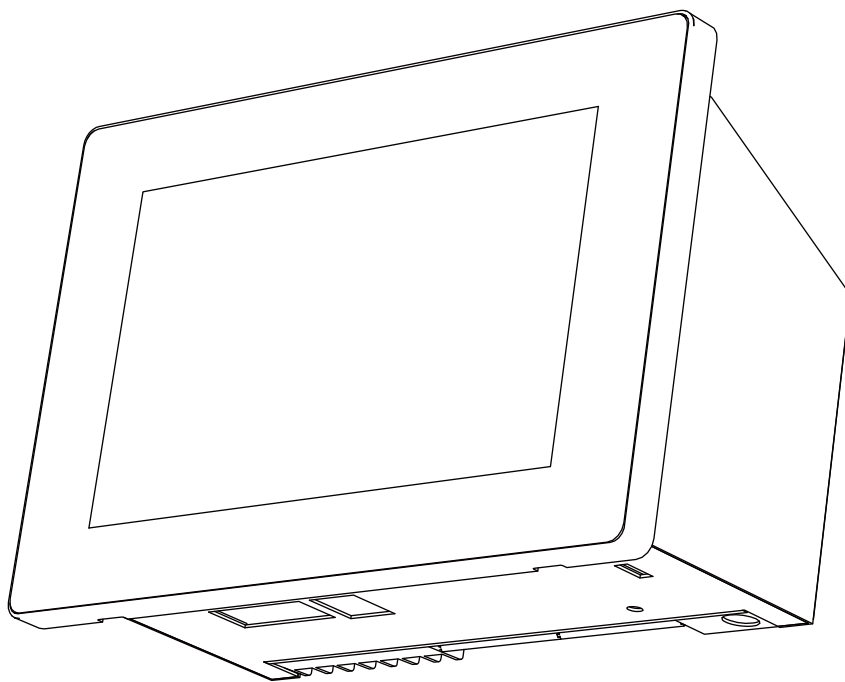


Central Control Device (Touch Screen Controller) Installation Manual

For commercial use

Model name:

BMS-CT2560U-UL



-
- **Save These Instructions!**
-

- Thank you for purchasing the system controller.
- Please read this installation manual carefully before installation, and perform the work only in the correct manner.

Contents

1	Precautions for safety	3
2	Specifications	5
3	Installation	8
3-1.	Installation of Main Unit Box and Panel	8
3-1-1.	When Installing from the Front	8
3-1-2.	When Installing from the Rear	9
3-2.	Attaching the Power Adapter	10
3-3.	Power, Signal, and Ground Line Connections	11

1 Precautions for safety

- Read these "Precautions for safety" carefully before installation.
- The precautions described below include important items regarding safety. Observe them without fail. Understand the following details (indications and symbols) before reading the body text, and follow the instructions.
- After the installation work has been completed, perform a trial operation to check for any problems. Explain how to use and maintain the unit to the customer.
Ask customer to keep this Manual at accessible place for future reference.

Indication	Meaning of Indication
 WARNING	Text set off in this manner indicates that failure to adhere to the directions in the warning could result in serious bodily harm (*1) or loss of life if the product is handled improperly.
 CAUTION	Text set off in this manner indicates that failure to adhere to the directions in the caution could result in serious bodily injury (*2) or damage (*3) to property if the product is handled improperly.

*1: Serious bodily harm indicates loss of eyesight, injury, burns, electric shock, bone fracture, poisoning, and other injuries which leave aftereffect and require hospitalization or long-term treatment as an outpatient.

*2: Bodily injury indicates injury, burns, electric shock, and other injuries which do not require hospitalization or long-term treatment as an outpatient.

*3: Damage to property indicates damage extending to buildings, household effects, domestic livestock, and pets.

Symbols	Meaning of Symbols
	"⊘" Indicates prohibited items. The actual contents of the prohibition are indicated by a picture or text placed inside or next to the graphic symbol.
	"ⓘ" Indicates compulsory (mandatory) items. The actual contents of the obligation indicated by a picture or text placed inside or next to the graphic symbol.

WARNING

	• Ask an authorized dealer or qualified installation professional to install or reinstall this unit. Inappropriate installation may result in electric shock or fire. • Electrical work must be performed by a qualified electrician in accordance with this installation manual. The work must satisfy all local, national and international regulations. Inappropriate work may result in electric shock or fire. • Be sure to turn off all main power supply switches before starting any electrical work. Failure to do so may result in electric shock.
	• Do not modify the unit. A fire or an electric shock may occur.
	• Always connect to ground Improper grounding may result in an electric shock. Before connecting the power, carry out Class D grounding according to the "Engineering Standard for Electric Work" and the "Internal Wiring Regulations".

EN

 CAUTION

- **Do not install in the following locations:**

- Locations where combustible gas may leak
- Locations with high humidity or water
- Dusty locations
- Locations in direct sunlight and locations subject to high temperatures
- Locations within 3.28 ft (1 m) from televisions or radios
- Outdoors, under awnings, or other locations exposed to rain and dew
- Locations exposed to outside air containing corrosive gases or salinity
- Locations with frequent vibrations

- **Do not operate the touch panel with mechanical pencils or other pointed objects.**



- **In installation work, use wiring with the correct ampacity.**

- Failure to do so may result in excessive heat or fire.

- **Use specified cables and connect them securely, and do not subject connecting terminals to external force.**

- Doing so may result in broken cables, excessive heat or fire.

- **Always install a circuit breaker on the primary side of the power supply.**

- **Clean the touch panel by wiping with an eyeglasses cleaner or other soft cloth. To remove oil-based ink, wipe with a cloth that has been moistened with a neutral detergent and then wrung out, and finish by wiping with a soft, dry cloth. Do not use commercial OA cleaners, cleansers, or other liquid cleaners containing abrasives.**

- **When attaching to a metal lath, wire lath or wooden structure with metal boards, attach it to the control panel, etc. without attaching it to the wall.**

- **Do not swallow the coin cell battery.**

- There is a risk of injury due to chemical reaction if the battery is accidentally swallowed.

CAUTION This device uses a lithium battery. Follow all local regulations when disposing of it.

2 Specifications

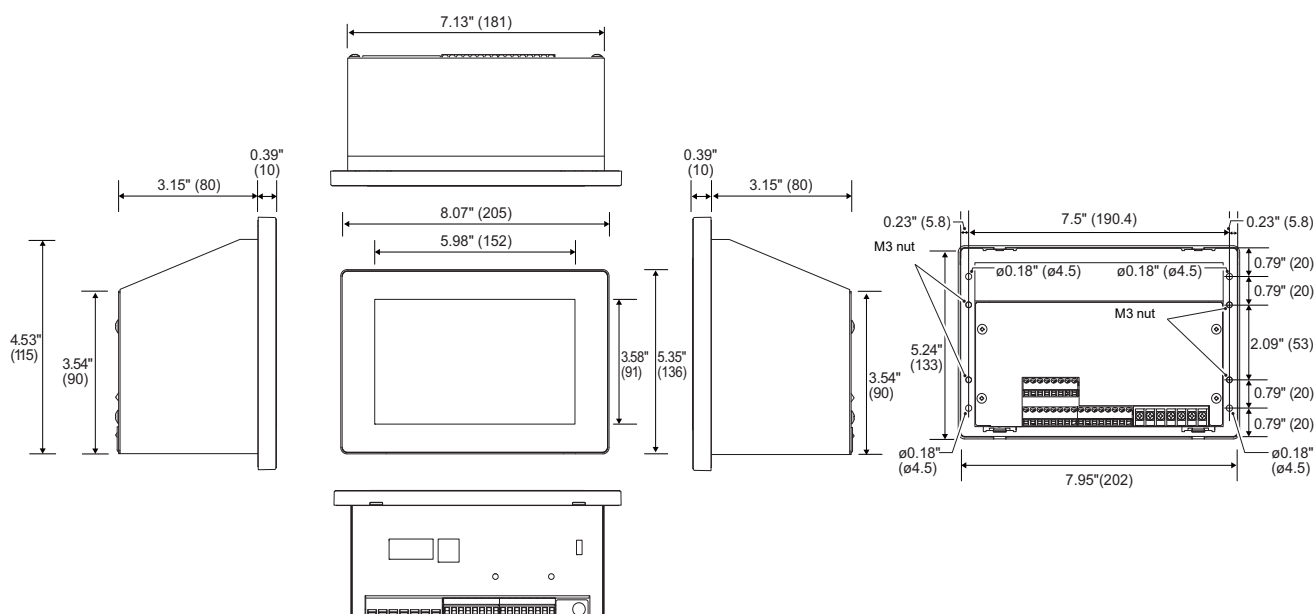
Product name		Touch Screen Controller
Model Name		BMS-CT2560U-UL
Power supply		AC 120 V 60 Hz
Consumed current		1.17 A
Number of connected units	Indoor unit	Up to 256 units (LINK1 terminal: maximum 128 units, LINK2 terminal: maximum 128 units)
	ON/OFF unit	Maximum 60 units
	ENERGY MONITORING RELAY INTERFACE	Up to 4 units
	DIGITAL INPUT/OUTPUT RELAY INTERFACE	Up to 4 units
Communication ports		•RS-485 port ×1 •LAN port ×1
USB port		USB memory stick connection port ×2
External contact input		8 inputs
External contact output		4 outputs
Operating temperature/humidity range		32 to 104°F (0°C to 40°C), 10% to 90% RH (no condensation)
Dimensions		H5.35"(136 mm)×W8.07"(205 mm)×D0.39"(10 mm)+3.15" (+80 mm) (Embedded dimensions shown in parenthesis)
Mass		2.95 lb (1.34 kg) (System Controller) 0.99 lb (0.45 kg) (power adapter)

EN

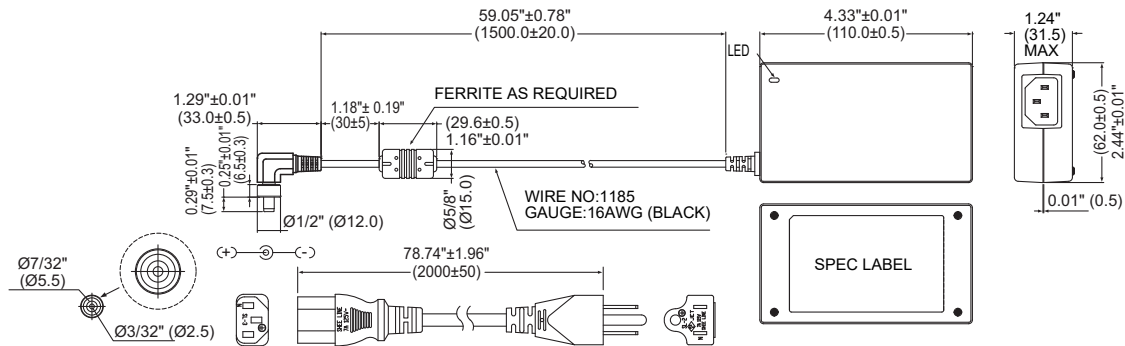
■ Outline drawing

Unit: inch (mm)

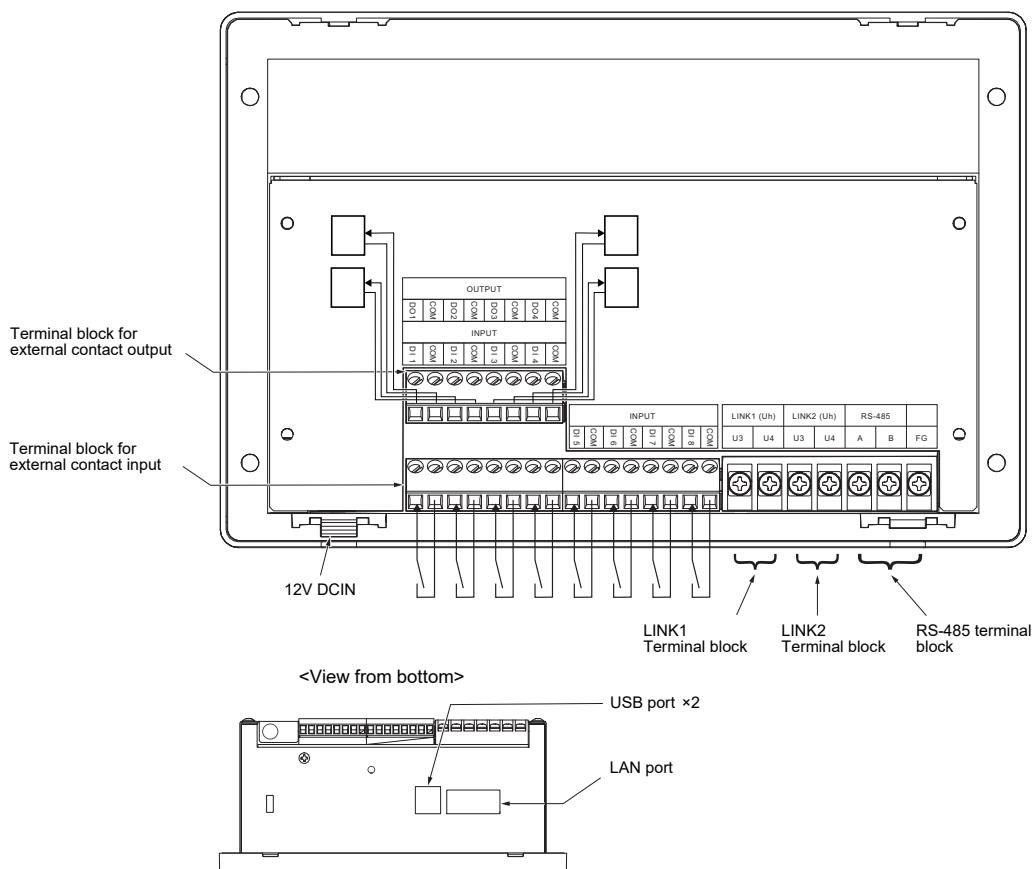
System Controller



Power adapter



■ Component Names



Name	Function
12V DCIN	Connect the power adapter
Terminal block for external contact output	Connect the external contact output
Terminal block for external contact input	Connect the external contact input
LINK terminal block	Connect the central control wiring
RS-485 terminal block	Connect the RS-485 terminal block
USB	For service
LAN	Can be connected to a PC via LAN communication and monitored and controlled

■ Before Installation

Confirm that all the parts listed below are included in the package.

Included Items

No.	Component name	Quantity	Remarks
1	System Controller	1	
2	Power adapter	1	
3	Power cable	1	
4	Owner's Manual	1	
5	Installation Manual	1	
6	Fixing screw	4	Fixing screw (M4×0.47" (12 mm)) for attaching the main unit from the front
7	Fixing screw	4	Fixing screw (M3×0.31" (8 mm)) for attaching the main unit from the rear
8	Closed end connector	2	RS-485 cable crimp connector
9	Cable tie	2	For fixing the power adapter
10	Double-sided tape	1	For fixing the power adapter

Wiring specifications

Use the following wiring material to connect signal wires and power supply wires. (Locally procured)

No.	Wiring	Wire type / wire diameter / wire length
1	For LINK terminal	Refer to "Design of Control Wiring" (P.13).
2	For RS-485	2-core shielded wires
		AWG16 . Up to 1640.5ft (500 m) (total extension distance)
3	For digital I/O	Two-core cable AWG22 . Up to 328.1ft (100m)
4	For Ethernet	LAN cable (category 5 or above) Maximum length: 328.1ft (100m)

3 Installation

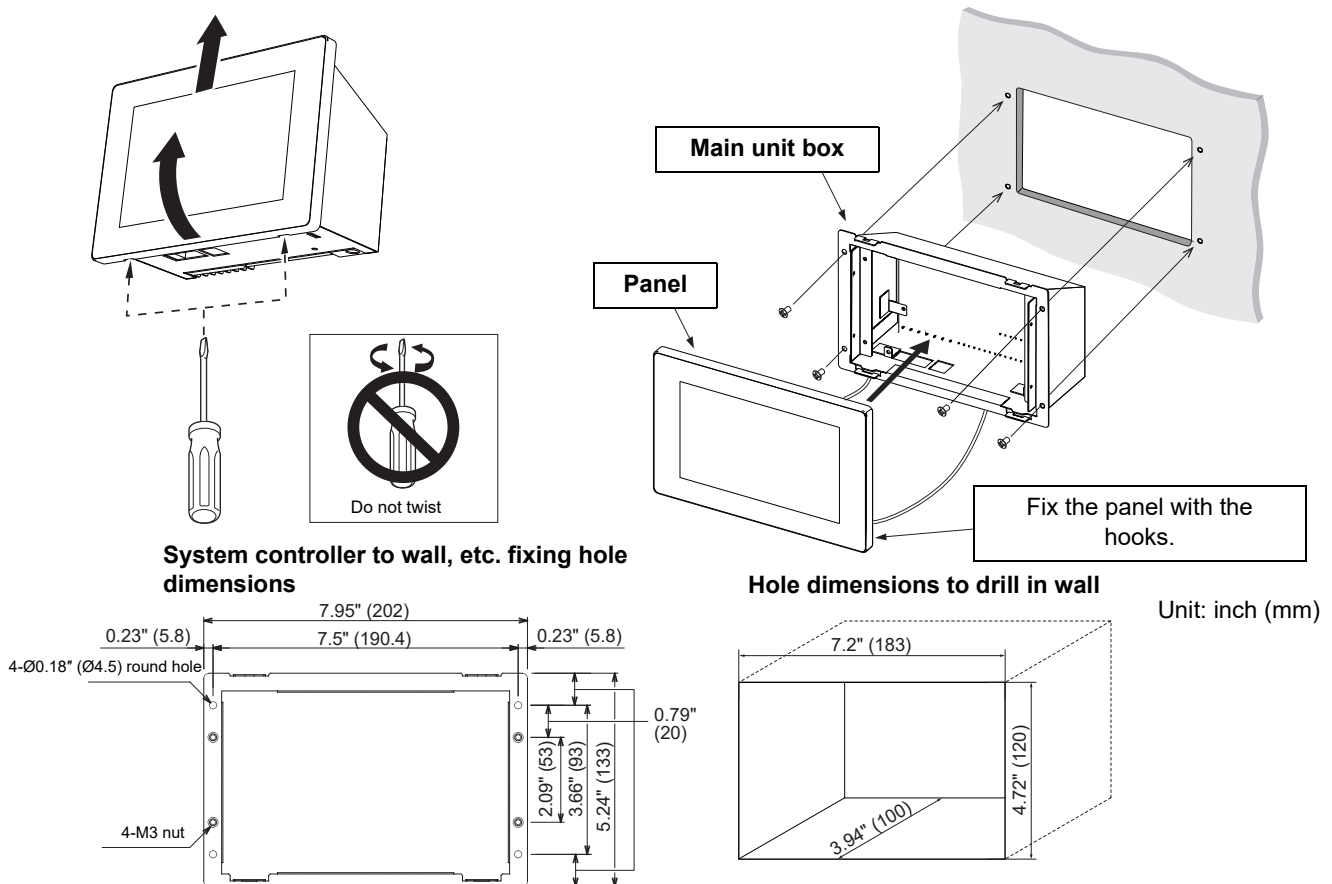
⚠ CAUTION

- Do not wire communication lines or input/output wiring next to power supply wiring, etc., or house them in the same metal pipe. Doing so may result in failure.
- Install the main unit away from noise sources.

3-1. Installation of Main Unit Box and Panel

The main unit box can be mounted either from the front or from the rear.

3-1-1. When Installing from the Front



* Since the left and right mounting screws are attached close to each other, please drill the left and right dimensions as accurately as possible.

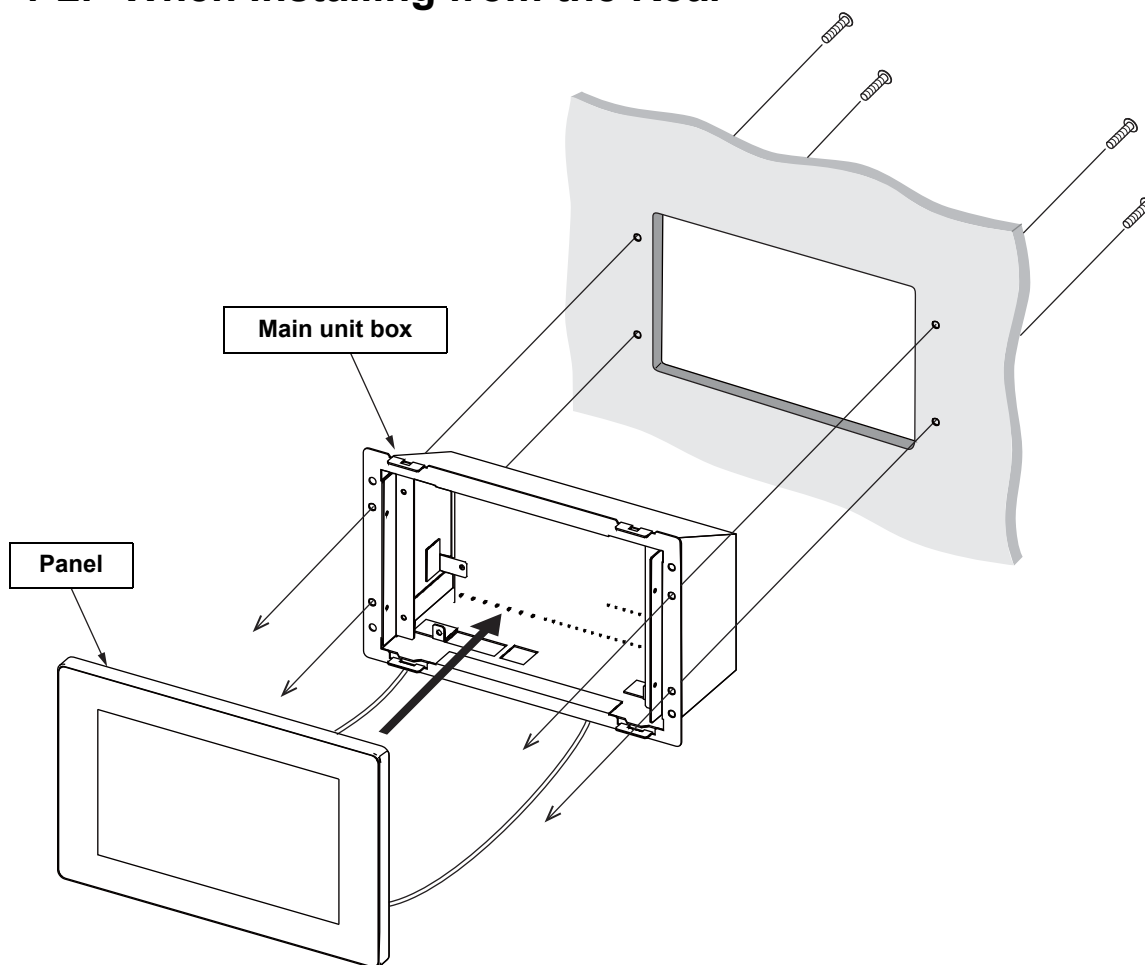
- 1 Connect the TU2C-LINK cable, AC adapter, and LAN cable to the main unit.
- 2 Fit the main unit on to the wall and switch board.
- 3 Insert a flat head screwdriver, etc. into the groove on the left and right of the bottom of the panel. There will be a snapping sound and the panel will come off.

REQUIREMENT

- Just insert the screwdriver and do not twist it.
- To prevent the panel from falling, support it during removal.

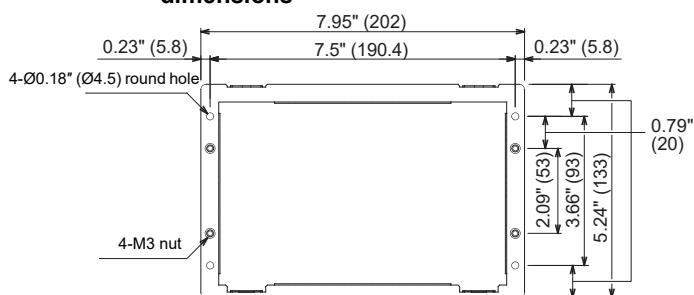
- 4 Fix the 4 main unit screws.
- 5 Close the panel by hooking the panel rear to the top of the main unit. There will be a snapping sound and the panel will be fixed.
- 6 When installation is completed, peel off the transparent film.

3-1-2. When Installing from the Rear

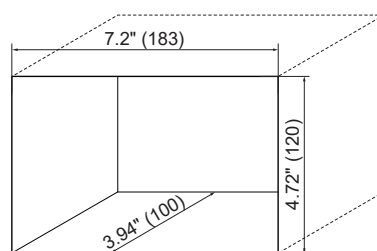


EN

System controller to wall, etc. fixing hole dimensions



Hole dimensions to drill in wall



Unit: inch (mm)

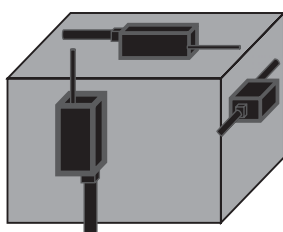
* Although the panel and the main unit box are separated to explain the screw attachment part in an easy to understand manner, it is not necessary to remove the main unit box from the panel in actual installation work.

- 1** Drill four Ø0.16" (4 mm) holes in the switchboard, wall, etc.
- 2** Fit the main unit on the switch board, wall, etc.
- 3** Fix from the rear of the main unit. Please use the supplied M3 × 0.31" (8 mm) screws.
- 4** Connect the TU2C-LINK cable, AC adapter, and LAN cable to the main unit.
- 5** When installation is completed, peel off the transparent film.

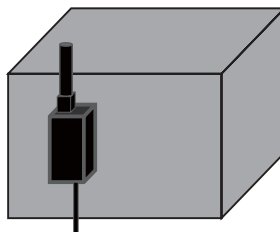
3-2. Attaching the Power Adapter

The power adapter can be installed on a flat surface or on a wall. Do not install it in any other orientation. Fix with the attached binding band and double-sided tape.

Installation allowed



Installation not allowed



* Install so that the power cable that connects to AC 120 V does not face upward.

REQUIREMENT

Do not install in the following locations.

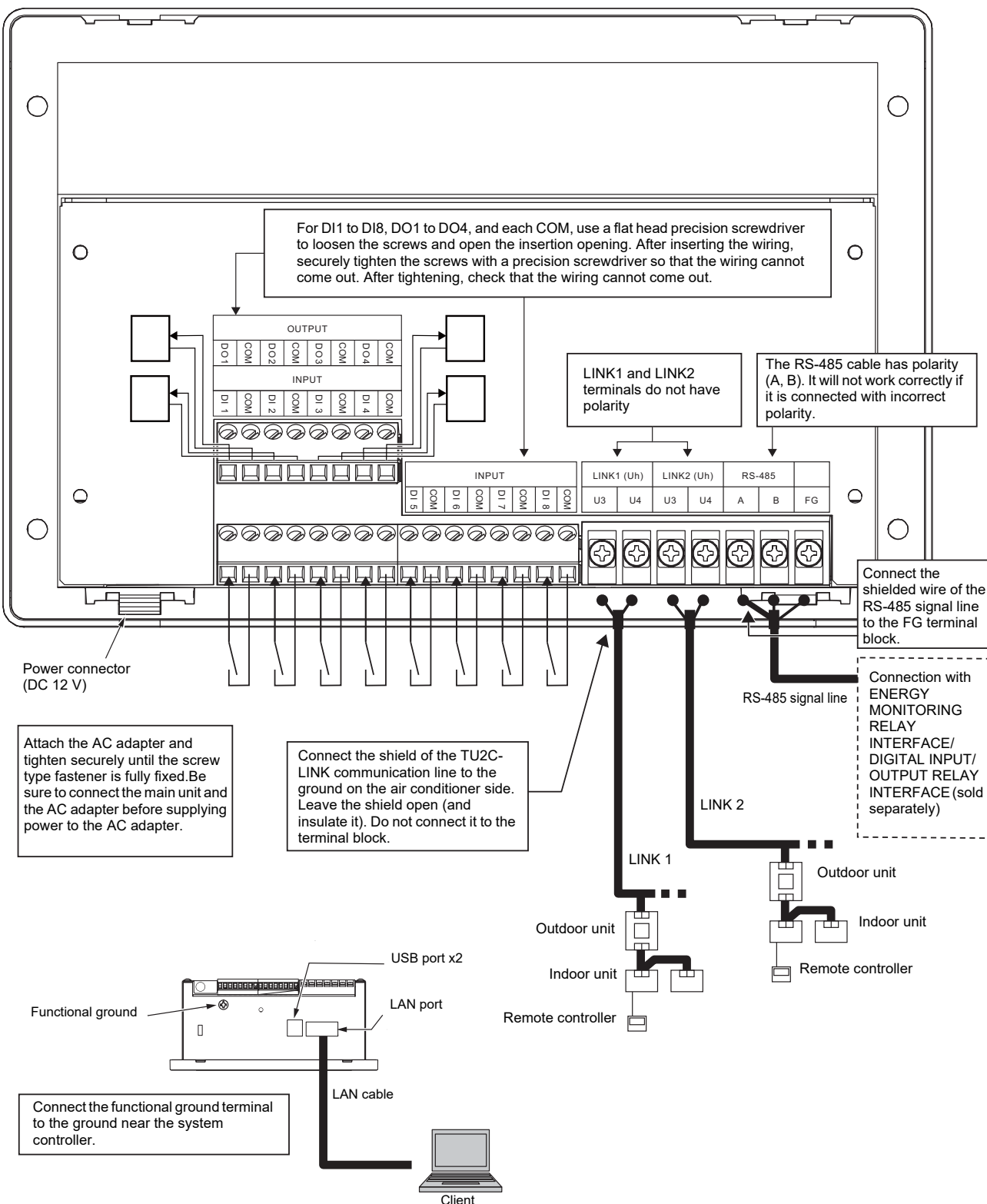
- Locations with high humidity or water
- Dusty locations
- Locations in direct sunlight and locations subject to high temperatures
- Locations within 3.28 ft (1 m) from televisions or radios
- Outdoors, under awnings, or other locations exposed to rain and dew

3-3. Power, Signal, and Ground Line Connections

Connect the power, signal and ground lines to the specified terminal blocks.

REQUIREMENT

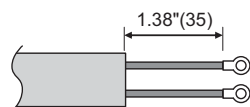
Attach round crimp terminals to all LINK 1, LINK 2, and RS-485 wiring, and tighten the screws securely. After tightening, check that the wiring cannot come out.



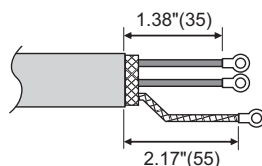
EN

Unit: inch (mm)

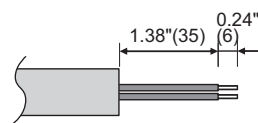
TU2C-LINK communication line stripping length



RS-485 cable wire stripping length

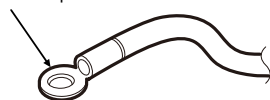


Digital I/O cable stripping length

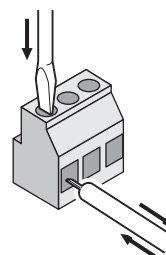


Attach a round crimp terminal to each wire of the power line and signal line.

Round crimp terminal



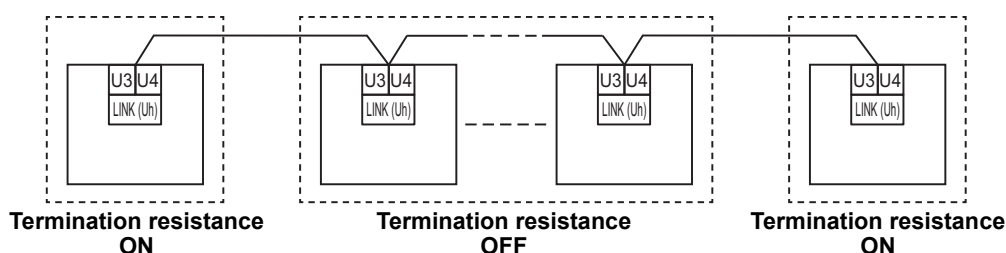
Loosen the screws with a screwdriver, insert the digital I/O cable, and tighten the screws securely.



Termination resistance setting

- RS-485 termination resistance setting Set at both ends of the RS-485 communication line. Set one end at the main unit and the other end at the interface. The termination resistance of the main unit is already set as a factory default. Refer to the interface installation manual to set the termination resistance of the interface.
- TU2C-LINK / TCC-LINK termination resistance setting <For TCC-LINK>
Leave just 1 line of the termination resistance in the interface board of the outdoor unit (centre unit) ON, and turn all the others OFF. (Refer to the wiring diagram attached to the outdoor unit for the position of SW.)
<For TU2C-LINK>
For the central control wiring (Uh line), set the termination resistance that is farthest away on the wiring between this central controller and the other unit (VRF, light commercial, air to air heat exchanger, general purpose control interface, air to water heat pump) to ON.

Refer to the manual of each model for the termination resistance setting method.



Shield grounding process

- RS-485 cable wire shielded wire Connect to the FG terminal block.
- TU2C-LINK communication line shielded wire When using the system controller with one unit, open the shielded wire of the TU2C-LINK communication line and perform insulation processing.
When using the system controller with multiple units, connect the shield of the TU2C-LINK communication line to the closed end and open the shield at the final end of the system controller to perform insulation processing.
Perform TU2C-LINK communication line shield grounding on the air conditioner side.

REQUIREMENT

- Be sure to install a circuit breaker or all-pole isolating switch (with a contact breaking distance of at least 0.12" (3 mm)) on the primary side of the power supply.
- Fasten the screws to the terminal block with torque of 0.37 lbf • ft (0.5 N•m).

■ Design of Control Wiring

Communication method and model name

The TU2C-LINK model (U series) can be used together with previous models (other than U series).

For details of the model and communication method, see the following table.

Communication method	TU2C-LINK (U series)	TCC-LINK (other than U series)
Outdoor unit	MMY-MUP*** ↑ U series model	Other than on the left (MMY-MAP***, MCY-MAP***, etc.)
Indoor unit	MM*-UP*** ↑ U series model	Other than on the left (MM*-AP***, etc.)
Wired remote controller	RBC-AMSU** ↑ U series model	Other than on the left
Wireless remote controller receiver	RBC-AXRU** ↑ U series model TCB-AXRU** ↑ U series model	Other than on the left
System controller	***_***U** ↑ U series model	Other than on the left

U series outdoor units: Super Multi u series (MMY-MUP***)

Outdoor units other than U series: Super Module Multi i series (MMY-MAP***), etc.

EN

When the connected outdoor unit is Super Multi u series (U series)

Follow the wiring specifications in the table below even when there is a mix of U series and non-U series in the connected indoor units or remote controllers.

Wiring specifications

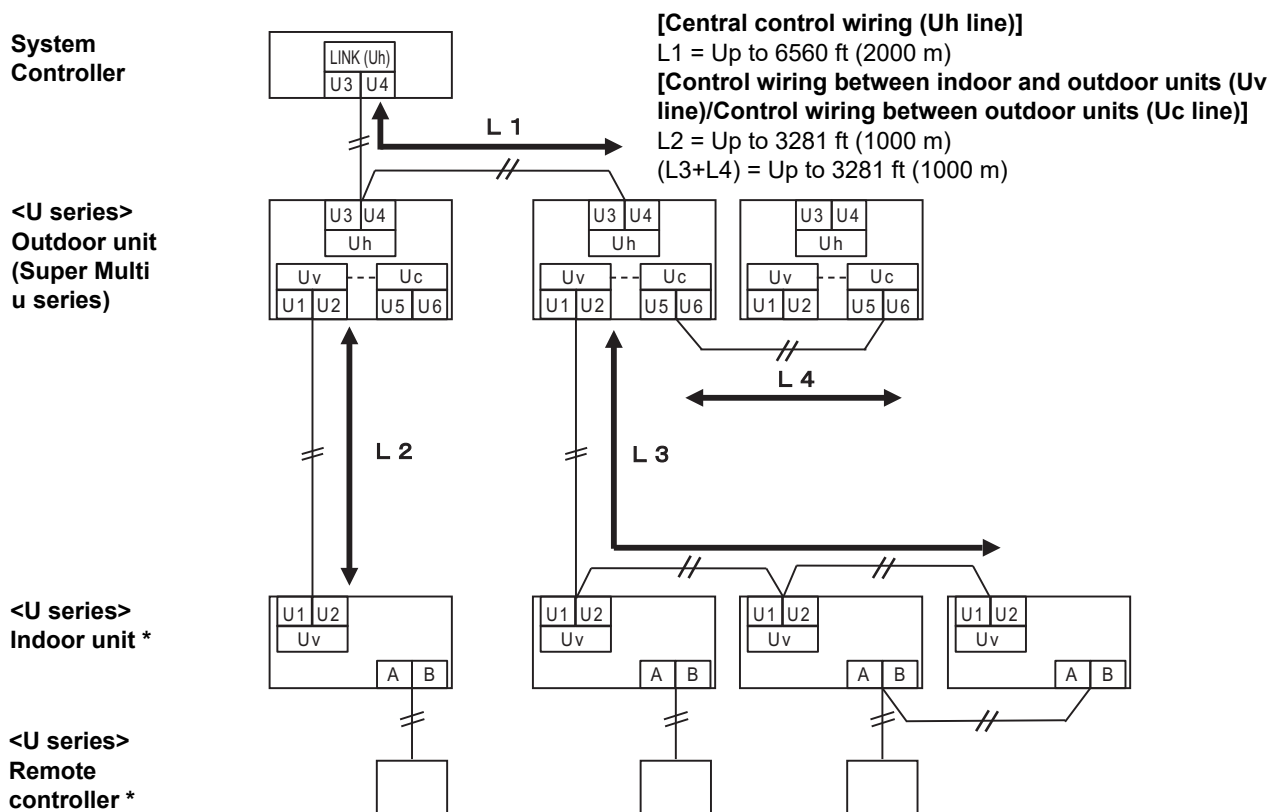
Item	Communication line
	Central control wiring (Uh line)
Wire diameter	AWG16: Up to 3281 ft (1000 m)
	AWG14: Up to 6560 ft (2000 m)
Wire type	2-core, non-polar
Wire types that can be used	Shielded wire

REQUIREMENT

When wiring the control wiring between indoor and outdoor units (Uv line)/control wiring between outdoor units (Uc line) and the central control wiring (Uh line), use the same wire type and diameter for each line.

Using a mixture of different wire types and diameters may cause a communication error.

System diagram



* The wiring specifications in the system diagram above are the same even when the indoor unit or remote controller are other than the U series.

When the connected outdoor units are other than Super Multi u series (U series)

Wiring specifications

Item	Communication line
	Control wiring between indoor and outdoor units and central control wiring
Wire diameter	AWG16: Up to 3281 ft (1000 m)
	AWG14: Up to 6560 ft (2000 m)
Wire type	2-core, non-polar
Wire types that can be used	Shielded wire

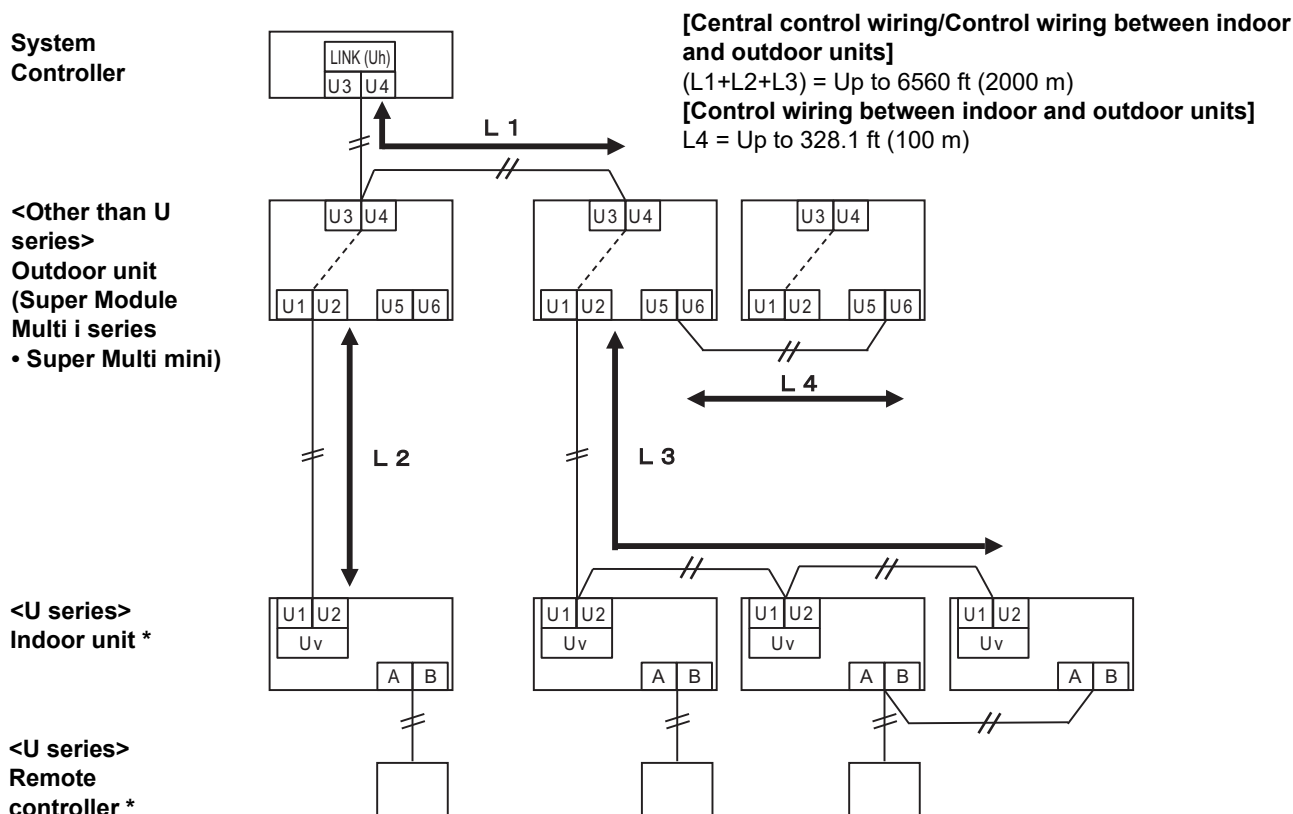
REQUIREMENT

When wiring the control wiring between indoor and outdoor units/central control wiring and the control wiring between outdoor units, use the same wire type and diameter for each line.

Using a mixture of different wire types and diameters may cause a communication error.

System diagram

EN



* The wiring specifications in the system diagram above are the same even when the indoor unit or remote controller are other than the U series.

When connecting to a previous model light commercial, air to air heat exchanger, air to water heat pump, or general purpose equipment control interface

Follow the wiring specifications in the table below even when there is a mix of U series and non-U series in the connected indoor units or remote controllers.

Wiring specifications

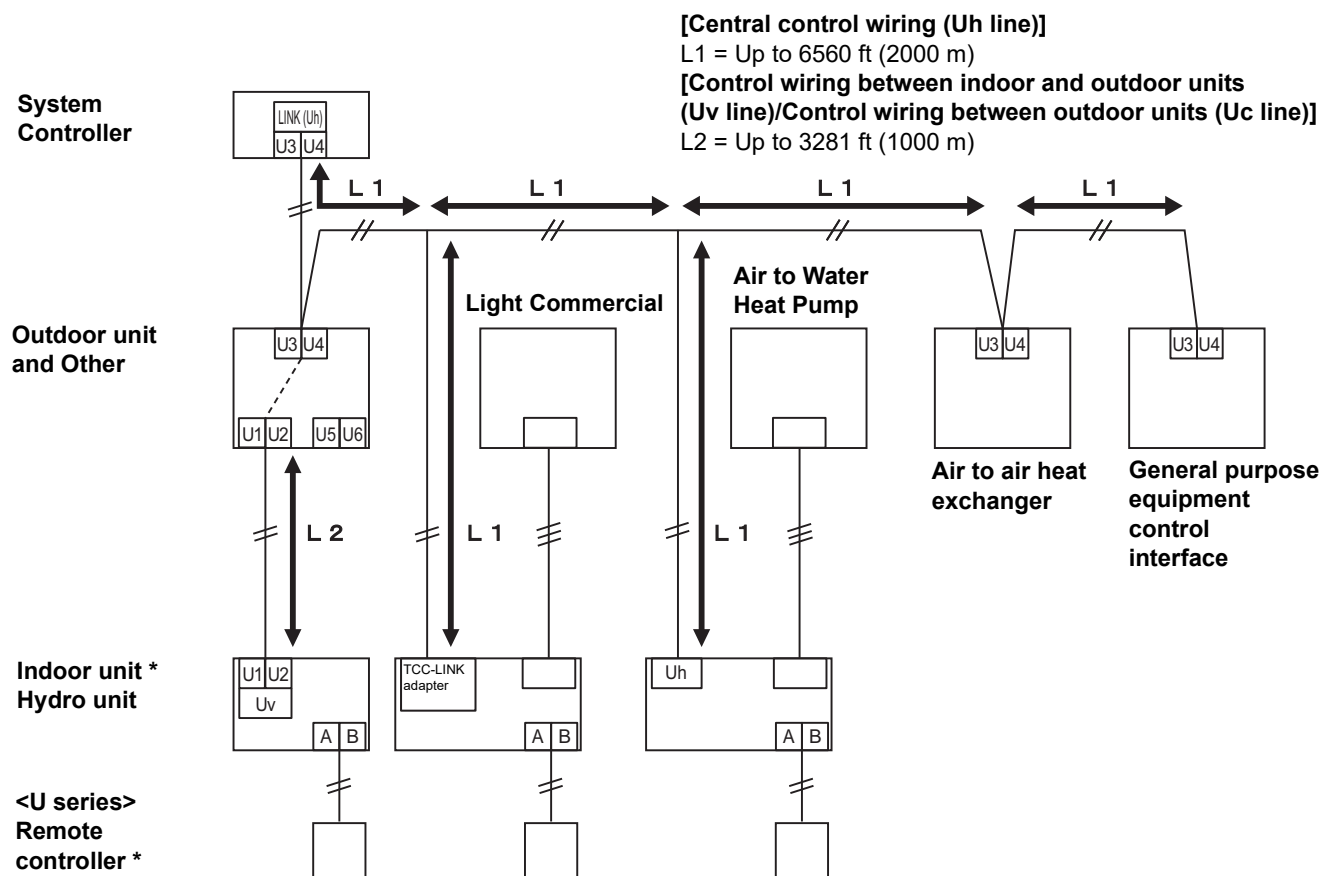
Item	Communication line
	Central control wiring (Uh line)
Wire diameter	AWG16: Up to 3281 ft (1000 m)
	AWG14: Up to 6560 ft (2000 m)
Wire type	2-core, non-polar
Wire types that can be used	Shielded wire

REQUIREMENT

When wiring the control wiring between indoor and outdoor units (Uv line)/control wiring between outdoor units (Uc line) and the central control wiring (Uh line), use the same wire type and diameter for each line.

Using a mixture of different wire types and diameters may cause a communication error.

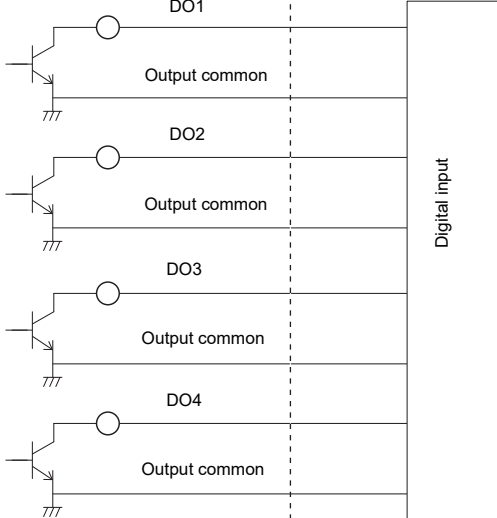
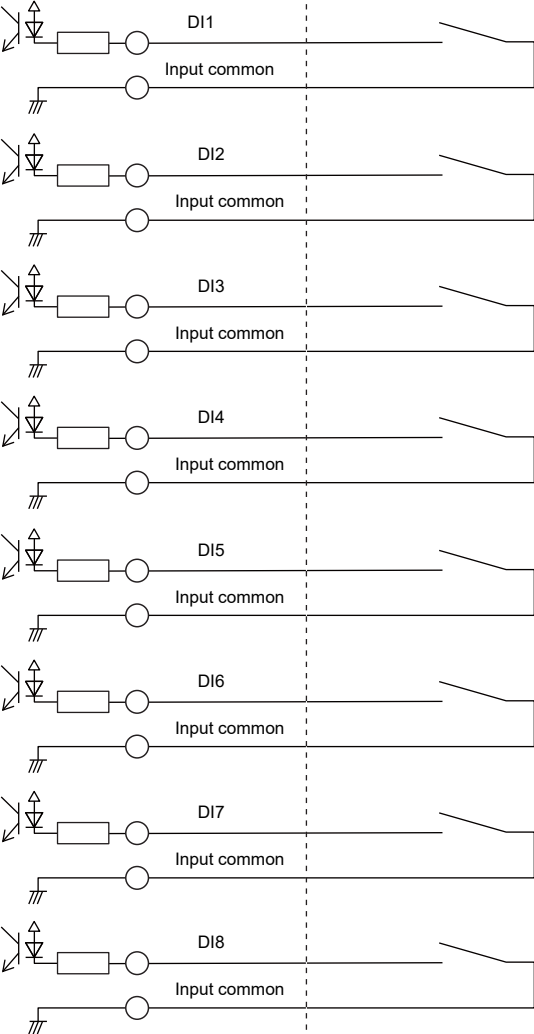
System diagram



* The wiring specifications in the system diagram above are the same even when the indoor unit or remote controller are other than the U series.

■ Connection to External Devices

Example of connection to external equipment which is connected to digital input/output terminal.

Name	I/O Item	System controller side		External device side	
		I/O conditions	Terminal name	Circuit example	I/O conditions
DO1 Output common	State output	Transistor Open collector output Terminal-to-common allowable voltage / current 24 V DC / 35 mA or less	DO1		Wiring length: Within 328.1 ft (100 m) * If you want to use relays, please refer to page 18.
DO2 Output common			Output common		
DO3 Output common			DO2		
DO4 Output common			Output common		
DI1 Input common	Control input Electric energy pulse		DI1		Wiring length: Within 328.1 ft (100 m) <Control input> No-voltage contact A Pulse or static <Electric energy pulse> No-voltage A Pulse Pulse width: 50 msec or more No-voltage contact compatible with a very small current (3 mA or less) DC5 V
DI2 Input common			Input common		
DI3 Input common			DI2		
DI4 Input common			Input common		
DI5 Input common			DI3		
DI6 Input common			Input common		
DI7 Input common			DI4		
DI8 Input common			Input common		

* Wire the cables so that the user does not touch the power supply directly.

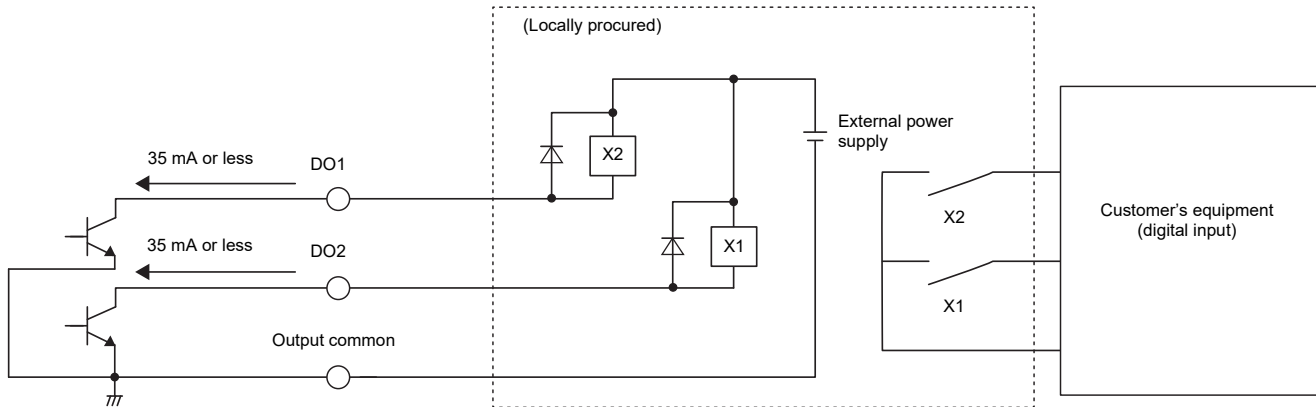
* On the external device side, use a basically insulated power circuit and place it in a location where the user cannot touch it.

EN

When using a relay for the circuit on the equipment side of the state output

IMPORTANT

Be sure to connect freewheeling diodes to both ends of the relay coil. (A relay with a built-in diode is recommended.)



■ Wiring connections

This section shows wiring connection examples with the indoor units, ENERGY MONITORING RELAY INTERFACE, DIGITAL INPUT/OUTPUT RELAY INTERFACE, and remote monitoring PC.

Air conditioning unit group settings

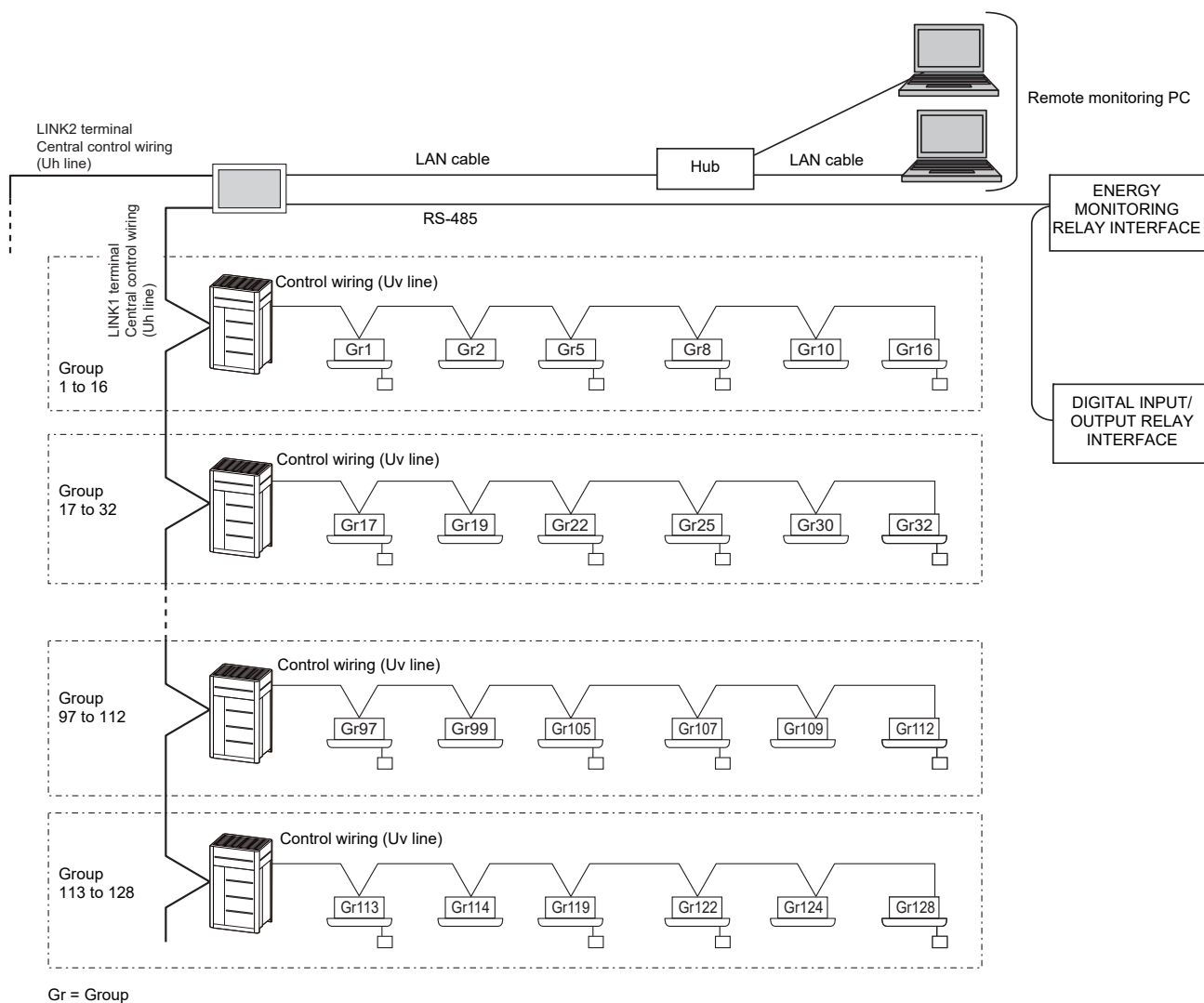
- Indoor units can be set together for each group unit.
- Groups 1 to 64 correspond to the central control addresses 1 to 64 of the indoor units.
- There is a LINK 1 and a LINK 2 for each TU2C-LINK communication line.
If only U Series outdoor units are connected, each line has 128 groups. LINK1 and LINK2 together have 256 groups and 256 zones.
When outdoor units other than the U Series are connected, each line has 64 groups. LINK1 and LINK2 together have 128 groups and 128 zones.
- *When an outdoor unit other than the U series is connected to either line, it is set when an outdoor unit other than the U series is connected on both lines.

Interface connection

Connect the ENERGY MONITORING RELAY INTERFACE and the DIGITAL INPUT/OUTPUT RELAY INTERFACE to the RS-485 cable line. For details of the connection method refer to the interface installation manual.

When using the power meter, connect the power meter separately for each device.

- Multi air conditioners for buildings
- Light Commercial
- Room Air Conditioner (home) (RAC TU2C-LINK I/F connection * For use outside Japan only)
- Air to Water Heat Pump (Hot water supply)
- Air to Water Heat Pump (Air conditioning)
- Air to Water Heat Pump (Air conditioning and Hot water supply)
- General purpose device control interface, External device

**NOTE**

When you remove the rear panel of this Unit, there is SW100 which is the termination resistance between LINK1 and LINK2 terminals.

For the central control wiring (Uh line), set the two terminating resistors at both ends of the wiring between this Unit and the air conditioner to ON "Close" as much as possible.

EN

Toshiba Carrier Corporation

336 TADEHARA, FUJI-SHI, SHIZUOKA-KEN 416-8521 JAPAN