



Building air conditioning control system

Central Controller

MJ-103MTRA

Installation Manual

This manual describes the installation of the central controller and wiring to the air conditioner. Refer to the installation manual of the air conditioner. Carefully read item 1 "Safety precautions to be observed without fail" before installing the unit.

1 Safety precautions to be observed without fail

* Hazards and levels of danger that can occur due to incorrect handling are classified by the following symbols.

⚠ Warning	Incorrect handling can result in death, serious injury, etc.
⚠ Cautions	Incorrect handling can result in injury or damage to the building or its contents.

* After reading this manual, keep in a handy place. When removing or repairing the unit, give this manual to the installer. When the user changes, also give to the new user.

⚠ Warning

<p>Ask your dealer or technical representative to install. If incorrect installation is done by a customer, it may cause an electric shock, fire, etc.</p>	<p>Securely install the controller according to the installation manual. If installation is not correct, it may cause an electric shock, fire, etc.</p>
<p>Securely install in a place which can withstand the weight of the controller. If it is not enough, the unit may drop and cause an injury.</p>	<p>The electric work should be performed by authorized personnel according to the installation manual. Any lack of electric circuit or any deficiency caused by installation may result in an electric shock or fire.</p>
<p>Securely connect the wiring using the specified cables and fix them so that the stress from the cables is not applied to the terminal connection sections. If connection or fixing is not sure, it may cause heat generation, a fire, etc.</p>	<p>Do not move and re-install the unit by yourself. If installation is incorrect, it may cause an electric shock, fire, etc. Ask your dealer or technical representative.</p>
<p>Never modify or repair by yourself. If the controller is modified or a repair is not correct, it may cause an electric shock, fire, etc. Consult your dealer if repairs are necessary.</p>	

⚠ Cautions

<p>Do not install the controller in a place where inflammable gas could leak. If gas leaks and collects around the unit, it may cause a fire or explosion.</p>	<p>Do not install this controller in a place where steam is generated such as bathroom, kitchen, etc. Avoid placing where water condenses on the walls. It may cause an electric shock or malfunction.</p>
<p>Do not use this controller in an abnormal environment. If the controller is used in a place where there is much oil (including machine oil), steam or sulfide gas, the performance of the controller may deteriorate or parts may be damaged.</p>	<p>Do not install this controller in a place where an acid or alkaline solution, special spray, etc. is used frequently. It may cause an electric shock or malfunction.</p>
<p>Perform wiring so the tension is not applied. If tension is applied, it may cause disconnection, heat generation or a fire.</p>	<p>Use specified wires corresponding to the current capacity for wiring. Otherwise it may cause power leakage, heat generation or fire.</p>
<p>Seal the wire lead-in port with putty to prevent the entry of dew, water, cockroaches and other insects, etc. It may cause an electric or malfunction.</p>	<p>Do not touch the PCB (Printed Circuit Board) with your hand or a tool. Also do not get dirt on the PCB. It may cause a fire or malfunction.</p>
<p>Do not wash this controller with water. It may cause an electric shock or malfunction.</p>	<p>Do not touch the switches with wet hands. It may cause an electric shock or malfunction.</p>
<p>Do not install this controller in a place where the ambient temperature exceeds 40°C or drops below 0°C, also do not install in a place where it is exposed to direct sunlight. It may cause a deformation or malfunction.</p>	<p>Do not press the switches with sharp objects. It may cause an electric shock or malfunction.</p>
	<p>Never connect the power source to M-NET transmission terminal block as this will cause a failure. It may cause a breakdown or fire.</p>

2 Confirmation of parts

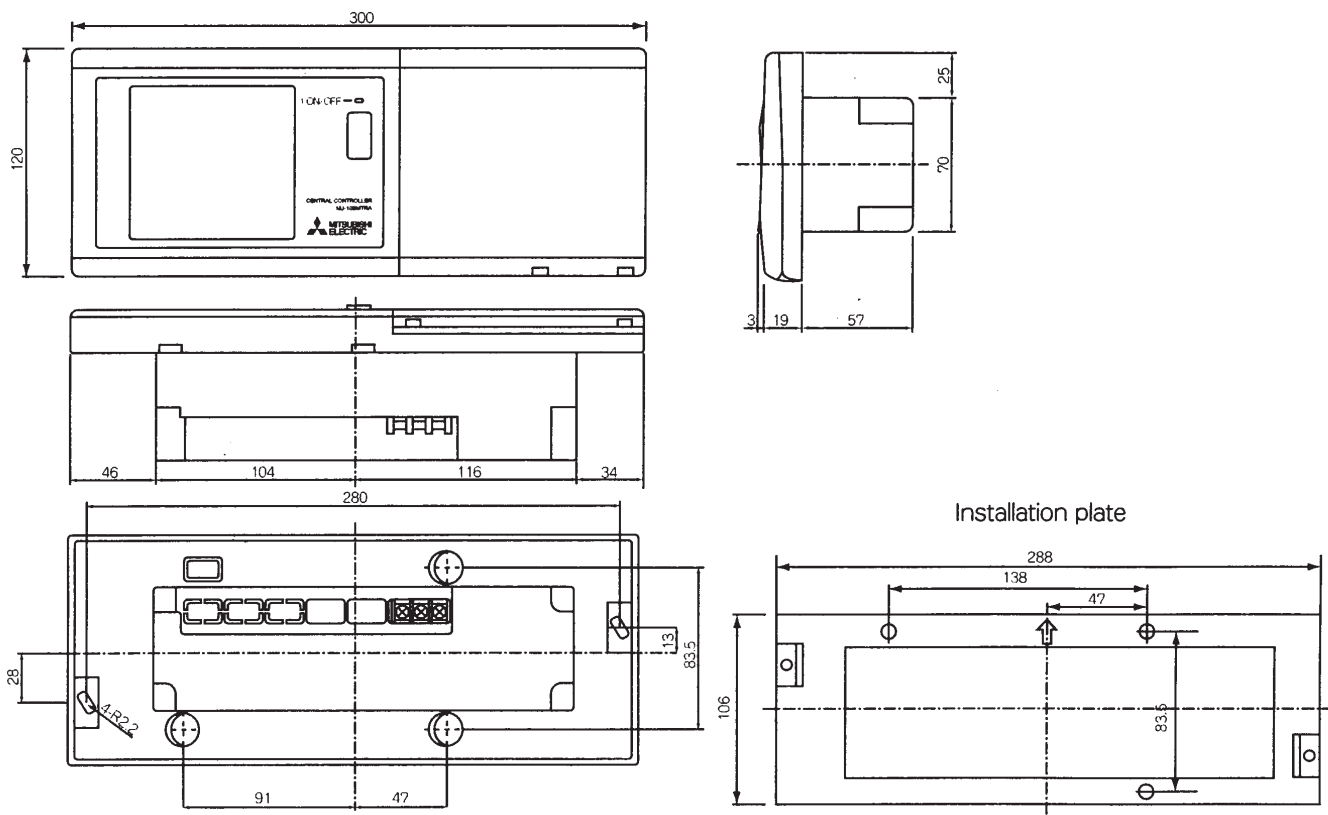
* Please confirm that in addition to this Installation Manual the following items are enclosed in the box.

No.	Part name	Qty.
①	Central controller	1
②	External input cable(5-pole)	1
③	External output cable(3-pole)	1
④	Installation plate	1
⑤	Wood screw 4.1×16(use when directly installing on the wall)	2
⑥	M4 round head screw for main unit installation	2
⑦	M3 round head screw for cover fixing	1
⑧	M4 countersunk screw (M4×30) for installation plate fixing	3
⑨	Instruction manual	1

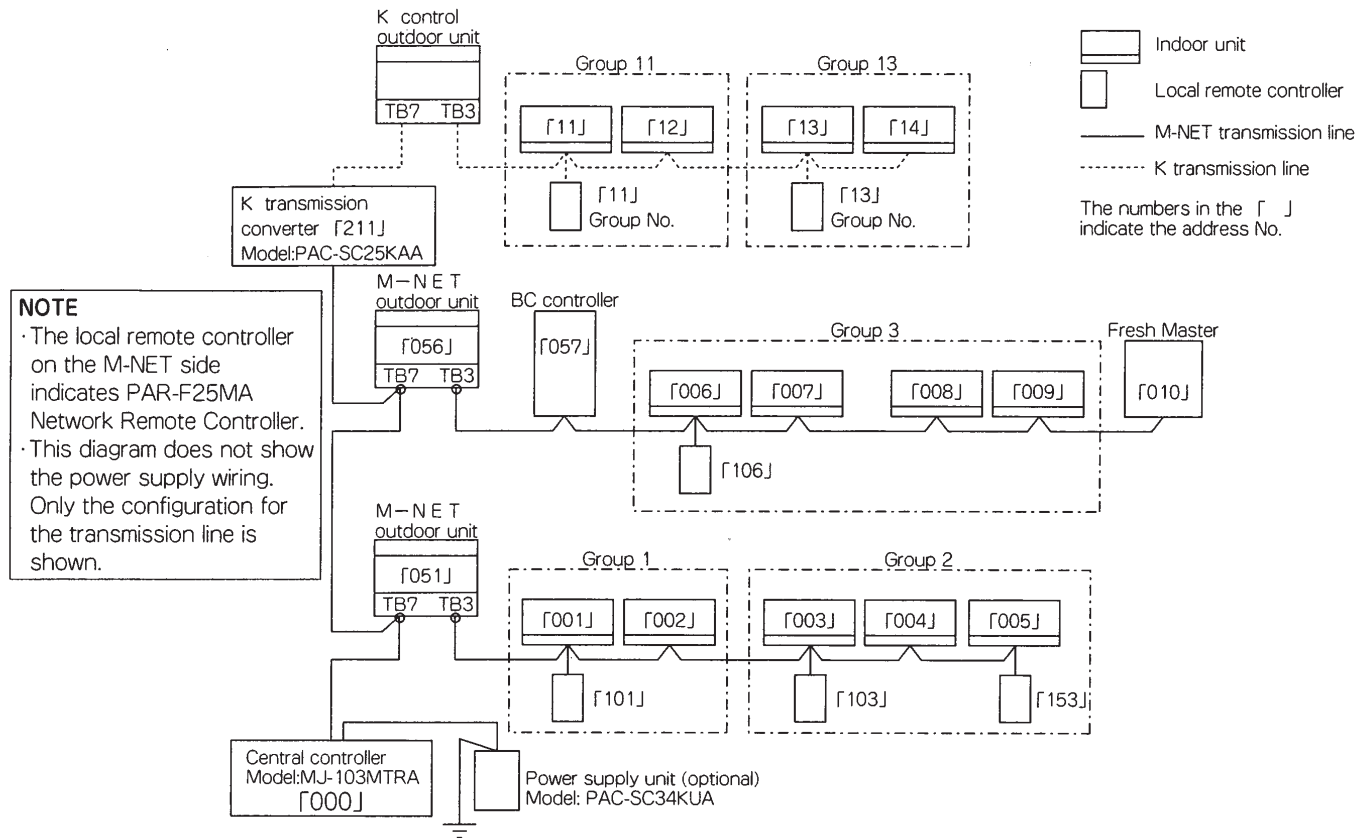
* If the screw enclosed for installation plate fixing cannot be used because the wall is thick,prepare an M4 countersunk screw with a length matching the wall thickness.

* Besides the above parts,the power supply unit(PAC-SC34KUA) for powering the central controller via a transmission line must be purchased.

3 Outline dimensions



4 System diagram



* Address setting for each M-NET device (The same address be used in duplicate.)

	Address setting method	Address
Indoor unit	Set randomly within the address range shown on the right.	1~50
Outdoor unit	Min.indoor unit address in same refrigerant system+No.50unit	51~100
BC controller	Outdoor unit address in same refrigerant system+No.1 unit	52~100
K control side remote.controller	Set randomly within the address range shown on the right.	1~50
Network remote controller	Set randomly within the address range shown on the right.	101~200
Fresh Master/LOSSNAY	Set randomly within the address range shown on the right.	1~50
K transmission converter	Min.address of K control indoor unit + No.200 unit	201~250

NOTE

* The following precautions will apply when using the K transmission converter(model:PAC-SC25KAA)and controlling the M-NET model and K control model with the same controller.

Refer to the K transmission converter installation manual for details.

① Central controller address

Always set the controller address to "000".
(Refer to 6 Address setting method for details.)

② Central controller DIP switches

Always set the NO.3 DIP switch of the controller to "ON"
(Refer to 7 Function selection method for details.)

③ Indoor unit address

Set all M-NET model indoor units from the No.1 unit,and then set the K control model addresses.
Indoor unit No.1 unit ~M-NET indoor unit max.address->K control indoor unit min.address ~ 50

④ K control model group No.

The min.indoor address No.of that group becomes the group No.(Same for local remote controller.)

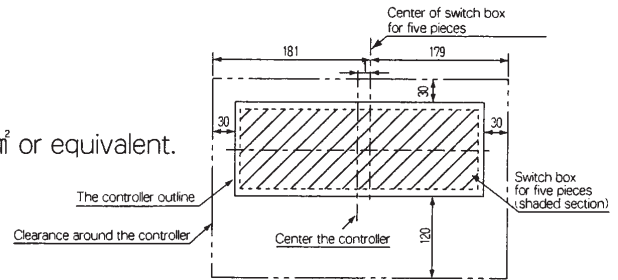
5 Installation method

1. Part prepared at site

- ① Prepare a switch box (with cover) for five pieces.
- ② Prepare lock nuts and bushing that match the conduit.
- ③ Prepare an M-NET transmission line CVVS(2-wire):1.25mm² or equivalent.

2. Installation method

- ① Secure the space shown on the right when installing the switch box for five pieces.
- ② When installing the controller on the switch box, the controller will be shifted by 1mm to the left as shown above.



NOTE

When installing two controllers horizontally in parallel, secure a clearance of 30mm or more between the products.

When installing vertically with the same clearance, removing of the cover will be difficult.

- ③ Connect the M-NET transmission line (centralized control line which connected TB7 of the outdoor unit) to M-NET transmission line terminal A and B.(Non Polarity)

* Type of wire. Use the cables which comply with the following specifications or equivalent.

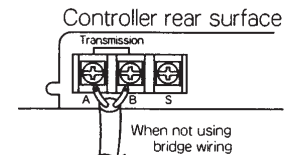
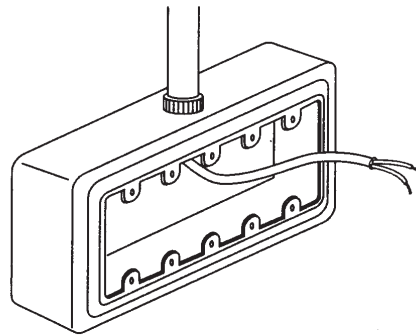
M-NET transmission line:

CVVS 1.25mm²(PCV-insulated,PCV-sheathed shield control cable)

CPEVS 1.25mm²(PE-insulated,PCV-sheathed shield communication cable)

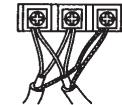
CAUTION

- * Never connect the power source to M-NET transmission terminal block as this will cause a unit failure.
- * Do not connect to the M-NET transmission line of indoor unit control line which connected to TB3 of the outdoor unit.
- * The conduit outlet faces only vertically. When leading the line out from above, seal the port so that water does not enter along the transmission line.



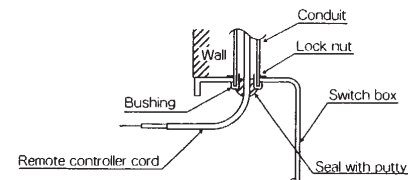
When not using bridge wiring

* When using bridge wiring of the shield, use the S-terminal as shown below.

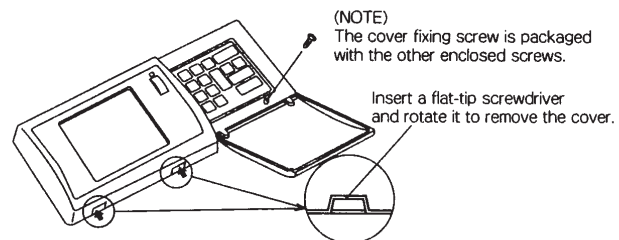


- ④ Securely seal the line lead-in port with putty to prevent the entry of dew, water cockroaches and insects, etc.

- * Seal the connecting section of the switch box and conduit with putty.



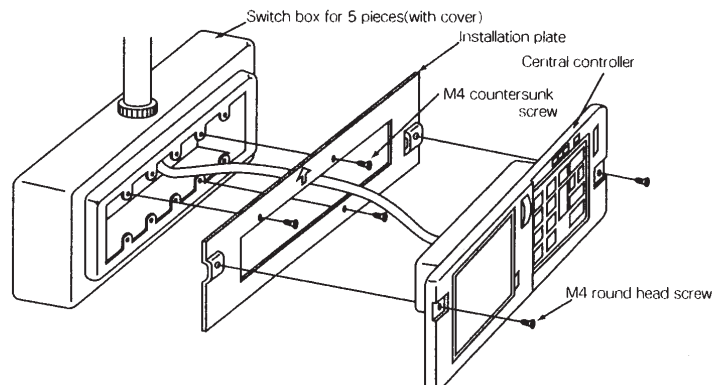
- ⑤ Remove the controller's cover and install on to the switch box for five pieces.



<Installation on to switch box for 5 Pieces>

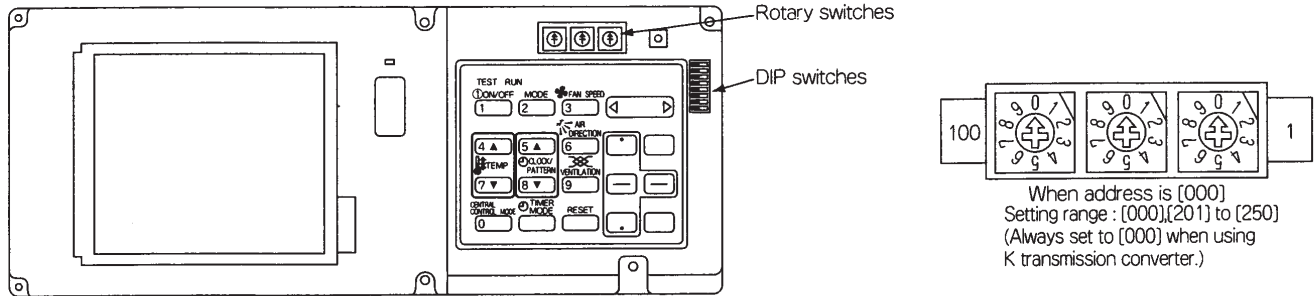
NOTE

- When installing the controller directly on to a wall instead of using the switch box, do not use the installation plate.
- If the screw enclosed for the installation plate, fixing cannot be used because of the wall thickness, prepare an M4 countersunk screw that matches the wall thickness.



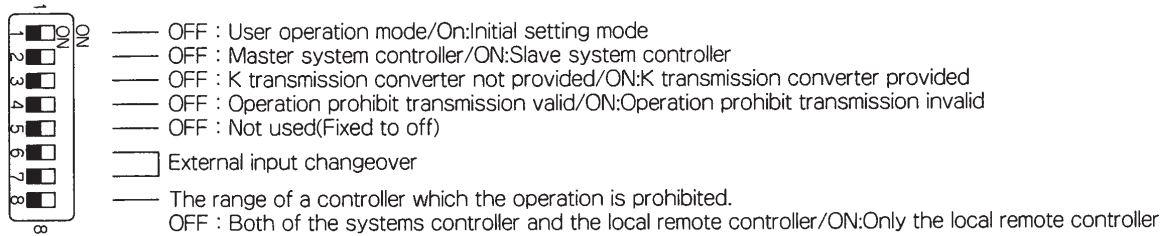
6 Address setting method

- * Set the address with the rotary switches on the upper right of the controller(when cover is removed).



7 Function selection method

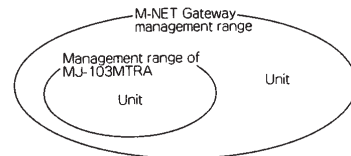
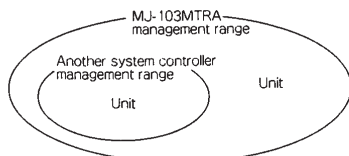
- * Select the functions with the DIP switches (8-pole)on the right side of the controller(with cover removed).



<Meanings of DIP switches>

Switch	Switch state	Name	Details
No.1	OFF	User operation mode	State for normal operation. The 1.Operation monitor,2.Operation setting,3.Schedule setting, 4.Malfunction monitor,and 5.Current time setting are executed in this mode.
	ON	Initial setting mode	State for making initial settings. The 1.Group setting,2.Interlocked setting,3.Refrigerant monitor, 4.Malfunction log,and 5.User setting are made in this mode.
No.2	OFF	Master systems controller (*1)	Set to use controller as master system controller.
	ON	Slave system controller (*2)	Set to use controller as slave system controller. (When this is set,the group setting and interlocked setting operations cannot be executed.Only monitoring can be executed.)
No.3	OFF	K transmission converter not provided	The packaged air conditioner to be used is only an M-NET model.
	ON	K transmission converter provided	K control model is included in the packaged air conditioner being used. (In this case,set the controller address "000" .) Prepare the K transmission converter (PAC-SC25KAA)separately.
No.4	OFF	Operation prohibit valid	Set this when using as a system controller for which local remote operation prohibit can be set. A system controller set to this can be used only for external input. Note that only one unit can be used in the system.
	ON	Operation prohibit invalid	Set this when using as a system controller for which local remote operation prohibit cannot be used. Set only one unit in the system to the operation prohibit transmission valid setting,and set all other units to the invalid setting.
No.5	Fixed to OFF		Not used.Always set this to "OFF" .
No.6,7	OFF/ON	External input changeover	This changes the input when using CN3(external input I/F). (Refer to 11. External input/output usage method for details.)
No.8	OFF	The range of a controller which the operation is prohibited.	Both of the system controller and the local remote controller.
	ON		Only the local remote controller.

(*1)(*2)Master system controller and slave system controller.



*When MJ-103MTRA controls another system controller or when the system contains only MJ-103MTRA: MJ-103MTRA is set as the master system controller.

*MJ-103MTRA performs the group setting in this configuration.

When MJ-103MTRA is controlled by another system controller: MJ-103MTRA is set as the slave system controller.

* The group setting is performed by Master system controller.

8 Group setting, Interlocked setting

(Group setting)

- *Set the group configuration with indoor units, local remote controllers and slave system controller to be controlled by the MJ-103MTRA.
- *Select “ 1 Group Setting “ on the menu screen in the initial setting mode (DIP Switch No.1 “ ON”),and set the group configuration.
- * Refer to the attached instruction manual section 5 Initial setting for the initial setting method.

(Interlocked setting)

- *Set the single or multiple indoor units and interlocked OA processor unit or LOSSNAY in the same group. Select “ 2 Interlocked Setting “ on the menu screen in the initial setting mode (DIP Switch No.1 “ ON “),and make a setting.
- * Refer to the attached instruction manual section 5-3 Interlocked setting for the setting method.

⚠ CAUTION

If there is not group setting information,the initial setting mode will display regardless of whether DIP switch No.1 is set to ON or OFF.In this case, “PLEASE SET THE GROUP CONFIGURATION” will blink on the screen, so set the group.

9 Test run

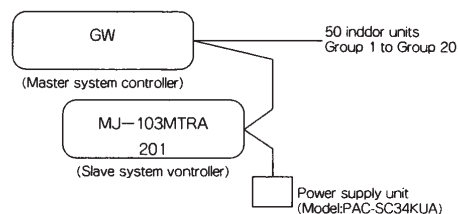
- *After setting the group or interlocked setting,confirm that the controller has started up,and then perform a test run.
- *It may take approx. 10 minutes for local remote controller operation to be enabled after the power is turned ON. In this case,press the ON/OFF button on the controller to enable immediate local remote controller operation.

(Test run procedure)

- 1.Turn ON the Power for the controller and all units.
 - 2.When the “INTIAL SETTING(PLEASE WAIT) “ blink on the controller LCD goes out,press the “ ①ON/OFF switch” and the “ temperature setting swich ▲” at the same time.
 - 3.Confirm the run state(is cold wind being blown out from the indoor unit and fresh master blow off parts) during the test run.
 - 4.When each unit has been confirmed,stop the unit with the controller or local remote controller. Even if the units are not stopped, the test run will stop automatically after approx. 2 hours.
- *Refer to the installation manual for the connected indoor unit for details on the test run method.

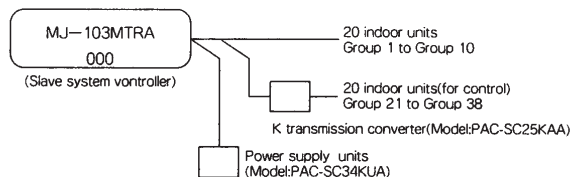
10 Example for system configuration

1.When the MJ103-MTRA is controlled by another system controller



- *G/W unit is set as the master system controller.MJ103-MTRA is set as the slavesystem controller and the address of MJ103-MTRA is set to range of “201” to “250”
- *Set so that there is one master system controller
- *Group setting or Interlocked setting can be performed only from the master system controller
- *Set so that there is one system controller in the system that can transmit the operation prohibition. (Refer to the installation Manual of G/W unit for more details.)

2.To control a K control model



- *Set MJ103-MTRA address to “000” When a K transmission converter is connected.Always set to the master system controller when the address is “000” .
- *When using a group setting for the K control model,set only the indoor unit that belongs to that group.
- *Set the min.indoor unit address in the group for the K control model group No.
- *Set the master system controller DIP switch No.4 to “ OFF” (operation prohibit transmission valid) when the K transmission controller is connected.

11 External input/output usaque method

1.External signal input function

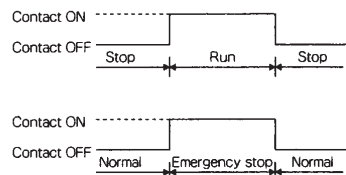
(1)External input

Emergency stop/normal,run/stop and prohibit/enable of local remote controller operation can be controlled for all air conditioners being control by using the no-voltage contact signal from an external source. (Select with the DIP switch settings)

No	External signal input function	DIP switch		Remarks
		No.6	No.7	
1	Do not use external input signal (factory setting)	OFF	OFF	
2	Execute emergency stop/normal with level signal	OFF	ON	The local remote controller ON/OFF operations,and the controller ON /OFF operation and prohibit/enable change operations will be prohibited during emergency stop.
3	Perform ON/OFF with level signal	ON	OFF	The local remote controller ON/OFF operations,and the controller ON/OFF operations and prohibit/enable change operations will be prohibited.
4	Perform ON/OFF, prohibit/enable with pulse signals.	ON	ON	Set the pulse width while the contact is ON to 0.5 to 1 sec.

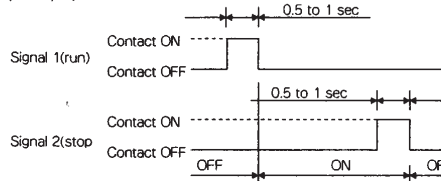
(2) Level signal and pulse signal

(A) Level signal



(B) Pulse signal

(Example) for ON/OFF



*The prohibit/enable input is the same.

(3)External input specifications

CN3	Lead wire	Emergency stop/normal level signal	ON/OFF level signal	ON/OFF, prohibit/enable pulse signal
No.1	Orange	Emergency stop/normal input	ON/OFF input	ON input
No.2	Yellow	Not used	Not used	OFF input
No.3	Blue	Not used	Not used	Local remote controller operation prohibit input
No.4	Violet	Not used	Not used	Local remote controller operation enable input
No.5	Green	Common (0V)		

(A) For level signal

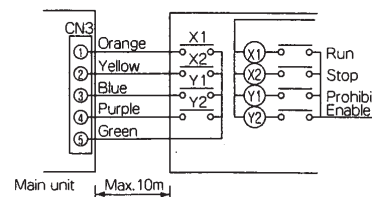
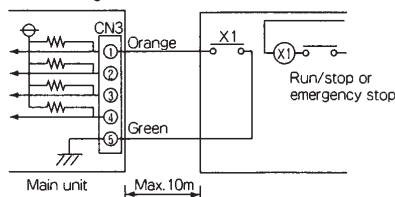
- When the emergency stop/normal signal is selected, the status will change from normal to emergency stop when the external input signal contact changes from OFF to ON ,and will change from emergency stop to normal when the contact changes from ON to OFF.
- When the ON/OFF signal is selected,the status will change from OFF to ON when the external input signal contact changes from OFF to ON ,and will change from ON to OFF when the contact changes from ON to OFF.

(B) For pulse signal

- Even if the ON signal is input during ON, the status will remain at ON state.
- If the local remote controller is prohibited,the ON/OFF operation mode and temperature setting operations by the local remote controller will be prohibited.
- Set the pulse width (contact ON time) to 0.5 to 1 sec.

(4)Recommended circuit example

(A) For level signal



- The no-voltage contact and extension cable,etc.,must be prepared separately at the site.
- The connection cable can be extended up to 10m.(Use a 0.3mm² or larger wire.)
- Cut the extra cable near the connector,and securely insulate the cut section with tape,etc.

2. External signal output function

(1) External output

When one or more air conditioners are running, the "ON" signal will be output, and if a malfunction occurs in one or more air conditioners, the "Malfunction" signal will be output.

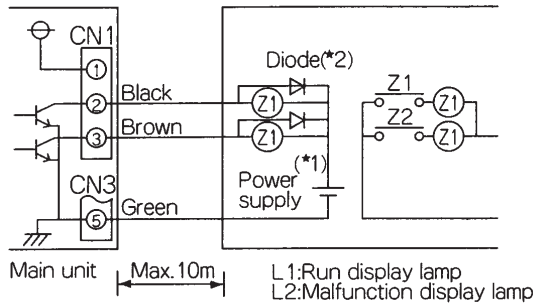
(2) External output specifications

CN1	Lead wire	Details of each terminal
No.1	Red	Common (DC5V)
No.2	Black	ON/OFF
No.3	Brown	Malfunction/normal

① "ON" signal and "Malfunction" signal will both be output.

(3) Recommended circuit example

To drive a relay



Use Z1 and Z2 relays having the following specifications.

Operation coil

Rated voltage :DC12V,DC24V

Power Consumption : 0.9W or less

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

(*2) Always insert a diode on both ends of the relay coil.

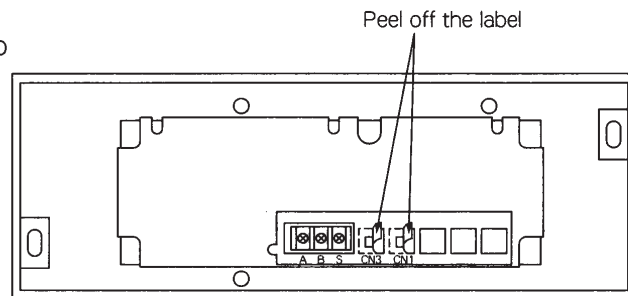
① Each element will turn on while ON operation and when a malfunction.

② The connection cable can be extended up to 10m.

③ The relays, lamps, diodes and extension cables, etc., must be prepared separately at the site.

⚠ CAUTION

When connecting the external input/output cables to connector CN3 and CN1 on the controller, peel off the label on the controller connector section.



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