Digital Panel Meter
K3TF

Easy-to-use, Low-cost Digital Panel Meter that Accepts AC Input

- Compact DIN-size (96 x 48 (W x H)) body.
- Mounting thickness of only 3.5 mm required.
- Highly visible display with 14.2-mm-high LEDs.
- Detects and displays root-mean-square value of half-wave rectified current.
- Confirms to EMC standards EN61010-1 (IEC61010-1).

CE

Model Number Structure

■ Model Number Legend

K3TF - □ □ □ □
1 2 3 4

1, 2. Input Code
- V5: 0 to 199.9 mV
- V6: 0 to 1.999 V
- V7: 0 to 19.99 V
- V8: 0 to 199.9 V
- V9: 0 to 400 V
- A6: 0 to 1.999 mA
- A7: 0 to 19.99 mA
- A8: 0 to 199.9 mA
- A9: 0 to 1.999 A

3. Series No.
- 1: Current series

4. Supply Voltage
- 4: 100 to 120 VAC
- 5: 200 to 240 VAC

Ordering Information

■ List of Models

Models with Line Monitor

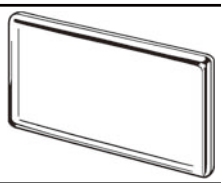
Range	Measuring ranges	Supply voltage	
		100 to 120 VAC	200 to 240 VAC
AC voltage	0 to 199.9 V	K3TF-V814	K3TF-V815
	0 to 400 V	K3TF-V914	K3TF-V915

Models with Signal Monitor

Range	Measuring ranges	Supply voltage	
		100 to 120 VAC	200 to 240 VAC
AC voltage	0 to 199.9 mV	K3TF-V514	K3TF-V515
	0 to 1.999 V	K3TF-V614	K3TF-V615
	0 to 19.99 V	K3TF-V714	K3TF-V715
AC current	0 to 1.999 mA	K3TF-A614	K3TF-A615
	0 to 19.99 mA	K3TF-A714	K3TF-A715
	0 to 199.9 mA	K3TF-A814	K3TF-A815
	0 to 1.999 A	K3TF-A914	K3TF-A915

Note: The K3TF-V8□□ and K3TF-V9□□ do not conform to CE marking standards.

■ Accessories (Order Separately)

Name	Appearance	Model
Water-resistive Soft Front Cover		K32-L49SC
Terminal Cover		K32-L49TC

Note: 1. Use the Mounting Bracket included with the K3TF for mounting.

2. The Terminal Cover is used for finger protection. It has no relation to water resistance.

Specifications

■ Ratings

Supply voltage	100 to 120 VAC (50/60 Hz); 200 to 240 VAC (50/60 Hz)
Operating voltage range	−15% to +10% of supply voltage
Power consumption	4 VA (at max. load)
Insulation resistance	10 MΩ min. (at 500 VDC) between external terminal and case
Dielectric strength	2,000 VAC min. for 1 min between input terminal and power supply 2,000 VAC min. for 1 min between external terminal and case
Noise immunity	±1,500 V on power supply terminals in normal or common mode
Vibration resistance	Malfunction: 10 to 55 Hz, 0.5-mm single amplitude for 10 min each in X, Y, and Z directions Destruction: 10 to 55 Hz, 0.75-mm single amplitude for 2 hrs each in X, Y, and Z directions
Shock resistance	Malfunction: 98 m/s^2 for 3 times each in 6 directions Destruction: 294 m/s^2 for 3 times each in 6 directions
Ambient temperature	Operating: −10° to 55°C (with no icing) Storage: −20° to 65°C (with no icing)
Ambient humidity	Operating: 35% to 85% (with no condensation)
Ambient operating atmosphere	No corrosive gas
EMC	(EMI) EN61326+A1 Industry Emission Enclosure: CISPR 11 Group 1 class A: CISRP16-1/-2 Emission AC Mains: CISPR 11 Group 1 class A: CISRP16-1/-2 (EMS) EN61326+A1 Industry Immunity ESD: EN61000-4-2: 4 kV contact discharge (level 2), 8 kV air discharge (level 3) Immunity RF-interference: EN61000-4-3: 10 V/m (amplitude-modulated, 80 MHz to 1 GHz) (level 3) Immunity Fast Transient Noise: EN61000-4-4: 2 kV (power line) (level 3) Immunity Burst Noise: 1 kV line to line (I/O signal line) Immunity Surge: EN61000-4-5: 1 kV line to line, 2 kV line to ground (power line) Immunity Conducted Disturbance EN61000-4-6: 3 V (0.15 to 80 MHz) (level 2) Immunity Voltage Dip/Interrupting EN61000-4-11: 0.5 cycles, 0, 180°, 100% (rated voltage)
Approved standard	Conforms to EN61326+A1, EN61010-1 (IEC61010-1) Conforms to VDE0106/P100 (finger protection) when the terminal cover is mounted.

Note: The K3TF-V8□□ and K3TF-V9□□ do not conform to CE marking standards.

■ Characteristics

Input signal	AC voltage/current
A/D conversion method	Double integral method
Root-mean-square value indication	Root-mean-square value of half-wave rectified current detected
Sampling period	2.5 times/s
Display refresh period	2.5 times/s
Max. displayed digits	3 1/2 digits (1999)
Display	7-segment red LED
Decimal point display position	Selected with slide switch (see note 1)
Overflow display	Overflow: /□□□
Zero suppression	Not supported.
External control	Process value hold (terminals on rear panel short-circuited)
Degree of protection	Front panel: IEC IP51 (see note 2) Case: IEC IP20 Terminals: IEC IP00

Note: 1. Only for models with signal monitor.

2. IP51 is maintained when the water-resistive soft cover and bracket are used. IP50 will be, however, maintained without these water-resistive accessories.

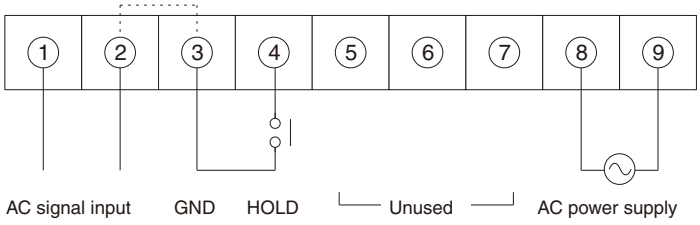
■ Measuring Ranges

Monitor	Input range	Measuring range	Max. resolution	Input impedance	Accuracy	Max. permissible load
Line monitor	AC voltage	0 to 199.9 V	100 mV	10 MΩ	±0.3%rdg ±1 digit (see note 1)	500 V
		0 to 400 V	1 V	10 MΩ	±0.3%rdg ±1 digit	500 V
Signal monitor	AC voltage	0 to 199.9 mV	100 μV	10 MΩ	±0.3%rdg ±1 digit	250 V
		0 to 1.999 V	1 mV	10 MΩ	±0.3%rdg ±1 digit	250 V
		0 to 19.99 V	10 mV	1 MΩ	±0.3%rdg ±1 digit	250 V
	AC current	0 to 1.999 mA	1 μA	100 Ω	±0.5%rdg ±1 digit	50 mA
		0 to 19.99 mA	10 μA	10 Ω	±0.5%rdg ±1 digit	150 mA
		0 to 199.9 mA	100 μA	1 Ω	±0.5%rdg ±1 digit	500 mA
		0 to 1.999 A	1 mA	0.1 Ω	±0.5%rdg ±1 digit	3 A

Note: 1. With 100% input. ±0.3% FS±1 digit when the input is less than 35% FS.
2. The above accuracy is at an input frequency range of 40 Hz to 1 kHz and an ambient temperature of 23±5°C.

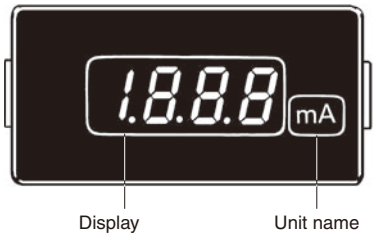
Connections

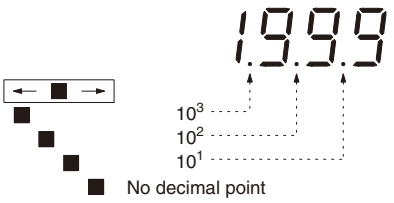
■ External Connections



Note: Terminals 2 and 3 of the models are not internally insulated. Connect a relay with high contact reliability and insulation (with a minimum load current of 0.3 mA) or a photocoupler with high insulation (with a residual voltage of 1 V max. and a current leakage of 0.1 mA max.) to these terminals for external control.

Nomenclature





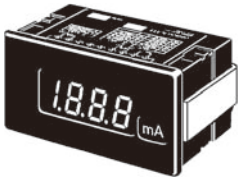
Select the decimal position with the slide switch under the cover on the front panel (signal monitor only).

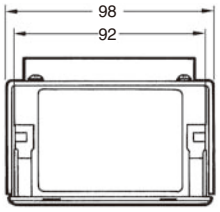
Remove the front panel by using a flat-blade screwdriver or your fingernail in the two notches at the bottom.

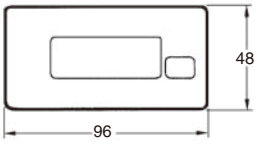
Note: The decimal position cannot be changed for the K3TF-V81□ or K3TF-V91□.

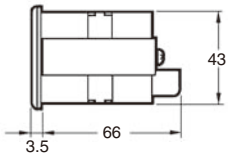
Dimensions

Note: All units are in millimeters unless otherwise indicated.



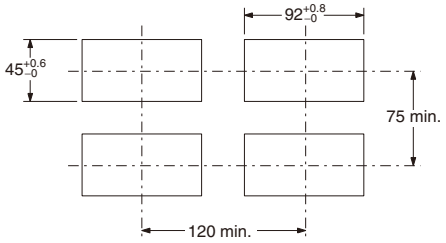






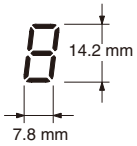
The K3TF uses M3.5 terminals.

Panel Cutouts



Note: The values above are recommended values. Do not group-mount the meters at intervals less than the recommended ones.

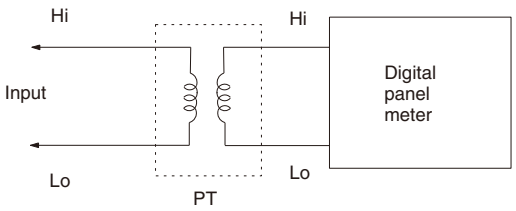
LED Indicator Size



Application Examples

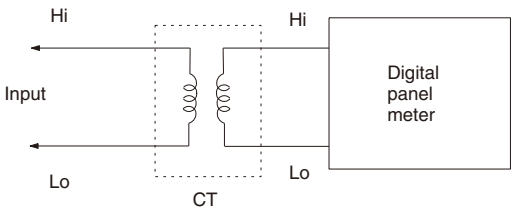
High AC Voltage Measurement

When voltage exceeding the maximum voltage in the standard range is measured (for example: more than 400 V), a divider or potential transformer (PT) is connected externally.



Large AC Current Measurement

When AC current exceeding 2 A is measured, a current transformer (CT) is connected externally.

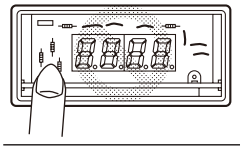


Safety Precautions

Refer to *Safety Precautions for All Digital Panel Meters*.

Precautions for Safe Use

The front panel cover is removed when setting the decimal point position or performing calibration. Do not, however, touch any parts other than the slide switches or adjustment knob or come close to any metal parts.



Precautions for Correct Use

Mounting

Recommended panel thickness is 1 to 3.2 mm.

Mount the Digital Panel Meter by attaching the mounting bracket supplied as an accessory from the rear of the Digital Panel Meter, hook the mounting bracket to the Digital Panel Meter securely, and tighten the mounting screws by turning them clockwise with a tightening torque of 5 kgf·cm (0.49 N·m). For dismounting, loosen the screws and widen the hooks.

Always attach the Mounting Bracket before wiring the terminals. Also, always remove the wiring before removing the Mounting Bracket.

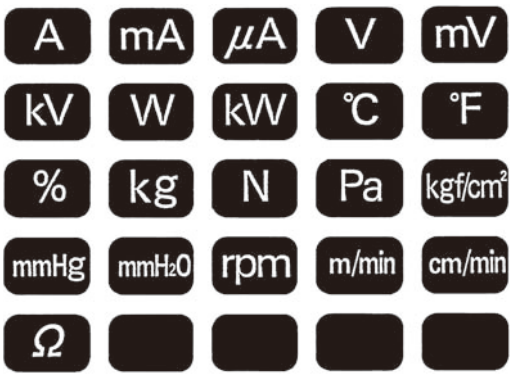
Mount the Digital Panel Meter as horizontally as possible.

Never use the Digital Panel Meter in locations where corrosive gas (particularly sulfide or ammonia gas) is generated.

As much as possible avoid use of the Digital Panel Meter in a location subject to severe shock or vibration, excessive dust, or excessive moisture.

Select a mounting location where the Digital Panel Meter can be used at an ambient operating temperature –10° to 55°C.

No product is shipped with the unit label attached. Select a unit label from the sheet provided, and attach it to the Digital Panel Meter.



Calibration

Calibrate the Digital Panel Meter regularly so that the Digital Panel Meter can maintain processing accuracy.

Use a standard signal generator with an accuracy of 99.99% min. for calibration.

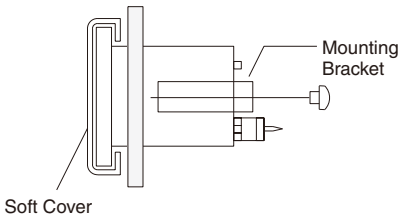
For the precise calibration methods, refer to the Instruction Sheet for the Digital Panel Meter.

After the front panel cover is removed to calibrate the K3TF or set the decimal position, do not touch components other than the slide switch and calibration adjustor. Keep metal objects off the K3TF after the cover is removed, especially when power is turned on.

Accessories (Order Separately)

Water-resistive Soft Front Cover

Before mounting the Digital Panel Meter to a panel, attach the water-resistive soft front cover and mounting bracket to the Digital Panel Meter properly so that the Digital Panel Meter will maintain IP51 water-resistive standards. Before you calibrate Digital Panel Meters, remove the water-resistive soft front cover. Refer to the operation manual included with the Digital Panel Meter for the calibration procedure.



Note: Be sure to use the Water-resistive Soft Front Cover and mounting bracket together.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

In the interest of product improvement, specifications are subject to change without notice.

Safety Precautions for All Digital Panel Meters

Refer to the *Precautions* section for each Digital Panel Meter for specific precautions applicable to each Digital Panel Meter.

⚠ WARNING

Electrocution may possibly occur. Never touch terminals when the power is ON. During operation, be sure that all terminal covers are attached to models for which terminal covers are included.

Serious injury, significant property damage, or a serious accident resulting from abnormal operation may possibly occur. Never use the product on a network without a protective circuit. Provide double or triple safety measures, including emergency stop circuits, interlock circuits, and limit circuits, in external control circuits to ensure safety in the entire system if an abnormality occurs due to malfunction of the product or another external factor affecting the product's operation.

⚠ CAUTION

Minor electric shock, fire, or malfunction may occasionally occur. Do not allow pieces of metal, wire, or fine metal shavings or filings from installation work to enter the product.

Moderate or minor injury or property damage resulting from explosion may occasionally occur. Do not use the product in locations where flammable or explosive gases are present.

Do not use the K3HB-X for measurements within Measurement Categories III, or IV (according to IEC 61010-1), and do not use the K3HB-S, K3HB-V, K3HB-H, K3HB-R, K3HB-P, K3HB-C, K3MA-J, K3MA-L, K3MA-F, or K3GN for measurements within Measurement Categories II, III, or IV (according to IEC 61010-1). Otherwise, unexpected operation, resulting in minor or moderate injury, or damage to the equipment may occasionally occur. Use the equipment for measurements only within the Measurement Category for which the product is designed.

Minor or moderate injury, or damage to equipment resulting from unexpected operation may occasionally occur. Do not operate the product if the settings of the product do not match the application. Be sure to make the correct the settings according to the application.

Property damage to equipment or facilities connected to the product may occasionally occur if the comparative outputs cease to operate resulting from product failure. Do not operate the product unless measures, such as installing a separate monitoring system, have been taken to ensure safety.

Minor or moderate injury, or damage to equipment resulting from fire may occasionally occur if screws become loose. Do not operate the product unless the screws on the terminal block and the connector locking screws have been tightened securely using a tightening torque within the following ranges.

Terminal block screws: 0.74 to 0.90 N·m for M3.5 screws,
0.43 to 0.58 N·m for M3 screws

Confirm the designated torque for connector locking screws for each specific model.

Minor or moderate injury, or damage to equipment resulting from unexpected operation following changes to online edit programs may occasionally occur. Do not operate the product unless it has been confirmed that no adverse effects will result even if the DeviceNet cycle time is extended.

Minor or moderate injury, or damage to equipment resulting from unexpected operation may occasionally occur when transferring a program to another node or changing the contents of the I/O memory. Do not perform either of these operations without confirming safety at the destination node.

Minor or moderate injury resulting from electric shock may occasionally occur. Do not attempt to disassemble, repair, or modify the product.

■ Precautions for Safe Use

1. Do not use the product in the following locations:
   - Locations subject to direct radiant heat from heating equipment
   - Locations where the product may come into contact with water or oil
   - Outdoor locations or locations subject to direct sunlight
   - Locations where dust or corrosive gases (in particular, sulfuric or ammonia gas) are present
   - Locations subject to extreme temperature changes
   - Locations where icing or condensation may occur
   - Locations subject to excessive shocks or vibration
2. Do not use the product in locations subject to temperatures or humidity levels outside the specified ranges or in locations prone to condensation. If the product is installed in a panel, ensure that the temperature around the product (not the temperature around the panel) does not go outside the specified range.
3. Provide sufficient space around the product for heat dissipation.
4. Heat generated by the product itself can raise its interior temperature and shorten its service life. Do not install multiple products side-by-side or stacked one on top of the other. If this kind of installation cannot be avoided, provide the products with forced cooling, such as that using fans.
5. The service life of the output relays depends on the switching capacity and switching conditions. Consider the actual application conditions and use the product within the rated load and electrical service life. Using the product beyond its service life may result in contact welding or burning.
6. Install the product horizontally.
7. Install each product on a designated panel of the recommended thickness.
8. When using crimp terminals or bare conductor connections, use the parts and materials that are designated for each model.

Item / Model	Crimp terminal	Bare conductor connection		Sheath stripping allowance
		Power supply	Other than power supply	
K3TF	M3.5	AWG22 to AWG14 (cross-sectional area: 0.326 to 2.081 mm^2)	AWG22 to AWG16 (cross-sectional area: 0.326 to 1.309 mm^2)	6 to 8 mm
K3HB Series K3MA Series K3GN	M3, width of 5.8 mm max.		AWG28 to AWG16 (cross-sectional area: 0.081 to 1.309 mm^2)	

9. To prevent inductive noise, wire the lines connected to the product separately from power lines carrying high voltages or currents. Do not wire in parallel with or in the same cable as power lines. Other measures for reducing noise include running lines along separate ducts and using shielded wires.
10. Make sure that the rated voltage is achieved within 2 s after turning ON the power.
11. Allow the product to warm up for at least 15 minutes after the power is turned ON.
12. Do not install the product near devices generating strong high-frequency waves or surges. When using a noise filter, check the voltage and current and install it as close to the product as possible.
13. Do not use thinner to clean the product. Use commercially available alcohol for cleaning.
14. Be sure to confirm the name and polarity for each terminal before wiring the terminal block and connectors.
15. Use the product within the specified supply voltage and rated load.
16. Do not connect anything to unused terminals.
17. Outputs turn OFF when the mode is changed or settings are initialized. Take this into consideration when setting up the control system.
18. Install and provide proper indications for a switch or circuit breaker that complies with the requirements of IEC 60947-1 and IEC 60947-3 to enable the operator to quickly turn OFF the power.
19. Provide a DeviceNet communications distance that satisfies the range given in the specifications, and use the designated communications cable. For cable details, refer to the *DeviceNet Catalog* (Cat. No. Q102).
20. Do not bend or pull the DeviceNet communications cable with excessive force.
21. Do not attach or remove connectors with the DeviceNet power turned ON. Doing so may cause product failure or malfunction.
22. Use wire that is capable of withstanding heat of 70°C min. to wire the K3HB series.

■ Precautions for Correct Use

For detailed information, refer to *Technical Guide for Digital Panel Meters*.

Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

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- Systems, machines, and equipment that could present a risk to life or property.

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Disclaimers

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Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the product may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased product.

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