

# Power Monitors

KM-N2

All the Power Monitoring Required for  
In-panel Installation in One Unit



- Power Monitors applicable around the globe
- Solve design, installation, wiring, and commissioning issues with only one unit
- Compact with a selection of several circuit measurements

# New Value For Control Panels

Control Panels: The Heart of Manufacturing Sites.

Evolution in control panels results in large evolution in production facilities.

And if control panel design, control panel manufacturing processes, and human interaction with them are innovated, control panel manufacturing becomes simpler and takes a leap forward.

OMRON will continue to achieve a control panel evolution and process innovation through many undertakings starting with the shared Value Design for Panel <sup>\*1</sup> concept for the specifications of products used in control panels.

## \*1 Value Design for Panel



Our shared Value Design for Panel (herein after referred to as "Value Design") concept for the specifications of products used in control panels will create new value to our customer's control panels.

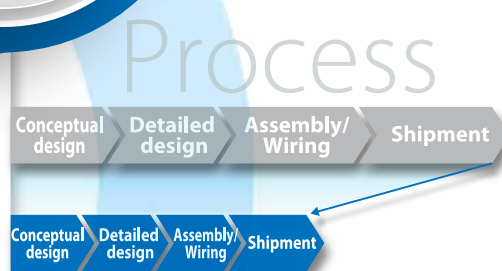
Combining multiple products that share the Value Design concept will further increase the value provided to control panels.



Innovation for  
panel building  
Process

Further Evolution  
for  
Panels

New Value  
For  
Control Panels



Panels

Simple & Easy  
for panel business  
People

People



# All the Power Monitoring Required for In-panel Installation in One Unit

## Over 20 Years of History in Power Monitoring Technology and Quality

OMRON's Power Monitors boast a long track record. They have been marketed since 1995, when saving energy was not a common topic. In the 20 years since then, OMRON has polished our product technology and increased quality. We have taken this power monitoring knowhow developed in Japan and marketed the resulting products worldwide with confidence.





# Power Monitors applicable around the globe\*1

## The New KM-N2 Power Monitors

OMRON's goal is to help save energy worldwide.

Based on that desire, we developed the OMRON KM-N2 Power Monitors.

The wide-range design is compatible with power supplies around the world.

Single-phase 2-wire  
Single-phase 3-wire  
Three-phase 3-wire  
Three-phase 4-wire

Single-phase 100 V to  
Three-phase 480 V

General-purpose CT  
(1 A or 5 A)



All with This One Unit

Modbus/RTU  
(RS-485)

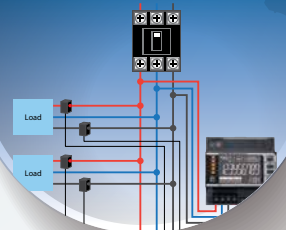
Pulse Output

IEC Class 0.5S  
Accuracy

Multi-circuit  
measurements\*2



Class 0.5S






\*1. VTs are required in some regions.


\*2. Three-phase 4-wire model is used for single circuit measurement.

# Solve Design, Installation, Wiring, and Commissioning Issues with Only One Unit

## Developed from the User's Point of View

Systems are completed by the combined contributions of designers, installers, commissioners, and users. The KM-N2 Power Monitors are designed to solve issues faced by all of these people.

 <p><b>Designer</b> If there are too many models, the correct model cannot be selected until detailed designs are available.</p>	 <p><b>Installer</b> Wiring mistakes must be minimized.</p>	 <p><b>User</b> It's important to know that work was performed safely. Small, dark displays are frustrating.</p>
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Rotary DIP switches are used to set the communications unit number. The setting can be made without turning ON the power supply.

Push-in terminals are used for communications and outputs. And, terminating resistance is provided for communications terminals. There is no need to obtain it separately.

Large, easy-to-read, white LCD characters increase visibility.

M3.5 screw terminals are used for the power supply terminals to ensure safety. Round crimp terminals can be used for secure connections.

Connect up to four CTs. Single-phase, 2-wire: 4 locations, Three-phase, 3-wire: 2 locations, Three-phase, 4-wire: 1 location

### Incorrect Wiring Detection

An alarm sounds to warn of power supply terminal connection errors. Incorrect connections can be corrected quickly, before actual operation.

### Inverter Noise Countermeasures

Present trends in saving energy have resulted in many devices that use inverters. Inverters generate high-frequency noise on the primary side, and that noise can affect measurements made by Power Monitors. Inverter noise countermeasures have been strengthened for OMRON's Power Monitors to maintain high measurement accuracy.

### Push-In Plus Terminal Blocks for Easy Wiring (Communications and outputs terminals)

Just Insert Wires: No Tools Required  
Now you can use Push-In Plus terminal blocks to reduce the time and work involved in wiring.

#### Easy to Insert

OMRON's Push-In Plus terminal blocks are as easy as inserting to a nearphone jack. They help reduce the work load and improve wiring quality.

#### Held Firmly in Place

Even though less insertion force is required, the wires are held firmly in place. The advanced mechanism design technology and manufacturing technology produced a spring that ensures better workability and reliability.



# Compact with a Selection of several circuit Measurements


## CT and Voltage Wiring Diagrams

- Three-phase Four-wire Circuit
- Single-phase, Two-wire Circuit Branched from Single-phase, Three-wire Circuit
- Single-phase Three-wire Circuit
- Single-phase, Three-wire Circuit and Single-phase, Two-wire Circuit Branched from Single-phase, Three-wire Circuit
- Three-phase Three-wire Circuit
- Single-phase Two-wire Circuit

Select the Connection Method That Matches Host Monitoring Needs

The diagram illustrates the integration of a power monitor with host monitoring systems. On the left, two circuit breakers are shown with CTs connected to the monitor. The monitor is connected to a PLC and a Central Monitoring System. The connections are as follows:

- Modbus/RTU communications:** A green line connects the monitor to the PLC.
- RS-485 communications:** A blue line connects the monitor to the Central Monitoring System.
- Pulse outputs (4 max.):** An orange line connects the monitor to a pulse counter, which then outputs to the Central Monitoring System.
- Total power consumption pulse output:** A red line connects the pulse counter to the Central Monitoring System.

Model	Applicable phase wiring methods	Power supply voltage	Dimensions	Communications
<b>KM-N2-FLK</b> 	Single-phase, 2-wire: 100 to 277 VAC Single-phase, 3-wire: 100 to 240 VAC (L-N) or 200 to 480 VAC (L-L) Three-phase, 3-wire: 173 to 480 VAC (L-L) Three-phase, 4-wire: 100 to 277 VAC (L-N) or 173 to 480 VAC (L-L)	Same as measured circuits: 100 to 277 VAC (L-N) 173 to 480 VAC (L-L)	90 × 90 × 65 mm (H×W×D)	RS-485 communications, pulse output

To use a commercially available current transformer, use a CT with a secondary current rating of 1 A or 5 A, and a rated load of at least 1.0 VA.

## Specifications

### Ratings

Item	Model	KM-N2-FLK
Applicable phase wiring methods		Single-phase two-wire, single-phase three-wire, three-phase three-wire, and three-phase four-wire
Maximum number of measured circuits*1		Single-phase two-wire: 4 circuits, Single-phase three-wire or three-phase three-wire: 2 circuits, Three-phase four-wire: 1 circuit
Allowable frequency range		45 to 65 Hz
Power consumption		7 VA max.
Input	Rated input voltages (power supply voltages)	Single-phase, 2-wire: 100 to 277 VAC Single-phase, 3-wire: 100 to 240 VAC (L-N) or 200 to 480 VAC (L-L) Three-phase, 3-wire: 173 to 480 VAC (L-L) Three-phase, 4-wire: 100 to 277 VAC (L-N) or 173 to 480 VAC (L-L)
	Allowable input voltage	85% to 115% of rated power supply voltage
	Allowable supply voltage range	85% to 115% of rated power supply voltage
	Input current (CT2 primary-side current)*2	General-purpose CT: 1 A or 5 A Rated load: 1.0 VA min.
	Allowable input current	6 A max.
	Rated input frequency	50/60 Hz
Ambient operating temperature		−25 to 55°C (with no condensation or icing)
Ambient operating humidity		25% to 85% max.
Storage temperature		−25 to 85°C (with no condensation or icing)
Storage humidity		25% to 85% max.
Operating altitude		2,000 m max.
Installation environment		Overvoltage category II, measurement category II, pollution degree 2
Electromagnetic environment		Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)
Compliant standards		EN 61010-2-030, EN 61326-1, and UL 61010-1

### Performance

Item	Model	KM-N2-FLK
Measurement specifications	Active power	IEC 62053-22 class 0.5S (Accuracy 0.5%)*3
	Reactive power	IEC 62053-23 class 2 (Accuracy 2.0%)*3
	Sampling cycle	80 ms for 50 Hz and 66.7 ms for 60 Hz
Insulation resistance		(1) Between all electrical circuits and the case: 20 MΩ min. (at 500 VDC) (2) Between all power supply and voltage inputs and all communications and pulse output terminals: 20 MΩ max. (at 500 VDC)
Dielectric strength		(1) Between all electrical circuits and the case: 2200 VAC for 1 min (2) Between all voltage and current inputs and all communications and pulse output terminals: 2200 VAC for 1 min
Vibration resistance		Single amplitude: 0.1 mm, Acceleration: 15 m/s <sup>2</sup> , Frequency: 10 to 15 Hz, 10 sweeps for 8 min each along three axes
Shock resistance		150 m/s <sup>2</sup> , 3 times each in 6 directions (up/down, left/right, forward/backward)
Weight		Approx. 350 g (Power Monitor only)
Degree of protection		IP20
Pulse output	Number of outputs	Number of outputs: 4 (photoMOS relay outputs) Used for the total power consumption pulse output.
	Output capacity	50 mA at 40 VDC ON residual voltage: 1.5 V max. (for output current of 50 mA) OFF leakage current: 0.1 mA max.
	Output unit	Output unit: 1, 10, 100, 1k, 5k, 10k, 50k, or 100k (Wh) Pulse ON time: 500 ms (Cannot be changed.)
Communications interface	Communications method	RS-485 (2-wire half-duplex with start-stop synchronization)
	Communications protocol	Modbus (RTU): Binary, CompoWay/F: ASCII
	Baud rate	1.2, 2.4, 4.8, 9.6, 19.2, or 38.4 kbps
	Data length	Data length: 7 or 8 bits Stop bits: 1 or 2 bits Vertical parity: Even, odd, or none
	Maximum transmission distance	1,200 m
	Maximum number of connected Power Monitors	Modbus: 99, CompoWay/F: 31 If you measure more than one circuit with one Power Monitor, the number of circuits is treated as the number of connected Power Monitors.
Dimensions (H×W×D)		90 × 90 × 65 mm (excluding protrusions)
Installation method		DIN Rail mounting
Accessories		Instruction Manual and Compliance Sheet

\*1. A CT with a different capacity can be specified for each circuit.

\*2. The KM-series CTs (the KM20-CTF or KM-NCT Series) cannot be used. Use general-purpose CTs with a secondary-side output of 1 A or 5 A.

\*3. The error of the CT or VT is not included. IEC 62053 is an international standard for power metering.



# Products That Create New Value in Control Panels



Switch Mode Power Supplies S8VK-S



Uninterruptible Power Supply (UPS) S8BA



Power Monitors KM-N2



Digital Temperature Controllers E5CC-B/E5EC-B



Measuring and Monitoring Relays K8DT



Solid-state Timers H3DT



Solid-state Timers H3Y-□-B/H3YN-B



Solid-state Timers H3RN-□-B



Liquid Leakage Sensor Amplifiers K7L-□□B



Sockets for MY series, H3Y-□-B and H3YN-B PYF-PU-□



Sockets for G2R-S, H3RN-□-B and K7L-□□B P2RF-PU



Slim I/O Relays G2RV-SR



Slim I/O Relays G3RV-SR



I/O Relay Terminals G70V



Solid State Relays for Heaters G3PJ



DIN Track Terminal Blocks XW5T

Panel Assist Web

[www.ia.omron.com/solution/panel/](http://www.ia.omron.com/solution/panel/)



Proposal for Innovation of Control Panel Building  
Cat. No. Y218

Refer to the KM-N2 Datasheet (Cat. No. N213) for details.

Before you place an order, please read and understand "Agreement for Using the Product" available on Omron's latest "Best control devices Omron", "General Brochure" or Omron's website.

**OMRON Corporation Industrial Automation Company**  
Kyoto, JAPAN

Contact: [www.ia.omron.com](http://www.ia.omron.com)

**Regional Headquarters**

**OMRON EUROPE B.V.**  
Wegalaan 67-69, 2132 JD Hoofddorp  
The Netherlands  
Tel: (31)2356-81-300/Fax: (31)2356-81-388

**OMRON ASIA PACIFIC PTE. LTD.**  
No. 438A Alexandra Road # 05-05/08 (Lobby 2),  
Alexandra Technopark,  
Singapore 119967  
Tel: (65) 6835-3011/Fax: (65) 6835-2711

**OMRON ELECTRONICS LLC**  
2895 Greenspoint Parkway, Suite 200  
Hoffman Estates, IL 60169 U.S.A.  
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

**OMRON (CHINA) CO., LTD.**  
Room 2211, Bank of China Tower,  
200 Yin Cheng Zhong Road,  
PuDong New Area, Shanghai, 200120, China  
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

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