sanwa

SANWA ELECTRIC INSTRUMENT CO., LTD.

# sanwa®

## GENERAL CATALOG 2014

**SANWA sees its mission as contributing to global environmental conservation and energy management through continuous advances in electrical and on-site measuring instruments, while "putting the trust and satisfaction of customers first".**

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sanwa®

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- Read the operation manual thoroughly and use equipment properly.
- The size of photos of products are not same as of actual product size.

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## Top class quality popular in 74 countries around the world.

Measurements become valid only when people place confidence in the quality of measuring instruments. Sanwa has supported the work of professionals for over half a century, and has produced a myriad of different solutions through the utilization of high levels of quality.

This quality control includes not only “products”, but also each and every operation, maintenance services, and sales and marketing activities, and is thoroughly implemented utilizing reliable systems and the intangible awareness of each of our employees. sanwa is a Japanese name brand that lives up to the trust of engineers around the world through the provision of high quality measuring instruments.



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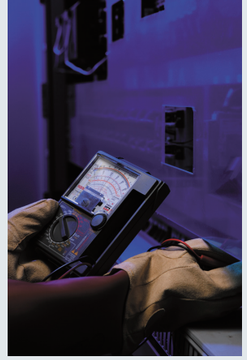

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## Sanwa’s mission

Sanwa sees its mission as contributing to global environmental conservation and energy management through continuous advances in electrical and on-site measuring instruments, while “putting the trust and satisfaction of customers first”.




# Clamp Meters

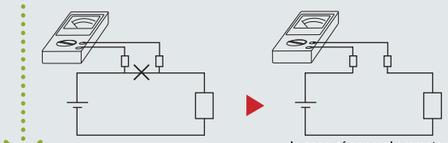
## What is Clamp Meter?

Clamp meters are convenient measuring instruments that allow the measurement of current simply by clamping a wire while being energized without cutting a circuit. In cases of measurement by a multitester and digital multimeter, the circuit must be cut to measure current. In contrast, with a clamp meter, current can be measured simply by clamping a live wire over its sheath. In addition to its simple operation, it allows safe measurement of a higher current (Use a type for higher current measurement such as DCM2000AD) since it is not directly connected to the circuit.

Like a multitester and insulation resistance tester, there are analog and digital types of clamp meters. The measuring range is typically about 20A to 200A or 400A both for DC and AC. As a special type, there are products allowing for the measurement of a higher current of 2,000A. Some types are also available to allow measurements of fine current of few milliamps for the purpose of detecting leakage current. Others allow the measurement by true RMS values for measurement of current of distorted AC waveforms other than of sine waves, for inverter power supply and switching power supply.

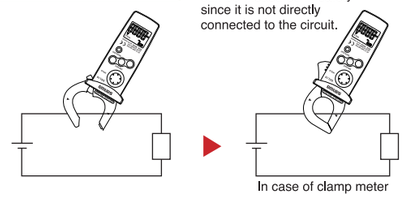
**Measurement by multimeter**

Cut the wiring on the circuit and connect a multimeter in series with the circuit.




**Measurement by clamp meter**

Simply clamp the wiring, and current can be measured in safety since it is not directly connected to the circuit.




## Four key points in choosing a suitable model

### *1. What are objects to be measured?*

Models to be chosen differ depending on what you intend to measure, AC current, DC current or leakage current.

### *2. Measurable conductor sizes*

A wide range of sizes are available from 21mm to 53mm in diameter according to measurable conductor sizes and measuring places.

### *3. Is true RMS measurement required?*

A clamp meter of the mean-value type cannot provide accurate results in the measurement of an inverter circuit and a motor circuit having many distortions. To make measurements for such circuits, a clamp meter of the true RMS type is required.

### *4. Other functions*

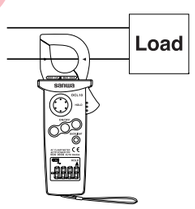
Other types are available featuring a tester function and recorder output function in addition to current measurement.

## Measuring method by clamp meter

For measuring current using a clamp meter, clamp one conductor (wire) to be measured. If two wires (parallel lines) are clamped, current measurement cannot be made. Take a measurement at the center of the core of the clamped portion to minimize measuring errors. A line separator is conveniently used in measuring the consumption current of home electric appliances. There are line separators that can amplify measured current 10 times to allow measurement by amplifying current lower than 1A. When DC current (DCA) is measured using a clamp meter for DC current, the current is indicated in a negative value (–) when the direction of the current is reversed. By using this function, you can know whether your car battery is at the state of charge or discharge.

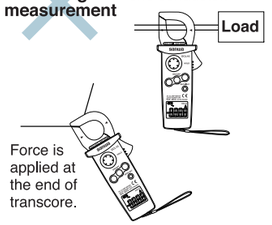
**Correct measurement**

Clamp one conductor at the center of transcore.




**Wrong measurement**

Clamp more than one conductor.



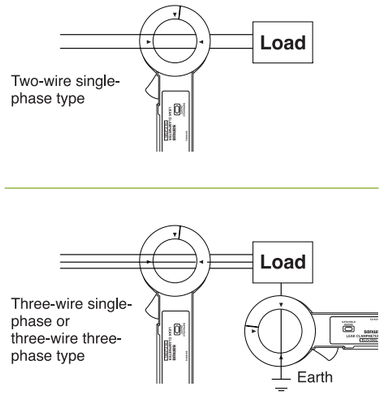

## True RMS measurement

A clamp meter of the mean value type detects the mean value of sine waves in AC measurement, multiplies the value 1.11 times (sine wave AC) and indicates it as the effective value. It even indicates the waveform of a distorted wave and the non-sine wave with different form factors in values multiplied 1.11 times, so indication errors occur as a result. For these measurements, use a clamp meter of the true RMS type that detects and indicates the true RMS value itself.
DCL20R (digital)

## Measurement of leakage current

Unlike ordinary current measurement, it is required to clamp all two wires (two-wire single-phase) or three wires (three-wire single-phase or three-wire three-phase) for measuring leakage current. The earthing wire also can be measured.

**Measurement by clamp meter**



## Clamp Meter AC


### DCL10 (with carrying pouch)

**ACA mini clamp meter with backlight**

- Slim core for narrow space
- Backlight
- Marks to make sure the object is properly clamped
- Data hold
- Auto power off (30min.)

**Sampling rate** : 2 times / sec.
**AC frequency bandwidth** : 45～400Hz
**Safety** : IEC61010-2-032, CAT.III300V Max. / CAT.II600V

(Backlight ON)

Max 300A | AP OFF | DATA HOLD | BACK LIGHT | PB

| DCL10 | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 60/300A | ± (1.5%+5) | 0.01A |
| Bandwidth | 50/60Hz, 45～400Hz | | |
| Display | 6000 | | |
| Clamp diameter/ Conductor size | 25mm/10×25mm | | |
| Withstand voltage | Less than 3700Vrms | | |
| Battery | R03×2 | | |
| Size / Mass | H145×W54×D28mm/approx. 120g | | |
| Standard accessories included | Carrying pouch (C-DCL10), Instruction manual | | |


### DCL1000 (with case)

**Lower cost lightweight & DMM functions**

- Lightweight approx. 290g
- Large LCD
- Easy to use large size data hold button

**Sampling rate** : 3 times / sec.
**AC frequency bandwidth** : 50～500Hz
**Safety** : IEC61010-2-032, CAT.III600V

**Optional accessories**

Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

Max 1000A | AP OFF | DATA HOLD | RNG HOLD | REL

| DCL1000 | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 400/1000A | ± (1.7%+5) | 0.1A |
| DCV | 400m/4/40/400/600V | ± (1.2%+3) | 0.1mA |
| ACV | 400m/4/40/400/600V | ± (2.2%+5) | 0.1mV |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (1.2%+4) | 0.1Ω |
| Continuity | Buzzer sounds at between 0Ω and 65Ω (±35Ω). Open voltage: approx. 0.4V | | |
| Diode test | Open voltage: approx. 1.6V | | |
| Bandwidth | ACA: 50/60Hz (sine wave), ACV: 50～500Hz (sine wave) | | |
| Display | 4000 | | |
| Withstand voltage | 5550VAC | | |
| Battery | R03X2 | | |
| Clamp diameter/ Conductor size | 42mm/20×54mm | | |
| Size / Mass | H238×W95×D45mm/290g | | |
| Standard accessories included | Test lead (TL-23a), Carrying case, Instruction manual | | |


### DCM400 (with case)

**Low cost & DMM functions**

- 4000 count / 42 segment analog bar graph
- Frequency measurement by clamping and using test lead
- Data hold
- Continuity check buzzer
- Auto power off (30min.)
- Low battery power indication

**Sampling rate** : 2 times / sec. for numeral display
**AC frequency bandwidth** : 50～60Hz (ACA : 1.9%±5), 60～500Hz (ACA : 2.5%±5), 50～500Hz (ACV)
**Safety** : IEC61010-1 (EN61010-1) CAT.III300V. / CAT.II 600V

**Optional accessories**

Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

Max 400A | Hz | DATA HOLD | DCV | AP OFF | PB

| DCM400 | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 40/400A | ± (1.9%+5) | 0.01A |
| ACV | 400/600V | ± (1.5%+5) | 0.1V |
| DCV | 400/600V | ± (1%+2) | 0.1V |
| Resistance | 400Ω | | 0.1Ω |
| Frequency (A) | 20～4k/10kHz | ± (0.1%+1) | 0.01Hz |
| Frequency (V) | 4k/40k/400k/1MHz | | 0.01kHz |
| Continuity | Buzzer sounds at less than approx. 40Ω. Open voltage : approx. 1.5V | | |
| Bandwidth | 50～60Hz (ACA : 1.9%±5) 60～500Hz (ACA:2.5%±5), 50～500Hz (ACV : 1.5±5) | | |
| Display | 4000 | | |
| Clamp diameter/ Conductor size | 25mm/10×34mm | | |
| Withstand voltage | Less than 3700Vrms | | |
| Battery | R03×2 | | |
| Size / Mass | H193×W50×D28mm/approx. 230g | | |
| Standard accessories included | Test lead (TL-23a), Carrying case (C-DCM400), Instruction manual | | |


### DCM60L (with case)

**Low cost & DMM functions**

- Measurable AC 0.1A～600A
- ACV & Resistance measurement
- Small design & easy to carry
- Data hold
- Continuity check buzzer

**Sampling rate** : 2 times / sec.
**AC frequency bandwidth** : 50～500Hz
**Safety** : IEC61010-1 (EN61010-1) CAT.III300V Max. / CAT.II 600V

**Optional accessories**

Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

Max 600A | DATA HOLD | PB

| DCM60L | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 200/600A | ± (2.0%+5) (50～60Hz) ± (2.9%+5) (60～500Hz) | 0.1A |
| ACV | 200/600V | ± (1.5%+5) (50～500Hz) | 0.1V |
| Resistance | 200Ω | ± (1.9%+3) | 0.1Ω |
| Continuity | Buzzer sounds at less than approx. 100Ω. Open voltage:approx. 1.6V | | |
| Bandwidth | 50～500Hz | | |
| Display | 1999 | | |
| Clamp diameter/ Conductor size | 25mm/10×30mm | | |
| Withstand voltage | Less than 3700Vrms | | |
| Battery | R03×2 | | |
| Size / Mass | H187×W50×D29mm/approx. 210g | | |
| Standard accessories included | Test lead (TL-23a), Carrying case (C-DCM60), Instruction manual | | |

## Clamp Meter AC


### DCM660R

**Suitable for Electric work and air conditioning & DMM functions**

- AC current measurable max. 660A
- True RMS
- Inrush current measurement
- Max/Min value hold
- Frequency measurement by clamping and using test lead
- Data hold, Auto power save
- LCD with back light

**Sampling rate** : 3 times / sec. for numeral display
**Safety** : IEC61010-1 CAT.III600V, IEC61010-2-032, IEC61010-031

**Optional accessories**

Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

Max 660A | DATA HOLD | RMS | APS | MAX MIN AVG | Hz | BACK LIGHT | INRUSH | PB

| DCM660R | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 66/660A | ± (2%+5) | 0.01A |
| ACV | 600V | ± (1.2%+5) | 0.1V |
| DCV | 600V | ± (1%+2) | 0.1V |
| Resistance | 660Ω | ± (1%+7) | 0.1Ω |
| Frequency (A) | 660/6.6k/30k | ± (0.2%+1) | 0.1Hz |
| Frequency (V) | 660/6.6k/66k/100k | ± (0.2%+1) | 0.1Hz |
| Continuity | Buzzer sounds at less than 30Ω. Open voltage: approx. 1.2V | | |
| Bandwidth | 50～500Hz | | |
| Display | 6600 | | |
| Clamp diameter/ Conductor size | 30mm/10×50mm | | |
| Battery | LR03×2 | | |
| Size / Mass | H208×W69×D38mm/approx. 265g | | |
| Standard accessories included | Test lead (TL-23a), Carrying case (C-DCM660), Instruction manual | | |

## Clamp Meter AC+True RMS


### DCL1200R

**RMS lightweight & DMM functions**

- Lightweight approx. 290g
- True RMS
- Large LCD with Backlight
- Easy to use large size data hold button
- AC voltage detection function (EF)
- Auto V / Ω detection
- MAX. 1200A measurable

**Display** : numeral display 6000
**Sampling rate** : 5 times / sec.
**AC frequency bandwidth** : 50 / 60Hz
**Safety** : IEC61010-2-032 CAT.III600V Max.

**Optional accessories**

Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

Max 1200A | RMS | Hz | EF (NCV) | AP OFF | DATA HOLD | RNG HOLD | DCV | BACK LIGHT | AUTO VΩ

| DCL1200R | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 400/1200A | ± (1.7%+5) | 0.1A |
| DCV | 6/60/600V | ± (0.7%+3) | 1mA |
| ACV | 6/60/600V | ± (1.7%+5) | 1mV |
| Auto resistance | 6k/60k/600k/6MΩ | ± (1.2%+4) | 1Ω |
| Resistance | 600Ω | ± (2.2%+8) | 0.1Ω |
| Frequency | 9.999/99.99/999.9/9.999k/30kHz | ± (0.6%+4) | 0.001Hz |
| Capacitance | 100n/1000n/10μ/100μ/2000μF | ± (3.7%+5) | 0.1nF |
| Continuity | Buzzer sounds at between 0Ω and 155Ω (±145Ω). Open voltage: approx. 0.4V | | |
| Diode test | Open voltage: approx. 1.6V | | |
| Voltage detection | Buzzer sounds and EF mark displays on LCD. Detection range 15V and over. 50/60H | | |
| Bandwidth | ACA: 50/60Hz, ACV: 50～500Hz | | |
| Display | 4000 | | |
| Withstand voltage | 5550VAC | | |
| Battery | R03×2 | | |
| Clamp diameter/ Conductor size | 42mm/20×54mm | | |
| Size / Mass | H238×W95×D45mm/290g | | |
| Standard accessories included | Test lead (TL-23a), Carrying case, Instruction manual | | |


### DCL20R (with carrying pouch)

**RMS mini clamp meter with backlight**

- True RMS
- Slim core for narrow space
- Backlight
- Marks to make sure the object is properly clamped
- Data hold
- Auto power off (30min.)

**Sampling rate** : 2 times / sec.
**AC frequency bandwidth** : 45～400Hz
**Safety** : IEC61010-2-032 CAT.III 300V Max. / CAT.II 600V

(Backlight ON)

Max 300A | RMS | AP OFF | DATA HOLD | BACK LIGHT | PB

| DCL20R | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 60/300A | ± (1.9%+5) | 0.01A |
| Bandwidth | 50/60Hz, 45～400Hz | | |
| Display | 6000 | | |
| Clamp diameter/ Conductor size | 25mm/10×25mm | | |
| Withstand voltage | Less than 3700Vrms | | |
| Battery | R03×2 | | |
| Size / Mass | H145×W54×D28mm/approx. 120g | | |
| Standard accessories included | Carrying pouch (C-DCL10), Instruction manual | | |


### DCL3000R

**ACA Clamp meter with flexible CT**

- Flexibility facilitating conductor clamping even in narrow space
- AC current measurable max. 3000A
- True RMS
- Data hold, Max/Min value hold
- Backlight

**Sampling rate** : approx. 2 times / sec.
**Safety** : IEC61010 CAT.IV 600V

Max 3000A | RMS | AP OFF | DATA HOLD | MAX MIN AVG | BACK LIGHT | PB

| DCL3000R | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 30/300/3000A | ± (3%+5) | 0.01A |
| Bandwidth | 45～500Hz | | |
| Display | 3150 | | |
| Clamp diameter/ Conductor size | approx. ϕ150mm max. | | |
| Battery | LR03×2 | | |
| Size / Mass | H120×W70×D26mm/approx. 300g | | |
| Standard accessories included | Carrying case (C-CL3000), Instruction manual | | |

## Clamp Meter AC (Analog Type)


### CAM600S (with case)

**AC600A, AMT functions**

- AC current measurable max. 600A
- Long analog pointer with "pointer lock" function
- Temperature measurement with optional probe

**Display** : Analog pointer
**AC frequency bandwidth** : 50 / 60Hz

**Optional accessories**

Temperature probe : T-THP
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

Max 600A · DCV · Optional °C · PB

| CAM600S | Measuring range | Accuracy |
|---|---|---|
| ACA | 6/15/60/150/600A | ±3% of full scale* |
| ACV | 150/300/600V | ±3% of full scale |
| DCV | 60V | ±3% of full scale |
| Resistance | 1k/100kΩ | 3% of arc |
| Temperature | -10~+200℃ (optional prove "T-THP" is necessary) | |
| Bandwidth | 50/60Hz | |
| Clamp diameter/ Conductor size | 36mm/10×50mm | |
| Withstand voltage | 5550VAC | |
| Battery | R03×1 | |
| Size / Mass | H221×W97×D43mm/420g | |
| Standard accessories included | Test lead (TL-21a), Carrying case (C-CAM6), Instruction manual | |

*4% in 300~600A

## Clamp Meter DC/AC


### DCM400AD (with case)

**Suitable for automotive maintenance & DMM functions**

- 4000 count / 42 segment analog bar graph
- DC / AC current 40A/400A
- Data hold / Range hold
- Relative value
- Continuity check buzzer
- Auto power off (30min.)
- Low battery power indication

**Display** : numeral display 3999, bar graph 42 segments
**Sampling rate** : 2 times / sec. 20 times / sec. for bar graph
**AC frequency bandwidth** : 50~500Hz
**Safety** : IEC61010-1 (EN61010-1) CAT.III 300V / CAT.II600V

**Optional accessories**

Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

Max 400A · DCA ACA · AP OFF · DATA HOLD · RNG HOLD · REL · DCV · PB

| DCM400AD | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 40/400A | ± (2%+10) | 0.01A |
| DCA | 40/400A | ± (2.5%+10) | 0.01A |
| ACV | 400/600V | ± (1.5%+5) | 0.1V |
| DCV | 400/600V | ± (1%+2) | 0.1V |
| Resistance | 400Ω | ± (1%+2) | 0.1Ω |
| Continuity | Buzzer sounds at less than approx. 40Ω. Open voltage : approx. 1.5V | | |
| Bandwidth | 50~500Hz | | |
| Display | 4000 | | |
| Clamp diameter/ Conductor size | 25mm/10×34mm | | |
| Withstand voltage | Less than 3700Vrms | | |
| Battery | LR03×2 | | |
| Size / Mass | H193×W50×D28mm/approx. 230g | | |
| Standard accessories included | Test lead (TL-23a), Carrying case (C-DCM400), Instruction manual | | |


### DCM-22AD (with case)

**DC / AC compact type & DMM functions**

- DC / AC current measurable max. 200A
- Continuity check buzzer
- Data hold
- Slim core for narrow space

**Display** : numeral display 1999
**Sampling rate** : 2 times / sec. for numeral display
**AC frequency bandwidth** : 40~400Hz (ACA), 40~500Hz (ACV)

**Optional accessories**

Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-91M

Max 200A · DCA ACA · DATA HOLD · DCV

| DCM-22AD | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 20/200A | ± (2%+5) | 0.01A |
| DCA | 20/200A | ± (2%+2) | 0.01A |
| ACV | 2/20/200/500V | ± (2%+5) | 0.001V |
| DCV | 2/20/200/500V | ± (1.5%+2) | 0.001V |
| Resistance | 2k/20k/200k/2000kΩ | ± (2%+5) | 0.001kΩ |
| Continuity | Buzzer sounds at less than approx. 400Ω. Open voltage : approx. 0.43V | | |
| Bandwidth | 40~400Hz (ACA), 40~500Hz (ACV) | | |
| Display | 1999 | | |
| Clamp diameter/ Conductor size | 22mm/10×21mm | | |
| Withstand voltage | 2000VAC | | |
| Battery | R03×2 | | |
| Size / Mass | H179×W56×D26.5mm/140g | | |
| Standard accessories included | Test lead (TL-61), Carrying case (C-CL), Instruction manual | | |


### DCM2000DR

**DC / AC currenct measurable max. 2000A & DMM functions**

- Dual display shows voltage/current and its frequency
- True RMS
- EF (Electric Field) sensing
- VFD (Variable Frequency Drive) frequency measurement
- Low input impedance voltage measurement capable of attenuating the effects of ghost voltage
- Data hold, Range hold
- Relative value
- Peak hold (5msec.)
- Auto Power Save (30min.) (cancelable)

**Sampling rate** : approx. 5 times / sec
**Safety** : IEC61010 CAT.IV 1000V

Max 2000A · RMS · DCA ACA · Hz · EF (NCV) · PEAK · LPF · AUTO VΩ · AP OFF · DATA HOLD · RNG HOLD · REL · BACK LIGHT

| DCM2000DR | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 200/2000A | ± (2.0%+5) | 0.1A |
| DCA | 200/2000A | ± (2.0%+5) | 0.1A |
| ACV | 6/60/600/1000V | ± (1.2%+5) | 0.001V |
| DCV | 6/60/600/1000V | ± (0.5%+5) | 0.001V |
| Resistance | 600/6k/60k/600k/6M/40MΩ | ± (0.5%+5) | 0.1Ω |
| Frequency | 10~1999Hz | ± (0.1%+4) | 0.01Hz |
| Continuity | Buzzer sounds at between 10Ω and 200Ω Open voltage: approx. 0.5V | | |
| Diode test | Open voltage: approx. 1.8V | | |
| Bandwidth | 50~400Hz | | |
| Display | 6000 | | |
| Clamp diameter/ Conductor size | 55mm/20×66mm | | |
| Battery | R6×2 | | |
| Size / Mass | H264×W97×D43mm/approx. 640g | | |
| Standard accessories included | Test lead (TL-29), Carrying case (C-DCM2000DR), Instruction manual | | |

## Clamp Meter DC/AC+True RMS


### DCL30DR (with carrying pouch)

**DC/AC RMS mini clamp meter with peak hold function**

- True RMS
- Peak hold (10ms)
- Backlight
- Marks to make sure the object is properly clamped
- Data hold
- Auto power off (30min.)

**Sampling rate** : 2 times / sec.
**AC frequency bandwidth** : 45~400Hz
**Safety** : IEC61010-1 (EN61010-1) CAT.III300V Max.

Max 400A · RMS · DCA ACA · PEAK · AP OFF · DATA HOLD · BACK LIGHT · PB

| DCL30DR | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 60/400A | ± (2.5%+5) | 0.01A |
| DCA | 60/400A | ± (2.0%+5) | 0.01A |
| Bandwidth | 50/60Hz, 45~400Hz | | |
| Display | 6000 | | |
| Clamp diameter/ Conductor size | 24.5mm/10×26mm | | |
| Withstand voltage | Less than 3700Vrms | | |
| Battery | LR03×2 | | |
| Size / Mass | H145×W54×D28mm/approx. 120g | | |
| Standard accessories included | Carrying pouch (C-DCL10), Instruction manual | | |


### DCM600DR

**Suitable for maintenance of vehicle, hybrid vehicle, electric vehicle & DMM functions**

- AC / DC current measurable max. 600A
- True RMS
- Peak hold
  ※When the peak button is pressed, the measuring range will be fixed to the 600A range.
- Relative value measurement
- Data hold, Auto power save
- LCD with back light

**Sampling rate** : 3 times / sec. for numeral disply,
**Safety** : IEC61010-1 CAT.III600V, IEC61010-2-032, IEC61010-031

**Optional accessories**

Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

Max 600A · DATA HOLD · RMS · APS · PEAK · DCA ACA · BACK LIGHT · REL · PB

| DCM600DR | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACA | 60/600A | ± (2%+5) | 0.01A |
| DCA | 60/600A | ± (2%+5) | 0.01A |
| ACV | 600V | ± (1.2%+5) | 0.1V |
| DCV | 600V | ± (1%+2) | 0.1V |
| Resistance | 999.9Ω | ± (1%+7) | 0.1Ω |
| Continuity | Buzzer sounds at less than 40Ω. Open voltage: approx. 2.9V | | |
| Bandwidth | 50~500Hz | | |
| Display | 6000 | | |
| Clamp diameter/ Conductor size | 30mm/10×50mm | | |
| Battery | LR03×2 | | |
| Size / Mass | H208×W69×D38mm/approx. 260g | | |
| Standard accessories included | Test lead (TL-23a), Carrying case (C-DCM660), Instruction manual | | |

## Clamp Meter Leak current


### DLC460F

**Multifunctional Io Leakage Clamp Meter**

- Low-pass filter function cuts current value of high frequency
- Max/Min value hold, Data hold
- Backlight
- Auto power save (30min.)

**Sampling rate** : 2 times / sec.
**Safety** : IEC61010-1 CAT.III600V, IEC61010-2-032, IEC61010-031

**Optional accessories**

Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC

Max 400A · LEAK · LPF · APS · DATA HOLD · MAX MIN AVG · BACK LIGHT

| DLC460F | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| ACmA | 60m/600mA | ±(1.2%+5) | 0.01mA |
| ACA | 60/400A | ±(1.2%+5) | 0.01A |
| ACV | 600V | ±(1.2%+5) | 0.1V |
| DCV | 600V | ±(1.0%+2) | 0.1V |
| Resistance | 999.9Ω | ±(1.0%+8) | 0.1Ω |
| Bandwidth | 40~400Hz | | |
| Display | 6000 (V/A), 9999 (Ω) | | |
| Clamp diameter/ Conductor size | 35mm/10×40mm | | |
| Battery | LR03×2 | | |
| Size / Mass | H206×W83×D38mm/approx. 320g | | |
| Standard accessories included | Test lead (TL-23a), Carrying case (C-DCM660), Instruction manual | | |

# Clamp Sensors

## What is Clamp Sensor?

A clamp sensor allows the measurement of AC and DC current and fine AC current of milliampere level (leakage current) by connecting to a DMM without connecting a wire as in the case of a clamp meter. Its combined use with DMM of PC series connectable to a PC allows the recording and monitoring of the measurements on a PC of consumption current for home electric appliances and leakage current running through an earthing wire.

**Measurable current differs by models. Check it before use.**

ACA ·····**CL-22AD, CL3000**

DCA ·····**CL-22AD, CL33DC**

AC Leak current ·····**CL124, CL140**

## Prior to making a measurement

The following description is given on a digital multimeter of 6000-count display type (PC700), but it also applies to 1999-count and 3999-count display types.
Check a DMM compatibly used with a clamp sensor (Refer to the information of compatible models of each product in p. 10, 11). Values are indicated in mV, which should be read in mA by multiplying a factor for each product. Models RD700 and RD701 have a separate fixed range of 400.0mV AC / DC (high impedance 1000MΩ) for exclusive use with an adaptor probe to give clear viewing of milli-volt display.

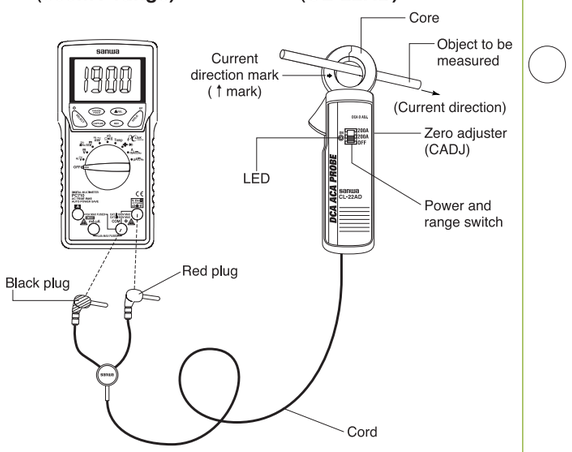
### e.g. When PC700 is used with CL-22AD

Fix the range at 600mV and set the clamp probe at 20～200A range. In this case, the measured value is obtained by multiplying the indicated value of the multimeter by the factor given below.

### e.g. When CL-22AD is used

DCA measurement → DC600mV range
ACA measurement → AC600mV range
20A range…Reading×0.1
200A range…Reading×1
When CL-22AD is set to the 20A range, it will be measured as 1.900A if the DMM indicates 19.00mV (19.00×0.1).

### Connecting DMM and CL-22AD




## Clamp Sensor

### CL124 (with case)

LEAK

**Micro / leak current (AC)**

■No battery Length : 2m

| CL124 | 1A | Applicable digital multimeter |
|---|---|---|
| Resolution | 1mA | PC7000 PC720M PC710 PC700 PC5000a PC510a PC500a PC773 RD701 RD700 |
| Measuring range | | 0～1000mA (1A) |
| Accuracy / Frequency range | | ± (1.0%rdg+0.1mV) / (50Hz/60Hz)<br>± (2.0%rdg+0.1mV) / (40Hz～1kHz) |
| Maximum allowable input* | | 100A continuous (50/60Hz) |
| Output inpedance | | Approx. 180Ω |
| Core diameter | | Approx. ϕ24mm max. |
| Size / Mass | | H100×W60×D26mm/approx. 150g |
| Standard accessories included | | Carrying case (C-CL140), Instruction manual |

* Allowable limit value in case of making an operational error, and output accuracy is not under warranty.
Output voltage : AC100mV when measuring max. current.

## Clamp Sensor

### CL140 (with case)

LEAK

**Micro / leak current (AC)**

■No battery Length : 2m

| CL140 | 1A | Applicable digital multimeter |
|---|---|---|
| Resolution | 1mA | PC7000 PC720M PC710 PC700 PC5000a PC510a PC500a PC773 RD701 RD700 |
| Measuring range | | 0～1000mA (1A) |
| Accuracy / Frequency range | | ± (1.0%rdg+0.1mV) / (50Hz/60Hz)<br>± (2.0%rdg+0.1mV) / (40Hz～1kHz) |
| Maximum allowable input* | | 200A continuous (50/60Hz) |
| Output inpedance | | Approx. 200Ω |
| Core diameter | | Approx. ϕ40mm max. |
| Size / Mass | | H128×W81×D36mm/approx. 240g |
| Standard accessories included | | Carrying case (C-CL140), Instruction manual |

* Allowable limit value in case of making an operational error, and output accuracy is not under warranty.
Output voltage : AC100mV when measuring max. current.

### CL33DC (with case)

**DC current**

■R03×2 Length : 1.8m Battery life : approx. 70H

| CL33DC | DC300A | DC30A | Applicable digital multimeter |
|---|---|---|---|
| Resolution | 0.1A | 0.01A | PC7000 PC720M PC710 PC700 PC5000a PC510a PC500a PC773 PC20 RD701 RD700 CD772 CD771 CD770 CD750P CD731a |
| Minimum scale | 5A<br>10A | 0.5A<br>1A | TA55 (Analog) |
| Core diameter | ϕ23mm | | |
| Size / Mass | H179×W56×D26.5mm/approx. 120g | | |
| Standard accessories included | Carrying case (C-CL), Instruction manual | | |

Resolution of TA55 (Analog) on 1999 display when measuring 199A max. at 300A range and 19A max. at 30A range
Resolution is one digit bigger at the upper range.
Output voltage : DC300mV when measuring max. current at each range.

### CL-22AD (with case)

**DC / AC current**

■R03×2 Length : 1.8m Battery life : approx. 70H

| CL-22AD | DC200A | DC20A | AC200A | AC20A | Applicable digital multimeter |
|---|---|---|---|---|---|
| Resolution | 0.1A | 0.01A | 0.1A | 0.01A | PC7000 PC720M PC710 PC700 PC5000a PC510a PC500a PC773 PC20 RD701 RD700 |
| | 0.1A | 0.01A | 1A | 0.1A | CD772 CD771 CD770 CD750P CD731a |
| Core diameter | ϕ23mm | | | | |
| Size / Mass | H179×W56×D26.5mm/approx. 120g | | | | |
| Standard accessories included | Carrying case (C-CL), Instruction manual | | | | |

Output voltage : DC200mV/AC200mV (0～400Hz) when measuring max. current at each range.
Waveform measurement by oscilloscope is impractical.

### CL3000 (with case)

**AC current, Flexible type**

■LR03×2 Length : 1.8m Battery life : approx. 110H

| CL3000 | AC30/300/3000A | Applicable digital multimeter |
|---|---|---|
| Accuracy | ±(2.0%+0.3%FS) | PC7000 PC720M PC710 PC700 PC773 PC20 RD701 RD700 CD772 CD771 CD770 CD750P CD731a |
| Frequency range | | 45～65Hz |
| Output inpedance | | 250Ω and less |
| Core diameter | | Approx. ϕ150mm max. |
| Size / Mass | | H120×W70×D26mm/approx.300g |
| Standard accessories included | | Carrying case (C-CL3000), Instruction manual |

* Output voltage : AC3V when measuring max. current at each range.

# Insulation Resistance Testers

## What is Insulation Resistance Tester?

The measurement of insulation resistance is performed to check the insulation status of electric equipments and circuits, which constitutes one of the important measuring items for safety control. The measurement of the insulation of electric equipments and circuits is made using an insulation resistance tester by stopping the operation of the electric equipments and circuits (by stopping power distribution). Voltage of several megohms to tens of megohms is measured in case of the measurement of insulation resistance of electronic parts and electric equipments, and voltage of 1MΩ or less is measured in case of electric works for interior wiring and others.

**Is not the resistance range of a multimeter adequate for the measurement of insulation resistance?**

The resistance of a digital multimeter or multitester covers the applied voltage (measured voltage) of approx. 0.3V up to 12V. An insulation resistance tester needs to make measurements at voltage higher than the working voltage of a circuit and electric and electronic equipment to be measured. The table on the right lists examples of rated voltage and uses of the insulation resistance tester.

**Examples of major applications of insulation resistance tester**

| Rated measurement voltage | General electric equipments | Electric equipments and circuits |
|---|---|---|
| | Insulation measurement at safe voltage | Insulation measurement of telephone circuits |
| 25V<br>50V | Insulation measurement of telephone circuit equipments and explosion-proof equipments | |
| 100V<br>125V | Insulation measurement of control equipments | Insulation measurement for maintaining and controlling low-voltage distribution wiring and equipments of 100V or less<br>Insulation measurement for maintaining and controlling low-voltage wiring and equipments of 200V class or lower |
| 250V | Insulation measurement of low-voltage distribution circuits and equipments | Insulation measurement for maintaining and controlling low-voltage wiring and equipments of 400V class or lower<br>Insulation measurement of 100V, 200V and 440V classes at the time of new installation |
| 500V | Insulation measurement of newly installed distribution circuits, and circuits and equipments of 600V or less (General) | Insulation measurement for maintaining and controlling low-voltage wiring and equipments of lower than 600V<br>Insulation measurement of 100V, 200V and 400V distribution wiring at the time of new installation |
| 1000V | Insulation measurement of circuits, equipments, and facilities of higher than 600V (General) | Insulation measurement of equipments normally operating at high working voltage (e.g. high-voltage cable, high-voltage electric equipment, and communications equipment using high voltage) |

## Three key points in choosing a suitable model

### 1. Analog type or digital type?

Analog type is suitable for visually checking the measurement.
Digital type is suitable for verifying the measurement by precise values.

### 2. What do you like to measure by your insulation resistance tester?

For measurement of electronic circuits and the like (See Figure ① below)
→ For easy reading of higher resistance : DM series / Digital type
For use in measurement in electric works and the like (See Figure ② below)
→ For easy reading of lower resistance : PDM series / Digital type

### 3. Required rated voltage

A wide voltage range is available from 15V (optimum for maintaining and controlling elevators) up to 1000V / 2000MΩ
There are types allowing two to three ranges by one unit.

## Measuring method of low-voltage circuit

In order to measure the insulation resistance of a low-voltage circuit, use an insulation resistance tester with the rated voltage of 500V. Open switches in the distribution board, shut off the power distribution and measure the insulation resistance between wires on the circuit and between wire and ground. If the measured value is below the reference value, open all branch switches and make measurements separately for each branch line of the mains line. The insulation resistance value of the low-voltage circuit is stipulated according to the Electrical Equipment Standard.

| Use voltage class of circuit | | Insulation resistance value |
|---|---|---|
| 300V or less | When voltage to ground is 150V or less (Voltage to ground: Voltage between wire and the earth in case of a ground type circuit, and voltage between wires in case of a non-ground type circuit. The same applies hereinafter.) | 0.1MΩ |
| | Other cases | 0.2MΩ |
| More than 300V | | 0.4MΩ |

## Scale-division method of the 1st and 2nd effective measurement range

① Scale of DM series


② Scale of PDM series

## Digital Type

# MG1000 MG500

**Allows you to measure insulation resistance more safely by avoiding operation mistakes.**

- Hot-line state (30V minimum) detection
- Large volt mark with the buzzer sound
- Automatic data hold function
- Bargraph just like analog meter
- Large display with backlight
- Easy to use & tough body

**Display** : numeral display 4000 **Sampling rate** : 2 times / sec.
**Safety** : IEC61010 CAT.III 600V

**Optional accessories**

Clip adapter : CL-16
Test lead : TLF-120 (MG500 Only)

APS | DATA HOLD | BACK LIGHT | AD | AUTO

1000V 4000MΩ | 500V 4000MΩ | 250V 4000MΩ

| MG1000 | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 4M/40M/400M/4000M | ±(3%+4) | 0.001MΩ |
| Test voltage | 1000/500/250V | | |
| ACV/DCV | 600V (AC/DC Automatic detection) | ±(3%+2) | 1V |
| Ω | 4000Ω (Buzzer and ALARM indicator) | ±(3%+3) | 1Ω |
| Ω | 40Ω | ±(3%+10) | 0.01Ω |
| Open circuit voltage | 1 to 1.3 times of nominal test voltage | | |
| Rated measurement current | 1.0~1.2mA | | |
| Short-circuit current | 2mA or less | | |
| Live circuit detection | At ≧30V AC/DC or more, inhibits test, buzzer sounds and ALARM indicator lights up. | | |
| Battery | LR6×6 | | |
| Size / Mass | H170×W142×D57mm/approx. 600g | | |
| Standard accessories included | Test Lead (TL-112a), Strap (ST-50), Instruction Manual | | |

Front cover image ▶

APS | DATA HOLD | BACK LIGHT | AD | AUTO

500V 4000MΩ | 250V 4000MΩ | 125V 4000MΩ

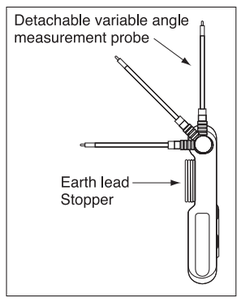
| MG500 | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 4M/40M/400M/4000M | ±(3%+4) | 0.001MΩ |
| Test voltage | 500/250/125V | | |
| ACV/DCV | 600V (AC/DC Automatic detection) | ±(3%+2) | 1V |
| Ω | 4000Ω (Buzzer and ALARM indicator) | ±(3%+3) | 1Ω |
| Ω | 40Ω | ±(3%+10) | 0.01Ω |
| Open circuit voltage | 1 to 1.3 times of nominal test voltage | | |
| Rated measurement current | 1.0~1.2mA | | |
| Short-circuit current | 2mA or less | | |
| Live circuit detection | At ≧30V AC/DC or more, inhibits test, buzzer sounds and ALARM indicator lights up. | | |
| Battery | R6×6 | | |
| Size / Mass | H170×W142×D57mm/approx. 600g | | |
| Standard accessories included | Test Lead (TL-112a), Strap (ST-50), Instruction Manual | | |

# HG561H

**Pocket size, 7 test voltage ranges**

- Test voltage selection mode
- LED level meter shows MΩ
- Easy-to-read LCD with fixed decimal point
- Automatic data hold function
- LCD with backlight & LED light for dark place

**Sampling rate** : approx. 2 times / sec.
**Safety** : IEC61010 CAT.III 300V CAT.II 600V




AP OFF | DATA HOLD | BACK LIGHT | AD | AUTO

15V 21MΩ | 25V 21MΩ | 50V 21MΩ

100V 110MΩ | 125V 110MΩ | 250V 110MΩ | 500V 110MΩ

| HG561H | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 15V/25V/50V 9.99MΩ/21.0MΩ<br>100V/125V/250V/500V<br>9.99MΩ/99.9MΩ/110MΩ | ±(2%+5) | 0.1MΩ |
| Test voltage | 15V/25V/50V/100V/125V/250V/500V | | |
| ACV/DCV | 600V (AC/DC Automatic Detection) | ±(1.6%+7) | 0.1V |
| Ω | 999.9Ω/99.99kΩ/999.9kΩ | ±(1.5%+4) | 0.1Ω |
| Insulation Resistance (Level meter) | 15V/25V/50V 5 Levels(LED light up/blinking)<br>100V/125V/250V/500V 7 Levels(LED light up/blinking) | | |
| Continuity | Buzzer sounds at 30Ω or less | | |
| Battery | LR03×4 | | |
| Size / Mass | H139×W91×D29mm/approx. 230g | | |
| Standard accessories included | Mesurement probe (TL-561), Alligator clip (CL-561), Carrying case (C-DG3a), Instruction manual | | |



## Digital Type

# M53

**2 test voltage ranges for elevator maintenance**

- Test voltage DC500V / 15V
- Auto range
- Auto power off (1min.)
- Low battery power indication
- Remote speed measurement (Speed meter SE-9000 is necessary.)

**Display** : numeral display 1999

**Optional accessories**

Carrying case : C-M53

AP OFF | 500V 200MΩ | 15V 20MΩ

| M53 | 2 ranges |
|---|---|
| MΩ | 2/20/200MΩ (3 auto ranges) |
| Accuracy | Within ±(2%+2) |
| ACV | 200/750V (2 auto ranges) |
| Accuracy | Within ±(1%+0.5%RNG+1) |
| DCV | 20/750V (2 auto ranges) |
| Accuracy | Within ±(0.5%+0.5%RNG+1) |
| Battery | LR6×6 |
| Size / Mass | H175×W115×D55mm/approx. 600g |
| Standard accessories included | Test lead (red/black with plug) and clip lead connecting to pin (TL-M54), Instruction manual |

## Hybrid Insulation Resistance Tester

Insulation Resistance + Clamp meter

# DG34a

**Hybrid pocket size Insulation Tester + Clamp meter**

- Lightweight approx. 160g
- Easy to use, pocket size
- ACV / DCV measurement range
- DCA / ACA measurement range
- Inorganic EL backlight
- Test leads holder with thermo plastic elastomer which is easy to reel
- Current measurement with thin U-shaped current sensor (7mm) at angles of 0 and 180 degrees
- Data hold
- Measurement of relative value
- With Clip adapter

**Display** : 3999
**Sampling rate** : 2 times / sec.

**Optional accessories**

Carrying case : C-DG3a
Clip adapter : CL-13a, CL-15a, TL-8IC

Max 100A | DCA ACA | DATA HOLD | REL | BACK LIGHT

500V 400MΩ | 250V 400MΩ | 125V 400MΩ

| DG34a | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 400MΩ | ±(3%+3) | 0.1MΩ |
| Test voltage | 125V/250V/500V | | |
| DCV | 600V | ±(1.1%+3) | 1V |
| ACV | 600V | ±(1.6%+7) | 1V |
| DCA | 100A | ±(2.0%+5) | 0.1A |
| ACA | 100A | ±(2.0%+5) | 0.1A |
| Open circuit voltage | 1 to 1.2 times of nominal test voltage | | |
| Rated measurement current | 125V/approx.1.25μA 250V/approx.2.5μA 500V/approx.5μA | | |
| Battery | LR03×2 | | |
| Size / Mass | H130×W75×D19.9mm / approx. 160g | | |
| Clamp diameter | ϕ10mm | | |
| Standard accessories included | Clip adapter (CL-DG3), Instruction manual | | |

# DG35a

**Hybrid pocket size Insulation Tester + Clamp meter**

- Lightweight approx. 160g
- Easy to use, pocket size
- ACV / DCV measurement range
- DCA / ACA measurement range
- Inorganic EL backlight
- Current measurement with thin U-shaped current sensor (7mm) at angles of 0 and 180 degrees
- Data hold
- Measurement of relative value
- With Clip adapter

**Display** : 3999
**Sampling rate** : 2 times / sec.

**Optional accessories**

Carrying case : C-DG3a
Clip adapter : CL-13a, CL-15a, TL-8IC

Max 100A | DCA ACA | DATA HOLD | REL | BACK LIGHT

500V 40MΩ | 250V 40MΩ | 125V 40MΩ

| DG35a | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 40MΩ | ±(3%+3) | 0.01MΩ |
| Test voltage | 125V/250V/500V | | |
| DCV | 600V | ±(1.1%+3) | 1V |
| ACV | 600V | ±(1.6%+7) | 1V |
| DCA | 100A | ±(2.0%+5) | 0.1A |
| ACA | 100A | ±(2.0%+5) | 0.1A |
| Open circuit voltage | 1 to 1.2 times of nominal test voltage | | |
| Rated measurement current | 125V/approx.1.25μA 250V/approx.2.5μA 500V/approx.5μA | | |
| Battery | LR03×2 | | |
| Size / Mass | H130×W75×D19.9mm / approx. 160g | | |
| Clamp diameter | ϕ10mm | | |
| Standard accessories included | Clip adapter (CL-DG3a), Instruction manual | | |

# DG36a

**Hybrid pocket size Insulation Tester + Clamp meter**

- Lightweight approx. 160g
- Easy to use, pocket size
- ACV / DCV measurement range
- DCA / ACA measurement range
- Inorganic EL backlight
- Current measurement with thin U-shaped current sensor (7mm) at angles of 0 and 180 degrees
- Data hold
- Measurement of relative value
- With Clip adapter

**Display** : 3999
**Sampling rate** : 2 times / sec.

**Optional accessories**

Carrying case : C-DG3a
Clip adapter : CL-13a, CL-15a, TL-8IC

Max 100A | DCA ACA | DATA HOLD | REL | BACK LIGHT

250V 40M Ω | 125V 40M Ω | 50V 40M Ω

| DG36a | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 40MΩ | ±(3.0%+3) | 0.01MΩ |
| Test voltage | 50V/125V/250V | | |
| DCV | 600V | ±(1.1%+3) | 1V |
| ACV | 600V | ±(1.6%+7) | 1V |
| DCA | 100A | ±(2.0%+5) | 0.1A |
| ACA | 100A | ±(2.0%+5) | 0.1A |
| Open circuit voltage | 1 to 1.2 times of nominal test voltage | | |
| Rated measurement current | 50V/approx.5μA 125V/approx.12.5μA 250V/approx.25μA | | |
| Battery | LR03×2 | | |
| Size / Mass | H130×W75×D19.9mm / approx. 160g | | |
| Clamp diameter | ϕ10mm | | |
| Standard accessories included | Clip adapter (CL-DG3a), Instruction manual | | |

## Pocket size / Digital

mobiken Series — Pocket size meter but with high accuracy and wide ranges. Sensor / Probes can be all neatly contained and protected within the folding case. Easy to carry in a shirt pocket.

### DG6

APS | DATA HOLD | 0Ω ADJ | 25V 40MΩ | 15V 40MΩ

**Suitable for low voltage insulation measurement for relay switch, telephone installation, and fire alarm.**

- Test voltage DC25V / 15V
- Wide measurement range 1kΩ～40MΩ
- High resolution 0.001MΩ (1kΩ)
- Data hold
- Zero ohm adjustment function ADJ (REL)
- Auto power save (30min.)

**Sampling rate :** 2 times / sec. for numeral display, 20 times / sec. for bar graph

| DG6 | | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 4/40M | ± (2%+0～7) | 0.001MΩ |
| Display | 4000 | | |
| Battery | LR44×2 | | |
| Size / Mass | H117×W76×D18mm/approx. 125g | | |
| Standard accessories included | Clip lead (CL-15a black only), Instruction manual | | |

**Optional accessories**

Clip adapter : CL-13a, CL-DG3a

### DG7

APS | DATA HOLD | 0Ω ADJ | 50V 40MΩ | 25V 40MΩ

**Suitable for low voltage insulation measurement for telephone installation and fire alarm.**

- Test voltage DC50V / 25V
- Wide measurement range 1kΩ～40MΩ
- High resolution 0.001MΩ (1kΩ)
- Data hold
- Zero ohm adjustment function ADJ (REL)
- Auto power save (30min.)

**Sampling rate :** 2 times / sec. for numeral display, 20 times / sec. for bar graph

| DG7 | | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 4/40M | ± (2%+0～4) | 0.001MΩ |
| Display | 4000 | | |
| Battery | LR44×2 | | |
| Size / Mass | H117×W76×D18mm/approx. 125g | | |
| Standard accessories included | Clip lead (CL-15a black only), Instruction manual | | |

**Optional accessories**

Clip adapter : CL-13a, CL-DG3a

### DG8

APS | DATA HOLD | 0Ω ADJ | 50V 40MΩ | 15V 40MΩ

**Suitable for low voltage insulation measurement for relay switch and telephone installation.**

- Test voltage DC50V / 15V
- Wide measurement range 1kΩ～40MΩ
- High resolution 0.001MΩ (1kΩ)
- Data hold
- Zero ohm adjustment function ADJ (REL)
- Auto power save (30min.)

**Sampling rate :** 2 times / sec. for numeral display, 20 times / sec. for bar graph

| DG8 | | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 4/40M | ± (2%+0～4) | 0.001MΩ |
| Display | 4000 | | |
| Battery | LR44×2 | | |
| Size / Mass | H117×W76×D18mm/approx. 125g | | |
| Standard accessories included | Clip lead (CL-15a black only), Instruction manual | | |

**Optional accessories**

Clip adapter : CL-13a, CL-DG3a

### DG9

APS | DATA HOLD | 125V 400MΩ | 50V 40MΩ

**Suitable for low voltage insulation measurement for telephone installation and emergency broadcasting equipment.**

- Test voltage DC125V / 50V
- Wide measurement range 1kΩ～400MΩ
- High resolution 0.001MΩ (1kΩ)
- Data hold
- Auto power save (30min.)

**Sampling rate :** 2 times / sec. for numeral display, 20 times / sec. for bar graph

| DG9 | | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 4/40M (50V)<br>40/400MΩ (125V) | ± (2%+0～4)<br>± (2%+2) | 0.001MΩ<br>0.01MΩ |
| Display | 4000 | | |
| Battery | LR44×2 | | |
| Size / Mass | H117×W76×D18mm/approx. 125g | | |
| Standard accessories included | Clip lead (CL-15a black only), Instruction manual | | |

**Optional accessories**

Clip adapter : CL-13a, CL-DG3a

### DG10

APS | DATA HOLD | 500V 400MΩ | 125V 40MΩ

**Suitable for high voltage insulation measurement at construction sites**

- Test voltage DC500V / 125V
- Wide measurement range 1kΩ～400MΩ
- High resolution 0.001MΩ (1kΩ)
- Data hold
- Auto power save (30min.)

**Sampling rate :** 2 times / sec. for numeral disply, 20 times / sec. for bar graph

| DG10 | | Best accuracy | Resolution |
|---|---|---|---|
| MΩ | 4M/40M (125V)<br>40M/400M (500V) | ± (3%+3)<br>± (3%+3) | 0.001MΩ<br>0.01MΩ |
| Display | 4000 | | |
| Battery | LR44×2 | | |
| Size / Mass | H117×W76×D18mm/approx. 125g | | |
| Standard accessories included | Clip lead (CL-15a black only), Instruction manual | | |

**Optional accessories**

Clip adapter : CL-13a, CL-DG3a

## Analog Type

### PDM1529S

**3 test voltage ranges**

- Test voltage DC1000V / 500V/ 250V
- Easy viewing and readable scale graduations
- One-shot or continuous measurement push switch
- DCV measurement range (DC60V)
- Auto discharge function
- Inner battery check range
- Shoulder Strap

**Safety :** IEC61010-1 CAT.III 600V

AD | PB | 1000V 2000MΩ | 500V 100MΩ | 250V 100MΩ

| PDM1529S | | |
|---|---|---|
| Insulation resistance (MΩ) | | 0.5～**2**～**1000**～2000MΩ 1000V<br>0.02～**0.1**～**50**～100MΩ 500V/250V |
| | Accuracy | ±5% of reading<br>(1st effective measurement range : written in thick print above)<br>±10% of reading<br>(2nd effective measurement range : written in small type above) |
| ACV | | 600V |
| | Accuracy | ±5% of full scale (50～60Hz sine wave) |
| DCV | | 60V |
| | Accuracy | ±5% of full scale |
| Battery | | 6LR61 (9V)×1 |
| Size / Mass | | H144×W99×D43mm/approx. 310g |
| Standard accessories included | | Test lead (TL-508Sa), Carrying case (C-08S), Instruction manual |

### PDM5219S

**3 test voltage ranges**

- Test voltage DC500V/ 250V / 125V
- Easy viewing and readable scale graduations
- One-shot or continuous measurement push switch
- DCV measurement range (DC60V)
- Auto discharge function
- Inner battery check range
- Shoulder Strap

**Safety :** IEC61010-1 CAT.III 600V

**Optional accessories**

Test lead : TLF-120

AD | PB | 500V 100MΩ | 250V 100MΩ | 125V 100MΩ

| PDM5219S | | |
|---|---|---|
| Insulation resistance (MΩ) | | 0.02～**0.1**～**50**～100MΩ 500V/250V/125V |
| | Accuracy | ±5% of reading<br>(1st effective measurement range : written in thick print above)<br>±10% of reading<br>(2nd effective measurement range : written in small type above) |
| ACV | | 600V |
| | Accuracy | ±5% of full scale (50～60Hz sine wave) |
| DCV | | 60V |
| | Accuracy | ±5% of full scale |
| Battery | | 6LR61 (9V)×1 |
| Size / Mass | | H144×W99×D43mm/approx. 310g |
| Standard accessories included | | Test lead (TL-508Sa), Carrying case (C-08S), Instruction manual |

### DM1008S

**Single test voltage range**

- Test voltage DC1000V
- One-shot or continuous measurement push switch
- DCV measurement range (DC60V)
- Auto discharge function
- Inner battery check range
- ACV measurement range
- Shoulder Strap

AD | PB | 1000V 2000MΩ

| DM1008S | | |
|---|---|---|
| Insulation resistance (MΩ) | | 1～**2**～**1000**～2000MΩ |
| | Accuracy | ±5% of reading<br>(1st effective measurement range: written in thick print above)<br>±10% of reading<br>(2nd effective measurement range: written in small type above) |
| ACV | | 600V |
| | Accuracy | ±5% of full scale (50～60Hz sine wave) |
| DCV | | 60V |
| | Accuracy | ±5% of full scale |
| Battery | | 6LR61 (9V)×1 |
| Size / Mass | | H144×W99×D43mm/approx. 310g |
| Standard accessories included | | Test lead (TL-508Sa), Carrying case (C-08S), Instruction manual |

### DM508S

**Single test voltage range**

- Test voltage DC500V・1000MΩ
- One-shot or continuous measurement push switch
- DCV measurement range (DC60V)
- Auto discharge function
- Inner battery check range
- Shoulder Strap

**Optional accessories**

Test lead : TLF-120

AD | PB | 500V 1000MΩ

| DM508S | | |
|---|---|---|
| Insulation resistance (MΩ) | | 0.5～1～**500**～1000MΩ |
| | Accuracy | ±5% of reading<br>(1st effective measurement range : written in thick print above)<br>±10% of reading<br>(2nd effective measurement range : written in small type above) |
| ACV | | 600V |
| | Accuracy | ±5% of full scale (50～60Hz sine wave) |
| DCV | | 60V |
| | Accuracy | ±5% of full scale |
| Battery | | 6LR61 (9V)×1 |
| Size / Mass | | H144×W99×D43mm/approx. 310g |
| Standard accessories included | | Test lead (TL-508Sa), Carrying case (C-08S), Instruction manual |

### PDM508S

**Single test voltage range**

- Test voltage DC500V・100MΩ
- One-shot or continuous measurement push switch
- DCV measurement range (DC60V)
- Auto discharge function
- Inner battery check range
- ACV measurement range
- Shoulder Strap

**Optional accessories**

Test lead : TLF-120

AD | PB | 500V 100MΩ

| PDM508S | | |
|---|---|---|
| Insulation resistance (MΩ) | | 0.05～**0.1**～**50**～100MΩ |
| | Accuracy | ±5% of reading<br>(1st effective measurement range : written in thick print above)<br>±10% of reading<br>(2nd effective measurement range : written in small type above) |
| ACV | | 600V |
| | Accuracy | ±5% of full scale (50～60Hz sine wave) |
| DCV | | 60V |
| | Accuracy | ±5% of full scale |
| Battery | | 6LR61 (9V)×1 |
| Size / Mass | | H144×W99×D43mm/approx. 310g |
| Standard accessories included | | Test lead (TL-508Sa), Carrying case (C-08S), Instruction manual |




# PC Link System

***Enhanced operational efficiency by means of data retrieval software, PC Link 7, which can handle measurements for up to a maximum of 8 channels.***

The PC Link system is the software dedicated to a PC for retrieving data outputted from a SANWA digital multimeter (PC series). The operation screen displays graphs in real time to alow you to check changes in measured values (voltage, current, etc.) with ease. Measured data can be saved on a CSV file, so it is easily processed on Excel. The ease of use in a variety of applications from data retrieval, processing and analysis results in its extensive acceptance for business, education and personal use.

## PC Link 7
**Max 8 Channels**

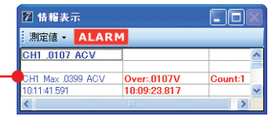
Windows 8 Compatible

PC-LINK SYSTEM

| Applicable Model | PC7000, PC720M, PC710<br>PC700, PC773, PC20, PC20TK |
|---|---|

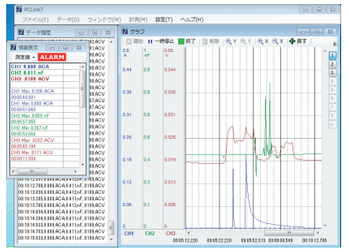
### ■Data acquisition screen

### ■Alert indication



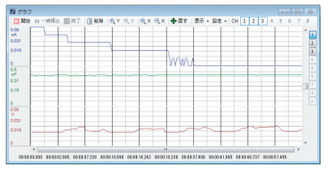

Highly visible alert
Send alert information by e-mails
Save them into files

### ■Multi-window flexible screen layout
(Flexible size and position of each window)



Customizable screen

### ■Traditional overlapped graphs and separated graphs by each channel. Also, easily switchable display/hide.



Separated graphs

Overlapped graphs

### *Major features :*

- Automatically detects a port connected with a digital multimeter
- No additional driver installation required with Windows standard USB drivers
- The retrieval interval can be set by seconds. The shortest reading interval of 0.2 – 0.3 seconds depending on the digital multimeter measuring function.
- Allows setting for vertical/horizontal zoom, reading at the cursor position, and Y axis split while retrieving data.
- Allows automatic retrieval by schedule setting.
- Allows data saving into CSV files and sending e-mails of alert information with alarm setting.
- Allows data saving into CSV files with the date and time appended.
- Multi-window, separated graphs by each channel
- Allows automatic e-mail of measurement data.
- Allows limited operations depending on the user with usage restriction function.
- Allows conditional recording by event function.

### PC Link 7 operating environment

OS:Windows XP (32bit ) / 7 (32bit / 64bit) / 8 (32bit / 64bit) | CPU:Pentium IV 1.6GHz or better | Memory:1GB or better | Resolution:800×600 or above

### Optional accessories for PC Link products

**KB-USB773**
**Optical link USB**

For PC773

**KB-USB7**
**Optical link USB**

For PC7 series

**KB-USB20**
**Optical link USB**

For PC20, PC20TK

# Digital Multimeters

## What is Digital Multimeter?

A digital multimeter is a convenient measuring instrument that allows by itself the measurement of DC voltage, AC voltage, DC current, AC current and resistance (Pocket type DMM normally cannot be used for the measurement of current for safety reasons). In addition to these basic measuring functions, most models are provided with features such as a diode test function and continuity buzzer. Some of recent products feature the measurement of frequency and capacitor capacity. Some have added functions of maximum and minimum value hold and relative value measurement as well as data hold and range hold functions. The PC series DMMs connect to a PC making it possible to let a PC assume the function of expensive recording meters and recorders.

## Advantages of digital multimeters (DMMs)

1. Highly accurate measurement. Higher accuracy (1% or less) compared with an analog multimeter (approximately 3%) .
2. Reduced measuring loss due to high internal impedance (low voltage drop between terminals).
3. No parallax reading error occurs as with an analog multitester.

## Four key points in choosing a suitable model

### 1. What are the necessary measuring functions?

Choose the necessary functions, except voltage and resistance measurement. (including need for the measurement of current (400mA, 10A, 12A, 20A), capacitor, frequency, temperature and measurement of 4-20mA, etc.)

### 2. Other necessary functions

Functions required differ depending on where the measurement is taken.

1) To record measured values concurrently with the process of measurement
   → To fix data by the data hold function.
   → To secure the test lead in the holster.
2) To check changes in measured values
   → Measurement of maximum values, minimum values, and relative values.

### 3. For measurements of waveforms of non-sine waves, choose a model supporting measurements by RMS values.

In measuring distorted sine and non-sine waves (square wave, triangular wave, pulse), significant errors occur in measurement by models making measurements by mean values.

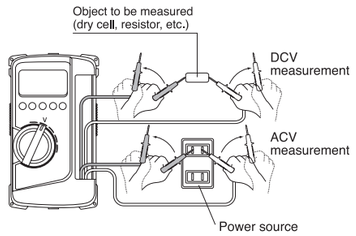
**There are two types of RMS values.**
AC-Coupled true RMS value : Adapted to measurements of distorted sine and non-sine waves of the AC
AC + DC-coupled true RMS value : Adapted to measurements of waveform containing a DC component.

### 4. Other functions

There are other types including a function to transfer data during measurement to a PC in real time and a function to record measured data in a built-in memory. To transfer data to a PC, optional connecting cables and data retrieval software (PC Link or PC Link Plus) are required in addition to a DMM of PC series.

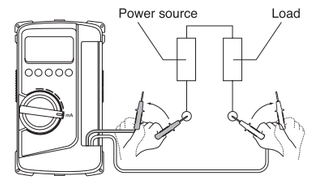
## Measurement

### Voltage, Resistance measurement



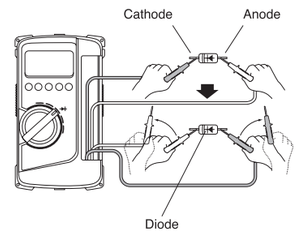

In making measurements, connect your DMM in parallel with an object to be measured. Do not apply signals exceeding the maximum rated input voltage.

### Current measurement




In making measurements, connect your DMM in series with an object to be measured.
Do not apply signals exceeding the maximum rated input current.

### Diode test




When the black test lead is connected to the cathode side of the diode and the red test lead to the anode side, the forward voltage can be measured. In contrast, if the black test lead is connected to the anode side of the diode and the red test lead to the cathode side, the reverse voltage can be measured and "OL" display appears.

## High accuracy & high resolution (PC Link)

## PC7000

**500000 Count for DCV, Dual Display**

- 4-4 / 5digits 50000 count (Selectable 5-4 / 5 digits 500000 count for DCV)
- Dual Display shows voltage/current and its frequency, and AC components and DC components of voltage/current
- AC True RMS
- Low-pass filter for variable frequency drive(VFD) circuit
- Current (mA / μA) %4-20mA measurement
- Capture (peak hold) 0.8ms in duration
- MAX, MIN, AVE recording mode
- K type temperature -50℃～1000℃
  ※Optional accessory K-AD is necessary.
  ※K type temp. sensor K-250PC is included as a standard accessory.
- Frequency measurement (AC sine wave only)
- Logic frequency measurement, duty cycle measurement
- Conductance measurement
- Dual display with backlight
- Data hold, Range hold
- Relative value
- Auto power saving mode (30min.) (cancelable)
- Optical Link USB interface (optional)

**Display** : numeral display 50000 & 500000 selectable, bar graph 41 segments
**Sampling rate** : 5 times/sec. for 50000 count, 1.25 times/sec. for 500000 count, 60 times/sec. for bar graph
**Safety** : IEC61010-1, IEC61010-31 CAT.III 600V Max./CAT. II 1000V Max., EN61326-1
**Battery life** : Approx. 100h (alkaline battery) at DCV range

RMS, Hz, %4-20, dBm, LPF, APS, DATA HOLD, RNG HOLD, REL, Duty, Capture, MAX MIN AVG, BACK LIGHT, USB, 2CH, Optional PC Link ℃

| PC7000 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 500m/5/50/500/1000V | ± (0.03%+2) | 0.01mV | 10MΩ |
| ACV | 500m/5/50/500/1000V | ± (0.5%+40) | 0.01mV | |
| DCA | 500μ/5000μ/50m/500m/5/10A | ± (0.1%+20) | 0.01μA | |
| ACA | 500μ/5000μ/50m/500m/5/10A | ± (0.6%+40) | 0.01μA | |
| Resistance | 500/5k/50k/500k/5M/50MΩ/99.99nS *1 | ± (0.2%+6) | 0.01Ω | |
| Capacitance | 50n/500n/5μ/50μ/500μ/5m/25mF | ± (0.8%+3)*2 | 0.01nF | |
| Temperature | -50～1000℃ (thermocouple K type) | ± (0.3%+2) | 0.1℃ | |
| Frequency | 10Hz～200kHz | ± (0.02%+4) | 0.001Hz | |
| Logic frequency | 5Hz～2MHz | ± (0.002%+4) | 0.001Hz | |
| Duty cycle | 0.1%～99.99% | ± (3d / kHz+2) | 0.01% | |
| dBm | -29.83dBm～54.25dBm | ± (0.25dB+2) | 0.01dB | |
| Continuity | Buzzer sounds at between 20Ω and 200Ω Open voltage : approx. 1.3V | | | |
| Diode test | Open voltage : approx. 3V | | | |

| | |
|---|---|
| Bandwidth | V : 45Hz～1kHz 1kHz～20kHz(below 500V), A : 40Hz～1kHz |
| Fuse / Battery | 12.5A/500V IR20kA φ6.3×32<br>0.63A/500V IR50kA φ6.3×32 — 6LR61(9V)×1 |
| Size / Mass | H184×W86×D52mm/430g (including holster) |
| Standard accessories included | Test Lead (TL-23a), Holster (H-700), Thermocouple K type (K-250PC), Instruction manual |

*1 nS(Conductance): High-value resistance of Giga-Ohms for leakage measurements. Conductance is the inverse of Resistance, that is S=1/Ω or nS=1/GΩ
*2 Accuracy of film capacitor or equivalent with low leakage.

### Optional accessories

Software : PC Link7
Optical PC link cable : KB-USB7
Clamp probe : CL124, CL140, CL-20D, CL-22AD, CL33DC
Temperature probe : T-300PC (PC Link software is necessary.)
K-8-250～800
K type adapter : K-AD
Test lead : TL-21M, TLF-120
Carrying case : C-PC7
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC

## High accuracy & built-in memory (PC Link)

## PC720M

**87,328 points data logging in built-in memory**

- 4 digits 9999 count & 3-5/6 digits 6000 count
- AC True RMS
- Dual display with backlight
- Automatic measurement for ACV/DCV/Ω under low impedance
- High speed bar graph
- Capacitance measurement
  ※Not suitable for measurement of condensers with large leak current.
- K type temperature -50℃～1000℃
  ※Optional accessory K-AD is necessary.
  ※K type temp. sensor K-250PC is included as a standard accessory.
- Frequency measurement (AC sine wave only)
- Logic frequency measurement, duty cycle measurement
- Conductance measurement
- MAX, MIN, MAX-MIN recording mode
- Capture (peak hold) 1ms in duration
- Data hold, Range hold
- Relative value
- Auto power saving mode (30min.) (cancelable)
- Optical Link USB interface (optional)

**Data Logging Mode**

- 87,328 data points in built-in memory (single display)
  43,664 data points in built-in memory (dual display)
- Selection of measurement interval
  0.05s/0.1s/0.5s/1s/2s/3s/4s/5s/10s/15s/30s/60s/120s/180s/300s/600s
- Auto-standby mode when a sampling speed of 30s or longer is selected
- Export logged data to PC
  ※Optional accessory PC Link7 is necessary.

**Display** : numeral display 9999 & 6000, bar graph 41 segments
**Sampling rate** : 5 times/sec., 60 times/sec. for bar graph
**Safety** : IEC61010-1, IEC61010-31 CAT.III 600V Max./CAT. II 1000V Max.EN61326-1
**Battery life** : Approx. 100h (alkaline battery) at DCV range

RMS, Hz, APS, DATA HOLD, RNG HOLD, REL, Duty, Capture, MAX MIN AVG, BACK LIGHT, USB, AUTO VΩ, 2CH, LOG GING, Optional PC Link ℃

| PC720M | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 60m/600m/9.999/99.99/999.9V | ± (0.06%+2) | 0.01mV | 10MΩ |
| ACV | 60m/600m/9.999/99.99/999.9V | ± (0.5%+3) | 0.01mV | |
| DCA | 600μ/6000μ/60m/600m/6/10A | ± (0.2%+4) | 0.1μA | |
| ACA | 600μ/6000μ/60m/600m/6/10A | ± (0.6%+3) | 0.1μA | |
| Resistance | 600/6k/60k/600k/6M/60MΩ/99.99nS *1 | ± (0.1%+3) | 0.1Ω | |
| Capacitance | 60n/600n/6μ/60μ/600μ/6m/25mF | ± (0.8%+3)*2 | 0.01nF | |
| Temperature | -50～1000℃ (thermocouple K type) | ± (0.3%+2) | 1℃ | |
| Frequency | 15Hz～50kHz | ± (0.04%+4) | 0.01Hz | |
| Logic frequency | 5Hz～1MHz | ± (0.03%+4) | 0.001Hz | |
| Duty cycle | 0%～100% | ± (3d / kHz+2) | 0.01% | |
| Continuity | Buzzer sounds at between 20Ω and 300Ω Open voltage : approx. 1.2V | | | |
| Diode test | Open voltage : approx. 3.5V | | | |

| | |
|---|---|
| Bandwidth | V : 40～3kHz 3kHz～20kHz (below 99.99V), A : 40～1kHz |
| Fuse / Battery | 12.5A/500V IR20kA φ6.3×32<br>0.63A/500V IR50kA φ6.3×32 — 6LR61(9V)×1 |
| Size / Mass | H184×W86×D52mm/430g (including holster) |
| Standard accessories included | Test Lead (TL-23a), Holster (H-700), Thermocouple K type (K-250PC), Instruction manual |

*1 nS(Conductance): High-value resistance of Giga-Ohms for leakage measurements. Conductance is the inverse of Resistance, that is S=1/Ω or nS=1/GΩ
*2 Accuracy of film capacitor or equivalent with low leakage.

### Optional accessories

Software : PC Link7
Optical PC link cable : KB-USB7
Clamp probe : CL124, CL140, CL-20D, CL-22AD, CL33DC
Temperature probe : T-300PC (PC Link software is necessary.)
K-8-250～800
K type adapter : K-AD
Test lead : TL-21M, TLF-120
Carrying case : C-PC7
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC

## High accuracy & multi-function (PC Link)

# PC710

**True RMS, Dual Display**


- 4 digits 9999 count & 3-5/6 digits 6000 count
- Dual Display shows voltage/current and its frequency, and AC components and DC components of voltage/current
- AC True RMS
- EF(Electric Field) Detection to indicate signal strength of electric field which surrounds current-carrying conductors
- Capture (peak hold) 1ms in duration
- MAX, MIN, AVE recording mode
- K type temperature -50℃～1000℃
  ※Optional accessory K-AD is necessary.
  ※K type temp. sensor K-250PC is included as a standard accessory.
- Frequency measurement (AC sine wave only)
- Logic frequency measurement, duty cycle measurement
- Conductance measurement
- Dual display with backlight
- Data hold, Range hold
- Relative value
- Auto power saving mode (30min.) (cancelable)
- Optical Link USB interface (optional)

**Display** : numeral display 9999 & 6000, bar graph 41 segments
**Sampling rate** : 5 times/sec., 60 times/sec. for bar graph
**Safety** : IEC61010-1, IEC61010-31 CAT.III 600V Max./CAT. II 1000V Max.EN61326-1
**Battery life** : Approx. 60h (manganese battery) at DCV range

RMS Hz EF(NCV) ℃ APS DATA HOLD RNG HOLD REL Duty Capture MAX MIN AVG BACK LIGHT USB 2CH
Optional PC Link ℃

| PC710 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 60m/600m/9.999/99.99/999.9V | ± (0.06%+2) | 0.01mV | 10MΩ |
| ACV | 60m/600m/9.999/99.99/999.9V | ± (0.5%+3) | 0.01mV | |
| DCA | 600μ/6000μ/60m/600m/6/10A | ± (0.2%+4) | 0.1μA | |
| ACA | 600μ/6000μ/60m/600m/6/10A | ± (0.6%+3) | 0.1μA | |
| Resistance | 600/6k/60k/600k/6M/60MΩ/99.99ns *1 | ± (0.1%+3) | 0.1Ω | |
| Capacitance | 60n/600n/6μ/60μ/600μ/6m/25mF | ± (0.8%+3)*2 | 0.01nF | |
| Temperature | -50～1000℃ (thermocouple K type) | ± (0.3%+2) | 1℃ | |
| Frequency | 15Hz～50kHz | ± (0.04%+4) | 0.01Hz | |
| Logic frequency | 5Hz～1MHz | ± (0.03%+4) | 0.001Hz | |
| Duty cycle | 0%～100% | ± (3d / kHz+2) | 0.01% | |
| Continuity | Buzzer sounds at between 20Ω and 300Ω Open voltage : approx. 1.2V | | | |
| Diode test | Open voltage : approx. 3.5V | | | |
| Bandwidth | V : 40Hz～3kHz 3kHz～20kHz(below 99.99V), A : 40Hz～1kHz | | | |
| Fuse / Battery | 12.5A/500V IR20kA φ6.3×32 0.63A/500V IR50kA φ6.3×32 | 6F22(9V)×1 | | |
| Size / Mass | H184×W86×D52mm/430g (including holster) | | | |
| Standard accessories included | Test Lead (TL-23a), Holster (H-700), Thermocouple K type (K-250PC), Instruction manual | | | |

*1 nS(Conductance): High-value resistance of Giga-Ohms for leakage measurements. Conductance is the inverse of Resistance, that is S=1/Ω or nS=1/GΩ
*2 Accuracy of film capacitor or equivalent with low leakage.

### Optional accessories

Software : PC Link7
Optical PC link cable : KB-USB7
Clamp probe : CL124, CL140, CL-20D, CL-22AD, CL33DC
Temperature probe : T-300PC (PC Link software is necessary.)
K-8-250～800
K type adapter : K-AD
Test lead : TL-21M, TLF-120
Carrying case : C-PC7
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC

## Digital Multimeter

# PC773

**11000 Count**
**Minimum resolution 0.01mV, 0.01Ω**


- 4-1/2 digits 11000 count
- 0.28% best accuracy
- AC True RMS
- Thermo plastic elastomer, high resistance against drop shock
- Maximum DC/AC 11A can be measured
- Continuity buzzer and LED
- Data hold, Range hold, Relative function
- Auto power off function (30 min.)
- Optical link USB interface (optional)

**Display** : numeral display 11000
**Sampling rate** : 4 times / sec.
**AC frequency bandwidth** : 45～100Hz(110mV range), 45～500Hz(1.1V range), 45～1kHz(11V range and avobe, ACA)
**Safety** : IEC61010-1 (EN61010-1) CAT.III 600V Max. / CAT.II1000V Max.

A fuse of large breaking capacity (30kA) is used to further improve the safety.

RMS Hz CONT. LED AP OFF DATA HOLD RNG HOLD REL BACK LIGHT USB PC Link ℃

| PC773 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 110m/1.1/11/110/1000V | ± (0.28%+2) | 0.01mV | 10M～100MΩ |
| ACV | 110m/1.1/11/110/1000V | ± (0.7%+50) | 0.01mV | |
| DCA | 110μ/1100μ/11m/110m/11A | ± (0.5%+4) | 0.01μA | |
| ACA | 110μ/1100μ/11m/110m/11A | ± (0.9%+20) | 0.01μA | |
| Resistance | 110/1.1k/11k/110k/1.1M/11M/110MΩ | ± (0.3%+6) | 0.01Ω | |
| Capacitance | 11n/110n/1.1μ/110μ/1.1m/11m/110mF | ± (2.0%+20) | 0.001nF | |
| Frequency | 110Hz/1.1kHz/11kHz/110kHz/1.1MHz | ± (0.01%+2) | 0.1Hz | |
| Continuity | Buzzer sounds and LED lights up at less than 30Ω Open Voltage: approx. 0.2V | | | |
| Diode test | Open Voltage: approx. 0.2V | | | |
| Bandwidth | 45Hz～100Hz(110mV range), 45Hz～500Hz(1.1V range), 45Hz～1kHz(11V range and above, ACA) | | | |
| Fuse / Battery | 315mA/1000V, breaking capacity 30kA 12A/1000V, breaking capacity 30kA | R6×2 | | |
| Size / Mass | H166×W82×D44mm/360g | | | |
| Standard accessories included | Test lead (TL-25a), Instruction manual | | | |

### Optional accessories

Software : PC Link 7 (This model works with PC Link 7 only.)
Clamp probe : CL-20D, CL-22AD, CL33DC, CL124, CL140
Temperature probe : T-300PC (PC Link software is necessary.)
Optical PC link cable : KB-USB773 Test lead : TLF-120
Carrying case : C-77, C-77H
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC



## High accuracy (PC Link)

# PC700

**Dual Display, Best Accuracy 0.06%**


- 4 digits 9999 count & 3-5/6 digits 6000 count
- Maximum DC/AC voltage measurement resolution 0.01mV
- Dual Display shows voltage/current and its frequency, and AC components and DC components of voltage/current
- High speed bar graph
- Frequency measurement (AC sine wave only)
- Logic frequency measurement, duty cycle measurement
- Data hold, Range hold
- Relative value
- Auto power saving mode (30min.) (cancelable)
- Optical Link USB interface (optional)

**Display** : numeral display 9999 & 6000, bar graph 41 segments
**Sampling rate** : 5 times/sec., 60 times/sec. for bar graph
**Safety** : IEC61010-1, IEC61010-31 CAT.III 600V Max./CAT. II 1000V Max.EN61326-1
**Battery life** : Approx. 60h (manganese battery) at DCV range

Hz APS DATA HOLD RNG HOLD REL Duty USB 2CH
Optional PC Link ℃

| PC700 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 60m/600m/9.999/99.99/999.9V | ± (0.06%+2) | 0.01mV | 10MΩ |
| ACV | 60m/600m/9.999/99.99/999.9V | ± (0.5%+3) | 0.01mV | |
| DCA | 600μ/6000μ/60m/600m/6/10A | ± (0.2%+4) | 0.1μA | |
| ACA | 600μ/6000μ/60m/600m/6/10A | ± (0.6%+3) | 0.1μA | |
| Resistance | 600/6k/60k/600k/6M/60MΩ | ± (0.1%+3) | 0.1Ω | |
| Capacitance | 60n/600n/6μ/60μ/600μ/6m/25mF | ± (0.8%+3)* | 0.01nF | |
| Frequency | 15Hz～50kHz | ± (0.04%+4) | 0.01Hz | |
| Logic frequency | 5Hz～1MHz | ± (0.03%+4) | 0.001Hz | |
| Duty cycle | 0%～100% | ± (3d / kHz+2) | 0.01% | |
| Continuity | Buzzer sounds at between 20Ω and 300Ω Open voltage : approx. 1.2V | | | |
| Diode test | Open voltage : approx. 3.5V | | | |
| Bandwidth | V : 40Hz～3kHz 3kHz～20kHz(below 99.99V), A : 40Hz～1kHz | | | |
| Fuse / Battery | 12.5A/500V IR20kA φ6.3×32 0.63A/500V IR50kA φ6.3×32 | 6F22(9V)×1 | | |
| Size / Mass | H184×W86×D52mm/430g (including holster) | | | |
| Standard accessories included | Test Lead (TL-23a), Holster (H-700), Instruction manual | | | |

*Accuracy of film capacitor or equivalent with low leakage.

### Optional accessories

Software : PC Link7
Optical PC link cable : KB-USB7
Clamp probe : CL124, CL140, CL-20D, CL-22AD, CL33DC
Temperature probe : T-300PC (PC Link software is necessary.)
K type adapter : K-AD
Test lead : TL-21M, TLF-120
Carrying case : C-PC7
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC

## Data processing (PC Link)

# PC20

**AC adapter connectable for long haul measurement**


- 3-3 / 4 digits 4000 count
- 0.5% best accuracy
- Capacitance measurement
  ※Not suitable for measurement of condensers with large leak current.
- Data hold / Range hold
- Safety cover for the 4・10A terminal
- Safety cap for AC adapter terminal
- Protective holster with wall hanger and lead holder
- Tilt stand
- Optical link USB interface (optional)

**Display** : numeral display 4000
**Sampling rate** : 3 times / sec.

Optional PC Link ℃
DATA HOLD RNG HOLD LPΩ USB

| PC20 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/1000V | ± (0.5%+2) | 0.1mV | DCV: 10M～100MΩ ACV:10M |
| ACV | 4/40/400/750V | ± (1.2%+2) | 0.001V | |
| DCA | 400μ/4000μ/40m/400m/4A/10A | ± (1.5%+2) | 0.1μA | |
| ACA | 400μ/4000μ/40m/400m/4A/10A | ± (1.8%+2) | 0.1μA | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (1.2%+2) | 0.1Ω | |
| Capacitance | 50n/500n/5μ/50μ/100μF | ± (5%+6) | 0.01nF | |
| Continuity | Buzzer sounds at between 10Ω and 120Ω, Open voltage : approx. 0.4V | | | |
| Diode test | Open voltage : approx. 1.5V | | | |
| Bandwidth | 40Hz～500kHz (below 500V) 40Hz～1kHz (ACA) | | | |
| Fuse / Battery | 0.5A/250V IR1500A φ5×20mm 12.5A/250V IR125A φ6.3×32mm | R6×2 | | |
| Size / Mass | H167×W90×D48mm/330g (including holster) | | | |
| Standard accessories included | Test lead (TL-21a), Holster (H-70), Instruction manual | | | |

### Optional accessories

Software : PC Link 7 Optical PC link cable : KB-USB20
Clamp probe : CL-20D, CL-22AD, CL33DC
Temperature probe : T-300PC (PC Link software is necessary.)
AC adapter : AD-71AC (100V), AD-72AC (220V)
Test lead : TL-21M, TLF-120
Carrying case : C-PC10/S or C-SP
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC

## Multifunction

# RD700
# RD701

### High input impedance 1000MΩ


RD700

- 3-3 / 4 digits 4000 count
- 0.3% best accuracy
- AC True RMS ※RD701 only
- Capacitance measurement
  ※Not suitable for measurement of condensers with large leak current.
- K type temperature
  ※Optional accessory K-AD is necessary.
  ※K type temp. sensor K-250PC is included as a standard accessory
- Frequency measurement
  ※Input voltage : 20VACrms and under
  ※Input signal : sign wave or square wave with 40%-70% duty
  ※Input sensitivity : 10Hz～20kHz/0.9Vrms and above
  : 20kHz～500kHz/2.6Vp or 1.9Vrms and above
  : 500kHz～1MHz/4.2Vp or 3Vrms and above
- ADP function (for current sensor)
- Max recording measurement
- Data hold / Range hold　■Relative value
- Auto power off (30min.) (cancelable)
- Alarm for improper test lead insertion to current terminal
- Protective holster with wall hanger and lead holder
- Tilt stand

**Display** : numeral display 4000 (Hz : 9999, capacitance : 5000)
**Sampling rate** : 3 times / sec. (Hz : 2 times / sec.)
**AC frequency bandwidth** : 50～500Hz

RD701 only

RMS Hz ⊣⊢ •)) ℃ AP OFF
DATA HOLD　RNG HOLD　REL　MAX MIN AVG　LPΩ

| RD700 / 701 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/1000V | ± (0.3%+4) | 0.1mV | 10M～1000MΩ |
| ACV | 400m/4/40/400/1000V | ± (1.5%+5) | 0.1mV | |
| DCA | 400μ/4000μ/40m/400m/4/10A | ± (1.2%+3) | 0.1μA | |
| ACA | 400μ/4000μ/40m/400m/4/10A | ± (1.5%+4) | 0.1μA | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (0.6%+4) | 0.1Ω | |
| Capacitance | 500n/5μ/50μ/500μ/3000μF | ± (2.5%+6) | 0.01nF | |
| Temperature | -20℃～300℃ | ± (2%+3) | 1℃ | |
| Frequency | 50Hz～1MHz | ± (0.5%+4) | 0.01Hz | |
| Continuity | Buzzer sounds at between 20Ω and 120Ω. Open voltage : approx. 0.4V | | | |
| Diode Test | Open voltage : approx. 1.6V | | | |
| Bandwidth | 50～500Hz | | | |
| Fuse / Battery | 12.5A/500V IR20kA φ6.3×32mm<br>0.63A/500V IR200kA φ6.3×32mm | 6LF22 (9V)×1 | | |
| Size / Mass | H179×W87×D55mm/460g (including holster) | | | |
| Standard accessories included | Test Lead (TL-23a), Thermocouple K type (K-250PC), Holster (H-50), Instruction manual | | | |

### Optional accessories

Clamp probe : CL124, CL140, CL-20D, CL-22AD, CL33DC
HV probe : HV-60
Temperature probe : K-8-800, K-8-650, K-8-300, K-8-500, K-8-250
K type adapter : K-AD
Test lead : TL-21M, TLF-120
Carrying case : C-CD
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC

## Hybrid Digital Multimeter

Multimeter ⊕ Clamp meter

# PM33a

### Hybrid pocket size DMM + Clamp meter

- Lightweight approx. 160g
- Maximum / Minimum value hold
- Current measurement with thin U-shaped current sensor(7mm) at angles of 0 and 180 degrees
- AC and DC currents measurable up to 100A
- Data hold
- Measurement of relative value
- Auto power off

**Safety** : IEC61010-1 CAT.II 600V, CAT.III 300V


DMM ⊕ TILT-UP CLAMP

Hybrid Mini Tester

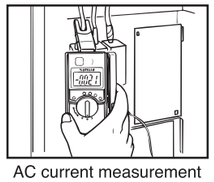
RoHS CE

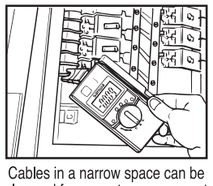
Max 100A　Hz　⊣⊢　•))　AP OFF　DCA ACA　DATA HOLD　RNG HOLD
REL　MAX MIN AVG

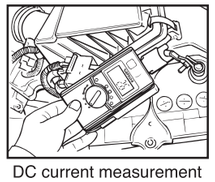
| PM33a | Measuring range | Best accuracy | Resolution |
|---|---|---|---|
| DCV | 660m / 6.6 / 66 / 600V | ± (0.7%rdg+3dgt) | 0.1mV |
| ACV | 660m / 6.6 / 66 / 600V | ± (1.4%rdg+6dgt) | 0.1mV |
| DCA | 100A | ± (2.0%rdg+5dgt) | 0.1A |
| ACA | 100A | ± (2.0%rdg+5dgt) | 0.1A |
| Resistance | 660 / 6.6k / 66k / 660k / 6.6M / 66MΩ | ± (0.9%rdg+3dgt) | 0.1Ω |
| Capacitance | 6.6n / 66n / 660n / 6.6μ / 66μ / 660μ / 6.6m / 66mF | ± (5.0%rdg+10dgt) | 0.001nF |
| Frequency | 660 / 6.6k / 66kHz | ± (0.5%rdg+3dgt) | 0.1Hz |
| Duty cycle | 20%～80% | ± (0.5%rdg+5dgt) | |
| Diode test | Open voltage : approx. 3V | | |
| Continuity | Buzzer sounds at below 30Ω. Open voltage : approx. 1.2V | | |
| Battery | LR03 x 2 | | |
| Size / Mass | H130×W75×D19.9mm / approx160g (including Battery) | | |
| Clamp diameter | φ10mm | | |
| Standard accessory | Instruction manual | | |

### Optional accessories

Carrying case : C-DG3a
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC


AC current measurement


Cables in a narrow space can be clamped for current measurement


DC current measurement


Easy to put in a shirt pocket

## Standard type


# CD770

### New Standard

- 3-3/4 digits 4000 count
- Easy to read large LCD
- Thermo plastic elastomer, high resistance against drop shock
- Safety cap on current terminal
- Data hold, Range hold, Relative function
- Continuity check, Diode test
- Auto power off function (30min.)

**Display** : numeral display 4000
**Sampling rate** : 3 times / sec.
**AC frequency bandwidth** : 40～400Hz (sine wave)

Hz ⊣⊢ •)) AP OFF DATA HOLD RNG HOLD REL LPΩ

| CD770 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/600V | ± (0.5%+2) | 0.1mV | DCV: 10M～100MΩ |
| ACV | 4/40/400/600V | ± (1.2%+7) | 1mV | |
| DCA | 400μ/4000μ/40m/400mA | ± (1.4%+3) | 0.1μ | ACV: 10M～11MΩ |
| ACA | 400μ/4000μ/40m/400mA | ± (1.8%+5) | 0.1μ | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (1.2%+5) | 0.1Ω | |
| Capacitance | 50n/500n/5μ/50μ/100μF | ± (5%+10) | 0.01nF | |
| Frequency | 5/50/500/5k/50k/100kHz | ± (0.3%+3) | 0.001Hz | |
| Continuity | Buzzer sounds at between 0Ω and 85Ω (±45Ω). Open voltage: approx. 0.4V | | | |
| Diode test | Open voltage: approx. 1.5V | | | |
| Bandwidth | 40～400Hz (sine wave) | | | |
| Fuse / Battery | 0.5A/250V 1.5kA Φ5×20mm | R6P×2 | | |
| Size / Mass | H166×W82×D44mm/340g | | | |
| Standard accessories included | Test lead (TL-21a), Instruction manual | | | |

### Optional accessories

Clamp probe : CL-20D, CL-22AD, CL33DC
HV probe : HV-60
Carrying case : C-77, C-77H
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

## Multifunctional new standard


A fuse of large breaking capacity (30kA) is used to further improve the safety.

# CD771

### Backlight & Cont. buzzer with LED

- 3-3/4 digits 4000 count
- Easy to read large LCD with Backlight
- Large breaking capacity fuse 30kA
- 1.5V battery check function
- Thermo plastic elastomer, high resistance against drop shock
- Safety cap on current terminal
- Data hold, Range hold, Relative function
- Continuity check, Diode test
- Auto power off function (30min.)
- Maximum 20A can be measured if the measurement time is less than 10 seconds. (Take 10 minutes or longer intervals between measurements)

**Display** : numeral display 4000
**Sampling rate** : 3 times / sec.
**AC frequency bandwidth** : 40～400Hz (sine wave)
**Safety** : IEC61010-1 (EN61010-1) CAT.III 600V Max. / CAT.IIDC1000V

Hz ⊣⊢ CONT. LED •)) BATT CHECK AP OFF
DATA HOLD　RNG HOLD　REL　LPΩ　BACK LIGHT

| CD771 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/1000V | ± (0.5%+2) | 0.1mV | DCV: 10M～100MΩ |
| ACV | 4/40/400/1000V | ± (1.2%+7) | 1mV | |
| DCA | 400μ/4000μ/40m/400m/4/10A | ± (1.4%+3) | 0.1μ | ACV: 10M～11MΩ |
| ACA | 400μ/4000μ/40m/400m/4/10A | ± (1.8%+5) | 0.1μ | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (1.2%+5) | 0.1Ω | |
| Capacitance | 50n/500n/5μ/50μ/100μF | ± (5%+10) | 0.01nF | |
| Frequency | 5/50/500/5k/50k/100kHz | ± (0.3%+3) | 0.001Hz | |
| Continuity | Buzzer sounds and LED lights up at between 0Ω and 85Ω (±45Ω). Open voltage: approx. 0.4V | | | |
| Diode test | Open voltage: approx. 1.5V | | | |
| Battery check | Approximate value (30Ω load) 1.5V battery only | | | |
| Bandwidth | 40～400Hz (sine wave) | | | |
| Fuse / Battery | 0.5A/1000V 30kA Φ6.35×32mm<br>10A/1000V 30kA Φ10×38mm | R6P×2 | | |
| Size / Mass | H166×W82×D44mm/360g | | | |
| Standard accessories included | Test lead (TL-23a), Instruction manual | | | |

### Optional accessories

Clamp probe : CL-20D, CL-22AD, CL33DC
HV probe : HV-60
Carrying case : C-77, C-77H
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

## True RMS new standard


A fuse of large breaking capacity (30kA) is used to further improve the safety.

# CD772

### Backlight & Temperature measurement

- 3-3/4 digits 4000 count
- AC True RMS
- Easy to read large LCD with Backlight
- Large breaking capacity fuse 30kA
- K-type thermocouple temperature measure ment -20℃～300℃
- Thermo plastic elastomer, high resistance against drop shock
- Safety cap on current terminal
- Data hold, Range hold, Relative function
- Continuity check, Diode test
- Auto power off function (30min.)
- Maximum 20A can be measured if the measurement time is less than 10 seconds. (Take 10 minutes or longer intervals between measurements)

**Display** : numeral display 4000
**Sampling rate** : 3 times / sec.
**AC frequency bandwidth** : 45～500Hz (4V range), 45～1KHz (40V range and above)
**Safety** : IEC61010-1 (EN61010-1) CAT.III 600V Max. / CAT.IIDC1000V

RMS Hz ⊣⊢ CONT. LED •)) ℃ APS
DATA HOLD　RNG HOLD　REL　LPΩ　BACK LIGHT

| CD772 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/1000V | ± (0.5%+2) | 0.1mV | DCV: 10M～100MΩ |
| ACV | 4/40/400/1000V | ± (1.2%+8) | 1mV | |
| DCA | 400μ/4000μ/40m/400m/4/15A | ± (1.4%+3) | 0.1μ | ACV: 10M～11MΩ |
| ACA | 400μ/4000μ/40m/400m/4/15A | ± (1.8%+6) | 0.1μ | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (1.2%+5) | 0.1Ω | |
| Capacitance | 50n/500n/5μ/50μ/100μF | ± (5%+10) | 0.01nF | |
| Frequency | 5/50/500/5k/50k/100kHz | ± (0.3%+3) | 0.001Hz | |
| Temperature | -20℃～300℃ | ± (0.3%+30) | 0.1℃ | |
| Continuity | Buzzer sounds and LED lights up at between 0Ω and 85Ω (±45Ω). Open voltage: approx. 0.4V | | | |
| Diode test | Open voltage: approx. 1.5V | | | |
| Bandwidth | 45～500Hz (4V range), 45～1KHz (40V range and above) | | | |
| Fuse / Battery | 0.5A/1000V 30kA Φ6.35×32mm<br>16A/1000V 30kA Φ10×38mm | R6P×2 | | |
| Size / Mass | H166×W82×D44mm/360g | | | |
| Standard accessories included | Test lead (TL-25a), Thermocouple K type (K-250CD) Instruction manual | | | |

### Optional accessories

Clamp probe : CL-20D, CL-22AD, CL33DC　HV probe : HV-60
Temperature probe : K-8-800, K-8-650, K-8-300, K-8-500, K-8-250
K type adapter : K-AD
Carrying case : C-77, C-77H
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TLF-120

## ALL-IN-ONE DMM


Using cover as a tilt stand ▶


### CD800a

**Tough body cover**

- 3-3 / 4 digits 4000 count
- 0.7% best accuracy
- Capacitance measurement
  ※Not suitable for measurement of condensers with large leak current.
- Frequency measurement (AC sine wave only)
- Data hold / Range hold
- Relative value
- Auto power off (30min.) (cancelable)
- Low power ohm (input voltage 0.4V) at continuity range
- Solid & protective body cover that can also be used as a tilt stand
- Chip holder behind the body cover

**Display** : numeral display 4000
**Sampling rate** : 2 times / sec.
**AC frequency bandwidth** : 40～400Hz

Hz | ⊣⊢ | •)) | AP OFF | DATA HOLD | RNG HOLD | REL | Duty | LPΩ

| CD800a | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/600V | ± (0.7%+3) | 0.1mV | DCV: 10MΩ～100MΩ |
| ACV | 4/40/400/600V | ± (1.6%+9) | 0.001V | |
| DCA | 40m/400mA | ± (2.2%+5) | 0.01mA | ACV: 10MΩ～11MΩ |
| ACA | 40m/400mA | ± (2.8%+5) | 0.01mA | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (1.5%+5) | 0.1Ω | |
| Capacitance | 50n/500n/5μ/50μ/100μF | ± (5%+10) | 0.01nF | |
| Frequency | 5Hz～100kHz | ± (0.5%+3) | | |
| Duty cycle | 20%～80% | ± (0.5%+5) | | |
| Continuity | Buzzer sounds at between 10Ω and 120Ω. Open voltage : approx. 0.4V | | | |
| Diode test | Open voltage : approx. 1.5V | | | |
| Bandwidth | 40～400Hz | | | |
| Fuse / Battery | 0.5A/250V 1.5kA φ5.2×20 ceramic | R6P×2 | | |
| Size / Mass | H176×W104×D46mm/approx. 340g | | | |
| Standard accessories included | Hand strap , Instruction manual | | | |

**Optional accessories**
Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC

## Standard type

### CD731a

**New Standard**

- 3-3/4 digits 4000 count
- Easy to read large LCD
- Safety cap on current terminal
- Data hold, Range hold
- Continuity check, Diode test
- Auto power off function (30min.) (cancelable)

**Display** : numeral display 4000
**Sampling rate** : 3 times / sec.
**AC frequency bandwidth** : 40～500Hz (sine wave)


⊣⊢ | •)) | AP OFF | DATA HOLD | RNG HOLD | LPΩ

| CD731a | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/1000V | ± (0.5%+2) | 0.1mV | DCV: 10MΩ～100MΩ |
| ACV | 4/40/400/750V | ± (1.2%+5) | 1mV | |
| DCA | 400μ/4000μ/40m/400m/4/20A | ± (1.5%+2) | 0.1μ | ACV: 10MΩ～11MΩ |
| ACA | 400μ/4000μ/40m/400m/4/20A | ± (1.8%+5) | 0.1μ | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (1.2%+4) | 0.1Ω | |
| Capacitance | 40n/400n/4μ/40μ/100μF | ± (5%+6) | 0.01nF | |
| Continuity | Open voltage: approx. 0.4V Buzzer sounds at approx 10 ～120Ω max. | | | |
| Diode test | Open voltage: approx. 1.5V | | | |
| Bandwidth | 40～500Hz (sine wave) | | | |
| Fuse / Battery | 0.5A/250V 1.5kA Φ5X20mm<br>20A/250V 200kA Φ6.3X32mm | R6×2 | | |
| Size / Mass | H167XW90XD48mm/315g (including holster) | | | |
| Standard accessories included | Test lead (TL-21a), Holster (H-70) Instruction manual | | | |

**Optional accessories**
Clamp probe : CL-20D, CL-22AD, CL33DC
HV probe : HV-60
Carrying case : C-SP
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

## Pocket type


### PM11

**Tough but compact DMM**

- 3-3 / 4 digits 4000 count
- 0.8% best accuracy
- Analog bar graph
- Compact storage of test leads
- Test lead can be snapped into a fixed position atop the case.

**Display** : numeral display 4000, bar graph 40 segments
**Sampling rate** : 1.3 times / sec., 13 times / sec. for bar graph
**AC frequency bandwidth** : 45～1kHz
**Safety** : IEC61010-1 CAT.III300V Max. / CAT.II500V Max.

•)) | AP OFF | ⊣⊢

| PM11 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/500V | ± (0.8%+4) | 0.1mV | DCV: 10MΩ～100MΩ |
| ACV | 4/40/400/500V | ± (2.3%+8) | 0.001V | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (2.0%+4) | 0.1Ω | ACV: 10MΩ～11MΩ |
| Continuity | Buzzer sounds at less than 35Ω. Open voltage : approx. 1.2V | | | |
| Diode test | Open voltage : approx. 3V | | | |
| Bandwidth | 45～1kHz | | | |
| Battery | Button battery LR-44×2 | | | |
| Size / Mass | H117×W76×D18mm/approx. 117g | | | |
| Standard accessories included | Instruction manual | | | |

**Optional accessories**
Clip adapter : CL-15a, CL-DG3a


### PM3

**8.5mm thick body with multi-function**

- 3-3 / 4 digits 4000 count
- 0.7% best accuracy
- Capacitance measurement
  ※Not suitable for measurement of condensers with large leak current.
- Frequency measurement (AC sine wave only)
- Duty cycle
- Data hold
- Relative value
- Auto power off (15min.) (cancelable)

**Display** : numeral display 4000
**Sampling rate** : 3 times / sec.
**AC frequency bandwidth** : 40～400Hz
**Safety** : IEC61010-1 CAT.II DC AC500V Max.

Hz | ⊣⊢ | •)) | AP OFF | DATA HOLD | REL | Duty | LPΩ

| PM3 | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/500V | ± (0.7%+3) | 0.1mV | DCV: 10MΩ～100MΩ |
| ACV | 4/40/400/500V | ± (2.3%+10) | 0.001V | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (2.0%+5) | 0.1Ω | ACV: 10MΩ～11MΩ |
| Capacitance | 5n/50n/500n/5μ/50μ/200μF | ± (5.0%+10) | 0.001nF | |
| Frequency | 9.999/99.99/999.9/9.99k/60.00kHz | ± (0.7%+5) | 0.001Hz | |
| Duty Cycle | 0.1～99% | | | |
| Continuity | Buzzer sounds at less than 10～120Ω. Open voltage : approx. 0.4V | | | |
| Diode Test | Open voltage : approx. 1.5V | | | |
| Bandwidth | 40～400Hz | | | |
| Battery | Coin type lithium battery CR2032 (3V)×1 | | | |
| Size / Mass | H108×W56×D11.5mm/approx. 85g | | | |
| Standard accessories included | Case holder (C-PM3), Instruction manual | | | |

**Optional accessories**
Clip adapter : CL-13a, CL-15a


### PM7a

**Updated longtime seller**

- 3-3 / 4 digits 4000 count
- 0.7% best accuracy
- Range hold
- Auto power off (15min.)
- Low power ohm (input voltage 0.4V) at continuity range
- Power saving design

**Display** : numeral display 4000
**Sampling rate** : 3 times / sec.
**AC frequency bandwidth** : 40～400Hz

•)) | AP OFF | RNG HOLD | LPΩ

| PM7a | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/500V | ± (0.7%+3) | 0.1mV | DCV: 10MΩ～100MΩ |
| ACV | 4/40/400/500V | ± (2.3%+10) | 0.001V | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (2.0%+5) | 0.1Ω | ACV: 10MΩ～11MΩ |
| Continuity | Buzzer sounds at less than 10～120Ω. Open voltage : 0.4V | | | |
| Diode test | Open voltage : approx. 1.5V | | | |
| Bandwidth | 40～400Hz | | | |
| Battery | Button battery LR-44×2 | | | |
| Size / Mass | H115×W57×D18mm/approx. 85g | | | |
| Standard accessories included | Instruction manual | | | |

**Optional accessories**
Clip adapter : CL-11, CL-15a


### PS8a

**Solar charge battery DMM**

- 3-3 / 4 digits 4000 count
- 0.7% best accuracy
- Range hold
- Auto power off (15min.)
- Low power ohm (input voltage 0.4V) at continuity range
- Power saving design

**Display** : numeral display 4000
**Sampling rate** : 3 times / sec.
**AC frequency bandwidth** : 40～400Hz

•)) | AP OFF | RNG HOLD | LPΩ

| PS8a | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/500V | ± (0.7%+3) | 0.1mV | DCV: 10MΩ～100MΩ |
| ACV | 4/40/400/500V | ± (2.3%+5) | 0.001V | |
| Resistance | 400/4k/40k/400k/4M/40MΩ | ± (2.0%+5) | 0.1Ω | ACV: 10MΩ～11MΩ |
| Continuity | Buzzer sounds at less than 10～120Ω. Open voltage : 0.4V | | | |
| Diode test | Open voltage : approx. 1.5V | | | |
| Bandwidth | 40～400Hz | | | |
| Battery | Amorphous solar battery + manganese dioxide lithium secondary battery | | | |
| Size / Mass | H115×W57×D18mm/approx. 85g | | | |
| Standard accessories included | Instruction manual | | | |

**Optional accessories**
Clip adapter : CL-11, CL-15a



# Analog Multitesters (circuit testers)

## What is Analog Multitester?

Analog multitesters basically make measurements of DC voltage, AC voltage, DC current and resistance. Except some special products, they have no function to measure the AC current. Characteristics of recent analog multitesters include the extended measuring range function (particularly for fine voltage and current) with an amplifier installed, the function to allow the measurement of capacitor capacity, and the zero-center meter function. To enhance operability and usability, some products include the auto range function, automatic polarity switching function, and a structure integrating a case to allow the storage of a test lead. There are some testers that allow the measurement of hFE (DC current amplification factor) of a transistor and temperature measurement using a temperature sensor, which is offered as an optional accessory.

## Advantages of analog multimeters

1. Easy to read the mean value of values changing in short cycles.
   * A digital tester does not give stable value determination.
2. No need for the operating power supply except for resistance range (excluding Model EM7000 integrating an amplifier, and CX506a integrating an oscillator) and zero-center function.
3. Suited for judgment based by intuition (in continuity test etc.).

## Four key points in choosing a suitable model

### 1. What are the necessary measuring functions?

Choose the necessary measuring functions in addition to voltage and resistance.

→ Need for the measurement of current (0.25A, 0.3A, 30A), DC only.
→ Measurements for remaining dry battery capacity, capacitor, and frequency.
→ Measurement of DC high voltage with the use of an optional accessory.

### 2. Other necessary functions

1) The needle occasionally swings to the opposite direction in DC voltage measurement.

   → Check the polarity by the zero-center meter function.

2) Hard to check for continuity.

   → Use an LED light-up type in noisy places CONT. LED
   → Use a buzzer type to verify with sounds.

### 3. Graduation of scale

There are two general types of graduation of the measuring range:

① 2.5, 5, 10, 50, 250, 500V
② 3, 12, 30, 120, 600V

For measurement of a car battery (24V), measurement in the 30V range of ② is suitable. Choose a type suitable for your intended application.

### 4. Other functions

Other types are furnished with an auto range function allowing the automatic optimal setting of voltage and resistance. There are also types integrating a transistor transmitter and others integrating a current-limiting fuse with breaking capacity of 100kA for enhanced safe operation.

## Basic measuring method

### Check the range before making a measurement

Most problems with a tester are caused by overcurrent and drop of the tester. Failures due to overcurrent are most frequently caused by voltage applied to a current range and resistance range with lower internal resistance (thereby causing overcurrent of tens to hundreds times to run through the circuit). Although some testers include a meter protector and a circuit protector using a diode, it is recommended to check the range before measuring.

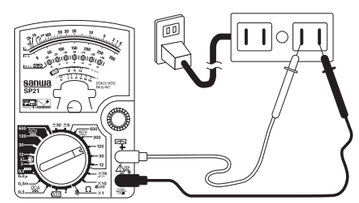
### For measuring unknown values

In measuring unknown current and voltage values, find an approximate value at the maximum range first and then make adjustments to the optimum range (1000V to 250V range in case of voltage measurement). This method prevents a failure caused by incorrect range adjustment.

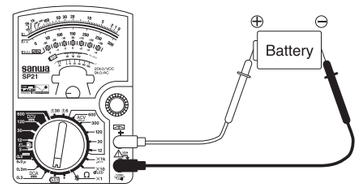
* Do not change the range during measurement.

## Examples

**AC100V plug outlet**



**Battery voltage**



## FET Tester

### EM7000

**High sensitivity for measurement of lower capacitance**

- High input impedance (DCV2.5～12MΩ/V), and 0.12μA range (DCA)
- Bandwidth 40Hz～1MHz AC sign wave
- Rectangular pulse P-P (Peak to Peak) measurement (duty cycle 20% and above)
- Wide ohm range 0.2Ω～200MΩ

**Bandwidth** : 40Hz～1Mhz (12V range and below)

**Optional accessories**

HV probe : HV-60
Carrying case : C-CA
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

| EM7000 | Measuring range | Accuracy |
|---|---|---|
| DCV | 0.3/1.2/3/12/30/120/300/1000V | ±3% of full scale |
| ±DCV | ±0.15/0.6/1.5/6/15/60/150/600V | ±7% of full scale |
| ACV rms (50 / 60Hz) | 3V (approx. 2.5MΩ)/12V (approx. 1.1MΩ) 30V (approx. 800kΩ)/120/300V (approx. 800kΩ)/ 750V (approx. 10MΩ) | ±3% of full scale |
| ACV P-P | Sine wave:8.4V (approx. 2.5MΩ/V)/ 33V (approx. 1.1MΩ/V) 84V (approx. 800MΩ/V)/330/840V (approx. 800kΩ/V) | ±5% of full scale |
| | Square symmetric wave:8.4V (2.5MΩ/V) | ±6% of full scale |
| | Triangular symmetric wave:8.4V (2.5MΩ/V) | ±6% of full scale |
| DCA | 0.12μ/0.3m/3m/30m/300m/6A | ±4% of full scale |
| DCA (NULL) | ±0.06μ/±0.15m/1.5m/15m/150mA | ±7% of full scale |
| ACA | 6A | ±3% of full scale |
| Resistance | 2k/20k/200k/2M/20M/200MΩ | ±3% of arc |
| dB | -10～+51dB | ±3% of arc |
| Bandwidth | 40Hz～1MHz (below 12V range) | |
| Battery | R6P 1.5V×2, 6F22 9V×1 | |
| Fuse | φ5.0×20mm ceramic (250V / 0.5A) φ5.0×20mm ceramic (250V / 6.3A) | |
| Size / Mass | H165×W106×D46mm / approx. 375g | |
| Standard accessories included | Test lead (TL-21a), Spare fuse, Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.

## Multifunctional model



### CX506a

**Capacitor & Transistor checker (built-in oscillator)**

- 26ch switch, wide range measurement
- Capacitance measurement 50pF～2000μF
- High input impedance 50kΩ / V (DC3～300Vrange)
- Switchable DC polarity

**Bandwidth** : 40Hz～30kHz (3V and 12V), 40Hz～10kHz (30V range)

**Optional accessories**

HV probe : HV-60
Carrying case : C-CA
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

| CX506a | Measuring range | Accuracy |
|---|---|---|
| DCV | 120m (4kΩ)/3/12/30/120 300 (50kΩ/V)/1000V (15kΩ) | 120m : ±4% ±2.5% of full scale |
| ACV | 3/12/30/120/300/750V (8kΩ/V) | ±3% of full scale (Less than 12V range : ±4%) |
| DCA | 30μ/0.3m/3m/30m/0.3A | ±2.5% of full scale |
| Resistance | 5k/50k/500k/5M/50MΩ | ±3% of arc |
| Capacitance | C1 : 50p～0.2μF C2 : 0.01μ～20μF C3 : 1～2000μF | C1/C2 ±6% of arc |
| hFE (DC Current Amplification Factor) | Transistor hFE:0～1000 | – |
| Bandwidth | 40～30kHz (12V:40Hz～30kHz 30V～ : 40Hz～10kHz) | |
| Battery | R6P×2, 6F22×1 | |
| Fuse | φ5.0×20mm (250V/0.5A) arc-extingishing material in ceramic tube | |
| Size / Mass | H165×W106×D46mm/approx. 370g | |
| Standard accessories included | Test lead (TL-21a), Clip lead (CL-506a) Instruction manual, Spare fuse | |

The value in ( ) at DCV and ACV is input resistance.

### YX-361TR

**Wide measurement range**

- Total 35 wide ranges (24ch sw + additional functions)
- ±DCV zero center meter
- LED for continuity check
- OUTPUT terminal (series capacitor terminal)
- Battery check

**Optional accessories**

HV probe : HV-10
Carrying case : C-YS
Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC
hFE probe : HFE-6T
Test lead : TL-91M

| YX-361TR | Measuring range | Accuracy |
|---|---|---|
| DCV (NULL) | 0.1/0.5/2.5/10/50/250/1000V (20kΩ/V) ±5/25V (40kΩ/V) | ±2.5% of full scale ±2.5% of full scale |
| ACV | 2.5/10/50/250/1000V (9kΩ/V) | ±3% of full scale (3V : ±5%) |
| DCA | 50μ/2.5m/25m/0.25A | ±2.5% of full scale |
| Resistance | 2k/20k/200k/2M/20MΩ | ±3% of arc |
| dB | -10～+62dB | ±3% of arc ±5% of arc |
| Continuity | LED : emitting light at 10Ω or less. Open voltage : 3V | |
| Battery check | 1.5V | |
| hFE | 1000 at X10 range (optional probe "HFE-6T" is necessary) | – |
| Bandwidth | 40～30kHz (less than 30V : ±3%) 30～100kHz (less than 30V : ±1dB) | |
| Battery | R6P×2, 6F22×1 | |
| Fuse | φ5.2×20mm (250V / 0.5A) | |
| Size / Mass | H150×W100×D37mm / approx. 290g | |
| Standard accessories included | Test lead (TL-61), Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.

## Multifunctional model

### SH-88TR

**Zero center meter (NULL)**

- Total 35 wide ranges (22ch sw + additional functions)
- Capacitance measurement 1μF～1F
- LED for continuity check

**Optional accessories**

HV probe : HV-10
Carrying case : C-YS
Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC
hFE probe : HFE-6T
Test lead : TL-91M

| SH-88TR | Measuring range | Accuracy |
|---|---|---|
| DCV (NULL) | 0.12/3/12/30/120/300/1200V (20kΩ/V) ±6/15/60/150/600V (40kΩ/V) | ±2.5% of full scale ±2.5% of full scale |
| ACV | 3/12/30/120/300/1200V (9kΩ/V) | ±3% of full scale (3V : ±5%) |
| DCA | 50μ/3m/30m/0.3A | ±2.5% of full scale |
| Resistance | 3k/30k/300k/3M/30MΩ | ±3% of arc |
| dB | -10～+63dB | ±3% of full scale (3V : ±5%) |
| Capacitance | 1000μ/0.01/0.1/1F | |
| Continuity | LED : emitting light at 10Ω or less. Open voltage : 3V | |
| hFE | 1000 at X10 range (optional probe "HFE-6T" is necessary) | – |
| Bandwidth | 40～30kHz (less than 30V : ±3%) 30～100kHz (less than 30V : ±1dB) | |
| Battery | R6P×2, 6F22×1 | |
| Fuse | φ5.2×20mm ceramic (250V / 0.5A) | |
| Size / Mass | H150×W100×D36mm/approx. 280g | |
| Standard accessories included | Test lead (TL-61), Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.

## High input impedance

AU-32

### AU-32
### AU-31

**Auto range, High input impedance**

- Auto range selection (V, Ω)
- Auto polarity
- High input impedance 1～10MΩ
- Series capacitor input ※AU-31 ACV only
- Auto 0Ω adjustment
- Inner battery check
- DC / AC auto selection ※AU-32 only
- 5 ranges DC / AC current ※AU-32 only

**Bandwidth** : 40～10kHz (0.25V : ±5%), 40～600Hz (2.5V and above : ±5%)
: 40～10kHz (0.3V : ±5%), 40～1kHz (3V and above : ±4%)

**Optional accessories**

HV probe : HV-50
Carrying case : C-SP
Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-91M

| AU-32 | Measuring range | Accuracy |
|---|---|---|
| DCV | ±250m (approx. 1MΩ/V)/2.5/10/50/250/500V (10MΩ/V) | ±3% of full scale |
| ACV | 250m (approx. 1MΩ/V)/2.5/10/50/250/500V (10MΩ/V) | ±3% of full scale |
| DCA | ±250μ/2.5m/25m/250m/2.5A | ±3% of full scale |
| ACA | 250μ/2.5m/25m/250m/2.5A | ±3% of full scale |
| Resistance | 20k/200k/2M/20M/200MΩ | ±3% of arc |
| dB | -10/+10/+22/+36/+50/+56dB | – |
| Bandwidth | 40～10kHz (0.25V : ±5%), 40～600Hz (2.5V～ : ±5%) | |
| Battery | R03×4 | |
| Fuse | φ5.2×20mm (250V/0.3A) | |
| Size / Mass | H48×W110×D124mm/approx. 290g | |
| Standard accessories included | Test lead (TL-61), Instruction manual | |

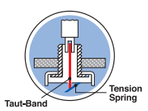
The value in ( ) at DCV and ACV is input resistance.

| AU-31 | Measuring range | Accuracy |
|---|---|---|
| DCV | ±300m (approx. 1MΩ/V)/3/12/60/300/1000V (10MΩ/V) | ±3% of full scale |
| ACV | 300m (approx. 1MΩ/V)/3/12/60/300/1000V (10MΩ/V) | ±3% of full scale |
| DCA | ±300m/3A | ±3% of full scale |
| ACA | 300m/3A | ±3% of full scale |
| Resistance | 20k/200k/2M/20M/200MΩ | ±3% of arc |
| dB | -9/+11/+23/+37/+51/+62dB | – |
| Bandwidth | 40～10kHz (0.3V : ±5%) 40～1kHz (3V～ : ±4%) | |
| Battery | R03×4 | |
| Fuse | φ5.2×20mm (250V/0.5A) | |
| Size / Mass | H48×W110×D124mm/approx. 290g | |
| Standard accessories included | Test lead (TL-61), Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.

## Drop shock proof meter

DROP PROOF




### YX360TRF

**Best seller drop shock proof meter**

- Drop shock proof meter
- Null (zero center) meter ±5 / ±25 in DCV
- High resistance up to 200MΩ with low voltage
- Protective body cover
- Capacitance, dB, Li measurement

**Bandwidth** : 30～100kHz (AC10V)

**Optional accessories**

hFE probe : HFE-6T
Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC
High voltage probe : HV-10T

| YX360TRF | Measuring range | Accuracy |
|---|---|---|
| DCV (NULL) | 0.1V (20kΩ / V) | ±5% of full scale |
| | 0.25 / 2.5 / 10 / 50 (20kΩ / V) / 250 / 1000V(9kΩ / V) | ±3% of full scale |
| | ±5 / 25V (40kΩ / V) | ±5% of full scale |
| ACV | 10 / 50 / 250 / 750V (9kΩ / V) | ±4% of full scale |
| DCA | 50μ / 2.5m /25m / 0.25A | *1 ±5% of full scale |
| Resistance | 2k / 20k / 200k / 2MΩ (X1 / X10 / X100 / X1k) 200MΩ (X100k) | ±3% of arc ±5% of arc |
| Load current (LI) | 0～150m / 15m / 1.5m / 150μ / 1.5μA | |
| Capacitance | 10μF | *2 |
| dB | -10dB～+22dB (for 10VAC) ～+62dB | – |
| DC high voltage | DC25kV (optional probe "HV-10T" is necessary) | – |
| hFE | 1000 at X10 range (optional probe "HFE-6T" is necessary) | – |
| Battery | R6 (IEC) or UM-3(1.5V)×2 | |
| Fuse | φ5.2×20mm (250V / 0.5A) | |
| Size / Mass | H159.5×W129×D41.5mm / approx. 320g | |
| Standard accessories included | Instruction manual, Hand strap | |

The value in bracket at DCV and ACV is input resistance.
*1 Not including the resistance of fuse.
*2 Pointer indication of the maximum move by charged current in the capacitor.

## Drop shock proof meter

### SP21

**Continuity check buzzer**

- Drop shock proof taut-band meter
- ±DCV zero center meter
- Fuse and diode protection
- Battery check
- Tilt stand

**Bandwidth** : 40～100kHz (AC12V)

**Optional accessories**

HV probe : HV-20
Carrying case : C-SPH or C-SP
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-21M, TLF-120

DROP PROOF

| SP21 | Measuring range | Accuracy |
|---|---|---|
| DCV | 0.3 (5kΩ)/3/12/30/120/600V (20kΩ/V) | ±3% of full scale |
| (NULL) | ±6/30V (20kΩ/V) | ±5% of full scale |
| ACV | 12/30/120/300/600V | ±3% of full scale |
| DCA | 60μ/30m/0.3A | ±3% of full scale |
| Resistance | 2k/20k/2MΩ | ±3% of arc |
| Capacitance | 500μF | *1 |
| Continuity | Buzzer sounds at less than approx. 10Ω. Open voltage: 3V | |
| Bandwidth | 40～100kHz (AC12V) | |
| Battery | R6P×2 | |
| Fuse | φ6.3×30mm (250V/0.5A) | |
| Size / Mass | H144×W99×D41mm/approx. 270g | |
| Standard accessories included | Test lead (TL-21a), Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.
*1 Pointer indication of the maximum move by charged current in the capacitor.

### SP20

**DC high volotage & temperature measurable**

- 20ch measurement ranges
- Capacitance measurement 500μF
- Tilt stand
- DC high voltage and temperature measurement (with optional accessories)

**Bandwidth** : 40～100kHz (AC10V)

**Optional accessories**

HV probe : HV-10
Temperature probe : T-THP
Carrying case : C-SPH or C-SP
Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-91M, TLF-120

DROP PROOF

Optional

| SP20 | Measuring range | Accuracy |
|---|---|---|
| DCV | 0.25/2.5/5/10/50/100V (20kΩ/V)/500V (9kΩ/V) | ±3% of full scale |
| ACV | 10/50/250/500V (9kΩ/V) | ±3% of full scale |
| DCA | 50μ/2.5m/25m/0.25A | ±3% of full scale |
| Resistance | 2k/20k/200k/2MΩ | ±3% of arc |
| Capacitance | 500μF | *1 |
| DC high voltage | DC25kV (Optional probe "HV-10" is necessary) | — |
| Temperature | -20 ～ +200℃ (Optional probe "T-THP" is necessary) | ±3% (T-THP) |
| Bandwidth | 40～100kHz (AC10V) | |
| Battery | R6P×2 | |
| Fuse | φ6.3×30mm (250V/0.5A) | |
| Size / Mass | H144×W99×D41mm/approx. 270g | |
| Standard accessories included | Test lead (TL-61), Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.
*1 Pointer indication of the maximum move by charged current in the capacitor.

### SP-18D

**Protective body cover**

- Low power ohm (3V) measurement upto 200MΩ
- Capacitance measurement 0.01μF～1000μF
- LED check by 3V terminal voltage at resistance range
- Battery check
- Protective body cover

**Bandwidth** : 30～80kHz (AC12V), 30～20kHz (AC30V)

**Optional accessories**

Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC

DROP PROOF

| SP-18D | Measuring range | Accuracy |
|---|---|---|
| DCV | 0.3/3/12/30/120/600V (20kΩ/V) | ±3% of full scale |
| ACV | 12/30/120/300/600V (9kΩ/V) | ±3% of full scale |
| DCA | 60μ/30m/0.3A | ±3% of full scale |
| Resistance | 2k/20k/2M/200MΩ | ±3% of arc |
| Battery check | 1.5V/1.5V Coin battery | — |
| Capacitance | 1000μF | *1 |
| Bandwidth | 30～80kHz (AC 12V) 30～20kHz (AC 30V) | |
| Battery | R6P×2 | |
| Fuse | φ5.2×20mm (250V/0.5A) | |
| Size / Mass | H159.5×W129×D41.5mm / approx. 320g | |
| Standard accessories included | Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.
*1 Pointer indication of the maximum move by charged current in the capacitor.

### TA55

**30A range for automotive**

- High level panel visibility
- Continuity check buzzer
- Tilt-stand
- Measureable upto DC30A / DC300A with optinal clamp probe

**Bandwidth** : 40～5kHz

**Optional accessories**

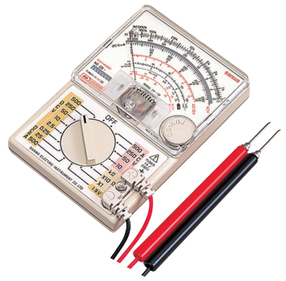
Clamp probe : CL33DC
Carrying case : C-SPH or C-SP
Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC
Test lead : TL-91M, TLF-120

DROP PROOF

| TA55 | Measuring range | Accuracy |
|---|---|---|
| DCV | 0.3/3/16/30/60V (20kΩ/V) | ±3% of full scale |
| ACV | 30/120/300V (9kΩ/V) | ±4% of full scale |
| DCA | 0.5/3/30A | ±5% of full scale |
| Resistance | 2k/20k/200k/2MΩ | ±3% of arc |
| Continuity | Buzzer sounds at less than approx. 10Ω. Open voltage : 3V | |
| Bandwidth | 40～5kHz | |
| Battery | R6P×2 | |
| Fuse | φ6.3×30mm (250V/3A) | |
| Size / Mass | H142×W97×D38mm/approx. 300g | |
| Standard accessories included | Test lead (TL-91), Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.

## Slim compact AMT



### CP-7D

**23mm thick small size**

- Wide scale panel with mirror
- Affixed test leads providing better safety
- High-precision, non-flammable, smokeless metal-oxide film resistor
- Battery check
- Fuse and diode circuit protection

**Bandwidth** : 30～100kHz (AC10V), 30～20kHz (AC50V)

**Optional accessories**

Carrying case : C-CP
Clip adapter : CL-11, CL-15a, CL-DG3a, TL-8IC

| CP-7D | Measuring range | Accuracy |
|---|---|---|
| DCV | 0.25/2.5/10/50/250/500V (4kΩ/V) | ±3% of full scale |
| ACV | 10/50/250/500V (4kΩ/V) | ±4% of full scale |
| DCA | 0.25m/25m/500mA | ±3% of full scale |
| Resistance | 2k/20k/1MΩ | ±3% arc |
| Load current (LI) | 0～74mA/7.4mA/150μA | — |
| Battery check | 0.9～1.5V | — |
| dB | -20～36dB | — |
| Bandwidth | 30～100kHz (AC10V) 30～20kHz (AC50V) | |
| Battery | R6P×1 | |
| Fuse | φ5.2×20mm (250V/0.5A) | |
| Size / Mass | H119×W85×D23mm/approx. 140g | |
| Standard accessories included | Test lead (TL-84), Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.

### AP33

**Small pocket size**

- Elastomer material absorbs shock from fall
- High-durability nylon-woven copper lead
- Using elastomer material improves flexibility and reduces the stress on the lead wire and the probe when bent.

**Bandwidth** : 40～10kHz (50V and below)

| AP33 | Measuring range | Accuracy |
|---|---|---|
| DCV | 10/50/250/500V (2kΩ/V) | ±5% of full scale |
| ACV | 50/250/500V (2kΩ/V) | ±5% of full scale |
| Battery check | 1.5V/9V | — |
| DCA | 25m/250mA | ±5% of full scale |
| Resistance | 5k/500kΩ | ±3% arc |
| Bandwidth | 40～10kHz (less than 50V) | |
| Battery | R03×1 | |
| Fuse | φ5×20mm (250V/0.5A) | |
| Size / Mass | H126×W87×D30mm/approx. 185g | |
| Standard accessories included | Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.

## For power line

### VS-100 (with case)

**Current-limiting fuse, 100kA breaking capacity, is installed.**

- For lower voltage circuit (500V and below) with large capacitance
- Current-limiting fuse that can interrupt 100kA, is installed.
- All renges are protected from input voltage upto 500V
- Carrying case

**Bandwidth** : 40～10kHz (50V and below)

| VS-100 | Measuring range | Accuracy |
|---|---|---|
| DCV | 10/50/250/500V (4kΩ/V) | ±3% of full scale |
| ACV | 10/50/250/500V (4kΩ/V) | ±3% of full scale |
| Resistance | 2k/20k/2MΩ | ±3% arc |
| Bandwidth | 40～10kHz (less than AC50V) | |
| Battery | R6P×2 | |
| Fuse | Current-limiting fuse 600V/3A, Breaking capacity 100kA<br>Glass-tube fuse φ6.3×30mm 0.25A/250V, Breaking capacity 100A | |
| Size / Mass | H144×W96×D56mm/approx. 400g | |
| Standard accessories included | Test lead (TL-100-0M), Carrying case (C-VS), Instruction manual | |

The value in ( ) at DCV and ACV is input resistance.






# Lux Meters

Various environments need appropriate illumination, whether it be ordinary homes, offices, or factories. Inadequate illumination or too much illumination can lead to false recognition, reduced work efficiency, and loss of vision caused by fatigue. Since appropriate illumination helps to improve work efficiency and assure work safety, the control of illumination is regarded as a very important element. The illuminance meter indicates, by values in the unit of LUX, how much light shines on each place. It is used for the purpose of assuring appropriate illumination suitable for every environment. JIS (Japanese Industrial Standards) has a standard given below as recommended values for each environment.

| Type | LUX 1500 | 700 | 300 | 150 | 70 | 30 | 15 | -LUX- |
|---|---|---|---|---|---|---|---|---|
| Housing | ✻Sewing (Dark material) | ✻Studying, Sewing<br>✻Reading (Long time or small letters) | ✻Reading ✻Makeup<br>✻Eating meal | Living room, child room, reception room, dining room, kitchen | Hall, stairway, corridor, escape stairway, garage | | | |
| School | ✻Precision drawing<br>✻Machine-sewing<br>✻Precision experiment | Drafting room ✻Blackboard<br>✻Sewing ✻Library reading room<br>✻Precision machining | Ordinary classroom, special classroom, library reading room | Auditorium, meeting room, hallway, stairway | Escape stairway | | | |
| Office | ✻Designing ✻Drawing<br>✻Typing ✻Calculation<br>✻Key-punching | Office, drafting room, gage board, telephone exchange room, distribution board | Executive room, conference room, reception room, hall, elevator | Work room, change room, stairway, warehouse | Escape stairway | | | |
| Road, park | | | | Tunnel of expressway (Illumination at the entrance and exit should be higher than this value.) | 70~15<br>Tunnel | 15~3<br>Road with busy traffic | 1.5~0.3<br>Road with scarce traffic, road in residential areas, park, other open spaces | |
| Hospital | Surgical table 10,000 over<br>✻Autopsy<br>✻First-aid treatment<br>✻Drug formulation | Surgical room, first-aid station, ocular inspection, drug preparation<br>✻Technological research ✻Injection | Clinic, examination room, dispensary, waiting room, medical office | Doctor's room, hospital room, X-ray room, medicine room | | | | |
| Theater, movie theater | | | ✻Ticket counter, doorway, back stage | Projection booth, corridor, stairway | Spectators' seat (during a break), escape stairway, garden | 3~1.5<br>Spectators' seats (while showing) | | |
| Inn, hotel | | Accounting office | Front desk, dining room | Guest room, amusement hall, corridor, lobby | | | | |
| Diner, restaurant | | ✻Sample case | ✻Register, kitchen, ✻dining table | Guest room, waiting room hallway | | | | |
| Beauty parlor, barber | | ✻Hairdo ✻Hair setting ✻Makeup | ✻Hairdo, ✻dressing | In shop | | | | |
| Shop | ✻Highlighted display in show window<br>✻Highlighted show case | ✻Highlighted display in shop<br>✻Show window, ordinary show case | Ordinary display of shop<br>Overall shop | | | | | |
| Department store | ✻Show window, main part on the 1st floor<br>✻Highlighted show case | Ordinary display<br>Ordinary show case | Atmospheric display | | | | | |

The combined use of local illumination is allowed in places marked with ✻. In these cases, it is desirable that the overall illumination should be 1 / 10 or more of the illumination by the local illumination.
✻ Reference: Illumination level JIS Z9110
·Each country has it's own standard. Please check the standards for your own country.

## Pocket Size


mobiken Series

Pocket size meter but with high accuracy and wide ranges. Sensor / Probes can be all neatly contained and protected within the folding case. Easy to carry in a shirt pocket.

### LX2

**Easy to use lux meter**

- Small stick shape sensor probe (sensor diameter ϕ9mm)
- 3999 count with analog bar graph
- Silicon photodiode
- Measuring range 0.1lx~399.9klx
- Data hold
- Auto power save (30min.)
- Cord length 900mm

| LX2 | |
|---|---|
| Optical sensor | Si photodiode with approximated relative luminous efficiency (ϕ9mm) |
| Display | Numeric : 3999 full scale, Bargraph:42-segment |
| Sampling rate | Approx. 2 times/sec. for numeral display.<br>Approx. 20 times/sec. for bar graph. |
| Measuring range | 400.0/4000/40.00k/400.0klx |
| Accuracy | ± (5%+1) below 3000 lx<br>± (7.5%+1) 3000 lx or higher<br>Compatible JIS standard A class<br>23℃±2℃ |
| Temperature Characteristics | ±5% at 23℃ within operating temperature/humidity range |
| Relative spectral sensitivity | Approximation of spectral luminous efficiency of the standard photometric observer |
| Grazing-incidence light characteristics | Cosine curve approximation |
| Battery | LR44×2 |
| Power consumption | Approx. 10mW |
| Operating temperature | 0℃~40℃ max. 80% RH no condensation |
| Storage temperature | -10℃~50℃ max. 80% RH no condensation |
| Size / Mass | Main body : H117×W76×D18mm/approx. 120g<br>Sensor probe : H84× W16×D10mm |
| Standard accessories included | Instruction manual |

## Analog Type

### LX3132

**Max 10000 lux measurable**

- Various light source can be measured such as filament lamp, fluorescent lamp, and mercury lamp.
- Silicon photodiode
- Taut-band drop shock proof meter

**Optional accessories**

Carrying case : C-01

| LX3132 | |
|---|---|
| Range | 100/300/1000/3000/10000LUX |
| Accuracy | ±10% of full scale Receiver angle 30° (less than -3%)<br>Receiver angle 60° (less than -10%) |
| Optical sensor | Si photodiode with approximated relative luminous efficiency |
| Indicator | Analog pointer Taut-band |
| Battery | R6P×2 |
| Size / Mass | H163×W100×D47mm/300g |
| Standard accessories included | Instruction manual |

# Optical / Laser Power Meters

## Laser power meters

Laser power meters are measuring instruments that let a laser beam emitted from a laser light source enter the sensor light receiver and indicate the value by converting light energy into electric signals. The unit used for this purpose is W (watt). The laser power meter is used for checking the light power of and maintaining laser-operating equipment. Since silicon photo diode used at the receiver of the laser power meter has different photoelectric conversion ratios according to the wavelength of the light received, it needs to be calibrated by the measuring wavelength.

* It is possible to obtain approximate value for the measuring wavelength based on a spectral sensitivity characteristic graph of the silicon photo diode.

**Reference: Main laser wavelength**

- 830nm Infrared semiconductor laser
- 780nm Infrared semiconductor laser (e.g. Used for CD player, MD recorder, etc.)
- 670nm Visible semiconductor laser
- 633nm He-Ne laser, red semiconductor laser (e.g. Used for DVD player, bar-code reader, etc.)
- 532nm Green laser
- 488nm Argon ion laser
- 405nm Purple-blue laser

## Optical power meters

Optical power meters are measuring instruments that indicate the power of an outgoing beam from an optical fiber connector by converting it into electric signals. It is mainly used for installation and maintenance of optical fiber and optical LAN.
The unit of fiber light is generally expressed in W (watt) and dBm related to 1mW expressed in logarithm.

**Conversion of dBm into mW** $[dBm]=10\log_{10}[mW]$

10dBm=10mW 0dBm=1mW -10dBm=100μW -20dBm=10μW
-30dBm=1μW -40dBm=100nW -50dBm=10nW -60dBm=1nW

**Wavelength for each model**

For long wave and long wavelength (1310nm,1550nm)
For short wave and long wavelength (650nm,780nm,800nm,850nm,880nm)

* Please contact us for products handling wavelengths other than the ones given above.

## Optical Power Meter

### OPM-360

**For fiber light (long wavelength 2 ranges)**
**Optical SC type fiber connector**

- Direct reading 2 wavelength ranges (1310/1550nm)
- 2 types power supply (AC adapter or inner rechargeable battery)
- 4 digits digital display (-60.00～0.00dBm/1nW～1mW)

※Consult us regarding FC type connector.

DATA HOLD REL

| OPM-360 | |
|---|---|
| Display | 4-digit digital |
| Measurable wavelengths | 1310/1550nm (2 ranges) |
| Optical power measuring range | -60.00～0.00dBm/1.00nW～1.000mW |
| Ranges | Automatic |
| Accuracy | ±5% (@ reference wavelength of -23dBm/5μW) |
| Photosensor | InGaAs-Pin photodiode φ1mm |
| Battery | Inner rechargeable battery or AC adapter (AD-30-2) |
| Size / Mass | H164×W85×D35mm/400g |
| Standard accessories included | AC adapter (AD-30-2), Instruction manual |

Accuracy : 18℃～25℃ max. 80% RH no condensation

### OPM37LAN

**For fiber light (short wavelength 5 ranges)**
**Optical FC type fiber connector**

- dBm and W measurement
- Relative value
- Offsetting, data averaging (20-data sequential averaging)
- Direct reading wavelength (650, 780, 800, 850, 880nm)
- RS-232C interface
- Various connectors can be equipped by changing optical connector adapter.
- 2m long sensor extension cord

**Optional accessories**

RS232C cable : KB-RS-OPM
SC-type optical connector adapter : OPA-F04
Simplex TOSLINK type optical connector adapter : OPA-F05
Duplex TOSLINK type optical connector adapter : OPA-F07

※Consult us regarding other type of connector.

DATA HOLD REL MAX MIN AVG 232c

| OPM37LAN | |
|---|---|
| Display | 4-digit digital |
| Ranges | Automatic, 8 ranges |
| Optical sensor | Si photodiode (sensor surface area 5.8×5.8mm) |
| Optical power measuring range | -60.00dBm～+13.00dBm<br>1.000nW～20.00mW |
| Optical input type | Direct to photodiode |
| Reference wavelengths | 650nm, 780nm, 800nm, 850nm, 880nm |
| Accuracy | ±5% (@ reference wavelength of -20dBm/10μW) |
| Resolution | dBm/dB (REL) mode : 0.01dB<br>W/W (REL) mode : 0.01% |
| Measuring cycle | 3.33 times/sec. |
| Battery | 006P type Alkaline battery or AC adapter (AD-30-2) |
| Size / Mass | Main body : H164×W85×D35mm/300g<br>Sensor head : φ25×26mm/25g |
| Standard accessories included | Optical sensor, Extension cord, AC adapter (AD-30-2)<br>FC-type (F01) connector adapter, Instruction manual |

Accuracy : 18℃～25℃ max. 80% RH no condensation

Sensor extension cord (2m)

## Laser Power Meter (Pocket Size)

mobiken Series

Pocket size meter but with high accuracy and wide ranges. Sensor / Probes can be all neatly contained and protected within the folding case. Easy to carry in a shirt pocket.

### LP1

**Optical power up to max. 40mW measurable**
**Direct reading wavelength customization**

- Wide optical power measurement range
- Silicon photodiode
- Sensor can be all neatly contained and protected within the folding case.
- Max / Min hold
- Auto power save (30min.)
- 500mm sensor cord

Wavelength customization
The standard LP1 is calibrated at 633 nm but can also read any other wavelength in the 400～1100 nm range using a chart inside the case cover.
We can calibrate directly to any other 400～1100 nm wavelength for special orders, with a 4 month lead time, so please contact our authorized agent if necessary.

APS MAX MIN AVG PC

| LP1 | |
|---|---|
| Optical sensor | Si photodiode (φ9mm) |
| Wavelength range | 400nm～1100nm |
| Wavelength | 633nm (He-Ne laser) reference wavelength<br>Convert by a table of spectral sensitivity characteristic (representing value) |
| Display | Numeric:3999 full scale, Bargraph : 42-segment |
| Sampling rate | Approx. 2 times/sec. for numeral display.<br>Approx. 20 times/sec. for bargraph. |
| Measuring range | 40.00u/400.0u/4.000m/40.00mW |
| Accuracy | ±5% (1mW : 4mW range, 633nm)<br>23℃±2℃ |
| Battery | LR44×2 |
| Power consumption | Approx. 6mW |
| Operating temperature | 0℃～40℃ max. 80% RH no condensation |
| Storage temperature | -10℃～50℃ max. 80% RH no condensation |
| Size / Mass | H117×W76×D18mm/approx. 120g<br>Sensor probe : H84×W16×D10mm |
| Standard accessories included | Instruction manual |

## Laser Power Meter (Digital Type)

### OPM35S

**For space light measurement**

- Silicon photodiode
- Measurable up tp 50.00mW
- Relative value
- Max hold, data averaging (20-data sequential averaging)
- Direct reading wavelength (488, 633, 670, 780, 830nm)
- RS-232C interface

**Optional accessories**

RS232C cable : KB-RS-OPM

REL MAX MIN AVG 232c

| OPM35S | |
|---|---|
| Display | 4-digit digital |
| Ranges | Automatic, 5 ranges |
| Optical sensor | Si photodiode (sensor surface area 10x10mm) |
| Optical power measuring range | 0.001μW～50.00mW |
| Optical input type | Direct to photodiode |
| Reference wavelengths | 488nm, 633nm, 670nm, 780nm, 830nm |
| Accuracy | ±5% (@ reference wavelength of 100μW) |
| Resolution | W/REL mode : 0.01% |
| Measuring cycle | 3.33 times/sec. |
| Battery | 006P type Alkaline battery or AC adapter (AD-30-2) |
| Size / Mass | H164×W85×D35mm/300g<br>Sensor head : H126×W15×D4mm/40g |
| Standard accessories included | Optical sensor, AC adapter (AD-30-2), Instruction manual |

Accuracy : 18℃～25℃ max. 80% RH no condensation

# Thermo Meter

There are two types of Thermo meters used in general : mercury thermo meter and alcohol thermo meter. For industrial use, an electric thermo meter with separate temperature detection element and display element is often used.

| Sensor Type | Thermistor type | Thermocouple | Platinum resistance bulb |
|---|---|---|---|
| Feature | Measurements are made by using changes in electric resistance (inverse proportion). This type is low-priced but not suitable for measurements of high temperature (300 degrees or more). | Measurements are made by using temperature difference of contacts when two types of metal wires are electrically connected. It responds quickly, is easy to be processed and operates easily. | It is more accurate than a thermocouple and suitable for low temperature measurement. However, it does not respond quickly and is not suitable for the measurement of minute spots. |
| Sanwa Product | Use T-THP. | Use K-8 series. | STH-500<br>T-300PC (for PC5 series, PC5a series and PC20) |

## Thermo Meter (Pocket Size)

mobiken Series

Pocket size meter but with high accuracy and wide ranges. Sensor / Probes can be all neatly contained and protected within the folding case. Easy to carry in a shirt pocket.

### TH3

**High accuracy & resolution**

- Easy to carry in a shirt pocket
- Sensor prove can be snapped into a fixed position atop the case
- Data hold, Max / Min hold
- Relative value
- Nonslip sensor holder
- Auto power save (30min.)

APS DATA HOLD REL MAX MIN AVG

| TH3 | |
|---|---|
| Measuring range | -50.0℃～200.0℃ |
| Resolution | 0.1℃ |
| Accuracy | ± (0.5%+0.5℃) |
| Sampling rate | Approx. 2 times/sec. |
| Display | 3999 |
| Sensor | Platinum foil thermometric resistor (100Ω at 0℃)<br>Sheath type Pt 100Ω φ2 x 64 JIS B class |
| Response | Approx. 7 sec. interval<br>(speed of sensor's response to achieve the level of 90%) |
| Battery | LR44×2 |
| Power consumption | Approx. 18mW |
| Accuracy assure temperature | 23℃±7℃ max. 80% RH No condensation |
| Operating temperature | 0℃～40℃ max. 80% RH No condensation |
| Storage temperature | -10℃～50℃ max. 80% RH No condensation |
| Size / Mass | H117×W76×D18mm/Approx. 120g |
| Standard accessories included | Instruction manual |

# Tachometers/Speed Meters

## Tachometer

### SE-200

**Contact type digital tachometer**

- Ergonomic design & palm size
- Easy to use contact type
- One push button operation
- Auto data hold for 10 sec.
- Auto power off

CE

DATA HOLD

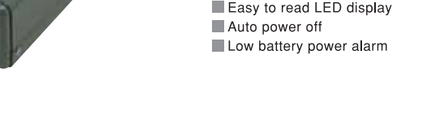
| SE-200 | |
|---|---|
| Measuring range | 60～20000rpm<br>1～333rps |
| Accuracy | ×1 range : ±1dgt, ×10 range : ±2dgt |
| Measuring method | Contact |
| Display | 9999 (LED display) |
| Battery | R6P×4 |
| Size | 183×42×31mm |
| Mass | Approx. 210g |
| Standard accessories included | Contact adaptor (SE-200AD)<br>Contact rubber tip (SE-210AD)<br>Hexagonal wrench (SE-220AD)<br>Instruction manual |

**Optional accessories**

Carrying case : C-SE2
Tangential speed ring : SE-10 (circumference 10cm, width 10mm),
SE-0.9 (circumference 10cm, width 0.9mm)

### SE-100

**Non contact type digital tachometer**



- Ergonomic design & palm size
- Free of measuring error, non contact type
- Auto data hold for 10 sec.
- Auto power off
- LED to check right detection

CE

DATA HOLD

| SE-100 | |
|---|---|
| Measuring range | 60～50000rpm<br>1～833rps |
| Accuracy | ×1 range : ±1dgt, ×10 range : ±2dgt |
| Measuring method | Non contact |
| Display | 9999 (LED display) |
| Detection distance | 10～150mm |
| Battery | R6P×4 |
| Size | 170×42×31mm |
| Mass | Approx. 170g |
| Standard accessories included | Reflective mark 20marks, Instruction manual |

**Optional accessories**

Carrying case : C-SE2
Reflective mark : 20marks×5sheets (total 100marks)

## Speed Meter

### SE-9000
### SE-9000M (with external encoder)

**For elevator maintenance, 2ch display**

- Suitable for elevator speed measurement of high building
- 2 independent display
- Analog output terminal to record measuring data
- 2 external hold terminals for remote control
- Remote control by external encoder
- Easy to read LED display
- Auto power off
- Low battery power alarm

AP OFF DATA HOLD

| SE-9000 / SE-9000M | |
|---|---|
| Measuring range | 0～1999.9m/min.<br>4-digit Red LED display (2 ch.) (Max 999.9)<br>(LED at upper left in the display will blink when the measured value exceeds 999.9m/min.) |
| Measuring time | 0.2 sec. (sampling time) |
| Accuracy | ±2dgt |
| Analog output | DC0～1999.9mV (at 0m/min.～1999.9m/min.)<br>Analog output accuracy : ± (0.5%±1mV) |
| Data hold | Ch.1, Ch.2 isolated<br>Operation by main switch or external hold switch |
| Auto power off | After 3 minutes of no operation except for during measurment |
| Battery | R6P×4 (with battery alarm) |
| Size / Mass | H174×W50×D50MM/Approx. 480g |
| Standard accessories included | Speed ring thickness 10mm (SE-10)×1<br>Speed ring thickness 0.9mm (SE-0.9)×1<br>Cord for hold input (SE-L-H)×2<br>Cord for analog output (SE-L-O)×1<br>Hex wrench×1, Carrying case (C-SE)×1<br>External encoder (speed ring)×1 (SE-9000M only)<br>Instruction manual |

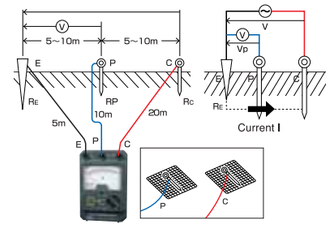


# Earth Tester

## Purpose of earth resistance

When some extraordinary cases occur, fault current and overcurrent may cause damages to equipment or a risk to humans because the equipment is not grounded. To prevent such risks, grounding plays an important role to assure safety. Grounding provides an escape way to electricity from an electric appliance through metal rod driven into the ground. After grounding works are performed to prevent hazards and assure safety, the earth resistance is measured. To measure the earth resistance, two grounding rods are stuck into the ground. Assuming that two rods are E and C, AC current I is applied between E and C. The earth resistance can be measured from the voltage generated between E and C. The relation between the current I and voltage V is expressed as follows. From this the earth resistance can be obtained. However, the earth resistance R obtained this way includes not only the earth resistance at the grounding electrode E but also the earth resistance at the grounding electrode C. If a third grounding electrode P is provided between the grounding electrodes E and C, the earth resistance RE at the grounding electrode E alone can be obtained from the current I and voltage Vp between E and C.

＊Although the grounding electrode P, too, has a resistance zone, it hardly affects the measurement because the impedance of the power supply of AC constant current is high.




## Arrangement of grounding rods

### Three-electrode method

Arrange the earth E and auxiliary grounding rods P and C in a straight line at intervals of about 5 to 10m.

＊If they cannot be arranged in a straight line because of the presence of an obstacle, arrange E-P and E-C at angles of about 30 degrees or less.

### Two-electrode method

If an earth E whose grounding resistance is known is present nearby, the unknown grounding resistance can be measured by using it. Connect the terminal E of the earth resistance meter and the earth E by a cord. Measurements are taken between E and P / C assuming P and C terminals as one terminal.

＊The indicated value includes the known resistance value of the earth E. Subtract the grounding resistance of E to obtain the true value.

△ Sand, gravel and frozen soil → Expose soil.
△ Concrete → Use a net. Flush enough water on the net to let it have a close contact with the ground.
× Asphalt → Cannot be measured.

## Earth Tester

### PDR-301

**Analog type display**

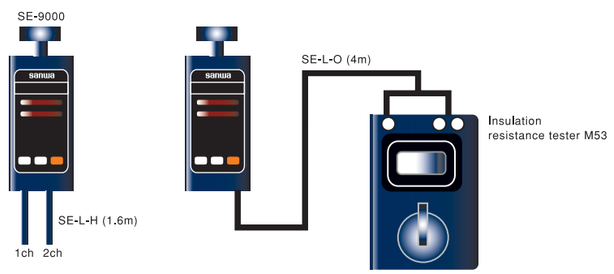
- Phase detection system circuit for stable measurement
- Easy self calibration
- AC 30V range to avoid indication errors caused by leak current
- Power saving design with push switch
- Exorbitance warning LED of auxiliary earth electrode resistance

**Optional accessories**

Carrying case : C-PDR300

| PDR-301 | |
|---|---|
| Earth resistance measuring range | 10/100/1000Ω<br>Accuracy : ×1 range ±5% of full scale<br>: ×10, ×100 range ±2.5% of full scale |
| Earth resistance measuring range | 0～30V<br>Accuracy ±2.5% of full scale |
| Display | Analog |
| Operation | Constant current system (tripolar or bipolar) |
| Battery | R6P×6 |
| Size / Mass | W175×H118×D55mm/Approx. 500g |
| Standard accessories included | Earth bar set (SET-PDR201),<br>Instruction manual |

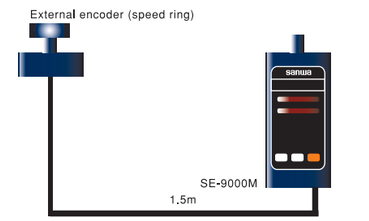
**●Remote control by SE-9000 / SE-9000M**




Measuring data can be remotely held by using SE-L-H cable.

Measuring data can be displayed by using SE-L-O on the LCD of M53.

**●Remote control by external encoder (SE-9000M only)**




Measuring data can be remotely monitored by SE-9000M.

# Assembly Training Kit

***Sanwa assembly training kits have been developed for educational uses. These assembly training kits are available for purchase from our agents only.***

## Analog type

Complete image

### KIT-8D

**Learning kit designed for measurement of small capacity electric circuits**

- Drop shock proof taut-band meter
- Battery check
- Meter zero adjuster
- Zero Ω adjuster
- Protective body cover

BATT CHECK · 0Ω ADJ · +/− · DSP

| KIT-8D | Measuring range | Accuracy |
|---|---|---|
| DCV | 0.3/3/12/30/120/300/600V (20kΩ/V) | ±3% of full scale |
| ACV | 12/30/120/300/600V (9kΩ/V) | ±4% of full scale |
| DCA | 60μ/3m/30m/0.3A | ±3% of full scale |
| Resistance | 20/200/20kΩ | ±3% of arc |
| Battery check | 1.5V | |
| Bandwidth | 50 or 60Hz (sine wave) | |
| Battery | UM-3(1.5V)×2 | |
| Fuse | φ5.2×20mm (250V/0.5A) | |
| Size / Mass | H159.5×W129×D41.5mm/approx.320g | |
| Standard accessories included | Instruction manuals | |

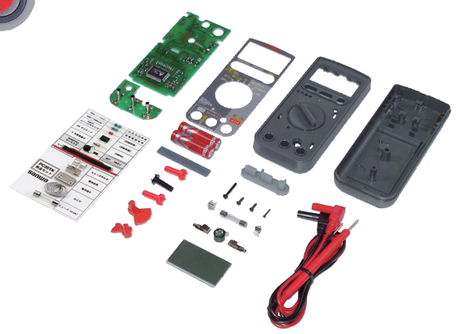
## Digital type

### PC20TK

**General-purpose DMM kit**

- 3-3/4 digits 4000 count
- Capacitance measurement (40nF～100μF)
- Data hold / Range hold
- Safety cover for the μA･mA
- Tilt stand
- Optical link RS232C / USB interface(optional)

**Display** : numeral display 4000
**Sampling rate** : 3 times / sec.



HOLD · DATA HOLD · RNG HOLD · 232c · USB · PC Link °C

| PC20TK | Measuring range | Best accuracy | Resolution | Input impedance |
|---|---|---|---|---|
| DCV | 400m/4/40/400/750V | ±(1.0%rdg+2dgt) | 0.1mV | |
| ACV | 4/40/400/750V | ±(1.5%rdg+5dgt) | 0.001V | DCV: |
| DCA | 400μ/4000μ/40m/400m | ±(1.5%rdg+2dgt) | 0.1μA | 10MΩ～ |
| ACA | 400μ/4000μ/40m/400m | ±(2.0%rdg+5dgt) | 0.1μA | 100MΩ |
| Resistance | 400/4k/40k/400k/4M/40M | ±(1.5%rdg+5dgt) | 0.1Ω | ACV:10M |
| Capacitance | 40n/400n/4μ/40μ/100μF | ±(7%rdg+6dgt) | 0.01nF | |
| Continuity | Buzzer sounds at between 10Ω and 120Ω. Open voltage: approx. 0.4V | | | |
| Diode test | Open voltage: approx. 1.5V | | | |
| Bandwidth | 40～400Hz (sine wave) | | | |
| Fuse / Battery | 0.5A/250V IR300A φ6.3X30mm R6×2 | | | |
| Size / Mass | H158×W70×D41mm/230g | | | |
| Standard accessories included | Test lead (TL-21a), Instruction manual | | | |

### Optional accessories

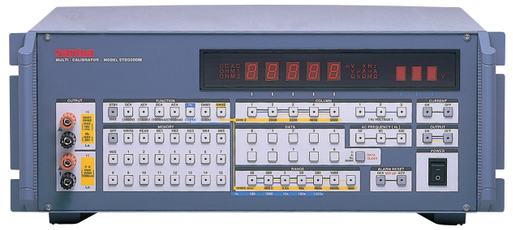
Software : PC Link7　Optical PC Link cable : KB-USB20
Clamp probe : CL-20D, CL-22AD, CL33DC
Temperature probe : T-300PC(PC Link software is necessary.)
Clip adapter : CL-11, CL-13a, CL-15a, CL-DG3a, TL-8IC
Holster : H-70



# Calibrator

## Calibrator

### STD5000M (Order production)



**Overview**

The STD5000M is a calibrator with soft touch buttons that can generate a desired DC voltage / current, AC voltage / current, resistance, frequency, etc. with a high degree of accuracy and stability.
The STD5000M is with a memory function allowing a broad range of uses for the device.

**Ranges**

- Voltage(DC･AC) : 0～1000V(6 ranges)
- Current(DC･AC) : 0～2000mA(6 ranges)
- Resistance1 : 0～500kΩ(10Ω steps)
- Resistance2 : 24 steps fixed resistance value(4 kinds 6 ranges)
- Hz : 40Hz～999kHz(5 ranges)

**Features**

- **High accuracy ±0.03% (DCV DC mA)**
  Reliable accuracy is achieved by using the standard voltage IC with a constant-temperature bath for the reference voltage and wire wound resistor and metal film resistor with high tolerance and low temperature coefficient for the resistance element.
- **Calibrates 6 types of functions**
  With the calibration elements of 6 functions(DCV, ACV, DCA, ACA, OHM, Hz) incorporated, it can be used for calibrating and maintaining the DMM, DPM (digital power meter), circuit tester and industrial instruments.
- **Installs 90 (6x15) output memories**
  With 90 (6x15) output memories installed, it is possible to save desired setting.
- **User-friendly speedy operability**
  Use of soft-touch push button switches for operation on the panel(except the power switch). Use of semiconductor switches with greater heat resistance and durability for change switches of the circuit, and latch-type relays requiring less electro motive force.
- **With overload protection device**
  To enhance security, overload protection in case of low voltage and current generation is performed on the semiconductor circuit, and overload protection in case of medium and high voltage generation(50V or more) is achieved by releasing the output terminal and circuit.

| STD5000M | Measuring range | Generation range | Resolution | Set accuracy | Maximum load |
|---|---|---|---|---|---|
| DCV | 50mV | 0～50mV | 1μV | ±(0.05%+30μV) | |
| | 500mV | 0～500mV | 10μV | ±(0.03%+30μV) | |
| | 5V | 0～5V | 100μV | ±(0.03%+200μV) | |
| | 50V | 0～50V | 1mV | ±(0.03%+2mV) | 10mA |
| | 500V | 0～500V | 10mV | ±(0.03%+20mV) | |
| | 1000V | 0～1000V | 100mV | ±(0.05%+0.3V) | |
| ACV | 50mV | 0～50mV | 1μV | ±(0.1%+50μV) | |
| | 500mV | 0～500mV | 10μV | ±(0.06%+100μV) | |
| | 5V | 0～5V | 100μV | ±(0.06%+0.4mV) | |
| | 50V | 0～50V | 1mV | ±(0.06%+4mV) | 10mA |
| | 500V | 0～500V | 10mV | ±(0.06%+40mV) | |
| | 1000V | 0～1000V | 100mV | ±(0.1%+0.4V) | |
| DCA | 50μA | 0～50μA | 1nA | ±(0.05%+30nA) | |
| | 500μA | 0～500μA | 10nA | ±(0.05%+30nA) | |
| | 5mA | 0～5mA | 100nA | ±(0.05%+0.2μA) | 13V |
| | 50mA | 0～50mA | 1μA | ±(0.05%+2μA) | (Open |
| | 500mA | 0～500mA | 10μA | ±(0.05%+20μA) | circuit voltage) |
| | 2000mA | 0～2000mA | 100μA | ±(0.1%+300μA) | |
| ACA | 50μA | 0～50μA | 1nA | ±(0.12%+60nA) | |
| | 500μA | 0～500μA | 10nA | ±(0.12%+80nA) | |
| | 5mA | 0～5mA | 100nA | ±(0.1%+0.5μA) | 13V |
| | 50mA | 0～50mA | 1μA | ±(0.1%+5μA) | (Open |
| | 500mA | 0～500mA | 10μA | ±(0.1%+50μA) | circuit voltage) |
| | 2000mA | 0～2000mA | 100μA | ±(0.15%+0.5mA) | |
| OHM1 | — | 0～500kΩ | 10Ω | — | — |
| Frequency | 40～99.9Hz | 0.1Hz | — | ±(0.1%+0.1Hz) | — |
| | 40～999Hz | 1Hz | — | ±(0.1%+1Hz) | — |
| | 40～9.99kHz | 10Hz | — | ±(0.1%+10Hz) | — |
| | 100～99.9kHz | 100Hz | — | ±(0.1%+100Hz) | — |
| | 1k～999kHz | 1kHz(Rectangular wave) | — | ±(0.1%+1kHz) | — |
| | 0～7V | 0.1V | — | ±(2%+0.2V) | — |

| STD5000M | Measuring range | Accuracy |
|---|---|---|
| OHM2 | 160/260/360/460Ω | ±(0.05%+0.1Ω) |
| | 1.6k/2.6k/3.6k/4.6kΩ | ±(0.05%) |
| | 16k/26k/36k/46kΩ | ±(0.05%) |
| | 160k/260k/360k/460kΩ | ±(0.05%) |
| | 1,600k/2,600k/3,600k/4,600kΩ | ±(0.05%～0.08%) |
| | 16M/26M/36M/46MΩ | ±(0.05%～0.2%) |
| Memory | 6×15(90) | |

| | |
|---|---|
| 50mV adjust digit | 4-1/2 digit(except for 1000V, 2000mA,OHM2) |
| Max. display | 50099 |
| Output adjust | LOCAL(surface panel) |
| Operating range | 23℃±3℃ below 70%RH |
| Preheating time | 30～60m. |
| Power supply | AC100V±10%, 50Hz, 60Hz |
| Power consumption | 30VA |
| Protection | DC and 50 V or higher AC ranges: Overload protection device with reset switch. DC and 5 V or lower AC ranges: Overload protection circuitry. |
| Size / Mass | H180×W480×D580mm/25kg |
| Standard accessories included | Instruction manual |

# LCR Meter

## LCR Meter

### LCR700

**Useful for sorting device value**

- Measuring Frequency DC～100kHz
- Ls/Lp/Cs/Cp measurement with sub parameters(D/Q/θ/ESR)
- Automatically selectable L/C/R measurement
- Device sorting mode
- Optical link USB interface (optional)
- Data hold, Back light

**Sampling rate** : 1.2 times / sec. (LCR mode)
0.5 times / sec. (DCR mode)

AP OFF · DATA HOLD · REL · BACK LIGHT · USB

| LCR700 | Measuring range | Best accuracy |
|---|---|---|
| Ls/Lp | 20.000μ/200.00μ/2000.0μ/20.000m/200.00mH 2000.0m/20.000/200.00/2000.0/20.000kH | ±(0.3%+3) |
| Cs/Cp | 200.00p/2000.0p/20.000n/200.00n/2000.0nF 20.000μ/200.00μ/2000.0μ/20.00mF | ±(0.3%+3) |
| Rs/Rp | 20.000/200.00/2.0000k/20.000kΩ 200.00k/2.0000M/20.000M/200.0MΩ | ±(0.3%+3) |
| Ω | 200.00/2.0000k/20.000k/200.00kΩ 2.0000M/20.000M/200.0MΩ | ±(0.3%+3) |

| | |
|---|---|
| Battery | 6LF22 (9V) ×1 |
| Size / Mass | H184×W87×D45/approx. 400g |
| Standard accessories included | Clip lead (CL-700), Holster (H-701), Instruction manual |

### Optional accessories

Optical link cable unit : LCR-USB
SMD clip lead : CL-700SMD
AC adapter : AD-30-2

# Detectors

## Voltage Detector

### KD1

- Detect AC voltage safely
- Lead-free
- Fast and easy to use pen type

| KD1 | |
|---|---|
| Voltage range | AC 80 to 600V, 50/60Hz |
| Measurement | Voltage Detection |
| Electrical wire to be measured | Open and coated wire |
| Insulation resistance | AC2000V for 1 minute |
| Indication | LED and continuous beeping sound |
| Sound volume | Greater or equal to 50dB at a position 50cm away |
| Light volume | Identifiable in the brightness of 5000lx |
| Batteries | Alkaline button cell LR44 (1.5V)×2 |
| Operating temperature | 0 to +40℃ |

## 3phase Detector

Carrying case

### KS1

- Phase sequence and open phase check
- Large size alligator clips

Safety : IEC61010 CAT. III 600V

| KS1 | |
|---|---|
| Measurement | Open phase and phase sequence |
| Voltage range | 3 phase AC 100V - 600V |
| Frequency | 45Hz~70Hz |
| Time limit | AC110V: Continuous, AC220V: 3 hours, AC480V: 12 minutes |
| Fuse | 0.2A/250V |
| Environment condition | Altitude 2000m or below, pollution degree II |
| Operating temperature /humidity | 0℃~40℃, 80%RH max. no condensation |
| Size | Main unit H102×W78×D32.5mm<br>Alligator clips Approx. 0.8m (Red, White and Blue) |
| Mass | Approx.212g (Alligator crips included) |
| Standard accessories included | Carrying case (C-KS)×1, Instruction manual |

### KS2

**Non-contact safety phase detector**

- Electrostatic induction measurement clips to be applicable to jacketed electrical wire.
- Phase sequence (positive, negative) and live wire condition check
- LED indication and buzzer
- Auto power off (5min.) (cancelable)
- Brightness switch

Safety : IEC61010-1 CAT.IV 600V/CAT.III 1000V, IEC61557-1,7 , IEC61326-1

| KS2 | |
|---|---|
| Measurement | Open phase and phase sequence |
| Measurement principle | Static induction |
| Measurable conductor diameter | Finished diameter: ϕ2.4~30mm, jacketed electrical wire |
| Voltage range | 3 phase, voltage to ground: AC75~1000V (sine wave, continuous) |
| Frequency | 45Hz~65Hz |
| Time limit | approx. 65hours (Power ON, standby state) |
| Battery | 6LR61(9V)×1 |
| Size / Mass | H128×W72×D46mm<br>/approx. 375g (Alligator clips 0.8m included) |
| Standard accessories included | Carrying case(C-KS2), Instruction manual |

### KS3

**Motor rotation direction testable**

- Phase sequence and open phase checking of three-phase lines
- Rotation direction check by turning three-phase motor shaft manually
- Bright LED indicataion

Safety : IEC61010-1 CAT.III 500V, IEC61557-1,7, IEC61010-2-030, IEC61010-031 , IEC61326-1

| KS3 | |
|---|---|
| Mesurement | Moter rotation direction, open phase and phase sequence |
| Voltage range | 3 phase, line voltage: AC75~500V (sine wave, continuous) |
| Frequency | 40Hz~400Hz |
| Motor rotaiton direction | Determined at rotation speeds from 2Hz (2 rotations/sec.) to 400Hz |
| Battery | 6LR61(9V)×1 |
| Size / Mass | H128×W72×D38mm/approx. 210g |
| Standard accessories included | Alligator clips(CL-KS), Test lead(TL-KS),<br>Instruction manual, Carryig case(C-KS2) |



## Test lead

### TL-11Ta

Length0.56m

### TL-21a

IEC61010 CAT.III 600V
CAT.II1000V
Length 1m
Clip adapter
CL-11
TL-8IC
CL-15a

### TL-21M

ϕ0.7mm shape-memory alloy test pin
Exchangeable ϕ2mm pin
Length 1m
Clip adapter
CL-11
TL-8IC
CL-15a

### TL-23a

IEC61010-031
CAT.II1000V
CAT.III600V
10A
Length 1m
Clip adapter
CL-11
TL-8IC
CL-15a

### TL-25a

IEC61010-031
CAT.II1000V
CAT.III600V
20A
Length 1m
Clip adapter
CL-11
TL-8IC
CL-15a

### TL-61
### TL-91

Length 0.9m
Clip adapter
CL-11
TL-8IC
CL-15a

### TL-61Ta
### TL-61Tb
### TL-61Tc

Length0.85m

### TL-84

Length 0.9m
Clip adapter
CL-11
TL-8IC
CL-15a

### TL-91M

ϕ0.7mm shape-memory alloy test pin
Exchangeable ϕ2mm pin
Length 1m
Clip adapter
CL-11
TL-8IC
CL-15a

### TL-95

ϕ4mm pin at body side
Length 1m
Clip adapter
CL-11
TL-8IC
CL-15a

### TL-112a

IEC61010-031
CAT.III1000V
CAT.IV600V 10A
Length 1m

### TL-122

IEC61010-031
CAT.III1000V
CAT.IV600V 10A
Length 1m
Clip adapter
CL-16

### TL-508Sa

Length 1m

### TLF-120

Length1.4m

### TL-M54

Length 1m

## Test lead

### TL-PM3

Length0.55m

## HV probe

### HV-10

### HV-20

480MΩresistor
measurement for
0～30kV or 25kV
Length 1m

### HV-50

### HV-60

1000MΩresistor
measurement for
0～30kV or 25kV
Length 1.2m

## Measurement probe

### TL-561

Length 0.18m

## AC adapter

### AD-71AC (100V)
### AD-72AC (220V)

Length 1.9m

## Optical link

### KB-USB20

Optical link USB
PC connection cable
Length 1.3m

## Clip adapter

### CL-11

Alligator clip
(use with test leads by inserting pins into socket)
(small size)
Length 0.2m

### CL-13a

CE

Alligator clip
(use with test leads by inserting pins into socket)
IEC61010 CAT.III 1000V
Length 70mm

### CL-15a

CE

Alligator clip
(use with test leads by inserting pins into socket)
(big size)
Length 0.2m

### KB-USB7

Optical link USB
PC connection cable
Length 1.3m

### KB-USB773

Optical link USB
PC connection cable
Length 1.3m

### LCR-USB

(with LCR Link Software)

Optical link USB
PC connection cable
Length 1.3m

### CL-16

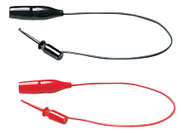
Alligator clip
(use with test leads by inserting pins into socket)
Length 70mm

### CL-DG3a

CE

Length 0.33m

### TL-8IC



IC clip
(use with test leads by inserting pins into socket)
Length 0.2m

## PC Link

### PC Link 7


CD-ROM

## PC Communication Set

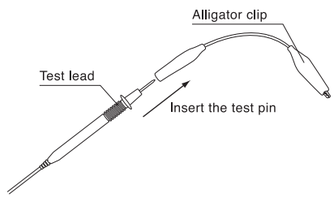
### G : KB-USB773+PC Link7
### H : KB-USB7+PC Link7
### I : KB-USB20+PC Link7

## Temperature sensor

### T-THP

-20℃～200℃
Thermistor probe
Sensor : φ2.5×31mm
Length 0.9m

### How to use :
### CL-11, CL-13a, CL-15a, CL-16, CL-DG3a, TL-8IC




## Clip lead

### CL-700

Length 0.15m

### CL-700SMD

Length 0.55m

### T-300PC

-50℃～300℃
Platinic thin film
Sensor : φ3.2×135mm
Length 2.2m
Accuracy : ± 1.9℃

### K-250CD
### K-250PC

-50℃～250℃
Linear thermocouple K type
Length 1m

### K-8-250

-50℃～250℃
Surface shape thermocouple K type
Sensor : 15×16mm
Length 1m

### CL-561

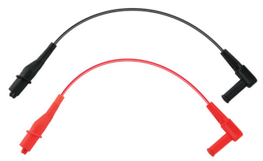
CE

Length 0.13m

## Clip lead for hFE measurement

CE

### CL-506a



Length 0.3m

## HFE probe

### HFE-6T

hFE 0 ～ 1000
Length 0.3m

### K-8-300

-50℃～300℃
Sheath shape thermocouple K type
Sensor : φ3.1×150mm
Length 1.2m

### K-8-500

-50℃～500℃
Surface shape thermocouple K type
Sensor : 15×16mm
Length 1m

### K-8-650

-50℃～650℃
flexible thermocouple K type
Sensor : φ1×300mm
Length 1.4m

## Temperature sensor

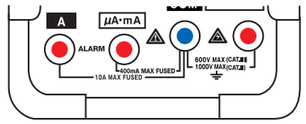
### K-8-800

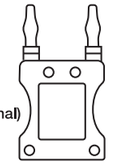
-50℃～800℃
Sheath shape thermocouple K type
Sensor : φ3.1 × 150mm
Length 1.2m

### K-AD

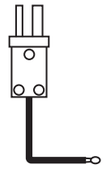
Thermocouple K type adaptor for connecting to K-8-250～K-8-800
Length 50mm

**To use K-8 series,**
**K-AD adapter is required.**



K-AD (optional)



K type temperature probe with international miniature connector

### C-DG3a

150 × 90 × 45mm
Soft case
with magnet sheets

### C-M53

130 × 190 × 70mm
Soft case

### C-PC7

205 × 140 × 80mm

## Carrying case

### C-01

180 × 160 × 54mm

### Notice :

RD700 / 701 and CD772 can only measure -20℃～300℃ (max) regardless of the specification of temperature probe.
Accuracy of K-8-XXX
-40℃～330℃ : ±2.5℃
330℃～1200℃ : ±0.75% of measured temperature

### C-PC10/S

240 × 155 × 65mm

### C-PM3

119 × 78 × 16mm

### C-SE2

224 × 97 × 37mm

### C-08S

160 × 144 × 54mm

### C-77

195 × 130 × 75mm
Soft case

### C-77H

190 × 140 × 70mm

### C-SP

165 × 140 × 50mm
Soft case

### C-SPH

160 × 150 × 55mm

### C-YS

160 × 140 × 40mm

### C-CA

180 × 150 × 50mm

### C-CD

190 × 145 × 70mm

### C-CL

190 × 90 × 45mm
Soft case

## Holster

### H-50

### H-70

### H-700

### C-CL3000

220 × 180 × 65mm

### C-CP

130 × 120 × 30mm

### C-DCM2000

250 × 123 × 57mm

# Accessory mapping

| Model | Model | TEST LEAD | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TL-11Ta | TL-21a | TL-21M | TL-23a | TL-25a | TL-29 | TL-61 | TL-61T | TL-82 | TL-84 | TL-91 | TL-91M | TL-112a | TL-508Sa | TL-M54 | TL-100-0M | TL-PM3 | TLF-120 |
| Digital Multimeter | CD731a | - | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | CD770 | - | ○ | ● | ● | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | CD771 | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | CD772 | - | - | - | - | ○ | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | CD800a | - | - | - | - | - | - | - | TL-61Ta | - | - | - | - | - | - | - | - | - | - |
| | DA-50C | - | - | - | - | - | - | ○ | - | - | - | ● | ● | - | - | - | - | - | - |
| | PC20 | - | ○ | ● | ● | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | PC500a | - | ● | ● | ○ | ● | - | - | - | ● | - | - | - | - | - | - | - | - | ● |
| | PC5000a | - | ● | ● | ○ | ● | - | - | - | ● | - | - | - | - | - | - | - | - | ● |
| | PC510a | - | ● | ● | ○ | ● | - | - | - | ● | - | - | - | - | - | - | - | - | ● |
| | PC520M | - | ● | ● | ● | ● | - | - | - | ○ | - | - | - | - | - | - | - | - | ● |
| | PC700 | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | PC7000 | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | PC710 | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | PC720M | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | PC773 | - | - | - | - | ○ | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | PM3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - |
| | PM33a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PM7a/PS8a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PM11 | ○ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | RD700/701 | - | ● | ● | ○ | ● | - | - | - | ● | - | - | - | - | - | - | - | - | ● |
| Clamp Meter | CAM600S | - | ○ | ● | ● | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | DCL10/20R/30DR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCL1000 DCL1200R | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | DCL3000R | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM-22AD | - | - | - | - | - | - | ○ | - | - | - | ● | ● | - | - | - | - | - | - |
| | DCM2000 | - | ● | ● | ● | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | DCM2000AD DCM2000R | - | ○ | ● | ● | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | DCM2000DR | - | - | - | - | - | ○ | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM400/AD | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | DCM60L | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | DCM600DR | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | DCM660R | - | ● | ● | ○ | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | DLC-330L | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DLC-400A | - | ● | ● | ● | ● | - | ○ | - | - | - | ● | ● | - | - | - | - | - | - |
| | DLC460F | - | ● | ● | ○ | ● | - | - | - | - | - | - | ● | - | - | - | - | - | - |
| Insulation Resistance Tester | DG34/35 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DG34a/35a/36a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DG6/7/8/9/10 | ○ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DG251 DG525 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - |
| | DM1008S | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - | - |
| | DM1528S | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - | - |
| | DM5218S | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - | ● |
| | DM508S PDM508S | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - | ● |
| | PDM1529S | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - | - |
| | PDM5219S | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - | ● |
| | HG561H | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | M53 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - |
| | MG1000 | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - | - | - |
| | MG500/125 | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - | - | - | ● |
| Analog Multitester | AP33 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | AU-31/32 | - | - | - | - | - | - | ○ | - | - | - | ● | ● | - | - | - | - | - | - |
| | CP-7D | - | - | - | - | - | - | - | - | - | ○ | - | - | - | - | - | - | - | - |
| | CX506a | - | ○ | ● | ● | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | EM7000 | - | ○ | ● | ● | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | SH-88TR | - | - | - | - | - | - | ○ | - | - | - | ● | ● | - | - | - | - | - | - |
| | SP-18D | - | - | - | - | - | - | - | TL-61Tc | - | - | - | - | - | - | - | - | - | - |
| | SP20 | - | - | - | - | - | - | ○ | - | - | - | ● | ● | - | - | - | - | - | ● |
| | SP21 | - | ○ | ● | ● | ● | - | - | - | - | - | - | - | - | - | - | - | - | ● |
| | TA55 | - | - | - | - | - | - | - | - | - | - | ○ | ● | - | - | - | - | - | ● |
| | VS-100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ○ | - | - |
| | YX360TRF | - | - | - | - | - | - | - | TL-61Tb | - | - | - | - | - | - | - | - | - | - |
| | YX-361TR | - | - | - | - | - | - | ○ | - | - | - | ● | ● | - | - | - | - | - | - |

● Optional ○ Standard



# Accessory mapping

| Model | Model | CLIP ADAPTER | | | | | | | CLIP LEAD | hFE CONNECTOR | MEASUREMENT PROBE | HIGH VOLTAGE PROBE | CLAMP SENSOR | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CL-11 | CL-13a | CL-15a | CL-16 | CL-DG3a | TL-8IC | CL-506a | CL-561 | | TL-561 | | CL140 | CL124 | CL33DC | CL-22AD | CL-20D | CL3000 |
| Digital Multimeter | CD731a | ● | ● | ● | - | ● | ● | - | - | - | - | HV-60 | ● | ● | ● | ● | ● | ● |
| | CD770 | ● | ● | ● | - | ● | ● | - | - | - | - | HV-60 | - | - | ● | ● | ● | ● |
| | CD771 | ● | ● | ● | - | ● | ● | - | - | - | - | HV-60 | - | - | ● | ● | ● | ● |
| | CD772 | ● | ● | ● | - | ● | ● | - | - | - | - | HV-60 | - | - | ● | ● | ● | ● |
| | CD800a | ● | - | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DA-50C | ● | - | ● | - | ● | ● | - | - | - | - | - | - | - | ● | ● | ● | - |
| | PC20 | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | ● | ● | ● | ● |
| | PC500a | ● | ● | ● | - | ● | ● | - | - | - | - | - | ● | ● | ● | ● | ● | - |
| | PC5000a | ● | ○ | ● | - | ● | ● | - | - | - | - | - | ● | ● | ● | ● | ● | - |
| | PC510a | ● | ● | ● | - | ● | ● | - | - | - | - | - | ● | ● | ● | ● | ● | - |
| | PC520M | △ | ○ | △ | - | △ | △ | - | - | - | - | - | ● | ● | ● | ● | ● | - |
| | PC700 | ● | ● | ● | - | ● | ● | - | - | - | - | - | ● | ● | ● | ● | ● | ● |
| | PC7000 | ● | ● | ● | - | ● | ● | - | - | - | - | - | ● | ● | ● | ● | ● | ● |
| | PC710 | ● | ● | ● | - | ● | ● | - | - | - | - | - | ● | ● | ● | ● | ● | ● |
| | PC720M | ● | ● | ● | - | ● | ● | - | - | - | - | - | ● | ● | ● | ● | ● | ● |
| | PC773 | ● | ● | ● | - | ● | ● | - | - | - | - | - | ● | ● | ● | ● | ● | ● |
| | PM3 | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PM33a | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | PM7a/PS8a | ● | - | ● | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PM11 | - | - | ● | - | ● | - | - | - | - | - | - | - | - | - | - | - | - |
| | RD700/701 | ● | ● | ● | - | ● | ● | - | - | - | - | HV-60 | ● | ● | ● | ● | ● | ● |
| Clamp Meter | CAM600S | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DCL10/20R/30DR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCL1000 DCL1200R | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DCL3000R | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM-22AD | ● | - | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DCM2000 | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DCM2000AD DCM2000R | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DCM2000DR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM400/AD | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DCM60L | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DCM600DR | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DCM660R | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DLC-330L | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DLC-400A | ● | - | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DLC460F | ● | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| Insulation Resistance Tester | DG34/35 | - | ● | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DG34a/35a/36a | - | ● | ● | - | ○ | ● | - | - | - | - | - | - | - | - | - | - | - |
| | DG6/7/8/9/10 | - | ● | ○ | - | ● | - | - | - | - | - | - | - | - | - | - | - | - |
| | DG251 DG525 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DM1008S | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DM1528S | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DM5218S | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DM508S PDM508S | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | HG561H | - | - | - | - | - | - | - | - | ○ | - | ○ | - | - | - | - | - | - |
| | PDM1529S | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PDM5219S | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | M53 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | MG1000 | - | - | - | ● | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | MG500/125 | - | - | - | ● | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Analog Multitester | AP33 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | AU-31/32 | ● | - | ● | - | ● | ● | - | - | - | - | HV-50 | - | - | - | - | - | - |
| | CP-7D | ● | - | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | CX506a | ● | ● | ● | - | ● | ● | ○ | - | - | - | HV-60 | - | - | - | - | - | - |
| | EM7000 | ● | ● | ● | - | ● | ● | - | - | - | - | HV-60 | - | - | - | - | - | - |
| | SH-88TR | ● | - | ● | - | ● | ● | - | - | HFE-6T | - | HV-10 | - | - | - | - | - | - |
| | SP-18D | ● | - | ● | - | ● | ● | - | - | - | - | - | - | - | - | - | - | - |
| | SP20 | ● | - | ● | - | ● | ● | - | - | - | - | HV-10 | - | - | - | - | - | - |
| | SP21 | ● | ● | ● | - | ● | ● | - | - | - | - | HV-20 | - | - | - | - | - | - |
| | TA55 | ● | - | ● | - | ● | ● | - | - | - | - | - | - | - | ● | - | - | - |
| | VS-100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | YX360TRF | ● | - | ● | - | ● | ● | - | - | HFE-6T | - | HV-10T | - | - | - | - | - | - |
| | YX-361TR | ● | - | ● | - | ● | ● | - | - | HFE-6T | - | HV-10 | - | - | - | - | - | - |

● Optional ○ Standard △ Only with TL-21a/TL-21M/TL-23a/TL-25a

# Accessory mapping

| Model | | OPTICAL LINK | | | | | | | | | TEMPERATURE SENSOR | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | KB-USB1 | KB-USB2 | KB-USB2a | KB-USB20 | KB-USB7 | KB-USB773 | KB-RS1 | KB-RS2 | KB-RS2a | T-THP | T-300PC | K-250CD | K-250PC | K-8-250/300/500/650/800 |
| Digital Multimeter | CD731a | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | CD770 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | CD771 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | CD772 | - | - | - | - | - | - | - | - | - | - | - | ○ | - | ● |
| | CD800a | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DA-50C | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PC20 | ● | - | - | ● | - | - | ● | - | - | - | - | - | - | - |
| | PC500a | - | - | ● | - | - | - | - | - | ● | - | ● | - | - | - |
| | PC5000a | - | - | ● | - | - | - | - | - | ● | - | ● | - | - | - |
| | PC510a | - | - | ● | - | - | - | - | - | ● | - | ● | - | ○ | ● |
| | PC520M | - | ● | - | - | - | - | - | ● | - | - | ● | - | ○ | ● |
| | PC700 | - | - | - | - | ● | - | - | - | - | - | ● | - | - | - |
| | PC7000 | - | - | - | - | ● | - | - | - | - | - | ● | - | ○ | ● |
| | PC710 | - | - | - | - | ● | - | - | - | - | - | ● | - | ○ | ● |
| | PC720M | - | - | - | - | ● | - | - | - | - | - | ● | - | ○ | ● |
| | PC773 | - | - | - | - | - | ● | - | - | - | - | - | - | - | - |
| | PM3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PM33a | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PM7a/PS8a | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PM11 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | RD700/701 | - | - | - | - | - | - | - | - | - | - | - | - | ○ | ● |
| Clamp Meter | CAM600S | - | - | - | - | - | - | - | - | - | ● | - | - | - | - |
| | DCL1020R/30DR | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCL1000 DCL1200R | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCL3000R | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM-22AD | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM2000AD DCM2000R | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM2000DR | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM400/AD | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM60L | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM600DR | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DCM660R | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DLC-330L | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DLC-400A | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DLC460F | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Insulation Resistance Tester | DG34/35 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DG34a/35a/36a | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DG6/7/8/9/10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DG251 DG525 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DM1008S | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DM1528S | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DM5218S | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | DM508S PDM508S | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PDM1529S | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PDM5219S | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | HG561H | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | M53 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | MG1000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | MG500/125 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Analog Multitester | AP33 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | AU-31/32 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | CP-7D | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | CX506a | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | EM7000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | SH-88TR | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | SP-18D | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | SP20 | - | - | - | - | - | - | - | - | - | ● | - | - | - | - |
| | SP21 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TA55 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | VS-100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | YX360TRF | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | YX-361TR | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

● Optional ○ Standard

# Clamp Meter comparative chart

| Display Type | AC | AC | AC | AC | AC | AC | AC | AC |
|---|---|---|---|---|---|---|---|---|
| Model | DCL1200R | DCL1000 | DCL20R | DCL10 | DCL3000R (New) | DCM660R | DCM60L | DCM400 |
| Digit | 4000 | 4000 | 6000 | 6000 | 3150 | 6600 | 1999 | 4000 |
| Category | CAT.III 600V | CAT.III 600V | CAT.III300V | CAT.III300V | CAT.Ⅳ 600V | CAT.III 600V | CAT.III300V | CAT.III300V |
| CE | ● | ● | ● | ● | ● | ● | ● | ● |
| Clamp diameter (mm) | 42 | 42 | 25 | 25 | 150 | 30 | 21 | 25 |
| Range | A/M | A/M | A | A | M | A | A | A |
| DCA (A) | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| ACA (A) | 400 | 400 | 60 | 60 | 30 | 66 | 200 | 40 |
| | 1200 | 1000 | 300 | 300 | 300 | 600 | 600 | 400 |
| | - | - | - | - | 3000 | - | - | - |
| | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| DCV (V) | 6 | 400m | - | - | - | 600 | - | 400 |
| | 60 | 4 | - | - | - | - | - | 600 |
| | 600 | 40 | - | - | - | - | - | - |
| | - | 400 | - | - | - | - | - | - |
| | - | 600 | - | - | - | - | - | - |
| ACV (V) | 6 | 400m | - | - | - | 600 | 200 | 400 |
| | 60 | 4 | - | - | - | - | 600 | 600 |
| | 600 | 40 | - | - | - | - | - | - |
| | - | 400 | - | - | - | - | - | - |
| | - | 600 | - | - | - | - | - | - |
| Resistance (Ω) | 6k | 400 | - | - | - | 660 | 200 | 400 |
| | 60k | 4k | - | - | - | - | - | - |
| | 600k | 40k | - | - | - | - | - | - |
| | 6M | 400k | - | - | - | - | - | - |
| | - | 4M | - | - | - | - | - | - |
| | - | 40M | - | - | - | - | - | - |
| Frequency (Hz) | 9.999 | - | - | - | - | 660～6.6k (when clamping) | - | 20～4k (when clamping) |
| | 99.99 | - | - | - | - | 30k (when clamping) | - | 10k (when clamping) |
| | 999.9 | - | - | - | - | 660 | - | 4k |
| | 9.999k | - | - | - | - | 6.6k | - | 40k |
| | 30.00k | - | - | - | - | 66k | - | 400k |
| | - | - | - | - | - | 100k | - | 1M |
| Backlight | ● | - | ● | ● | ● | ● | - | - |
| True RMS | ● | - | ● | - | ● | ● | - | - |
| Auto power save | ● | ● | ● | ● | ● | ● | - | ● |
| Peak hold | - | - | - | - | - | INRUSH | - | - |
| Data hold | ● | ● | ● | ● | ● | ● | ● | ● |
| Range hold | ● | - | - | - | - | - | - | - |
| EF (NCV) | ● | - | - | - | - | - | - | - |
| LPF | - | - | - | - | - | - | - | - |
| Bargraph | - | - | - | - | - | - | - | ● |
| Continuity | BUZZER | BUZZER | BUZZER | BUZZER | - | BUZZER | BUZZER | BUZZER |
| Dimension (H) mm | 238 | 238 | 145 | 145 | 120 | 208 | 187 | 193 |
| Dimension (W) mm | 95 | 95 | 54 | 54 | 70 | 69 | 50 | 50 |
| Dimension (D) mm | 45 | 45 | 28 | 28 | 26 | 38 | 29 | 28 |
| Mass (g) | 290 | 290 | 120 | 120 | 300 | 265 | 210 | 230 |

# Clamp Meter comparative chart

| Display Type | AC (Analog) | DC/AC | DC/AC | DC/AC | DC/AC | DC/AC | DC/AC | LEAK |
|---|---|---|---|---|---|---|---|---|
| Model | CAM600S | DCM600DR | DCM400AD | DCM-22AD | DCM2000AD (New) | DCM2000DR | DCL30DR | DLC460F |
| Digit | - | 6000 | 4000 | 1999 | 4000 | 6000 | 6000 | 6000/9999 |
| Category | CAT.III600V | CAT.III600V | CAT.III300V | - | CAT.III 600V | CAT.Ⅳ 1000V | CAT.III300V | CAT.III600V |
| CE | - | ● | ● | - | - | ● | ● | ● |
| Clamp diameter (mm) | 36 | 30 | 25 | 22 | 53 | 55 | 24.5 | 35 |
| Range | M | A | A | M | M | A/M | A | A |
| DCA (A) | - | 60 | 40 | 20 | 40 | 200 | 60 | - |
| | - | 600 | 400 | 200 | 400 | 2000 | 400 | - |
| | - | - | - | - | 2000 | - | - | - |
| ACA (A) | 6 | 60 | 40 | 2 | 40 | 200 | 60 | 60m |
| | 15 | 600 | 400 | 20 | 400 | 2000 | 400 | 600m |
| | 60 | - | - | - | 2000 | - | - | 60 |
| | 150 | - | - | - | - | - | - | 400 |
| | 600 | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| DCV (V) | 60 | 600 | 400 | 2 | 400m | 6 | - | 600 |
| | - | - | 600 | 20 | 4 | 60 | - | - |
| | - | - | - | 200 | 40 | 600 | - | - |
| | - | - | - | 500 | 400 | 1000 | - | - |
| | - | - | - | - | 600 | - | - | - |
| ACV (V) | 150 | 600 | 400 | 2 | 400m | 6 | - | 600 |
| | 300 | - | 600 | 20 | 4 | 60 | - | - |
| | 600 | - | - | 200 | 40 | 600 | - | - |
| | - | - | - | 500 | 400 | 1000 | - | - |
| | - | - | - | - | 600 | - | - | - |
| Resistance (Ω) | 1k | 999.9 | 400 | 2k | 400 | 600 | - | 999.9 |
| | 100k | - | - | 20k | 4k | 6k | - | - |
| | - | - | - | 200k | 40k | 60k | - | - |
| | - | - | - | 2000k | 400k | 600k | - | - |
| | - | - | - | - | 4000k | 60M | - | - |
| | - | - | - | - | 40M | 40M | - | - |
| Frequency (Hz) | - | - | - | - | 100 | 10～1999 | - | - |
| | - | - | - | - | 1k | - | - | - |
| | - | - | - | - | 10k | - | - | - |
| | - | - | - | - | 100k | - | - | - |
| | - | - | - | - | 1000k | - | - | - |
| | - | - | - | - | - | - | - | - |
| Backlight | - | ● | - | - | - | ● | ● | ● |
| True RMS | - | ● | - | - | - | ● | ● | - |
| Auto power save | - | ● | ● | - | ● | ● | ● | ● |
| Peak hold | - | ● | - | - | - | ● | ● | - |
| Data hold | POINTER LOCK | ● | ● | ● | ● | ● | ● | ● |
| Range hold | - | - | ● | - | ● | ● | - | - |
| EF (NCV) | - | - | - | - | - | - | - | - |
| LPF | - | - | - | - | - | ● | - | ● |
| Bargraph | - | - | ● | - | - | - | - | - |
| Continuity | - | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER | - | BUZZER |
| Dimension (H) mm | 221 | 208 | 193 | 179 | 240 | 264 | 145 | 206 |
| Dimension (W) mm | 97 | 69 | 50 | 56 | 84 | 97 | 54 | 83 |
| Dimension (D) mm | 43 | 38 | 28 | 26.5 | 34 | 43 | 28 | 38 |
| Mass (g) | 420 | 260 | 230 | 140 | 400 | 640 | 120 | 320 |

True RMS

# Insulation Resistance Tester comparative chart

| Display Type | DIGITAL | | | | |
|---|---|---|---|---|---|
| Model | DG6 | DG7 | DG8 | DG9 | DG10 |
| Category | - | - | - | - | - |
| CE | - | - | - | - | - |
| Test voltage range | 2 | 2 | 2 | 2 | 2 |
| Insulation resistance (Test voltage / Maximum scale value) | 25V/4MΩ 40MΩ | 50V/4MΩ 40MΩ | 50V/4MΩ 40MΩ | 125V/40MΩ 400MΩ | 500V/40MΩ 400MΩ |
| | 15V/4MΩ 40MΩ | 25V/4MΩ 40MΩ | 15V/4MΩ 40MΩ | 50V/4MΩ 40MΩ | 125V/4MΩ 40MΩ |
| ACV (V) | - | - | - | - | - |
| DCV (V) | - | - | - | - | - |
| Discharge | - | - | - | - | - |
| Backlight | - | - | - | - | - |
| Inner battery check | - | - | - | - | - |
| Meter structure | - | - | - | - | - |
| Data hold | ● | ● | ● | ● | ● |
| Auto power save | ● | ● | ● | ● | ● |
| Dimension (H) mm | 117 | 117 | 117 | 117 | 117 |
| Dimension (W) mm | 76 | 76 | 76 | 76 | 76 |
| Dimension (D) mm | 18 | 18 | 18 | 18 | 18 |
| Mass (g) | 125 | 125 | 125 | 125 | 125 |

| Display Type | DIGITAL (New) | | | | | | |
|---|---|---|---|---|---|---|---|
| Model | MG1000 | MG500 | M53 | HG561H | DG34a | DG35a | DG36a |
| Category | CAT.III600V | CAT.III600V | - | CAT.III600V | - | - | - |
| CE | ● | ● | - | ● | - | - | - |
| Test voltage range | 3 | 3 | 2 | 7 | 3 | 3 | 3 |
| Insulation resistance (Test voltage / Maximum scale value) | 1000V/4000MΩ | 500V/4000MΩ | 500V/200MΩ | 15V/25V/50V/12MΩ | 500V/400MΩ | 500V/40MΩ | 250V/40MΩ |
| | 500V/4000MΩ | 250V/4000MΩ | 15V/20MΩ | 100V/125V/250V/500V/110MΩ | 250V/400MΩ | 250V/40MΩ | 125V/40MΩ |
| | 250V/4000MΩ | 125V/4000MΩ | | | 125V/400MΩ | 125V/40MΩ | 50V/40MΩ |
| ACV (V) | 600 | 600 | 750 | 600 | 600 | 600 | 600 |
| Registance | 40/4000 | 40/4000 | - | 999.9/99.99k/999.9k | - | - | - |
| Discharge | ● | ● | - | ● | - | - | - |
| Backlight | ● | ● | - | ● | ● EL | ● EL | ● EL |
| Inner battery check | ● | ● | - | ● | - | - | - |
| Data hold | ● | ● | - | ● | ● EL | ● EL | ● EL |
| Auto power save | ● | ● | ● | ● | - | - | - |
| Dimension (H) mm | 170 | 170 | 175 | 139 | 130 | 130 | 130 |
| Dimension (W) mm | 142 | 142 | 115 | 91 | 75 | 75 | 75 |
| Dimension (D) mm | 57 | 57 | 55 | 29 | 19.9 | 19.9 | 19.9 |
| Mass (g) | 600 | 600 | 600 | 230 | 160 | 160 | 160 |

| Display Type | ANALOG | | | | | | |
|---|---|---|---|---|---|---|---|
| Model | PDM1529S | PDM5219S | DM1528S | DM5218S | DM1008S | DM508S | PDM508S |
| Category | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V |
| CE | ● | ● | ● | ● | - | - | - |
| Test voltage range | 3 | 3 | 3 | 3 | 1 | 1 | 1 |
| Insulation resistance (Test voltage / Maximum scale value) | 1000V/2000MΩ | 500V/100MΩ | 1000V/2000MΩ | 500V/1000MΩ | 1000V/2000MΩ | 500V/1000MΩ | 500V/100MΩ |
| | 500V/100MΩ | 250V/100MΩ | 500V/1000MΩ | 250V/500MΩ | - | - | - |
| | 250V/100MΩ | 125V/100MΩ | 250V/500MΩ | 125V/200MΩ | - | - | - |
| ACV (V) | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| DCV (V) | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| Discharge | ● | ● | ● | ● | ● | ● | ● |
| Backlight | - | - | - | - | - | - | - |
| Inner battery check | ● | ● | ● | ● | ● | ● | ● |
| Meter structure | BAND | BAND | BAND | BAND | BAND | BAND | BAND |
| Data hold | - | - | - | - | - | - | - |
| Auto power save | - | - | - | - | - | - | - |
| Dimension (H) mm | 144 | 144 | 144 | 144 | 144 | 144 | 144 |
| Dimension (W) mm | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| Dimension (D) mm | 43 | 43 | 43 | 43 | 43 | 43 | 43 |
| Mass (g) | 310 | 310 | 310 | 310 | 310 | 310 | 310 |

# Digital Multimeter comparative chart

| Model | PC7000 | PC720M | PC710 | PC700 | PC5000a | PC520M | PC510a |
|---|---|---|---|---|---|---|---|
| Digit | 50000/500000 | 9999/6000 | 9999/6000 | 9999/6000 | 50000/500000 | 5000 | 5000 |
| Category | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V |
| CE | ● | ● | ● | ● | - | - | - |
| Range | A/M | A/M | A/M | A/M | A/M | A/M | A/M |
| DCV (V) | 500m | 60m | 60m | 60m | 500m | 50m | 50m |
| | 5 | 600m | 600m | 600m | 5 | 500m | 500m |
| | 50 | 9.999 | 9.999 | 9.999 | 50 | 5 | 5 |
| | 500 | 99.99 | 99.99 | 99.99 | 500 | 50 | 50 |
| | 1000 | 999.9 | 999.9 | 999.9 | 1000 | 500 | 500 |
| | - | - | - | - | - | 1000 | 1000 |
| ACV (V) | 500m | 60m | 60m | 60m | 500m | 50m | 50m |
| | 5 | 600m | 600m | 600m | 5 | 500m | 500m |
| | 50 | 9.999 | 9.999 | 9.999 | 50 | 5 | 5 |
| | 500 | 99.99 | 99.99 | 99.99 | 500 | 50 | 50 |
| | 1000 | 999.9 | 999.9 | 999.9 | 1000 | 500 | 500 |
| | - | - | - | - | - | 1000 | 1000 |
| DCA (A) | 500μ | 600μ | 600μ | 600μ | 500μ | 500μ | 500μ |
| | 5000μ | 6000μ | 6000μ | 6000μ | 5000μ | 5000μ | 5000μ |
| | 50m | 60m | 60m | 60m | 50m | 50m | 50m |
| | 500m | 600m | 600m | 600m | 500m | 500m | 500m |
| | 5 | 6 | 6 | 6 | 5 | 5 | 5 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| ACA (A) | 500μ | 600μ | 600μ | 600μ | 500μ | 500μ | 500μ |
| | 5000μ | 6000μ | 6000μ | 6000μ | 5000μ | 5000μ | 5000μ |
| | 50m | 60m | 60m | 60m | 50m | 50m | 50m |
| | 500m | 600m | 600m | 600m | 500m | 500m | 500m |
| | 5 | 6 | 6 | 6 | 5 | 5 | 5 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Resistance (Ω) | 500 | 600 | 600 | 600 | 500 | 50 | 50 |
| | 5k | 6k | 6k | 6k | 5k | 500 | 500 |
| | 50k | 60k | 60k | 60k | 50k | 5k | 5k |
| | 500k | 600k | 600k | 600k | 500k | 50k | 50k |
| | 5M | 6M | 6M | 6M | 5M | 500k | 500k |
| | 50M | 60M | 60M | 60M | 50M | 5M | 5M |
| | - | - | - | - | - | 50M | 50M |
| Capacitance (F) | 50n | 60n | 60n | 60n | 50n | 50n | 50n |
| | 500n | 600n | 600n | 600n | 500n | 500n | 500n |
| | 5μ | 6μ | 6μ | 6μ | 5μ | 5μ | 5μ |
| | 50μ | 60μ | 60μ | 60μ | 50μ | 50μ | 50μ |
| | 500μ | 600μ | 600μ | 600μ | 500μ | 500μ | 500μ |
| | 5m | 6m | 6m | 6m | 9999μ | 9999μ | 9999μ |
| | 25m | 25m | 25m | 25m | - | - | - |
| Temperature (°c) min | -50 | -50 | -50 | ○ | ○ | -50 | -50 |
| Temperature (°c) max | 1000 | 1000 | 1000 | ○ | ○ | 1000 | 1000 |
| Frequency (Hz) min | 10 | 15 | 15 | 15 | 10 | 10 | 10 |
| Frequency (Hz) max | 200k | 50k | 50k | 50k | 200k | 125k | 125k |
| Logic frequency (Hz) min | 5 | 5 | 5 | 5 | 5 | - | - |
| Logic frequency (Hz) max | 2M | 1M | 1M | 1M | 2M | - | - |
| Continuity | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER |
| Diode test | ● | ● | ● | ● | ● | ● | ● |
| Duty cycle | ● | ● | ● | ● | ● | - | - |
| dBm | ● | - | - | - | - | - | - |
| Conductance | ● | ● | ● | - | - | - | - |
| Auto power save | ● | ● | ● | ● | ● | ● | ● |
| Battery check | - | - | - | - | - | - | - |
| Data hold | ● | ● | ● | ● | ● | ● | ● |
| Range hold | ● | ● | ● | ● | ● | ● | ● |
| Peak hold | ● | ● | ● | - | ● | - | ● |
| Relative value | ● | ● | ● | ● | ● | - | ● |
| 4—20mA% | ● | - | - | - | ● | - | - |
| True RMS (AC+DC) | - | - | - | - | ● | - | - |
| True RMS (AC) | ● | ● | ● | - | ● | ● | ● |
| Auto zero adjust | - | - | - | - | - | ● | ● |
| Bargraph | ● | ● | ● | ● | ● | ● | ZOOM |
| Max/Min | ● | ● | ● | - | ● | - | - |
| Backlight | ● | ● | ● | ● | - | - | - |
| PC link | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Dimension (H) mm | 184 | 184 | 184 | 184 | 179 | 179 | 179 |
| Dimension (W) mm | 86 | 86 | 86 | 86 | 87 | 87 | 87 |
| Dimension (D) mm | 52 | 52 | 52 | 52 | 55 | 55 | 55 |
| Mass (g) | 430 | 430 | 430 | 430 | 460 | 460 | 460 |

○ Optional accessory is necessary.



# Digital Multimeter comparative chart

| Model | PC500a | PC773 | PC20 | CD770 | CD771 | CD772 | CD751 |
|---|---|---|---|---|---|---|---|
| Digit | 5000 | 11000 | 4000 | 4000 | 4000 | 4000 | 3200 |
| Category | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V |
| CE | - | ● | - | - | ● | ● | - |
| Range | A/M | A/M | A/M | A/M | A/M | A/M | A/M |
| DCV (V) | 50m | 110m | 400m | 400m | 400m | 400m | 320m |
| | 500m | 1.1 | 4 | 4 | 4 | 4 | 3.2 |
| | 5 | 11 | 40 | 40 | 40 | 40 | 32 |
| | 50 | 110 | 400 | 400 | 400 | 400 | 320 |
| | 500 | 1000 | 1000 | 600 | 1000 | 1000 | 1000 |
| | 1000 | - | - | - | - | - | - |
| ACV (V) | 50m | 110m | 4 | 4 | 4 | 4 | 3.2 |
| | 500m | 1.1 | 40 | 40 | 40 | 40 | 32 |
| | 5 | 11 | 400 | 400 | 400 | 400 | 320 |
| | 50 | 110 | 750 | 600 | 1000 | 1000 | 750 |
| | 500 | 1000 | - | - | - | - | - |
| | 1000 | - | - | - | - | - | - |
| DCA (A) | 500μ | 110μ | 400μ | 400μ | 400μ | 400μ | 32μ |
| | 5000μ | 1100μ | 4000μ | 4000μ | 4000μ | 4000μ | 320μ |
| | 50m | 11m | 40m | 40m | 40m | 40m | 3200μ |
| | 500m | 110m | 400m | 400m | 400m | 400m | 32m |
| | 5 | 11 | 4 | - | 4 | 4 | 320m |
| | 10 | - | 10 | - | 10 | 15 | 20 |
| ACA (A) | 500μ | 110μ | 400μ | 400μ | 400μ | 400μ | 32μ |
| | 5000μ | 1100μ | 4000μ | 4000μ | 4000μ | 4000μ | 320μ |
| | 50m | 11m | 40m | 40m | 40m | 40m | 3200μ |
| | 500m | 110m | 400m | 400m | 400m | 400m | 32m |
| | 5 | 11 | 4 | - | 4 | 4 | 320m |
| | 10 | - | 10 | - | 10 | 15 | 20 |
| Resistance (Ω) | 50 | 110 | 400 | 400 | 400 | 400 | 320 |
| | 500 | 1.1k | 4k | 4k | 4k | 4k | 3.2k |
| | 5k | 11k | 40k | 40k | 40k | 40k | 32k |
| | 50k | 110k | 400k | 400k | 400k | 400k | 320k |
| | 500k | 1.1M | 4M | 4M | 4M | 4M | 3.2M |
| | 5M | 11M | 40M | 40M | 40M | 40M | 30M |
| | 50M | 110M | - | - | - | - | - |
| Capacitance (F) | 50n | 11n | 50n | 50n | 50n | 50n | - |
| | 500n | 110n | 500n | 500n | 500n | 500n | - |
| | 5μ | 1.1μ | 5μ | 5μ | 5μ | 5μ | - |
| | 50μ | 11μ | 50μ | 50μ | 50μ | 50μ | - |
| | 500μ | 110μ | 100μ | 100μ | 100μ | 100μ | - |
| | 9999μ | 1.1m | - | - | - | - | - |
| | - | 11m/110m | - | - | - | - | - |
| Temperature (°c) min | ○ | ○ | ○ | - | - | -20 | - |
| Temperature (°c) max | ○ | ○ | ○ | - | - | 300 | - |
| Frequency (Hz) min | 10 | 11.1 | - | 1 | 1 | 1 | - |
| Frequency (Hz) max | 125k | 1.1M | - | 100k | 100k | 100k | - |
| Logic frequency (Hz) min | - | - | - | - | - | - | - |
| Logic frequency (Hz) max | - | - | - | - | - | - | - |
| Continuity | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER |
| Diode test | ● | ● | ● | ● | ● | ● | ● |
| Duty cycle | - | - | - | - | - | - | - |
| dBm | - | - | - | - | - | - | - |
| Conductance | - | - | - | - | - | - | - |
| Auto power save | ● | ● | - | ● | ● | ● | ● |
| Battery check | - | - | - | - | ● | - | - |
| Data hold | ● | ● | ● | ● | ● | ● | ● |
| Range hold | ● | ● | ● | ● | ● | ● | ● |
| Peak hold | - | - | - | - | - | - | - |
| Relative value | - | ● | - | - | ● | ● | - |
| 4—20mA% | - | - | - | - | - | - | - |
| True RMS (AC+DC) | - | - | - | - | - | - | ● |
| True RMS (AC) | - | ● | - | - | - | ● | - |
| Auto zero adjust | ● | - | - | - | - | - | - |
| Bargraph | ● | - | - | - | - | - | ● |
| Max/Min | - | - | - | - | - | - | - |
| Backlight | - | ● | - | - | ● | ● | - |
| PC link | ○ | ○ | ○ | - | - | - | - |
| Dimension (H) mm | 179 | 166 | 167 | 166 | 166 | 166 | 165.5 |
| Dimension (W) mm | 87 | 82 | 90 | 82 | 82 | 92 | 78 |
| Dimension (D) mm | 55 | 44 | 48 | 44 | 44 | 44 | 41.5 |
| Mass (g) | 460 | 360 | 330 | 340 | 360 | 360 | 315 |

# Digital Multimeter comparative chart

| Model | CD731 | CD731a | CD721 | RD700 / 701 | CD750P | CD800a |
|---|---|---|---|---|---|---|
| Digit | 3200 | 4000 | 3200 | 4000 | 4000 | 4000 |
| Category | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III600V | CAT.III 600V | CAT.III600V |
| CE | - | - | - | - | - | - |
| Range | A/M | A/M | A/M | A/M | A | A/M |
| DCV (V) | 320m | 400m | 320m | 400m | 400m | 400m |
| | 3.2 | 4 | 3.2 | 4 | 4 | 4 |
| | 32 | 40 | 32 | 40 | 40 | 40 |
| | 320 | 400 | 320 | 400 | 400 | 400 |
| | 1000 | 1000 | 1000 | 1000 | 1000 | 600 |
| | - | - | - | - | - | - |
| ACV (V) | 3.2 | 4 | 3.2 | 400m | 4 | 4 |
| | 32 | 40 | 32 | 4 | 40 | 40 |
| | 320 | 400 | 320 | 40 | 400 | 400 |
| | 750 | 750 | 750 | 400 | 750 | 600 |
| | - | - | - | 1000 | - | - |
| | - | - | - | - | - | - |
| DCA (A) | 32μ | 400μ | 32m | 400μ | - | 40m |
| | 320μ | 4000μ | 320m | 4000μ | - | 400m |
| | 3200μ | 40m | 12 | 40m | - | - |
| | 32m | 400m | - | 400m | - | - |
| | 320m | 4 | - | 4 | - | - |
| | 20 | 20 | - | 10 | - | - |
| ACA (A) | 32μ | 400μ | 32m | 400μ | - | 40m |
| | 320μ | 4000μ | 320m | 4000μ | - | 400m |
| | 3200μ | 40m | 12 | 40m | - | - |
| | 32m | 400m | - | 400m | - | - |
| | 320m | 4 | - | 4 | - | - |
| | 20 | 20 | - | 10 | - | - |
| Resistance (Ω) | 320 | 400 | 320 | 400 | 400 | 400 |
| | 3.2k | 4k | 3.2k | 4k | 4k | 4k |
| | 32k | 40k | 32k | 40k | 40k | 40k |
| | 320k | 400k | 320k | 400k | 4M | 400k |
| | 3.2M | 4M | 3.2M | 4M | 40M | 4M |
| | 30M | 40M | 30M | 40M | - | 40M |
| | - | - | - | - | - | - |
| Capacitance (F) | - | 40n | - | 500n | - | 50n |
| | - | 400n | - | 5μ | - | 500n |
| | - | 4μ | - | 50μ | - | 5μ |
| | - | 40μ | - | 500μ | - | 50μ |
| | - | 100μ | - | 3000μ | - | 100μ |
| | - | - | - | - | - | - |
| | - | - | - | - | - | - |
| Temperature (˚c) min | - | - | - | -20 | - | - |
| Temperature (˚c) max | - | - | - | 300 | - | - |
| Frequency (Hz) min | - | - | - | 10 | - | 1 |
| Frequency (Hz) max | - | - | - | 1M | - | 100k |
| Logic frequency (Hz) min | - | - | - | - | - | - |
| Logic frequency (Hz) max | - | - | - | - | - | - |
| Continuity | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER |
| Diode test | ● | ● | ● | ● | ● | ● |
| Duty cycle | - | - | - | - | - | ● |
| dBm | - | - | - | - | - | - |
| Conductance | - | - | - | - | - | - |
| Auto power save | ● | ● | ● | ● | ● | ● |
| Battery check | - | - | 1.5V | - | - | - |
| Data hold | ● | ● | ● | ● | ● | ● |
| Range hold | ● | ● | ● | ● | ● | ● |
| Peak hold | - | - | - | - | - | - |
| Relative value | - | - | - | ● | - | ● |
| 4—20mA% | - | - | - | - | - | - |
| True RMS (AC+DC) | - | - | - | - | - | - |
| True RMS (AC) | - | - | - | RD701 Only | - | - |
| Auto zero adjust | - | - | - | - | ● | - |
| Bargraph | ● | - | ● | - | - | - |
| Max/Min | - | - | - | - | - | - |
| Backlight | - | - | - | - | - | - |
| PC link | - | - | - | - | - | - |
| Dimension (H) mm | 165.5 | 167 | 165.5 | 179 | 157.5 | 176 |
| Dimension (W) mm | 78 | 90 | 78 | 87 | 70 | 104 |
| Dimension (D) mm | 41.5 | 48 | 41.5 | 55 | 38.5 | 46 |
| Mass (g) | 315 | 315 | 315 | 460 | 220 | 340 |

# Digital Multimeter comparative chart

| Model | DA-50C | PM11 | PM10 | PM3 | PM7a/PS8a | PM33/PM33a |
|---|---|---|---|---|---|---|
| Digit | 4000 | 4000 | 3200 | 4000 | 4000 | 6600 |
| Category | - | CAT. III300V | CAT.III300V | CAT.II500V | - | CAT.II600V |
| CE | - | ● | - | ● | - | ● |
| Range | A/M | A | A | A | A/M | A |
| DCV (V) | 400m | 400m | 320m | 400m | 400m | 660m |
| | 4 | 4 | 3.2 | 4 | 4 | 6.6 |
| | 40 | 40 | 32 | 40 | 40 | 66 |
| | 400 | 400 | 320 | 400 | 400 | 660 |
| | 600 | 500 | 500 | 500 | 500 | - |
| | - | - | - | - | - | - |
| ACV (V) | 400m | 4 | 3.2 | 4 | 4 | 660m |
| | 4 | 40 | 32 | 40 | 40 | 6.6 |
| | 40 | 400 | 320 | 400 | 400 | 66 |
| | 400 | 500 | 500 | 500 | 500 | 660 |
| | 600 | - | - | - | - | - |
| | - | - | - | - | - | - |
| DCA (A) | 40m | - | - | - | - | 100A |
| | 10 | - | - | - | - | - |
| | - | - | - | - | - | - |
| | - | - | - | - | - | - |
| | - | - | - | - | - | - |
| | - | - | - | - | - | - |
| ACA (A) | 40m | - | - | - | - | 100A |
| | 10 | - | - | - | - | - |
| | - | - | - | - | - | - |
| | - | - | - | - | - | - |
| | - | - | - | - | - | - |
| | - | - | - | - | - | - |
| Resistance (Ω) | 400 | 400 | 320 | 400 | 400 | 660 |
| | 4k | 4k | 3.2k | 4k | 4k | 6.6k |
| | 40k | 40k | 32k | 40k | 40k | 66k |
| | 400k | 400k | 320k | 400k | 400k | 660k |
| | 4000k | 4M | 3.2M | 4M | 4M | 6.6M |
| | 40M | 40M | 30M | 40M | 40M | 66M |
| | - | - | - | - | - | - |
| Capacitance (F) | - | - | - | 5n | - | 6.6n |
| | - | - | - | 50n | - | 66n |
| | - | - | - | 500n | - | 660n |
| | - | - | - | 5μ | - | 6.6μ |
| | - | - | - | 50μ | - | 66μ |
| | - | - | - | 200μ | - | 660μ |
| | - | - | - | - | - | 6.6m/66m |
| Temperature (˚c) min | - | - | - | - | - | - |
| Temperature (˚c) max | - | - | - | - | - | - |
| Frequency (Hz) min | 10 | - | - | 9.999 | - | 20 |
| Frequency (Hz) max | 999.9k | - | - | 60k | - | 66k |
| Logic frequency (Hz) min | - | - | - | - | - | - |
| Logic frequency (Hz) max | - | - | - | - | - | - |
| Continuity | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER | BUZZER |
| Diode test | ● | ● | ● | ● | ● | ● |
| Duty cycle | - | - | - | ● | - | ● |
| dBm | - | - | - | - | - | - |
| Conductance | - | - | - | - | - | - |
| Auto power save | ● | ● | - | ● | ● | ● |
| Battery check | - | - | - | - | - | - |
| Data hold | ● | - | - | ● | - | ● |
| Range hold | ● | - | - | - | ● | ● |
| Peak hold | - | - | - | ● | - | - |
| Relative value | ● | - | - | - | - | ● |
| 4—20mA% | - | - | - | - | - | - |
| True RMS (AC+DC) | - | - | - | - | - | - |
| True RMS (AC) | - | - | - | - | - | - |
| Auto zero adjust | - | - | - | - | - | - |
| Bargraph | ● | ● | ● | - | - | - |
| Max/Min | ● | - | - | - | - | ● |
| Backlight | - | - | - | - | - | - |
| PC link | - | - | - | - | - | - |
| Dimension (H) mm | 145 | 117 | 117 | 108 | 115 | 130 |
| Dimension (W) mm | 82 | 76 | 76 | 56 | 57 | 75 |
| Dimension (D) mm | 30 | 18 | 18 | 11.5 | 18 | 19.9 |
| Mass (g) | 200 | 117 | 110 | 85 | 85 | 160 |

# Analog Multitester comparative chart

| Model | EM7000 | CX506a | YX-361TR | SH-88TR | AU-32 | AU-31 | YX360TRF |
|---|---|---|---|---|---|---|---|
| Category | CAT.III600V | CAT.III600V | - | - | - | - | CAT.III600V |
| CE | - | - | - | - | - | - | - |
| DCV (V) | 0.3 | 120m | 0.1 | 0.12 | 250m | 300m | 0.1 |
| | 1.2 | 3 | 0.5 | 3 | 2.5 | 3 | 0.25 |
| | 3 | 12 | 2.5 | 12 | 10 | 12 | 2.5 |
| | 12 | 30 | 10 | 30 | 50 | 60 | 10 |
| | 30 | 120 | 50 | 120 | 250 | 300 | 50 |
| | 120 | 300 | 250 | 300 | 500 | 1000 | 250 |
| | 300 | 1000 | 1000 | 1200 | - | - | 1000 |
| | 1000 | - | - | - | - | - | - |
| ACV (V) | 3 | 3 | 2.5 | 3 | 250m | 300m | 10 |
| | 12 | 12 | 10 | 12 | 2.5 | 3 | 50 |
| | 30 | 30 | 50 | 30 | 10 | 12 | 250 |
| | 120 | 120 | 250 | 120 | 50 | 60 | 750 |
| | 300 | 300 | 1000 | 300 | 250 | 300 | - |
| | 750 | 750 | - | 1200 | 500 | 1000 | - |
| DCA (A) | 0.12μ | 30μ | 50μ | 50μ | 250μ | 300m | 50μ |
| | 0.3m | 0.3m | 2.5m | 3m | 2.5m | 3 | 2.5m |
| | 3m | 3m | 25m | 30m | 25m | - | 25m |
| | 30m | 30m | 0.25 | 0.3 | 250m | - | 0.25 |
| | 300m | 0.3 | - | - | 2.5 | - | - |
| | 6 | - | - | - | - | - | - |
| ACA (A) | 6 | - | - | - | 250μ | 300m | - |
| | - | - | - | - | 2.5m | 3 | - |
| | - | - | - | - | 25m | - | - |
| | - | - | - | - | 250m | - | - |
| | - | - | - | - | 2.5 | - | - |
| Resistance (Ω) | 2k | 5k | 2k | 3k | 20k | 20k | 2k |
| | 20k | 50k | 20k | 30k | 200k | 200k | 20k |
| | 200k | 500k | 200k | 300k | 2M | 2M | 200k |
| | 2M | 5M | 2M | 3M | 20M | 20M | 2M |
| | 20M | 50M | 20M | 30M | 200M | 200M | 200M |
| | 200M | - | - | - | - | - | - |
| Capacitance (F) | - | 0.2μ | - | 1000μ | - | - | 10μ |
| | - | 20μ | - | 0.01 | - | - | - |
| | - | 2000μ | - | 0.1 | - | - | - |
| | - | - | - | 1 | - | - | - |
| Auto range | - | - | - | - | ● | ● | - |
| Low frequency output measurement | ● | - | ● | ● | ● | ● | ● |
| Continuity | - | - | LED | LED | - | - | - |
| Battery check | - | - | 1.5V | - | - | - | - |
| Auto polarity | - | - | - | - | ● | ● | - |
| Meter structure | BAND | BAND | BAND * | PIVOT | PIVOT | PIVOT | BAND |
| Drop shock proof meter | - | - | - | - | - | - | ● |
| Zero center meter | ● | - | ● | ● | - | - | ● |
| Temperature measurement | - | - | - | - | - | - | - |
| Protection circuit for power line | - | - | - | - | - | - | - |
| hFE | - | ● | ○ | ○ | - | - | ○ |
| Dimension (H) mm | 165 | 165 | 150 | 150 | 48 | 48 | 159.50 |
| Dimension (W) mm | 106 | 106 | 100 | 100 | 110 | 110 | 129 |
| Dimension (D) mm | 46 | 46 | 37 | 36 | 124 | 124 | 41.50 |
| Mass (g) | 375 | 370 | 290 | 280 | 290 | 290 | 320 |

○ Optional accessory is necessary.

* Serial Number ≧ 6064916

# Analog Multitester comparative chart

| Model | SP21 | SP20 | SP-18D | TA55 | CP-7D | AP33 | VS-100 |
|---|---|---|---|---|---|---|---|
| Category | CAT.III600V | - | - | - | - | CAT.III300V | - |
| CE | - | - | - | - | - | - | - |
| DCV (V) | 0.3 | 0.25 | 0.3 | 0.3 | 0.25 | 10 | 10 |
| | 3 | 2.5 | 3 | 3 | 2.5 | 50 | 50 |
| | 12 | 5 | 12 | 16 | 10 | 250 | 250 |
| | 30 | 10 | 30 | 30 | 50 | 500 | 500 |
| | 120 | 50 | 120 | 60 | 250 | - | - |
| | 600 | 100 | 600 | - | 500 | - | - |
| | - | 500 | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| ACV (V) | 12 | 10 | 12 | 30 | 10 | 50 | 10 |
| | 30 | 50 | 30 | 120 | 50 | 250 | 50 |
| | 120 | 250 | 120 | 300 | 250 | 500 | 250 |
| | 300 | 500 | 300 | - | 500 | - | 500 |
| | 600 | - | 600 | - | - | - | - |
| | - | - | - | - | - | - | - |
| DCA (A) | 60μ | 50μ | 60μ | 0.5 | 0.25m | 25m | - |
| | 30m | 2.5m | 30m | 3 | 25m | 250m | - |
| | 0.3 | 25m | 0.3 | 30 | 500m | - | - |
| | - | 0.25 | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| ACA (A) | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| Resistance (Ω) | 2k | 2k | 2k | 2k | 2k | 5k | 2k |
| | 20k | 20k | 20k | 20k | 20k | 500k | 20k |
| | 2M | 200k | 2M | 200k | 1M | - | 2M |
| | - | 2M | 200M | 2M | - | - | - |
| | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| Capacitance (F) | 500μ | 500μ | 1000μ | - | - | - | - |
| | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - |
| Auto range | - | - | - | - | - | - | - |
| Low frequency output measurement | - | - | - | - | ● | - | - |
| Continuity | BUZZER | - | - | BUZZER | - | - | - |
| Battery check | 1.5V | 1.5V | 1.5V | 12V | 1.5V | 1.5V/9V | - |
| Auto polarity | - | - | - | - | - | - | - |
| Meter structure | BAND | BAND | BAND | BAND | PIVOT | PIVOT | PIVOT |
| Drop shock proof meter | ● | ● | ● | ● | - | - | - |
| Zero center meter | ● | - | - | - | - | - | - |
| Temperature measurement | - | ○ | - | - | - | - | - |
| Protection circuit for power line | - | - | - | - | - | - | ● |
| hFE | - | - | - | - | - | - | - |
| Dimension (H) mm | 144 | 144 | 159.5 | 142 | 119 | 126 | 144 |
| Dimension (W) mm | 99 | 99 | 129 | 97 | 85 | 87 | 96 |
| Dimension (D) mm | 41 | 41 | 41.5 | 38 | 23 | 30 | 56 |
| Mass(g) | 270 | 270 | 320 | 300 | 140 | 185 | 400 |

○ Optional accessory is necessary.

## ISO 9001

■Quality Management System

The manufacturing plant of Sanwa Tesmex Co., Ltd. obtained ISO9002 certification from the foundation "Japan Quality Assurance Organization (JQA)" in 1996.In October 2002,Sanwa Electric Instrument Co., Ltd. was organized as one company incorporating the manufacturing division and sales division. In November 2002, the company obtained ISO9001:2000 certification (JQA-1453).
The scope of the registration covers the design, development, production and servicing of multi-meters, clamp meters, insulating-resistance testers, standard generators, light power meters, and laser power meters.

JQA-1453 091-A

## ISO 14001

■Environmental Management System ISO 14001

We implemented activities aimed at acquiring certification under the ISO 14001 standard for environmental management systems, and were granted the certification by the Japan Quality Assurance Association in November 2007. (JQA-EM5956)

JQA-EM5956 091-C

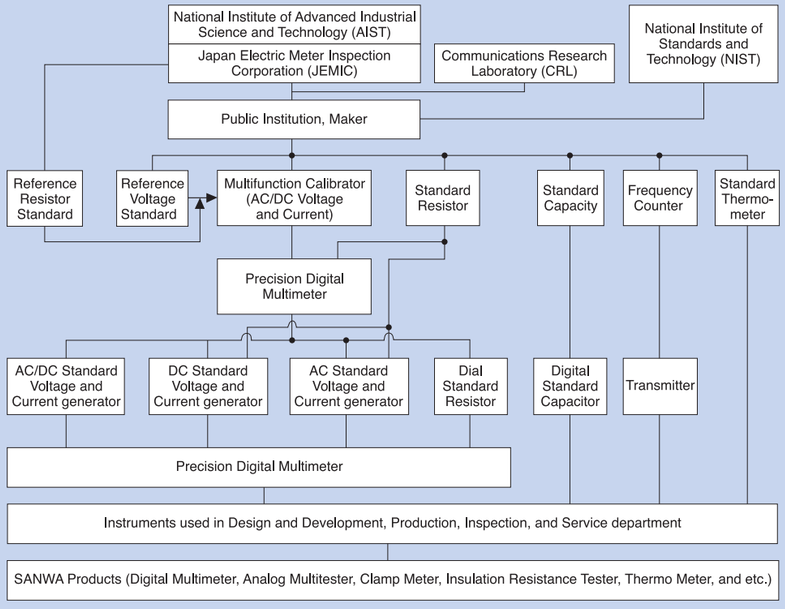
■Environmental Philosophy

We involve all employees in environmentally balanced activities throughout every stage of the process of delivering products and services to customers in order to achieve sound environmental management as a community and customer-oriented company.
(Established on April 2nd, 2007)

## Traceability

Traceability to prove the compliance with national and international standards is an essential factor for measuring instruments used as test instruments associated with quality assurance. Products of Sanwa are calibrated by reference samples which is periodically checked for its compliance with national standards. A calibration certificate and test data report are available on your request (a fee applies).

**Traceability Flow Chart**




## Repairs and servicing

Please contact an agent of Sanwa in your country for periodic calibration and repairs, which are offered on a chargeable basis. Please refer to the website of Sanwa for the authorized agents.



# Safety

### The International Safety Standard IEC61010

This Safety Standard which is established for protecting operators and environment stipulates safety requirements for measuring instruments and electric equipment. The IEC standard defines the degree of pollution, measurement classification, barrier, material, spatial distance and creepage distance to assure safety. The impulse withstand voltage as transitional energy is estimated from the measurement category and main power supply voltage to conduct tests for measuring instruments.

**Test voltage (impulse withstand voltage)**

| Nominal AC or DC line of main power supply and neutral voltage | CAT.II | CAT.III | CAT.IV |
|---|---|---|---|
| 300V | 2500V | 4000V | 6000V |
| 600V | 4000V | 6000V | 8000V |
| 1000V | 6000V | 8000V | 12000V |

The output impedance of an impulse generator is 12Ω in the measurement categoryII, and 2Ω in measurement categories III and IV.

### CE marking

CE marking is a safety mark which can be attached only on a product meeting the safety requirements of the Directive of Council of the European Union (EC Directive). A product attached with the CE mark is designed so as to meet the requirements of the "Low Voltage Directive" and "EMC Directive" of the EC Directive. Low Voltage Directive: This Directive covers products of power supply voltage of 50V-1000V (AC) and 75V-1500V (DC), and it defines electric safety requirements against shocks, burns, etc. The applicable standard is EN61010 corresponding to IEC1010 give on the left. EMC Directive: This Directive stipulates conditions so as not to give out strong electromagnetic waves from equipment to the outer environment and to protect equipment from the effect of electromagnetic waves from the outside.

### Measurement category (overvoltage category)

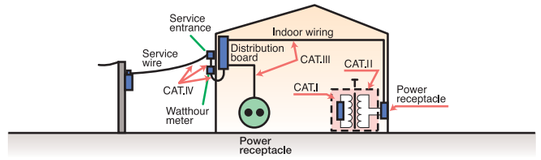
The IEC standard classifies measuring circuits according to measurement categories for the safe use of a measuring instrument in low voltage facilities. The measurement categories are classified into I to IV. A larger number of the category denotes a spot involving higher transient energy. For safe measurement, wear protective gears such as insulated gloves and dust-proof glasses in an environment of CAT.III.

**Measurement category Ⅳ (CAT. Ⅳ):**
Equipment used for measurement in low voltage facilities.
Temporary overcurrent preventer, and electric measurement on ripple control unit, etc.

**Measurement category Ⅲ (CAT. Ⅲ):**
Equipment used for measurement in building facilities
Distribution board, circuit breaker, wiring including cables, busbar, junction box, switch, receptacle, and industrial equipment located in fixed facilities, and other equipment such as a fixed motor connected to fixed facilities in a permanent manner.

**Measurement category Ⅱ (CAT. Ⅱ):**
Equipment used for measurement performed on a circuit directly connected to low voltage facilities
Measurement on electric household appliances, portable tools and similar tools

**Measurement category Ⅰ (CAT. Ⅰ):**
Equipment used for measurement on a circuit not directly connected to main power supply
Circuit not derived from the main power supply




# For safe measurement

### ◆ Method for safe use of measuring instrument ◆

**Multimeter**

**Voltage measurement**
Never use a measuring instrument for a measurement category higher than specified. A tester not conforming to the international safety standard is for use with weak current. Never use these testers on a high power circuit of 250V or more (excluding VS-100). Referring to measurement categories defined in the IEC standard, use a measuring instrument of equivalent or higher category. For instance, when a measuring instrument is used on a motor of facility of 200V main power supply, which corresponds to CategoryIII, use a measuring instrument of CAT.III or higher.

**Current measurement**
Use special caution not to input voltage to the current measuring terminal in measurement. In current measurement, a meter is connected in series with the measuring circuit. For this reason, impedance inside the meter is low, thereby possibly causing a short-circuit fault. To prevent such a short-circuit fault and assure safe operation, fuses are installed for protection. Check the protection capability of the fuses. RD700 uses a quick-breaking ceramic fuse of rated voltage 250V and breaking current 1.5kA for the milliamp measuring circuit, which causes the fuse to blow out to prevent short-circuit when the main power supply is 250V or less and short circuit current is 1.5kA or less.

**Clamp meter**

- Use all clamp meters for measurement of low voltage circuit of 600V or less.
- In choosing an appropriate model, special attention should be paid to the current measurement range and diameter of a conductor to be clamped.

**Insulation resistance tester**

- The insulation resistance tester cannot be used on an measuring object in live-wire status.
- If the measuring voltage is specified, choose a model of the specified voltage. It is a general practice to choose the measuring voltage equivalent to or a little higher than voltage usually applied to the measuring object.
- Since the insulating-resistance tester measures resistance values by applying DC high voltage on a measuring object, the measurement may damage the measuring object if voltage is directly applied on he electronic circuit including the IC and LSI.
- The insulating-resistance tester generates DC high voltage during measurement. If an electric shock occurs, a falling accident from a high altitude may follow. Use special caution in operation at a high altitude.
- If your measuring instrument is provided with a voltage measuring function, use it at no higher than the maximum measuring voltage.

**Thermo Meter (Temperature Probe)**

- The temperature sensor cannot be used for measurement in direct contact with a live part.
- Use caution in handling a sharp-edged probe to avoid an injury.
- The grip is heated in high temperature measurement. Use an appropriate jig to secure the probe in high temperature measurement.

**Tachometer・Speed Meter**

- In measurement on a rotating motor (measurement of speed for elevator in operation), risks are involved due to the strong force of the measuring object. Use special caution in measurement to assure safety. Never touch the rotating part during measurement.

**Laser Power Meter**

- Infrared semiconductor laser light is invisible to the naked eye. It may occasionally emit high power of 30mW or more, which may threaten vision if eyes are exposed to the light. Use special caution to avoid gazing at the light directly or exposing eyes to reflected light.

# Function marks and terminology used in sanwa General Catalog

## Function marks

**True RMS** (True root-mean-square value)
True RMS value. AC current and voltage of a non-sine wave can be measured by true RMS values.

**Dual Display**
Allows simultaneous reading.

**Drop shock proof**
The meter element is furnished with a taut band and impact-resistant design enough to withstand a shock of drop.

**DC / AC measurable**
Both ACA and DCA are measurable.

**Leakage current**
A clamp meter that can make the measurement of leakage current have a range to allow measurements in milliamp.

**Frequency**
Expressed in the unit of Hz (hertz). Commercial frequency of 50Hz/60Hz can be measured.

**Capacitor**
Capacitor capacity (electrostatic capacity) is measured and expressed in the unit of F (farad), μF, etc.

**Duty cycle**
The duty cycle of repeating waveform is indicated on a percentage basis (%). It can be used for the analysis of control signals.

**Continuity check**
The LED lights up when the measuring object is electrically conducting.

**Continuity buzzer**
The buzzer sounds when the measuring object is electrically conducting.

**Battery check**
Battery voltage is measured and assessed by running a given current.

**Temperature measurement**
Temperature can be measured using the optional probe.

**4-20mA%**
4-20mA for sending instrumentation signals. Expresses the current loop of 4mA as 0% and 20mA as 100%

**dBm**
Scaling of voltage values is performed according to the reference impedance into dBm. Convenient for use with audio equipment.

**hFE**
Provided with graduations for measuring the DC current amplification factor (hFE) of a transistor.

**EF function**
Non contact AC voltage detection function

**Capture (peak hold)**
The peak value like in-rush current is indicated. The minimum pulse width capturable differs according to models.

**Low-pass filter**
Low-pass filter cuts current value of high frequency.

**Inrush**
Inrush current can be measured

**Zero-center meter (NULL)**
Moves the indicator of the analog tester to the center of the scale (meter graduations) to make measurement of positive and negative voltage.

**Automatic Measurement for DCV/ACV/Ω**
Mesurement function of DCV/ACV/Ω can be automatically selected.

**Logging**
The reading can be stored in the meter itself.

**Auto polarity**
Puts the indicator at the center in the automatic standby status by the setting of the selector switch so as to allow measurement by positive and negative values.

**Polarity switch**
The positive and negative polarity of the measuring terminal can be changed by this switch.

**Output terminal**
Cancels the DC current portion of voltage mixed with DC and AC to measure the AC portion alone. It is used for the measurement of audio signals.

**Auto power off**
Power is automatically turned off when a certain time has elapsed after power-up. Some models have a function to cancel this function.

**Auto power save**
The display disappears to bring the device into the power-save state when a certain time has passed after power-up. Some models have a function to cancel this function.

**Data hold**
A value indicated on the display is fixed. It is fixed even after the test lead is removed, and can be used as a record for reference purposes.

**Range hold**
The range is fixed in the measurement of varying voltage and current which is difficult to read in the auto range.

**Measurement of relative value**
A certain measured value is assumed as 0 and measured values after that are expressed by positive or negative values relative the value fixed as 0.

**MAX / MIN / AVG**
The maximum value, the minimum value and the average value are displayed or recorded. The recorded value can be seen later on the display.

**Low power ohm**
Resistance is measured by applying voltage of approximately 0.4V or less on a measuring object. It is characterized by the fact that the semiconductor does not conduct at approximately 0.4V or less even in forward direction.

**Backlight**
Allows indicator reading in a dark place.

**Automatic live circuit detection**
Live circuit detection prevents insulation test if the mesured object is a live circuit.

**Auto discharge**
When the measurement of insulating resistance is complete, voltage charged in the measuring object is discharged.

**USB connection**
Data can be outputted by connection to the USB port of a PC.

**RS232C connection**
The signal output terminal is provided to send data to a PC. RS232C is the name of the signal standard.

**Fuse for power supply**
Current-limiting fuse to break the conduction up to 100kA

**Temperature measurement with PC Link**
Temperature can be measured using the optional probe and PC Link software. (T-300PC is necessary.)

**Zoom bar graph**
The scale is changed so as to allow reading minute changes on the bar graph.

**Correction of resistance of test lead**
This is a function to cancel the resistance portion of the internal circuit of the main body and test lead in the resistance measurement.

**Zero-ohm adjuster**
Cancels the contact resistance and internal resistance of the test lead to allow the measurement of the resistance value of a measuring object alone.

**Insulating resistance**
Insulating resistance can be measured (e.g. 500V/1000MΩ)

**DC voltage**
Mark for clamp meters with DCV function.

**Products utilizing lead-free solder**
These are products that utilize lead-free solder and contain some components that do not conform to the RoHS Directive.

## Glossary

**Accuracy / Tolerance**
Correctness. JIS defines the term "accuracy" to be used for digital testers and "tolerance" for analog testers. The accuracy / tolerance differs depending on the range.

**± (□%+□) =± (□%rdg+□dgt)**
rdg is an abbreviation of "Reading" meaning a read value on digital display. "dgt" is an abbreviation of "Digit" meaning the least unit of digital display. For instance, "±2dgt" refers to error of ±2 counts.

**Full-scale value (fs)**
It is the indication of tolerance expressed by percentage values relative to the full-scale value of the range.

**Scale length**
The tolerance in resistance measurement is expressed with reference to the scale length of the range.

**Frequency characteristic**
Frequency range of measurable signals in the measurement of AC voltage and current.

**Input resistance (Impedance)**
Internal resistance between measuring terminals. For instance, it is expressed as "MΩ" with the DMM and as "KΩ/V" with the AMT.

**Clamp diameter**
It gives a guide for the thickness of a clampable wire.

**Clamp conductor size**
Size of a maximum conductor shape.

**Withstand voltage**
It refers to insulating withstand voltage of the measuring instrument itself.

**Range**
The measuring range of a function is sub-divided and expressed as 2V/20V/200V, etc.

**Auto range**
The range is automatically increased or decreased in steps such as 2V/20V/200V and moves to the optimum range for measuring voltage.

**Live-wire check**
When a test lead is set at an insulating resistance measuring point on a measuring object, the ACV measuring status starts to check whether voltage is being supplied.

**Display digit**
Maximum number of display digits of the digital display. 1999 is expressed as 2000. Three and a half digits and four and a half digits are also used.

**Function**
Function for measuring voltage, current, resistance, electrostatic capacity and frequency.

**Resolution**
Displayable minimum value of the last digit. For instance, the resolution of the 1.999V range is 0.001V.


**A**
AD-71AC.....P45
AD-72AC.....P45
AP33.....P33
AU-31.....P31
AU-32.....P31

**C**
C-01....P46
C-08S....P46
C-77....P46
C-77H....P46
CAM600S.....P08
C-CA....P46
C-CD....P46
C-CL....P46
C-CL3000.....P46
C-CP....P46
C-DG3a....P47
CD731a....P26
CD770.....P25
CD771.....P25
CD772.....P25
CD800a.....P26
C-DCM2000....P46
CL-11.....P44
CL124.....P10
CL-13a.....P44
CL140.....P11
CL-15a.....P44
CL-16.....P44
CL-22AD.....P11
CL33DC.....P11
CL3000.....P11
CL-506a.....P44
CL-561.....P44
CL-700.....P44
CL-700SMD.....P44
CL-DG3a.....P44
C-M53.....P47
CP-7D.....P33
C-PC7.....P47
C-PC10/S....P47
C-PM3....P47
C-SE2....P47
C-SP....P47
C-SPH....P47
CX506a.....P30
C-YS....P47

**D**
DCL10.....P06
DCL1000.....P06
DCL20R.....P07
DCL1200R.....P07
DCL30DR.....P09
DCL3000R.....P07
DCM-22AD.....P08
DCM60L.....P06
DCM600DR.....P09
DCM660R.....P07
DCM400.....P06
DCM400AD.....P08
DCM2000DR.....P08
DG10.....P16
DG34a.....P15
DG35a.....P15
DG36a.....P15
DG6.....P16
DG7.....P16
DG8.....P16
DG9.....P16
DLC460F.....P09
DM1008S.....P17
DM508S.....P17

**E**
EM7000.....P30

**H**
H-50....P47
H-70....P47
H-700....P47
HFE-6T....P44
HG561H....P14
HV-10.....P44
HV-20.....P44
HV-50.....P44
HV-60.....P44

**K**
K-250CD...P45
K-250PC...P45
K-8-250...P45
K-8-300...P45
K-8-500...P45
K-8-650...P45
K-8-800...P46
K-AD...P46
KB-USB20....P45
KB-USB7....P45
KB-USB773....P45
KD1...P42
KIT-8D...P40
KS1...P42
KS2...P42
KS3...P42

**L**
LCR700....P41
LCR-USB....P45
LP1....P37
LX2....P35
LX3132.....P35

**M**
M53.....P15
MG500.....P14
MG1000.....P14

**O**
OPM35S....P37
OPM-360....P36
OPM37LAN....P36

**P**
PC20.....P23
PC20TK.....P40
PC700.....P22
PC7000.....P21
PC710.....P22
PC720M.....P21
PC773.....P23
PC Link 7.....P19/P45
PDM1529S.....P17
PDM508S.....P17
PDM5219S.....P17
PDR-301.....P39
PM3.....P27
PM33a.....P24
PM7a.....P27
PM11.....P27
PS8a.....P27

**R**
RD700.....P24
RD701.....P24

**S**
SE-100.....P38
SE-200.....P38
SE-9000.....P38
SE-9000M.....P38
SH-88TR.....P31
SP-18D.....P32
SP20.....P32
SP21.....P32
STD5000M.....P41

**T**
TA55.....P32
TH3.....P37
TL-11Ta.....P43
TL-112a.....P43
TL-122.....P43
TL-21a.....P43
TL-21M.....P43
TL-23a.....P43
TL-25a.....P43
TL-508Sa.....P43
TL-561.....P45
TL-61.....P43
TL-61Ta.....P43
TL-61Tb.....P43
TL-61Tc.....P43
TL-84.....P43
TL-8IC.....P44
TL-91....P43
TL-91M.....P43
TL-95.....P43
TL-M54.....P43
TL-PM3.....P44
TLF-120.....P43
T-300PC...P45
T-THP...P45

**V**
VS-100.....P33

**Y**
YX360TRF.....P31
YX-361TR.....P30