MITSUBISHI ELECTRIC

CURRENT SENSOR
MODEL EMU-CT400-A, EMU-CT600-A
INSTRUCTION MANUAL

・EMU-CT400-A / EMU-CT600-A is split current sensor for energy measuring unit.
・Read this manual thoroughly before using the equipment for proper handling.
・This manual should be retained for the future reference.
・Be sure that the manual is delivered to the end users.
・The following items for this device are included in package. Check that no items are missing.
(1)Split current sensor x1 (2)Instruction manual x1

If you are considering using this unit for special purpose such as nuclear power plants, aerospace, medical care, or passenger vehicles, please refer to our sales representative.

1. Safety Precautions

1.1 Precautions concerning working environment and conditions

Do not use the unit in any of the following places. Doing so may cause malfunctions or a reduction in service life.

・Places where the ambient temperature exceeds the working temperature range(-5°C to +55°C).
・Places where the humidity exceeds the humidity range (30% to 85%RH) or where condensation occurs.
・Places with a lot of dust, corrosive gas, salt or oily smoke.
・Places where the unit may be exposed to rain or drops of water.
・Places where metal pieces or inductive substances are laying around.
・Places where the daily average temperature exceeds +35°C.
・Places with a lot of vibration or impacts.
・Places exposed to direct sunlight.
・Places where the out of the cabinet.
・Places with strong electromagnetic field or noise.
・Place where the altitude exceeds 2000m.

1.2 Precautions concerning preparations before using the equipment

・Use the unit in the specified usage environment and conditions.
・Check the current and voltage ratings of the equipment.

1.3 Precautions concerning installation and connection

Make sure to use the module by following cautions of this section.

⚠ Danger	・ Perform installation, disassembly, the wiring work after intercepting a power supply by all means . There might be the damage of an electric shock or the product. (⚠) ・ Do not install around non-insulated dangerous electric shock conductors that can cause electric shock, electric burn or arc flash . (⚠)

⚠ Caution	<Precautions concerning installation and connection> ・ Any person who is involved in the installation and the wiring of this Programmable Controller should be fully competent to do the work. ・ Use an electric wire of the size of penetrating this current sensor for a primary side cable, do not use a non-insulation electric wire or a metal for a primary cable. ・ When threading and wiring, take utmost care that cuttings and wire pieces do not enter the equipment. ・ Connect the wires carefully, checking the wiring diagram. Incorrect wiring can cause unit failures, fires, and electric shocks. ・ Perform wiring work with current off and do not perform live wire operations. Doing so can cause electric shocks, unit failures, and fires. ・ After tightening, be sure to check that all screws have been tightened. Failure to tighten any screw can cause unit malfunctions, fires, and electric shocks. ・ Use the M3 screws crimp type terminals (less than external form 7.2mm) appropriate for which is suitable for electric wiresize (1.25mm^2). The use of the infelicity causes malfunction of the machinery, trouble, a damage by a fire, the fire by outbreak of the poor disconnection and contact. ・ UL／c-UL listed corresponds, use the wires according to the following conditions and UL-listed crimp type terminals. Single wire：AWG24 to AWG18, Stranded wire：AWG20 to AWG18 ・ +75°C copper conductor only. ・ Confirm that a terminal is closed surely. The lack of clamping causes malfunction of the machinery, a fire, the electric shock. ・ Carry out the clamping of the crimp-type terminal lugs by prescribed torque (0.49 to 0.78N・m). The excessive clamping becomes the ruination of the terminal and the screw. ・ Keep the second terminals 1cm or more away from the panel and the first conductor. ・ Read the manual of measuring units which is used with this current sensor , and is used well, and follow it. ・ Use this current sensor in cabinet certainly. <To avoid getting shock> ・ As for the panel, it be assumed that it was given the following matters. a) It is necessary to attach a key to the cabinet. b) The structure that a power supply is intercepted automatically is necessary when opening a cabinet. ・ Degrees of protection (IP code) needs to higher than IP2X level. <Precautions concerning usage> ・ Dust or rust on the split part can degrade the performance of the current transformer . Wipe the dirt from the surface with soft dry cloth. ・ Use the unit within the rated range stated here. Using the unit out of the rated range may cause not only malfunctions or unit failure, but also fires or burnout. ・ The secondary side of the current sensor has a built-in protective circuit against opening of the secondary terminal. No problem occurs by opening the terminal during wiring work. However, for safety, do not continuously apply current while the terminal is open.

1.4 Precautions concerning maintenance

⚠ Caution	・Protect the unit from a power failure. Failure to do so can cause unit failures, fires, or electric shocks. ・Wipe off the surface dirt with tender cloth. Don't let chemical cloths touch it for a long time, and do not wipe it with benzine or thinner.

1.5 Precautions concerning inspection

⚠ Caution	・Perform the check in the state that does not turn on electricity by all means. Check out the following. a) Does not this product have the damage? b) Are not there an abnormal sound, bad-smelling fever? c) Are not there installation, the slack of the screw?

1.6 Precautions concerning storage

●When storing the unit, turn off power, disconnect cables and wires, and put them in vinyl bags or the like.
●When storing the unit for a long time, avoid keeping it in the places shown below.

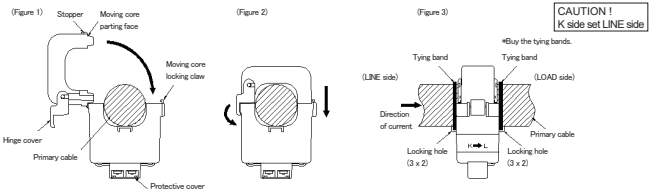
・ Places where the ambient temperature is out of the range from -10°C to +60°C.
・ Places where the humidity exceeds the humidity range (5% to 95%RH) or where condensation occurs.
・ Places where metallic particles or inductive substances are laying around.
・ Places where the unit is exposed directly to rain, water droplets.
・ Places where the daily average temperature exceeds +35°C.
・ Places with a lot of vibration or impact.
・ Places with a lot of dust, corrosive gas, salt or oily smoke.

1.7 Precautions concerning disposal

Dispose this product appropriately in accordance with the national or community rule. (Refer to 3.1 WEEE Directive.)

2. Installation

●Installation



1) Press the locking claw of the moving core, please open the moving core by removing the engagement (Figure 1). At this time, the hinge cover opens automatically. Before inserting the cable, check the symbols K and L to fit the current sensor in the correct direction. (The direction from the power supply side to the load side is indicated with →.) (Figure 3)

2) After checking that the core parting faces are free from dirt, close the moving core. Push down the moving core until the stoppers are securely locked. (Locking claw of the moving core is applied to the stopper, you hear click.) After the stopper is securely locked, close the hinge cover. (Figure 2)

3) Pass the tying bands into the current sensor locking holes to secure the sensor with the cable.(Figure 3)

*For the details, see the manual for combination measurement unit.

*Applicable wire size in the table of specification is the normal sectional areas of 600V vinyl-coated cable. These values are the standard nominal sectional areas. These electric wires may not pass through the sensor owing to the error of the outer diameters of vinyl insulators finished by manufacturers or deformation (bending) of the wires. Check the wire on site.

●Connection

・For the details, see the manual for the combination measurement unit.
・See the manual, please wire the polarity (Power supply side, Load side), 1 side (R phase), 2 side (S phase), 3 side (T phase) and the polarity (k, l) of the secondary side of the CT to the k, l terminal of the measuring unit.

3. Specification

Model	EMU-CT400-A	EMU-CT600-A
Rated primary current	400A AC～	600A AC～
Maximum voltage (voltage to ground / line voltage)*	266V/460V AC～	
Frequency	45 to 65Hz	
Ratio error	±1% (5% to 100%of rating, RL≦10Ω)	
Phase displacement	±1.2c rad (5% to 100%of rating, RL≦10Ω)	
Measurement (installation) category	CAT Ⅲ	
Pollution degree	2	
applicable wire size (reference)	IV wire: 500mm^2	
Working temperature range	-5℃ to +55℃ (daily mean temperature: +35℃ or less)	
Working humidity range	30% to 85%RH (no condensation)	
UL／c-UL conformity combination unit	This sensor confirm UL/c-UL in a condition to make combination use with Mitsubishi MELSEC-Q series programmable controllers Energy Measuring Unit (Models QE81WH, QE81WH4W, QE84WH and QE83WH4W). When EMU-CT400-A and EMU-CT600-A is combined with EcoMonitorLight (Model:EMU4-BD1-MB, EMU4-HD1-MB), EcoMonitorPlus (Model:EMU4-BM1-MB, EMU4-HM1-MB,EMU4-A2,EMU4-VA2), and Mitsubishi MELSEC iQ-Rseries programmable controllers Energy Measuring Unit (Model RE81WH), it is necessary to confirm compatibility with an end product.	
CE marking and UKCA marking conformity standard	EN61010-2-032	

*Please check the maximum voltage for the combination measurement unit.

⚠ Caution	<Usage as the CE marking and UKCA marking conformity article> ・Use in the environment with the pollution degree 2 or less. ・Install the current sensor to the secondary of the circuit breaker. ・Install the current sensor in the cabinet. ・Use the PVC insulation electric wire.(less than heat-resistant temperature +70℃,the rating voltage 300V class.)

3.1 WEEE Directive

This symbol mark is for EU countries only. This symbol mark is according to the directive 2012/19/EU Article 14 Information for users and Annex IX. This symbol means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from your household waste.

4. Contained harmful substances

(1) 电器电子产品有害物质限制使用标识

根据《电器电子产品有害物质限制使用管理办法》，该标记适用于在中国销售的电器电子产品，其中的数字为产品的环保使用期限。

只要遵守本产品在安全和使用方面的注意事项，从生产日算起的环保使用期限内不会造成环境污染或对人体、财产产生深刻的影响。

注) 产品正常使用废弃后，应按照国家和地方的法律法规完成该电器电子产品的回收和再利用。

(2) 产品中有害物质的名称及含量

本产品中所含有的 6 种有害物质的名称、含有信息及含有部件如右表所示。

产品中有害物质的名称及含量

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
核心	○	○	○	○	○	○
内部导点	×	○	○	○	○	○
箱子	○	○	○	○	○	○
端子盖	○	○	○	○	○	○
螺钉	○	○	○	○	○	○
铭牌	○	○	○	○	○	○
接线	○	○	○	○	○	○
接线皮	○	○	○	○	○	○

本表格依据 SJ/T11364 的规定编制。

○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。

×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T26572规定的限量要求。且虽然目前业界没有成熟的替代方案，但是符合欧盟RoHS指令要求。

5. Customer Service

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: TOKYO BUILDING, 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, Japan

Please refer to "catalog" or "user's manual (Details)" for more detail.