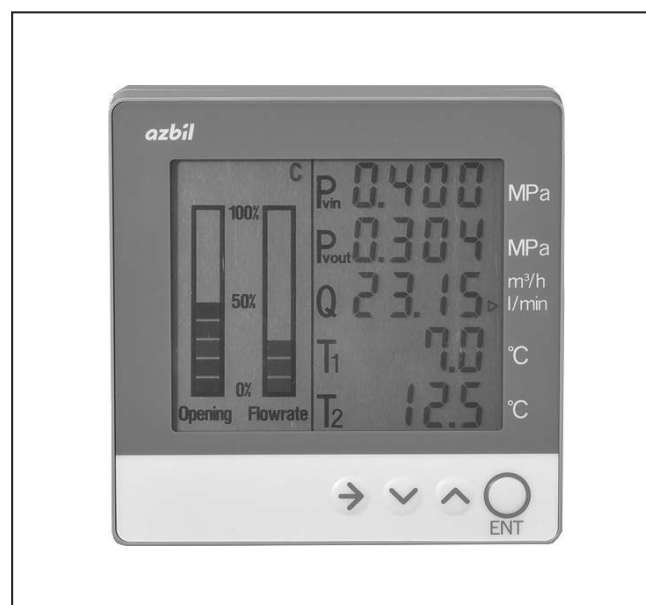


Display Panel for ACTIVAL+™ Modbus™ Protocol / Standalone Model

■ General

Display Panel Model QY5010S1000 is the data indicator for ACTIVAL+™. Display Panel displays data measured by Model FVY513_J/ FVY514_J/ FVY515_J (flow pressure, flow temperature, flow) and valve position.

Besides, the setting buttons on the Display Panel allow you to set and change various data.



■ Features

- Multiple data in a single display:
You can check flow temperature of AHU inlet/outlet, flow pressure of valve inlet/outlet, and flow measured by Model FVY513_J/FVY514_J/ FVY515_J and the valve position at one time.
- Installable 50 m away from Model FVY513_J/ FVY514_J/ FVY515_J:
Display panel is connected to Model FVY513_J/ FVY514_J/FVY515_J with JIS* VCTF cable (0.3 mm² × 4 cores), and max. cable length is 50 m.
- * JIS: Japanese Industrial Standards
- Continuous display:
Display Panel displays data all the time. You can thus check flow conditions and valve position at any time.
- Compact and lightweight:
Small and light body facilitates installation on an AHU panel or inside a control panel cabinet.
- Easy wiring:
Since Display Panel main unit is connected to the base plate with the connector inside, wiring to Display Panel is complete only by connecting the wires to the base plate.
- Parameter setting and error code check available:
Display Panel allows you to set parameters and check error codes of Model FVY513_J/ FVY514_J/FVY515_J.

Safety Precautions

Please read instructions carefully and use the product as specified in this manual. Be sure to keep this manual near by for ready 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.



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 6 years.



The design life specified for this product assumes that maintenance, such as replacement of the limited-life parts, is carried out properly. Refer to the section on maintenance in this manual.


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**


 Before wiring or maintenance, turn off the power to the product. Failure to do so might cause electric shock or device failure.


 CAUTION


 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-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.

 Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards. Mistakes in installation or wiring may cause fire or electric shock.

 All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.

 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 might cause device failure or overheating.

 Do not disassemble the product. Doing so might cause device failure.

■ System Configurations

● Connection example of Modbus Protocol

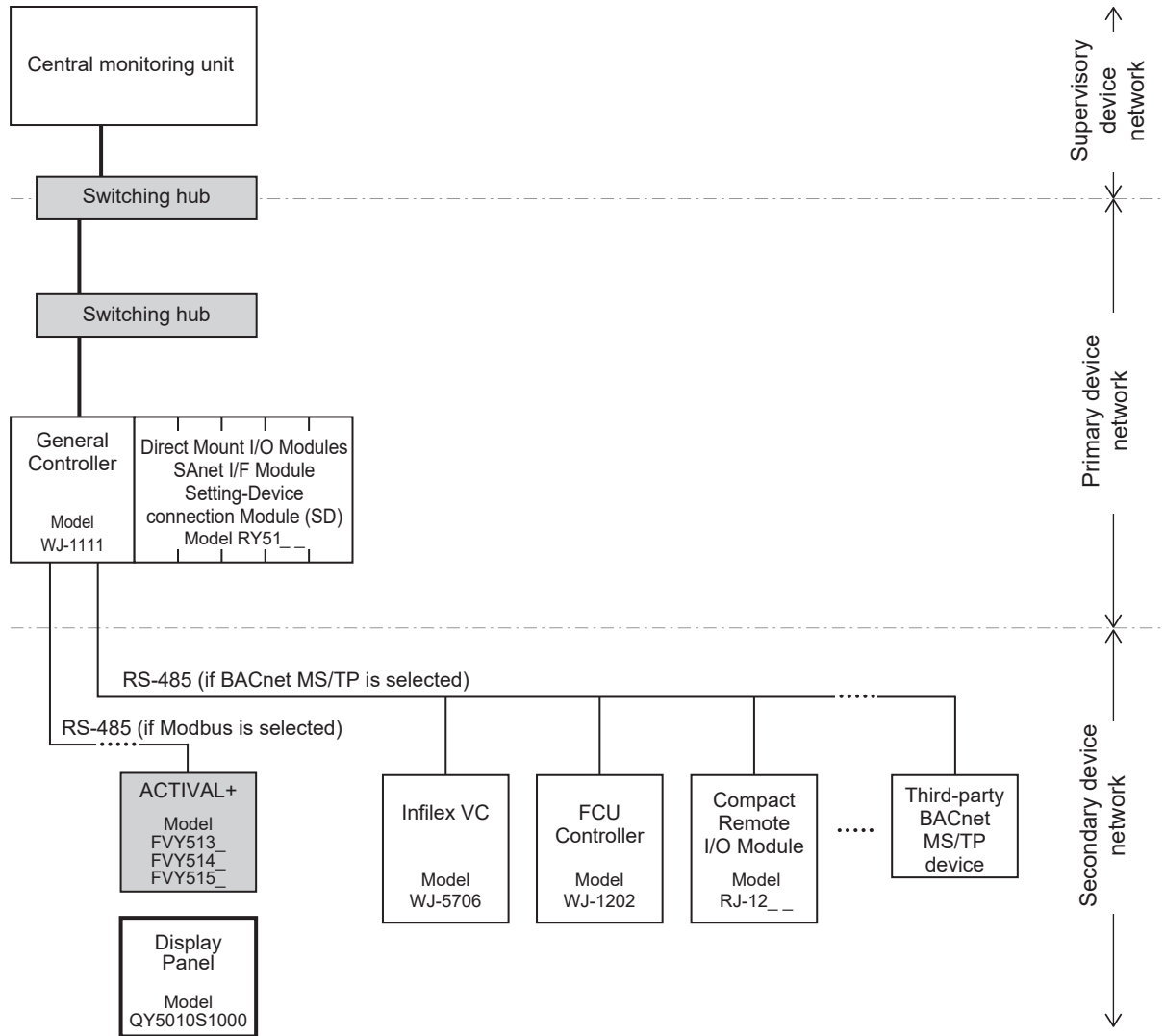


Figure 1. System configuration example: Modbus Protocol

Model Numbers

Model number		Description
QY5010		Base model number of Display Panel for Model FVY513_J/FVY514_J/FVY515_J
	S1000	Power supplied from Model FVY513_J/FVY514_J/FVY515_J

Specifications

Item		Specification	
Power supply		12 V DC ± 1 V (supplied from Model FVY513_J/FVY514_J/FVY515_J)	
Power consumption		Max. 0.1 VA	
Cable		JIS VCTF (0.3 mm ² × 4 cores) cable	
Environmental conditions	Rated operating condition* ¹	Ambient temperature	0 °C to 50 °C
		Ambient humidity	10 %RH to 85 %RH (non-condensing)
		Vibration	5.9 m/s ² (10 Hz to 150 Hz)
	Transport/storage conditions	Ambient temperature	-20 °C to 70 °C
		Ambient humidity	10 %RH to 85 %RH (non-condensing)
		Vibration (storage)	5.9 m/s ² (10 Hz to 150 Hz)
		Vibration (transport)	9.8 m/s ² (10 Hz to 150 Hz)
Enclosure rating		IEC IP40 (dustproof)	
Display* ²	Device	Liquid Crystal Display (LCD)	
	Items to display	Pvin	Valve inlet pressure (MPa or kPa)
		Pvout	Valve outlet pressure (MPa or kPa)
		Q	Actual flow (m ³ /h or l/min)
		T1	Coil inlet temperature (°C)
		T2	Coil outlet temperature (°C)
		HC	Heat/Cool
		E	Error
		Opening	Actual valve position (% in bar graph)
		Flowrate	Actual flow rate (% in bar graph)
Communication	Transmission system	AP-bus (RS-485 communication)	
	Transmission speed	4800 bps	
	Transmission distance	Max. 50 m	
	Number of Display Panel connectable	One per single Model FVY513_J/FVY514_J/FVY515_J	
Materials	Case	Modified polyphenylene ether (PPE)	
	Base plate	Modified polyphenylene ether (PPE)	
	Face plate	Polyester (PET)	
Accessory		• Two tapping screws (M4) for mounting • Two 'kPa' unit stickers	
Weight		150 g	

Notes:

*1 LCD service life may shorten if Display Panel is used in an environment with high temperature and humidity.

*2 For display accuracy, refer to specification data of Model FVY513_J/FVY514_J/FVY515_J.

Recommended Wire Specifications

Cable type	Wiring length
Flexible cable (Cabtire cable), 0.3 mm ² \times 4-core, dia. 4.5 mm to dia. 6.0 mm / JIS*3 VCTF cable, 0.3 mm ² \times 4-core, dia. 4.5 mm to dia. 6.0 mm. (Cable is not supplied with Display Panel.)	50 m

*3 JIS: Japanese Industrial Standards

Option

Item		Note
Waterproof box	Part No. 83170324-001	Required when Display Panel is installed outdoors.

■ Dimensions

● Outside dimensions

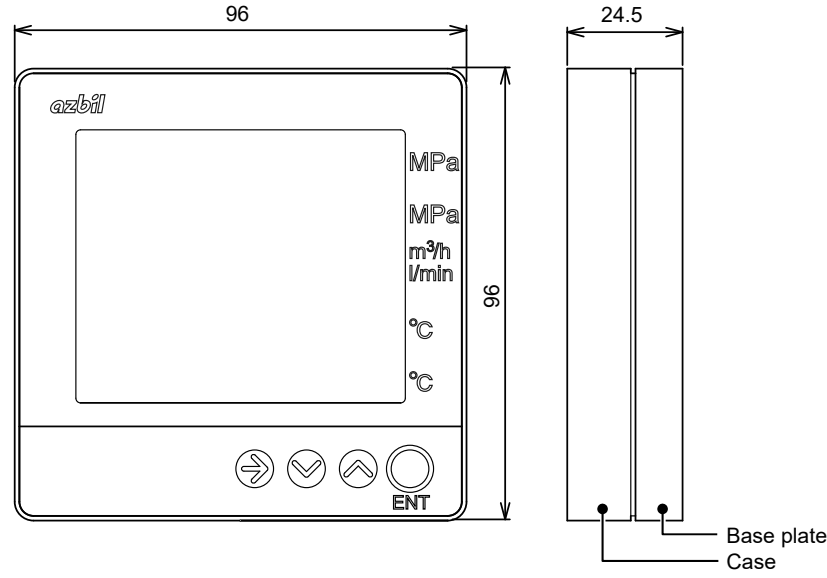


Figure 2. Outside dimensions (mm)

● Mounting dimensions of the base plate

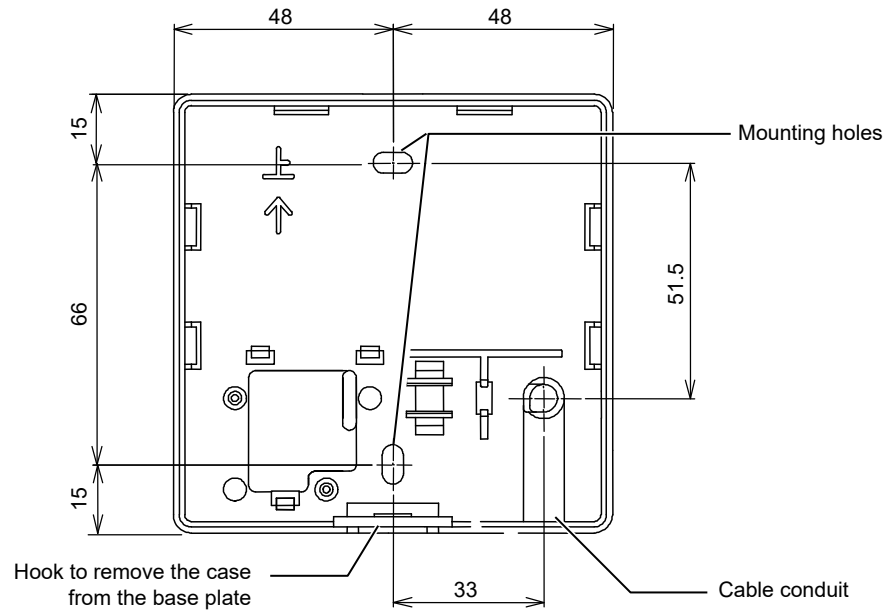


Figure 3. Mounting dimensions of the base plate (mm)

Parts Identification

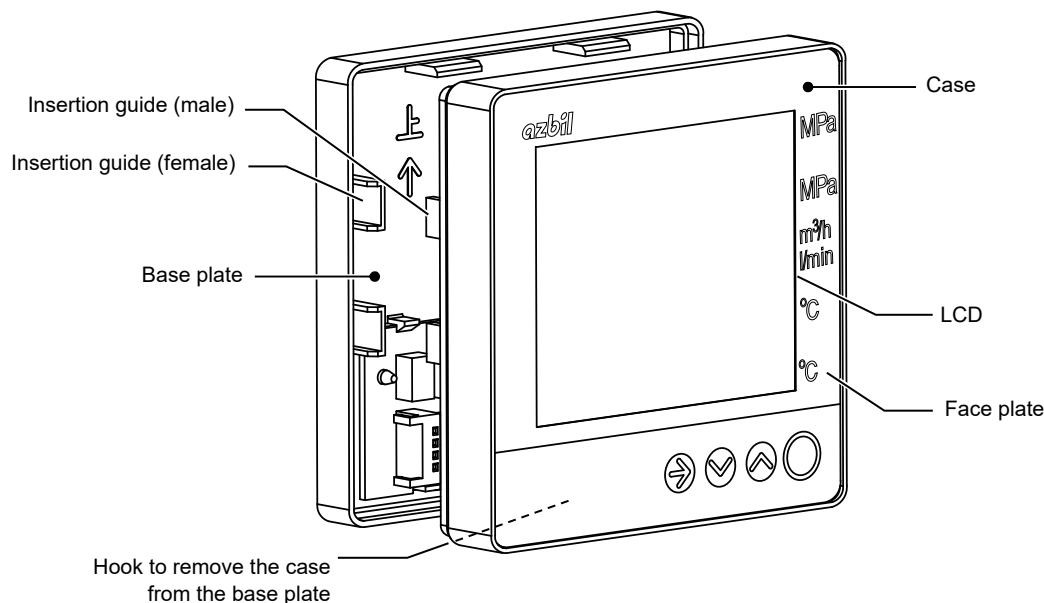


Figure 4. Parts identification

Items to be displayed on LCD

Analog values such as pressure, flow, and temperature are displayed on the LCD. Setting buttons set/change various parameters and display error description (when an error occurs). Be sure to enable the parameter setting (Parameter 60) before changing any parameters. For details, see AB-7044, *ACTIVAL + Modbus Protocol / Standalone Model Instruction Manual*.

(1) Analog values display screen

Analog values display screen appears on the LCD when you turn on the Display Panel.

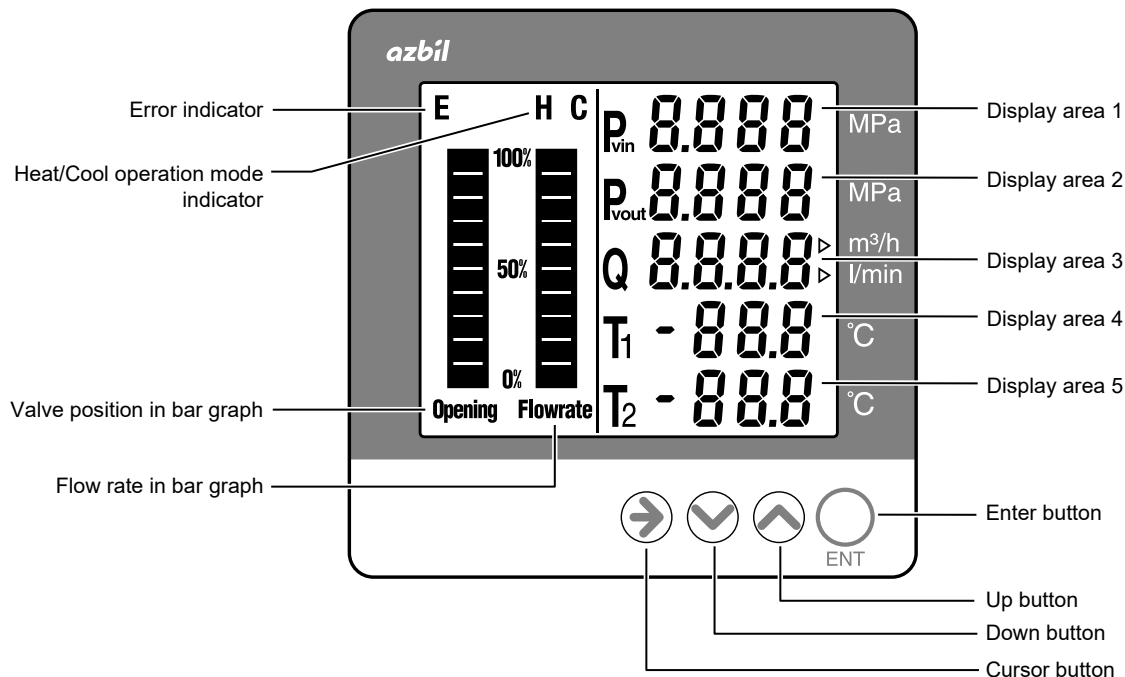


Figure 5. Analog values display screen

Display area	Item	Display range	Display range		Unit
			Display Panel connected to:	Range	
1	Pvin	Valve inlet pressure	Model FVY5130/FVY5140/FVY5150	0.000 to 1.100	MPa
				0 to 1100	kPa *1
			Model FVY5137/FVY5147/FVY5157	0.000 to 1.800	MPa
				0 to 1800	kPa *1
			Model FVY513E/FVY514E	0.000 to 2.200	MPa
				0 to 2200	kPa *1
2	Pvout	Valve outlet pressure	Model FVY5130/FVY5140/FVY5150	0.000 to 1.100	MPa
				0 to 1100	kPa *1
			Model FVY5137/FVY5147/FVY5157	0.000 to 1.800	MPa
				0 to 1800	kPa *1
			Model FVY513E/FVY514E	0.000 to 2.200	MPa
				0 to 2200	kPa *1
3	Q	Actual flow	0 to 9999		m ³ /h or l/min *2
4	T ₁	Coil inlet temperature	-10.0 to 99.9		°C
5	T ₂	Coil outlet temperature	-10.0 to 99.9		°C
Opening		Valve position indicated in a bar graph	0 to 100 (with every 10 % increment)		%
Flowrate		Flow indicated in a bar graph	0 to 100 (with every 10 % increment)		%
E		Error occurred ([E] flashes.)	—		—
H C		AHU operation mode ([H]: Heat / [C]: Cool)	—		—

*1 The unit of the valve inlet and outlet pressure is selectable between 'MPa' and 'kPa' by setting on the Display Panel (Model QY5010S). If you select 'kPa,' put the 'kPa' unit stickers supplied with the Display Panel.

*2 The unit of the actual flow is selectable between 'm³/h' and 'l/min' by setting on the Display Panel (Model QY5010S). The selected unit is indicated with [▷] mark on the display.

Setting buttons	Function
[→] Cursor button	Not used in the analog values display screen.
[V] Down button	Press this button to switch to the error display screen when the error indicator [E] flashes.
[^] Up button	Press this button to switch to the error display screen when the error indicator [E] flashes.
[ENT] Enter button	Press and hold this button to switch to the parameter setting screen.

(2) Parameter setting screen

Press and hold the [ENT] button to switch to the parameter setting screen from the analog values display screen.

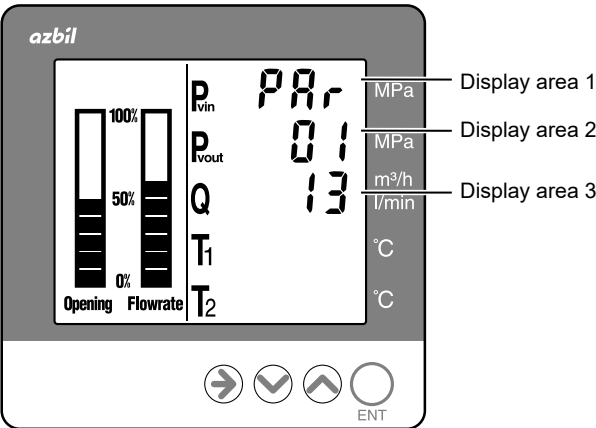


Figure 6. Parameter setting screen

Display area	Display item
1	Prr indicating the parameter setting screen
2	Parameter number
3	Current setpoint set for the parameter shown in the display area 2.
4	No item displayed
5	No item displayed

Setting buttons	Function
[→] Cursor button	Press this button to select the digit of the parameter number and of the setpoint. The selected digit flashes.
[v] Down button	Press this button to change the selected digit.
[^] Up button	Press this button to change the selected digit.
[ENT] Enter button	Press this button to finally set the changed parameter. Press and hold this button to go back to the analog values display screen.

Note:
No button operation for continuous 10 minutes on the parameter setting screen will automatically switch from the parameter setting screen to the analog values display screen.

(3) Error display screen

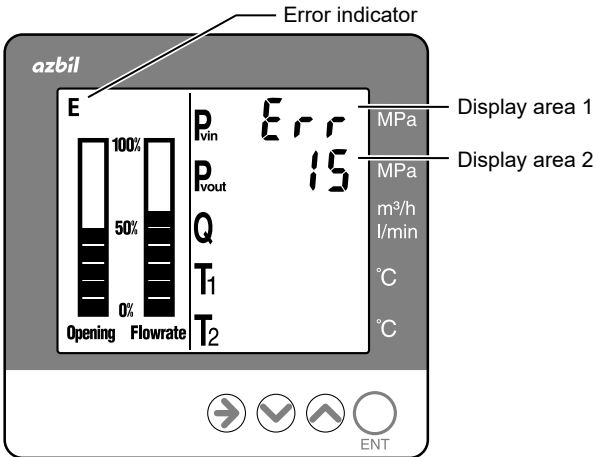


Figure 7. Error display screen

Display area	Display item
[E]	Error occurred
1	Err indicating the error display screen
2	Error code
3	No item displayed
4	No item displayed
5	No item displayed

Setting buttons	Function
[→] Cursor button	Not used in the error display screen.
[v] Down button	Press this button to go back to the analog values display screen.
[^] Up button	Press this button to go back to the analog values display screen.
[ENT] Enter button	Not used in the error display screen.

Note:
For details of the error codes, refer to AB-7044, *ACTIVAL + Modbus Protocol / Standalone Model Instruction Manual*.

■ Installation and Wiring

⚠ WARNING



Before wiring or maintenance, be sure to turn off the power to the product. Failure to do so might cause electric shock or device failure.

⚠ CAUTION



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



All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.

● Installation

IMPORTANT:

- Do not install this product in an atmosphere containing corrosive gas or explosive gas.
- Do not install this product in a location exposed to direct sunlight. Direct sunlight accelerates LCD degradation.
- Waterproof box (optional) is required for the product to be installed outdoors. Ask our sales personnel for the waterproof box.

- 1) Make two holes for two M4 tapping screws (one for upper and the other for lower sides) on a mounting location, such as an AHU side plate or a panel cabinet. Distance between the centers of upper and lower M4 screws is 66 ± 2 mm.
- 2) Lead the cable (connected to the base plate terminals) out of the base plate through the base plate conduit (on the bottom right), and mount the base plate on the mounting location with the two M4 tapping screws (accessory of Display Panel).

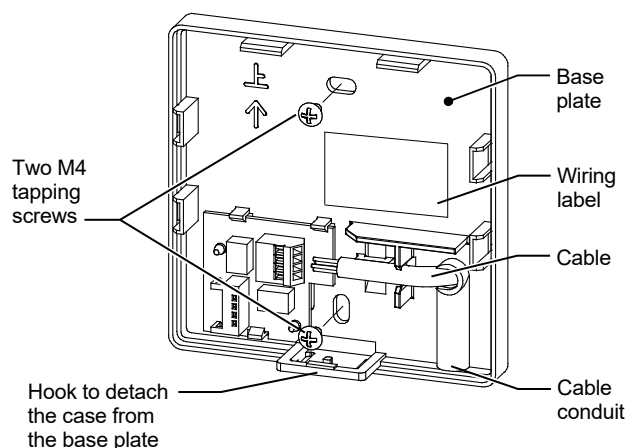


Figure 8. Mounting of the base plate with two M4 tapping screws

- 3) Assemble the case with the base plate by inserting the male insertion guide of the case into the female insertion guide of the base plate. Four insertion guides are provided on the right and left sides (Two on each side). Press the case well so that the case is completely assembled with the base plate. The case is connected to the base plate with the internal connector.

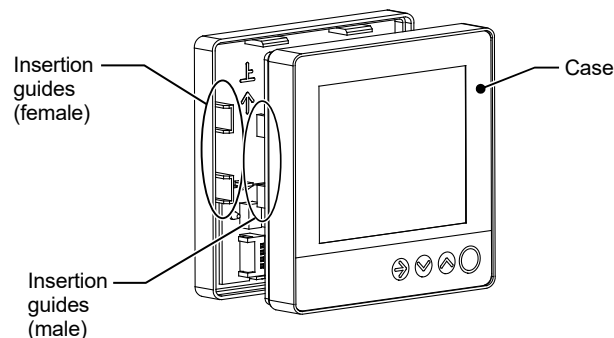


Figure 9. Case assembly with the base plate

- 4) Arrange the cable connected to Display Panel.
Cautions for arranging the cable:
 - Do not pull the cable.
 - To prevent water from flowing down to Display Panel through the cable, let the cable sag, as Figure 10 shows.
 - When installing Display Panel on an AHU side plate, seal the wiring hole on the AHU side plate, as Figure 10 shows. Damp or dew condensation may damage the Display Panel, otherwise.

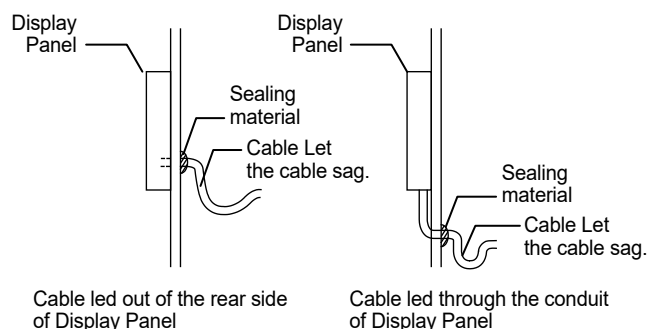


Figure 10. Cable arrangement

- 5) Film is attached to the front surface (face plate) of Display Panel for protection before shipment. Remove the film before activating Display Panel.

- 6) Display Panel is generally installed on a visible position such as on a wall in a machine room or on a control panel cabinet. However, it may possibly be installed outdoors or in a ceiling. In such a case, install the Display Panel as shown in Figure 11 and Figure 11. Consider the conditions and requirements of your Display Panel installation and decide the location.

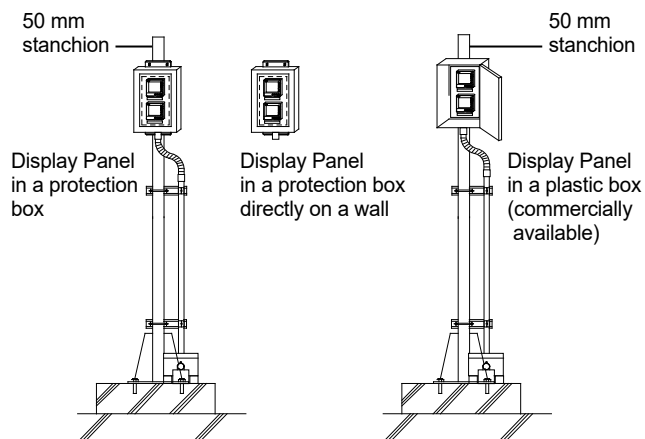


Figure 11. Display Panel installed outdoors (in a rainproof box)

If Display Panel needs to be installed in a ceiling, install it near the ceiling access panel. Mount Display Panel in a dustproof box to install in a dusty area in a ceiling.

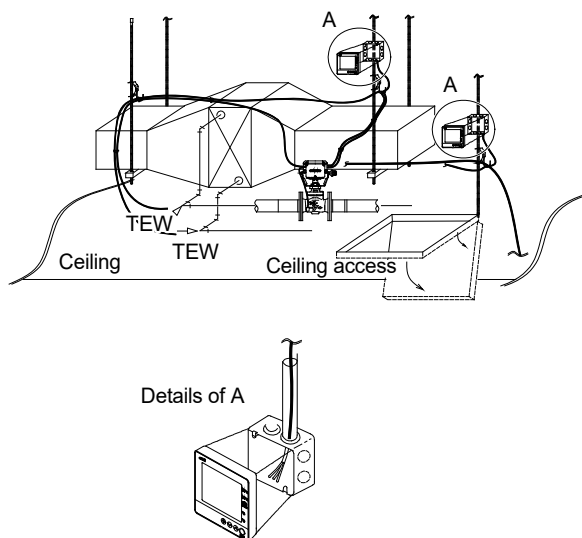


Figure 12. Display Panel installed in a ceiling

● Wiring

- 1) Press the hook on the bottom of the base plate and detach the case.
- 2) Use $\phi 5.5$ to $\phi 6.0$ mm cable (JIS VCTF ($0.3 \text{ mm}^2 \times 4$ cores) cable recommended) for connection. Strip 5 to 6 mm sheath of each lead wire. (See Figure 13.)
- 3) Refer to the wiring label (attached to the base plate) and insert stripped lead wires to each terminal.

Terminals arrangement

Terminal number	Type	Lead wire color*
1	12 V DC (+)	Red (RED)
2	0 V	Black (BLK)
3	AP-bus (+)	White (WHT)
4	AP-bus (-)	Green (GRN)

* Note: Lead wire color shown in the above table is the wire colors of the recommended cable.

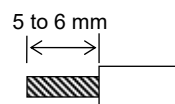


Figure 13. Sheath strip length

- 4) Lock each lead wire with lever lock provided on each terminal. Use a tool such as slotted screwdriver to slide the lever lock.

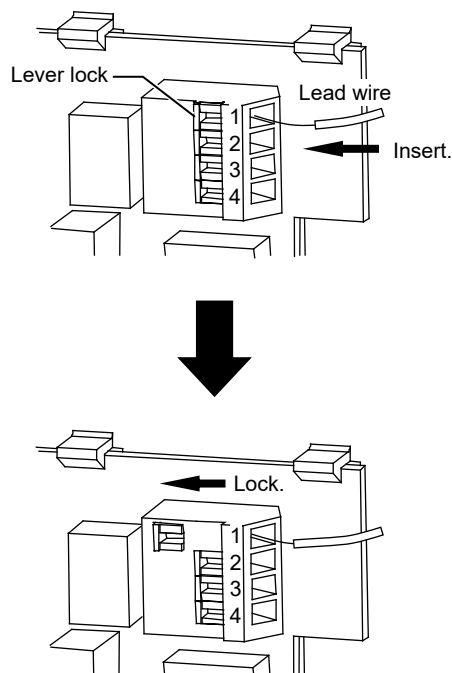


Figure 14. Lead wire connection

- 5) Insert the cable into the slit and fix the cable on the base plate with a cable tie.

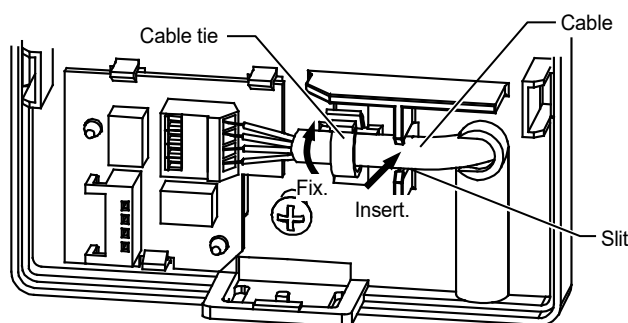


Figure 15. Cable fixed on the base plate

● Wiring to Model FVY513_J/FVY514_J/FVY515_J

IMPORTANT:

Do not pull the cable connected from the terminals of Display Panel to the terminals of Model FVY513_J/FVY514_J/FVY515_J.

Display Panel is used in combination with Model FVY513_J/FVY514_J/FVY515_J. To connect the cable to Model FVY513_J/FVY514_J/FVY515_J, refer to Specification/Installation of Model FVY513_J/FVY514_J/FVY515_J.

- AB-7408, *ACTIVAL + Modbus Protocol Model (PN16 / EN-GJL-200) Specifications/Instructions*
- AB-7042, *ACTIVAL + Standalone Model (JIS 10K / FC200) Specifications/Instructions*
- AB-7131, *ACTIVAL + Standalone Model (JIS 20K / SCPH2) Specifications/Instructions*

■ Maintenance

⚠ WARNING



Before maintenance, turn off the power to the product. Failure to do so might cause electric shock or device failure.

⚠ CAUTION



Do not disassemble the product. Doing so might cause device failure.

For replacement of Display Panel, whole unit must be replaced. Display Panel cannot be partially replaced.

● Care for the face plate

Clean the face plate with dry soft cloth. Never use detergent or organic solvent to clean the screen. Otherwise, LCD screen will get scratched, discolored, or deformed.

■ Disposal

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



This product complies with the following harmonised standards of the Electromagnetic Compatibility Directive (EMCD).

EMCD: EN 61326-1 Class A, Table 2 (for use in an industrial electromagnetic environment)

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Specifications are subject to change without notice.