## OMRON

# model KM-N2-FLK

### **Power Monitor**

## **EN INSTRUCTION MANUAL**

Thank you for purchasing this compact power monitor, model KM-N2-FLK (referred to as model

This manual describes the functions, performance, and application methods needed for optimum use of model KM-N2.

Please observe the following when using model KM-N2.

- This product is designed for use by qualified personnel with a knowledge of electrical systems.
   Before using the product, thoroughly read and understand this manual to ensure correct use.
   Keep this manual in a safe location so that it is available for reference whenever required.

The following notice applies only to products that carry the CF mark:

This is a class A product. In residential areas it may cause radio Interference, in which case the user may be required to take adequate measures to reduce interference

### OMRON SOCIAL SOLUTIONS CO.,LTD.

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For detailed instructions, download "Model KM-N2-FLK User's Manual" (catalog no. N200-E1-01) from our website.

### PRECAUTIONS ON SAFETY

### Key to Warning Symbols



Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or there may be property damage.

9101317-1 G

<u></u> CAUTION	
Property damage may occur due to fire. Tighten the terminal screws to the specified torques. After tightening the screw, check that the screw is not loose. M3.5 screw: 0.8N · m M3 screw: 0.5 to 0.6N · m	•
Minor or moderate injury or property damage may occur due to explosion.  Do not use in locations exposed to flammable or explosive gases.	•
Breakdown or explosion may occasionally occur. Use the power voltage and load within the specified and rate ranges.	
Electric shock may occasionally occur.  Do not touch any of the terminals while the power is being supplied.	A
Electric shock may occasionally occur.  Always make sure that the power to the circuit the CT is being attached to is turned OFF before connecting the CT*.	A
Burns may occasionally occur.  Do not touch the product while power is being supplied or immediately after power is turned OFF.  Use the electric wire that heat resistant temperature is 85 degrees or more when wiring to the product.	
Minor electric shock, fire, or malfunction may occasionally occur.  Do not supply a current to the CT input terminal that exceeds the maximum CT secondary current.	$\Diamond$
Minor electric shock, fire, or malfunction may occasionally occur.  Never disassemble, modify, or repair the product.	<b>®</b>

### \* CT: Current Transformer

### [Meaning of the warning symbols on the product] Electric shock may occasionally occur. Use the product according to this contents.

- Use AWG24 to 14 to wire the power and input voltage terminals. The heat resistant temperature of the wire is 85 degrees or more.
  Use AWG18 to 14 to wire the CT terminals. The heat resistant temperature of the wire
- is 85 degrees or more.
  Use AWG24 to 14 to wire the communication terminals. The heat resistant
- temperature of the wire is 85 degrees or more

### PRECAUTIONS FOR SAFE USE

- Observe the following to ensure safe use of model KM-N2.

   Do not use or store the product in any of the following locations.

   Locations subject to shock or vibration

   Unstable locations

- Do not pull cables.
   If the product is used in a manner not specified by the INSTRUCTION MANUAL, the protection provided by the product may be impaired.
   For compliance with standards and safety, in order to protect against overcurrent, install a branch circuit
- For compliance with standards and safety, in order to protect against overcurrent, install a branch circuit protector with a rated current of 1A conforming to the voltage at which the device is used and the appropriate standards of the country where the device is used (US: UL Listed, Canada: CUL Listed, and other countries: for example, IEC60947-1 and IEC60947-2). Failure to do so may lead to an electric shock or fire. Check the wiring diagram in this manual to connect the voltage input terminal of this product to the branch circuit protector. If a multi-pole circuit breaker is to be used as an overcurrent protector, it must be constructed as to interrupt all of the neutral (grounded) and ungrounded conductors of the mains supply simultaneously. (For example, a 4-pole circuit breaker that can simultaneously disconnect 4 poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can simultaneously disconnect 4 poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can simultaneously disconnect 4 poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can simultaneously disconnect 4 poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can simultaneously disconnect 4-poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can simultaneously disconnect 4-poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can simultaneously disconnect 4-poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can simultaneously disconnect 4-poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can simultaneously disconnect 4-poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can be caused as an overcurrent protector, 13-poles.) If other branch circuit protector (For example, 12-pole circuit breaker that can be caused as an overcurrent protector, 13-poles.) If other

- Separate the product wiring from high-voltage or high-current power lines to prevent inductive noise. Do not place the product wiring parallel to or in the same ducts or conduits as power lines. Use separate ducts, separate conduits, or shielded cables to prevent noise.

  This is a "class A" product. In residential areas it may cause radio interference. The user may be required to take adequate measures to reduce interference if this occurs.

### PRECAUTIONS FOR CORRECT USE

- This product is not categorized as "a specified measuring instrument" officially approved by an organization specified in relevant measurement acts. It cannot be used to certify power usage.

  Set the parameters of the product so that they are suitable for the system being measured.

  Mount this product on DIN rails for use.

  Use this product in an overvoltage category II environment. When using in an overvoltage category III environment, install a varistor between the voltage input terminal of this product and the ground to reduce the overvoltage. Select a varistor that suits your environment and conditions.

  In a power supply system where it is unearthed neutral, a varistor cannot be installed between the voltage input terminal and the ground, so it cannot be used in an overvoltage category III environment.

  This product rannot be used to measure the inverter's secondary side.
- This product cannot be used to measure the inverter's secondary side.
- This product carried be used to measure the inverter's secondary side.
   Ensure that the rated voltage is reached within 2 seconds of turning the power on.
   When cleaning the unit, make sure the power is off and wipe the surface of the unit with a soft dry cloth. Do not use chemicals including solvents such as thinners, benzine, or alcohol.
   Use a CT whose secondary output is 1A or 5A.
   Use ferrule terminals to connect CTs to the CT terminals on the main unit to ensure the assembly complies
- The data for active energy is sayed at 5 minute intervals. The data for the 5 minutes preceding the unit
- powering off may not be saved under some circumstances.

  Dispose of this product appropriately as industrial refuse in accordance with local and national regulations.

### **Features**

This product is an energy monitor that fits in the industrial control panel. It complies with the international IEC accuracy standards and can be connected using generic CTs.

One unit can measure a maximum of four circuits. The unit can measure the power of each point accurately

# Main unit specifications

Item	Content		
Rated input voltage (Common terminals of a	3-phase 4-wire : 100 to 254VAC (L-N), 173 to 440VAC (L-L) (earthed neutral)		
power supply and a measurement voltage input.)	3-phase 4-wire : 100 to 120VAC (L-N), 173 to 208VAC (L-L) (unearthed neutral)		
	1-phase 2-wire : 100 to 277VAC		
	1-phase 3-wire : 100 to 220VAC (L-N), 200 to 440VAC (L-L)		
	3-phase 3-wire : 173 to 277VAC (L-L)		
Rated frequency	50/60Hz		
Allowable power supply voltage range	Rated input voltage 85 to 115%		
Power consumption	7VA or less		
Ambient operating temperature	-25 to 55 °C (with no icing or condensation)		
Ambient operating humidity	25 to 85%RH		
Storage temperature	−25 to 85 °C (with no icing or condensation)		
Storage humidity	25 to 85%RH		
Dielectric strength voltage	Between electronic circuitry and case: AC2200V for 1 minute     Between the set of power and voltage inputs and the set of communication terminals and pulse output terminals: AC2200V for 1 minute		
Insulation resistance	Between electronic circuitry and case: 20MΩ max. (at DC500V mega)     Between the set of power and voltage inputs and the set of communication terminals and pulse output terminals: 20MΩ max. (at DC500V mega)		
Vibration resistance	Single amplitude: 0.1mm, Acceleration: 15m/s², Frequency: 10 to 150Hz 10 sweeps for eight minutes along the three axes		
Shock resistance	150m/s <sup>2</sup> , 3 times each in the up, down, left, right, forward, and back directions		
Electromagnetic environment	Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)		
Display and Operation	LED, LCD display, buttons (Up, down, <		
Weight	Approximately 350g (main unit), approximately 450g (when in packaging)		
Mounting	Attaching the DIN rail		
Altitude	Under 2000m		
Installation environment	Overvoltage category and measurement category: II, Pollution level: 2		
Applicable standards	EN61010-2-030, EN61326-1, UL61010-1		
Supplied Accessories	Instruction Manual (this document), compliance sheet		

## Measurement specifications

Item	Content
Active power	0.5% (IEC62053-22 class 0.5S)*
Reactive power	2% (IEC62053-23 class 2)*
Measurement frequency	80ms (at 50Hz), 66.7ms (at 60Hz)
Functions	Conversion

\* IEC62053 is an international standard dealing with electricity metering.

## Input specifications

Item	Content		
Applicable circuit type	3-phase 4-wire, 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire		
Number of measuring circuits	3-phase 4-wire : Maximum 1 circuit		
	1-phase 2-wire : Maximum 4 circuits		
	1-phase 3-wire, 3-phase 3-wire : Maximum 2 circuits		
Connectable CTs	Generic CT (Secondary rated current: 1A or 5A)*		
Rated current for CT secondary side	1A		
Maximum current for CT secondary side	6A		

\* Use a CT with a rated load of 1.0 VA or more.

· Regarding the copliance with CT standards

o:available X:Not available	UL and CSA compliant	UL and CSA not compliant, CE compliant	Not compliant all of UL, CSA, and CE
KM-NCT-E□□□A	×	0	0
KM20-CTN□□□	×	×	0
KM-NCT-□□□A	×	×	×
KM20-CTF-□□□A	×	×	×
Listing CT of XOBA / XOBA7 category	0	Please check with the CT distributor.	0

## Output specifications

Item		Content
Pulse output	Number of output points	: 4 (PhotoMOS relay outputs)
(Active energy)	Output capacity	: DC40V, 50mA or less
	Residual voltage when ON	: Less than 1.5V (when output current is 50mA)
	Current leakage when OFF	: 0.1mA max.
	Output units	: 1,10,100,1k,5k,10k,50k, 100k(Wh)
	Pulse ON time	: 500ms fixed
RS-485	Protocol	: Modbus (RTU),CompoWay/F
	Sync method	: Asynchronous
	Communication speed	: 38400, 19200, 9600, 4800, 2400, 1200bps
	Maximum transmission distance	: 1200m
	Maximum number of devices connected	: 99 (Modbus), 31 (CompoWay/F)

**9 9 9** 

DIN hook-

## Attaching the body of the unit

- 1) Fix the DIN rail to the installation location DIN rail (recommended product): Model PFP-50N/-100N (from Omron)
- Lower the DIN hook on the bottom of the body of the unit 3 Fit the flanges of the body of KM-N2 onto the
- DIN rail and click into place 4 Raise the DIN hook and fix the body to the DIN rail

model PFP-M (from Omron)

- Ensure that the DIN rails and the body are attached properly.
  Looseness may cause the DIN rails, body, and wires to separate if
- ibrations or impacts occur.
   Fix end plates to the body units at each end of the DIN rail. These stop the units from jumping off the DIN rail due to vibration or impacts.
   End plate (recommended product):
- Make sure you install so there is space for wiring above and below the body of the unit. (about 50mm above the unit and about 30 mm below the unit)

  When removing the body from the DIN rail, use a flathead screwdriver
- to flick open the DIN hook and open downwards.
- For safety purposes, install the unit in a location where you won't touch the terminals when operating the main unit. For example, install so that the terminals are hidden within the control board so that a person working on the unit will not be able to touch live wires.

## Wiring the CTs, Wiring for power and monitored voltage input

## Wiring the CTs

- You will need 3 CTs to measure 3-phase 4-wire, 2 CTs to measure 1-phase 3-wire or 3-phase 3-wire,
- Too will need 3 CTs to measure 3-phase 4-wire, 2 CTs to measure 1-phase 3-wire of 3-phase 3-wire, and 1 CT to measure 1-phase 2-wire.
   For wiring to the CT input terminals, use 18 to 14 AWG (cross section surface area of 0.75 to 2.0mm²) electrical wire. The heat resistant temperature of the wire is 85 degrees or more.
   Use ferrule terminals suitable for the wire diameter to connect to the CT input terminals.
   The recommended torque for screwing the 3mm screws onto the terminal panel is 0.5 to 0.6N·m. Make
- sure the ferrule terminal is pushed all the way in and tightened firmly
- Wiring for power and monitored voltage input

Voltage input terminals V1/V2/V3/VN on this product act as both operating power terminals and as voltage measurement terminals. Check the wiring diagram in this manual to connect the voltage input terminal of this product to the branch circuit protector. If a multi-pole circuit breaker is to be used as an overcurrent protector, it must be constructed as to interrupt all of the neutral (grounded) and ungrounded conductors of the mains supply simultaneously. (For example, a 4-pole circuit breaker that can simultaneously disconnect 4 poles.) If other branch circuit protector (For example, fuse) is to be used as an overcurrent protector, select ones with the same observativities for all poles. characteristics for all poles.

- For safety purposes, turn off the mains power to ensure there is no power supply while you are
- Wire correctly so the phase sequence is correct. You will be unable to measure the power and energy correctly if you fail to do so.

  For the wiring for the power and measured voltage, use 24 to 14 AWG (cross section surface area of 23 to 30 mms<sup>2</sup>) electrical wire and ring or Y-shaped crimping terminals suitable for M3.5 screws.
- 0.2 to 2.0mm²) electrical wire and ring or Y-shaped crimping terminals suitable for M3.5 screws.
   The recommended torque for screwing the M3.5 screws onto the terminal panel is 0.8N·m. Make sure the crimping terminal is pushed all the way in and tightened firmly. After fixing the wiring in place, pull
- gently to confirm that the wiring is fixed firmly.

   During use, make sure the terminal panel cover is closed.

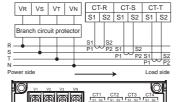
### Wiring diagrams

 The below table shows the wiring of voltage input terminals and CT input terminals with each phase and wire type (3-phase 4-wire, 1-phase 2-wire, 1-phase 3-wire, and 3-phase 3-wire) . Wire the device according to the phase and wire type.

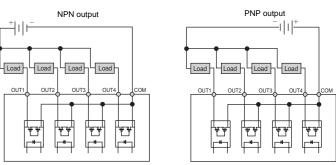
	Voltage input terminals				CT input	terminals																					
	VR	VS	VT	VN	CT		CT-S	CT-T																			
3-phase 4-wire	V1	V2	V3	VN	circuit A	CT1	CT2	CT3																			
					circuit A	CT1																					
1-phase 2-wire	V1 —	_	-   -	_	-	_	_	-	VN	circuit B	CT2	l _	_														
1-priase 2-wire																										V 1 4	circuit C
								circuit D	CT4	1																	
1-phase 3-wire	V1	_	V3	VN	circuit A	CT1	_	CT2																			
i priace o wire	V.   _	*3	10   111	circuit C	CT3		CT4																				
3-phase 3-wire	V1	V2	V3		circuit A	CT1		CT2																			
3-priase 3-wire	''	V1   V2   V3	"		circuit C	CT3		CT4																			

(wiring example for 3-phase 4-wire) P1/P2· Primary

- The diagram at right shows the relationship between the wiring table and the terminals on the main unit.
  For details about how to wire the CTs,connect the S1 terminal to the CT power supply side (K) and the S2 terminal to the CT load side (L).
  For the distinction between the power supply side For the distinction between the power supply side (K) and load side (L) of the CT,refer to the manual of the CTs you are using.



## Pulse output wiring



This unit is equipped with 4 pulse output terminals. Terminal number 5 is a common terminal.

- The terminal is the push-in type. Also read "Cautions when connecting the Push-In Plus terminal
- Do not directly connect an external power source to OUT or COM. Make sure the load is connected.

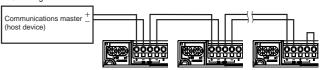
- For wiring to the pulse output terminals, use 24 to 14 AWG cross section surface area of 0.2 to 2.0mm²).
   Single wires, stranded wires, and ferrule terminals can be used. Make the recommended stripped wire length when using singles wires or stranded wire between 8 and 10mm. (Must be 10mm when using AWG14, however.)
   To avoid the influence of noise, use separate wiring for the signals and for the power.
   Output for circuit A is allocated to OUT1, circuit B to OUT2, circuit C to OUT3, and circuit D to OUT4, and these allocations are fixed.

## RS-485 wiring

-DIN rail

The configuration of the connection should be either 1:1 or 1:N. If the 1:N connection is Modbus, up to 99 KM-N2 can be connected. If CompoWay/F, up to 31 KM-N2 can be connected.

The terminal is the push-in type. Also read "Cautions when connecting the Push-In Plus terminal



- There is no FG terminal on KM-N2. Connect only the + wire and wire of RS-485.
- Use twisted pair cables.
  For wiring to the RS-485 terminals, use 24 to 14 AWG cross section surface area of 0.2 to 2.0mm<sup>2</sup>).
- For willing to the RS-465 terminals, use 24 to 14 AWG cross section statilate area of 0.2 c.0mim).
   Single wires, stranded wires, and ferrule terminals can be used. Make the recommended stripped wire length when using singles wires or stranded wire between 8 and 10mm. (Must be 10mm when using AWG14, however.)
   To avoid the influence of noise, use separate wiring for the RS-485 communications and for the power.
   The maximum transmission distance is 1200m.
   Irrespective of the transmission distance and number of units connected, perform communications checks with the actual units.
   During use, make sure the terminal panel cover is closed.

Setting the communication address Turn the rotary switch to set the communication address. The value on the left is the tens of the

communication address and the value on the right is

(A) Rotary switch (units of 10)

B Rotary switch (units of 1)

The value on the rotary switch is allocated to the communication address for circuit A (the first circuit). The values in the following table are allocated automatically when using a multi-address system.
You cannot set the communications addresses for circuits B to D individually.

		Circuit A	Circuit B	Circuit C	Circuit D
3-	phase 4-wire	Setting value	_	_	_
	phase 2-wire, phase 2-wire voltage selected	Setting value	Setting value+1	Setting value+2	Setting value+3
1-	phase 3-wire, 3-phase 3-wire	Setting value	_	Setting value+1	_
1-	phase 3-wire composite	Setting value	_	Setting value+1	Setting valuei2

### Termination settings

- This unit is equipped with a terminating resistor inside the main unit. On the unit that is the terminator for communications, short the RS-485 terminal and the RS-485 E terminal with a cable. Connect with
- for communications, short the RS-485 terminal and the RS-485 E terminal with a cable. Connect with the internal terminating resistor.

  If the host device you are using does not have its own built in terminating resistor, connect a terminating resistor to the host device. The terminating resistance is 1200 (1/2W).

  Do not wire in a terminating resistor terminal on KM-N2 that are along the transmission path. This can caused communication failures.

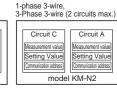
## Multi-address system

This unit makes it possible to have a maximum of 4 measuring circuits in one unit. The measuring circuits act as independent power monitors, each able to measure, each having different settings, and each allocated different communications addresses

You can easily change the number of circuits by enabling or disabling the measuring circuits.

1-Phase 2-wire (4 circuits max.) Circuit C Circuit B Circuit A

model KM-N2



# Safety standard compatibility The temporary overvoltage occurring on the main power supply must not exceed the following values Confirm the voltage using the power supply voltage of the product that you purchased. Short-time overvoltage: 1200 V+ (power supply voltage) Long-time overvoltage: 250 V+ (power supply voltage) For safety standard compliant, Listing CT of XOBA / XOBA7 category must be used. <Meaning of the warning symbols on the product> Electric shock may occasionally occur. Use the product according to this content.

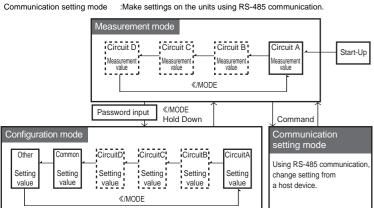
Heat resistant temperature of wires that are used with the product needs to be more than

## Mode configuration

This model has three modes: measuring mode, setting mode, and communication setting mode.

:The measured values for each circuit are displayed. Measuring mode :By operating keys on the body of the unit you can change settings for Setting mode each of the circuits, and make common settings for communications,

output, the display, etc.



In the measuring mode and setting mode, the circuit B to D items are displayed by switch the enable/ disable settings for each of the circuits to "ON" (enabled). (The circuits indicated inside the dotted lines are "OFF" (disabled) in the default state.)

Switching between the measuring mode and the setting mode
Switch between the measuring mode and setting mode by pressing and holding the [<</MODE] key.

"Press and hold" means pressing the key for 1 or more seconds

- How to enter the password When moving from the measuring mode to the setting mode, you need to enter the password that has been set.
   The default password is "0001".
- You can set a password of 4 numerals between 0000 and 9999. Change the password as necessary.
   You will be unable to reset the password if you forget it. Take care to note the password carefully when changing it.
- There is no functionality to disable the password setting.
  If you forget the password, contact the place of purchase or the manufacturer.

## Measuring mode

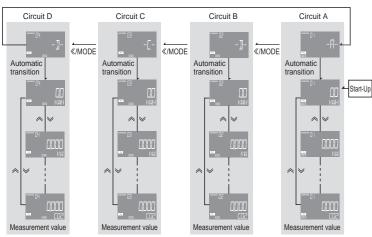
### Measurement display

When the [<</MODE] key is pressed, the measuring items are displayed after the screen for showing the destination circuit.

• The measuring items for circuits B to D are displayed when the circuit settings are enabled (ON).

- Press the [♠][♦] keys to switch the items measured.

(1P2W display example)



\* Circuits B to D are displayed when measuring is enabled (ON). With 3P4W, only circuit A is displayed. With 1P3W and 3P3W, only circuits A and C are displayed.

Measurement display list						
	Item	Main display/numerals	Sub display/units			
1	Active energy	0.000 to 999999.999	kWh			
1	(import)	1000.000 to 999999.999	MWh			
2	Active power	-99999.999 to 999999.999	kW			
3	Current 1	0.000 to 999999.999	A : 1-phase 2-wire			
3	Current	0.000 to 999999.999	A_R : 3-phase 4-wire, 1-phase 3-wire, 3-phase 3-wire			
			None : 1-phase 2-wire			
4	4 Current 2 0.000 to	0.000 to 999999.999	A_N : 1-phase 3-wire			
			A_S : 3-phase 4-wire, 3-phase 3-wire			
5	Current 3	0.000 to 999999.999	None : 1-phase 2-wire			
3	Current 3 0.000 to 999999.999		A_T : 3-phase 4-wire, 1-phase 3-wire, 3-phase 3-wire			
			V : 1-phase 2-wire			
6	Phase voltage 1	0.0 to 99999999.9	V_R : 3-phase 4-wire, 1-phase 3-wire			
			None : 3-phase 3-wire			
7	Phase voltage 2	0.0 to 99999999.9	None : 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire			
′	Friase voltage 2	0.0 10 33333333.3	V_S : 3-phase 4-wire			
8	Phase voltage 3	0.0 to 99999999.9	None : 1-phase 2-wire, 3-phase 3-wire			
8	Priase voltage 3	0.0 to 9999999.9	V_T : 3-phase 4-wire, 1-phase 3-wire			

	Item	Main display/numerals	Sub display/units		
9	later wire valtaged	0.0.45.00000000	None : 1-phase 2-wire, 1-phase 3-wire		
9	Inter-wire voltage1	0.0 to 99999999.9	V_R-S : 3-phase 4-wire, 3-phase 3-wire		
10	Concettors arises and	0.0.4~ 00000000	None : 1-phase 2-wire, 1-phase 3-wire		
10	Inter-wire voltage2	0.0 to 99999999.9	V_R-T : 3-phase 4-wire, 3-phase 3-wire		
44	Concettors arises and	0.000000000	None : 1-phase 2-wire		
11	Inter-wire voltage3	0.0 to 99999999.9	V_R-T : 3-phase 4-wire, 1-phase 3-wire, 3-phase 3-wire		
12	Frequency	45.0 to 65.0	Hz		
13	Power factor	-1.00 to 1.00	PF		
14	Reactive power	-99999.999 to 999999.999	kVAR		
15	Active energy	0.000 to 999999.999	-kWh		
13	(export)	1000.000 to 999999.999	-MWh		
16	Cumulative total	0.000 to 999999.999	kVARh		
10	reactive power	1000.000 to 999999.999	MVARh		
17	Reactive energy	0.000 to 999999.999	-kVRh		
''	(import)	1000.000 to 999999.999	-MVRh		
18	Reactive energy	0.000 to 999999.999	+kVRh		
10	(export)	1000.000 to 999999.999	+MVRh		
19	T1 active energy	0.000 to 999999.999	kWh		
19	(import)	1000.000 to 999999.999	MWh		
20	T2 active energy	0.000 to 999999.999	kWh		
20	(import)	1000.000 to 999999.999	MWh		
21	T3 active energy (import)	0.000 to 999999.999	kWh		
21		1000.000 to 999999.999	MWh		
22	T4 active energy (import)	0.000 to 999999.999	kWh		
22		1000.000 to 999999.999	MWh		
	Active energy	0.000 to 999999.999	kWh (flashes)		
23	(import) (resettable)	1000.000 to 999999.999	MWh (flashes)		
24	Active energy (export)	0.000 to 999999.999	-kWh (flashes)		
24	(resettable)	1000.000 to 999999.999	-MWh (flashes)		
	Cumulative total	0.000 to 999999.999	kVARh (flashes)		
25	reactive power (resettable)	1000.000 to 999999.999	MVARh (flashes)		
26	Reactive energy	0.000 to 999999.999	-kVRh (flashes)		
20	(import) (resettable)	1000.000 to 999999.999	-MVRh (flashes)		
27	Reactive energy	0.000 to 999999.999	+kVRh (flashes)		
21	(export) (resettable)	1000.000 to 999999.999	+MVRh (flashes)		
28	T1 active energy	0.000 to 999999.999	kWh (flashes)		
20	(import) (resettable)	1000.000 to 999999.999	MWh (flashes)		
29	T2 active energy	0.000 to 999999.999	kWh (flashes)		
29	(import) (resettable)	1000.000 to 999999.999	MWh (flashes)		
30	T3 active energy	0.000 to 999999.999	kWh (flashes)		
30	(import) (resettable)	1000.000 to 999999.999	MWh (flashes)		
31	T4 active energy	0.000 to 999999.999	kWh (flashes)		
31	(import) (resettable)	1000.000 to 999999.999	MWh (flashes)		
32	Conversion velve	0.000 to 999999.999	xxx *Setting can be changed		
32	Conversion value	1000.000 to 999999.999	kxxx *Setting can be changed		
* The	unita abanga automati	colly when the diaplay reach	on the maximum value, with the display value on KM N2		

The units change automatically when the display reaches the maximum value, with the display value on KM-N2 returning to 0, but recording continues. Accurate values can be obtained by using the communication function.

## Setting mode

### Setting item list

	MENU No.	Setting Item	Main display Display of options and input values	Default Value
	A1	Phase and wire type	3P4W / 1P2W /1P3W / 3P3W /1P2W2 / 1P3W2	3P4W
	A2	Communication address*1	Modbus :, 01 to 99 CompoWay/F : 00 to 99	(invalid value)
Circuit	A3	Current on the CT secondary side	1A / 5A	5A
A	A4	Current on the CT primary side	1 to 99999	5
	A5	Voltage assignment	V_R / V_T / V_R-T	V_R
	A6	Pulse output ON/OFF	ON / OFF	OFF
	A7	Active energy reset		
	B0	Circuit B ON/OFF	ON / OFF	OFF
	B1	Phase and wire type	3P4W / 1P2W /1P3W / 3P3W /1P2W2 / 1P3W2	_
	B2	Communication address*1	Modbus :, 01 to 99 CompoWay/F : 00 to 99	(invalid value)
Circuit R*2	В3	Current on the CT secondary side	1A / 5A	5A
B -	B4	Current on the CT primary side	1 to 99999	5
	B5	Voltage assignment	V_R / V_T / V_R-T	V_R
	B6	Pulse output ON/OFF	ON / OFF	OFF
	В7	Active energy reset		
	00	Protocol	MODBS / COMPF	MODBS
	01	Communication speed	1.2K / 2.4K /4.8K 9.6K / 19.2K / 38.4K(bps)	9.6K
	02	Data length	7/8	8
	03	Stop bit	1/2	1
	04	Parity	NONE / ODD / EVEN	EVEN
	05	Transmission wait time	00 to 99	20
Common	06	VT ratio	1.00 to 999.99	1.00
CMMN	07	Conversion rate	0.000 to 99.999	10.000
	08	Conversion display units	3 places: XXX Each place: 0 to 9, A to Z, /, -, _	CO2
	09	Pulse output units	1 / 10 / 100 / 1K / 5K 10K / 50K /100K (Wh)	100
	0A	Automatic LCD off	OFF / 1.0 / 5.0 / 10.0 (minutes)	5.0
	0B	Warning ON/OFF	ON / OFF	ON
	0C	Tariff ON/OFF	ON / OFF	ON
	0D	Change password	0000 to 9999	0001
	90	Software version display	V.1.0.0	_
Others ETC	91	All active energy reset		
EIC	91	All active ellergy reset		

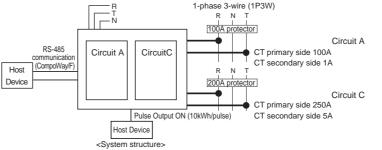
\*1 The communication address can only be set using the rotary switch. You cannot set it with the [ ] and [ ] levs.

\*2 Same for circuit C and D

· Setting example

Circuit A

Phase and wire type



To measure, you first need to make settings in the settings mode for the circuits and communications. Example settings are shown for the following conditions

Circuit C

Phase and wire type

<ul> <li>Current on the CT secondary side</li> </ul>	: 1A	<ul> <li>Current on the CT secondary side</li> </ul>	: 5A
<ul> <li>Current on the CT primary side</li> </ul>	: 100A	<ul> <li>Current on the CT primary side</li> </ul>	: 250A
Communication address	: 15	Communication address	: 16 (numbered starting from circuit A)
Pulse output ON/OFF	<ul> <li>ON (automatically allocated to OUT1)</li> </ul>	Pulse output ON/OFF	: ON (automatically allocated to OUT3)

Circuit A settings		Circuit C settings	
Phase and wire type	: MENU A1	Current on the CT primary side	: MENU C4
<ul> <li>Current on the CT secondary side</li> </ul>	: MENU A3	Pulse output ON/OFF	: MENU C6
Current on the CT primary side	: MENU A4	* The secondary current for CTs (MENU C3 does not need to be changed.	
Pulse output ON/OFF	: MENU A6		
RS-485 communication setting	gs	Pulse output settings	
Protocol	: MENU 00	Pulse output units	: MENU 09
<ul> <li>Communication speed</li> </ul>	: MENU 01		
Data length	: MENU 02		
Stop bit	: MENU 03		
Parity	: MENU 04		
	: MENU 05		
<ul> <li>Transmission wait time</li> </ul>			

### (1) Communication address setting mode Set communication address of circuit A to 15

Set the tens on the rotary switch to 1 and set the ones to 5.

Refer to "RS-485 wiring" in "Setting the communication address" for details

The communication address can only be set using the rotary switch. You cannot set it with the e communication address can only be set for circuit A. By setting the address of circuit A to 15,

the address of circuit C will be automatically set to 16 under these conditions. (Refer to "RS-485

The address can be changed in the setting mode, the measuring mode, or even when the unit is off. Setting changes are reflected after the power is turned on or the unit is restarted.

### ② Moving to the setting mode

• Press and hold the [<</MODE] key to move to the password entry screen.



- Enter the password. Change the values using the [♠] and [♦] keys. Press the [<</MODE] to change
- the place. (Password default: 0001)
- Press the [ENTER] key to confirm the value. OK is displayed if the password is correct and the screen \* If you press the [ESC] key before press the [ENTER] key, current input is canceled.(Same for other settings.)

## 3 Communications protocol settings (common settings)

### Set to CompoWay/F

• Press the [<</MODE] key to move to the common settings "CMMN" screen.



- Press the [ >>] key to move to the common settings items "Protocol (MENI J 00)" is displayed . Press the [ENTER] key to enter the setting mode. The setting value in the main display flashes.
- Press the [♠][♦] keys to select "COMPF".
- · Press the [ENTER] key to confirm your selection



\* Make other communications settings to suit the host device

## 4 Pulse output units settings (common settings)

### Set to 10kWh/pulse

- Press the [<</MODE] key to move to the common settings "CMMN" category display screen.</li>
   From the common setting items, press the [
   | (≪) | keys to move to "Pulse output units (MENU 09)".
   Press the [ENTER] key to enter the setting mode. The setting value in the main display flashes.
- Press the [≪][≪] keys to select "10k".
- · Press the [ENTER] key to confirm your selection



### ⑤ Circuit A settings

### Set the phase and wire type to 1P3W

- Press the [<</MODE] key to move to the circuit A setting items.</li>
   "Phase and wire type (MENU A1)" is displayed.
   Press the [ENTER] key to enter the setting mode. The setting value in the main display flashes.
- Press the [♠][♦] keys to select "1P3W" (1-phase 3-wire).
   Press the [ENTER] key to confirm the selected items.



### Set the CT secondary side current to 1A

- From the circuit A setting item, press the [♠][♦] keys to move to "CT secondary side current (MENU A3)".
   Press the [ENTER] key to enter the setting mode. The setting value in the main display if the beautiful and the setting was the setting with the setting was the setting wa

- Press the [≪][≪] keys to select "1A".
   Press the [ENTER] key to confirm the selected items.

### Set the CT primary side current to 100A

- From the circuit A setting item, press the [♠][♦] keys to move to "CT primary side
- . Press the [ENTER] key to enter the setting mode. The digit in the ones place on the
- Press the [A] | | keys to change the value to "100".

  Press the [<</MODE] key to move one place to the left.

  If you press the [<</MODE] key on the end at the left, the cursor moves to the right end.
- Press the [ENTER] key to confirm your change.

### Set pulse output to ON

- From the circuit A setting item, press the [♠][♦] keys to move to "Pulse output ON/OFF (MENU A6)".
   Press the [ENTER] key to enter the setting mode.
   Press the [♠][♦] keys to select "ON".
   Press the [ENTER] key to confirm the selected items.

### (6) Circuit C settings

### Enables circuit C

- Press the [<</MODE] key to move to the settings screen for circuit C.
   Press the [≼] key to move to the circuit C setting item.
   "Circuit C DN/OFF (MENU CO)" is displayed.
   Press the [ENTER] key to enter the setting mode. The setting value in the main
- Press the [※][※] keys to select "ON".
  Press the [ENTER] key to confirm the selected items.



## Set CT primary side

- From the circuit C setting item, press the [♠][♦] keys to move to "CT primary side current (MENU C4)".
   Set the same as for circuit A after this.

### Setting pulse output ON or OFF

From the circuit C setting item, press the [☆][❤] keys to move to "Pulse output ON/OFF (MENU C6)".
 Set the same as for circuit A after this.

### (7) Reflecting the settings

• Press and hold the [<</MODE] key to finish the settings and restart. \* When the settings have been changed, the changes are saved when moving to the measurement mode and the unit restarts. Settings are not saved if the unit is turned off while still in the setting mode. (Only the communication address, set with the rotary switch, is reflected.)



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