

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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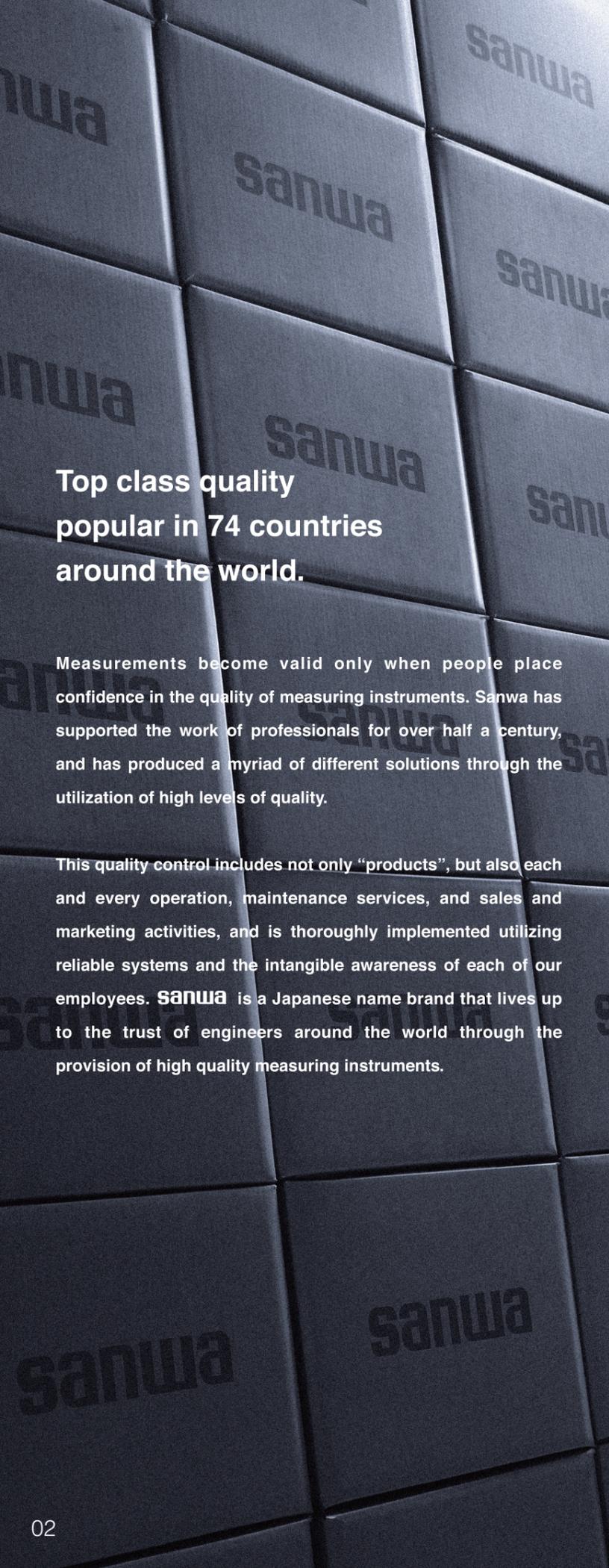
SANWA ELECTRIC INSTRUMENT CO., LTD.

Dempa Bldg, 4-4 Sotokanda 2-Chome, Chiyoda-Ku, Tokyo 101-0021 Japan
Tel: +81-3-3251-0941 Fax: +81-3-3256-9740

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- Printed photos may appear a little different from the actual color of products.
- Read the operation manual thoroughly and use equipment properly.
- The size of photos of products are not same as of actual product size.

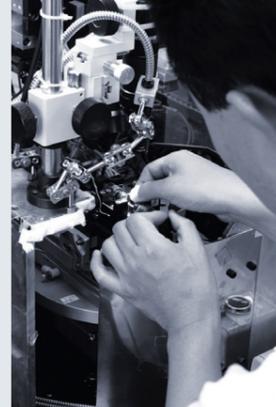
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**Top class quality
popular in 74 countries
around the world.**

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

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



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PC Link System,
Digital Multimeter

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Sanwa's mission

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

Digital Multimeter



CE

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



PC773

11000 Count
Minimum resolution 0.01mV, 0.01Ω

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

Display : numeral display 11000
Sampling rate : 4 times / sec.
AC frequency bandwidth : 45~100Hz(110mV range), 45~500Hz(1.1V range), 45~1kHz(11V range and above, ACA)
Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III
600V Max. / CAT.II1000V Max.

RMS	Hz	CONT. LED	AP OFF	
DATA HOLD	RNG HOLD	REL	BACK LIGHT	
PC Link	USB	PC Link	C	
Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	110m/1.1/11/110/1000V	±(0.28%+2)	0.01mV	10M~100MΩ
ACV	110m/1.1/11/110/1000V	±(0.7%+50)	0.01mV	
DCA	110μ/1100μ/11m/110m/11A	±(0.5%+4)	0.01μA	
ACA	110μ/1100μ/11m/110m/11A	±(0.9%+20)	0.01μA	
Resistance	110/1.1k/11k/110k/1.1M/11M/110MΩ	±(0.3%+6)	0.01Ω	
Capacitance	11n/110n/1.1μ/110μ/1.1m/11m/110mF	±(2.0%+20)	0.001nF	
Frequency	110Hz/1.1kHz/11kHz/110kHz/1.1MHz	±(0.01%+2)	0.1Hz	
Continuity	Buzzer sounds and LED lights up at less than 300Ω Open Voltage: approx. 0.2V			
Diode test	Open Voltage: approx. 0.2V			
Bandwidth	45Hz~100Hz(110mV range), 45Hz~500Hz(1.1V range), 45Hz~1kHz(11V range and above, ACA)			
Fuse / Battery	315mA/1000V, breaking capacity 30kA 12A/1000V, breaking capacity 30kA	R6X2		
Size / Weight	H166XW82XD44mm/360g			
Standard accessories included	Test lead (TL-25), Instruction manual			

Optional accessories

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

PC Link 7



Major features:

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

- Multi-window, separated graphs by each channel
- Allows automatic e-mail of measurement data.
- Allows limited operations depending on the user with usage restriction function.
- Allows conditional recording by event function.

Applicable Model	PC773		
PC Link 7 operating environment	OS	Windows XP/7 32bit	
	CPU	Pentium IV 16 GHz or better	
	Memory	1GB or better	
	Resolution	800x600 or above	

Optional accessories

Clamp probe

CL-20D
AC current



CL-22AD (with case)
DC / AC current



CL33DC (with case)
DC current



CL124 (with case)
Micro / leak current (AC)



CL140 (with case)
Micro / leak current (AC)



Temperature probe

T-300PC

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



Test lead

TLF-120

Length 1.4m



Clip adapter

CL-11

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



CL-15

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



TL-8IC

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



Carrying case

C-77

195 × 130 × 75mm
Soft case



C-77H

186 × 140 × 72mm



Clamp Meters

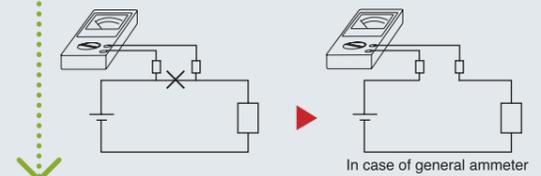
What is Clamp Meter?

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 milliamperes 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.

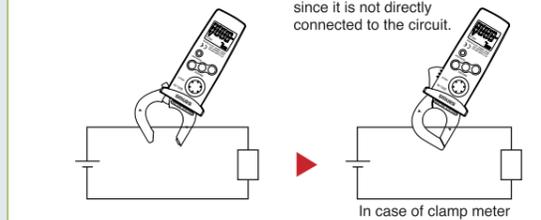
Measurement by multimeter

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

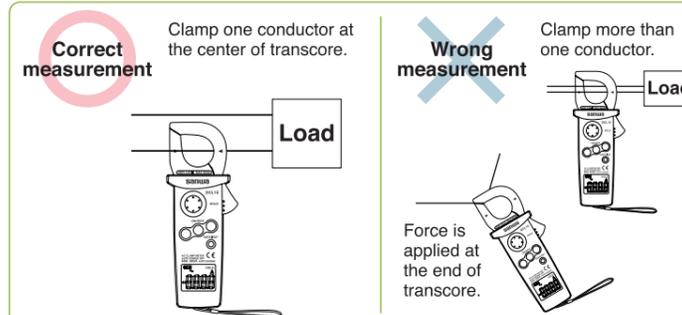
A clamp meter of the mean value type detects the mean value of sine waves in AC measurement, multiplies the value 1.11 times (sine wave AC) and indicates it as the effective value. It even indicates the waveform of a distorted wave and the non-sine wave with different form factors in values multiplied 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

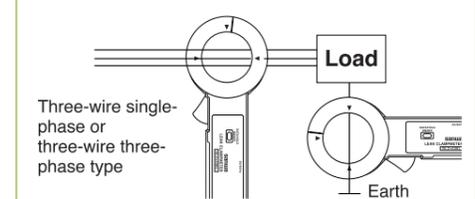
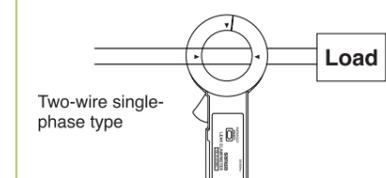
Unlike ordinary current measurement, it is required to clamp all two wires (two-wire single-phase) or three wires (three-wire single-phase or three-wire three-phase) for measuring leakage current. The earthing wire also can be measured.

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.



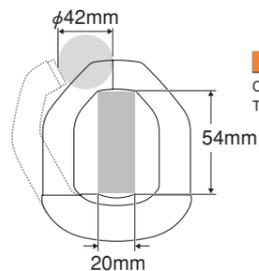
Measurement by clamp meter



Clamp Meter Ac

CE

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



DCL1000 (with case)

Lower cost lightweight & DMM functions

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

Sampling rate : 3 times / sec.

AC frequency bandwidth : 50~500Hz

Safety : IEC61010-2-032 (2002), CAT.III600V

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

Clamp Meter Ac

CE



DCM60L (with case)

Low cost & DMM functions

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

Sampling rate : 2 times / sec.

AC frequency bandwidth : 50~500Hz

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

Optional accessories

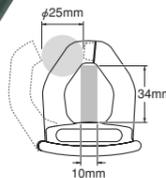
Clip adapter : CL-11, TL-8IC
 Test lead : TLF-120

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

CE



DCM400 (with case)

Low cost & DMM functions

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

Sampling rate : 2 times / sec. for numeral display

AC frequency bandwidth : 50~60Hz (ACA : 1.9%±5), 60~500Hz (ACA : 2.5%±5), 50~500Hz (ACV)

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

Optional accessories

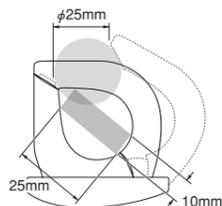
Clip adapter : CL-11, TL-8IC
 Test lead : TLF-120

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		0.1Ω
Frequency (A)	20~4k/10kHz		0.01Hz
Frequency (V)	4k/40k/400k/1MHz	± (0.1%+1)	0.01kHz
Continuity	Buzzer sounds at less than approx. 40Ω. Open voltage : approx. 1.5V		

Bandwidth	50~60Hz (ACA : 1.9%±5) 60~500Hz (ACA:2.5%±5), 50~500Hz (ACV : 1.5±5)
Display	4000
Clamp diameter/Conductor size	25mm/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

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.III300V 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 (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.III600V

Optional accessories

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

Max 600A DCV Optional °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

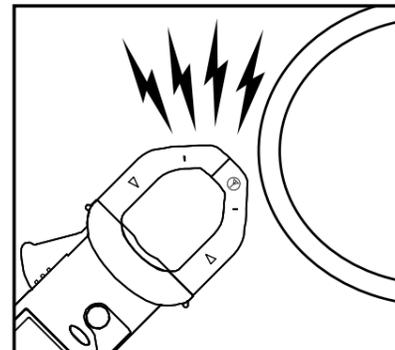
*4% in 300~600A



Clamp Meter AC+True RMS

CE

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

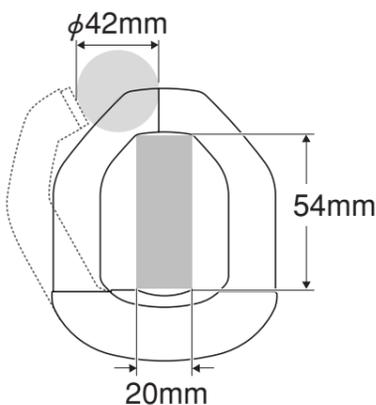
Display : numeral display 6000
Sampling rate : 5 times / sec.
AC frequency bandwidth : 50 / 60Hz
Safety : IEC61010-2-032 (2002) CAT.III600V Max.

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

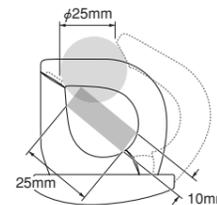


Clamp Meter AC+True RMS

CE



(Backlight ON)



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.)

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	PF
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				

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		

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		



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		



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

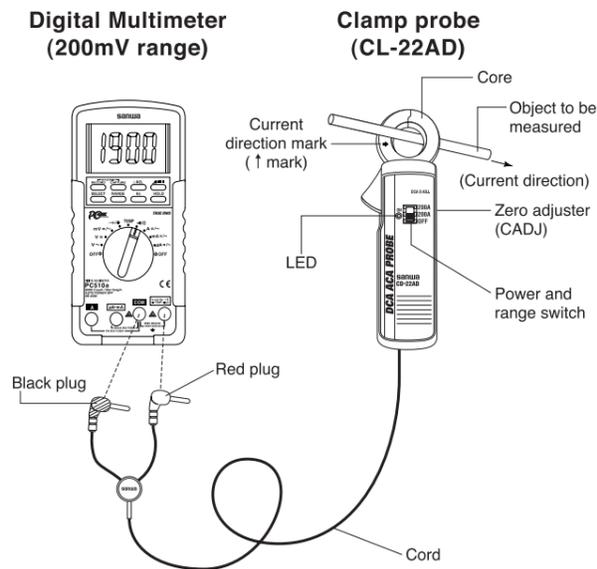
Fix the range at 500mV and set the clamp probe at 20~200A range. In this case, the measured value is obtained by multiplying the indicated value of the multimeter by the factor given below.

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



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.

CL33DC (with case)

DC current

■ R03×2 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

■ R03×2 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 RD701 RD700 DA-50C PC20
	0.1A	0.01A	1A	0.1A	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

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.

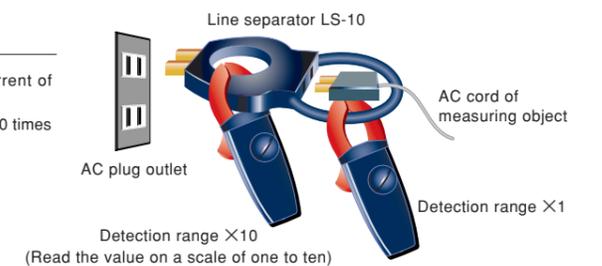


Line separator



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



Detection range ×10
(Read the value on a scale of one to ten)

Insulation Resistance Testers

What is Insulation Resistance Tester?

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

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

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

Examples of major applications of insulation resistance tester

Rated measurement voltage	General electric equipments	Electric equipments and circuits
	Insulation measurement at safe voltage	
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.

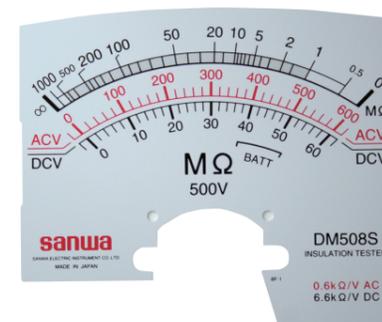
Measuring method of low-voltage circuit

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.

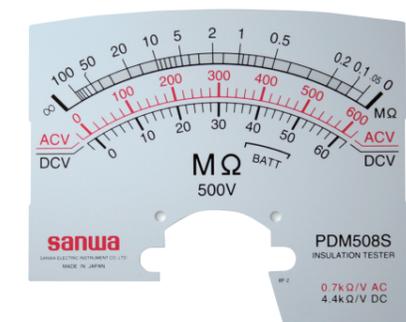
Use voltage class of circuit	Insulation resistance value
300V or less	When voltage to ground is 150V or less (Voltage to ground: Voltage between wire and the earth in case of a ground type circuit, and voltage between wires in case of a non-ground type circuit. The same applies hereinafter.) 0.1MΩ
	Other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



CE



Front cover image ▶

MG1000

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

- Hot-line state (30V minimum) detection
- Large bolt 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

APS DATA HOLD BACK LIGHT AD
1000V 500V 250V
4000MΩ 4000MΩ 4000MΩ

MG1000	Measuring range	Best accuracy	Resolution
MΩ	4M/40M/400M/4000M	± (3%+4)	0.001MΩ
Test voltage	1000/500/250V		
ACV/DCV	600V (AC/DC Automatic detection)	± (3%+2)	1V
Ω	4000Ω (Buzzer and ALARM indicator)	± (3%+3)	1Ω
Ω	40Ω	± (3%+10)	0.01Ω

Open circuit voltage	1 to 1.3 times of nominal test voltage
Rated measurement current	1.0~1.2mA
Short-circuit current	2mA or less
Live circuit detection	At ≥30V AC/DC or more, inhibits test, buzzer sounds and ALARM indicator lights up.
Battery	LR6×6
Size / Weight	H170×W142×D57mm/approx. 600g
Standard accessories included	Test Lead (TL-112), Strap (ST-50), Instruction Manual

Optional accessories

Clip adapter : CL-16

APS DATA HOLD BACK LIGHT AD
500V 250V 125V
4000MΩ 4000MΩ 4000MΩ

MG500	Measuring range	Best accuracy	Resolution
MΩ	4M/40M/400M/4000M	± (3%+4)	0.001MΩ
Test voltage	500/250/125V		
ACV/DCV	600V (AC/DC Automatic detection)	± (3%+2)	1V
Ω	4000Ω (Buzzer and ALARM indicator)	± (3%+3)	1Ω
Ω	40Ω	± (3%+10)	0.01Ω

Open circuit voltage	1 to 1.3 times of nominal test voltage
Rated measurement current	1.0~1.2mA
Short-circuit current	2mA or less
Live circuit detection	At ≥30V AC/DC or more, inhibits test, buzzer sounds and ALARM indicator lights up.
Battery	R6×6
Size / Weight	H170×W142×D57mm/approx. 600g
Standard accessories included	Test Lead (TL-112), Strap (ST-50), Instruction Manual

APS DATA HOLD BACK LIGHT AD
125V 50V 25V
400MΩ 400MΩ 400MΩ

MG125	Measuring range	Best accuracy	Resolution
MΩ	400k/4M/40M/400MΩ	± (3%+4)	0.1KΩ
Test voltage	125/50/25V		
ACV/DCV	600V (AC/DC Automatic detection)	± (3%+2)	1V
Ω	4000Ω (Buzzer and ALARM indicator)	± (3%+3)	1Ω
Ω	40Ω	± (3%+10)	0.01Ω

Open circuit voltage	1 to 1.3 times of nominal test voltage
Rated measurement current	1.0~1.2mA
Short-circuit current	2mA or less
Live circuit detection	At ≥30V AC/DC or more, inhibits test, buzzer sounds and ALARM indicator lights up.
Battery	R6×6
Size / Weight	H170×W142×D57mm/approx. 600g
Standard accessories included	Test Lead (TL-112), Strap (ST-50), Instruction Manual

Hybrid Insulation Resistance Tester

DATA HOLD REL DCA ACA BACK LIGHT 500V 250V 125V
400MΩ 400MΩ 400MΩ

Insulation Resistance + Clamp meter



Hybrid Mini 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)

DATA HOLD REL DCA ACA BACK LIGHT 500V 250V 125V
40MΩ 40MΩ 40MΩ

Insulation Resistance + Clamp meter



Hybrid Mini Tester



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)



CE

MG500

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

- Hot-line state (30V minimum) detection
- Large bolt 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



CE

MG125

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

- Hot-line state (30V minimum) detection
- Large bolt 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

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
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Function	Best accuracy	Resolution
MΩ	4/40M ± (2%+0~7)	0.001MΩ
Display	4000	
Battery	Silver oxide cell (SR44)X2	
Size / Weight	H117XW76XD18mm/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
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Function	Best accuracy	Resolution
MΩ	4/40M ± (2%+0~4)	0.001MΩ
Display	4000	
Battery	Silver oxide cell (SR44)X2	
Size / Weight	H117XW76XD18mm/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
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Function	Best accuracy	Resolution
MΩ	4/40M ± (2%+0~4)	0.001MΩ
Display	4000	
Battery	Silver oxide cell (SR44)X2	
Size / Weight	H117XW76XD18mm/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
	40/400MΩ (125V) ± (2%+2)	0.01MΩ
Display	4000	
Battery	Silver oxide cell (SR44)X2	
Size / Weight	H117XW76XD18mm/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
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Function	Best accuracy	Resolution
MΩ	4M/40M (125V) ± (3%+3)	0.001MΩ
	40M/400M (500V) ± (3%+3)	0.01MΩ
Display	4000	
Battery	Silver oxide cell (SR44)X2	
Size / Weight	H117XW76XD18mm/approx. 125g	
Standard accessories included	Clip lead (CL-15 black only), Instruction manual	

Optional accessories

Clip adapter : CL-13

Analog Type



CE

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

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



CE

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



CE

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



CE

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



CE

AD	1000V 2000MΩ	500V 1000MΩ	250V 500MΩ
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Function	Best accuracy	Resolution
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)X1	
Size / Weight	H144XW99XD43mm/approx. 310g	
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual	

AD	500V 1000MΩ	250V 500MΩ	125V 200MΩ
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Function	Best accuracy	Resolution
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)X1	
Size / Weight	H144XW99XD43mm / approx. 310g	
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual	

AD	1000V 2000MΩ
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Function	Best accuracy	Resolution
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)X1	
Size / Weight	H144XW99XD43mm/approx. 310g	
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual	

AD	500V 1000MΩ
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Function	Best accuracy	Resolution
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)X1	
Size / Weight	H144XW99XD43mm/approx. 310g	
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual	

AD	500V 100MΩ
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Function	Best accuracy	Resolution
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)X1	
Size / Weight	H144XW99XD43mm/approx. 310g	
Standard accessories included	Test lead (TL-508S), Carrying case (C-08S), Instruction manual	

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.

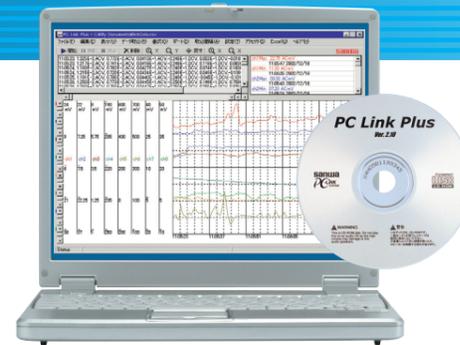


Image for PC Link Plus screen

PC Link Plus
Max 8 Channels

PC Link
Single Channel



Applicable Models PC20, PC500a, PC510a, PC520M, PC5000a

Flexible support for diversified environments

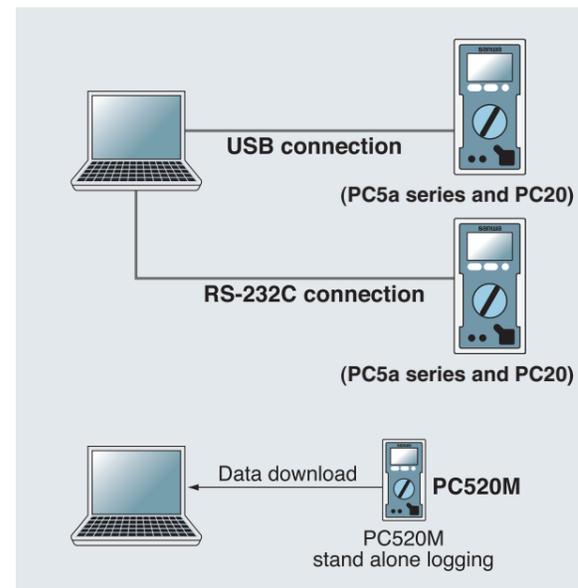
A digital multimeter set at a certain measuring point concurrently monitors and measures various factors such as voltage, current and frequency on up to 8 channels (with the use of PC Link Plus). RS232C or USB cable can be used to allow flexible connection between a digital multimeter and a PC.

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 into CSV files 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.



- 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/>

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:800×600 or above

Optional accessories for PC Link products



PC Link 7
Max 8 Channels



Applicable Model PC773

For easier operation, higher visibility, and ...
Furbished GUI and Windows 7 compatible
Enhanced new features such as separated graphs, user restrictions, and etc.

Data acquisition screen

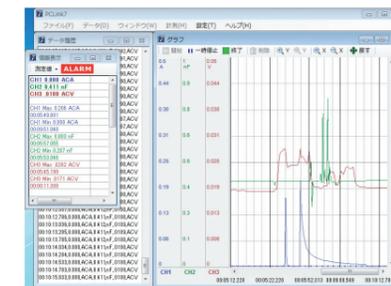


Alert indication



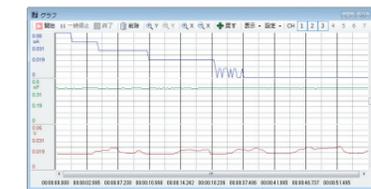
Highly visible alert
Send alert information by e-mails
Save them into files

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

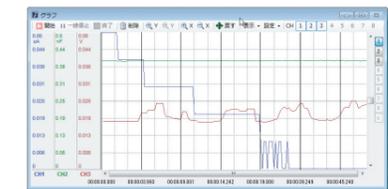


Customizable screen

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



Separated graphs



Overlapped graphs

Major features:

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

PC Link 7 operating environment

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

Optional accessories for PC Link products

■ KB-USB773
Optical link USB



■ PC Link 7
Software CD-ROM



■ Microsoft and Windows are registered trademarks or brands of US Microsoft Corporation in the USA and other countries.

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.

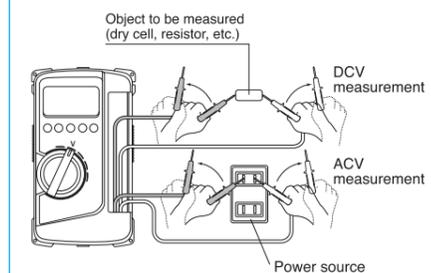
AC-Coupled true RMS value: Adapted to measurements of distorted sine and non-sine waves of the AC
 AC + DC-coupled true RMS value: Adapted to measurements of waveform containing a DC component.

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.

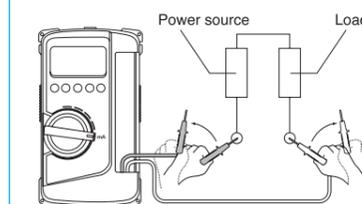
Measurement

Voltage, Resistance measurement



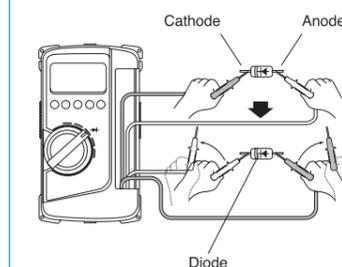
In making measurements, connect your DMM in parallel with an object to be measured. Do not apply signals exceeding the maximum rated input voltage.

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
- Optional 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



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	50/500/5k/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			
Bandwidth	V : 45Hz~1kHz, 1kHz~20kHz (below 500V), A : 45Hz~1kHz			
Fuse / Battery	12.5A/500V IR20kA φ6.3X32mm 0.63A/500V IR200kA φ6.3X32mm 6LF22 (9V)X1			
Battery	6LF22 (9V)X1			
Size / Weight	H179XW87XD55mm / 460g (including holster)			
Standard accessories included	Test lead (TL-82), Holster (H-50), Clip adapter (CL-13), 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

High accuracy & multi-function (PC Link)



PC510a

Temperature measurement, True RMS

- 3-4 / 5 digits 5000 count
- 0.06% 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.II1000V 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	± (0.06%+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 φ6.3X32mm 0.63A/500V IR200kA φ6.3X32mm 6LF22 (9V)X1			
Size / Weight	H179XW87XD55mm/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 & 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



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 φ6.3X32mm 0.63A/500V IR200kA φ6.3X32mm 6LF22 (9V)X1			
Size / Weight	H179XW87XD55mm/460g (including holster)			
Standard accessories included	Test lead (TL-82), Holster (H-50), Thermocouple K type (K-250PC), Clip adapter (CL-13), 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

High accuracy (PC Link)



PC500a

Best accuracy 0.08% high accuracy model

- 3-4 / 5 digits 5000 count
- 0.06% 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	± (0.06%+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 φ6.3X32mm 0.63A/500V IR200kA φ6.3X32mm 6LF22 (9V)X1			
Size / Weight	H179XW87XD55mm/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)



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: 10M~100MΩ
ACV	4/40/400/750V	± (1.2%+2)	0.001V	ACV:10M
DCA	400μ/4000μ/40m/400m/4A/10A	± (1.5%+2)	0.1μA	
ACA	400μ/4000μ/40m/400m/4A/10A	± (1.8%+2)	0.1μA	
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.2%+2)	0.1Ω	
Capacitance	50n/500n/5μ/50μ/100μF	± (5%+6)	0.01nF	
Continuity	Buzzer sounds at between 10Ω and 120Ω. Open voltage : approx. 0.4V			
Diode test	Open voltage : approx. 1.5V			
Bandwidth	40Hz~500kHz (below 500V) 40Hz~1kHz (ACA)			
Fuse / Battery	0.5A/250V IR1500A φ5X20mm 12.5A/250V IR125A φ6.3X32mm	R6X2		
Size / Weight	H167xW90xD48mm/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



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: 10M~100MΩ
ACV	4/40/400/600V	± (1.2%+7)	1mV	10M~100MΩ
DCA	400μ/4000μ/40m/400mA	± (1.4%+3)	0.1μA	ACV: 10M~100MΩ
ACA	400μ/4000μ/40m/400mA	± (1.8%+5)	0.1μA	10M~11MΩ
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 φ5X20mm		R6P×2	
Size / Weight	H166XW82XD44mm/340g			
Standard accessories included	Test lead (TL-21), Instruction manual			

Optional accessories

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



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

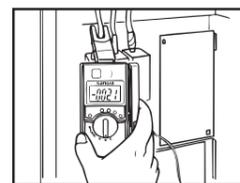
Safety : IEC61010-1 CAT.II 600V, CAT.III 300V



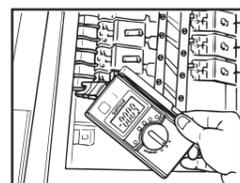
Function	Measuring range	Best accuracy	Resolution
DCV	660m / 6.6 / 66 / 600V	± (0.7%rdg+3dgt)	0.1mV
ACV	660m / 6.6 / 66 / 600V	± (1.6%rdg+7dgt)	0.1mV
DCA	100A	± (2.0%rdg+5dgt)	0.1A
ACA	100A	± (2.0%rdg+5dgt)	0.1A
Resistance	660 / 6.6k / 66k / 660k / 6.6M / 66MΩ	± (1.2%rdg+5dgt)	0.1Ω
Capacitance	6.6n / 66n / 660n / 6.6μ / 66μ / 660μ / 6.6mF / 66mF	± (5.0%rdg+10dgt)	0.001nF
Frequency	660 / 6.6k / 66kHz	± (0.5%rdg+3dgt)	0.1Hz
Duty cycle	20%~80%	± (0.5%rdg+5dgt)	
Diode test	Open voltage : approx. 3V		
Continuity	Buzzer sounds at below 30Ω. Open voltage : approx. 1.2V		
Battery	LR03 x 2		
Size / Weight	H130 x W75 x D19.9mm / approx160g(including Battery)		
Clamp diameter	φ 10mm		
Standard accessory	Instruction manual		

Optional accessories

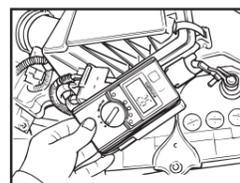
Carrying case (C-DG3), Clip adapter (CL-DG3, CL-11, CL-15, TL-8IC)



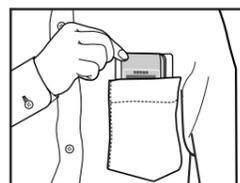
AC current measurement



Cables in a narrow space can be clamped for current measurement



DC current measurement



Easy to put in a shirt pocket

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.)
- Maximum 20A can be measured if the measurement time is less than 10 seconds. (Take 10 minutes or longer intervals between measurements)

Display : numeral display 4000
Sampling rate : 3 times / sec.
AC frequency bandwidth : 40~400Hz (sine wave)
Safety : IEC61010-1 (EN61010-1) 2001-02 CAT.III 600V Max. / CAT.II DC1000V



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/1000V	± (0.5%+2)	0.1mV	DCV: 10M~100MΩ
ACV	4/40/400/1000V	± (1.2%+7)	1mV	10M~100MΩ
DCA	400μ/4000μ/40m/400m/4/10A	± (1.4%+3)	0.1μA	ACV: 10M~100MΩ
ACA	400μ/4000μ/40m/400m/4/10A	± (1.8%+5)	0.1μA	10M~11MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.2%+5)	0.1Ω	
Capacitance	50n/500n/5μ/50μ/100μF	± (5%+10)	0.01nF	
Frequency	5/50/500/5k/50k/100kHz	± (0.3%+3)	0.001Hz	
Continuity	Buzzer sounds and LED lights up at between 0Ω and 85Ω (±45Ω). Open voltage: approx. 0.4V			
Diode test	Open voltage: approx. 1.5V			
Battery check	Approximate value (30Ω load) 1.5V battery only			
Bandwidth	40~400Hz (sine wave)			
Fuse / Battery	0.5A/1000V 30kA φ6.35X32mm		R6P×2	
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, C-77H Clip adapter : CL-11, CL-15, TL-8IC



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



True RMS new standard



CE

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.)
- Maximum 20A can be measured if the measurement time is less than 10 seconds. (Take 10 minutes or longer intervals between measurements)

Display : numeral display 4000

Sampling rate : 3 times / sec.

AC frequency bandwidth : 45~500Hz (4V range), 45~1KHz (40V range and above)

Safety : IEC61010-1 (EN61010-1) 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~100MΩ
ACV	4/40/400/1000V	± (1.2%+8)	1mV	ACV: 10M~11MΩ
DCA	400 μ/4000 μ/40m/400m/4/15A	± (1.4%+3)	0.1 μA	
ACA	400 μ/4000 μ/40m/400m/4/15A	± (1.8%+6)	0.1 μA	
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.2%+5)	0.1Ω	
Capacitance	50n/500n/5 μ/50 μ/100 μF	± (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 R6P×2 16A/1000V 30kA Φ10X38mm R6P×2
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, C-77H 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



CE



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~100MΩ
ACV	4/40/400/600V	± (1.6%+9)	0.001V	ACV: 10M~11MΩ
DCA	40m/400mA	± (2.2%+5)	0.01mA	
ACA	40m/400mA	± (2.8%+5)	0.01mA	
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.5%+5)	0.1Ω	
Capacitance	50n/500n/5 μ/50 μ/100 μF	± (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 R6P×2
Size / Weight	H176XW104XD46mm/approx. 340g
Standard accessories included	Hand strap, Instruction manual

Optional accessories

Clip adapter : CL-11, TL-8IC

Multifunction



CE

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~1000MΩ
ACV	400m/4/40/400/1000V	± (1.5%+5)	0.1mV	
DCA	400 μ/4000 μ/40m/400m/4/10A	± (1.2%+3)	0.1 μA	
ACA	400 μ/4000 μ/40m/400m/4/10A	± (1.5%+4)	0.1 μA	
Resistance	400/4k/40k/400k/4M/40MΩ	± (0.6%+4)	0.1Ω	
Capacitance	500n/5 μ/50 μ/500 μ/3000 μF	± (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 6LF22 (9V)X1 0.63A/500V IR200kA Φ6.3X32mm
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

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~11MΩ
DCA	400 μ/4000 μ/40m/400mA/4A/20A	± (1.5%+2)	0.1 μA	
ACA	400 μ/4000 μ/40m/400mA/4A/20A	± (1.8%+5)	0.1 μA	
Resistance	400/4k/40k/400k/4M/40MΩ	± (1.2%+4)	0.1Ω	
Capacitance	50n/500n/5 μ/50 μ/100 μF	± (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 R6X2 20A/250V 200kA Φ6.3X32mm
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~
ACV	4/40/400/500V	± (2.3%+8)	0.001V	100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (2.0%+4)	0.1Ω	ACV: 10M~
Continuity	Buzzer sounds at less than 35Ω. Open voltage : approx. 1.2V			11MΩ
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

Pocket type



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~
ACV	4/40/400/500V	± (2.3%+10)	0.001V	100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (2.0%+5)	0.1Ω	ACV: 10M~
Continuity	Buzzer sounds at less than 10~120Ω. Open voltage : 0.4V			11MΩ
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

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~
ACV	4/40/400/500V	± (2.3%+10)	0.001V	100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (2.0%+5)	0.1Ω	ACV: 10M~
Capacitance	5n/50n/500n/5μ/50μ/200μF	± (5.0%+10)	0.001nF	10M~
Frequency	9.999/99.99/999.9/9.99k/60.00kHz	± (0.7%+5)	0.001Hz	11MΩ
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

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~
ACV	4/40/400/500V	± (2.3%+5)	0.001V	100MΩ
Resistance	400/4k/40k/400k/4M/40MΩ	± (2.0%+5)	0.1Ω	ACV: 10M~
Continuity	Buzzer sounds at less than 10~120Ω. Open voltage : 0.4V			11MΩ
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.

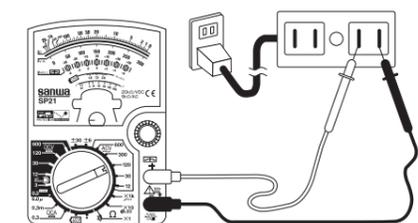
For measuring unknown values

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.

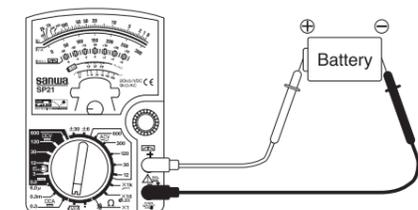
* Do not change the range during measurement.

Examples

AC100V plug outlet



Battery voltage



FET Tester



EM7000

High sensitivity for measurement of lower capacitance

- High input impedance (DCV 2.5~12MΩ/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
	Square symmetric wave: 8.4V (2.5MΩ/V)	±6% of full scale
	Triangular symmetric wave: 8.4V (2.5MΩ/V)	±6% of full scale
DCA	0.12μA/0.3mA/3mA/30mA/300mA/6A	±4% of full scale
DCA (NULL)	±0.06μA/±0.15mA/1.5mA/15mA/150mA	±7% of full scale
ACA	6A	±3% of full scale
Resistance	2k/20k/200k/2M/20M/200MΩ	±3% of arc
dB	-10~+51dB	±3% of arc

Bandwidth	40Hz~1MHz (below 12V range)
Battery	R6P 1.5V×2, 6F22 9V×1
Fuse	φ5.0×20mm ceramic (250V / 0.5A) φ5.0×20mm ceramic (250V / 6.3A)
Size / 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



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 : ±3%)
DCA	50μA/3mA/30mA/0.3A	±2.5% of full scale
Resistance	3k/30k/300k/3M/30MΩ	±3% of arc
dB	-10~+63dB	±3% of full scale (3V : ±5%)
Capacitance	1000μ/0.01/0.1/1F	
Continuity	LED : emitting light at 10Ω or less. Open voltage : 3V	
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.

Multifunctional model



CX506a

Capacitor & Transistor checker (built-in oscillator)

- 26ch switch, wide range measurement
- Capacitance measurement 50pF~2000μF
- High input impedance 50kΩ / V (DC3~300V range)
- 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	30μA/0.3mA/3mA/30mA/0.3A	±2.5% of full scale
Resistance	5k/50k/500k/5M/50MΩ	±3% of arc
Capacitance	C1 : 50p~0.2μF C2 : 0.01μ~20μF C3 : 1~2000μF	C1/C2 : ±6% of arc
hFE (DC Current Amplification Factor)	Transistor hFE: 10~1000	—

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.

High input impedance



AU-32

AU-32 AU-31

Auto range, High input impedance

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

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

Optional accessories

HV probe : HV-50
 Carrying case : C-SP
 Clip adapter : CL-11, TL-8IC



Function	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	±250μA/2.5mA/25mA/250mA/2.5A	±3% of full scale
ACA	250μA/2.5mA/25mA/250mA/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.

Function	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	±300mA/3A	±3% of full scale
ACA	300mA/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



Function	Measuring range	Accuracy
DCV (NULL)	0.1V (20kΩ / V) 0.25 / 2.5 / 10 / 50 (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	50μA / 2.5mA / 25mA / 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)	0~150mA / 15mA / 1.5mA / 1.5μA	
Capacitance	10μF	*2
dB	-10dB~+22dB (for 10VAC) ~+62dB	—
DC high voltage	DC25kV (optional probe "HV-10T" is necessary)	—
hFE	1000 at X10 range (optional probe "HFE-6T" is necessary)	—

Battery	R6 (IEC) or UM-3(1.5V)×2
Fuse	φ5.2×20mm (250V / 0.5A)
Size / 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.



Taut-Band Tension Spring

Drop shock proof meter



SP21

Continuity check buzzer

- Drop shock proof taut-band meter
- \pm 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



Function	Measuring range	Accuracy
DCV (NULL)	0.3 (5k Ω)/3/12/30/120/600V (20k Ω /V) \pm 6/30V (20k Ω /V)	\pm 3% of full scale \pm 5% of full scale
ACV	12/30/120/300/600V	\pm 3% of full scale
DCA	60 μ /30m/0.3A	\pm 3% of full scale
Resistance	2k/20k/2M Ω	\pm 3% of arc
Capacitance	500 μ F	*1
Continuity	Buzzer sounds at less than approx. 10 Ω . Open voltage: 3V	
Bandwidth	40~100kHz (AC12V)	
Battery	R6P \times 2	
Fuse	ϕ 6.3 \times 30mm (250V/0.5A)	
Size / Weight	H144 \times W99 \times D41mm/approx. 270g	
Standard accessories included	Test lead (TL-21), Instruction manual	

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

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 (4k Ω /V)	\pm 3% of full scale
ACV	10/50/250/500V (4k Ω /V)	\pm 4% of full scale
DCA	0.25m/25m/500mA	\pm 3% of full scale
Resistance	2k/20k/1M Ω	\pm 3% arc
Load current (LI)	0~74mA/7.4mA/150 μ A	—
Battery check	0.9~1.5V	—
dB	-20~36dB	—
Bandwidth	30~100kHz (AC10V) 30~20kHz (AC50V)	
Battery	R6P \times 1	
Fuse	ϕ 5.2 \times 20mm (250V/0.5A)	
Size / Weight	H119 \times W85 \times D23mm/approx. 140g	
Standard accessories included	Test lead (TL-84), Instruction manual	

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



SP20

DC high voltage & temperature measurable

- 20ch measurement ranges
- Capacitance measurement 500 μ F
- 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



Function	Measuring range	Accuracy
DCV	0.25/2.5/5/10/50/100V (20k Ω /V)/500V (9k Ω /V)	\pm 3% of full scale
ACV	10/50/250/500V (9k Ω /V)	\pm 3% of full scale
DCA	50 μ /2.5m/25m/0.25A	\pm 3% of full scale
Resistance	2k/20k/200k/2M Ω	\pm 3% of arc
Capacitance	500 μ F	*1
DC high voltage	DC25kV (Optional probe "HV-10" is necessary)	—
Temperature	-20~+200 $^{\circ}$ C (Optional probe "T-THP" is necessary)	\pm 3% (T-THP)
Bandwidth	40~100kHz (AC10V)	
Battery	R6P \times 2	
Fuse	ϕ 6.3 \times 30mm (250V/0.5A)	
Size / Weight	H144 \times W99 \times D41mm/approx. 270g	
Standard accessories included	Test lead (TL-61), Instruction manual	

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



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 (2k Ω /V)	\pm 5% of full scale
ACV	50/250/500V (2k Ω /V)	\pm 5% of full scale
Battery check	1.5V/9V	—
DCA	25m/250mA	\pm 5% of full scale
Resistance	5k/500k Ω	\pm 3% arc
Bandwidth	40~10kHz (less than 50V)	
Battery	R03 \times 1	
Fuse	ϕ 5 \times 20mm (250V/0.5A)	
Size / Weight	H126 \times W87 \times D30mm/approx. 185g	
Standard accessories included	Instruction manual	

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



SP-18D

Protective body cover

- Low power ohm (3V) measurement upto 200M Ω
- Capacitance measurement 0.01 μ F~1000 μ F
- 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



Function	Measuring range	Accuracy
DCV	0.3/3/12/30/120/600V (20k Ω /V)	\pm 3% of full scale
ACV	12/30/120/300/600V (9k Ω /V)	\pm 3% of full scale
DCA	60 μ /30m/0.3A	\pm 3% of full scale
Resistance	2k/20k/2M/200M Ω	\pm 3% of arc
Battery check	1.5V/1.5V Coin battery	—
Capacitance	1000 μ F	*1
Bandwidth	30~80kHz (AC 12V) 30~20kHz (AC 30V)	
Battery	R6P \times 2	
Fuse	ϕ 5.2 \times 20mm (250V/0.5A)	
Size / Weight	H159.5 \times W129 \times D41.5mm / approx. 320g	
Standard accessories included	Instruction manual	

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

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 (4k Ω /V)	\pm 3% of full scale
ACV	10/50/250/500V (4k Ω /V)	\pm 3% of full scale
Resistance	2k/20k/2M Ω	\pm 3% arc
Bandwidth	40~10kHz (less than AC50V)	
Battery	R6P \times 2	
Fuse	Current-limiting fuse 600V/3A, Breaking capacity 100kA Glass-tube fuse ϕ 6.3 \times 30mm 0.25A/250V, Breaking capacity 100A	
Size / Weight	H144 \times W96 \times 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.



TA55

30A range for automotive

- High level panel visibility
- Continuity check buzzer
- Tilt-stand
- Measurable upto DC30A / DC300A with optional 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	0.3/3/16/30/60V (20k Ω /V)	\pm 3% of full scale
ACV	30/120/300V (9k Ω /V)	\pm 4% of full scale
DCA	0.5/3/30A	\pm 5% of full scale
Resistance	2k/20k/200k/2M Ω	\pm 3% of arc
Continuity	Buzzer sounds at less than approx. 10 Ω . Open voltage : 3V	
Bandwidth	40~5kHz	
Battery	R6P \times 2	
Fuse	ϕ 6.3 \times 30mm (250V/3A)	
Size / Weight	H142 \times W97 \times D38mm/approx. 300g	
Standard accessories included	Test lead (TL-91), 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 φ9mm)
- 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 (φ9mm)
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/400.0klx
Accuracy	± (5%+1) below 3000 lx ± (7.5%+1) 3000 lx or higher Compatible JIS standard A class 23°C±2°C
Temperature Characteristics	±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-44×2
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×W76×D18mm/approx. 120g Sensor probe : H84×W16×D10mm
Standard accessories included	Instruction manual

Analog Type



LX3132

Max 10000 lux measurable

- Various light source can be measured such as filament lamp, floor 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	±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×2
Size / Weight	H163×W100×D47mm/300g
Standard accessories included	Instruction manual



Optical / Laser Power Meters

Laser power meters

Laser power meters are measuring instruments that let a laser beam emitted from a laser light source enter the sensor light receiver and indicate the value by converting light energy into electric signals. The unit used for this purpose is W (watt). The laser power meter is used for checking the light power of and maintaining laser-operating equipment. Since silicon 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.



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



OPM37LAN

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

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

Optional accessories

RS232C cable : KB-RS-OPM
SC-type optical connector adapter : OPA-F04
Simplex TOSLINK type optical connector adapter : OPA-F05
*Consult us regarding other type of connector.



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
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.



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 bargraph.
Measuring range	40.00μ/400.00μ/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



Display	4-digit digital
Ranges	Automatic, 5 ranges
Optical sensor	Si photodiode (sensor surface area 10x10mm)
Optical power measuring range	0.001 μW~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



Display	4-digit digital
Ranges	Automatic, 5 ranges
Optical sensor	Si photodiode (sensor surface area 10x10mm)
Optical power measuring range	0.001 μW~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

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

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

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, PC5a 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.)

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

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 100Q φ2 x 64 JIS B class
Response	Approx. 7 sec. interval (speed of sensor's response to achieve the level of 90%)
Battery	SR-44×2
Power consumption	Approx. 18mW
Accuracy assure temperature	23°C±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



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

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)

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

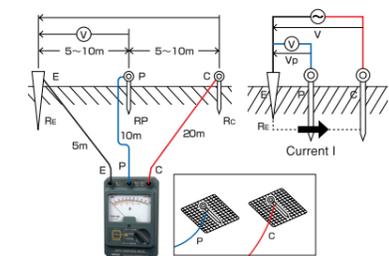
Measuring range	0~1999.9m/min. 4-digit Red LED display (2 ch.) (Max 999.9) (LED at upper left in the display will blink when the measured value exceeds 999.9m/min.)
Measuring time	0.2 sec. (sampling time)
Accuracy	±2dgt
Analog output	DC0~1999.9mV (at 0m/min.~1999.9m/min.) Analog output accuracy : ± (0.5%±1mV)
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

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

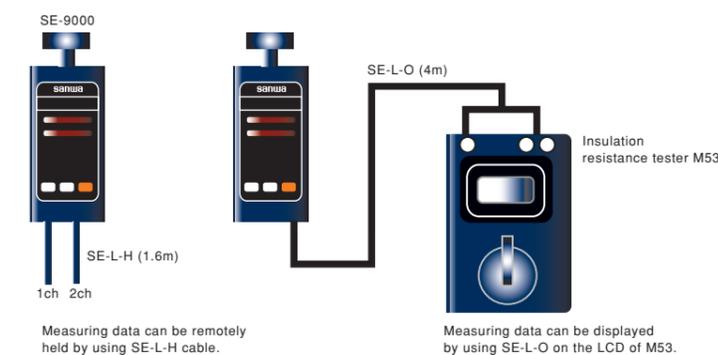
- Phase detection system circuit for stable measurement
- Easy self calibration
- AC 30V range to avoid indication errors caused by leak current
- Power saving design with push switch
- Exorbitance warning LED of auxiliary earth electrode resistance

Optional accessories

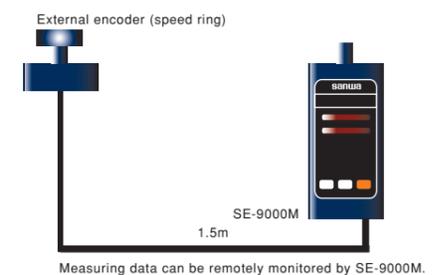
Carrying case : C-PDR300

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

Remote control by SE-9000 / SE-9000M



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



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

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 Ω adjuster
- Protective body cover



Complete image



Function	Measuring range	Accuracy
DCV	0.3/3/12/30/120/300/600V (20kΩ/V)	±3% of full scale
ACV	12/30/120/300/600V (9kΩ/V)	±4% of full scale
DCA	60μA/3m/30m/0.3A	±3% of full scale
Resistance	20/200/20kΩ	±3% of arc
Battery check	1.5V	
Bandwidth	50 or 60Hz (sine wave)	
Battery	UM-3(1.5V) X 2	
Fuse	φ 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~100μF)
- Data hold / Range hold
- Safety cover for the μA·mA
- Tilt stand
- Optical link RS232C / USB interface(optional)

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



Complete image
※Holster is optional accessory.



Function	Measuring range	Best accuracy	Resolution	Input impedance
DCV	400m/4/40/400/750V	±(1.0%rdg+2dgt)	0.1mV	DCV:
ACV	4/40/400/750V	±(1.5%rdg+5dgt)	0.001V	10M~
DCA	400μA/4000μA/40m/400m	±(1.5%rdg+5dgt)	0.1μA	100MΩ
ACA	400μA/4000μA/40m/400m	±(2.0%rdg+5dgt)	0.1μA	ACV:10M
Resistance	400/4k/40k/400k/4M/40M	±(1.5%rdg+5dgt)	0.1Ω	
Capacitance	40n/400n/4μ/40μ/100μF	±(7%rdg+8dgt)	0.01nF	
Continuity	Buzzer sounds at between 10Ω and 120Ω. Open voltage: approx. 0.4V			
Diode test	Open voltage: approx. 1.5V			
Bandwidth	40~400Hz (sine wave)			
Fuse / Battery	0.5A/250V R300A φ6.3X30mm 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

STD5000M (Order production)



Overview

The STD5000M is a calibrator with soft touch buttons that can generate a desired DC voltage / current, AC voltage / current, resistance, frequency, etc. with a high degree of accuracy and stability.

The STD5000M is with a memory function allowing a broad range of uses for the device.

Ranges

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

Features

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

Function	Measuring range	Generation range	Resolution	Set accuracy	Maximum load
DCV	50mV	0~50mV	1μV	±(0.05%+30μV)	10mA
	500mV	0~500mV	10μV	±(0.03%+30μV)	
	5V	0~5V	100μV	±(0.03%+200μV)	
	50V	0~50V	1mV	±(0.03%+2mV)	
	500V	0~500V	10mV	±(0.03%+20mV)	
ACV	1000V	0~1000V	100mV	±(0.05%+0.3V)	10mA
	50mV	0~50mV	1μV	±(0.1%+50μV)	
	500mV	0~500mV	10μV	±(0.06%+100μV)	
	5V	0~5V	100μV	±(0.06%+0.4mV)	
	50V	0~50V	1mV	±(0.06%+4mV)	
DCA	500V	0~500V	10mV	±(0.06%+40mV)	10mA
	1000V	0~1000V	100mV	±(0.1%+0.4V)	
	50μA	0~50μA	1nA	±(0.05%+30nA)	
	500μA	0~500μA	10nA	±(0.05%+30nA)	
	5mA	0~5mA	100nA	±(0.05%+0.2μA)	
ACA	50mA	0~50mA	1μA	±(0.05%+2μA)	13V (Open circuit voltage)
	500mA	0~500mA	10μA	±(0.05%+20μA)	
	2000mA	0~2000mA	100μA	±(0.1%+300μA)	
	50μA	0~50μA	1nA	±(0.12%+60nA)	
	500μA	0~500μA	10nA	±(0.12%+80nA)	
OHM1	5mA	0~5mA	100nA	±(0.1%+0.5μA)	13V (Open circuit voltage)
	50mA	0~50mA	1μA	±(0.1%+5μA)	
	500mA	0~500mA	10μA	±(0.1%+50μA)	
	2000mA	0~2000mA	100μA	±(0.15%+0.5mA)	
	0~7V	0.1V	—	±(2%+0.2V)	

Function	Measuring range	Accuracy
OHM2	160/260/360/460Ω	±(0.05%+0.1Ω)
	1.6k/2.6k/3.6k/4.6kΩ	±(0.05%)
	16k/26k/36k/46kΩ	±(0.05%)
	160k/260k/360k/460kΩ	±(0.05%)
	1,600k/2,600k/3,600k/4,600kΩ	±(0.05%~0.08%)
16M/26M/36M/46MΩ	±(0.05%~0.2%)	
Memory	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°C±3°C below 70%RH
Preheating time	30~60m.
Power supply	AC100V±10%, 50Hz, 60Hz
Power consumption	30VA
Protection	DC and 50 V or higher AC ranges: Overload protection device with reset switch. DC and 5 V or lower AC ranges: Overload protection circuitry.
Size/Weight	H180×W480×D580mm/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

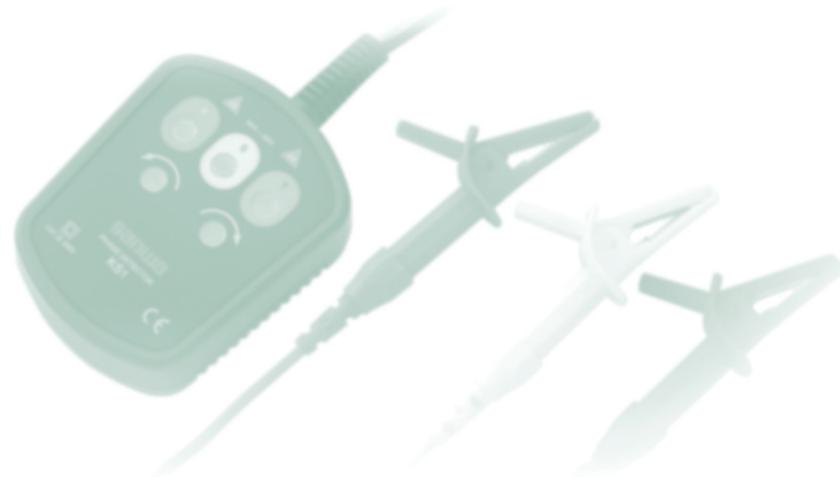
Voltage Detector

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



Length0.56m

TL-21



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

CE

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

CE

TL-25



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

CE

TL-61



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

TL-61T



Length0.85m

TL-63



Length1m

TL-82



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

CE

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

CE

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

CE

TL-122



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



TL-506S



Length 0.9m

TL-507



Length 1m

TL-8IC



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

Clip lead for hFE measurement

CL-506



Length 0.3m

HFE probe

HFE-5



(use with test leads by inserting pins into socket)
Length 0.3m

TL-508S



Length 1m

TL-100-OM



Length 1m

TLF-120



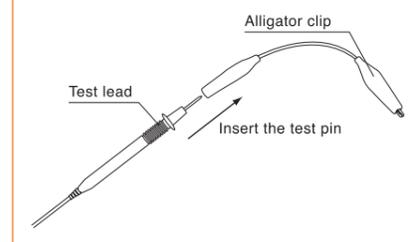
Length 1.4m

HFE-6, HFE-6T



hFE 0 ~ 1000
Length 0.3m

How to use :
CL-11, CL-13, CL-15, TL-8IC



AC adapter

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



Length 1.9m

TL-M54



Length 1m

TL-PM3



Length 0.55m

TL-PM5



Length 0.65m

HV probe

HV-10



HV-20
480M Ω resistor
measurement for
0~30kV or 25kV
Length 1m

Optical link

KB-USB773



Optical link USB
PC connection cable
Length 1.3m



KB-USB1



Optical link USB
PC connection cable
Length 1.3m

KB-USB2
KB-USB2a



Optical link USB
PC connection cable
Length 1.5m

KB-RS1



Optical link RS-232C
PC connection cable
Length 1.9m

KB-RS2
KB-RS2a



Optical link RS-232C
PC connection cable
Length 1.9m

HV-50



HV-60
1000M Ω resistor
measurement for
0~30kV or 25kV
Length 1.2m

Clip adapter

CL-11



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

CL-15



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

CL-13



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

PC Link Plus / PC Link

PC Link 7
PC Link Plus
PC Link



CD-ROM

PC Communication Set

- A : KB-RS1 + PC Link
- B : KB-RS2 + PC Link
- C : KB-USB1 + PC Link
- D : KB-USB2 + PC Link
- E : KB-RS2a + PC Link
- F : KB-USB2a + PC Link
- G : KB-USB773 + PC Link 7

Temperature sensor

T-THP



-20 $^{\circ}$ C~200 $^{\circ}$ C
Thermistor probe
Sensor : ϕ 2.5 \times 31mm
Length 0.9m

T-300PC



-50 $^{\circ}$ C~300 $^{\circ}$ C
Platinic thin film
Sensor : ϕ 3.2 \times 135mm
Length 2.2m
Accuracy : \pm 1.9 $^{\circ}$ C

CL-16



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

CL-100SD



IEC61010-031
CAT.III1000V
CAT.IV600V
Length 0.5m
Clip Lead
CL-16

CL-DG3



Length 0.29m

K-250CD, K-250PC



-50 $^{\circ}$ C~250 $^{\circ}$ C
Linear thermocouple K type
Length 1m

K-8-250



-50 $^{\circ}$ C~250 $^{\circ}$ C
Surface shape thermocouple K type
Sensor : 15 \times 16mm
Length 1m

K-8-300



-50 $^{\circ}$ C~300 $^{\circ}$ C
Sheath shape thermocouple K type
Sensor : ϕ 3.1 \times 150mm
Length 1.2m

K-8-500



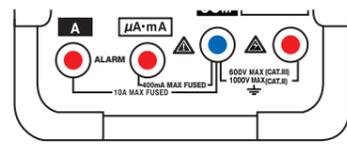
-50°C~500°C
Surface shape thermocouple K type
Sensor : 15 × 16mm
Length 1m

K-8-650



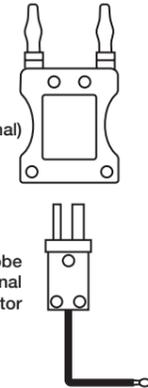
-50°C~650°C
flexible thermocouple K type
Sensor : φ1 × 300mm
Length 1.4m

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



K-AD (optional)

K type temperature probe with international miniature connector



K-8-800



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

K-AD



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

C-CP



130 × 120 × 30mm

C-DA



160 × 125 × 45mm

C-DCM2000



123 × 250 × 57mm

C-DG3



100 × 160 × 40mm
Soft case with magnet sheets

C-M53



130 × 190 × 70mm
Soft case

C-NH7



130 × 162 × 55mm

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

Carrying case

C-01



160 × 54 × 180mm

C-08S



144 × 160 × 54mm

C-PC10/S



240 × 155 × 65mm

C-PM3



119 × 78 × 16mm

C-SE2



224 × 97 × 37mm

C-77



195 × 130 × 75mm
Soft case

C-77H



186 × 140 × 72mm

C-CA



180 × 150 × 50mm

C-SP



165 × 140 × 50mm
Soft case

C-SPH



160 × 150 × 55mm

C-STH



348 × 100 × 37mm

C-CD



190 × 145 × 70mm

C-CDS



175 × 110 × 45mm

C-CL



190 × 90 × 45mm
Soft case

C-YS



160 × 140 × 40mm

Holster

H-70



H-50



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/400MΩ
	500V/4000MΩ	250V/4000MΩ	50V/400MΩ	250V/400MΩ	250V/400MΩ
	250V/4000MΩ	125V/4000MΩ	25V/400MΩ	125V/400MΩ	125V/400MΩ
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/1000MΩ	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	PC773	PC5000a	PC520M	PC510a	PC500a	PC20	CD770	CD771
Digit	11000	50000/500000	5000	5000	5000	4000	4000	4000
Category	CAT.III600V	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	A/M
DCV (V)	110m	500m	50m	50m	50m	400m	400m	400m
	1.1	5	500m	500m	500m	4	4	4
	11	50	5	5	5	40	40	40
	110	500	50	50	50	400	400	400
	1000	1000	500	500	500	1000	600	1000
	-	-	1000	1000	1000	-	-	-
ACV (V)	110m	500m	50m	50m	50m	4	4	4
	1.1	5	500m	500m	500m	40	40	40
	11	50	5	5	5	400	400	400
	110	500	50	50	50	750	600	1000
	1000	1000	500	500	500	-	-	-
	-	-	1000	1000	1000	-	-	-
DCA (A)	110μ	500μ	500μ	500μ	500μ	400μ	400μ	400μ
	1100μ	5000μ	5000μ	5000μ	5000μ	4000μ	4000μ	4000μ
	11m	50m	50m	50m	50m	40m	40m	40m
	110m	500m	500m	500m	500m	400m	400m	400m
	11	5	5	5	5	4	-	4
	-	10	10	10	10	10	-	10
ACA (A)	110μ	500μ	500μ	500μ	500μ	400μ	400μ	400μ
	1100μ	5000μ	5000μ	5000μ	5000μ	4000μ	4000μ	4000μ
	11m	50m	50m	50m	50m	40m	40m	40m
	110m	500m	500m	500m	500m	400m	400m	400m
	11	5	5	5	5	4	-	4
	-	10	10	10	10	10	-	10
Resistance (Ω)	110	500	50	50	50	400	400	400
	1.1k	5k	500	500	500	4k	4k	4k
	11k	50k	5k	5k	5k	40k	40k	40k
	110k	500k	50k	50k	50k	400k	400k	400k
	1.1M	5M	500k	500k	500k	4M	4M	4M
	11M	50M	5M	5M	5M	40M	40M	40M
	110M	-	50M	50M	50M	-	-	-
Capacitance (F)	11n 11m	50n	50n	50n	50n	50n	50n	50n
	110n 110mF	500n	500n	500n	500n	500n	500n	500n
	1.1μ	5μ	5μ	5μ	5μ	5μ	5μ	5μ
	11μ	50μ	50μ	50μ	50μ	50μ	50μ	50μ
	110μ	500μ	500μ	500μ	500μ	100μ	100μ	100μ
	1.1m	9999μ	9999μ	9999μ	9999μ	-	-	-
Temperature (°C) min	○	○	-50	-50	○	○	-	-
Temperature (°C) max	○	○	1000	1000	○	○	-	-
Frequency (Hz) min	110	10	10	10	10	-	5	5
Frequency (Hz) max	1.1M	200k	125k	125k	125k	-	100k	100k
Logic frequency (Hz) min	-	5	-	-	-	-	-	-
Logic frequency (Hz) max	-	2M	-	-	-	-	-	-
Continuity	BUZZER	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	166	179	179	179	179	167	166	166
Dimension (W) mm	82	87	87	87	87	90	82	82
Dimension (D) mm	44	55	55	55	55	48	44	44
Weight (g)	360	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.III600V	CAT.III600V	CAT.III600V	CAT.III600V	CAT.III600V	CAT.III600V	CAT.III 600V
CE	●	●	●	●	●	●	●
Range	A/M	A/M	A/M	A/M	A/M	A/M	A
DCV (V)	400m	320m	320m	400m	320m	400m	400m
	4	3.2	3.2	4	3.2	4	4
	40	32	32	40	32	40	40
	400	320	320	400	320	400	400
	1000	1000	1000	1000	1000	1000	1000
ACV (V)	4	3.2	3.2	4	3.2	400m	4
	40	32	32	40	32	4	40
	400	320	320	400	320	40	400
	1000	750	750	750	750	400	750
	-	-	-	-	-	1000	-
DCA (A)	400μ	32μ	32μ	400μ	32m	400μ	-
	4000μ	320μ	320μ	4000μ	320m	4000μ	-
	40m	3200μ	3200μ	40m	12	40m	-
	400m	32m	32m	400m	-	400m	-
	4	320m	320m	4	-	4	-
ACA (A)	400μ	32μ	32μ	400μ	32m	400μ	-
	4000μ	320μ	320μ	4000μ	320m	4000μ	-
	40m	3200μ	3200μ	40m	12	40m	-
	400m	32m	32m	400m	-	400m	-
	4	320m	320m	4	-	4	-
Resistance (Ω)	400	320	320	400	320	400	400
	4k	3.2k	3.2k	4k	3.2k	4k	4k
	40k	32k	32k	40k	32k	40k	40k
	400k	320k	320k	400k	320k	400k	4M
	4M	3.2M	3.2M	4M	3.2M	4M	40M
Capacitance (F)	50n	-	-	50n	-	500n	-
	500n	-	-	500n	-	5μ	-
	5μ	-	-	5μ	-	50μ	-
	50μ	-	-	50μ	-	500μ	-
	100μ	-	-	100μ	-	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.III600V	-	CAT. III300V	CAT.III300V	CAT.II500V	-	CAT.II600V
CE	●	-	●	●	●	-	●
Range	A/M	A/M	A	A	A	A/M	A
DCV (V)	400m	400m	400m	320m	400m	400m	660m
	4	4	4	3.2	4	4	6.6
	40	40	40	32	40	40	66
	400	400	400	320	400	400	660
	600	600	500	500	500	500	-
ACV (V)	4	400m	4	3.2	4	4	660m
	40	4	40	32	40	40	6.6
	400	40	400	320	400	400	66
	600	400	500	500	500	500	660
	-	600	-	-	-	-	-
DCA (A)	40m	40m	-	-	-	-	100A
	400m	10	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
ACA (A)	40m	40m	-	-	-	-	100A
	400m	10	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
Resistance (Ω)	400	400	400	320	400	400	660
	4k	4k	4k	3.2k	4k	4k	6.6k
	40k	40k	40k	32k	40k	40k	66k
	400k	400k	400k	320k	400k	400k	660k
	4M	4000k	4M	3.2M	4M	4M	6.6M
Capacitance (F)	50n	-	-	-	5n	-	6.6n 6.6m
	500n	-	-	-	50n	-	66n 66m
	5μ	-	-	-	500n	-	660n
	50μ	-	-	-	5μ	-	6.6μ
	100μ	-	-	-	50μ	-	66μ
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

Analog Multitester comparative chart

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

○ Optional accessory is necessary.

* Serial Number ≥ 6064916

Analog Multitester comparative chart

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

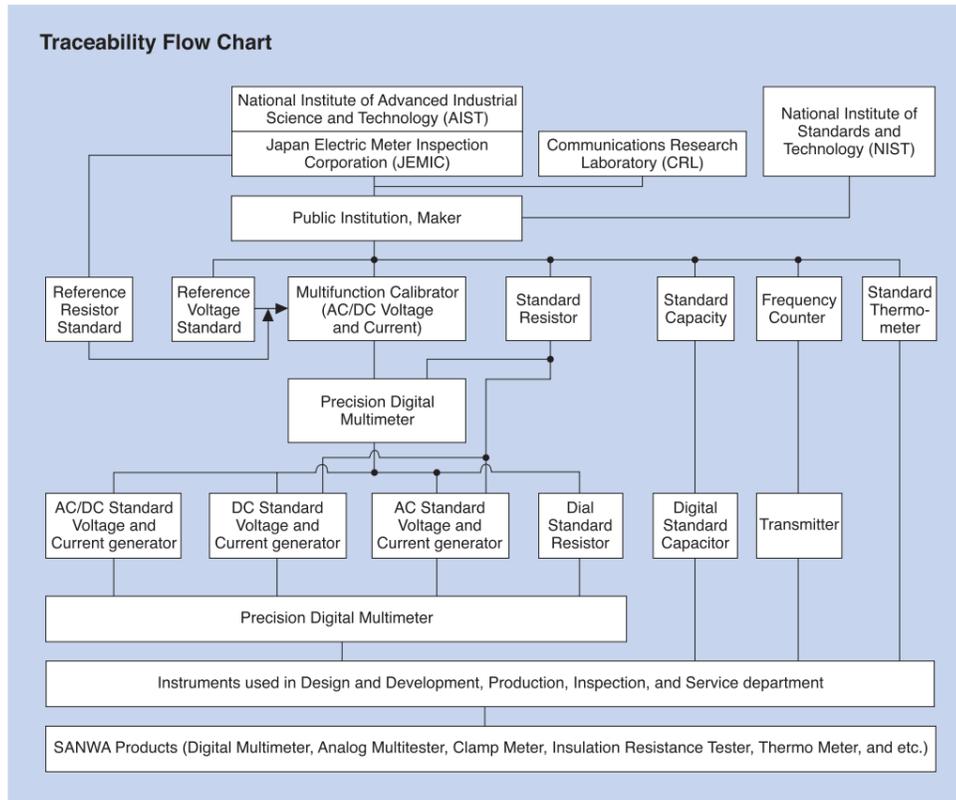


Environmental Philosophy

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 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.

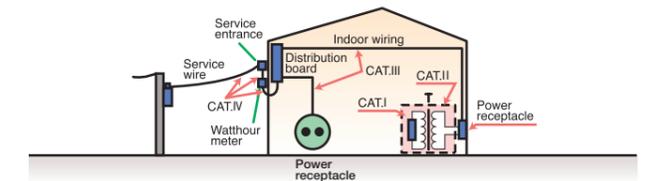
Measurement category II (CAT. II):

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

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), μ 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.

% 4-20 **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 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

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

Glossary

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

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

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

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

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

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

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

Clamp conductor size
Size of a maximum conductor shape.

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

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

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

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

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

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

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

A
AD-71AC.....P53
AD-72AC.....P53
AP33.....P39
AU-31.....P37
AU-32.....P37

C
C-01.....P54
C-08S.....P54
C-77.....P05/54
C-77H.....P05/54
CAD-2L.....P45
CAD-3L.....P45
CAM600S.....P09
C-CA.....P54
C-CD.....P54
C-CDS.....P54
C-CL.....P54
C-CP.....P55
C-DG3.....P55
CD731a.....P31
CD770.....P29
CD771.....P29
CD772.....P30
CD800a.....P31
C-DA.....P55
C-DCM2000.....P55
CL-11.....P05/52
CL-100SD.....P52
CL124.....P05/14
CL-13.....P52
CL140.....P05/15
CL-15.....P05/52
CL-16.....P52
CL-20D.....P05/15
CL-22AD.....P05/15
CL33DC.....P05/15
CL-506.....P53
CL-DG3.....P52
C-M53.....P55
C-NH7.....P55
CP-7D.....P39
C-PC10/S.....P55
C-PM3.....P55
CS-10VB.....P45
C-SE2.....P55
C-SP.....P55
C-SPH.....P55
C-STH.....P55
CX506a.....P36
C-YS.....P55

D
DCL10.....P08
DCL1000.....P08
DCL20R.....P11
DCL1200R.....P10
DCL30DR.....P13
DCM-22AD.....P12
DCM60L.....P09
DCM400.....P09
DCM400AD.....P12
DCM2000AD.....P12
DG10.....P20
DG34.....P19
DG35.....P19
DG6.....P20
DG7.....P20
DG8.....P20
DG9.....P20
DLC-330L.....P13
DLC-400A.....P13
DM1008S.....P21
DM1528S.....P21
DM508S.....P21
DM5218S.....P21

E
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