

**sanwa**

**GENERAL CATALOG 2010-2011**

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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- The size of photos of products are not same as of actual product size.

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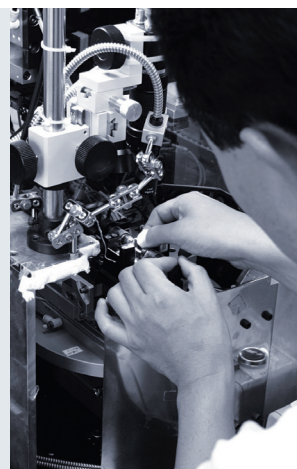




Top class quality  
popular in 74 countries  
around the world.

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.



New Products



Clamp Meter

**Hybrid Digital Multimeter**  
PM33.....P04

**Hybrid Insulation Resistance Tester**  
DG34,35.....P05

**Exposition of clamp meter**.....P07  
Clamp Meter comparative chart.....P57

CAM600S.....P09  
DCL10.....P08  
DCL1000.....P08  
DCL1200R.....P10  
DCL20R.....P11  
DCL30DR.....P13  
DCM60L.....P09  
DCM400.....P09  
DCM400AD.....P12  
DCM2000AD.....P12  
DCM-22AD.....P12  
DLC-330L.....P13  
DLC-400A.....P13

**Exposition of clamp sensor**.....P14  
CL124.....P14  
CL140.....P15  
CL-20D.....P15  
CL-22AD.....P15  
CL33DC.....P15  
LS-10.....P15

## 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.

$\pm (\square\%+\square) = \pm (\square\%rdg+\square dgt)$   
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, " $\pm 2dgt$ " refers to error of  $\pm 2$  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 "M $\Omega$ " with the DMM and as "K $\Omega/V$ " 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.....P51  
AD-72AC.....P51  
AP33.....P37  
AU-31.....P35  
AU-32.....P35

## C

C-01.....P52  
C-08S.....P52  
C-77.....P52  
C-77H.....P52  
CAD-2L.....P43  
CAD-3L.....P43  
CAM600S.....P09  
C-CA.....P52  
C-CD.....P52  
C-CDS.....P52  
C-CL.....P52  
C-CP.....P52  
C-DG3.....P53  
CD731a.....P30  
CD770.....P27  
CD771.....P28  
CD772.....P28  
CD750P.....P30  
CD800a.....P29  
C-DA.....P53  
C-DCM2000.....P53  
CL-11.....P50  
CL-100SD.....P50  
CL124.....P14  
CL-13.....P50  
CL140.....P15  
CL-15.....P50  
CL-16.....P50  
CL-20D.....P15  
CL-22AD.....P15  
CL33DC.....P15  
CL-506.....P51  
CL-DG3.....P50  
C-M53.....P53  
C-NH7.....P53  
CP-7D.....P37  
C-PC10/S.....P53  
C-PM3.....P53  
CS-10VB.....P43  
C-SE2.....P53  
C-SP.....P53  
C-SPH.....P53  
C-STH.....P53  
CX506a.....P34  
C-YS.....P53

## D

DA-50C.....P30  
DCL10.....P08  
DCL1000.....P08  
DCL20R.....P11  
DCL1200R.....P10  
DCL30DR.....P13  
DCM-22AD.....P12  
DCM60L.....P09  
DCM400.....P09  
DCM400AD.....P12  
DCM2000AD.....P12  
DG10.....P20  
DG34.....P05  
DG35.....P05  
DG6.....P20  
DG7.....P20  
DG8.....P20  
DG9.....P20  
DLC-330L.....P13  
DLC-400A.....P13  
DM1008S.....P21  
DM1528S.....P21  
DM508S.....P21  
DM5218S.....P21

## E

EM7000.....P34

## H

H-50.....P53  
H-70.....P53  
HFE-5.....P51  
HFE-6.....P51  
HFE-6T.....P51  
HV-10.....P50  
HV-20.....P50  
HV-50.....P50  
HV-60.....P50

## K

K-250CD.....P51  
K-250PC.....P51  
K-8-250.....P51  
K-8-300.....P51  
K-8-500.....P51  
K-8-650.....P52  
K-8-800.....P52  
K-AD.....P52  
KB-RS1.....P51  
KB-RS2a.....P51  
KB-USB1.....P51  
KB-USB2a.....P51  
KD1.....P48  
KIT-8D.....P46  
KS1.....P48

## L

LP1.....P41  
LS-10.....P15  
LX2.....P39  
LX3132.....P39

## M

MG125.....P19  
MG500.....P19  
MG1000.....P18

## O

OPM35S.....P41  
OPM-360.....P40  
OPM36M.....P41  
OPM37LAN.....P40  
OPM-570L.....P41  
OPM-572.....P42  
OPM-572MD.....P42

## P

PC20.....P27  
PC20TK.....P46  
PC500a.....P26  
PC5000a.....P25  
PC510a.....P26  
PC520M.....P25  
PC Link.....P23/51  
PC Link Plus.....P23/51  
PDM508S.....P21  
PDR-301.....P45  
PM3.....P31  
PM33.....P04  
PM7a.....P31  
PM11.....P31  
PS8a.....P31

## R

RD700.....P29  
RD701.....P29

## S

SE-100.....P44  
SE-200.....P44  
SE-9000.....P44  
SE-9000M.....P44  
SH-88TR.....P35  
SP-18D.....P36  
SP20.....P36  
SP21.....P36  
STD5000M.....P47

## T

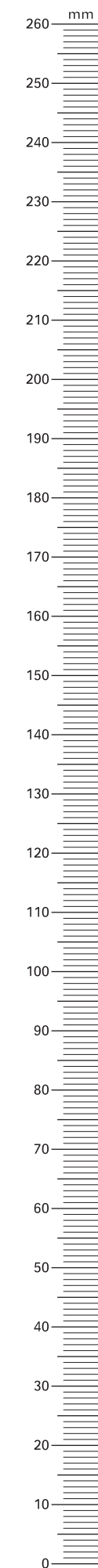
TA55.....P36  
TH3.....P42  
TL-10T.....P49  
TL-100-OM.....P50  
TL-112.....P49  
TL-122.....P50  
TL-21.....P49  
TL-21M.....P49  
TL-23.....P49  
TL-25.....P49  
TL-506S.....P50  
TL-507.....P50  
TL-508S.....P50  
TL-61.....P49  
TL-61T.....P49  
TL-63.....P49  
TL-82.....P49  
TL-84.....P49  
TL-88.....P49  
TL-8IC.....P51  
TL-91.....P49  
TL-91M.....P49  
TL-95.....P49  
TL-M54.....P50  
TL-PM3.....P50  
TL-PM5.....P50  
TLF-120.....P50  
T-300PC.....P51  
T-THP.....P51

## V

VS-100.....P37

## Y

YX360TRF.....P35  
YX-361TR.....P34







Insulation Resistance Tester



PC Link System, Digital Multimeter



Analog Multitester



Various Instruments

**Exposition of insulation resistance tester.....P17**  
 Insulation Resistance Tester comparative chart.....P58  
 DG6.....P20  
 DG7.....P20  
 DG8.....P20  
 DG9.....P20  
 DG10.....P20  
 DM1008S.....P21  
 DM1528S.....P21  
 DM508S.....P21  
 DM5218S.....P21  
 MG125.....P19  
 MG500.....P19  
 MG1000.....P18  
 PDM508S.....P21

**Exposition of PC Link system.....P23**  
**Exposition of digital multimeter.....P24**  
 Digital Multimeter comparative chart.....P59~P61  
 CD731a.....P30  
 CD770.....P27  
 CD771.....P28  
 CD772.....P28  
 CD750P.....P30  
 CD800a.....P29  
 DA-50C.....P30  
 PC20.....P27  
 PC500a.....P26  
 PC5000a.....P25  
 PC510a.....P26  
 PC520M.....P25  
 PC Link.....P23  
 PC Link Plus.....P23  
 PM3.....P31  
 PM7a.....P31  
 PM11.....P31  
 PS8a.....P31  
 RD700.....P29  
 RD701.....P29

**Exposition of analog multitester.....P33**  
 Analog Multitester comparative chart.....P62~P63  
 AP33.....P37  
 AU-31.....P35  
 AU-32.....P35  
 CP-7D.....P37  
 CX506a.....P34  
 EM7000.....P34  
 SH-88TR.....P35  
 SP-18D.....P36  
 SP20.....P36  
 SP21.....P36  
 TA55.....P36  
 VS-100.....P37  
 YX360TRF.....P35  
 YX-361TR.....P34

**Lux Meters.....P39**  
 Exposition of Lux meter.....P39  
 LX2.....P39  
 LX3132.....P39

**Optical/Laser Power Meter.....P40**  
 Exposition of optical/Laser power meter.....P40  
 LP1.....P41  
 OPM35S.....P41  
 OPM-360.....P40  
 OPM36M.....P41  
 OPM37LAN.....P40  
 OPM-570L.....P41  
 OPM-572.....P42  
 OPM-572MD.....P42

**Thermo Meter.....P42**  
 Exposition of Thermo meter.....P42  
 TH3.....P42

**Cord Tester.....P43**  
 CAD-2L.....P43  
 CAD-3L.....P43  
 CS-10VB.....P43

**Tachometer / Speed Meter.....P44**  
 SE-100.....P44  
 SE-200.....P44  
 SE-9000.....P44  
 SE-9000M.....P44

**Earth Tester.....P45**  
 Exposition of Earth tester.....P45  
 PDR-301.....P45

**Assembly Training Kit.....P46**  
 KIT-8D.....P46  
 PC20TK.....P46

**Calibrator.....P47**  
 STD5000M.....P47

**Detector.....P48**  
 3 phase detector KS1.....P48  
 Voltage detector KD1.....P48

## 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".



# New Products

New Products

Clamp Meter

Insulation Resistance Tester

PC Link System, Digital Multimeter

Analog Multimeter

Various Instruments

Accessories

## Hybrid Digital Multimeter



### PM33

#### 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

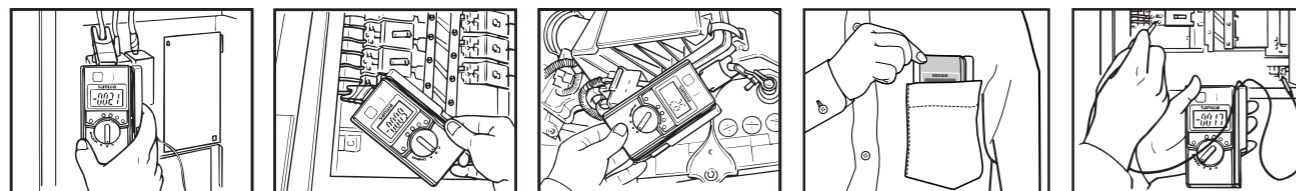
Safety : IEC61010-1 CAT.II 600V, CAT.III 300V



Function	Measuring range	Best accuracy	Resolution
DCV	660m / 6.6 / 66 / 600V	± (0.7%rdg+3dgt)	0.1mV
ACV	660m / 6.6 / 66 / 600V	± (1.6%rdg+7dgt)	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	± (1.2%rdg+5dgt)	0.1Ω
Capacitance	6.6n / 66n / 660n / 6.6μ / 66μ / 660μ / 6.6m / 66mF	± (5.0%rdg+10dgt)	0.001nF
Frequency	660 / 6.6k / 66k/Hz	± (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 / Weight	H130 x W75 x D19.9mm / approx160g(including Battery)
Clamp diameter	φ 10mm
Standard accessory	Instruction manual

**Optional accessories**  
Carrying case (C-DG3), Clip adapter (CL-DG3, CL-11, CL-15, TL-8IC)



AC current measurement [PM33] [DG34] [DG35]

Cables in a narrow space can be clamped for current measurement [PM33] [DG34] [DG35]

DC current measurement [PM33] [DG34] [DG35]

Easy to put in a shirt pocket [PM33] [DG34] [DG35]

Insulation Resistance measurement [DG34] [DG35]

## Hybrid Insulation Resistance Tester



### DG34

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

- Lightweight approx. 155g
- Easy to use, pocket size
- ACV / DCV measurement range
- DCA / ACA measurement range
- U-shaped CT
- 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
- Auto power off
- With Clip adapter

Function	Measuring range	Best accuracy	Resolution
DCV	400V	± (1.1%rdg+3dgt)	0.1V
ACV	400V	± (1.6%rdg+7dgt)	0.1V
DCA	100A	± (2.0%rdg+5dgt)	0.1A
ACA	100A	± (2.0%rdg+5dgt)	0.1A
Insulation Resistance	500V / 400MΩ 250V / 400MΩ 125V / 400MΩ	± (3.0%rdg+3dgt)	0.1MΩ
Current Measuring	500V approx.5μA(100MΩ loaded) 250V approx.2.5μA(100MΩ loaded) 125V approx.1.25μA(100MΩ loaded)		

Battery	LR03 x 2
Size / Weight	H130 x W75 x D19.9mm / approx160g(including Battery)
Clamp diameter	φ 10mm
Standard accessory	Clip adapter(CL-DG3), Instruction manual

#### Optional accessories

Carrying case (C-DG3), Clip adapter (CL-11, CL-15, TL-8IC)



### DG35

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

- Lightweight approx. 155g
- Easy to use, pocket size
- ACV / DCV measurement range
- DCA / ACA measurement range
- U-shaped CT
- 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
- Auto power off
- With Clip adapter

Function	Measuring range	Best accuracy	Resolution
DCV	400V	± (1.1%rdg+3dgt)	0.1V
ACV	400V	± (1.6%rdg+7dgt)	0.1V
DCA	100A	± (2.0%rdg+5dgt)	0.1A
ACA	100A	± (2.0%rdg+5dgt)	0.1A
Insulation Resistance	500V / 40MΩ 250V / 40MΩ 125V / 40MΩ	± (3.0%rdg+3dgt)	0.01MΩ
Current Measuring	500V approx.50μA(10MΩ loaded) 250V approx.25μA(10MΩ loaded) 125V approx.12.5μA(10MΩ loaded)		

Battery	LR03 x 2
Size / Weight	H130 x W75 x D19.9mm / approx160g(including Battery)
Clamp diameter	φ 10mm
Standard accessory	Clip adapter(CL-DG3), Instruction manual

#### Optional accessories

Carrying case (C-DG3), Clip adapter (CL-11, CL-15, TL-8IC)

New Products

Clamp Meter

Insulation Resistance Tester

PC Link System, Digital Multimeter

Analog Multimeter

Various Instruments

Accessories



# Clamp Meters

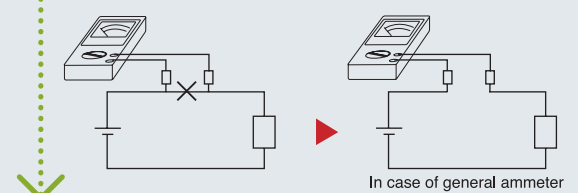
## What is Clamp Meter?

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 multimeter 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 multimeter 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.

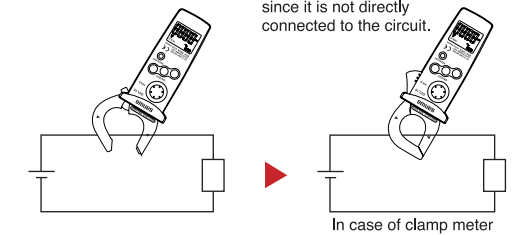
### Measurement by multimeter

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.

## 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

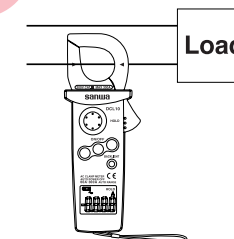
Unlike ordinary current measurement, it is required to clamp all two wires (two-wire single-phase) or three wires (three-wire single-phase or three-wire three-phase) for measuring leakage current. The earthing wire also can be measured.

## 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.

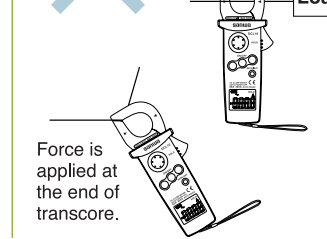
### Correct measurement

Clamp one conductor at the center of transverse.



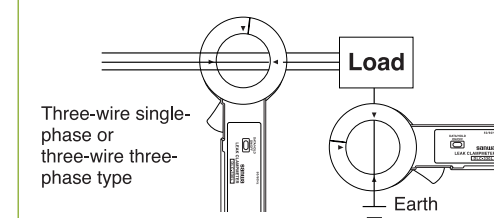
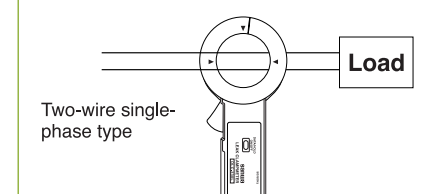
### Wrong measurement

Clamp more than one conductor.



Force is applied at the end of transverse.

### Measurement by clamp meter

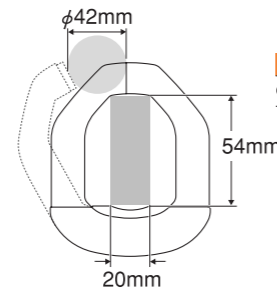




## Clamp Meter AC

CE

**Light Weight 290g**  
\*Approx. 30% lighter than our equivalent models\*



## DCL1000 (with case)

## Lower cost lightweight &amp; 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 (2002), CAT.II600V

Max 1000A AP OFF DATA HOLD

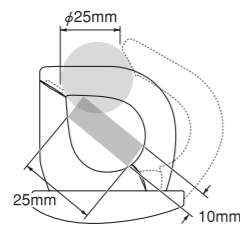
Function	Measuring range	Best accuracy	Resolution
ACA	400/1000A	± (1.7%+5)	0.1A
DCV	400m/4/40/400/600V	± (1.2%+3)	0.1mV
ACV	400m/4/40/400/600V	± (2.2%+5)	0.1mV
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.2%+4)	0.1Ω
Continuity	Buzzer sounds at between 0Ω and 65Ω (±35Ω), Open voltage: approx. 0.4V		
Diode 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/20X54mm
Size / Weight	H238XW95XD45mm/290g
Standard accessories included	Test lead (TL-23), Carrying case, Instruction manual

## Optional accessories

Clip adapter : CL-11, TL-8IC, CL-15  
Test lead : TLF-120

CE



(Backlight ON)

## 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 (2002), CAT.II300V Max. / CAT.II600V

Max 300A AP OFF DATA HOLD BACK LIGHT

Function	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/10X25mm		
Withstand voltage	Less than 3700Vrms		
Battery	R03X2		
Size / Weight	H145XW54XD28mm/approx. 120g		
Standard accessories included	Carrying pouch (C-DCL10), Instruction manual		

## Clamp Meter AC

CE



## DCM60L (with case)

## Low cost &amp; 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.

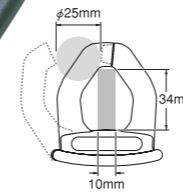
AC frequency bandwidth : 50~500Hz

Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.II300V Max. / CAT.II 600V

## Optional accessories

Clip adapter : CL-11, TL-8IC  
Test lead : TLF-120

CE



## DCM400 (with case)

## Low cost &amp; 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)

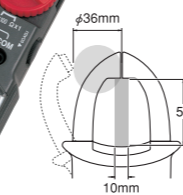
Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III300V. / CAT.II 600V

## Optional accessories

Clip adapter : CL-11, TL-8IC  
Test lead : TLF-120

## Clamp Meter AC (Analog Type)

CE



## 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

Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.II600V

## Optional accessories

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

Max 600A DATA HOLD

Function	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	21mm/10X30mm
Withstand voltage	Less than 3700Vrms
Battery	R03X2
Size / Weight	H187XW50XD29mm/approx. 210g
Standard accessories included	Test lead (TL-88), Carrying case (C-DCM60), Instruction manual

Max 400A Hz DATA HOLD DCV AP OFF

Function	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	± (1%+2)	0.1Ω
Frequency (A)	20~4k/10kHz	± (0.1%+1)	0.01Hz
Frequency (V)	4k/40k/400k/1MHz	± (0.1%+1)	0.01Hz
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/10X34mm
Withstand voltage	Less than 3700Vrms
Battery	R03X2
Size / Weight	H193XW50XD28mm/approx. 230g
Standard accessories included	Test lead (TL-88), Carrying case (C-DCM400), Instruction manual

Max 600A DCV °C

Function	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°C (optional probe "T-THP" is necessary)	

Bandwidth	50/60Hz
Clamp diameter/Conductor size	36mm/10X50mm
Withstand voltage	5550VAC
Battery	R03X1
Size / Weight	H221XW97XD43mm/420g
Standard accessories included	Test lead (TL-21), Carrying case (C-CAM6), Instruction manual

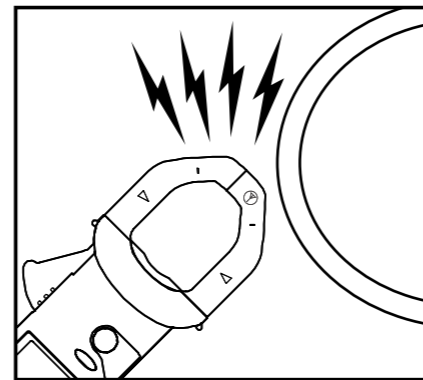
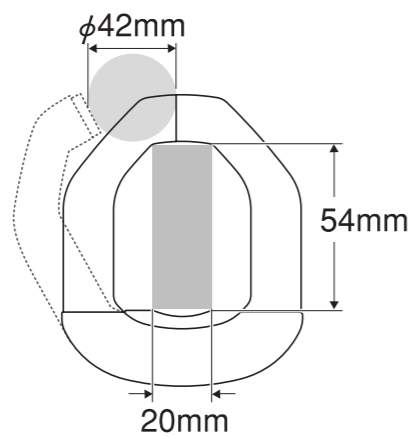
\*4% in 300~600A



Clamp Meter AC+True RMS



**Light Weight 290g**  
\*Approx. 30% lighter than our equivalent models\*



Non contact AC Voltage detection function

**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 (2002) CAT.III600V Max.

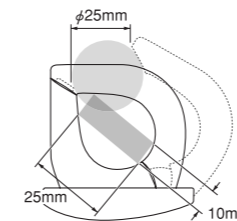
Max 1200A	RMS	Hz	EF (NCV)
AP OFF	DATA HOLD	RNG HOLD	DCV
			BACK LIGHT

Function	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, 50/60Hz		
Bandwidth	ACA: 50/60Hz, ACV: 50~500Hz		
Display	4000		
Withstand voltage	5550VAC		
Battery	R03X2		
Clamp diameter/Conductor	42mm/20X54mm		
Size / Weight	H238XW95XD45mm/290g		
Standard accessories included	Test lead (TL-23), Carrying case, Instruction manual		

**Optional accessories**

Clip adapter : CL-11, TL-8IC, CL-15  
Test lead : TLF-120

Clamp Meter AC+True RMS



(Backlight ON)

**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 (2002) CAT.III 300V Max. / CAT.II 600V

Max 300A	RMS	AP OFF	DATA HOLD	BACK LIGHT	CE
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Function	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/10X25mm		
Withstand voltage	Less than 3700Vrms		
Battery	R03X2		
Size / Weight	H145XW54XD28mm/approx. 120g		
Standard accessories included	Carrying pouch (C-DCL10), Instruction manual		

Slim jaws with width of approximately 9mm are used to enable the user to easily clamp the conductive wire under measurement among densely routed conductive wires.

A lever and buttons are laid out in positions where they can be handled with a single hand.

The use of a large data hold button with a good click feel enables the user to press the button even in an overhead or other location where the button is not viewable during measurement and to check the measured value later.

The use of a portrait type LCD with a backlight provided in the lower part allows the user to read the displayed value while holding the meter.

Its rear has been curved so that the clamp meter can be held comfortably in the palm.

DCL10, DCL20R (The picture is actual size.)





## 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) 2001-02 CAT.III 300V / CAT.II600V

**Optional accessories**

Clip adapter : CL-11, TL-8IC  
 Test lead : TLF-120



Function	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 / Weight	H193×W50×D28mm/approx. 230g		
Standard accessories included	Test lead (TL-88), 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, TL-8IC



Function	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 / Weight	H179×W56×D26.5mm/140g		
Standard accessories included	Test lead (TL-61), Carrying case (C-CL), Instruction manual		

**DCM2000AD (with case)****DC / AC current measurable max. 2000A & DMM functions**

- DC / AC current measurable max. 2000A
- Auto power off (10min.)
- Data hold / Range hold

**Display** : numeral display 4000  
**Sampling rate** : 2 times / sec.  
**AC frequency bandwidth** : 50 / 60Hz  
**Safety** : IEC61010-1 (EN61010-1) 2001-02 CAT.III600V Max.

**Optional accessories**

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



Function	Measuring range	Best accuracy	Resolution
ACA	40/400/2000A	± (1.5%+8)	0.01A
DCA	40/400/2000A	± (1.5%+8)	0.01A
ACV	400m/4/40/400/600V	± (1.2%+8)	0.1mV
DCV	400m/4/40/400/600V	± (1.2%+8)	0.1mV
Resistance	400/4k/40k/400k/4000k/40MΩ	± (1.5%+8)	0.1Ω
Frequency	100/1k/10k/100k/1000kHz	± (0.5%+3)	0.1Hz
Continuity	Buzzer sounds at less than approx. 40Ω. Open voltage : approx. 1.5V		
Bandwidth	50/60Hz		
Display	4000		
Clamp diameter/Conductor size	53mm/20×60mm		
Withstand voltage	5550VAC		
Battery	R03×2		
Size / Weight	H240×W84×D34mm/approx. 400g		
Standard accessories included	Test lead (TL-21), Carrying case (C-DCM2000), 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) 2001-02 CAT.III300V Max.



Function	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 / Weight	H145×W54×D28mm/approx. 120g		
Standard accessories included	Carrying pouch (C-DCL10), Instruction manual		

## Clamp Meter Leak current

**DLC-400A (with case)****Leak current measurement, DMM functions, recorder output terminal**

- 0.01mA (leakage current resolution) to 400A wide 6 ranges
- Data hold
- Data transfer to a recorder (output : DC200mV max.)

**Display** : numeral display 1999  
**Sampling rate** : 2 times / sec.  
**AC frequency bandwidth** : 50 / 60Hz

**Optional accessories**

Clip adapter : CL-11, TL-8IC



Function	Measuring range	Best accuracy	Resolution
ACA	20m/200m/2000m/20/200/400A	± (1%+0.25%RNG)	0.01mA
ACV	2/20/200/600V	± (1%+0.5%RNG)	0.001V
DCV	200m/2/20/200/600V	± (1%+0.5%RNG)	0.1mV
Resistance	200/2k/20k/200k/2000k/20MΩ	± (1%+0.5%RNG)	0.1Ω
Bandwidth	50/60Hz		
Display	1999		
Clamp diameter/Conductor size	38mm/10×40mm		
Withstand voltage	2000VAC		
Battery	R03×2		
Size / Weight	H205×W84×D34mm/approx. 390g		
Standard accessories included	Test lead (TL-61), Carrying case (C-LCM), Instruction manual		

**DLC-330L (with case)****Leak current measurement, analog bar graph display**

- Analog bar graph
- Leak current measurable AC30m~300A, 4 ranges
- Slim core but able to clamp max. 10×36mm conductor
- Auto power off (10min.)
- Data hold

**Display** : numeral display 3200  
**Sampling rate** : 2 times / sec. for numeral display, 12 times / sec. for bar graph  
**AC frequency bandwidth** : 50 / 60Hz



Function	Measuring range	Best accuracy	Resolution
ACA	30m/300m/30/300A	± (1.2%+5)	0.01mA
Bandwidth	50/60Hz		
Display	3200		
Clamp diameter/Conductor size	32mm/10×36mm		
Withstand voltage	2000VAC		
Battery	LR-44 (1.5V)×2		
Size / Weight	H162×W64×D23mm/125g		
Standard accessories included	Carrying case (C-DLC330L), 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-20AD, CL-22AD, CL124, CL140**

DCA ..... **CL-22AD, CL33DC**

AC Leak current ..... **CL124, CL140**

## Prior to making a measurement

The following description is given on a digital multimeter of 5000-count display type (PC520M), 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. 12, 13). 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 PC520M is used with CL-22AD

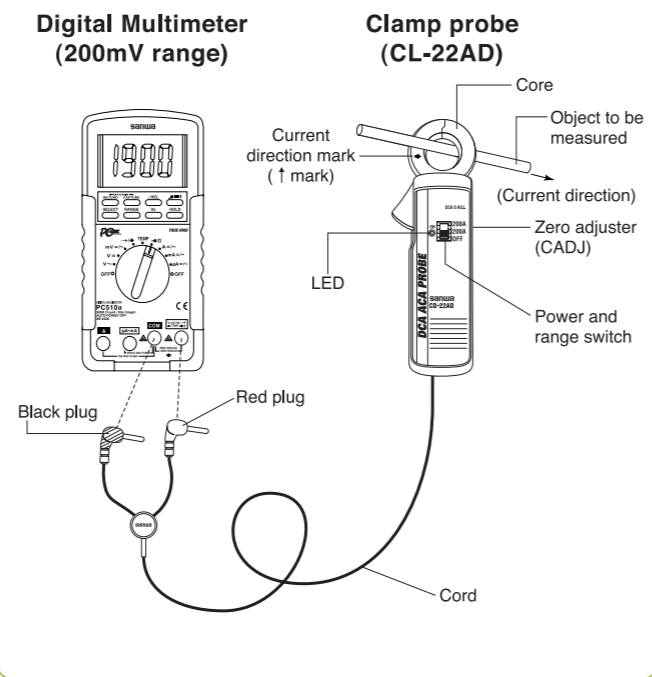
Fix the range at 500mV and set the clamp probe at 20~200A range. In this case, the measured value is obtained by multiplying the indicated value of the multimeter by the factor given below.

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

DCA measurement → DC500mV range  
ACA measurement → AC500mV 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

Range	1A	Applicable digital multimeter
Resolution	1mA	PC5000a PC510a PC500a PC5000 PC520M PC510 PC500 PC20 RD701 RD700
Measuring range	0~1000mA (1A)	
Accuracy / Frequency range	± (1.0%rdg+0.1mV) / (50Hz/60Hz) ± (2.0%rdg+0.1mV) / (40Hz~1kHz)	
Maximum allowable input*	100A continuous (50/60Hz)	
Output impedance	Approx. 180Ω	
Core diameter	Approx. φ24mm max.	
Size / Weight	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.



CE

## Clamp Sensor

### CL140 (with case)

LEAK

Micro / leak current (AC)

■No battery Length : 2m

Range	1A	Applicable digital multimeter
Resolution	1mA	PC5000a PC510a PC500a PC5000 PC520M PC510 PC500 PC20 RD701 RD700
Measuring range	0~1000mA (1A)	
Accuracy / Frequency range	± (1.0%rdg+0.1mV) / (50Hz/60Hz) ± (2.0%rdg+0.1mV) / (40Hz~1kHz)	
Maximum allowable input*	200A continuous (50/60Hz)	
Output impedance	Approx. 200Ω	
Core diameter	Approx. φ40mm max.	
Size / Weight	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.



CE

### CL33DC (with case)

DC current

■R03X2 Length : 1.8m Battery life : approx. 70H

Range	DC300A	DC30A	Applicable digital multimeter
Resolution	0.1A	0.01A	PC5000a PC510a PC500a PC5000 PC520M PC510 PC500 PC20 RD701 RD700 DA-50C CD772 CD771 CD770 CD750P CD731a
Minimum scale	5A 10A	0.5A 1A	TA55 (Analog)
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

■R03X2 Length : 1.8m Battery life : approx. 70H

Range	DC200A	DC20A	AC200A	AC20A	Applicable digital multimeter
Resolution	0.1A	0.01A	0.1A	0.01A	PC5000a PC510a PC500a PC5000 PC520M PC510 PC500 PC20 RD701 RD700 DA-50C CD772 CD771 CD770 CD750P CD731a
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.



### CL-20D

AC current

■No battery Length : 1.8m

Range	AC200A	AC20A	Applicable digital multimeter
Resolution	0.1A	0.01A	PC5000a PC510a PC500a PC5000 PC520M PC510 PC500 PC20 RD701 RD700 DA-50C CD772 CD771 CD770 CD750P CD731a
Standard accessories included	Instruction manual		

Output voltage : AC2V (AC200A (50~400Hz), AC20A (50/60Hz) when measuring max. current at each range.)

### Optional accessories

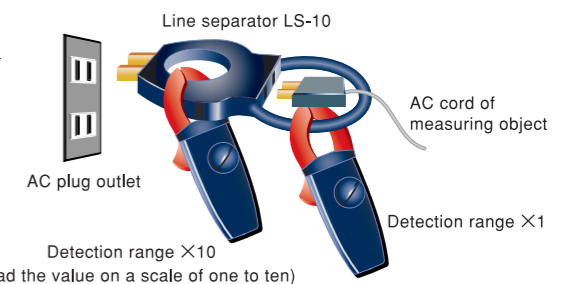
Carrying case : C-CL



## Line separator

### LS-10

- Suitable for measuring consumption current of house hold appliances
- Detection range scaling factor = 1 time / 10 times
- Rated voltage = AC125V
- Rated current = AC12A
- Core diameter = φ32mm
- H165×W65×D20mm / 110g





# 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 multimeter 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	
25V 50V	Insulation measurement of telephone circuit equipments and explosion-proof equipments	Insulation measurement of telephone circuits
100V 125V	Insulation measurement of control equipments	Insulation measurement for maintaining and controlling low-voltage distribution wiring and equipments of 100V or less 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 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 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.

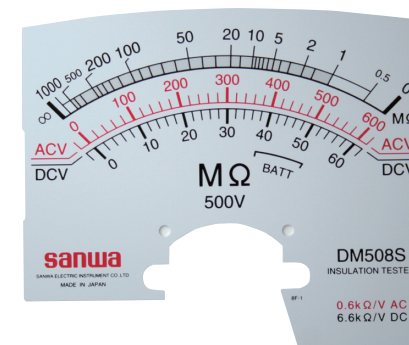
## Measuring method of low-voltage circuit

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.

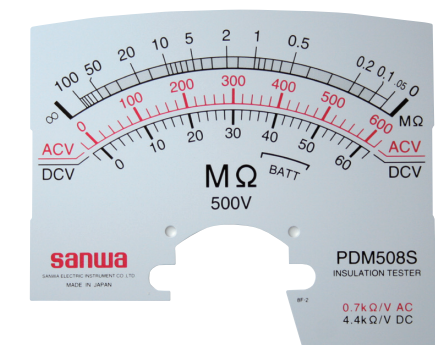
Use voltage class of circuit	Insulation resistance value
300V or less	When voltage to ground is 150V or less (Voltage to ground: Voltage between wire and the earth in case of a ground type circuit, and voltage between wires in case of a non-ground type circuit. The same applies hereinafter.) 0.1MΩ
	Other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

Automatic live circuit detection ( $\geq 30V$  AC/DC)

APS	DATA HOLD	BACK LIGHT	AD
1000V 4000M $\Omega$	500V 4000M $\Omega$	250V 4000M $\Omega$	



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## MG1000/MG500/MG125

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/MG125 only)

## 3 Range Test Voltage

## General Information

- In any range (M $\Omega$ ), the hot-line state (30 V minimum) can be detected through the buzzer sound and the red LED illumination. If you press the MEASURE button by mistake in this state, no test voltage will be generated. Thus, the measuring circuit and the equipment involved will not be affected adversely.
- During the measurement of M $\Omega$ , a large volt mark is illuminated on the LCD with the buzzer sound, allowing you to find that voltage is generated.
- To select the highest test voltage range, you need to turn the rotary switch while holding down the 0 $\Omega$  ADJ button. This design feature prevents the highest test voltage from being generated by an operation mistake.
- An easy-to-hold body with a portrait design has been adopted to ensure stable measurements.
- The tester comes with a strap, and uses less slippery elastomeric material for its lateral sides so that the user can grip the tester more firmly.
- After measurements have been finished, the last measured value can be held automatically. Unlike an analog tester, you do not need to check the reading during measurements and therefore can comfortably concentrate on the object under measurement.
- A large logarithmic bargraph is provided to enable the user to check the measured value like using an analog tester.
- The backlight allows you to check the measured value even in a dark place. Since the rated voltage output can be checked with the green LED, you can find whether the measurement is being carried out properly.
- Auto discharge function.
- Low battery warning indicator.

MG1000	Measuring range	Best accuracy	Resolution
M $\Omega$	4M/40M/400M/4000M	$\pm (3\%+4)$	0.001M $\Omega$
Test voltage	1000/500/250V		
ACV/DCV	600V (AC/DC Automatic detection)	$\pm (3\%+2)$	1V
$\Omega$	4000 $\Omega$ (Buzzer and ALARM indicator)	$\pm (3\%+3)$	1 $\Omega$
$\Omega$	40 $\Omega$	$\pm (3\%+10)$	0.01 $\Omega$
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 $\geq 30V$ AC/DC or more, inhibits test, buzzer sounds and ALARM indicator lights up.		
Battery	LR6 $\times$ 6		
Size / Weight	H170 $\times$ W142 $\times$ D57mm/approx. 600g		
Standard accessories included	Test Lead (TL-112), Strap (ST-50), Instruction Manual		

## MG500

Automatic live circuit detection ( $\geq 30V$  AC/DC)

APS	DATA HOLD	BACK LIGHT	AD
500V 4000M $\Omega$	250V 4000M $\Omega$	125V 4000M $\Omega$	



CE



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MG500	Measuring range	Best accuracy	Resolution
M $\Omega$	4M/40M/400M/4000M	$\pm (3\%+4)$	0.001M $\Omega$
Test voltage	500/250/125V		
ACV/DCV	600V (AC/DC Automatic detection)	$\pm (3\%+2)$	1V
$\Omega$	4000 $\Omega$ (Buzzer and ALARM indicator)	$\pm (3\%+3)$	1 $\Omega$
$\Omega$	40 $\Omega$	$\pm (3\%+10)$	0.01 $\Omega$
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 $\geq 30V$ AC/DC or more, inhibits test, buzzer sounds and ALARM indicator lights up.		
Battery	R6 $\times$ 6		
Size / Weight	H170 $\times$ W142 $\times$ D57mm/approx. 600g		
Standard accessories included	Test Lead (TL-112), Strap (ST-50), Instruction Manual		

## MG125

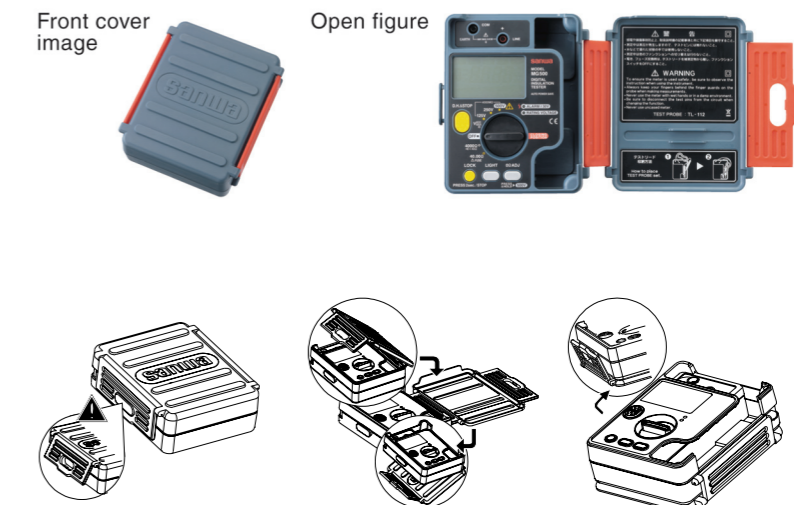
Automatic live circuit detection ( $\geq 30V$  AC/DC)

APS	DATA HOLD	BACK LIGHT	AD
125V 400M $\Omega$	50V 400M $\Omega$	25V 400M $\Omega$	



CE

## Opening / closing the body cover





## 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

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



## DG7

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



## DG8

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



## DG9

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



## DG10

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 display,  
20 times / sec. for bar graph

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

Function	Best accuracy	Resolution
MΩ	4/40M ± (2%+0~7)	0.001MΩ
Display	4000	
Battery	Silver oxide cell (SR44)×2	
Size / Weight	H117×W76×D18mm/approx. 125g	
Standard accessories included	Clip lead (CL-15 black only), Instruction manual	

## Optional accessories

Clip adapter : CL-13

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

Function	Best accuracy	Resolution
MΩ	4/40M ± (2%+0~4)	0.001MΩ
Display	4000	
Battery	Silver oxide cell (SR44)×2	
Size / Weight	H117×W76×D18mm/approx. 125g	
Standard accessories included	Clip lead (CL-15 black only), Instruction manual	

## Optional accessories

Clip adapter : CL-13

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

Function	Best accuracy	Resolution
MΩ	4/40M (50V) ± (2%+0~4)	0.001MΩ
Display	4000	
Battery	Silver oxide cell (SR44)×2	
Size / Weight	H117×W76×D18mm/approx. 125g	
Standard accessories included	Clip lead (CL-15 black only), Instruction manual	

## Optional accessories

Clip adapter : CL-13

APS	DATA HOLD	125V 400MΩ	50V 40MΩ
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Function	Best accuracy	Resolution
MΩ	4/40M (50V) ± (2%+0~4)	0.001MΩ
Display	4000	
Battery	Silver oxide cell (SR44)×2	
Size / Weight	H117×W76×D18mm/approx. 125g	
Standard accessories included	Clip lead (CL-15 black only), Instruction manual	

## Optional accessories

Clip adapter : CL-13

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

Function	Best accuracy	Resolution
MΩ	4M/40M (125V) ± (3%+3)	0.001MΩ
Display	4000	
Battery	Silver oxide cell (SR44)×2	
Size / Weight	H117×W76×D18mm/approx. 125g	
Standard accessories included	Clip lead (CL-15 black only), Instruction manual	

## Optional accessories

Clip adapter : CL-13

## Analog Type



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## DM1528S

## 3 test voltage ranges

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

Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III  
600V



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## DM5218S

## 3 test voltage ranges

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

Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III  
600V

## Optional accessories

Test lead : TLF-120



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## 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

Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III  
600V



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## 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

Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III  
600V

## Optional accessories

Test lead : TLF-120



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## 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

Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III  
600V

## Optional accessories

Test lead : TLF-120

AD	1000V 2000MΩ	500V 1000MΩ	250V 500MΩ
DM1528S	Insulation resistance (MΩ)		
	1~2~1000~2000MΩ 1000V		
	0.5~1~500~1000MΩ 500V		
	0.1~0.5~200~500MΩ 250V		
	Accuracy		
	±5% of reading (1st effective measurement range : written in thick print above)		
	±10% of reading (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 / Weight	H144×W99×D43mm/approx. 310g		
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual		

AD	500V 1000MΩ	250V 500MΩ	125V 200MΩ
DM5218S	Insulation resistance (MΩ)		
	0.5~1~500~1000MΩ 500V		
	0.1~0.5~200~500MΩ 250V		
	0.05~0.2~100~200MΩ 125V		
	Accuracy		
	±5% of reading (1st effective measurement range : written in thick print above)		
	±10% of reading (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 / Weight	H144×W99×D43mm / approx. 310g		
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual		

AD	1000V 2000MΩ
DM1008S	Insulation resistance (MΩ)
	1~2~1000~2000MΩ
	Accuracy
	±5% of reading (1st effective measurement range : written in thick print above)
	±10% of reading (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 / Weight	H144×W99×D43mm/approx. 310g
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual

AD	500V 1000MΩ
DM508S	Insulation resistance (MΩ)
	0.5~1~500~1000MΩ
	Accuracy
	±5% of reading (1st effective measurement range : written in thick print above)
	±10% of reading (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 / Weight	H144×W99×D43mm/approx. 310g
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual

AD	500V 100MΩ
PDM508S	Insulation resistance (MΩ)
	0.05~0.1~50~100MΩ
	Accuracy
	±5% of reading (1st effective measurement range : written in thick print above)
	±10% of reading (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 / Weight	H144×W99×D43mm/approx. 310g
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual





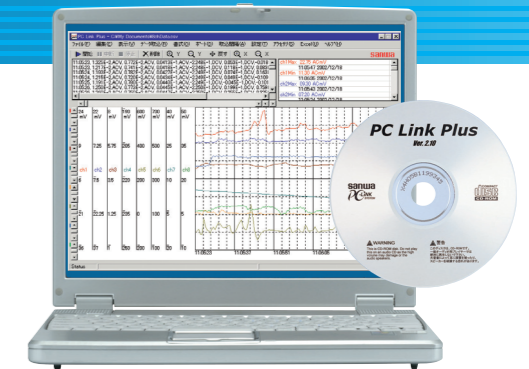
PC Link System,  
Digital Multimeter

# PC Link System

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

**A wide variety of applications ranging from business and educational institutions to personal users.**

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 allow 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.



Example of PC Link Plus screen

**PC Link Plus**  
Max 8 Channels

**PC Link**  
Single Channel



**Applicable Models** PC20, PC500a, PC510a, PC520M, PC5000a

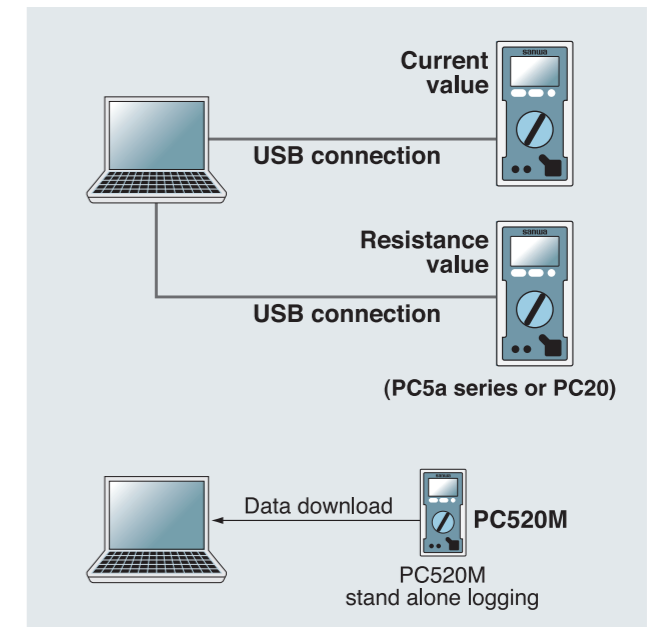
## Flexible support for diversified environments

A digital multimeter set at a certain measuring point concurrently monitors and measures various factors such as voltage, current and frequency on up to 8 channels (with the use of PC Link Plus). RS232C or USB cable can be used to allow flexible connection between a digital multimeter and a PC. Concurrent measurements can be made even in an environment with various interfaces mixed.

\* PC connecting cable is available as an option.

### Major features:

- Automatically detects a port connected with a digital multimeter
- The retrieval interval can be set from 1 second.
- Allows viewing the previous screen while retrieving data.
- Allows automatic retrieval by schedule setting.
- Allows data saving in a CSV format with the date and time appended.
- The Y axis of a graph can be divided into 10.
- Allows automatic e-mail transmission attached with measurement data (Outlook Express Ver.6 and higher).
- Allows data import to Excel in up to 65,536 lines.



### PC Link Plus operating environment

OS: Windows98 / 98SE / ME / 2000 / XP  
 CPU: Pentium 450MHz or better  
 Memory: 128MB or better (for 8 channels logging)  
 Resolution: 800x600 or above

- The latest version of PC Link Plus is Ver2.10. (March, 2005)
- Free version-up service is available in our website.

<http://www.sanwa-meter.co.jp/>

### Optional accessories for PC Link products



New Products  
Clamp Meter  
Insulation Resistance Tester  
PC Link System, Digital Multimeter  
Analog Multimeter  
Various Instruments  
Accessories



# 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 multimeter.

## 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.

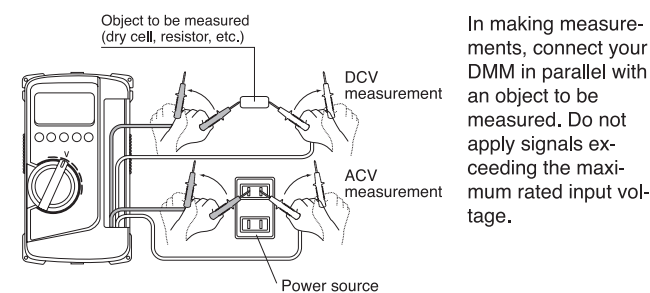
AC-Coupled true RMS value: Adapted to measurements of distorted sine and non-sine waves of the AC  
AC + DC-coupled true RMS value: Adapted to measurements of waveform containing a DC component.

### 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.

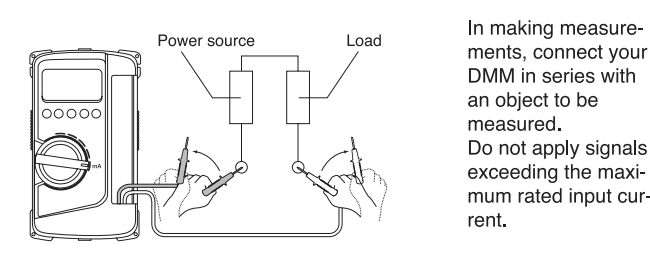
## Measurement

### Voltage, Resistance measurement



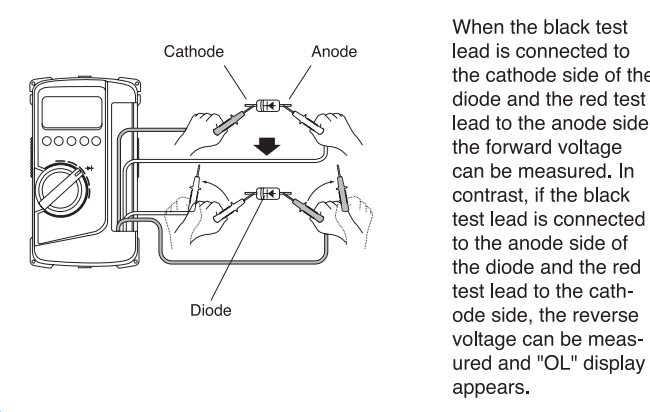
In making measurements, connect your DMM in parallel with an object to be measured. Do not apply signals exceeding the maximum rated input voltage.

### 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)



### PC5000a

#### 50000 & 500000 Count

- 4-4 / 5 digits 50000 count (Selectable 5-4 / 5 digits 500000 count for DCV & Hz)
  - 0.03% best accuracy
  - AC / AC + DC True RMS
  - Fast speed bar graph
  - Capacitance measurement (5000 count)
    - \*Not suitable for measurement of condensers with large leak current.
  - 4-20mA% measurement
  - dBm 20 selectable reference impedance
  - Line frequency (AC sine wave) measurement
  - Logic frequency measurement
  - Duty cycle measurement
  - Capture (peak hold) 0.8ms in duration
  - MAX, MIN, MAX-MIN recording mode
  - Peak hold
  - Data hold, Range hold
  - Relative value
  - Auto power off (17min.) (cancelable)
  - Alarm for improper test lead insertion to current terminal
  - Protective holster with wall hanger and lead holder
  - Tilt stand
  - Optical link RS232C / USB interface (optional)
- Display** : numeral display 50000 & 500000 selectable  
Bar graph 52 segments
- Sampling rate** : 5 times / sec. for 50000 count numeral display, 1.25 times / sec. for 500000 count numeral display 60 times / sec. for bar graph
- AC frequency bandwidth** : V : 45Hz~1kHz, 1kHz~20kHz (below 500V), A : 45Hz~1kHz
- Safety** : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.II1000V Max.
- Battery life** : Approx. 120h (alkaline battery) at DCV range



RMS	Hz	+	))	% 4-20	dBm	AP OFF	DATA HOLD
RNG HOLD	REL	Duty	Capture	MAX MIN	232c	USB	Optional PC Link C

Function	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	±(0.8%+60)	0.01mV	
DCA	500μ/5000μ/50m/500m/5/10A	±(0.1%+20)	0.01μA	
ACA	500μ/5000μ/50m/500m/5/10A	±(1.0%+40)	0.01μA	
Resistance	500/5/50k/500k/5M/50MΩ	±(0.2%+6)	0.01Ω	
Capacitance	50n/500n/5μ/50μ/500μ/9999μF	±(0.8%+3)	0.01nF	
Frequency	10Hz~200kHz	±(0.02%+4)	0.0001Hz	
Logic frequency	5Hz~2MHz	±(0.002%+4)	0.0001Hz	
Duty cycle	0.1%~99.99%	±(3d / kHz+2)		
dBm	-11.76dBm~54.25dBm at 600Ω	±(0.25dB+2)		
4~20mA%	4mA=0%, 20mA=100%	±25d	0.01%	
Continuity	Buzzer sounds at between 20Ω and 200Ω. Open voltage : approx. 3V			
Diode test	Open voltage : approx. 3.5V			

### Optional accessories

Software : PC Link, PC Link Plus  
Optical PC link cable : KB-RS2a, KB-USB2a  
Clamp probe : CL124, CL140, CL-20D, CL-22AD, CL33DC  
Temperature probe : T-300PC (PC Link software is necessary.)  
Test lead : TL-21M, TL-21, TLF-120  
Carrying case : C-CD

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



### PC520M

#### 43,000 points data logging in built-in memory

- 3-4 / 5 digits 5000 count
  - 0.08% best accuracy
  - AC True RMS
  - Fast speed bar graph
  - Capacitance measurement
    - \*Not suitable for measurement of condensers with large leak current.
  - K type temperature -50°C~1000°C
    - \*Optional accessory K-AD is necessary.
    - \*K type temp. sensor K-250PC is included as a standard accessory.
  - Frequency measurement (AC sine wave only)
  - Data hold / Range hold
  - Auto power off (17min.) (cancelable)
  - Test lead resistance zero adjustment function
  - Protective holster with wall hanger and lead holder
  - Tilt stand
  - Optical link RS232C / USB interface (optional)
- Data Logging Mode**
- 43,000 data points in built-in memory
  - Selection of measurement interval
    - 0.05s/1s/20s/40s/1min/2min/4min/8min (DCV, ACV, DCA, ACA)
    - 0.2s/1s/20s/40s/1min/2min/4min/8min (C, Ω)
    - 0.4s/1s/20s/40s/1min/2min/4min/8min (Hz)
  - Auto-standby mode during data logging to extend battery life
  - Auto-stop of data logging when batteries are low to guarantee accuracy of every logged datum
  - Export logged data to PC
- Display** : numeral display 5000, bar graph 52 segments
- Sampling rate** : 5 times / sec., 60 times / sec. for bar graph
- AC frequency bandwidth** : 40Hz~20kHz (below 500V), 40Hz~1kHz (ACA)
- Safety** : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.II 1000V Max.
- Battery life** : Approx. 150h (alkaline battery) at DCV range



RMS	Hz	+	))	°C	AP OFF
DATA HOLD	RNG HOLD	TLR Cal	232c	USB	

Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	50m/500m/5/50/500/1000V	±(0.08%+2)	0.01mV	10MΩ
ACV	50m/500m/5/50/500/1000V	±(0.5%+3)	0.01mV	
DCA	500μ/5000μ/50m/500m/5/10A	±(0.2%+4)	0.1μA	
ACA	500μ/5000μ/50m/500m/5/10A	±(0.6%+3)	0.1μA	
Resistance	50/500/5k/50k/500k/5M/50MΩ	±(0.2%+2)	0.01Ω	
Capacitance	50n/500n/5μ/50μ/500μ/9999μF	±(0.8%+3)	0.01nF	
Temperature	-50°C~1000°C (thermocouple K type)	±(0.3%+3)	1°C	
Frequency	10Hz~125kHz	±(0.01%+2)	0.001Hz	
Continuity	Buzzer sounds at between 20Ω and 120Ω. Open voltage : approx. 3V			
Diode test	Open voltage : approx. 3.5V			

### Optional accessories

Software : PC Link, PC Link Plus  
Optical PC link cable : KB-RS2, KB-USB2  
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, TL-21, TLF-120  
Carrying case : C-CD



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



CE

## PC510a



## Temperature measurement, True RMS

- 3-4 / 5 digits 5000 count
- 0.08% best accuracy
- AC True RMS
- High speed bar graph
  - Zoom bargraph (5 times)
- Capacitance measurement
  - Not suitable for measurement of condensers with large leak current.
- K type temperature -50°C~1000°C
  - Optional accessory K-AD is necessary.
  - K type temp. sensor K-250PC is included as a standard accessory.
- Frequency measurement (AC sine wave only)
- MAX-MIN recording mode
- Peak hold
- Data hold / Range hold
- Relative value
- Auto power off (17min.) (cancelable)
- Test lead resistance zero adjustment function
- Protective holster with wall hanger and leadholder
- Tilt stand
- Optical link RS232C / USB interface (optional)

**Display** : numeral display 5000, bar graph 52 segments  
**Sampling rate** : 5 times / sec., 60 times / sec. for bar graph  
**AC frequency bandwidth** : 40Hz~20kHz (below 500V), 40Hz~1kHz (ACA)  
**Safety** : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.II 1000V Max.  
**Battery life** : Approx. 120h (manganese battery) at DCV range



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	50m/500m/5/50/500/1000V	± (0.08%+2)	0.01mV	10MΩ
ACV	50m/500m/5/50/500/1000V	± (0.5%+3)	0.01mV	
DCA	500μ/5000μ/50m/500m/5/10A	± (0.2%+4)	0.1μA	
ACA	500μ/5000μ/50m/500m/5/10A	± (0.6%+3)	0.1μA	
Resistance	50/500/5k/50k/500k/5M/50MΩ	± (0.2%+2)	0.01Ω	
Capacitance	50n/500n/5μ/50μ/500μ/9999μF	± (0.8%+3)	0.01nF	
Temperature	-50°C~1000°C (thermocouple K type)	± (0.3%+3)	1°C	
Frequency	10Hz~125kHz	± (0.01%+2)	0.001Hz	
Continuity	Buzzer sounds at between 20Ω and 120Ω. Open voltage : approx. 3V			
Diode test	Open voltage : approx. 3.5V			
Bandwidth	40Hz~20kHz (below 500V) 40Hz~1kHz (ACA)			
Fuse / Battery	12.5A/500V IR20kA φ6.3×32mm 0.63A/500V IR200kA φ6.3×32mm	6LF22 (9V)×1		
Size / Weight	H179×W87×D55mm/460g (including holster)			
Standard accessories included	Test lead (TL-82), Holster (H-50), Thermocouple K type (K-250PC), Instruction manual			

## Optional accessories

Software : PC Link, PC Link Plus Optical PC link cable : KB-RS2a, KB-USB2a  
 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, TL-21, TLF-120  
 Carrying case : C-CD Clip adapter : CL-13

## High accuracy (PC Link)



CE

## PC500a



## Best accuracy 0.08% high accuracy model

- 3-4 / 5 digits 5000 count
- 0.08% best accuracy
- High speed bar graph
- Capacitance measurement
  - Not suitable for measurement of condensers with large leak current.
- Frequency measurement (AC sine wave only)
- Data hold / Range hold
- Auto power off (17min.) (cancelable)
- Protective holster with wall hanger and lead holder
- Tilt stand
- Optical link RS232C / USB interface (optional)

**Display** : numeral display 5000, bar graph 52 segments  
**Sampling rate** : 5 times / sec., 60 times / sec. for bar graph  
**AC frequency bandwidth** : 40~20kHz (below 500V), 40~1kHz (ACA)  
**Safety** : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.II 1000V Max.  
**Battery life** : Approx. 120h (manganese battery) at DCV range



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	50m/500m/5/50/500/1000V	± (0.08%+2)	0.01mV	10MΩ
ACV	50m/500m/5/50/500/1000V	± (0.5%+3)	0.01mV	
DCA	500μ/5000μ/50m/500m/5/10A	± (0.2%+4)	0.1μA	
ACA	500μ/5000μ/50m/500m/5/10A	± (0.6%+3)	0.1μA	
Resistance	50/500/5k/50k/500k/5M/50MΩ	± (0.2%+2)	0.01Ω	
Capacitance	50n/500n/5μ/50μ/500μ/9999μF	± (0.8%+3)	0.01nF	
Frequency	10Hz~125kHz	± (0.01%+2)	0.001Hz	
Continuity	Buzzer sounds at between 20Ω and 120Ω. Open voltage: approx. 3V			
Diode Test	Open voltage : approx. 3.5V			
Bandwidth	40Hz~20kHz (below 500V) 40Hz~1kHz (ACA)			
Fuse / Battery	12.5A/500V IR20kA φ6.3×32mm 0.63A/500V IR200kA φ6.3×32mm	6LF22 (9V)×1		
Size / Weight	H179×W87×D55mm/460g (including holster)			
Standard accessories included	Test lead (TL-82), Holster (H-50), Instruction manual			

## Optional accessories

Software : PC Link, PC Link Plus Optical PC link cable : KB-RS2a, KB-USB2a  
 Clamp probe : CL124, CL140, CL-20D, CL-22AD, CL33DC  
 Temperature probe : T-300PC (PC Link software is necessary.)  
 Test lead : TL-21M, TL-21, TLF-120  
 Carrying case : C-CD Clip adapter : CL-13

## Data processing (PC Link)



CE

## 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 RS232C / USB interface (optional)

**Display** : numeral display 4000  
**Sampling rate** : 3 times / sec.  
**AC frequency bandwidth** : 40~500Hz  
**Safety** : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.II DC1000V, 750V Max.  
**With AC adapter** : IEC61010-1 (EN61010-1) 2001-02 CAT.III 200V Max.



Function	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%+2)	0.001V	ACV: 10MΩ~100MΩ
DCA	400μ/4000μ/40m/400m/4A/10A	± (1.5%+2)	0.1μA	ACV: 10MΩ~100MΩ
ACA	400μ/4000μ/40m/400m/4A/10A	± (1.8%+2)	0.1μA	ACV: 10MΩ~100MΩ
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 / Weight	H167×W90×D48mm/330g (including holster)			
Standard accessories included	Test lead (TL-21), Holster (H-70), Instruction manual			

## Optional accessories

Software : PC Link, PC Link Plus Optical PC link cable : KB-RS1, KB-USB1  
 Clamp probe : CL124, CL140, 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-13, CL-15, TL-8IC

## Standard type



CE

## 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)  
**Safety** : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max.



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/600V	± (0.5%+2)	0.1mV	DCV: 10MΩ~100MΩ
ACV	4/40/400/600V	± (1.2%+3)	1mV	ACV: 10MΩ~100MΩ
DCA	400μ/4000μ/40m/400m/4A	± (1.4%+3)	0.1μA	ACV: 10MΩ~100MΩ
ACA	400μ/4000μ/40m/400m/4A	± (1.8%+5)	0.1μA	ACV: 10MΩ~100MΩ
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 / Weight	H166×W82×D44mm/340g			
Standard accessories included	Test lead (TL-21), Instruction manual			

## Optional accessories

Clamp probe : CL-20D, CL-22AD, CL33DC  
 Carrying case : C-77 Clip adapter : CL-11, CL-15, TL-8IC  
 Test lead : TLF-120



Multifunctional new standard

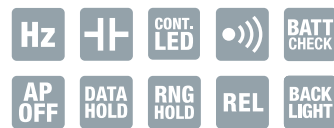


CD771

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.)

**Display :** numeral display 4000  
**Sampling rate :** 3 times / sec.  
**AC frequency bandwidth :** 40~400Hz (sine wave)  
**Safety :** IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.IIDC1000V

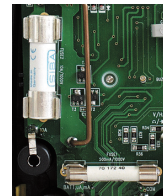


Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/1000V	± (0.5%+2)	0.1mV	DCV: 10M~
ACV	4/40/400/1000V	± (1.2%+7)	1mV	10M~
DCA	400μ/4000μ/40m/400m/4/10A	± (1.4%+3)	0.1μ	100MΩ
ACA	400μ/4000μ/40m/400m/4/10A	± (1.8%+5)	0.1μ	ACV: 10M~
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.2%+5)	0.1Ω	11MΩ
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 Φ6.35X32mm 10A/1000V 30kA Φ10X38mm	R6PX2		
Size / Weight	H166XW82XD44mm/360g			
Standard accessories included	Test lead (TL-23), Instruction manual			

Optional accessories

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

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



Multifunction



RD700



RD700 RD701

High input impedance 1000MΩ

- 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

**Safety :** IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.II1000V Max.



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/1000V	± (0.3%+4)	0.1mV	10M~
ACV	400m/4/40/400/1000V	± (1.5%+5)	0.1mV	1000MΩ
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°C~300°C	± (2%+3)	1°C	
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 Φ6.3X32mm 0.63A/500V IR200kA Φ6.3X32mm	R6PX2	6LF22 (9V)X1	
Size / Weight	H179XW87XD55mm/460g (including holster)			
Standard accessories included	Test Lead (TL-82), Thermocouple K type (K-250PC), Holster (H-50), Instruction manual			

Optional accessories

- Clamp probe : CL124, CL140, CL-20D, CL-22AD, CL33DC
- 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, TL-21, TLF-120
- Carrying case : C-CD Clip adapter : CL-13

True RMS new standard



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 measurement -20°C~300°C
- 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 :** 45~500Hz (4V range), 45~1KHz (40V range and above)  
**Safety :** IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.IIDC1000V

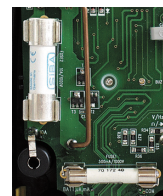


Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/1000V	± (0.5%+2)	0.1mV	DCV: 10M~
ACV	4/40/400/1000V	± (1.2%+8)	1mV	10M~
DCA	400μ/4000μ/40m/400m/4/15A	± (1.4%+3)	0.1μ	100MΩ
ACA	400μ/4000μ/40m/400m/4/15A	± (1.8%+6)	0.1μ	ACV: 10M~
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.2%+5)	0.1Ω	11MΩ
Capacitance	50n/500n/5μ/50μ/100μF	± (5%+10)	0.01nF	
Frequency	5/50/500/5k/50k/100kHz	± (0.3%+3)	0.001Hz	
Temperature	-20°C~300°C	± (0.3%+30)	0.1°C	
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 Φ6.35X32mm 16A/1000V 30kA Φ10X38mm	R6PX2		
Size / Weight	H166XW82XD44mm/360g			
Standard accessories included	Test lead (TL-25), 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 Clip adapter : CL-11, CL-15, TL-8IC
- Test lead : TLF-120

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



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



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/600V	± (0.7%+3)	0.1mV	DCV: 10M~
ACV	4/40/400/600V	± (1.6%+9)	0.001V	10M~
DCA	40m/400mA	± (2.2%+5)	0.01mA	100MΩ
ACA	40m/400mA	± (1.5%+5)	0.01mA	10M~
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.5%+5)	0.1Ω	11MΩ
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 Φ5.2X20 ceramic	R6PX2		
Size / Weight	H176XW104XD46mm/approx. 340g			
Standard accessories included	Hand strap, Instruction manual			

Optional accessories

- Clip adapter : CL-11, TL-8IC



## Standard type



CE

## 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)  
**Safety** : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.II 1000V



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/1000V	± (0.5%+2)	0.1mV	DCV: 10M~100MΩ
ACV	4/40/400/750V	± (1.2%+5)	1mV	ACV: 10M~100MΩ
DCA	400μ/4000μ/40m/400mA/4A/20A	± (1.5%+2)	0.1μ	ACV: 10M~100MΩ
ACA	400μ/4000μ/40m/400mA/4A/20A	± (1.5%+5)	0.1μ	ACV: 10M~100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.2%+4)	0.1Ω	11MΩ
Capacitance	50n/500n/5μ/50μ/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 20A/250V 200kA Φ6.3X32mm	R6X2		
Size / Weight	H167XW90XD48mm/315g (including holster)			
Standard accessories included	Test lead (TL-21), Holster (H-70) Instruction manual			

## Optional accessories

Clamp probe : CL-20D, CL-22AD, CL33DC  
 Carrying case : C-SP Clip adapter : CL-11, CL-15, TL-8IC, HV probe:HV-60

## 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.



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/500V	± (0.8%+4)	0.1mV	DCV: 10M~100MΩ
ACV	4/40/400/500V	± (2.3%+8)	0.001V	ACV: 10M~100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (2.0%+4)	0.1Ω	ACV: 10M~100MΩ
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-44X2			
Size / Weight	H117XW76XD18mm/approx. 117g			
Standard accessories included	Instruction manual			

## Optional accessories

Clip adapter : CL-13

## Slim compact



## DA-50C

## Easy to use slim body

- 3-3 / 4 digits 4000 count
- 0.6% best accuracy
- Fast speed bar graph
- Frequency measurement (AC sine wave only)
- Low power ohm (input voltage 0.4V) at continuity range
- Max / Min recording measurement
- Data hold / Range hold
- Relative value
- Auto power off (30min.) (cancelable)

**Display** : numeral display 3999, bar graph 40 segments  
**Sampling rate** : 2 times / sec., 20 times / sec. for bar graph  
**AC frequency bandwidth** : 45~100Hz (400mV), 45~500Hz (4V and above)



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/600V	± (0.6%+2)	0.1mV	DCV: 10M~100MΩ
ACV	4/40/400/600V	± (1.4%+5)	0.1mV	ACV: 10M~100MΩ
DCA	40m/10A	± (1.4%+2)	0.01mA	ACV: 10M~100MΩ
ACA	40m/10A	± (1.8%+5)	0.01mA	ACV: 10M~100MΩ
Resistance	400/4k/40k/400k/4000k/40MΩ	± (0.8%+2)	0.1Ω	100MΩ
Frequency	99.99/999.9/9.999k/99.99k/999.9kHz	± (0.3%+3)	0.01Hz	
Continuity	Buzzer sounds at less than 40Ω. Open voltage : approx. 0.4V			
Diode test	Open voltage : approx. 2.2~3.3V			
Bandwidth	45~100Hz (400mV) 45~500Hz (higher than 4V)			
Fuse / Battery	0.5A/250V Φ5.2X20mm 10A/250V Φ5.2X20mm	R03X2		
Size / Weight	H145XW82XD30mm/approx. 200g			
Standard accessories included	Test Lead (TL-61), Instruction manual			

## Optional accessories

Clamp probe : CL-20D, CL-22AD, CL33DC Carrying case : C-DA Clip adapter : CL-11, TL-8IC



CE

## 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.



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/500V	± (0.7%+3)	0.1mV	DCV: 10M~100MΩ
ACV	4/40/400/500V	± (2.3%+10)	0.001V	ACV: 10M~100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (2.0%+5)	0.1Ω	ACV: 10M~100MΩ
Capacitance	5n/50n/500n/5μ/50μ/200μF	± (5.0%+10)	0.001nF	11MΩ
Frequency	9.999/99.999/999.9/9.99k/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)X1			
Size / Weight	H108XW56XD11.5mm/approx. 85g			
Standard accessories included	Case holder (C-PM3), Instruction manual			

## Optional accessories

Clip adapter : CL-13, CL-15

## Safety Multimeter



CE

## CD750P

## Full-range 750V overload protection circuit

- 3-3 / 4 digits 4000 count
- Giving priority to the safety
- 750V high overload protection circuit is equipped.
- 1000V withstand fuse is installed.
- 3 terminals with cover design to ensure safety.
- With carrying case to store test leads

**Display** : numeral display 4000  
**Sampling rate** : 2 times / sec.  
**AC frequency bandwidth** : 40~500Hz  
**Safety** : IEC61010-1 CAT.III 600V Max. / CAT.II DC1000V, AC750V Max.



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/1000V	± (0.7%rdg+5dgt)	0.1mV	DCV: 10M~100MΩ
ACV	4/40/400/750V	± (1.6%rdg+9dgt)	0.001V	ACV: 10M~100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.5%rdg+10dgt)	0.1Ω	ACV: 10M~100MΩ
Continuity	Buzzer sounds at less than 10~200Ω. Open voltage : approx. 0.4V			
Diode Test	Open voltage : approx. 1.5V			
Bandwidth	40~500Hz			
Fuse / Battery	0.44A / 1000V IR10kA Φ10X35mm (DMM-B44 / 100 Bussmann, Inc.)	R03X2		
Size / Weight	H157.5 X W70 X D38.5mm / 220g			
Standard accessories included	Test lead (TL-122), Carrying case (C-NH7), Instruction manual			

## Optional accessories

Clamp probe : CL-20D, CL-22AD, CL33DC High voltage probe : HV-60



## 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



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/500V	± (0.7%+3)	0.1mV	DCV: 10M~100MΩ
ACV	4/40/400/500V	± (2.3%+10)	0.001V	ACV: 10M~100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (2.0%+5)	0.1Ω	ACV: 10M~100MΩ
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-44X2			
Size / Weight	H115XW57XD18mm/approx. 85g			
Standard accessories included	Instruction manual			

## Optional accessories

Clip adapter : CL-11, TL-8IC



## 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



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/500V	± (0.7%+3)	0.1mV	DCV: 10M~100MΩ
ACV	4/40/400/500V	± (2.3%+5)	0.001V	ACV: 10M~100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (2.0%+5)	0.1Ω	ACV: 10M~100MΩ
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 / Weight	H115XW57XD18mm/approx. 85g			
Standard accessories included	Instruction manual			

## Optional accessories

Clip adapter : CL-11, TL-8IC



# 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 
  - 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.

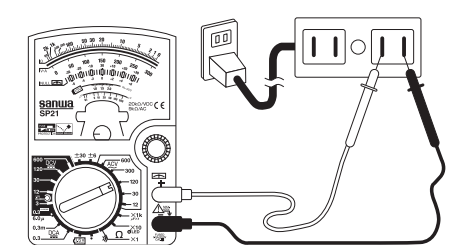
### For measuring unknown values

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.

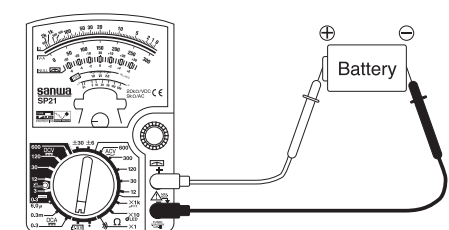
\* Do not change the range during measurement.

## Examples

### AC100V plug outlet



### Battery voltage





## FET Tester



CE

## 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)  
 Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max.

## Optional accessories

HV probe : HV-50  
 Carrying case : C-CA  
 Clip adapter : CL-11, TL-8IC, CL-15  
 Test lead : TL-21M, TLF-120



Function	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
DCA	Square symmetric wave 8.4V (2.5MΩ/V) Triangular symmetric wave 8.4V (2.5MΩ/V)	±6% of full scale
DCA (NULL)	0.12μA/0.3m/3m/30m/300m/6A	±4% of full scale
ACA	±0.06μA/±0.15m/1.5m/15m/150mA	±7% 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 / Weight	H165×W106×D46mm / approx. 375g	
Standard accessories included	Test lead (TL-21), Spare fuse, Instruction manual	

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

## Multifunctional model



CE

## CX506a

## Capacitor &amp; 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)

Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max.

## Optional accessories

HV probe : HV-50  
 Carrying case : C-CA  
 Clip adapter : CL-11, TL-8IC, CL-15  
 Test lead : TL-21M, TLF-120



Function	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 : 1~2000μ	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-extinguishing material in ceramic tube	
Size / Weight	H165×W106×D46mm/ approx. 370g	
Standard accessories included	Test lead (TL-21), Clip lead (CL-506) Instruction manual, Spare fuse	

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-Y5  
 Clip adapter : CL-11, TL-8IC  
 hFE probe : HFE-6



Function	Measuring range	Accuracy
DCV (NULL)	120m/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 100 or less, Open voltage : 3V	
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 / Weight	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-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, TL-8IC



AU-32



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 / Weight	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 / Weight	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

## 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

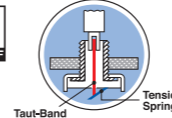
Bandwidth : 30~100kHz (AC10V)  
 Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.III1000VDC / 750VAC Max.

## Optional accessories

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



CE



Taut-Band Tension Spring



Function	Measuring range	Accuracy
DCV (NULL)	0.1V (20kΩ / V) 0.25/2.5/10/50/250V (20kΩ/V) / 250/1000V(9kΩ/V) ±5 / 25V (40kΩ / V)	±5% of full scale ±3% of full scale ±5% of full scale
ACV	10 / 50 / 250 / 750V (9kΩ / V)	±4% of full scale
DCA	50μ / 2.5m / 25m / 0.25A	±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	10 μF	*2
dB	-10dB~-+22dB (for 10VAC) ~+62dB	-
DC high voltage	DC25kV (optional probe "HV-10T" is necessary)	-
hFE	1000 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 / Weight	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)

Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V

## Optional accessories

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



## SP20

## DC high voltage &amp; 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, TL-8IC  
Test lead : TLF-120



## 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, TL-8IC



## TA55

## 30A range for automotive

- High level panel visibility
- Continuity check buzzer
- Tilt-stand
- Measurable 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, TL-8IC  
Test lead : TL-91M, TLF-120



Function	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 / Weight	H144×W99×D41mm/approx. 270g	
Standard accessories included	Test lead (TL-21), Instruction manual	

\*1 Pointer indication of the maximum move by charged current in the capacitor.



Function	Measuring range	Accuracy
DCV	0.25/2.5/10/50/100V (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 ~ +200C (Optional probe "T-THP" is necessary)	±3% (T-THP)
Bandwidth	40~100kHz (AC10V)	
Battery	R6P×2	
Fuse	φ6.3×30mm (250V/0.5A)	
Size / Weight	H144×W99×D41mm/approx. 270g	
Standard accessories included	Test lead (TL-61), Instruction manual	

\*1 Pointer indication of the maximum move by charged current in the capacitor.



Function	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 / Weight	H159.5×W129×D41.5mm / approx. 320g	
Standard accessories included	Instruction manual	

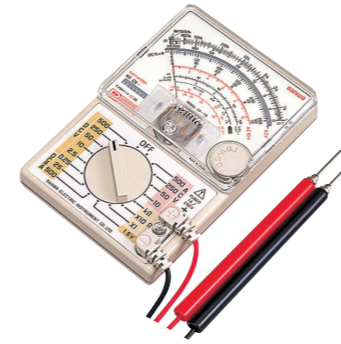
\*1 Pointer indication of the maximum move by charged current in the capacitor.



Function	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 / Weight	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, TL-8IC



Function	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	—

Function	Measuring range	Accuracy
Bandwidth	30~100kHz (AC10V) 30~20kHz (AC50V)	
Battery	R6P×1	
Fuse	φ5.2×20mm (250V/0.5A)	
Size / Weight	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)  
Safety : IEC61010 CAT.III 300V CAT.II 500V

## Optional accessories

Clip adapter : CL-15



Function	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

Function	Measuring range	Accuracy
Bandwidth	40~10kHz (less than 50V)	
Battery	R03×1	
Fuse	φ5.2×20mm (250V/0.5A)	
Size / Weight	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 ranges are protected from input voltage upto 500V
- Carrying case

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



Function	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

Function	Measuring range	Accuracy
Bandwidth	40~10kHz (less than AC50V)	
Battery	R6P×2	
Fuse	Current-limiting fuse 600V/3A, Breaking capacity 100kA Glass-tube fuse φ6.3×30mm 0.25A/250V, Breaking capacity 100A	
Size / Weight	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 re-

garded 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 *Reading (Long time or small letters)	*Reading *Makeup *Eating meal	Living room, child room, reception room, dining room, kitchen	Hall, stairway, corridor, escape stairway, garage			
School		*Precision drawing *Machine-sewing *Precision experiment	Drafting room *Blackboard *Sewing *Library reading room *Precision machining	Ordinary classroom, special classroom, library reading room	Auditorium, meeting room, hallway, stairway	Escape stairway			
Office		*Designing *Drawing *Typing *Calculation *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 Tunnel	15-3 Road with busy traffic	1.5-0.3 Road with scarce traffic, road in residential areas, park, other open spaces	
Hospital	Surgical table 10,000 over	*Autopsy *First-aid treatment *Drug formulation	Surgical room, first-aid station, ocular inspection, drug preparation *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 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 *Highlighted show case	*Highlighted display in shop *Show window, ordinary show case	Ordinary display of shop Overall shop					
Department store		*Show window, main part on the 1st floor *Highlighted show case	Ordinary display 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 its own standard. Please check the standards for your own country.

## Pocket Size



### LX2

#### Easy to use lux meter

- Small stick shape sensor probe (sensor diameter  $\phi$ 9mm)
- 3999 count with analog bar graph
- Silicon photodiode
- Measuring range 0.1lx~399.9klx
- Data hold
- Auto power save (30min.)
- Cord length 900mm

**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.

APS	DATA HOLD
Optical sensor	Si photodiode with approximated relative luminous efficiency ( $\phi$ 9mm)
Display	Numeric: 3999 full scale, Bargraph: 42-segment
Sampling rate	Approx. 2 times/sec. for numeral display. Approx. 20 times/sec. for bar graph.
Measuring range	400.0/4000/40,00k/400,0kx
Accuracy	$\pm$ (5%+1) below 3000 lx $\pm$ (7.5%+1) 3000 lx or higher Compatible JIS standard A class 23°C $\pm$ 2°C
Temperature Characteristics	$\pm$ 5% at 23°C 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	SR-44 or LR-44 $\times$ 2
Power consumption	Approx. 10mW
Operating temperature	0°C~40°C max. 80% RH no condensation
Storage temperature	-10°C~50°C max. 80% RH no condensation
Size / weight	Main body: H117 $\times$ W76 $\times$ D18mm/approx. 120g Sensor probe: H84 $\times$ W16 $\times$ D10mm
Standard accessories included	Instruction manual

## Analog Type



### LX3132

#### Max 10000 lux measurable

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

#### Optional accessories

Carrying case : C-01

Range	100/300/1000/3000/10000LUX
Accuracy	$\pm$ 10% of full scale Receiver angle 30° (less than -3%) Receiver angle 60° (less than -10%)
Optical sensor	Si photodiode with approximated relative luminous efficiency
Indicator	Analog pointer Taut-band
Battery	R6P $\times$ 2
Size / Weight	H163 $\times$ W100 $\times$ 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 photodiode 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

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 / Weight	H164×W85×D35mm/400g
Standard accessories included	AC adapter (AD-30-2), Instruction manual

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



### OPM-37LAN

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

\* Consult us regarding other type of connector.

DATA HOLD REL

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 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 W/W (REL) mode : 0.01%
Measuring cycle	3.33 times/sec.
Battery	006P type Alkaline battery or AC adapter (AD-30-2)
Size / Weight	Main body : H164×W85×D35mm/300g Sensor head : φ25×26mm/25g
Standard accessories included	Optical sensor, Extension cord, AC adapter (AD-30-2) FC-type (F01) connector adapter, Instruction manual

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



Sensor extension cord (2m)

## Laser Power Meter (Pocket Size)



### 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.



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.

APS Max HOLD

Optical sensor	Si photodiode (φ9mm)
Wavelength range	400nm~1100nm
Wavelength	633nm (He-Ne laser) reference wavelength 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. Approx. 20 times/sec. for bar graph.
Measuring range	40.00u/400.0u/4.000m/40.00mW
Accuracy	±5% (1mW : 4mW range, 633nm) 23°C±2°C
Battery	SR-44 or LR-44×2
Power consumption	Approx. 6mW
Operating temperature	0°C~40°C max. 80% RH no condensation
Storage temperature	-10°C~50°C max. 80% RH no condensation
Size / weight	H117×W76×D18mm/approx. 120g Sensor probe : H84×W16×D10mm
Standard accessories included	Instruction manual

## Laser Power Meter (Digital Type)



### OPM35S

For space light measurement

- Silicon photodiode
- Measurable up to 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 HOLD

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 / Weight	H164×W85×D35mm/300g Sensor head : H126×W15×D4mm/40g
Standard accessories included	Optical sensor, AC adapter (AD-30-2), Instruction manual

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



### OPM36M

For DVD-RAM, CD, MD laser power measurement

- Silicon photodiode
- Stick type sensor for DVD-RAM, CD, and MD is included as a standard accessory.
- Measurable up to 50.00mW
- Relative value
- Max hold, data averaging (20-data sequential averaging)
- Direct reading wavelength (633nm for DVD, 780nm for CD&MD)
- RS-232C interface

### Optional accessories

RS232C cable : KB-RS-OPM

REL Max HOLD

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	Wavelengths used by DVD (633~650nm), CD (780nm), MD (780nm)
Accuracy	±5% (@ reference wavelength of 100μW)
Resolution	W/REL mode : 0.01%
Measuring cycle	6.66 times/sec.
Battery	006P type Alkaline battery or AC adapter (AD-30-2)
Size / Weight	H164×W85×D35mm/300g CD sensor : H126×W15×D4mm/40g MD sensor : H68×W72×D6mm/30g DVD-RAM sensor : H123×W138×D8mm/80g
Standard accessories included	DVD-RAM sensor, MD sensor CD/DVD-ROM sensor (stick type), AC adapter (AD-30-2), Instruction manual

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

## Laser Power Meter (Analog Type)



### OPM-570L (with case)

For semiconductor laser

- Wavelength 650~680nm visible semiconductor laser
- Wavelength 760~830nm infrared semiconductor laser
- No power source / battery necessary.
- 4mm thick sensor head

Indicator	Taut-band Meter
Measurable wavelengths	760~830nm/650~680nm (2 ranges)
Optical power measuring range	0.01~10mW
Ranges	0.3/1/3/10mW (4 ranges)
Accuracy	±5% of full scale (@ reference wavelength)
Photosensor	Si photodiode
Size / Weight	H163×W100×D46mm/250g Sensor head:H126×W15×D4mm/40g
Standard accessories included	Carrying case (C-01), Instruction manual



# Cord Testers

## Laser Power Meter (Analog Type)



### OPM-572 (with case)

#### For He-Ne, argon, and semiconductor laser

- IR beam visual check sensor
- No power source / battery necessary.
- Output terminal for optical wave monitoring
- Direct reading wavelength (485~515/610~640/650~690/760~830nm)

Indicator	Taut-band Meter
Measurable wavelengths	485~515/610~640/650~690/760~830nm (4 ranges)
Optical power measuring range	0.01~30mW
Ranges	0.3/1/3/10/30mW (5 ranges)
Accuracy	±5% of full scale (@ reference wavelength)
Photosensor	Si photodiode (IR beam visual sensor)
Size / Weight	H163×W100×D48mm/280g Sensor head : H126×W15×D4mm/40g
Standard accessories included	Carrying case (C-01), Analog output cords (red and black) Instruction manual



### OPM-572MD (with case)

#### For He-Ne, semiconductor, and MD laser

- Stick sensor and MD (Mini Disk) shape sensor are attached.
- No power source / battery necessary.
- Output terminal for optical wave monitoring
- IR beam visual check sensor

Indicator	Taut-band Meter
Measurable wavelengths	610~640/650~690/760~830nm (3 ranges), 760~830nm for MD
Optical power measuring range	0.01~30mW
Ranges	0.3/1/3/10/30mW (5 ranges)
Accuracy	±5% of full scale (@ reference wavelength)
Photosensor	Si photodiode (IR beam visual sensor)
Size / Weight	H163×W100×D48mm/280g Sensor head : H126×W15×D4mm/40g MD photosensor (equivalent to the shape of Mini Disk)
Standard accessories included	Carrying case (C-01), Analog output cords (red and black) Instruction manual

# 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 T-300PC (for PC5 series and PC20)

## Thermo Meter (Pocket Size)



### TH3

#### High accuracy & resolution

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



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.

### APS

Measuring range	-50.0°C~200.0°C
Resolution	0.1°C
Accuracy	± (0.5%+0.5°C)
Sampling rate	Approx. 2 times/sec.
Display	3999
Sensor	Platinum foil thermometric resistor (100Ω at 0°C) Sheath type Pt 100Ω #2 x 64 JIS B class
Response	Approx. 7 sec. interval (speed of sensor's response to achieve the level of 90%)
Battery	SR-44X2
Power consumption	Approx. 18mW
Accuracy assure temperature	23±7°C max. 80% RH No condensation
Operating temperature	0°C~40°C max. 80% RH No condensation
Storage temperature	-10°C~50°C max. 80% RH No condensation
Size / weight	H117×W76×D18mm/Approx. 120g
Standard accessories included	Instruction manual

## Cord Tester



### CS-10VB

#### Multiple Cord Tester

- Continuity, faint open circuit, insulation between terminals of multiple cords
- Test voltage DC250/500V for insulation
- Faulty data hold
- LED and buzzer for judgment

Type	2~10 line type
Test voltage	Continuity : DC12V Insulation : DC250/500V
Test value (resistance)	1M~500MΩ
Resolution	LED (green) blink, buzzer
Notes	For multiple cables
Size / Weight	H175×W345×D220mm/5kg
Standard accessories included	Adopter box (CSB-2), Instruction manual



### CAD-3L

#### 3-Line Type Cord Tester

- Continuity and insulation between each couple of 2 lines (1-2, 2-3, and 1-3)
- Resistance value setting dial equipped
- Test voltage DC100/250/500V for insulation
- Automatic and manual mode
- LED and buzzer for judgment

Type	3 line type
Test voltage	Continuity : AC10kHz Insulation : DC100/250/500V
Test value (resistance)	1M~1000MΩ
Resolution	LED (green) blink, buzzer
Notes	For 3 plug lines
Size / Weight	H155×W375×D230mm/3.4kg
Standard accessories included	Adopter box (CAD-3), Instruction manual



### CAD-2L

#### Cord Tester

- Insulation and continuity of mass-produced cord with plugs
- Test voltage DC100/250/500V for insulation
- Automatic and manual mode
- LED and buzzer for judgment

Type	2 line type
Test voltage	Continuity : AC10kHz CAD-2M Insulation : DC1000V CAD-2L Insulation : DC 100/250/500V
Test value (resistance)	1M~1000MΩ
Resolution	LED (green) blink, buzzer
Notes	For 2 plug lines
Size / Weight	H155×W375×D230mm/3.3kg
Standard accessories included	Adopter box (CAD-2), Instruction manual



# Tachometers/Speed Meters

# Earth Tester

## 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



#### DATA HOLD

Model	SE-200
Measuring range	60~20000rpm 1~333rps
Accuracy	X1 range : ±1dgt, X10 range : ±2dgt
Measuring method	Contact
Display	9999 (LED display)
Battery	R6P×4
Size	183×42×31mm
Weight	Approx. 210g
Standard accessories included	Contact adaptor (SE-200AD) Contact rubber tip (SE-210AD) Hexagonal wrench (SE-220AD) 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
- One push button operation
- Auto data hold for 10 sec.
- Auto power off
- LED to check right detection



#### DATA HOLD

Model	SE-100
Measuring range	60~50000rpm 1~833rps
Accuracy	X1 range : ±1dgt, X10 range : ±2dgt
Measuring method	Non contact
Display	9999 (LED display)
Detection distance	10~150mm
Battery	R6P×4
Size	170×42×31mm
Weight	Approx. 170g
Standard accessories included	Reflective mark 20 sheets, Instruction manual

#### Optional accessories

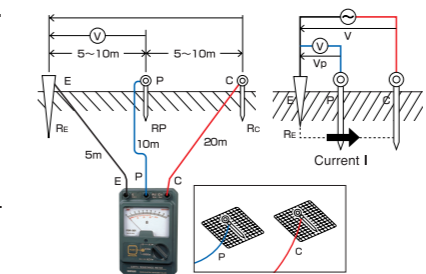
Carrying case : C-SE2  
Reflective mark : 20marks x 5sheets (total 100marks)

## 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 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

Earth resistance measuring range	10/100/1000Ω Accuracy : X1 range ±5% of full scale : X10, X100 range ±2.5% of full scale
Earth resistance measuring range	0~30V Accuracy ±2.5% of full scale
Display	Analog
Operation	Constant current system (tripolar or bipolar)
Battery	R6P×6
Size / Weight	W175×H118×D55mm/Approx. 500g
Standard accessories included	Earth bar set (SET-PDR201), Instruction manual

## Speed Meter

### SE-9000

SE-9000M (with external encoder)

For elevator maintenance, 2ch display

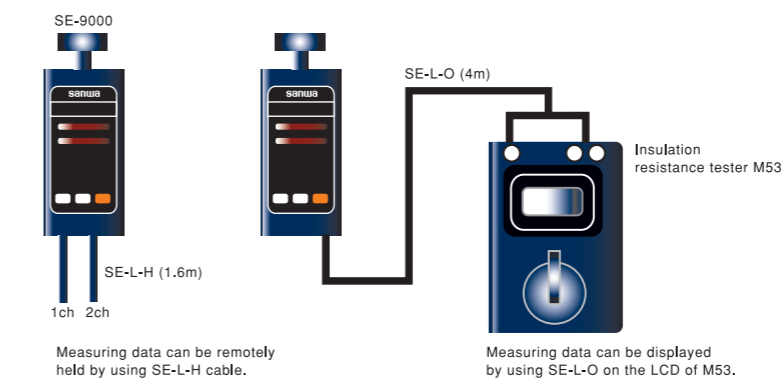
- Suitable for elevator speed measurement of high building
- 2 independent display
- Analog output terminal to record measuring data
- 2 external hold terminals for remote control
- Remote control by external encoder
- Easy to read LED display
- Auto power off
- Low battery power alarm



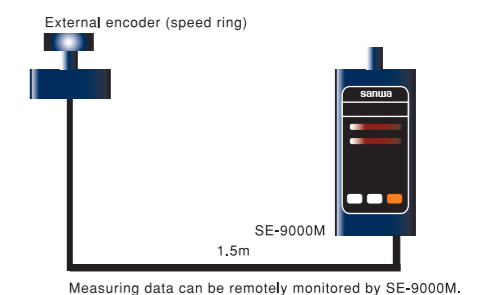
#### AP OFF DATA HOLD

Measuring range	0~1999.9m/min. 4-digit Red LED display (2 ch.) (Max 999.9) (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.) Analog output accuracy : ± (0.5%±1mV)
Data hold	Ch.1, Ch.2 isolated Operation by main switch or external hold switch
Auto power off	After 3 minutes of no operation except for during measurement
Battery	R6P×4 (with battery alarm)
Size / Weight	H174×W50×D50MM/Approx. 480g
Standard accessories included	Speed ring thickness 10mm (SE-10)×1 Speed ring thickness 0.9mm (SE-0.9)×1 Cord for hold input (SE-L-H)×2 Cord for analog output (SE-L-O)×1 Hex wrench×1, Carrying case (C-SE)×1 External encoder (speed ring)×1 (SE-9000M only) Instruction manual

### Remote control by SE-9000 / SE-9000M



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





# 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

### KIT-8D

Learning kit designed for measurement of small capacity electric circuits

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



Complete image



Function	Measuring range	Accuracy
DCV	0.3/3/12/30/120/300/600V (20k $\Omega$ /V)	$\pm$ 3% of full scale
ACV	12/30/120/300/600V (9k $\Omega$ /V)	$\pm$ 4% of full scale
DCA	60 $\mu$ /3m/30m/0.3A	$\pm$ 3% of full scale
Resistance	20/200/20k $\Omega$	$\pm$ 3% of arc
Battery check	1.5V	
Bandwidth	50 or 60Hz (sine wave)	
Battery	LUM-3(1.5V) X 2	
Fuse	$\phi$ 5.2X20mm (250V/0.5A)	
Size / Weight	H159.5XW129XD41.5mm/approx.320g	
Standard accessories included	Instruction manuals	

## Digital type

### PC20TK

General-purpose DMM kit

- 3-3/4 digits 4000 count
- Capacitance measurement (40nF~100 $\mu$ F)
- Data hold / Range hold
- Safety cover for the  $\mu$ A $\cdot$ mA
- Tilt stand
- Optical link RS232C / USB interface(optional)

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



Complete image  
※ Holster is optional accessory.



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4.0/400/750V	$\pm$ 1.0%rdg+2dgt	0.1mV	DCV:
ACV	4.40/400/750V	$\pm$ 1.5%rdg+5dgt	0.001V	10M $\Omega$
DCA	400 $\mu$ /4000 $\mu$ /40m/400m	$\pm$ 1.5%rdg+2dgt	0.1 $\mu$ A	10M $\Omega$
ACA	400 $\mu$ /4000 $\mu$ /40m/400m	$\pm$ 2.0%rdg+5dgt	0.1 $\mu$ A	100M $\Omega$
Resistance	400/4k/40k/400k/4M/40M	$\pm$ 1.5%rdg+5dgt	0.1 $\Omega$	ACV:10M
Capacitance	40n/400n/4 $\mu$ /40 $\mu$ /100 $\mu$ F	$\pm$ 7%rdg+6dgt	0.01nF	
Continuity	Buzzer sounds at between 10 $\Omega$ and 120 $\Omega$ . Open voltage: approx. 0.4V			
Diode test	Open voltage: approx. 1.5V			
Bandwidth	40~400Hz (sine wave)			
Fuse / Battery	0.5A/250V R300A $\phi$ 6.3X30mm R6 X 2			
Size / Weight	H158XW70XD41mm/230g			
Standard accessories included	Test lead (TL-21), Instruction manual			

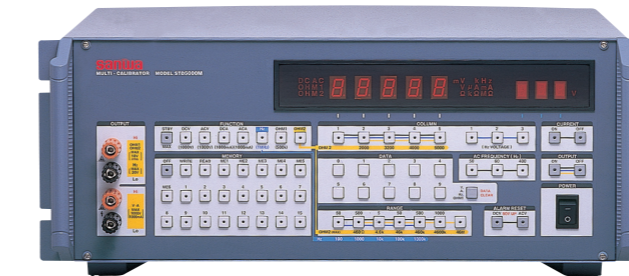
#### Optional accessories

Software : PC Link, PC Link Plus Optical PC Link cable : KB-RS1, KB-USB1  
Clamp probe : CL-20D, CL-22AD, CL33DC  
Temperature probe : T-300PC(PC Link software is necessary.)  
Clip adapter : CL-11  
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 : 0~500k $\Omega$ (10 $\Omega$  steps)
- Resistance2 : 24 steps fixed resistance value(4 kinds 6 ranges)
- Hz : 40Hz~999kHz(5 ranges)

#### Features

- **High accuracy  $\pm$ 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.

Function	Measuring range	Generation range	Resolution	Set accuracy	Maximum load
DCV	50mV	0~50mV	1 $\mu$ V	$\pm$ (0.05%+30 $\mu$ V)	10mA
	500mV	0~500mV	10 $\mu$ V	$\pm$ (0.03%+30 $\mu$ V)	
	5V	0~5V	100 $\mu$ V	$\pm$ (0.03%+200 $\mu$ V)	
	50V	0~50V	1mV	$\pm$ (0.03%+2mV)	
	500V	0~500V	10mV	$\pm$ (0.03%+20mV)	
	1000V	0~1000V	100mV	$\pm$ (0.05%+0.3V)	
ACV	50mV	0~50mV	1 $\mu$ V	$\pm$ (0.1%+50 $\mu$ V)	10mA
	500mV	0~500mV	10 $\mu$ V	$\pm$ (0.06%+100 $\mu$ V)	
	5V	0~5V	100 $\mu$ V	$\pm$ (0.06%+4mV)	
	50V	0~50V	1mV	$\pm$ (0.06%+4mV)	
	500V	0~500V	10mV	$\pm$ (0.06%+40mV)	
	1000V	0~1000V	100mV	$\pm$ (0.1%+0.4V)	
DCA	50 $\mu$ A	0~50 $\mu$ A	1nA	$\pm$ (0.05%+30nA)	13V (Open circuit voltage)
	500 $\mu$ A	0~500 $\mu$ A	10nA	$\pm$ (0.05%+30nA)	
	5mA	0~5mA	100nA	$\pm$ (0.05%+2.2 $\mu$ A)	
	50mA	0~50mA	1 $\mu$ A	$\pm$ (0.05%+2 $\mu$ A)	
	500mA	0~500mA	10 $\mu$ A	$\pm$ (0.05%+20 $\mu$ A)	
	2000mA	0~2000mA	100 $\mu$ A	$\pm$ (0.1%+300 $\mu$ A)	
ACA	50 $\mu$ A	0~50 $\mu$ A	1nA	$\pm$ (0.12%+60nA)	13V (Open circuit voltage)
	500 $\mu$ A	0~500 $\mu$ A	10nA	$\pm$ (0.12%+60nA)	
	5mA	0~5mA	100nA	$\pm$ (0.1%+5 $\mu$ A)	
	50mA	0~50mA	1 $\mu$ A	$\pm$ (0.1%+50 $\mu$ A)	
	500mA	0~500mA	10 $\mu$ A	$\pm$ (0.15%+0.5mA)	
	2000mA	0~2000mA	100 $\mu$ A	$\pm$ (0.15%+0.5mA)	
OHM1	40~99.9Hz	0.1Hz	—	$\pm$ (0.1%+0.1Hz)	—
	40~999Hz	1Hz	—	$\pm$ (0.1%+1Hz)	—
	40~9.9kHz	10Hz	—	$\pm$ (0.1%+10Hz)	—
	100~99.9kHz	100Hz	—	$\pm$ (0.1%+100Hz)	—
	1k~999kHz	1kHz(Rectangular wave)	—	$\pm$ (0.1%+1kHz)	—
	0~7V	0.1V	—	$\pm$ (2%+0.2V)	—
Function	Measuring range			Accuracy	
	OHM2	160/260/360/460 $\Omega$		$\pm$ (0.05%+0.1 $\Omega$ )	
		1.6k/2.6k/3.6k/4.6k $\Omega$		$\pm$ (0.05%)	
		16k/26k/36k/46k $\Omega$		$\pm$ (0.05%)	
		160k/260k/360k/460k $\Omega$		$\pm$ (0.05%)	
		1.600k/2.600k/3.600k/4.600k $\Omega$		$\pm$ (0.05%~0.08%)	
Memory	6X15(90)				

50mV adjust digit	4-1/2 digit(except for 1000V, 2000mA,OHM2)
Max. display	50099
Output adjust	LOCAL(surface panel)
Operating range	23 $\pm$ 3 $\pm$ 3C below 70%RH
Preheating time	30~60m.
Power supply	AC100 $\pm$ 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/Weight	H180XW480XD580mm/25kg
Standard accessories included	Instruction manual



# Detectors

## 3phase Detector

### KS1



CE

- Phase sequence and open phase check
- Large size alligator clips
- IEC61010 CAT. III 600V



Measurement	Open phase and Rotating direction
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°C~40°C, 80%RH max. no condensation
Standards	IEC61010-1 CAT. III 600V, IEC61326, IEC61010-031
Dimensions	Main unit H102×W78×D32.5mm Alligator clips Approx. 0.6m (Red, White and Blue)
Weight	Approx.212g (Alligator crips included)
Standard accessories included	Carrying pouch (C-KS)×1, Instruction manual



Carrying pouch

## Voltage Detector

### KD1



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

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°C



## Test lead

### TL-11T



Length 0.56m

### TL-21



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

### TL-21M



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

### TL-23



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

### TL-25



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

### TL-61



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

### TL-61T



Length 0.85m

### TL-63



Length 1m

### TL-82



IEC61010 CAT.III 1000V  
Length 1m  
Clip adapter  
CL-13

### TL-84



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

### TL-88



IEC61010 CAT.III 600V  
CAT.II1000V  
Length 1.1m  
Clip adapter  
CL-11  
TL-8IC

### TL-91



Length 1m  
Clip adapter  
CL-11  
TL-8IC

### TL-91M



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

### TL-95






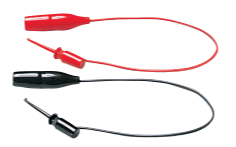






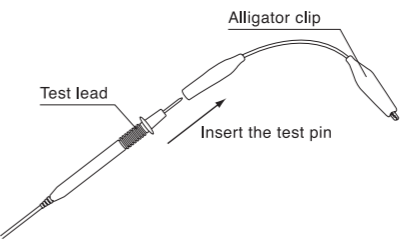


















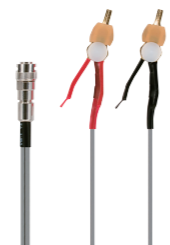




φ4mm pin at body side  
Length 1m  
Clip adapter  
CL-11  
TL-8IC

### TL-112



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



<p><b>TL-122</b></p>  <p>IEC61010-031 CAT.III1000V CAT.IV600V 10A Length 1m Clip adapter CL-16</p>	<p><b>TL-506S</b></p>  <p>Length 0.9m</p>	<p><b>TL-507</b></p>  <p>Length 1m</p>		<p><b>TL-8IC</b></p>  <p>IC clip (use with test leads by inserting pins into socket) Length 0.2m</p>	<p><b>Clip lead for hFE measurement</b></p> <p><b>CL-506</b></p>  <p>Length 0.3m</p>	<p><b>HFE probe</b></p> <p><b>HFE-5</b></p>  <p>(use with test leads by inserting pins into socket) Length 0.3m</p>	
<p><b>TL-508S</b></p>  <p>Length 1m</p>	<p><b>TL-100-OM</b></p>  <p>Length 1m</p>	<p><b>TLF-120</b></p>  <p>Length 1.4m</p>		<p><b>HFE-6, HFE-6T</b></p>  <p>hFE 0 ~ 1000 Length 0.3m</p>	<p><b>How to use :</b> <b>CL-11, CL-13, CL-15, TL-8IC</b></p> 	<p><b>AC adapter</b></p> <p><b>AD-71AC (100V)</b> <b>AD-72AC (220V)</b></p>  <p>Length 1.9m</p>	
<p><b>TL-M54</b></p>  <p>Length 1m</p>	<p><b>TL-PM3</b></p>  <p>Length 0.55m</p>	<p><b>TL-PM5</b></p>  <p>Length 0.65m</p>	<p><b>HV probe</b></p> <p><b>HV-10</b></p>  <p><b>HV-20</b> 480M<math>\Omega</math>resistor measurement for 0~30kV or 25kV Length 1m</p>		<p><b>Optical link</b></p> <p><b>KB-USB1</b></p>  <p>Optical link USB PC connection cable Length 1.3m</p> <p><b>KB-USB2</b>  <b>CE</b> <b>KB-USB2a</b></p> <p>Optical link USB PC connection cable Length 1.5m</p>	<p><b>KB-RS1</b></p>  <p>Optical link RS-232C PC connection cable Length 1.9m</p> <p><b>KB-RS2</b>  <b>CE</b> <b>KB-RS2a</b></p> <p>Optical link RS-232C PC connection cable Length 1.9m</p>	<p><b>PC Link Plus / PC Link</b></p> <p><b>PC Link Plus</b> <b>PC Link</b></p>  <p>CD-ROM</p> <p><b>PC Communication Set</b></p> <p><b>A : KB-RS1 + PC Link</b> <b>B : KB-RS2 + PC Link</b> <b>C : KB-USB1 + PC Link</b> <b>D : KB-USB2 + PC Link</b> <b>E : KB-RS2a + PC Link</b> <b>F : KB-USB2a + PC Link</b></p>
<p><b>HV-50</b></p>  <p><b>HV-60</b> 1000M<math>\Omega</math>resistor measurement for 0~30kV or 25kV Length 1.2m</p>	<p><b>Clip adapter</b></p> <p><b>CL-11</b></p>  <p>Alligator clip (use with test leads by inserting pins into socket) (small size) Length 0.2m</p> <p><b>CL-15</b></p>  <p>Alligator clip (use with test leads by inserting pins into socket) (big size) Length 0.2m</p>		<p><b>CL-13</b></p>  <p>Alligator clip (use with test leads by inserting pins into socket) IEC61010 CAT.III 1000V Length 70mm</p>		<p><b>Temperature sensor</b></p> <p><b>T-THP</b></p>  <p>-20<math>^{\circ}</math>C~200<math>^{\circ}</math>C Thermistor probe Sensor : <math>\phi</math>2.5 <math>\times</math> 31mm Length 0.9m</p>	<p><b>T-300PC</b></p>  <p>-50<math>^{\circ}</math>C~300<math>^{\circ}</math>C Platinic thin film Sensor : <math>\phi</math>3.2 <math>\times</math> 135mm Length 2.2m Accuracy : <math>\pm</math> 1.9<math>^{\circ}</math>C</p>	<p><b>K-250CD, K-250PC</b></p>  <p>-50<math>^{\circ}</math>C~250<math>^{\circ}</math>C Linear thermocouple K type Length 1m</p>
<p><b>CL-16</b></p>  <p>Alligator clip (use with test leads by inserting pins into socket) IEC61010 CAT.III 1000V Length 70mm</p>	<p><b>CL-100SD</b></p>  <p>IEC61010-031 CAT.III1000V CAT.IV600V Length 0.5m Clip Lead CL-16</p>	<p><b>CL-DG3</b></p>  <p>Length 0.29m</p>		<p><b>K-8-250</b></p>  <p>-50<math>^{\circ}</math>C~250<math>^{\circ}</math>C Surface shape thermocouple K type Sensor : 15 <math>\times</math> 16mm Length 1m</p>	<p><b>K-8-300</b></p>  <p>-50<math>^{\circ}</math>C~300<math>^{\circ}</math>C Sheath shape thermocouple K type Sensor : <math>\phi</math>3.1 <math>\times</math> 150mm Length 1.2m</p>	<p><b>K-8-500</b></p>  <p>-50<math>^{\circ}</math>C~500<math>^{\circ}</math>C Surface shape thermocouple K type Sensor : 15 <math>\times</math> 16mm Length 1m</p>	



**K-8-650**



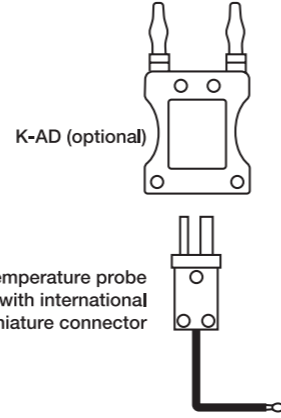
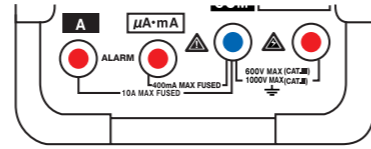
-50°C~650°C  
flexible thermocouple K type  
Sensor : φ1 × 300mm  
Length 1.4m

**K-8-800**



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

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



**C-DA**



160 × 125 × 45mm

**C-DCM2000**



123 × 250 × 57mm

**C-DG3**



100 × 160 × 40mm  
Soft case  
with magnet sheets

**K-AD**



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

**Notice :**

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

**C-M53**



130 × 190 × 70mm  
Soft case

**C-NH7**



130 × 162 × 55mm

**C-PC10/S**



240 × 155 × 65mm

**Carrying case**

**C-01**



160 × 54 × 180mm

**C-08S**



144 × 160 × 54mm

**C-77**



195 × 130 × 75mm  
Soft case

**C-PM3**



119 × 78 × 16mm

**C-SE2**



224 × 97 × 37mm

**C-SP**



165 × 140 × 50mm  
Soft case

**C-77H**



186 × 140 × 72mm

**C-CA**



180 × 150 × 50mm

**C-CD**



190 × 145 × 70mm

**C-SPH**



160 × 150 × 55mm

**C-STH**



348 × 100 × 37mm

**C-YS**



160 × 140 × 40mm

**C-CDS**



175 × 110 × 45mm

**C-CL**



190 × 90 × 45mm  
Soft case

**C-CP**



130 × 120 × 30mm

**Holster**

**H-70**



**H-50**









## Accessory mapping

Model	CLAMP SENSOR	OPTICAL LINK	TEMPERATURE SENSOR
Model	CL-140 CL-124 CL33DC CL-22AD CL-20D	KB-USB1 KB-USB2 KB-USB2a KB-RS1 KB-RS2 KB-RS2a	T-THP T-300PC K-250CD K-250PC K-8-250 K-8-300 K-8-500 K-8-650 K-8-800
CD721/NH	● ● ● ● ●	-	-
CD731/a	● ● ● ● ●	-	-
CD751	(except CD731a)	-	-
CD750P	● ● ● ● ●	-	-
CD770	● ● ● ● ●	-	-
CD771	● ● ● ● ●	-	-
CD772	● ● ● ● ●	○	● ● ● ● ●
CD800	● ● ● ● ●	-	-
CD800a	● ● ● ● ●	-	-
CD801	● ● ● ● ●	-	-
DA-50C	● ● ● ● ●	-	-
PC20	● ● ● ● ●	●	●
PC500/a	● ● ● ● ●	●	●
PC5000/a	● ● ● ● ●	●	●
PC510/a	● ● ● ● ●	●	○ ● ● ● ● ● ● ● ●
PC520M	● ● ● ● ●	●	○ ● ● ● ● ● ● ● ●
PM3	● ● ● ● ●	-	-
PM33	● ● ● ● ●	-	-
PM5	● ● ● ● ●	-	-
PM7a	● ● ● ● ●	-	-
PS8a	● ● ● ● ●	-	-
PM10	● ● ● ● ●	-	-
PM11	● ● ● ● ●	-	-
RD700	● ● ● ● ●	-	○ ● ● ● ● ● ● ● ●
RD701	● ● ● ● ●	-	○ ● ● ● ● ● ● ● ●
SD-420C	● ● ● ● ●	-	-
CAM600S	-	●	-
DCL1020R/300R	-	-	-
DCL1000	-	-	-
DCL1200R	-	-	-
DCM-22AD	-	-	-
DCM2000	-	-	-
DCM2000AD	-	-	-
DCM2000R	-	-	-
DCM400	-	-	-
DCM400AD	-	-	-
DCM60L	-	-	-
DCM600	-	-	-
DLC-330L	-	-	-
DLC-400A	-	-	-
DG34/35	-	-	-
DG67/8/9/10	-	-	-
DG251	-	-	-
DG525	-	-	-
DM1008S	-	-	-
DM-1006S/506S	-	-	-
PDM-506S	-	-	-
DM-1527	-	-	-
DM-5257	-	-	-
DM1528S	-	-	-
DM5218S	-	-	-
DM508S	-	-	-
PDM508S	-	-	-
M53	-	-	-
MG1000	-	-	-
MG500/125	-	-	-
AP33	-	-	-
AU-31/32	-	-	-
CP-7D	-	-	-
CX506a	-	-	-
EM7000	-	-	-
PW100Fb	-	-	-
SH-88TR	-	-	-
SP-18D	-	-	●
SP20	-	-	-
SP21	-	-	-
TA55	●	-	-
VS-100	-	-	-
YX360TRD	-	-	-
YX360TRF	-	-	-
YX-361TR	-	-	-

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

## Clamp Meter comparative chart

Display Type	AC	AC	AC	AC	AC	AC	AC (Analog)	DC/AC	DC/AC	DC/AC	DC/AC	DC/AC	LEAK	LEAK
Model	DCL1200R	DCL1000	DCL20R	DCL10	DCM60L	DCM400	CAM600S	DCM400AD	DCM-22AD	DCM2000AD	DCL30DR	DLC-400A	DLC-330L	
Digit	4000	4000	6000	6000	1999	4000	-	4000	1999	4000	6000	1999	3200	
Category	CAT.III 600V	CAT.III 600V	CAT.III300V	CAT.III300V	CAT.III300V	CAT.III300V	CAT.III600V	CAT.III300V	-	CAT.III 600V	CAT.III300V	-	-	
CE	●	●	●	●	●	●	●	●	-	●	●	-	-	
Clamp diameter (mm)	42	42	25	25	21	25	36	25	22	53	24.5	38	32	
Withstand voltage	5550	5550	3700	3700	3700	3700	5550	3700	2000	5550	3700	2000	2000	
Range	A/M	A/M	A	A	A	A	M	A	M	M	A	M	A/M	
DCA (A)	-	-	-	-	-	-	-	40	20	40	60	-	-	
	-	-	-	-	-	-	-	400	200	400	400	-	-	
	-	-	-	-	-	-	-	-	-	2000	-	-	-	
ACA (A)	400	400	60	60	200	40	6	40	20	40	60	20m	30m	
	1200	1000	300	300	600	400	15	400	200	400	400	200m	300m	
	-	-	-	-	-	-	60	-	-	2000	-	2000m	30	
	-	-	-	-	-	-	150	-	-	-	-	20	300	
	-	-	-	-	-	-	600	-	-	-	-	200	-	
	-	-	-	-	-	-	-	-	-	-	-	400	-	
DCV (V)	6	400m	-	-	-	400	60	400	2	400m	-	200m	-	
	60	4	-	-	-	600	-	600	20	4	-	2	-	
	600	40	-	-	-	-	-	-	200	40	-	20	-	
	-	400	-	-	-	-	-	-	500	400	-	200	-	
	-	600	-	-	-	-	-	-	-	600	-	600	-	
ACV (V)	6	400m	-	-	200	400	150	400	2	400m	-	2	-	
	60	4	-	-	600	600	300	600	20	4	-	20	-	
	600	40	-	-	-	-	600	-	200	40	-	200	-	
	-	400	-	-	-	-	-	-	500	400	-	600	-	
	-	600	-	-	-	-	-	-	-	600	-	-	-	
Resistance (Ω)	6k	400	-	-	200	400	1k	400	2k	400	-	200	-	
	60k	4k	-	-	-	-	100k	-	20k	4k	-	2k	-	
	600k	40k	-	-	-	-	-	-	200k	40k	-	20k	-	
	6M	400k	-	-	-	-	-	-	2000k	400k	-	200k	-	
	600	4M	-	-	-	-	-	-	-	4000k	-	2000k	-	
	-	40M	-	-	-	-	-	-	-	40M	-	20M	-	
Frequency (Hz)	9.999	-	-	-	-	20~4k (when clamping)	-	-	-	100	-	-	-	
	99.99	-	-	-	-	10k (when clamping)	-	-	-	1k	-	-	-	
	999.9	-	-	-	-	4k	-	-	-	10k	-	-	-	
	9.999k	-	-	-	-	40k	-	-	-	100k	-	-	-	
	30.00k	-	-	-	-	400k	-	-	-	1000k	-	-	-	
	-	-	-	-	-	1M	-	-	-	-	-	-	-	
Backlight	●	-	●	●	-	-	-	-	-	-	●	-	-	
True RMS	●	-	●	-	-	-	-	-	-	-	●	-	-	
Auto power off	●	●	●	●	-	●	-	●	-	●	●	-	●	
Peak hold	-	-	-	-	-	-	-	-	-	-	●	-	-	
Data hold	●	●	●	●	●	●	POINTER LOCK	●	●	●	●	●	●	
Range hold	●	-	-	-	-	-	-	●	-	●	-	-	-	
Output terminal	-	-	-	-	-	-	-	-	-	-	-	●	-	
EF (NCV)	●	-	-	-	-	-	-	-	-	-	-	-	-	
Bargraph	-	-	-	-	-	●	-	●	-	-	-	-	●	
Continuity	BUZZER	BUZZER	-	-	BUZZER	BUZZER	-	BUZZER	BUZZER	BUZZER	-	-	-	
Dimension (H) mm	238	238	145	145	187	193	221	193	179	240	145	205	162	
Dimension (W) mm	95	95	54	54	50	50	97	50	56	84	54	84	64	
Dimension (D) mm	45	45	28	28	29	28	43	28	26.5	34	28	34	23	
Weight (g)	290	290	120	120	210	230	420	230	140	400	120	390	125	

New Products

Clamp Meter

Insulation Resistance Tester

PC Link System, Digital Multimeter

Analog Multimeter

Various Instruments

Accessories

New Products

Clamp Meter

Insulation Resistance Tester

PC Link System, Digital Multimeter

Analog Multimeter

Various Instruments

Accessories



## 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	●	●	●	●	●
Auto power off	-	-	-	-	-
Dimension (H) mm	117	117	117	117	117
Dimension (W) mm	76	76	76	76	76
Dimension (D) mm	18	18	18	18	18
Weight (g)	125	125	125	125	125

Display Type	DIGITAL				
Model	MG1000	MG500	MG125	DG34	DG35
Category	CAT.III600V	CAT.III600V	CAT.III600V	-	-
CE	●	●	●	-	-
Test voltage range	3	3	3	3	3
Insulation resistance (Test voltage / Maximum scale value)	1000V/4000MΩ	500V/4000MΩ	125V/400MΩ	500V/400MΩ	500V/40MΩ
	500V/4000MΩ	250V/4000MΩ	50V/400MΩ	250V/400MΩ	250V/40MΩ
	250V/4000MΩ	125V/4000MΩ	25V/400MΩ	125V/400MΩ	125V/40MΩ
ACV (V)	600	600	600	400V	400V
DCV (V)	600	600	600	400V	400V
Resistance	40/4000	40/4000	40/4000	-	-
Discharge	●	●	●	-	-
Backlight	●	●	●	● EL	● EL
Inner battery check	●	●	●	-	-
Data hold	●	●	●	●	●
Auto power save	●	●	●	-	-
Auto power off	-	-	-	-	-
Dimension (H) mm	170	170	170	130	130
Dimension (W) mm	142	142	142	75	75
Dimension (D) mm	57	57	57	19.9	19.9
Weight (g)	600	600	600	160	160

Display Type	ANALOG						
Model	DM1528S	DM5218S	DM1008S	DM508S	PDM508S	DM-1527	DM-5257
Category	CAT.III600V	CAT.III600V	CAT.III600V	CAT.III600V	CAT.III600V	-	-
CE	●	●	●	●	●	-	-
Test voltage range	3	3	1	1	1	3	3
Insulation resistance (Test voltage / Maximum scale value)	1000V/2000MΩ	500V/1000MΩ	1000V/2000MΩ	500V/1000MΩ	500V/100MΩ	1000V/2000MΩ	500V/1000MΩ
	500V/1000MΩ	250V/500MΩ	-	-	-	500V/1000MΩ	250V/500MΩ
	250V/500MΩ	125V/200MΩ	-	-	-	250V/500MΩ	100V/200MΩ
ACV (V)	600	600	600	600	600	600	600
DCV (V)	60	60	60	60	60	-	-
Discharge	●	●	●	●	●	●	●
Backlight	-	-	-	-	-	-	-
Inner battery check	●	●	●	●	●	●	●
Meter structure	BAND	BAND	BAND	BAND	BAND	BAND	BAND
Data hold	-	-	-	-	-	-	-
Auto power save	-	-	-	-	-	-	-
Auto power off	-	-	-	-	-	-	-
Dimension (H) mm	144	144	144	144	144	175	175
Dimension (W) mm	99	99	99	99	99	118	118
Dimension (D) mm	43	43	43	43	43	55	55
Weight (g)	310	310	310	310	310	520	520

## Digital Multimeter comparative chart

Model	PC5000a	PC520M	PC510a	PC500a	PC20	CD770	CD771
Digit	50000/500000	5000	5000	5000	4000	4000	4000
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	50m	50m	50m	400m	400m	400m
	5	500m	500m	500m	4	4	4
	50	5	5	5	40	40	40
	500	50	50	50	400	400	400
	1000	500	500	500	1000	600	1000
-	1000	1000	1000	-	-	-	
ACV (V)	500m	50m	50m	50m	4	4	4
	5	500m	500m	500m	40	40	40
	50	5	5	5	400	400	400
	500	50	50	50	750	600	1000
	1000	500	500	500	-	-	-
-	1000	1000	1000	-	-	-	
DCA (A)	500μ	500μ	500μ	500μ	400μ	400μ	400μ
	5000μ	5000μ	5000μ	5000μ	4000μ	4000μ	4000μ
	50m	50m	50m	50m	40m	40m	40m
	500m	500m	500m	500m	400m	400m	400m
	5	5	5	5	4	-	4
10	10	10	10	10	-	10	
ACA (A)	500μ	500μ	500μ	500μ	400μ	400μ	400μ
	5000μ	5000μ	5000μ	5000μ	4000μ	4000μ	4000μ
	50m	50m	50m	50m	40m	40m	40m
	500m	500m	500m	500m	400m	400m	400m
	5	5	5	5	4	-	4
10	10	10	10	10	-	10	
Resistance (Ω)	500	50	50	50	400	400	400
	5k	500	500	500	4k	4k	4k
	50k	5k	5k	5k	40k	40k	40k
	500k	50k	50k	50k	400k	400k	400k
	5M	500k	500k	500k	4M	4M	4M
50M	5M	5M	5M	40M	40M	40M	
-	50M	50M	50M	-	-	-	
Capacitance (F)	50n	50n	50n	50n	50n	50n	50n
	500n	500n	500n	500n	500n	500n	500n
	5μ	5μ	5μ	5μ	5μ	5μ	5μ
	50μ	50μ	50μ	50μ	50μ	50μ	50μ
	500μ	500μ	500μ	500μ	100μ	100μ	100μ
9999μ	9999μ	9999μ	9999μ	-	-	-	
Temperature (°C) min	○	-50	-50	○	○	-	-
Temperature (°C) max	○	1000	1000	○	○	-	-
Frequency (Hz) min	10	10	10	10	-	5	5
Frequency (Hz) max	200k	125k	125k	125k	-	100k	100k
Logic frequency (Hz) min	5	-	-	-	-	-	-
Logic frequency (Hz) max	2M	-	-	-	-	-	-
Continuity	BUZZER	BUZZER	BUZZER	BUZZER	BUZZER	BUZZER	BUZZER/LED
Diode test	●	●	●	●	●	●	●
Duty cycle	●	-	-	-	-	-	-
dBm	●	-	-	-	-	-	-
Auto power off	●	●	●	●	-	●	●
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	○	○	○	○	○	-	-
Optional AC adapter connection	-	-	-	-	○	-	-
Dimension (H) mm	179	179	179	179	167	166	166
Dimension (W) mm	87	87	87	87	90	82	82
Dimension (D) mm	55	55	55	55	48	44	44
Weight (g)	460	460	460	460	330	340	360

○ Optional accessory is necessary.



### Digital Multimeter comparative chart

Model	CD772	CD751	CD731	CD731a	CD721	RD700 / 701	CD750P	
Digit	4000	3200	3200	4000	3200	4000	4000	
Category	CAT.II1600V	CAT.II1600V	CAT.II1600V	CAT.II1600V	CAT.II1600V	CAT.II1600V	CAT.III 600V	
CE	●	●	●	●	●	●	●	
Range	A/M	A/M	A/M	A/M	A/M	A/M	A	
DCV (V)	400m 4 40 400 1000 -	320m 3.2 32 320 1000 -	320m 3.2 32 320 1000 -	400m 4 40 400 1000 -	320m 3.2 32 320 1000 -	400m 4 40 400 1000 -	400m 4 40 400 1000 -	400m 4 40 400 1000 -
ACV (V)	4 40 400 1000 -	3.2 32 320 750 -	3.2 32 320 750 -	4 40 400 750 -	3.2 32 320 750 -	400m 4 40 400 1000 -	4 40 400 750 -	4 40 400 750 -
DCA (A)	400μ 4000μ 40m 400m 4 15	32μ 320μ 3200μ 32m 320m 20	32μ 320μ 3200μ 32m 320m 20	400μ 4000μ 40m 400m 4 20	32m 320m 12 400m -	400μ 4000μ 40m 400m 4 10	- - - - - -	- - - - - -
ACA (A)	400μ 4000μ 40m 400m 4 15	32μ 320μ 3200μ 32m 320m 20	32μ 320μ 3200μ 32m 320m 20	400μ 4000μ 40m 400m 4 20	32m 320m 12 400m -	400μ 4000μ 40m 400m 4 10	- - - - - -	- - - - - -
Resistance (Ω)	400 4k 40k 400k 4M 40M	320 3.2k 32k 320k 3.2M 30M	320 3.2k 32k 320k 3.2M 30M	400 4k 40k 400k 4M 40M	320 3.2k 32k 320k 3.2M 30M	400 4k 40k 400k 4M 40M	400 4k 40k 400k 4M -	400 4k 40k 400k 4M -
Capacitance (F)	50n 500n 5μ 50μ 100μ	- - - - -	- - - - -	50n 500n 5μ 50μ 100μ	- - - - -	500n 5μ 50μ 500μ 3000μ	- - - - -	- - - - -
Temperature (°C) min	-20	-	-	-	-	-20	-	
Temperature (°C) max	300	-	-	-	-	300	-	
Frequency (Hz) min	5	-	-	-	-	50	-	
Frequency (Hz) max	100k	-	-	-	-	1M	-	
Logic frequency (Hz) min	-	-	-	-	-	-	-	
Logic frequency (Hz) max	-	-	-	-	-	-	-	
Continuity	BUZZER/LED	BUZZER	BUZZER	BUZZER	BUZZER	BUZZER	BUZZER	
Diode test	●	●	●	●	●	●	●	
Duty cycle	-	-	-	-	-	-	-	
dBm	-	-	-	-	-	-	-	
Auto power off	●	-	●	●	●	●	-	
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	-	-	-	-	-	-	-	
Optional AC adapter connection	-	-	-	-	-	-	-	
Dimension (H) mm	166	165.5	165.5	167	165.5	179	157.5	
Dimension (W) mm	82	78	78	90	78	87	70	
Dimension (D) mm	44	41.5	41.5	48	41.5	55	38.5	
Weight (g)	360	315	315	315	315	460	220	

### Digital Multimeter comparative chart

Model	CD800a	DA-50C	PM11	PM10	PM3	PM7a/PS8a	PM33	
Digit	4000	4000	4000	3200	4000	4000	6600	
Category	CAT.II1600V	-	CAT.III300V	CAT.III300V	CAT.II500V	-	CAT.II1600V	
CE	●	-	●	●	●	-	●	
Range	A/M	A/M	A	A	A	A/M	A	
DCV (V)	400m 4 40 400 600 -	400m 4 40 400 600 -	400m 4 40 400 500 -	320m 3.2 32 320 500 -	400m 4 40 400 500 -	400m 4 40 400 500 -	400m 4 40 400 500 -	660m 6.6 66 660 - -
ACV (V)	4 40 400 600 -	400m 4 40 400 600 -	4 40 400 500 -	3.2 32 320 500 -	4 40 400 500 -	4 40 400 500 -	4 40 400 500 -	660m 6.6 66 660 -
DCA (A)	40m 400m -	40m 10 -	- -	- -	- -	- -	100A -	- -
ACA (A)	40m 400m -	40m 10 -	- -	- -	- -	- -	100A -	- -
Resistance (Ω)	400 4k 40k 400k 4M 40M	400 4k 40k 400k 4M 40M	400 4k 40k 400k 4M 40M	320 3.2k 32k 320k 3.2M 30M	400 4k 40k 400k 4M 40M	400 4k 40k 400k 4M 40M	400 4k 40k 400k 4M 40M	660 6.6k 66k 660k 6.6M 66M
Capacitance (F)	50n 500n 5μ 50μ 100μ	- - - - -	- - - - -	- - - - -	5n 50n 500n 5μ 50μ 200μ	- - - - -	- - - - -	6.6n 6.6m 66n 66m 660n 6.6μ 66μ 660μ
Temperature (°C) min	-	-	-	-	-	-	-	
Temperature (°C) max	-	-	-	-	-	-	-	
Frequency (Hz) min	5	99.99	-	-	9.999	-	660	
Frequency (Hz) max	100k	999.9k	-	-	60k	-	66k	
Logic frequency (Hz) min	-	-	-	-	-	-	-	
Logic frequency (Hz) max	-	-	-	-	-	-	-	
Continuity	BUZZER	BUZZER	BUZZER	BUZZER	BUZZER	BUZZER	BUZZER	
Diode test	●	●	●	●	●	●	●	
Duty cycle	●	-	-	-	●	-	●	
dBm	-	-	-	-	-	-	-	
Auto power off	●	●	●	●	●	●	●	
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	-	-	-	-	-	-	-	
Optional AC adapter connection	-	-	-	-	-	-	-	
Dimension (H) mm	176	145	117	117	108	115	130	
Dimension (W) mm	104	82	76	76	56	57	75	
Dimension (D) mm	46	30	18	18	11.5	18	19.9	
Weight (g)	340	200	117	110	85	85	160	

New Products

Clamp Meter

Insulation Resistance Tester

PC Link System, Digital Multimeter

Analog Multimeter

Various Instruments

Accessories

New Products

Clamp Meter

Insulation Resistance Tester

PC Link System, Digital Multimeter

Analog Multimeter

Various Instruments

Accessories



## Analog Multimeter 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 1.2 3 12 30 120 300 1000	120m 3 12 30 120 300 1000	0.1 0.5 2.5 10 50 250 1000	120m 3 12 30 120 300 1200	250m 2.5 10 50 250 500	300m 3 12 60 300 1000	0.1 0.25 2.5 10 50 250 1000
ACV (V)	3 12 30 120 300 750	3 12 30 120 300	2.5 10 50 250 1000	3 12 30 120 300 1200	250m 2.5 10 50 250 500	300m 3 12 60 300 1000	10 50 250 750
DCA (A)	0.12μ 0.3m 3m 30m 300m	30μ 0.3m 3m 30m	50μ 2.5m 25m 0.25	50μ 3m 30m 0.3	250μ 2.5m 25m 250m	300m 3 - - -	50μ 2.5m 25m 0.25
ACA (A)	6 - - -	- - - -	- - - -	- - - -	250μ 2.5m 25m 250m	300m 3 - -	- - - -
Resistance (Ω)	2k 20k 200k 2M 20M 200M	5k 50k 500k 5M 50M	2k 20k 200k 2M 20M	3k 30k 300k 3M 30M	20k 200k 2M 20M 200M	20k 200k 2M 20M 200M	2k 20k 200k 2M
Capacitance (F)	- - -	0.2μ 20μ 2000μ	- - -	1000μ 0.01 0.1	- - -	- - -	10μ
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
Weight (g)	375	370	290	280	290	290	320

○ Optional accessory is necessary.

\* Serial Number ≥ 6064916

## Analog Multimeter comparative chart

Model	SP21	SP20	SP-18D	TA55	CP-7D	AP33	VS-100
Category	CAT.III600V	-	-	-	-	CAT.III300V	-
CE	●	-	-	-	-	●	-
DCV (V)	0.3 3 12 30 120 600	0.25 2.5 5 10 50 500	0.3 3 12 30 120 600	0.3 3 16 30 60	0.25 2.5 10 50 250	10 50 250 500	10 50 250
ACV (V)	12 30 120 300 600	10 50 250 500	12 30 120 300	30 120 300	10 50 250 500	50 250 500	10 50 250
DCA (A)	60μ 30m 0.3	50μ 2.5m 25m	60μ 30m 300m	0.5 3 30	0.25m 25m 500m	25m 250m	- -
ACA (A)	-	-	-	-	-	-	-
Resistance (Ω)	-2k 20k 2M	2k 20k 200k 2M	2k 20k 2M	2k 20k 200k 2M	2k 20k 1M	5k 500k	2k 20k 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
Weight (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.



## 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)

### Environmental Philosophy

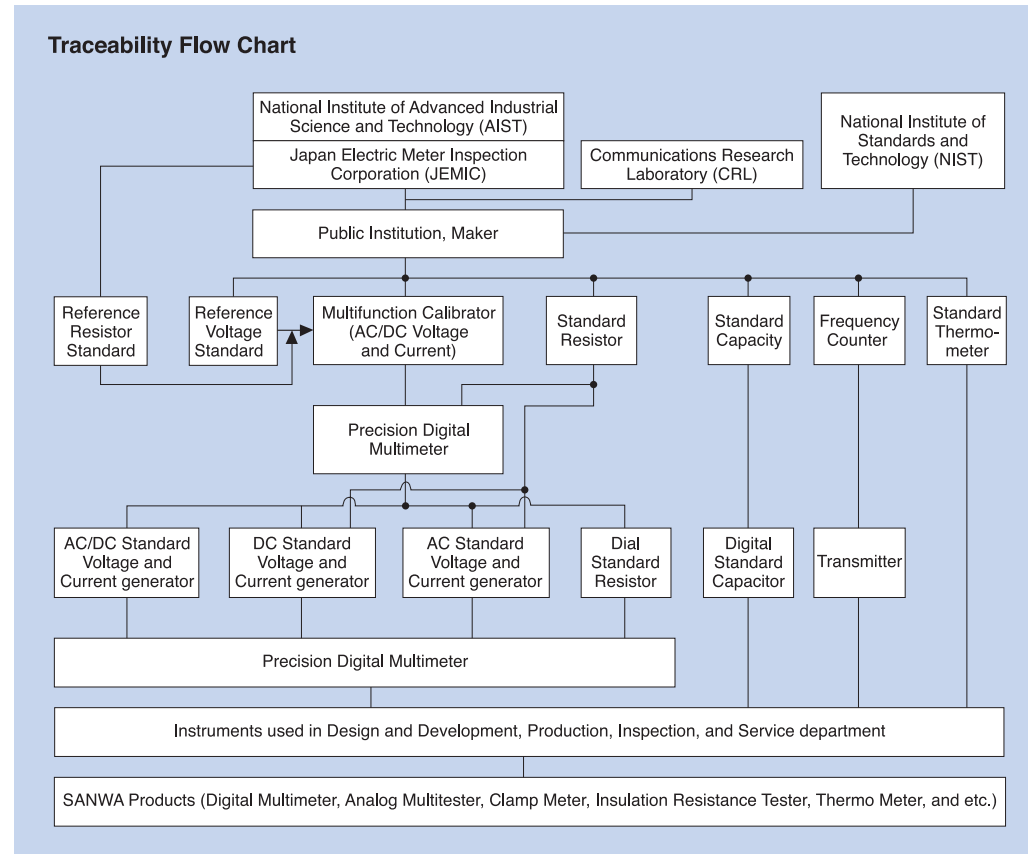
We involve all employees in environmentally balanced activities throughout every stage of the process of delivering products and services to customers in order to achieve sound environmental management as a community and customer-oriented company.

(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).



## 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 category I, 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 (D-C), 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):

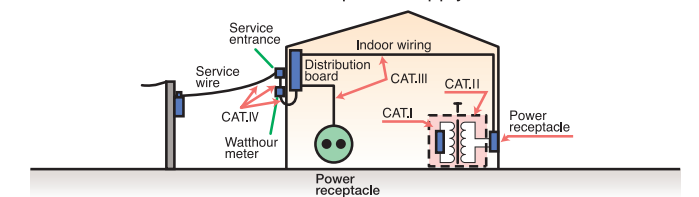
Equipment used for measurement in building facilities. Distribution board, circuit breaker, wiring including cables, busbar, junction box, switch, receptacle, and industrial equipment located in fixed facilities, and other equipment such as a fixed motor connected to fixed facilities in a permanent manner.

### 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 Category III, 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 the 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

- RMS** **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.
- Hz** **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),  $\mu$ F, etc.
- CONT. LED** **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.
- BATT CHECK** **Battery check**  
Battery voltage is measured and assessed by running a given current.
- hFE** **hFE**  
Provided with graduations for measuring the DC current amplification factor (hFE) of a transistor.
- 4-20mA%**  
4-20mA for sending instrumentation signals. Expresses the current loop of 4mA as 0% and 20mA as 100%.
- dBm** **dBm**  
Scaling of voltage values is performed according to the reference impedance into dBm. Convenient for use with audio equipment.
- °C** **Temperature measurement**  
Temperature can be measured using the optional probe.
- PC Link** **Temperature measurement with PC Link**  
Temperature can be measured using the optional probe and PC Link software. (T-300PC is necessary.)
- AP OFF** **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.
- APS** **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** **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.
- RNG HOLD** **Range hold**  
The range is fixed in the measurement of varying voltage and current which is difficult to read in the auto range.
- REL** **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 to the value fixed as 0.
- Duty** **Duty cycle**  
The duty cycle of repeating waveform is indicated on a percentage basis (%). It can be used for the analysis of control signals.
- Capture** **PEAK**  
**Capture (peak hold)**  
The peak value like in-rush current is indicated. The minimum pulse width capturable differs according to models.
- MAX MIN** **MAX / MIN**  
The minimum value and maximum value of measured values are recorded. The recorded values can be seen later on the display.
- Max HOLD** **Maximum value hold**  
The maximum value is held and displayed in the measurement of voltage, current and ADP.
- Zoom** **Zoom bar graph**  
The scale is changed so as to allow reading minute changes on the bar graph.
- TLR Cal** **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.
- AUTO POL** **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.
- POL Switch** **Polarity switch**  
The positive and negative polarity of the measuring terminal can be changed by this switch.
- 0Ω ADJ** **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.
- 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.
- DCA ACA** **DC / AC measurable**  
Both ACA and DCA are measurable.
- DSP** **Drop shock proof**  
The meter element is furnished with a taut band and impact-resistant design enough to withstand a shock of drop.
- LPΩ** **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.
- LEAK** **Leakage current**  
A clamp meter that can make the measurement of leakage current have a range to allow measurements in milliamp.
- BACK LIGHT** **Backlight**  
Allows indicator reading in a dark place.
- OUT** **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.
- AD** **Auto discharge**  
When the measurement of insulating resistance is complete, voltage charged in the measuring object is discharged.
- 232c** **RS232C connection**  
The signal output terminal is provided to send data to a PC. RS232C is the name of the signal standard.
- USB** **USB connection**  
Data can be outputted by connection to the USB port of a PC.
- POWER FUSE** **Fuse for power supply**  
Current-limiting fuse to break the conduction up to 100kA.
- INS Ω** **Insulating resistance**  
Insulating resistance can be measured (e.g. 500V/1000MΩ).
- DCV** **DC voltage**  
Mark for clamp meters with DCV function.
- EF (NCV)** **EF function**  
Non contact AC voltage detection 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.