Energy Measuring Unit Extension for the system with the same voltage

Energy Measuring Unit Extension for the system with the different voltage

Model EMU4-A2 / EMU4-VA2

User’s Manual (Digest)

Before using this unit, please read both this manual and Details carefully and pay attention to safety to handle this unit correctly.

1. Features

- This unit is an optional device dedicated to Energy Measuring Unit (ExTimeMeterPlus).
- Adding this unit enables measurement of multiple circuits.
- Model EMU4-V1A2 enables measurement of the system with the different voltages.

2. Checking package contents

This following items for this device and included in package. Check that no items are missing.

- (1) Energy Measuring unit unit
- (2) User’s Manual (Digest)

3. Safety Precautions

3.1 Precautions for Operating Environment and Conditions

This unit is designed and manufactured to operate in pollution degree 2 (Note) environment. When used in higher pollution degree, protect this unit from pollution on another device side to be incorporated.

Over voltage category of measuring circuit in this unit is Cat III (Note), and that of auxiliary power circuit (MA, MB) is Cat II (Note).

Do not use this product in the places listed below. Failure to follow the instruction may cause malfunctions and a life decrease of product.

- Places the Ambient temperature exceeds the range: 0 - 50°C.
- Altitude exceeds 2000m.
- Places in a strong electromagnetic field or places large amounts of external noise exist.
- Places exposed to direct sunlight.
- Places exposed to oil or water drop.
- Places the rain humidity exceeds the range 30-95% or placed with dew.

This unit is the open type device, which are designed to be housed within another device for prevention of electric shock. House this unit within the device such as the control panel before use. (Indoor use)

For the precautions of the completeness of the system incorporating this unit with the EMC Directives, refer to the User’s Manual (Digest). (Note) For the definition of the pollution degree and the over voltage category, refer to EN61010-1/2010.

3.2 Matters concerning the precaution before use

- Use the unit in the specified usage environment and condition.
- To use this unit, Base unit (EMU4-EM1-MB, EMU4-AM1-MB, EMU4-LG1-MB) is necessary. As for Base unit, refer to User’s manual (Details) of each Base unit.
- To use this unit, dedicated small-size display unit (EMU4-D65) is necessary. For the setting method, refer to User’s manual (Details) of the display unit.

3.3 Installation and Wiring Precautions

- Shut off the external power supply for the unit in all phases before installing or wiring. Failure to do so may cause an electric shock or damage of the unit.
- Work under the electric outage condition when installing and wiring. Failure to do so may cause a electric shock, a failure of the unit, a fire etc.

4. Name and function of each part

4.1 Name of each part

(1) EMU4-A2
(2) EMU4-VA2
(3) Back and right side (common to EMU4-A2 and EMU4-VA2)

4.2 Indications and functions of LEDs

The names and operations of LEDs are as follows

- **ALM. B1 LED**: Red Indicate occurrence status of upper/lower limit alert of the circuit B1.
- **OFF**: No alert
- **ON**: An error occurs (Note 1)
- **OFF**: Halting measurement
- **ON**: An error occurs (Note 1)
- **OFF**: Power off or hardware failure (Note 1)
- **ON**: An error occurs (Note 1)

4.3 Connecting to Base unit

(1) Peel the black label on the right side of the Base unit.
(2) Insert the connector (male) of the Extension unit connecting to SENSOR A.
(3) Slide connection hooks (green-colored) on the top part of the module.
(4) Pull IEC rail fixture downward and attach to the rail fixture in the module slowly and carefully.

4.4 Attaching and removing wire

5. Precautions for Use

6. Maintenance Precautions

6.1 Mounting on IEC rail

6.2 Mounting on JIS agreement type attachment

7. Troubleshooting

- **(Note)** For details, refer to Chapter 4 “Error codes” of “User’s Manual (Details)”. (Note) For the single-phase 2-wire system, in the case of measuring two circuits in one terminal block, these indicate the measuring status of the circuit A2 or B2. (See Figure 4-2)

Warning: When working the electric outage condition while connecting or disconnecting Extension units. Failure to do so may cause electric shock. A failure of the unit, a fire etc.

- **(Note 1)** Failure to follow the instruction may cause a failure and reduced life of the unit.
- **(Note 2)** For the single-phase 2-wire system, in the case of measuring two circuits in one terminal block, these indicate the measuring status of the circuit A2 or B2.

- **(Note)** For the definition of the pollution degree and the over voltage category, refer to EN61010-1/2010.

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7. How to wire

7.1 Wiring

Follow the wiring diagram for external connections of this unit.

To use this unit, Base unit: EMU4-BM1-14B, EMU4-HM1-MB, EMU4-GL1-MB is necessary.

When using this unit, current sensor (EMU-CT400, EMU-CT600, EMU-CT400-A, EMU-CT600-A) is necessary (Note 1) Fuse: P405H (by Daito Communication Apparatus Co., Ltd) equivalent.

For the other examples, refer to "User's Manual (Detail)".

7.2 How to connect wires

• Insert a wire to the terminal all the way until it touches the end.

<Voltage input terminals, External input/output terminals>

• Use appropriate crimp-type terminal.

Note 1: Use stranded wire. AWG20-16 (0.5 - 1.25mm²) for the different voltage system.

For the different voltage system

Stranded wire: AWG22-16 (0.3–1.25mm²)

Single wire: AWG22-16 (0.3–1.25mm²)

• Use electric wires as below, and tighten the terminal screws by the torque as below.

Maximum voltage of the circuit connected to EMU4-VA2 is 277 / 480V. For the circuit over this voltage, use the transformer. Using the transformer, primary voltage is configurable up to 11000V. Secondary voltage is fixed to 110V. (Special primary voltage of VT can be set up to 11000V in any, and special secondary voltage of VT can be set up to 520V in any.)

For MODBUS® communication, use of MODBUS® communication wirings is possible.

For the actual usage, connect the FG terminal to ground. (D-type ground: Type 3) Connect it directly to the ground terminal.

- For the inductive, connect the FG terminal to the ground terminal. (Single ground type) Connect directly to the ground terminal.

- Do not connect to 5V terminal during the installation wiring and previous test. Refer to "User's manual (Detail)" Chapter 12 'Specifications' for the applying place.

- The current sensors dedicated to this unit EMU-CT400/600 resemble the split current transformer for general gauges CW-5SL closely in appearance. However, characteristics are completely different. Be sure to connect the dedicated current sensor. Connecting CW-5SL to the unit directly may cause failure of the device, a burn or a fire.

- Maximum voltage of the circuit connected to EMU4-VA2 is 220V / 440V AC.

EMU-CT*** and EMU-CT***-A are used only for low voltage circuit. (Maximum voltage: 460V) It cannot be used for a high voltage circuit. EMU2-CT5 and EMU2-CT5-4W are extendable up to 11 m, using together with an extension cable. To extend the wire further, use the current transformer CW-5S(L) for EMU2-CT5 and EMU2-CT5-4W.

In case using stranded wire, take measures so that the filament should not vary by using a bar terminal or by processing the point twisted.

Strip length of the used wire in use has to be 10 to 11mm.

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