OMRON

model KM-N3-FLK

On-Panel Power Monitor

EN INSTRUCTION MANUAL

Thank you for purchasing the On-panel Power Monitor, model KM-N3-FLK (referred to as model KM-N3 in this manual).
This manual describes the functions, performance, and application methods needed for optimum use of model KM-N3.
Please observe the following when using model KM-N3.

- 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.

TRACEABILITY INFORMATION:

Importer in EU:
Omron Europe B.V.
Wegalaan 67-69
2132 JD Hoofddorp,
The Netherlands

Manufacturer:
Omron Corporation,
Shiokoji Horikawa,
Shimogyo-ku,
Kyoto 600-8530 JAPAN

The following notice applies only to products that carry the CE 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

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For detailed instructions, download "Model KM-N3-FLK User's Manual" (catalog no. N214-E1-01) from our website.

PRECAUTIONS ON SAFETY

Key to Warning Symbols

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

⚠ 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 screw: 0.5 to 0.58N·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.	⚡
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*.	⚡
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.	🚫
Minor electric shock, fire, or malfunction may occasionally occur. Never disassemble, modify, or repair the product.	🚫

* CT: Current Transformer

PRECAUTIONS FOR SAFE USE

Observe the following to ensure safe use of model KM-N3.

- Do not use or store the product in any of the following locations.
  - Locations subject to shock or vibration
  - Unstable locations where the user might fall/tumble down
  - Locations subject to temperatures or humidity outside rated ranges
  - Locations subject to condensation as the result of severe changes in temperature
  - Outside or otherwise exposed to direct sunlight and weather
  - Locations subject to static electricity or other forms of noise
  - Locations exposed to electromagnetic fields
  - Locations subject to exposure to water or oil.
  - Locations subject to exposure to salt water spray.
  - Locations subject to corrosive gases (in particular, sulfide gas and ammonia gas).
  - Locations subject to dust (including iron dust).
  - Locations subject to exposure to solvents
- Be sure to wire properly with the terminals with correct symbols.
- Use AWG20 to 16 (with a cross-section of 0.5 to 1.5mm^2) to wire the power supply terminals. The heat resistant temperature of the wire is 85 degree or more.
- Use AWG18 to 14 (with a cross-section of 0.75 to 2.0mm^2) to wire the CT and measurement voltage terminals. Use the crimping terminals of the round shape or Y-shape compatible with the M3 screw. The heat resistant temperature of the wire is 85 degree or more.
- Use twisted or solid wire AWG24 to 16 (with a cross-section of 0.25 to 1.5mm^2) to wire communication terminals. The heat resistant temperature of the wire is 85 degree or more.
- Before using or maintaining the product, thoroughly read and understand this manual.
- Understand the user manual before setting the device.
- Do not pull cables.
- 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. Install the branch circuit protector on the (1) L+ terminal of this product and the Line side of the power supply.
- Before using the device, be sure to check the wiring before turning on the power. Electric shock, injury, accident, or malfunction may occasionally occur because defective wiring.
- Do not touch any of the terminals while the power is being supplied.
- Do not install the product close to heat-producing devices (those using coil elements, for instance).
- 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.
- Use the product by incorporating it in a panel 1 to 8 mm thick. If the panel thickness is not appropriate or the mounting method is not appropriate, the product might be come off.

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.
- 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 cannot 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.
- The data for active energy is saved 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.

사 용 자 안 내 문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은
기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

Features

This product is an electric energy monitor mounted on the panel of the control board. It complies with the international IEC accuracy standards and can be connected using general-purpose 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	AC100 to 240V
Rated frequency	50/60Hz
Variation range of power supply voltage	85 to 110% of rated power supply voltage
Variation range of power supply frequency	45 to 65Hz
Power consumption	7VA or less
Ambient operating temperature	-25 to 55 oC (with no icing or condensation)
Ambient operating humidity	25 to 85%RH
Storage temperature	-25 to 85 oC (with no icing or condensation)
Storage humidity	25 to 85%RH
Dielectric strength voltage	1) Between the set of electric circuits and the case: 1400 VAC for 1 minute 2) Between the batch input of power supply, voltage, and current and the set of communication terminals and pulse output terminals: 1400 VAC for 1 minute
Insulation resistance	1) Between electronic circuitry and case: 20MΩ max. (at DC500V mega) 2) Between the batch input of power supply, voltage, and current and the set of communication terminals and pulse output terminals: 20MΩ max. (at 500 VDC mega)
Vibration resistance	Single amplitude: 0.1mm, Acceleration: 15m/s^2, Frequency: 10 to 150Hz 10 sweeps for eight minutes along the three axes
Shock resistance	150m/s^2, 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	LCD display, buttons
Weight	Approximately 300g (main unit), approximately 400g (when in packaging)
Mounting	Mounting on the panel
Altitude	Under 2000m
Installation environment	Overvoltage category and measurement category: II, Pollution level: 2
Applicable standards	EN61010-1, EN61010-2-030, EN61326-1, UL61010-1, UL61010-2-030
Supplied Accessories	Instruction Manual (this document), compliance sheet, Mounting adapter, waterproof packing

Measurement specifications

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

*IEC62053 is an international standard dealing with electricity metering.
*This does not include the measuring error margin of the generic CT.

Measurement 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
Rated input voltage	3-phase 4-wire(earthed neutral) : 100 to 277 VAC (L-N), 173 to 480 VAC (L-L) 3-phase 4-wire(unearthed neutral) : 100 to 120 VAC (L-N), 173 to 208 VAC (L-L) 1-phase 2-wire : 100 to 277 VAC 1-phase 3-wire : 100 to 240 VAC (L-N), 200 to 480 VAC (L-L) 3-phase 3-wire : 173 to 277 VAC (L-L)
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**

○ : available × : 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	×	○	○
KM20-CTN□□□	×	×	○
KM-NCT-□□□A	×	×	×
KM20-CTF-□□□A	×	×	×
Listing CT of XOBA / XOBA 7category	○	Please check with the CT distributor.	○

Output specifications

Item	Content	
Pulse output (Active energy)	Number of output points	: 4 (PhotoMOS relay outputs)
	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)

Attaching the body of the unit

① **Create an opening on the panel according to the panel machining dimensions.**
- Use a panel 1 to 8 mm thick.

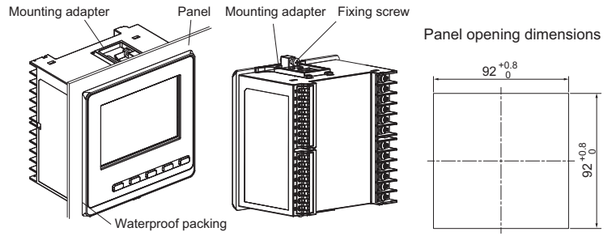
② **In order to make the unit waterproof, with the accessory waterproof packing on the front of the panel, insert the unit into the panel opening.**
- Unless the waterproof packing is put, the product is not waterproof.

③ **Fit the attached mounting adapter into the fixing grooves on the top and bottom faces of the rear case.**

④ **Push in the mounting adapter from the terminal side until it contacts the panel to fix the main unit tentatively.**

⑤ **Fasten the fixing screws of the top and bottom mounting adapter alternately as keeping balance little by little.**
- Apply a fastening torque of 0.29 to 0.39 N•m.

* For safety purposes, install the main unit where you are not able to touch the terminals when operating the main unit. For example, install the main unit with the terminals hidden within the control board so that a person working on the unit will not be able to touch live wires.

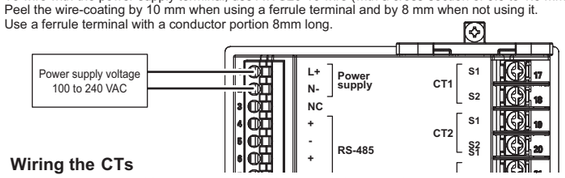


Panel opening dimensions

Wiring of power supply, CT, and measurement voltage input

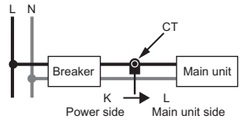
■ Wiring the power supply

For safety purposes, turn off the mains power and the breaker to ensure there is no power supply while you are working.
- The terminal is the push-in type. Also read "Cautions when connecting the Push-In Plus terminal " when wiring.
- To wire with the power supply terminal, use AWG20-16 wire (with a cross-section of 0.5 to 1.5 mm^2).
- Peel the wire-coating by 10 mm when using a ferrule terminal and by 8 mm when not using it.
- Use a ferrule terminal with a conductor portion 8mm long.



■ Wiring the CTs

For safety purposes, turn off the mains power and the breaker to ensure there is no power supply while you are working.
- You will need 3 CTs to measure 3-phase 4-wire, 2 CTs to measure 1-phase 3-wire or 3-phase 3-wire, and 1 CT to measure 1-phase 2-wire.
- CTs have polarity, so confirm the current directions at the power supply side (K) and load side (L) before wiring the CTs. If the direction is not appropriate, power cannot be measured correctly.



- To wire the CT input terminals, use AWG18-14 wire (with a cross-section of 0.75 to 2.0 mm^2) and crimping terminals of the round shape or Y-shape (5.8mm wide or less) compatible with the M3 screw.
- The recommended torque for screwing the 3mm screws onto the terminal panel is 0.5 to 0.58 N·m. Make sure the crimping terminal is pushed all the way in and tightened firmly. After fixing the wiring, confirm that the wire is fixed securely.

■ Wiring the measurement voltage input

For safety purposes, turn off the mains power and the breaker to ensure there is no power supply while you are working.
- 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.
- To wire with the measurement voltage input terminal, use AWG18-14 electric wire (with a cross-section of 0.75-2.0mm^2) and crimping terminals of the round shape or Y-shape (5.8mm wide or less) compatible with the M3 screw.
- The recommended fastening torque of the M3 terminal screw is 0.5 to 0.58 N·m. Make sure the ferrule terminal is pushed all the way in and tightened firmly. After fixing the wiring, confirm that the wire is fixed securely.

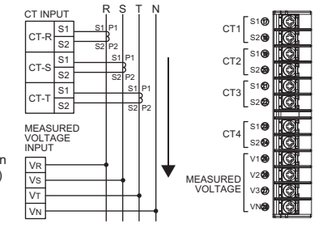
■ Wiring diagrams

- 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.

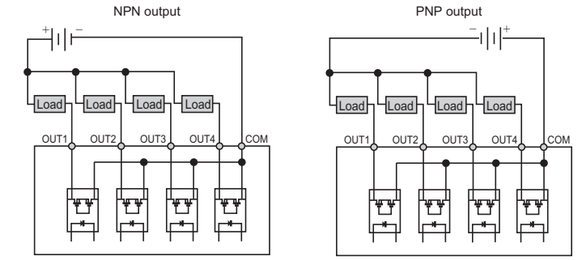
	VR	VS	VT	VN	CT-R	CT-S	CT-T
3-phase 4-wire	V1	V2	V3	VN	circuit A : CT1	CT2	CT3
1-phase 2-wire	V1	—	—	VN	circuit A : CT1 circuit B : CT2 circuit C : CT3 circuit D : CT4	—	—
1-phase 3-wire	V1	—	V3	VN	circuit A : CT1 circuit C : CT3	—	CT2 CT4
3-phase 3-wire	V1	V2	V3	—	circuit A : CT1 circuit C : CT3	—	CT2 CT4

(wiring example for 3-phase 4-wire)
P1/P2: Primary
S1/S2: Secondary

- 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 (K) and load side (L) of the CT,refer to the manual of the CTs you are using.



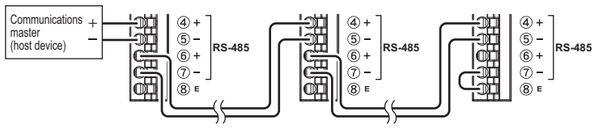
Pulse output wiring



This unit is equipped with 4 pulse output terminals. The common terminal is used commonly.
- The terminal is the push-in type. Also read "Cautions when connecting the Push-In Plus terminal " when wiring.
- Do not directly connect an external power source to OUT or COM. Make sure the load is connected.
- To wire with the pulse output terminal, use AWG24-16 twisted or solid wire (with a cross-section of 0.25 to 1.5 mm^2).
- Peel the wire-coating by 10 mm when using a ferrule terminal and by 8 mm when not using it.
- Use a ferrule terminal with a conductor portion 8mm long.
- 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

The configuration of the connection should be either 1:1 or 1:N. If the 1:N connection is Modbus, up to 99 KM-N3 can be connected. If CompoWay/F, up to 31 KM-N3 can be connected.
- The terminal is the push-in type. Also read "Cautions when connecting the Push-In Plus terminal " when wiring.



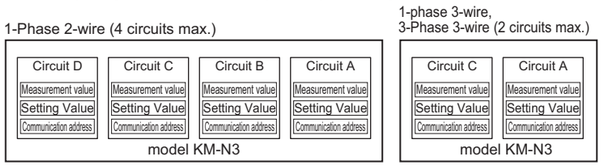
- There is no FG terminal on KM-N3. Connect only the + wire and - wire of RS-485.
- Use twisted pair cables.
- To wire with the RS-485 terminal, use twisted or solid wire of AWG24-16 (with a cross-section of 0.25 to 1.5 mm^2).
- Peel the wire-coating by 10 mm when using a ferrule terminal and by 8 mm when not using it.
- Use a ferrule terminal with a conductor portion 8mm long.
- 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.

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 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 120Ω (1/2W).
- Do not wire in a terminating resistor terminal on KM-N3 that are along the transmission path. This can caused communication failures.

⚠ Safety standard compatibility
If the equipment is used by a method not specified by the manufacturer, the equipment might lose the equipped protection.
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 85 degree.

Multi-address system

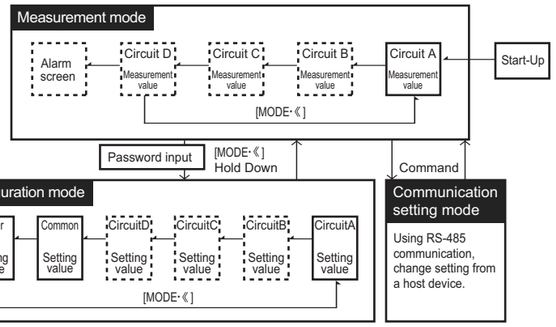
This unit makes it possible to have a maximum of 4 measuring circuits in one unit.
The measuring circuits act as independent power monitors, each able to measure, each having different settings, and each allocated different communications addresses.
You can easily change the number of circuits by enabling or disabling the measuring circuits.



Mode configuration

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

Measuring mode	:The measured values or alarm details of each circuit are displayed.
Setting mode	:By operating keys on the body of the unit you can change settings for each of the circuits, and make common settings for communications, output, the display, etc.
Communication setting mode	:Make settings on the units using RS-485 communication.



- In the measuring 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.)
- The alarm screen is displayed when an alarm has occurred.

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.

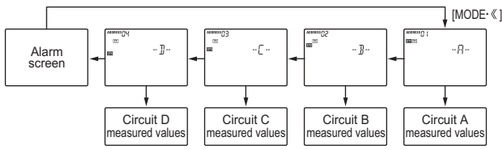
How to enter the password
- When moving from the measuring mode to the setting mode, you need to enter the password that has been set.
- The default password is "**0001**".
- You can set a password of 4 numerals between 0000 and 9999. Change the password as necessary.
- You will be unable to reset the 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

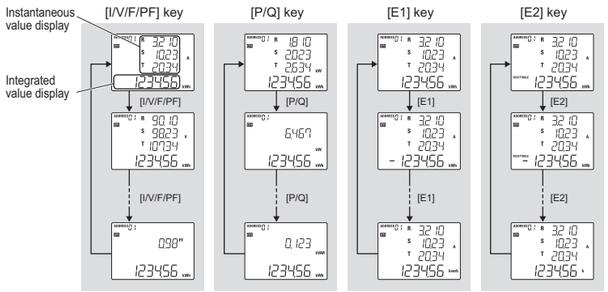
- **Measurement display**

When the [MODE·《] key is pressed, the measuring items are displayed after the screen for showing the destination circuit.
- By pressing the [I/V/F/PF], [P/Q], [E1], or [E2] key, the measuring items are switched.
- When an alarm has occurred, the screen transits to not only the screen displaying the measured values but also the screen displaying the alarm details.

(1P2W display example)



(Display of circuit A measured values)



∗ By pressing the [I/V/F/PF] or [P/Q] key, the instantaneous value display is switched.
∗ By pressing the [E1] or [E2] key, the integrated value display is switched.

- **Measurement display list**

	key	Item	Instantaneous value display	Integrated value display	units
1	I/V/F/PF	Current	0.000 to 9999	-----	A
2		Voltage A *1	0.000 to 9999	-----	V/kV
3		Voltage B *2	0.000 to 9999	-----	V/kV
4		Frequency	45.0 to 65.0	-----	Hz
5		Power factor	-1.00 to 1.00	-----	PF
1	P/Q	Active power (each phase)	-9999 to 9999	-----	kW/MW
2		Active power (total)	-9999 to 9999	-----	kW/MW
3		Reactive power (each phase)	-9999 to 9999	-----	kvar/Mvar
4		Reactive power (total)	-9999 to 9999	-----	kvar/Mvar
1	E1	Active energy (import)	-----	0 to 999999	kWh/MWh
2		Active energy (export)	-----	0 to 999999	kWh/MWh ("--" is lit)
3		Cumulative total reactive power	-----	0 to 999999	kvarh/Mvarh ("Total Q" is lit)
4		Reactive energy (import)	-----	0 to 999999	kvarh/Mvarh ("--" is lit)
5		Reactive energy (export)	-----	0 to 999999	kvarh/Mvarh
6		T1 active energy (import)	-----	0 to 999999	kWh/MWh
7		T2 active energy (import)	-----	0 to 999999	kWh/MWh
8		T3 active energy (import)	-----	0 to 999999	kWh/MWh
9		T4 active energy (import)	-----	0 to 999999	kWh/MWh
1	E2	Active energy (import) (resettable)	-----	0 to 999999	kWh/MWh ("RESETTABLE" is lit)
2		Active energy (export) (resettable)	-----	0 to 999999	kWh/MWh ("--" is lit) ("RESETTABLE" is lit)
3		Cumulative total reactive power (resettable)	-----	0 to 999999	kvarh/Mvarh ("Total Q" is lit) ("RESETTABLE" is lit)
4		Reactive energy (import) (resettable)	-----	0 to 999999	kvarh/Mvarh ("--" is lit) ("RESETTABLE" is lit)
5		Reactive energy (export) (resettable)	-----	0 to 999999	kvarh/Mvarh ("RESETTABLE" is lit)
6		T1 active energy (import) (resettable)	-----	0 to 999999	kWh/MWh ("RESETTABLE" is lit)
7		T2 active energy (import) (resettable)	-----	0 to 999999	kWh/MWh ("RESETTABLE" is lit)
8		T3 active energy (import) (resettable)	-----	0 to 999999	kWh/MWh ("RESETTABLE" is lit)
9		T4 active energy (import) (resettable)	-----	0 to 999999	kWh/MWh ("RESETTABLE" is lit)
10		Conversion value	-----	0 to 999999	N/A

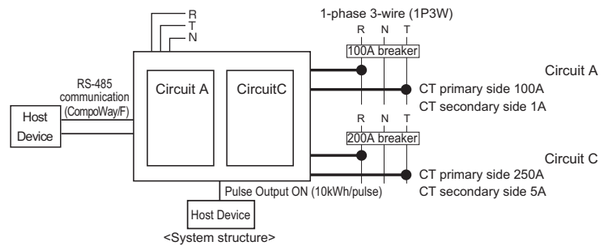
∗ The unit such as k or M is switched automatically.
∗ Although the indication value of the model KM-N3 main unit is returned to zero when the integrated value has reached the maximum, the unit continues to integrate the measured value. Correct values can be obtained by using the communication function.
*1 Voltage A: The phase voltage and line voltage of the each phase and wire type are displayed.
*2 Voltage B: The line voltage is displayed only for the three-phase four-wire type.

Setting mode

- **Setting item list**

	MENU No.	Setting Item	Main display Display of options and input values	Default Value
Circuit A	A1	Phase and wire type	3P4W / 1P2W /1P3W / 3P3W /1P2W2 / 1P3W2	3P4W
	A2	Communication address	Modbus : --, 01 to 99 CompoWay/F : -- 00 to 99	01
	A3	Current on the CT secondary side	1A / 5A	5A
	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	-----	-----
Circuit B	B0	Circuit B ON/OFF	ON / OFF	OFF
	B1	Phase and wire type	The phase and wire type set by menu No. A1 is displayed.	
	B2	Communication address	Modbus : --, 01 to 99 CompoWay/F : -- 00 to 99	Automatic S/N
	B3	Current on the CT secondary side	1A / 5A	5A
	B4	Current on the CT primary side	1 to 9999	5
	B5	Voltage assignment	V_R / V_T / V_R-T	V_R
	B6	Pulse output ON/OFF	ON / OFF	OFF
	B7	Active energy reset	-----	-----
Circuit C	C0	Circuit C ON/OFF	ON / OFF	OFF
	C1	Phase and wire type	The phase and wire type set by menu No. A1 is displayed.	
	C2	Communication address	Modbus : --, 01 to 99 CompoWay/F : -- 00 to 99	Automatic S/N
	C3	Current on the CT secondary side	1A / 5A	5A
	C4	Current on the CT primary side	1 to 9999	5
	C5	Voltage assignment	V_R / V_T / V_R-T	V_R
	C6	Pulse output ON/OFF	ON / OFF	OFF
	C7	Active energy reset	-----	-----
Circuit D	D0	Circuit D ON/OFF	ON / OFF	OFF
	D1	Phase and wire type	The phase and wire type set by menu No. A1 is displayed.	
	D2	Communication address	Modbus : --, 01 to 99 CompoWay/F : -- 00 to 99	Automatic S/N
	D3	Current on the CT secondary side	1A / 5A	5A
	D4	Current on the CT primary side	1 to 9999	5
	D5	Voltage assignment	V_R / V_T / V_R-T	V_R
	D6	Pulse output ON/OFF	ON / OFF	OFF
	D7	Active energy reset	-----	-----
Common CMMN	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
	06	VT ratio	1.00 to 999.99	1.00
	07	Conversion rate	0.000 to 99.999	10.000
	08	Pulse output units	1 / 10 / 100 / 1K / 5K 10K / 50K /100K (Wh)	100
	09	Automatic LCD off	OFF / 1.0 / 5.0 / 10.0 (minutes)	OFF
	0A	Alarm display with negative effective power value ON/OFF	ON / OFF	ON
	0B	Tariff ON/OFF	ON / OFF	OFF
	0C	Change password	0000 to 9999	0001
Others ETC	90	Software version display	V.1.0.0	
	91	All active energy reset	-----	-----
	92	Initialize	-----	-----
	93	Restart	-----	-----

- Setting example



<System structure>

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 A		Circuit C	
• Phase and wire type	: 1P3W	• Circuit C ON/OFF	: ON
• Current on the CT secondary side	: 1A	• Phase and wire type	: 1P3W
• Current on the CT primary side	: 100A	• Current on the CT secondary side	: 5A
• Communication address	: 15	• Current on the CT primary side	: 250A
• Pulse output ON/OFF	: ON (automatically allocated to OUT1)	• Communication address	: 16 (numbered starting from circuit A)
		• Pulse output ON/OFF	: ON (automatically allocated to OUT3)

Items that have a minimum setting are as follows:

Circuit A settings		Circuit C settings	
• Phase and wire type	: MENU A1	• Circuit C ON/OFF	: MENU C0
• Address number	: MENU A2	• Current on the CT primary side	: MENU C4
• Current on the CT secondary side	: MENU A3	• Pulse output ON/OFF	: MENU C6
• Current on the CT primary side	: MENU A4	∗ The secondary current for CTs does not need to be changed.	
• Pulse output ON/OFF	: MENU A6		

RS-485 communication settings		Pulse output settings	
• Protocol	: MENU 00	• Pulse output units	: MENU 08
• Communication speed	: MENU 01		
• Data length	: MENU 02		
• Stop bit	: MENU 03		
• Parity	: MENU 04		
• Transmission wait time	: MENU 05		

① Moving to the setting mode

- Press and hold the [MODE·《] key to move to the password entry screen.

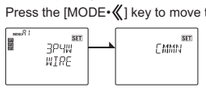
- Enter the password. Change the values using the [《] and [》] keys. Press the [MODE·《] to change the place. (Password default: 0001)
- Press the [ENTER] key to confirm the value. OK is displayed if the password is correct and the screen moves to the setting mode.

∗If you press the [ESC] key before press the [ENTER] key, current input is canceled.(Same for other settings.)

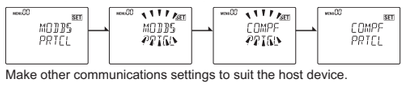
② Communications protocol settings (common settings)

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 (MENU 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.

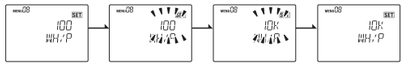


∗ Make other communications settings to suit the host device.

③ Pulse output units settings (common settings)

Set to 10kWh/pulse

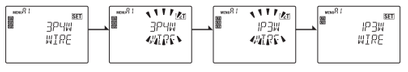
- Press the [MODE·《] key to move to the common settings "CMMN" category display screen.
- From the common setting items, press the [《][》] keys to move to "Pulse output units (MENU 08)".
- Press the [ENTER] key to enter the setting mode. The setting value in the main display flashes.
- Press the [《][》] keys to select "10k".
- Press the [ENTER] key to confirm your selection.



④ Circuit A settings

Set the phase and wire type to 1P3W

- Press the [MODE·《] key to move to the circuit A setting items.
  "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 communication address of circuit A to 15
- On the setup items of circuit A, press [《] or [》] key to move to the "Communication address (MENU A2)."
- Press the [ENTER] key to enter the setup mode. The ones place of the main display blinks.
- Press the [《] or [》] key to change the numerical value to "15."
  – By pressing the [MODE·《] key, the cursor moves left by one digit.
  – By pressing the [《] key at the leftmost digit, the cursor moves to the rightmost digit.
- Press the [ENTER] key to determine the settings.

*1 The communication address settings are assigned to circuit A. When multi-address is used, the values on the table below are assigned automatically.
*2 The communication addresses of circuits B-D cannot be set up individually.

	Circuit A	Circuit B	Circuit C	Circuit D
3-phase 4-wire	Setting value	—	—	—
1-phase 2-wire, 1-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 value +2

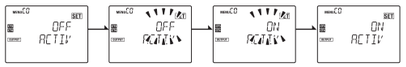
Set the CT secondary side current to 1A
- From the circuit A setting item, press the [《][》] keys to move to "CT secondary side current (MENU A3)".
- Press the [ENTER] key to enter the setting mode. The setting value in the main display flashes.
- Press the [《][》] keys to select "1A".
- Press the [ENTER] 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 current (MENU A4)".
- Press the [ENTER] key to enter the setting mode. The digit in the ones place on the main display flashes.
- Press the [《][》] 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.

⑤ 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 ON/OFF (MENU C0)" is displayed.
- Press the [ENTER] key to enter the setting mode. The setting value in the main display flashes.
- Press the [《][》] keys to select "ON".
- Press the [ENTER] key to confirm the selected items.



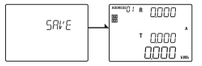
Set CT primary side
- From the circuit C setting item, press the [《][》] keys to move to "CT primary side current (MENU C4)".
- Set the same as for circuit A after this.

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.

⑥ 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.



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