Power monitoring unit
F-MPC04, F-MPC04P, F-MPC04S

Power monitoring unit F-MPC04 series

F-MPC04 (UM01)

F-MPC04P (UM02)

F-MPC04S (UM03)

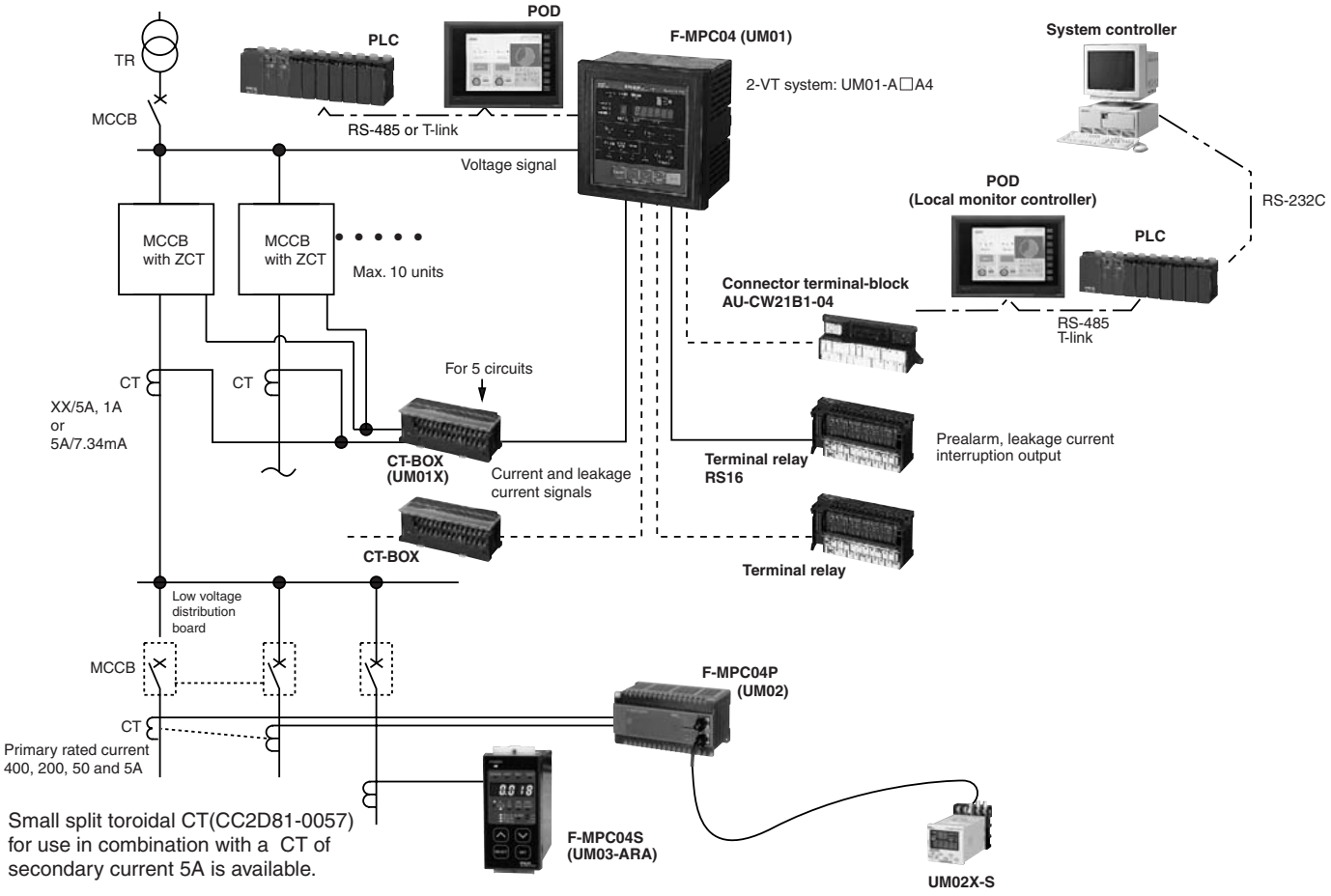
■ Description

- F-MPC04 series power monitoring equipment, designed for used in low voltage circuits, can perform electric power management and monitoring from high to low voltage circuit efficiently and economically, used together with F-MPC60B and F-MPC30 series.
- F-MPC04 series consists of 3 types: type UM01 integrated power monitoring unit that can monitors up to 10 feeders, type UM02 multi-circuit power monitoring unit that is space-saving and can monitor up to 8 feeders in three-phase three-wire system, and type UM03 single circuit power monitoring unit, being compact, that has optimum output functions for preventive maintenance, and is best suited for installation in a unit of facility, section, and floor.
- RS-485 communications interface is standard except (UM01-ATA4E). With our application software of F-MPC-Net power monitoring system, you can automatically display, print, and save the data measured by F-MPC 04 on your PC.

Type				F-MPC04	F-MPC04P			F-MPC04S	
				UM01-A□A4E	**UM02-AR2**	**UM02-AR3**	**UM02-AR4**	**UM03-ARA3G**	**UM03-ARA3**
				Integrated power monitoring unit	Multi-circuit power monitoring unit			Single-circuit power monitoring unit	
Measuring function	No. of phase and wire	1-phase 2-wire		10 circuits	12 circuits	—	—	1 circuit	1 circuit
		1-phase 3-wire 3-phase 3-wire		10 circuits	—	8 circuits	—		
		3-phase 4-wire		6 circuits	—	—	4 circuits	—	—
	No. of voltage circuit			2	1			1	1
	Measuring item	Voltage	[V]	○	○			○	○
		Current	[A]	○	○			○	○
		Power	[W]	○	○			○	○
		Active power	[Wh]	○	○			○	○
		Reactive power	[var]	○	○			○	○
		Reactive energy	[varh]	○	–			○	○
		Power-factor		○	○			○	○
		Leakage current	[Io]	○	–			○	–
		Basic component of leakage current	[Iob]	–	–			○	–
	Maintenance item	Demand	Current	○	–			○	○
			Power	○	–			○	○
			Max. current	○	–			○	○
			Max. power	○	○			○	○
		Max. voltage value		○	○			–	–
		Min. voltage value		○	○			–	–
	Harmonic current			○	–			○ (Demand only)	
Protection	Current prealarm (OCA)			○	–			○	○
	Leakage current prealarm (OCGA)			○	–			○	–
	Leakage current trip (OCG)			○	–			○	–
Communications interface				RS-485, T-link	RS-485			RS-485	RS-485
Display and setting				○	Display and setting unit UM02S			○	○
Devices to be connected	Current sensor (Current Transformer:CT)			○ *1	CT: 5, 50, 200, 400A				
	ZCT (separately installed)			○	–			○	–
	MCCB with ZCT			○	–			○	–

Note *1: FMPC 04 (UM01) is connected to CT via CT-BOX. For combination of F-MPC04 (UM01), CT-BOX and CT, *See page 09/120* and *09/136* ; "Applicable CT."

■ System configuration example
Low voltage



Small split toroidal CT(CC2D81-0057) for use in combination with a CT of secondary current 5A is available.

09

Power monitoring unit
F-MPC04

Integrated power monitoring unit, UM01-A

■ Description

Integrating complete functions required for power distribution and power line data management in a single unit (up to 10 circuits for 3-phase 3-wire system)

- Supports multiple power distribution lines
  UM01-A allows economical management of each facility and installation by means of communications interface.
- Easy mounting to existing switchboards
  Split-through type CTs enables UM01-A's easy mounting to existing boards.
- Flexible energy management
  UM01-A manages power line data such as measurement, preventive maintenance, maintenance and electricity quality, and transmit those data to upper level controller, thus promises energy and labor-saving.
- Harmonics current measurement
  The third, fifth, seventh, and total harmonic current can be measured.

UM01-A□A4E

CT-BOX

- Related Equipment
  Molded case circuit breakers with ZCT and split type current transformers are also introduced as related products, RS16 Terminal Relay which outputs leakage current prealarm and the connector terminal-block which outputs kWh pulse, are also explained (UM01 use only).

■ Type number nomenclature

Integrated power monitoring unit

UM01-A T A 4 E □

Basic type
UM01-A□A: F-MPC04 series integrated power monitoring unit (with kWh pulse output)

Communications interface
T: T-link
R: RS-485

Special version
H0: CT direct input
No mark: CT secondary current 5A, 1A

Nameplate language
E: English

VT input type
4: 2VT conformed
Up to 10 feeders: 3∅3W, 1∅2W, 1∅3W
Up to 6 feeders: 3∅4W

■ Ordering information

Specify the following:
1. Type number

■ Types

Description	Specification	Type	Page
Integrated power monitoring unit	RS-485, 2VT-conformed	**UM01-ARA4E**	
	T-link, 2VT-conformed	**UM01-ATA4E**	
CT-BOX	For CT secondary current 5A	**UM01X-5**	
	For CT secondary current 1A	**UM01X-1**	
	For CT secondary current 7.34mA	**UM01X-0**	
Related product			
Terminal Relay		**RS16-DE04H**	*See page 09/139.*
Connector terminal block		**AU-CW21B1**	*See page 09/140.*
Connector cable		**AX014**	

■ Applicable CT

Current transformer (CT)	CT secondary current	Applicable CT-BOX	Applicable integrated power monitoring unit
Small CT Type CC2D81-0057	7.34mA	UM01X-0	UM01-A□A4EH0
Split CT Type CC2N□□-□□□□ Type CC2D□□-□□□□	1A	UM01X-1	UM01-A□A4E
General-purpose CT XX/1A	1A		
General-purpose CT XX/5A	5A	UM01X-5	

■ Specifications

• General specifications

Item		Specification
Rating	Rated frequency	50 or 60Hz (Select at initial setting.)
	Rated voltage	Applicable to both 110V and 220V AC, 110V AC for use with a VT secondary circuit
	Rated current	Depends on CT-BOX specifications (5A, 1A, 7.34mA in a CT secondary circuit, power consumption: 0.1VA max., excluding power loss in the external cable resistance)
	Zero-phase CT	EW type or MCCB output with a ZCT (zero-phase current transformer) (FUJI model)
Control power supply		85 to 242V AC (Connects to dedicated control power supply terminals)
Inrush current		18A max., 3ms max. (100V AC 50Hz) 36A max., 3ms max. (200V AC 50Hz)
Control power consumption *1		25VA max. (Power monitoring unit + two CT-BOXes + two Terminal Relays with all contacts ON)
Ambient temperature		Operating: -10 to + 55˚C (no icing or no condensation) Storage: -20 to +70˚C (no icing on no condensation)
Humidity		20 to 90% RH (no condensation)
Atmosphere		Free from corrosive gases and excessive dusts or particles
Alarm and shutdown outputs		Continuous output current: 1A max. (with output of terminal relay, RS16-DE04H) Make and break current: 250V AC 5A, 30V DC 5A max.
Insulation resistance		10MΩ min.: between ground and electric circuits connected together 5MΩ min.: between electric circuits, between contacts
Dielectric strength		2000V AC, 1 minute between ground and electric circuits connected together, excluding T-link and RS-485 signal circuits
Impulse		4.5kV (1.2 × 50μs) between ground and electric circuits connected together, excluding T-link and RS-485 signal circuits
Momentary overload capability		20 times rated current, nine times for 0.5s, once for 2s
Shock resistance		Approx. 300m/s^2, three times in each of X, Y, and Z axes
Noise immunity		1 to 1.5MHz damped oscillation noise having 2.5 to 3kV peak voltage for 2s 1.5kV square wave (rise time: 1ns, pulse width: 1μs) for 10 minutes continuously
Vibration resistance		JIS C 0040, crossover frequency: 57Hz, 9.8m/s^2
Electrostatic noise resistance		Mounting steel panel surface: ± 8kV F-MPC04 (UM01-A) front panel surface: ± 15kV
Permissible momentary power failure		20ms, continuous operation (excluding display)
Mass		Power monitoring unit UM01: 1000g, CT-BOX: 300g Terminal relay: 200g

Note *1 The control power consumption on the table applies to where CT-BOXes and Terminal relays are connected to the power monitoring unit UM01.

Power monitoring unit
F-MPC04

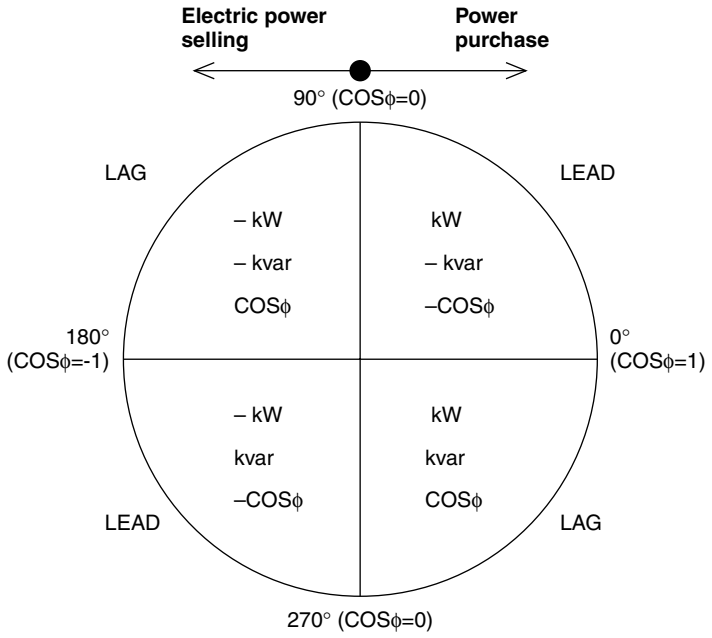
• Measurement and display specifications

Measurement	Display	Effective measurement range	Accuracy (%)	Remarks
Current: I(r), I(s), I(t)	4 digits	0, 2.5 to 150% of CT secondary current	±2.5%	Approx. 2.5% or less is displayed as 0.00.
Voltage: $V_{(uv)}$, $V_{(vw)}$, $V_{(wu)}$		85 to 242V AC at VT secondary voltage	±2.5%	3φ3W: 264V max. 3φ4W (phase voltage): 264V max. 3φ4W (line voltage): $\sqrt{3}$ x 264V
Zero-phase current (Io)		0, 50 to 1200mA	±20%	Approx. 50mA or less is displayed as 0.
Active power		0 to 2kW, at transformer secondary circuit conversion	±2.5%	
Reactive power		0 to 2kvar, at transformer secondary circuit conversion	±2.5%	
Power-factor	□, □□	Lead 0% to 100% to log 0%	±5%	90° phase-angle conversion
Active electric energy	5 digits	+0 to 99999 –0 to 99999	JIS ordinary class or equivalent	
Reactive electric energy	4 digits (communications data only)	+0 to 9999 –0 to 9999	JIS ordinary class or equivalent	No inidication available on the UM01
Minimum voltage	4 digits	85 to 264V AC at each phase VT secondary voltage	±2.5%	
Maximum voltage		85 to 264V AC at each phase VT secondary voltage at maximum voltage phase	±2.5%	
Higher harmonics current		0, 2.5 to 150%: 3rd, 5th harmonics 0, 5.0 to 150%: 7th harmonics	±2.5% (± 5%: 7th harmonics)	

Note : * The accuracy includes the errors of CT-BOXes and ZCTs connected to the UM01-A. The errors of integrated VTs and CTs are not included.
The current, voltage, and electric power measurement characteristics conform to JIS C 1102 (Electrical Measurement Instrument).
The displayed values are moving averages calculated for four seconds for current and one second for voltage.

The sign "±" in electric measuring

The sign “±" is used to display "LEAD/LAG" in power-factor. measuring and “electric power selling/purchase” in electric power measuring. No signs are used if a value is "+". The sign “±" has the following meanings depending on the measured items.



- Active power: kW
  +: Power purchase (Consumed electric power)
  –: Electric power selling (Inverse electric power flow)
- Reactive power: kvar
  +: Lagging current by reactive volt-ampere meter method
  –: Leading current by reactive volt-ampere meter method
  * “LEAD/LAG” reverses with electric power selling/purchase.
- Power factor: COSφ
  +:LEAD –: LAG

• Demand measurement

Item	Specification
Current (I(r), I(s), I(t)) Effective power Zero-phase current (Io) Harmonics currents, voltage	Time: Select one from 0, 1, 5, 10, 15, and 30 minutes it at the initial setting (common to all 10 circuits). Display item: 1. Demand values 2. Maximum demands (maximum values recorded before the last reset operation)

● **Specifications of a leakage current relay**

Sensitive current

Setting value	200/500/1000mA on Lock
Operating Level	50 to 100% of setting value (Operate at less than 50%, no opearate at 100%)

Operation time characteristics

Setting time	Inertia non-operating time	Operating time
0.1s	–	0.1s max.
0.3s	0.1s min.	0.3s max.
0.5s	0.3s min.	0.5s max.
1.0s	0.5s min.	1.0s max.

Note: • Sensitive current and operation time can be set by an arbitrary combination.
• The values on the table is for a trip relay's specifications. The pre-alarm relay operates at half the operating level on the table, and its operation time is 10s fixed. The pre-alarm relay can be used as an alarm against leakage current increase in case of cable insulation deterioration or flood.

● **Data display at fault occurrence**
Pre-alarm of load current, pre-alarm of leakage current relay (auto-reset), maximum current indication at circuit interruption (indication reset by resetting)

● **kWh-pulse-output specifications** (for products with a kWh-pulse-output feature)
Transistor open collector output: 35V DC, 50mA max., (residual voltage at ON state: 2.5V max.)
Output pulse width: 200ms ±20ms
Output pulse rate: 10^n kWh/pulse, n =-2, -1, 0, 1, 2, or 3 (selected from VT and CT ratio.)

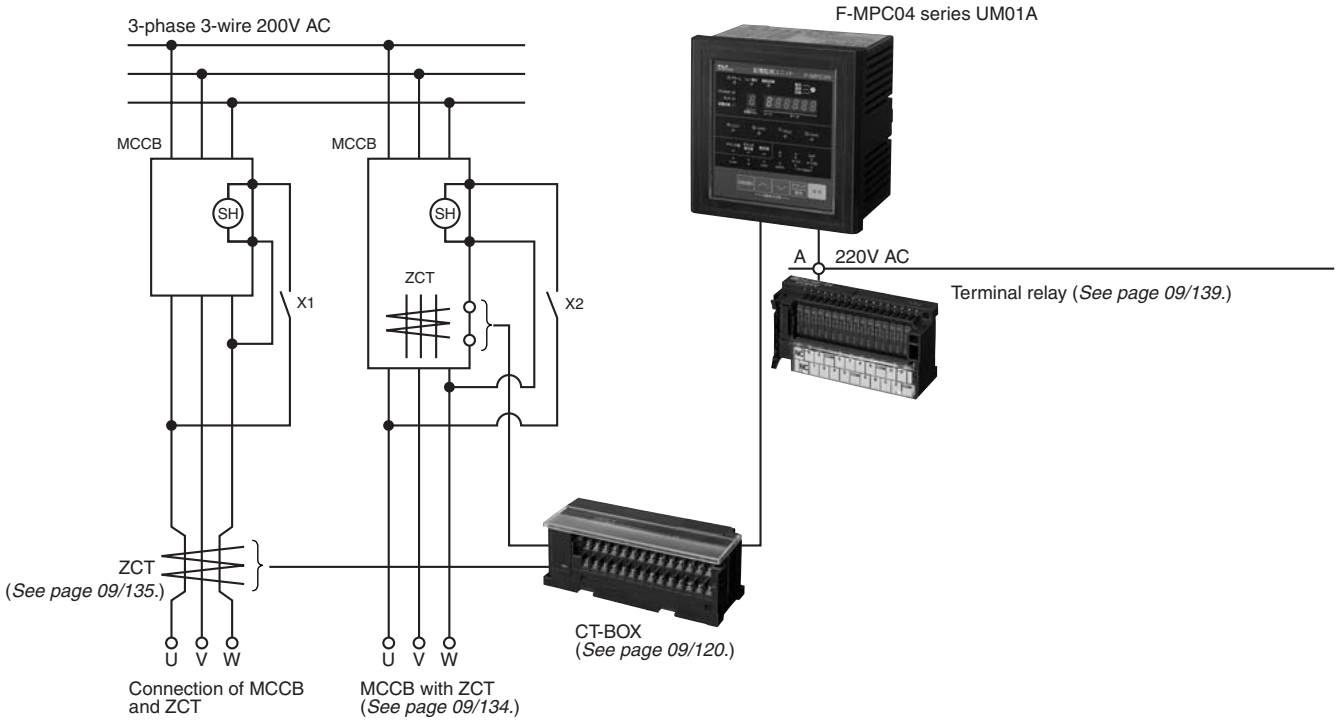
■ **Communications specifications**

Description	T-link	RS-485
Standard	—	EIA RS-485
Data exchange	1:N (UM01) Polling/selecting	
Transmission distance	700m	1000m
No. of stations	Max. 32 (excluding master)	Max. 32 (including master)
Address setting	00 to 99	01 to 99
Transmission speed	500kbps	4800/9600/19200bps
Data format	Dedicated	Start bit: 1 bit (fixed)
		Data length: 7/8 bits (selectable)
		Parity bit: None/even/odd (selectable)
		Stop bit: 1 bit (fixed)

Power monitoring unit
F-MPC04

■ System configuration

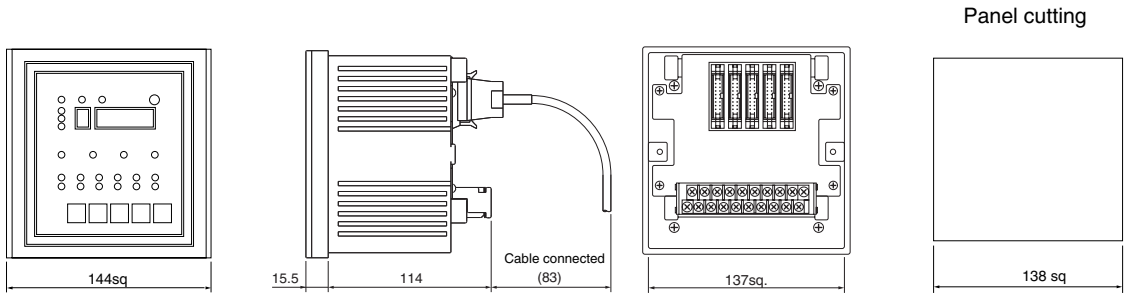
With an integrated power monitoring unit UM01-A, you can easily construct a low-voltage power distribution system equipped with leakage current measuring, leakage current pre-alarm, and earth leakage circuit shutdown.



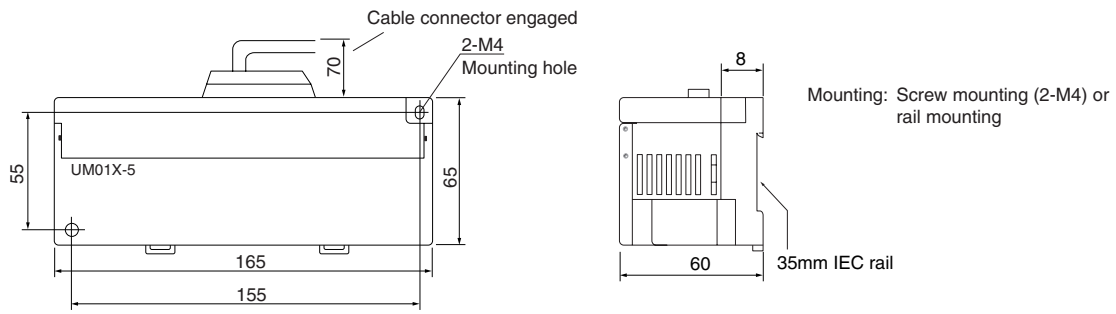
(SH) : Shunt trip device

■ Dimensions, mm

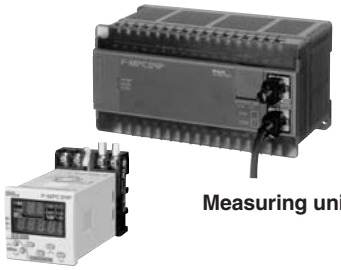
• Integrated power monitoring unit, UM01



• CT-BOX, UM01X



Multi-circuit power monitoring unit, UM02



Measuring unit UM02

Display and setting unit

■ Description

Integrating measuring functions required for power monitoring in one unit

- A single unit measures multiple circuits
  A single UM02 can measure up to 8 feeders in 3-phase 3-wire, 12 feeders in 1-phase 2-wires and up to 4 feeders in 3-phase 4-wire circuit.
- Easy installation into existing switchboards
  Compact UM02 can be easily installed into on-site power distribution or lighting panel, irrespective of new panel or existing panel, to create power monitoring system economically.
- On-site measuring instrument
  UM02 can be used an on-site measuring instrument by combining with an optional display and setting unit UM02X-S.
- Communication interface
  As UM02 has an RS-485 communications interface as standard, it can communicate with other power monitoring equipment with RS-485

■ Type number nomenclature

Multi-circuit power monitoring unit (Measuring unit)

UM02-AR 3

Basic type
UM02-AR: Measuring unit

Applicable circuit
2: 1-phase 2-wire, up to 12 feeders
3: 3-phase 3-wire, 1-phase 3-wire, up to 8 feeders
4: 3-phase 4-wire, up to 4 feeders

■ Type and applicable circuit

Description	Applicable circuit	**Type**
Measuring unit	1-phase 2-wire, up to 12 feeders	**UM02-AR2**
	3-phase 3-wire, 1-phase 3-wire, up to 8 feeders	**UM02-AR3**
	3-phase 4-wire, up to 4 feeders	**UM02-AR4**

Sold separately

Display and setting unit	—	**UM02X-S**
Cable for UM02-AR connection	0.5m	**UM02X-C005**
	5m	**UM02X-C050**

09

■ Ordering information

Specify the following:
1. Type number

Power monitoring unit
F-MPC04P

■ Specifications F-MPC04P (UM02)

• General specifications

Item		Specification
Ratings	Voltage	Direct input: 100 or 200V AC, 400V AC (AR4 only) VT primary/ secondary: 220, 440V AC, 3.3k, 6.6kV AC/110V AC, 440/220V AC *1
	Current	Split CT: 50, 200, 400A AC Small split current sensor CT: 5A AC (primary rated set range 10 to 7500A) *1
Control power supply		100/200V AC common use (85 to 264V AC) AR2: between terminals P1-N, AR3: between terminals U-V, AR4: between terminals P1-P2
Inrush current		15A max., 3ms max. (100V AC 50Hz) 30A max., 3ms max. (200V AC 50Hz)
Control power consumption		20VA or less (or approx. 15VA at 200V AC, 10VA at 100V AC)
Ambient temperature Humidity Atmosphere		Operating: -10 to 55˚C (no icing or no condensation) Storage: -20 to 70˚C (no icing or no condensation) 20 to 90% RH (no condensation) Free from corrosive gases and excessive dusts or particles
Insulation resistance Dielectric strength		10MΩ min. between electric circuits and ground 2000V AC, 1 minute (2500V AC, 1 minute for AR4) between control power circuits and ground
Lightning impulse noise resistance		4.5kV (1.2 × 50μs) between control power circuits and ground (6.0kV for AR4)
Momentary overload capability Vibration resistance Shock resistance Noise immunity Permissible momentary power failure		20 times rated current, 9 times for 0.5s. JIS C 0040, crossover frequency 57Hz, 9.8m/s^2 Approx. 300m/s^2, 3 times in each of X, Y. and Z axes 1.5kV square wave (rise time: 1ns, pulse width: 1μs) for 10 minutes continuously 20ms (continuous operation) except RS-485 communications
Mass		Measuring unit: Approx. 500g, Display and setting unit: Approx. 200g

Note *1 Make VT and CT ratio settings through the display and seting unit UM02X-S or from the host controller.

• Measurement specifications

Item	Effective measurement range		Display	Accuracy *1
Current (N-phase current measured in AR4) Active power Reactive power *2	With split CT (200A and 400A AC) combined 0, 0.4% of In to 500A With small split current sensor (50A AC) combined 0, 0.4% of In to 50A with small split current sensor (5A) combined *4 0 to n times CT rating		4 digits	±1.5% ±2.5% for S-phase current of AR3 and N-phase current of AR4
Power-factor			□. □□	±5% (converted into a phase angle of 90˚)
Active electric energy *2			5 digits	Equivalent to JIS ordinary class *4
Max. active power *3	Same as above. (with a demand time set to 0, 1, 5, 10, 15, or 30min.)		4 digits	±1.5%
Min. voltage each phase *2	AR2, R3 85 to 264V (directly or VT secondary voltage conversion) The minimum and maximum voltage are average values for 0.3s.	AR4 Phase voltage 50 to 288V (directly or VT secondary voltage conversion) Line voltage 86 to 498V The minimum and maximum voltage are average values for 0.3s.	4 digits	±1.5%
Max. voltage each phase *2			4 digits	±1.5%

Notes *1 Measurement accuracy does not include CT and current sensor.
*2 In measurement mode display is the number of digits of RS-485 communications data. The display and setting unit does not display communications data on reactive power, minimum voltage, and maximum voltage values.
*3 Max active power and active electric energy values can be reset by the display and setting unit and host controller. And, when VT ratio or CT ratio is changed, these are autamalically reset.
*4 With 1-turn or 3-turn primary winding selected for the 5A small split current sensor, the lower limit of minute current measurement is selected as specified below.

Classfication	Measurement and display range	Measurement lower limit (Electric energy starting current)	Accuracy Current and power	Electric energy
1 turn	0 or 2% to rating × 10	2% of rating	0 to rating: ±1.5% of rating Exceeding rating: ±1.5% (FS) *	±2.5% (5% to 100% of rating, load power factor -0.8 to 1.0 to +0.8)
3 turns	0 or 0.7% to rating × 3	0.7% of rating		

Note: * The range of the measuring unit UM02-AR is automatically changed internally depending on the load current.

• Sampling interval and display value

Type	Sampling interval/display value of current and power (Communication)	Sampling and cumlative interval of power
UM02-AR2	Approx. 0.2s / Average voltage for aprox. 1.5s	Approx. 0.2s
UM02-AR3	Approx. 0.2s / Average voltage for aprox. 1.5s	Approx. 0.2s
UM02-AR4	Approx. 0.1s / Average voltage for aprox. 0.4s	Approx. 0.1s

■ Display and setting unit UM02X-S, specifications

Item	Specification	Remarks
Control power supply	Supplied from the measuring unit UM02-AR	
Measuring unit UM02-AR communications specifications	EIA RS-485 (always 19200bps fixed)	
Number of connectable measuring unit UM02-AR	5 max.	UM02-AR2, AR3, AR4
Max. cable length between UM02-AR and UM02X-S	23m	Total length between UM02X-S and all UM02-ARs
Display item	Operating status, measurement value VT, CT setting value, fault	Selective indication by a switch
Setting	Voltage, current (CT), demand time, pulse multiplication rate, No. of turns of CT secondary winding, host controller communications mode (different communications interface)	UM02-AR incorporates a different RS-485 interface to communicate with a host controller.

Note : The display and setting unit UM02X-S provides a function to start inital communications to recognize the UM02-AR automatically when UM02X-S is turned on. If on-site indication is not necessary once the setting to the measuring unit UM02-AR is complete, UM02-AR fully operates even without UM02X-S.

■ Communications specifications

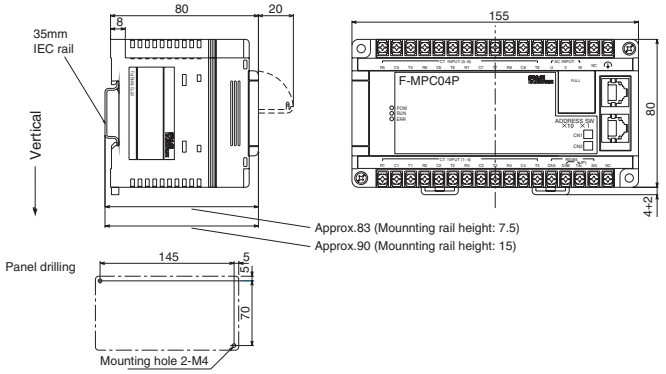
Item		Specification
Standard		EIA RS-485
Transmission system		2-wire half duplex
Data exchange		1: N (F-MPC04P, UM02-AR) polling/selecting
Transmission distance		1000m (total length)
No. of connectable units		Up to 31 units per system
Station number setting		01 to 99 (set with digital switch)
Transmission characters		ASCII
Transmission speed		4800, 9600, or 19200 bps (selectable)
Data format	Number of start bits	1 (fixed)
	Data length	7 or 8 bits (selectable)
	Parity bit	None, even, or odd (selectable)
	Number of stop bits	1 (fixed)
	BCC	Horizontal parity: Even

Note : Use the display and set unit to change the transmission setting.
The communications specifications cannot be changed through the host controller.

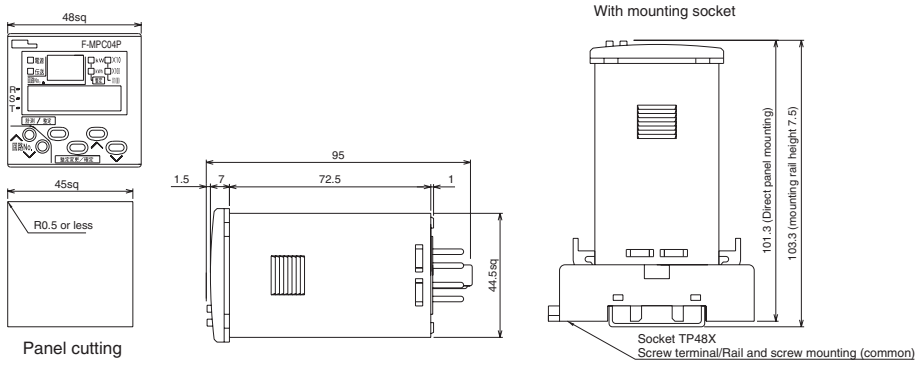
Power monitoring unit
F-MPC04P

■ Dimensions, mm

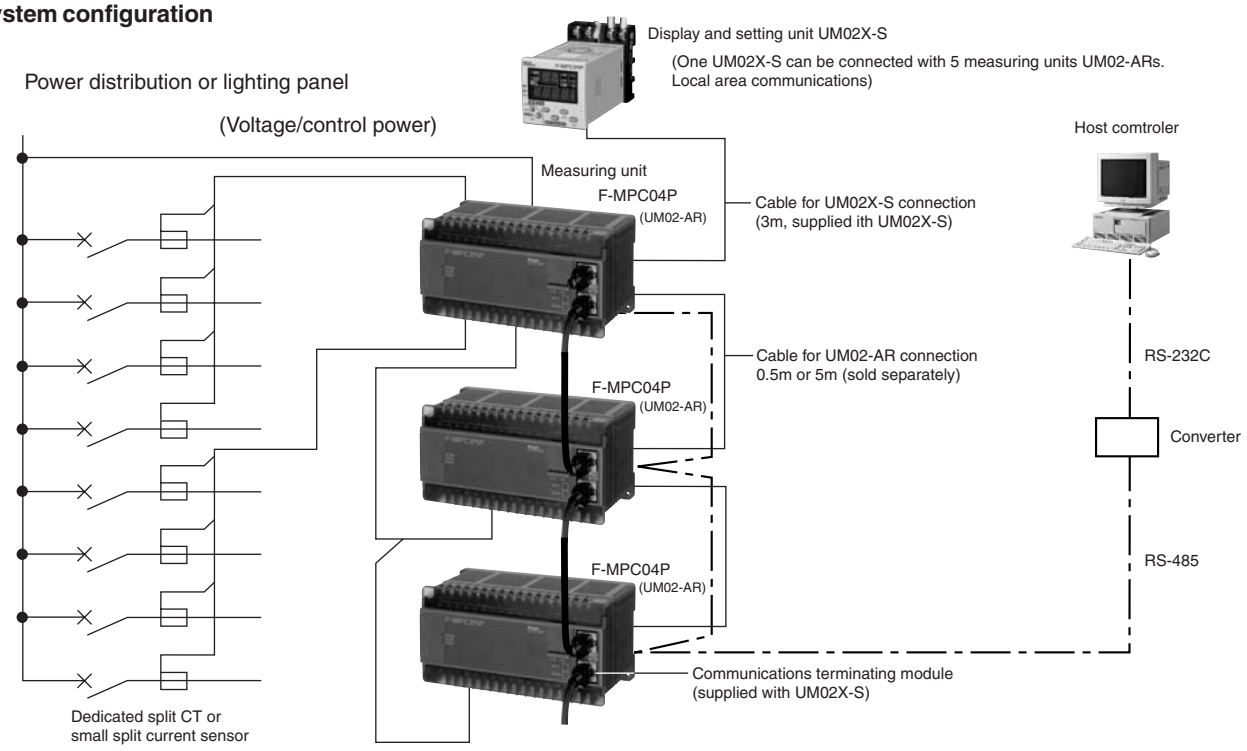
● Measuring unit UM02-AR



● Display and setting unit UM02X-S



■ System configuration



Note: * The display and setting unit UM02X-S is a local area communications master and can monitor and be able to set maximum five measuring units, UM02-ARs.

** Station address setting of measuring unit UM02-AR
Use a digital switch on the measuring unit to set a different station address (communication address to host controller).
In local area communication of the display and setting unit UM02X-S, the UM02X-S will automatically read out the address of the measuring units connected with cables for unit connection, and communicate with hem.,

Single circuit power monitoring unit, UM03

■ Description

Integrating measuring functions required for power monitoring in one unit

● Output functions for preventive maintenance selectable
- Power alarm/current prealarm
- kWh pulse output
- Leakage current alarm, leakage current prealarm output (model with leakage current measuring function) only

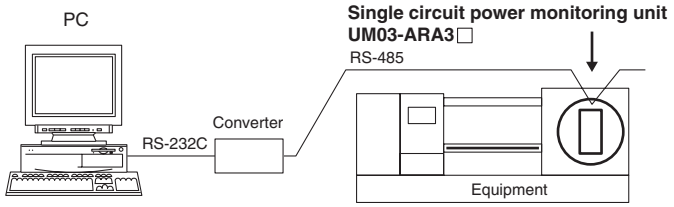
● Capable of measuring inrush current of welders
- High-speed sampling and calculation of voltage and current

● Compact design allows installation almost anywhere.
- Space-saving construction simplifies installation.
- Suited for monitoring individual equipment, section, and floor

● Networking capability
- RS-485 interface.
- Can be connected to power distribution system same way as the power monitoring equipment F-MPC 60B, 30, 04 (UM01, UM02) series products

UM03-ARA3

■ System configuration



■ Types numbers

Single circuit power monitoring unit		Type
Leakage current measuring function	Not provided	**UM03-ARA3**
	Provided	**UM03-ARA3G**

■ Ordering information

Specify the following:
1. Type number

■ Specifications

• General specifications

Applicable circuit		Single circuit 3-phase 3-wire: 2-CT, single-phase 3-wire: 2-CT, single-phase 2-wire: 1-CT
Control power supply		100 to 200V AC (85 to 264V AC) 50/60Hz (45 to 66Hz)
Inrush current		15A, 3ms or less (at 110V AC, 50Hz) 30A, 3ms or less (at 220V AC, 50Hz)
Control power consumption		Approx. 7VA (at 220V AC) Approx. 5VA (at 110V AC)
VT consumed burden		Approx. 0.2VA
Continuous overload capability	Current input circuit	110% of maximum setting value (150% of rated current), 2 hours
	Voltage input circuit	291V AC (1.1×264V AC), 2 hours
Short-time overload capability	Current input circuit	2000% of max. setting value (150% of rated current), 9 times for 0.5s
	Voltage input circuit	200% of max. setting value (264V AC), 9 times for 0.5s
Vibration		10 to 58Hz 0.075mm (one-way amplitude) 58 to 150Hz: constant acceleration 10m/s^2, 10 cycles for 8 min in each X, Y, and Z directions
Shock		300m/s^2, in each X, Y, and Z directions, 2 times
Withstand voltage / Insulation resistance (500V DC megger)		2kV /10MΩ Between power supply terminals connected together and other terminals connected together 2kV /10MΩ Between measurement input terminals connected together and other terminals connected together 2kV /10MΩ Between alarm output terminals connected together and other terminals connected together 500V /10MΩ Between watthour pulse output terminals connected together and other terminals connected together
Ambient temperature		Operating: -10 to +55˚C Storage: -20 to +70˚C
Humidity		20 to 90%RH (no condensation)
Atmosphere		Free from corrosive gases and excessive of dusts
Grounding		Grounding resistance of 100Ω or less
Allowable momentary power failure time		20ms (operation will continue)
Altitude		Less than 2,000m
Mass		Approx. 400g (actual unit only, CT excluded)

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Power monitoring unit
F-MPC04S (UM03)

• Measurement specifications

Item	Effective measurement range	Display	Accuracy *1
Current (R/S/T), demand current Max. demand current value	• With CT (200A AC) 0, 0.4% of In (0.8A) to 300A	4-digit	±1.5%: R- and T-phase ±2.5%: S-phase
Demand value and max. demand value of total harmonic current	• With CT (400A AC) 0, 0.4% of In (1.6A) to 600A	4-digit	± 2.5%
Active power (±) Demand power Max. active demand power value	• With CT (5A) 0, 0.4% of In (0.2A) to 50A 0, to 1.5 times CT rating (for 5A)	4-digit	±1.5%
Reactive power (±)	(converted into CT secondary: 7.5A)	4-digit	±3%
Power factor (±)	(Max. display range: up to 9,999A)	3-digit	±5% (Converted into a phase angle of 90˚)
Active electric energy (+only)	• Demand time setting: 0, 1 to 15min	5-digit	Equivalent to JIS ordinary class (pf: 0.5-1.0- –0.5)
Reactive electric energy (±absolute value addition)	(by 1min step) 30min setting: Available	5-digit	±5%
Voltage	Converted into an input voltage 60 to 264 V AC	4-digit	±1.5% ±2.5%: Vv-w
Frequency	45 to 66Hz *2	3-digit	±0.5%
Leakage current (Io/Iob) *3 Max. demand value	0, 10 to 1000mA	4-digit	±2.5%

Note: *1 Measurement accuracy does not include that of combined CT and small current sensor.
*2 When the measured frequency is out of the effective measurement range, 0.0Hz iz displayed.
*3 Only UM03-ARA3G can measure the leakage current.
Io: Leakage current including harmonics Iob: Leakage current comprissing fandamental wave only.

• Output specifications

Item		UM03-ARA3	UM03-ARA3G	Specification
Watthour pulse output		Provided	Provided	Transistor open collector output 35V DC 100mA
Alarm output	Current prealarm (OCA), power alarm *	Provided	Provided	Replay output 250V AC 1A
	Leakage current prealarm (OCGA) Leakage current alarm (OCG)	Not provided	Provided	

Note: * Choose the current prealarm (OCA) output or power alarm by change of setting.

Watthour pulse output details

Output specifications	35V DC 100mA (residual 2.5V or less at ON)
Output pulse width	100ms±20ms
Output cycle	200ms or more
Pulse multiplication rate	10^nkWh/pulse (n=–3 to 2 setting)

Alarm output details

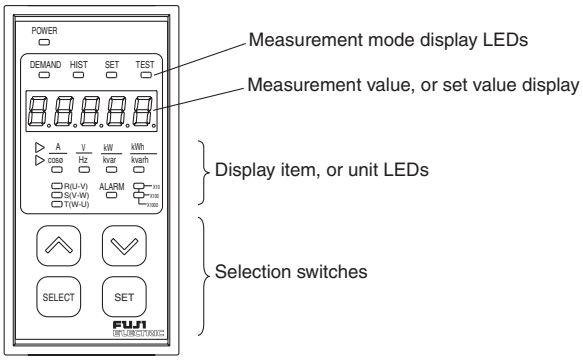
	Setting range		Accuracy	
	Operate value	Time	Operate value	Time
Current prealarm (OCA) *1	I: 20 to 120% of rated value, Lock (5% step)	Depending on the demand time setting	±5% (rated min ±1.5%)	±10%
Power alarm *1	0 to 9999kW (1kW step)			
Leakage current alarm (OCG) (Io operation)	Operate current 100, 200, 500mA, Lock	0.1, 0.3, 0.5, 1.0s	75%±5% of setting value	75%±5% of setting value (min±25ms)
Leakage current prealarm (OCGA)	50±5mA 100 to 500mA (50mA step), Lock	0.1, 0.3, 0.5, 1.0, 10s or demand time *2	±5%	±5%

Note: *1 Choose the current prealarm (OCA) output or power alarm by change of setting.
*2 If you select the demand time, the prealarm operate only with Iob (leakage current of fundamental wave only)

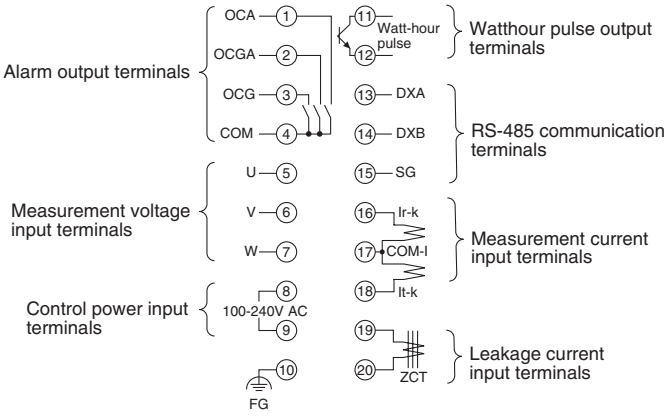
■ Communications specifications

Item		Specification	Factory setting
Standard		EIA RS-485	–
Transmission system		2-wire half duplex	–
Data exchange		1: N polling/selecting	–
Transmission distance		1000m (total length)	–
No. of connectable units		Up to 31units per system	–
Station number setting		1 to 99	(no setting)
Transmission characters		ASCII	–
Transmission speed		4800, 9600, or 19200 bps (selectable)	19200 bps
Data format	Number of start bits	1 (fixed)	–
	Data length	7 or 8 bits (selectable)	7 bits
	Parity bit	None, even,or odd (selectable)	Odd
	Number of stop bits	1 (fixed)	–
	BCC	Horizontal parity: Even (fixed)	–

■ Front panel

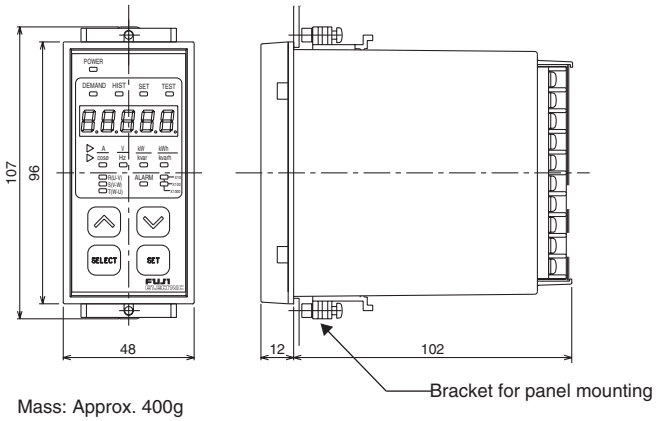


• Terminal layout



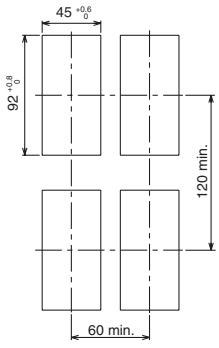
Note: Alarm output terminal ② ③ and ZCT input terminal ⑲ ⑳ of the UM03-ARA3 (without leakage current measuring function) are NC terminals. Do not connect anything to these terminals.

■ Dimensions, mm



Mass: Approx. 400g

Panel cutting



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