump.
6	Refrigerant charge base	—
7	Refrigerant cylinder	· Only for R410A · Top of cylinder (Pink)
		· Cylinder with syphon
8	Refrigerant recovery equipment	—

Cautions for refrigerant piping work

New refrigerant R410A is adopted for replacement inverter series. Although the refrigerant piping work for R410A is same as for R22, exclusive tools are necessary so as not to mix with different kind of refrigerant. Furthermore as the working pressure of R410A is 1.6 times higher than that of R22, their sizes of flared sections and flare nuts are different.

1 Thickness of pipes

Because the working pressure of R410A is higher compared to R22, be sure to use refrigerant piping with thickness shown below. (Never use pipes of 7/256 in [0.7 mm] or below.)

Diagram below: Piping diameter and thickness

Nominal dimensions (in)	Outside diameter (mm)	Thickness : in [mm]	
		R410A	R22
1/4	6.35	1/32 [0.8]	1/32 [0.8]
3/8	9.52	1/32 [0.8]	1/32 [0.8]
1/2	12.70	1/32 [0.8]	1/32 [0.8]
5/8	15.88	5/128 [1.0]	5/128 [1.0]
3/4	19.05	5/128 [1.0]*	5/128 [1.0]

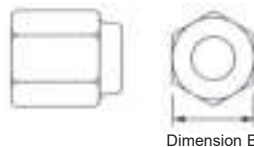
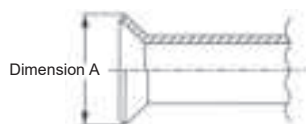
*Use 1/2 H or H pipes.

2 Dimensions of flare cutting and flare nut

The component molecules in HFC refrigerant are smaller compared to conventional refrigerants. In addition to that, R410A is a refrigerant, which has higher risk of leakage because its working pressure is higher than that of other refrigerants.

Therefore, to enhance airtightness and strength, flare cutting dimension of copper pipe for R410A has been specified separately from the dimensions for other refrigerants as shown below. The dimension B of flare nut for R410A also has partly been changed to increase strength as shown below. Set copper pipe correctly referring to copper pipe flaring dimensions for R410A below. For 1/2 and 5/8 inch pipes, the dimension B changes.

Use torque wrench corresponding to each dimension.



Flare cutting dimensions

Unit : in [mm]

Nominal dimensions (in)	Outside diameter (mm)	Dimension A (3/4)	
		R410A	R22
1/4	6.35	11/32-23/64 [9.1]	9.0
3/8	9.52	1/2-33/64 [13.2]	13.0
1/2	12.70	41/64-21/32 [16.6]	16.2
5/8	15.88	49/64-25/32 [19.7]	19.4
3/4	19.05	—	23.3

Flare nut dimensions

Unit: in [mm]

Nominal dimensions (in)	Outside diameter (mm)	Dimension B	
		R410A	R22
1/4	6.35	43/64 [17.0]	17.0
3/8	9.52	7/8 [22.0]	22.0
1/2	12.70	1-3/64 [26.0]	24.0
5/8	15.88	1-9/64 [29.0]	27.0
3/4	19.05	—	36.0

3 Tools for R410A (The following table shows whether conventional tools can be used or not.)

Tools and materials	Use	R410A tools	Can R22 tools be used?	Can R407C tools be used?
Gauge manifold	Air purge, refrigerant charge	Tool exclusive for R410A	×	×
Charge hose	and operation check	Tool exclusive for R410A	×	×
Gas leak detector	Gas leak check	Tool for HFC refrigerant	×	○
Refrigerant recovery equipment	Refrigerant recovery	Tool exclusive for R410A	×	×
Refrigerant cylinder	Refrigerant charge	Tool exclusive for R410A	×	×
Applied oil	Apply to flared section	Ester oil, ether oil and alkylbenzene oil (minimum amount)	×	Ester oil, ether oil: ○ Alkylbenzene oil: minimum amount
Safety charger	Prevent compressor malfunction when charging refrigerant by spraying liquid refrigerant	Tool exclusive for R410A	×	×
Charge valve	Prevent gas from blowing out when detaching charge hose	Tool exclusive for R410A	×	×
Vacuum pump	Vacuum drying and air purge	Tools for other refrigerants can be used if equipped with adpoter for reverse flow check	△ (Usable if equipped with adpoter for reverse flow)	△ (Usable if equipped with adpoter for reverse flow)
Flare tool	Flaring work of piping	Tools for other refrigerants can be used by adjusting flaring dimension	△ (Usable by adjusting flaring dimension)	△ (Usable by adjusting flaring dimension)
Bender	Bend the pipes	Tools for other refrigerants can be used	○	○
Pipe cutter	Cut the pipes	Tools for other refrigerants can be used	○	○
Welder and nitrogen gas cylinder	Weld the pipes	Tools for other refrigerants can be used	○	○
Refrigerant charging scale	Refrigerant charge	Tools for other refrigerants can be used	○	○
Vacuum gauge or thermistor vacuum gauge and vacuum valve	Check the degree of vacuum. (Vacuum valve prevents back flow of oil and refrigerant to thermistor vacuum gauge)	Tools for other refrigerants can be used	○	○
Charging cylinder	Refrigerant charge	Tool exclusive for R410A	×	—

× : Prepare a new tool. (Use the new tool as the tool exclusive for R410A.)

△ : Tools for other refrigerants can be used under certain conditions.

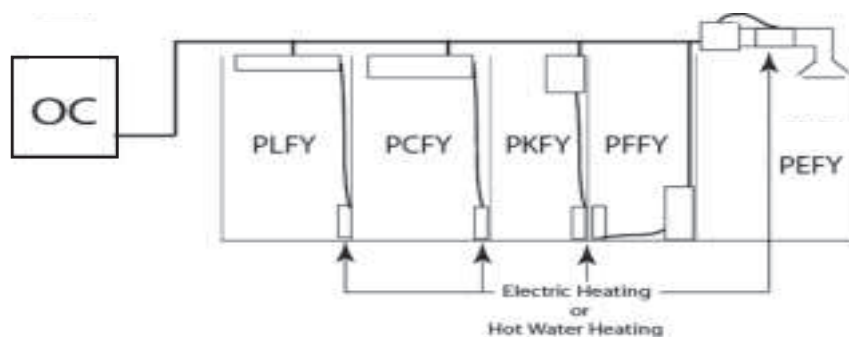
○ : Tools for other refrigerants can be used.

2-1. Auxiliary HEATING ON/OFF CONTROL SET-UP

(1) Auxiliary heating operation controls another heat source that depends on the main system's operations, which means the interlock operation shown in "b)" will be possible.

a) Indoor unit must be R410A UL model for this function to operate.

b) Different Indoor unit applications that can be applied:



(2) **Outdoor unit DIPSW5-4 for auxiliary heating control:**

Set DIPSW5-4 when power is turned off at unit.

OFF: Disable auxiliary Heating Function (Initial setting)

ON : Enable auxiliary Heating Function

(3) **Determine required indoor fan speed during defrost mode:**

To set the fan speed, see the chapter referring to heater control in the indoor unit's Technical & Service Manual.

(4) Determine fan speed setting during indoor thermo-OFF conditions:

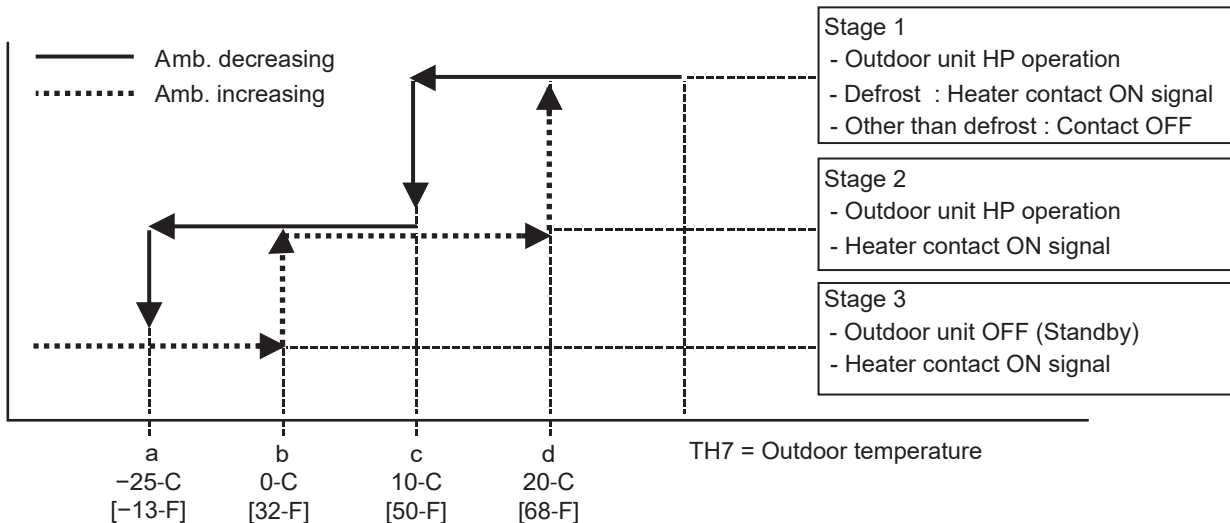
- a) These settings are done within Indoor DIPSW1-7 and DIPSW1-8, see chart below for options.
b) Recommended SW1-7 OFF and SW1-8 ON will determine airflow based on "Setting on the remote controller".

Auxiliary heating signal		Fan speed setting	Fan speed setting
Thermo condition		OFF	ON
SW1-7	SW1-8		
OFF	OFF	Very low	Setting on remote controller
ON	OFF	Low	
OFF	ON	Setting on remote controller	
ON	ON	Stopped	

(5) Setting outdoor unit and auxiliary heat switch over temperatures

When the DIPSW 5-4 is set to "ON", the outdoor unit and the contact output operates as shown below.

- a) Outdoor default setting and operations are shown below:



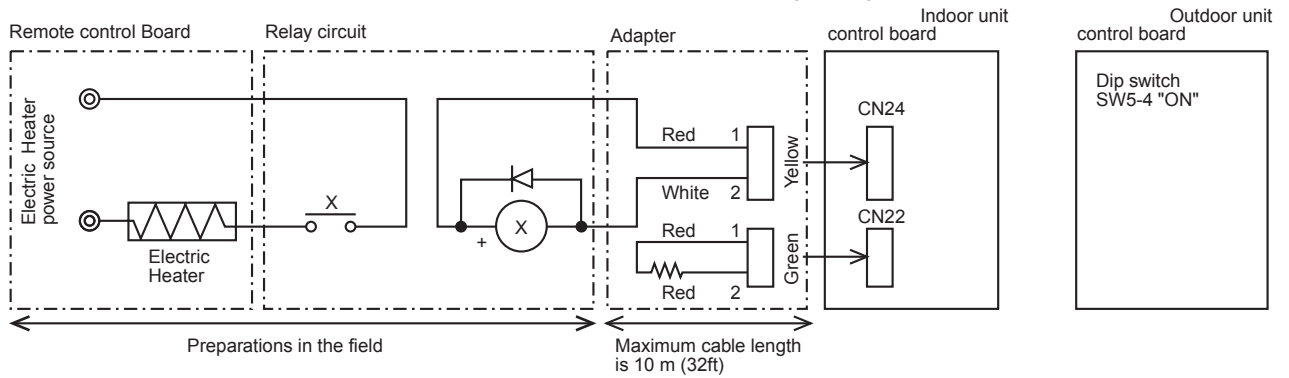
When the set temperature ranges overlap, the previously set pattern (1, 2 or 3) has a priority.
The stage 1 has the highest priority, 2 the second and then 3.

- b) Based on above chart listed the sequence of operation on "On ambient decrease"
- Stage 1: (TH7 = > 50°F [10°C]): the outdoor unit runs in HP mode.
 - Stage 2: (TH7 = 50 to -13°F [10 to -25°C]): the outdoor unit runs in HP mode with auxiliary heating.
 - Stage 3: (TH7 = < -13°F [-25°C]): Auxiliary heating only (Outdoor unit is OFF).
- c) Based on above chart listed the sequence of operation on "On ambient increase"
- Stage 3: (TH7 = < 32°F [0°C]): Auxiliary heating only (Outdoor unit is OFF).
 - Stage 2: (TH7 = > 32 to 68°F [0 to 20°C]): Auxiliary heating with outdoor unit in HP mode.
 - Stage 1: (TH7 = > 68°F [20°C]): Outdoor unit in HP mode only.

(6) Locally procured wiring

A basic connection method is shown.

(i.e. interlocked operation with the electric heater with the fan speed setting on high)



For relay X use the specifications given below operation coil

Rated voltage: 12 V DC

Power consumption: 0.9W or less

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

The length of the electrical wiring for the PAC-YU24HT is 2 meters (6-1/2 ft)

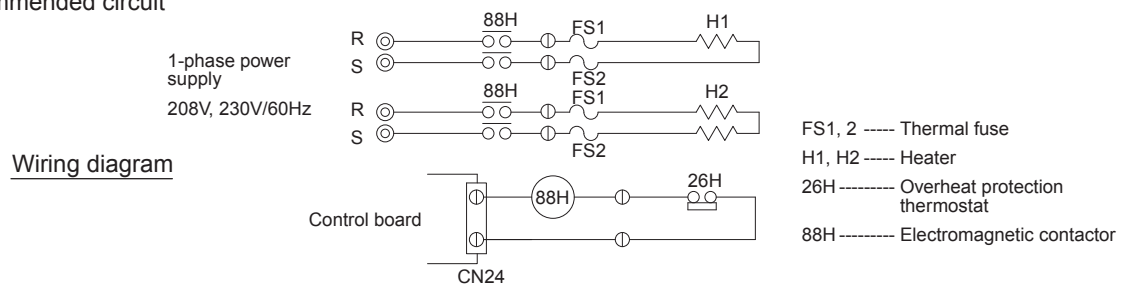
To extend this length, use sheathed 2-core cable.

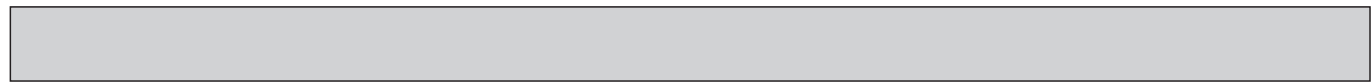
Control cable type: CVV, CVS, CPEV, or equivalent.

Cable size: 0.5 mm² to 1.25 mm² (AWG22 to AWG16)

Do not extend the cable more than 10 meters (32 ft).

Recommended circuit





2-2. SYSTEM CONSTRUCTION

Outdoor unit		4HP	4.5HP	5HP	7HP
		MXZ-SM36NAM-U1 MXZ-SM36NAMHZ-U1	MXZ-SM42NAMHZ-U1	MXZ-SM48NAM-U1 MXZ-SM48NAMHZ-U1	MXZ-SM60NAM-U1
Applicable indoor unit	Capacity	Type 04 to Type 36	Type 04 to Type 54		Type 04 to Type 72
	Max. No. of units	11 units	12 units		
		Total system capacity range	50 to 130% of outdoor unit capacity		

	CMY-Y62-G-E	CMY-Y64-G-E	CMY-Y68-G-E
Branching pipe components	Branch header (2 branches)	Branch header (4 branches)	Branch header (8 branches)

Model Capacity	Cassette Ceiling				Ceiling Concealed				Wall Mounted				Ceiling Suspended	Floor standing		Multi-position air handling unit
	4-way flow	2 by 2		1-way flow										Exposed	Concealed	
	PLFY-EP	PLFY-P	PLFY-P	PMFY-P	PEFY-P				PKFY-P				PCFY-P	PFFY-P	PFFY-P	PVFY-P
	NEMU-E	NCMU-E	NFMU-E	NBMU-E	NMAU	NMSU-E	NMHU-E	NMHSU-E	NBMU-E	NHMU-E	NKMU-E	NLMU-E	NKMU-E	NEMU-E	NRMU-E	NAMU-E
04	—	—	—	—	—	—	—	—	—	—	—	○	—	—	—	—
05	—	—	○	—	—	—	—	—	—	—	—	—	—	—	—	—
06	—	—	—	○	○	○	—	—	○	—	—	○	—	○	○	—
08	—	○	○	○	○	○	—	—	—	○	—	○	—	○	○	○
12	○	○	○	○	○	○	—	—	—	○	—	○	—	○	○	○
15	○	○	○	○	○	○	○	—	—	○	—	○	○	○	○	—
18	○	—	○	—	○	○	○	—	—	○	—	○	—	○	○	○
24	○	—	—	—	○	○	○	—	—	—	○	—	○	○	○	○
27	—	—	—	—	○	—	○	—	—	—	—	—	—	—	—	—
30	○	—	—	—	○	—	○	—	—	—	○	—	○	—	—	○
36	○	—	—	—	○	—	○	—	—	—	—	—	○	—	—	○
48	○	—	—	—	○	—	○	—	—	—	—	—	—	—	—	○
54	—	—	—	—	○	—	○	—	—	—	—	—	—	—	—	○
72	—	—	—	—	—	—	—	○*	—	—	—	—	—	—	—	—

* Only MXZ-SM60 is connectable.

—: Not connectable
○: Connectable

Remote controller	Name	M-NET remote controller	MA remote controller
	Model number	PAR-F27MEA-E PAR-U01MEDU	PAR-21MAA, PAR-40MAA
	Functions	• A handy remote controller for use in conjunction with the Melans centralized management system. • Addresses must be set.	• Addresses setting is not necessary.

Outdoor unit			MXZ-SM36NAM-U1 MXZ-SM36NAMHZ-U1	MXZ-SM42NAMHZ-U1	MXZ-SM48NAM-U1 MXZ-SM48NAMHZ-U1	MXZ-SM60NAM-U1
			4HP	4.5HP	5HP	7HP
Rated capacity (kBtu/h)	Cooling	Heating	36	42	48	60
		Refrigerant	42	48	54	66
	R410A					
Connectable indoor unit	Capacity class		Type 06 to Type 36			
			Caution: Never connect the indoor unit which rated capacity exceeds 36 kBtu/h (Type 36).			
	Max. No. of units		4 units	5 units	8 units	8 units
Connectable branch box	Total system capacity range		33 to 130% of outdoor unit capacity (12 to 46.8 kBtu/h)	29 to 130% of outdoor unit capacity (12 to 54.6 kBtu/h)	25 to 130% of outdoor unit capacity (12 to 62.4 kBtu/h)	20 to 130% of outdoor unit capacity (12 to 78 kBtu/h)
	Number of units		1 or 2 units			

Connectable indoor unit lineups (Heat pump inverter type)								
Model type	Model name	Capacity class [kBtu/h]						
		06	09	12	15	18	24	30
Deluxe Wall-mounted	MSZ-FH06/09/12/15NA, 18NA2 MSZ-FS06/09/12/15/18NA	●	●	●	●	●		
Designer	MSZ-EF09/12/15/18NA(W/B/S)		●	●	●	●		
Standard Wall-mounted	MSZ-GL06/09/12/15/18/24NA	●	●	●	●	●	●	
Low static ducted ^{*2} ^{*3}	SEZ-KD09/12/15/18NA		●	●	●	●		
P-series mid static ducted ^{*2} ^{*3}	PEAD-A09/12/15/18/24/30/36AA7		●	●	●	●	●	●
1-way cassette	MLZ-KP09/12/18NA(2)		●	●	●	●		
P-series 22*22 4-way cassette	SLZ-KF09/12/15NA		●	●	●	●		
P-series 33*33 4-way cassette	PLA-A12/18/24/30/36EA7 ^{*4}			●		●	●	●
Floor standing	MFZ-KJ09/12/15/18NA		●	●	●	●		
Standard Multi-position air handler ^{*1}	SVZ-KP12/18/24/30/36NA			●		●	●	●

Branch box	PAC-MKA52BC	PAC-MKA32BC
Number of branches (Indoor unit that can be connected)	5 branches (MAX. 5 units)	3 branches (MAX. 3 units)

Note: A maximum of 2 branch boxes can be connected to 1 outdoor unit.

2- branch pipe (joint): Optional parts			
In the case of using 1- branch box	No need		
In the case of using 2- branch boxes	Model name	Connection method	Select a model according to the connection method.
	MSDD-50AR-E	flare	
	MSDD-50BR-E	brazing	

Option	Optional accessories for indoor units and outdoor units are available.
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^{*1} When connecting a multi-position unit(s), set additional constraints as follows. For connections other than those specified below, consult your dealer.

● **Models other than MXZ-SM60NAM** (For each connected branch box)

Number of connecting multi-position unit	Constraints
2	Any indoor units other than ducted units are not connectable.
1	- The total system wide capacity should be 130% or below including the ducted unit. - Only 1 ducted unit can be included in the connection.

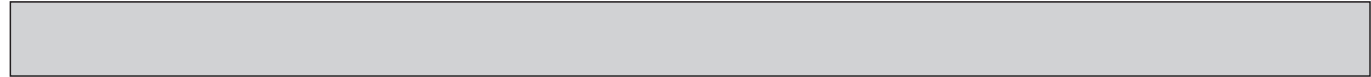
● **MXZ-SM60NAM** (For each connected branch box)

Number of connecting multi-position unit	Constraints
2	Any indoor units other than ducted unit are not connectable.
1	- The total system wide capacity should be 100% or below including the ducted unit. - Only 1 ducted unit can be included in the connection.

^{*2} For MXZ-SM60NAM; When connecting the SEZ and PEAD-series units, the total system wide capacity per 1 branch box should be 100% or below including the ducted units. (Only if connecting to branch box)

^{*3} When not outside units 60: A branch box can connect to maximum 3 of the ducted units. When connecting with 3 of the ducted units per 1 branch box, other indoor units cannot be connected.
When outside units 60: A branch box can connect to maximum 2 of the ducted units. When connecting with 1 and over 1 of the ducted units, the total ability including of the ducted units is 100% and below 100%.

^{*4} When the system includes 1 unit of ducted units, the number of the maximum connectable indoor units is decreased as follows:
3 for MXZ-SM36NAM(HZ), 4 for MXZ-SM42NAMHZ, and 6 for MXZ-SM48NAM(HZ) and MXZ-SM60NAM



2-3. SYSTEM SPECIFICATIONS

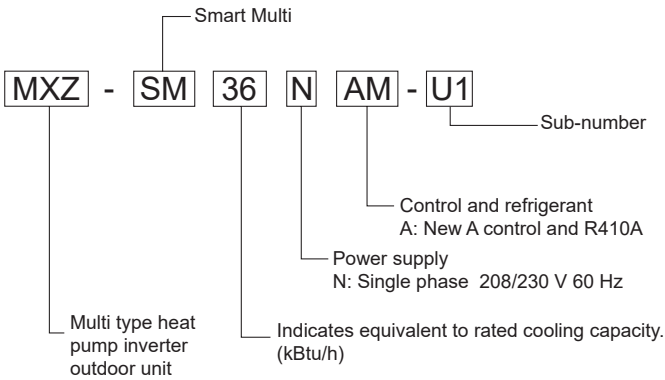
(1) Outdoor Unit

Service Ref.		MXZ-SM36NAM-U1 MXZ-SM36NAMHZ-U1	MXZ-SM42NAMHZ-U1	MXZ-SM48NAM-U1 MXZ-SM48NAMHZ-U1	MXZ-SM60NAM-U1
Capacity	Cooling (kBtu/h)	36	42	48	60
	Heating (kBtu/h)	42	48	54	66
Compressor (kW)		2.8	2.9	3.4	3.9

Cooling/Heating capacity indicates the maximum value at operation under the following condition.

Cooling	Indoor	D.B. 80°F/W.B. 67°F: [D.B. 26.7°C/W.B. 19.4°C]
	Outdoor	D.B. 95°F/W.B. 75°F: [D.B. 35°C/W.B. 23.9°C]
Heating	Indoor	D.B. 70°F/W.B. 60°F: [D.B. 21.1°C/W.B. 15.6°C]
	Outdoor	D.B. 47°F/W.B. 43°F: [D.B. 8.3°C/W.B. 6.1°C]

(2) Method for identifying



SPECIFICATIONS

Conversion formula:	$\text{kcal/h} = \text{kW} \times 860$ $\text{Btu/h} = \text{kW} \times 3412$ $\text{CFM} = \text{m}^3/\text{min} \times 35.31$
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*6 When the temperature is below D.B. 50°F [D.B. 10°C] with branch box system, noise could potentially occur.
Note: Refer to the indoor unit's service manual for the indoor units specifications.

Service Ref.			MXZ-SM36NAMHZ-U1			MXZ-SM42NAMHZ-U1			MXZ-SM48NAMHZ-U1			
Indoor type			Non-Ducted	Mix	Ducted	Non-Ducted	Mix	Ducted	Non-Ducted	Mix	Ducted	
M1-metric (AHR1210/240-2017)	Cooling	Capacity Rated*1	Btu/h	36,000	36,000	36,000	42,000	42,000	42,000	48,000	48,000	48,000
		Rated power consumption*1	W	2,400	2,610	2,855	3,135	3,440	3,820	3,665	3,930	4,245
		Current input (208/230V)	A	11.7/10.6	12.7/11.5	13.9/12.6	15.3/13.8	16.8/15.2	18.6/16.9	17.9/16.2	19.2/17.3	20.7/18.7
		EER	Btu/h/W	15.00	13.80	12.60	13.40	12.20	11.00	13.10	12.20	11.30
		SEER	-	23.00	20.70	18.30	22.00	20.00	18.00	23.00	19.80	16.50
	Heating	Capacity Rated 47°F*1	Btu/h	42,000	42,000	42,000	48,000	48,000	48,000	54,000	54,000	54,000
		Capacity Max. 17°F*2	Btu/h	42,000	42,000	42,000	48,000	48,000	48,000	54,000	54,000	54,000
		Capacity Max. 5°F	Btu/h	42,000	42,000	42,000	48,000	48,000	48,000	54,000	54,000	54,000
		Rated power consumption 47°F*1	W	3,080	3,200	3,325	3,430	3,750	4,140	3,955	4,335	4,795
		Current input (208/230V)	A	15.0/13.6	15.6/14.1	16.2/14.7	16.7/15.1	18.3/16.6	20.2/18.3	19.3/17.5	21.2/19.1	23.4/21.2
M1-metric (AHR1210/240-2023)	Cooling	COP 47°F*1	W/W	4.00	3.85	3.70	4.10	3.75	3.40	4.00	3.65	3.30
		HSPF IⅣ / V	-	12.50/10.30	12.10/9.90	11.70/9.50	12.00/9.50	11.5/9.5	11.00/9.50	12.00/9.40	11.50/9.20	11.00/9.00
		Capacity Rated*1	Btu/h	36,000	36,000	36,000	42,000	42,000	42,000	48,000	48,000	48,000
		Rated power consumption*1	W	2,400	2,740	3,190	3,135	3,500	3,965	3,665	4,090	4,615
		Current input (208/230V)	A	11.7/10.6	13.4/12.1	15.6/14.1	15.3/13.8	17.1/15.4	19.4/17.5	17.9/16.2	20.0/18.1	22.5/20.4
	Heating	EER2	Btu/h/W	15.00	13.15	11.30	13.40	12.00	10.60	13.10	11.75	10.40
		SEER2	-	23.00	19.30	15.60	21.50	18.85	14.70	23.00	18.85	14.70
		Capacity Rated 47°F*1	Btu/h	42,000	42,000	42,000	48,000	48,000	48,000	54,000	54,000	54,000
		Capacity Max. 17°F*2	Btu/h	42,000	42,000	42,000	48,000	48,000	48,000	54,000	54,000	54,000
		Capacity Max. 5°F	Btu/h	42,000	42,000	42,000	48,000	48,000	48,000	54,000	54,000	54,000
Rated power consumption 47°F*1	W	3,080	3,330	3,620	3,435	3,805	4,265	3,960	4,400	4,950		
Current input (208/230V)	A	15.0/13.6	16.3/14.7	17.7/16.0	16.8/15.2	18.6/16.8	20.8/18.8	19.3/17.5	21.5/19.4	24.2/21.8		
COP 47°F*1	W/W	4.00	3.70	3.40	4.10	3.70	3.30	4.00	3.60	3.20		
HSPF2 IⅣ / V	-	12.00/10.65	10.95/9.70	9.90/8.80	11.10/9.80	10.10/9.30	9.10/8.80	11.50/9.80	10.15/9.05	8.80/8.30		
Power supply			1 Phase 208/230 V, 60 Hz									
Breaker Size/Max. fuse size			40 A/40 A (When power is supplied separately), 45 A/50 A (When power is supplied from the outdoor unit)									
Min. circuit ampacity			36 A (When power is supplied separately), 42 A (When power is supplied from the outdoor unit)									
Indoor unit connectable		Total capacity	50 to 130% of outdoor unit capacity									
		Model/Quantity *3	CITY MULTI	04 - 36/11			04 - 54/12			04 - 54/12		
		Branch box		06 - 36/4			06 - 36/5			06 - 36/8		
Sound pressure level (measured in anechoic room)			dB <A>			50/54			51/54			
Refrigerant piping diameter		Liquid pipe	inch (mm)	ø3/8 (9.52)								
		Gas pipe	inch (mm)	ø5/8 (15.88)								
Fan		Type × Quantity	Propeller fan × 2									
		Airflow rate	m³/min	110								
			L/s	1,834								
			cfm	3,885								
		Control, Driving mechanism	DC control									
		Motor output	kW	0.074 + 0.074								
		External static press.	0									
Compressor		Type × Quantity	Scroll hermetic compressor × 1									
		Manufacture	Mitsubishi Electric Corporation									
		Starting method	Inverter									
		Motor output	kW	2.8			2.9			3.4		
		Case heater	kW	0								
		Lubricant	FV50S 78oz. (2.3L)									
External finish			Galvanized Steel Sheet <Munsell 3Y 7.8/ 1.1>									
External dimension H × W × D		mm	1,338 × 1,050 × 330 (+25)									
		inch	52-11/16 × 41-11/32 × 13 (+1)									
Protection devices		High pressure protection	HP switch									
		Inverter circuit (COMP/FAN)	Overcurrent detection, Overheat detection (Heat sink thermistor)									
		Compressor protection	Compressor thermo, Overcurrent detection									
		Fan motor protection	Overheating/Voltage protection									
Refrigerant		Type x original charge	R410A 10 lbs. 9 oz. (4.8kg)									
		Control	Linear Expansion Valve									
Net weight		lb (kg)	278 (126)									
Heat exchanger			Cross fin and tube									
HIC circuit (HIC: Heat Inter-Changer)			HIC circuit									
Defrosting method			Reversed refrigerant circuit									
Guaranteed operation range		(Cooling)	D.B. 23 to 115°F [D.B.-5 to 46°C] *4*5*6									
		(Heating)	D.B. -13 to 70°F [D.B. -25 to 21°C]									
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Because of continuing improvement, above specifications may be subject to change without notice.									

*1 Rating conditions Cooling Indoor : D.B. 80°F/W.B. 67 °F [D.B.26.7°C/W.B. 19.4°C]

Outdoor : D.B. 95°F [D.B. 35.0°C]

Heating Indoor : D.B. 70°F [D.B. 21.1°C]

Outdoor : D.B. 47°F/W.B. 43°F [D.B. 8.3°C/W.B. 6.1°C]

*2 Conditions Heating Indoor : D.B. 70°F [D.B. 21.1°C]

Outdoor : D.B. 17°F/W.B. 15°F [D.B. -8.3°C/W.B. -9.4°C]

*3 It can not be connected mixed CITY MULTI indoor unit and branch box indoor unit.

*4 D.B. 5 to 115°F [D.B. -15 to 46°C], when an optional Air Outlet Guide is installed.

However, this condition does not apply to the indoor units listed in *5.

*5 50 to 115°F (10 to 46°C)D.B.: When connecting PKFY-P06NBMU, PKFY-P08NHMU,

PKFY-P04/06/08/12NLMU, PFFY-P06/08/12NEMU, and PFFY-P06/08/12NRMU type indoor unit.

*6 When the temperature is below D.B. 50°F [D.B. 10°C] with branch box system, noise could potentially occur.

Note: Refer to the indoor unit's service manual for the indoor units specifications.

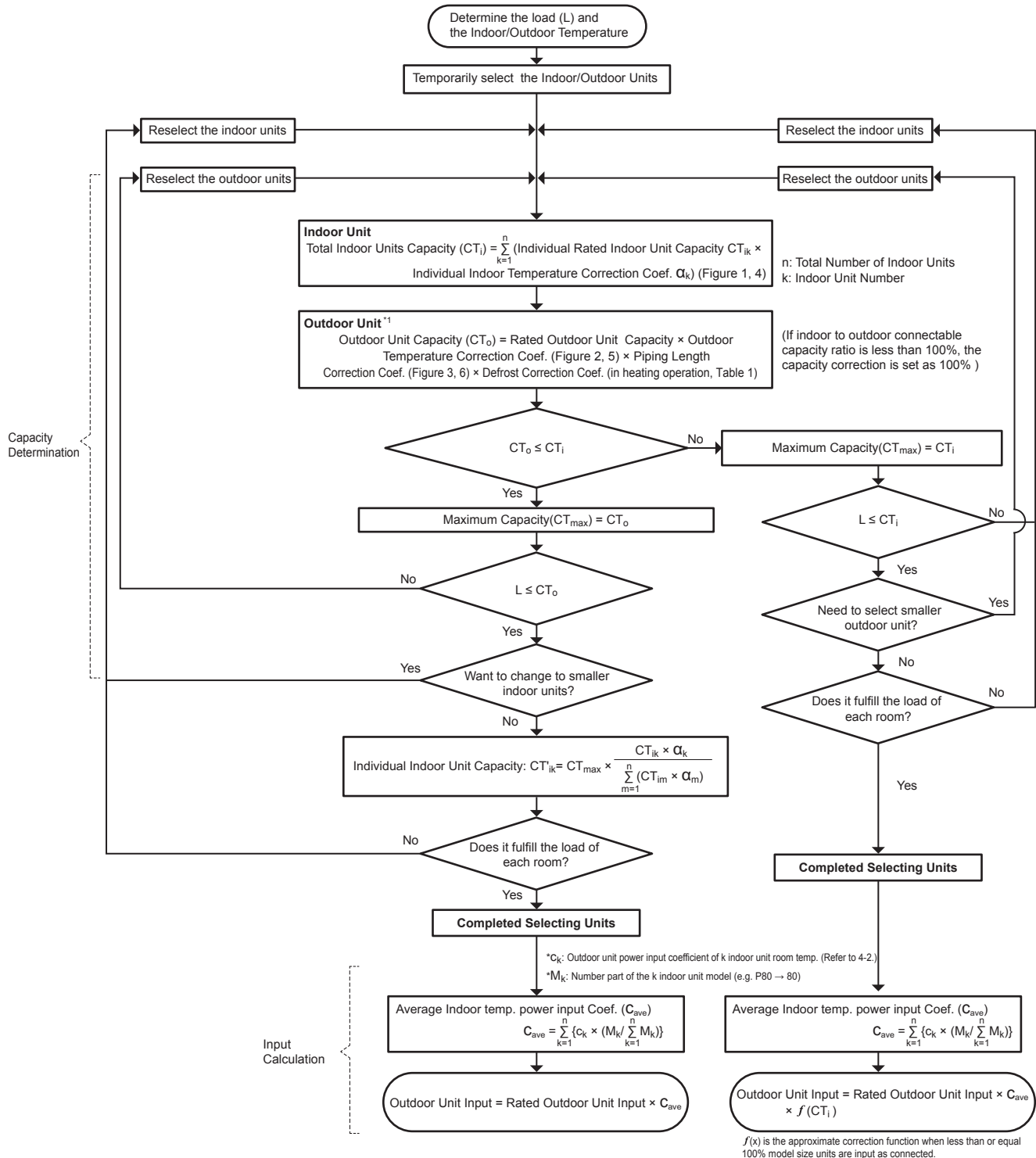
Conversion formula: kcal/h = kW × 860
Btu/h = kW × 3412
CFM = m³/min × 35.31

*3 It can not be connected to fixed CITY MULTI indoor unit and branch box indoor unit.
 *4 D.B. 5 to 115°F [D.B. -15 to 46°C], when an optional Air Outlet Guide is installed.
 However, this condition does not apply to the indoor units listed in *5.
 *5 50 to 115°F (10 to 46°C) D.B.: When connecting PKFY-P06NBMU, PKFY-P08NBHMU,
 PKFY-P04/06/08/12NLMU, PKFY-P06/08/12NEMU, and PKFY-P06/08/12NRMU type indoor unit.
 *6 When the temperature is below D.B. 50°F [D.B. 10°C] with branch box system, noise could potentially occur.
 Note: Refer to the indoor unit's service manual for the indoor units specifications.

4-1. SELECTION OF COOLING/HEATING UNITS

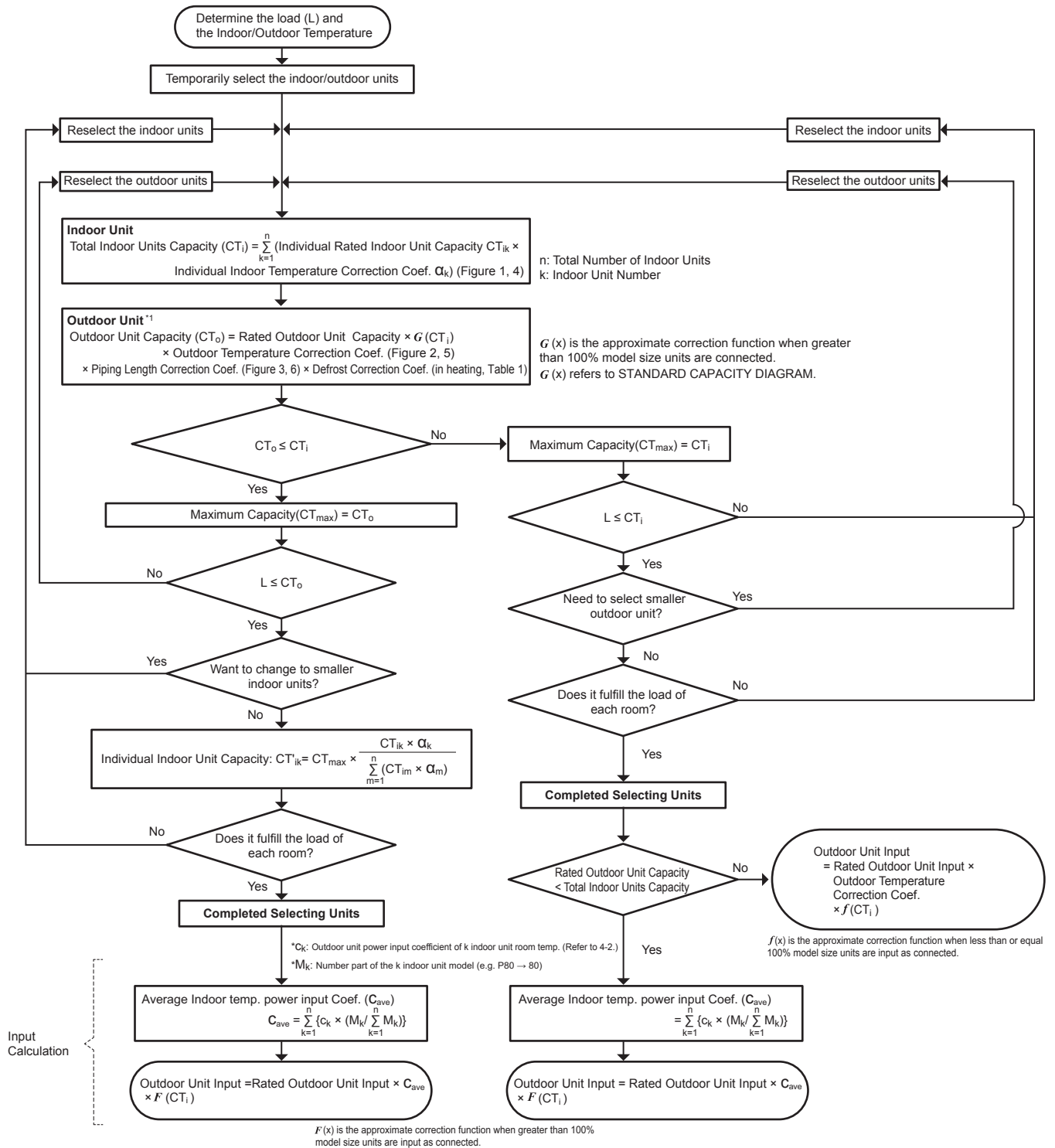
How to determine the capacity when less than or equal 100% indoor model size units are connected in total:

The purpose of this flow chart is to select the indoor and outdoor units. For other purposes, this flow chart is intended only for reference.



How to determine the capacity when greater than 100% indoor model size units are connected in total:

The purpose of this flow chart is to select the indoor and outdoor units. For other purposes, this flow chart is intended only for reference.



<Cooling>

Design Condition	
Outdoor Design Dry Bulb Temperature	98.6°F (37.0°C)
Total Cooling Load	30.3 kBTu/h
Room1	
Indoor Design Dry Bulb Temperature	80.6°F (27.0°C)
Indoor Design Wet Bulb Temperature	68.0°F (20.0°C)
Cooling Load	13.6 kBTu/h
Room2	
Indoor Design Dry Bulb Temperature	75.2°F (24.0°C)
Indoor Design Wet Bulb Temperature	66.2°F (19.0°C)
Cooling Load	16.7 kBTu/h
<Other>	
Indoor/Outdoor Equivalent Piping Length	250 ft

Capacity of indoor unit

(kBTu/h)

Model Number for indoor unit	Model 04	Model 05	Model 06	Model 08	Model 12	Model 15	Model 18	Model 24	Model 27	Model 30	Model 36	Model 48	Model 54	Model 72
Model Capacity	4.0	5.0	6.0	8.0	12.0	15.0	18.0	24.0	27.0	30.0	36.0	48.0	54.0	72.0

Model name	Capacity class							
	06	09	12	15	18	24	30	36
SVZ	-	-	12.0	-	18.0	24.0	30.0	36.0
SLZ-KF	-	8.4	11.1	15.0	-	-	-	-
SEZ-KD	-	8.1	11.5	14.1	17.2	-	-	-
MFZ-KJ	-	9.0	12.0	15.0	17.0	-	-	-
MLZ-KP	-	9.0	12.0	-	17.2	-	-	-
MSZ-FH	6.0	9.0	12.0	15.0	17.2	-	-	-
MSZ-FS	6.0	9.0	12.0	15.0	17.2	-	-	-
MSZ-GL	6.0	9.0	12.0	14.0	17.2	22.5	-	-
MSZ-EF	-	9.0	12.0	15.0	18.0	-	-	-
PEAD	-	9.0	12.0	15.0	18.0	24.0	30.0	36.0
PLA	-	-	12.0	-	18.0	24.0	30.0	36.0

1. Cooling Calculation

(1) Temporary Selection of Indoor Units

Room1

PEFY-P15 **15.0 kBTu/h (Rated)**

Room2

PEFY-P18 **18.0 kBTu/h (Rated)**

(2) Total Indoor Units Capacity

P15+ P18 = P33

(3) Selection of Outdoor Unit

The P36 outdoor unit is selected as total indoor units capacity is P33

MXZ-SM36NAM **36.0 kBTu/h**

(4) Total Indoor Units Capacity Correction Calculation

Room1

Indoor Design Wet Bulb Temperature Correction (68.0°F) 1.02 (Refer to Figure 1)

Room2

Indoor Design Wet Bulb Temperature Correction (66.2°F) 0.95 (Refer to Figure 1)

Total Indoor Units Capacity (CTi)

$$\begin{aligned}
 CT_i &= \Sigma (\text{Indoor Unit Rating} \times \text{Indoor Design Temperature Correction}) \\
 &= 15.0 \times 1.02 + 18.0 \times 0.95 \\
 &= 32.4 \text{ kBTu/h}
 \end{aligned}$$

(5) Outdoor Unit Correction Calculation

Outdoor Design Dry Bulb Temperature Correction (98.6°F) 0.98 (Refer to Figure 2)

Piping Length Correction (250 ft) 0.93 (Refer to Figure 3)

Total Outdoor Unit Capacity (CTo)

$$\begin{aligned}
 C_{To} &= \text{Outdoor Rating} \times G(CT_i)^{*1} \times \text{Outdoor Design Temperature Correction} \\
 &\quad \times \text{Piping Length Correction} \\
 &= 36.0 \times 0.98 \times 0.93 \\
 &= 32.8 \text{ kBTu/h}
 \end{aligned}$$

*1 G(CTi) is used only when greater than 100% indoor model size are connected in total, refer to STANDARD CAPACITY DIAGRAM.

(6) Determination of Maximum System Capacity

Comparison of Capacity between Total Indoor Units Capacity (CTi) and Total Outdoor Unit Capacity (CTo)

CTi = 32.4 < CTo = 32.8, thus, select CTi.

CTx = CTi = 32.4 kBTu/h

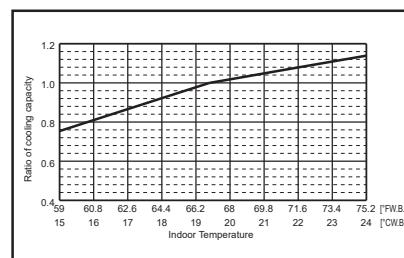


Figure 1 Indoor unit temperature correction
To be used to correct indoor unit only

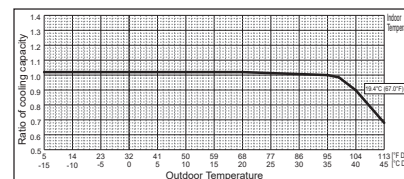


Figure 2 Outdoor unit temperature correction
To be used to correct outdoor unit only

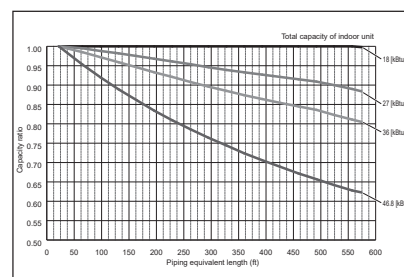


Figure 3 Correction of refrigerant piping length

(7) Comparison with Essential Load

Against the essential load 30.3 kBtu/h, the maximum system capacity is 32.4 kBtu/h: Proper outdoor units have been selected.

(8) Calculation of Maximum Indoor Unit Capacity of Each Room

CTx = CTi, thus, calculate by the calculation below

Room1

Indoor Unit Rating × Indoor Design Temperature Correction
 = 15.0 × 1.02
 = 15.3 kBtu/h **OK: fulfills the load 13.6 kBtu/h**

Room2

Indoor Unit Rating × Indoor Design Temperature Correction
 = 18.0 × 0.95
 = 17.1 kBtu/h **OK: fulfills the load 16.7 kBtu/h**

Go on to the heating trial calculation since the selected units fulfill the cooling loads of Room 1, 2.

<Heating>

Design Condition	
Outdoor Design Wet Bulb Temperature	35.6°F (2.0°C)
Total Heating Load	34.4 kBtu/h
Room1	
Indoor Design Dry Bulb Temperature	69.8°F (21.0°C)
Heating Load	16.3 kBtu/h
Room2	
Indoor Design Dry Bulb Temperature	73.4°F (23.0°C)
Heating Load	18.1 kBtu/h
<Other>	
Indoor/Outdoor Equivalent Piping Length	328 ft

Capacity of indoor unit

(kBtu/h)

Model Number for indoor unit	Model 04	Model 05	Model 06	Model 08	Model 12	Model 15	Model 18	Model 24	Model 27	Model 30	Model 36	Model 48	Model 54
Model Capacity	4.5	5.6	6.7	9.0	13.5	17.0	20.0	27.0	30.0	34.0	40.0	54.0	60.0

Model name	Capacity class							
	06	09	12	15	18	24	30	36
SVZ	-	-	12.0	-	18.0	27.0	34.0	40.0
SLZ-KF	-	10.2	13.7	17.1	-	-	-	-
SEZ-KD	-	10.9	13.6	18.0	17.2	-	-	-
MFZ-KJ	-	10.9	13.0	18.0	21.0	-	-	-
MLZ-KP	-	10.9	13.0	-	21.0	-	-	-
MSZ-FH	6.0	10.9	13.6	18.0	20.3	-	-	-
MSZ-FS	6.0	10.9	13.6	18.0	20.3	-	-	-
MSZ-GL	6.0	10.9	14.4	18.0	21.6	27.6	-	-
MSZ-EF	-	10.9	13.0	18.0	21.0	-	-	-
PEAD	-	10.9	13.5	15.7	18.0	26.0	34.0	40.0
PLA	-	-	13.5	-	18.0	26.0	34.0	40.0

2. Heating Calculation

(1) Temporary Selection of Indoor Units

Room1
PEFY-P15 **17.0 kBtu/h (Rated)**

Room2
PEFY-P18 **20.0 kBtu/h (Rated)**

(2) Total Indoor Units Capacity

P15 + P18 = P33

(3) Selection of Outdoor Unit

The P36 outdoor unit is selected as total indoor units capacity is P33

MXZ-SM36NAM **42.0 kBtu/h**

(4) Total Indoor Units Capacity Correction Calculation

Room1

Indoor Design Dry Bulb Temperature Correction (69.8°F) 1.00 (Refer to Figure 4)

Room2

Indoor Design Dry Bulb Temperature Correction (73.4°F) 0.92 (Refer to Figure 4)

Total Indoor Units Capacity (CTi)

CTi = Σ (Indoor Unit Rating × Indoor Design Temperature Correction)
 = 17.0 × 1.00 + 20.0 × 0.92
 = 35.4 kBtu/h

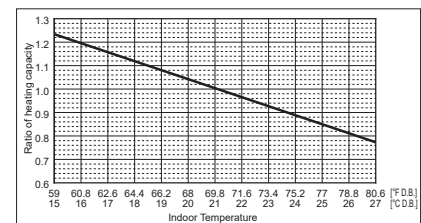


Figure 4 Indoor unit temperature correction
To be used to correct indoor unit only

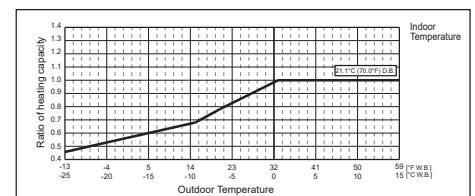


Figure 5 Outdoor unit temperature correction
To be used to correct outdoor unit only

(5) Outdoor Unit Correction Calculation

Outdoor Design Wet Bulb Temperature Correction (35.6°F) 1.0 (Refer to Figure 5)
Piping Length Correction (328 ft) 0.94 (Refer to Figure 6)
Defrost Correction 0.89 (Refer to Table 1)

Total Outdoor Unit Capacity (CTo)

$$\begin{aligned} \text{CTo} &= \text{Outdoor Unit Rating} \times \text{G(CTi)}^{*1} \times \text{Outdoor Design Temperature Correction} \\ &\quad \times \text{Piping Length Correction} \times \text{Defrost Correction} \\ &= 42.0 \times 1.0 \times 0.94 \times 0.89 \\ &= 35.1 \text{ kBtu/h} \end{aligned}$$

*1 G(CTi) is used only when greater than 100% indoor model size are connected in total, refer to STANDARD CAPACITY DIAGRAM.

Table 1 Table of correction factor at frost and defrost

Outdoor Intake temperature <W.B.:°F (°C)>	43(6)	37(4)	36(2)	32(0)	28(-2)	25(-4)	21(-6)	18(-8)	14(-10)	5(-15)	-4(-20)	-13(-25)
Correction factor	1.0	0.98	0.89	0.88	0.89	0.9	0.95	0.95	0.95	0.95	0.95	0.95

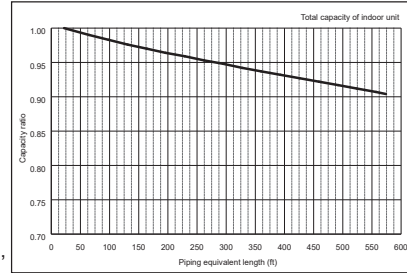


Figure 6 Correction of refrigerant piping length

(6) Determination of Maximum System Capacity

Comparison of Capacity between Total Indoor Units Capacity (CTi) and Total Outdoor Unit Capacity (CTo)

CTi = 35.4 > CTo = 35.1, thus, select CTo.

CTx = CTo = 35.1 kBtu/h

(7) Comparison with Essential Load

Against the essential load 34.4 kBtu/h, the maximum system capacity is 35.1 kBtu/h: Proper outdoor units have been selected.

(8) Calculation of Maximum Indoor Unit Capacity of Each Room

CTx = CTo, thus, calculate by the calculation below

Room1

$$\begin{aligned} &\text{Maximum Capacity} \times \text{Room1 Capacity after the Temperature Correction} / (\text{Room1,2 Total Capacity after the Temperature Correction}) \\ &= 35.1 \times (17.0 \times 1.00) / (17.0 \times 1.00 + 20.0 \times 0.92) \\ &= 16.9 \text{ kBtu/h} \quad \text{OK: fulfills the load 16.3 kBtu/h} \end{aligned}$$

Room2

$$\begin{aligned} &\text{Maximum Capacity} \times \text{Room1 Capacity after the Temperature Correction} / (\text{Room1,2 Total Capacity after the Temperature Correction}) \\ &= 35.1 \times (20.0 \times 0.92) / (17.0 \times 1.00 + 20.0 \times 0.92) \\ &= 18.2 \text{ kBtu/h} \quad \text{OK: fulfills the load 18.1 kBtu/h} \end{aligned}$$

Completed selecting units since the selected units fulfill the heating loads of Room 1, 2.

3. Power input of outdoor unit

Outdoor unit: MXZ-SM36NAM

Indoor unit 1: PEFY-P15

Indoor unit 2: PEFY-P18

<Cooling>

(1) Rated power input of outdoor unit

2.31 kW

(2) Calculation of the average indoor temperature power input coefficient

Coefficient of the outdoor unit for indoor unit 1 (Outdoor temp. 98.6°F [37.0°C] D.B., Indoor temp. 68.0°F [20.0°C] W.B.)
1.04 (Refer to "4-2. CORRECTION BY TEMPERATURE".)

Coefficient of the outdoor unit for indoor unit 2 (Outdoor temp. 98.6°F [37.0°C] D.B., Indoor temp. 64.4°F [18.0°C] W.B.)
0.85 (Refer to "4-2. CORRECTION BY TEMPERATURE".)

$$\text{Average indoor temp. power input coefficient (C}_{ave}) = \sum_{k=1}^n \{c_k \times (M_k / \sum_{k=1}^n M_k)\}$$

n: Total number of the indoor units

k: Number of the indoor unit

c_k: Outdoor unit power input coefficient of k indoor unit room temp.

M_k: Number part of the k indoor unit model (e.g. P80 → 80)

$$\begin{aligned} \text{Correction Coefficient of Indoor temperature} &= 1.04 \times 15 / (15 + 18) + 0.85 \times 18 / (15 + 18) \\ &= 0.94 \end{aligned}$$

(3) Coefficient of the partial load f(CTi)

Total Indoor units capacity

15 + 18 = 33, thus, f(CTi) = 0.9 (Refer to the tables in "4-4. STANDARD CAPACITY DIAGRAM".)

(4) Outdoor power input (Plo)

Maximum System Capacity (CTx) = Total Outdoor unit Capacity (CTo), so use the following formula

$$\begin{aligned} \text{Plo} &= \text{Outdoor unit Cooling Rated Power Input} \times \text{Correction Coefficient of Indoor temperature} \times f(\text{CTi}) \\ &= 2.31 \times 0.94 \times 0.9 \\ &= 1.95 \text{ kW} \end{aligned}$$

<Heating>

(1) Rated power input of outdoor unit **3.02 kW**

(2) Calculation of the average indoor temperature power input coefficient

Coefficient of the outdoor unit for indoor unit 1 (Outdoor temp. 26.6°F [-3°C] W.B., Indoor temp. 70°F [21.1°C] D.B.)

1.16 (Refer to "4-2. CORRECTION BY TEMPERATURE".)

Coefficient of the outdoor unit for indoor unit 2 (Outdoor temp. 26.6°F [-3°C] W.B., Indoor temp. 78.8°F [26°C] D.B.)

1.09 (Refer to "4-2. CORRECTION BY TEMPERATURE".)

Average indoor temp. power input coefficient (C_{ave}) = $\sum_{k=1}^n \{c_k \times (M_k / \sum_{k=1}^n M_k)\}$

n: Total number of the indoor units

k: Number of the indoor unit

c_k : Outdoor unit power input coefficient of k indoor unit room temp.

M_k : Number part of the k indoor unit model (e.g. P80 → 80)

Correction Coefficient of Indoor temperature = $1.16 \times 15 / (15 + 18) + 1.09 \times 18 / (15 + 18)$
= 1.12

(3) Coefficient of the partial load $f(CTi)$

Total indoor units capacity

15 + 18 = 33, thus, $f(CTi) = 0.9$ (Refer to the tables in "4-4. STANDARD CAPACITY DIAGRAM".)

(4) Outdoor power input (Plo)

Maximum System Capacity (CTx) = Total Indoor unit Capacity (CTi), so use the following formula

Plo = Outdoor unit Heating Rated Power Input × Correction Coefficient of Indoor temperature × $f(CTi)$

= $3.02 \times 1.12 \times 0.9$

= 3.04 kW

4-2. CORRECTION BY TEMPERATURE

CITY MULTI could have varied capacity at different designing temperature. Using the nominal cooling/heating capacity value and the ratio below, the capacity can be observed at various temperature.

<Cooling>

Figure 7 Indoor unit temperature correction

To be used to correct indoor unit capacity only

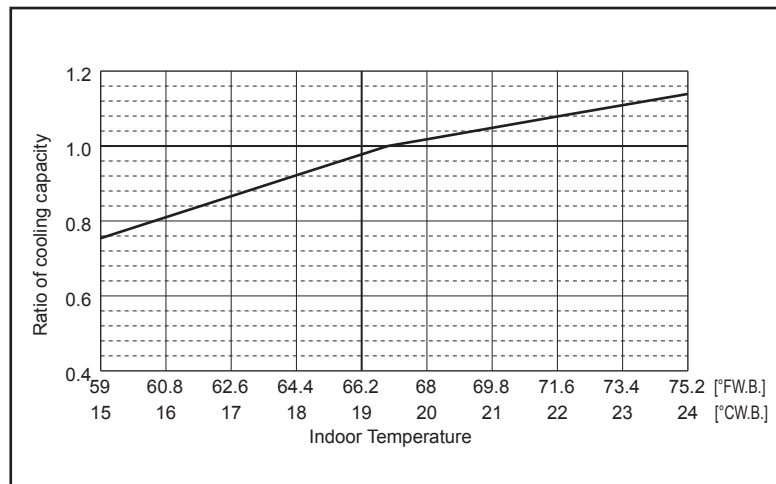
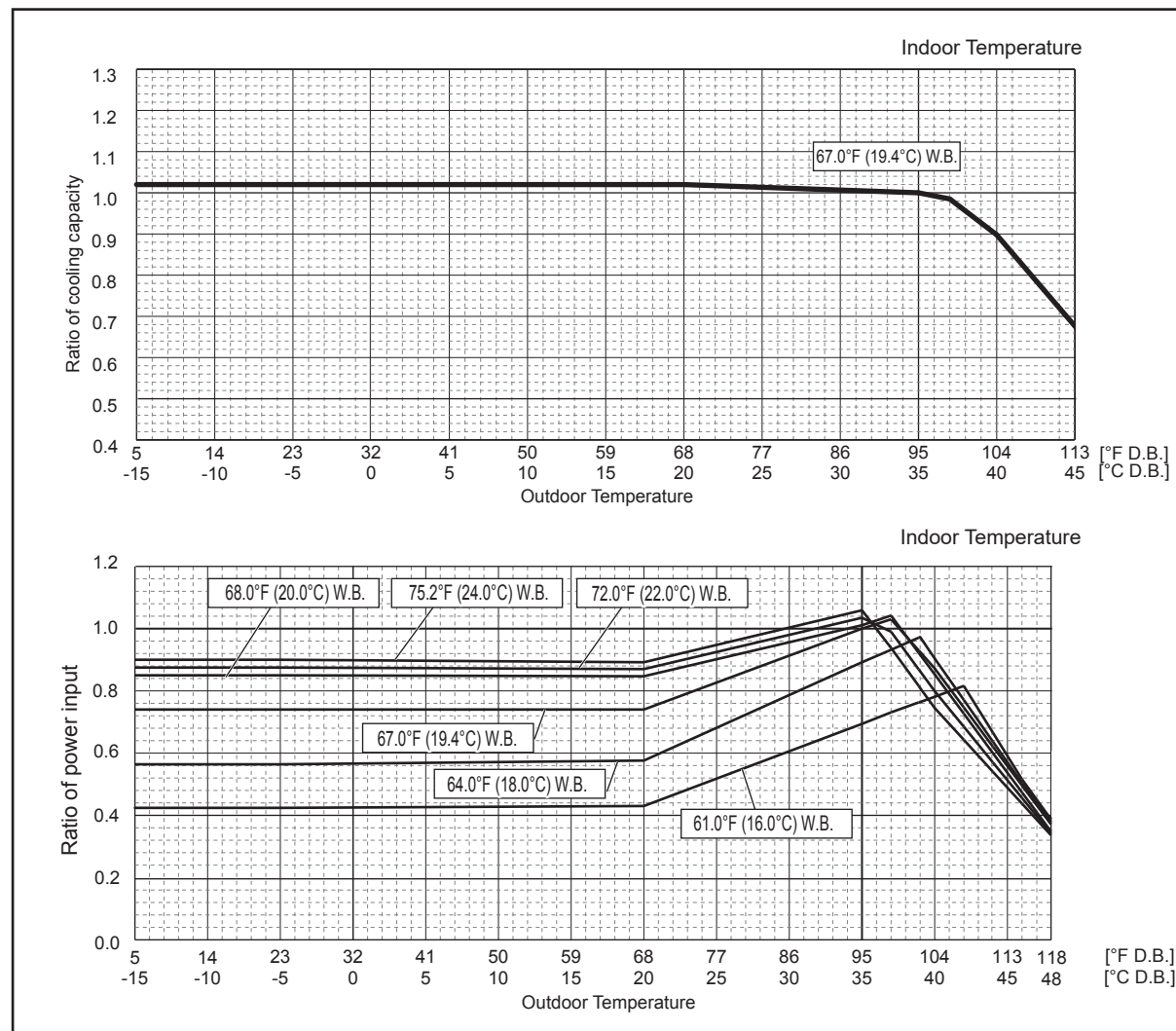


Figure 8 Outdoor unit temperature correction

To be used to correct outdoor unit capacity only



<Heating>

MXZ-SM36NAM-U1

MXZ-SM48NAM-U1

MXZ-SM60NAM-U1

Figure 9 Indoor unit temperature correction

To be used to correct indoor unit capacity only

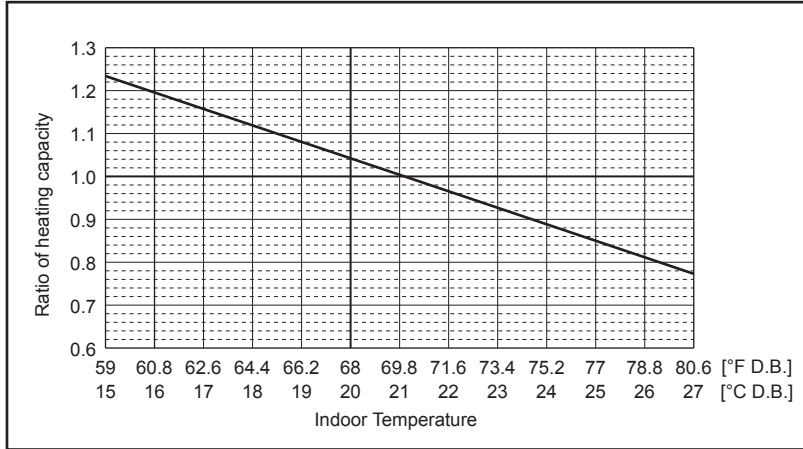
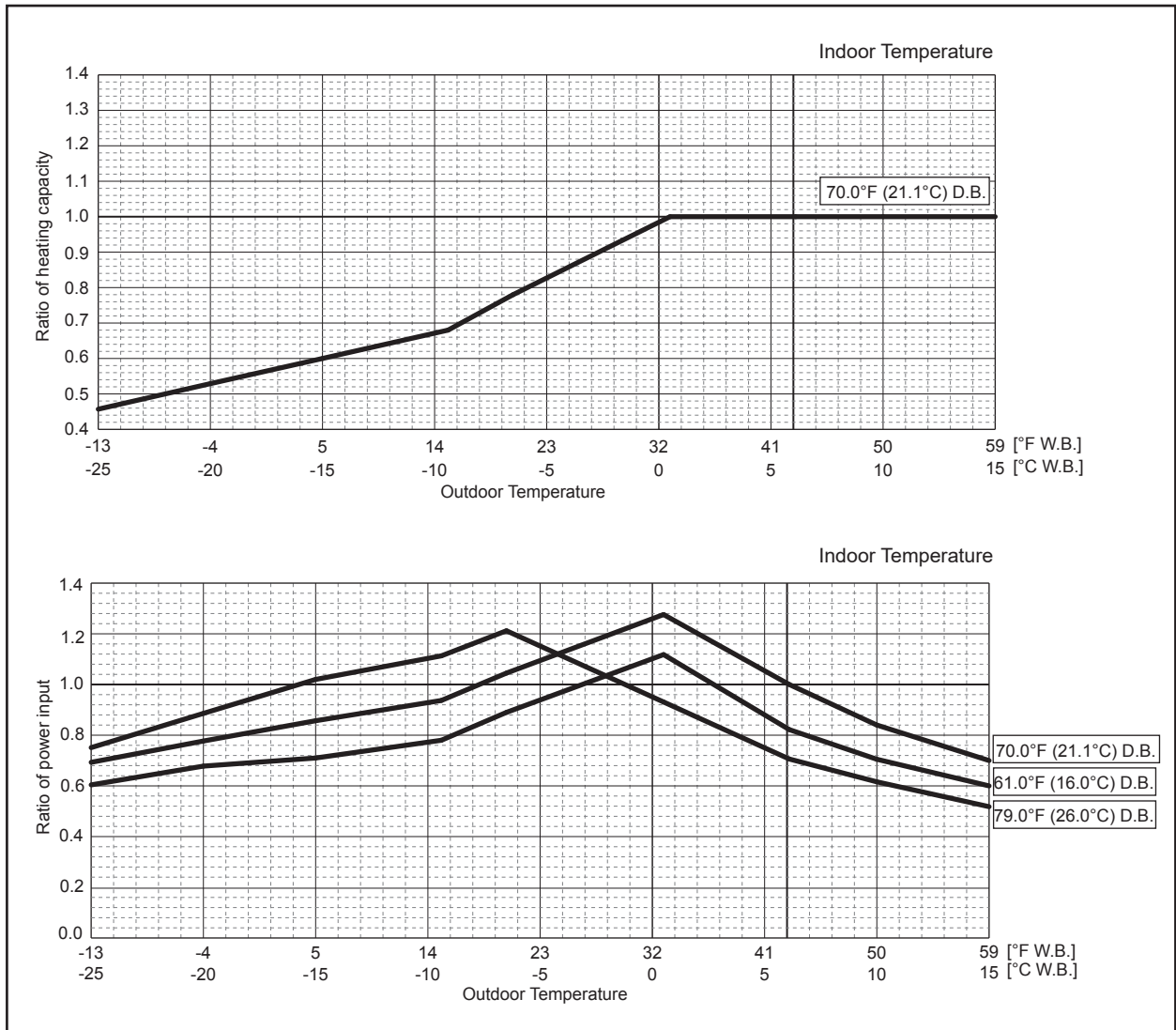


Figure 10 Outdoor unit temperature correction

To be used to correct outdoor unit capacity only



<Heating>

MXZ-SM36NAMHZ-U1

MXZ-SM42NAMHZ-U1

MXZ-SM48NAMHZ-U1

Figure 11 Indoor unit temperature correction

To be used to correct indoor unit capacity only

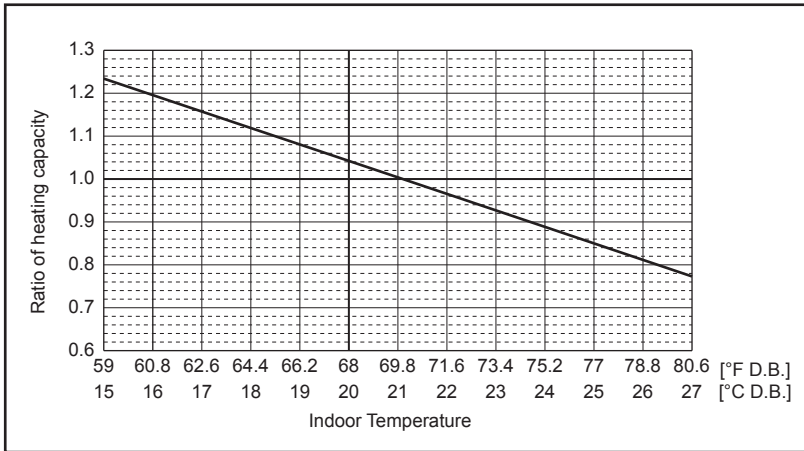
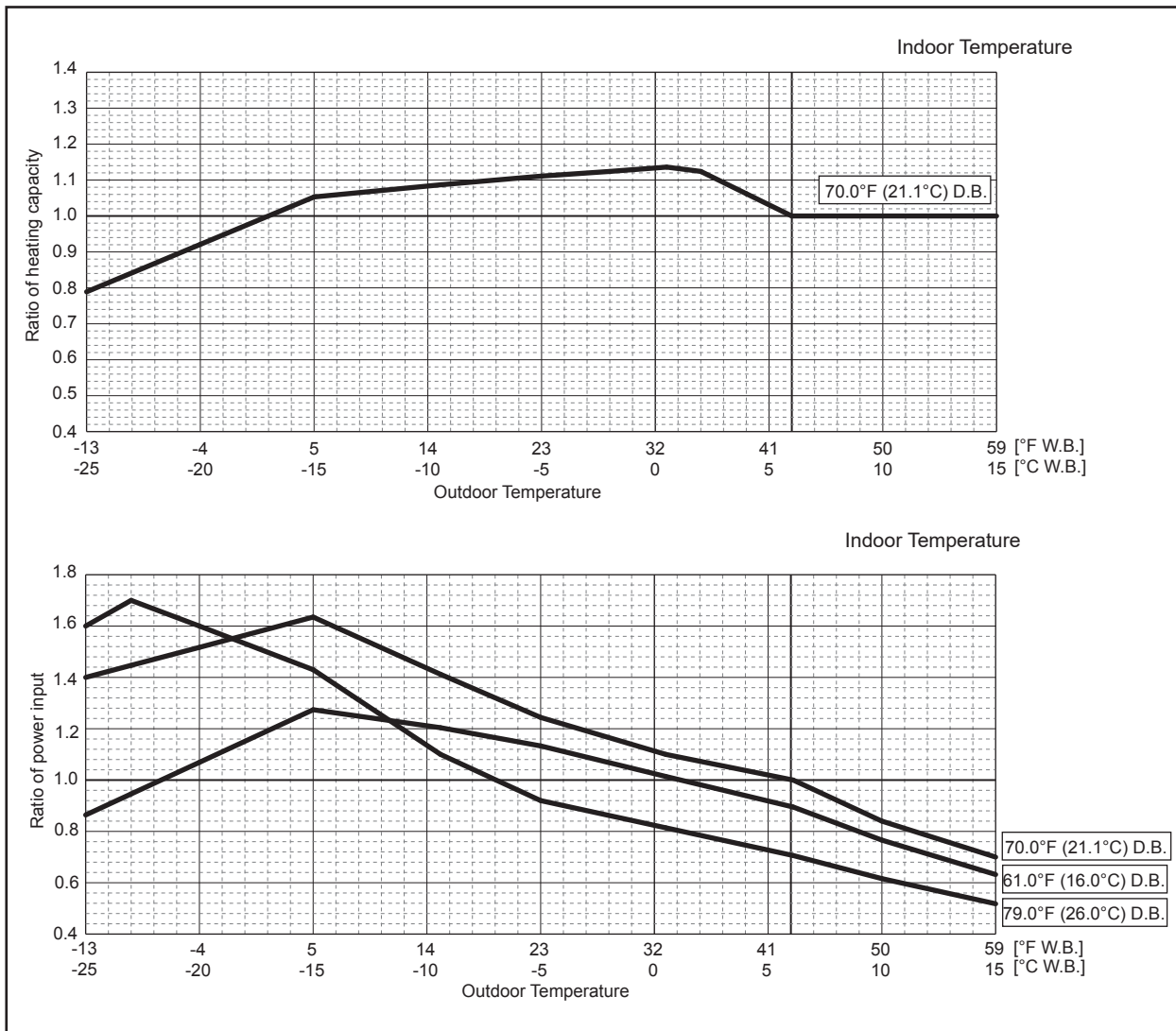


Figure 12 Outdoor unit temperature correction

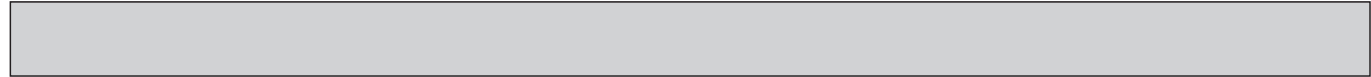
To be used to correct outdoor unit capacity only



4-3. STANDARD OPERATION DATA (REFERENCE DATA)

Operation				MXZ-SM36NAM-U1		MXZ-SM48NAM-U1		MXZ-SM60NAM-U1	
Operating conditions	Ambient temperature	Indoor	DB/WB	80°F/67°F [26.7°C / 19.4°C]	70°F/60°F [21.1°C/15.6°C]	80°F/67°F [26.7°C/19.4°C]	70°F/60°F [21.1°C/15.6°C]	80°F/67°F [26.7°C/19.4°C]	70°F/60°F [21.1°C/15.6°C]
		Outdoor		95°F/75°F [35.0°C/23.9°C]	47°F / 43°F [8.3°C/6.1°C]	95°F/ 75°F [35.0°C / 23.9°C]	47°F/43°F [8.3°C/6.1°C]	95°F/75°F [35.0°C/23.9°C]	47°F/43°F [8.3°C/6.1°C]
	Indoor unit	No. of connected units	Unit	3		4		4	
		No. of units in operation		3		4		4	
		Model		12 × 3		12 × 4		15 × 4	
	Piping	Main pipe	Ft (m)	9.84 (3)		9.84 (3)		9.84 (3)	
		Branch pipe		14.76 (4.5)		14.76 (4.5)		14.76 (4.5)	
		Total pipe length		54.13 (16.5)		68.90 (21)		68.90 (21)	
	Fan speed		—	Hi		Hi		Hi	
	Amount of refrigerant		LBS. OZ. (kg)	17 LBS. (7.7)		17 LBS. 3 OZ. (7.8)		19 LBS. 6 OZ. (8.8)	
Outdoor unit	Electric current		A	10.2	13.3	15.6	17.1	19.3	20.4
	Voltage		V	230		230		230	
	Compressor frequency		Hz	47	66	64	81	53	64
LEV opening	Indoor unit		Pulse	268	438	247	313	386	498
Pressure	High pressure/Low pressure		PSIG [MPaG]	370/116 [2.55/0.80]	406/104 [2.80/0.72]	419/112 [2.89/0.77]	409/97 [2.82/0.67]	397/144 [2.74/0.99]	425/97 [2.93/0.67]
Temp. of each section	Outdoor unit	Discharge	°F [°C]	139.1 [59.5]	145.8 [63.2]	154.2 [67.9]	149.2 [65.1]	141.8 [61.0]	154.4 [68.0]
		Heat exchanger outlet		101.3 [38.5]	34.3 [1.3]	99.7 [37.6]	32.2 [0.1]	99.9 [37.7]	33.1 [0.6]
		Accumulator inlet		49.5 [9.7]	33.4 [0.8]	47.1 [8.4]	31.3 [-0.4]	52.7 [11.5]	32.2 [0.1]
		Compressor inlet		45.3 [7.4]	33.6 [0.9]	42.4 [5.8]	32.7 [0.4]	53.4 [11.9]	30.9 [-0.6]
	Indoor unit	Lev inlet		83.7 [28.7]	100.2 [37.9]	71.1 [21.7]	98.8 [37.1]	89.6 [32.0]	104.0 [40.0]
		Heat exchanger inlet		49.6 [9.8]	132.3 [55.7]	47.5 [8.6]	134.6 [57.0]	56.1 [13.4]	141.8 [61.0]

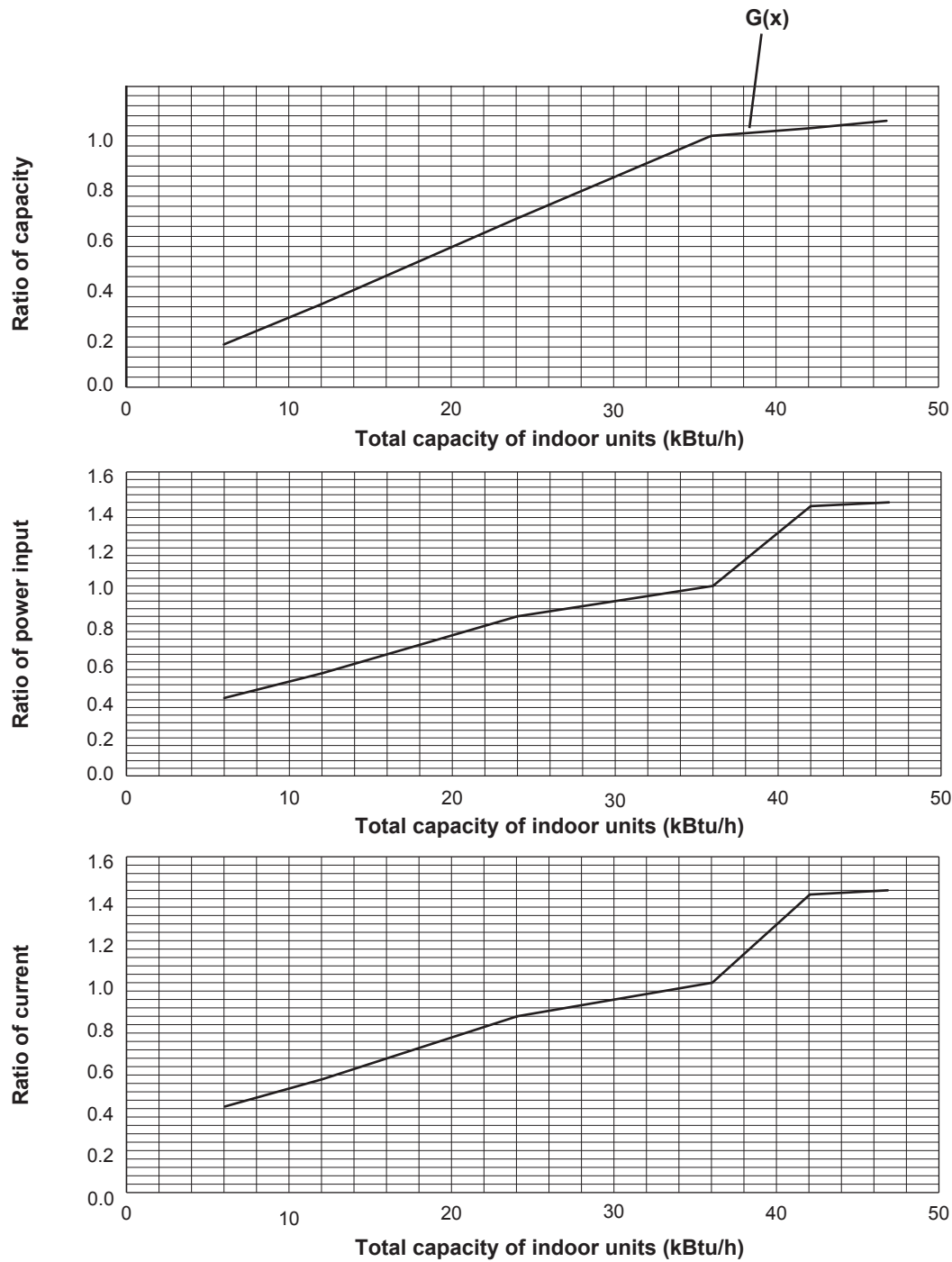
Operation				MXZ-SM36NAMHZ-U1		MXZ-SM42NAMHZ-U1		MXZ-SM48NAMHZ-U1	
Operating conditions	Ambient temperature	Indoor	DB/WB	80°F/67°F [26.7°C/19.4°C]	70°F/60°F [21.1°C/15.6°C]	80°F/67°F [26.7°C/19.4°C]	70°F/60°F [21.1°C/15.6°C]	80°F/67°F [26.7°C/19.4°C]	70°F/60°F [21.1°C/15.6°C]
		Outdoor		95°F/75°F [35.0°C/23.9°C]	47°F / 43°F [8.3°C/6.1°C]	95°F/ 75°F [35.0°C/23.9°C]	47°F/43°F [8.3°C/6.1°C]	95°F/ 75°F [35.0°C/23.9°C]	47°F/43°F [8.3°C/6.1°C]
	Indoor unit	No. of connected units	Unit	3		3		4	
		No. of units in operation		3		3		4	
		Model		12 × 3		12 × 2 + 18 × 1		12 × 4	
	Piping	Main pipe	Ft (m)	9.84 (3)		9.84 (3)		9.84 (3)	
		Branch pipe		14.76 (4.5)		14.76 (4.5)		14.76 (4.5)	
		Total pipe length		54.13 (16.5)		68.90 (21)		68.90 (21)	
	Fan speed		—	Hi		Hi		Hi	
	Amount of refrigerant		LBS. OZ. (kg)	17 LBS. (7.7)		17 LBS. (7.7)		17 LBS. 3 OZ. (7.8)	
Outdoor unit	Electric current		A	10.2	13.3	13.4	14.8	15.6	17.1
	Voltage		V	230		230		230	
	Compressor frequency		Hz	47	66	58	70	64	81
LEV opening	Indoor unit		Pulse	268	438	234/358	292/437	247	313
Pressure	High pressure/Low pressure		PSIG [MPaG]	370/116 [2.55/0.80]	406/104 [2.80/0.72]	403/155 [2.78/1.07]	332/100 [2.29/0.69]	419/112 [2.89/0.77]	409/97 [2.82/0.67]
Temp. of each section	Outdoor unit	Discharge	°F [°C]	139.1 [59.5]	145.8 [63.2]	142.9 [61.6]	131.7 [55.4]	154.2 [67.9]	149.2 [65.1]
		Heat exchanger outlet		101.3 [38.5]	34.3 [1.3]	100.9 [38.3]	32.9 [0.5]	99.7 [37.6]	32.2 [0.1]
		Accumulator inlet		49.5 [9.7]	33.4 [0.8]	55.4 [13.0]	31.8 [-0.1]	47.1 [8.4]	31.3 [-0.4]
		Compressor inlet		45.3 [7.4]	33.6 [0.9]	54.5 [12.5]	31.1 [-0.5]	42.4 [5.8]	32.7 [0.4]
	Indoor unit	Lev inlet		83.7 [28.7]	100.2 [37.9]	73.8 [23.2]	79.0 [26.1]	71.1 [21.7]	98.8 [37.1]
		Heat exchanger inlet		49.6 [9.8]	132.3 [55.7]	56.5 [13.6]	123.8 [51.0]	47.5 [8.6]	134.6 [57.0]



4-4. STANDARD CAPACITY DIAGRAM

Before calculating the sum of total capacity of indoor units, please convert the value into the kW model capacity following the formula on "4-1-1. Method for obtaining system cooling and heating capacity".

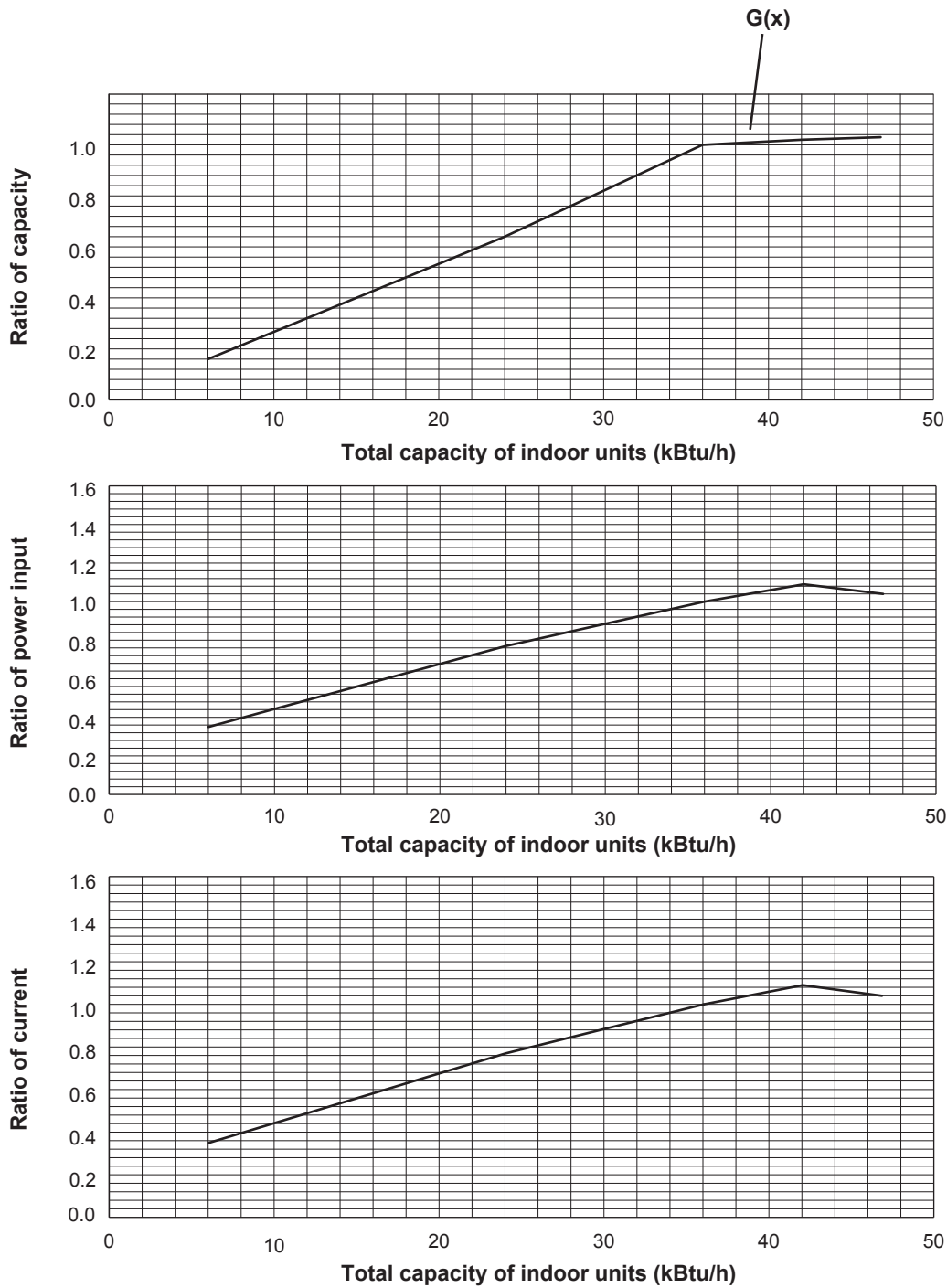
4-4-1. MXZ-SM36NAM-U1 MXZ-SM36NAMHZ-U1 <Cooling>



4-4-2. MXZ-SM36NAM-U1

MXZ-SM36NAMHZ-U1

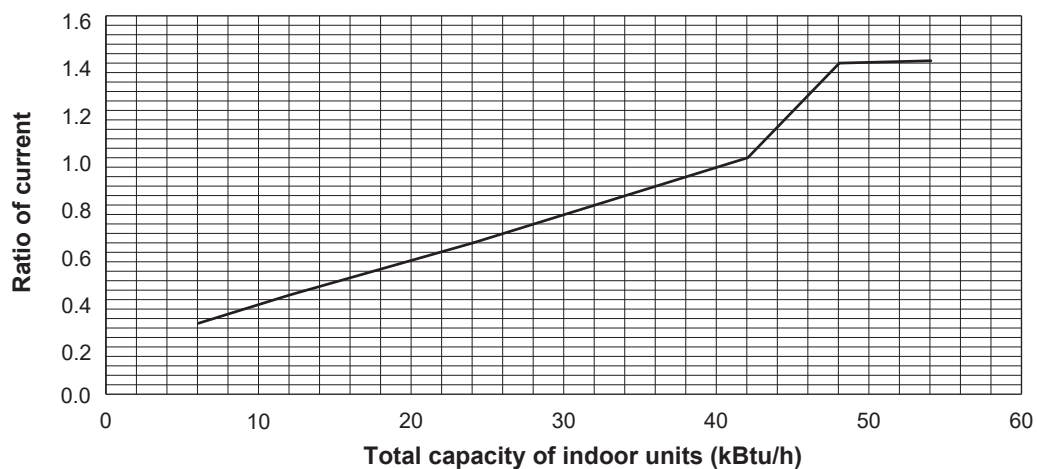
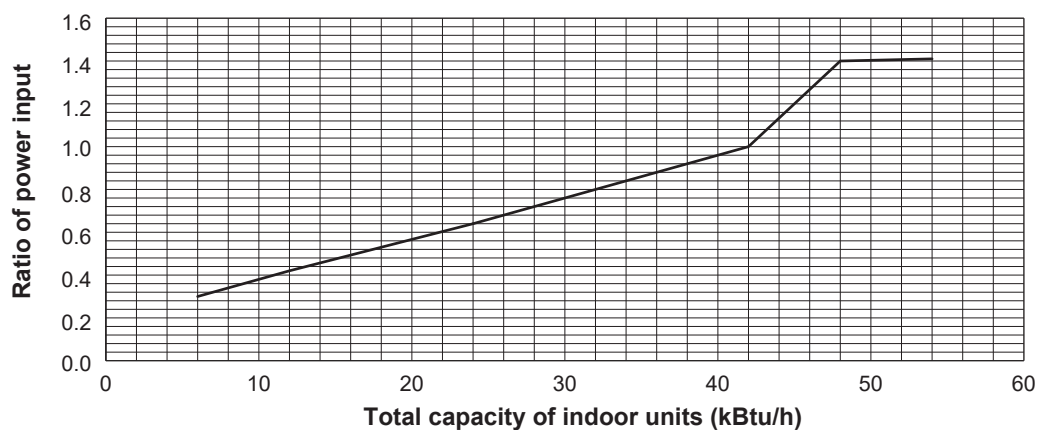
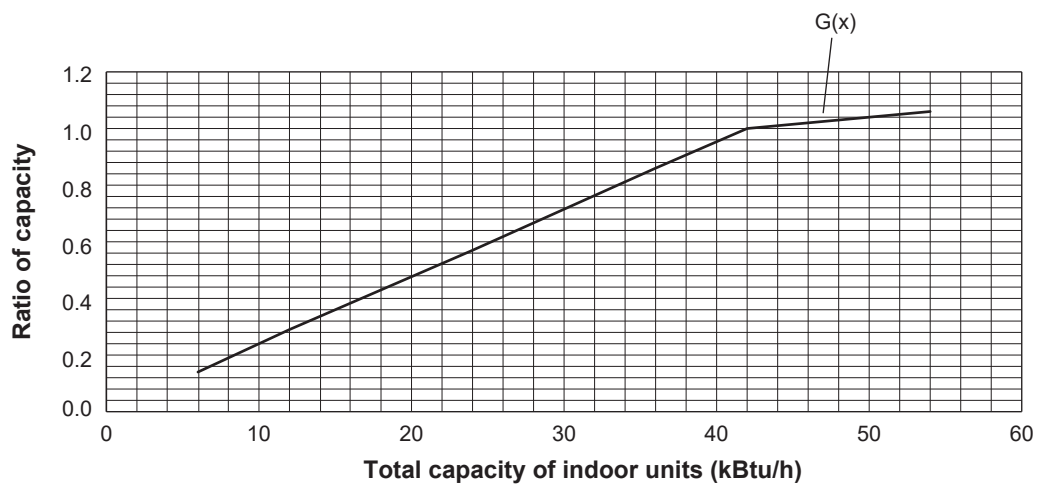
<Heating>



4-4-3. MXZ-SM42NAMHZ-U1

<Cooling>

		Non-Ducted	Mix	Ducted
Nominal cooling capacity	Btu/h	42,000	42,000	42,000
Input	W	3,130	3,470	3,890
Current (208V)	A	15.5	17.1	19.0
Current (230V)	A	14.0	15.4	17.2

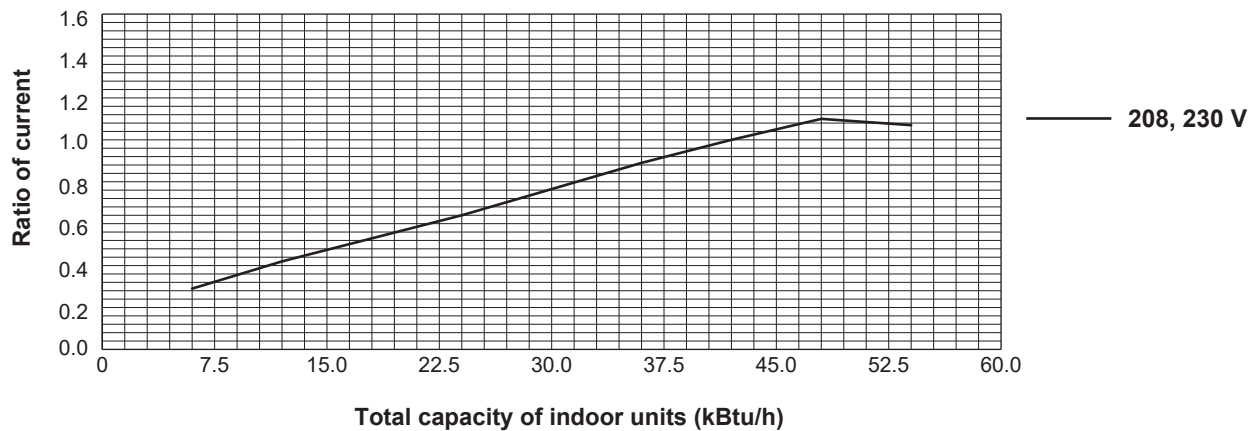
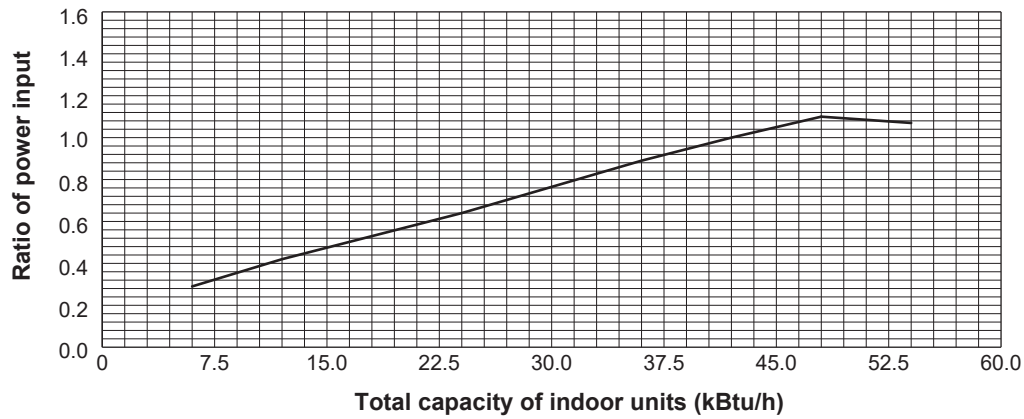
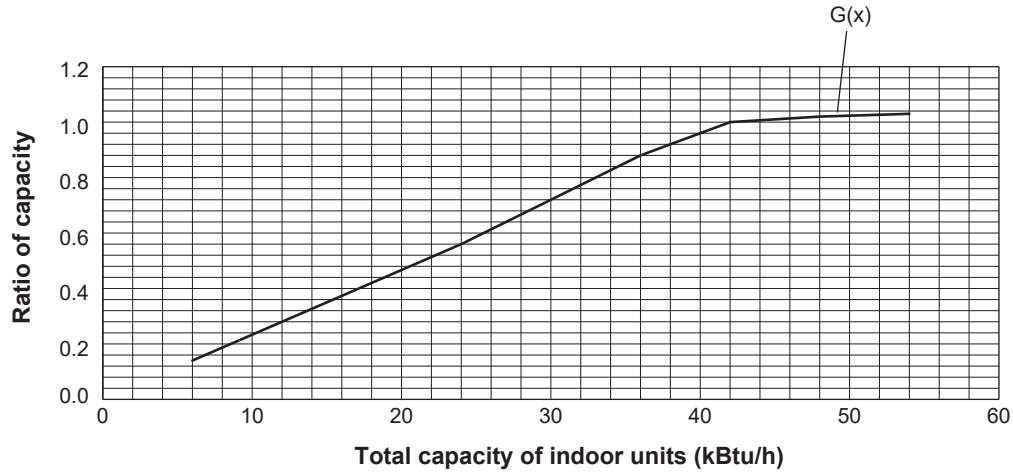


— 208, 230 V

4-4-4. MXZ-SM42NAMHZ-U1

<Heating>

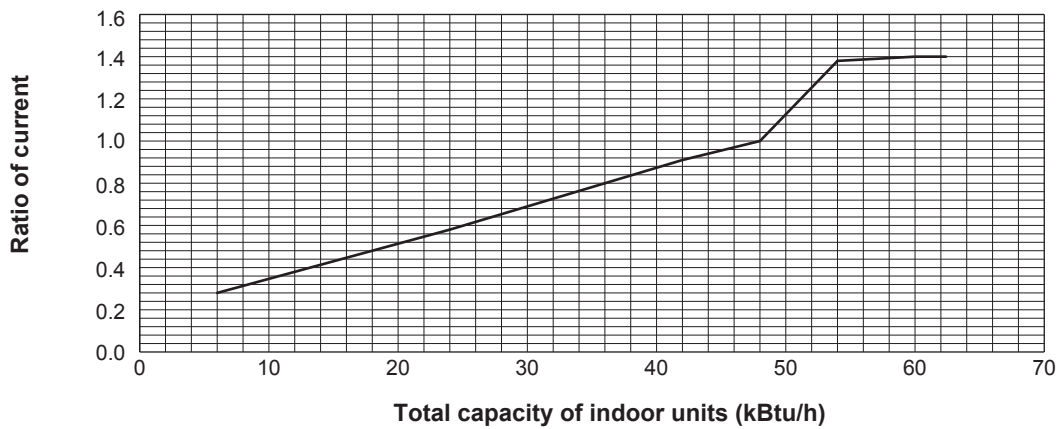
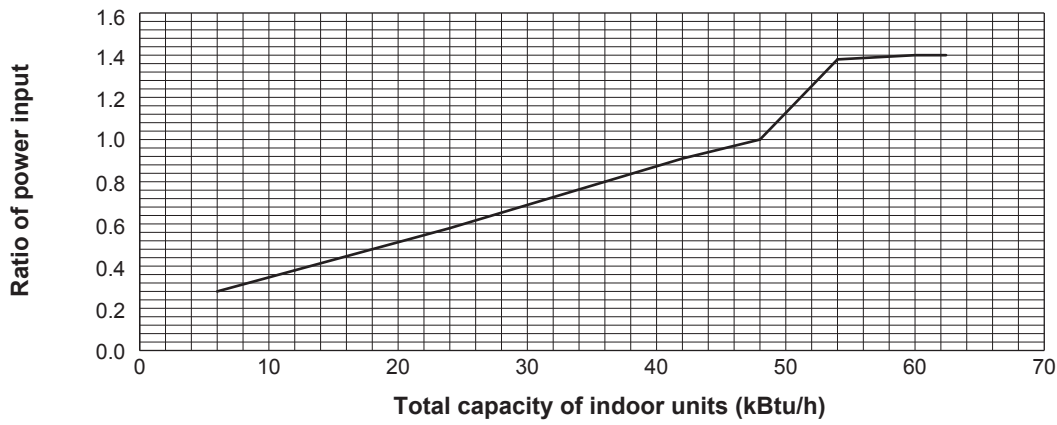
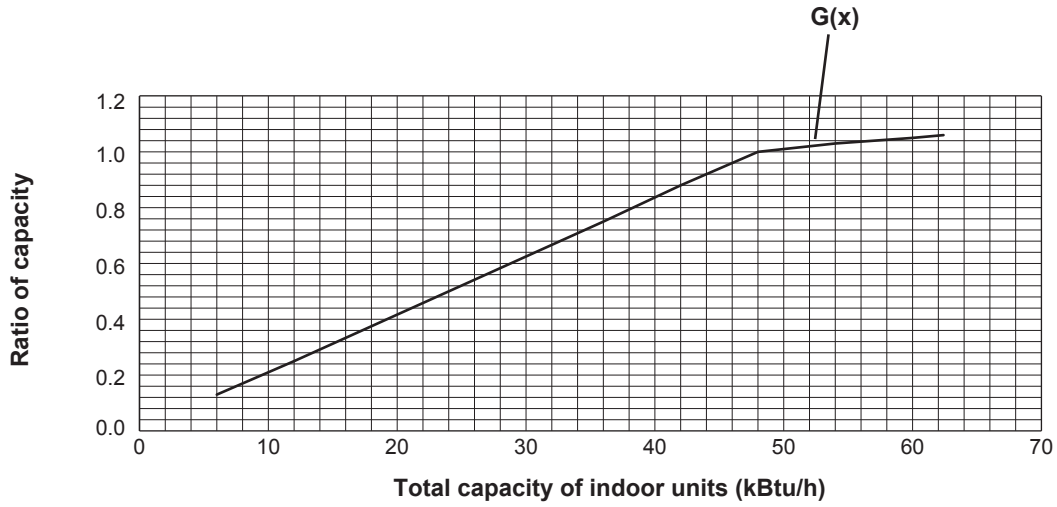
		Non-Ducted	Mix	Ducted
Nominal heating capacity	Btu/h	48,000	48,000	48,000
Input	W	3,430	3,750	4,140
Current (208V)	A	16.8	18.3	20.2
Current (230V)	A	15.2	16.6	18.3



4-4-5. MXZ-SM48NAM-U1

MXZ-SM48NAMHZ-U1

<Cooling>

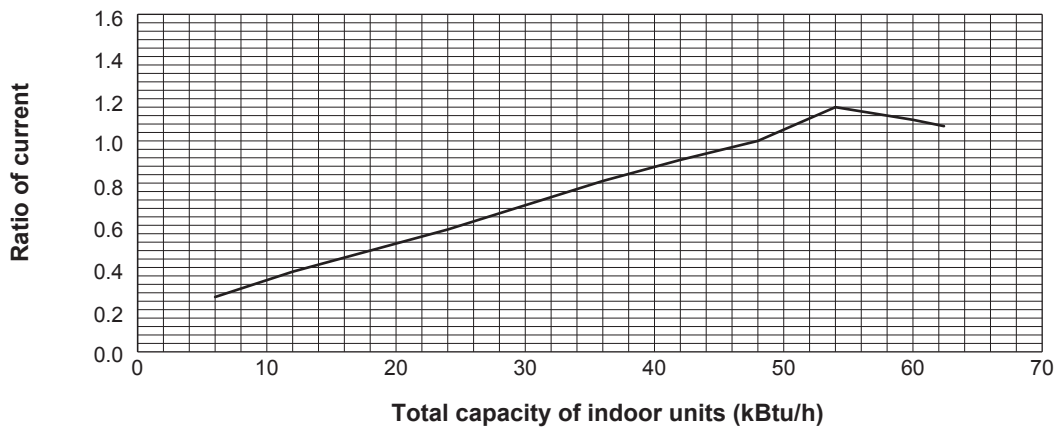
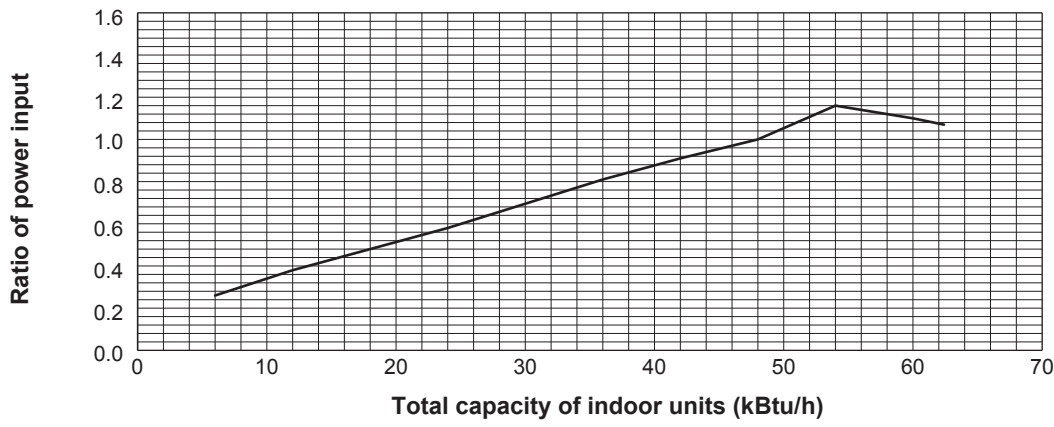
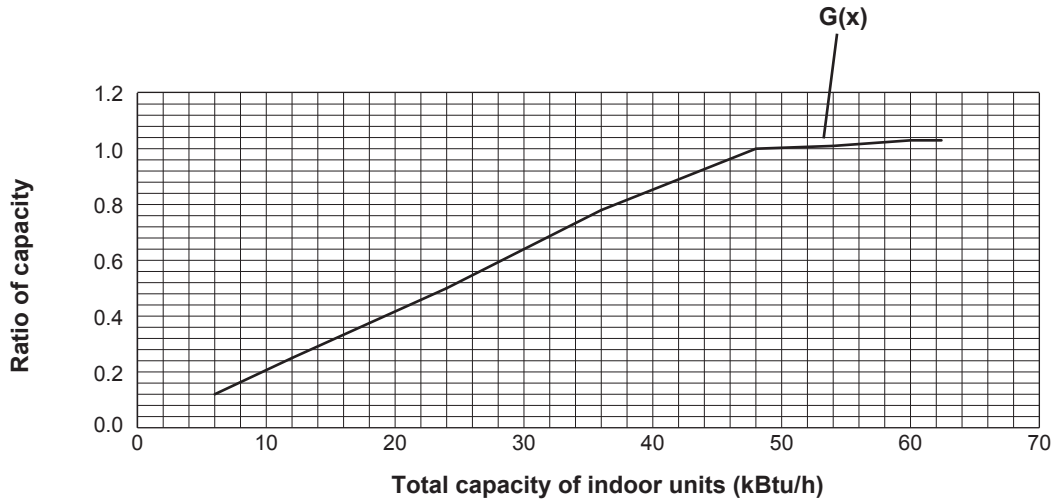


— 208, 230 V

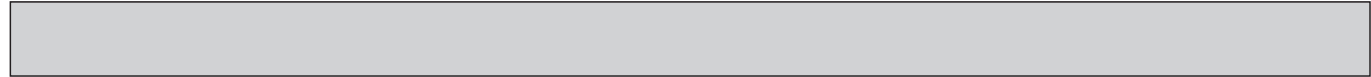
4-4-6. MXZ-SM48NAM-U1

MXZ-SM48NAMHZ-U1

<Heating>

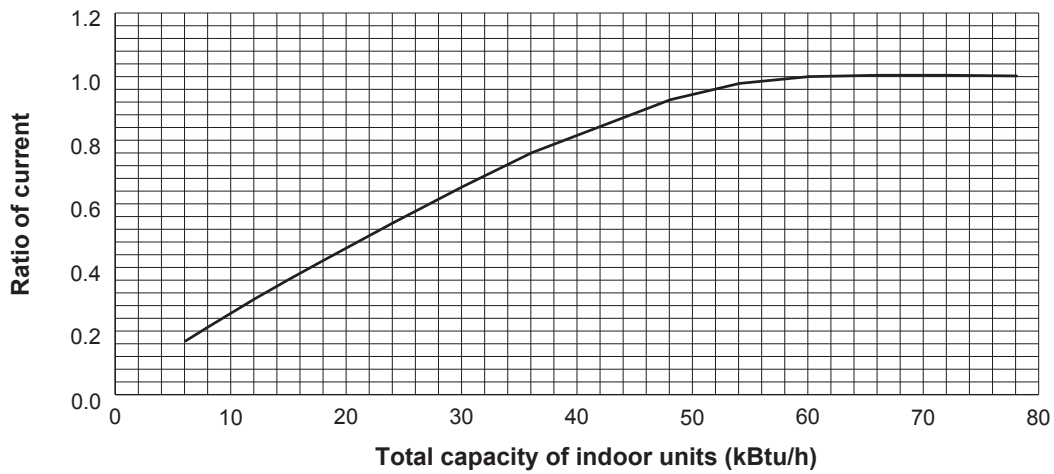
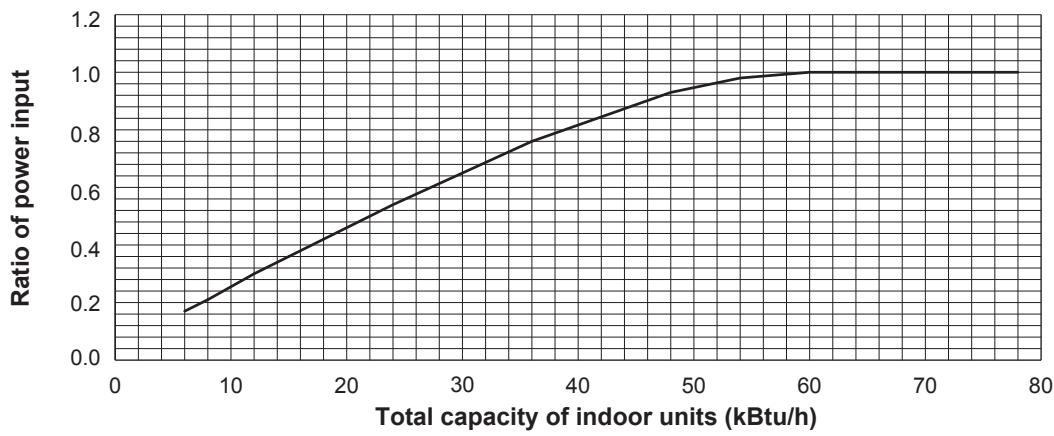
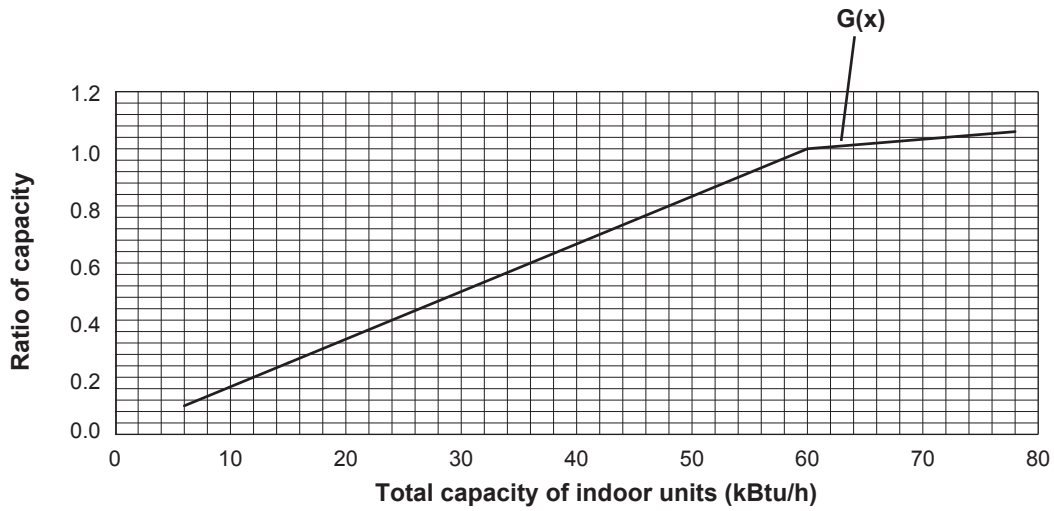


208, 230 V



4-4-7. MXZ-SM60NAM-U1

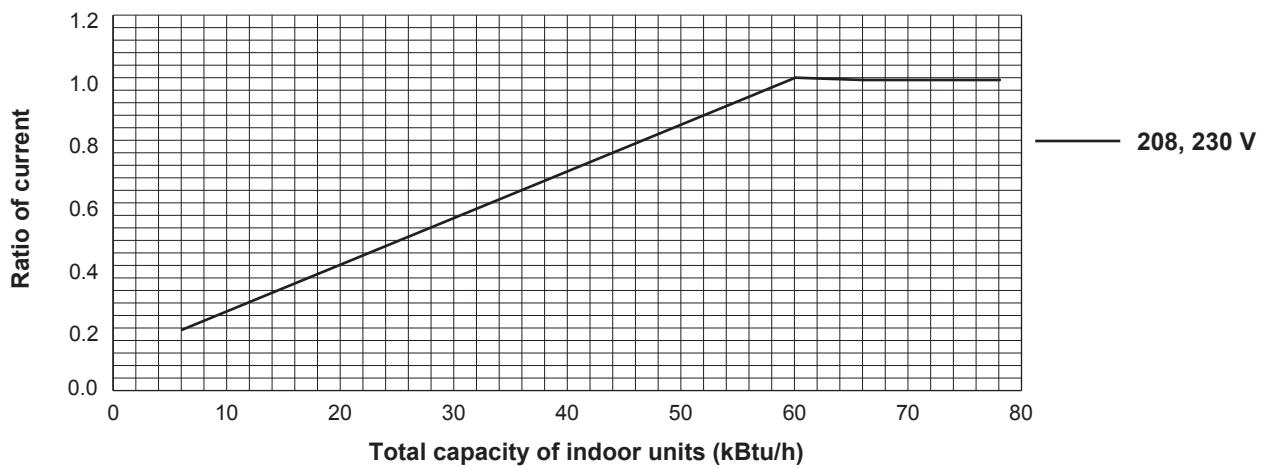
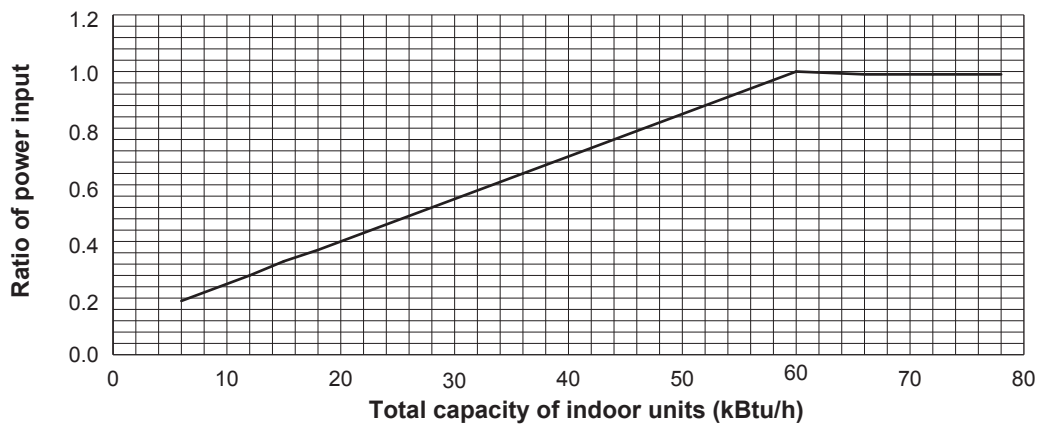
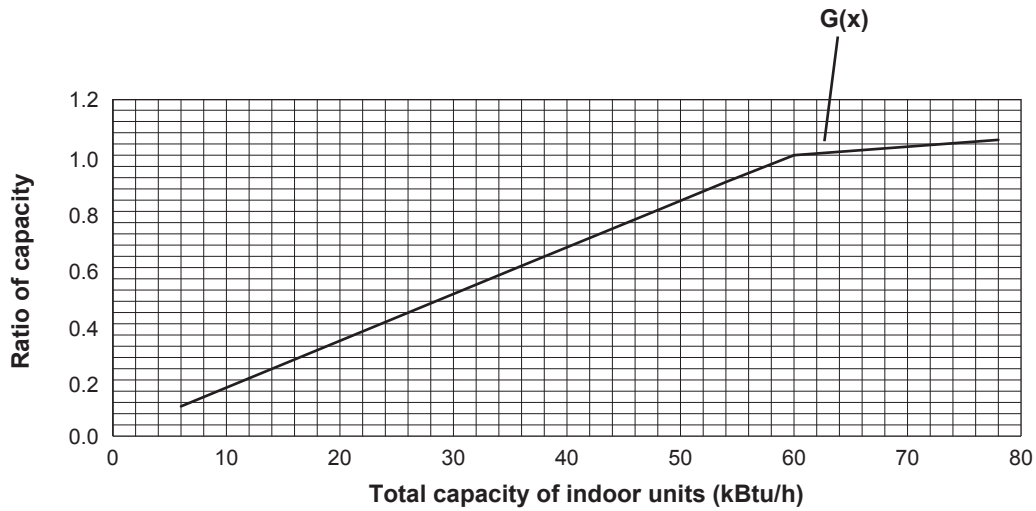
<Cooling>



— 208, 230 V

4-4-8. MXZ-SM60NAM-U1

<Heating>



4-5. CORRECTING CAPACITY FOR CHANGES IN THE LENGTH OF REFRIGERANT PIPING

- (1) During cooling, obtain the ratio (and the equivalent piping length) of the outdoor units rated capacity and the total in-use indoor capacity, and find the capacity ratio corresponding to the standard piping length from Figure 13 to 17. Then multiply by the cooling capacity from Figure 7 and 8 in "4-2. CORRECTION BY TEMPERATURE" to obtain the actual capacity.
- (2) During heating, find the equivalent piping length, and find the capacity ratio corresponding to standard piping length from Figure 13. Then multiply by the heating capacity from Figure 9 and 10 in "4-2. CORRECTION BY TEMPERATURE" to obtain the actual capacity.

(1) Capacity Correction Curve

Figure 13 MXZ-SM36NAM-U1 MXZ-SM36NAMHZ-U1 <Cooling>

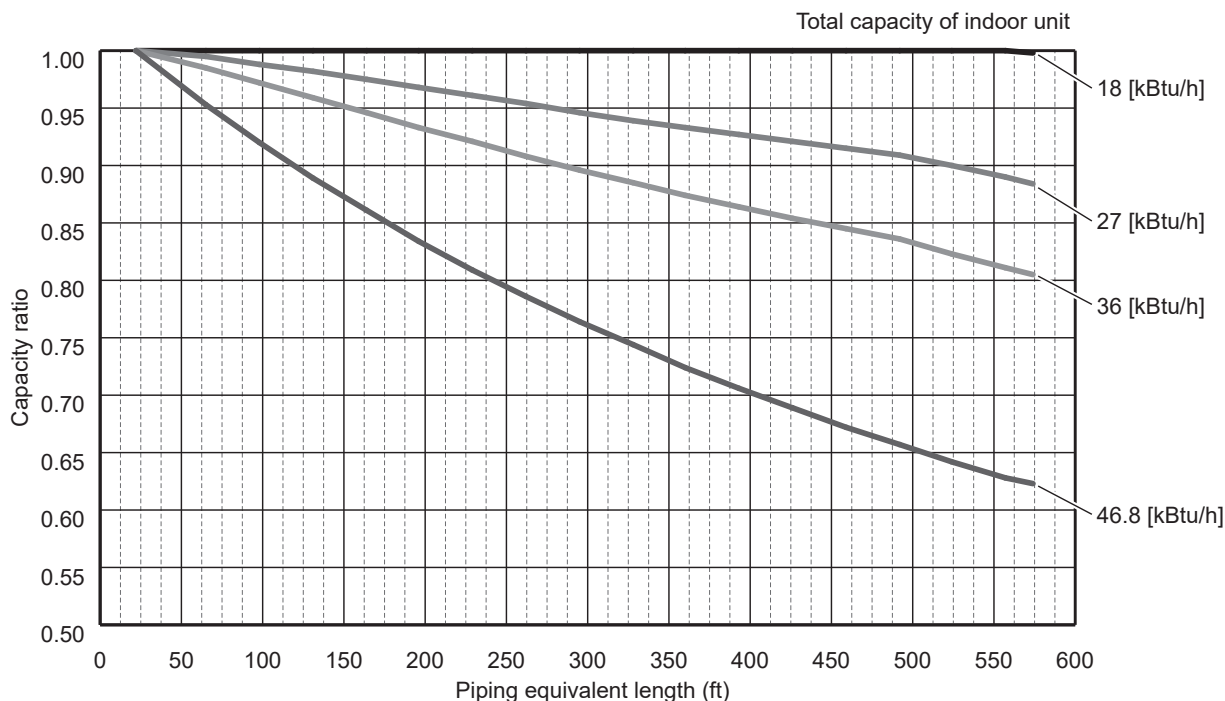


Figure 14 MXZ-SM42NAMHZ-U1 <Cooling>

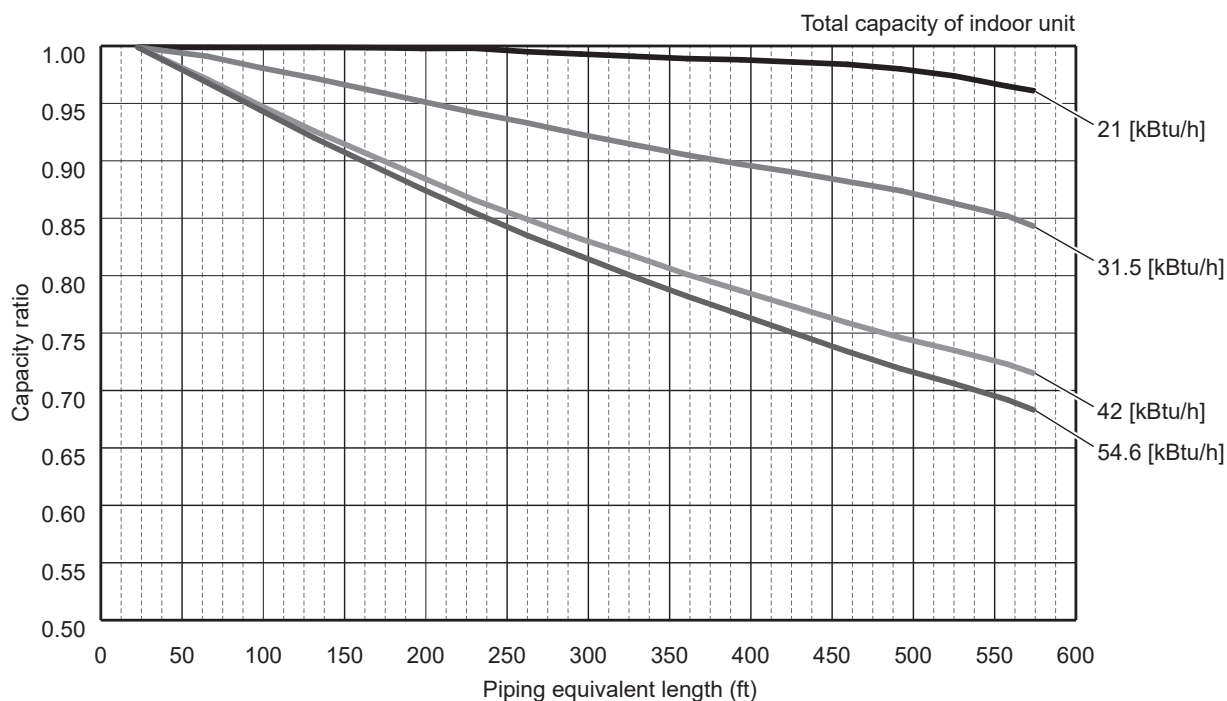


Figure 15 MXZ-SM48NAM-U1

MXZ-SM48NAMHZ-U1

<Cooling>

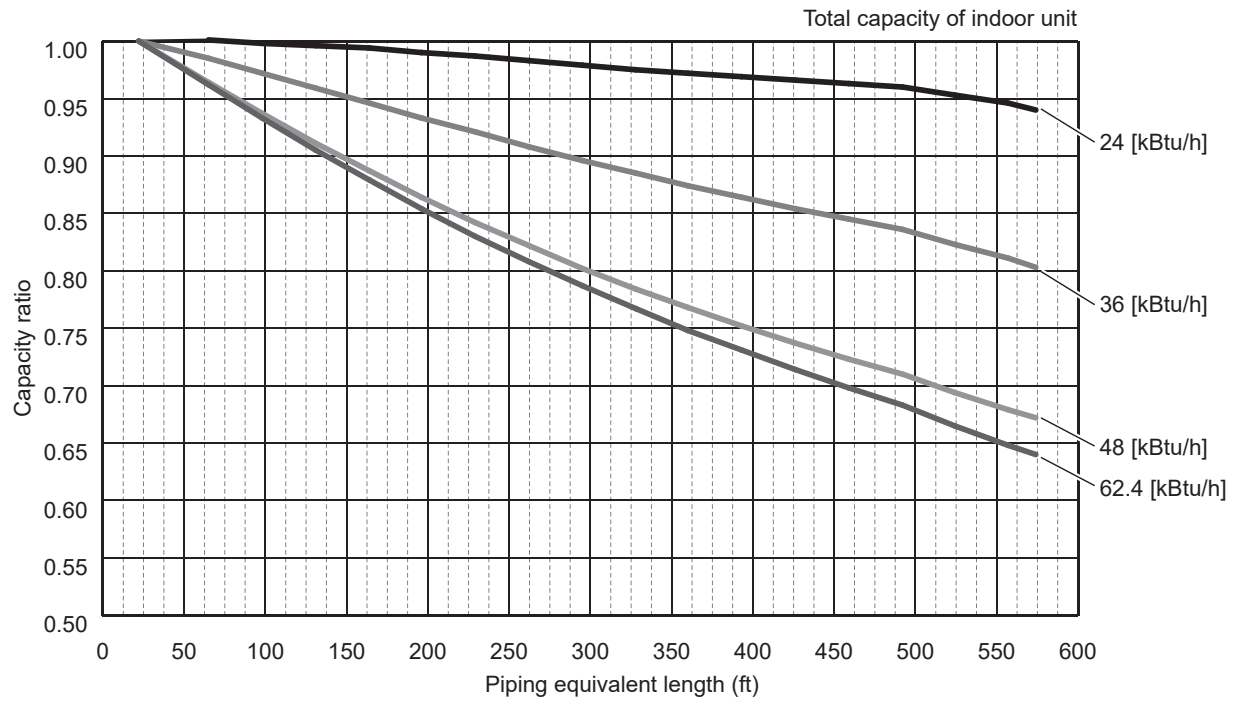


Figure 16 MXZ-SM60NAM-U1

<Cooling>

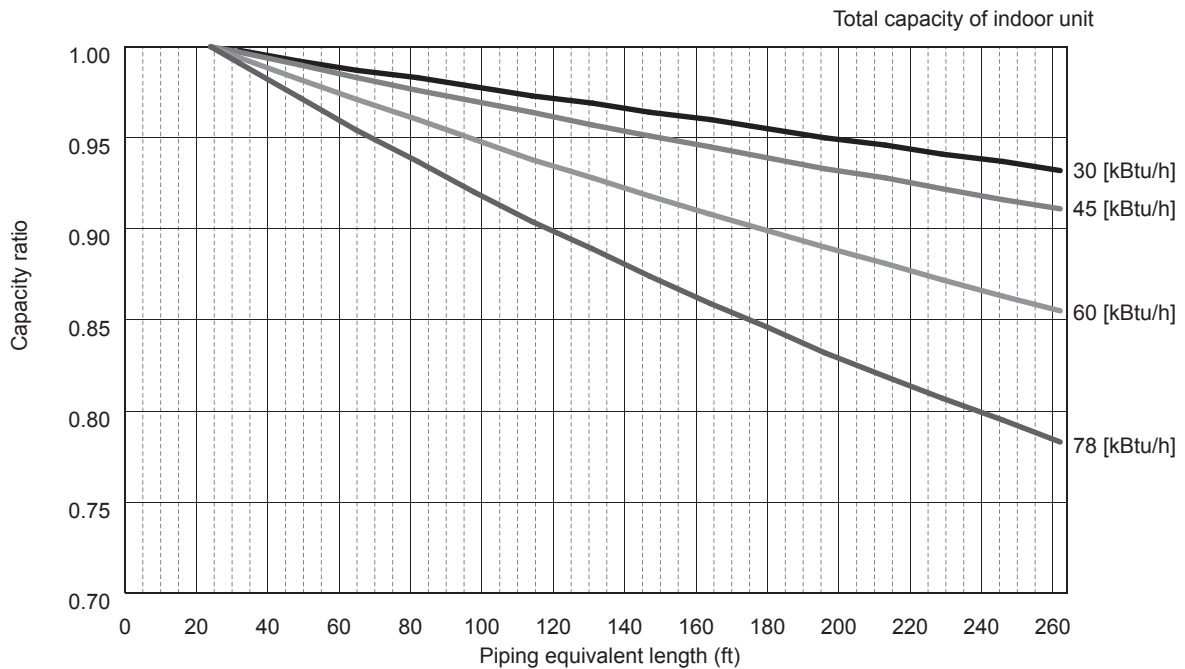


Figure 17 MXZ-SM36NAM-U1 MXZ-SM36NAMHZ-U1
 MXZ-SM42NAMHZ-U1
 MXZ-SM48NAM-U1 MXZ-SM48NAMHZ-U1 <Heating>
 Total capacity of indoor unit

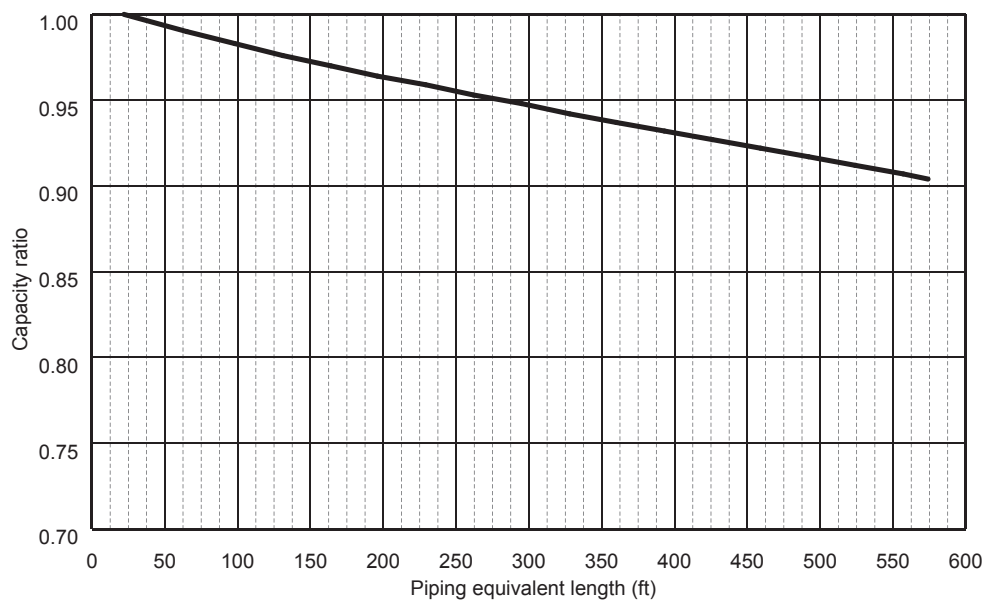
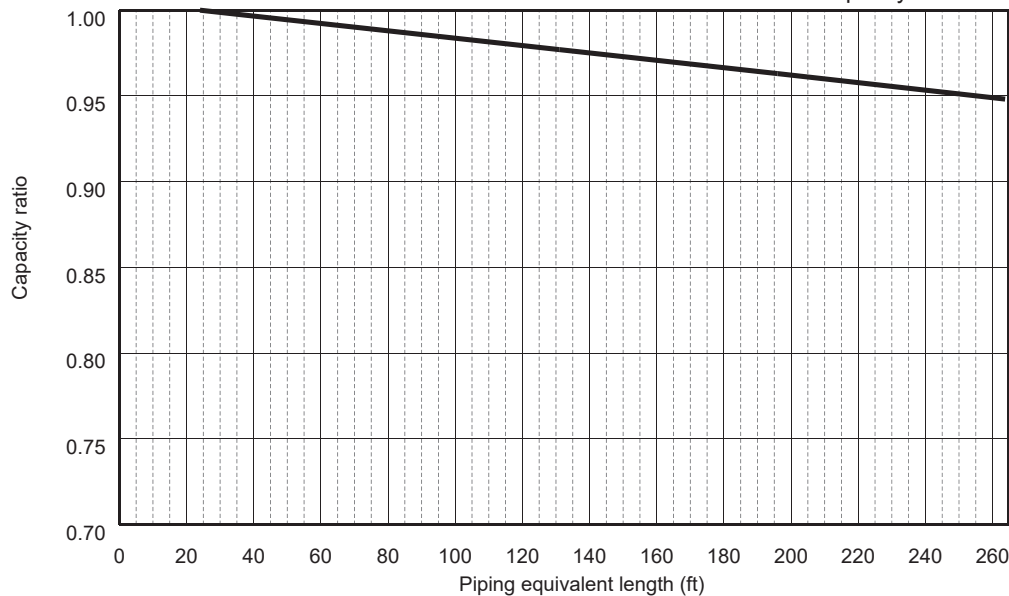


Figure 18 MXZ-SM60NAM-U1 <Heating>
 Total capacity of indoor unit



(2) Method for Obtaining the Equivalent Piping Length

Equivalent length = (length of piping to farthest indoor unit) + (0.3 × number of bends in the piping) (m)

4-5-1. Correction of Heating Capacity for Frost and Defrosting

If heating capacity has been reduced due to frost formation or defrosting, multiply the capacity by the appropriate correction factor from the following table to obtain the actual heating capacity.

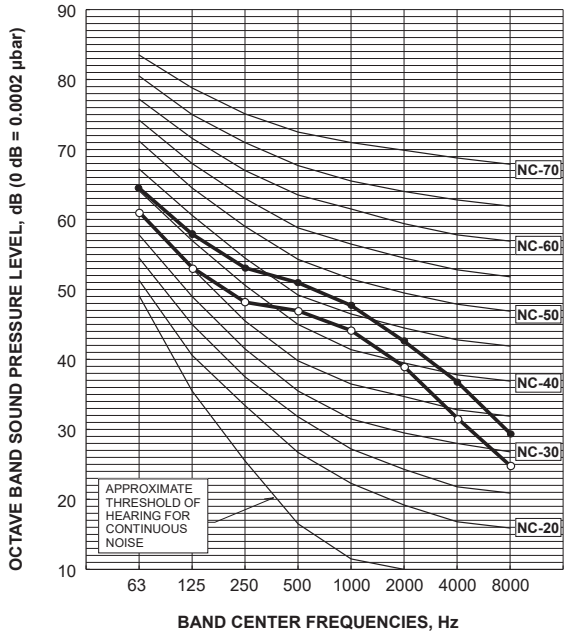
Correction factor diagram

Outdoor Intake temperature <W.B.°F (°C)>	43(6)	37(4)	36(2)	32(0)	28(-2)	25(-4)	21(-6)	18(-8)	14(-10)	5(-15)	-4(-20)	-13(-25)
Correction factor	1.00	0.98	0.89	0.88	0.89	0.90	0.95	0.95	0.95	0.95	0.95	0.95

4-6. NOISE CRITERION CURVES

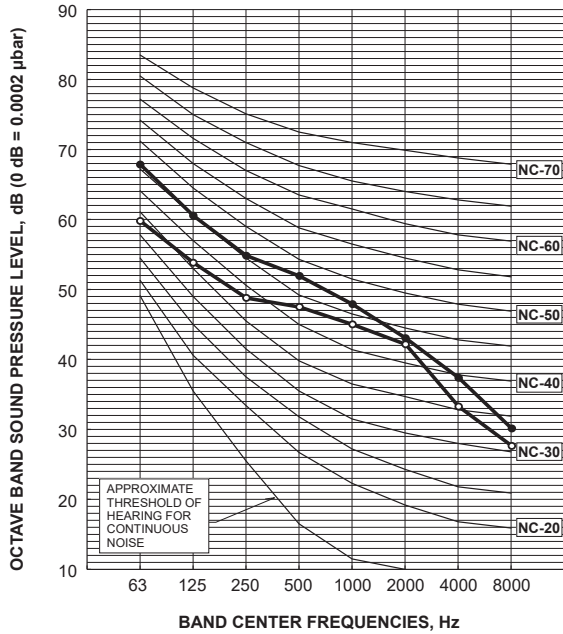
MXZ-SM36NAM-U1
MXZ-SM36NAMHZ-U1

MODE	SPL(dB)	LINE
COOLING	49	○—○
HEATING	53	●—●



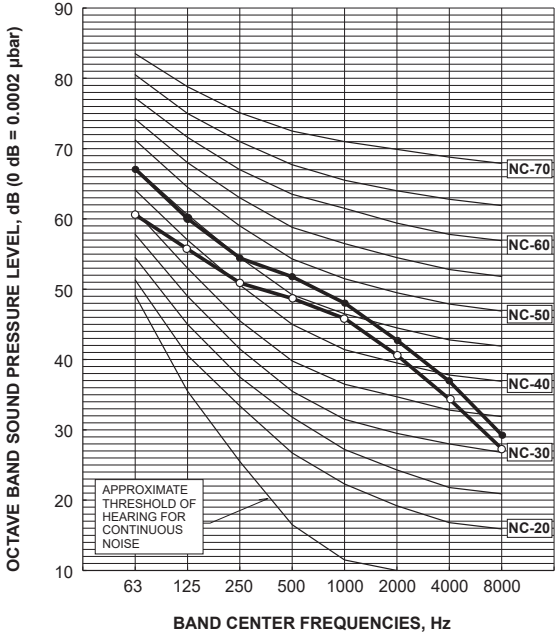
MXZ-SM42NAMHZ-U1

MODE	SPL(dB)	LINE
COOLING	50	○—○
HEATING	54	●—●



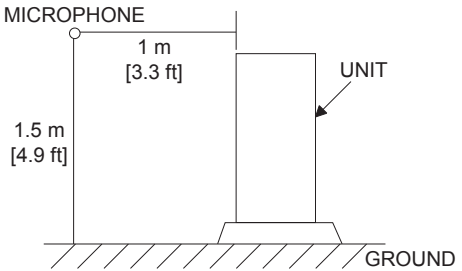
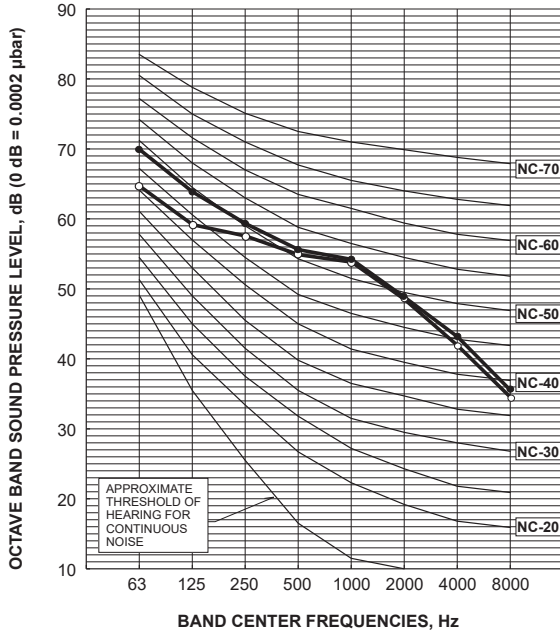
MXZ-SM48NAM-U1
MXZ-SM48NAMHZ-U1

MODE	SPL(dB)	LINE
COOLING	51	○—○
HEATING	54	●—●



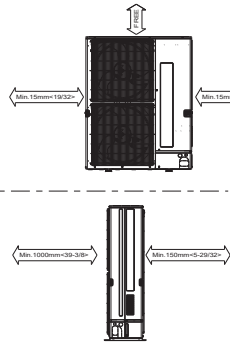
MXZ-SM60NAM-U1

MODE	SPL(dB)	LINE
COOLING	58	○—○
HEATING	59	●—●



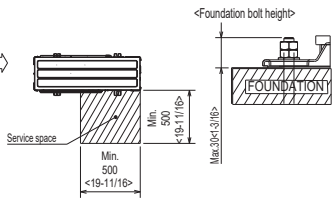
1 FREE SPACE(Around the unit)

The diagram below shows a basic example.
Explanation of particular details are given in the installation manuals etc.



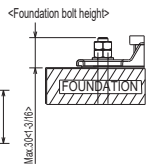
2 SERVICE SPACE

Dimensions of space needed for service access are shown in the below diagram.



3 FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation (M10<W3/8>) bolts. (Bolts and washers must be purchased locally.)



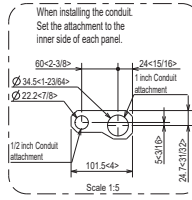
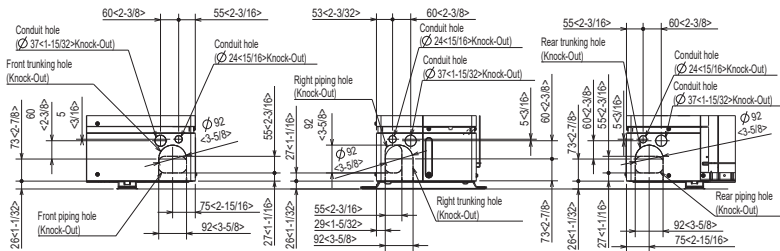
4 PIPING-WIRING DIRECTIONS

Piping and wiring connections can be made from 4 directions: Front, Right, Rear and Below.

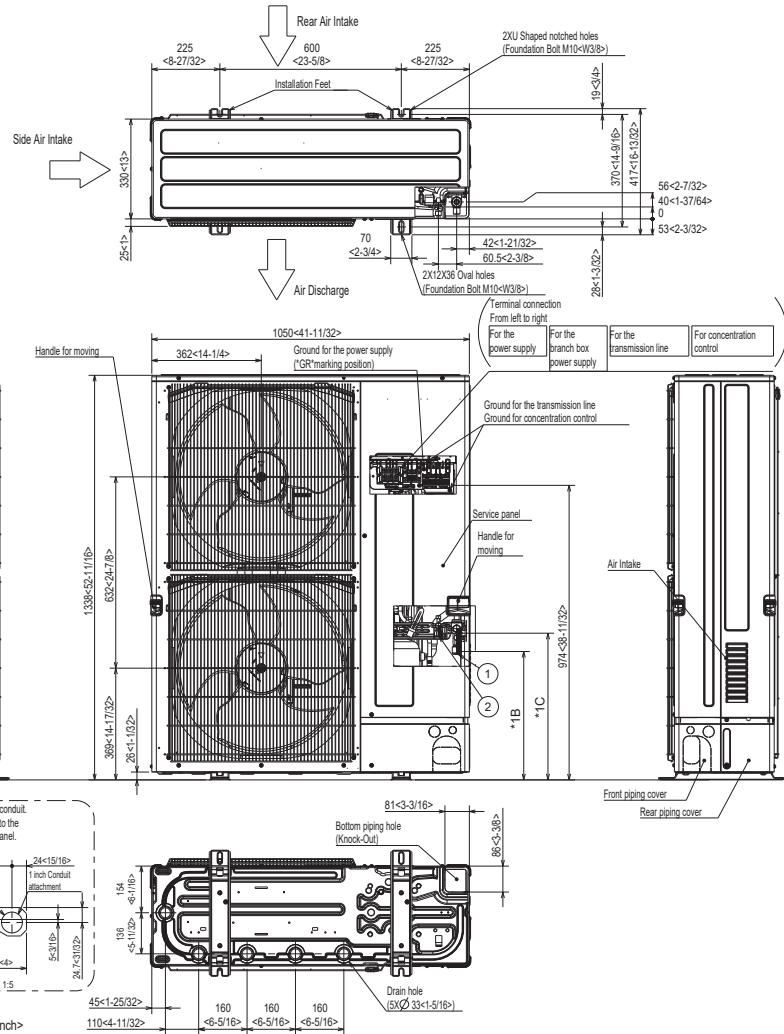
Example of Notes

- ① ... Refrigerant GAS pipe connection (FLARE) Ø A
② ... Refrigerant LIQUID pipe connection (FLARE) Ø 9.52 (3/8F)
*1 ... Indication of STOP VALVE connection location.

Piping Knock-Out Hole Details



mm <inch>



MXZ-SM36NAMHZ			
MXZ-SM42NAMHZ	15.88 (5/8F)	426 <16-25/32>	485 <19-3/32>
MXZ-SM48NAMHZ			
MXZ-SM60NAM	19.05 (3/4F)	393 <15-15/32>	450 <17-23/32>
MXZ-SM36NAM	15.88 (5/8F)	426 <16-25/32>	485 <19-3/32>
MXZ-SM48NAM			
MODEL NAME	DIMENSION A	DIMENSION B	DIMENSION C

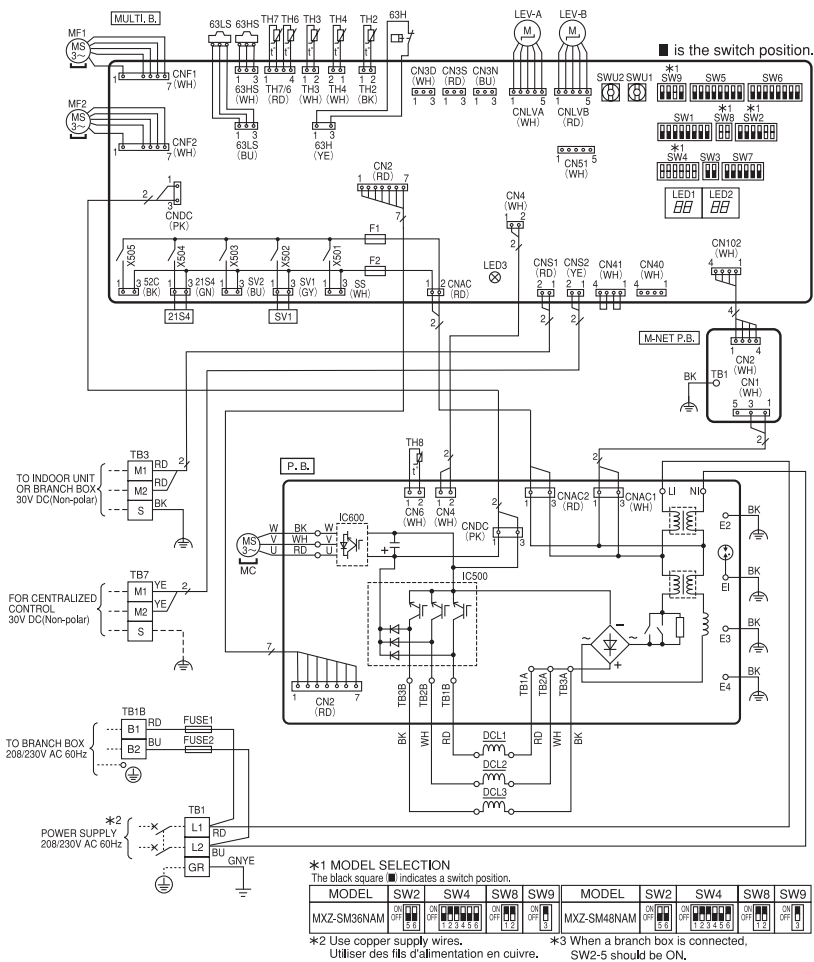
Unit: mm
<inch>

MXZ-SM36NAM-U1

MXZ-SM48NAM-U1

[LEGEND]

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block (Power Supply)	TH7	Thermistor (Ambient)	SW5	Switch (Function Selection)
TB1B	Terminal Block (Branch Box)	TH8	Thermistor (Heat Sink)	SW6	Switch (Function Selection)
TB3	Terminal Block (Indoor/Outdoor, Branch Box/Outdoor Transmission Line)	LEV-A, LEV-B	Linear Expansion Valve	SW7	Switch (Function Selection)
TB7	Terminal Block (Centralized Control Transmission Line)	DC1, DC2, DC3	Reactor	SW8	Switch (Model Selection)
FUSE1, FUSE2	Fuse (T20A L250V)	P.B.	Power Circuit Board	SW9	Switch (Function/Model Selection)
MC	Motor for Compressor	U/V/W	Connection Terminal (U/V/W-Phase)	SWU1	Switch (Unit Address Selection, ones digit)
MF1, MF2	Fan Motor	L1	Connection Terminal (L1-Phase)	SWU2	Switch (Unit Address Selection, tens digit)
21S4	Solenoid Valve Coil (4-Way Valve)	N1	Connection Terminal (L2-Phase)	SS	Connector (Connection for Option)
63H	High Pressure Switch	NI	Connection Terminal (Reactor)	CN3D	Connector (Connection for Option)
63HS	High Pressure Sensor	IC500	Converter	CN3S	Connector (Connection for Option)
63LS	Low Pressure Sensor	IC600	Inverter	CN3N	Connector (Connection for Option)
SV1	Solenoid Valve Coil (Bypass Valve)	E1, E2, E3, E4	Connection Terminal (Electrical Parts Box)	CN51	Connector (Connection for Option)
TH2	Thermistor (Hic Pipe)	MULTI.B.	Multi Controller Circuit Board	LED1, LED2	LED (Operation Inspection Display)
TH3	Thermistor (Outdoor Liquid Pipe)	SW1	Switch (Display Selection)	LED3	LED (Power Supply to Main Microcomputer)
TH4	Thermistor (Compressor)	SW2	Switch (Function/Model Selection)	F1, F2	Fuse (T6.3A L250V)
TH6	Thermistor (Suction Pipe)	SW3	Switch (Test Run)	X501~X505	Relay
		SW4	Switch (Model Selection)	M-NET P.B.	M-NET Power Circuit Board
				TB1	Connection Terminal (Electrical Parts Box)



Cautions when Servicing

- ⚠ **WARNING:** When the main supply is turned off, the voltage in the main capacitor will drop to 20 VDC in approx. 2 minutes. When servicing, make sure that LED1, LED2 on the outdoor multi controller circuit board goes out, and then wait for at least 1 minute.
- Components other than the outdoor circuit boards may be faulty: Check and take corrective action, referring to the service manual. Do not replace the outdoor circuit boards without checking.

NOTES:

1. Refer to the wiring diagrams of the indoor units for details on wiring of each indoor unit.

2. Self-diagnosis function

The indoor and outdoor units can be diagnosed automatically using the self-diagnosis switch (SW1) and LED indication (LED1, LED2) found on the outdoor multi controller circuit board.
LED indication: Set all contacts of SW1 to OFF.

- During normal operation

The LED indicates the drive state of outdoor unit.

Bit	1	2	3	4	5	6	7	8
Indication	Compressor operated	52C	21S4	SV1	(SV2)	—	—	Always lit

- When fault requiring inspection has occurred

The LED alternately indicates the check code and the address of the unit in which the fault has occurred.

[Example]

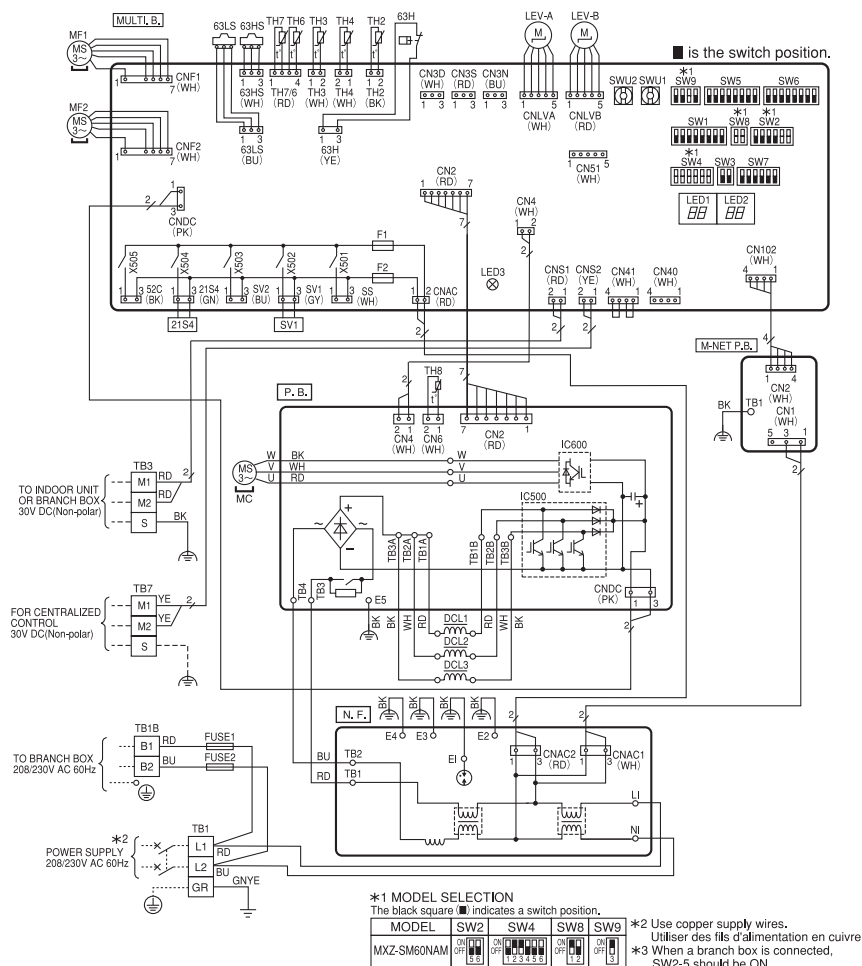
When the compressor and SV1 are on during cooling operation.

1	2	3	4	5	6	7	8
ON	ON	ON	ON	ON	ON	ON	ON

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[LEGEND]

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block (Power Supply)	LEV-A, LEV-B	Linear Expansion Valve	SW5	Switch (Function Selection)
TB1B	Terminal Block (Branch Box)	DC1, DC2, DC3	Reactor	SW6	Switch (Function Selection)
TB3	Terminal Block (Indoor/Outdoor, Branch Box/Outdoor Transmission Line)	N.F.	Noise Filter Board	SW7	Switch (Function Selection)
TB7	Terminal Block (Centralized Control Transmission Line)	LI	Connection Terminal (L1-Phase)	SW8	Switch (Model Selection)
FUSE1, FUSE2	Fuse (T20A L250V)	NI	Connection Terminal (L2-Phase)	SW9	Switch (Function/Model Selection)
MC	Motor for Compressor	TB1, TB2	Connection Terminal (Power Circuit Board)	SWU1	Switch (Unit Address Selection, ones digit)
MF1, MF2	Fan Motor	E1, E2, E3, E4	Connection Terminal (Electrical Parts Box)	SWU2	Switch (Unit Address Selection, tens digit)
21S4	Solenoid Valve Coil (4-Way Valve)	P.B.	Power Circuit Board	SS	Connector (Connection for Option)
63H	High Pressure Switch	TB3, TB4	Connection Terminal (Noise Filter Board)	CN3D	Connector (Connection for Option)
63HS	High Pressure Sensor	U/V/W	Connection Terminal (U/V/W-Phase)	CN3S	Connector (Connection for Option)
63LS	Low Pressure Sensor	TB1A, TB2A, TB3A, TB1B, TB2B, TB3B	Connection Terminal (Reactor)	CN3N	Connector (Connection for Option)
SV1	Solenoid Valve Coil (Bypass Valve)	E5	Connection Terminal (Electrical Parts Box)	CN51	Connector (Connection for Option)
TH2	Thermistor (Hic Pipe)	IC500	Converter	LED1, LED2	LED (Operation Inspection Display)
TH3	Thermistor (Outdoor Liquid Pipe)	IC600	Inverter	LED3	LED (Power Supply to Main Microcomputer)
TH4	Thermistor (Compressor)	MULTLB.	Multi Controller Circuit Board	F1, F2	Fuse (T6.3A L250V)
TH6	Thermistor (Suction Pipe)	SW1	Switch (Display Selection)	X501~X505	Relay
TH7	Thermistor (Ambient)	SW2	Switch (Function/Model Selection)	M-NET P.B.	M-NET Power Circuit Board
TH8	Thermistor (Heat Sink)	SW3	Switch (Test Run)	TB1	Connection Terminal (Electrical Parts Box)
		SW4	Switch (Model Selection)		



Cautions when Servicing

- ⚠ WARNING: When the main supply is turned off, the voltage in the main capacitor will drop to 20 VDC in approx. 2 minutes. When servicing, make sure that LED1, LED2 on the outdoor multi controller circuit board goes out, and then wait for at least 1 minute.
- Components other than the outdoor circuit boards may be faulty: Check and take corrective action, referring to the service manual. Do not replace the outdoor circuit boards without checking.

NOTES:

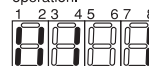
- Refer to the wiring diagrams of the indoor units for details on wiring of each indoor unit.
- Self-diagnosis function
The indoor and outdoor units can be diagnosed automatically using the self-diagnosis switch (SW1) and LED indication (LED1, LED2) found on the outdoor multi controller circuit board.
LED indication : Set all contacts of SW1 to OFF.

- During normal operation
The LED indicates the drive state of outdoor unit.

Bit	1	2	3	4	5	6	7	8
Indication	Compressor operated	52C	21S4	SV1	(SV2)	—	—	Always lit

- When fault requiring inspection has occurred
The LED alternately indicates the check code and the address of the unit in which the fault has occurred.

[Example]
When the compressor and SV1 are on during cooling operation.



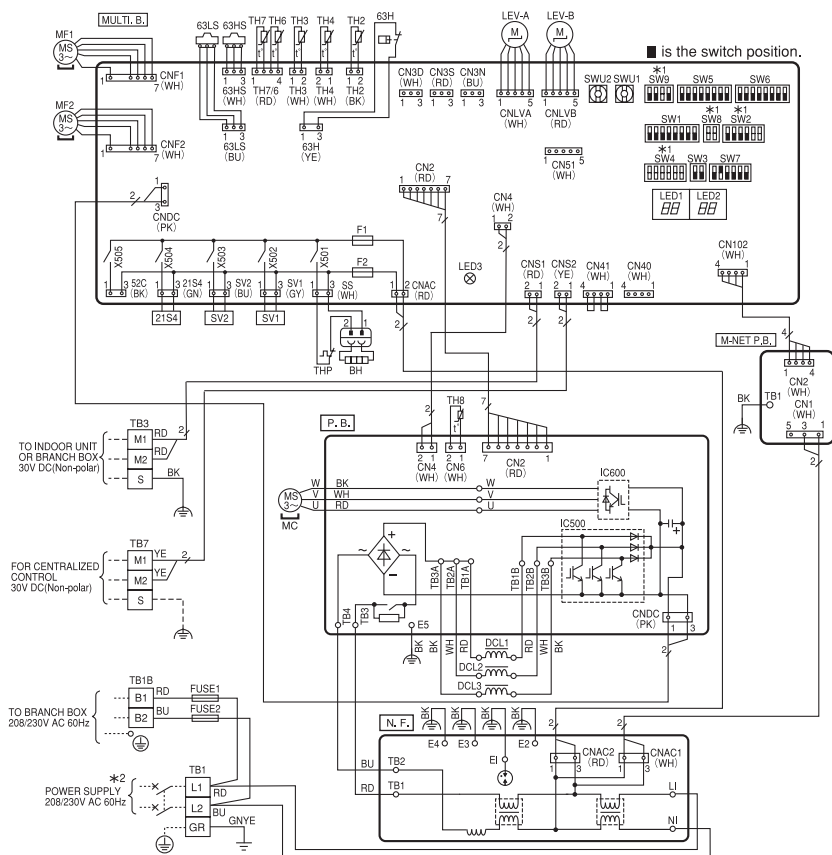
MXZ-SM36NAMHZ-U1

MXZ-SM42NAMHZ-U1

MXZ-SM48NAMHZ-U1

[LEGEND]

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block (Power Supply)	TH7	Thermistor (Ambient)	SW4	Switch (Model Selection)
TB1B	Terminal Block (Branch Box)	TH8	Thermistor (Heat Sink)	SW5	Switch (Function Selection)
TB3	Terminal Block (Indoor/Outdoor, Branch Box/Outdoor Transmission Line)	LEV-A, LEV-B	Linear Expansion Valve	SW6	Switch (Function Selection)
TB7	Terminal Block (Centralized Control Transmission Line)	DC1, DC2, DC3	Reactor	SW7	Switch (Function Selection)
FUSE1, FUSE2	Fuse (T20A L250V)	N.F.	Noise Filter Board	SW8	Switch (Model Selection)
MC	Motor for Compressor	LI	Connection Terminal (L1-Phase)	SW9	Switch (Function/Model Selection)
MF1, MF2	Fan Motor	NI	Connection Terminal (L2-Phase)	SWU1	Switch (Unit Address Selection, ones digit)
21S4	Solenoid Valve Coil (4-Way Valve)	TB1, TB2	Connection Terminal (Power Circuit Board)	SWU2	Switch (Unit Address Selection, tens digit)
63H	High Pressure Switch	E1, E2, E3, E4	Connection Terminal (Electrical Parts Box)	SS	Connector (Connection for Option)
63LS	Low Pressure Sensor	P.B.	Power Circuit Board	CN3D	Connector (Connection for Option)
SV1	Solenoid Valve Coil (Bypass Valve)	TB3, TB4	Connection Terminal (Noise Filter Board)	CN3S	Connector (Connection for Option)
SV2	Solenoid Valve Coil (Switching Valve)	U/V/W	Connection Terminal (U/V/W-Phase)	CN3N	Connector (Connection for Option)
BH	Base Heater	TB1A, TB2A, TB3A, TB1B, TB2B, TB3B	Connection Terminal (Reactor)	CN51	Connector (Connection for Option)
THP	Thermal Protector	E5	Connection Terminal (Electrical Parts Box)	LED1, LED2	LED (Operation Inspection Display)
TH2	Thermistor (Hic Pipe)	IC500	Converter	LED3	LED (Power Supply to Main Microcomputer)
TH3	Thermistor (Outdoor Liquid Pipe)	IC600	Inverter	F1, F2	Fuse (T6.3A L250V)
TH4	Thermistor (Compressor)	MULTI.B.	Multi Controller Circuit Board	X501~X505	Relay
TH6	Thermistor (Suction Pipe)	SW1	Switch (Display Selection)	M-NET P.B.	M-NET Power Circuit Board
		SW2	Switch (Function/Model Selection)	TB1	Connection Terminal (Electrical Parts Box)
		SW3	Switch (Test Run)		



*1 MODEL SELECTION

The black square (■) indicates a switch position.

MODEL	SW2	SW4	SW8	SW9	MODEL	SW2	SW4	SW8	SW9	MODEL	SW2	SW4	SW8	SW9
MXZ-SM36NAMHZ	ON	OFF	OFF	OFF	MXZ-SM42NAMHZ	ON	OFF	OFF	OFF	MXZ-SM48NAMHZ	ON	OFF	OFF	OFF
	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6		1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6		1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6

*2 Use copper supply wires.

Utiliser des fils d'alimentation en cuivre.

*3 When a branch box is connected, SW2-5 should be ON.

Cautions when Servicing

- ⚠ **WARNING:** When the main supply is turned off, the voltage in the main capacitor will drop to 20 VDC in approx. 2 minutes. When servicing, make sure that LED1, LED2 on the outdoor multi controller circuit board goes out, and then wait for at least 1 minute.
- Components other than the outdoor circuit boards may be faulty: Check and take corrective action, referring to the service manual. Do not replace the outdoor circuit boards without checking.

NOTES:

1. Refer to the wiring diagrams of the indoor units for details on wiring of each indoor unit.

2. Self-diagnosis function

The indoor and outdoor units can be diagnosed automatically using the self-diagnosis switch (SW1) and LED indication (LED1, LED2) found on the outdoor multi controller circuit board.

LED indication : Set all contacts of SW1 to OFF.

• During normal operation

The LED indicates the drive state of outdoor unit.

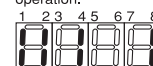
Bit	1	2	3	4	5	6	7	8
Indication	Compressor operated	52C	21S4	SV1	SV2	—	—	Always lit

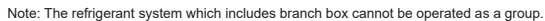
• When fault requiring inspection has occurred

The LED alternately indicates the check code and the address of the unit in which the fault has occurred.

[Example]

When the compressor and SV1 are on during cooling operation.





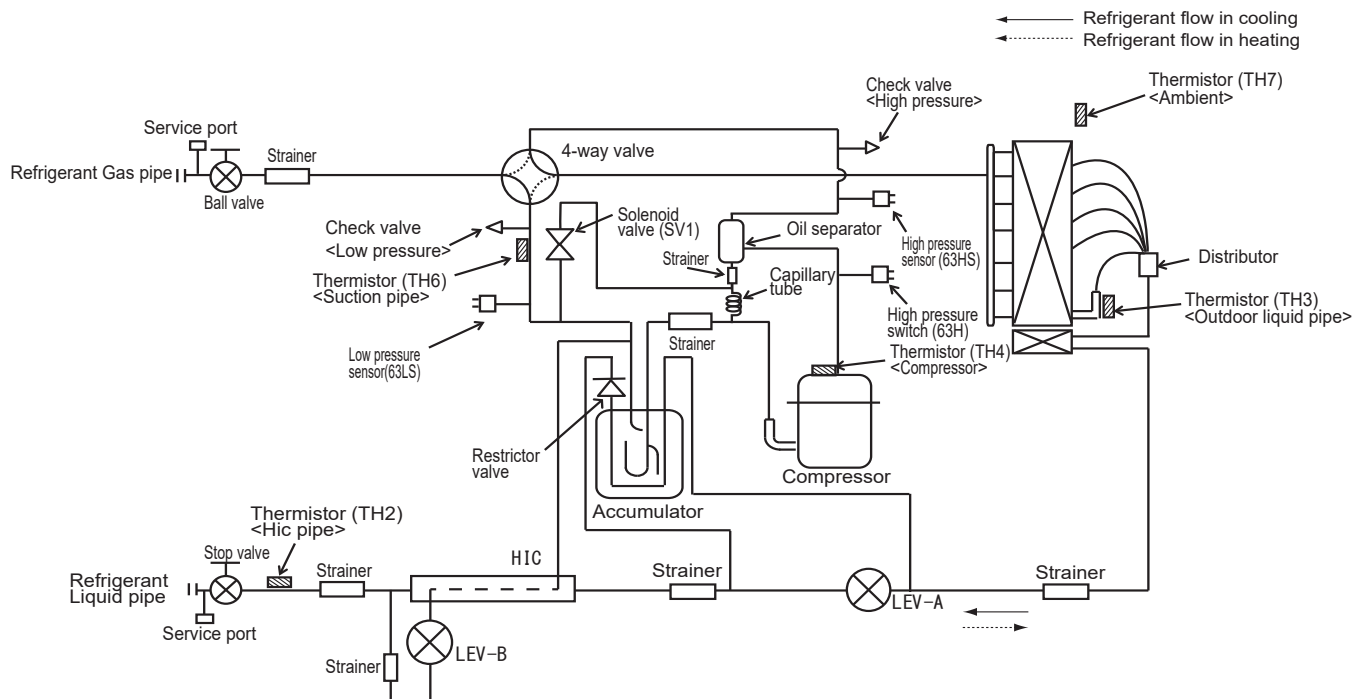
7-2. Special Function Operation and Settings for M-NET Remote Controller

For the detailed procedure of "group settings" and "paired settings", refer to the remote controller's manuals.

7-3. REFRIGERANT SYSTEM DIAGRAM

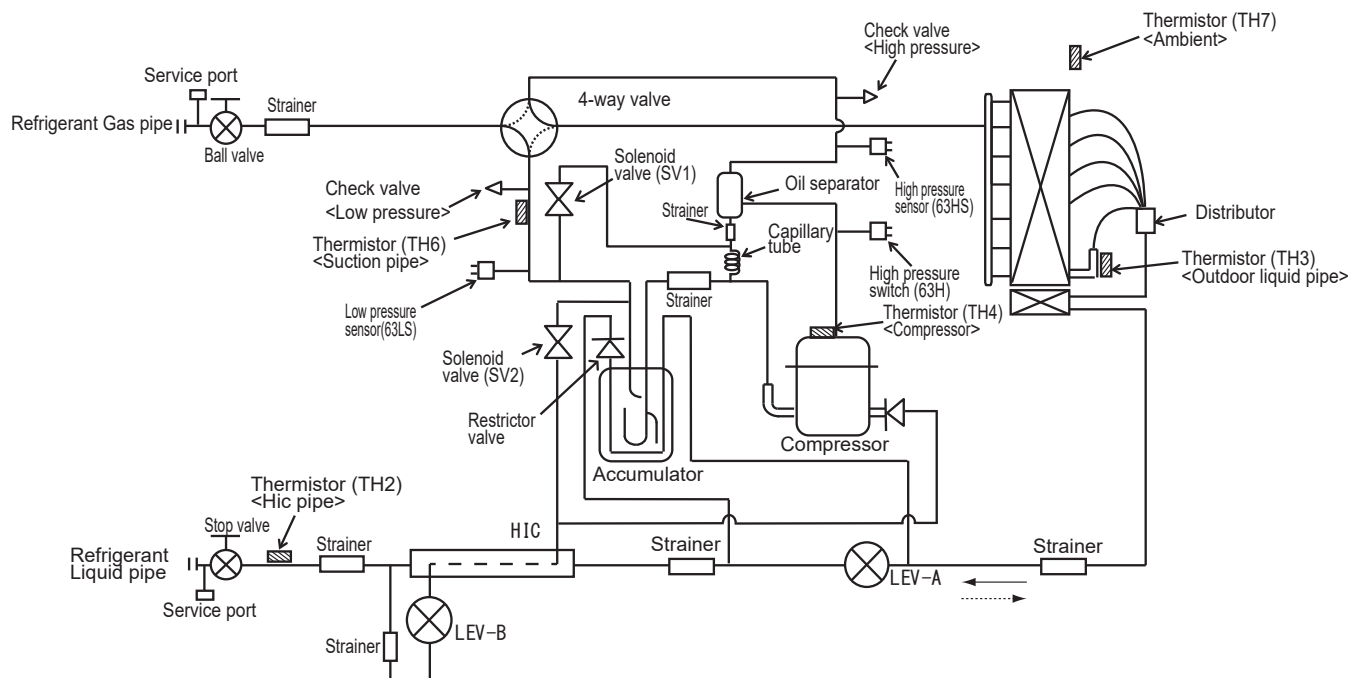
MXZ-SM36NAM-U1

MXZ-SM48NAM-U1



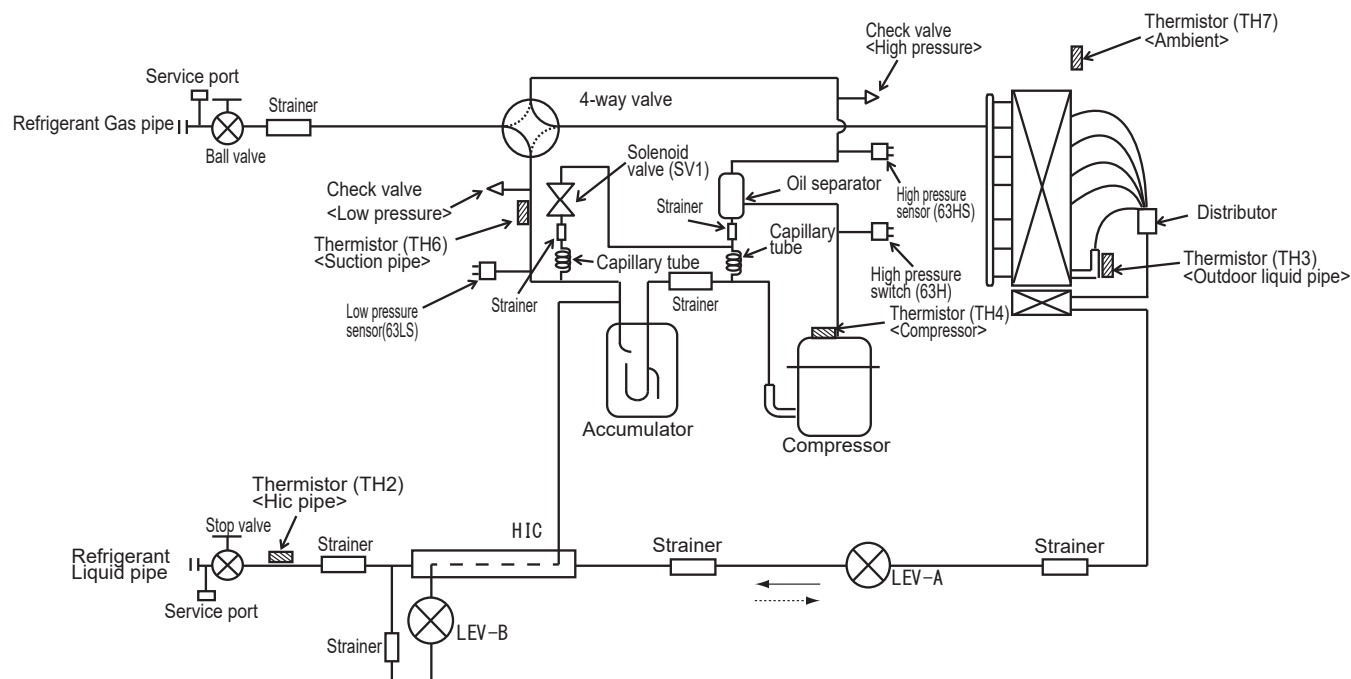
Capillary tube for oil separator [inch(mm)]: $\varnothing 0.098 \times \varnothing 0.031 \times L39.37$ ($\varnothing 2.5 \times \varnothing 0.8 \times L1000$)

MXZ-SM36NAMHZ-U1
MXZ-SM42NAMHZ-U1
MXZ-SM48NAMHZ-U1



Capillary tube for oil separator [inch(mm)]: $\varnothing 0.098 \times \varnothing 0.031 \times L39.37$ ($\varnothing 2.5 \times \varnothing 0.8 \times L1000$)

MXZ-SM60NAM-U1

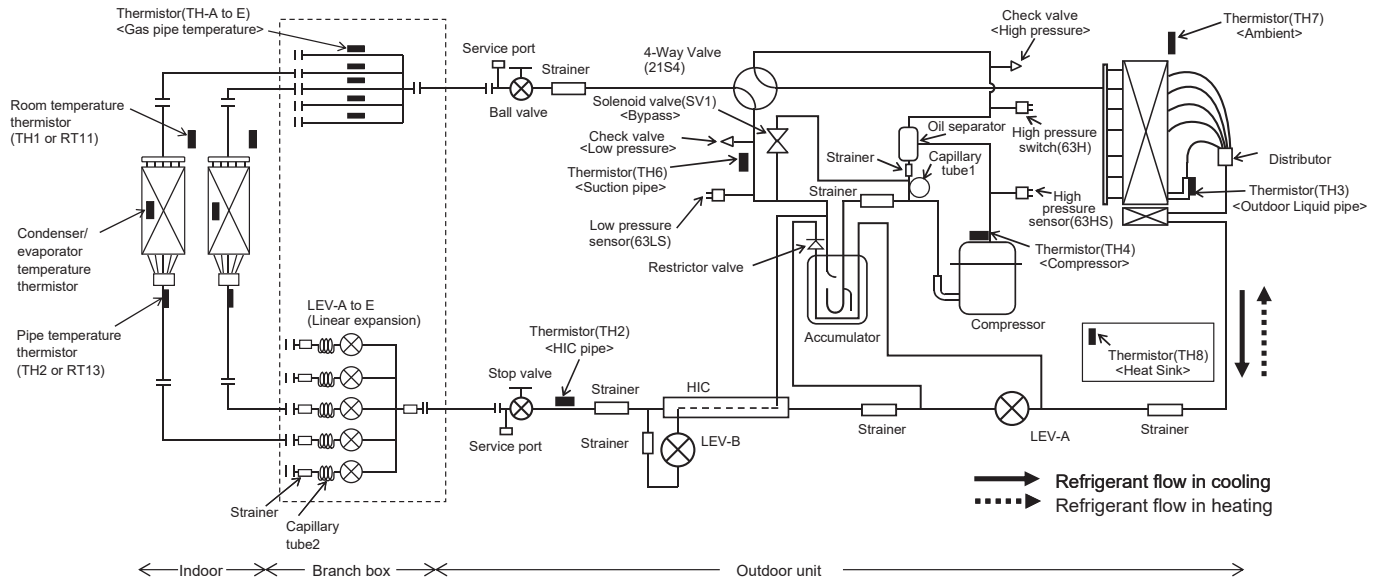


Capillary tube for oil separator [inch(mm)]: $\varnothing 0.098 \times \varnothing 0.031 \times L31.50$ ($\varnothing 2.5 \times \varnothing 0.8 \times L800$)

Capillary tube for solenoid valve [inch(mm)]: $\varnothing 0.157 \times \varnothing 0.117 \times L19.685$ ($\varnothing 4.0 \times \varnothing 3.0 \times L500$)

MXZ-SM36NAM-U1

MXZ-SM48NAM-U1

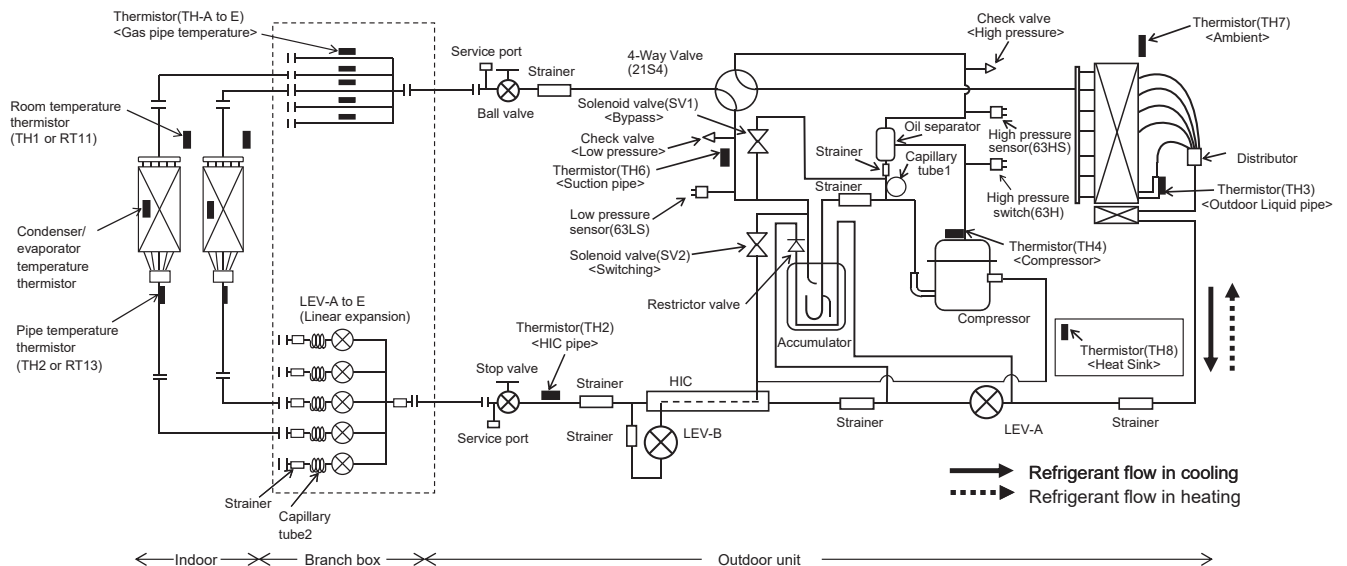


	Capillary tube 1 (For return of oil from oil separator)	Capillary tube 2 behind LEV (in cooling mode)
Outdoor unit	$\phi 0.098 \times \phi 0.031 \times L(39-1/2)$ ($\phi 2.5 \times \phi 0.8 \times L1000$)	—
Branch box	—	$(\phi 0.157 \times \phi 0.117 \times L(5-1/8)) \times 5$ ($(\phi 4.0 \times \phi 3.0 \times L130) \times 5$)
	—	$(\phi 0.157 \times \phi 0.117 \times L(5-1/8)) \times 3$ ($(\phi 4.0 \times \phi 3.0 \times L130) \times 3$)

MXZ-SM36NAMHZ-U1

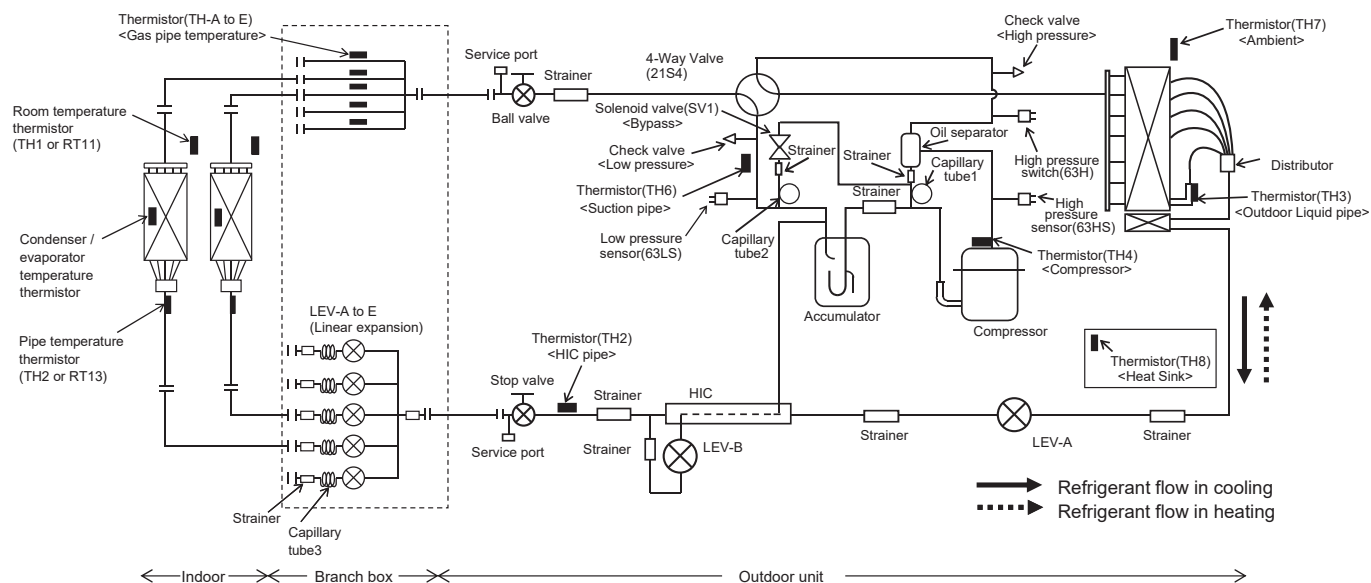
MXZ-SM42NAMHZ-U1

MXZ-SM48NAMHZ-U1



	Capillary tube 1 (For return of oil from oil separator)	Capillary tube 2 behind LEV (in cooling mode)
Outdoor unit	$\phi 0.098 \times \phi 0.031 \times L(39-1/2)$ ($\phi 2.5 \times \phi 0.8 \times L1000$)	—
Branch box	—	$(\phi 0.157 \times \phi 0.117 \times L(5-1/8)) \times 5$ ($(\phi 4.0 \times \phi 3.0 \times L130) \times 5$)
	—	$(\phi 0.157 \times \phi 0.117 \times L(5-1/8)) \times 3$ ($(\phi 4.0 \times \phi 3.0 \times L130) \times 3$)

MXZ-SM60NAM-U1



Unit: inch (mm)

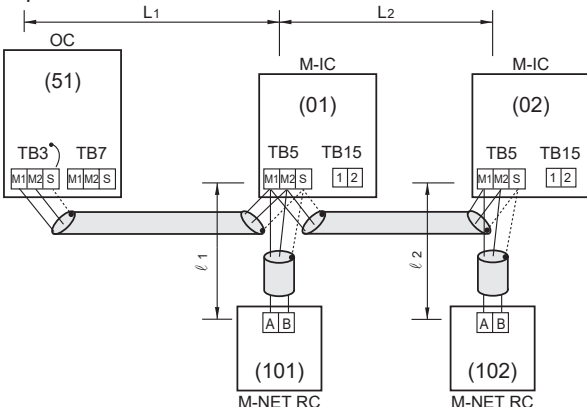
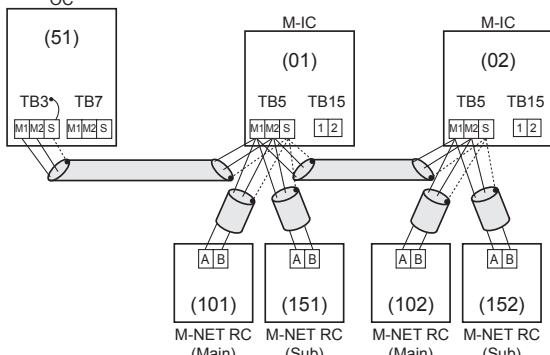
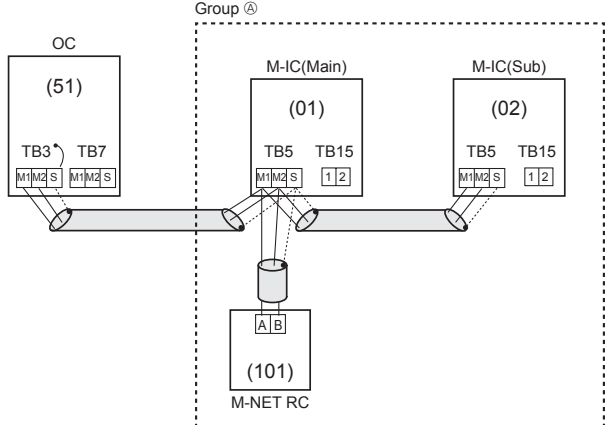
	Capillary tube 1 (For return of oil from oil separator)	Capillary tube 2 (For solenoid valve (SV1))	Capillary tube 3 behind LEV (in cooling mode)
Outdoor unit	$\varnothing 0.098 \times \varnothing 0.031 \times L(39-1/2)$ ($\varnothing 2.5 \times \varnothing 0.8 \times L800$)	$\varnothing 0.157 \times \varnothing 0.117 \times L(19-5/8)$ ($\varnothing 4.0 \times \varnothing 3.0 \times L500$)	—
Branch box	—	—	$(\varnothing 0.157 \times \varnothing 0.117 \times L(5-1/8)) \times 5$ ($(\varnothing 4.0 \times \varnothing 3.0 \times L130) \times 5$)
	—	—	$(\varnothing 0.157 \times \varnothing 0.117 \times L(5-1/8)) \times 3$ ($(\varnothing 4.0 \times \varnothing 3.0 \times L130) \times 3$)

7-4. SYSTEM CONTROL

7-4-1. Example for the System

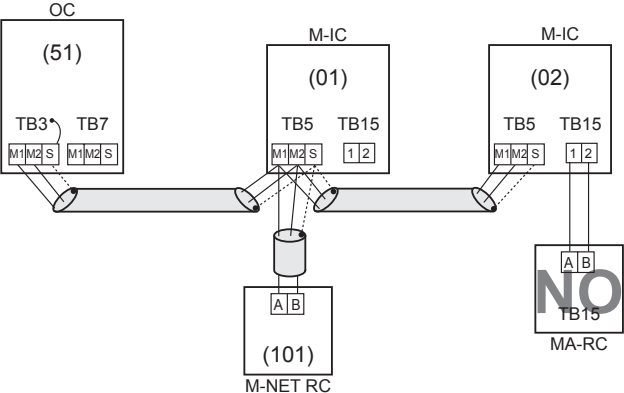
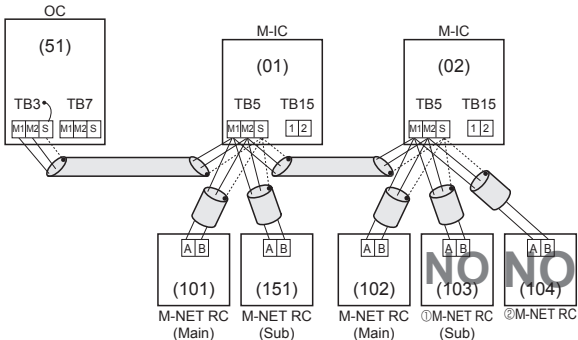
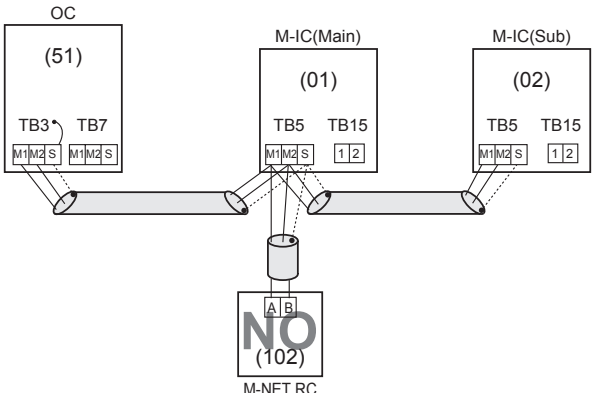
- Example for wiring control cables, wiring method and address setting, permissible lengths, and the constraint items are listed in the standard system with detailed explanation.

A. Example of an M-NET remote controller system (address setting is necessary.)

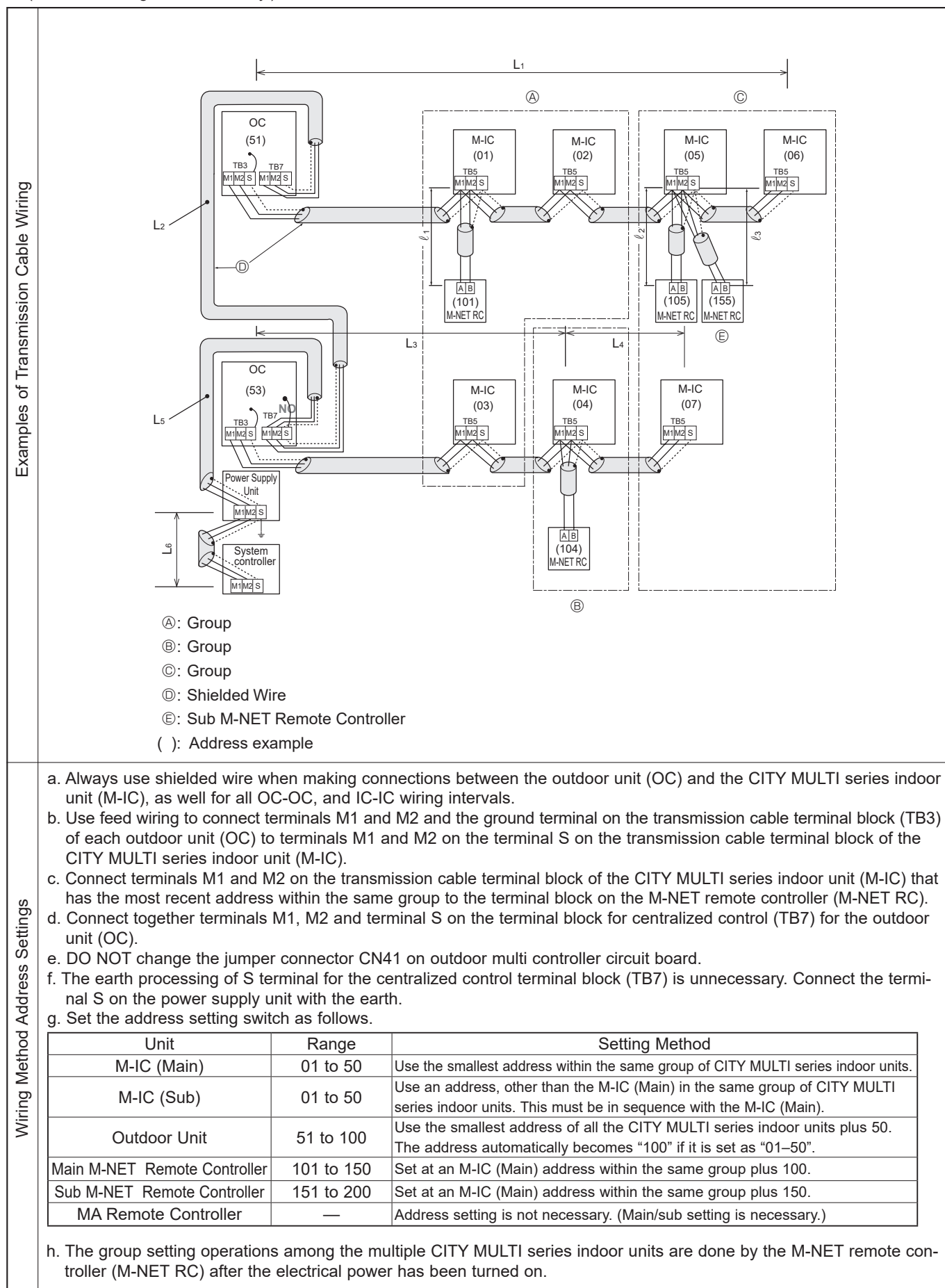
Example of wiring control cables		Wiring Method and Address Setting																
1. Standard operation  • 1 M-NET remote controller for each CITY MULTI series indoor unit • There is no need for setting the 100 position on the M-NET remote controller.		a. Use feed wiring to connect terminals M1 and M2 on transmission cable block (TB3) for the outdoor unit (OC) to terminals M1 and M2 on the transmission cable block (TB5) of each CITY MULTI series indoor unit (M-IC). Use non-polarized 2-core wire. b. Connect terminals M1 and M2 on transmission cable terminal block (TB5) for each indoor unit with the terminal block (TB6) for M-NET the remote controller (M-NET RC). c. Set the address setting switch (on outdoor unit P.C.B) as shown below. <table><tr><th>Unit</th><th>Range</th><th>Setting Method</th></tr><tr><td>CITY MULTI series indoor unit (M-IC)</td><td>001 to 050</td><td>—</td></tr><tr><td>Outdoor unit (OC)</td><td>051 to 100</td><td>Use the smallest address of all the indoor unit plus 50.</td></tr><tr><td>M-NET Remote controller (M-NET RC)</td><td>101 to 150</td><td>Indoor unit address plus 100</td></tr></table>		Unit	Range	Setting Method	CITY MULTI series indoor unit (M-IC)	001 to 050	—	Outdoor unit (OC)	051 to 100	Use the smallest address of all the indoor unit plus 50.	M-NET Remote controller (M-NET RC)	101 to 150	Indoor unit address plus 100			
Unit	Range	Setting Method																
CITY MULTI series indoor unit (M-IC)	001 to 050	—																
Outdoor unit (OC)	051 to 100	Use the smallest address of all the indoor unit plus 50.																
M-NET Remote controller (M-NET RC)	101 to 150	Indoor unit address plus 100																
2. Operation using 2 M-NET remote controllers  • Using 2 M-NET remote controllers for each CITY MULTI series indoor unit.		a. Same as above 1.a b. Same as above 1.b c. Set address switch (on outdoor unit P.C.B) as shown below. <table><tr><th>Unit</th><th>Range</th><th>Setting Method</th></tr><tr><td>CITY MULTI series indoor unit (M-IC)</td><td>001 to 050</td><td>—</td></tr><tr><td>Outdoor unit (OC)</td><td>051 to 100</td><td>Use the smallest address of all the indoor units plus 50.</td></tr><tr><td>Main M-NET Remote Controller (M-NET RC)</td><td>101 to 150</td><td>Indoor unit address plus 100</td></tr><tr><td>Sub M-NET Remote Controller (M-NET RC)</td><td>151 to 200</td><td>Indoor unit address plus 150</td></tr></table>		Unit	Range	Setting Method	CITY MULTI series indoor unit (M-IC)	001 to 050	—	Outdoor unit (OC)	051 to 100	Use the smallest address of all the indoor units plus 50.	Main M-NET Remote Controller (M-NET RC)	101 to 150	Indoor unit address plus 100	Sub M-NET Remote Controller (M-NET RC)	151 to 200	Indoor unit address plus 150
Unit	Range	Setting Method																
CITY MULTI series indoor unit (M-IC)	001 to 050	—																
Outdoor unit (OC)	051 to 100	Use the smallest address of all the indoor units plus 50.																
Main M-NET Remote Controller (M-NET RC)	101 to 150	Indoor unit address plus 100																
Sub M-NET Remote Controller (M-NET RC)	151 to 200	Indoor unit address plus 150																
3. Group operation  • Multiple CITY MULTI series indoor units operated together by 1 M-NET remote controller		a. Same as above 1.a b. Connect terminals M1 and M2 on transmission cable terminal block (TB5) of the M-IC main unit with the most recent address within the same CITY MULTI series indoor unit (M-IC) group to terminal block (TB6) on the M-NET remote controller. c. Set the address setting switch (on outdoor unit P.C.B) as shown below. <table><tr><th>Unit</th><th>Range</th><th>Setting Method</th></tr><tr><td>M-IC (Main)</td><td>001 to 050</td><td>Use the smallest address within the same group of CITY MULTI series indoor units.</td></tr><tr><td>M-IC (Sub)</td><td>001 to 050</td><td>Use an address, other than that of the M-IC (Main) from among the units within the same group of indoor units. This must be in sequence with the M-IC (Main).</td></tr><tr><td>Outdoor unit</td><td>051 to 100</td><td>Use the smallest address of all the CITY MULTI series indoor units plus 50.</td></tr><tr><td>Main M-NET Remote Controller (M-NET RC)</td><td>101 to 150</td><td>Set at an M-IC (Main) address within the same group plus 100.</td></tr></table> d. Use the CITY MULTI series indoor unit (M-IC) within the group with the most functions as the M-IC (Main) unit.		Unit	Range	Setting Method	M-IC (Main)	001 to 050	Use the smallest address within the same group of CITY MULTI series indoor units.	M-IC (Sub)	001 to 050	Use an address, other than that of the M-IC (Main) from among the units within the same group of indoor units. This must be in sequence with the M-IC (Main).	Outdoor unit	051 to 100	Use the smallest address of all the CITY MULTI series indoor units plus 50.	Main M-NET Remote Controller (M-NET RC)	101 to 150	Set at an M-IC (Main) address within the same group plus 100.
Unit	Range	Setting Method																
M-IC (Main)	001 to 050	Use the smallest address within the same group of CITY MULTI series indoor units.																
M-IC (Sub)	001 to 050	Use an address, other than that of the M-IC (Main) from among the units within the same group of indoor units. This must be in sequence with the M-IC (Main).																
Outdoor unit	051 to 100	Use the smallest address of all the CITY MULTI series indoor units plus 50.																
Main M-NET Remote Controller (M-NET RC)	101 to 150	Set at an M-IC (Main) address within the same group plus 100.																
Combinations of 1 through 3 above are possible.																		

• Name, Symbol and the Maximum Remote controller Units for Connection

Name	Symbol	Maximum units for connection
Outdoor unit	OC	—
CITY MULTI series indoor unit	M-IC	Refer to "3. SPECIFICATIONS".
M-NET remote controller	M-NET RC	Maximum 2 M-NET RC for 1 indoor unit, Maximum 12 M-NET RC for 1 OC

Permissible Lengths	Constraint items
Indoor/outdoor transmission line Maximum length AWG 16 [1.25 mm²] L1 + L2 [656 ft [200 m] M-NET Remote controller cable length 1. If AWG 20 to AWG 16 [0.5 to 1.25 mm²] R1, R2 [33ft [10 m] 2. If the length exceeds 33ft [10 m], the exceeding section should be AWG 16 [1.25 mm²] and that section should be a value within the total extension length of the transmission cable and maximum transmission cable length. (L3)	- M-NET remote controller (M-NET RC) and MA remote controller (MA RC) cannot be used together. - Do not connect anything with TB15 of CITY MULTI series indoor unit (M-IC). 
Same as above	 1 Use the CITY MULTI series indoor unit (M-IC) address plus 150 as the sub M-NET remote controller address. In this case, it should be 152. 2 3 or more M-NET remote controllers (M-NET RC) cannot be connected to 1 CITY MULTI series indoor unit.
Same as above	 1 The M-NET remote controller address is the CITY MULTI series indoor unit main address plus 100. In this case, it should be 101.

- B. Example of a group operation system with 2 or more outdoor units and an M-NET remote controller.
(Address settings are necessary.)

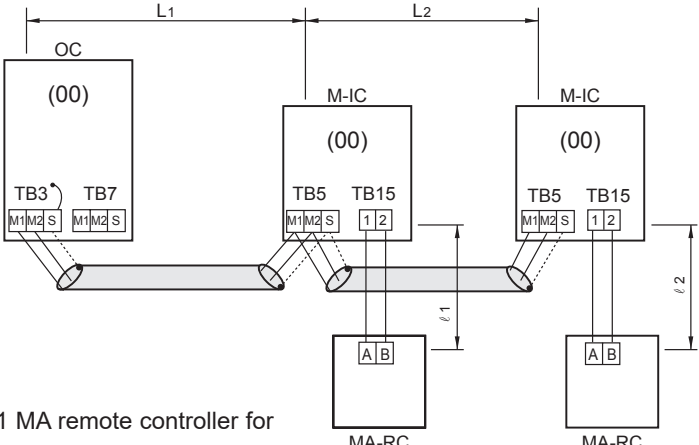
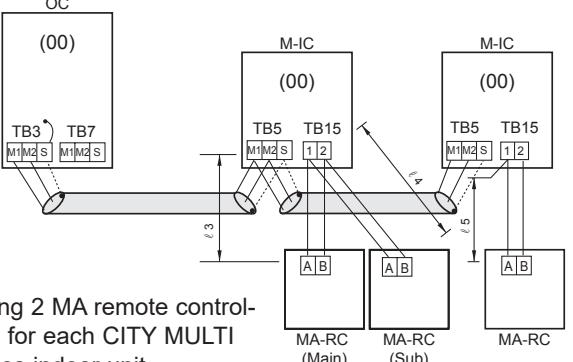
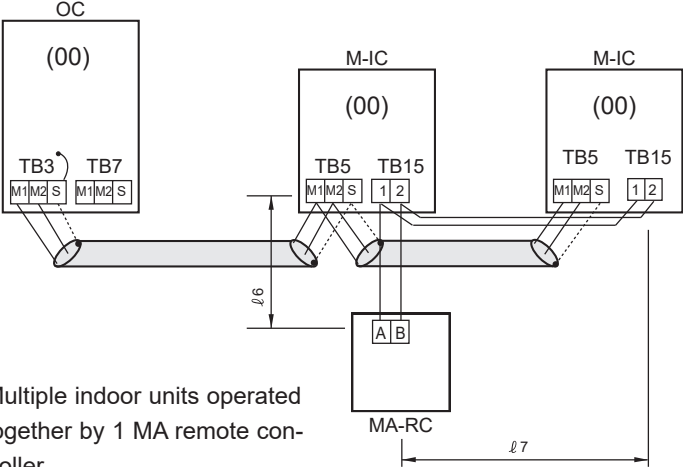


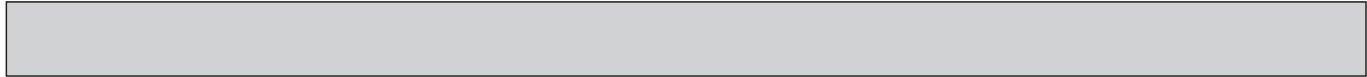
• Name, Symbol, and the Maximum Units for Connection

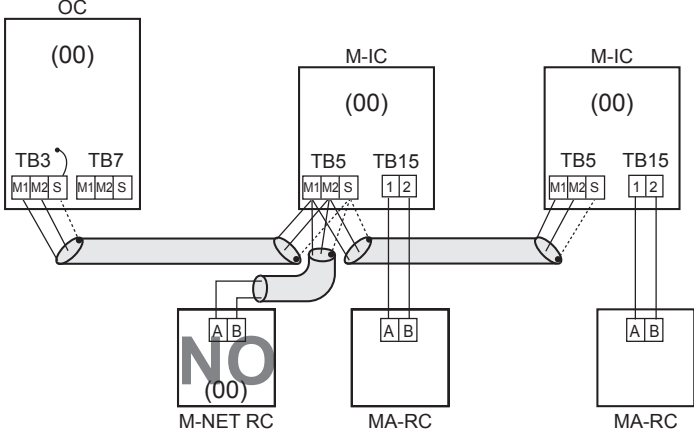
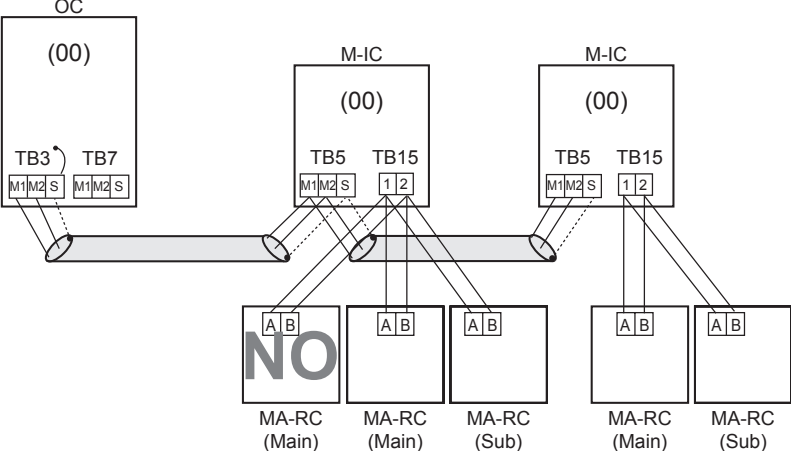
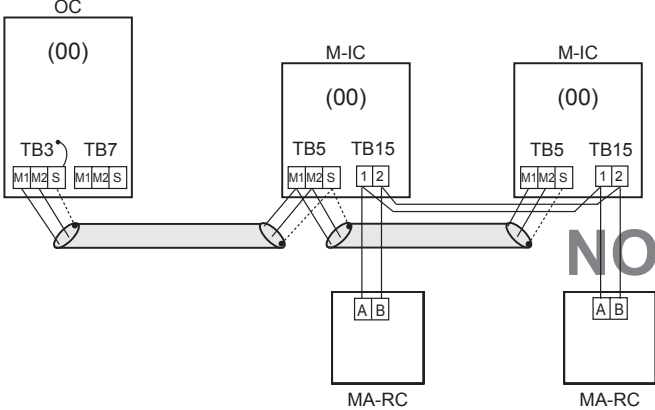
Permissible Length	- Maximum line length via outdoor unit: $L_1+L_2+L_3+L_4$, $L_3+L_4+L_5+L_6$, $L_1+L_2+L_5+L_6$ [1640 ft [500 m] (AWG16 [1.25 mm²]) - Indoor/outdoor transmission line Maximum length: L_1, L_3+L_4, L_2+L_5, L_6 [656 ft [200 m] (AWG16 [1.25 mm²]) - M-NET Remote controller cable length: R_1, R_2+R_3 [33 ft [10 m] (AWG20 to AWG16 [0.5 to 1.25 mm²]) If the length exceeds 33 ft [10 m], use an AWG16 [1.25 mm²] shielded wire. The section of the cable that exceeds 33 ft [10 m] must be included in the max length via outdoor units and max transmission cable length.
Prohibited items	(A) : Group (B) : Group (C) : Group (D) : Shielded Wire (E) : Sub M-NET Remote Controller () : Address example - Never connect together the terminal blocks (TB5) for transmission wires for CITY MULTI series indoor unit (M-IC) that have been connected to different outdoor units (OC). - Set all addresses to ensure that they are not overlapped. - M-NET remote controller and MA remote controller cannot be connected with the CITY MULTI series indoor unit of the same group wiring together.

C. Example of a MA remote controller system (address setting is not necessary.)

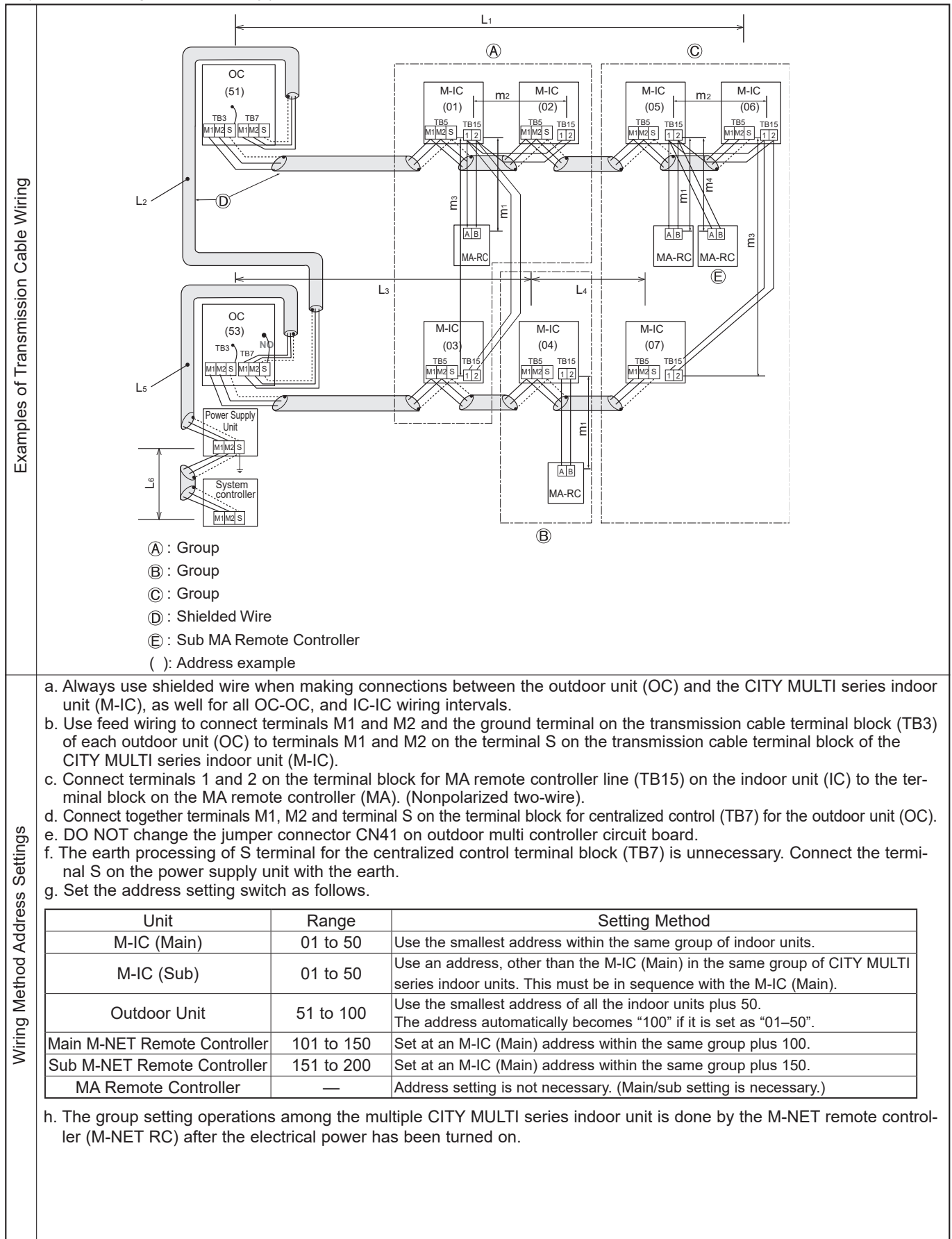
NOTE: In the case of same group operation, need to set the address that is only main CITY MULTI series indoor unit.

Example of wiring control cables	Wiring Method and Address Setting
1. Standard operation  • 1 MA remote controller for each indoor unit	a. Use feed wiring to connect terminals M1 and M2 on transmission cable block (TB3) for the outdoor unit (OC) to terminals M1 and M2 on the transmission cable block (TB5) of each CITY MULTI series indoor unit (M-IC). Use non-polarized 2-core wire. b. Connect terminals 1 and 2 on transmission cable terminal block (TB15) for each CITY MULTI series indoor unit with the terminal block for the MA remote controller (MA-RC).
2. Operation using 2 remote controllers  • Using 2 MA remote controllers for each CITY MULTI series indoor unit	a. The same as above a b. The same as above b c. In the case of using 2 remote controllers, connect terminals 1 and 2 on transmission cable terminal block (TB15) for each indoor unit with the terminal block for 2 MA remote controllers. • Set either one of the controllers to "sub remote controller". Refer to the installation manual of MA remote controller.
3. Group operation  • Multiple indoor units operated together by 1 MA remote controller	a. The same as above a b. The same as above b c. In the case of group operation using MA remote controller (MA-RC), connect terminals 1 and 2 on transmission cable terminal block (TB15) of each CITY MULTI series indoor unit. Use non-polarized 2-core wire. d. In the case of same group operation, need to set the address that is only main CITY MULTI series indoor unit. Please set the smallest address within number 01–50 of the CITY MULTI series indoor unit with the most functions in the same group.
Combinations of 1 through 3 above are possible.	

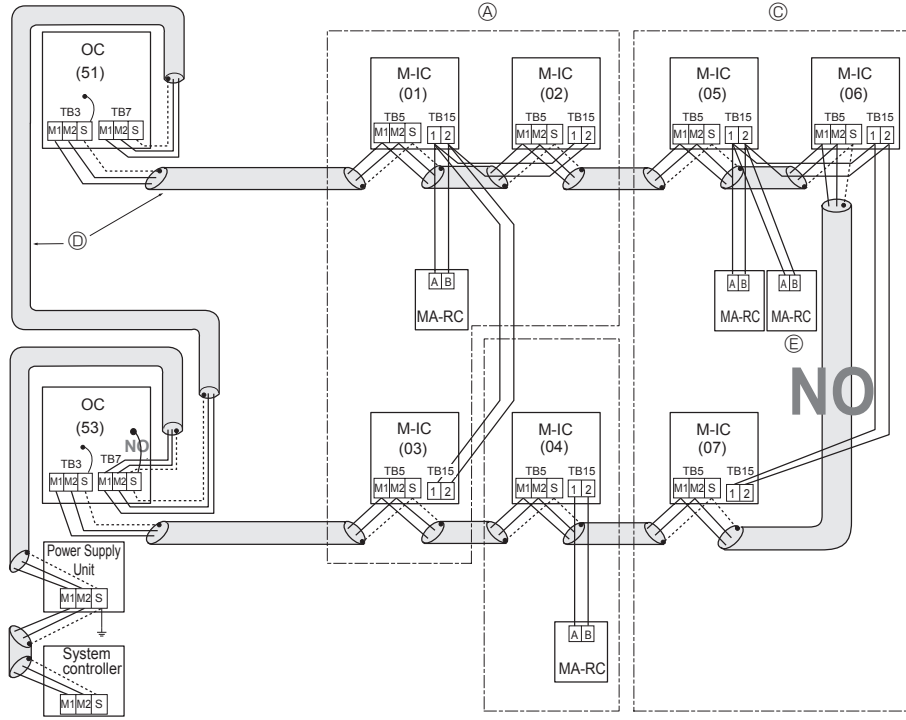


Permissible Lengths	Prohibited items
Indoor/outdoor transmission line Maximum length: L1 + L2 [656 ft [200 m] (AWG 16 [1.25 mm²]) MA remote controller cable length: R1, R2 [656 ft [200 m] (AWG 22 to AWG 16 [0.3 to 1.25 mm²])	The MA remote controller and the M-NET remote controller cannot be used together with the CITY MULTI series indoor unit of the same group. M-NET remote controller cannot be connected without address setting. 
Indoor/outdoor transmission line Maximum length: L1 + L2 [656 ft [200 m] (AWG 16 [1.25 mm²]) MA remote controller cable length: R3 +R4, R5 [656 ft [200 m] (AWG 22 to AWG 16 [0.3 to 1.25 mm²])	3 MA remote controllers or more cannot be connected with the CITY MULTI series indoor unit of the same group. 
Indoor/outdoor transmission line Maximum length: L1 + L2 [656 ft [200 m] (AWG 16 [1.25 mm²]) MA remote controller cable length: R6 +R7 [656 ft [200 m] (AWG 22 to AWG 16 [0.3 to 1.25 mm²])	The second MA remote controller is connected with the terminal block (TB15) for the MA remote controller of the same CITY MULTI series indoor unit (M-IC) as the first MA remote control. 

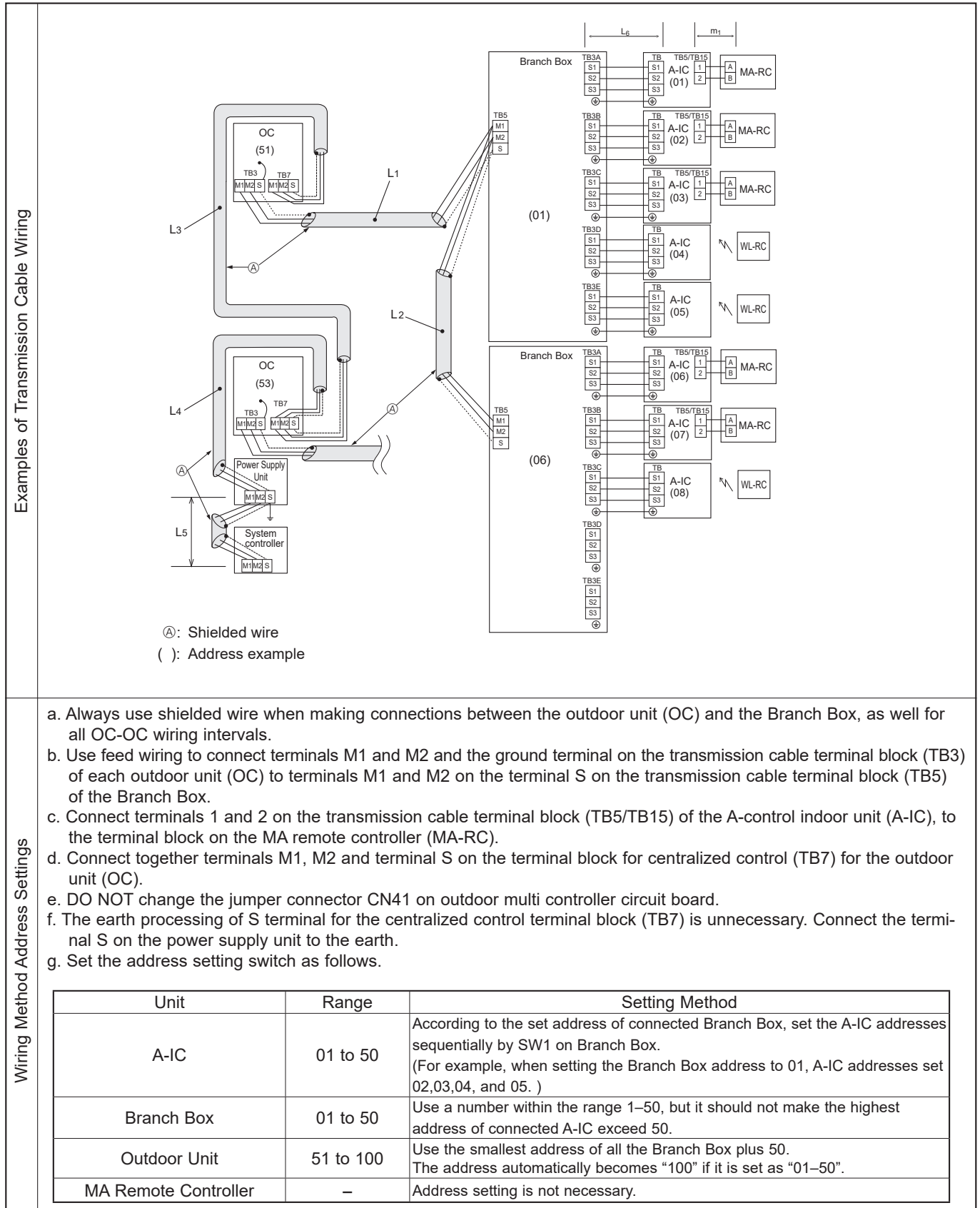
D. Example of a group operation with 2 or more outdoor units and an MA remote controller.
(Address settings are necessary.)



• Name, Symbol, and the Maximum Units for Connection

Permissible Length	Maximum line length via outdoor unit (M-NET cable): $L_1+L_2+L_3+L_4$ and $L_1+L_2+L_6+L_7$ [1640 ft [500 m] (AWG 16 [1.25 mm²] or more) Indoor/outdoor transmission line Maximum length (M-NET cable): L_1 and L_3+L_4 and L_2+L_6 and L_7 [656 ft [200 m] (AWG 16 [1.25 mm²] or more) MA Remote controller cable length: m_1 and $m_1+m_2+m_3$ and $m_1+m_2+m_3+m_4$ [656 ft [200 m] (AWG 22 to AWG 16 [0.3 to 1.25 mm²])
Prohibited items	 (A) : Group (B) : Group (C) : Group (D) : Shielded Wire (E) : Sub MA Remote Controller () : Address example • Never connect together the terminal blocks (TB5) for transmission wires for CITY MULTI series indoor unit (M-IC) that have been connected to different outdoor units (OC). • M-NET remote controller and MA remote controller cannot be connected with the CITY MULTI series indoor unit of the same group wiring together.

E. Example of a system using Branch Box and A-Control indoor unit

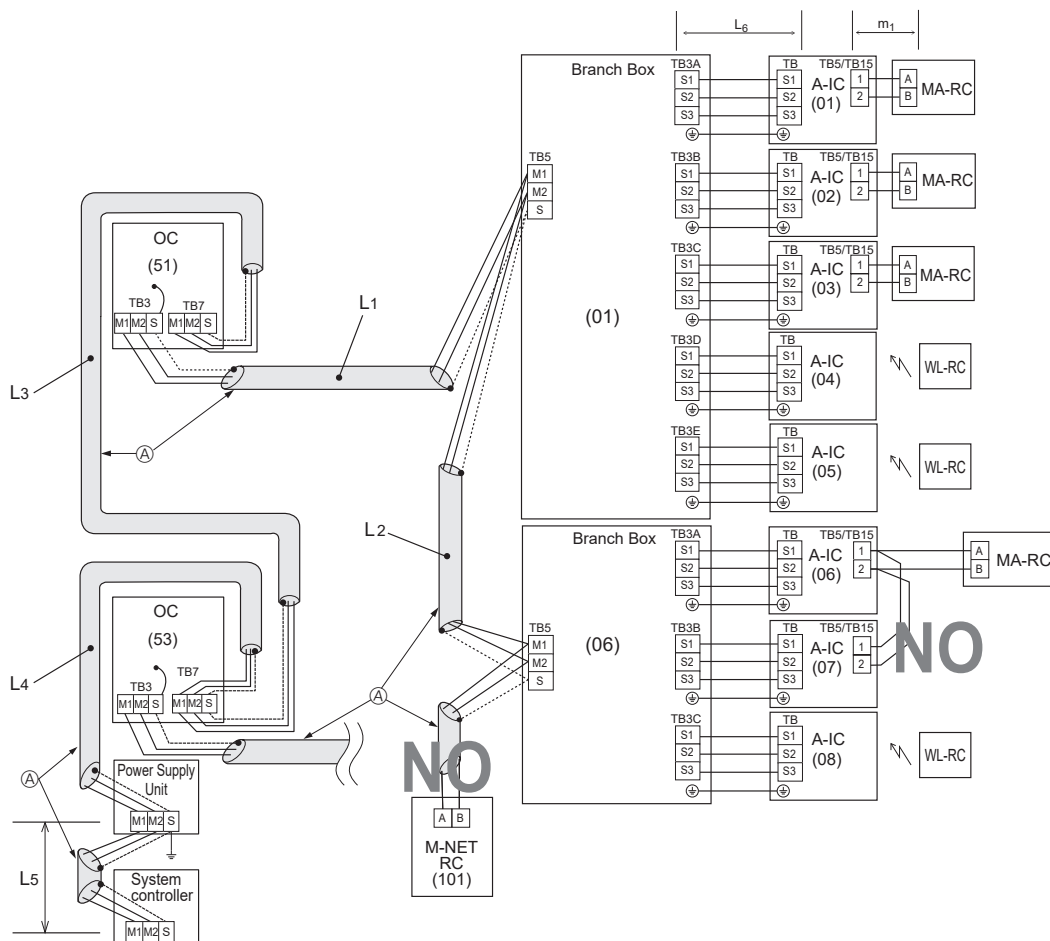


• Name, Symbol, and the Maximum Units for Connection

Permissible Length

Longest length via outdoor unit (M-NET cable): $L_1 + L_2 + L_3 + L_4 + L_5 \leq 1640 \text{ ft [500 m]}$ (AWG16 [1.25 mm²] or more)
 Branch box/outdoor transmission line Maximum length (M-NET cable): $L_1 + L_2, L_3 + L_4, L_5 \leq 656 \text{ ft [200 m]}$ (AWG16 [1.25 mm²] or more)
 Indoor/branch box transmission line Maximum length (A-Control cable): $L_6 \leq 82 \text{ ft [25 m]}$ (AWG14 [1.5 mm²])
 Remote controller cable length: $m_1 \leq 656 \text{ ft [200 m]}$ (AWG22 to AWG16 [0.3 to 1.25 mm²])

Constraint items



Ⓐ: Shielded wire
 (): Address example

- Plural indoor units cannot be operated by an MA single remote controller.
- Different refrigerant systems cannot be connected together.
- M-NET Remote controller cannot be connected to this system.

8-1. CHECKPOINTS FOR TEST RUN

8-1-1. Procedures before test run

- (1) Before a test run, make sure that the following work is completed.
 - Installation related:
Make sure that the panel of cassette type and electrical wiring are done.
Otherwise electrical functions like auto vane will not operate normally.
 - Piping related:
Perform leakage test of refrigerant and drain piping.
Make sure that all joints are perfectly insulated.
Check stop valves on both liquid and gas side for full open.
 - Electrical wiring related:
Check ground wire, transmission cable, remote controller cable, and power supply cable for secure connection.
Make sure that all switch settings of address or adjustments for special specification systems are correctly settled.
- (2) Safety check:
With the insulation tester of 500 V, inspect the insulation resistance.
Do not touch the transmission cable and remote controller cable with the tester.
The resistance should be over 1.0 M". Do not proceed inspection if the resistance is less than 1.0 M".
Inspect between the outdoor unit power supply terminal block and ground first, metallic parts like refrigerant pipes or the electrical box next, then inspect all electrical wiring of outdoor unit, indoor unit, and all linked equipment.
- (3) Before operation:
 - a) Turn the power supply switch of the outdoor unit to on for compressor protection. For a test run, wait at least 12 hours from this point.
 - b) Register control systems into remote controller(s). Never touch the ON/OFF switch of the remote controller(s). Refer to "7-2. Special Function Operation and Settings for M-NET Remote Controller" as for settings. In MA remote controller(s), this registration is unnecessary.
- (4) More than 12 hours later from power supply to the outdoor unit, turn all power switch to on for the test run. Perform test run according to the "Operation procedure" table of the bottom of this page. While test running, make test run reports.

8-1-1-1. Test run for M-NET Remote controller

For the detailed procedure, refer to the remote controller's manuals.