MITSUBISHI ELECTRIC

Changes for the Better

for a greener tomorrow

Programmable Logic Controller
MELSEC-Q Series
Energy Measuring Module / Insulation Monitoring Module

MELSEC Q Series

e&ecoFactory

Improving productivity and reducing cost by visualizing energy information.

MELSEC-Q Series

Energy Measuring Module / Insulation Monitoring Module

Energy conservation has become an extremely important issue in light of the various energy issues facing the world.
A vital element of these energy-saving efforts is measuring power to create a system where energy use is visible. Power consumption is now measured not only in terms of incoming power and at the distribution panel but also at specific points such as feeders and individual devices. The energy data collected is then used to detect and eliminate waste, and achieve more efficient use of power. Mitsubishi Electric's MELSEC-Q Series energy measuring module/insulation monitoring module enable detailed energy management through performing various energy measurements onsite with the flexibility to suit various production facilities.
Through combining the energy data with production data of a programmable logic controller (PLC), management based on specific power consumption is also possible. This kind of productivity-focused energy management creates a platform for full-scale energy-saving measures which can assist in removing inefficiencies in use of power during operations and enhancing productivity.

New Solutions through Energy Measurements

Our energy measuring solutions create new solutions through preventive maintenance and quality control. Preventive maintenance, or in other words, performing maintenance before a serious problem occurs, is enabled through constantly monitoring current and voltage and using alarms based on upper/lower limit error values to alert personnel to problems. Quality control is achieved through immediate detection of power or voltage-based faults to restrict damage and stop the flow of defective products along the production line.
Our insulation monitoring module support safety of the production site and equipment through monitoring leakage currents and the insulation state of individual devices to assist in preventing faults and production line stoppages.

Energy Saving

Preventive Maintenance

Quality Management

Management of Specific Consumption

MELSEC-Q Series

Energy Measuring module

Features

- Simple method of measuring various energy data
- Energy data can be linked with production data to enable management based on specific energy consumption
- Facilitates preventive maintenance and quality control through energy measurements that detect faults/problems at an early stage
- Wide range of models available to match phase/wire type and number of circuits

QE81WH
(3-phase 3-wire, single circuit)

QE84WH
(3-phase 3-wire, 4 circuits)

QE81WH4W
(3-phase 4-wire, single circuit)

QE83WH4W
(3-phase 4-wire, 3 circuits)

Insulation Monitoring Module

QE82LG
(Leakage current, 3-phase 3-wire, 2 circuits)

Features

- Measure leakage currents in equipment units and constantly monitor insulation deterioration to prevent problems
- No need to disconnect wires to measure insulation resistance, greatly reducing maintenance time
- Accurately identify insulation deterioration using the I_{or} method
- Link with PLC to make onsite energy use visible and support immediate responses when a problem occurs

Space Saving
Simply insert the module into an empty slot in the PLC to enable energy measurements without affecting the layout of devices in the control panel.

Visible Energy Use
Install the module in a PLC and then display the information on computers and displays to create a system where energy use is highly visible.

Reduced Wiring and Set-up Work
No communication module or cable is required, realizing reduced wiring. Set-up is simplified as well through use of the GX Works2 software.

Effective Solution for Manufacturing Equipment
Combine energy data with production data from the PLC to monitor the productivity and status of manufacturing equipment.

e&ecoFactory
Improving productivity and reducing cost by visualizing energy information.

Contents

Energy Measuring Module Measure Various Energy Data Easily: Simply Insert Directly into PLC Slot

■Line-up


QE81WH


QE84WH


QE81WH4W

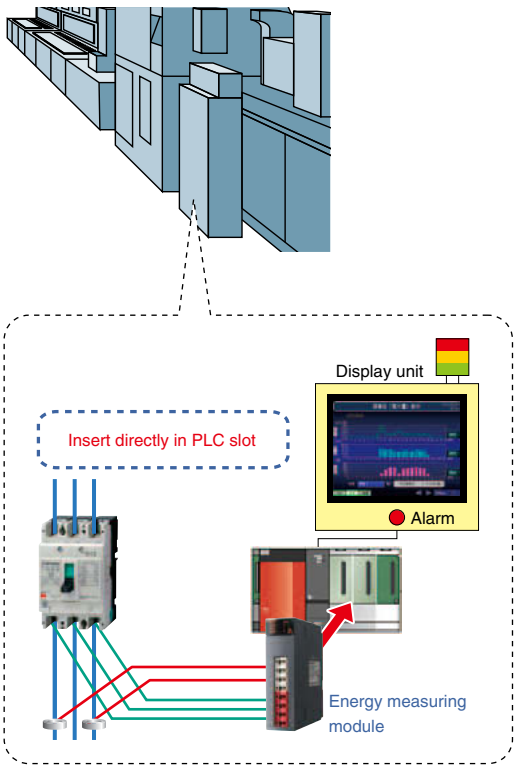

QE83WH4W

General specifications

	Energy measuring module			
Model name	QE81WH	QE84WH	QE81WH4W	QE83WH4W
Phase Wire system	Single-phase 2-wire, single-phase 3-wire, 3-phase 3-wire		3-phase 4-wire*	
Measurement items	Electric energy (consumption, regenerative), reactive energy, current, voltage, power factor, frequency, etc.			
No. of measurement circuits	1	4	1	3

*A voltage converter (QE8WH4VT) is always required when use for 3-phase 4-wire circuit.

Usage Diagram



Insert into MELSEC-Q PLC

Modules can be inserted directly into a MELSEC-Q PLC, removing the need for a separate communication module or cable and realizing energy measurements with reduced wiring and set-up work. In addition, productivity-based energy management is possible through linking production data to detailed data on the energy use of manufacturing equipment.

Simplified Measurement of Various Energy Data

Energy measuring module can be used for diverse applications as they enable measurements of current, voltage and power consumption as well as other items such as frequency, power factor and reactive power. Choose from our extensive line-up designed for various circuits and phase/wire types.

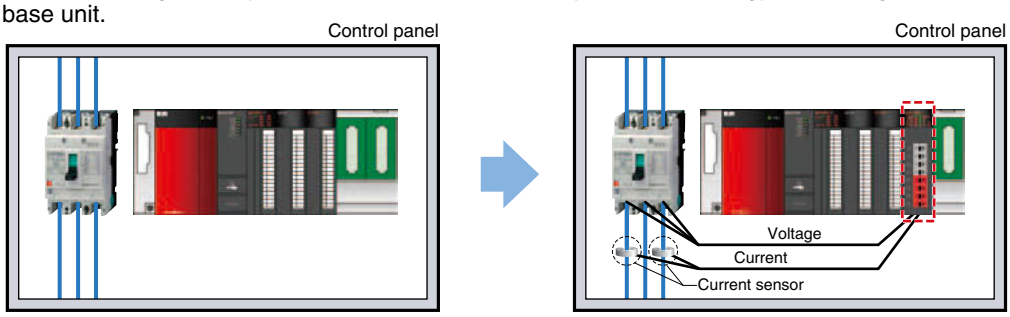
Use Energy Data Effectively for Preventive Maintenance and Quality Control

Power-based faults in production equipment and quality defects can be detected through measuring energy data. This enables onsite personnel to take actions in advance and effectively manage maintenance and quality.

Energy Measuring Module Directly Installable in PLC Slot

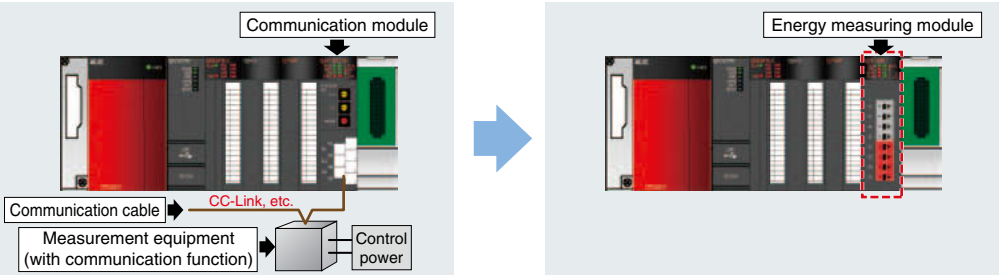
Feature 1 No Additional Space Required

- There is no need to change the layout of the control panel; simply insert the energy measuring module into an open slot of the base unit.



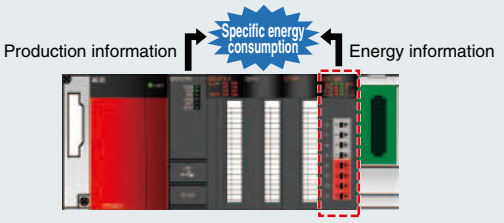
Feature 2 Less Wiring and Set-up Work

- Previously, installing an energy measuring device required a communication unit, cable and creation of a communication program. The energy measuring module eliminates this need, realizing reduced wiring and workload as well as lower costs.



Feature 3 High-speed (250ms or 500ms), Detailed Energy Measurements

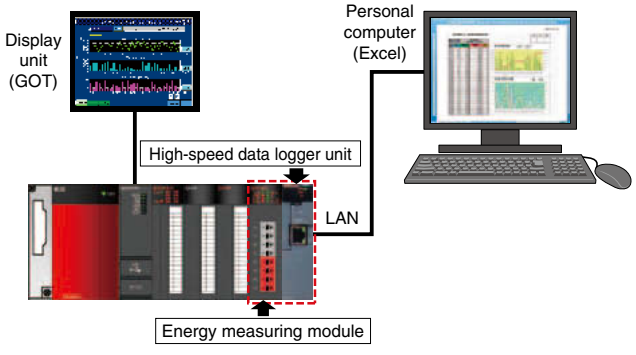
- Specific energy consumption*1 can be calculated by combining the production data of the PLC's CPU and the energy data of the energy measuring module.
- The data is collected at the high speed of 250ms (single circuit models) or 500ms (multi-circuit models) and stored in a buffer memory, supporting detailed management of specific energy consumption.
- In the current measurement mode of multi-circuit models, the module can measure the current on 8 circuits.



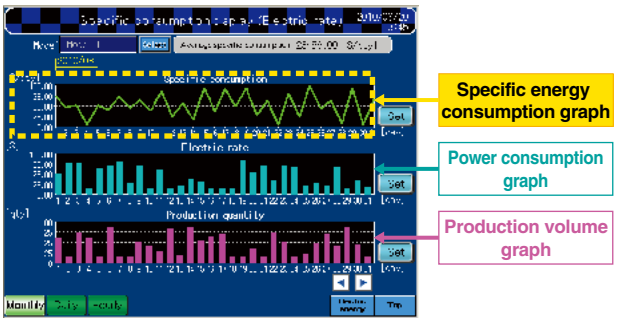
*1: Specific energy consumption is equal to energy consumption divided by production volume. It is a measure of energy productivity. Improving specific energy consumption leads to improvements in productivity.

Feature 4 Simple Visualization of Energy Use

- Visualization of the specific energy consumption can be easily achieved through use of a graphic operation terminal*2 (GOT) installed on the control panel at the manufacturing site.
- Analysis is also possible using a computer combined with a high-speed data logger unit (QD81DL96).*2



Example of graphic display of specific energy consumption with GOT

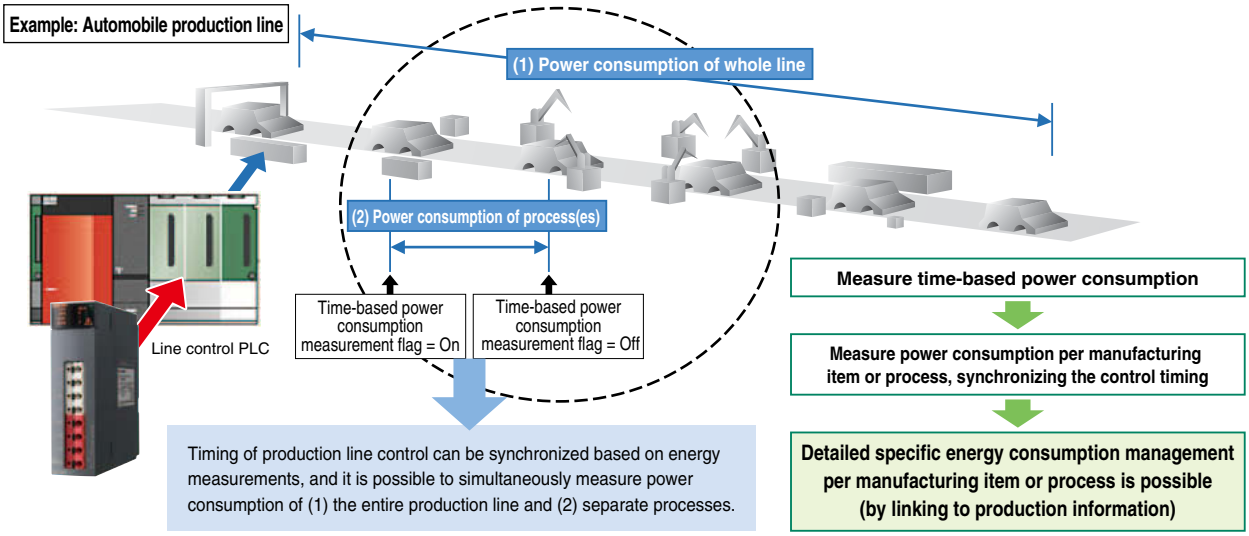


*2: Sample screen data used to display the specific power consumption, energy use and production quantity on a GOT (GT15 or GT16 models in the GOT1000 Series*3 *4) and the sample files for the high-speed data logger unit used to manage/analyze specific power consumption on a computer can be downloaded free of charge from the Mitsubishi Electric factory automation website (www.MitsubishiElectric.co.jp/fa/).
*3: The GOT sample screen data is designed for use with the GT16**-V (640 × 480). When using the sample data with other models and resolutions, please change the model settings in GT Works3. We recommend use of a GOT model that supports up to 65,536 colors.
*4: When using a GT15 model which is function version C or earlier, an optional function board is required.

Energy Measuring Module Installation Examples

Solution Example 1 Energy Savings

Specific energy consumption can be managed in detail according to individual items or processes to assist in reducing the power consumption of production equipment and realize energy savings.

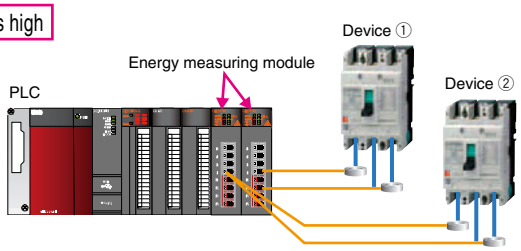


The time-based power consumption measurement function can be used to determine consumption during periods of production and non-production. Even during non-production periods, it is easy to detect inefficiencies such as standby power consumption to facilitate further energy savings.

Specific Consumption Management

Display of points where specific consumption is high

Example of GOT display screen



Energy Management

Display of device ① and ② power comsumption

Example of GOT display screen

Example 1: Higher Productivity via Specific Consumption Management

Energy data can be matched with production data to support management based on specific power consumption. Onsite visualization of this data is useful in streamlining operations.

Production data such as production volume and the number of product parts can be coordinated with energy data to enable detailed energy management on the basis of product type or manufacturing process. Onsite visualization of energy use via displays allows for confirmation of the status of individual units in real-time. Problems can be identified and then remedied immediately through display of points where specific consumption is high.

Example 2: Identify Power Usage of Each Device to Control Peak Usage

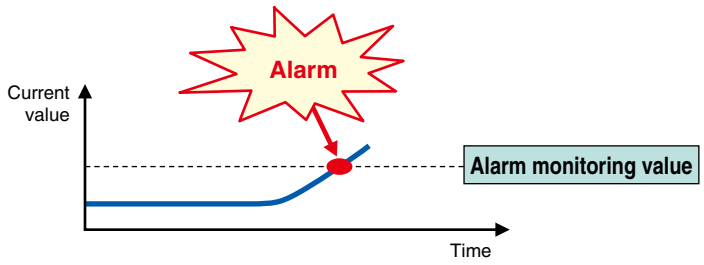
Data on the power consumption of individual devices and production items can be used to maintain total power consumption at a constant level, realize optimal levels of power consumption or to shift the peak power usage times.

Power consumption differs according to the production equipment and item being produced. The energy measuring unit measures the power consumption of various devices in detail, enabling users to shift peak power usage times by (1) shifting equipment start-up times or (2) shifting the simultaneous operation time of equipment/production items with high power consumption. This flexibility in shifting the peak usage times allows adjustments according to the cost of electricity to reduce power costs.

Solution Example 2 Preventive Maintenance

Constantly measuring current (or power) consumption can help prevent serious faults and equipment failure, ultimately resulting in reduced production losses.

Example: Increase in current (or power) consumption detected
→ Preventive measures to fix the problem such as refilling the lubricant or replacing the grinding machine cutter blade.



Set upper and lower limit alarm monitoring values (monitor equipment failures)

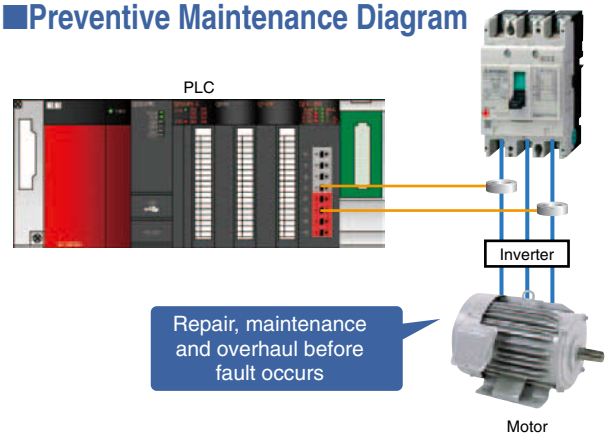
↓ Alarm

Equipment maintenance and repair
(Example: Refill lubricant, replace cutter blade)

↓

Preventive maintenance measures are taken before equipment stoppage, leading to reduced production loss.

■Preventive Maintenance Diagram



Example: Detect motor current values and prevent faults

By constantly monitoring the motor current for any abnormal changes, any motor trouble can be detected immediately and serious problems prevented.

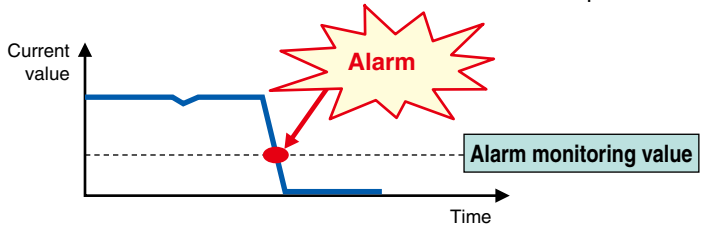
Sudden changes in current and usage volume are often a sign that there is a problem with equipment. The energy measuring module detects any signs of trouble to allow the problem to be remedied before failure of equipment or an accident occurs. Maintenance and overhaul measures can be taken to avoid damage caused by production line stoppages and the expense of replacing equipment. In this way, energy measuring module help to ensure safe operation of equipment while reducing costs.

Measure current comsumption → Identify errors → Service before equipment fails → Eliminate costs of faults

Solution Example 3 Quality Control

The energy measuring module detects failure of manufacturing equipment when there is a stoppage in the flow of current or voltage, thereby supporting quality control.

Example: Disconnection of power to the heater detected
→Allows immediate detection of defective products.



Monitor upper and lower limit alarms (voltage, current or frequency)

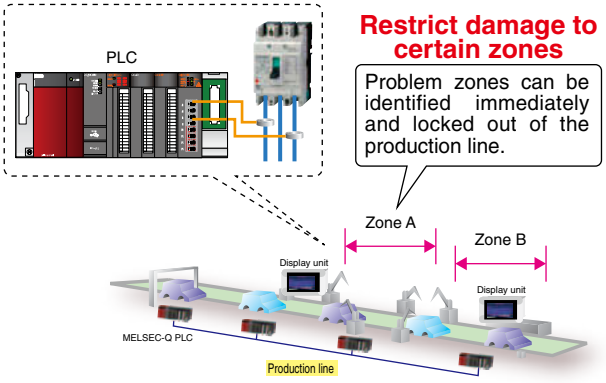
↓ Alarm

Lot rejection of products in case of defective equipment

↓

Prevent shipment of defective products

■Quality Control Diagram



Example: Detect errors and lock out problem zones

Equipment energy values are monitored for errors to allow immediate detection of any defects to products

In production lines that handle precision products such as automobile parts, semiconductors and LED panels, power errors (errors in current, voltage or frequency) can affect product quality. The energy measuring module quickly alerts line managers to any equipment fault so that the flow of substandard parts can be stopped, thus reducing unnecessary costs.

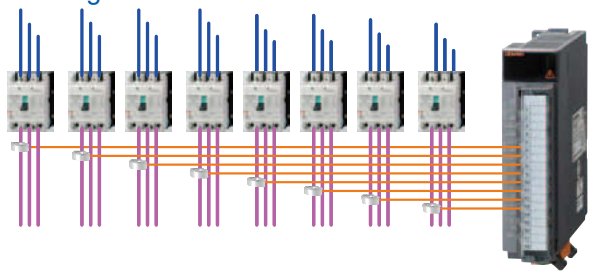
Monitor power comsumptoin → Identify errors → Identify defects immediately → Stop flow of defective parts

Other Convenient Functions

●Current measurement mode

Current measurement mode* is a special function for multi-circuit models that allows the currents of up to eight circuits to be measured in a 100ms cycle. Modules with this mode provide space savings and a perfect solution for managing the current values of production equipment.

◆Diagram of installed unit



QE84WH, QE83WH4W

Measurement modes

- Current measurement mode allows measurements of up to eight circuits in a 100ms cycle
- Many devices can be monitored simultaneously, a benefit facilitating preventive maintenance
- Mode can be switched according to the application; measurements can also be performed in normal operation mode

* Items other than the current cannot be measured in the current measurement mode.

Related products

●Support for quick setup with GX Works2

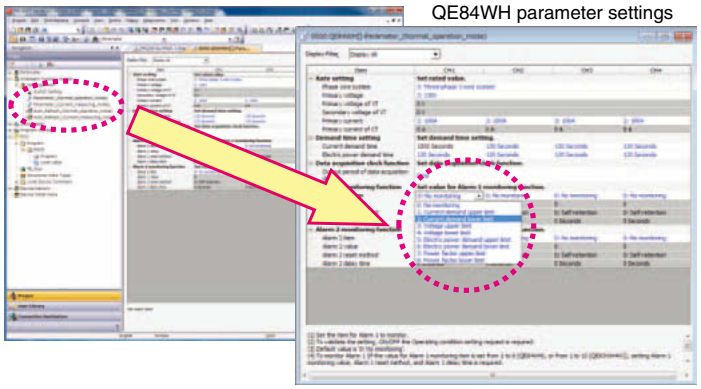
Parameter settings for energy measuring units/insulation monitoring units can be performed simply using the programmable logic controller engineering software, MELSOFT GX Works2.

GX Works2

Parameter settings

Simple “program-less” settings
Parameters can be set by inputting them into a text box or selecting them from a pull-down list.

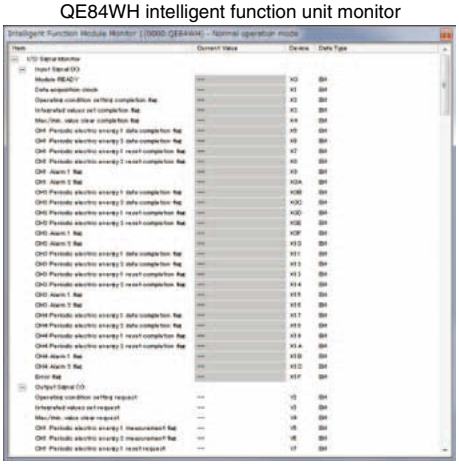
Example screen of QE84WH parameter settings



Intelligent function unit monitor

Simple to check parameter settings and measured values
There's no need to check the buffer memory allocation when looking at the measured values, saving time and effort.

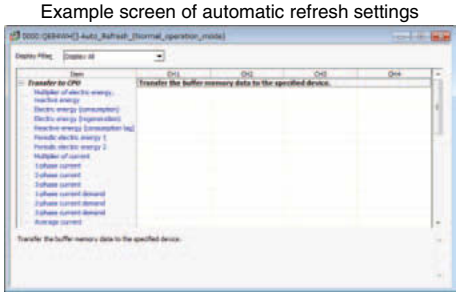
Example screen of QE84WH intelligent function unit monitor



Automatic refresh

Transfers the buffer memory data to the specified device.
Read/Write processes via a program are not necessary.

Example screen of automatic refresh settings



Compatible units
Energy measuring units: QE81WH, QE81WH4W, QE84WH and QE83WH4W
* Please see page 8 for compatible versions and other details.
Insulation monitoring units: QE82LG
* Please see page 19 for compatible version and other details.

Compatible Systems

(1) Compatible CPU units and Installable quantity

The table below shows CPU units which are compatible with energy measuring module and the number of energy measuring module that can be installed. Please take the power supply capacity into account when selecting units as there may be insufficiencies depending on combinations with other units installed or the number of measurement units installed. If an insufficiency in power supply occurs, consider changing the combination of units installed.

(a) When installing on a CPU unit

Compatible CPU units						Installable quantity			
CPU type	CPU model name					QE81WH	QE81WH4W	QE84WH	QE83WH4W
Basic model QCPU	Q00JCPU					16		8	
	Q00CPU	Q01CPU				24			
High-performance model QCPU	Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU	64			
Process CPU	Q02PHCPU	Q06PHCPU	Q12PHCPU	Q25PHCPU		64			
Redundant CPU	Q12PRHCPU	Q25PRHCPU				53			
Universal model QCPU	Q00UJCPU					16		8	
	Q00UCPU	Q01UCPU				24			
	Q02UCPU					36			
	Q03UDCPU Q20UDHCPU Q10UDEHCPU Q100UDEHCPU	Q04UDHCPU Q26UDHCPU Q13UDEHCPU	Q06UDHCPU Q03UDECPU Q20UDEHCPU	Q10UDHCPU Q04UDEHCPU Q26UDEHCPU	Q13UDHCPU Q06UDEHCPU Q50UDEHCPU	64			
High-speed universal model QCPU	Q03UDVCPU	Q04UDVCPU	Q06UDVCPU	Q13UDVCPU	Q26UDVCPU	64			
C Controller module	Q06CCPU-V	Q06CCPU-V-B	Q12DCCPU-V			64			

(b) When installing on a MELSECNET/H remote I/O station

Compatible network units	Installable quantity*1
QJ72LP25-25 QJ72LP25G QJ72BR15	64

*1: Limited by the number of I/O points on the network units.

(2) Applicable base units

Energy measuring module can be installed in any I/O slot*2 of a basic base unit or extension base unit.

*2: For a redundant CPU, only can be installed on an extension base unit; it cannot be installed on a basic base unit. The number of installed modules is limited within the number of I/O points on the CPU unit.

(3) Compatible software packages

The software packages compatible with energy measuring module are shown below.

Product name	Model name	Version	Remarks
GX Developer	SWnD5C-GPPW	8.82L or higher	MELSEC PLC programming software. The “n” in the model name is 4 or higher.
GX Works2	SWnDNC-GXW2	1.90U or higher	iQ Platform compatible PLC engineering software. The “n” in the model name is 1 or higher.

General Specifications & Measurement Items

(1) General specifications for main module

Item			Specifications			
			QE81WH	QE84WH	QE81WH4W	QE83WH4W
Phase wire system			Single-phase 2-wire／Single-phase 3-wire／3-phase 3-wire common use		3-phase 4-wire	
Instrument ratings	Voltage circuit	Single-phase 2-wire, 3-phase 3-wire *1	100～220VAC (If the voltage exceeds 220VAC, an external voltage transformer is required.)		–	
		Single-phase 3-wire*1	110VAC (between wires 1-2 and between wires 2-3), 220VAC (between wires 1-3)		–	
		3-phase 4-wire*2 *4	–		63.5/110～277/480VAC (When the voltage exceeds 277/480VAC, a voltage transformer is required. The primary voltage values of the voltage converter (QE8WH4VT) are shown.)	
	Current circuit *3		50, 100, 250, 400, 600AAC (use of special split current sensor; all values indicate primary side current values of current sensor) 5AAC (use of special 5A current sensor; 5A current sensor can be used in combination with current transformer in a two-level configuration, and primary-side current value can be set to a maximum of 6,000A)			
	Frequency		50 to 60Hz (automatic frequency selection)			
Main unit tolerances (excluding current sensor)	Normal operation mode		Current, demand current *5 : ±1.0% (relative to 100% of rating)			
			Voltage : ±1.0% (relative to 100% of rating)			
			Power, demand power *5 : ±1.0% (relative to 100% of rating)			
			Reactive power : ±1.0% (relative to 100% of rating)			
			–		Apparent power : ±1.0% (relative to 100% of rating)	
			Frequency : ±1.0% (in 45 to 65Hz range)			
			Power factor : ±3.0% (relative to electrical angle of 90°)			
			Electric energy : ±2.0% (5% to 100% range of rating, power factor=1)			
			Reactive energy : ±2.5% (10% to 100% range of rating, power factor=0)			
	Current measurement mode		–	Current, demand current *3 ±1.0% (relative to 100% of rating)	–	Current, demand current *3 ±1.0% (relative to 100% of rating)
No. of measurement circuits	Normal operation mode		1 circuit (1 channel)	4 circuits in same voltage system (4 channels)	1 circuit (1 channel)	3 circuits in same voltage system (3 channels)
	Current measurement mode		–	8 circuits (8 channels)	–	8 circuits (8 channels)
Data refresh period	Normal operation mode		250ms*6	500ms*6	250ms*6	500ms*6
	Current measurement mode		–	100ms	–	100ms
Response time			2s or less			
Power outage compensation			Backup to nonvolatile memory (saved items: setting values, max./min. values and its occurrence date/time, energy use (regenerative, consumption), reactive energy use, time-based energy use)			
Consumption current (DC 5V)			0.17A	0.46A	0.18A	0.39A
No. of required slots			1			
No. of input/output points			16 points (I/O assignment: 16 intelligent points)	32 points (I/O assignment: 32 intelligent points)	16 points (I/O assignment: 16 intelligent points)	32 points (I/O assignment: 32 intelligent points)
Weight			0.10kg	0.19kg	0.10kg	0.19kg
Applicable wires	Voltage input terminal	Solid wire	AWG24 to AWG17	AWG24-AWG16	AWG28 to AWG16	AWG24-AWG16
		Stranded wire	AWG20 to AWG16*7	AWG20-AWG16	AWG28 to AWG16*7	AWG20-AWG16
	Current input terminal	Solid wire	AWG24 to AWG17	–	AWG26 to AWG16	–
		Stranded wire	AWG20 to AWG16*7	AWG20-AWG18*8	AWG26 to AWG14	AWG20-AWG18*8
Applicable standards *9			CE Marking (EN61131-2, EN61010-1, EN61326-1), UL Standards (UL508), c-UL Standards (CSA C22.2 No. 14), KC Marking			

*1:The module can be connected directly to 100 to 220V circuits. When the voltage exceeds 220VAC, an external voltage transformer (VT) is required.
(It is possible to arbitrarily set the primary voltage of VT to up to 6,600V and the secondary voltage to up to 220V.)
*2:For voltage input, a voltage converter (QE8WH4VT) is required.When the primary voltage of the voltage transducer exceeds 277/480VAC, an external voltage transformer (VT) is required.
(It is possible to arbitrarily set the primary voltage of VT to up to 6,600V as phase voltage.)
*3:The ratio error of the voltage converter is ±1.0% (of the rated primary voltage).
*4:The ratio error of the current sensor is ±1% (5 to 100% of the rating).
*5:The demand values are moving average deviations within the specified time limit.
*6: The electric energy and reactive energy are constantly measured. Short cycle load fluctuations shorter than the data refresh cycle are also tracked.
*7: Use the recommended rod terminal Nichifu TGV TC-1.25-11T.
*8: Use the applicable crimp terminal R1.25-3. A crimp terminal with insulation sleeve cannot be used.
*9: QE81WH4W or QE83WH4W is applicable to the standards when combined with voltage converter (QE8WH4VT).

(2) Measurement items

	Measurement items			
	Details			
	QE81WH	QE84WH	QE81WH4W	QE83WH4W
Current	1-phase current, 2-phase current*2, 3-phase current*2, total current		1-phase current, 2-phase current, 3-phase current, Neutral current, total current	
Demand current *1	Demand current (1-phase, 2-phase*2 and 3-phase*2), min./max. demand current and date/time of occurrence		Demand current (1-phase, 2-phase, 3-phase and Neutral), min./max. demand current and date/time of occurrence	
Voltage	Voltage V12, V23*2 and V31*2, total voltage, min./max. voltage and date/time of occurrence		Voltage V12, V23 and V31, total voltage, min./max. voltage and date/time of occurrence (L-L), voltage V1N, V2N and V3N, total phase voltage, min./max. phase voltage and date/time of occurrence (L-N)	
Power	Power			
Demand power*1	Demand power, min./max. demand power and date/time of occurrence			
Reactive power	Reactive power			
Power factor	Power factor, min./max. power factor and date/time of occurrence			
Frequency	Frequency			
Electric energy	Electric energy (consumption), electric energy (regenerative)			
Reactive energy	Reactive energy (consumption lagging)			
Time-based electric energy*3	Time-based electric energy 1, Time-based electric energy 2			

*1: When the phase wire system is set to single-phase 2-wire, these parameters are not measured.
*2: Indicates the moving average over the specified time period.
*3: The electric energy (consumption) is measured while the designated output device is on.

Options

(1) Voltage converter for energy measuring module

Product name	Model name	Phase Wire system	Exterior appearance	Sales unit
Voltage converter	QE8WH4VT*1	3-phase 4-wire		1

*1: Necessary for voltage input of QE81WH4W and QE83WH4W.

(2) Split current sensor

Product name	Model name	Rated primary current	Phase Wire system	Exterior appearance	Sales unit
Split current sensor*1	EMU-CT50	50A	Single-phase 2-wire Single-phase 3-wire 3-phase 3-wire 3-phase 4-wire		1
	EMU-CT100	100A			1
	EMU-CT250	250A			1
	EMU-CT400	400A			1
	EMU-CT600	600A			1
5A split current sensor*2	EMU2-CT5	5A	Single-phase 2-wire Single-phase 3-wire 3-phase 3-wire		1
	EMU2-CT5-4W		3-phase 4-wire		2

*1: Use this to measure a low-voltage circuit (440V or less).
2: When measuring a high-voltage circuit or when using an existing CT, system will be a two-stage configuration with the 5A split current sensor connected to the secondary side of CT (/5A).

(3) Products related to 5A split current sensor

Product name	Model name	Cable length	Exterior appearance	Sales unit
5A current sensor cable (exclusive to QE Series)	EMU2-CB-Q5A*1 (for QE81WH)	0.5m		1
	EMU2-CB-Q5A-4W*2 (for QE81WH4W)			1
	EMU2-CB-Q5B*1 (for QE84WH)			1
	EMU2-CB-Q5B-4W*2 (for QE83WH4W)			1
Standard extension cable*3	EMU2-CB-T1M	1m		1
	EMU2-CB-T5M	5m		
	EMU2-CB-T10M	10m		
Separate extension cable*3	EMU2-CB-T1MS	1m		2
	EMU2-CB-T5MS	5m		
	EMU2-CB-T10MS	10m		

*1: Always use when using the EMU2-CT5. Select according to the energy measuring module model.
*2: Always use when using the EMU2-CT5-4W. Select according to the energy measuring module model.
*3: Use to extend the EMU2-CT5 or EMU2-CT5-4W.

Option Specifications

(1) Split current sensor

Item	Specifications				
Model	EMU-CT50	EMU-CT100	EMU-CT250	EMU-CT400	EMU-CT600
Rated primary current	50A	100A	250A	400A	600A
Rated secondary current	16.66mA	33.33mA	66.66mA	66.66mA	66.66mA
Rated load	0.1VA				
Specific error	±1% (5% to 100% of rating)				
Max. working voltage	460V				
Rated overcurrent strength (reference)	40-fold of rated primary current (1 sec.)				
Weight	0.1kg			0.7kg	

*Maximum wiring length between module and CT: 50m.

(2) 5A current sensor

Item	Specifications	
Model	EMU2-CT5	EMU2-CT5-4W
Applicable circuit	Single-phase 2-wire / Single-phase 3-wire / 3-phase 3-wire	3-phase 4-wire
Rated primary current	5A	
Rated secondary current	1.66mA	
Rated load	0.1VA	
Specific error	±1% (5 to 100% of rating)	
Max. working voltage	260V	
Weight (piece)	0.1kg	

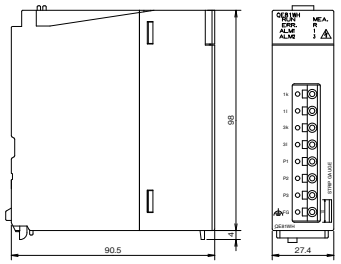
(3) Voltage converter

Item	Specifications	Item	Specifications
Model	QE8WH4VT	Current consumption	30mA
Phase/Wire	3-phase 4-wire	Secondary wiring length	Max. 5m
Input voltage range	63.5/110 to 277/480VAC (Does not operate below 55/95VAC.)	Mounting method	IEC rail mounting, screw tightening
		Weight	0.3kg
Frequency	50/60Hz	Accessories	Module panel mounting screw M3x16, instruction manual
Tolerable voltage output error	±1.0% (in respect to rated primary voltage)	Compatible wire (usable wire length)	Single-wire: AWG12 to 22
Max. No. of connected units	5 units	Voltage input terminal	Standard wire: AWG12 to 22
VA consumption	P1-P0 : 2VA, P2-P0 : 0.3VA, P3-P0 : 0.3VA (at 277/480VAC input)	Tightening torque	Module panel mounting screw M3x16
			0.61 to 0.82N·m

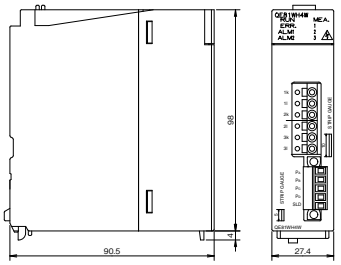
Outline Drawings

(1) Energy measuring module

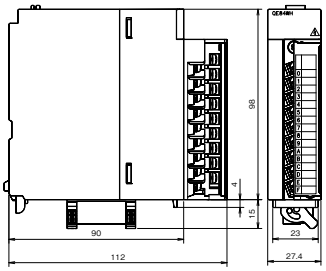
①QE81WH



②QE81WH4W



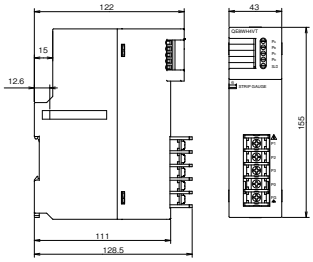
③QE84WH, QE83WH4W common



* Above figure shows details printed on QE84WH.

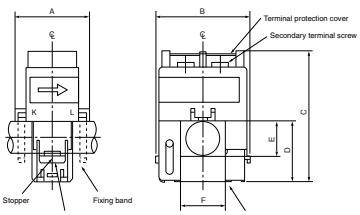
(2) Voltage converter for energy measuring module

①QE8WH4VT



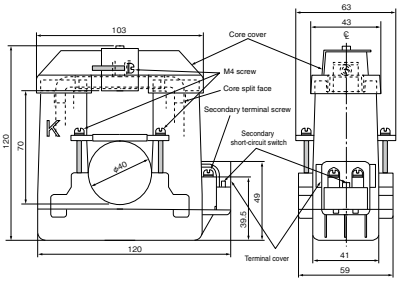
(3) Split current sensor

①EMU-CT50 EMU-CT100 EMU-CT250

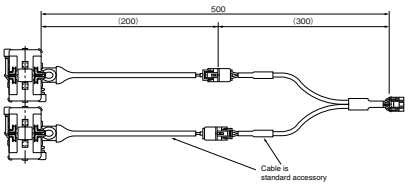


Model	A	B	C	D	E	F
EMU-CT50/CT100	31.5	39.6	55.2	25.7	15.2	18.8
EMU-CT250	36.5	44.8	66	32.5	22	24

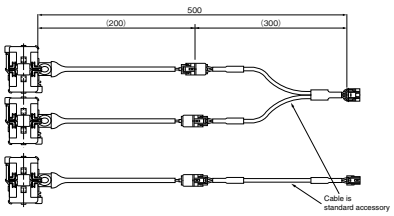
②EMU-CT400 EMU-CT600



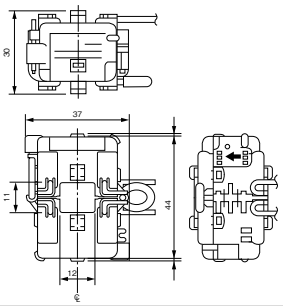
③EMU2-CT5



④EMU2-CT5-4W

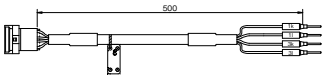


⑤5A split current sensor CT section

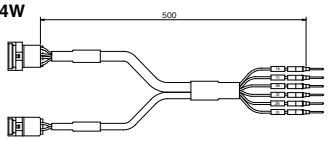


(4) Products related to 5A split current sensor

①EMU2-CB-Q5A

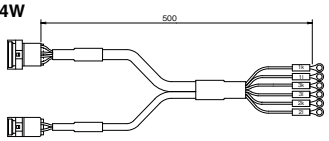


②EMU2-CB-Q5A-4W

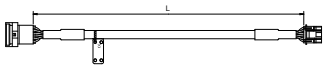


③EMU2-CB-Q5B

④EMU2-CB-Q5B-4W

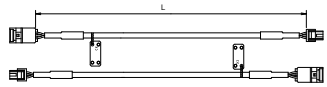


⑤EMU2-CB-T1M EMU2-CB-T5M EMU2-CB-T10M



Model	EMU2-CB-T1M	EMU2-CB-T5M	EMU2-CB-T10M
L dimensions	1m	5m	10m

⑥EMU2-CB-T1MS EMU2-CB-T5MS EMU2-CB-T10MS

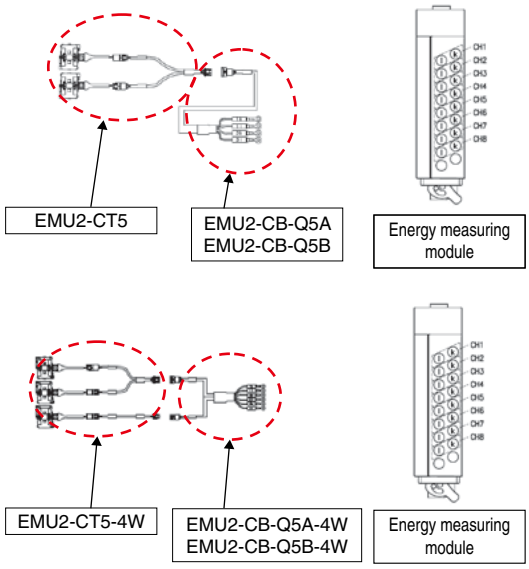


Model	EMU2-CB-T1MS	EMU2-CB-T5MS	EMU2-CB-T10MS
L dimensions	1m	5m	10m

Use of options

(1) Dedicated cable for QE energy measuring module (EMU2-CB-Q5A(-4W), EMU2-CB-Q5B(-4W))

●When using multi-circuit energy measuring modules, connect this cable between the module and 5A split current sensor.



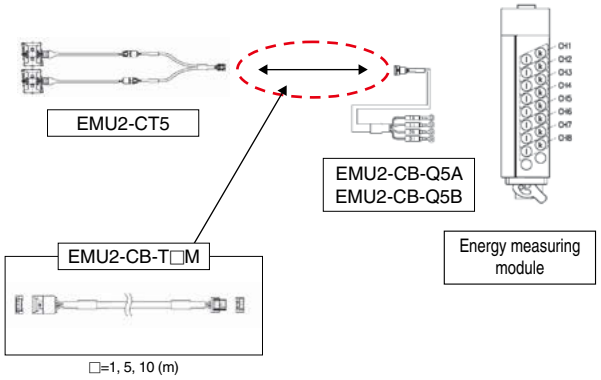
(2) Extension cable (standard type) (EMU2-CB-T□M)

(□=1, 5, 10)

●When using the 5A split current sensor, use this cable to extend the distance between the main unit and load side.

●Connect the cable between the 5A split current sensor and energy measuring module dedicated sensor cable for the energy measuring module.

* The distance can be extended up to 11m.



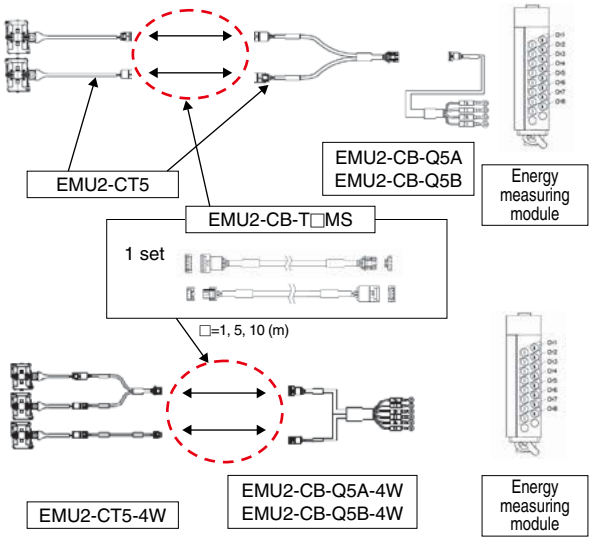
(3) Extension cable (separate type) (EMU2-CB-T□MS)

(□=1, 5, 10)

●When using the 5A split current sensor, the load 1 side and load 3 side are separated. Use this cable to extend the cable after the division.

●Connect the cable between the 5A split current sensor and the connections after the division.

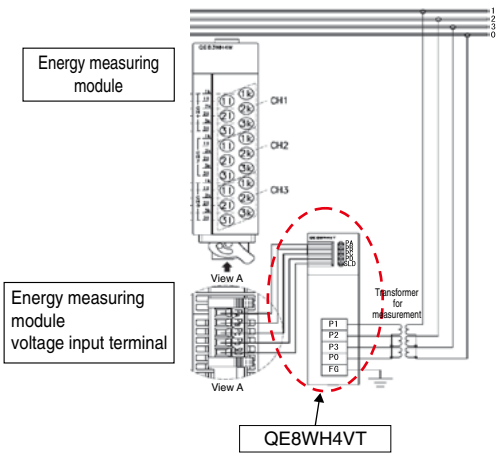
* The distance can be extended up to 11m.



(4) Dedicated voltage converter for energy measuring module (QE8WH4VT)

●Always use this voltage converter when measuring a 3-phase 4-wire circuit.

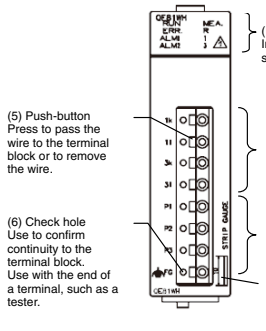
* 3-phase 4-wire module model (QE81WH4W, QE83WH4W)
* Up to five energy measuring modules can be connected. Both QE81WH4W and QE83WH4W models can be used.



The diagrams avobe are based on the QE84WH and EMU2-CB-Q5B(-4W).

Energy Measuring Module Names and Functions of Each Part

QE81WH: Names and functions



Terminal block signal names

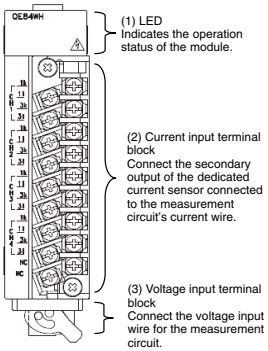
Terminal name	Explanation
1k 1l	Phase 1 current input terminal (power side) Phase 1 current input terminal (load side)
3k 3l	Phase 3 current input terminal (power side) Phase 3 current input terminal (load side)
P1 P2 P3	Phase 1 voltage input terminal Phase 2 voltage input terminal Phase 3 voltage input terminal
FG	Frame GND terminal

QE81WH: LED displays and functions

The names and functions of the LEDs are explained below.

Name	Display color	Function	On/Off conditions
RUN LED	Green	Indicates the module's operation status.	On: Operating normally Off: Internal power Off, hardware error, etc., occurring *1
ERR. LED	Red	Indicates the module's error and status.	Flicker: Outside setting value range error occurring*1 On: Hardware error occurring*1 Off: Operating normally
ALM1 LED	Red	Indicates the module's alarm 1 occurrence state.	Flicker: Alarm 1 occurring On: Alarm 1 occurring -- not occurring (When alarm 1 reset method is set to self-hold.) Off: Alarm 1 not occurring
ALM2 LED	Red	Indicates the module's alarm 2 occurrence state.	Flicker: Alarm 2 occurring On: Alarm 2 occurring -- not occurring (When alarm 2 reset method is set to self-hold.) Off: Alarm 2 not occurring
MEA. LED	Green	Indicates the module's measurement status.	On: Measuring Off: Not measuring (no measurement)
R LED	Green	Indicates the module's measurement status (regenerative).	On: Measuring (regenerative) Off: Other than the above
1 LED	Green	Indicates the module's side 1 measuring status (regenerative).	On: Measuring side 1 (regenerative) Off: Other than the above
3 LED	Green	Indicates the module's side 3 measuring status (regenerative).	On: Measuring side 3 (regenerative) Off: Other than the above

QE84WH: Names and functions



Terminal block signal names

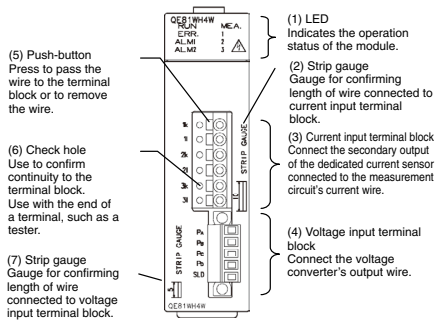
Terminal name		Explanation
CH1	1k 1l	Phase 1 current input terminal (power side) Phase 1 current input terminal (load side)
	3k 3l	Phase 3 current input terminal (power side) Phase 3 current input terminal (load side)
CH2	1k 1l	Phase 1 current input terminal (power side) Phase 1 current input terminal (load side)
	3k 3l	Phase 3 current input terminal (power side) Phase 3 current input terminal (load side)
CH3	1k 1l	Phase 1 current input terminal (power side) Phase 1 current input terminal (load side)
	3k 3l	Phase 3 current input terminal (power side) Phase 3 current input terminal (load side)
CH4	1k 1l	Phase 1 current input terminal (power side) Phase 1 current input terminal (load side)
	3k 3l	Phase 3 current input terminal (power side) Phase 3 current input terminal (load side)
P1 P2 P3		Phase 1 voltage input terminal Phase 2 voltage input terminal Phase 3 voltage input terminal
FG		Frame GND terminal

QE84WH: LED displays and functions

The names and functions of the LEDs are explained below.

Name	Display color	Function	On/Off conditions
0 LED	Green	Indicates the module's operation status.	On: Operating normally Off: Internal power Off, hardware error, etc., occurring*1
1 LED	Green	Indicates the module's CH1 measurement status	On: Measuring power rate (consumption) Flicker: Measuring power rate (regenerative) Off: Not measuring (no measurement)
2 LED	Green	Indicates the module's CH2 measurement status	
3 LED	Green	Indicates the module's CH3 measurement status	
4 LED	Green	Indicates the module's CH4 measurement status	
5 LED	Green	Indicates the module's CH1 side 3 measuring status (regenerative).	On: Measuring side 3 power rate (regenerative) Off: Other than the above
6 LED	Green	Indicates the module's CH2 side 3 measuring status (regenerative).	
7 LED	–	–	Always Off
8 LED	Red	Indicates the module's error and status.	Flicker: Outside setting value range error occurring*1 On: Hardware error occurring*1 Off: Operating normally
9 LED	Green	Indicates the module's CH1 side 1 measuring status (regenerative)	On: Measuring side 1 power rate (regenerative) Off: Other than the above
A LED	Green	Indicates the module's CH2 side 1 measuring status (regenerative)	
B LED	Green	Indicates the module's CH3 side 1 measuring status (regenerative)	
C LED	Green	Indicates the module's CH4 side 1 measuring status (regenerative)	
D LED	Green	Indicates the module's CH3 side 3 measuring status (regenerative)	On: Measuring side 3 power rate (regenerative) Off: Other than the above
E LED	Green	Indicates the module's CH4 side 3 measuring status (regenerative)	
F LED	–	–	Always Off

QE81WH4W: Names and functions



Terminal block signal names

Terminal name	Explanation
1k 1l	Phase 1 current input terminal (power side) Phase 1 current input terminal (load side)
2k 2l	Phase 2 current input terminal (power side) Phase 2 current input terminal (load side)
3k 3l	Phase 3 current input terminal (power side) Phase 3 current input terminal (load side)
PA PB PC PD	Voltage converter secondary terminal block connection terminal
SLD	Terminal for shield connection

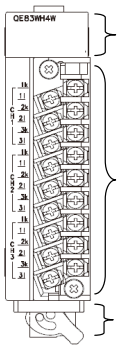
QE81WH4W: LED displays and functions

The names and functions of the LEDs are explained below.

Name	Display color	Function	On/Off conditions
RUN LED	Green	Indicates the module's operation status.	On: Operating normally Off: Internal power Off, hardware error, etc., occurring*1
ERR. LED	Red	Indicates the module's error and status.	Flicker: Outside setting value range error occurring On: Hardware error occurring*1 Off: Operating normally*1
ALM1 LED	Red	Indicates the module's alarm 1 occurrence state.	Flicker: Alarm 1 occurring On: Alarm 1 occurring -- not occurring (When alarm 1 reset method is set to self-hold.) Off: Alarm 1 not occurring
ALM2 LED	Red	Indicates the module's alarm 2 occurrence state.	Flicker: Alarm 2 occurring On: Alarm 2 occurring -- not occurring (When alarm 2 reset method is set to self-hold.) Off: Alarm 2 not occurring
MEA. LED	Green	Indicates the module's measurement status.	On: Measuring (consumption) Flicker: Measuring (regenerative) Off: Not measuring (no measurement)
1 LED	Green	Indicates the module's side 1 measuring status (regenerative).	On: Measuring side 1 power rate (regenerative) Off: Other than the above
2 LED	Green	Indicates the module's side 2 measuring status (regenerative)	On: Measuring side 2 power rate (regenerative) Off: Other than the above
3 LED	Green	Indicates the module's side 3 measuring status (regenerative).	On: Measuring side 3 power rate (regenerative) Off: Other than the above

*1 : For details, please refer to section10.1 List of error codes of User's Manual (details).

QE83WH4W: Names and functions



Terminal block signal names

Terminal name		Explanation
CH1	1k 1l	Phase 1 current input terminal (power side) Phase 1 current input terminal (load side)
	2k 2l	Phase 2 current input terminal (power side) Phase 2 current input terminal (load side)
	3k 3l	Phase 3 current input terminal (power side) Phase 3 current input terminal (load side)
CH2	1k 1l	Phase 1 current input terminal (power side) Phase 1 current input terminal (load side)
	2k 2l	Phase 2 current input terminal (power side) Phase 2 current input terminal (load side)
	3k 3l	Phase 3 current input terminal (power side) Phase 3 current input terminal (load side)
CH3	1k 1l	Phase 1 current input terminal (power side) Phase 1 current input terminal (load side)
	2k 2l	Phase 2 current input terminal (power side) Phase 2 current input terminal (load side)
	3k 3l	Phase 3 current input terminal (power side) Phase 3 current input terminal (load side)
PA PB PC PD		Voltage converter's secondary terminal block connection terminal
SLD		Terminal for shield connection

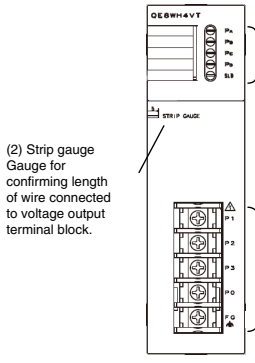
QE83WH4W: LED displays and functions

The names and functions of the LEDs are explained below.

Name	Display color	Function	On/Off conditions
0 LED	Green	Indicates the module's operation status.	On: Operating normally Off: Internal power Off, hardware error, etc., occurring *1
1 LED	Green	Indicates the module's CH1 measurement status	On: Measuring (consumption) Flicker: Measuring (regenerative) Off: Not measuring (no measurement)
2 LED	Green	Indicates the module's CH2 measurement status	
3 LED	Green	Indicates the module's CH3 measurement status	
4 LED	Green	Indicates the module's CH1 side 1 measuring status (regenerative)	On: Measuring side 1 power rate (regenerative) Off: Other than the above
5 LED	Green	Indicates the module's CH2 side 1 measuring status (regenerative)	
6 LED	Green	Indicates the module's CH3 side 1 measuring status (regenerative)	
7 LED	–	–	Always Off
8 LED	Red	Indicates the module's error and status.	Flicker: Outside setting value range error occurring*1 On: Hardware error occurring*1 Off: Operating normally
9 LED	Green	Indicates the module's CH1 side 2 measuring status (regenerative).	On: Measuring side 2 power rate (regenerative) Off: Other than the above
A LED	Green	Indicates the module's CH2 side 2 measuring status (regenerative).	
B LED	Green	Indicates the module's CH3 side 2 measuring status (regenerative).	
C LED	Green	Indicates the module's CH1 side 3 measuring status (regenerative).	On: Measuring side 3 power rate (regenerative) Off: Other than the above
D LED	Green	Indicates the module's CH2 side 3 measuring status (regenerative).	
E LED	Green	Indicates the module's CH3 side 3 measuring status (regenerative).	
F LED	–	–	Always Off

*1 : For details, please refer to section10.1 List of error codes of User's Manual (details).

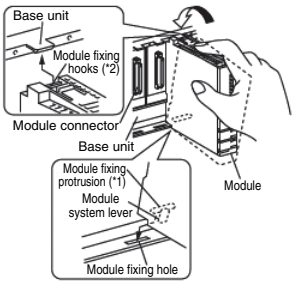
QE8WH4VT: Names and functions

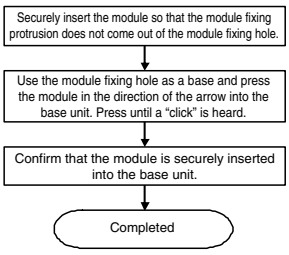


Terminal block signal names

Terminal name		Explanation
Voltage output terminal block	PA PB PC PD	Voltage output terminal
	SLD	Terminal for shield connection
Voltage input terminal block	P1	Phase 1 voltage input terminal
	P2	Phase 2 voltage input terminal
	P3	Phase 3 voltage input terminal
	P0	Phase 0 voltage input terminal
	FG	Frame GND terminal

Mounting the energy measuring module



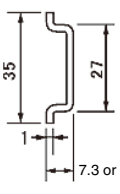


- Connect to the MELSEC-Q Series base unit.
- When mounting the module, insert the module fixing protrusion into the module fixing hole on the base unit. Securely insert so that the module fixing protrusion does not come out of the module fixing hole. Mounting the module with force instead of carefully inserting it will lead to module damage.
- When using in a place with high levels of vibration and impact, screw the module onto the base unit. Module fixing screw: M3x12mm (prepared by user) Tightening torque: 0.36 to 0.48N.m

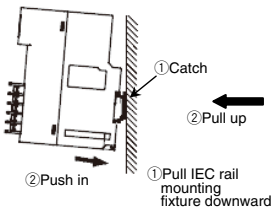
Mounting methods

①Mounting on IEC rail

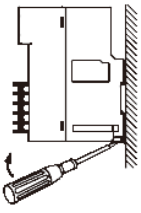
●Applicable IEC rail (35mm)



●Mounting



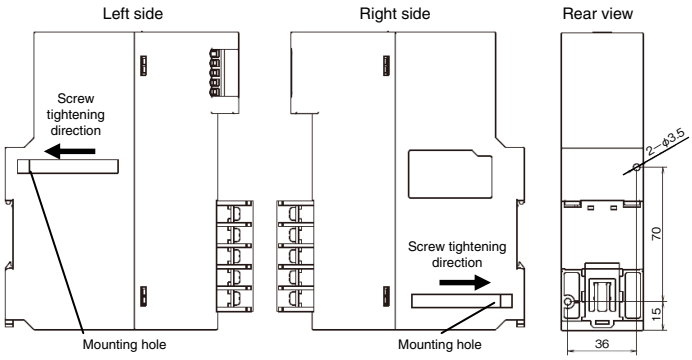
●Removing



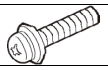
Mount the IEC rails every 25 to 100mm with M4 or M5 screws.
When mounting in a row, fix both ends with the side-slip prevention fitting.
When removing from the IEC rail and then mounting again, push the IEC rail mounting fixture upward and in, and then mount the module.

②Mounting with screws

There are two mounting holes on the side of the module. Tighten the enclosed screws (M3x16) with a 0.61 to 0.82N.m torque.



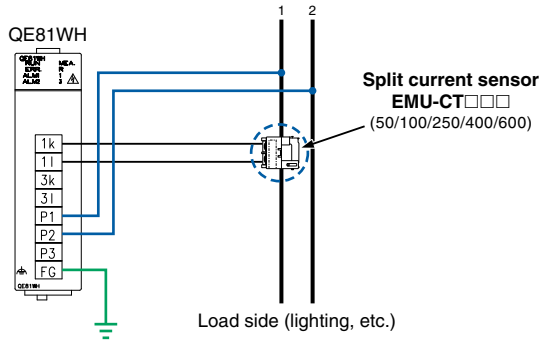
●Enclosed screw

	Cross recessed pan head machine screw (M3x16) 2 screws

Connection Diagrams

(1) QE81WH

Single-phase 2-wire

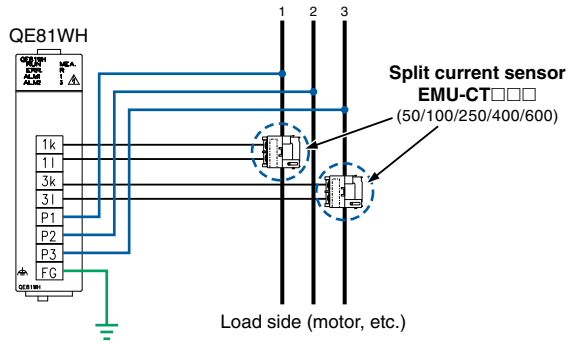


* Cables between the QE81WH and the split current sensor are to be prepared by the user.

System configuration

Device name	Model	Qty.
Enegy measuring module	QE81WH	1
Split current sensor	EMU-CT□□□	1

3-phase 3-wire (low-voltage circuit)



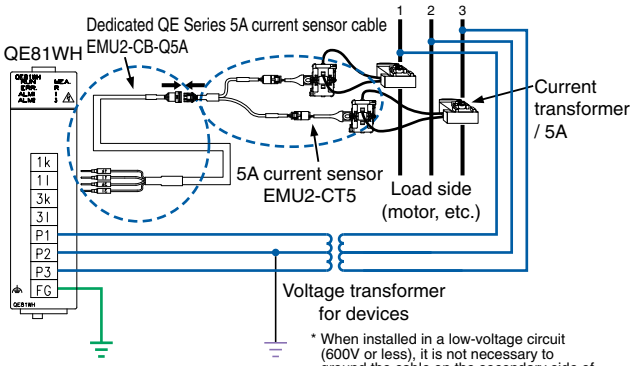
* Cables between the QE81WH and the split current sensor are to be prepared by the user.

System configuration

Device name	Model	Qty.
Enegy measuring module	QE81WH	1
Split current sensor	EMU-CT□□□	2

3-phase 3-wire (high-voltage circuit)

(use together with voltage transformer / current transformer for devices)



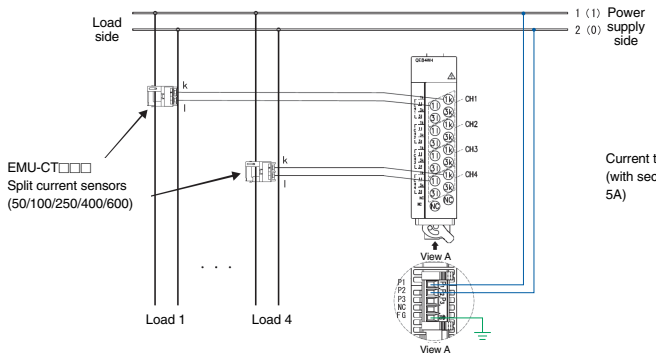
* When installed in a low-voltage circuit (600V or less), it is not necessary to ground the cable on the secondary side of the voltage transformer.

System configuration

Device name	Model	Qty.
Enegy measuring module	QE81WH	1
5A split current sensor	EMU2-CT5	1
Dedicated 5A split current sensor cable	EMU2-CB-Q5A	1

(2) QE84WH <normal operation mode>

Single-phase 2-wire (low-voltage circuit)

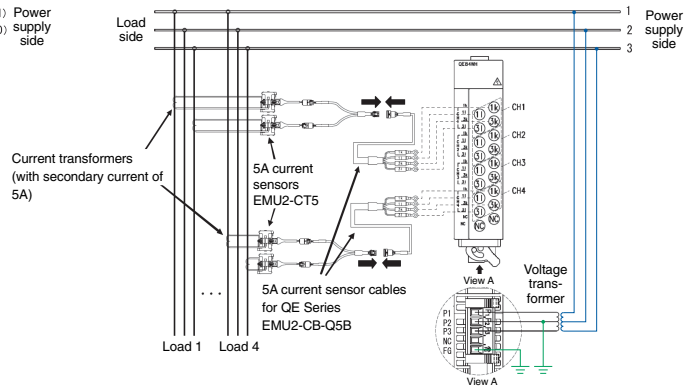


* Cables between the QE84WH and the split current sensor are to be prepared by the user. The maximum wiring length is 50m.

System configuration

Device name	Model	Qty.
Enegy measuring module, multi-circuit model	QE84WH	1
Split current sensor	EMU-CT□□□	1/circuit

3-phase 3-wire (high-voltage circuit)



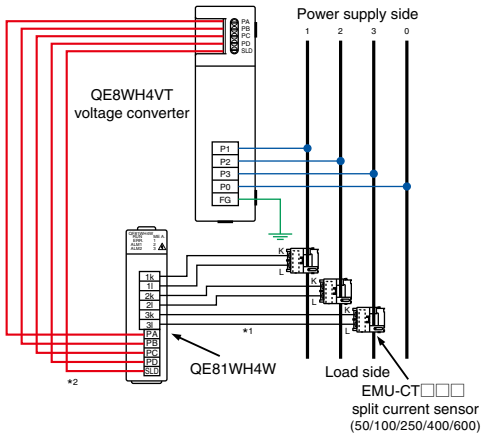
Note: When installed in a low-voltage circuit (600V or less), it is not necessary to ground the cable on the secondary side of the voltage transformer.

System configuration

Device name	Model	Qty.
Enegy measuring module, multi-circuit model	QE84WH	1
5A split current sensor	EMU2-CT5	1/circuit
Dedicated 5A split current sensor cable	EMU2-CB-Q5B	1/circuit

(3) QE81WH4W

3-phase 4-wire (low-voltage circuit) use voltage converter/split current sensor

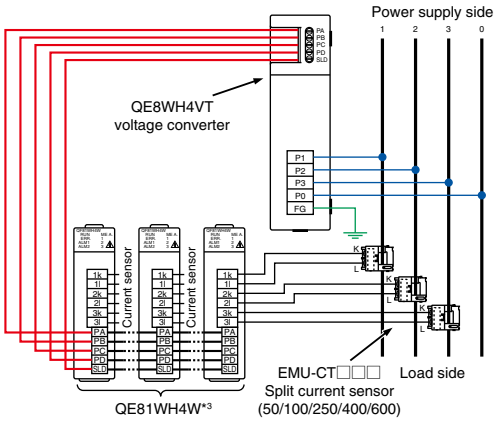


*1: Cables between the QE81WH4W and the split current sensor are to be prepared by the user. The maximum wiring length is 50m.
*2: Cables between QE8WH4VT and QE81WH4W are to be supplied by the customer (max. length: 5m).

System configuration

Device name	Model	Qty.
Enegy measuring module, 3-phase 4-wire model	QE81WH4W	1
Split current sensor	EMU-CT□□□	3
Dedicated voltage converter	QE8WH4VT	1

3-phase 4-wire (low-voltage circuit, multiple circuits measurement in same voltage system) (use voltage converter/split current sensor, multiple QE81WH4W connected)



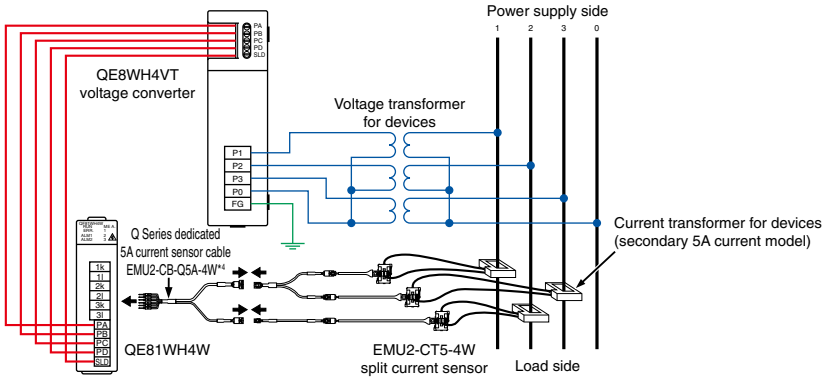
* Maximum of five units can be connected.

System configuration *Example of above configuration (3-circuit measurement)

Device name	Model	Qty.
Enegy measuring module, 3-phase 4-wire model	QE81WH4W	3
Split current sensor	EMU-CT□□□	9
Dedicated voltage converter	QE8WH4VT	1

*3: The dedicated voltage transformer can be used to connect up to 5 QE modules.

3-phase 4-wire (high-voltage circuit) (use voltage converter/current transformer)



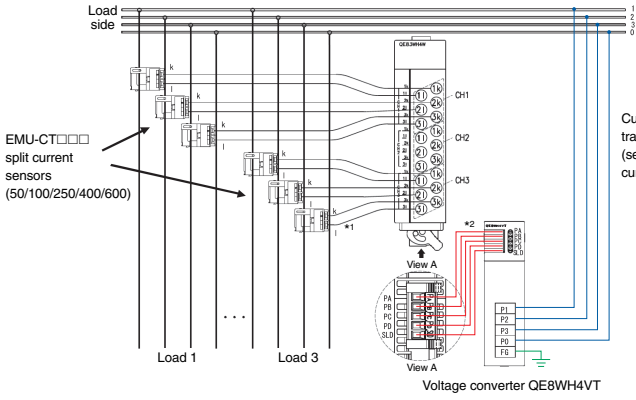
*4: When installed in a low-voltage circuit (600V or less), it is not necessary to ground the cable on the secondary side of the voltage transformer.

System configuration

Device name	Model	Qty.
Enegy measuring module, 3-phase 4-wire model	QE81WH4W	1
5A split current sensor (for 3-phase 4-wire)	EMU2-CT5-4W	1
Dedicated 5A split current sensor cable (for 3-phase 4-wire)	EMU2-CB-Q5A-4W	1
Dedicated voltage converter	QE8WH4VT	1

(4) QE83WH4W <normal operation mode>

3-phase 4-wire (low-voltage circuit)

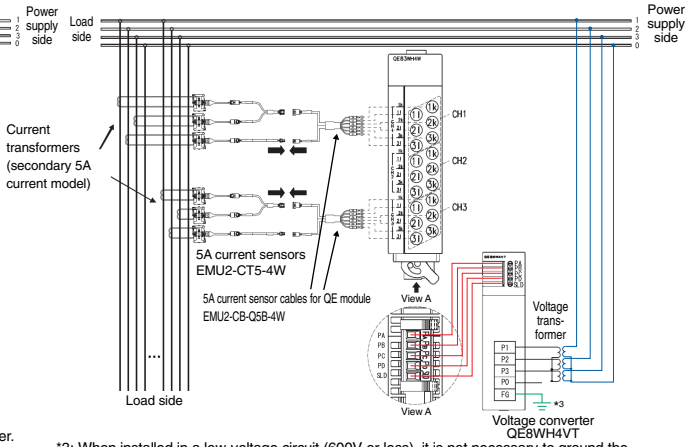


*1: Cables between the QE83WH4W and the split current sensor are to be prepared by the user. The maximum wiring length is 50m.
*2: Cables between QE8WH4VT and QE83WH4W are to be supplied by the customer (max. length: 5m).

System configuration

Device name	Model	Qty.
Enegy measuring module, 3-phase 4-wire, multi-circuit model	QE83WH4W	1
Split current sensor	EMU-CT□□□	3/circuit
Dedicated voltage converter	QE8WH4VT	1

3-phase 4-wire (high-voltage circuit)



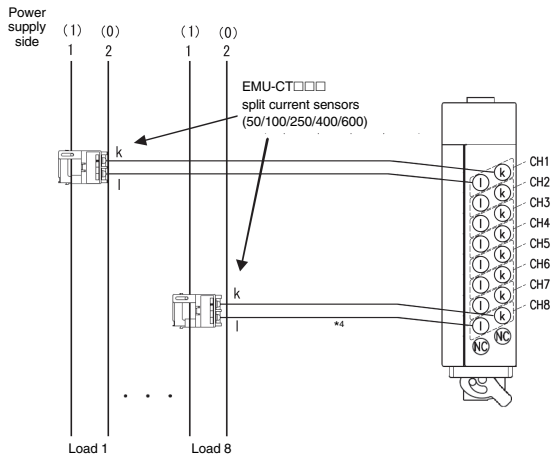
*3: When installed in a low-voltage circuit (600V or less), it is not necessary to ground the cable on the secondary side of the voltage transformer.

System configuration

Device name	Model	Qty.
Enegy measuring module, 3-phase 4-wire, multi-circuit model	QE83WH4W	1
Split current sensor	EMU2-CT5-4W	1/circuit
Dedicated 5A split current sensor cable (for 3-phase 4-wire)	EMU2-CB-Q5B-4W	1
Dedicated voltage converter	QE8WH4VT	1

(5) QE84WH, QE83WH4W current measurement mode (common)

Low-voltage circuit

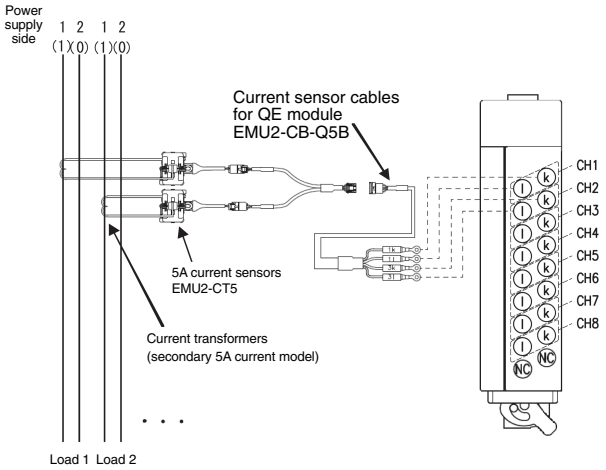


*4: Cables between the QE84WH-QE83WH4W and the split current sensor are to be prepared by the user. The maximum wiring length is 50m.

System configuration

Device name	Model	Qty.
Enegy measuring module multi-circuit model	QE84WH/QE83WH4W	1
Split current sensor	EMU-CT□□□	1/circuit

High-voltage circuit



System configuration

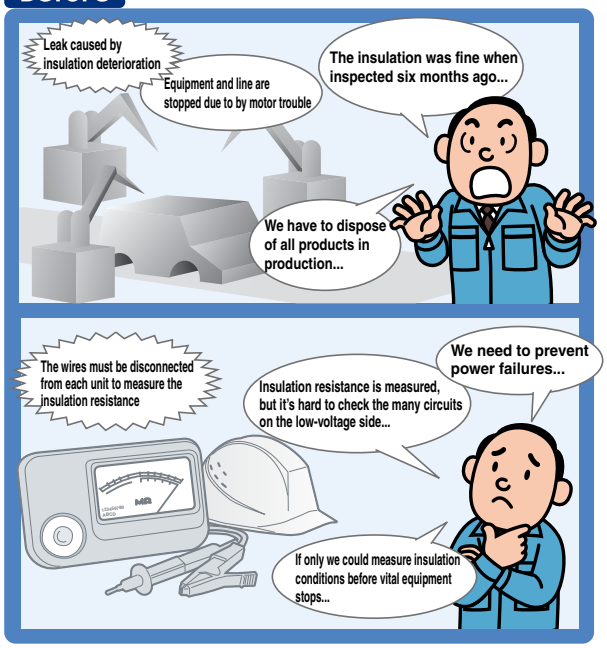
Device name	Model	Qty.
Enegy measuring module multi-circuit model (for 3-phase 4-wire)	QE84WH/QE83WH4W	1
5A split current sensor	EMU2-CT5	1*5/2 circuits
Dedicated 5A split current sensor cable.	EMU2-CB-Q5B	1

*5: Using the current measurement mode, two circuits can be measured with one EMU2-CT5.

Insulation Monitoring Module

Insulation monitoring by PLC. Insulation deterioration in equipment can be detected without omission.

Before



After

Insulation deterioration is constantly monitored for each unit/load

Insulation Monitoring Module
QE82LG

- Prevention of sudden failure of machines and lines
- Reduction of downtime caused by insulation deterioration
- Cost reduced by ending defective product disposal due to sudden line stoppage
- Reduction of maintenance hours for periodic inspections
- Detection of insulation deterioration (earth leakage) at early stage

Advantages of Introducing the Insulation Monitoring Module

■Conventional systems

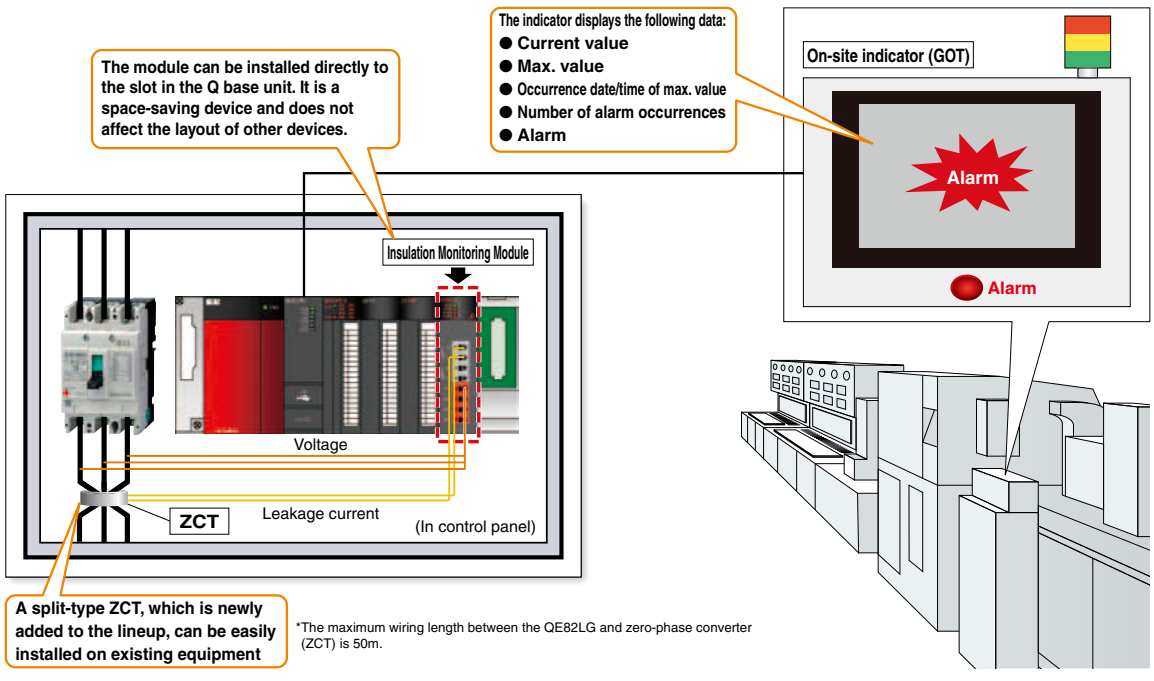
- Measurement of insulation resistance with wiring disconnected during inspection
- Power must be suspended to set the equipment in the non-voltage state
- When leakage current is detected, power supply stops suddenly
- Insulation deterioration cannot be detected easily due to the loc component

■Insulation Monitoring Module

Constant monitoring of leakage current during operation

- Reduction of labor for insulation resistance test
- No need to suspend power supply to equipment
- Early detection of insulation deterioration signs
- Improvement of availability and reduction of product loss through measures taken before sudden stop

System Configuration Example



*The maximum wiring length between the QE82LG and zero-phase converter (ZCT) is 50m.

Features of MELSEC-Q Series Insulation Monitoring Module

Feature1 Early Detection of Insulation Deterioration in Production Equipment

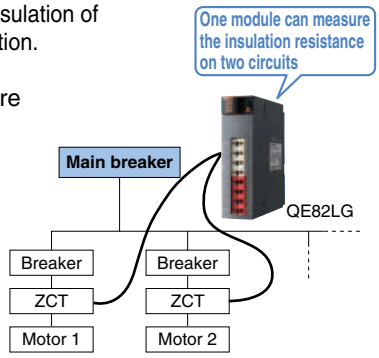
- Since this module is connected directly to the PLC in the control panel, leakage current from points close to loads can be measured easily without the need for additional installation space.
- The module can detect troubles caused by earth leakage (ground fault) and monitor the insulation of motor loads in the production equipment. It does not overlook ongoing insulation deterioration.
- Upper-limit monitoring values for alarms can be set in two stages. Insulation deterioration/condition is detected at each stage, enabling countermeasures before equipment stoppage/malfunction.

Conventional insulation monitoring equipment

System where leakage occurs can be identified, but it's not possible to detect insulation deterioration in equipment.

Insulation Monitoring Unit

Insulation monitoring pinpoints the problematic equipment, making it possible to recognize deteriorated insulation location early on!



Feature2 Constant Monitoring for Insulation Deterioration of Equipment Using Ior Method

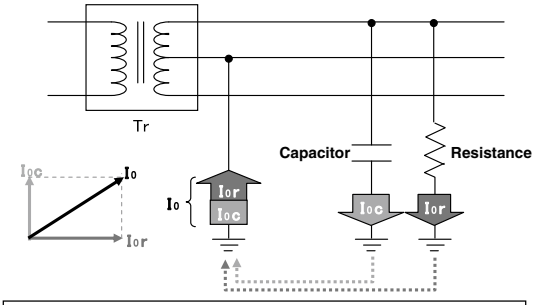
- The module can measure resistive-component leakage current (Ior). Even on circuits which cannot be monitored for insulation using the conventional Io method, such as inverter circuits on which capacitor component leakage current (Ioc) is large, the module removes the Ioc component and can correctly monitor the leakage current caused by insulation deterioration.
- The module constantly measures the resistive-component leakage current (Ior) even while equipment is running. It detects any sign of insulation deterioration without power interruption.

*A correct measurement cannot be made with the inverter or servo amplifier's binary value. Always measure with the primary value.

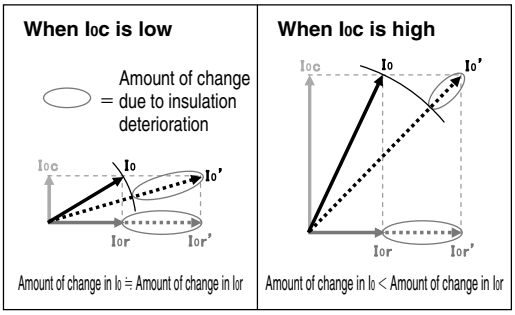
The Ior method stated in the "Standard Specifications for Public Works Construction (Electric Equipment Work)" edited by the Ministry of Land, Infrastructure, Transport and Tourism is used.

Since leakage current (Io) is affected by the Ioc of the whole equipment, the Ior measurement is effective for insulation deterioration diagnosis

■Method of leakage current measurement (Io and Ior measurements)



- The Ioc fluctuates on equipment with long wiring distance or inverter devices and filters.



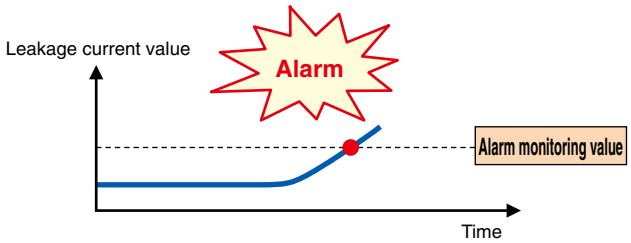
Insulation Monitoring Module Solution Example

Preventive Maintenance

From Corrective to Preventive Maintenance as a Result of Insulation Monitoring

Constant measurement of leakage current (Io or Ior) can prevent sudden trouble and reduce production loss due to equipment stoppage.

Example: Increase in leakage current is detected based on the preset alarm monitoring value, so maintenance of deteriorated insulation is performed.



Monitoring of upper limit alarm (leakage current) (Monitoring of equipment trouble)

↓ Alarm

Equipment maintenance and repair

↓

Reduction of production loss due to equipment stoppage

*1: Sample screen data used to display the Io/Ior present values, maximum values and occurrence times/dates of maximum values on a GOT (GT15 or GT16 models in the GOT1000 Series*2 *3) can be downloaded free of charge from the Mitsubishi Electric factory automation website (www.MitsubishiElectric.co.jp/fa/).
*2: The GOT sample screen data is designed for use with the GT16**-V (640 × 480). When using the sample data with other models and resolutions, please change the model settings in GT Works3. We recommend use of a GOT model that supports up to 65,536 colors.
*3: When using a GT15 model which is function version C or earlier, an optional function board is required.

Applicable Systems

(1) Number of modules which can be installed on applicable units

(a) When installing on a CPU unit

Applicable CPU units						Installable quantity
CPU type	CPU model name					
Basic model QCPU	Q00JCPU					16
	Q00CPU	Q01CPU				24
High-performance model QCPU	Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU	64
Process CPU	Q02PHCPU	Q06PHCPU	Q12PHCPU	Q25PHCPU		64
Redundant CPU	Q12PRHCPU	Q25PRHCPU				53
Universal model QCPU	Q00UJCPU					16
	Q00UCPU	Q01UCPU				24
	Q02UCPU					36
	Q03UDCPU Q20UDHCPU Q10UDEHCPU Q100UDEHCPU	Q04UDHCPU Q26UDHCPU Q13UDEHCPU	Q06UDHCPU Q03UDECPU Q20UDEHCPU	Q10UDHCPU Q04UDEHCPU Q26UDEHCPU	Q13UDHCPU Q06UDEHCPU Q50UDEHCPU	64
High-speed universal model QCPU	Q03UDVCPU	Q04UDVCPU	Q06UDVCPU	Q13UDVCPU	Q26UDVCPU	64
C Controller module	Q06CCPU-V	Q06CCPU-V-B	Q12DCCPU-V			64

(b) When installing on a MELSECNET/H remote I/O station

Applicable network units			Installable quantity*1
QJ72LP25-25	QJ72LP25G	QJ72BR15	64

*1: Limited within the number of I/O points on the network units.

(2) Applicable base units

QE82LG can be installed in any I/O slot (*2) of the basic base unit or an extension base unit.

*2: In the case of a redundant CPU, the module can be installed only on an extension base unit. It cannot be installed on the basic base unit. The number of installed modules is limited within the number of I/O points on the CPU unit.

(3) Application to multi-CPU systems

QE82LG is applicable to multi-CPU systems. When using QE82LG on a multi-CPU system, first please refer to the "QCPU User's Manual (Multi-CPU System)."

(4) Applicable software packages

The software packages compatible with QE82LG are shown below.

Product name	Model name	Remarks
GX Developer	SWnD5C-GPPW	MELSEC PLC programming software. The "n" in the model name is 4 or higher.
GX Works2	SWnDNC-GXW2	iQ Platform compatible PLC engineering software. The "n" in the model name is 1 or higher.

General Specifications & Measurement Items

(1) General specifications

Item			Specification		
Phase wire system			Single-phase 2-wire, single-phase 3-wire and 3-phase 3-wire systems common use		
Instrument rating	Voltage circuit *1 *2	Single-phase 2-wire	110VAC and 220VAC common use		
		3-phase 3-wire			
		Single-phase 3-wire	110VAC (between wires 1-2, between wires 2-3), 220VAC (between wires 1-3)		
	Leakage current circuit		AC1A (ZCT is used. The current is the primary current of ZCT.)		
	Frequency		50-60Hz (automatic frequency selection)		
Measurement range			Low-sensitivity mode : 0 to 1000mA High-sensitivity mode : 0.00 to 100.00mA		
Resolution			Low-sensitivity mode : 1mA High-sensitivity mode : 0.01mA		
Main unit tolerances (excluding ZCT)			Low-sensitivity mode : Leakage current (I_Δ) : ±2.5% (10% to 100% of rating) : ±2.5mA (≤10% of rating) : Resistive-component leakage current ($I_{\Delta r}$) : ±2.5% (10% to 100% of rating) : ±2.5mA (≤10% of rating) High-sensitivity mode : Leakage current (I_Δ) : ±2.5mA : Resistive-component leakage current ($I_{\Delta r}$) : ±2.5mA (The resistive-component leakage current does not include electrostatic capacity.)		
Number of measurement circuits			2 circuits*3		
Data refresh period			Leakage current : 2 sec or less Resistive-component leakage current : 10 sec or less		
Power outage compensation			Backup to nonvolatile memory (Saved items: Setting values, max. value and its occurrence date/time, alarm occurrence times)		
Internal current consumption (5 VDC)			0.17A		
Number of occupied I/O points			16 points (I/O assignment: intelligent 16 points)		
Weight			0.1kg		
Applicable wire			Voltage input terminal	Single wire	AWG24 to AWG17
				Stranded wire*5	AWG20 to AWG16
			ZCT input terminal (Z+, Z terminal)*4	Single wire	AWG24 to AWG17
				Stranded wire*5	AWG20 to AWG16
Applicable standards			CE Marking (EN61131-2, EN61010-1, EN61326-1) UL Standards (UL508), c-UL Standards (CSA C22.2 No. 14)		

*1:The module can be connected directly to 100 to 220V circuits. When the voltage exceeds 220VAC, an external voltage transformer (VT) is required. (It is possible to arbitrarily set the primary voltage of VT to up to 6,600V and the secondary voltage to up to 220V.)

*2: $I_{\Delta r}$ can be measured on a single-phase 3-wire or 3-phase 3-wire delta circuit. On special grounded circuits, such as 3-phase 3-wire star circuits, high-resistance grounded circuits and capacitor grounded circuits, only I_Δ can be measured.

*3: Leakage current (I_Δ and $I_{\Delta r}$) of CH1 and CH2 can be measured only on circuits when the voltage input was on the same system.

*4: Use the CH1 and CH2 wires in a twisted state for the connection between the ZCT secondary terminal and this module's terminal (Z+, Z).

*5: When using a stranded wire, use a rod terminal or twist the end, etc., so that the fine wires do not come apart. Recommended rod terminal: TGN TC-1.25-11T (Nichifu).

(2) Measurement items

Measurement items	Details
Leakage current (Io)	Current value
	Max. value
	Occurrence date/time of max. value
	Number of first stage alarm occurrences
	Number of second stage alarm occurrences
Resistive-component leakage current (Ior)	Current value
	Max. value
	Occurrence date/time of max. value
	Number of first stage alarm occurrences
	Number of second stage alarm occurrences

(3) Specifications for Zero-phase Current Transformer (ZCT)

■Split-type Zero-phase Current Transformer

Item	Specification				
Model name	CZ-22S	CZ-30S	CZ-55S	CZ-77S	CZ-112S
Hole diameter [mm]	22	30	55	77	112
Allowable current	50	100	300	600	1000
Mass [kg]	0.5	0.6	1.8	2.8	6.0
Rated short-time current	50kA (peak value is 100kA)				

■Through-type Zero-phase Current Transformer

Item	Specification					
Model name	ZT15B	ZT30B	ZT40B	ZT60B	ZT80B	ZT100B
Hole diameter [mm]	15	30	40	60	80	100
Allowable current	See the following table “Penetrable max. wire size and allowable current of ZCT”					
Mass [kg]	0.2	0.4	0.6	2.0	2.6	3.3
Rated short-time current	50kA (peak value is 100kA)					

■Zero-phase Current Transformer with primary conductor

Item	Specification		
Model name	ZTA600A	ZTA1200A	ZTA2000A
Allowable current [A]	600	1200	2000
Mass [kg]	6.5	11	27
Number of poles	3		
Rated voltage	AC600V		
Rated short-time current	100kA (peak value)		

■Penetrable max. wire size and allowable current of ZCT

Wiring method			Penetrable max. wire size (mm²) (allowable current (A))										
			Split-type					Through-type					
Phase wire system	No. of wires	Wire type	CZ-22S	CZ-30S	CZ-55S	CZ-77S	CZ-112S	ZT15B	ZT30B	ZT40B	ZT60B	ZT80B	ZT100B
Single-phase 2-wire	2	600-V vinyl wire (IV wire)	22 (115)	60 (217)	250 (556)	500 (842)	–	14 (88)	60 (217)	150 (395)	325 (650)	600 (992)	800 (1185)
		600-V cross-linked polyethylene insulated wire with single core (CV wire)	22 (130)	38 (190)	200 (545)	500 (920)	1000 (1465)	2 (33)	38 (190)	60 (260)	250 (655)	400 (870)	600 (1140)
Single-phase 3-wire 3-phase 3-wire	3	600-V vinyl wire (IV wire)	22 (115)	38 (162)	200 (496)	500 (842)	–	8 (61)	38 (162)	100 (298)	250 (556)	500 (842)	725 (1095)
		600-V cross-linked polyethylene insulated wire with single core (CV wire)	14 (100)	22 (135)	150 (455)	325 (760)	800 (1285)	2 (33)	22 (135)	60 (260)	200 (560)	325 (760)	600 (1140)

Remarks (1) Note that the wire thickness may vary slightly depending on the manufacturer. (2) The IV wire applies to cases where insulators are used. (3) The CV wire applies to cases of installation in a covered conduit in air. (Cables of 600mm² or more have various structures. The values are shown for reference.)

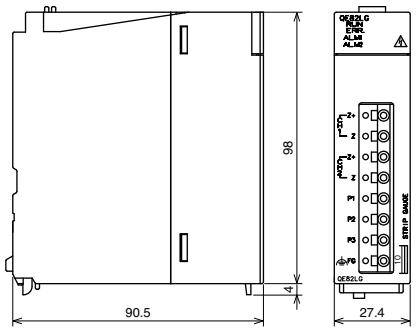
Optional Parts

Part name	Model	Outline Dimension	Photo
Split-type zero phase converter	CZ-22S	②	
	CZ-30S		
	CZ-55S		
	CZ-77S		
	CZ-112S		
Through-type zero phase converter	ZT15B	③	
	ZT30B		
	ZT40B		
	ZT60B	④	
	ZT80B		
	ZT100B		
Zero phase converter with primary conductor	ZTA600A	⑤	–
	ZTA1200A	⑥	
	ZTA2000A	⑦	*Refer to outline drawing

Outline Dimension Drawings

Unit : mm

①QE82LG

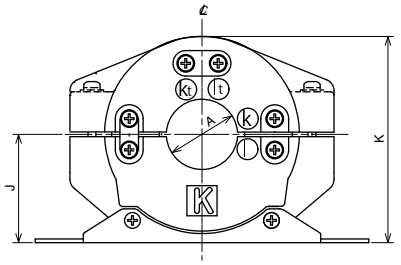


Unit : mm

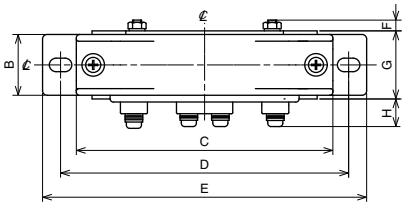
②CZ-22S/30S/55S/77S/112S

■Dimensions of Split-type Zero-phase Current Transformer

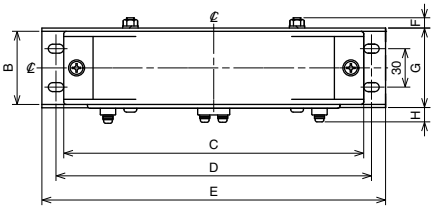
	CZ-22S	CZ-30S	CZ-55S	CZ-77S	CZ-112S
A	22	30	55	77	112
B	27	27	32	41	57
C	100	114	148	198	234
D	112	130	160	210	246
E	128	144	177	232	268
F	5	5	7	10	8
G	30	30	36	45	62
H	12	12	12	12	12
J	41	47	66	90	109
K	77	89	124	171	207



(CZ-22S/30S/55S/77S)

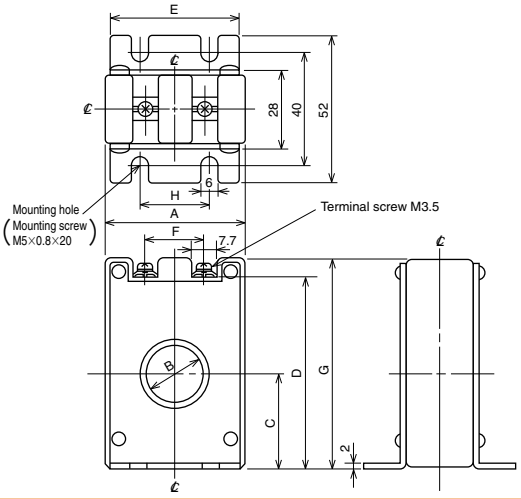


(CZ-112S)



Unit : mm

③ZT15B/30B/40B



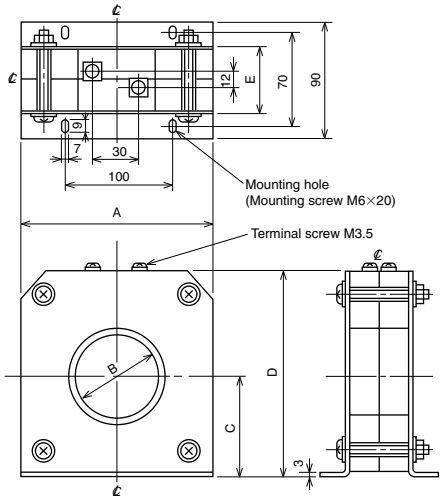
■Dimensions of ZT15B, 30B and 40B

	ZT15B	ZT30B	ZT40B
A	48	68	85
B	15	30	40
C	29	37	43
D	62	82	92
E	46	66	81
F	15	30	40
G	70	90	100
H	25	50	50

■Dimensions of ZT60B, 80B and 100B

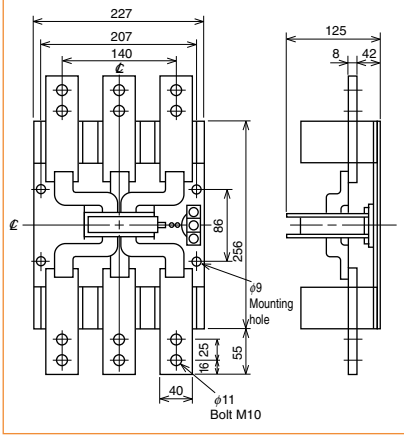
	ZT60B	ZT80B	ZT100B
A	140	160	185
B	60	80	100
C	73	82	93
D	150	169	190
E	46	48	50

④ZT60B/80B/100B

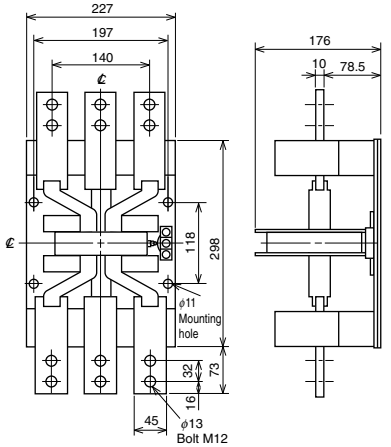


Unit : mm

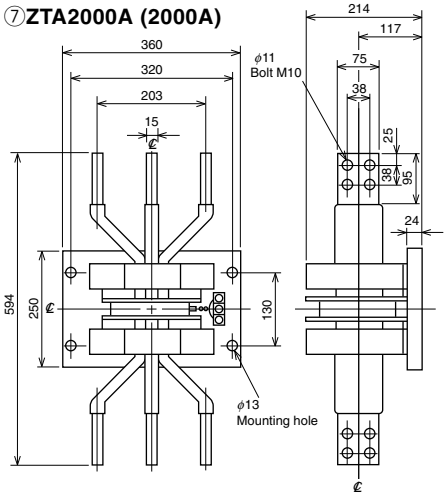
⑤ZTA600A (600A)



⑥ZTA1200A (1200A)

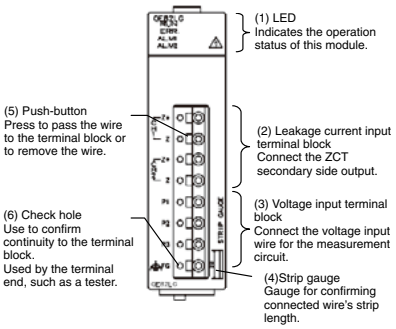


⑦ZTA2000A (2000A)



Insulation monitor module: Names and functions of each part

QE82LG Names and Functions



Terminal block signal names

Terminal name	Explanation
CH1 Z+, Z	Leakage current input terminal (CH1)
CH2 Z+, Z	Leakage current input terminal (CH2)
P1 P2 P3	Phase 1 voltage input terminal Phase 2 voltage input terminal Phase 3 voltage input terminal
FG	Frame GND terminal

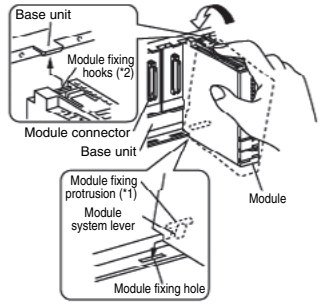
QE82LG LED displays and functions

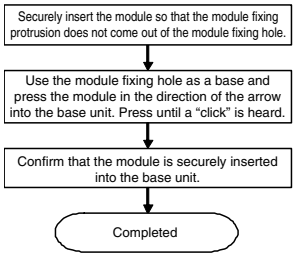
The names and functions of the LEDs are explained below.

Name	Display color	Role	ON/OFF conditions
RUN LED	Green	Indicates this product's operation status.	ON: Operating normally OFF: Internal power OFF, hardware error, etc., occurring *1
ERR. LED	Red	Indicates this product's error and status.	Flicker: Outside setting value range error occurring *1 ON: Hardware error occurring *1 OFF: Operating normally
ALM1 LED	Red	Indicates the product's CH1 alarm occurrence state.	The display changes according to the alarm status of the following four alarm occurrence flags. *2 CH1 leakage current first stage alarm occurrence flag (Xn1) CH1 leakage current second stage alarm occurrence flag (Xn2) CH1 resistance leakage current first stage alarm occurrence flag (Xn3) CH1 resistance leakage current second stage alarm occurrence flag (Xn4)
ALM2 LED	Red	Indicates the product's CH2 alarm occurrence state.	The display changes according to the alarm status of the following four alarm occurrence flags. *2 CH2 leakage current first stage alarm occurrence flag (Xn5) CH2 leakage current second stage alarm occurrence flag (Xn6) CH2 resistance leakage current first stage alarm occurrence flag (Xn7) CH2 resistance leakage current second stage alarm occurrence flag (Xn8)

*1: Refer to the User's Manual (Details Section) "9.1 List of Error codes" for details.
*2: Refer to the User's Manual (Details Section) "4.2.3 Alarm monitor function" for details.

Mounting the insulation monitor module

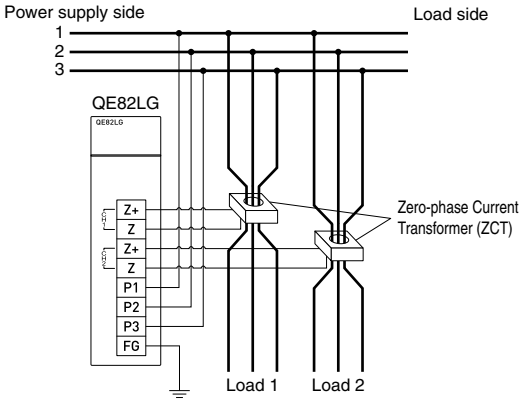




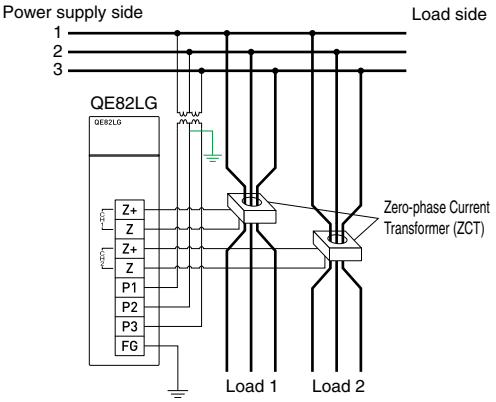
- When mounting the module, insert the module fixing protrusion into the module fixing hole on the base unit. Securely insert so that the module fixing protrusion does not come out of the module fixing hole. Mounting the module with force instead of carefully inserting it will lead to module damage.
- When using in a place with high levels of vibration and impact, screw the module onto the base unit.
  Module fixing screw: M3x12mm (prepared by user)
  Tightening torque: 0.36 to 0.48N.m

Connection Diagrams

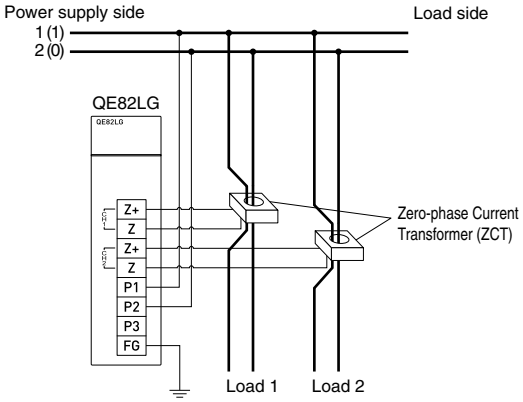
For 3-phase 3-wire type



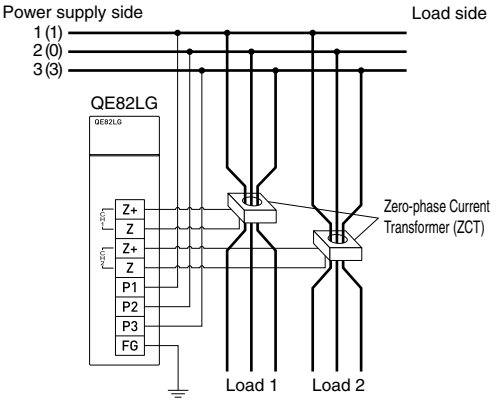
For 3-phase 3-wire type (with voltage transformer)



For single-phase 2-wire type



For single-phase 3-wire type



* Cables between QE82LG and Zero-phase Current Transformer (ZCT) are to be prepared by the customer. * In all cases, make sure to connect FG to ground.

Safety Precautions (Always read before using)

[Precautions for working environment and working conditions]

⚠ CAUTION

●Do not use this product in the following types of places. There is a risk of malfunction and shortened service life.
- Where ambient temperature exceeds 0 to 55°C
- Where daily average temperature exceeds 35°C
- Where relative humidity exceeds 5 to 95%RH, or where dew condenses
- Where altitude exceeds 2000m
- Where product is subject to rain or water drops, etc.
- Where product is subject to direct sunlight
- Where metal or conductive substances could scatter
- Where there are strong magnetic files or high levels of external noise
- Where there are high levels of dust, corrosive gas, salt or soot
- Where there are high levels of vibration or impact
- Installation in place other than control panel

[Precautions for design]

⚠ DANGER

●Do not write data into the "System Area" of the intelligent function module's buffer memory. Do not output (turn ON) the "Use Prohibited" signal output from the CPU module to the intelligent function module. The PLC system could malfunction if data is written into the "System Area" or if an output is made to the "Use Prohibited" signal.

⚠ CAUTION

●The input signal wire must not be bundled with or placed near the main circuit or power wire. Separate the wire by at least 300mm (excluding the terminal block input section). Noise could cause malfunctioning.

[Precautions for installation]

⚠ CAUTION

●For safety purposes, the installation and wiring work must be performed by a qualified electrician.
●Use the PLC within the general specification environment listed in the User's Manual for the CPU module being used.
Using the product in an environment exceeding the general specifications range could lead to electric shocks, fires, malfunction, product damage or deterioration.
●Press down on the module mounting lever on the bottom of the unit, and securely insert the module fixing protrusion into the base module's fixing hole.
Improper mounting of the module will lead to malfunctions, troubles and dropping of the module.
Tighten the module with screws when using in an environment with high levels of vibration.
●Tighten the screws with the specified torque range. (The M3x12mm module fixing screw must be prepared by the user.)
Tightening torque 0.36 to 0.48N.m
Loose screws can cause problems such as dropping, short-circuiting or malfunctioning. Excessively tight screws can problems such as dropping from screw or module damage, short-circuits, or malfunctions.
●Shut off all phases of the power supply at an external point before mounting or removing the module. The product could be damaged if all phases are not shut off.
●Do not directly touch the module's conductive sections or electronic parts. There is a risk of module malfunctioning and faults.

[Precautions for wiring]

⚠ DANGER

●Shut off all phases of the power supply at an external point before mounting or wiring the module. There is a risk of electric shocks or product damage if all phases are not shut off.

⚠ CAUTION

●Always ground the FG terminal with the PLC dedicated Class D grounding (Class 3 grounding, etc.). There is a risk of electric shock or malfunction.
●Always use this product in combination with the dedicated current sensor (EMU-CT50, EMU-CT100, EMU-CT250, EMU-CT400, EMU-CT600, EMU2-CT5).
The current sensor's input must not exceed this product's rating. Always refer to the current sensor's manual to maintain this product's functions and accuracy.
●EMU-CT50, EMU-CT100, EMU-CT250, EMU-CT400 and EMU-CT600 are dedicated for a low-voltage circuit. These cannot be used for a high-voltage circuit.
Pass the EMU2-CT5 through the secondary side (5A) of the converter. It can be used directly with a circuit up to a 200V circuit.
If connected inadvertently to a high-voltage circuit, a very hazardous state including device burning and fires could result.
Refer to section "Appendix 2 Option Device (1) Specifications" for details on the maximum working voltage.
●The dedicated current sensor has a polarity (direction). Pay attention to the polarity when installing.
●Do not open the secondary side of the dedicated current sensor.
●Attach a foreign matter entry prevention label onto the top of the module to prevent foreign matter such as wiring scraps from getting into the module during wiring.
Do not remove this label during wiring work.
Always remove this label to dissipate heat when operating the system. If the foreign matter entry prevention label is not removed, heat could build up in the module and shorten the life.
●The wires connected to the module must be placed in a duct or fixed with a clamp. If the wires are not placed in a duct or if not fixed with a clamp, the wires could sway or move, or careless pulling, etc., could cause damage to the module or wires, or malfunctions could occur from wire contact faults.

[Precautions for wiring] (Continued from left bottom)

⚠ CAUTION

●Always use the appropriate wire size. An incorrect wire size could lead to fires caused by heating.
●When using a stranded wire, twist the rod terminal or end, etc., to prevent the strands from loosening. Using an improper bar terminal could cause disconnections or contact faults, and lead to device malfunction, trouble, burning or fires.
●When finished with the wiring, always confirm that no wiring has been overlooked or incorrectly wired. Overlooked wiring or incorrect wiring could cause device malfunction, fires or electric shock.
●Tighten the terminal screws within the specified torque range.
Loose terminal screws can lead to short-circuits and malfunctions.
Excessively tight terminal screws can lead to short-circuits and malfunctions from screw or module damage.
●Use suitable crimp terminals for the current input wire, and tighten with the specified torque. If an open-end type crimp terminal is used, the wire could dislocate when the terminal screw loosens, or faults could occur.
●When using a stranded wire for the voltage input wire, twist the end, etc., so that the strands do not loosen.
●One of the following measures must be incorporated with the panel to protect persons having no experience with electrical facilities from electric shocks.
(a) Provide a lock on the panel so that only persons sufficiently qualified to handle electric facilities can open the panel.
(b) Provide a structure to automatically shut the power off when the panel is opened.
The panel protection class must be IP2X or higher.
●Pulling on the wires connected to the unit could cause malfunctions, or damage the module or wires.
●Carefully confirm the product's rated voltage, rated current and terminal layout, and correctly connect the wires to the module. Fires or trouble could occur if a voltage differing from the rating is input or incorrectly wired.
●When performing the insulation resistance test or power frequency withstand voltage test, do not exceed the specified voltage value.

[Precautions for startup and maintenance]

⚠ CAUTION

●Use this product within the rating range given in this manual. Use exceeding this rating range will not only lead to malfunctions and trouble, it may also cause fires and burning.
●Always confirm that there are no live exposed wires in the area before starting operations. If any exposed wires are found, stop the operation immediately and provide suitable insulation protection, etc.
●Do not disassemble or modify the unit. There is a risk of fault, malfunction, injury or fire.
●Shut off all phases of the power supply at an external point before mounting or wiring the module. There is a risk of electric shocks or product damage if all phases are not shut off.
●Do not touch the terminal when the module is powered. There is a risk of electric shock or malfunction.

[Precautions for inspections]

⚠ CAUTION

●Shut off all phases of the power supply at an external point before cleaning or tightening the module mounting screws. There is a risk of product trouble or malfunction if all phases are not shut off.
●Clean the surface with a soft, dry cloth.
●Do not allow a chemical cloth, etc., to come in contact for extended periods, or wipe the product with benzene or thinner, etc.
●Perform the following inspections to ensure correct use for the product for a long time.
<Daily inspection>
①Is the product damaged? ②Are any of the LED displays abnormal? ③Is there any abnormal noise, odors or heating?
<Periodic inspection (once every six to twelve months)>
④Is the product mounting state, terminal block connections or connector connections loose?
(Always turn the power OFF before inspecting)

[Precautions for storage]

⚠ CAUTION

●When storing this product, turn the power OFF, disconnect all wires, and place it in a polyvinyl bag, etc. Avoid the following types of places when storing for a long time. There is a risk of trouble and shorter life.
- Where ambient temperature exceeds -25 to +75°C
- Where daily average temperature exceeds 35°C
- Where relative humidity exceeds 5 to 95%RH, or where dew condenses
- Where there are high levels of dust, corrosive gas, salt or soot
- Where there are high levels of vibration or impact
- Where product is subject to rain or water drops, etc.
- Where product is subject to direct sunlight
- Where metal or conductive substances could scatter
- Where there are strong magnetic files or high levels of external noise

[Precautions for disposal]

⚠ CAUTION

●Dispose of this product appropriately following the "Laws regarding processing and cleaning of wastes (Waste Management Laws)."

*Refer to the User's Manual (Details Section) of each model for details.

WARRANTY

Please confirm the following product warranty details before starting use.

1. Gratis Warranty Term and Gratis Warranty Scope

If any faults or defects (hereinafter "trouble") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired or exchanged at no cost via the dealer or Mitsubishi Service Company.
Note that if repairs are required at a site within Japan or overseas, expenses to dispatch an engineer shall be charged for. Onsite re-adjustments and trial operations required for replacing a fault unit shall be excluded from Mitsubishi's responsibility.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) As a principle, the primary fault diagnosis must be preformed by the user. If requested by the client, Mitsubishi or Mitsubishi's service network can perform the work for a fee.
In this case, if Mitsubishi is found at fault for the cause of the fault, the service will be performed for free.
(2) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(3) Even within the gratis warranty term, repairs shall be charged for in the following cases.
① Trouble occurring from inappropriate storage or handling, carelessness or negligence by the user, and trouble occurring from the user's hardware or software designs.
② Trouble caused by unapproved modifications or repairs, etc., to the product by the user.
③ When the Mitsubishi product is assembled into a user's device, trouble that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
④ Trouble that could have been avoided if consumable parts designated in the instruction manual, etc., had been properly serviced or replaced.
⑤ Replacement of consumable parts (battery, relay, fuse, etc.).
⑥ Trouble not attributable to Mitsubishi including external irresistible forces such as fires or abnormal voltages, and trouble caused by force majeure such as earthquakes, lightning, wind and water damage.
⑦ Trouble caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
⑧ Any other trouble found to not be the responsibility of Mitsubishi or identified as not the responsibility of Mitsubishi by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not possible after production is discontinued.

3. Exclusion of chance loss and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, chance losses or lost profits incurred to the user by troubles in Mitsubishi products, damages and secondary damages caused from special reasons regardless of Mitsubishi's expectations, compensation for accidents, compensation for damages to products other than Mitsubishi products, or compensation for any other duties including replacement work by user, readjustment of on-site machines and equipment or trial operation for startup.

4. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

5. Product application

(1) In using the Mitsubishi MELSEC programmable logic controller, the application must not lead to a major accident even if any trouble or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any trouble or fault.
(2) The Mitsubishi general-purpose programmable logic controller has been designed and manufactured for applications in general industries, etc.
Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for railway companies or governmental agencies shall be excluded from the programmable logic controller applications.
Application of the Mitsubishi programmable logic controller must also be excluded in applications which could greatly affect human life or assets, including use in aircraft, medical applications, railways, incineration and fuel devices, manned transport devices, pleasure equipment and safety devices.
Note that even with these applications, if the user approves that the application is to be limited and a special quality is not required, application will be considered. Please consult with Mitsubishi in this case.

MEMO

Mitsubishi Electric Programmable Logic Controller MELSEC-Q Series

Country/Region	Sales office	Tel/Fax
USA	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061, USA	Tel : +1-847-478-2100 Fax : +1-847-478-0327
Brazil	Mitsubishi Electric do Brasil Comércio e Serviços Ltda. Av Paulista, 1439-Cj. 74 Bela Vista, 01311-200, Sao Paulo, Brazil	Tel : +55-11-3146-2200 Fax : +55-11-3146-2217
Germany	Mitsubishi Electric Europe B.V. German Branch Gothaer Strasse 8 D-40880 Ratingen, Germany	Tel : +49-2102-486-0 Fax : +49-2102-486-1120
UK	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Hertfordshire AL10 8XB, UK	Tel : +44-1707-276100 Fax : +44-1707-278992
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Spain	Mitsubishi Electric Europe B.V. Spanish Branch Carretera de Rubi 76-80 E-08190 Sant Cugat del Valles (Barcelona), Spain	Tel : +34-93-565-3131 Fax : +34-93-589-1579
France	Mitsubishi Electric Europe B.V. French Branch 25, Boulevard des Bouvets, F-92741 Nanterre Cedex, France	Tel : +33-1-5568-5568 Fax : +33-1-5568-5757
Czech Republic	Mitsubishi Electric Europe B.V. Czech Branch Avenir Business Park, Radlická 714/113a CZ-158 00 Praha 5	Tel : +420-251-551-470 Fax : +420-251-551-471
Poland	Mitsubishi Electric Europe B.V. Polish Branch ul. Krakowska 50 32-083 Balice, Poland	Tel : +48-12-630-47-00 Fax : +48-12-630-47-01
Russia	Mitsubishi Electric Europe B.V. Moscow Office 52/3, Kosmodamianskaya nab., 115054, Moscow, Russia	Tel : +7-812-633-3497 Fax : +7-812-633-3499
South Africa	Circuit Breaker Industries Ltd. Private Bag 2016, ZA-1600 Isando, South Africa	Tel : +27-11-928-2000 Fax : +27-11-392-2354
China	Mitsubishi Electric Automation (CHINA) Ltd. No. 1386 Hongqiao Road, Mitsubishi Electric Automation Center Shanghai China, 200336	Tel : +86-21-2322-3030 Fax : +86-21-2322-3000
Taiwan	Setsuyo Enterprise Co., Ltd. 6F., No.105 Wu-Kung 3rd.Rd, Wu-Ku Hsiang, Taipei Hsine 248, Taiwan	Tel : +886-2-2299-2499 Fax : +886-2-2299-2509
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