

Industrial Automation Guide 2016



Industrial Products & Systems

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Targeted Technologies

Creating maximum output with minimum input

By identifying the many ways of innovation in specific industries we developed the 'targeted technologies' concept. It's a way of thinking about technology in a prioritized format. Prioritized according to our customers' most pressing needs. The result? A set of solutions that make immediate impact on the core of our customers' businesses. A set of solutions that hit the target every time. Take a look at the examples on our website.

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Welcome to our world

Our best-in-class devices for your automation system

Welcome to Omron's world of advanced industrial automation. The INDUSTRIAL AUTOMATION GUIDE is your essential tool to select best-in-class devices for your automation system. It highlights our core competences in sensing, control, visualisation, motion and panel components.

Of course, Omron offers a much larger range of products than you can find on the attached DVD. For more information on services and company competence visit our website.

Here you will find:

- Latest product news
- Technical product specifications
- 2D / 3D CAD Library
- Customer references
- Technology concepts
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Industrial Automation Guide 2016

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“To the machine the work of the machine,
to man the thrill of further creation.”

Kazuma Tateisi, founder of Omron

Omron at a glance

200.000 products ranging
input, logic and output

Sensing, Control Systems, Visualization, Drives, Robots, Safety,
Quality Control & Inspection, Control and Switching Components

7%

Investment in Research & Development

Innovation track
record of 80 years

Top 150 global patent assignee

1.200 employees dedicated to R&D

11.000 + issued and pending patents

37.000

Employees worldwide

210

Locations worldwide

22

Countries in EMEA

Working for the
benefit of society



Close to your needs

Technical training & seminars, technical support, Automation Technology Centers, online community (MyOmron), online catalogues and technical documentation, customer service & sales support, inter-operability labs (Tsunagi), safety services, repairs.

Your needs, our focus

Solutions perfectly matching your needs

We asked ourselves: 'What do you need in sensors and components?' Well, first you need reliability. Then a variety and choice of performance levels. You may also want advanced functionality, with special features defined by you – or you may want standardized solutions, with highly competitive prices.

Whatever it is, it can all add up to a wish list that is difficult to fulfil. Until now. That's because our new 361° Approach not only provides a complete all-round offer without gaps, it also puts you at the very centre of the product selection process. It's an approach that leads to a Perfect Match – one with the extra degree of confidence that comes from choosing Omron.

361° in one view



Quality



Line-up



Application



Customization



Global availability



Specs

	Quality	Line-up	Application	Customization	Global availability	Specs
PRO^{plus}	Premium	Tailored	Special	Yes	Yes	Application oriented
PRO	Premium	Complete	Advanced	Yes	Yes	Above Standard
LITE	Premium	Standard	Basic	No	No	Basic
	'Quality' refers to the standard of manufacturing and the materials used – this translates into reliability	'Line-up' refers to the number of model types	'Application' indicates the complexity of the automation	'Customization' is the possibility to modify the product		'Specs' refers to the choice of performance levels

The extra degree of advantage

Three distinct lines of sensors and components

Three distinct lines

361° Approach offers three distinct lines within each sensor or component product category. LITE products are cost-effective without any compromise in quality. PRO products represent the “install & forget” option, offering longer lifetime, higher protection, and more features. While PROplus products are designed for specific applications or customer demands.

Optimized reliability

All three lines are backed by the Omron commitment to quality, so even when you need a price-competitive advantage, you can be confident that they will never let you down.

Solutions that perfectly match your needs

The 361° Approach ensures that you can quickly and easily identify the perfect match solution to your needs – nothing more, nothing less.

Optimized costs

Your sensor and component costs are also minimized – because it eliminates over-specification.

Why an extra 1°?

The extra degree is what you get when you do business with Omron, and that means different things to different customers – all depending on their needs. For example, if you need specification advice, the extra degree is ‘service’. But ultimately, to everyone it means “an extra degree of confidence in the perfect match”.



Sysmac: A fully integrated platform

Integration and Functionality

Sysmac is an integrated automation platform dedicated to providing complete control and management of your automation plant. At the core of this platform, the Machine Controller series offers synchronous control of all machine devices and advanced functionality such as motion, robotics and database connectivity. This multidisciplinary concept allows you to simplify solution architecture, reduce programming and optimize productivity.

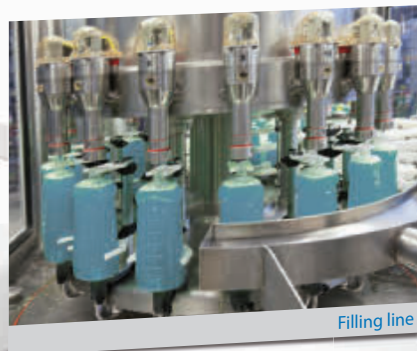


Machine Automation Controller

FACTORY
AUTOMATION

MACHINE
CONTROL

Motion



Filling line

- Motion Control: Integrated within the IDE, and operating in real-time
- Standard PLCopen Function Blocks plus Omron generated motion FB's
- Direct Synchronous control for Position, Speed and Torque

Safety



Assembly

- All safety related data is synchronized with the whole network
- Safety functions such as muting, guard locking, EDM and valve monitoring are simple to manage

- ✓ **One Integrated Development Environment software** for Configuration, Programming, Simulation and Monitoring



Information



Pills blister packing

- Sysmac communicates in real-time with Databases such as SQL
- Secure Data: In the event of a server going down or losing communications, data is automatically stored in internal memory
- Sysmac operates with Databases at high speed [1000 table element/ 100 ms] ensuring realistic Big Data Processing to improve productivity and aid predictive maintenance etc.

✓ Integrated Automation Control:

The Sysmac platform is scalable and provides the performance and functionality for a wide range of solutions from simple machines through to manufacturing cells

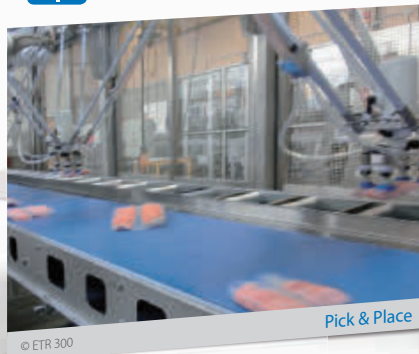
Vision



Quality inspection

- Higher resolution images available without increasing the vision processing time
- Shape search technology: Provides more stable and accurate object detection for Pick & Place projects

Robotics



Pick & Place

- Up to 8 Delta robots with one controller
- Time-based Robotic Function Blocks make programming easier

Sensing



Presence detection of the rubber seal

- Full control of the process parameter setting and predictive maintenance functions
- High precision detection and positioning data synchronized on the network

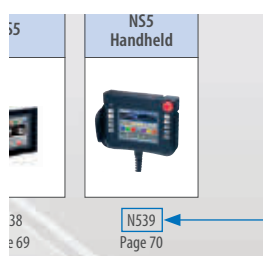
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	96 Motion controllers	112 Servo systems	170 Robots	202 Frequency inverters
Sensing				
	236 Photoelectric sensors	278 Mark and Color sensors	284 Lightcurtains and area sensors	292 Fiber optic sensors and amplifiers
				
	370 Inspection & Ident systems	426 Measurement sensors		
Safety				
	462 Emergency stop and control devices	472 Safety limit switches	480 Safety door switches	506 Safety sensors
				
	574 Temperature controllers	596 Power supplies	614 Uninterruptible power supplies (UPS)	622 Timers
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Software				

Control components

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Quick Link

Control components

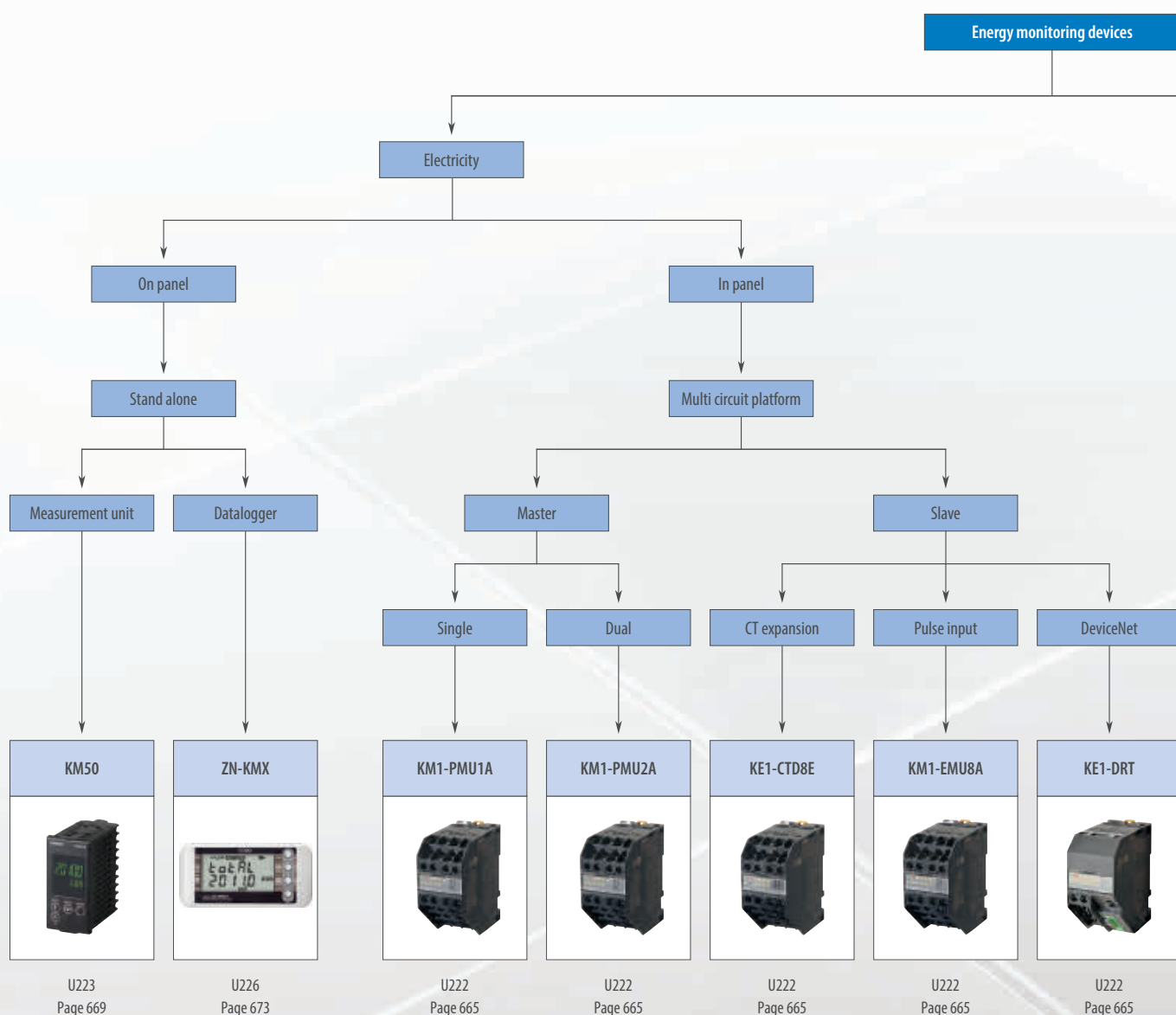
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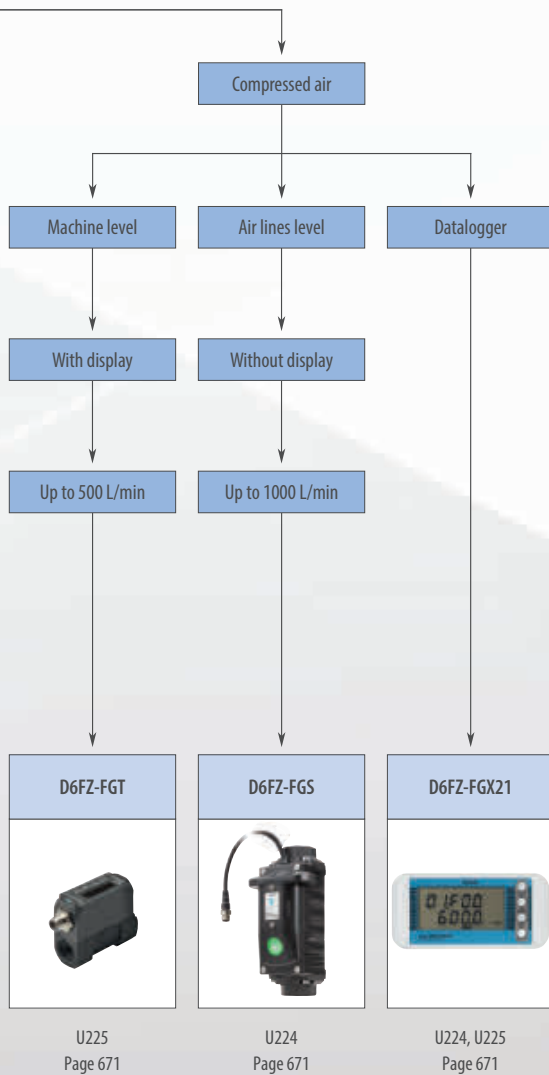
RISE ABOVE YOUR ENERGY CHALLENGES

Energy monitoring devices







Understanding energy usage is the first step in becoming energy efficient. Learn how to expose energy waste deep within your system with new hardware and software solutions that target devices consuming excess power.

- Measure more lines with fewer devices
- Accurate measurements with minimal installation space
- Monitor electrical and other forms of energy





Selection table

		KM1 series				KM50 series	ZN-KMX series
							
Model		KM1-PMU_A	KE1-CTD8E	KM1-EMU8A	KE1-DRT-FLK	KM50-E1-FLK	ZN-KMX-21A
Type		In panel, reduced wiring, space-saving, multi-circuit measurement				On panel type	Data logger for KM50 series
Application		Electricity measurements					
Installation		In panel, DIN track				On panel, option DIN track	Magnet mounting, screw mounting, hook, free standing
Display		–				Eleven segment LEDs	7-seg. 5-digit 2-step LCD display
Size (W × H × D) [mm]		45 × 96 × 90 (maximum width of 45 × 5 when five Units are linked together)				DIN 48 × 96, Depth: 88	117.2 × 56.8 × 24.6
Applicable phase	Single-phase, two-wire	Yes	Yes	–	–	Yes	Depending on connected KMs
	Three-phase, three-wire	Yes	Yes	–	–	Yes	
	Three-phase, four-wire	PMU1A only	Yes	–	–	Yes	
400-V direct measurement		Yes	–	–	–	Yes	
Power supply		100 to 240 VAC	Provided by Master	100 to 240 VAC		100 to 240 VAC	DC input: 24 VDC ±10%
Measured items	Energy	Yes	Yes	–	–	Yes	Yes
	Active power	Yes	Yes	–	–	Yes	Yes
	Reactive power	Yes	Yes	–	–	Yes	–
	Current	Yes	Yes	–	–	Yes	–
	Voltage	Yes	–	–	–	Yes	–
	Power factor	Yes	Yes	–	–	Yes	–
	Frequency	Yes	–	–	–	Yes	–
	Pulse count	–	–	Yes	–	Yes	Yes
Communication interface		RS-485	–	RS-485	DeviceNet or RS485	RS-485	RS-485 KM side/ Ethernet PC side
Alarm output		Yes	Yes	–	–	Yes	Yes
Data logging		Yes	–	–	–	Yes	SD card
Page/Quick Link		665/U222				669/U223	673/U226

D6FZ series				
				
Model	D6FZ-FGT200	D6FZ-FGT500	D6FZ-FGS1000	D6FZ-FGX21
Type	Air flow sensor up to 200 l/min	Air flow sensor up to 500 l/min	Air flow sensor up to 1,000 l/min	Data logger for D6FZ series
Application	Air flow and nitrogen (N2) measurement			
Installation	Mounting bracket		–	Mounting magnet
Display	11-segment digital display		–	7-seg. 5-digit 2-step LCD display
Size (W × H × D) [mm]	30 × 77 × 63.7		64 × 93 × 195	117.2 × 56.8 × 24.6
Applicable pipe	Rc1/4 (8 A)	Rc1/2 (15 A)	Rc1 (25 A)	–
Power supply	12 to 24 VDC ±10%			24 VDC ±10%
Measured items	Flow	Yes	Yes	Yes
	Leakage	Yes	Yes	Yes
	Pressure	–	–	Yes
	Temperature	–	–	Yes
Communication interface	Analog (4 to 20 mA), pulse, RS-485			Ethernet PC side
Alarm output	Threshold value			Yes
Data logging	–	–	–	SD card
Page/Quick Link	671/U225		671/U224	671/U224, U225



Multi-circuit smart power monitor

The KM1 platform enables the visualization of power consumption for back panel applications utilizing a master-slave concept. Up to four slave units can be connected to a master unit for simultaneous measurement of electric and non-electric parameters.

- Installation time consistently reduced
- Mounting space reduced up to 24% compared to traditional monitoring products
- Reduced number of devices: one platform can measure up to 36 circuits
- Wiring reduced due to high speed inner bus communication and the power supply voltage from the master
- Customizable platform for any applications
- Integrated energy classification due to customizable internal thresholds
- High precision measurements even for currents below 5% of the nominal value.

Ordering information

Smart power monitors

Unit type	Unit category	Power supply voltage	Communications	Order code
Dual power system measurement unit	Measurement master	100 to 240 VAC	RS-485	KM1-PMU2A-FLK
Power measurement unit				KM1-PMU1A-FLK
Pulse/temperature input unit	Function slave	Power supplied from the measurement master unit	–	KM1-EMU8A-FLK
CT extension unit	CT extension slave			KE1-CTD8E
DeviceNet communications unit	Communications slave	100 to 240 VAC	RS-485 or DeviceNet	KE1-DRT-FLK

Options (Order separately)

Separate or In-panel current transformer (CT)

Rated primary current	Rated secondary current	Installation	Order code
5 A	Special output	Installed separately	KM20-CTF-5A
50 A			KM20-CTF-50A
100 A			KM20-CTF-100A
200 A			KM20-CTF-200A
400 A			KM20-CTF-400A
600 A			KM20-CTF-600A
5 A/50 A		In-panel (penetration type)	KM20-CTB-5A/50A

Note: CT cables are not included with the CTs.

Current transformer (CT) cable

Specification	Order code
3-m cable	KM20-CTF-CB3

Note: Use the CT cable specified by OMRON or one manufactured by JST Mfg. Co.
You can also use a 1.25-B3A crimping terminal or AWG22 power cable.

Related devices (Sold separately)

Communications interface converter

Dimensions (mm)	Communications conversion	Power supply voltage	Order code
30 × 80 × 78 (W×H×D)	RS-232C, USB <-> Half-duplex RS-485	100 to 240 VAC	K3SC-10 AC100-240
		24 VAC/DC	K3SC-10 AC/DC24

Specifications

Ratings

Item	Master unit		Slave unit	
	KM1-PMU2A-FLK (Dual power systems)	KM1-PMU1A-FLK (Single power system)	KM1-EMU8A-FLK (Pulses/temperatures)	KE1-CTD8E (CT extension unit)
Applicable phase wiring method	Single-phase two wire, single-phase three wire and three-phase three wire	Single-phase two wire, single-phase three wire, three-phase three wire and three-phase four wire	–	Single-phase two wire, single-phase three wire, three-phase three wire and three-phase four wire
Maximum number of CT connections	4	3	–	8
Selectable types of CT capacities	2 types	1 type	–	Two types per Slave Unit
Power supply	Rated power supply voltage	100 to 240 VAC, 50/60 Hz		–
	Allowable supply voltage range	85% to 110% of rated power supply voltage		–
	Power supply allowable frequency range	45 to 65 Hz		–
	Power consumption	Standalone: 10 VA max., Maximum expansion: 14 VA max.		10 VA max.
Input	Rated input voltage	100 to 480 VAC (single-phase, 2-wire): Line voltage 100/200 VAC (single-phase, 3-wire): Phase voltage/line voltage 100 to 480 VAC (3-phase, 3-wire): Line voltage	100 to 480 VAC (single-phase, 2-wire): Line voltage 100/200 VAC (single-phase, 3-wire): Phase voltage/line voltage 100 to 480 VAC (3-phase, 3-wire): Line voltage 58 to 277 VAC (3-phase, 4-wire): Phase voltage	–
	Rated input current (CT)	(5, 50, 100, 200, 400, or 600 A)		–
	Rated input power	With 5-A CT: 4 kW With 50-A CT: 40 kW With 100-A CT: 80 kW With 200-A CT: 160 kW With 400-A CT: 320 kW With 600-A CT: 480 kW		–
	Rated input frequency	50/60 Hz		–
	Allowable input frequency range	45 to 65 Hz		–
	Allowable input voltage	110% of rated input voltage (continuous)		–
	Allowable input current	120% of rated input current (continuous)		–
				120% of rated input current (continuous)
Ambient operating temperature	–10 to 55°C (with no condensation or icing)			
Storage temperature	–25 to 65°C (with no condensation or icing)			
Ambient operating humidity	25% to 85%			
Storage humidity	25% to 85%			
Altitude	2,000 m max.			

Performance

Item	Master unit		Slave unit	
	KM1-PMU2A-FLK (Dual power systems)	KM1-PMU1A-FLK (Single power system)	KM1-EMU8A-FLK (Pulses/temperatures)	KE1-CTD8E (CT extension unit)
Accuracy*1	Voltage	±1.0% FS, ±1 digit; or, ±2.0% FS, ±1 digit for voltage across Vtr under the same conditions		–
	Current	±1.0% FS, ±1 digit However, the accuracy is ±2.0% FS, ±1 digit for the phase-S current for a three-phase, three wire circuit and the phase-N current for a single-phase, three wire circuit under the same conditions.		±1.0% FS, ±1 digit However, the accuracy is ±2.0% FS, ±1 digit for the phase-S current for a three-phase, three wire circuit and the phase-N current for a single-phase, three wire circuit under the same conditions.
	Power (active power and reactive power)	Active power and reactive power ±2.0% FS, ±1 digit (Power factor = 1)		Active power and reactive power ±2.0% FS, ±1 digit (Power factor = 1)
	Frequency	±0.3 Hz ±1 digit		–
	Power factor*2	±5.0% FS at an ambient temperature of 23°C, rated input, rated frequency, and a power factor of 0.5 to 1 to 0.5		±5.0% FS at an ambient temperature of 23°C, rated input, rated frequency, and a power factor of 0.5 to 1 to 0.5
	Temperature	–		±5°C two hours after the power supply is turned ON (after performing any adjustments for the ambient temperature)

Item		Master unit		Slave unit	
		KM1-PMU2A-FLK (Dual power systems)	KM1-PMU1A-FLK (Single power system)	KM1-EMU8A-FLK (Pulses/temperatures)	KE1-CTD8E (CT extension unit)
RS-485	Protocols	Communications protocol setting: CompoWay/F or Modbus			
	Sync method	Start-stop			
	Node number setting	CompoWay/F: 0 to 99, Modbus: 1 to 99 When a switch operation is performed to set the protocol to Modbus when the node number is set to 0, the node number is automatically changed to 1.			
	Baud rate	9,600 bps, 19,200 bps, or 38,400 bps			
	Transmission code	CompoWay/F: ASCII, Modbus: Binary			
	Data length ^{*3}	CompoWay/F: 7 bits, 8 bits; Modbus: 8 bits			
	Stop bits ^{*3}	CompoWay/F: 1 bit or 2 bits; Modbus: 1 bit with priority, 2 bits without priority			
	Parity	Even, odd, or none			
	Maximum transmission distance	500 m			
	Maximum number of nodes	CompoWay/F: 31, Modbus: 99			
	Communication items	Refer to the relevant communication specification manuals			
USB		USB 1.1 compatible			

^{*1} Based on JISC1111, without special CT error, at ambient temperature of 23° C, rated input, and rated frequency. Applicable to 2nd, 3rd, 5th, 7th, 9th, 11th, and 13th harmonics.

^{*2} Power factor formula: Power factor = Active power/Apparent power

$$\text{Apparent power} = \sqrt{(\text{Active power})^2 + (\text{Reactive power})^2}$$

^{*3} The set value may change when the protocol is changed to Modbus. Check the set values if you change the DIP switch settings.

Special CTs

Current Transformer (CT) Cable

Configuration	Installed separately						In-panel (penetration type)
Model	KM20-CTF-5A	KM20-CTF-50A	KM20-CTF-100A	KM20-CTF-200A	KM20-CTF-400A	KM20-CTF-600A	KM20-CTB-5A/50A
Rated primary current	5 A	50 A	100 A	200 A	400 A	600 A	5 A/50 A
Rated secondary current	1.67 mA	1.67 mA	33.3 mA	66.7 mA	66.7 mA	66.7 mA	1.67 mA/16.7 mA
Secondary winding	3,000 turns				6,000 turns	9,000 turns	3,000 turns
Applicable frequency	10 Hz to 5 kHz						
Insulation resistance	Between output terminals and case: 50 MΩ min. (at 500 VDC)						
Dielectric strength	Between output terminals and case: 2,000 VAC for 1 minute						
Protective element	7.5-V clamp element						
Allowable number of connections/ disconnections	100 times						
Inner diameter (mm)	10		16	24	37		10
Operating temperature and humidity ranges	−20 to 60° C, 85% max. (with no condensation)						
Storage temperature and humidity ranges	−30 to 65° C, 85% max. (with no condensation)						

KM-series Power monitor models

Series name		KM1 Series		
Model		KM1-PMU_A-FLK	KE1-CTD8E	KM1-EMU8A-FLK
Dimensions (mm)		45 × 96 × 90 (W×H×D) (maximum width of 45 × 5 when five Units are linked together)		
Applicable phase wiring method	Single-phase, two wire	OK	OK	–
	Single-phase, three wire	OK	OK	–
	Three-phase, three wire	OK	OK	–
	Three-phase, four wire	PMU1A only	OK	–
	400-V direct measurement	OK	–	–
Power Monitor power supply		100 to 240 VAC	Provided from the Master Unit	100 to 240 VAC
Measured items	Total power consumption	OK	OK	–
	Active power	OK	OK	–
	Instantaneous reactive power	OK	OK	–
	Current	OK	OK	–
	Voltage	OK	–	–
	Power factor	OK	OK	–
	Frequency	OK	–	–
	Pulse count	–	–	OK (Can be changed with event input.)
	Temperature	–	–	OK

KE1-DRT-FLK DeviceNet communications unit

Item	Specification			
Communications	<ul style="list-style-type: none"> Remote I/O communications (I/O assignment settings with simple assignment settings or the Configurator) Message communications 			
Connection configuration	Can be a combination of multidrops and T-branching (for both main and branch lines).			
Baud rate	500, 250, or 125 kbps (automatically detected)			
Rated primary current	5 dedicated lines (2 signal lines, 2 power lines, and 1 shield)			
Communications distance	Baud rate	Maximum network length ^{*1}	Branch line length	Total for all branch lines
	500 kbps	100 m max. (100 m max.)	6 m max.	39 m max.
	250 kbps	250 m max. (100 m max.)	6 m max.	78 m max.
	125 kbps	500 m max. (100 m max.)	6 m max.	156 m max.

^{*1} Numbers in parentheses are the lengths for thin cable.



Highly visible on-panel energy monitoring

The KM50 can measure produced and consumed power, current and voltage as well as leading reactive power, lagging reactive power, power factor, and frequency amongst others.

- Assist energy saving analysis with built-in energy classification functionality
- High precision measurements, even for currents below 5% of the nominal value, through automatic range switching
- Able to measure and distinguish consumed and generated power
- Measurement of reactive power and power factor
- Integrated pulse measurement and direct conversion to measure energy management KPI

Ordering information

KM50-E Smart power monitor

Applicable circuits	Power supply voltage (shared)	Dimensions	Communications	Protocol	Order code
Single-phase, two wire: 100 to 480 VAC Single-phase, three wire: 100/200 VAC Three-phase, three wire: 100 to 480 VAC Three-phase, four wire: 85 to 277 VAC	100 to 240 VAC	96 × 48 × 93 (H × W × D)	RS-485	CompoWay/F: 31 nodes, Modbus: 99 nodes (Both are supported by the same model.)	KM50-E1-FLK

CTs

Rated primary current	Rated secondary current	Installation	Order code
5 A	Special output	Installed separately	KM20-CTF-5A
50 A			KM20-CTF-50A
100 A			KM20-CTF-100A
200 A			KM20-CTF-200A
400 A			KM20-CTF-400A
600 A			KM20-CTF-600A

CT Cable

Cable length	Order code
3 m	KM20-CTF-CB3

Note: Either use the CT Cable specified by OMRON or use 1.25-B3A crimp terminals and AWG22 wire from J.S.T. Mfg. Co., Ltd.

Note: CT cables are not included with the CTs.

Specifications

Ratings

Item		KM50-E	
Applicable circuit		Single-phase two wire, single-phase three wire, three-phase three wire and three-phase four wire power	
Rated power supply voltage		100 to 240 VAC, 50/60 Hz	
Allowable supply voltage range		85% to 110% of rated power supply voltage	
Allowable frequency range		45 to 65 Hz	
Power consumption		7 VA max.	
Rated input	Rated input voltage	100 to 480 VAC (single-phase, 2-wire): 100/200 VAC (single-phase, 3-wire): 100 to 480 VAC (3-phase, 3-wire): 58 to 277 VAC (3-phase, 4-wire):	Line voltage Phase voltage/line voltage Line voltage Phase voltage
	Rated input current	5 A, 50 A, 100 A, 200 A, 400 A, or 600 A (primary current of Special CT) ^{*1}	
	Rated frequency	50/60 Hz	
	Rated input power	With 5-A CT: 4 kW With 100-A CT: 80 kW With 400-A CT: 320 kW	With 50-A CT: 40 kW With 200-A CT: 160 kW With 600-A CT: 480 kW
	Allowable input voltage	110% of rated input voltage (continuous)	
	Allowable input current	120% of rated input current (continuous)	
Ambient operating temperature		-10 to 55°C (with no condensation or icing)	
Storage temperature		-25 to 65°C (with no condensation or icing)	
Ambient and storage operation humidity		25% to 85%	
Installation environment		Overvoltage category and measurement category: 2, Pollution level: 2	

^{*1} A special output signal is output as the secondary current from the Special CT.

Performance

Smart power monitor

Item		KM50-E
Accuracy	Voltage	±1.0% FS ±1 digit (at ambient temperature of 23°C, rated input, and rated frequency). However, the accuracy is ±2.0% FS ±1 digit for the V _{tr} line voltage for three-phase, three wire power and the V _{rs} line voltage for single-phase, three wire power under the same conditions.
	Current	±1.0% FS ±1 digit (at ambient temperature of 23°C, rated input, and rated frequency). However, the accuracy is ±2.0% FS ±1 digit for the phase-S current for three-phase, three wire power and the phase-N current for single-phase, three wire power under the same conditions.
	Active power Reactive power	±2.0% FS ±1 digit (at ambient temperature of 23°C, rated input, rated frequency, and a power factor of 1) Reactive power formula: Reactive power = $v \times i \times \sin \theta$ "v" is the instantaneous voltage and "i" is the instantaneous current. θ is the phase difference between the voltage and current.
	Frequency	±0.3 Hz ±1 digit (at ambient temperature of 23°C, rated input, and rated frequency)
	Power factor	±5.0% FS ±1 digit (at ambient temperature of 23°C, rated input, rated frequency, and power factor = 0.5 to 1 to 0.5) Power factor formula: Power factor = Active power/Apparent power Apparent power = $\sqrt{(\text{Active power})^2 + (\text{Reactive power})^2}$
	Temperature	±5°C two hours after the power is turned ON (after setting the offset to match the ambient environment)
Communications	Communications method	RS-485 (two wire half-duplex)
	Sync method	Start-stop
	Unit number setting	CompoWay/F: 0 to 99, Modbus: 1 to 99
	Baud rate	1.2, 2.4, 4.8, 9.6, 19.2, 38.4 kbps
	Transmission code	CompoWay/F: ASCII, Modbus: Binary
	Data length	7, 8 bits
	Stop bit length	1, 2 bits
	Vertical parity	Even, odd, or none
	Maximum transmission distance	500 m
	Maximum number of connected Power Monitors	CompoWay/F: 31, Modbus: 99

CTs






Item	KM20-CTF-5A	KM20-CTF-50A	KM20-CTF-100A	KM20-CTF-200A	KM20-CTF-400A	KM20-CTF-600A
Rated primary current	5 A	50 A	100 A	200 A	400 A	600 A
Secondary winding	3,000 turns				6,000 turns	9,000 turns
Application frequency	10 Hz to 5 kHz					
Insulation resistance	Between output terminal and external case: 50 MΩ min. (at 500 VDC)					
Dielectric strength	Between output terminal and external case: 2,000 VAC for 1 min					
Protective element	7.5 V clamp element					
Allowable number of connections/disconnections	100 times					
Inner diameter	10 dia.		16 dia.	24 dia.	37 dia.	
Operating temperature and humidity range	-20 to 60°C 85% (with no condensation)					
Storage temperature and humidity range	-30 to 65°C 85% (with no condensation)					








Identify waste in your compressed air lines with the D6FZ-FGS1000 and at machine level with the D6FZ-FGT200/500

- Air flow sensors provide visualization of invisible energy waste for compressed air systems to improve energy management and Energy Service company (ESCO) actions.
- High accuracy flow measurement
 - Simultaneous measurements of leakage, usage (every model), pressure and temperature (only D6FZ-FGS1000)
 - Analog and pulse outputs
 - RS-485 communications
 - mountable to curved pipe or coupler

Ordering information

Units		
Appearance	Product name	Order code
	Air flow sensor (200L type)	D6FZ-FGT200
	Air flow sensor (500L type)	D6FZ-FGT500
	Air flow sensor (1000L type, cable length: 0.2 m)	D6FZ-FGS1000
	Air flow station (Cable length 1.5 m, including T-branch connector cable)	D6FZ-FGX21
	Air flow sensor set (1000L type) Air flow sensor (1000L type) Air flow station T-branch connector Single-end wire cable (3 m)	D6FZ-FGS1000-S

Accessories (sold separately)

Appearance	Product name			Order code
	T-branch connector			D6FZ-FC02
	(Air flow sensor D6FZ-FGT only) Mounting bracket Mounting bracket: 1 Plus screw (M3): 4			D6FZ-FC03
	(Air flow station D6FZ-FGX21 only) Mounting magnet Mounting magnet: 2 Plus screw (M3): 2			ZN9-EM01-S
	Single-end wire cable	Cable length 3 m	M12 connector (8 pin)	D6FZ-JD3A
		Cable length 10 m		D6FZ-JD10A
		Cable length 20 m		D6FZ-JD20A
	Double-end connector cable	Cable length 3 m	M12 connector (8 pin)	D6FZ-JD3B
		Cable length 5 m		D6FZ-JD5B
		Cable length 10 m		D6FZ-JD10B
		Cable length 20 m		D6FZ-JD20B

Specifications

Air flow sensor

Item		Model	D6FZ-FGT200	D6FZ-FGT500
Applicable fluid			Air, nitrogen (N ₂)* ¹	
Working pressure			0.75 MPa (withstands pressure of 1.5MPa)	
Measurement range* ²			0 to 200 L/min	0 to 500 L/min
Accuracy* ²			±2.0%F.S. at 50 L/min or more ±0.5%F.S. at less than 50 L/min	
Pressure loss			2 kPa max.	4 kPa max.
Power supply voltage			12 to 24 VDC ±10% ripple (p-p) 10% max.	
Current consumption			120 mA max.	
Functions			Momentary flow/integrated flow/reversing display/zero point adjustment/peak and bottom hold/key lock/eco model/scaling (analog output)/judgement hysteresis/teaching	
Output	Output interface	Analog	Current output 4 to 20 mA (1 contact), maximum load resistance 300Ω max.	
		ON/OFF	Open collector output (2 outputs) 26.4 VDC 50 mA max. ON residual voltage 2 V max. (Outputs can be selected from judgement output, pulse output and unit error output)	
		RS-485	2-wire half duplex communication, start-stop synchronized method Baud rate: 9.6k/19.2k/38.4k/115.2kbps, data bit length: 7/8bit, stop bit length: 1/2bit, parity: none/even/odd, termination resistor (120Ω): ON/OFF, communications protocol: compatible with CompoWay/F	
	Output values		Momentary flow, integrated flow, judgement output, unit error output	
Connection bore diameter			Rc1/4 (8 A)	Rc1/2 (15 A)
Dimensions			30(W) × 77(D) × 63.7(H) mm	
Weight (when packaged)			Approx. 400 g (500 g)	

^{*1} Clean Dry Gas (must not contain large particle e.g. duct, oil and mist)

^{*2} Converted value assuming the accumulated flow quantity following conditions
std (factory default): 20°C at 1 atmospheric pressure 101.3 kPa, nor: 0°C at 1 atmospheric pressure 101.3 kPa

Item			Model	D6FZ-FGS1000
Applicable fluid				Air, nitrogen (N ₂)
Working pressure				0.99 MPa max.
Measurement	Flow	Detection range	1 to 1,000 L/min (std)	
		Resolution	0.1 L/min	
		Accuracy	±2.0% of reading at 50 L/min (std) or more ±0.1%F.S. at less than 50 L/min	
	Pressure	Detection range	0 to 0.99 MPa	
		Accuracy	±2%F.S.	
	Temperature	Detection range	-10 to 60°C	
		Accuracy	±1.5% (absolute temperature)	
Pressure loss				Direct piping:10 kPa max. (0.5 MPa, at maximum flow) Using coupler (TL type by NAGAHORI INDUSTRY CO., LTD.): 10 kPa max. (0.5 MPa, at maximum flow)
Power supply voltage				16 to 24 VDC ±10% ripple (p-p) 10% max. (Using single unit), 24 VDC ±10% ripple (p-p) 10% max. (Using multiple units)
Power consumption				2 W max.
Output	Output interface	Analog	Current output 4 to 20 mA (2 contact) ^{*1} Max. load resistance 270 Ω max.	
		ON/OFF	Open drain output (2 outputs) ^{*2} 24 VDC 50mA max. ON residual voltage 1.5 V max., OFF leakage current 50 μA max.	
		RS-485	2-wire half duplex communication, start-stop synchronized method Baud rate: 115.2 kbps (fixed), Data bit length: 8 bits (fixed), stop bit length: 1 bit (fixed), parity: even (fixed), communications pro- tocol: compatible with CompoWay/F	
	Outpus values		Momentary standard flow, integrated standard flow, pressure, unit error output	
Wiring connection				M12 connector (8-pin)
Connection bore diameter				Rc1 (25 A) bushing enables conversion to 15 A and 20 A
Dimensions				64(W) × 93(D) × 195(H) mm (excluding flange)
Weight (when packaged)				Approx. 1.2 kg (Approx. 1.7 kg)

^{*1} Analog output comprise the momentary standard flow rate and pressure.

^{*2} The integrated standard flow of the pulse output can be selected from 1, 10 (factory default), 100, or 1000 L(std)/P.




Monitor energy flow with a plug-and-play device

The power sensor station collects and displays energy flow from multiple sources across your entire site with simple plug-and-play integration. Visualize energy data with the built-in LCD display or connect your PC with the available software for a closer look. Identify energy waste faster and simpler with the ZN series of power sensor stations.

- Up to 31 KM50 power monitoring devices can be connected in RS-485 communication.
- Multiple ZN units can be integrated in an existing LAN network
- SD card can be used to stored the monitoring data of the ZN
- Graphs and monitored data can be easily represented on your PC through the Omron Multi Data Viewer Light software
- Monitoring data can be exported in .csv file format

Ordering information

Appearance	Product name	Power supply	Order code
	Station unit	DC cable	ZN-KMX21-A

Specifications

Item	ZN-KMX21-A
Connectable power sensor/monitor	KM50-E
Max. number of connectable power sensor/monitor units	31 units
Recording interval	1 s, 2 s, 5 s, 10 s, 20 s, 30 s, 1 min.
Recorded data	Power, integrated power, power factor, sum of pulse input counts 1 and 2
Operation function	Integrated power total sum, integrated momentary power, electricity rate total sum
Memory capacity (Internal)	Internal memory: approx. 200 data items (at maximum load); approx. 6800 data items (at minimum load)
Memory capacity (External)	SD card with SDHC compatibility (Save measured values, save and read setting values)
Power supply	DC input: 24 VDC±10%
Current consumption	80 mA max.
Mounting	Magnet mounting, screw mounting, hook, free standing
Weight (when packaged)	Approx. 500 g

Dimensions

