FCU Controller

■ Overview

This product (model WJ-1202) is a controller for fan coil units (FCU).
It starts or stops the FCU and controls the airflow volume and valves.
Also, it can provide setback operation or operation linked with the outdoor air handling units, etc.
If a user interface device is connected, occupants can start or stop FCU units and change the temperature settings.
This product is compatible with BACnet MS/TP, which is an open protocol.

■ Features

- Open communication protocol
  This product is compatible with BACnet MS/TP, which is an open protocol.
- Various types of valve control
  ON/OFF control or proportional control for valves for maintaining indoor temperature at a setpoint.
  Also, by measuring the return water temperature of the fan coil unit, it can maintain the indoor temperature at the setpoint while keeping the return water temperature above the setpoint (the return water temperature control function).
  This function prevents excess flow rate at the fan coil unit and reduces the transport power needed by central plants.
- Supported input and output
  This product can be connected to a temperature sensor.
  Also, general-purpose digital inputs and outputs can be used for linked ON/OFF or linked operation with a humidifier, etc.
- Standalone operation
  This product can be used as a standalone controller.
- Various setting devices
  Azbil's various types of user interface, including the Neopanel™2 (model QJ-1301), Neopanel (model QY7205), Neoplate (model QY7290), and Multi-area user terminal (model QJ-1201), can be connected so that users can turn FCUs ON/OFF or change the temperature settings.
  ON/OFF operation or temperature settings can be prohibited from the central monitoring unit.
- Online engineering work
  If there is a need to change the control parameters during operation, they can be changed while the controller is running.
- Installation method
  Less labor is needed for wiring because LAN cables with RJ-45 modular connectors are used for temperature sensors, setting devices, and BACnet MS/TP communication.
  Wiring work is made easier by spring terminal blocks for the power, fan outputs, valve outputs, and general-purpose digital I/O terminals.

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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 applications like the following where safety is especially required, implementation of fail-safe design, redundant design, regular maintenance, etc., should receive appropriate consideration so that the product can be used 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 (Recommended Period of Use)

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

■ Symbols

	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.)
	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	
	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.
	Do not install the product in a location where it can be accessed by unauthorized people who have not been trained for safety.
	Installation and wiring must be performed by personnel qualified to do instrumentation and electrical work. Failure to do so may cause fire or 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.
	Do not touch the terminals or insert conductive material between the terminals while the power is on. Doing so may result in electric shock.
	Do not touch electrically charged parts. Doing so may cause electric shock.
	Use crimp terminals with insulation for connections to the product terminals. Failure to do so may cause a short circuit leading to fire or device failure.

⚠ CAUTION	
	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.
	Keep this product in the package for storage. Failure to do so may damage or stain the product.
	Install, wire, and use this product under the conditions specified by this manual. Failure to do so may cause fire or device failure.
	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.
	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
	Do not use an uninterruptible power supply (UPS) that outputs rectangular waves. Doing so may cause the device to fail.
	Provide a power circuit breaker for the power source to this product. The product does not have a power switch.

⚠ CAUTION	
	When connecting valves, FANs, and digital output lines, provide a circuit protector (e.g., a circuit breaker or fuse) for the power source.
	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.
	Do not allow wire clippings, metal shavings, and other refuse to enter into the product. Doing so may cause fire or product damage.
	Do not disassemble this product. Doing so may cause device failure.
	Do not allow chemicals (e.g., solvents, oil, or cleaning agents) to contact this product. They may damage the case.
	Before cleaning the product, be sure to turn off the power to the product. Failure to do so may cause electric shock, device failure, or malfunction.

■ System Configuration

The FCU Controller can be connected to the central monitoring unit or can be used as a standalone controller.

● System connection

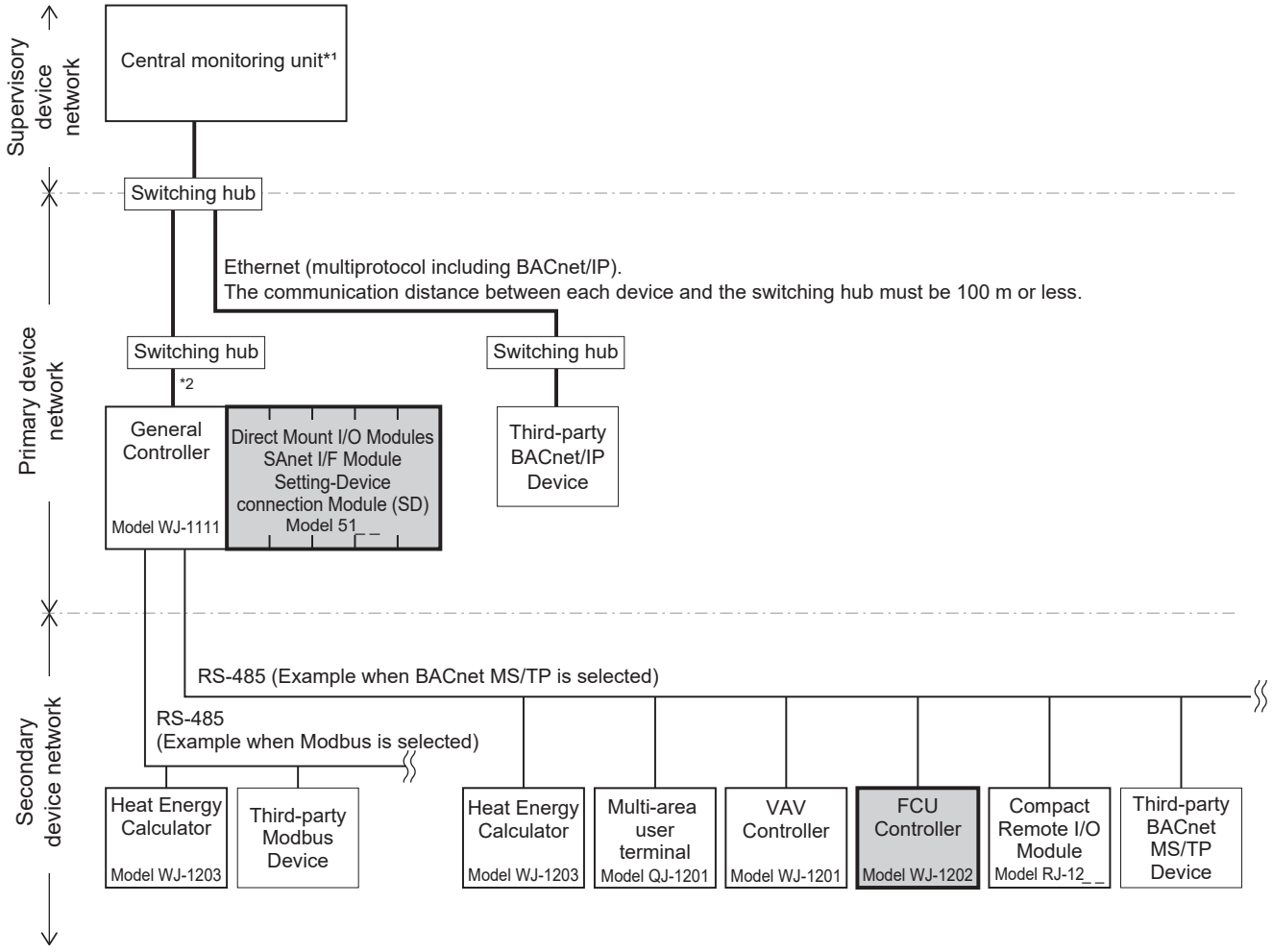


Figure 1. System configuration example

*1 Azbil's Supervisory Controller (model BH-101G0_0000) or a third-party central monitoring unit using BACnet/IP communications can be used for central monitoring.

*2 The General Controller supports BACnet/IPv4 or BACnet/IPv6. The IPv6 specification is based on BACnet-2012 (compliant with the IEIEJ-G-0006:2017 standard by the Institute of Electrical Installation Engineers of Japan) with ANNEX U of BACnet-2016.

*3 The General Controller has two RS-485 communication channels. For each channel, a communication protocol can be selected from among BACnet MS/TP, Modbus™ RTU, and Modbus ASCII.

- Number of connectable devices if BACnet MS/TP is used

  If only Azbil devices are connected:

  50 devices per channel (VAV/FCU Controllers, Compact Remote I/O Modules, Heat Energy Calculator, etc.)

  For the General Controller, there are restrictions: 70 secondary devices or 50 of Azbil's VAV and FCU controllers in total

  If only third-party devices are connected:

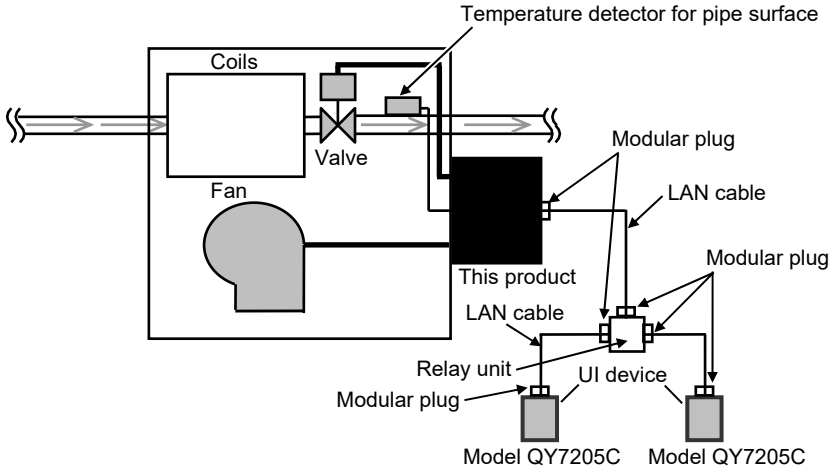
  31 devices per channel (with a transmission speed of 76.8 kbps, 30 objects perdevice)

- Number of connectable devices if Modbus is used

  31 devices per channel (with a transmission speed of 76.8 kbps, 30 objects perdevice)

If the third-party devices have different transmission speeds or number of objects, or if Azbil devices and third-party devices are on the same channel, the number of devices that can be connected will vary. For details, please contact Azbil Corporation.

● Standalone



Note: With the system connection (not standalone) settings, chilled or hot water judgment by the pipe surface temperature detector is not supported.

Figure 2. Connection example: FCU controller connected to a chilled/hot water valve and two UI devices

■ Model Number

Model number							Specification	Remarks
WJ-12								
	02						FCU Controller	
		W					Power: 100–240 V AC (if there is no transformer for the control valve)	*1
			1				Connected to General Controller, ON-OFF valve control	*2
			2				Connected to General Controller, proportional valve control	
			3				Connected to General Controller, proportional valve control with return water temperature control	
			4				Standalone, ON-OFF valve control	*2
			5				Standalone, proportional valve control	*3
			6				Standalone, proportional valve control with return water temperature control	*3
				0			Indoor temperature measurement: Pt100	
				K			Indoor temperature measurement: Pt1000	
					0		External contacts: no I/O	
					1		External contacts: 2 DIs and 1 DO	No external contacts for ON-OFF control valves
						1		

*1 The power has a functional grounding terminal.

*2 Models WJ-1202W1_01 and WJ-1202W4_01 (for ON-OFF control valves) have no external contacts.

*3 Standalone models WJ-1202W5_11 and WJ-1202W6_11 (for proportional control valves) have external contacts.

● Options

Item		Model number	Description
Auxiliary device	Temperature sensor for pipe surface (for measuring of return water temperature by a proportional control valve with return water temperature control)	TY7820Z0P01	Length: 1.5 m
		TY7820Z0P05	Length: 5 m
		TY7820Z0P10	Length: 10 m
		TY7820Z0P30	Length: 30 m
	Temperature detector for pipe surface (standalone specification and for cooling/ heating automatic changeover using ON/OFF or proportional control)	81301851-001	Length: 1.3 m
		81301851-002	Length: 2.5 m

■ Specifications

● Basic specifications

Item			Specification
Power		Voltage	Model WJ-1202W: 100–240 V AC (85–264 V AC)
		Frequency	50/60 Hz ±3 Hz
		Consumption	Models WJ-1202W1_01 & WJ-1202W4_01: 6 VA max. Other than the above: 7 VA max.
		Inrush current	15 A max. (for 100 V AC) 30 A max. (for 240 V AC)
		Leakage current	Model WJ-1202W_ _ _1 0.5 mA max. (for 240 V AC)
		Insulation resistance	Model WJ-1202W_ _ _1 Between power terminals and the ground terminal: 100 MΩ min. (at 500 V DC)
Central processing unit			32-bit
Communication	RS-485	Method	BACnet MS/TP
		Speed	9.6, 19.2, 38.4, 76.8 kbps (default: 76.8 kbps)
		Distance	1000 m max.
	Neopanel2/ Neopanel	Method	Dedicated serial communication (requires 12 V DC power)
		Speed	100 bps
		Distance	50 m max.
		Number of connectable units	2
Materials		Base	Modified PPE resin
		Cover	Modified PPE resin
		Terminal cover	Modified PPE resin
Mass			Models WJ-1202W1_01 & WJ-1202W4_01: 0.23 kg Other than the above: 0.52 kg
Environment	Operating conditions	Ambient temperature	0–50 °C
		Ambient humidity	10–90 % RH (without condensation)
		Elevation	2000 m max.
		Vibration	3.2 m/s^2 max., 10–150 Hz
	Transportation/ storage conditions	Ambient temperature	−20–60 °C
		Ambient humidity	5–95 % RH (without condensation)
		Vibration (storage)	3.2 m/s^2 max., 10–150 Hz
		Vibration (transport)	9.8 m/s^2 max., 10–150 Hz
	Other		• No corrosive gas should be detected. • No exposure to direct sunlight. • Do not let the product get wet.*1
Installation location*2			In the equipment or above the ceiling
Installation method			Screws or ceiling suspension bolts

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

*2 Do not install it on the floor, in ceiling panels, or in similar locations because electric shock could occur if you step on the product or touch it with your hand.

● Input and output

Item		Specification		
Fan output		Output method	Relay output, dry (non-voltage) contacts, N.O. contacts (form A)	
		Contact rating	125 V AC, 3 A max. (inductive load: cos φ0.4 min.) 250 V AC, 1.5 A max. (inductive load: cos φ0.4 min.)	
		Minimum applied load	100 V AC, 10 mA (connecting a 24 V AC load, etc., is prohibited)	
FCU power monitoring input (for standalone operation)		Input voltage range	100–240 V AC	
Valve output		Output method	Relay output, voltage contact, a-contact	
		Contact rating	WJ-1202W_ _ _1*1	125 V AC, 0.8 A max. (inductive load: cos φ0.4 min.) 250 V AC, 0.4 max. (inductive load: cos φ0.4 min.) A maximum of 5 model MY5560C ACTIVAL-Mini valves can be connected in parallel.
		Minimum applied load	WJ-1202W_ _ _1*1	24 V AC, 10 mA
Temperature input		Measurement range	0–50 °C	
		Input signal	WJ-1202_ _0_1	RTD (Pt100)
			WJ-1202_ _K_1	RTD (Pt100)
Return water temperature input (WJ-1202W3_ _1 & WJ-1202W6_11)		Measurement range	0–80 °C	
		Input signal	RTD (Pt100)	
Digital output (WJ-1202W_ _11)		Number of outputs	1	
		Output method	Relay output, dry (non-voltage) contacts, N.O. contacts (form A)	
		Contact rating	250 V AC, 0.5 A max. (inductive load: cos φ0.4 min.)	
		Minimum applied load	10mA	
Digital input (WJ-1202W_ _11)		Number of inputs	2	
		Current	5 mA DC (typ.)	
		Voltage	12 V DC (typ.)	
		Connectable load	Dry contacts	
		Dry contact rating	Allowable ON contact resistance: 100 Ω max. Allowable OFF contact resistance: 100 kΩ min.	
Cooling/heating changeover input (for standalone operation)		Pipe temperature input signal	Thermistor (20 kΩ at 25 °C)	
		Contact input signal	Dry contact signal. Minimum applied load of the contacts must be 0.1 mA or less.	
Neoplate	Temperature setting input	Input signal	1–10 kΩ potentiometer	
	Air conditioning switch input	Current	10 mA DC (typ.)	
		Voltage	12 V DC (typ.)	
		Connectable load	Dry contacts	
	Indicator output	Output method	Transistor output, wet contacts	
		Current	10 mA DC (typ.)	
		Voltage	12 V DC (typ.)	
		Output limit resistance	1.2 kΩ (typ.)	

*1 Proportional control valves whose full stroke time is less than 30 seconds cannot be connected.

■ Specifications for Wiring

Item	Recommended cable	Rating	Maximum length	Connection type	Conditions
Power	600 V PVC-insulated (IEC-60227-3), control-use vinyl insulated vinyl sheathed (CVV), or equivalent	1.25–2.5 mm^2 stranded wire	—	Spring terminal block*1	—
Ground		1.25–2.5 mm^2 stranded wire	—	Spring terminal block*1	100 Ω max. ground resistance Model WJ-1202W_ _ _1 only
Fan output		2.0–2.5 mm^2 stranded wire	50 m	Spring terminal block*1	
Valve output		2.0–2.5 mm^2 stranded wire	50 m	Spring terminal block*1	100 V AC min.
		1.25–2.5 mm^2 stranded wire			24 V AC
Digital output		2.0–2.5 mm^2 stranded wire	50 m	Spring terminal block*1	For more than 60 V AC/DC
		0.75–2.5 mm^2 stranded wire			For 60 V AC/DC or less
Digital input (per input)		0.75–1.5 mm^2 stranded wire	50 m	Spring terminal block*1	Only contact input is allowed.
Neopanel2/ Neopanel, Neoplate	—	LAN cable*2	50 m	RJ-45 modular connector*2	—
RS-485	—		1000 m	RJ-45 modular connector*2	
Temperature input RTD (Pt100)	—		50 m	RJ-45 modular connector*2	
Temperature input RTD (Pt1000)	600 V PVC-insulated, CVV, or equivalent	1.25–2.5 mm^2 connector cable Model DY7221A*4	50 m	RJ-45 modular connector*2	
Return water temperature input RTD (Pt100)	—	LAN cable*3	30 m	RJ-45 modular connector*2	
Cooling/heating changeover input (for standalone operation)	600 V PVC-insulated, CVV, or equivalent	0.75–1.5 mm^2 stranded wire	50 m	Spring terminal block	Thermistor, contact input (minimum applied load must be 0.1 mA max.)

*1 Ferrules can be used for spring terminal blocks, but there are restrictions on the wire size. For details, refer to table 1 in “Wiring the power and IO terminal blocks.”

*2 Use the following connector.
Plug: Model SS-37000-002 (manufatured by Bel Stewart Connector)
The same plug is available from Azbil Corporation, model DY7207A0100 (100 pcs).

*3 Use a category 5e (0.5 mm diameter × 8 cores) or higher LAN cable compliant with EIA/TIA-568. Cable with connector (model DY7210) and cable with connector for short-distance communication (model DY7220) are communication cables manufactured by Azbil Corporation using the connectors in *2. If a cable with an external diameter of 6 mm or more is used, make sure to leave sufficient maintenance space (especially in the depth direction) for the FCU Controller. The use of an existing category 3 or 5 cable compliant with EIA/TIA-568 is acceptable. In that case, please contact Azbil Corporation concerning the cable length.

*4 Since the resistance temperature detector (Pt1000) has 2 wires, the resistance of the wiring will cause a measurement error. If the cross-sectional area of the wire is 1.25 mm^2, the measurement error will be approximately 0.1 °C per 10 m. Adjust for the error at the controller depending on the situation.

■ Dimensions

● Models WJ-1202W1_ 01 and WJ-1202W4_ 01

Height 150 mm, width 100 mm, depth 35.9 mm

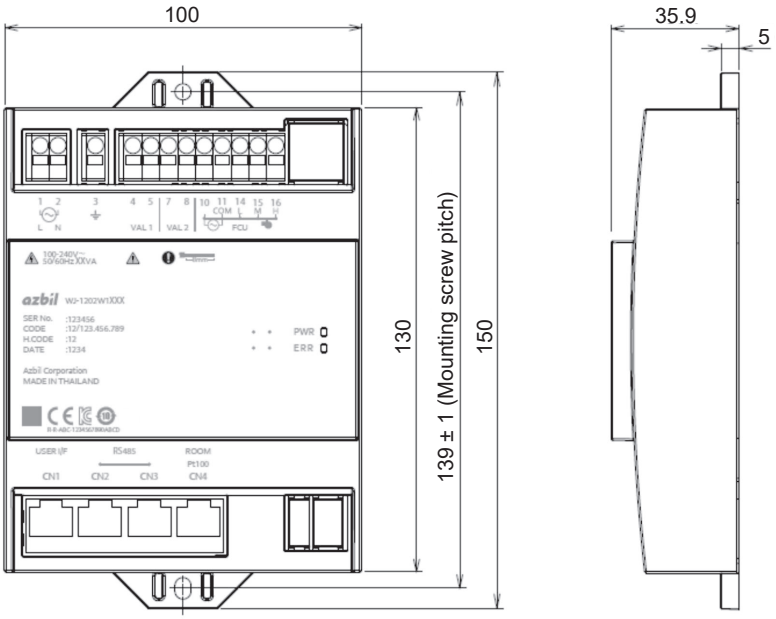


Figure 3. Dimensions (mm)

● Models WJ-1202W2_ _1, WJ-1202W3_ _1, WJ-1202W5_11, and WJ-1202W6_11

Height 200 mm, width 140 mm, depth 47.9 mm

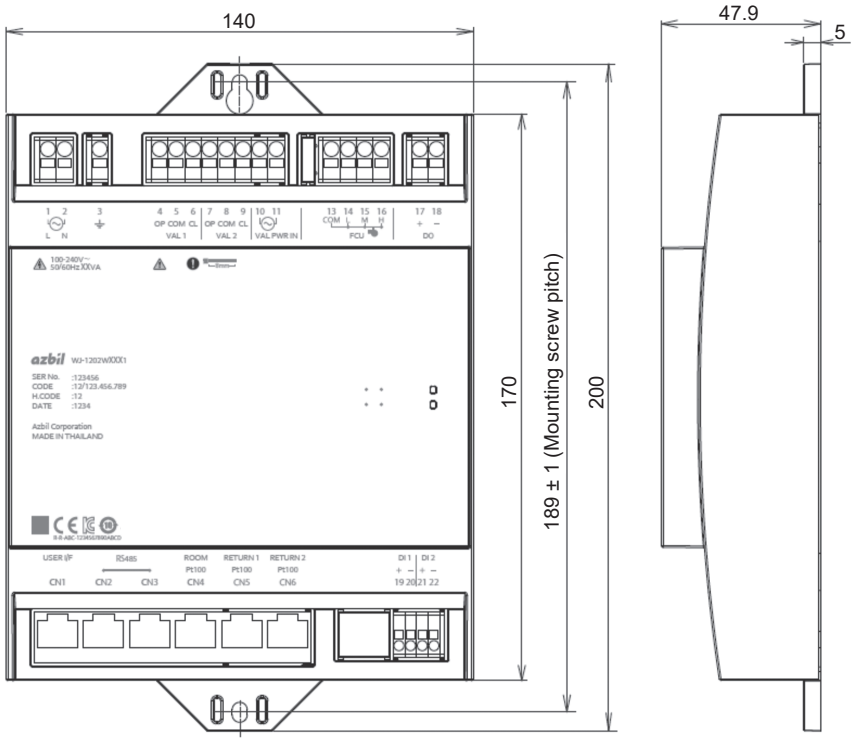


Figure 4. Dimensions (mm)

■ Name of Parts

● Models WJ-1202W1_01 and WJ-1202W4_01

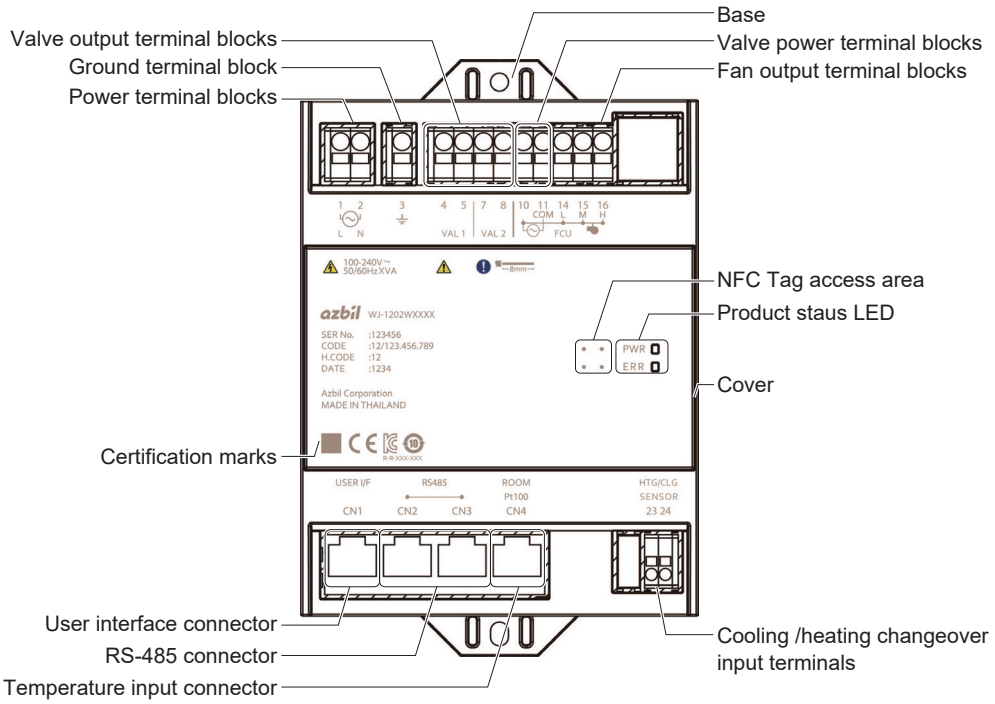


Figure 5. Name of Parts

● Models WJ-1202W2_ _1, WJ-1202W3_ _1, WJ-1202W5_11, and WJ-1202W6_11

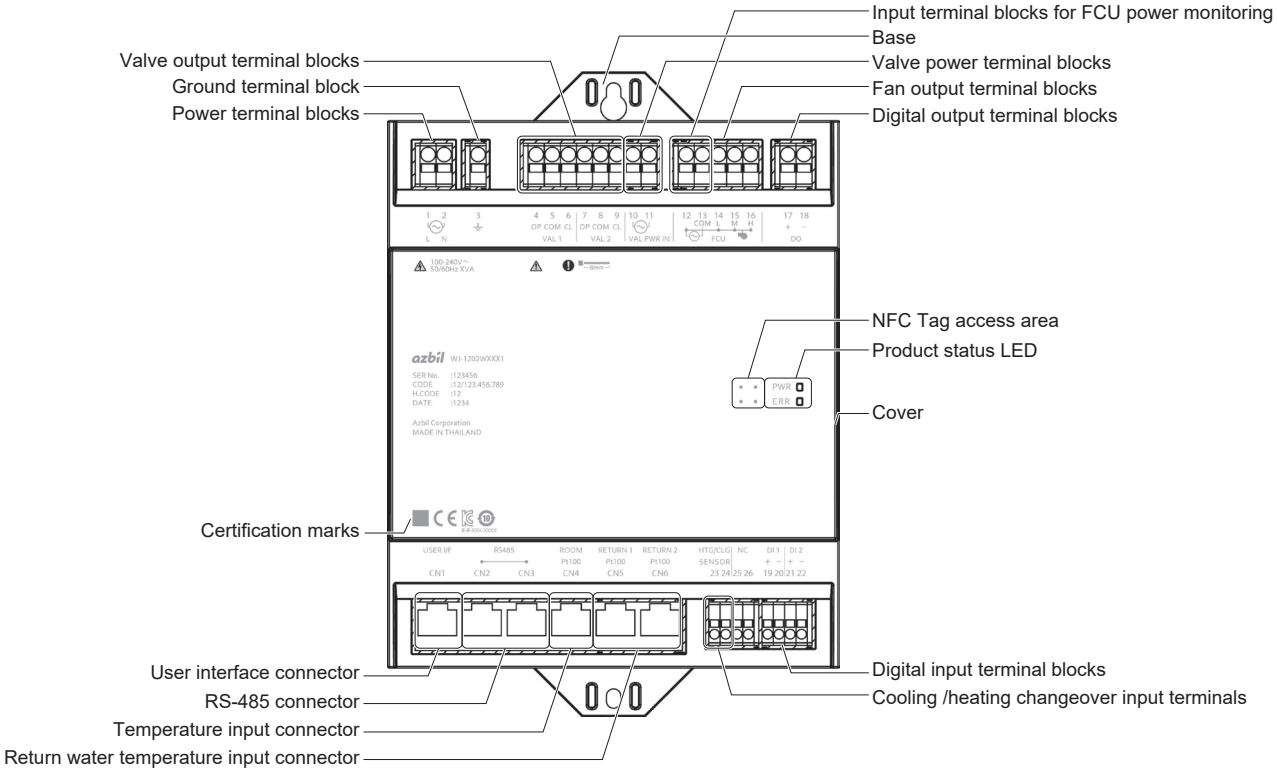


Figure 6. Name of Parts

Notes: Only model WJ-1202W_ _ _1 has a ground terminal block and valve output terminal blocks.
Only models WJ-1202W3_ _ _1 and WJ-1202W6_11 have return water temperature input connectors.
Only model WJ-1202W _ _11 has digital output terminal blocks and digital input terminal blocks.
Certification marks can be found on models WJ-1202W1_01, WJ-1202W2_ _1, and WJ-1202W3_ _1.
Only models WJ-1202W4_01, and WJ-1202W5_11 have cooling /heating changeover input terminals.

■ Installation

⚠ WARNING

Installation and wiring must be performed by personnel qualified to do instrumentation and electrical work.
Failure to do so may cause fire or electric shock.

⚠ CAUTION

Install, wire, and use this product under the conditions specified by this manual.
Failure to do so may cause fire or device failure.

● Installation location

- As shown, leave enough space (the hatched area) to install the product.

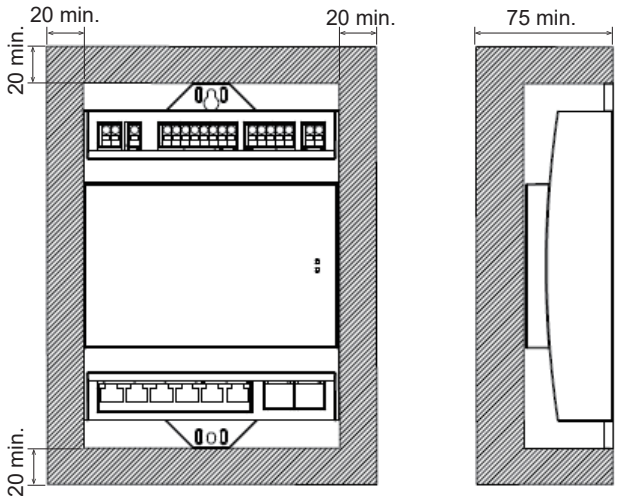


Figure 7. Installation space (mm)

- If it is not possible to leave a space of 75 mm in the depth direction, use a LAN cable whose diameter is 6 mm or less.

● Installation angle

- Fasten the product firmly with the screws so that it does not wobble.
- Attach the product vertically to the mounting surface. Install the product in a position where the nameplate can be easily seen.
- If the product is not installed in a dust-proof box, do not install it as illustrated in figure 8A, because dust would easily collect in the connectors.

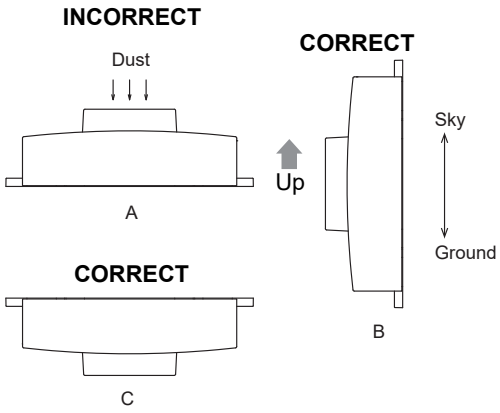


Figure 8.

● Installation method

Direct installation with screws

(1) Make screw holes for the M4 screws.
Screw hole pitch: 189 ± 1 mm (139 ± 1 for model 1202W1_ _1)

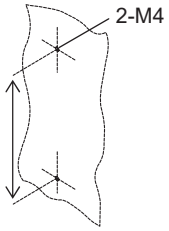


Figure 9.

(2) Fasten the product with two M4 screws.

(3) Check that the product is securely fastened.

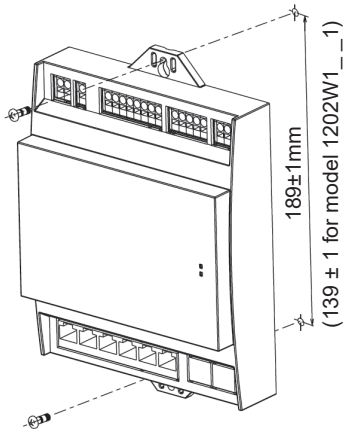


Figure 10.

Installation with celling suspension bolt (width ⅜" or dia. 9 mm)

(1) At the projecting portions on the upper and lower side of the product, tightly bind the cable ties through the 2 elongated holes (as in the left-hand figure below).

(2) If the JBFB mounting fixture made by Negurosu Denko Co., Ltd., is used, clamp the celling suspension bolt with the JBFB, pass the included screws through the mounting holes on the top and bottom of the product, and fasten the product by tightening the screws (as in the right-hand figure below).

(3) Check that the product and the parts for mounting are securely fastened.

Note: The product may rotate around the axis of the bolt. When wiring, be careful not to leave strong tension on the wire.

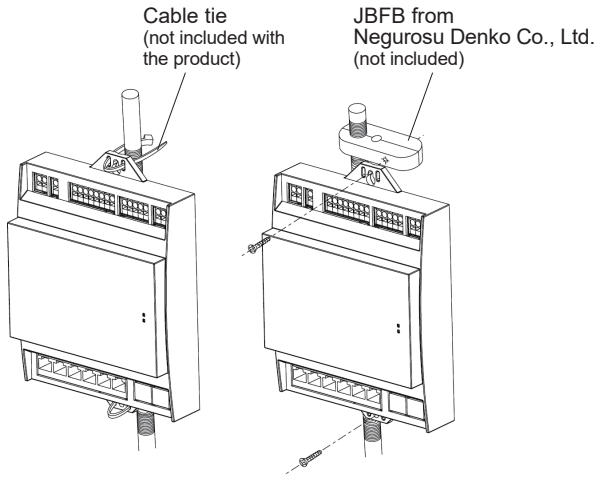


Figure 11.

■ Wiring

⚠ WARNING	
❗	Installation and wiring must be performed by personnel qualified to do instrumentation and electrical work. Failure to do so may cause fire or electric shock.
❗	Before wiring, turn off the power to this product. Failure to do so may result in electric shock or device failure.
🚫	Do not touch the terminals or insert conductive material between the terminals while the power is on. Doing so may result in electric shock.
🚫	Do not touch electrically charged parts. Doing so may cause electric shock.
❗	Use crimp terminals with insulation for connections to the product terminals. Failure to do so may cause a short circuit leading to fire or device failure.

⚠ CAUTION	
❗	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
🚫	Do not use an uninterruptible power supply (UPS) that outputs rectangular waves. Doing so may cause the device to fail.
❗	Provide a power circuit breaker for the power source to this product. The product does not have a power switch.
❗	When connecting valves, FANs, and digital output lines, provide a circuit protector (e.g., a circuit breaker or fuse) for the power source.
❗	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.
🚫	Do not allow wire clippings, metal shavings, and other refuse to enter into the product. Doing so may cause fire or product damage.

IMPORTANT	If more than the rated voltage is accidentally applied to this product, replace the product with a new one. Failure to do so may cause device failure.

● Notes on wiring

IMPORTANT	This product requires a functional ground. Ground this product with ground resistance of less than 100 Ω. Improper grounding may cause malfunction or device failure.

- Use the specified cables.
- Take care that tension from the wired cables is not applied to the product.
  Use cable ties, etc., to bind the cables to the object on which the product is installed, securing the cables so that they will not put tension on the product.
  Secure them at a position near the product.
  Especially, if temperature input connectors are affected by vibration etc., the measured temperature may vary. To prevent this, secure the modular cables for measuring temperature at a position as close to the connectors as possible.
  Secure the power cable and RS-485 cable separately. Do not bundle them with any other cables.
- Do not run cables along the front/back of the product (to prevent malfunctions caused by electromagnetic noise).

INCORRECT

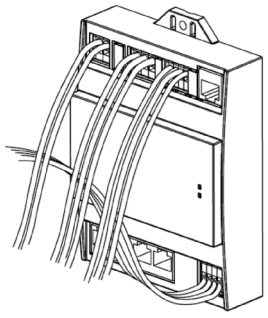


Figure 12. Models WJ-1202W1_01 and WJ-1202W4_01

INCORRECT

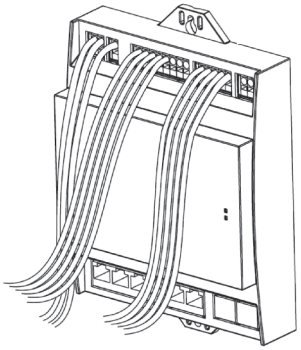
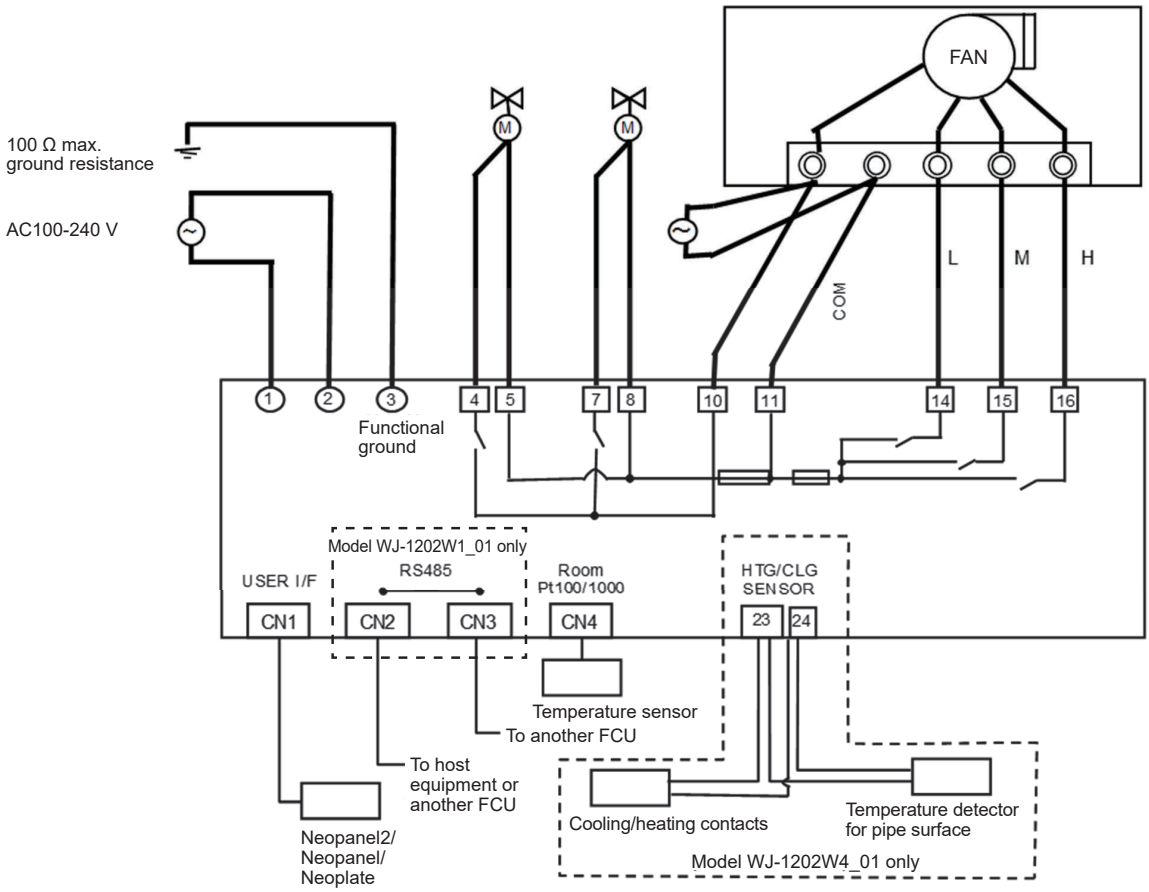


Figure 13. Models WJ-1202W2_ _1, WJ-1202W3_ _1, WJ-1202W5_11, and WJ-1202W6_11

● Wiring for models WJ-1202W1_01 and WJ-1202W4_01 (for ON/OFF valve without transformer)

IMPORTANT	• The power for the valve is supplied by the FCUs via this product. The power for the FCUs and for the valves cannot be separated. Therefore, if a spring-return valve is not used, the valve will not be fully closed when the power for the fan is turned off (except when the valve is already fully closed).



For details on terminators, refer to “Wiring the RS-485 terminals.”

Figure 14. Models WJ-1202W1_01 and WJ-1202W4_01

Table 1 Valve connection

Connected valve(s)	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.

If the operation status of an FCU is changed from OFF to L/M/H using Neoplate, this product will not be able to recognize the change in FCU status.
If an FCU controller for proportional control valves is used as a controller for ON-OFF valves, connect valve 1 between terminals 4 & 5, and valve 2 between terminals 7 & 8 on the FCU controller.
The power for the valves should be supplied from the outside.

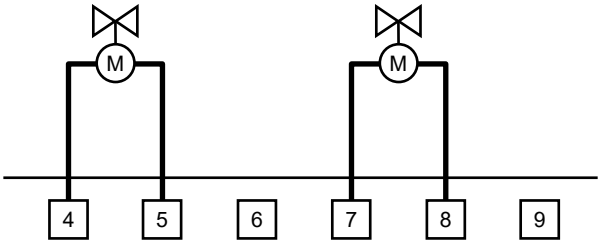


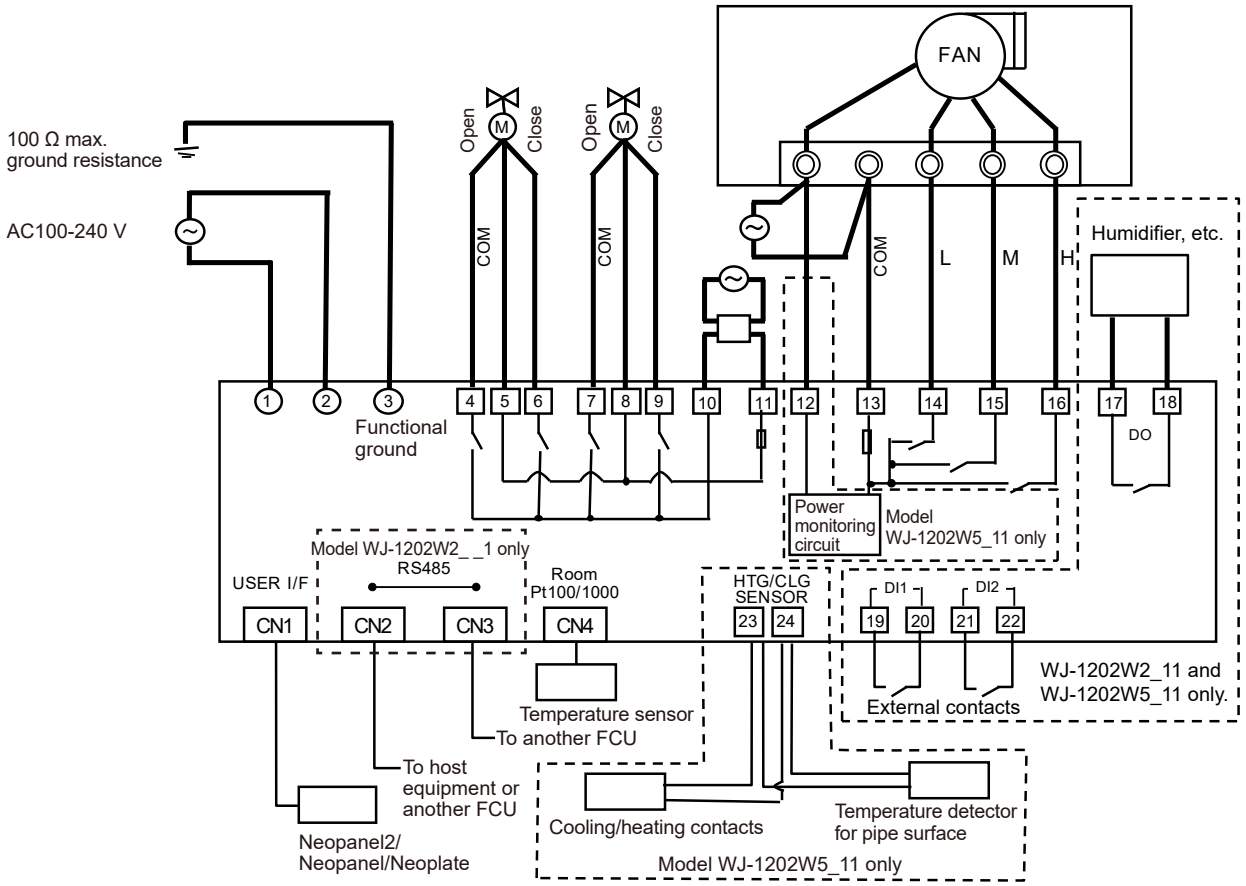
Figure 15. If an FCU controller for proportional valves is used for ON-OFF valves

● Wiring for models WJ-1202W2_ _1 and WJ-1202W5_11 (for a proportional valve without a transformer)

This wiring is for connecting valves* other than ACTIVAL-Mini (model VY5502A or MY5560C) valves or connecting multiple (5 max.) ACTIVAL-Mini valves in parallel to one output.

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

IMPORTANT	• If the valves are used in a system that requires 24-hour continuous operation, open or close the valves fully at least once a day in order to maintain precise control. Full opening or closing can be set by the parameter settings.



For details on terminators, refer to “Wiring the RS-485 terminals.”

Figure 16. Models WJ-1202W2_ _1 and WJ-1202W5_11

Table 2 Valve connection

Connected valve(s)	Between terminals 4, 5, & 6	Between 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

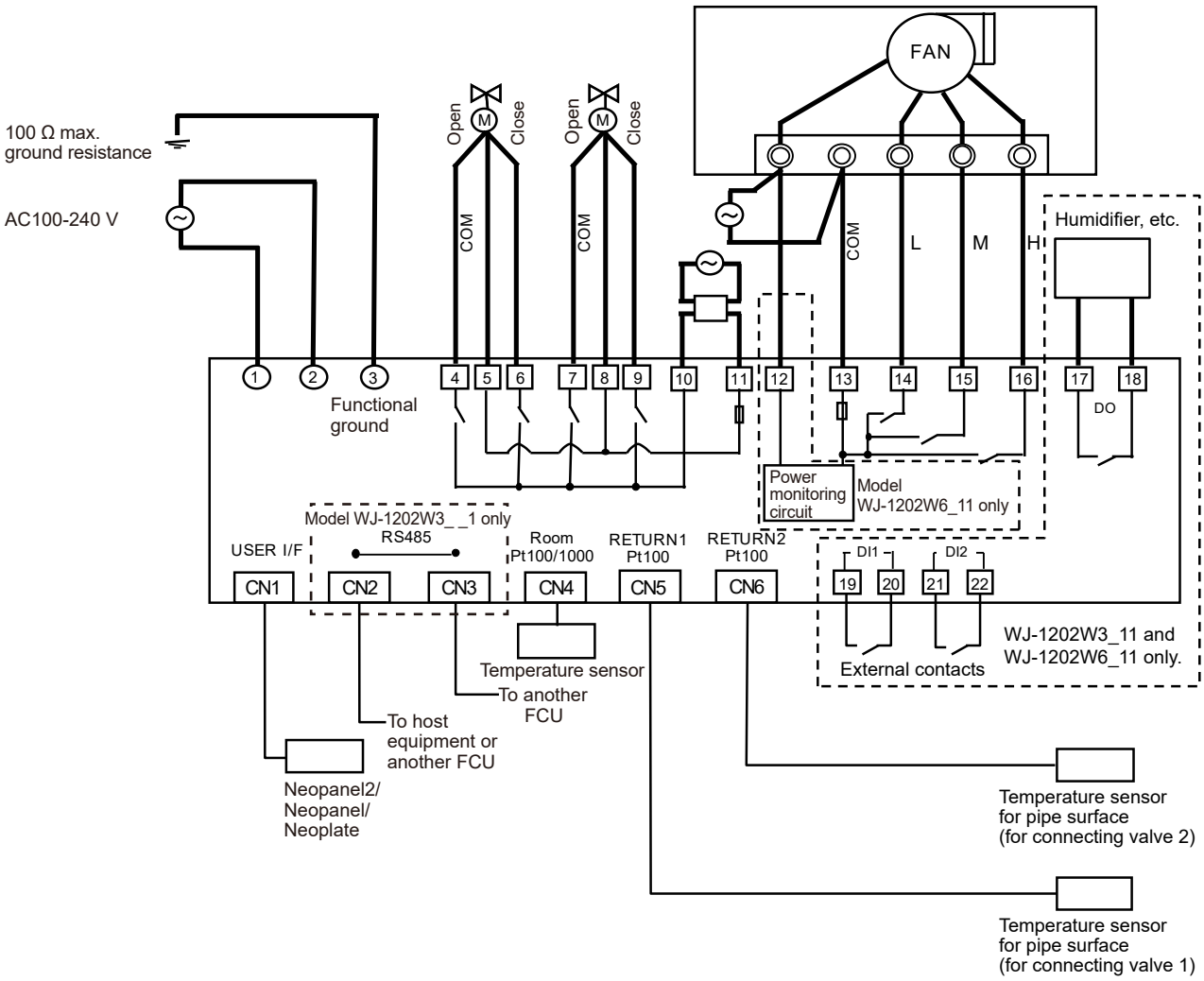
* Sequence for opening valves can be selected by the parameter settings.

● Wiring for models WJ-1202W3_ _1 and WJ-1202W6_11 (for proportional control valve with return water temperature control without transformer)

This wiring is for connecting valves* other than ACTIVAL-Mini (model VY5502A or MY5560C) or connecting multiple (5 max.) ACTIVAL-Mini valves in parallel to one output.

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

IMPORTANT	• If the valves are used in a system that requires 24-hour continuous operation, open or close the valves fully at least once a day in order to maintain precise control. Full opening or closing can be set by the parameter settings.



For details on terminators, refer to “Wiring the RS-485 terminals.”

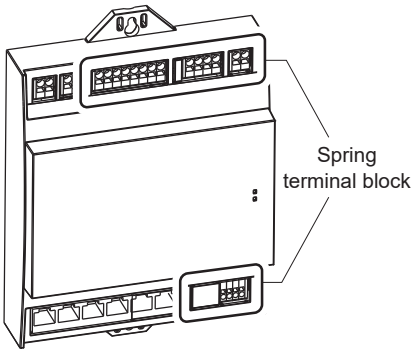
Figure 17. Models WJ-1202W3_ _1 and WJ-1202W6_11

Table 3 Valve connection

Connected valve(s)	Between terminals 4, 5, & 6	Between 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 power and IO terminal blocks



(1) Strip 8–9 mm of sheath from the cable core wire.

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

Make sure that there are no stray wires from the stripped conductor.

The following restrictions apply when using ferrules for spring terminal blocks.

Table 4 Available ferrules (_ _ specifies the color)

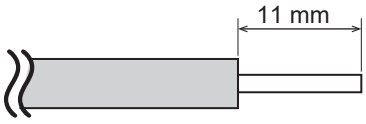
Manufacturer's part number (Phoenix Contact)	Wire size	
	mm^2	AWG
AI0.75-8_ _	0.75	18
AI1-8_ _	1.0	18
AI1.5-8_ _ *1	1.5	16

*1 Cannot be used for terminal blocks for digital input

Note: The crimping tool for the ferrules (made by Phoenix Contact) is CRIMPFOX 6: part No. 1212034.

- The length of insulation to strip is 11 mm.

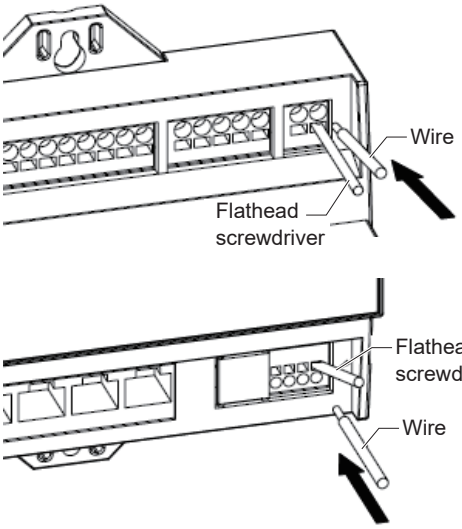
  Note: This length is different from the length of the insulation stripping gauge (8 mm) on the front of the product.



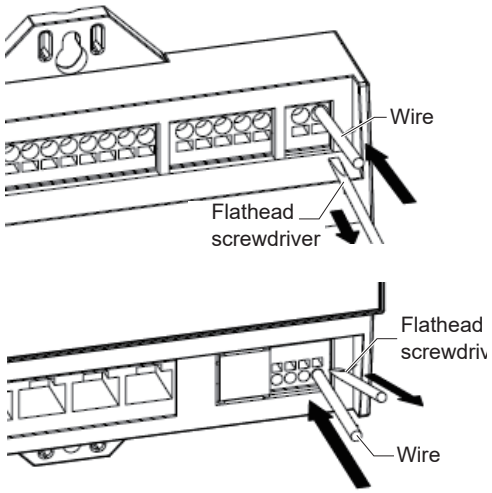
  Make sure that there are no stray wires from the stripped conductor.

- If the wire protrudes out of the ferrule, cut the wire so that it does not protrude more than 0.5 mm.
- Lightly pull on the ferrule and wire to make sure they are correctly connected.

(2) Insert a flathead screwdriver* into the screwdriver insertion slot (square hole). While keeping the screwdriver there, insert the wire into the terminal (round hole) as far as it will go.



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



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

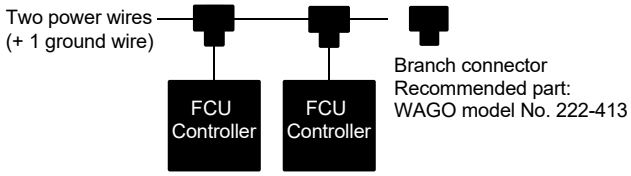
Note: If you pull the wire diagonally, it may be disconnected.

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

* Recommended screwdriver: SZF 0-0,4×2,5 model 1204504 made by Phoenix Contact

● Daisy chain for power cables

With this product, multiple wires cannot be connected to the power terminal block.
To supply power to multiple products, use the following method.

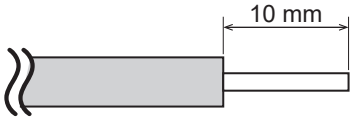


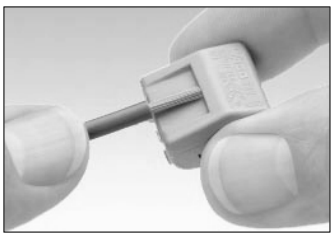
How to use a WF-3 branch connector

Connect the branch connector* as described below.
(*WAGO model No. 222-413 is recommended)

Figure 18. Model No. 222-413

(1) Strip 10 mm of sheath from the cable core wire.
Note: Only the specified length must be stripped.
Also, make sure that there are no stray wires from the stripped conductor.

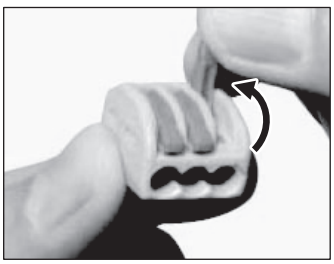




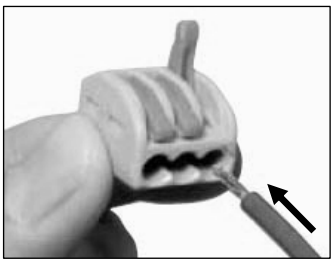
Check using the strip gauge

(2) Connect the wire in the steps below.

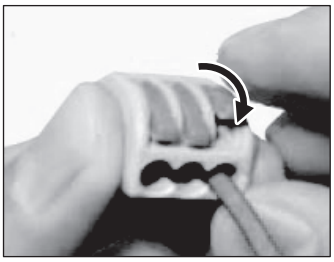
a. Push up the lever.



b. Insert the wire into the connector as far as it will go.



c. Push down the lever. Wiring is completed.



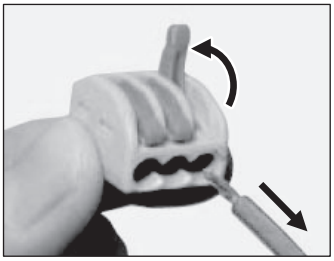
Note: As a general rule, connect one wire to one clamping unit
(JIS 9960-1 [IEC 60204-1], 13.1.1, “General requirements”).

(3) Lightly pull on the wire to check that it does not come out. (Do not pull hard.)

Note: To remove the wire, follow the steps below.

a. Push up the lever.

b. Pull the wire out.



(4) Protect the wiring connections.
As shown in figure 21, provide a box, etc., for protection.

Note: When there is a space to store a branch connector in a box, the branch connector can be secured using a fixing adapter (model 222-413-SR made by WAGO).

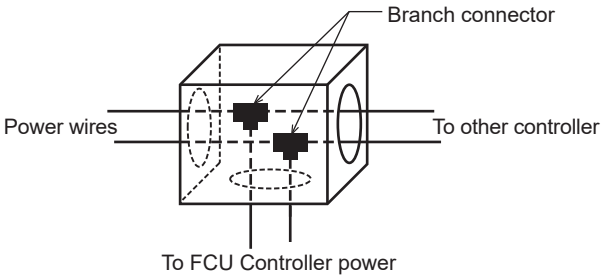


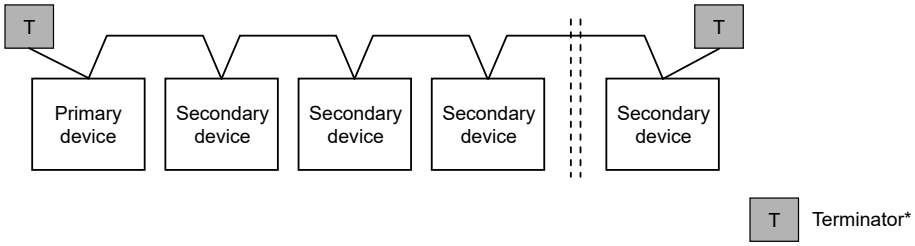
Figure 19.

● Recommended cable

Refer to “Specifications for Wiring”

● Wiring the RS-485 terminals

RJ-45 modular connectors are used.
Connect a terminator (120 Ω) to the last device connected to RS-485.



Note: Use the terminators listed below.
Model 83162637-005 RS-485 terminator (1 pc.)
Model 83162637-006 RS-485 terminator (10 pcs.)

Note:

1. Do not branch the wiring for RS-485 communication.
2. Branch wiring using model DY7203A0000 is prohibited.

● Termination of modular connectors

User interface lines, RS-485 lines, temperature input lines, and return water temperature input lines use modular connectors.

- The modular connector is composed of modular plug (male) and modular jack (female).
- The modular jack is located on the controller unit.
- A modular plug must be crimped to the LAN cable at the site.
  However, for Pt1000 temperature input, use model number DY7221A.
  This section describes how to crimp the modular plug onto the LAN cable and connect it to the modular jack.

  Note: Recommended modular plug
  Use the modular plug recommended by Azbil.

(1) Strip the sheath of the LAN cable.
You will see 8 core wires inside.

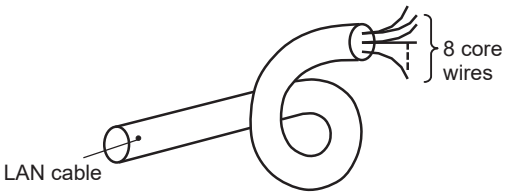


Figure 20.

(2) Arrange the 8 core wires according to number.
Refer to table 7 and check the color of the core wires to align them (a typical example is shown below).
Do not damage or strip the insulation of the 8 core wires.

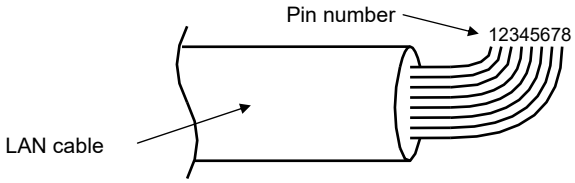


Figure 21.

Table 5

Pin No.	Color of wire	Other
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 properly ordered core wires into the modular plug.
Figure 21 illustrates the order of lines on the side with the contact pins when it is viewed from above.

- Trim the core wires by a nipper so that their length is the same.
- If the wires are too long, crimping will fail. Be careful.

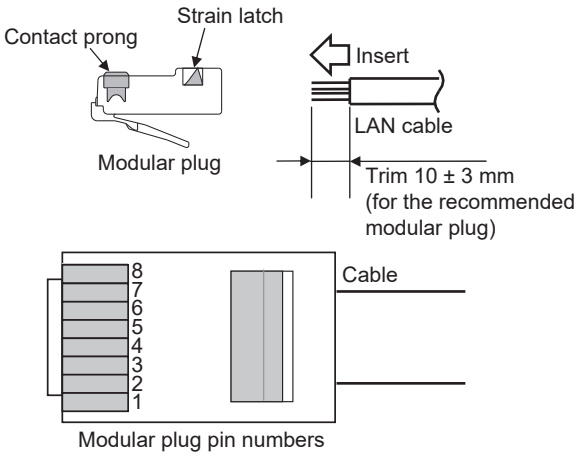


Figure 22.

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

- By crimping, the contact pins are inserted into the wires to ensure conductivity.
- Strength is ensured by the strain latch that crimps the LAN cable outer insulation.
Check these two points.

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

(6) Check the conductivity.

- Make sure that the core wires are correctly aligned and that the contact pins pierce the wires.
- Also, check that there is no damage or disconnection along the cable.

Note: Conductivity can be checked easily using a modular tester (model DY7206A0000).

(7) Connect the LAN cable to the modular jack.
After checking the conductivity, plug the LAN cable into the modular jack on the product. Also, connect it to the user interface device.

Note: Insert the modular plug into the modular jack until it clicks.
Lightly pull on the cable to check that it does not come out.

■ Other Parts

This section describes the use of other parts.

● Notes for use

- Be sure to install the modular branch unit, modular relay unit, and the adapters for user interface devices or sensors in an outlet box or panel.
- Insert the modular plug into the modular jack until it clicks.
Lightly pull on the cable to check that it does not come out.

● Modular branch unit

This is used to branch the communication cable when two user interface devices are connected.

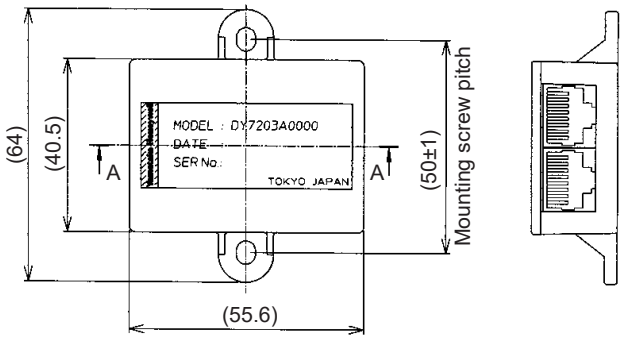


Figure 23. Modular branch unit (model DY7203A0000) (mm)

Note: Do not branch the RS-485 communication cable.
Branch wiring using model DY7203A0000 is prohibited.

● Modular relay unit

This is used to extend the communication cable by connecting it to another cable.

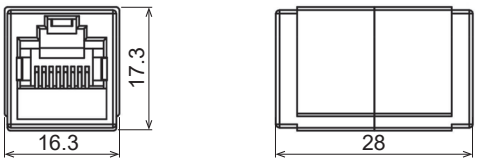


Figure 24. Modular relay unit (model DY7202A0000) (mm)

● Adapter for the user interface device

This is used to connect an analog setting device (with airflow change function).
If model QY7205C is connected, the adapter is not necessary.

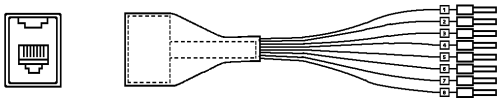


Figure 25. Adapter for the user interface device (model DY7204A0008)

● Sensor adapters

These are used to connect the temperature sensor if modular connectors are used.

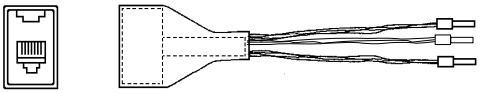


Figure 26. Sensor adapter for Pt100 (model DY7204A0003)

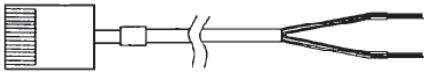


Figure 27. Short connector cable with two terminals for Pt1000 (model DY7221A)

● Modular plug

This is used to connect the cable to the modular jack.

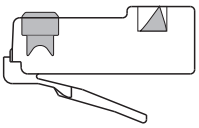


Figure 28. Modular plug (model DY7207A0100)

● Bracket (model 84513744-001)

When model WJ-1202W1000 FCU Controller is replaced with model WJ-1202W1001 controller, this bracket is used to install it using the existing screw holes.

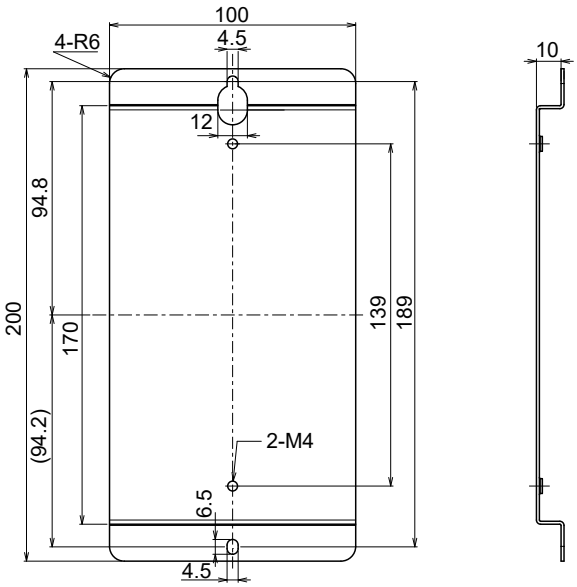


Figure 29. Bracket (model 84513744-001)

■ Tools

This section tells about tools that are available from us.

● Modular crimper

A tool for crimping a modular plug to a LAN cable.

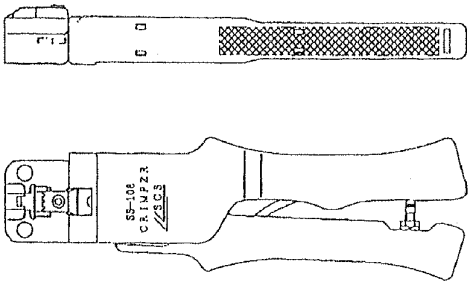


Figure 30. Modular crimper (model DY7205A0002)

● Modular cable tester

A tester tool that checks if a LAN cable and a modular plug are attached properly.

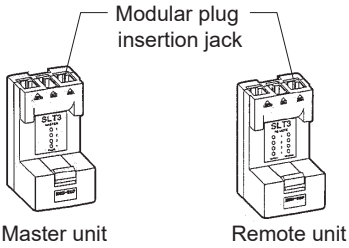


Figure 31. Modular cable tester (model DY7206A0000)

There are three modular jacks on the tester: USOC, 568A, and 568B.
To test a cable, insert the modular plugs into the 568B modular jacks on the tester's master and remote units. If the four green LEDs on the remote unit blink in order, wire assignment is successful.
If any of the LEDs does not light up, or if a red LED lights up, there is an error in wire assignment.

■ Software Details

(1/3)

Item	Function	Description	Remarks
Operation (Common to all types)	FCU ON/OFF	Turns on/ off the fan coil units using the central monitoring unit or user interface device. ON/OFF operation from the user interface device can be prohibited by the central monitoring unit.	For ON/OFF operation from the user interface device or the central monitoring unit, the latest command has priority.
	Setback operation	Changes the temperature setpoint by the previously set setback value only. Using the user interface device or the central monitoring unit, you can switch to setback operation.	For setback operation from the user interface device or the central monitoring unit, the latest command has priority.
	Temperature settings	Temperature settings can be changed from the user interface device or the central monitoring unit. Changing the temperature settings from the user interface device can be prohibited by the central monitoring unit.	When settings are changed from the user terminal or the central monitoring unit, the latest command has priority. The high/low limit settings on the user terminal can be specified by the central monitoring unit.
	Outdoor AHU → FCU ON/OFF	The fan coil unit will be turned ON/OFF linked with the ON/OFF of outdoor air handling units.	One General Controller can control up to 6 FCU Controller groups.
	FCU → Outdoor AHU ON/OFF	The outdoor air handling unit will be turned ON/OFF linked with the ON/OFF of the fan coil unit.	One General Controller can control up to 6 FCU Controller groups.
	ON/OFF linkage with general DI	The interlock or ON/OFF of the FCUs can be implemented in linkage with a general-purpose DI to the FCU Controller.	—
	ON/OFF linkage with general DO	The FCU Controller can send output to a general-purpose DO linked with the ON/OFF of fan coil units (or in addition to cooling/heating status).	—
Control (ON/OFF type)	Temperature control	Controls ON/OFF of valves so that the measured indoor temperature can be maintained at the setpoint.	—
	Airflow control	Controls multiple levels of fan airflow according to the measured indoor temperature measurement and the setpoint. For the levels, either “L, M, of H” or “L, M, H, or OFF” can be selected.	The airflow is controlled if airflow is set to AUTO. If airflow is directly selected from L, M, or H, the selected type of airflow is output.

(2/3)

Item	Function	Description	Remarks
Control (Proportional control or proportional control with return water temperature control)	Temperature control	Operates three-position valves by PID control so that the measured indoor temperature can be maintained at the setpoint.	—
	Noise control	In order to prevent the sound of water draining, the valve can be fully closed when the valve travel falls below a certain value.	—
	Airflow control	Controls multiple levels of fan airflow according to the measured indoor temperature measurement and the setpoint. For the levels, either “L, M, of H” or “L, M, H, or OFF” can be selected. Also, according to the application, “water-priority” or “airflow-priority” control can be provided.	The airflow is controlled if airflow is set to AUTO. If airflow is directly selected from L, M, or H, the selected airflow is output.
Control (Proportional control with return water temperature control)	Return water temperature control	Controls the valve travel using the return water temperature PI control and indoor temperature PID control, which makes the measured return water temperature maintain the specified setpoint so that the difference between supply and return water temperatures of the fan coil unit can be kept constant.	—
Control (Common to all types)	Cooling/heating changeover	If it is necessary to switch the cooling/heating mode, the central monitoring unit sends mode information on the following. Cooling, heating, fan (without cooling/heating), auto	One General Controller can control up to 16 FCU Controller groups.
	Mixing prevention control	For interior and perimeter air conditioning units with linked operation, this function prevents mixing loss by maintaining a setpoint deviation between them.	One VAV/FCU Controller (or one group) can be set for one FCU Controller (or one group).
	Supply air temperature optimization control for outdoor AHUs (supply air load/reset control)	Optimizes supply air temperature for outdoor air conditioning units based on the control state of FCU Controllers to deliver a comfortable indoor environment and to save energy.	One General Controller can control up to 6 FCU Controller groups.
	VWV or VWT control*2	By appropriately controlling the supply water pump according to the FCU load, the transport power can be reduced. Also, the efficiency of the chiller can be improved by appropriate chiller outlet temperature settings.	One General Controller can control up to 6 FCU Controller groups.
	Fan coil unit ON/OFF, valve travel, airflow linkage	Turns fan coil units ON/OFF, controls valve travel, and changes airflow linked with multiple fan coil units.	Do not operate the linked fan coil units using the user interface device. For proportional control valves with return water temperature control, each FCU Controller separately determines the needed valve travel through sharing of the indoor temperature control data that is used for calculating the valve travel.

(3/3)

Item	Function	Description	Remarks
Central monitoring function	Separate monitoring	Monitors the information below for each FCU Controller by the central monitoring unit. FCU ON/OFF, FCU failure, temperature measurement, temperature settings, specified high/low limits, setback deviation, airflow changeover, valve travel, cooling/heating changeover, control status*3, return water temperature, return water temperature settings, UT operational limitations, UT setting limitations (It is not necessary to monitor all items above.)	—
	Group monitoring*1	Monitors the information below for each group by the central monitoring unit. FCU ON/OFF, FCU failure, temperature measurement, temperature settings, specified high/low limits, setback deviation, return water temperature, return water temperature settings, UT operational limitations, UT setting limitations (It is not necessary to monitor all items above.)	One General Controller can set up to 25 FCU controller groups. One FCU controller cannot belong to multiple groups.
	Batch operation	By sending a command to the FCU Controllers in the same group, the central monitoring unit can force the valves to fully open/close. This helps pipe flushing operations.	One General Controller can control up to 6 FCU Controller groups.
Automatic ON/OFF function (only with proportional control or proportional control with return water temperature control) for standalone operation	ON/OFF	The fan coil unit automatically starts or stops according to the FCU power status detected by the FCU power monitoring circuit.	• When the FCU power changes from OFF to ON, the fan coil unit starts. • When the FCU power changes from ON to OFF, the fan coil unit stops (operating status can be set by parameters).
External contact input (Only proportional control or proportional control with return water temperature control)	Alarm input	The input value of DI1 is reflected at the alarm point: NML (0) when the DI1 contacts are open; ALM (1) when they are closed.	
	State input	The input value of DI2 is reflected at the general-purpose DI point: OFF (0) when the DI2 contacts are open; ON (1) when they are closed.	
Linkage functions by external contacts (Only proportional control or proportional control with return water temperature control)	ON/OFF or interlock by alarm input	When the alarm input is “ALM” the FCU stops. ON/OFF operation from the user interface device or the central monitoring unit can be prohibited.	
	ON/OFF or interlock by state input	When the state input is “OFF” the FCU stops or is set to setback operation. ON/OFF operation from the user interface device or the central monitoring unit can be prohibited.	

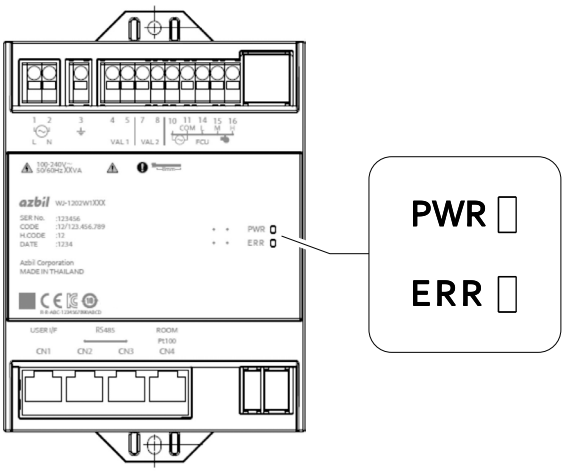
*1 The function of ON/OFF linkage with general-purpose DI (interlock) cannot be used for the FCU Controller connected to the user interface device that is used for group ON/OFF operation.
If used, the FCU Controller will stop its FCUs due to the general-purpose digital input, and through linked operation all of the FCU Controllers in the same group will stop their FCUs.

*2 VWV: variable water volume
VWT: variable water temperature

*3 The control state is an indicator of the FCU load status.
It is used for supply air temperature control for outdoor air conditioning units, VWV, or VWT control.

■ Indicators

● Product Status LEDs



Item	LED name	Color	State	Description
Power status	Power (PWR)	Green	Not lit	Power OFF
			Lit	Power ON
Abnormal status	Error (ERR)	Red	Not lit	No abnormalities
			Blinking (at 1.4 s intervals)	Minor failure
			Lit	Major failure, initializing
			Blinking (at 0.2 s intervals)	Communication error

Note: When power is first supplied or when the CPU is reset, the red LED lights up temporarily, but this does not indicate an error.

■ When Connecting Two User Interface Devices

A maximum of two Neopanel2 (model QJ-1301) or Neopanel (model QY7205) units can be connected.

- To connect them, a modular branch unit (model DY7203A0000) is required.
- The address number of the second Neopanel must be 2.
  Two Neopanels with address number 1 will not work correctly.
  The address number is printed on the shipping carton and on the nameplate inside the product (it can be seen after removing the base).

Note:

1. For ON/OFF operation and temperature settings, the latest operation has priority.
2. A Neopanel whose address is 2 does not have the temperature measuring function.

■ Handling

IMPORTANT	• If more than the rated voltage is accidentally applied to this product, replace the product with a new one. Failure to do so may cause device failure.

● Notes before power ON

- Check again that the wiring is done correctly.

■ Maintenance

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

⚠ CAUTION	
	Do not disassemble this product. Doing so may cause device failure.
	Before cleaning the product, 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 (including cleaning agents), solvents, etc., when removing dirt or dust from the product's surface.

■ Disposal

When this product is no longer needed, dispose of it as industrial waste in accordance with local regulations.
Do not reuse all or part of this product.

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■ For CE-Marked Products

Install this product where it is accessible only to people with sufficient knowledge concerning electrical equipment.
This product complies with the following harmonised standards of the Radio Equipment Directive (RED), the Electromagnetic Compatibility Directive (EMCD) and the Low Voltage Directive (LVD).
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

The model numbers of CE-certified products are WJ-1202W1_01, WJ-1202W2_ _1, and WJ-1202W3_ _1.

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Specifications are subject to change without notice.

Azbil Corporation
Building Systems Company

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