

Central Controller

Model: MJ-180A

Installation Manual

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Before installing or operating this unit, please read this manual carefully.
After installation, be sure to keep this manual in a safe place for future reference.



This manual describes the procedure for installing the MJ-180A as well as instructions for wiring air conditioners. Always refer to the installation manual that is included with the air conditioner unit during installation. For your safety, be sure to read the section below entitled "1. Safety Precautions" thoroughly, before installing the MJ-180A.

Keep this manual in an easy to reach, safe place. Make sure that the manual remains with the MJ-180A should ownership or the operator of the MJ-180A ever change.


1. Safety Precautions


Before installing this unit, be sure to read all of the safety precautions provided below. The safety precautions include some very important points that should be carefully followed.

Symbols and Terms

 WARNING	failure to observe and follow these points could result in serious injury or death.
 CAUTION	failure to observe and follow these points could result in serious injury or damage to property.

Specific Precautions

 WARNING	
<p>Make sure that only your authorized dealer or technical representative installs the MJ-180A. Installation of the MJ-180A by anyone other than an authorized dealer or technical representative may result in an electrical shock or fire.</p>	<p>Be sure to follow the directions for installation exactly as described in the installation manual. Installation of the MJ-180 using any procedure other than that described in the installation manual may result in an electrical shock or fire.</p>
<p>Only install the MJ-180A in a place that is strong enough to support its weight. Installation in a structurally weak place may cause the unit to fall resulting in personal injury or damage to property.</p>	<p>All electrical work must be performed by a licensed technician, according to local regulations and the instructions given in this manual. Installation or circuitry work that is conducted by anyone other than a licensed technician may result in an electrical shock or fire.</p>
<p>Wire connections should be secure to protect the terminals so that they are not impaired by any external forces. Poor connections and unstable wiring can adversely affect the performance of the MJ-180A and may cause undue heat or even a fire.</p>	<p>Do not move and reinstall the unit yourself. Ask your vendor or distributor for assistance whenever the unit is moved or reinstalled. Installation by anyone other than a licensed technician may result in an electrical shock or fire.</p>
<p>Modifications to the MJ-180A should only be done by an authorized dealer or technical representative. Modifications to the MJ-180A made by anyone other than an authorized dealer or technical representative may result in an electrical shock or fire.</p>	<p>The MJ-180A must be earthed. Do not connect the protective earth line to gas pipes, water pipes, lightning conductors or telephone grounding lines. Improper grounding may cause an electrical shock or fire.</p>
<p>Make sure that a dedicated cable is used to power the MJ-180A. Any other cable connection may result in a power overload.</p>	<p>The terminal block cover of each line must be firmly attached to prevent accumulation of dust or moisture. An improperly attached cover may cause an electrical shock or fire.</p>
<p>Make sure that there is a main power switch (also, installation of a breaker is mandatory in some areas). An easily accessible breaker helps reduce the risk of electrical shock.</p>	<p>Always shut off the power to the unit before removing the cover. Failure to do this may cause an electrical shock or fire.</p>
<p>This product complies with the EN50081-1 and EN50082-1 Generic standards, and EN50090-2 of the Home and Building Electronic Systems standards has not been considered. In other words, the immunity level only applies to the levels stipulated by the Generic standards. It is necessary to confirm that class A equipment, ISM equipment and other equipment fitted with strong electromagnetic output sources do not exist in the immediate vicinity of the product during installation. If there is no choice other than operating the product in an environment containing strong electromagnetic field, contact the manufacturer in order to set up applicable protection devices.</p>	

 CAUTION	
<p>Do not install the MJ-180 in any place where it may be exposed to flammable gases. The accumulation of flammable gases near the unit could cause an explosive reaction.</p>	<p>Do not install the unit in a place where it might be exposed to steam or condensation such as a bathroom or kitchen. Doing so may cause an electrical shock or malfunction as this unit is not water proof.</p>
<p>Do not install the MJ-180 in any place where it may be exposed to oil, steam or sulfuric gas. Exposure to such an environment may cause the performance level to decline or cause damage to components.</p>	<p>Do not install the unit in a place where it might be exposed to any acidic or alkaline solutions or sprays. Doing so may cause an electrical shock or malfunction.</p>
<p>Allow some slack to remain when wiring the MJ-180A. Too much tension may cause the wiring to snap or break resulting in undue heating or a fire.</p>	<p>Use standard wiring in compliance with the correct current capacity. Failure to do this may cause an electrical leakage, overheating or fire.</p>
<p>Do not allow water to come into contact with the exterior or interior of the unit. Any exposure to water, even during cleaning of the unit, may result in an electrical shock or malfunction.</p>	<p>Do not allow any PCB (Printed Circuit Board) to come into contact with your hands or tools. Take measures to protect the PCB from dust and debris. Failure to do this may cause an electrical shock or fire.</p>
<p>Do not install the unit in a place where it will be exposed to direct sunlight or in any environment that would expose the unit to temperatures higher than 40°C or lower than 0°C.</p>	<p>Only use fuses of the specified capacity. A fuse of larger capacity or a steel or copper wire could cause a fire or malfunction.</p>
<p>Do not install the unit outdoors. Doing so may cause a malfunction or fire.</p>	

2. Supplied Parts and Accessories

Make sure that in addition to this installation manual, the following items are enclosed in the box.

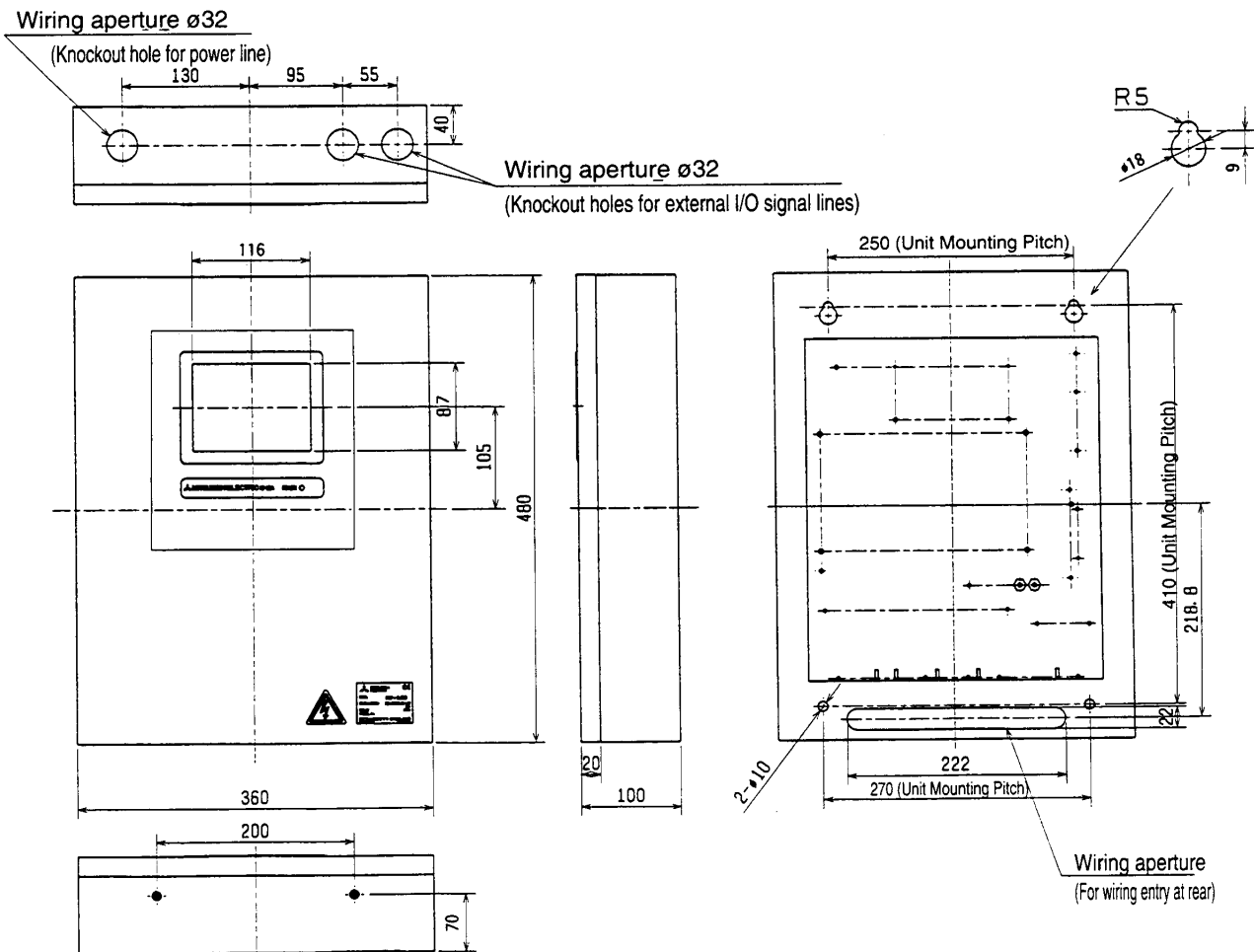
No.	Part	Quantity
①	Central Controller	1
②	Rubber Bushing	3
③	Waterproof rubber tape	6
④	Instruction Book (Initial settings and amending settings)	1
⑤	Instruction Book (General Operations)	1

3. Features

3-1. Specifications

Power Source Requirements	Input Voltage: AC220V-AC240V, 0.3A (maximum loading) 50Hz, Single-phase	
	Fuse: 2.0A Fast-break type (IEC127-2 S.S.2)	
Interface conditions for transmission line	M-NET transmission line:	DC30V+AMI signal
	MAIN-BUS transmission line:	AMI signal
Maximum number of G/W units	2	
Operating Environment	Temperature	Operating 0-+40°C Non operating 0-+60°C
	Humidity	30-90%RH (no condensation)
Dimensions	480 (height) × 360 × (width) × 100 (depth) [mm]	
Weight	9kg	

3-2. Exterior Dimensions



⚠ CAUTION

Be careful to avoid injuring yourself or damaging the inner components of the unit when drilling the knockout holes.

4. Installation

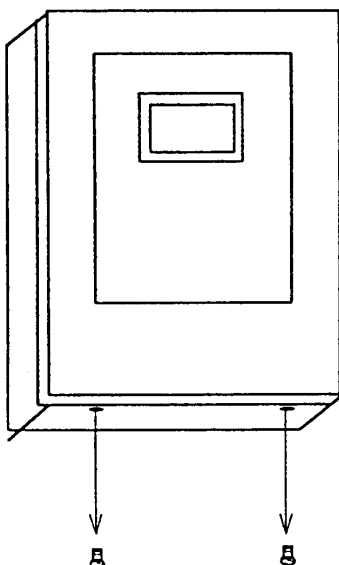
4-1. On-site preparations

Please prepare the following the items before installation.

Item	Specifications
Unit fixing screw	M8 screw × 4 pcs.
Power cable Protective earth cable	The power cable should comply with both local standards as well as the power requirements of the unit. Recommended type: $\phi 1.6$ mm- $\phi 2.0$ mm (H03VV-F, H03VVH-2F, H05VV-F, H05VVH2-F2)
Main power switch (circuit breaker)	Qty.: 1pc Type: 250VAC Single-phase 50Hz 3A Recommended type; CP30-BA series (MITSUBISHI ELECTRIC) or equivalent.
Transmission line	Cable type: sheathed cables that comply with the following requirements <ul style="list-style-type: none"> • CPEVS $\phi 1.2$ mm-$\phi 1.6$ mm • CVVS 1.25 mm²-2.0 mm² *CPEVS: PE insulated, PCV jacketed, shielded communications cable *CVVS: PVC insulated, PVC jacketed, shielded control cable NOTE Cable length: there are transmission line limitations (please refer to section 7, System Constraints).
External input/output cable	Type of cable: sheathed, vinyl cords or cables that comply with the following specifications. <ul style="list-style-type: none"> • CPEV $\phi 1.2$ mm-$\phi 1.6$ mm • CVV 1.25 mm²-2.0 mm² *CPEV: PE insulated, PCV jacketed communications cable *CVV: PVC insulated, PVC jacketed control cable NOTE Cable length: The total length of the transmission line must not exceed 10m.
Wiring conduits (connectors)	Size: Must meet the following specifications (or equivalent) If connecting through rear: External diameter $\phi 19.1$ If connecting through top: Internal diameter $\phi 31.8$ Connector: Internal diameter $\phi 32.3$

4-2. Removing the cover

(1) Remove the cover screws



(2) Lift the cover up to remove it from the body

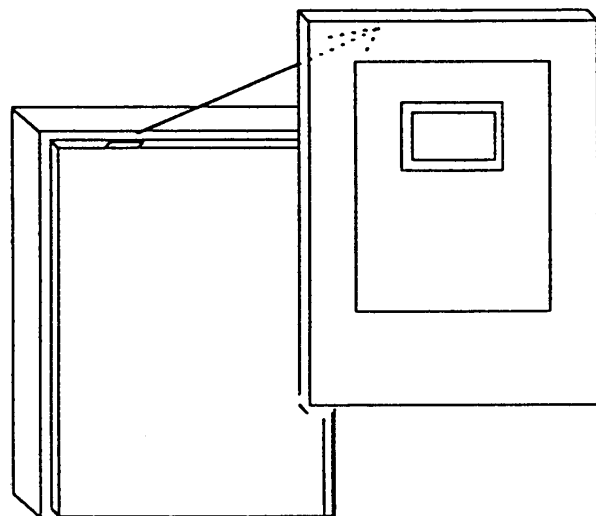


Fig.4-1

4-3. Installation space and orientation

Select an installation space considering the specifications shown in Fig. 4-2.

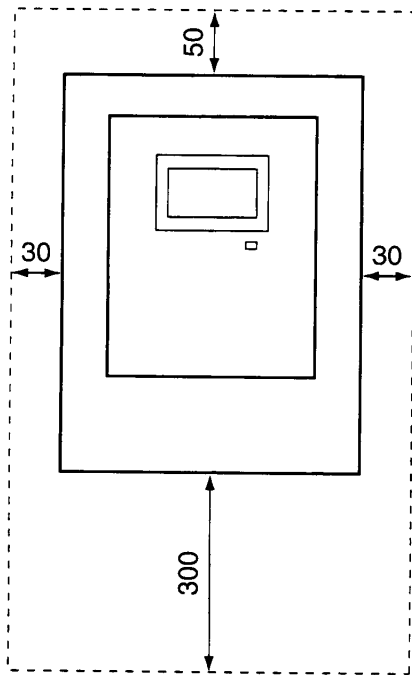


Fig. 4-2

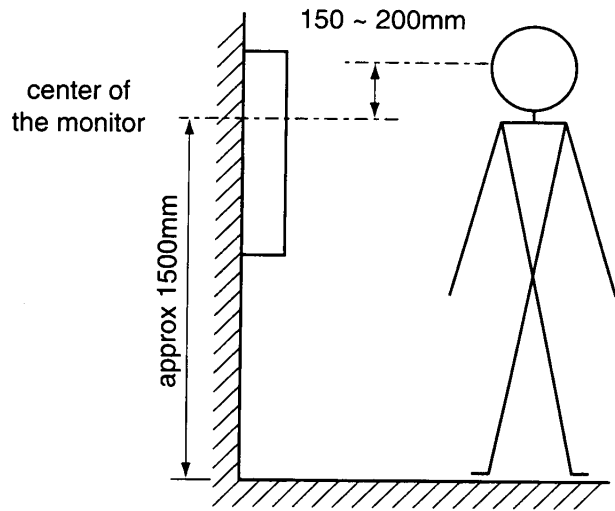


Fig. 4-3

4-4. Methods for Bringing Wiring into Unit

(1) Connecting through the rear of the unit (This is the recommended method.)

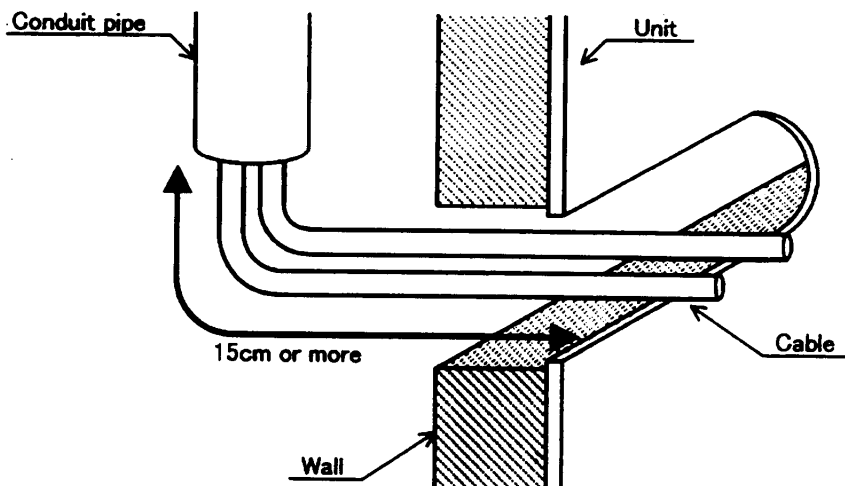


Fig. 4-4

NOTE

When connecting the power cable and the signal cables, don't bundle their each cable less than 15 cm from this unit.

(2) Connecting through the top of the unit

(Note: A conduit must be used. Stick waterproof rubber tape between the conduit and the connector and between the connector and unit. Insert the rubber bushing between the conduit and connector, then fasten securely.)

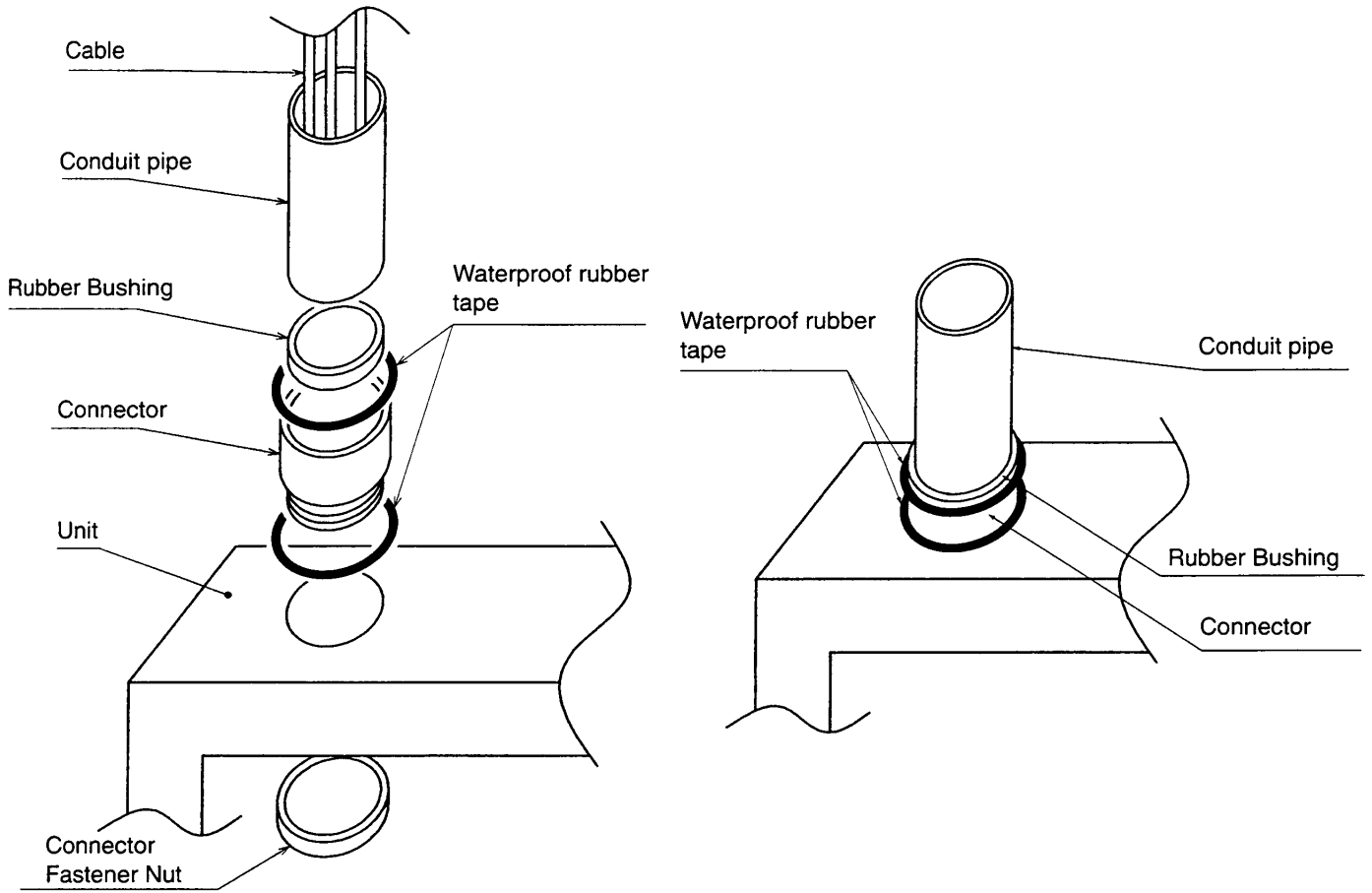


Fig. 4-5

⚠ WARNING

If connecting wiring through the top, be sure to install so that water and condensation cannot enter.

⚠ CAUTION

Take care to avoid personal injury and damage to internal components when drilling the knockout holes.

4-5. Installing the body

Attach the body onto the wall using four M8 screws as shown in Fig. 4-6.

⚠ CAUTION

Four screws are recommended to prevent the body from falling.

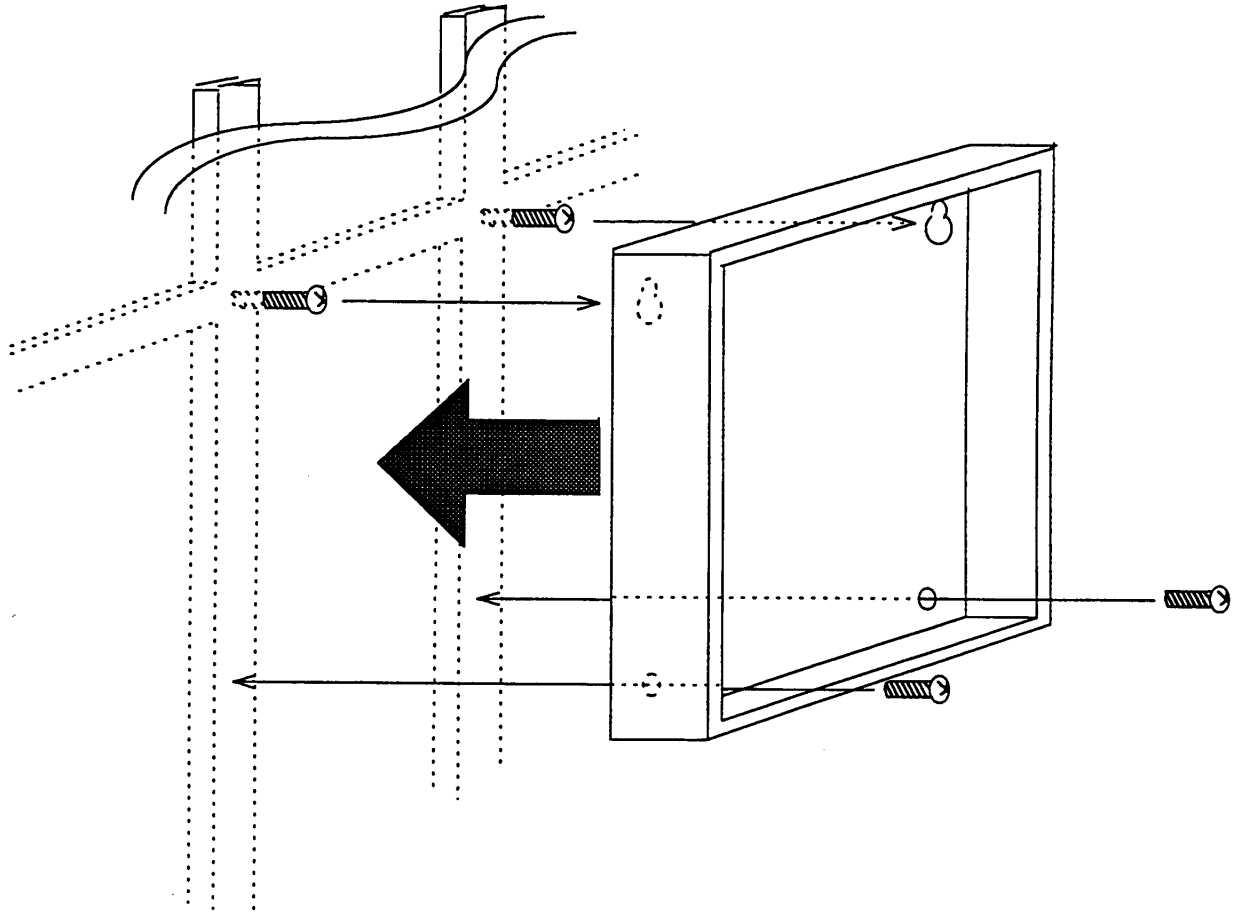


Fig. 4-6

5. Wiring

⚠ WARNING

- All electrical work must be performed according to local regulations. Failure to do this may result in an electrical shock or fire.
- Be sure to shut off the power source to the unit as well as any other units that may be connected to the MJ-180A before wiring.

⚠ CAUTION

- Never connect the power source directly to the transmission line. This will cause a unit failure.

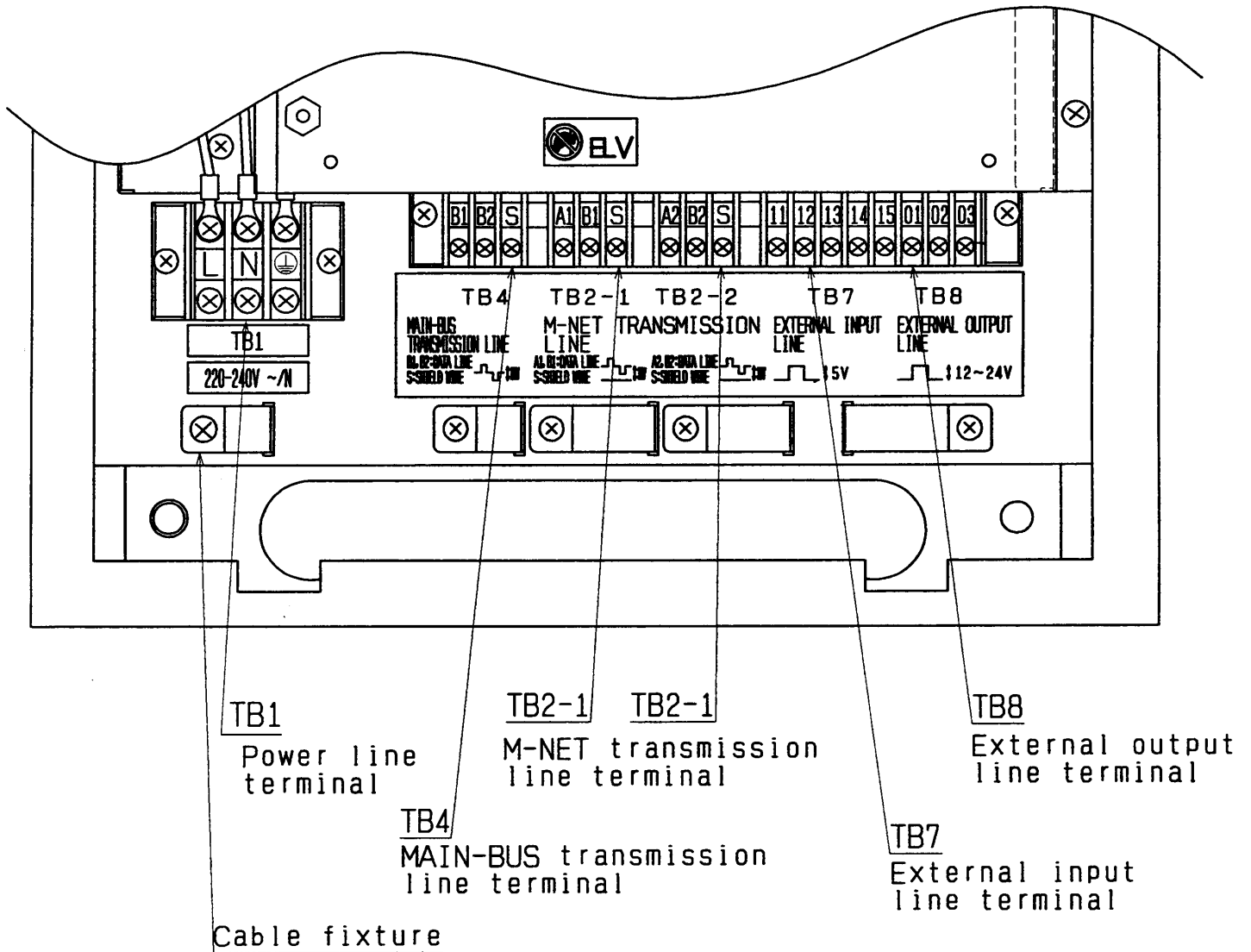


Fig. 5-1

5-1. Power cable

Wire the power cable and the protective earth cable to L, N, ⊕ (protective earth) as shown in Fig. 5-2; also, connect the line terminal to TB1.

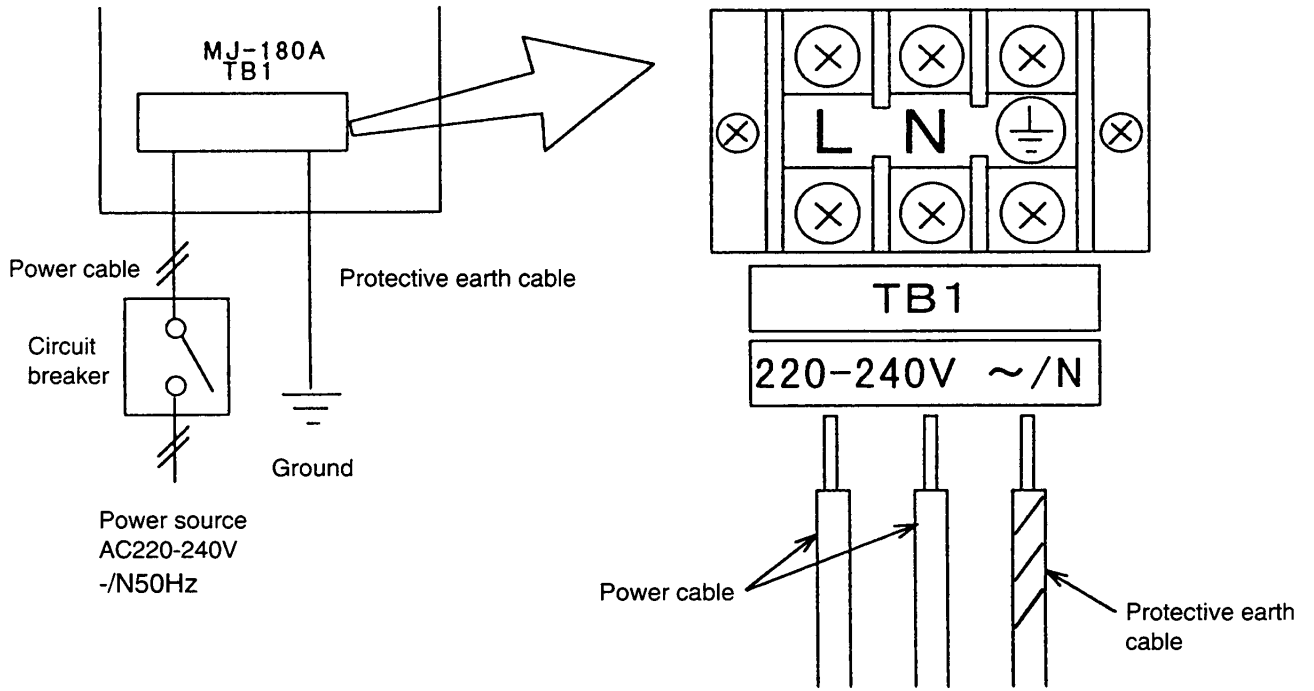


Fig. 5-2

NOTE

Be sure to connect the N-phase of power cable to the “N” in the powerline terminal (TB1).

5-2. MAIN-BUS transmission line

Wire the MAIN-BUS transmission line to the B1, B2 (non-polarity) and S (shield) terminals onto the TB4 (refer to Fig.5-4).

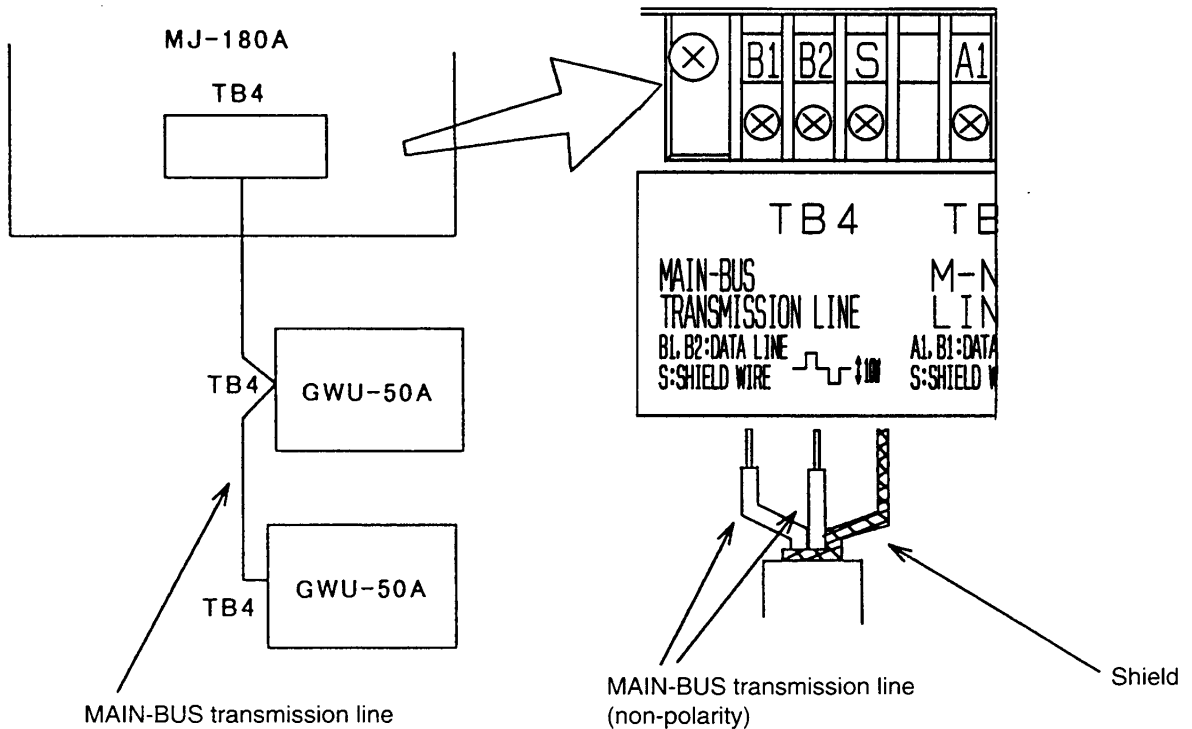


Fig. 5-4

5-3. M-NET transmission line

Connect the M-NET transmission cable to the A1, B1 or A2, B2 (non-polarity data) and S (shield) terminals onto the TB2-1 or TB2-2 (refer to Fig. 5-3).

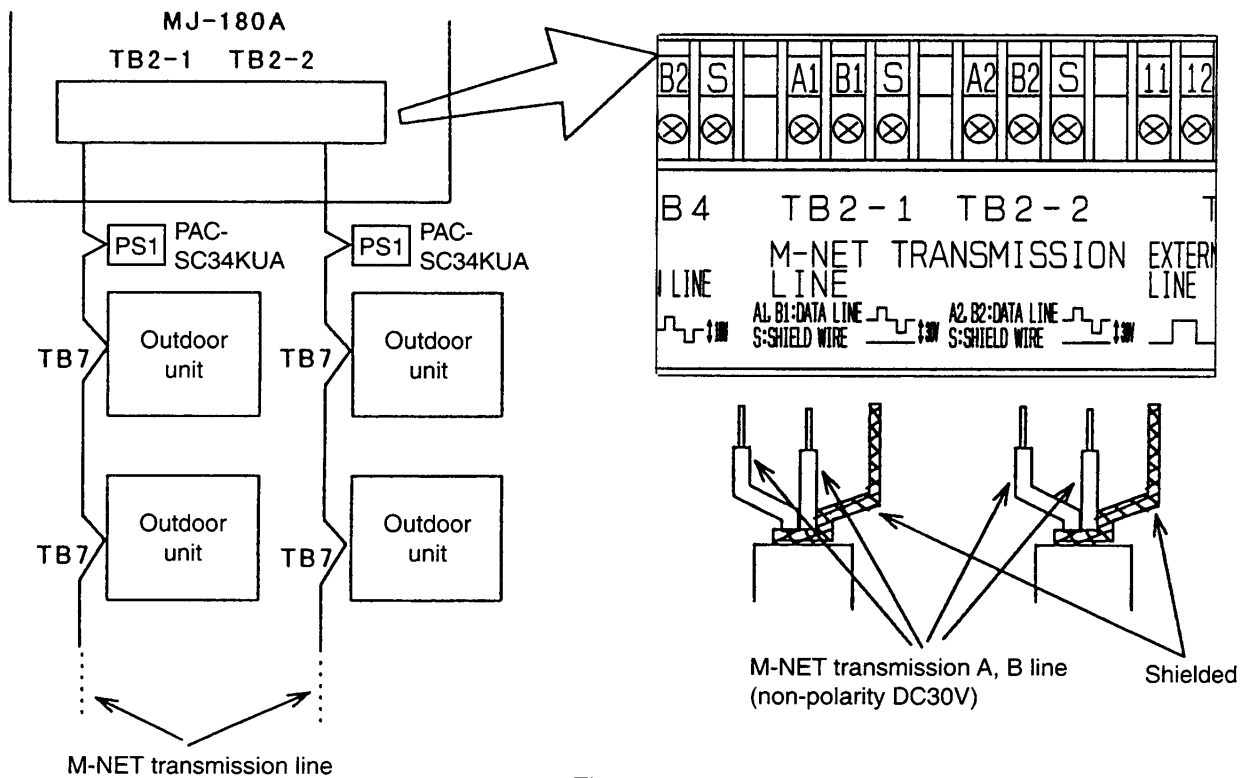


Fig. 5-3

NOTE

The shielding wire of each transmission line should be grounded by a single earthing on the power supply unit (PAC-SC34KUA). The shielding wire should be connected only to the S terminal of a single unit sharing a common transmission line.

5-4. External input/output line

Wire the external input cables to terminals 11, 12, 13, 14, and 15 on the TB7 (as shown in Fig. 5.5).
 Wire the external output cables to terminals 01, 02 and 03 on the TB8 (as shown in Fig. 5-5).
 Refer to the 6. External input/output functions for the specification of each terminal.

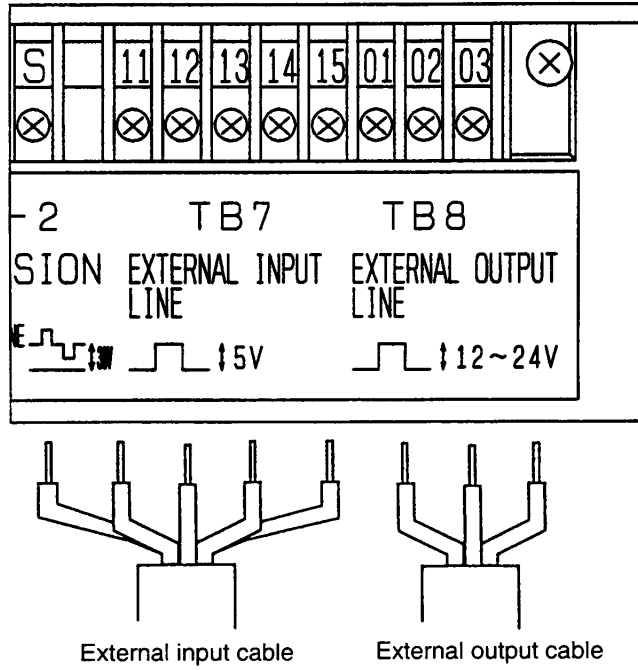


Fig. 5-5

(1) Recommended circuitry examples

① External input circuit

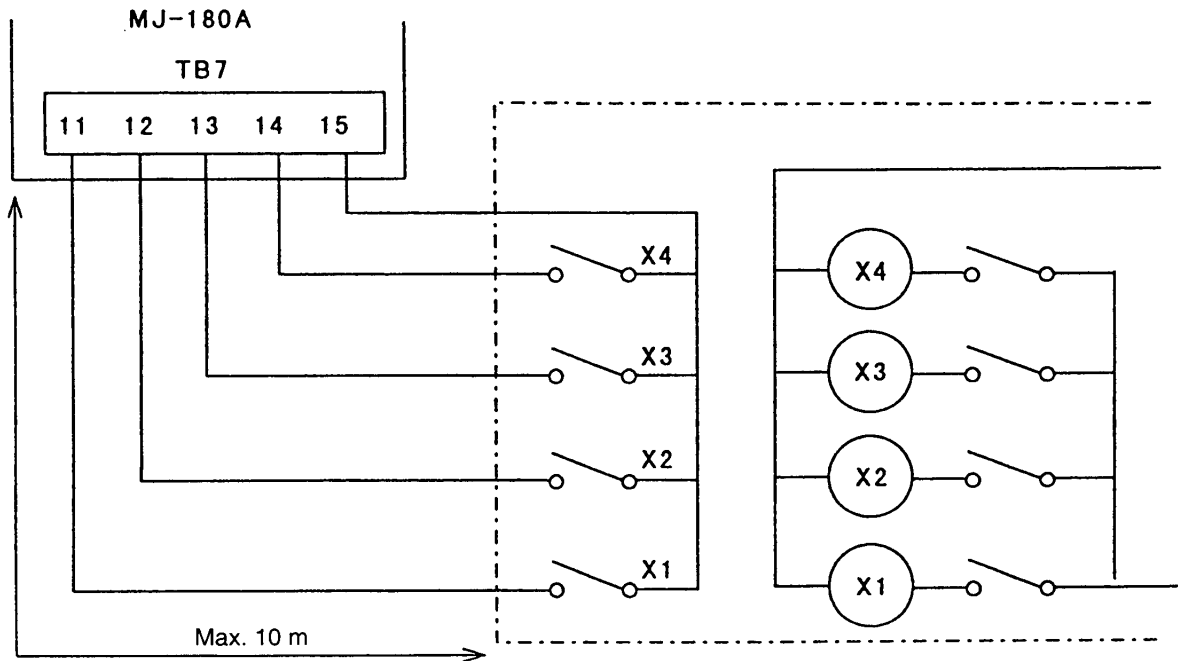
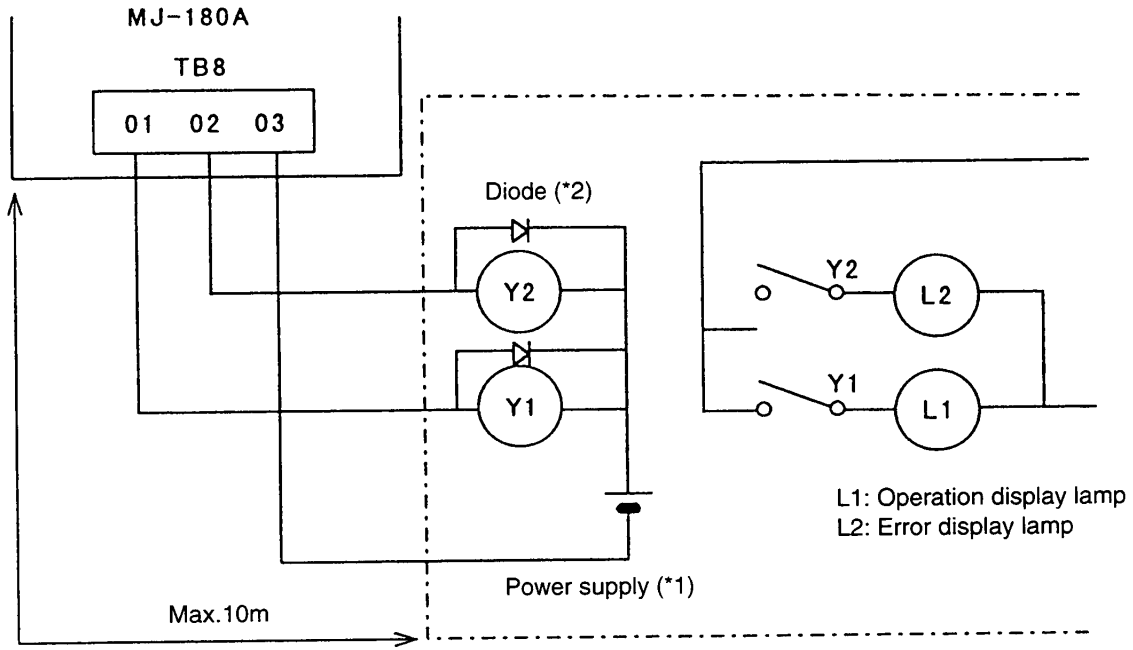


Fig.5-6

② External output circuit



Relays Y1 and Y2 should follow the specifications below:

Voltage: DC12V/DC24V

Power consumption: 0.9W or below

(*1) Prepare a separate power supply according to the relay being used (DC12V or DC24V).

(*2) Always insert a diode.

Fig. 5-7

NOTE

After connecting each cable, be sure to secure them with the cable fixture.

6. External input/output functions

6-1. External signal input function

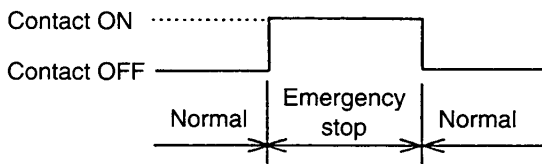
(1) External input

Emergency stop/normal/run/stop/prohibit functions can all be operated via the remote controller on all air conditioners with an external, non-voltage contact signal (the functions must first be set using the DIP switches).

No.	External signal input function	SW801		Descriptions
		No.1	No.2	
1	External input signal disabled (factory setting).	OFF	OFF	External input cannot be received.
2	Executes the emergency stop/normal functions with the level signal.	OFF	ON	ON/OFF functions of the remote controller and the ON/OFF and the prohibit/enable change functions of the controller can not be used during an emergency stop.
3	To operate ON/OFF and prohibit/enable functions using pulse signals	ON	ON	Set the pulse rate while the contact is ON to 500 ms or more.

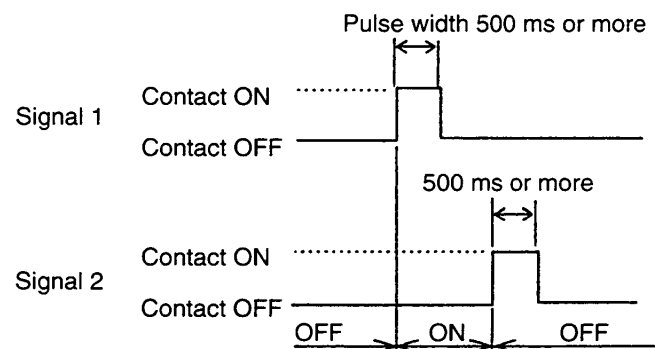
(2) Level signal and pulse signal

(A) Level signal and pulse signal



(B) Pulse signal

(Example) for ON/OFF



* The prohibit / enable input is the same.

(3) External input specification

TB7 Terminal number	Emergency stop / normal level signal	ON / OFF, Prohibit / Permit pulse signal
11	Emergency stop / normal input	ON input
12	Not used	OFF input
13	Not used	Prohibits input from the remote controller.
14	Not used	Permit input from the remote controller.
15	Common (0 V)	

(A) Level signals

- ① If the contact is set from OFF to ON by an external input when the emergency stop/normal signal has been set, status will change from normal to emergency stop. If the contact is set from ON to OFF, the status will change from emergency stop to normal.

(B) Pulse signals

- ① The status of the ON/OFF and Prohibit/Enable operations are switched depending on the pulse signal that is input.
- ② If an ON signal is input while ON is already active, the status will not change.
- ③ Set the pulse rate (when the contact is ON) to 500 ms or more.

6-2. External signal output functions

(1) External output

When one or more air conditioners are running, the ON signal is output; if a malfunction should occur in one or more of the air conditioners, a MALFUNCTION signal will be output.

(2) External output specifications

TB8 Terminal number	Details of each terminal
01	ON / OFF
02	Malfunction / Normal
03	Common (0V)

① The ON signal is output even when a malfunction occurs.

7. Initial Settings

(1) Remove the two screws that secure the cover to the unit.

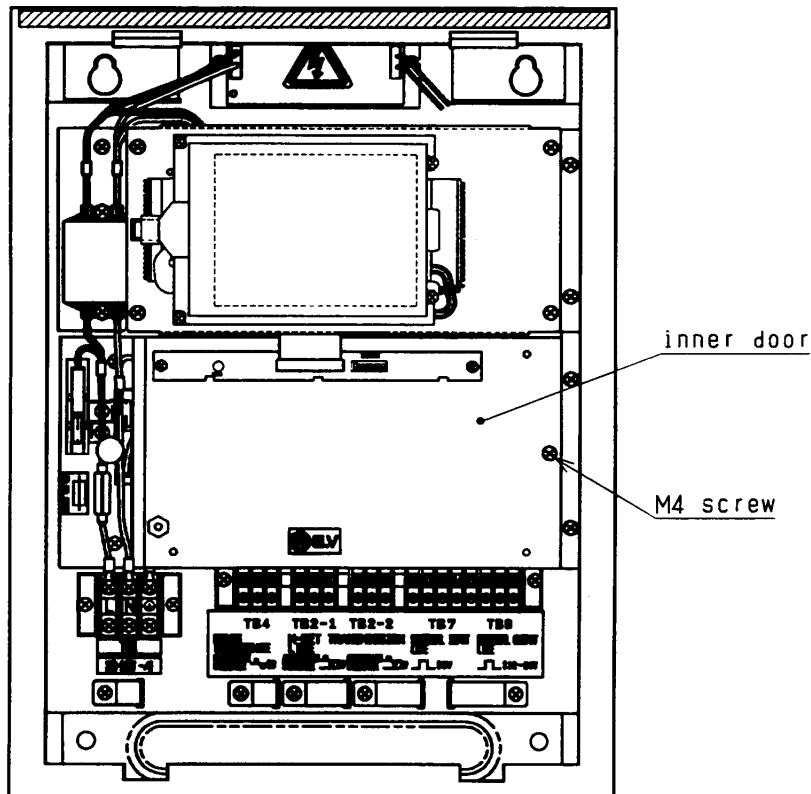
⚠ WARNING

- Be sure to shut off the power sources to the MJ-180A and all other units which it may be connected with before making any of the initial settings.

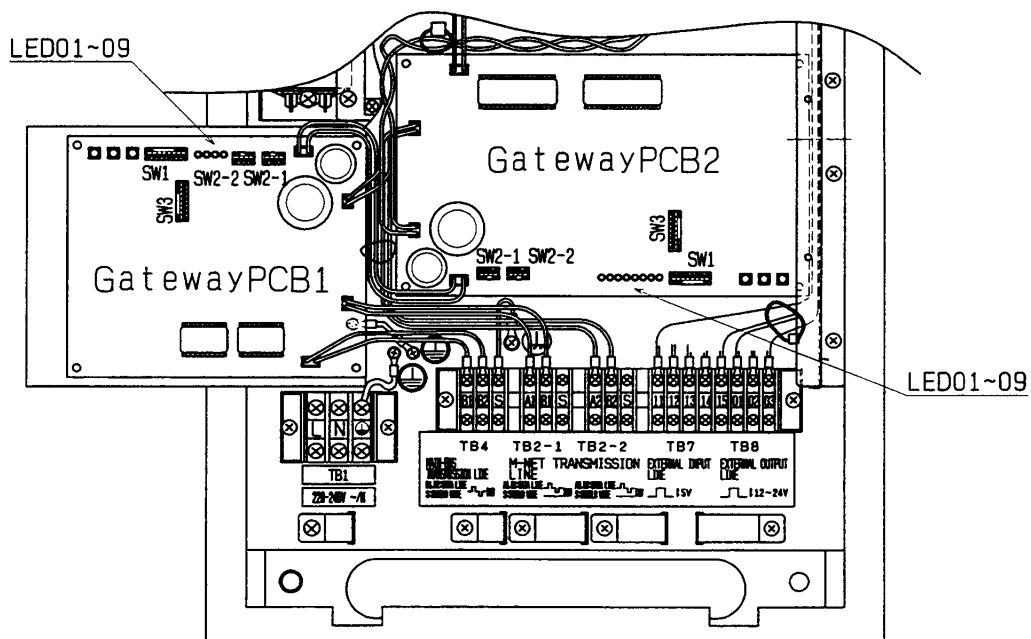
⚠ CAUTION

- Be careful working with the metal fixtures of the MJ-180A as they may have sharp edges.
- Do not allow the printed circuit board to come into contact with hands or tools.

Refer to the illustration below (Fig. 7-1) for details regarding the interior of the MJ-180A.

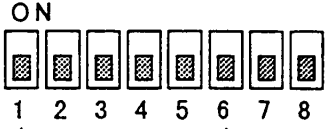


(Fig. 7-1)

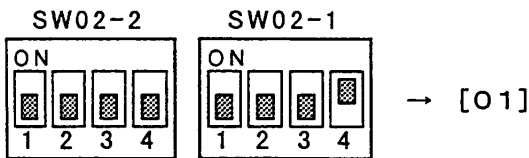


(Fig. 7-2)

(2) Setting gateway dip switches

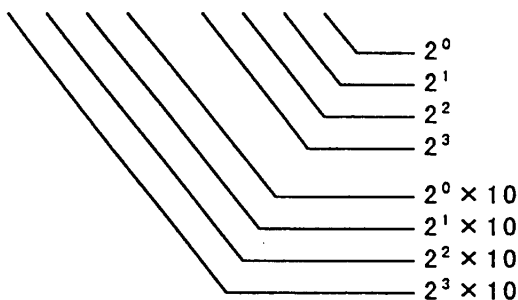
Symbol	Standard	Remarks
SW02-1	MAIN-BUS system address setting (one unit)	Refer to (3)
SW02-2	MAIN BUS system address setting (ten units)	
SW03	Setting functions (All set OFF when the unit leaves the factory.)  <p>ON</p> <p>1 2 3 4 5 6 7 8</p> <p>6: K transmission converter</p> <ul style="list-style-type: none"> • OFF: not provided • ON: provided <p>Range of operational access</p> <ul style="list-style-type: none"> • OFF: SC and RC • ON: RC only <p>All others are set in the OFF position</p>	For details regarding function setting, refer to (4) SC: system controller <ul style="list-style-type: none"> • Gateway • Centralized controller, etc. RC: remote controller

(3) Setting the address of the MAIN BUS



- The internal gateway circuit board is set up as follows:

Gateway number	SW2
Gateway PCB1	01
Gateway PCB2	02



- To use an expansion gateway, set the SW2 DIP switches to 03 and 04.

(4) Function settings

a) Setting an operational access range (SW3-1)

OFF: Manually setting a prohibited operation at the unit, denies access to signals from all system controllers and remote controllers connected to the M-transmission line of the MJ-180A.

ON: Manually setting a prohibited operation at the unit, denies access to signals from remote controllers connected to the M-transmission line of the MJ-180A.

b) Setting the K-transmission converter ON/OFF functions (SW3-06)

OFF: controls M-NET type air conditioners only.

ON: controls both M-NET and K-transmission type air conditioners.

K-transmission converters (PAC-SC25KAA) are supplied separately.

(5) When DIP switch settings are complete, replace the cover. Reverse the cover removal procedure to attach the cover.

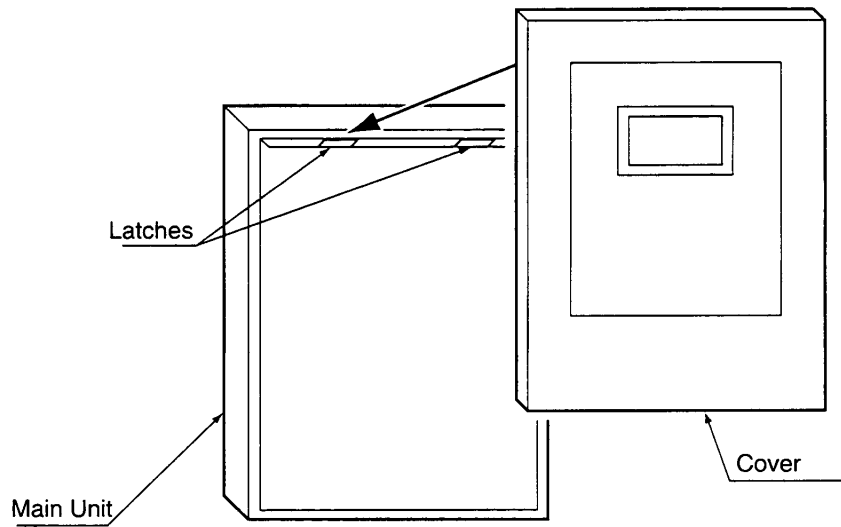
NOTE

Switches

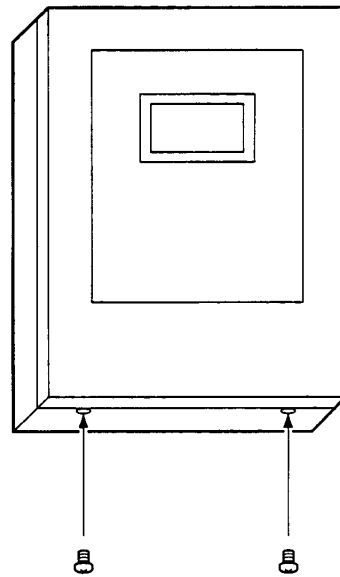
Switches on the PCB (dip switch, tact switch and jumper wire) are only to be set by an authorized service engineer. Unauthorized settings will result in a malfunction.

8. Attaching and Fastening the Cover

(1) Fit the cover into the latches on the top part of the main unit, and lower the cover into place.



(2) Tighten the screws.



NOTE

Before setting the cover in place, make sure that the seal around the screen area is firmly in place. This seal is loose or missing the touch panel may fail to operate properly.

9. Maintenance

The MJ-180A is equipped with a system of LED's that indicate the various functions as well as operational status. An explanation of these indicators is provided below.

○: OFF ●: ON

Function	Symbol	Status	Meaning	SW1 setting																		
Gateway normal status Transmit / receive status indication Error point indication	LED1	○/●	M-NET transmitting	All OFF																		
	LED2		M-NET receiving																			
	LED3		MAIN-BUS transmitting																			
	LED4		MAIN-BUS receiving																			
	LED5	–	Not defined																			
	LED6	○/●	Unit normal / abnormal																			
	LED7		M-NET communication normal / error																			
	LED8		MAIN-BUS communication normal / error																			
Gateway boot status indication Error point indication	LED1	○/●	MAIN-BUS address not registered	Only SW8 ON																		
	LED2		M-NET booting not completed																			
	LED3		Booting on standby																			
	LED4-6	–	Not defined																			
	LED7	○/●	M-NET communication normal / error																			
	LED8		MAIN-BUS communication normal / error																			
MAIN-BUS communication error indication	LED1	○/●	Address normal / duplicated (6600)	Only SW7 ON																		
	LED2		Polarity normal / not settled (6601)																			
	LED3		Hardware normal / error (6602)																			
	LED4	–	Not defined																			
	LED5	○/●	Command normal / incorrect (6606)																			
	LED6		Normal / No ACK (6607)																			
	LED7		Normal / No response (6608)																			
	LED8		Normal / Polling time out																			
M-NET communication error indication	LED1	○/●	Address normal / duplicated (6600)	Only SW4 ON																		
	LED2		Polarity normal / not settled (6601)																			
	LED3		Hardware normal / error (6602)																			
	LED4		Bus normal / busy (6603)																			
	LED5		Command normal / incorrect (6606)																			
	LED6		Normal / No ACK (6607)																			
	LED7		Not defined																			
	LED8	–	Normal / Polling time out																			
M-NET communication error address	LED1-8	●	Address 0-255 <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>LED</td> <td>8</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> </tr> <tr> <td></td> <td>2⁷</td> <td>2⁶</td> <td>2⁵</td> <td>2⁴</td> <td>2³</td> <td>2²</td> <td>2¹</td> <td>2⁰</td> </tr> </table>	LED	8	7	6	5	4	3	2	1		2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰	SW4, 8 ON
LED	8	7	6	5	4	3	2	1														
	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰														
Day of the week indication	LED1-8	●	Indicates the day of the week in BCD based on the Gateway built-in clock. <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>SUN</td> <td>MON</td> <td>TUE</td> <td>WED</td> <td>THU</td> <td>FRI</td> <td>SAT</td> </tr> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> </table>	SUN	MON	TUE	WED	THU	FRI	SAT	0	1	2	3	4	5	6	SW6, 7 OFF				
SUN	MON	TUE	WED	THU	FRI	SAT																
0	1	2	3	4	5	6																
Year indication	LED1-8	●	Indicates year in BCD based on the Gateway built-in clock. LED8(MSB)-LED5(LSB) ... Tens digit LED4(MSB)-LED1(LSB) ... Units digit	SW6, 8 OFF																		
Month indication	LED1-8	●		SW6 OFF																		
Date indication	LED1-8	●		SW7, 8 OFF																		
Hour indication	LED1-8	●		SW7 OFF																		
Minute indication	LED1-8	●		SW8 OFF																		
Second indication	LED1-8	●		SW8 OFF																		
Main body power supply	LED9	○/●	Power OFF / ON	–																		

10. System Constraints

(1) MAIN-BUS transmission line

- Maximum distance possible for MAIN-BUS transmission $\leq 500\text{m}$

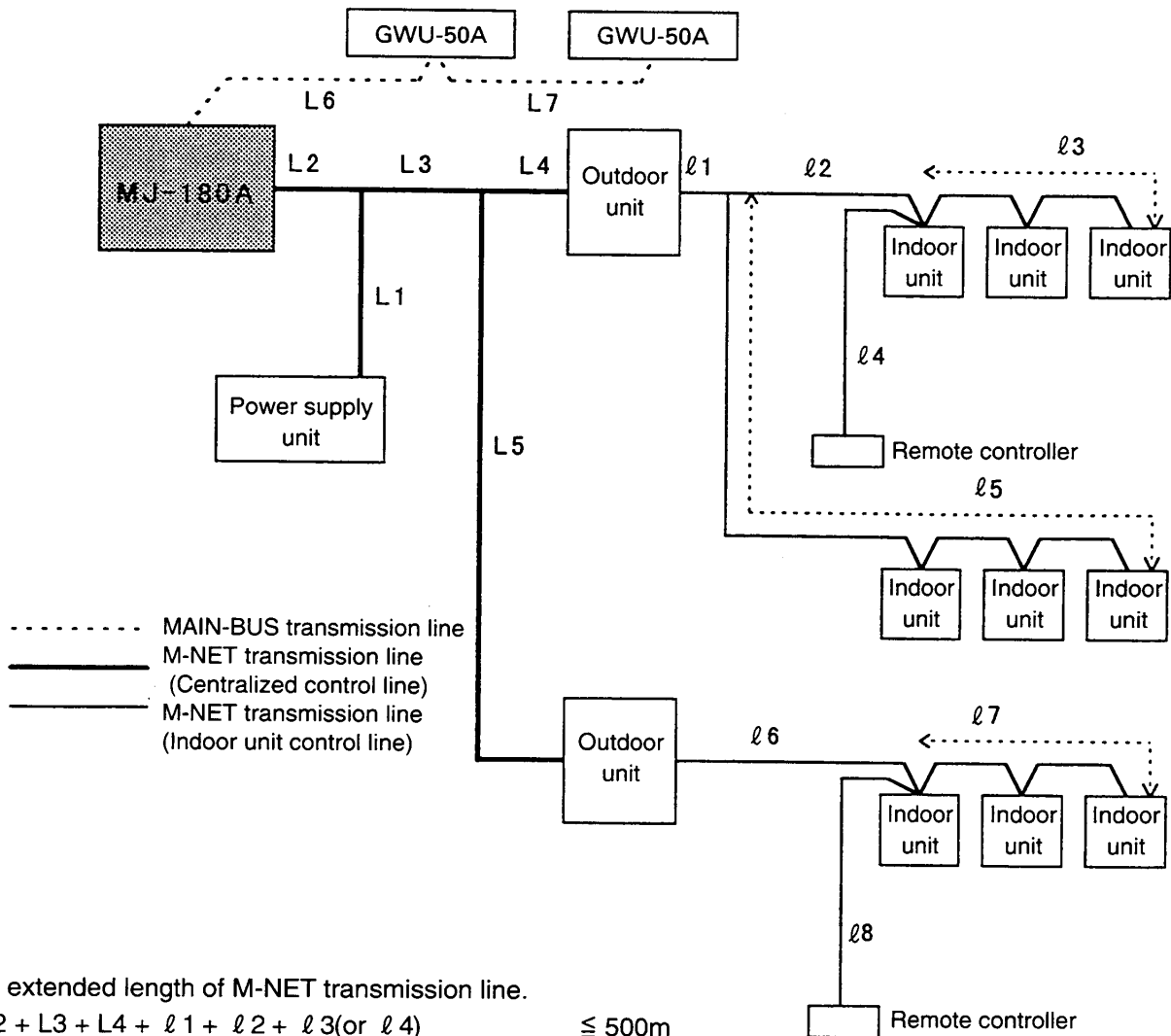
(2) M-NET transmission line

- Maximum distance possible for M-NET transmission $\leq 500\text{m}^*$
- Maximum length to power unit $\leq 200\text{m}^*$

NOTE

* The greater indoor unit on remote control cable length should be used to determine the maximum cable length.

Example



1) Total extended length of M-NET transmission line.

- ① $L2 + L3 + L4 + l1 + l2 + l3(\text{or } l4) \leq 500\text{m}$
- ② $L2 + L3 + L4 + l1 + l5 \leq 500\text{m}$
- ③ $L2 + L3 + L5 + l6 + l7(\text{or } l8) \leq 500\text{m}$
- ④ $l3(l4) + l2 + l1 + L4 + L5 + l6 + l7(\text{or } l8) \leq 500\text{m}$
- ⑤ $l5 + l1 + L4 + L5 + l6 + l7(\text{or } l8) \leq 500\text{m}$

2) Indoor unit - Maximum current receiving length.

- ① $l1 + l2 + l3(\text{or } l4) \leq 200\text{m}$
- ② $l1 + l5 \leq 200\text{m}$

3) Feeding unit - Maximum current feeding length.

- ① $L1 + L2 \leq 200\text{m}$
- ② $L1 + L3 + L4(\text{or } L5) \leq 200\text{m}$

4) Total extended length of MAIN-BUS transmission line.

- ① $L6 + L7 \leq 500\text{m}$

11. Trial Run

- (1) Be sure to conduct the trial run in accordance with the instructions given in the operation manual.**
(Instruction Book (Initial settings and amending settings))
- (2) Do not omit the trail run. The trial run is essential.**

This product is designed and intended for use in the residential,
commercial and light-industrial environment.

The product at hand is based on the following EU regulations:

- Low Voltage Directive 73/23/EEC
- Electromagnetic Compatibility Directive 89/336/EEC