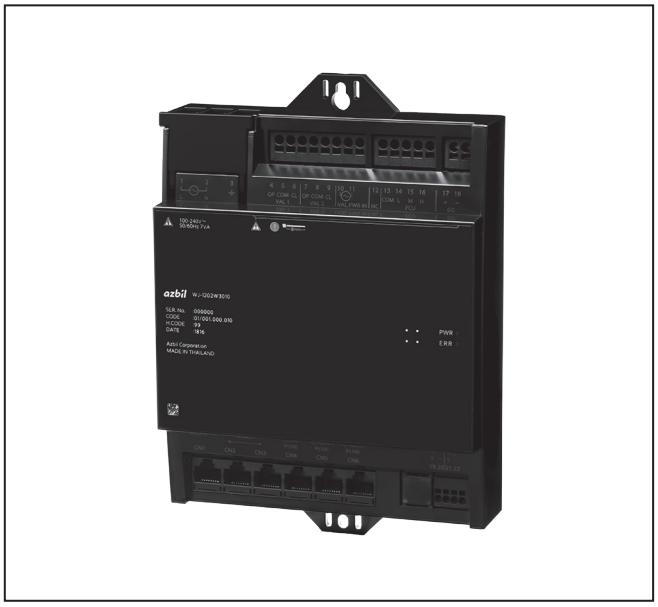
FCU Controller

■ Overview

This product (Model WJ-1202) is a controller for the FCU (fan coil unit).
It starts or stops the FCU, controls the airflow volume and valves.
Furthermore, it enables the setback operation, the interlock operation with the outdoor air handling units, etc.
By connecting the user terminal, a user can start or stop the FCU.
This product is compatible with BACnet MS/TP which is an open protocol.



■ Features

- Open communication protocol
  This product is a controller compatible with BACnet MS/TP which is an open protocol.
- Various valve controls
  The product executes ON/OFF control and proportional control for valves by maintaining an indoor temperature setpoint.
  By measuring the return water temperature of the fan coil unit, the valve is controlled so as to keep the indoor temperature at the setpoint while setting the return water temperature above the setpoint (the return water temperature control function). This function prevents overflow of the fan coil unit to reduce the transport power of the heat source.
- Connecting various I/Os
  Temperature sensors can be connected to this product.
  General-purpose digital inputs and outputs are also available for enabling interlock with start/stop operation and humidifiers and other devices.
- Various user terminals
  Azbil's various user terminals, including the Neopanel (Model QY7205) and Neoplate (Model QY7290) can be connected for enabling a user to start and stop the fan coil unit and change the temperature setpoint. The central monitoring unit can be used to start and stop the FCU and prohibit changes to the temperature settings.
- Online engineering work
  If a need to change the control parameters arises during operation, the control parameters can be changed while the controller is still running.
- Simple installation
  RJ-45 connectors are used for the temperature sensors, user terminals, and for BACnet MS/TP communication for enabling the use of LAN cables for reducing the wiring work.
  Spring terminal blocks are used for fan output, valve output, and general-purpose digital input and output for simplifying the wiring work.

CE

Safety Precautions

Please read instructions carefully and use the product as specified in this manual. Be sure to keep this manual nearby for quick reference.

Restrictions on Use

This product was developed, designed, and manufactured for general air conditioning use.

Do not use the product in a situation where human life may be at risk or for nuclear applications in radiation controlled areas. If you wish to use the product in a radiation controlled area, please contact Azbil Corporation.

Particularly, when the product is used in the following applications where safety is required, implementation of fail-safe design, redundant design, regular maintenance, etc., should be considered in order to use the product safely and reliably.

- Safety devices for protecting the human body
- Start/stop control devices for transportation machines
- Aeronautical/aerospace machines

For system design, application design, instructions for use, or product applications, please contact Azbil Corporation.

Azbil Corporation bears no responsibility for any result, or lack of result, deriving from the customer's use of the product.

■ Caution for Instrumentation Design

- Considering unexpected failures or contingencies, be sure to design and check safety of the system and equipment.

■ Recommended Design Life

It is recommended that this product be used within the recommended design life.

The recommended design life is the period during which you can use the product safely and reliably based on the design specifications.

If the product is used beyond this period, its failure ratio may increase due to time-related deterioration of parts, etc.

The recommended design life during which the product can operate reliably with the lowest failure ratio and least deterioration over time is estimated scientifically based on acceleration tests, endurance tests, etc., taking into consideration the operating environment, conditions, and frequency of use as basic parameters.

The recommended design life of this product is 10 years.

■ Warnings and Cautions

 WARNING	Alerts users that improper handling may cause death or serious injury.
 CAUTION	Alerts users that improper handling may cause minor injury or material loss.

■ Signs

 Electric shock	Alerts users to possible hazardous conditions caused by erroneous operation or erroneous use. The symbol inside ⚠ indicates the specific type of danger. (For example, the sign on the left warns of the risk of electric shock.)
 Disassemble	Notifies users that specific actions are prohibited to prevent possible danger. The symbol inside ⃠ graphically indicates the prohibited action. (For example, the sign on the left means that disassembly is prohibited.)
 General	Instructs users to carry out a specific obligatory action to prevent possible danger. The symbol inside ● graphically indicates the actual action to be carried out. (For example, the sign on the left indicates general instructions.)

⚠ WARNING	
 Prohibition	Do not use the product where it is exposed to direct sunlight. Doing so may cause the internal temperature to rise which will result in an accident or device failure.
 Prohibition	Do not install the product in a location where it can be accessed by unauthorized people who have not been trained for safety.
 Fire	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards. Failure to do so may cause fire or electric shock.
 Electric shock	Before wiring or maintenance, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
 Electric shock	Do not touch the terminals or insert conductive material between the terminals while the power is on. Doing so may result in electric shock.
 Electric shock	Do not touch electrically charged parts. Doing so may cause electric shock.

⚠ WARNING	
 Electric shock	Do not open the terminal cover while the power is on. Doing so may result in electric shock.
 Electric shock	After wiring, be sure to reattach the terminal cover. Failure to do so may result in electric shock.
 Electric shock	Use crimp terminals with insulation for connections to the product terminals. Failure to do so may result in electric shock or fire.

⚠ CAUTION	
 Ground	Be sure to ground this product with a ground resistance of less than 100 Ω. Improper grounding may cause electric shock or malfunction.
 Fire	Take anti-lightning surge measures based on regional and building characteristics. Lightning may cause fire or critical damage to this product if protective measures are not taken.
 General	Keep this product in the package for storage. Failure to do so may damage or stain the product.
 General	Use this product under the operating conditions (for temperature, humidity, power, vibration, shock, mounting location, mounting method, mounting direction, atmosphere, etc.) listed in the specifications. Failure to do so may cause fire or device failure.
 General	Take anti-noise measures if this product is installed in a location near source of electric noise. Failure to do so may cause malfunction or device failure.
 General	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
 Prohibition	Do not use an uninterruptible power supply (UPS) that outputs rectangular waves. Doing so may cause the device to fail.
 General	Provide a power circuit breaker for the power source to this product. The product does not have a power switch.
 General	When connecting valves, FANs, and digital output lines, provide a circuit protector (e.g., a circuit breaker or fuse) for the power source.

⚠ CAUTION	
 General	For wiring, strip the insulation from cables as specified in this manual. If the length of exposed wire is longer than specified, it may cause electric shock or short circuit between adjacent terminals. If it is too short, it may not make proper contact.
 Fire	Firmly tighten the terminal screws with the torque indicated in this specification. Insufficient tightening of the terminal screws may cause fire or device failure.
 Prohibition	Do not allow wire clippings, metal shavings, and other refuse to enter into the product. Doing so may cause fire or product damage.
 General	If more than the rated power voltage is applied to the product, replace the product with new one for your safety. Failure to do so may cause device failure or cause fire.
 Disassemble	Do not disassemble this product. Doing so may cause device failure.
 Prohibition	Do not allow chemicals (e.g., solvents, oil, or cleaning agents) to contact this product. They may damage the case.
 General	Before cleaning the product or retorquing the terminal screws, be sure to turn off the power to the product. Failure to do so may cause electric shock, device failure, or malfunction.

■ System Configuration

● Example system configuration

For the central monitoring units and products to which this product can be connected, please contact Azbil.

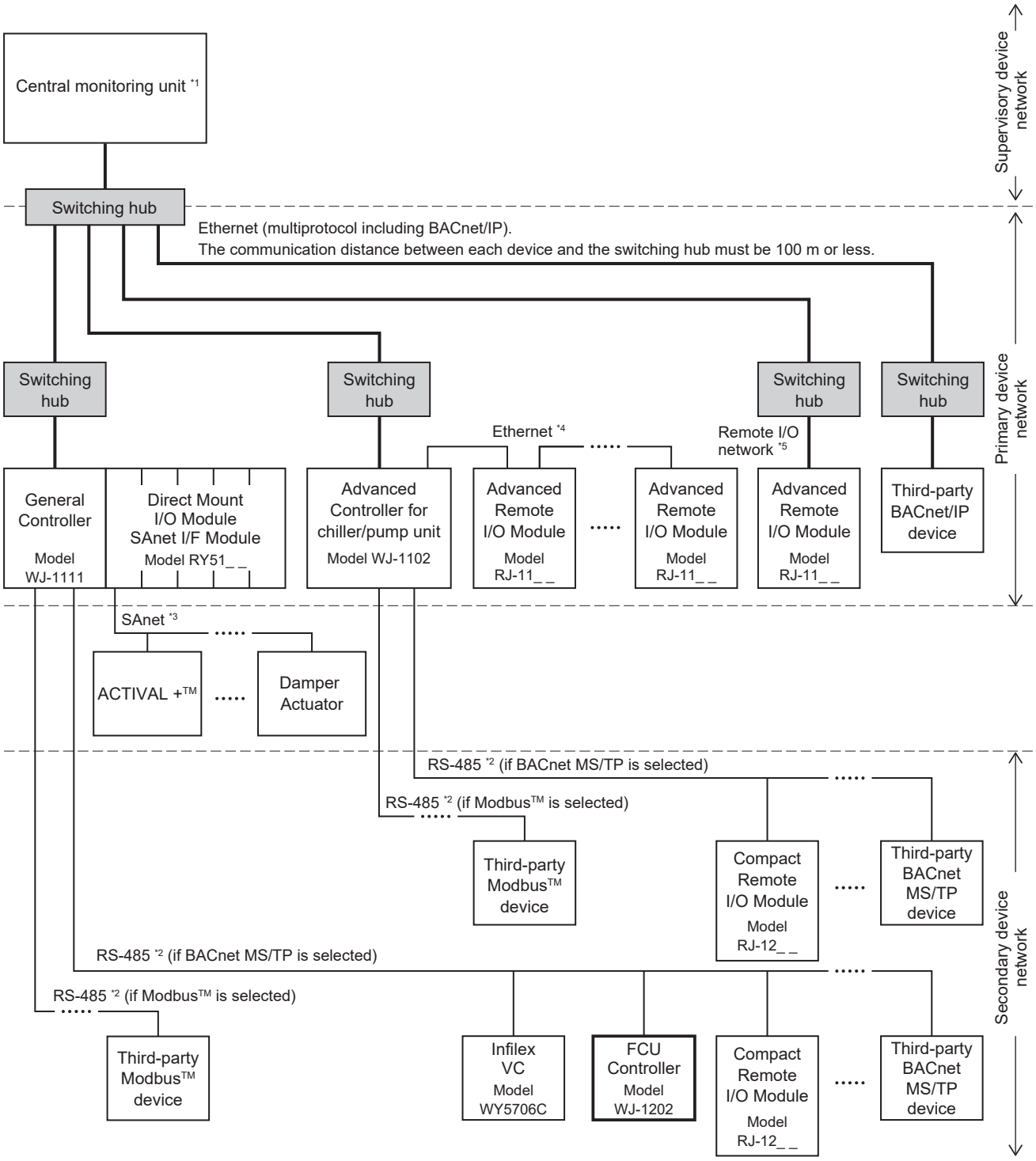


Figure 1. Example system configuration

*1 The system can be connected to Azbil Supervisory Controller (Model BH-101G0W0000) or a third-party central monitoring unit for BACnet/IP communications.

*2 The General Controller and Advanced Controller have two RS-485 communication channels.
For each channel, communication protocol can be selected from BACnet MS/TP, Modbus™ RTU, or Modbus™ ASCII.
- Number of devices that can be connected for BACnet MS/TP
  If only the Azbil devices are connected:
  50 devices/channel (VAV/FCU Controllers, Compact Remote I/O Modules, etc.)
  The maximum number of the secondary devices that can be connected to one General Controller is 70 , or 50 which is the sum of Azbil VAV and FCU Controllers. The Advanced Controller has no restrictions.
  If only the third-party devices are connected:
  31 devices/channel (when transmission speed is 76.8 kbps, 30 objects/device)
- Number of devices that can be connected for Modbus™
  31 devices/channel (when transmission speed is 76.8 kbps, 30 objects/device)

If the transmission speed and the number of objects are different among the third-party devices, or if the Azbil devices and third-party devices coexist on the same channel, the number of connected devices will vary. For details, please contact one of Azbil salespersons.

*3 By connecting the SAnet Interface Module, it is possible to connect the Intelligent Component Series devices.
参照 For restrictions on the SAnet communication line, refer to AB-6713, *Intelligent Component Series for SAnet Communication: Installation Manual.*

*4 A network that connects the Advanced Controller and Advanced Remote I/O Modules under its control is referred to as a local I/O network.
A switching hub is not required for the local I/O network since a daisy chain Ethernet is used between the Advanced Controller and the Advanced Remote I/O Modules under its control, as well as between the Advanced Remote I/O Modules and the I/O modules for the Advanced Controller.

*5 A network that connects the Advanced Controller and Advanced Remote I/O Modules through a host network is referred to as a remote I/O network.
A switching hub is required to connect the Advanced Remote I/O Modules to the remote I/O network.
The maximum number of the Advanced Remote I/O Modules connected to this network is 3 per Advanced Controller.

■ Model Numbers

Model number							Specification	Remarks
WJ-12								
	02						FCU Controller	
		W					Power: 100–240 V AC (no transformer for valve)	
			1				Valve ON/OFF control	
			2				Valve proportional control	
			3				Valve proportional control with return water temperature control	
				0			Indoor temperature measurement: Pt100	
					0	0	External contacts: No I/Os	
					1	0	External contacts: I/O included (DI x 2, DO x 1)	No valve ON/OFF*

* The valve ON/OFF control type is available for Model WJ-1202W1000 only.

● Optional parts

Item		Model number	Description
Auxiliary device	Temperature sensor for pipe surface (proportional control type with return water temperature control for measuring return water temperature)	TY7820Z0P01	Length 1.5 m
		TY7820Z0P05	Length 5 m
		TY7820Z0P10	Length 10 m
		TY7820Z0P30	Length 30 m

■ Specifications

● Basic specifications

Item			Specification
Power supply		Input voltage	100–240 V AC (85–264 V AC)
		Input frequency	50/60 Hz ±3 Hz
		Power consumption	WJ-1202W1000 6 VA max. Other than the above 7 VA max.
		Inrush current	15 A max. (100 V AC) 30 A max. (240 V AC)
		Leakage current	0.5 mA max. (240 V AC)
		Insulation resistance	Between power terminals together and ground terminal 100 MΩ min. (500 V DC)
CPU			32-bit
Communication	RS-485	Communication method	BACnet MS/TP
		Communication speed	9.6 kbps, 19.2 kbps, 38.4 kbps, 76.8 kbps (default: 76.8 kbps)
		Communication distance	1000 m max.
	Neopanel	Communication method	Proprietary serial communication (12 V DC power supply)
		Communication speed	100 bps
		Communication distance	50 m max.
		Number of connectible units	2
Main materials		Base	Modified PPE resin
		Cover	Modified PPE resin
		Terminal cover	Modified PPE resin
Weight			0.55 kg
Environmental conditions	Operating conditions	Ambient temperature	0 to 50 °C
		Ambient humidity	10–90 % RH (without condensation)
		Altitude	2000m or less
		Vibration	3.2 m/s^2 max. (at 10–150 Hz)
	Transportation/ storage conditions	Ambient temperature	-20 to 60 °C
		Ambient humidity	5–95 % RH (without condensation)
		Vibration (storage)	3.2 m/s^2 max. (at 10–150 Hz)
		Vibration (transportation)	9.8 m/s^2 max. (at 10–150 Hz)
	Other		• No corrosive gas should be detected. • The product must not be exposed to direct sunlight. • Do not let the product get wet.*1
Installation location*2			Inside equipment, in the ceiling
Installation method			Installed with screws or celling hanger bolt

*1 Because the device is not splash-proof, if installing in a location where it could be splashed by water, put into a splash-proof box or provide other splash-proof protection.

*2 Electric shock could occur if you step on the product or touch it with your hand, and so do not mount on the floor, in ceiling panels, or similar locations.

● Input/output specifications

Item			Specifications
Fan output		Output type	Relay output, dry contact, normally open contact
		Contact rating	125 V AC, 3 A max. (inductive load: cos φ0.4 or more) 250 V AC, 1.5 A max. (inductive load: cos φ0.4 or more)
		Min. applicable load	100 V AC, 10 mA (connection of 24 V AC loads and similar is prohibited)
Control valve output*		Output type	Relay output, voltage contact, normally open contact
		Contact rating	125 V AC, 0.8 A max. (inductive load: cos φ0.4 or more) 250 V AC, 0.4 A max. (inductive load: cos φ0.4 or more)
		Min. applicable load	24 V AC, 10 mA
Temperature input		Measurement range	0 to 50 °C
		Input signal	RTD (Pt100)
Return water temperature input		Measurement range	0 to 80 °C
		Input signal	RTD (Pt100)
Digital output		Number of outputs	1
		Output type	Relay output, dry contact, normally open contact
		Contact rating	250 V AC, 0.5 A max. (inductive load: cos φ0.4 or more)
		Min. applicable load	10 mA
Digital input		Number of inputs	2
		Current	5 mA DC typ.
		Voltage	12 V DC typ.
		Connectible load	Dry contact
		Dry contact rating	Allowable ON contact resistance 100 Ω max. Allowable OFF contact resistance 100 kΩ min.
Neoplate	Temperature setting input	Input signal	1–10 kΩ potentiometer
	Air conditioning switch input	Current	10 mA DC typ.
		Voltage	12 V DC typ.
		Connectible load	Dry contact
	Indicator lamp output	Output type	Transistor output, voltage contact
		Current	10 mA DC typ.
		Voltage	12 V DC typ.
		Output limit resistance	12 kΩ typ.

* Proportional type valves with a full stroke time of less than 30 seconds cannot be connected.

■ Specifications for Wiring

Item	Recommended wire	Rating	Maximum length	Connection type	Remarks
Power supply	600 V PVC-insulated wire (IEC60227-3)/ CVV equivalent, stranded cable	Stranded wire 2.0–3.5 mm^2	—	M3.5 screw terminal block	—
Ground	600 V PVC-insulated wire (IEC60227-3)/ CVV equivalent, stranded cable	Stranded wire 2.0–3.5 mm^2	—	M3.5 screw terminal block	Ground resistance is 100 Ω max.
Fan output	600 V PVC-insulated wire (IEC60227-3)/ CVV equivalent, stranded cable	Stranded wire 2.0 mm^2	50 m	Spring terminal block	
Valve output	600 V PVC-insulated wire (IEC60227-3)/ CVV equivalent, stranded cable	Stranded wire 2.0 mm^2	50 m	Spring terminal block	100 V AC min.
	600 V PVC-insulated wire (IEC60227-3)/ CVV equivalent, stranded cable	Stranded wire 1.25 mm^2			24 V AC
Digital output (DO)	600 V PVC-insulated wire (IEC60227-3)/ CVV equivalent, stranded cable	Stranded wire 2.0 mm^2	50 m	Spring terminal block	When exceeding 60 V AC/DC
	600 V PVC-insulated wire (IEC60227-3)/ CVV equivalent, stranded cable	Stranded wire 0.75–2.0 mm^2			60 V AC/DC or lower
Digital input (DI)	600 V PVC-insulated wire (IEC60227-3)/ CVV equivalent, stranded cable	Stranded wire 0.75–1.25 mm^2	50 m	Spring terminal block	Only contact input is allowed.
USER I/F (Neopanel/Neoplate)	—	LAN cable*2	50 m	RJ-45 modular connector*1	—
RS-485	—		1000 m	RJ-45 modular connector*1	
Temperature input RTD (Pt100)	—		50 m	RJ-45 modular connector*1	
Return water temperature input RTD (Pt100)	—		30 m	RJ-45 modular connector*1	

*1 Use the following connector.
Plug: Model SS-37000-002 (manufactured by Bel Stewart Connector Corp.)
The same type plug is available from Azbil Corporation, Model DY7207A0100 (contents: 100 pcs).

*2 Use a category 5e (0.5 mm diameter x 8 core wires) or higher LAN cable compliant with EIA/TIA-568.
Wire with connector (Model DY7210) and wire with connector for short-distance communication (Model DY7220) are communication wires manufactured by Azbil Corporation using the connectors shown in *1.
If using a wire with outer diameter of 6 mm or more, check that there is sufficient space for performing maintenance (particularly in the back direction).

■ Dimensions

Height: 200 mm, Width: 142 mm, Depth: 46.9 mm

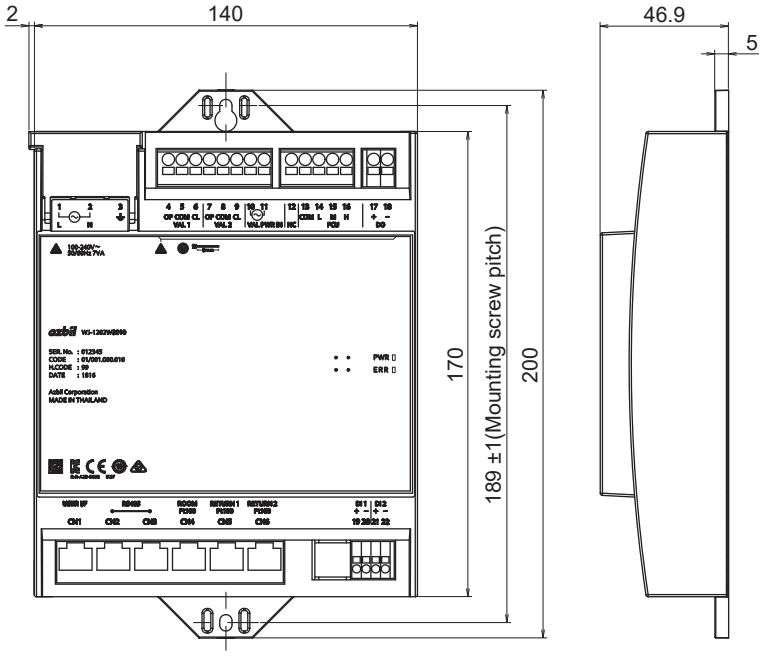


Figure 2. Dimensions (mm)

■ Parts Identification

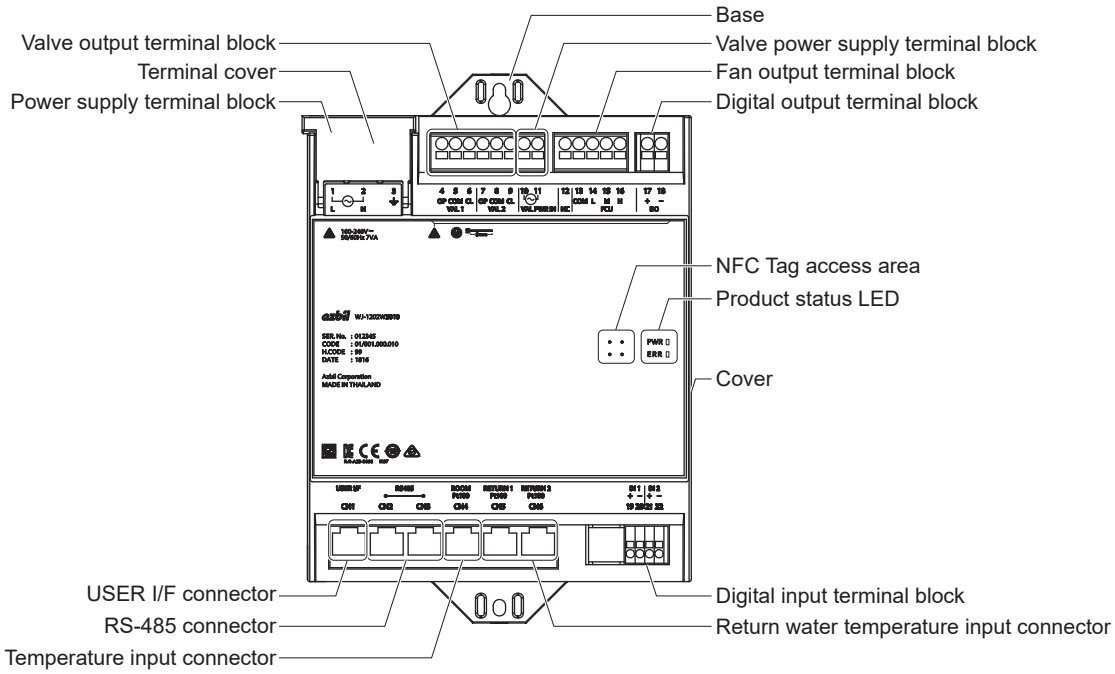


Figure 3. Parts identification

■ Installation

⚠ WARNING

Fire

Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.
Failure to do so may cause fire or electric shock.

⚠ CAUTION

General

Use this product under the operating conditions (for temperature, humidity, power, vibration, shock, mounting location, mounting method, mounting direction, atmosphere, etc.) listed in the specifications.
Failure to do so may cause fire or device failure.

● Installation location

- The following space should be secured around the product.
  The hatched area is for maintenance.

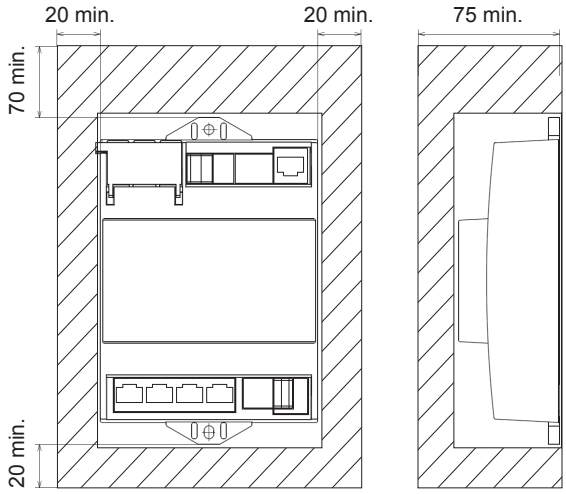


Figure 4. Maintenance space (mm)

- If you cannot secure 75 mm in the height direction, it is necessary to use a LAN cable with an external diameter of 6 mm or less. In addition, connect the terminator after extending using a connector cable (Model DY7220A0010) or modular relay unit (Model DY7202A0000) because there will be difficulties for installation of the terminator.

● Installation position

- Fasten the product firmly with the screws so as not to wobble.
- Be sure to mount the product so that the mounting surface is vertical.
  Mount the product in a position where the nameplate is easily seen.

- If the product is not installed in a dust-proof box, do not mount it as illustrated in Fig. 5. A.
  Dust will easily collect in the connectors.

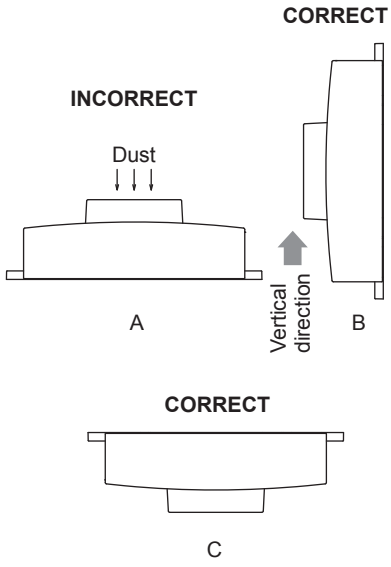


Figure 5.

● Installation method

<Direct Installation with Screws>

(1) Make screw holes for the M4 screws.
Screw hole pitch: 189 ± 1 mm

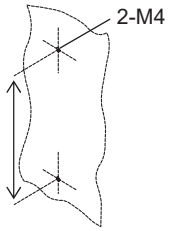


Figure 6.

(2) Fasten the product with two M4 screws.

(3) Check that the product is firmly fastened.

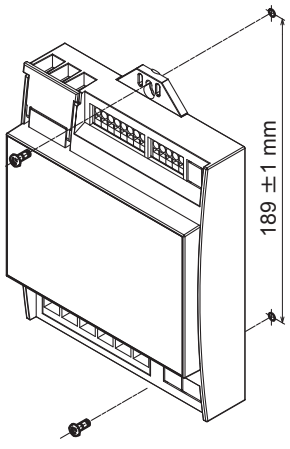


Figure 7.

<Installation with Celling Suspension Bolt (W3/8 or φ9)>

(1) At the projected portions on the upper and lower side of the product, tightly bind the cable ties through the 2 elongated holes on the projected portions. (See the left side of Fig. 8.)

(2) If the mounting fixture JBFB supplied by NEGUROSU DENKO CO.,LTD. is used, squeeze the ceiling hanger bolt with it and tighten it while piercing the upper and lower two mounting holes with the attached screws. (See the right side of Fig. 8.)

(3) Check that the product is firmly fastened including the parts for mounting.

(4) When attaching the product by the celling hanger bolt, it may rotate around the axis of the bolt. Be careful not to apply strong tension to the wire when wiring.

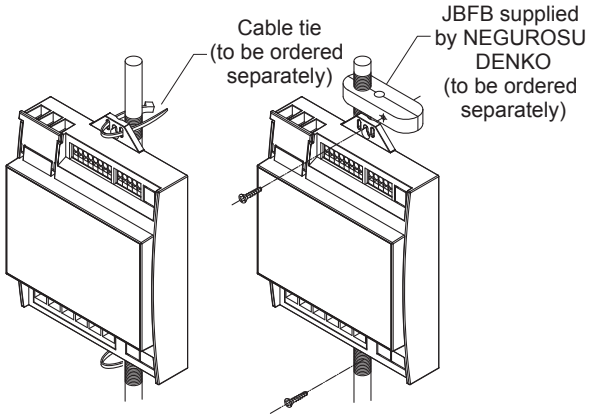


Figure 8.

■ Wiring

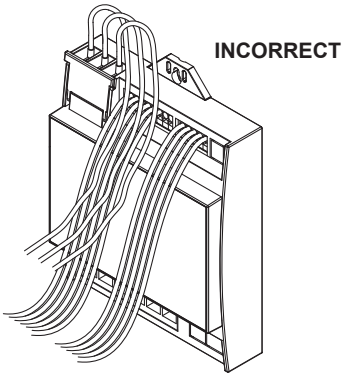
⚠ WARNING	
Fire	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards. Failure to do so may cause fire or electric shock.
Electric shock	Before wiring or maintenance, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
Electric shock	Do not touch the terminals or insert conductive material between the terminals while the power is on. Doing so may result in electric shock.
Electric shock	Do not touch electrically charged parts. Doing so may cause electric shock.
Electric shock	Do not open the terminal cover while the power is on. Doing so may result in electric shock.
Electric shock	After wiring, be sure to reattach the terminal cover. Failure to do so may result in electric shock.
Electric shock	Use crimp terminals with insulation for connections to the product terminals. Failure to do so may result in electric shock or fire.

⚠ CAUTION	
Ground	Be sure to ground this product with a ground resistance of less than 100 Ω. Improper grounding may cause electric shock or malfunction.
General	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
Prohibition	Do not use an uninterruptible power supply (UPS) that outputs rectangular waves. Doing so may cause the device to fail.
General	Provide a power circuit breaker for the power source to this product. The product does not have a power switch.
General	When connecting valves, FANs, and digital output lines, provide a circuit protector (e.g., a circuit breaker or fuse) for the power source.

⚠ CAUTION	
General	For wiring, strip the insulation from cables as specified in this manual. If the length of exposed wire is longer than specified, it may cause electric shock or short circuit between adjacent terminals. If it is too short, it may not make proper contact.
Fire	Firmly tighten the terminal screws with the torque indicated in this specification. Insufficient tightening of the terminal screws may cause fire or device failure.
Prohibition	Do not allow wire clippings, metal shavings, and other refuse to enter into the product. Doing so may cause fire or product damage.
General	If more than the rated power voltage is applied to the product, replace the product with new one for your safety. Failure to do so may cause device failure or cause fire.

● Notes for wiring

- Use the specified wires.
- Be careful that tension caused by the wires is not applied on the unit.
  Use cable ties or similar implements to secure the wires to the mounting mating part of the unit so that tension from the wires is not applied to the unit.
  Secure at a position near the unit.
  Be particularly careful to secure the modular cable for temperature measurement as close as possible to the connector because the temperature measurement value can fluctuate if the temperature input connector is subjected to vibrations and other external effects.
  Bundle the power cable and RS-485 cable separately, and do not bundle these cables with any other cables.
- Do not route wires in front or back of the product (to prevent malfunctions due to noise).



● Model WJ-1202W1000 (valve ON/OFF control) wiring

IMPORTANT: • Power for the valve output is supplied by the FCU Controller through this product.
The power for the FCU Controller and the valve cannot be separated.
Therefore, if the spring-return valve is not used, the valve is not fully closed when power for the fan is turned off. (If the valve is already fully closed, it will keep the position.)

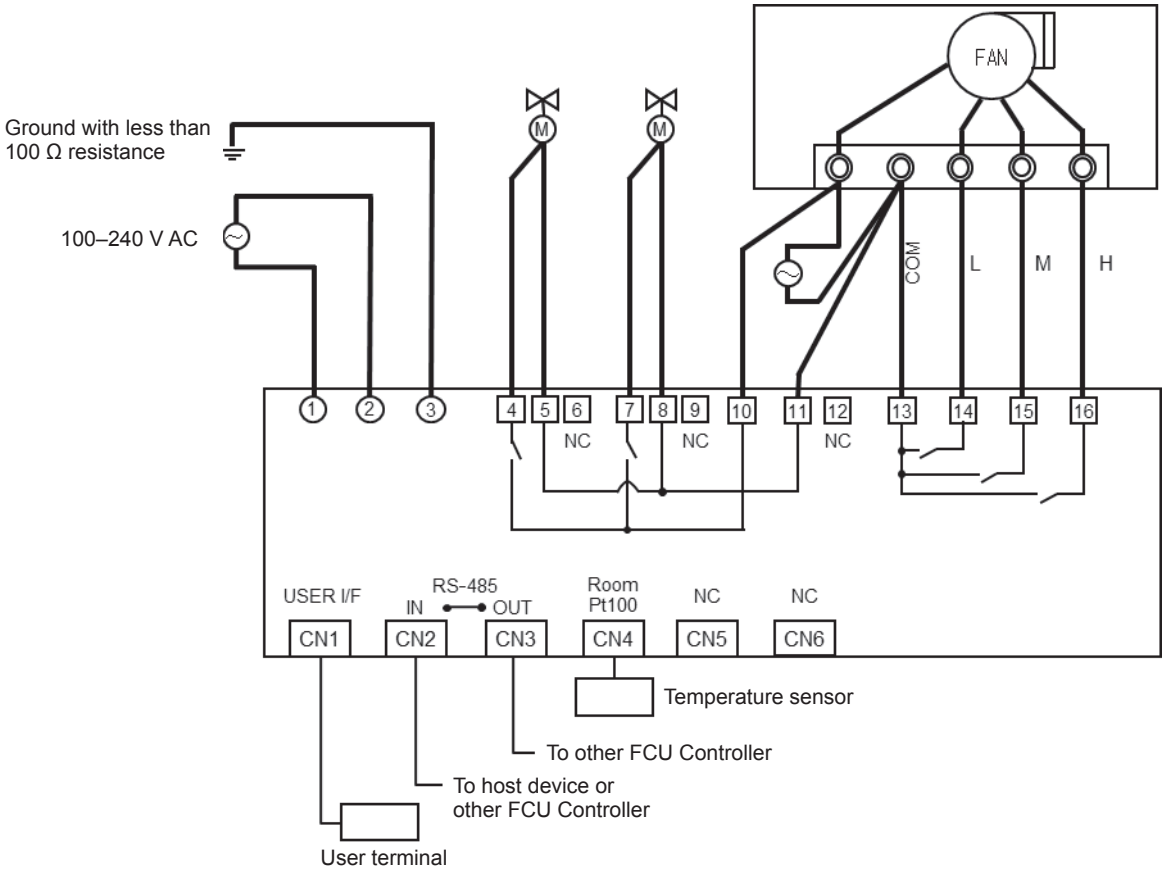


Figure 9. Model WJ-1202W1000

Table 1 Valve wiring

Connection target	Between terminals 4–5	Between terminals 7–8
Chilled water valve	Chilled water valve	No connection
Hot water valve	Hot water valve	No connection
Chilled/hot water valve	Chilled/hot water valve	No connection
Chilled water valve + hot water valve	Chilled water valve	Hot water valve
Chilled water valve + chilled/hot water valve*	Chilled water valve	Chilled/hot water valve

* Sequence for opening valves can be selected by the parameter settings.

Even if a FCU is operated from OFF to L/M/H using a Neoplate, this product cannot recognize the fan coil state of the FCU.
When a proportional type valve is used as an ON/OFF valve, connect valve 1 to terminals 4–5 and valve 2 to terminals 7–8 on the FCU Controller.
Power for the valves should be supplied from the outside.

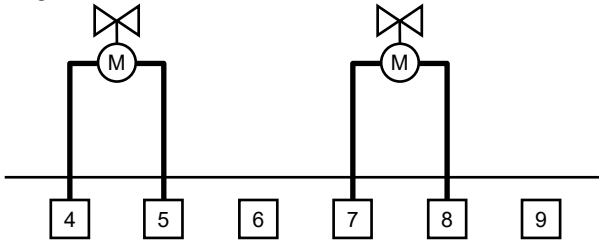


Figure 10. When a proportional type valve is used as an ON/OFF valve

● Model WJ-1202W2___ (no transformer, proportional valve control) wiring

This is used for connecting valves* other than ACTIVAL-mini (Model VY5502A or MY5560C) or connecting multiple ACTIVAL-minis in parallel to one output.

* A valve whose full-stroke opening/closing time is less than 30 seconds cannot be connected.

IMPORTANT: • For a facility executing 24-hour continuous operation, it is necessary to fully open or close the valves at least once a day in order to keep a precise control.
It is possible to fully open or close the valves by the parameter settings.

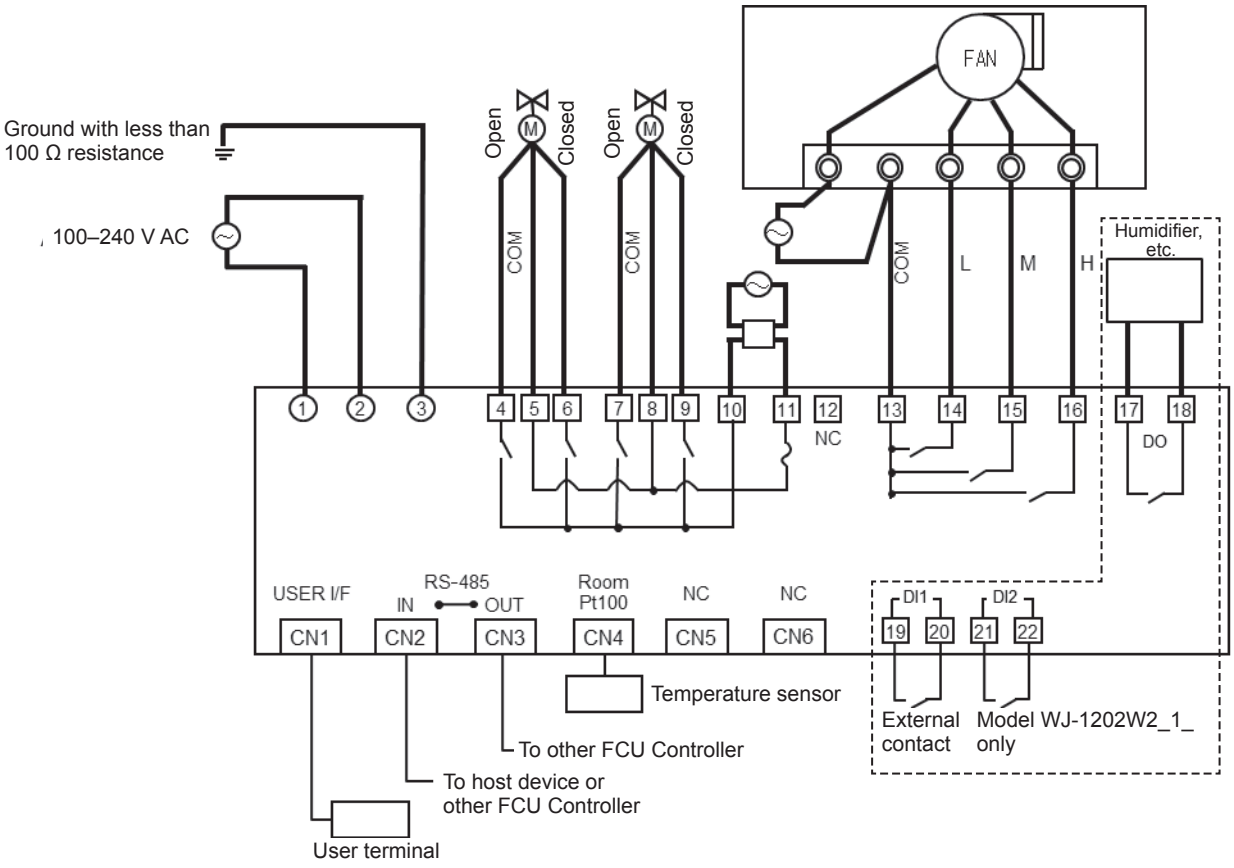


Figure 11. Model WJ-1202W2____

Table 2 Valve wiring

Connection target	Terminals 4–5–6	Terminals 7–8–9
Chilled water valve	Chilled water valve	No connection
Hot water valve	Hot water valve	No connection
Chilled/hot water valve	Chilled/hot water valve	No connection
Chilled water valve + hot water valve	Chilled water valve	Hot water valve
Chilled water valve + chilled/hot water valve*	Chilled water valve	Chilled/hot water valve

* Sequence for opening valves can be selected by the parameter settings.

● Model WJ-1202W3___ (no transformer, proportional control with return water temperature control) wiring

IMPORTANT: • For a facility executing 24-hour continuous operation, it is necessary to fully open or close the valves at least once a day in order to keep a precise control.
It is possible to fully open or close the valves by the parameter settings.

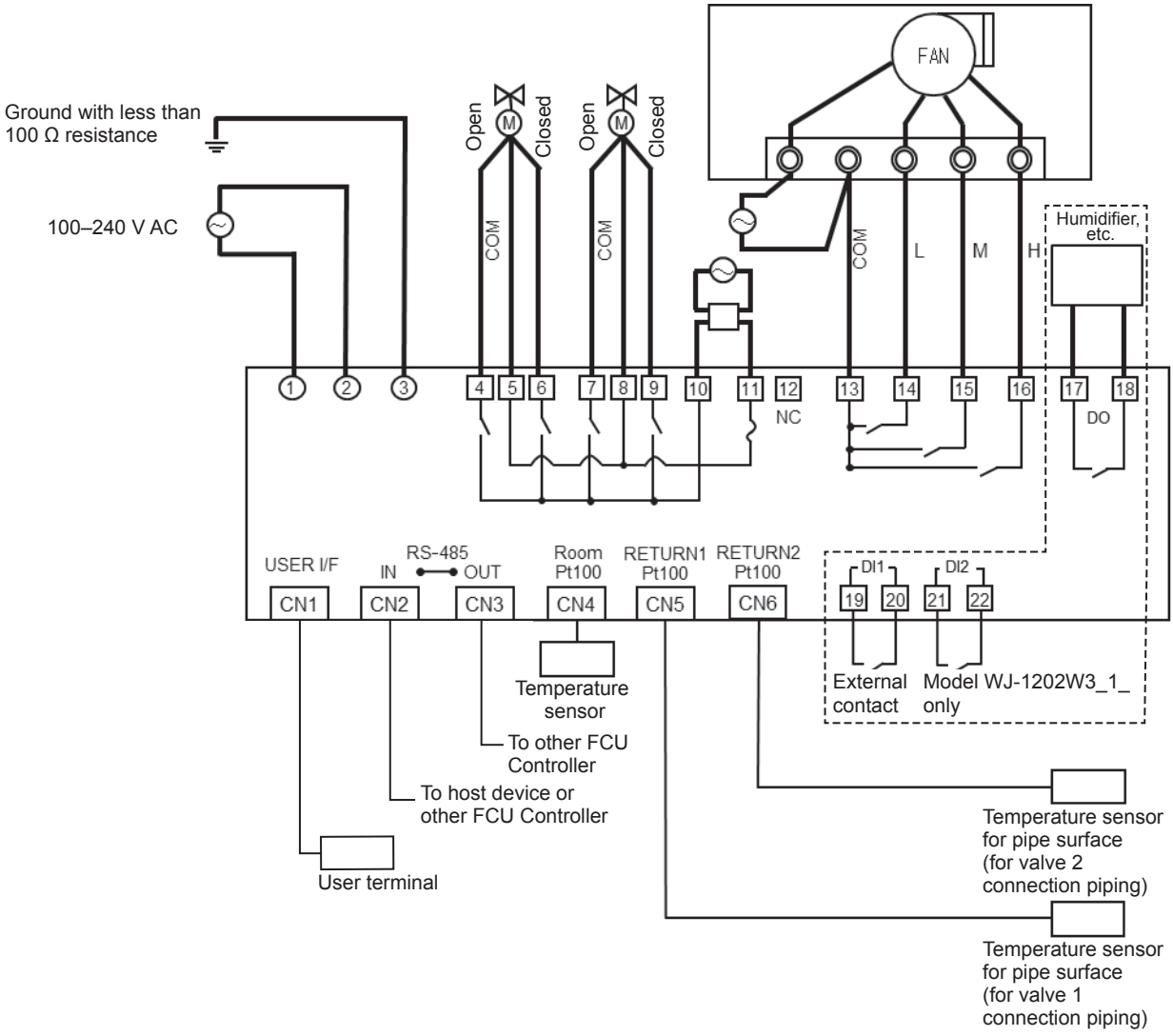


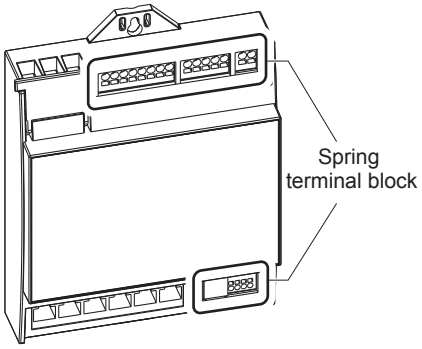
Figure 12. Model WJ-1202W3___

Table 3 Valve wiring

Connection target	Terminals 4–5–6	Terminals 7–8–9
Chilled water valve	Chilled water valve	No connection
Hot water valve	Hot water valve	No connection
Chilled/hot water valve	Chilled/hot water valve	No connection
Chilled water valve + hot water valve	Chilled water valve	Hot water valve
Chilled water valve + chilled/hot water valve*	Chilled water valve	Chilled/hot water valve

* Sequence for opening valves can be selected by the parameter settings.

● Wiring the IO terminal block

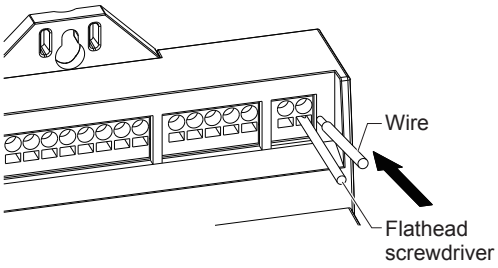


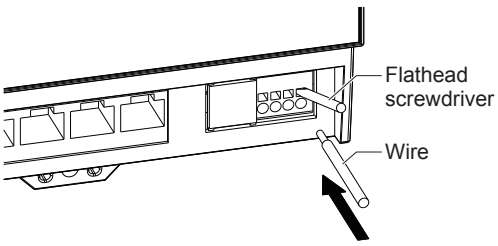
(1) Strip the wire sheath (8–9 mm).

Note: There is an insulation stripping gauge on the front side of the product.

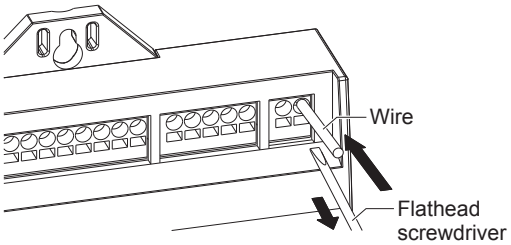
Check that there are no straying wires from the stripped wire.

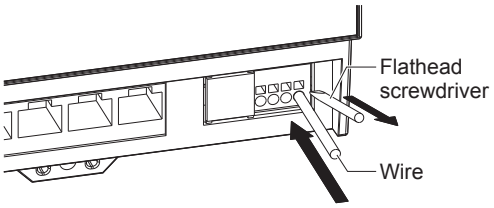
(2) Insert the flathead screwdriver* into the screwdriver insertion slot (square hole), leave the screwdriver in this state, and insert the wire into the terminal (round hole) until it reaches the back end.





(3) Pull out the flathead screwdriver* while holding the wire.





(4) Lightly pull the wire to check that it does not come out.

Note: If you pull out the wire diagonally, it may be disconnected.

(5) Check that there are no straying wires again.

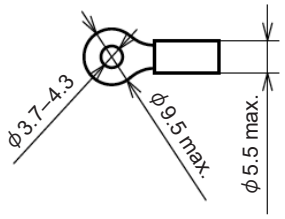
* Recommended screwdriver: SZF 0-0,4×2,5 Model 1204504 made by PHOENiX CONTACT

● Recommended wires

For the recommended wires, refer to “Specifications for Wiring.”

● Wiring the power supply terminal block

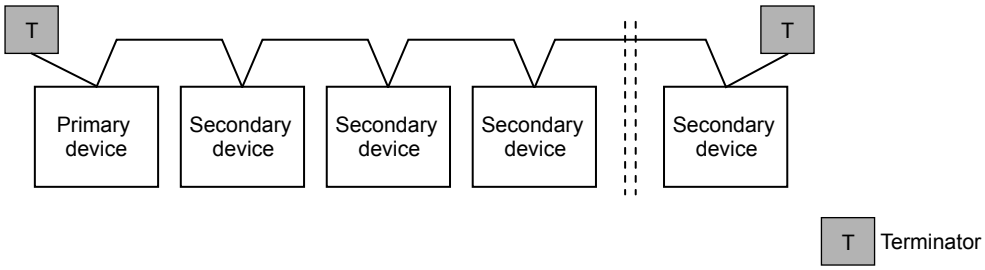
Attach the round crimp terminal lugs shown in the figure below, and connect to the power supply terminal block. The recommended tightening torque for the power terminal screw is 0.5 N·m.
This terminal lug can be tightened jointly to a maximum of two terminals.



Note: Use a magnetic screwdriver.

● Wiring the RS-485 terminals

RJ45 modular connectors are used for connection.
Connect a terminator (120 Ω) to the last device connected to the RS-485.



* Use the terminators listed below.
Model 83162637-005, RS-485 terminator (x 1)
Model 83162637-006, RS-485 terminators (x 10)

Notes:
1. Do not branch wiring for RS-485 communication.
2. Branch wiring using Model DY7203A0000 is prohibited.

● Termination of modular connectors

The USER I/F cable, RS-485 cable, temperature input cable, and return water temperature input cable are modular connectors.

- The modular connector is composed of modular plug (male) and modular jack (female).
- The modular jack is already provided on the controller unit.
- The modular plug needs to be crimped with the LAN cable at the site.
  This describes how to attach the modular plug to the LAN cable and connect it to the modular jack.
  Note: Recommended modular plug
  Use the modular plug recommended by Azbil.

(1) Peel off the outer sheath of the LAN cable.
When the outer sheath is peeled off, make sure that there are 8 core wires inside the sheath.

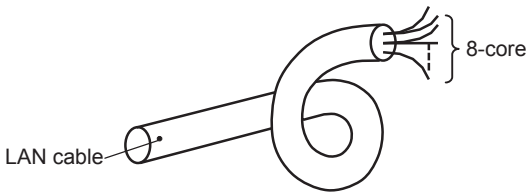


Figure 13.

(2) Align the 8 core wires according to number.
Check the color of the core wires by referring to Table 4 to align them (a typical example is shown). Do not damage or peel off the insulation of the 8 core wires.

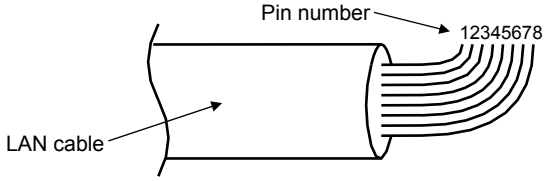


Figure 14.

Table 4

Pin No.	Wire color	Wire alignment
1	White and orange	Line 2 of pair 2
2	Orange	Line 1 of pair 2
3	White and green	Line 2 of pair 3
4	Blue	Line 1 of pair 1
5	White and blue	Line 2 of pair 1
6	Green	Line 1 of pair 3
7	White and brown	Line 2 of pair 4
8	Brown	Line 1 of pair 4

(3) Insert the aligned core wires of the LAN cable into the modular plug.
Fig. 15 shows the modular plug with the contacts facing upward.

- Trim the core wires with a nipper so that their lengths are the same.
- Be careful not to make them too long.
  If the wires are too long, they may not be crimped in the plug correctly.

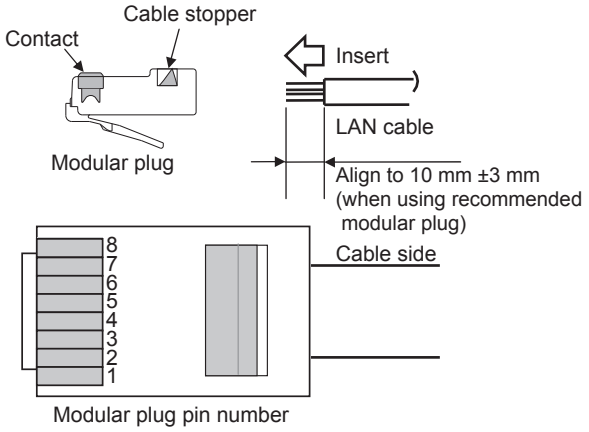


Figure 15.

(4) Crimp the wires using the tool for the modular plug.

- When the wires are crimped with the modular plug, insert the contacts to the wires in order to ensure conductivity.
- Strength of crimping is ensured by the cable stopper on the outer sheath of the LAN cable.
  Check the two points described above.

(5) Attach the modular plugs on both sides of the LAN cable.

(6) Check conductivity.

- Check that the core wires are correctly aligned and the contacts are stuck in the wires.
- Check that there is no damage or disconnection of the cable.

  Note: You can check conductivity easily using the modular tester (Model DY7206A0000).

(7) Connect to the modular jack.
When checking of conductivity is complete, plug the LAN cable to the modular jack provided on the product. Also, attach the user terminal.

Note: When you plug the modular plug into the modular jack, push it in until it clicks.
Lightly pull the cable to check that it is firmly connected.

■ Construction Parts

This describes how to use the construction parts.

● Notes for use

- Be sure to install the modular branch unit, modular relay unit, and the user terminal/sensor connecting adapter in the outlet box or panel.
- When you plug the modular plug into the modular jack, push it in until it clicks.
  Lightly pull them to check that they are firmly connected.

● Modular branch unit

This is used to branch out the communication line for two user terminals to be connected.

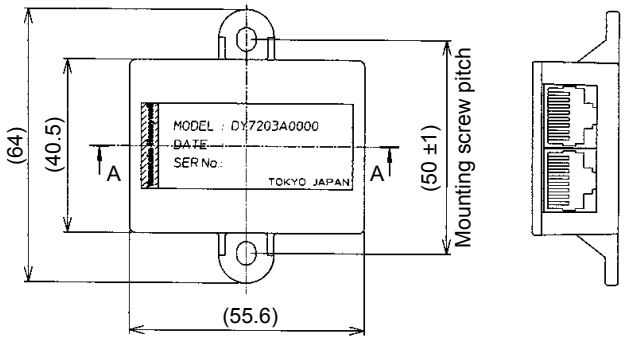


Figure 16. Modular branch unit (Model DY7203A0000) (mm)

Note: Do not branch wiring for RS-485 communication.
Branch wiring using Model DY7203A0000 is prohibited.

● Modular relay unit

This is used to extend the communication line by connecting to another communication line.

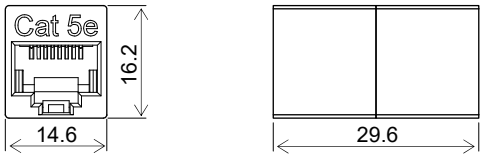


Figure 17. Modular relay unit (Model DY7202A0000) (mm)

● User terminal connecting adapter

This is used to connect the analog user terminal (with airflow switch function).

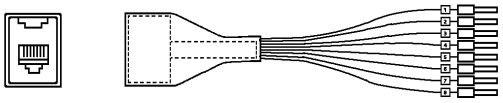


Figure 18. User terminal connecting adapter
(Model DY7204A0008)

● Sensor connecting adapter

This is used to connect the temperature sensor using the modular connector.

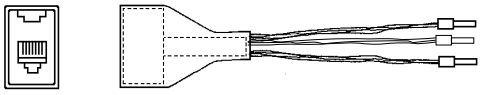


Figure 19. Sensor connecting adapter (Model DY7204A0003) for Pt100

● Modular plug

This is used to connect to the modular jack.

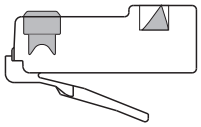


Figure 20. Modular plug (Model DY7207A0100)

● Bracket (Model DY7208A0002)

When the conventional product (IRC) is replaced by the FCU Controller, this bracket is used to mount the FCU Controller using the mounting screw holes made for the conventional product. The brackets are available in two sizes, and the large bracket is used for this product.

- Large bracket

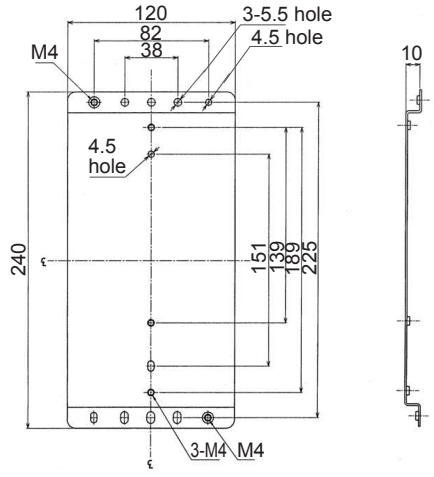


Figure 21. Large bracket (Model DY7208A0002) (mm)

■ Construction Tools

This describes how to use the products provided as construction tools.

● Modular crimper

This is used to crimp the modular plug to the LAN cable.

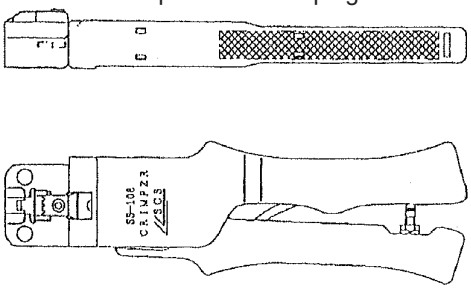


Figure 22. Modular crimper (Model DY7205A0002)

● Modular cable tester

This is used to check that the modular plug and the LAN cable are correctly crimped by the modular crimper.

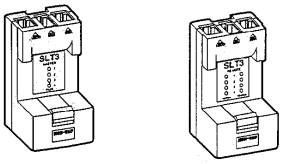


Figure 23. Modular cable tester (Model DY7206A0000)

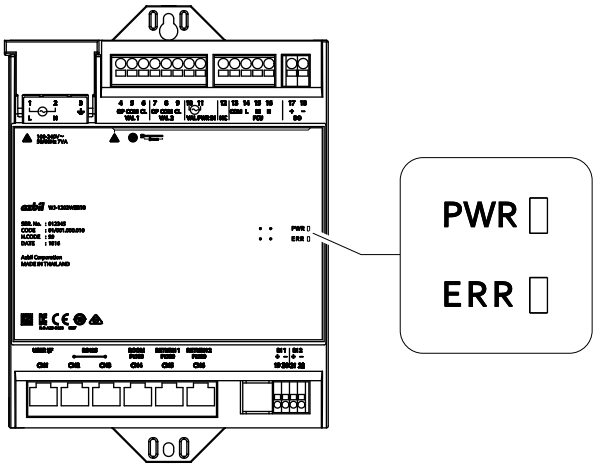
■ Software

Item	Function	Description	Remarks
Operation (Common for all types)	ON/OFF FCU	Turns on/off the fan coil unit using the central monitoring unit or user terminal. It is possible to disable ON/OFF operation by the user terminal using the central monitoring unit.	The ON/OFF operation from the user terminal or the central monitoring unit is prioritized based on the "higher priority to later commands" rule.
	Setback operation	Temperature setpoint is adjusted by the predefined setback value. It is possible to switch to setback operation using the central monitoring unit or the user terminal.	The setback operation from the user terminal or the central monitoring unit is prioritized based on the "higher priority to later commands" rule.
	Changing of temperature settings	It is possible to change the temperature settings using the central monitoring unit or the user terminal. It is possible to disable changing of temperature settings by the user terminal using the central monitoring unit.	The temperature settings change operation from the user terminal or the central monitoring unit is prioritized based on the "higher priority to later commands" rule. The high/low limit settings on the user terminal can be specified by the central monitoring unit.
	Interlock operation from the outdoor air handling unit to FCU	The fan coil unit ON/OFF operation is interlocked with the ON/OFF operation of the outdoor air handling unit.	One General Controller can control up to 6 FCU Controller groups.
	Interlock operation from FCU to the outdoor air handling unit	The outdoor air handling unit ON/OFF operation is interlocked with the ON/OFF operation of the fan coil unit.	One General Controller can control up to 6 FCU Controller groups.
	General DI interlock	Interlocking with the general DI that is input to the FCU Controller enables interlocking of the fan coil unit and ON/OFF operation.	
	General DO interlock	It is possible to output to the general DO interlock linking with the ON/OFF operation for the fan coil unit, or with the ON/OFF operation for the fan coil unit + state of cooling or heating.	
Control (ON/OFF type)	Temperature control	Executes ON/OFF control to maintain the indoor temperature measurement at the setpoint.	
	Airflow control	Executes multi-level control for airflow of fans based on the difference between the indoor temperature measurement and the setpoint. In multi-level control, the level can be selected from (L, M, or H), or from (L, M, H, or OFF).	Airflow control is performed when airflow is set to AUTO. When airflow is directly selected from (L, M, or H), the selected airflow is output.
Control (Proportional control, proportional control with return water temperature control)	Temperature control	Executes PID control and controls the floating valves to maintain the indoor temperature measurement at the setpoint.	
	Noise control	In order to prevent the water draining sound, it is possible to fully close the valve when its opening position gets below a specified value.	
	Airflow control	Executes multi-level control for airflow of fans based on the difference between the indoor temperature measurement and the setpoint. In multi-level control, the level can be selected from (L, M, or H), or from (L, M, H, or OFF). Furthermore, it is possible to execute airflow control with priority on water or air according to the application.	Airflow control is performed when airflow is set to AUTO. When airflow is directly selected from (L, M, or H), the selected airflow is output.

Item	Function	Description	Remarks
Control (Proportional control with return water temperature control)	Return water temperature control	Valve opening position is controlled using “Return water temperature PI control” and “Indoor temperature PID control.” Using the two controls, the measurement value of return water temperature can follow its setpoint that is specified to keep a constant temperature difference between the supply water temperature and the return water temperature of the fan coil unit.	
Control (Common for all types)	Cooling/ heating switching	If the cooling/heating mode needs to be changed, the central monitoring unit sends the following cooling/heating mode information: Cooling, heating, fanning (cooling or heating cannot be executed), AUTO	One General Controller can change the cooling/heating mode for up to 16 FCU Controller groups.
	Mixing prevention control	In order to prevent the mixing loss, sets the difference between the set temperature of the interior zone air conditioning and the perimeter zone air conditioning that are interlocked.	One unit or group of VAV Controllers or FCU Controllers can be set to one unit or group of FCU Controllers.
	Supply air temperature optimizing control for the outdoor air handling unit (supply air load/reset control)	Optimizes the supply air temperature for the outdoor air handling unit in order to attain a comfortable environment and energy savings based on the control state of each FCU Controller.	One General Controller can control up to 6 FCU Controller groups.
	Fan coil unit ON/OFF, valve opening position, airflow interlock	This performs interlocking operation of multiple fan coil units, ON/OFF operation, valve opening position control, and airflow switching.	Do not use the user terminal for the fan coil units that are interlocked. For proportional control with return water temperature control, each FCU Controller individually decides the valve position sharing the indoor temperature control data that is used for calculating the valve position.
Central monitoring	Individual monitoring	The central monitoring unit can monitor the following data for each FCU Controller: FCU ON/OFF, FCU alarm, temperature measurement, temperature settings, high/low limit settings, setback deviation, airflow switching, valve position, cooling/heating switching, return water temperature, return water temperature setting, prohibit UT operation, prohibit UT settings (Not all of the items above are required to monitor.)	
	Group monitoring	The central monitoring unit can monitor the following data as a group: FCU ON/OFF, FCU alarm, temperature measurement, temperature settings, high/low limit settings, setback deviation, return water temperature, return water temperature setting, prohibit UT operation, prohibit UT settings (Not all of the items above are required to monitor.)	One General Controller can set up to 25 FCU Controller groups. One FCU Controller cannot belong to multiple groups.
	Batch operation	The central monitoring unit can execute valve fully open/close operation forcibly for all the FCUs that belong to the same group This function helps pipe flushing operation.	One General Controller can control up to 6 FCU Controller groups.

■ Indicators

● Product status LEDs

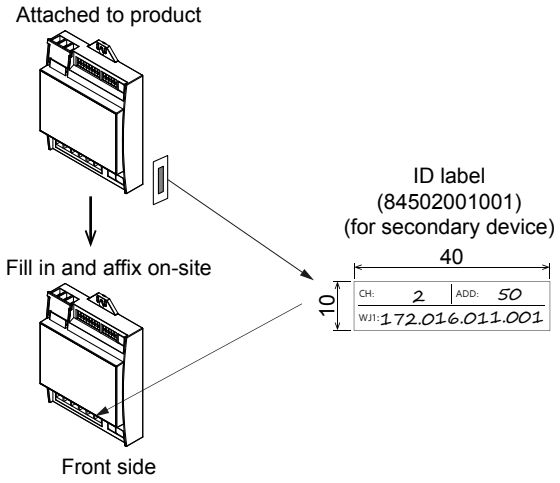


Item	Indicator	Color	State	Description
Power supply status	POWER	Green	Not lit	Power OFF
			Lit	Power ON
Abnormal status	ERROR	Red	Not lit	No abnormalities
			Flashing (1.4 sec intervals)	Minor failure
			Lit	Major failure, initializing
			Flashing (8 sec lit, suddenly not lit)	Major failure
			Flashing (8 sec not lit, suddenly lit)	Major failure
			Flashing (0.2 sec intervals)	Communication error

Note: The red LED turns on temporarily when the power supply is started and the CPU is reset, but this does not indicate an abnormal status.

■ ID Label

When performing adjustment, write down the BACnet MS/TP channel number under the General Controller and the BACnet MAC address of this product, and affix it to the product.



■ Connecting 2 User Terminals

A maximum of two Neopanels (Model QY7205) can be connected to this product.

- To connect two user terminals, the modular branch unit (Model DY7203A0000) is required.
- The address number of the 2nd Neopanel should be "2."
  If two Neopanels have the address number "1," they will not work correctly.
  The address number is printed on the shipping carton and on the nameplate (base should be removed) attached to the inside surface of the Neopanel.

Notes:

1. The ON/OFF operation and temperature settings are prioritized based on the "higher priority to later commands" rule.
2. The Neopanel with the address "2" does not have the temperature measuring function.

■ Handling

⚠ CAUTION	
 General	If more than the rated power voltage is applied to the product, replace the product with new one for your safety. Failure to do so may cause device failure or cause fire.

● Notes before power-on

- Check again that the wiring is done correctly.

■ Maintenance

⚠ WARNING	
 Electric shock	Do not touch electrically charged parts. Doing so may cause electric shock.

⚠ CAUTION	
 Disassemble	Do not disassemble this product. Doing so may cause device failure.
 General	Before cleaning the product or retorquing the terminal screws, be sure to turn off the power to the product. Failure to do so may cause electric shock, device failure, or malfunction.

Azbil personnel who have been trained on the product will carry out periodic maintenance.
Please contact us as necessary.

● Notes on cleaning

Do not use chemicals containing cleaning agents, solvents, etc., when removing dirt and other dust on the product surface.

■ Disposal

Dispose of this product as industrial waste in accordance with your local regulations.
Do not reuse all or any part of the product.

■ CE Marking

Install this product where it is accessible only to people with sufficient knowledge concerning electrical equipment.
The IK code* of this product is IK07.
The cabinet can withstand impact of a 500 g steel ball dropped from a height of 40 cm.
This product complies with the following harmonised standards of the Radio Equipment Directive (RED), the Electromagnetic Compatibility Directive (EMCD), the Low Voltage Directive (LVD) and the Restriction of Hazardous Substances Directive (RoHSD).

RED: EN 300 330
EMCD: EN 61326-1 Class A, Table 2 (for use in an industrial electromagnetic environment)
EN 301 489-1 / EN 301 489-3
LVD: EN 61010-1 Overvoltage category II
Pollution degree 2
RoHSD: EN 50581

*IK code: Based on EN 62262, this uses 11 levels to indicate the degrees of protection provided by cabinets for electrical equipment against external mechanical impacts.

Azbil Corporation
Building Systems Company

https://www.azbil.com/

Specifications are subject to change without notice.

AB-7460
Rev. 0.0 Nov. 2018
(J: AI-7460 Rev. 0.0)