



TEST & MEASURING INSTRUMENTS



STANDARD ELECTRIC WORKS CO., LTD.

BRIEF OF PROFILE OF SEW

History

In 1973 Mr. and Mrs. **Stanley Shay** established the **Standard Electric Works Co., Ltd. (SEW)** in Pan Chiao, Taipei Hsien, Taiwan to manufacture and market various test and measurement instruments worldwide. Our manufacturing department is composed of dependable, highly skilled individuals. Their hard work and dedication has set the foundation for the company's continual growth.

1973 Major products included Analog Panel Meters, Multitesters, Insulation Testers, Clamp Meters, Earth Resistance Testers, and Phase Sequence Indicators.

1989 Began research, development, and production of digital and analog electric field measurement instruments.

1998 SEW partnered with TOPTRONIC to enhance product development and upgrade our manufacturing technology. In addition to the products that SEW and TOPTRONIC already offered, we jointly developed a new line of test and measurement instruments that included the following :

- High Voltage Insulation Testers
- High Voltage Detectors
- High Voltage Probe Meters
- High Voltage Multifunction Phasing Sticks
- Personal Safety Voltage Detectors
- Capacitive High Voltage Detectors
- Earth Leakage Circuit (ELCB) Testers
- Circuit Break Identifier

2006 The Miao Li Plant, a new state-of-the-art production plant was built to meet the needs of our expanding business. This facility houses a 100kV testing facilities, environmental control test laboratory, high voltage tester, hardness tester molding machine, H.V. insulation tester, and other testing facilities. All of which are tested and calibrated regularly.

2007 Production of Test Leads for applications of different kinds of instruments. Most of them are patented in the U.S., Germany and China.

2008 Plastic extruder was added to production lines to further ensure the quality of products and reduce the production costs.

2010 For its continual growth, SEW recently purchased a new factory. Its headquarters will be relocated from Panchiao Taipei Hsien to the Yongning Scientific Park in Tucheng District Xinbei City.

Mission Statement

To develop, manufacture, and supply high quality test and measurement instruments worldwide, SEW is committed to meeting our clients' needs and expectations by constantly striving to develop new and innovative products with the latest technology to meet current market demands. With our dedicated team, we pride ourselves in delivering a reliable, quality product with the highest safety standards.

Quality Control Certifications

Most SEW products meet the safety requirements to protect the users' safety.

- 1996.6 TUV ISO 9002 Quality Management System
- 2002.12 TÜV ISO 9001 : 2000 Quality Management System
- 2009.12 TÜV ISO 9001 : 2008 Quality Management System
- TÜV(SÜD) ETL MET conducts inspects the plant annually.



Head Office (5F)



Miao Li Plant

H.V. Insulation Tester(1kV up)

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Case Design Selection Guide

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Case Design Selection Guide

2700 Series Case



2800 Series Case












4100 Series Case












6200 Series Case










Digital Multifunction and Insulation Tester Selection Guide

Model	1151 IN	1152 MF	1153 AI	1154 TMF	1155 TMF	2788 MF	4101 IN	4102 MF	4175 TMF
Insulation Test	1000V / 8GΩ	1000V / 8GΩ		1000V / 8GΩ	1000V / 8GΩ	1000V / 8GΩ	1000V / 8GΩ	1000V / 8GΩ	1000V / 8GΩ
	500V / 4GΩ	500V / 4GΩ		500V / 4GΩ	500V / 4GΩ	500V / 4GΩ	500V / 4GΩ	500V / 4GΩ	500V / 4GΩ
	250V / 2GΩ	250V / 2GΩ		250V / 2GΩ	250V / 2GΩ	250V / 2GΩ	250V / 2GΩ	250V / 2GΩ	250V / 2GΩ
				125V / 1GΩ	125V / 1GΩ				125V / 1GΩ
				100V / 800MΩ	100V / 800MΩ				100V / 800MΩ
				50V / 400MΩ	50V / 400MΩ				50V / 400MΩ
			10V / 80MΩ						
PI(Polarization Index)	●	●			●	●	●	●	●
DAR (Dielectric Absorption Ratio)	●	●			●	●	●	●	●
Continuity Test	0-1999Ω	0-1999Ω	0-1999Ω	0-1999Ω	0-1999Ω	0-1999Ω	0-1999Ω	0-1999Ω	0-1999Ω
Voltmeter	ACV	0-700V	0-700V	0-100V	0-700V	0-700V	0-700V	0-700V	0-700V
	DCV	0-950V	0-950V	0-100V	0-950V	0-950V	0-950V	0-950V	0-950V
MOV(Metal Oxide Varistor)		5-1020V		5-1020V	5-1020V	5-1020V		5-1020V	5-1020V
Gas Arrester Voltage Result		5-1020V		5-1020V	5-1020V	5-1020V		5-1020V	5-1020V
Display	LCM	LCM	LCM	LCM	LCM	LCM	LCM	LCM	LCM
Microprocessor Controlled	●	●	●	●	●	●	●	●	●
Bargraph	●	●	●	●	●	●	●	●	●
Auto Range	●	●	●	●	●	●	●	●	●
Long Test	●	●	●	●	●	●	●	●	●
Auto Power Off	●	●	●	●	●	●	●	●	●
Data Hold	●	●	●	●	●	●	●	●	●
Auto Discharge	●	●	●	●	●	●	●	●	●
Auto Null	●	●	●	●	●	●	●	●	●
Water Proof	●	●	●	●	●	●	●	●	●
CE Approved	●	●	●	●	●	●	●	●	●
B.S 16 th Edition	●	●	●	●	●	●	●	●	●
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Picture									













Digital H.V. Insulation Tester(1kV up) Selection Guide

Model	2803 IN	2804 IN	4103 IN	4104 IN	6210A IN	6211A IN	6212A IN	6213A IN	7010 IN
Insulation Test	0.5kV / 25GΩ	1kV / 50GΩ	0.5kV / 25GΩ	1kV / 50GΩ	0.5kV / 25GΩ	1kV / 50GΩ	25GΩ(0.5kV)-500GΩ(10kV)	25GΩ(0.5kV)-500GΩ(10kV)	70GΩ(0.5kV)-2000GΩ(15kV)
	1kV / 50GΩ	2.5kV / 125GΩ	1kV / 50GΩ	2.5kV / 125GΩ	1kV / 50GΩ	2.5kV / 125GΩ			
	2.5kV / 125GΩ	5kV / 250GΩ	2.5kV / 125GΩ	5kV / 250GΩ	5kV / 125GΩ	5kV / 250GΩ			
	5kV / 250GΩ	10kV / 500GΩ	5kV / 250GΩ	10kV / 500GΩ	10kV / 250GΩ	10kV / 500GΩ			
PI(Polarization Index)								●	●
DAR (Dielectric Absorption Ratio)								●	●
Display	LCM	LCM	LCM	LCM	LCM	LCM	LCM	LCM	LCM
Microprocessor Controlled	●	●	●	●	●	●	●	●	●
Bargraph	●	●	●	●	●	●	●	●	●
Counting Timer	●	●	●	●	●	●	●	●	●
Long Test	●	●	●	●	●	●	●	●	●
Auto Range	●	●	●	●	●	●	●	●	●
Auto Power Off	●	●	●	●	●	●	●	●	●
Auto Discharge	●	●	●	●	●	●	●	●	●
External Voltage Warning Indication	●	●	●	●	●	●	●	●	●
Live Circuit Warning	●	●	●	●	●	●	●	●	●
Low Battery Indicator	●	●	●	●	●	●	●	●	●
EEPROM Calibration	●	●	●	●	●	●	●	●	●
Water Proof (Nice the Lid Secured)			●	●					
CE Approved	●	●	●	●	●	●	●	●	●
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Picture									









Digital Insulation Tester(1kV below) Selection Guide

Model	1160 IN	1161 IN	ST-2550	ST-2551	1851 IN	2151 IN	2751 IN	2801 IN
Insulation Test Voltage	250V / 2000MΩ	250V / 2000MΩ	250V / 2000MΩ	250V / 2000MΩ	250V / 200MΩ	250V / 2000MΩ	250V / 2000MΩ	250V / 1000MΩ
	500V / 2000MΩ	500V / 2000MΩ	500V / 2000MΩ	500V / 2000MΩ	500V / 200MΩ	500V / 2000MΩ	500V / 2000MΩ	500V / 2000MΩ
	1000V / 2000MΩ	1000V / 2000MΩ	1000V / 2000MΩ	1000V / 2000MΩ	1000V / 2000MΩ	1000V / 2000MΩ	1000V / 2000MΩ	1000V / 3000MΩ
Continuity Test Ranges	0-200Ω	0-20Ω	200Ω	20Ω / 200Ω / 2000Ω	20Ω / 2000Ω	0-2000Ω	20Ω / 200Ω / 2000Ω	0 / 0.5 / 5 / 50 / 500Ω
Voltage Range(ACV)	600V	600V	600V	600V	600V	600V	600V	
Voltage Range(DCV)								
Display	3½ digit	3½ digit	3½ digit	3½ digit	3½ digit	3½ digit	3½ digit	LCM
Microprocessor Controlled		●				●		●
Bargraph								●
Data Hold	●	●				●	●	●
Counting Timer								●
Long Test	●	●	●	●	●	●	●	●
Auto Range	●	●	●	●	●	●	●	●
Auto Null								●
Auto Power Off		●	●	●	●	●	●	●
Auto Discharge	●	●	●	●	●	●	●	●
External Voltage Warning Indication								●
Fuse Protection	●	●			●	●	●	●
Live Circuit Warning					●	●	●	●
Water Proof (Nice the Lid Secured)						●		
CE Approved	●	●	●	●	●	●	●	●
B.S 16 th Edition	●	●			●	●	●	●
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Picture								






Analog Insulation Tester(1kV below) Selection Guide

Model	1100 IN	1125 IN	1126 IN	1132 IN	ST-1503	ST-1504	1800 IN	1801 IN	1832 IN	2132 IN	2732 IN	4132 IN
Insulation Resistance Ranges				250V / 100MΩ	500V / 1000MΩ	250V / 100MΩ	250V / 100MΩ	50V / 20MΩ	250V / 100MΩ	250V / 100MΩ	250V / 100MΩ	250V / 100MΩ
	100V / 200MΩ	500V / 1000MΩ	1000V / 2000MΩ	500V / 200MΩ	1000V / 2000MΩ	500V / 200MΩ	500V / 200MΩ	125V / 50MΩ	500V / 200MΩ	500V / 200MΩ	500V / 200MΩ	500V / 200MΩ
				1000V / 400MΩ		1000V / 400MΩ	1000V / 400MΩ	250V / 100MΩ	1000V / 400MΩ	1000V / 400MΩ	1000V / 400MΩ	1000V / 400MΩ
Continuity Test Ranges				3Ω 500Ω	100Ω	100Ω	50Ω	50Ω	3Ω 500Ω	3Ω 500Ω	3Ω 500Ω	3Ω 500Ω
Voltage Range(ACV)	600V	600V	600V	600V	600V	600V	600V	600V	600V	600V	600V	600V
Taut Band Movement	●	●	●	●	●	●	●	●	●	●	●	●
Mirror Scale	●			●					●	●	●	●
Battery Check	●	●	●	●	●	●	●	●	●	●	●	●
Auto Discharge	●	●	●	●	●	●	●	●	●	●	●	●
External Voltage Warning Indication				●					●	●	●	●
Live Circuit Warning	●			●					●	●	●	●
Fuse Protection	●	●	●	●	●	●	●	●	●	●	●	●
Long / Hand Free Testing Locker	●	●	●	●			●	●	●	●	●	●
CE Approved	●	●	●	●	●	●	●	●	●	●	●	●
B.S 16 th Edition				●					●	●	●	●
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Picture												









Digital Earth Resistance Tester Selection Guide

Model	1120 ER	ST-1520	1820 ER	2120 ER	2720 ER	4120 ER	4234 ER	4235 ER
Terminal	3	3	3	3	3	3	4	4
Earth Resistance Test	20 / 200 / 2k	20 / 200 / 2k	20 / 200 / 2k	20 / 200 / 2k	20 / 200 / 2k	20 / 200 / 2k	2 / 20 / 200 / 2k	20 / 200 / 2k
Earth Resistivity								●
Earth Voltage(AC)	200V	200V	200V	200V	200V	200V	300V	300V
Display	3½ digit	3½ digit	3½ digit	3½ digit	3½ digit	3½ digit	LCM	LCM
Data Hold	●	●	●	●	●	●	●	●
Auto Power Off		●					●	●
Long Time Test			●	●	●	●	●	●
Low Battery Indication	●	●	●	●	●	●	●	●
Over Range Indication	●	●	●	●	●	●	●	●
Open Circuit Indication	●	●	●	●	●	●	●	●
CE Approved	●	●	●	●	●	●	●	●
Page	36	37	40	42	39	43	34	35
Picture								

Analog Earth Resistance Tester Selection Guide

Model	ST-1505	1805 ER	2105 ER	2705 ER	4105 ER
Earth Resistance Test	10 / 100 / 1000	10 / 100 / 1000	12 / 120 / 1200	10 / 100 / 1000	12 / 120 / 1200
Earth Voltage Test(ACV)	30V	30V	30V	30V	30V
Terminal	3	3	3	3	3
Auto Power Off	●				
Battery Check	●	●	●	●	●
Open Circuit Indication	●	●	●	●	●
Long Test		●	●	●	●
Lamp For Scale Panel					●
Water Proof			●		●
CE Approved	●	●	●	●	●
Page	38	41	42	38	43
Picture					




Phase Sequence Indicator Selection Guide

Model	ST-850	855 PR	ST-860	862 PR	863 PR	887 PR	888 PMR	890 PR
Contact	●	●	●	●	●	●	●	
Non-Contact								
Neon & LED Indicates	●	●	●	●	●		●	●
LCD Indicates						●		
Indicates Phase Presence	●	●	●	●	●	●	●	●
Indicates Phase Rotation	●	●	●	●	●	●	●	●
Indicates Motor Rotation			●				●	
Input Voltage(AC)	90-600	200-600	100-600	100-600	100-600	400-700	100-600	150-1000
Frequency Range(Hz)	50/60	50/60	45-70	45-70	45-70	15-400	10-400	45-65
CE Approved	●	●	●	●	●	●	●	●
UL Approved			●					
Page	84	84	83	85	85	86	87	88
Picture								



Digital Clamp Meter Selection Guide

Model	ST-2600	2660 CL	ST-3600	ST-3602	ST-3620	3800 CL	3810 CL	3900 CL	3902 CL	3904 CL
ACA	400A	600A	1500A	1500A	1500A	1000A	1000A	2000A	2000A	2000A
ACV	600V	600V	750V	750V	750V	600V	600V	600V	600V	600V
DCA		600A	1500A	1500A		1000A	1000A	2000A	2000A	2000A
DCV		600V	1000V	1000V		600V	600V	600V	600V	600V
Resistance	4k	40M	1500	1500	200	2k	2k	40M	20M	40M
Continuity	●	●		●	●	●	●	●	●	●
Frequency		40MHz						40MHz	20MHz	40MHz
Capacitance		40mF							2mF	4mF
Diode		●	●	●		●	●		●	●
Display (LCD counts)	4000	4000	2000	2000	2000	4000	4000	4000	2000	4000
Bargraph		●						●		
Auto Range	●	●		●		●	●	●	●	●
Auto Power Off		●						●	●	●
Relative		●						●		
Data Hold	●	●	●	●	●				●	●
Max./Min. Mode		●				Max.	Max.	Max./Min.		
Peak Hold		●			●			●		
Buzzer	●	●		●	●	●	●	●	●	●
Low Battery Indication	●	●	●	●	●	●	●	●	●	●
Over Range Indication	●	●	●	●	●	●	●	●	●	●
Conductor Size	27mm	35mm	55mm	55mm	55mm	40mm	40mm	55mm	55mm	55mm
True RMS							●			
CE Approved	●	●				●	●	●	●	●
Page	94	93	95	95	95	94	94	96	96	96
Picture										

Rotary Scale Clamp Meter

Model	ST-375	ST-600	1010 CL
ACA	300A	300A	1000A
ACV	600V	600V	750V
DCV	75V		
Resistance	2k	2k	2k
Pointer Lock	●	●	●
Taut Band movement			●
Moving Coil Movement	●	●	
Conductor Size	38mm	38mm	52mm
CE Approved	●	●	
Page	92	92	92
Picture			

Digital AC Leakage Clamp Meter

Model	3920 CL	3921 CL
Range	0-200mA 0-2A 0-20A 0-200A 0-1000A	0-200mA 0-2A 0-20A 0-200A 0-1000A
ACV	600V	600V
DCV		600V
Conductor Size	55mm	55mm
Data Hold	●	●
Low Battery Indication	●	●
Display (Count)	2000	2000
CE Approved	●	●
Page	97	97
Picture		



CE

2803 IN



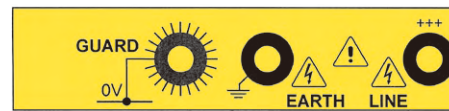
CE

2804 IN

FEATURES

- Microprocessor controlled with advanced safety features.
- Displays and sound warning if external voltage present.
- Battery life extended by Enersave™ feature.
- Continuous battery monitoring.
- Auto-ranging/auto-off.
- Built-in carrying case, test leads in separate pouch.
- Real-time bargraph display of test voltage and voltage decay during discharge.
- Audible and visual message displayed if external voltage is present.
- 2 Lines x 16 Characters large LCD.
- Display can be customized for special orders.
- Show test time duration (up to 99.9s) for easy comparison.
- EEPROM calibration.
- EN 61010-1 CAT III
EN 61326-1

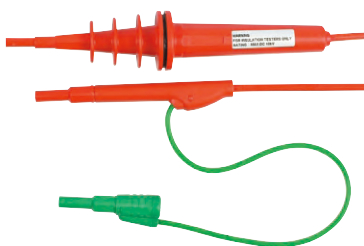
Test Leads Connections



SPECIFICATIONS

Model	2803 IN				2804 IN			
Test Voltage (DC V)	0.5KV	1KV	2.5KV	5KV	1KV	2.5KV	5KV	10KV
Measuring Ranges (Auto-Ranges)	0-25GΩ	0-50GΩ	0-125GΩ	0-250GΩ	0-50GΩ	0-125GΩ	0-250GΩ	0-500GΩ
Accuracy	0-50GΩ :±3% of reading 50-250GΩ :±5% of reading				0-50GΩ : ± 3% of reading 50-500GΩ :±5% of reading			
Dimensions	170(L)×120(W)×95(D)mm				170(L)×120(W)×95(D)mm			
Weight (Battery Included)	930g Approx.				1030g Approx.			
Power Source	1.5V (AA)×8 Batteries				1.5V (AA)×8 Batteries			
Accessories	Test leads Shoulder belt (BET-2800) Instruction manual Batteries				Test leads Shoulder belt (BET-2800) Instruction manual Batteries			

Test Leads



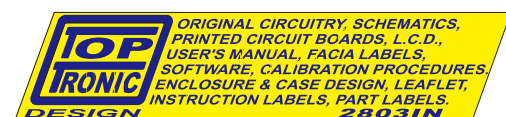
AL-50



AL-30



AL-30C





CE

4103 IN



CE

4104 IN

FEATURES

- 2 Lines x 16 Characters large LCD.
- Smart microprocessor controlled.
- Four insulation test voltage.
- Insulation resistance auto-ranging on all ranges.
- Measure insulation time test.
- Bar-graph indicates test voltage-rise and decay can be observed during tests.
- Warning and display of external voltage presence.
- ENER-SAVE™
- Very low battery consumption.
- Low battery indicator.
- Overload protection.
- Auto-off.
- EN 61010-1 CAT III
EN 61326-1

SPECIFICATIONS

Model	4103 IN				4104 IN			
Test Voltage (DC V)	0.5KV	1KV	2.5KV	5KV	1KV	2.5KV	5KV	10KV
Measuring Ranges (Auto-Ranges)	0-25GΩ	0-50GΩ	0-125GΩ	0-250GΩ	0-50GΩ	0-125GΩ	0-250GΩ	0-500GΩ
Accuracy	±5% rdg				±5% rdg			
Output Power Limit	1W				1W			
Sealed with Gasket	V				V			
Insulation Resistance between Electrical Circuit and Housing : 2000MΩ/ 2000V	V				V			
Withstand Voltage : 7000 Vac for One Min. between Electrical Circuit and Case	V				V			
Operation-Temperature	-15°C to 55°C				-15°C to 55°C			
Operation-Humidity	80% Max. relative humidity				80% Max. relative humidity			
Weight	1670g Approx.				1900g Approx.			
Dimensions	250 (L) x 190(W) x 110(D)mm							
Power Source	1.5V (AA) x 8 Batteries							
Accessories	Test leads (AL-50+AL-30+AL-30C) Instruction manual Shoulder belt (BET-2800) Batteries							





6200 IN



6201 IN

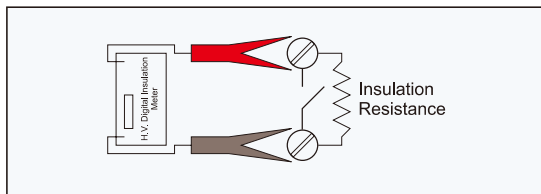
FEATURES

- Microprocessor controlled.
- High quality Taut Band movement.
- Two insulation test voltages.
- Insulation resistance, auto ranging on all ranges.
- Low Battery LED indication.
- Beeper warning of external voltage.
- Fully protected : crow bar.
- Housed in heavy-duty carry case.

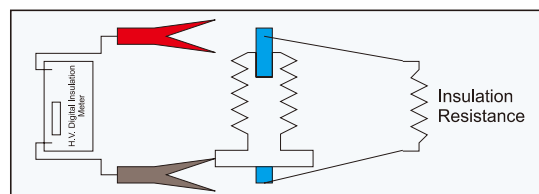
SPECIFICATIONS

Model	6200 IN		6201 IN	
Test Voltage (DC V)	2500V	5000V	5000V	10000V
Measuring Ranges	0-100GΩ	0-200GΩ	0-200GΩ	0-400GΩ
Accuracy	±5% of full scale			
Live Warning	>500 Volts AC			
Operating-Temperature	0° C to 40° C			
Operating-Humidity	85% Max. relative humidity			
Weight	3500g (battery included)			
Dimensions	330(L) x 260(W) x 160(D)mm			
Power Source	1.5V "C" x 8 Alkaline Batteries			
Accessories	Test leads (AL-50+AL-30+AL-30C) Instruction manual Batteries			

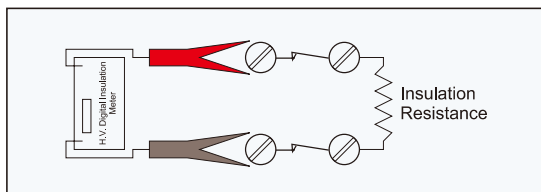
● Measuring Insulation of Open Contacts of Circuit Breaker.



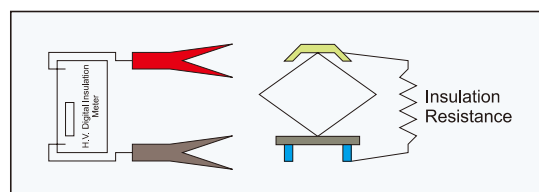
● Insulator



● Measuring Insulation between contacts of Circuit Breaker.



● Insulator on Railway Coach





CE

6210A IN



CE

6211A IN

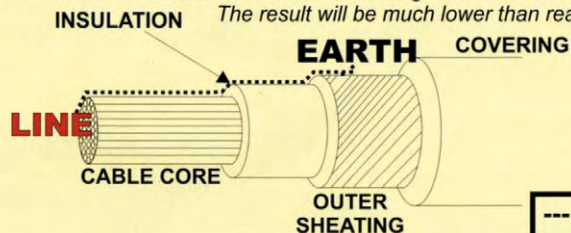
FEATURES

- Microprocessor technology ensure high performance accuracy and reliability.
- Four insulation test voltage(DC V).
- Insulation resistance auto ranging on all ranges.
- Bar-graph indicates test voltage,decay can be observed during discharge.
- Measures insulation test time.
- Display warning of external voltage.
- Fully protected : crow bar.
- Housed in heavy duty carry case.
- EEPROM calibration.
- EN 61010-1 CAT III
EN 61326-1

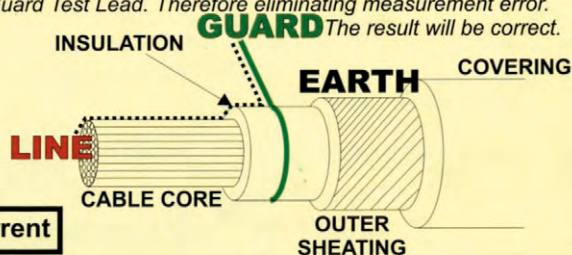
SPECIFICATIONS

Model	6210A IN				6211A IN			
	0.5KV	1KV	2.5KV	5KV	1KV	2.5KV	5KV	10KV
Test Voltage (DC V)	0.5KV	1KV	2.5KV	5KV	1KV	2.5KV	5KV	10KV
Measuring Ranges (Auto-Ranges)	0-25GΩ	0-50GΩ	0-125GΩ	0-250GΩ	0-50GΩ	0-125GΩ	0-250GΩ	0-500GΩ
Accuracy	±3%rdg				±3%rdg			
Output Current Limit	50uA to 100uA (1W)				50uA to 100uA (1W)			
Live warning	> 500V AC				> 500V AC			
Operating-Temperature	0°C ~ 40°C				0°C ~ 40°C			
Operating-Humidity	85% Max. relative humidity				85% Max. relative humidity			
Weight	3.5kg Approx.				3.6kg Approx.			
Dimensions	330(L) x 260(W) x 160(D)mm				330(L) x 260(W) x 160(D)mm			
Power Source	1.5V "C" x 8 Alkaline Batteries				1.5V "C" x 8 Alkaline Batteries			
Accessories	Test leads (AL-50+AL-30+AL-30C) Instruction manual Batteries				Test leads (AL-50+AL-30+AL-30C) Instruction manual Batteries			

Without Guard Connection, Error Surface Leakage Current Circulate between Line and Earth Test Probes, creating a measurement error. The result will be much lower than real.



With Guard Connected, Surface Leakage Current is eliminated by the Guard Test Lead. Therefore eliminating measurement error. The result will be correct.





CE

6212A IN

OVERVIEW

The 6212A IN is a variable high voltage Insulation meter from 500V to 10kV in 500V steps.

The meter is menu driven and uses Dynamic Current auto ranging technology.

It has a Bar-Graph which displays the voltage stressing the insulation while the test is in progress and the voltage decay during the automatic discharge of the tested circuit.

The top line of the display shows the elapsed time at the start of the test. Digital readout of the total time will remain displayed even after testing has ceased.

A 6 digit digital display is showing the actual Insulation resistance.

This instrument displays a voltage warning and sounds when AC or DC is present before injecting the test voltage.

It can only detect when voltage is higher than 500V.

It will buzz intermittently when high voltage is generated and this will remain until the circuit under test is fully discharged

FEATURES

- 2 x 16 characters, large intelligent LCD Module.
- 20 Insulation test voltages
500V, 1kV, 1.5kV, 2kV, 2.5kV, 3kV, 3.5kV, 4kV, 4.5kV, 5kV, 5.5kV, 6kV, 6.5kV, 7kV, 7.5kV, 8kV, 8.5kV, 9kV, 9.5kV, 10kV.
- Insulation resistance auto-ranging on all ranges.
- Ener-Save™
- Bar-graph indicates test voltage. Rise and decay can be observed .
- Warning of external voltage presence(>500Vac or Vdc).
- Overload protection.
- Low battery indicator.
- Measure insulation time test.
- Low battery consumption.
- Smart microprocessor controlled.
- Better than 10% accuracy on all ranges.
- Auto-off.
- EN 61010-1 CAT III
EN 61326-1



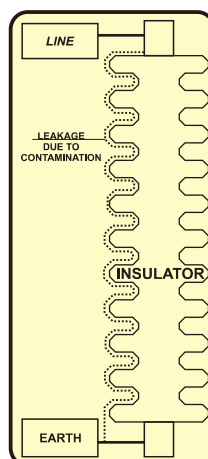
SPECIFICATIONS

Test Voltage(DC V)	0.5kV to 10kV (0.5kV increment steps)
Insulation Resistance (Auto-ranging)	25GΩ / 0.5kV 25GΩ at 0.5kV → 500GΩ at 10kV
Accuracy	±3%rdg ±1dgt
Output Current Limit	50uA to 100uA(1W)
Live Warning	> 500V AC
Operating-Temperature	0°C ~ 40°C
Operating-Humidity	85% Max. relative humidity
Dimensions	330(L) x 260(W) x 160(D)mm
Weight	Approx. 3.6kg (battery included)
Power Source	1.5V "C" x 8 Alkaline Batteries
Accessories	Test leads(AL-50+AL-30+AL-30C) Instruction manual Batteries

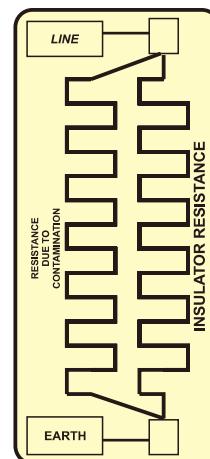
FIRST MEASUREMENT

MEASURE WITHOUT THE GUARD TO TAKE EVERYTHING INTO ACCOUNT AND FIND OUT IF NEED CLEANING.

DIRTY INSULATOR



ELECTRICAL EQUIVALENT CIRCUIT DIRTY INSULATOR

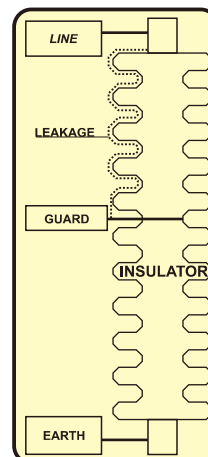


RESISTANCE DUE TO CONTAMINATION CAN BE VERY LOW AND LOWER THE TOTAL RESISTANCE. CLEANING PERIODICALLY CAN ALSO REDUCE SYSTEM POWER CONSUMPTION.

SECOND MEASUREMENT

MEASURE WITH THE GUARD TO ENSURE INSULATOR IS CORRECT.

TYPICAL TEST





6213A IN

FEATURES

- Smart microprocessor controlled.
- 2 x 16 characters, large, High Contrast, Intelligent LCD Module.
- 20 Insulation test voltages
500V, 1kV, 1.5kV, 2kV, 2.5kV, 3kV, 3.5kV, 4kV, 4.5kV, 5kV, 5.5kV, 6kV, 6.5kV, 7kV, 7.5kV, 8kV, 8.5kV, 9kV, 9.5kV, 10kV.
- Calculate Dielectric Absorption Ratio (DAR) Automatically.
- Calculate Polarization Index (PI) Automatically.
- Insulation resistance Auto-Ranging on all ranges.
- Ener-Save™.
- Bar-graph indicates test voltage. Rise and decay can be observed.
- Warning of external voltage presence(>500Vac or Vdc).
- Overload protection.
- Low battery indicator(real time battery voltage measurement).
- Measure insulation time duration of the test.
- Low battery consumption.
- Better than 10% accuracy on all ranges.
- Auto-off.
- EN 61010-1 : 2001
EN 61326-1

SPECIFICATIONS

Test Voltage	From 500Vdc to 10KVdc Adjustable in 500 V Steps
Preset Buttons	1KV, 2.5KV, 5KV, 10KV
Measuring Range	800KΩ-500GΩ (AUTO-RANGING)
Accuracy	± 5% ± 2 digits
Output Power Limit	1W
Voltage Regulation	Selected Voltage +20%-5% of nominal value unless current limited. Meaning that if output current is too high, the voltage will be lowered automatically.
Weight	3.6 kg Approx.
Dimensions	330(L) x 260(W) x 160(D)mm
Power Source	1.5V "C" x 8 Alkaline Batteries
Accessories	Color coded flexible silicone test leads (AL-50+AL-30+AL-30C) Instruction manual Batteries

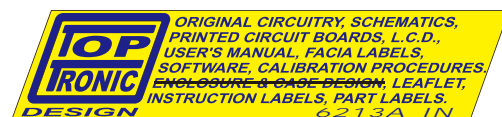
SPECIAL FEATURES

- **DAR = Dielectric Absorption Ratio.**
The dielectric Absorption Ratio is the ratio of the Insulation Resistance measured at 1 Min divided per the Insulation Resistance measured at 30 Seconds.
30 Seconds after starting a test (with Ener-Save™ disabled), the tester will beep, indicating the operator that the resistance value measured at 30 second now has been saved internally.
1 Minute after starting a test (with Ener-Save™ disabled), the tester will beep again, indicating the user that the DAR result is now computed, and change the display format to now display the DAR result.
- **PI = Polarization Index.**
The Polarization Index or PI is the ratio of the Insulation Resistance measured at 10 Minutes divided per the Insulation Resistance measured at 1 Minute.
10 Minutes after starting a test (with Ener-Save™ disabled), the tester will beep again, indicating the user that the PI result is now computed, and change the display format to now display the PI result.
The tester will Auto-Stop at 10 minutes.
- **Digital Display.**
The digital Liquid Crystal Display is large. It measures 98mm(W) x 24mm(H) and has a 2 Lines of 16 characters. Language can be changed on demand, as an option. Dutch / French / German etc... (factory fitted at order)
- **Automatic Battery Test.**
When the tester starts, it test it's batteries by drawing a heavy current from the batteries. During that heavy current, it measures the battery voltage and displays it for a few seconds on the display.
During normal use, the tester monitors the battery voltage, but without drawing a battery test current. It just measures the battery while in normal use.
- **Automatic Discharge of Capacitive and Inductive Circuits.**
This tester will discharge automatically all circuits charged by the tester, after a test is done, again, this will only be activated if the test leads make contact at any time before, during and after the test.

It's your responsibility to ensure proper contact of the leads at all Times.

Once a test is finished, the testers will automatically discharge capacitive or inductive circuit of their charge. The discharge can be observed on the display, in the form of a bar-graph. Again, do not disconnect the leads while discharging.

Wait until completion of the discharge before removing any lead. During discharge, the Buzzer will beep and the bar-graph will show some voltage. With some high charges, this may take some time. Be patient and let the instrument discharge completely before proceeding to removing the leads.





CE

7010 IN

OVERVIEW

This digital insulation tester is a variable high voltage insulation meter from 500 V to 15kV in 500V steps. Its output voltage can be adjusted using 500 V up or down steps. The meter is menu driven and uses Dynamic Current Auto-ranging technology. It is equipped with a bar-graph which displays the voltage stressing the insulation while the test is in progress. During the automatic discharge of the circuit tested, the bar-graph displays the voltage decay. The display shows the elapsed time since the start of the test. Digital readout of the total time remains displayed even after testing has ceased.

This instrument displays and sounds a voltage warning when AC or DC is present before injecting the test voltage. The warning circuit can only detect when voltage is higher than 300V .

This Variable High Voltage Digital Insulation Meter will buzz intermittently when high voltage is generated and this will remain until the circuit under test is fully discharged.

FEATURES

- Microprocessor controlled.
- 2x16 characters large, high contrast, intelligent LCD module.
- 30 Insulation test voltages: 500V, 1kV, 1.5kV, 2kV, 2.5kV, 3kV, 3.5kV, 4kV, 4.5kV, 5kV, 5.5kV, 6kV, 6.5kV, 7kV, 7.5kV, 8kV, 8.5kV, 9kV, 9.5kV, 10kV, 10.5kV, 11kV, 11.5kV, 12kV, 12.5kV, 13kV, 13.5kV, 14kV, 14.5kV, 15kV.
- Voltmeter: ACV, DCV.
- Menu driven.
- PI (Polarization Index) function.
- DAR (Dielectric Absorption Ratio) function.
- Insulation resistance auto-ranging on all ranges.
- Bargraph indicates test voltage, rise and decay can be observed.
- Backlight function.
- Warning of external voltage presence (>300 Vac or Vdc)
- Data hold function.
- Overload protection.
- Testing time adjustment 1~30minutes.
- Calendar.
- Memory function.
- Measure insulation time duration of the test.
- Auto-off function.
- EN 61010-1 CATIII
EN 61557-1 EN 61557-2
EN 61326-1

SPECIFICATIONS

Test Voltage	From 500 Vdc to 15kV Adjustable in 500V step
Preset Button	1kV, 5kV, 10kV, 15kV
Insulation Resistance	70GΩ/0.5kV 70GΩ at 0.5kV-2000GΩ at 15kV
Accuracy:	0~2GΩ:±5%rdg 2GΩ~20GΩ:±2%rdg 20GΩ~200GΩ:±3%rdg 200GΩ~2000GΩ:±5%rdg
Resolution	2GΩ:0.001GΩ 20GΩ:0.01GΩ 200GΩ:0.1GΩ 2000GΩ:1GΩ
Test Current	2mA Max.
Voltmeter	ACV: 0~700V DCV: 0~1000V
	Accuracy: ±1.5% F.S.
	Resolution: 1V
Power Source	Rechargeable battery
Dimension	430(L) x 324(W) x 127(D)mm
Weight	Approx. 5kg
Accessories	Test leads (AL-50+AL-30+AL-30C) Instruction manual Battery

SPECIAL FEATURES

Voltmeter

When testing insulation resistance while there is a presence of voltage (whether ACV or DCV) on the measured object, conventional insulation testers are highly susceptible to damage. With this new line of insulation testers, it has the ability to switch to voltage detection mode without damaging the once it detects the presence of voltage. It will also display the voltage finding on the LCD screen. With this new and unique function, it will allow the user to safely rule out the possibility of any presence of voltage on the measured object prior to measuring its insulation.

DAR = Dielectric Absorption Ratio.

The dielectric Absorption Ratio is the ratio of the Insulation Resistance measured at 1 Min divided per the Insulation Resistance measured at 30 Seconds. 30 Seconds after starting a test, the tester will beep, indicating the operator that the resistance value measured at 30 seconds now has been saved internally. 1 Minute after starting a test, the tester will beep again, indicating the user that the DAR result is now computed, and change the display format to now display the DAR result.

PI = Polarization Index.

The Polarization Index or PI is the ratio of the Insulation Resistance measured at 10 Minutes divided per the Insulation Resistance measured at 1 Minute. 10 Minutes after starting a test, the tester will beep again, indicating the user that the PI result is now computed, and change the display format to now display the PI result. The tester will Auto-Stop at 10 minutes.

FEATURES

- A LCD indicated instrument for insulation(MΩ), Continuity(Ω)and AC voltage.
- Three insulation test voltages(DC V) : 250V, 500V, 1000V.
- 3 1/2 digital LCD(2000 counts).
- LCD backlight display.
- 68 x 34mm(1.338" x 2.677") large LCD display.
- Automatic circuit discharge.
- Test insulation at rated voltage into a 1mA load.
- 200mA short circuit testing current for continuity.
- AC voltage measurement.
- Fuse protection.
- Data hold function.
- EN 61010-1 CAT III 600V
EN 61326-1
- BS 16th edition.



CE

1160 IN

SPECIFICATIONS

Insulation Resistance

Test Voltage(DCV)	250V / 500V / 1000V
Output Voltage Open Circuit	+10%
Measuring Ranges (Auto)	0-20/0-200/0-2000MΩ
Resolution	0-20MΩ : 10kΩ 0-200MΩ : 100kΩ 0-2000MΩ : 1MΩ
Output Current	1mA DC
Accuracy	0-20MΩ : ±(1.5%rdg+5dgt) 0-200MΩ : ±(2.5%rdg+3dgt) 0-2000MΩ : ±(5%rdg+5dgt)

General

Impedance	10MΩ
Power Source	1.5V(AA) x 8
Dimension	175(L) x 85(W) x 75(H)mm
Weight	Approx. 600g(batteries included)
Accessories	Test Leads Fuse(0.5A 250V) Shoulder belt Carrying case Instruction manual Batteries

AC Voltage

Range	0-600V
Resolution	1V
Line Frequency Range	40-120Hz
Accuracy	±(1.5%rdg+3dgt)

Current for continuity

Measuring Range	0-200Ω
Resolution	0.1Ω
Short Circuit Terminal Current	200mA DC min.
Open circuit terminal voltage	4V DC min.
Accuracy	±(1.5%rdg+3dgt)



TEL-AL28-5

BET-1800

CAC-1151

120(L)x110(w)x210(D)mm

FEATURES

- Microprocessor controlled.
- 68 x 34mm(1.338" x 2.677") large LCD display.
- 3½ digital LCD(2000 counts).
- A LCD indicated instrument for insulation(MΩ), Continuity(Ω) and AC voltage.
- Three insulation test voltages(DC V) : 250V, 500V, 1000V.
- Automatic circuit discharge.
- Test insulation at rated voltage into a 1mA load.
- 200mA short circuit testing current for continuity.
- Auto ranging.
- Fuse protection.
- Auto data hold.
- Meets :EN 61010-1 CAT III 600V
IEC 61557-1
IEC 61557-2
EN 61326-1
- BS 16th edition.



CE

1161 IN

SPECIFICATIONS

Insulation Resistance

Test Voltage(DCV)	250V / 500V / 1000V
Output Voltage Open Circuit	+10%
Measuring Ranges (Auto ranging)	0-1.999/0-19.99/0-199.9/ 0-1999MΩ
Resolution	0-1.999MΩ : 1KΩ 0-19.99MΩ : 10KΩ 0-199.9MΩ : 100KΩ 0-1999MΩ : 1MΩ
Output Current	1mA DC
Accuracy	0-2MΩ : ±(5%rdg+5dgt) 0-20MΩ : ±(1.5%rdg+5dgt) 0-200MΩ : ±(2.5%rdg+3dgt) 0-2000MΩ : ±(5%rdg+5dgt)

AC Voltage

Range	0-600V
Resolution	1V
Line Frequency Range	40-120Hz
Accuracy	±(1.5%rdg+3dgt)

Current for continuity

Measuring Range	0-20Ω
Resolution	0.01Ω
Shot Circuit Terminal Current	200mA DC min
Open circuit terminal voltage	4V DC min
Accuracy	±(1.5%rdg+3dgt)

General

Impedance	10MΩ
Power Source	1.5V(AA) x 8
Dimension	175(L) x 85(W) x 75(H)mm
Weight	Approx. 600g(batteries included)
Accessories	Test Leads Fuse(0.5A 250V) Shoulder belt Carrying case Instruction manual Batteries



TEL-AL28-5

BET-1800

CAC-1151

120(L)x110(w)x210(D)mm



CE

Designed for telecom applications

1100 IN



CE

1125 IN

FEATURES

- High quality Taut Band movement.
- It is a light and portable combination instrument for testing insulation(MΩ) and AC voltage.
- LED indication works when testing insulation.
- Use a high efficiency and accurate DC-DC converter.
- Battery check facility.
- AC voltage measurement can be made without depressing the test button.
- EN 61010-1 CAT III 600V
EN 61326-1

SPECIFICATIONS

Insulation Resistance	1100 IN	1125 IN	1126 IN
Test Voltage(DC V)	100V	500V	1000V
Output Voltage on Open Circuit	Rated test voltage +10%		
Measuring Range	0-200MΩ	0-1000MΩ	0-2000MΩ
Mid-scale value	5MΩ	20MΩ	50MΩ
Accuracy	0.2-100MΩ : ±5% rdg	1-500MΩ : ±5% rdg	2-1000MΩ : ±5% rdg
	0.7% of scale length at other ranges		
Short Circuit Current	1mA		

AC Voltage

Range	0-600V
Accuracy	±2.5% of full scale

General

Operating Temperature & Humidity	0°-40°C relative humidity up to 85%	
Storage Temperature & Humidity	0°-50°C relative humidity up to 75%	
Power Source	1.5V(AA) x 4	1.5V(AA) x 8
Dimensions	175(L) x 85(W) x 75(H)mm	
Weight	Approx. 510 g	Approx. 560 g(batteries included)
Accessories	Test leads Instruction manual Carrying case (Optional) Shoulder belt Batteries	



AL-24A

BET-1800

CAC-1151(Optional)
120(L)x110(w)x210(D)mm

FEATURES

- High quality Taut Band movement.
- Three insulation test voltages (DC) : 250V, 500V, 1000V.
- Two continuity test on low ohms : 500Ω & 3Ω.
- Small and light weight.
- AC voltmeter with linear scale up to 600 Vac.
- 205mA continuity short circuit current.
- 1mA test current on insulation test at nominal voltage.
- Automatic discharge of capacitance and inductive circuit with charge stored in the circuit under test.
- Live warning and display of external voltage presence.
- Fuse, air gap, crowbar and overload protected.
- On line battery monitoring shows if battery is ok.
- Auto null of the test leads on continuity tests.
- Very low battery consumption.
- On-Load battery check (+/240mA load for worst case).
- Mirror scale.
- Push and turn locking switch for long and hand free testing.
- EN 61010-1 CAT III 600V.
EN 61326-1
- BS 16th edition.

SPECIFICATIONS

Insulation Resistance

Test Voltage (DC V)	250V	500V	1000V
Output Ranges on open circuit	Rated test Voltage+10%		
Measuring Ranges	0-100MΩ	0-200MΩ	0-400MΩ
Mid-Scale Value	1MΩ	2MΩ	4MΩ
Scale Multiplier	x1/2	x1	x2
Accuracy	±3% of indicated value		
Output Short-Circuit Current	1.3mA		

Continuity

Measuring Ranges	3Ω/500Ω
Output Short-Circuit Current	205mA
Accuracy	±1.5% of scale length

AC Voltage

AC Voltage Range	0-600V AC
Accuracy	±3% of scale length



CE

1132 IN

General

Voltage Warning	Warning light circuit live lit From 90Vdc/70Vac Buzzer beep from 24Vac/dc
Battery Check	Battery check indicates good batteries from 8Vdc to 13Vdc during a load test of 240mA
Battery OK	Battery OK LED from 8Vdc and is operative while testing
Power source	1.5V(SUM-3) x 8. Type AA.
Dimension	175(L) x 85(W) x 75(D)mm
Weight	Approx. 650g(battery included)
Accessories	Test leads Fuse(0.5A 250V) Carrying case Instruction manual Batteries



TEL-AL11-5

BET-1800

CAC-1151

120(L)x110(w)x210(D)mm



CE

ST-2550



CE

ST-2551

FEATURES

- A LCD indicates testing insulation(MΩ), continuity(Ω) and AC voltage.
- Instant operation is possible with a push button.
- In addition, for continuous measurement of MΩ , Ω or ACV a convenient timer is provided with automatic power off after three to five minutes to save the battery power.
- LED(red) indication when testing insulation, continuity and voltage.
- Use of a high efficiency and accurate DC-DC converter.
- Auto ranging.
- Most suitable for insulation resistance measurement of electrical household appliances, power line distribution and installation.
- IEC 1010 CAT II 600V.

SPECIFICATIONS

Insulation Resistance	ST-2550	ST-2551
Test Voltage (DC V)	250V/500V/1000V	250V/500V/1000V
Output Voltage on Open Circuit	+10%	+10%
Measuring Ranges	0-20MΩ /0-200MΩ / 0-2000MΩ	0-20MΩ /0-200MΩ / 0-2000MΩ
Accuracy	20MΩ :±(1.5%rdg+2dgt) 200MΩ :±(2.5%rdg+2dgt) 2000MΩ :±(5%rdg+3dgt)	20MΩ :±(1.5%rdg+2dgt) 200MΩ :±(2.5%rdg+2dgt) 2000MΩ :±(5%rdg+3dgt)

Continuity

Measuring Ranges	200 Ω	20Ω /200Ω /2kΩ
Short Circuit Current	11mA	15.5/11/2.7mA
Accuracy	±(1.5%rdg+2dgt)	20Ω :±(2%rdg+4dgt) 200Ω :±(1.5%rdg+2dgt) 2KΩ :±(1.5%rdg+2dgt)
Buzzer Sounds Below	10 Ω	8Ω /10Ω /50Ω

AC Voltage

AC Voltage Range	0-600V AC	0-600V AC
Accuracy	±(1.5%rdg+2dgt)	±(1.5%rdg+2dgt)

General

Display	LCD 3½ (2000counts)	LCD 3½ (2000counts)
Impedance	10MΩ	10MΩ
Power Source	1.5V(SUM-3)×6 Type AA	1.5V(SUM-3)×6 Type AA
Dimensions	163(L)×100(W)×50(D)mm	163(L)×100(W)×50(D)mm
Weight	Approx. 440g (battery included)	Approx. 480g (battery included)
Accessories	Test leads Instruction manual Heavy-duty case Batteries	Test leads Instruction manual Heavy-duty case Batteries



AL-24A

TOC-1504

CE



ST-1503

CE



ST-1504

FEATURES

- High quality Taut Band movement.
- It is a light and portable combination instrument for testing insulation (MΩ), continuity (Ω) and AC voltage.
- Instant operation is possible with a pushbutton. In addition, for continuous measurement of MΩ or Ω a convenient timer is provided with automatic power off after three to Five minutes to save the battery power.
- LED (red) indication when testing insulation and continuity.
- Use of a high efficiency and accurate DC-DC converter.

- Most suitable for insulation resistance measurement of electrical household appliances, power line distribution and installation.
- IEC 1010 CAT II 600V



AL-24A

TOC-1504

SPECIFICATIONS

Insulation Resistance

ST-1503

ST-1504

Test Voltage (DC V)	500V/1000V	250V/500V/1000V
Output Voltage on Open Circuit	+10%	+10%
Measuring Ranges (Mid-scale value)	0-1000MΩ /0-2000MΩ (20MΩ) (40MΩ)	0-100MΩ /0-200MΩ /0-400MΩ (1MΩ) (2MΩ) (4MΩ)
Accuracy	±5% rdg	±5% rdg
Short Circuit Current	1mA	2mA
Maximum Battery Current	Approx. 80mA(500V) 150mA(1000V)	Approx. 60mA(250V) 80mA(500V) 150mA(1000V)

Continuity

Measuring Range	0-100Ω	0-100Ω
Line Frequency Range	40-70Hz	40-70Hz
Open Circuit Voltage	100mV	100mV
Short Circuit Current	22.5mA	23.5mA
Accuracy	±5% of scale length	±5% of scale length

AC Voltage

AC Voltage Range	0-600V AC	0-600V AC
Accuracy	±2.5% of full scale	±2.5% of full scale

General

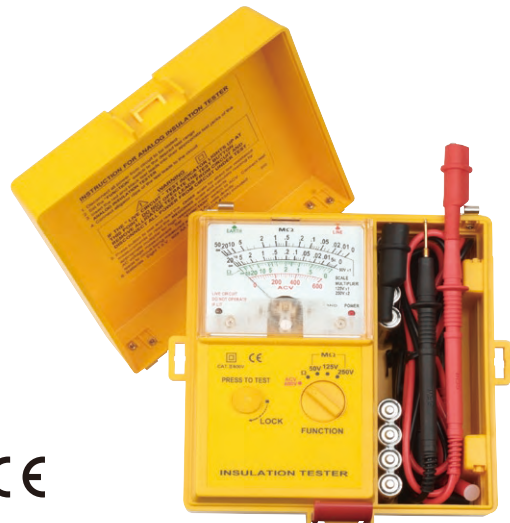
Power Source	1.5V (SUM-3)×6 Type AA	1.5V (SUM-3)×6 Type AA
Dimensions	163(L)×100(W)×50(D)mm	163(L)×100(W)×50(D)mm
Weight	Approx. 440g (battery included)	Approx. 470g (battery included)
Accessories	Test leads Instruction manual Heavy-duty case Batteries	Test leads Instruction manual Heavy-duty case Batteries

This model designed for telecoms



CE

1800 IN



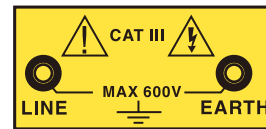
CE

1801 IN

FEATURES

- High quality Taut Band movement.
- Battery operated.
- Solid state circuitry.
- Battery check feature.
- Automatic circuit discharge.
- Color-coded scale.
- Three insulation test voltages.
- AC voltage measurement.
- Fuse protected.
- EN 61010-1 CAT III 600V
EN 61326-1
- BS 16th edition.

Test Leads Connections



SPECIFICATIONS

Insulation Resistance

1800 IN

1801 IN

	1800 IN			1801 IN		
Test Voltage (DC V)	250V	500V	1000V	50V	125V	250V
Measuring Ranges	0-100MΩ	0-200MΩ	0-400MΩ	0-20MΩ	0-50MΩ	0-100MΩ
Output Voltage on Open Circuit	+10%			+10%		
Short Circuit Terminal Current	2mA DC			2mA DC		
Power Consumption	Max. consumption current Approx.190mA			Max. consumption current Approx.190mA		

Continuity

Measuring Ranges	0-50 Ω & ∞	0-50 Ω & ∞
Accuracy	±5% of scale length	±5% of scale length
Open Circuit Terminal Voltage	445mVDC .Approx.	445mVDC .Approx.
Short Circuit Terminal Current	145mADC .Approx.	145mADC .Approx.
Power Consumption	Max. consumption current Approx.200mA	Max. consumption current Approx.200mA

AC Voltage

AC Voltage Range	0-600V AC	0-600V AC
Accuracy	±2.5% of full scale	±2.5% of full scale
Line Frequency Range	40-1K Hz	40-1K Hz

General

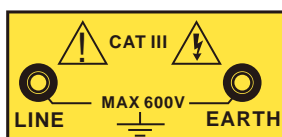
Dimension (with housing front cover)	170(L)×165(W)×92(D) mm	170(L)×165(W)×92(D) mm
Weight (Battery Included)	Approx. 970g	Approx. 970g
Power Source	1.5V(SUM-3)x8 Type AA	1.5V(SUM-3)x8 Type AA
Accessories	Fuse(1A, 250V) Test leads (TEL-AL11-5) Shoulder belt (BET-1800) Instruction manual Batteries	Fuse(1A,250V) Test leads (TEL-AL11-5) Shoulder belt (BET-1800) Instruction manual Batteries



CE

1832 IN

Test Leads Connections



FEATURES

- High quality Taut Band movement.
- Three insulation test voltages (DC) : 250V, 500V, 1000V.
- Two continuity test on low ohms : 500Ω & 3Ω
- Small and light weight, all in one case (do not need bag).
- AC voltmeter with linear scale up to 600 Vac.
- 210mA continuity short circuit current.
- 1mA test current on insulation test at nominal voltage.
- Automatic discharge of capacitance and inductive circuit off charge stored in the circuit under test.
- Live warning and display of external voltage presence.
- Fuse, air gap, crowbar and overload protected.
- On line battery monitoring shows if battery is ok.
- Auto null of the test leads on continuity tests.
- Very low battery consumption.
- On-Load battery check (205mA load for worst case).
- Mirror scale.
- Push and turn locking switch for long and hand free testing.
- EN 61010-1 CAT III 600V.
EN 61326-1
- BS 16th edition.

SPECIFICATIONS

Insulation Resistance

Test Voltage (DC V)	250V	500V	1000V
Output Voltage on open circuit	Rated test Voltage +10%		
Measuring Ranges	0-100MΩ	0-200MΩ	0-400MΩ
Mid-Scale Value	1MΩ	2MΩ	4MΩ
Scale Multiplier	×1/2	×1	×2
Accuracy	±3% of indicated value		
Output Short-Circuit Current	1.3mA		

Continuity

Measuring Ranges	3Ω /500Ω
Output Short-Circuit Current	≥210mA
Accuracy	±1.5% of scale length

AC Voltage

AC Voltage Range	0-600V AC
Accuracy	± 3% of scale length

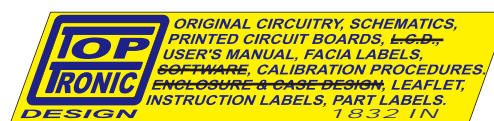
General

Voltage Warning	Warning light circuit live lit From 90Vdc/70Vac Buzzer beep from 24Vac/dc
Battery Check	Battery check indicate good batteries from 8Vdc to 13Vdc during a load test of 205mA
Battery OK	Battery OK LED from 8Vdc and is operative while testing
Power Source	1.5V(SUM-3) ×8. Type AA.
Dimension	170(L)×165(W)×92(D)mm (with housing front cover)
Weight	1.1kg(battery included)
Accessories	Test leads Fuse (0.5A 250V) Shoulder belt Instruction manual Batteries



TEL-AL11-5

BET-1800





CE

1851 IN

WHY TEST IS NECESSARY ?

Insulation

Every electrical apparatus and installation need to be safe for the user and for the equipment itself.

Electrical conductors of electricity need to be insulated from each other, so that they do not create electrical hazard or unnecessary consumption.

Badly insulated circuits can create leakage current which can be dangerous and trip your GFCI, RCCB or ELCB.

Each country regulate those levels at which the insulation is acceptable.

Generally, Insulation resistance measurements are done between each conductor and the earth, and between each conductors.

Continuity

Checking the continuity of wires, complete circuits, connections, closure of contacts, circuit breakers, fuses, bounding resistance of connections, etc...are all very important.

FEATURES

- A LCD indicated instrument for insulation(MΩ), continuity(Ω) and AC Voltage.
- Three insulation test voltage(DC) : 250V, 500V, 1000V (Vdc).
- 3 ½ digital LCD (2000 counts).
- 68 x 34mm large LCD display.
- Test insulation at rated voltage into a 1mA load.
- 210mA short circuit continuity current.
- External voltage warning indication.
- Automatic circuit discharge.
- Fuse protection.
- EN 61010-1 CAT III 600V
EN 61326-1
- BS 16th edition.

SPECIFICATIONS

Insulation Resistance

Test range (DC V)	250V	500V	1000V
Measuring Ranges	0-200MΩ		0-2000MΩ
Resolution	1 count/100KΩ		1 count/1MΩ
Output Voltage on Open Circuit	Rated test Voltage +10%		
Output Current	1mA DC		
Power Consumption	Max. consumption current Approx. 250mA		
Accuracy	±1.5%rdg±5dgt	±(3%rdg+3dgt) (under 1GΩ /2000MΩ) ±(5%rdg+3dgt) (under 2GΩ /2000MΩ)	

Continuity

Measuring Ranges	0-20 Ω	0-2k Ω
Resolution	0.01 Ω	1 Ω
Accuracy	±(1.5%rdg+5dgt)±(1.5%rdg+3dgt)	
Buzzer Sound Below	Under 10 Ω	————
Open Circuit Terminal Voltage	4V DC min	
Short Circuit Terminal Current	210mA DC min.	
Power Consumption	Max. consumption current approx. 160mA	

AC Voltage

AC Voltage Range	0-600V
Resolution	1V
Line Frequency Range	40-120Hz
Accuracy	±(1.5%rdg+3dgt)

General

Dimension	170(L) ×165(W)×92(D)mm (with housing front cover)
Weight	1040g(battery included)
Power Source	1.5V(SUM-3) ×8 Type AA.
Accessories	Test leads Fuse(1A 250V) Instruction manual Shoulder belt Batteries



CE

2751 IN

FEATURES

- 68 x 34 mm (1.338" x 2.677") large LCD display.
- Three insulation test voltage(DC) : 250V, 500V, 1000V.
- External voltage warning indication.
- Automatic circuit discharge.
- Test insulation at rated voltage into a 1mA load.
- 200mA continuity short circuit test current.
- Fuse protection.
- Timer for test function (count 3-5 minutes)
- Data hold function.
- Auto power off function.
- EN 61010-1 CAT III 600V
EN 61326-1
- BS 16th edition.



TEL-AL11-5

TOC-2751

SPECIFICATIONS

Insulation Resistance

Test Voltage (DCV)	250V/500V/1000V
Measuring Ranges (Auto)	0-20 / 0-200 / 0-2000MΩ
Output Voltage Open Circuit	+10%
Accuracy	20MΩ: ± (1.5%rdg +5dgt) 200MΩ: ± (2.5%rdg +3dgt) 2000MΩ: ± (5%rdg +5dgt)
Output Current	1mA DC min. At 0.25MΩ(250V range) 1mA DC min. At 0.5MΩ(500V range) 1mA DC min. At 1MΩ(1000V range)
Power Consumption	Max. Consumption current approximately 250mA

AC Voltage

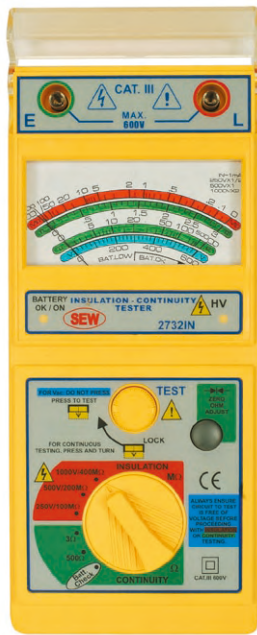
Measuring Ranges	0 ~ 600V
Resolution	1V
Line Frequency Range	40 ~ 120Hz
Accuracy	± (1.5%rdg +3dgt)

Continuity

Measuring Ranges (Auto)	0-20 / 0-200 / 0-2000Ω
Accuracy	± (1.5%rdg +3dgt)
Open Circuit Terminal Voltage	4Vdc min.
Short Circuit Terminal Current	200mAdc min.
Power Consumption	Max. Consumption current approximately 300mA
Buzzer Sounds	Under 10Ω

General

Display	LCD 3½ (2000 counts)
Dimensions	205(L) x 90(W) x 55(D)mm
Weight	Approx. 550g (battery included)
Power Source	1.5V SUM-3 (AA) x 6 or equivalent
Accessories	Test leads Fuse (0.5A, 250V) Heavy-duty case Instruction manual Batteries



CE

2732 IN

FEATURES

- High Quality Taut Band movement.
- Three insulation test voltage :
 1. 250Vdc - 100MΩ
 2. 500Vdc - 200MΩ
 3. 1000Vdc - 400MΩ
- Two Continuity Test on "Low Ohms".
 1. 500Ω
 2. 3Ω
- Small and Lightweight, "all in one" case (do not need bag).
- AC voltmeter with linear scale up to 600Vac.
- 200mA continuity short circuit test current.
- 1mA test current on insulation test at nominal voltage.
- Automatic discharge of capacitance and inductive circuit off charge stored in the circuit under test.
- Live Warning and display of external voltage presence.
- Fuse, air gap, crowbar and overload protected.
- On line battery monitoring shows if battery is ok.
- Auto null of the test leads on continuity tests.
- Very low battery consumption.
- On-load battery check (205mA load for worst case).
- Operates on 6 dry batteries AA, R6P type.
- Mirror scale.
- Push and Turn locking switch for long and hand free testing.
- Designed to meet international standards.
- Supplied with high quality test leads.
- EN 61010-1 CAT III 600V
- EN 61326-1

SPECIFICATIONS

Insulation Resistance

Test Voltage (DCV)	250V	500V	1000V
Output Voltage Open Circuit	+10%		
Measuring Ranges	0 ~ 100MΩ	0 ~ 200MΩ	0 ~ 400MΩ
Mid-scale Value	1MΩ	2MΩ	4MΩ
Scale Multiplier	x1/2	x1	x2
Accuracy	± 5% of full scale		
Output Current	±1.3mA		

Continuity

Measuring Ranges	3 / 500Ω
Output Short-Circuit Current	≥ 210mA
Accuracy	±1% of scale length

AC Voltage

Measuring Ranges	0 ~ 600V
Accuracy	±3% of scale length

General

Voltage Warning	Warning light circuit live lit from 90Vdc / 70Vac buzzer beep from 24Vac /dc.
Battery Check	Battery check indicate good batteries from 8Vdc to 13Vdc during a load test of 205mA. Battery ok : battery ok led lit from 6.5Vdc and is operative while testing.
Dimensions	205(L) x 90(W) x 55(D)mm
Weight	Approx. 550g (battery included)
Power Source	1.5V SUM-3 (AA) x 6 or equivalent
Accessories	Test leads Fuse (0.5A, 250V) Heavy-duty case Instruction manual Batteries



TEL-AL11-5

TOC-2751





CE

2151 IN

FEATURES

- Microprocessor controlled.
- 68 x 34mm (1.338" x 2.677") large LCD display.
- 3 ½ digital LCD (2000 counts) A LCD indicated instrument for insulation(MΩ), continuity(Ω) and AC voltage.
- Three insulation test voltages(DC) : 250V, 500V, 1000V.
- Automatic circuit discharge.
- Test insulation at rated voltage into a 1mA DC load.
- > 200mA short circuit testing current for a resistance tests.
- Auto ranging.
- REL function.
- Auto power OFF.
- Fuse protection.
- Auto data hold.
- Meets : EN 61010-1 CAT III 600V
IEC 61557-1
IEC 61557-2
EN 61326-1
- BS 16th edition.

SPECIFICATIONS

Insulation Resistance

Test Voltage(DCV)	250V, 500V, 1000V
Output Voltage Open Circuit	+10%
Measuring Ranges (Auto ranging)	0-1.999, 0-19.99, 0-199.9, 0-1999M Ω
Resolution	0-1.999MΩ : 1kΩ 0-19.99MΩ : 10kΩ 0-199.9MΩ : 100kΩ 0-1999MΩ : 1MΩ
Output Current	1mA DC
Accuracy	0-1.999MΩ : ±(5%rdg+5dgt) 0-19.99MΩ : ±(1.5%rdg+5dgt) 0-199.9MΩ : ±(2.5%rdg+3dgt) 0-1999MΩ : ±(5%rdg+5dgt)

AC Voltage

Range	0-600V
Resolution	1V
Line Frequency Range	40-120Hz
Accuracy	±(1.5%rdg+3dgt)

Continuity

Measuring Range	20Ω, 200Ω, 2000Ω
Resolution	0-20Ω : 0.01Ω 0-200Ω : 0.1Ω 0-2000Ω : 1Ω
Short Circuit Terminal Current	> 200mA DC
Open Circuit Terminal Voltage	12V DC
Accuracy	±(1.5%rdg+3dgt)

General

Impedance	10MΩ
Power Source	1.5V(AA) x 8
Dimension	210(L) x 210(W) x 100(H)mm
Weight	Approx. 1490g (batteries included)
Accessories	Test Leads Fuse(0.5A 250V) Shoulder belt Instruction manual Batteries

FEATURES

- High quality Taut Band movement.
- Three insulation test voltages (DC) : 250V, 500V, 1000V.
- Two continuity test on low ohms : 500Ω & 3Ω
- Small and light weight.
- AC voltmeter with linear scale up to 600 Vac.
- 205mA continuity short circuit current.
- 1mA test current on insulation test at nominal voltage.
- Automatic discharge of capacitance and inductive circuit with charge stored in the circuit under test.
- Live warning and display of external voltage presence.
- Fuse, air gap, crowbar and overload protected.
- On line battery monitoring shows if battery is ok.
- Very low battery consumption.
- On-Load battery check (240mA load for worst case).
- Mirror scale.
- Push and turn locking switch for long and hand free testing.
- EN 61010-1 CAT III 600V
EN 61326-1
- BS 16th edition.

SPECIFICATIONS

Insulation Resistance

Test Voltage (DC V)	250V	500V	1000V
Output Ranges on open circuit	Rated test Voltage±10%		
Measuring Ranges	0-100MΩ	0-200MΩ	0-400MΩ
Mid-Scale Value	1MΩ	2MΩ	4MΩ
Scale Multiplier	x1/2	x1	x2
Accuracy	±3% of indicated value		
Output Short-Circuit Current	1.3mA		

Continuity

Measuring Ranges	3Ω/500Ω
Output Short-Circuit Current	205mA
Accuracy	±1.5% of scale length



TEL-AL11-5

BET-1800



CE

2132 IN

AC Voltage

AC Voltage Range	0-600V AC
Accuracy	±3% of scale length

General

Voltage Warning	Warning light circuit live lit from 90Vdc/70Vac Buzzer beep from 24Vac/dc
Battery Check	Battery check indicate good batteries from 8Vdc to 13Vdc during a load test of 240mA
Battery OK	Battery OK LED from 8Vdc and is operative while testing
Power source	1.5V(SUM-3) x 8. Type AA.
Dimension	210(L) x 210(W) x 100(D)mm
Weight	Approx. 1400g(battery included)
Accessories	Test leads Fuse(0.5A 250V) Shoulder belt Instruction manual Batteries





CE

2801 IN

FEATURES

- Microprocessor controlled with advanced safety features.
- Three test voltages 250/500/1000V.
- Displays and sound warning if external voltage present.
- Battery life extended by Ener-Save™ feature.
- Continuous battery monitoring.
- Auto-ranging/auto-null/auto-off.
- Insulation tested at 1mA.
- Built-in carrying case, test leads in separate pouch.
- Real-time bar-graph display of test voltage and voltage decay during discharge.
- Audible and visual message displayed if external voltage is present.
- Large LCD.
- Display can be customized for special orders.
- Continuity buzzer.
- Show test time duration (up to 99.9s) for easy comparison.
- EN 61010-1 CAT III.
EN61326-1
- BS 16th edition



Test Leads Connections



SPECIFICATIONS

Insulation Resistance

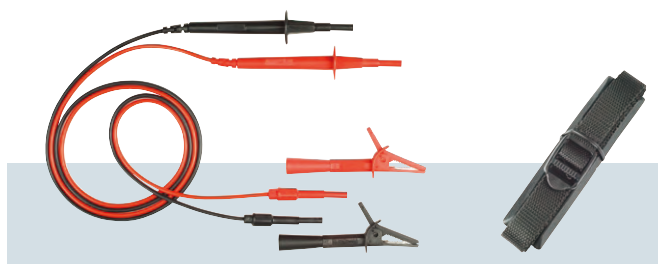
Test Voltage(DC V)	250V	500V	1000V
Measuring Ranges (Auto-Ranges)	0-1000MΩ	0-2000MΩ	0-3000MΩ
Output Current	1mA DC min at 0.25MΩ (250V) 1mA DC min at 0.5MΩ (500V) 1mA DC min at 1MΩ (1000V)		
Accuracy	±3%rdg		

Continuity

Low-Resistance	0-500Ω
Resolution	0.001Ω
SC Current	220mA
Accuracy	±1.0%rdg

General

Dimensions	170(L) × 120(W) × 95(D)mm
Weight	Approx. 850g (battery included)
Power Source	1.5V(AA) × 8 Batteries
Accessories	Test leads Shoulder belt Instruction manual Batteries



AL30+AL30C

BET-2800





CE

4132 IN

FEATURES

- High Quality Taut Band movement.
- Three insulation test voltage :
 1. 250Vdc - 100MΩ
 2. 500Vdc - 200MΩ
 3. 1000Vdc - 400MΩ
- Two Continuity Test on "Low Ohms".
 1. 500Ω
 2. 3Ω
- Small and Light weight, "all in one" case (do not need bag).
- AC voltmeter with linear scale up to 600Vac.
- 200mA continuity short circuit test current.
- 1mA test current on insulation test at nominal voltage.
- Automatic discharge of capacitance and inductive circuit off charge stored in the circuit under test.
- Live Warning and display of external voltage presence.
- Fuse, air gap, crowbar and overload protected.
- On line battery monitoring shows if battery is ok.
- Auto null of the test leads on continuity tests.
- Very low battery consumption.
- On-load battery check (205mA load for worst case).
- Operates on 6 dry batteries AA, R6P type.
- Mirror scale.
- Push and Turn locking switch for long and hand free testing.
- Designed for meet international standards.
- Supplied with high quality test leads.
- EN 61010-1 CAT III 600V
EN 61326-1



TEL-AL11-5

BET-2800

SPECIFICATIONS

Insulation Resistance

Test Voltage (DC V)	250V	500V	1000V
Output Ranges on open circuit	+10%		
Measuring Ranges	0-100MΩ	0-200MΩ	0-400MΩ
Mid-Scale Value	1MΩ	2MΩ	4MΩ
Scale Multiplier	X 1/2	X 1	X 2
Accuracy	±5% of full scale		
Output Short-Circuit Current	±1.3mA		

Continuity

Measuring Ranges	3-500Ω
Output Short-Circuit Current	≥210mA
Accuracy	±1% of scale length

AC Voltage

Measuring Ranges	0-600V
Accuracy	±3% of scale length

General

Voltage Warning	Warning light circuit live lit from 90Vdc / 70Vac. Buzzer beep from 24Vac / dc.
Battery Check	Battery check indicate good batteries from 8Vdc to 13Vdc during a load test of 205mA. Battery ok : battery OK Led lit from 6.5Vdc and is operative while testing
Dimensions	250(L) x 190(W) x 110(D)mm
Weight	Approx.1400g(battery included)
Power Source	1.5V (SUM-3) x 8. Type AA
Accessories	Test leads Fuse (0.5A 250V) Shoulder belt Instruction manual Batteries



FEATURES

- Auto-Range microprocessor controlled.
- Insulation test voltages : 250, 500, 1000V.Ω
- Mov/protection devices test.
- Gas Arrester function.
- Automatic voltmeter AC/DC at Start/Reset.
- Test ON-OFF.
- Battery test.
- Safety voltmeter before each test.
- Auto-Discharge on all test and all ranges.
- Leads Auto-Null key.
- Test Auto-Stop.
- Smart hold & Stop on voltmeter ac/dc.
- Ener-Save™.
- EN 61010-1 CAT III 600V.
EN 61326-1

SPECIFICATIONS

Insulation Resistance

Test Voltage(DC)	250. 500. 1000V
Measuring Ranges	250V : 0.2MΩ~2GΩ 500V : 0.2MΩ~4GΩ 1000V : 0.2MΩ~8GΩ
Accuracy	0.2MΩ~4GΩ : ±3%rdg 4GΩ~8GΩ : ±5%rdg
Nominal Voltage Rated	1mA
Short Circuit Current	1.2mA
Polarization Index(PI)	on all ranges
Detective Absorption Ratio(DAR)	on all ranges

Continuity

Ranges	0.01~100/100~300/300~1999 Ω
Resolution	2 counts
Accuracy	0.01-100Ω : ±1.0%rdg 100-300Ω : ±1.5%rdg 300-1999Ω : ±2.0%rdg
AUTO-NULL	up to 5 Ω
Buzzer	up to 3 Ω

KΩTest

Ranges	1~400kΩ
Short Circuit Test Current	1.3mA

Voltmeter

DC Voltage	0-950V
AC Voltage	0-700V
Resolution	1V
Accuracy	±1.5%



CCO-2700 B BET-2700 A BET-2700 B

●Optional (for 2751 IN 2732 IN 2712 EL 2726 NA 2788 MF)



CE

2788 MF

Diode Test

Test Voltage	5Vdc
Max Test Current	1.5mA
Resolution	0.1V
Measurement Voltage	0-4.5V
Accuracy	3%

MOV Test

Measuring Range	5~1020 Vdc
Voltage Results Accuracy	±3%
Resolution	2 counts

GAS Arrester Test

Measuring Range	5~1020 Vdc
Voltage Results Accuracy	±3%
Resolution	2 counts

General

Fuse	500mA 250V(5x20mm) HBC. Fast Blow
Display	2 lines x 16 characters LCD
Dimension	205(L) x 90(W) x 55(D)mm
Weight	1460g Approx.
Power Source	1.5V SUM-3 (AA) x 6
Operating Temperature	1°C to 55°C
Storage Temperature	-20°C to 70°C
Accessories	Test leads Fuse(0.5A 250V) Heavy-duty case Instruction manual Batteries



TEL-AL11-5

TOC-2788



CE

1152 MF

FEATURES

- Auto-Range microprocessor controlled.
- Automatic voltmeter AC/DC at Start/Reset.
- Auto-off.
- Battery test.
- Battery test at Switch ON/Reset.
- Safety voltmeter before each test.
- Auto-Discharge on all test and all ranges.
- Leads Auto-Null key.
- Test Auto-Stop.
- Smart hold & stop on voltmeter ac/dc.
- Ener-Save™.
- Continuity short circuit current > 220mA.
- Continuity open circuit voltage of 5Vdc.
- Nominal voltage @ 1mA on all insulation ranges.
- Display customization for OEM.
- Accept 8 Rechargeable batteries or Alkaline or normal.
- EN 61010-1 CAT III 600V.
- EN 61010-1 CAT III 100V(only 1153AI).
- EN 61326-1
- UK 16th edition.

SPECIAL FUNCTIONS

● DAR = Dielectric Absorption Ratio.

The dielectric Absorption Ratio is the ratio of the Insulation Resistance measured at 1 Min divided per the Insulation Resistance measured at 30 Seconds.

30 Seconds after starting a test (with EnerSave™ disabled), the tester will beep, indicating the operator that the resistance value measured at 30 second now has been saved internally. 1 Minute after starting a test (with EnerSave™ disabled), the tester will beep again, indicating the user that the DAR result is now computed, and change the display format to now display the DAR result.

● PI = Polarization Index.

The Polarization Index or PI is the ratio of the Insulation Resistance measured at 10 Minutes divided per the Insulation Resistance measured at 1 Minute.

10 Minutes after starting a test (with EnerSave™ disabled), the tester will beep again, indicating the user that the PI result is now computed, and change the display format to now display the PI result.

The tester will Auto-Stop at 10 minutes.



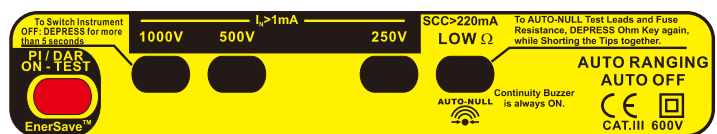
CE

1154 TMF

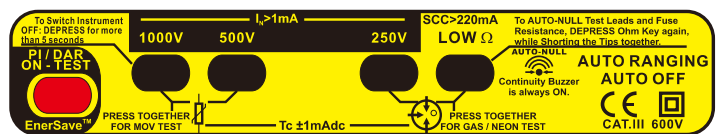
● Voltmeter

When testing insulation resistance while there is a presence of voltage (whether ACV or DCV) on the measured object, conventional insulation testers are highly susceptible to damage. With this new line of insulation testers, it has the ability to switch to voltage detection mode without damaging the once it detects the presence of voltage. It will also display the voltage finding on the LCD screen. With this new and unique function, it will allow the user to safely rule out the possibility of any presence of voltage on the measured object prior to measuring its insulation.

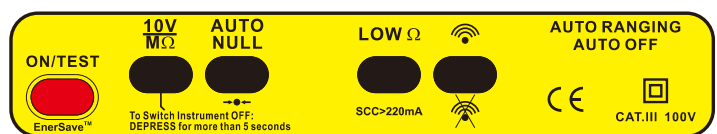
1151 IN



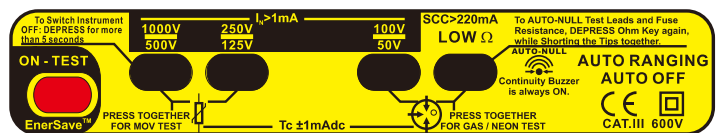
1152 MF



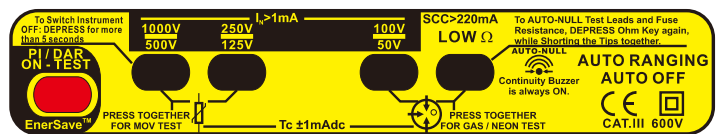
1153 AI



1154 TMF



1155 TMF



TOP IRONIC DESIGN
 ORIGINAL CIRCUITRY, SCHEMATICS,
 PRINTED CIRCUIT BOARDS, L.C.D.,
 USER'S MANUAL, FACIA LABELS,
 SOFTWARE, CALIBRATION PROCEDURES,
 ENCLOSURE & CASE DESIGN, LEAFLET,
 INSTRUCTION LABELS, PART LABELS
 1151 IN - 1155 TMF

SPECIFICATIONS

1151 IN
1152 MF
1153 AI
1154 TMF
1155 TMF

Multi-Function Testers	Electrical Instalations	Electrical Instalations Maintenance Analysis	Auto Motive Repairs Maintenance	Electrical Instalations Telecoms Maintenance	Electrical Instalations Telecoms Maintenance Analysis
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Insulation

Test Voltage	Insulation Resistance					
1000V	0.2MΩ~8GΩ	●	●		●	●
500V	0.2MΩ~4GΩ	●	●		●	●
250V	0.2MΩ~2GΩ	●	●		●	●
125V	0.1MΩ~1GΩ				●	●
100V	0.1MΩ~800MΩ				●	●
50V	0.1MΩ~400MΩ				●	●
10V	0.1MΩ~80MΩ			●		
Accuracy	0.1MΩ~4GΩ : ±3%rdg 4GΩ~8GΩ : ±5%rdg					
PI=Polarization Index		●	●			●
DAR=Dielectric Absorption Ratio		●	●			●

Metal Oxide Varistor (MOVs)

Test Voltage	Accuracy & Resolution		●		●	●
5~1020V	±3%rdg ±2counts					

Gas Arrester Voltage Result @ 1mA

Test Voltage	Accuracy & Resolution		●		●	●
5~1020V	±3%rdg ±2counts					

Continuity Short Circuit Current > 220mA

Range	Accuracy					
0.01~100Ω	±1%rdg	●	●	●	●	●
100~300Ω	±1.5%rdg	●	●	●	●	●
300~1999Ω	±2%rdg	●	●	●	●	●
Auto-Null	Up to 5Ω	●	●	●	●	●
Buzzer	Threshold Value	●	●	●	●	●
	Up to 3Ω	●	●	●	●	●

Voltmeter (Autoranging)

Range	Accuracy & Resolution					
0~700Vac	±1.5%F.S ±1V	●	●		●	●
0~950Vdc	±1.5%F.S ±1V	●	●		●	●
0~100Vac	±1.5%F.S ±1V			●		
0~100Vdc	±1.5%F.S ±1V			●		
Auto-Hold		●	●	●	●	●

General

Battery Load Current	About 300mA
Battery Type	Alkaline 1.5V(AA) x 8 (Rechargeables 1.2V x 8)
L.C.D Type	Large Type 2 x 16 Characters
Auto-off	Approx. 5 minutes
Fuse	Fast HBC 500mA 250V(5x20mm)
Dimensions	175(L) x 85(W) x 75(H) mm
Weight	Approx. 655g
Operating Temperature	1°C to 55°C not in full sun
Storage Temperature	-20°C to 70°C
Accessories	Test leads Shoulder belt Carrying case Instruction manual Batteries



CE

4101 IN



4102 MF

- This Family(4101 IN and 4102 MF)of Originally Designed Unique Products have features ranging from Insulation Resistance Testing, Voltage(ac-dc) measurements with Automatic Hold facility, Continuity Test with a short circuit current of minimum 200mA.
- Two very unique features are found on the Multifunction Model 4102MF; MOV and Gas Arrester Testing.
- Today, most equipments and electrical installations are protected by MOVs and Gas arresters.
- The 4102 MF can test these devices to establish if the devices are still operating correctly or not.
- Energy conservation is featured on all these new Advanced Products.
- EnerSave™ limits the test duration to about 10 Seconds to save energy.
- This new generation of test equipments have no moving parts. All calibration are saved internally in a non volatile memory.
- Calibration can be done at any calibration facility around the world, without the need for dedicated calibration equipment.
- This makes these products easier to maintain and lower the cost of calibration and ownership.
- Their calibration interval can be extended without much problem.
- They comply to all the latest regulations, including UK.
- This product family is part of our new World Class series.
- Meets EN 61010-1 CAT III 600V. EN61326-1

FEATURES COMPARISON

	4101IN	4102MF
Digital EE Calibration (No Potentiometers)	■	■
Keypad Operation	■	■
Automatic Voltmeter AC/DC at Start / Reset	■	■
ON-Reset/Restart Key	■	■
Off Push Button (press more than 5 Sec on 1kV key)	■	■
Auto-Off	■	■
MOV / Protection Devices Test		■
Test ON-OFF	■	■
Polarization Index (PI) on 250, 500 and 1000V	■	■
Dielectric Absorption Ratio (DAR) on 250, 500 and 1000V	■	■
Battery Test	Test Battery at Start	Test Battery at Start
Battery Test at Switch ON / Reset	■	■
Voltmeter on request by Keypad	Automatic	Automatic
Safety Voltmeter before each Test	■	■
Auto-Discharge on all Test and all Ranges	■	■
Continuity Short Circuit Current >220mA (225mA Typical)	■	■
Continuity Open Circuit Voltage of 5V dc	■	■
Nominal Voltage @ 1mA on all Insulation Ranges	■	■
Buzzer ON/OFF	Always ON	Always ON
Leads Auto-Null key	■	■
Test Auto-Stop	■	■
Display Customization for OEM	■	■
Re-programmable Microprocessor for Easy Updates	■	■
Can be calibrated in ALL calibration laboratories	■	■
Insulation measurement from 2kΩ (250V range) to 8GΩ (1kV Range)	■	■
Continuity from 0,01Ω (220mA) to 1999Ω	■	■
DC Voltmeter from ±1Vdc to ±950Vdc	■	■
AC Voltmeter from 1Vac to 700Vac	■	■
Accept 8 Rechargeable Batteries or Alkaline or Normal	■	■
Smart Hold & Stop on Voltmeter ac / dc	■	■
Gas Arrester Function	■	■
EnerSave™	■	■

Insulation Test

4101 IN

4102 MF

Test Voltage (DC V)	250V/500V/1000V	250V/500V/1000V
Output Voltage @ 1mA	Reted test Voltage +10% Max	
Measuring Ranges	0.2M-2G/0.2M-4G/0.2M-8GΩ	0.2M-2G/0.2M-4G/0.2M-8GΩ
Accuracy	0.2MΩ~4GΩ:±3%rdg 4GΩ~8GΩ:±5%rdg	0.2MΩ~4GΩ:±3%rdg 4GΩ~8GΩ:±5%rdg
When Voltage is constant, Current is Limited at	±1.2mA	±1.2mA
Short Circuit Current	±4mA Max	±4mA Max

Continuity Test

Measuring Ranges	0.01-1999Ω	0.01-1999Ω
Accuracy	0.01-100Ω : ±1.0% rdg 100-300Ω : ±1.5% rdg 300-1999Ω : ±2.0% rdg	0.01-100Ω : ±1.0% rdg 100-300Ω : ±1.5% rdg 300-1999Ω : ±2.0% rdg
Short Circuit Current	> 220mA	>220mA
Open Circuit Voltage	5V dc	5Vdc
Resolution	±2 counts	±2counts

Voltmeter

AC Voltage(Auto)	0-700V	0-700V
DC Voltage(Auto)	0-950V	0-950V
Accuracy	±1.5%	±1.5%
Resolution	±1V	±1V

MOV Test

Test Voltage	—————	5-1020Vdc
Voltage Result Accuracy	—————	±3%
Voltage Result Resolution	—————	±2 counts

GAS Arrester Test

Test Voltage	—————	5-1020Vdc
Voltage Result Accuracy	—————	±3%
Voltage Result Resolution	—————	±2 counts

Protections

Over Load	700V (between all terminals)
Over Voltage	Class III-700V towards ground
Fuse	500mA 250V,(5 x 20mm) , HBC, Fast Blow

General

Display	2 lines x 16 characters LCD	
Auto-Null Threshold	5Ω	
Buzzer Threshold	3Ω	
Fast Test	10Sec	
Long Test	60Sec	
With PI and DAR test Function	10Min	
Load Battery Test Current	About 300mA	
Power Source	1.5V x 8 (Type AA)	
Dimensions	250(L) x 190(W) x 110(H)mm	
Weight	1460g Approx. (battery included)	
Operating Temperature	1°C to 55°C not in full sun	
Storage Temperature	-20°C to 70°C	
Accessories	Test leads (TEL-AL11-5) Instruction manual	Shoulder belt (BET-2800) Batteries





4153 IN



4158 MF

- A new generation of Modern Digital MultiFunction Testers is born. These Testers have a range of new features not even found in Expensive Advanced Test Equipments.
- They are models 4152 IN, 4153 IN, 4154 MF, 4155 MF, 4156 IN, 4157 MF, 4158 MF, 4159 MF and 4160 MF.
- All, not only Rugged, but designed to excel in Harsh environment, still, remaining low cost and affordable.
- They can be operated with rechargeable batteries, alkaline or low cost general purpose batteries.
- This Family of Originally Designed Unique Products have features ranging from Insulation Resistance Testing, Voltage (ac-dc) measurements with Automatic Hold facility, Diode Testing, Ohm Meter, Continuity Test with a short circuit current of minimum 220mA.
- Two very unique features are found on the Multifunction Models: MOV and Gas Testing.
- Today, most equipments and electrical installations are protected by MOVs and Gas arresters. Our new family of testers can test these devices to establish if the devices are still operating correctly or not.
- Energy conservation is featured on all these new Advanced Products.
- The Quick Test button run the test while its depressed, automatically stopping if the key is not pressed.
- EnerSave™ limit the test duration to about 10 Seconds.
- Quick Test and EnerSave™ are unique features. Both save energy.
- This new generation of test equipments have no moving parts. All calibration are saved internally in a non volatile memory. Calibration can be done at any calibration facility around the world, without the need for dedicated calibration equipment. This makes these products easier to maintain and lower the cost of calibration. Their calibration interval can be extended without much problem. They comply to all the latest regulations, including UK.
- This product family is part of our new World Class series.
- Meets EN 61010-1 CAT III 600V. EN 61326-1

FEATURES COMPARISON

Model	4152IN	4153IN	4154MF	4155MF	4156IN	4157MF	4158MF	4159MF	4160MF
Digital EE Calibration (No Potentiometers)	■	■	■	■	■	■	■	■	■
Keypad Operation	■	■	■	■	■	■	■	■	■
Automatic Voltmeter AC/DC at Start / Reset	■	■	■	■	■	■	■	■	■
ON-Reset/Restart Key	■	■	■	■	■	■	■	■	■
Off Push Button	■	■	■	■	■	■	■	■	■
Auto-Off	■	■	■	■	■	■	■	■	■
MOV / Protection Devices Test	■	■	■	■	■	■	■	■	■
Quick Test (Test While Press Quick Test)	EnerSave™	■	■	■	■	EnerSave™	EnerSave™	EnerSave™	EnerSave™
Test ON-OFF	■	■	■	■	■	■	■	■	■
Guard Terminal for Precision High Resistance Test	■	■	■	■	■	■	■	■	■
Polarization Index (PI) on 250, 500 and 1000V	■	■	■	■	■	■	■	■	■
Dielectric Absorption Ratio (DAR) on 250, 500 and 1000V	■	■	■	■	■	■	■	■	■
Battery Test by Key	Test Battery at Start	■	■	Test Battery at Start	Test Battery at Start	Test Battery at Start	Test Battery at Start	Test Battery at Start	Test Battery at Start
Battery Test at Switch ON / Reset	■	■	■	■	■	■	■	■	■
Voltmeter on request by Keypad	Automatic	■	■	■	■	■	■	■	■
Safety Voltmeter before each Test	■	■	■	■	■	■	■	■	■
Auto-Discharge on all Test and all Ranges	■	■	■	■	■	■	■	■	■
Continuity Short Circuit Current >220mA (225mA Typical)	■	■	■	■	■	■	■	■	■
Continuity Open Circuit Voltage of 5V dc	■	■	■	■	■	■	■	■	■
Nominal Voltage @ 1mA on all Insulation Ranges	■	■	■	■	■	■	■	■	■
Buzzer ON/OFF by Key	Always ON	■	■	■	■	■	■	■	■
Leads Auto-Null Key	■	■	■	■	■	■	■	■	■
Test Auto-Stop	■	■	■	■	■	■	■	■	■
Display Customization for OEM	■	■	■	■	■	■	■	■	■
Re-programmable Microprocessor for Easy Updates	■	■	■	■	■	■	■	■	■
Can be calibrated in ALL calibration laboratories	■	■	■	■	■	■	■	■	■
Insulation measurement from 2kΩ (250V range) to 8GΩ (1kV Range)	■	■	■	■	■	■	■	■	■
Continuity from 0.01Ω (220mA) to 1999Ω	■	■	■	■	■	■	■	■	■
DC Voltmeter from 1Vdc to 950Vdc	■	■	■	■	■	■	■	■	■
AC Voltmeter from 1Vac to 700Vac	■	■	■	■	■	■	■	■	■
Ohm Meter 400kΩ resistance range	■	■	■	■	■	■	■	■	■
Diode Test @ 1.1 to 1.2mA dc	■	■	■	■	■	■	■	■	■
Accept 8 Rechargeable Batteries or Alkaline or Normal	■	■	■	■	■	■	■	■	■
Smart Hold & Stop on Voltmeter ac / dc	■	■	■	■	■	■	■	■	■
Gas Arrester Function	■	■	■	■	■	■	■	■	■
EnerSave™	■	■	■	■	■	■	■	■	■

Insulation Test	Insulation Testers	Multifunction Testers
Test Voltage (DC V)	250V/500V/1000V	250V/500V/1000V
Output Voltage @ 1mA	Rated test Voltage +10% Max	
Measuring Ranges	0.2M-2G/0.2M-4G/0.2M-8GΩ	0.2M-2G/0.2M-4G/0.2M-8GΩ
Accuracy	0.2MΩ~4GΩ:±3%rdg 4GΩ~8GΩ:±5%rdg	0.2MΩ~4GΩ:±3%rdg 4GΩ~8GΩ:±5%rdg
When Voltage is constant, Current is Limited at	±1.2mA	±1.2mA
Short Circuit Current	±4mA Max	±4mA Max

Continuity Test		
Measuring Ranges	0.01-1999Ω	0.01-1999Ω
Accuracy	0.01-100Ω : ±1.0% rdg 100-300Ω : ±1.5% rdg 300-1999Ω : ±2.0% rdg	0.01-100Ω : ±1.0% rdg 100-300Ω : ±1.5% rdg 300-1999Ω : ±2.0% rdg
Short Circuit Current	> 220mA	>220mA
Open Circuit Voltage	5V dc	5Vdc
Resolution	±2 counts	±2counts

Voltmeter		
AC Voltage(Auto)	0-700V	0-700V
DC Voltage(Auto)	0-950V	0-950V
Accuracy	±1.5%	±1.5%
Resolution	±1V	±1V

MOV Test		
Test Voltage	—————	5-1020Vdc
Voltage Result Accuracy	—————	±3%
Voltage Result Resolution	—————	±2 counts

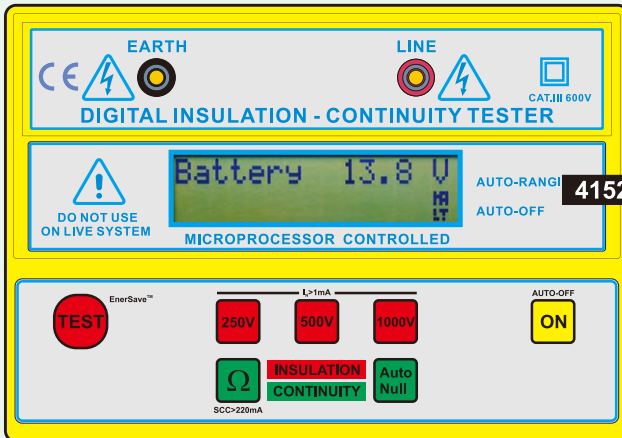
GAS Arrester Test		
Test Voltage	—————	5-1020Vdc
Voltage Result Accuracy	—————	±3%
Voltage Result Resolution	—————	±2 counts

Diode Test		
Test Voltage	—————	5 Vdc
Max Test Current	—————	1.5mA
Resolution	—————	0.1V
Measurement Voltage	—————	0-4.5V
Accuracy	—————	3%
Resolution	—————	±2 counts

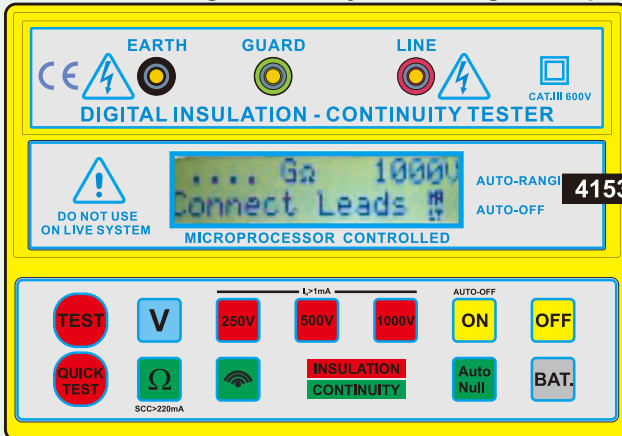
Protections	
Over Load	700V (between all terminals)
Over Voltage	Class III-700V towards ground
Fuses	500mA 250V(5 x 20mm), HBC, Fast Blow

General	
Display	2 lines x 16 characters LCD
Auto-Null Threshold	5Ω
Buzzer Threshold	3Ω
Fast Test	10Sec
Long Test	60Sec
With PI and DAR test Function	10Min
Load Battery Test Current	About 300mA
Power Source	1.5Vx 8 (Type AA)
Dimensions	250(L) x 190(W) x 110(H)mm
Weight	1460g Approx. (battery included)
Operating Temperature	1 °C to 55 °C not in full sun
Storage Temperature	-20 °C to 70 °C
Accessories	Test leads (TEL-AL11-5) Shoulder belt (BET-2800) Instruction manual Batteries

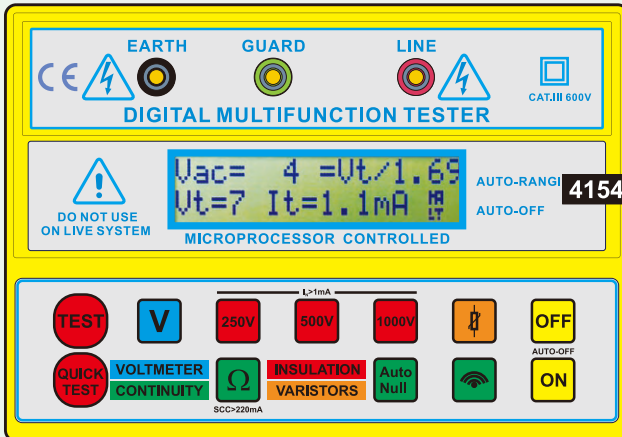




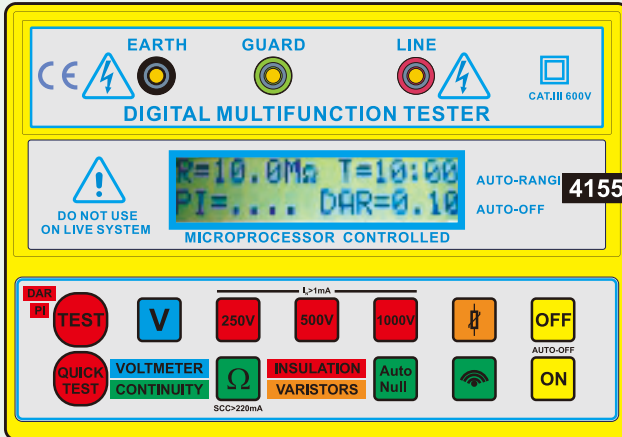
4152IN showing the Battery test during start up.



4153IN interactive display asking to connect leads.



4154MF display of MOV test results.



4155MF display of PI and DAR test results.

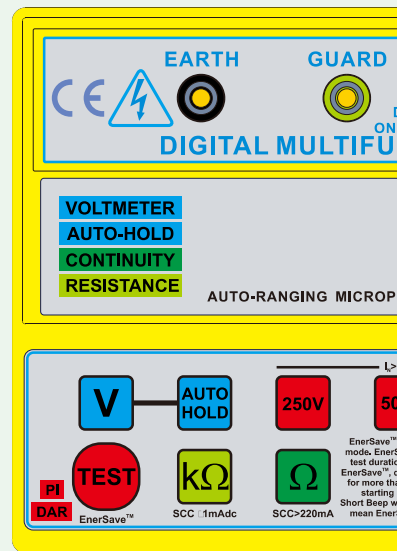
ON → When Depressing the “ON” Button, the Instrument starts up or Resets.

AUTO-OFF → If after a test, no key is depressed for ± 5 minutes, the Instrument will switch off automatically.

OFF → You can turn OFF the Tester without the wait for Auto-off. Press Off to switch OFF the Tester immediately. If a test is still in Progress, pressing OFF will stop the test. In this case you need to press off again.

BAT. → Depressing the “BATT” key will automatically draw current from the batteries. While current is drawn, the total battery voltage is measured and displayed. On models without this key, this feature is automatically executed at startup. Please note that battery voltage is always monitored during use of the instrument.

V → Ac and Dc voltages are automatically detected and Shown. This is the default function of the Instrument. The Voltmeter is selected by default by the Instrument. The voltmeter is activated before any test start and the user must connect the test leads to any circuit before starting any test. This ensure complete safety to the user and the Instrument. Should voltage be present on the circuit under Test, this **SAFETY VOLTMETER** will warn the user of the danger.



4160MF during voltage measurement.

AUTO HOLD → As **ADDED SAFETY**, this Auto-Hold helps the user taking measurement without watching the display. The user can focus instead, on it's hands and test leads. While AUTO-HOLD is enabled, the tester will automatically HOLD the last valid reading, which mean that when the user touch a voltage, that voltage is held on the display even after un-touching the voltage. This add great safety for the user as he can focus on it's safety by only looking at the test leads.

▶ → This Test inject a current (about 1mA) into the diode and measure the Forward Voltage on it's terminals. Voltage which can be measured is 0 to 5V.

All Functions are using an ear...

250V 500V 1000V → Insulation test Voltage selection is done by Depressing the corresponding key.

TEST → Depress to Start or Stop the Selected Test

EnerSave™ → EnerSave™ is a Smart Program which Save Energy when ever possible by limiting the Test Duration.

QUICK TEST → Test is performed while this key is depressed and stop when released. Models with this key do not have EnerSave™ because they don't need it.

DAR → This is the ratio of the Insulation Resistance at 1 Min divided per the Insulation Resistance at 30 Seconds.

PI → This is the ratio of the Insulation Resistance at 10 Min divided per the Insulation Resistance at 1 Minute.

4160MF DIGITAL MULTIFUNCTION TESTER

Buttons: TEST, V, 250V, 500V, 1000V, kΩ, OFF, AUTO-OFF, ON, Voltmeter, Continuity, Insulation, Ohm Meter, Auto Null, Buzzer, Diodes.

MOV Test → This Key select the MOV Test. Today's new Equipments and Electrical Installations are generally Protected by MOVs. It is now easy to test these devices to ensure their proper working and replace them if found damaged. The knee Voltage is shown on the display.

Gaz Arrester Function → The Trigger Threshold Voltage is shown on the LCD. All Gaz protection can be Tested, including Neon Lights.

Measurement with Auto-Hold

- Ω** → Select the Continuity test which has a Short Circuit Current of 220mA. Complies to all latest standard.
- Auto Null** → Auto-Null the resistance of the test leads and of the fuse so that continuity measurements can show only the resistance under test.
- Buzzer** → Turn Buzzer On or Off. When ON, low resistance value BEEP when low. It's helping when tracing circuitry.
- kΩ** → Select the Ohm Meter which has a Short Circuit Current of ±1mA. It can measure up to 400K Ohms.

4156IN DIGITAL INSULATION - CONTINUITY TESTER

Display: 100.1 Ω Continuity

Buttons: TEST, V, 250V, 500V, 1000V, kΩ, OFF, AUTO-OFF, ON, Voltmeter, Continuity, Insulation, Ohm Meter, Auto Null, Buzzer.

4156IN showing the Continuity Test in Progress

4157MF DIGITAL MULTIFUNCTION TESTER

Display: 10.05 MΩ Hold

Buttons: TEST, V, 250V, 500V, 1000V, kΩ, OFF, AUTO-OFF, ON, Voltmeter, Continuity, Insulation, Varistors, Auto Null, Buzzer.

4157MF InsulationTest stopped early by EnerSave™

4158MF DIGITAL MULTIFUNCTION TESTER

Display: 10.05 MΩ 10000V + 12%

Buttons: TEST, V, 250V, 500V, 1000V, kΩ, OFF, AUTO-OFF, ON, Voltmeter, Continuity, Resistance, Varistors, Diodes, Auto Null, Buzzer.

4158MF During InsulationTest Auto-Discharge

4159MF DIGITAL MULTIFUNCTION TESTER

Display: Forward Voltage Diode Vf=0.51V

Buttons: TEST, V, 250V, 500V, 1000V, kΩ, OFF, AUTO-OFF, ON, Voltmeter, Continuity, Resistance, Diodes, Auto Null, Buzzer.

4159MF During diode test

easy "human minded" interface

FEATURES

- Auto-Rang microprocessor controlled.
- Telecommunication test voltage : 50V and 100V.
- Large range of insulation test voltages : 50, 100, 125, 250, 500, 1000V.
- Mov/protection devices test.
- Gas Arrester function.
- Automatic voltmeter AC/DC at Start/Reset.
- Test ON-OFF.
- Battery test.
- Battery test at Switch ON/Reset.
- Safety voltmeter before each test.
- Auto-Discharge on all test and all ranges.
- Leads Auto-Null key.
- Test Auto-Stop.
- Smart hold & Stop on voltmeter AC/DC.
- Ener-Save™.
- EN 61010-1 CAT III 600V.
EN 61326-1

SPECIFICATIONS

Insulation Resistance

Test Voltage(DC)	50.100.125.250.500.1000V
Measuring Ranges	50V : 0.1M~400MΩ 100V : 0.1M~800MΩ 125V : 0.1M~1GΩ 250V : 0.2M~2GΩ 500V : 0.2M~4GΩ 1000V : 0.2M~8GΩ
Accuracy	0.1MΩ~4GΩ:±3%rdg 4GΩ~8GΩ:±5%rdg
Nominal Voltage Rated	1mA
Short Circuit Current	1.2mA
Polarization Index(PI)	on all ranges
Detective Absorption Ratio(DAR)	on all ranges

Continuity

Ranges	0.01~100/100~300/300~1999Ω
Resolution	2 counts
Accuracy	0.01-100Ω : ±1.0%rdg 100-300Ω : ±1.5%rdg 300-1999Ω : ±2.0%rdg
AUTO-NULL	up to 5Ω
Buzzer	up to 3Ω



TEL-AL11-5

BET-2800



CE

4175 TMF

Voltmeter

DC Voltage	0-950V
AC Voltage	0-700V
Resolution	1V
Accuracy	±1.5%

MOV Test

Measuring Range	5~1020 Vdc
Voltage Results Accuracy	±3%
Resolution	2 counts

GAS Arrester Test

Measuring Range	5~1020 Vdc
Voltage Results Accuracy	±3%
Resolution	2 counts

General

Fuse	500mA 250V(5x20mm) HBC. Fast Blow
Display	Liquid Crystal Display
Dimension	250(L) x 190(W) x 110(D)mm
Weight	1460g Approx.
Power Source	1.5V (AA) x8
Operating Temperature	1°C to 55°C
Storage Temperature	-20°C to 70°C
Accessories	Test leads Shoulder belt Instruction manual Batteries





CE

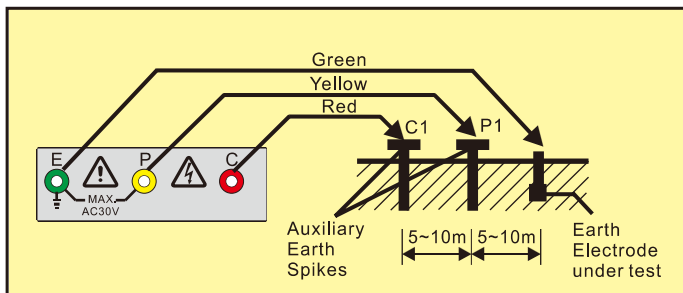
4167 MF

4167 MF multi- function tester is a combination of earth resistance tester and insulation tester. This two in one multi- function tester is an ideal tool for users to measure insulation and earth resistance.

FEATURES

- High quality Taut Band movement.
- Capable of measuring earth voltage.
- 2mA measuring current permits earth resistance tests with tripping earth leakage current breakers in the circuit under test.
- Test leads are supplied as standard accessories for simplified two-wire measuring system.
- Two insulation test voltages (DC) : 250V and 500V.
- Alternating voltage measurement.
- Battery life indicator.
- Battery operated.
- Fuse protected.
- EN61010-1 CATIII 600V
EN 61326-1

Earth Resistance Measurement



SPECIFICATIONS

Earth Resistance

Measuring system	Earth resistance by constant current inverter 820Hz, 2mA approx.
Measuring ranges	Earth resistance : 0-12/0-120/0-1200Ω Earth voltage : 0-30V AC 40-500Hz
Accuracy	Earth resistance : ±3%F.S. Earth voltage : ±2.5%F.S.

Insulation

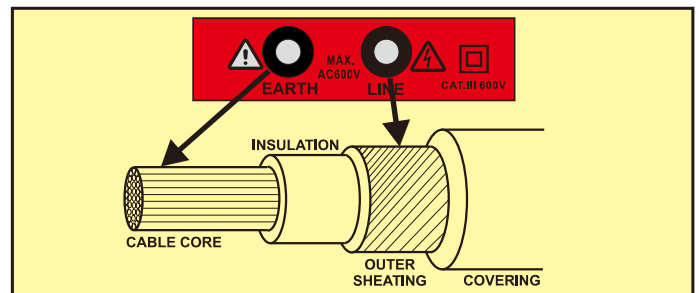
Test voltage (DC V)	250V	500V
Measuring ranges	0-100MΩ	0-200MΩ
Output voltage on open circuit	Rated test voltage +10%	
Short circuit terminal current	2mA DC	
Accuracy	±5% of scale length	

ACV

AC Voltage range	0-600V
Accuracy	±2.5% of full scale
Line frequency range	40-500Hz

- Dimensions : 250(L) x 190(W) x 110(D)mm
- Weight : Approx. 1500g (battery included)
- Power source : 1.5V (AA) x 8 pieces or equivalent
- Safety standard : EN61010-1 CAT III 600V
- Accessories :
Test leads :
(1)AL-36 : red-15m, yellow-10m, green-5m
+AL-33 : simplified measurement probe.
(2)AL-24A
Auxiliary earth spikes(TEL-1505)
Shoulder belt(BET-2800)
Instruction manual
Batteries

Insulation Test Connections





CE

4234 ER

FEATURES

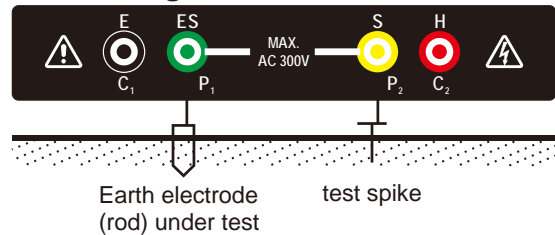
- Auto-Ranging microprocessor controlled.
- Earth testing at 2Ω, 20Ω, 200Ω, 2kΩ,
- Earth voltage measuring : 0-300V AC.
- Automatic C spike check.
- Automatic P spike check.
- 2-Wire test.
- 3-Wire test.
- 4-Wire test.
- LCM display.
- Auto power OFF.
- Data hold.
- Robust, Compact and easy to carry.
- EN 61010-1 CAT IV 300V
IEC 61557-1 IEC 61557-5
EN 61326-1



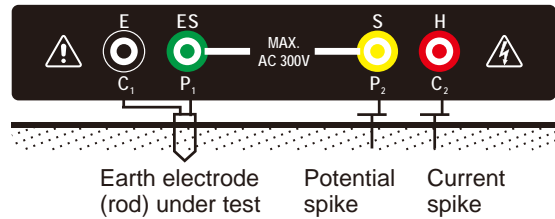
SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-2Ω, 0-20Ω, 0-200Ω, 0-2kΩ Earth Voltage 0-300V AC
Accuracy	Earth Resistance ±2%rdg±3dgt Earth Voltage ±2%rdg±3dgt
Earth Resistance Resolution	0-2Ω : 0.01Ω 0-20Ω : 0.1Ω 0-200Ω : 1Ω 0-2kΩ : 10Ω
Temperature & Humidity	Operating : 0°C-50°C ≤ 80%R.H. Storage : -10°C-60°C ≤ 80%R.H.
Power Source	1.5V(AA) x 8
Dimensions	250(L) x 190(W) x 110(D)mm
Weight	Approx. 1430g(battery included)
Accessories	Test leads(red-15m, black-10m, yellow-10m, green-5m) 4 Auxiliary earth spikes Instruction manual Carrying case Shoulder belt Batteries Fuse (0.1A 250V)

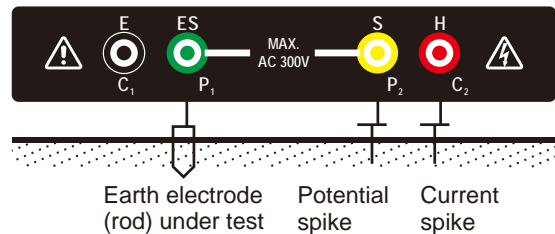
Earth Voltage measurement



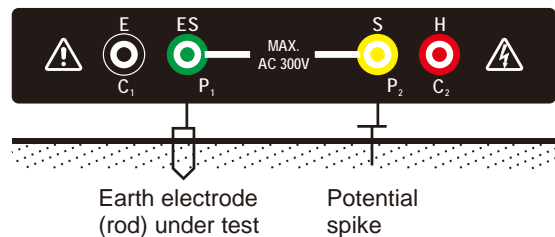
Four-terminal earth resistance measurement



Three-terminal earth resistance measurement



Two-terminal earth resistance measurement





4235 ER

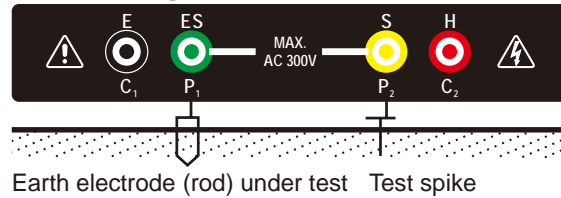
SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-20Ω, 0-200Ω, 0-2kΩ Earth Resistivity 0.06~6.28 kΩ.m 0.62~62.8 kΩ.m 6.28~628 kΩ.m Earth Voltage 0-300V AC
Accuracy	Earth Resistance ±2%rdg3dgt Earth Resistivity $\rho = 2 \times \pi \times L \times R$ Earth Voltage ±2%rdg±3dgt
Earth Resistance Resolution	0-20Ω : 0.01Ω 0-200Ω : 0.1Ω 0-2kΩ : 1Ω
Measuring System	Earth resistance by constant current Inverter 820Hz approx. 2mA
Temperature & Humidity	Operating : 0°C~50°C ≤80%R.H. Storage : -10°C~60°C ≤80%R.H.
Power Source	1.5V(AA) x 8
Dimensions	250(L) x 190(W) x 110(D)mm
Weight	Approx. 1430g(battery included)
Accessories	Test leads(red-15m, black-10m, Yellow-10m, green-5m) Auxiliary earth bars Instruction manual Carrying case Batteries

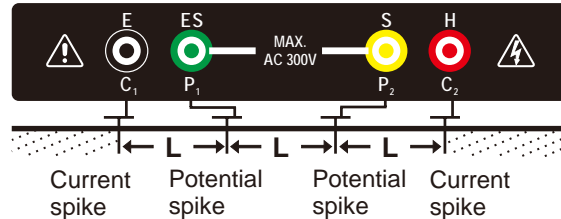
FEATURES

- Auto-Ranging microprocessor controlled.
- Earth resistivity (ρ) test.
- Earth testing at 20Ω, 200Ω, 2kΩ,
- Earth voltage measuring : 0~300V AC.
- Automatic C spike check.
- Automatic P spike check.
- 2-Wire test, 3-Wire test, 4-Wire test.
- LCM display.
- Auto power OFF.
- Data hold.
- 200 measurement results can be saved in the memory and recalled on the display.
- Interval between auxiliary earth spikes is 1.0~50.0m.
- EN61010-1 CAT IV 300V
IEC 61557-1 IEC 61557-5
EN61326-1

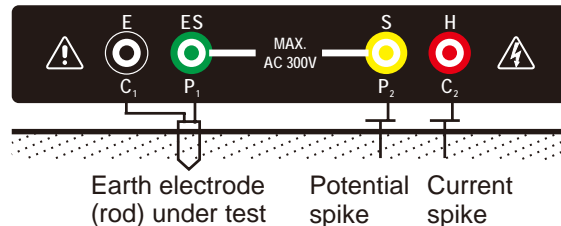
Earth Voltage measurement



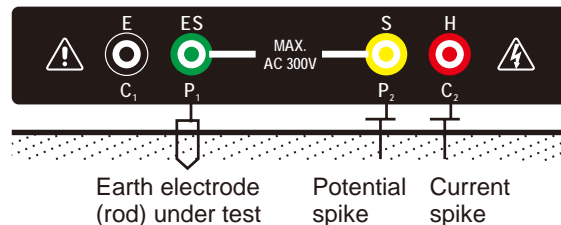
Earth resistivity measurement(ρ)



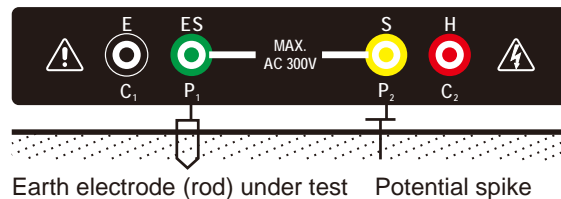
Four-terminal earth resistance



Three-terminal earth resistance measurement



Two-terminal earth resistance measurement



The 1120 ER is a "professional instrument". The instrument is suitable for the testing of single earth electrodes such as lightning conductors and other small earthing systems. The resistance of conductors such as continuity and conduit coupling joints can also be measured. Two-terminal operation measurement, which reduces the accuracy, can also be done by shorting P and C terminals.

Earth resistance can be measured directly from 0.01 ohms up to 1999 ohms. The reading is displayed on a large, easy-to-read digital display. It is available to adjust to 0W ADJ. Control to set reading of zero.

The 1120 ER makes measurements by passing a constant current through the device under test (generally a conductor or low resistance) and measuring the voltage across it. The earth resistance is then calculated by Ohm's Law.

It has an advanced circuit design that permits the instrument to operate with the minimum influence from earth voltage and earth resistance of the auxiliary spikes. This superb instrument is powered by 8 x 1.5 volt manganese-alkaline AA batteries. The calibration of the instrument is performed with the included test leads. Therefore, when using the supplied test leads, the accuracy does not suffer of the three-terminal method of measurement for the most common applications.

The test frequency of 820Hz has been chosen to avoid stray currents at power frequencies and their harmonics. However, the 1120 ER has a built-in filter to reject unwanted signals. The batteries are constantly being checked while in use. The case is ideal for outdoor work. With the 1120 ER, earth electrode testing, which is an important part of electrical installation and maintenance procedure, is made easy. The 1120 ER can be used by the electrical contractor or maintenance engineer to check the effectiveness of their type of earth electrode systems.

FEATURES

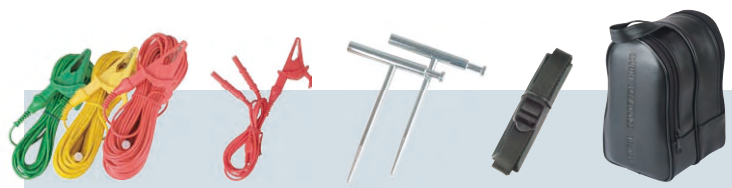
- Capable of measuring earth voltage.
- 2mA measuring current permits earth resistance to test without tripping earth leakage current breakers in the circuit.
- Test leads are supplied as standard accessories for simplified two-wire measuring system.
- 0Ω adjustment.
- Data hold function.
- Battery operated.
- Battery life indicator.
- Standard Accessories for 3T and 2T.
- Designed to meet IEC/EN 61010-1 CAT III 200V. IEC 61557-1 IEC 61557-5 EN 61326-1
- Calibration performed with supplied test leads.



1120 ER

SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-20Ω/0-200Ω /0-2000Ω Earth Voltage 0-200V AC (40-500Hz)
Accuracy	Earth Resistance ±(2% rdg+2dgt) or ±0.1%, which is greater Earth Voltage ±(1% rdg+2dgt)
Earth Resistance Resolution	0-20 Ω (0.01 Ω) 0-200 Ω (0.1 Ω) 0-2000 Ω (1 Ω)
Measuring System	Earth Resistance by constant current inverter 820Hz approx. 2mA.
Display	LCD 3-1/2digit(2000 counts)
Open Circuit Indication	LED will be unlit
Low Battery Indication	"" symbol appears on the display
Data Hold Indication	"" symbol appears on the display
Over Range Indication	"1" (MSD)
Power Source	1.5V (AA) x 8, or equivalent
Dimensions	175(L) x 85(W) x 75(D)mm
Weight	Approx. 600g(battery included)
Accessories	Test leads (red-15m yellow-10m green-5m) Auxiliary earth spikes. Simplified measurement probe Shoulder belt Carrying case Instruction manual Batteries



AL-36

AL-33

TEL-1505

BET-1800

CAC-1120
130(L)x135(w)
x210(D)mm



ST-1520

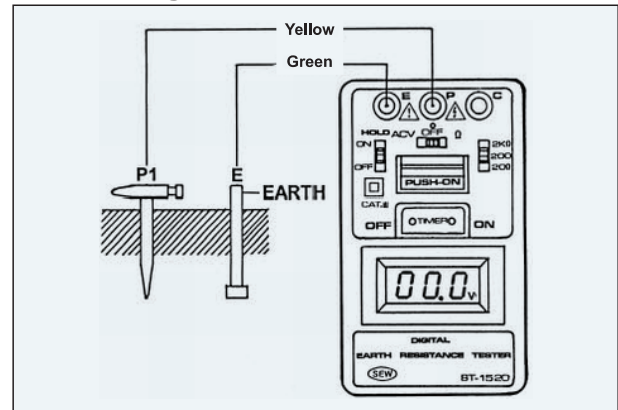
SPECIFICATIONS

Measurement Ranges	Earth Resistance 0-20Ω/0-200Ω/0-2000Ω Earth Voltage 0-200V AC (40-500Hz)
Accuracy	Earth Resistance ± (2% rdg+2dgt) or ±0.1Ω. which is greater. Earth Voltage ± (1% rdg+2dgt)
Earth Resistance Resolution	0-20Ω (0.01Ω) 0-200Ω (0.1Ω) 0-2000Ω (1Ω)
Measurement System	Earth resistance by constant current inverter 820Hz approx. 2mA.
Low Battery Indication	"B" symbol appears on the display
Data Hold Indication	"DH" symbol appears on the display
Over Range Indication	"1" (MSD)
Open Circuit Indication	LED will be unlit
Display LCD	3½ digit(2000 counts)
Power Source	1.5V(AA)×6.
Dimensions	163(L)×100(W)×50(D)mm
Weight	480g approx.(battery included)
Accessories	Test leads (AL-36: red-15m yellow-10m green- 5m) Auxiliary earth bars. Heavy-duty case Instruction manual Batteries

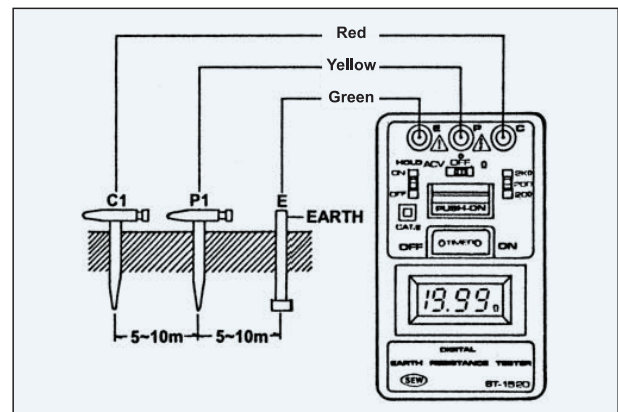
FEATURES

- Capable of measuring earth voltage (Vac).
- 2mA measuring current permits the testing of earth resistance without tripping earth leakage current circuit breakers in the circuit.
- Auto power off function.
- The timer operates automatically about three to five the "PUSH BUTTON SWITCH" and "TIMER ON BUTTON" are pressed together.
- This will keep test "ON" for the duration of the timer.
- Battery operated.
- Data hold function.
- Small and light weight.
- IEC 1010 CAT III 200V.
- **Calibration performed with supplied test leads.**

Earth Voltage Measurement



Earth Resistance Measurement



AL-36

TEL-1505

TOC-1505



CE

ST-1505

FEATURES

- High quality Taut Band movement.
- Capable of measuring earth voltage (Vac).
- The timer operates automatically for about three to five minutes when the "PUSH BUTTON SWITCH" and "TIMER ON BUTTON" are pressed together. This will keep test "ON" for the duration of the timer.
- Battery life indication.
- Battery replacement can be easily made without removing the carrying case.
- IEC 1010 CAT II 30V.
- **Calibration performed with supplied test leads.**

SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-10Ω/0-100Ω/0-1000Ω Earth Voltage 0-30V AC (40-500Hz)
Accuracy	Earth Resistance ± 3% of full scale Earth Voltage ± 2.5% of full scale
Measuring System	Earth resistance by constant current inverter (Square Signal) 820Hz approx. 2mA.
Power Source	1.5V(SUM-3)×6. Type AA.
Dimensions	163(L)×100(W)×50(D)mm
Weight	460g approx.(battery included)
Accessories	Test leads (AL-36: red-15m yellow-10m green-5m) Auxiliary earth spikes. (TEL-1505) Heavy-duty case (TOC-1505) Instruction manual Batteries



CE

2705 ER

FEATURES

- Capable of measuring earth voltage.
- 2mA measuring current permits the testing of earth resistance without tripping earth leakage current circuit breakers in the circuit under test.
- Test leads are supplied as standard accessories for simplified two-wire measuring system.
- Battery operated.
- Battery check function.
- EN 61010-1 CAT III 30V.
EN 61326-1
- **Calibration performed with supplied test leads.**

SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-10 / 0-100 / 0-1000Ω Earth Voltage 0-30 Vac(40~500Hz)
Accuracy	Earth Resistance ± 3% of full scale Earth Voltage ± 2.5% of full scale
Measuring System	Earth resistance by constant current inverter 820Hz, 2mA approx.
Dimensions	205(L) x 90 (W) x 55(D)mm
Weight	Approx. 514g (battery included)
Power Source	1.5V (AA) x 6 or equivalent
Accessories	Test leads (AL-36:red-15m, yellow-10m ,green-5m) Auxiliary earth spikes(TEL-1505) Simplified measurement probe(AL-33) Heavy-duty case(TOC-2720) Instruction manual Batteries




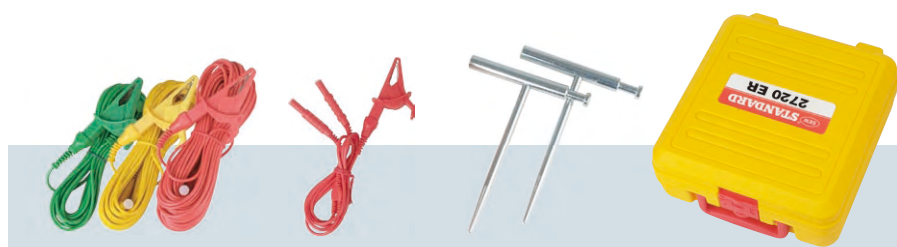
2720 ER

FEATURES

- Capable of measuring earth voltage (Vac).
- 2mA measuring current permits the testing of earth resistance without tripping earth leakage current circuit breakers in the circuit.
- The leads are supplied as standard accessories for simplified two-wire measuring system.
- Data hold function.
- Battery operated.
- Battery test indicator.
- Timer for test function(count 3-5 minutes).
- EN 61010-1 CAT III 200V.
IEC 61557-1 IEC 61557-5
EN 61326-1
- **Calibration performed with supplied test leads.**

SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-20/0-200/0-2000Ω Earth Voltage 0-200 Vac
Accuracy	Earth Resistance ±(2% rdg+2dgt) Earth Voltage ±(1% rdg+2dgt)
Earth Resistance Resolution	0-20Ω (0.01Ω) 0-200Ω (0.1Ω) 0-2000Ω (1Ω)
Measuring System	Earth resistance by constant current inverter 820Hz, 2mA approx.
Low Battery Indication	"  " Symbol appears on the display
Data Hold Indication	" [HOLD] " Symbol appears on the display
Over Range Indication	"1" (MSD)
Display	LCD 3½ digit (2000 counts)
Dimensions	205(L) x 90 (W) x 55(D)mm
Weight	Approx. 550g (battery included)
Power Source	1.5V (AA) x 6 or equivalent
Accessories	Test leads (AL-36:red-15m, yellow-10m, green-5m) Auxiliary earth spikes Simplified measurement probe Heavy-duty case Instruction manual Batteries



AL-36

AL-33

TEL-1505

TOC-2720



CE

1820 ER

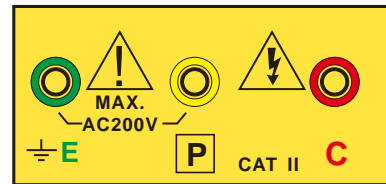
SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-20Ω/0-200Ω/0-2000Ω Earth Voltage 0-200V AC (40-500Hz)
Accuracy	Earth Resistance ± (2% rdg+2dgt) Earth Voltage ± (1% rdg+2dgt)
Earth Resistance Resolution	0-20Ω (0.01Ω) 0-200Ω (0.1Ω) 0-2KΩ (1Ω)
Measuring System	Earth Resistance by constant current inverter 820Hz approx. 2mA.
Low Battery Indication	" $\frac{1}{2}$ " symbol appears on the display
Data Hold Indication	"HOLD" symbol appears on the display
Over Range Indication	"1" (MSD)
Open Circuit Indication	LED will be unlit
Display	LCD 3½ digit(2000 counts)
Power Source	1.5V(AA) ×8.
Dimensions	170(L)×165(W)×92(D)mm
Weight	Approx.1000g(battery included)
Accessories	Test leads (AL-36: red-15m yellow -10m green -5m) Auxiliary earth spikes. Simplified measurement probe Shoulder belt Instruction manual Batteries

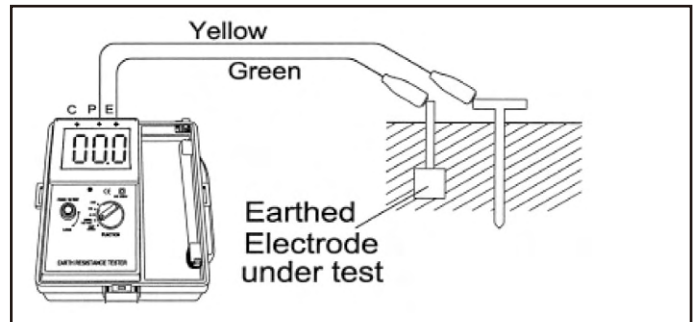
FEATURES

- Capable of measuring earth voltage (Vac).
- 2mA measuring current permits the testing of earth resistance without tripping earth leakage current
- circuit breakers in the circuit.
- The leads are supplied as standard accessories for simplified two-wire measuring system.
- Data hold function.
- Battery operated.
- EN 61010-1 CAT II 300V.
IEC 61557-1 IEC 61557-5
EN 61326-1
- **Calibration performed with supplied test leads.**

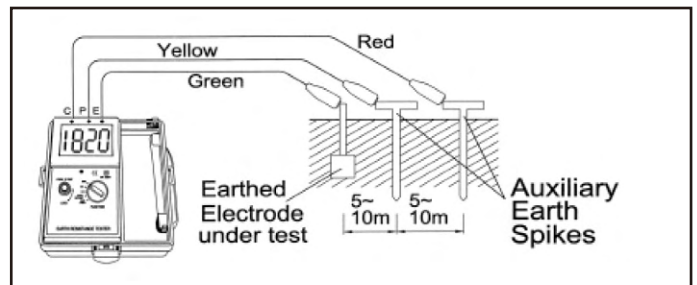
Test Leads Connections



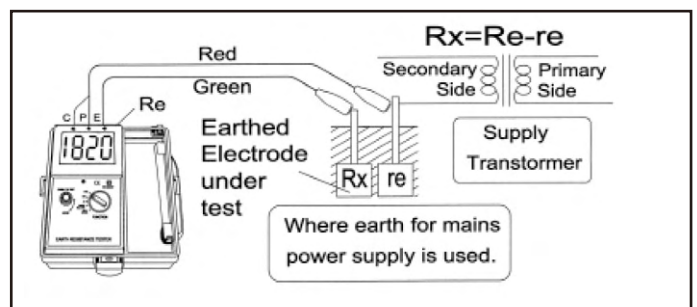
Earth Voltage Measurement



Earth Resistance Measurement



Earth Resistance Measurement





CE

1805 ER

WHY "GROUNDING TEST" IS NECESSARY?

"Grounding" has a few different purposes, such as for safety and for the stability of the electrical circuits. Listed below is more info about it.

1. Power system to the ground :

The purpose is preventing the secondary side from the damage of the primary side. It's necessary for users' safety.

2. Equipment to the ground :

Connect equipments or shells to the ground. The purpose is protecting human being from the leakage of the equipments.

3. Electrical signal to the ground :

Set up a "Zero volt " reference point or a loop path for all different signals. The purpose is for correct operation of measuring and safety device.

4. Grounding for shielding :

To prevent static electricity. To prevent noise, electromagnetic interference (put shielding).

Application: shielding room, cable and communication wires to the ground, Equipments' guard terminals to the ground, power transformers and filters to the ground.

FEATURES

- High quality Taut Band movement.
- Capable of measuring earth voltage (Vac).
- 2mA measuring current permits the testing of earth resistance without tripping earth leakage current circuit breakers in the circuit.
- The leads are supplied as standard accessories for simplified two-wire measuring system.
- Battery operated.
- Battery test indication.
- EN 61010-1 CAT III 150V
EN 61326-1.
- *Calibration performed with supplied test leads.*

SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-10Ω/0-100Ω/0-1000Ω Earth Voltage 0-30V AC (40-500Hz)
Accuracy	Earth Resistance ± 3% of full scale Earth Voltage ± 2.5% of full scale
Measuring System	Earth Resistance by constant current inverter 820Hz approx. 2mA.
Open Circuit Indication	LED unlit
Power Source	1.5V(AA)×8
Dimensions	170(L)×165(W)×92(D)mm
Weight	Approx.1000g(battery included)
Accessories	Test leads (AL-36: red-15m yellow -10m green -5m) Auxiliary earth spikes. Simplified measurement probe. Heavy-duty case Shoulder belt Instruction manual Batteries



AL-36

AL-33

BET-1800

TEL-1505





FEATURES

- Capable of measuring earth voltage.
- 2mA measuring current permits the testing of earth resistance without tripping earth leakage current circuit breakers in the circuit under test.
- The leads are supplied as standard accessories for simplified two-wire measuring system.
- 0Ω adjustment.
- Data hold function.
- Battery operated.
- Battery life indicator.
- Designed to meet EN 61010-1 CAT III 200V. IEC 61557-1 IEC 61557-5 EN 61326-1

● **Calibration performed with supplied test leads.**

SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-20Ω/0-200Ω /0-2000Ω Earth Voltage 0-200V AC (40-500Hz)
Accuracy	Earth Resistance ±(2% rdg+2dgt) or ±0.1Ω, which is greater Earth Voltage ±(1% rdg+2dgt)
Earth Resistance Resolution	0-20 Ω (0.01 Ω) 0-200 Ω (0.1 Ω) 0-2000 Ω (1 Ω)
Measuring System	Earth Resistance by constant current inverter 820Hz approx. 2mA.
Display	LCD 3-1/2digit (2000 counts)
Open Circuit Indication	LED will be unlit
Low Battery Indication	"  " symbol appears on the display
Data Hold Indication	"  " symbol appears on the display
Over Range Indication	"1" (MSD)
Power Source	1.5V (AA) x 8. or equivalent
Dimensions	210(L) x 210(W) x 100(D)mm
Weight	Approx.1395g (battery included)
Accessories	Test leads (AL-36 : red-15m , yellow-10m , green-5m) Simplified measurement probe.(AL-33) Auxiliary earth spikes. Shoulder belt. Instruction manual. Batteries.

FEATURES

- Capable of measuring earth voltage.
- 2mA measuring current permits the testing of earth resistance without tripping earth leakage current circuit breakers in the circuit under test.
- The leads are supplied as standard accessories for simplified two-wire measuring system.
- Battery operated.
- Battery life indicator.
- Designed to meet EN 61010-1 CAT III 30V. EN 61326-1
- **Calibration performed with supplied test leads.**

SPECIFICATIONS

Measuring Ranges	Earth Resistance 0-120Ω-1200Ω/0-1200Ω Earth Voltage 0-30V ac (40-500Hz)
Accuracy	Earth Resistance ±3% of full scale Earth Voltage ±2.5% of full scale
Measuring System	Earth resistance by constant current inverter(Square Signal) 820Hz approx. 2mA
Power Source	1.5V (AA) x 8 or equivalent
Dimensions	210(L) x 210(W) x 100(D)mm
Weight	Approx.1370g (battery included)
Accessories	Test leads (AL-36 : red-15m , yellow-10m , green-5m) Simplified measurement probe. (AL-33) Auxiliary earth spikes. Shoulder belt. Instruction manual. Batteries.



CE

4120 ER

FEATURES

- Capable of measuring earth voltage.
- 2mA measuring current permits the testing of earth resistance without tripping earth leakage current circuit breakers in the circuit under test.
- The leads are supplied as standard accessories for simplified two-wire measuring system.
- Data hold function.
- Battery operated.
- Battery life indicator.
- EN 61010-1 CAT III 300V.
IEC 61557-1 IEC 61557-5
EN 61326-1
- **Calibration performed with supplied test leads.**

SPECIFICATIONS

Measuring Ranges	Earth resistance 0-19.99/0-199.9/0-1999Ω Earth voltage 0-199.9 Vac (40-500Hz)
Accuracy	Earth Resistance ±(2%rdg+2dgts) at 200/2000Ω ±(2%rdg+0.1Ω) at 20Ω Earth Voltage ±(1%rdg+2dgts)
Earth Resistance Resolution	0-19.99Ω(0.01Ω) 0-199.9Ω(0.1Ω) 0-1999Ω(1Ω)
Measuring System	Earth resistance by constant current inverter 820Hz, 2mA approx.
Low Battery Indication	" " Symbol appears on the display
Data Hold Indication	" " Symbol appears on the display
Over Range Indication	"1" (MSD)
Open Circuit Indication	LED will be unlit
Display	LCD 3 1/2 digit (2000 counts)
Dimensions	250(L) x 190(W) x 110(D)mm
Weight	Approx.1500g (battery included)
Power Source	1.5V (AA) x 8 or Equivalent
Accessories	Instruction manual. Test leads (AL-36 : red-15m, yellow-10m, green-5m) Auxiliary earth spikes. Aimplified measurement probe. Shoulder belt. Batteries.



CE

4105 ER

FEATURES

- Capable of measuring earth voltage.
- 2mA measuring current permits the testing of earth resistance without tripping earth leakage current circuit breakers in the circuit under test.
- The leads are supplied as standard accessories for simplified two-wire measuring system.
- Battery operated.
- Battery life indicator.
- Lamp for the scale's panel.(auto shut-off in 10 seconds)
- EN 61010-1 CAT III 30V
EN 61326-1

SPECIFICATIONS

Measuring Ranges	Earth resistance 0-12 / 0-120 / 0-1200Ω Earth voltage 0-30 Vac(40~500Hz)
Accuracy	Earth resistance ±(2.5%+1mm) Earth voltage ±(2.5%+1mm)
Measuring System	Earth resistance by constant current inverter 820Hz, 2mA approx.
Open Circuit Indication	LED unlit
Dimensions	250(L) x 190 (W) x 110(D)mm
Weight	Approx. 1500g (battery included)
Power Source	1.5V (AA) x 8 or Equivalent
Accessories	Instruction manual Test leads (AL-36 : red-15m, yellow -10m, green-5m) Auxiliary earth spikes Simplified measurement probe Shoulder belt Batteries



AL-36

AL-33

BET-1800

TEL-1505

The TEL1 is the Basic Test Equipment an Electrician cannot do without. TEL1 is a **Dual Function Test Instrument** utilized to **Verify Electrical Wiring Connections** and the **Functioning of Earth Leakage / Residual Current Detectors** devices by forcing the ELCB/RCD to trip.

This verifies that the protection device open the mains power supply circuit when a current higher than a certain amplitude circulate into the ground/earth wire (generally around 15mA)

This ensure the electrical installation meet safety and regulation requirements.

The **Wiring Check** is reported on the **Bright Neon Lights** and the Key code is shown on the table located under the tester.

The table tells the user if the wires are connected correctly or not and guide the user to solve his fault, if any. However, it does not detect or show if a a short circuit is present between the Neutral and Earth/Ground wires as well as does not detect or show if a swap occured between the Neutral and Earth/Ground wires due to the fact that these wires are connected together at the supply transformer or some time, again, are connected together by a link, somewhere Else in the power distribution system.

The **WIRING INTEGRITY CHECKER** of the TEL1 uses three **Large** and **Bright Neon** Lights to detect and display voltage conditions on and between powered electrical wires.

These neon lights will lit according to a different sequence related to the wiring conditions of the electrical system. The table located under the tester shows the wiring conditions.

The **Residual Current Detector** or **Earth Leakage Circuit Breaker Tester** injects and simulate a Ground/Earth Fault current into the Earth/Ground wire to trip the device under test. The fault current can be increased by rotating the switch to the new higher value to force the device to trip.

Once selected by the rotary switch, the user press the TEST button to inject the current. When the current is Flowing into the Earth/Ground wire, the I_{EARTH} LED lit, confirming that current is still flowing into the Earth/Ground wire. Power Resistors are utilized to inject the current and No Phase shift is introduced between voltage and current. When rotating the selector, different resistors are selected by the rotary switch, this in turn, change the current selection. The User need to select the current on the rotary switch and then, press the TEST button shortly to inject the Fault Current. This ensure the fault current is only temporary injected into the system.

An Example on How to use the device is as follow:

Rotate the switch anti-clockwise to the lowest current setting. Plug the tester into the wall socket. The wiring check will now indicate the wiring condition of the system as seen from the plug. Verify the Neon lights against the table. If the wiring is correct, carry on with the next test. If the wiring is not correct, then you need to solve the problem before continuing.

If the wiring is correct, then you are ready to test the ELCB/RCD sensitivity. Press TEST for a **short time** and check the I_{EARTH} LED while pressing. If the I_{EARTH} and the Neons lights are now OFF, that mean the ELCB/RCD tripped. If the lights are still ON, then, stop pressing the Test button and increase the selected fault current and press Test again.

I_{EARTH} LED lit when current is going into the Earth/Ground wire. Most domestic breakers trips around 15mA of sensitivity.

The TEL1 help the user finding the sensitivity at which the ELCB/RCD trips.

SPECIFICATIONS

Nominal Voltage System : 110V-220V-230V-240Vac available - User Selectable at purchase.

System Voltage Frequency : 50-60Hz

Wiring Check Accuracy : Table Valid for Voltage within 5% of nominal voltage. If voltage differs from Nominal Voltage System by more than 5%, table may be incorrect.

Earth / Ground Current Simulator Accuracy : Current is set by Selected Resistors and therefore Proportional to Voltage. Resistance Accuracy is 10% Maximum.

Overall Rating : Intermittent Rated (Press TEST Shortly). DO NOT KEEP PRESSING TEST.

Resistance Rating : Current Injection System uses Resistors which are Not Continuously Rated.

Case Material : ABS

Safety Standard : EN 61010-1 EN 61326-1



SPECIFY PLUG TYPE WHEN ORDERING

TEL1-1 110V
TEL1-2 220V
TEL1-3 230V
TEL1-4 240V

WIRING CHECK TABLE

			● = ON	○ = OFF	
A	B	C	CONDITION		
●	●	●	WIRING OK		
●	●	○	NO EARTH (GROUND)		
○	●	●	NO NEUTRAL		
○	○	○	NO LINE		
○	○	●	REVERSED LINE / EARTH		
●	○	○	REVERSED LINE / NEUTRAL		
DOES NOT DETECT N-E SWAPPED					



CE

FEATURES

810 EL

- Wiring check.
- Can be used on 2 wires L-E (ELCB/RCCB/GFCI tester).
- Can be used on 3 wires L-E-N (with wiring check).
- Sense automatically 50 or 60 Hz.
- No battery required.
- Simple operation.
- Current injected in phase with the voltage.
- Fused.
- Wide operating voltage (195Vac to 265 Vac).
- Other voltage optional(110V).
- Robust.
- EN 61010-1 CAT III 265V
EN 61326-1

SPECIFICATIONS

Wiring Check LEDs	Line-Neutral=Green Line-Earth=Green Neutral-Earth=Red
Current Settings	10-50mA@230Vac
Current Selection	Knob
Frequency of Operation	50/60 Hz Sinusoidal
Over-Temperature Protection	Yes by NTC sensor Test stopped indication by Red Led.
Operating Voltage (L-E)	230 Vac ±15%
Meter Accuracy	±3% of full scale
Operating Temperature	-5°C to 45°C
Storage Temperature	-10°C to 85°C
Dimensions	150(L)x 73(W) x 50(D)mm
Weight	220g Approx.
Accessories	Test leads (TEL-1812) Instruction manual



CAC-855
170(L)x145(w)x60(D)mm



1810 EL

Test Leads Connections

FEATURES

- Taut Band movement.
- Simple operation.
- Wiring check.
- Robust.
- Can be used on 2 wires L-E (ELCB/RCCB/GFCI tester).
- Can be used on 3 wires L-E-N (with wiring check).
- No battery required.
- Sense automatically 50 or 60Hz.
- Current injected in phase with the voltage.
- Other voltage optional(110V).
- EN 50081-1 EN 50082-1.



SPECIFICATIONS

Current Settings	10-50mA@230Vac
Current Selection	Knob
Frequency of Operation	50/60 Hz Sinusoidal
Over-Temperature Protection	NO
Operating Voltage (L-E)	230 Vac ±15%
Meter Accuracy	±1% of full scale
Protection	Fused(200mA 250V)
Operating Temperature	-5°C to 45°C
Storage Temperature	-10°C to 85°C
Battery	None
Dimensions	170(L) x 165(W) x 92(D)mm
Weight	730g Approx.
Accessories	Test leads (TEL-1810) Shoulder belt (BET-1800) Instruction manual





CE

1811 EL

FEATURES

- 2 Lines x 16 Characters LCD.
- Very Low Consumption.
- Microprocessor Controlled.
- Suitable for industrial applications.
- Battery than 3% accuracy (Current).
- Menu Driven.
- Accurate Digital readout of Disconnection Time.
- Accurate Digital readout of Disconnection Sensitivity.
- Data Hold function.
- Zero Crossing Circuitry permit testing at 0° or 180° .
- Disconnection Phase Polarity Shown on LCD display.
- Auto-Off and Off override.
- Polarity Trip indicator(Positive or Negative Phase).
- EN 61010-1 CAT III 450V
EN 50081-1 EN 50082-1.

Test Leads Connections



SPECIFICATIONS

Current Settings	0-999mAac / 50Hz
Current Selection	Knob
Phase Start Selection	Referenced to Earth
0°and 180°	Yes
Over-Temperature Protection	Yes
Phase Polarity Trip Indicator	Referenced to Earth
Yes	
Operating Voltage (L-E)	110 Vac to 450 Vac
Timer Resolution	1ms (Max Time=99 .999s)
Timer Accuracy	1ms ±1ms
Current Accuracy	±1% ±1mA
Current Resolution	1mA
Voltmeter Accuracy(50Hz)	50-350 Vac=± 2%±1V 350-450 Vac=±5%±1V
Voltmeter Resolution	1V
Operating Temperature	- 5°C to 40°C
Storage Temperature	- 10°C to 85°C
Power Source	8 x AA Batteries Bat OK LED lit if > 7.5V
Maximum Current Specified at	450 Vac/50Hz
Dimensions	170(L) x 165(W) x 92(D)mm
Weight	Approx. 1180 g (battery included)
Accessories	Test leads (TEL-1811) Shoulder belt (BET-1800) Instruction manual Batteries



CE

1812 EL

FEATURES

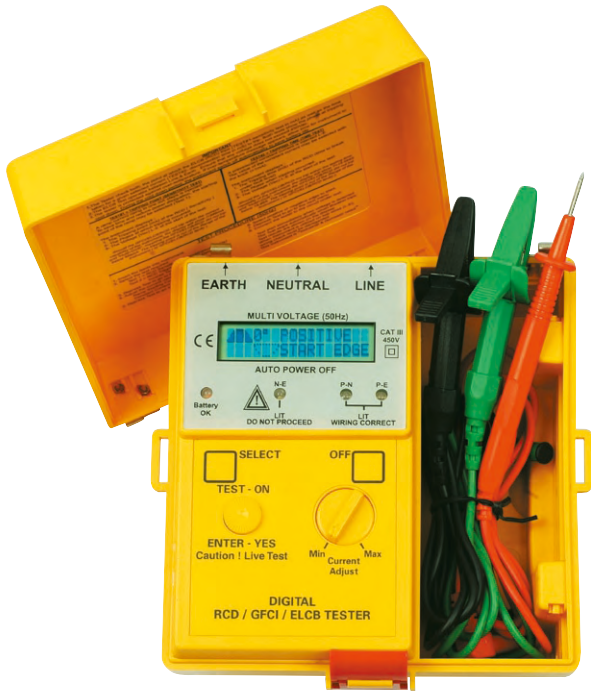
- 2 Lines x 16 Characters LCD.
- Very Low Consumption.
- Microprocessor Controlled.
- Menu Driven.
- Accurate Digital readout of Disconnection Time.
- Automatic data hold function.
- Zero Crossing Circuitry permit testing at 0° or 180° .
- Disconnection Phase Polarity Shown on LCD display.
- Auto-Off and Off override.
- Polarity Trip indicator(Positive or Negative Phase).
- Wiring polarity indicator.
- Measure voltage and frequency between Line and Earth before testing.
- EN 61010-1 CAT III 240V
EN 61326-1.

Test Leads Connections



SPECIFICATIONS

Current Settings	3mA, 5mA, 7mA, 10mA,15mA, 20mA, 30mA, 35mA,50mA, 100mA, 125mA,150mA, 175mA, 250mA,300mA, 375mA, 500mA.
Current Selection	Rotary switch selector
Phase Start Selection	Referenced to Earth
0°and 180°	Yes
Over-Temperature Protection	Yes (3 sensors)
Wiring Correctness Indication	Yes (LEDs)
Trip Indicator	Yes (LCD)
Phase Polarity Trip Indicator	Yes (LCD)
Referenced to Earth	
Operating Voltage (L-E)	1812EL-A 240Vac 1812EL-B 230Vac 1812EL-C 220Vac 1812EL-D 110Vac
Voltmeter (L-E)	20Vac-280Vac
Timer Resolution	1ms (Max time=2.999s)
Timer Accuracy	±2%±2ms
Current Accuracy	±5% ±1mA
Voltmeter Resolution	1Vac
Voltmeter Accuracy	±2%±1Vac
Operating Temperature	- 5°C to 45°C
Storage Temperature	- 10°C to 85°C
Power Source	8 x AA Batteries Bat OK LED = Vbat > 7.5V Measure battery voltage at start up
Dimensions	170(L) x 165(W) x 92(D)mm
Weight	Approx. 1020 g (battery included)
Accessories	Test leads (TEL-1812) Shoulder belt (BET-1800) Instruction manual Batteries

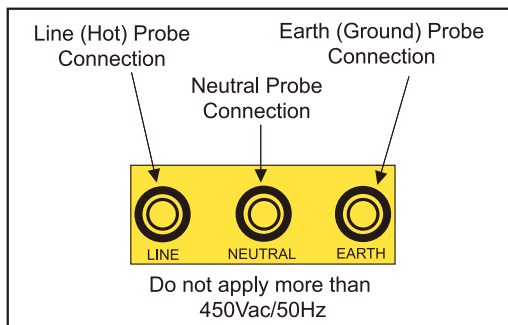


1813 EL

FEATURES

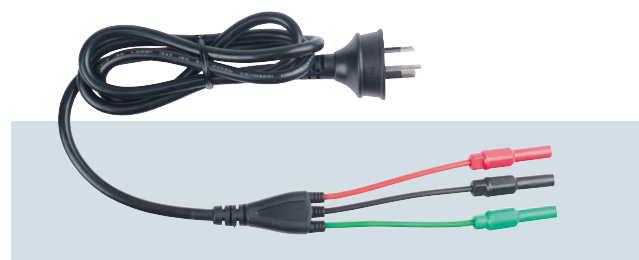
- Microprocessor controlled.
- 2 Lines x 16 Characters LCD.
- Very low consumption.
- Suitable for domestic version.
- Battery than 3% accuracy (current).
- Menu driven.
- Accurate digital readout of disconnection time.
- Accurate digital readout of disconnection sensitivity.
- Automatic Data Hold function.
- Zero crossing circuitry permit testing at 0° or 180° .
- Disconnection phase polarity shown on LCD display.
- Auto-Off and Off override.
- Polarity trip indicator (positive or negative phase)
- Wiring polarity indicator.
- Measure voltage between Line and Earth before testing.
- 60Hz available.

CONNECTIONS



SPECIFICATIONS

System Voltage(50Hz/60Hz)	550 V 380 V 240 V
Current Settings	2-999mA ac
Current Selection	Knob
Phase Start Selection Referenced to Earth	0° and 180°
Over-Temperature Protection	Yes
Wiring Correction Indication	Yes
Phase Polarity Trip Indicator	Yes
Operating Voltage (L- E)	110 Vac to 317 Vac
Timer Resolution	1ms (Max Time=19.999s)
Timer Accuracy	1ms ± 1ms
Current Accuracy	±1% ±1mA
Current Resolution	1mA
Voltmeter Accuracy(50Hz)	50-350 Vac:±2%±1V 350-450 Vac:±5%±1V
Voltmeter Resolution	1V
Operating Temperature	-5°C to 45°C
Storage Temperature	-10°C to 85°C
Dimensions	170(L)×165(W)×92(D)mm
Weight	Approx.1300g(battery included)
Power Source	1.5V(AA)×8 Batteries Bat OK Led=Vbat > 7.5V
Accessories	Test leads (TEL-1813) Shoulder belt (BET-1800) Instruction manual Batteries



TEL_EL(Optional)





CE

2712 EL

The 2712 EL is a compact hand held residual current detector or earth leakage circuit breaker or ground fault circuit interrupter tester (designation could be different from country to country), designed to meet international standards of performance and safety. This model is quality instrument used by professionals to obtain accurate values of the protection disconnection time While a selectable fault current is injected to earth (ground).

FEATURES

- Microprocessor Controlled.
- 2 Lines x 16 Characters LCD.
- Very Low Consumption.
- 50Hz and 60Hz operation.
- Menu driven.
- Accurate digital readout of disconnection time.
- Automatic data hold function.
- Over temperature protection.
- Over voltage protection.
- Fuse protection.
- Zero Crossing Circuitry permit testing at 0° or 180° .
- Disconnection Phase Polarity Shown on LCD display.
- Auto-Off and Off override.
- Polarity Trip indicator(Positive or Negative Phase).
- Wiring polarity indicator.
- Measure voltage between line and earth before testing.
- Frequency measurement indication.
- EN 61010-1 CAT III 300V
- EN 61326-1.

SPECIFICATIONS

Current Settings	3mA, 5mA, 10mA, 15mA, 20mA, 30mA, 50mA, 100mA, 150mA, 250mA, 300mA, 500mA
Current Selection	Rotary switch selector
Phase Angle Setting	0° and 180° selectable
Operating Voltage (L-E) 50Hz or 60 Hz	Version A : 240Vac Version B : 230Vac Version C : 220Vac Version D : 110Vac
Voltmeter (L-E)	20Vac-280Vac (50Hz or 60Hz)
Over-Temperature Protection	Yes (3 sensors)
Wiring Correctness Indication	Yes (LEDs)
Trip Indicator	Yes (LCD)
Phase Polarity Trip Indicator	Yes (LCD) Referenced to Earth
Timer Resolution	1ms (max time=19.99s)
Timer Accuracy	±2ms
Current Accuracy	±5% ±1mA
Voltmeter Resolution	1Vac
Voltmeter Accuracy	±2% ±1Vac
Operating Temperature	-5°C to 45°C
Storage Temperature	-10°C to 85°C
Dimensions	205(L) x 90(W) x 55(D)mm
Weight	Approx. 530 g(battery included)
Power Source	1.5V(AA) x 6 or equivalent
Accessories	Test leads Heavy-duty case (TOC-2751) Instruction manual Batteries



TOC-2751



TEL_EL(Optional)





CE

2820 EL

FEATURES

- Operating voltage 100-450V L-E.
- Rated current 999mA, at 317V AC/50Hz
- Checks ELCB trip time and trip point(sensitivity).
- Auto-Off/Auto-Ranging.
- Phase angle selection(0° / 180°).
- Indicates tripping phase angle.
- Impact resistant enclosure.
- Over temperature shut-down.
- Transient protection.
- Suitable for heavy industrial use.
- Fused.
- EN 61010-1 CAT III 450V
EN 61326-1.

OPERATING PRINCIPLES

EARTH LEAKAGE TESTS

The testers may be used to check the trip point (Test 1) of the ELCB or the trip time (Test 2).
Test 1 is normally used on instantaneous ELCB s while
Test 2 is normally used on inverse and fixed time-delay ELCBs.

TEST PROCEDURE

Test 1-instantaneous ELCBs A ramp current, increasing at approximately 12 mA/s is introduced between L and E and the point at which the ELCB trips is recorded. To save time and reduce energy dissipation, the starting point of the ramp may be selected. Test 2-Inverse and fixed time delay ELCBs. A constant current is selected and injected between L-E and the tripping time is recorded.

SPECIFICATIONS

Trip Current-Range	0-1 A at 317V (Auto-Range Programmable)
Trip Current-Resolution	1mA
Operating Voltage (L-E)	100-450V
Phase Angle Setting	0° and 180° selectable
Timer-Max	99.999s
Timer-Resolution	1ms
Typical Accuracy	
Trip-Current	±1%rdg ±1mA
Trip-Time	±1%rdg ±1dgt
Voltage	±3%rdg ±1dgt
Operating-Temperature	-10°C to +40°C
-Humidity	80% Max relative humidity
Dimensions	170(L) × 120(W) × 95(D)mm
Weight (Battery Included)	800g
Power Source	1.5V(AA) × 8 Batteries
Accessories	Test leads Shoulder belt Instruction manual Batteries



TEL-1811

BET-2800



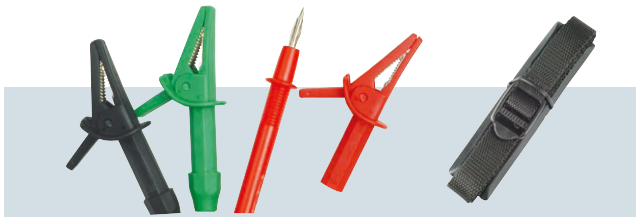


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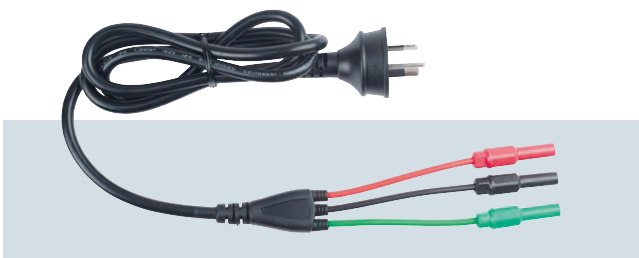
4112 EL

FEATURES

- Microprocessor Controlled.
- 2 Lines x 16 Characters LCD.
- Very Low Consumption.
- Menu driven.
- Accurate digital readout of disconnection time.
- Automatic data hold function.
- Zero Crossing Circuitry permit testing at 0° or 180° .
- Disconnection Phase Polarity Shown on LCD.
- Auto-Off and Off override.
- Polarity Trip indicator(Positive or Negative Phase).
- Wiring polarity indicator.
- Measure voltage between line and earth before testing.
- Indicates frequency of voltage L-E.
- EN 61010-1 CAT III 300V
EN 61326-1

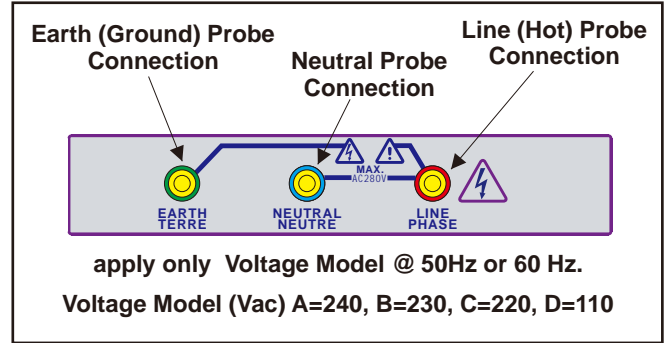


BET-2800



TEL_EL(Optional)

CONNECTIONS



SPECIFICATIONS

Current Settings	3mA, 5mA, 7mA, 10mA,15mA, 20mA, 30mA, 35mA,50mA, 100mA, 125mA,150mA, 175mA, 250mA,300mA, 375mA, 500mA.
Current Selection	Rotary switch
Phase Start Selection	Referenced to Earth 0° and 180°
Over-Temperature Protection	Yes
Wiring Correctness Indication	Yes
Trip Indicator	Yes
Phase Polarity Trip Indicator	Yes
Operating Voltage (L-E)	Referenced to Earth 240Vac - 50Hz or 60 Hz Voltage Model (Vac)
Timer Resolution	1ms (max time=19.99s)
Timer Accuracy	1ms ±1ms
Current Accuracy	±5%±1mA
Operating Temperature	-5°C to 45°C
Storage Temperature	-10°C to 85°C
Dimensions	250(L) x 190(W) x 110(D)mm
Weight	Approx.1500g (battery included)
Power Source	1.5V(AA) x 8 Batteries Bat OK Led = Vbat > 7.5V
Accessories	Test leads Instruction manual Shoulder belt Batteries





CE

6220 EL

FEATURES

- Microprocessor Controlled.
- 2 Lines x 16 Characters LCD.
- Very Low Consumption.
- Menu driven.
- Accurate digital readout of disconnection time.
- Automatic data hold function.
- Zero Crossing Circuitry permit testing at 0° or 180° .
- Disconnection Phase Polarity Shown on LCD.
- Auto-Off and Off override.
- Polarity Trip indicator(Positive or Negative Phase).
- Wiring polarity indicator.
- Measure voltage between line and earth before testing.
- Indicates frequency of voltage L-E.
- EN 61010-1 CAT III 300V
EN 61326-1.

SPECIFICATIONS

Rated Tripping Current at 317V	1000mA (2000mA on special orders)
Lowest Resolution	1mA
System Voltage	230 / 380 / 550V / 50Hz
Maximum Trip Time	99.99s
Highest Resolution	10ms
Typical Accuracy	
Rated Trip Current	±1%rdg ±2dgt
Voltage Range	±1%rdg ±1dgt
Trip Time	±1%rdg ±2dgt
Operating-Temperature	0°C ~ 40°C
Operating-Humidity	80% Max. relative humidity
Dimensions	330(L) x 260(W) x 160(D)mm
Weight	Approx. 3.7kg (battery included)
Power Source	1.5V "C" x 8 Alkaline Batteries
Accessories	Test leads (TEL-1811) Instruction manual Batteries

INTRODUCTION

- The 6220 EL is menu assisted making it extremely user-friendly.
- It is a universal ELCB tester suitable for testing all ELCB's, including instantaneous, inverse time-delay and fixed time-delay types. Although primarily intended for the testing of industrial ELCB's it may be used to test 30mA ELCB's i.e.welding plugs.
- The instrument is extremely versatile and easy to use. It is a two lead instrument and may be used on either 380V or 550V systems (220 or 317V L-E). It should be noted however that the maximum current attainable is proportional to the system voltage(1000mA at 550V/700mA at 380V).
- The operation of the unit is fully microprocessor controlled through a keypad. There are no switches or pushbuttons.
- The tester has an auto-off feature and draws no current when off which increases to a minimal 8mA during operation. It operates off 8 X "C" cell batteries with a life of over 12 months in normal use.

ELCB TEST CRITERIA

The basic procedure to test the three main types of ELCB's mentioned above is described below :

● Instantaneous ELCB's

Instantaneous ELCB's are the easiest to test, especially with the 6220 EL, due to its fully automatic operation. Once the tester has been connected to earth, a gradually increasing fault (ramp current) is automatically applied as soon as the second lead (red probe) is touched to a line and voltage is detected. As the fault increases this may be clearly seen on the LCD display. On tripping, the reading freezes, indicating the sensitivity of the unit. To save time and reduce heat dissipation, the ramp starting current may be selected. DURING THIS TEST THE TIMER IS INOPERATIVE.

● Inverse time-delay ELCB's

The correct operation of an inverse time-delay ELCB may only be ascertained if the characteristic curve of the ELCB in question is to hand. The operation of the ELCB is best assessed by checking the tripping time for given fault currents at a minimum of two points on the curve. These points should be on either side of the knee as shown in Figure 1.



The desired fault current is selected by simply keying this in via the key pad. When the unit is connected, the fault is injected and the timer starts. On tripping, the reading freezes. The Tripping time for the fault current applied may then readily be compared to published curves.





CE

6221 EL

This Test Instrument is a **combined** 3 Phases Presence and Rotation Indicator combined with a 3 Phases Industrial Earth Leakage Tester.

When utilized as a 3 Phase Presence and Rotation Indicator, the instrument does not use the batteries and can still be utilized if the batteries are not present or if the batteries are too low.

The 3 phase Presence and Rotation Indicator which is inside the 6221 EL, takes its power from the circuit under test.

The Earth Leakage can be utilized on a Single Phase (up to 317Vac Line to Earth) or a **3 Phase Powered System** (550V Line to Line or Phase to Phase) with a protective Earth conductor.

The Earth Leakage requires batteries.

When utilized on a single phase, ensure correct connection between Line and Earth before using the tester.

When utilized on a **3 Phase Powered System**, the instrument is then utilized as a 3 Phases Presence and Rotation Indicator and a Earth leakage tester (selecting which phase to Earth will be utilized for the ELCB test).

When utilized on a 3 Phases Powered System, this instrument is a rotary field indication instrument which display all three phases by lighting up its corresponding Lamp. It display the rotation (clockwise or anti-clockwise) on a LED.

To test the tripping time or the tripping current of a Earth Leakage Circuit Breaker, make sure to connect the earth wire.

This instrument represents the quickest and easiest way for servicing, repairing and electrical maintenance of 3 phase system with earth leakage.

With this equipment, you can, before connecting Load to Supply: On the supply side; Quickly verify the presence of the three Phases on a 3 Phases Power System.

Confirm the Phase Rotation on a Powered 3 Phase System.

Test the Tripping (disconnection) current and time of the protections.

FEATURES

- Indicates Phase Rotation.
- Indicates Phase Presence.
- TEST for Disconnection Sensitivity.
- Indicates Battery Status.
- TEST for Disconnection Time.
- Measure Voltage Phase to Earth.
- Select One of 3 Phase to test ELCB.
- Color Coded test Leads.
- Phase Presence Indication from as low as 100Vac.
- Works from 8 x "C" size 1.5VBattery.
- Very Low Consumption.
- Fused Earth Leakage Tester .
- Lightweight, Robust & Compact.
- ELCB Works 50Vac to 330Vac 50Hz / 60Hz.
- Led indication of Voltage on ELCB.
- Phase Rotation and Presence does not require battery to indicate.
- EN 61010-1 CAT III 550V.
EN 61326-1

SPECIFICATIONS

Determination of the Phase Presence

Nominal Voltage for Phase Presence Indication (the voltage required for the neon lamps L1, L2, L3 to lit up).....
From 100Vac to 450Vac.

Frequency RangeFrom 10Hz to 400Hz.

Determination of the Phases Rotary Field Direction:

Direction (the voltage required to have the direction LEDs L1-L2-L3 or L2-L1-L3 to indicates)..From 100 to 450Vac.

Frequency RangeFrom 2Hz to 400Hz.

Protection

Over Load.....550V(between all terminals)

Over VoltageClass III - 450V towards ground.

Earth Leakage

Current Settings 999mAac / 50Hz-60Hz

Current Selection Knob

Phase Start Selection(*) 0° and 180°

Over-Temperature Protection(*) Yes

Phase Polarity Trip Indicator(*) Yes

Operating Voltage (L-E) 110Vac to 317Vac

(*)Referenced to Earth

Timer Resolution 1ms(Max Time = 99.99s)

Timer Accuracy 1ms ± 4ms

Current Accuracy ±3% ± 4mA

Current Resolution 1mA

Voltmeter Accuracy (50Hz) 50-350 Vac = ± 3%±2V
350-550Vac = ± 7%±3V

Voltmeter Resolution 1V

Maximum Current Specified at 317Vac / 50Hz

Batteries 1.5V "C" x 8

Bat OK Led = Vbat >9V

Dimensions: 330(L) x 260(W) x 160(D)mm

Weight: 3.85 kg(battery included)

Operating temperature Range: -15°C to +55°C

Storage Temperature: -20°C to +70°C





CE

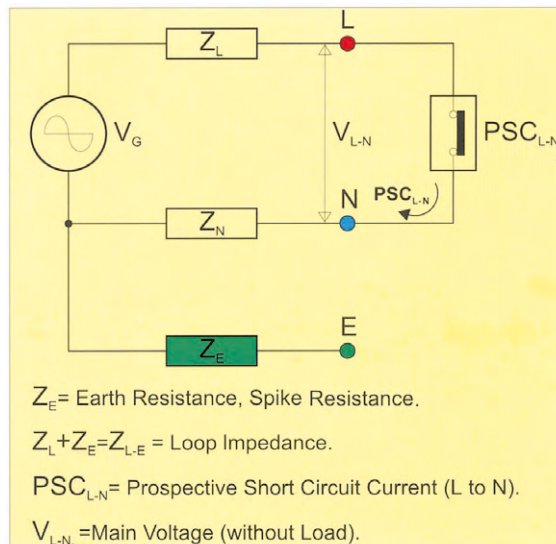
1824 LP

FEATURES

- Measures Earth Resistance without the need for poles in the ground or external measuring wires.
- Earth Measurement uses the real earth current path and the current generated by the electric network, without the need for any disconnection.
- The Earth Resistance displayed is exactly the earth resistance that the earth current will need to go through is an earth fault occurs. (you do not need to add all the bonding points and connection paths)
- Displays voltage supply at the transformer (Line to Neutral), without loading the transformer.
- Single One Smart Push button operation; ON, Scroll trough results and menus.
- Checks wiring integrity(LEDs).
- Auto-off/auto-ranging (software range).
- Microprocessor controlled.
- Combined Prospective Short circuit Current, Loop and Earth Tester.
- Loop test for L-E and PSC between L-N.
- Voltage test L-N.
- Display can be customized for large orders.
- EN 61010-1 CAT III 300V
EN 61326-1



The 1824LP is the first of a new generation of instruments for the testing of electrical installations. It has a **built-in Earth tester** which does not requires the use of poles or long wires. This instrument is useful for fault-finding or commissioning of electrical installations. This new instrument uses a three wires unique principle of operation. It display the main **system voltage** of the power utility, without loading the wiring. The 1824LP displays the **Loop Impedance** between Line and Earth ($Z_L + Z_E = Z_{L-E}$) and **Prospective Short Circuit** between Line and Neutral.



SPECIFICATIONS

Loop Impedance Range L - E	0.03-2000 (Software Ctrl)
Test Currents In Each Loop	11.76A at 230V/50Hz
Voltage Measurement	50 to 280V AC (Sine)
Earth wire/path Return Resistance	0.01-2000 (Software Ctrl)
Neutral Wire Resistance	(Not available, see 1826NA)
Line Wire Resistance & Transformer Windings	(Not available, see 1826NA)
PSC Current (L -N) Max	6kA at 230Vac supply
PSC Current (L -E) Max	(Not available, see 1826NA)
Operating Voltage	230V±20 at 50Hz Sine
Typical Accuracy	
Loop Impedance	4%rdg±2dgt
PSC Current	10%rdg±5dgt
Voltage	2%rdg±1dgt
Operating -Temperature	-10°C to +40°C 80%
-Humidity	max relative humidity
Dimensions (L×W×D)	(170×165×92)mm
Weight	970g Approx.
Power Source	1.5V(AA)×8 Batteries
Accessories	Test leads (AL-34) Shoulder belt (BET-1800) Instruction manual Batteries



CE

1825 LP

FEATURES

- Measures the volt drop as if 16A was flowing between Line and Neutral.
- Displays voltage without current (V at 0A).
- Display voltage as if 16A flowing between Line and Neutral (V at 16A).
- Loop test for L-E
- PSC between L-N.
- Single One Smart Push button operation; ON, Scroll through Results and menus.
- Checks wiring integrity (LEDs).
- Auto-off/auto-ranging (software range).
- Microprocessor controlled.
- Combined Prospective Short circuit Current, Loop and Load Tester.
- Display can be customized for large orders.
- EN 61010-1 CAT III 300V
EN 61326-1

Test Leads Connections



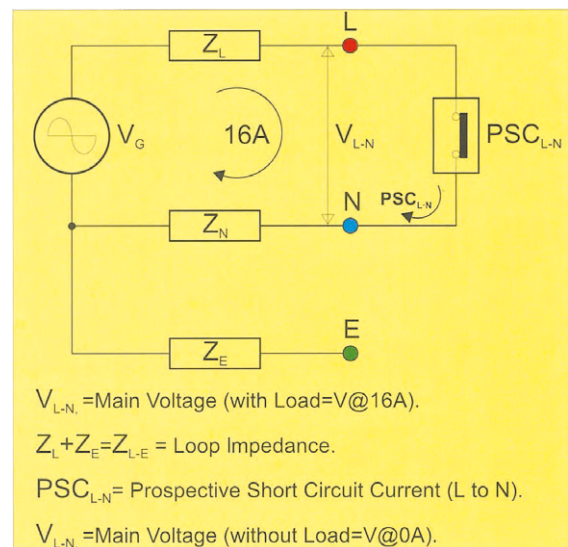
1825LP is the instrument which display the main **system voltage** (V at 0A) of the power utility and calculates the **volt drop** between Line and Neutral as if 16A is flowing between Line to Neutral.

1825LP displays the system voltage minus the voltage losses into the Line and Neutral impedances (losses due to the current circulating into these impedances).

The result of this dropped **voltage is displayed as if you had a 16A load** (V at 16A).

This instrument is useful for fault-finding or commissioning of electrical installations.

This new instrument uses a three wires unique principle of operation. 1825LP displays the **Loop Impedance** between Line and Earth ($Z_L + Z_E = Z_{L-E}$) and **Prospective Short Circuit** between Line and Neutral.



SPECIFICATIONS

Loop Impedance Range L - E	0.03-2000 (Software Ctrl)
Test Currents in Each Loop	11.76A at 230V/50Hz
Voltage Measurement L - N	50 to 280V AC (Sine)
Load Current for Volt Drop (L - N)	16A (Calculation)
Neutral Wire Resistance	(Not available, see 1826NA)
Line Wire Resistance & Transformer Windings	(Not available, see 1826NA)
PSC Current (L-N) Max	6 kA at 230Vac supply
PSC Current (L-E) Max	(Not available, see 1826NA)
Operating Voltage	230V±20 at 50Hz Sine
Typical Accuracy	
Loop Impedance	5%rdg±2dgt
PSC Current	12%rdg±5dgt
Voltage	3%rdg±1dgt
Operating - Temperature	-10 °C to +40 °C 80%
-Humidity	max relative humidity
Dimensions (L×W×D)	(170×165×92)mm
Weight	970g Approx.
Power Source	1.5V(AA)×8 Batteries
Accessories	Test leads (AL-34) Shoulder belt (BET-1800) Instruction manual Batteries



CE

2811 LP

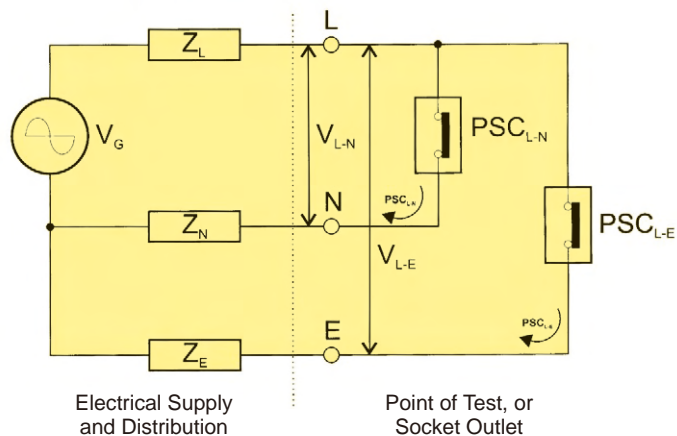
SPECIFICATIONS

Loop Impedance Range L-E,L-N	20/200/2000Ω (Auto-Range)
Loop Impedance Test Current	12A at 230V/50Hz
Voltage Measurement L-N,L-E	80 to 250V AC/50Hz
Earth wire/path return resistance	20/200/2000Ω (Auto-Range)
Neutral Wire Return Resistance	20/200/2000Ω (Auto-Range)
Line Wire Return Resistance & Transformer Windings	20/200/2000Ω (Auto-Range)
PSC Current (L-N) Max	3kA
Operating Voltage	230V±20%/Hz
Typical Accuracy	
Loop Impedance	±5%rdg ± 2dgt
PSC Current	±20%rdg ± 5dgt
Voltage	±1%rdg ± 1dgt
Operating -Temperature	-10°C to +40°C
-Humidity	80% max relative humidity
Dimensions	170(L)×120(W)×95(D)mm
Weight	780g (battery included)
Power Source	1.5V(AA)×8 Batteries
Accessories	Test leads Shoulder belt Instruction manual Batteries

FEATURES

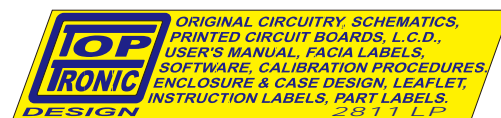
- Microprocessor controlled with advanced safety features.
- Displays and sound warning if external voltage present.
- Displays mains voltage, scroll trough menus.
- Checks wiring integrity (LEDs and display).
- Single button operation.
- Auto-off/auto-ranging.
- Microprocessor controlled.
- Combined prospective short circuit current, PSC and LOOP tester.
- Built-in carry case, test leads in separate pouch.
- Loop test for L-E and L-N and PSC.
- Voltage test L-N and L-E.
- Enables analysis of constituent components in L-E and L-N loops giving resistance of earth, neutral wire, live wire and transformer winding.
- Display can be customized for special orders.
- 60Hz available on request.
- EN 61010-1 CAT III 250V
EN 61326-1.

FAULT FINDING AND ANALYZING THE ELECTRICAL NETWORK



ISL-2811

BET-2800



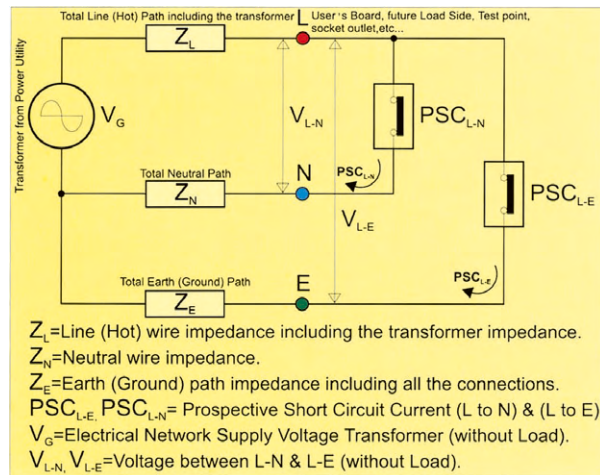


1826 NA

FEATURES

- Measures Earth Resistance without the need for poles in the ground or external measuring wires.
- Earth Measurement uses the real earth current path and the current generated by the electric network, without the need for any disconnection.
- The Earth Resistance displayed is exactly the earth resistance that the earth current will need to go through is an earth fault occurs. (you do not need to add all the bonding points and connection paths resistances)
- Displays voltage supply at the transformer (Line to Neutral), without loading the transformer. Displays voltage between Line (Phase) and Earth (Ground), without drawing any current.
- Measures the Impedance of the Line itself, so you can analyze and differentiate between the multiple paths of the wiring.
- Measures the Neutral Impedance. Single One Smart Push button operation ; ON, Test, Scroll through results and menus.
- Checks wiring integrity (LEDs).
- Auto-off/auto-ranging (software ranging). Microprocessor controlled.
- Combined Prospective Short circuit Current, Loop, individual wire and Earth Tester.
- Voltage test L-N and L-E.
- Loop test for L-E and L-N and PSC.
- Enables analysis of constituent components in L-E and L-N loops giving resistance of earth, neutral wire, live wire and transformer winding.
- Test leads, shoulder belt, user's manual, batteries included.
- Display can be customized for large orders.
- EN 61010-1 CAT III 300V
EN 61326-1

The 1826 NA is the first portable electrical network analyzer. It has a built-in Earth tester which does not require the use of poles or long wires. This instrument is useful for fault-finding or commissioning of electrical installations. Differentiation between the Line (hot), Neutral and Earth (ground) path by reading their values has never been so easy. Bad contacts, old wiring or bad earth path are quickly identified. Faulty electrical network can be resolved in a fraction of the time normally required using conventional equipment. Down time due to a faulty electrical network is minimal as the fault can be identified and diagnosed quickly. Find which wire need to be attended to and why (find those old wires with high impedance before a fire starts, and replace them). The complete electrical network can be analyzed by scrolling through the results.



SPECIFICATIONS

Loop Impedance Range L-E, L-N	0.03-2000 Ω (Software Ctrl)
Test Currents in Each Loop	11.76A at 230V/50Hz
Voltage Measurement L-N, L-E	50 to 280V AC (Sine)
Earth wire/path Return Resistance	0.01-2000 Ω (Software Ctrl)
Neutral Wire Resistance	0.01-2000 Ω (Software Ctrl)
Line Wire Resistance & Transformer Windings	0.01-2000 Ω (Software Ctrl)
PSC Current (L-N) Max	6kA at 230Vac supply
PSC Current (L-E) Max	6kA at 230Vac supply
Operating Voltage	230V \pm 20 at 50Hz Sine
Typical Accuracy	
Loop Impedance	4%rdg \pm 2dgt
PSC Current	10%rdg \pm 5dgt
Voltage	2%rdg \pm 1dgt
Operating - Temperature - Humidity	-10°C to +40°C 80% max relative humidity
Dimensions (LxWxD)	(170x165x92)mm
Weight	970g Approx.
Power Source	1.5V(AA)x8 Batteries
Accessories	Test leads (AL-34) Shoulder belt (BET-1800) Instruction manual Batteries



2126 NA

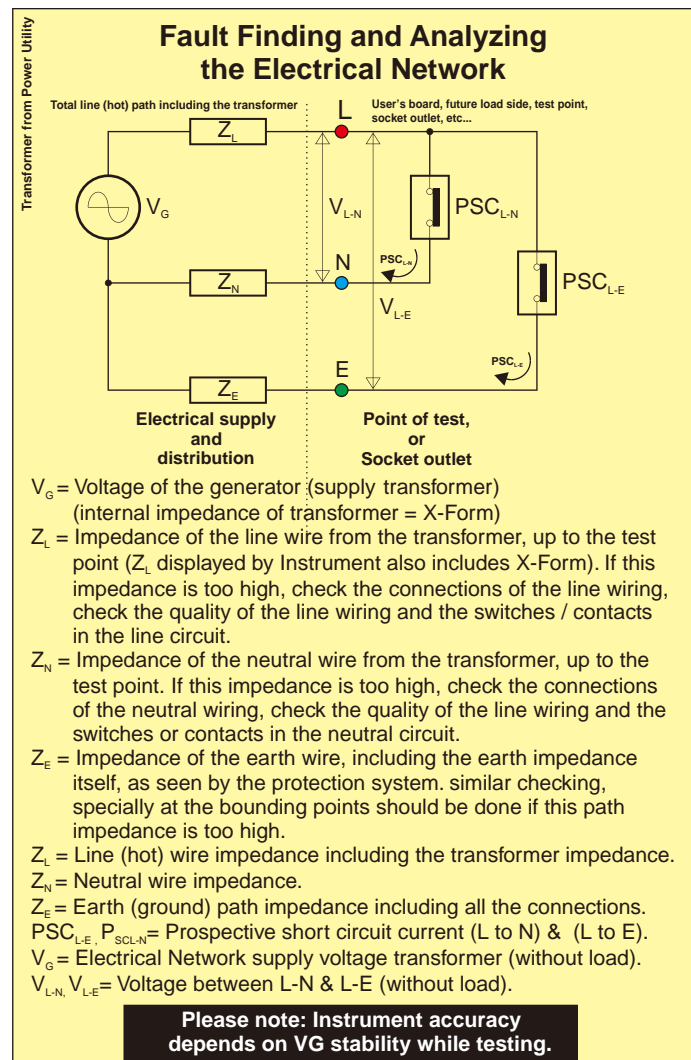
FEATURES

- Built-in earth tester.
- Built-in loop/psc tester. 0.03-2000Ω (software ctrl).
- Built-in voltmeter.
- Built-in wiring checker.
- One push button smart control.
- Display L-N and L-E voltages. 50 to 280Vac (sine).
- Display line path impedance. 0.01-2000Ω (software ctrl).
- Display earth path impedance. 0.01-2000Ω (software ctrl).
- Display neutral path impedance. 0.01-2000Ω (software ctrl).
- Display psc line to neutral. 6kA@230Vac supply.
- Display psc line to earth. 6kA@230Vac supply.
- Re-scroll through previous results.
- Bat. ok/low battery indicator.
- Auto-off function.
- Color coded test leads.
- Rugged Case.
- Ultra low power consumption.
- EN 61010-1 CAT III 270V
EN 61326-1.

SPECIFICATIONS

Loop / Earth / Wires	0.03-2000Ω(auto-ranging)
Prospective Short Circuit	0~6kA at 230Vac
Operating Voltage	50V ~ 275Vac (50Hz)
Best Performance at Rated Voltage	230Vac ±20% Max. 10A
Accuracy of Voltage	±1%(210~250V) ±3% otherwise
Accuracy of Loops / Earth	±2%(0.05~50Ω)
Accuracy of Wires Impedances	±15%(above 500Ω)
Operating-Temperature	0°C~40°C
-Humidity	85% Maximum
Dimensions	210(L) x 210(W) x 100(D)mm
Weight	Approx. 1445g (battery included)
Power Source	1.5V (AA)x6 or equivalent
Accessories	Test leads (AL-34) Shoulder belt (BET-1800) Instruction manual Batteries

The 2126 NA is the first portable real electrical network analyzer. It has a built-in earth tester which does not require the use of poles or long wires. This instrument is useful for fault-finding or commissioning of electrical installations. Differentiating between the line (hot), neutral and earth (ground) path by reading their values has never been easier. Bad contacts, old wiring or bad earth path are quickly identified. Faulty electrical network can be resolved in a fraction of the time normally required using conventional equipment. Down time due to a faulty electrical network is minimal as the fault can be identified and diagnosed quickly. Find which wire needs to be attended to and why (find those old wires with high impedance before a fire starts and replace them). The complete electrical network can be analyzed by scrolling through the results. Of course, it has a built-in loop impedance and prospective short circuit tester as well as a voltmeter.





2726 NA

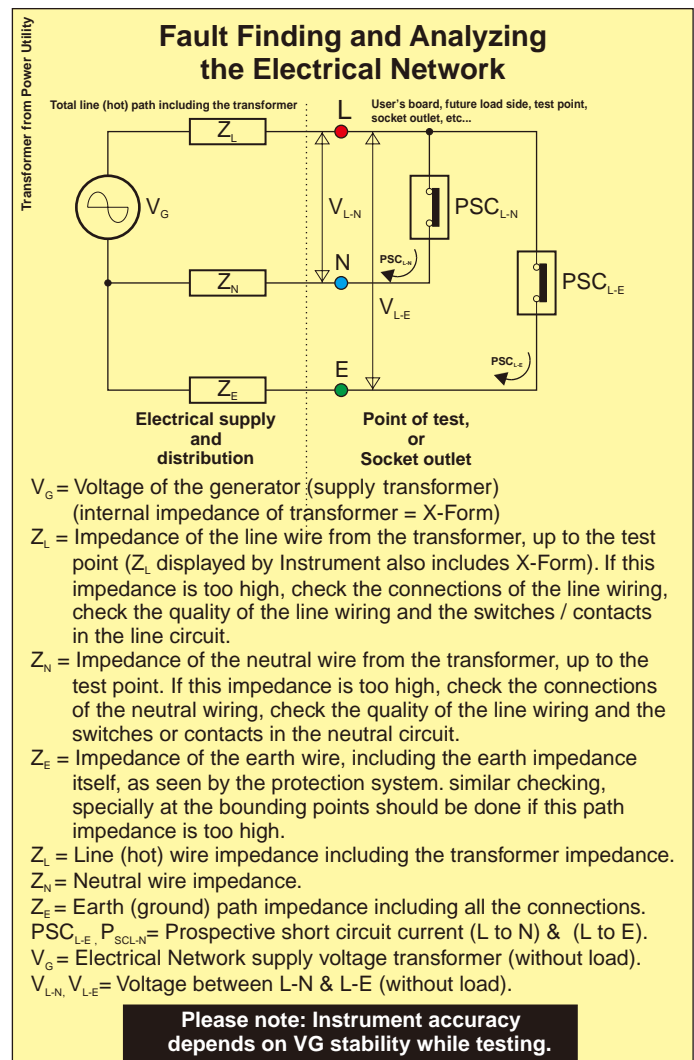
FEATURES

- Built-in earth tester.
- Built-in loop/psc tester. 0.03-2000Ω (software ctrl).
- Built-in voltmeter.
- Built-in wiring checker.
- One push button smart control.
- Display L-N and L-E voltages. 50 to 280Vac (sine).
- Display line path impedance. 0.01-2000Ω (software ctrl).
- Display earth path impedance. 0.01-2000Ω (software ctrl).
- Display neutral path impedance. 0.01-2000Ω (software ctrl).
- Display psc line to neutral. 6kA @ 230Vac supply.
- Display psc line to earth. 6kA @ 230Vac supply.
- Re-scroll through previous results.
- Bat. ok/low battery indicator.
- Auto-off function.
- Color coded test leads.
- Rugged Case.
- Ultra low power consumption.
- EN 61010-1 CAT III 270V
EN 61326-1.

SPECIFICATIONS

Loop / Earth / Wires	0.03-2000Ω (auto-ranging)
Prospective Short Circuit	0~6kA at 230Vac
Operating Voltage	50V ~ 275Vac (50Hz)
Best Performance at Rated Voltage	230Vac ±20% Max. 10A
Accuracy of Voltage	±1% (210~250V) ±3% otherwise
Accuracy of Loops / Earth	±2% (0.05~50Ω)
Accuracy of Wires Impedances	±15% (above 500Ω)
Operating-Temperature	0°C~40°C
-Humidity	80% Maximum
Dimensions	205(L) x 90 (W) x 55(D)mm
Weight	Approx. 570g (battery included)
Power Source	1.5V (AA)x6 or equivalent
Accessories	Test leads (AL-34) Heavy-duty case Instruction manual Batteries

The 2726 NA is the first portable real electrical network analyzer. It has a built-in earth tester which does not require the use of poles or long wires. This instrument is useful for fault-finding or commissioning of electrical installations. Differentiating between the line (hot), neutral and earth (ground) path by reading their values has never been easier. Bad contacts, old wiring or bad earth path are quickly identified. Faulty electrical network can be resolved in a fraction of the time normally required using conventional equipment. Down time due to a faulty electrical network is minimal as the fault can be identified and diagnosed quickly. Find which wire need to be attended to and why (find those old wires with high impedance before a fire starts and replace them). The complete electrical network can be analyzed by scrolling through the results. Of course, it has a built-in loop impedance and prospective short circuit tester as well as a voltmeter.





4126 NA

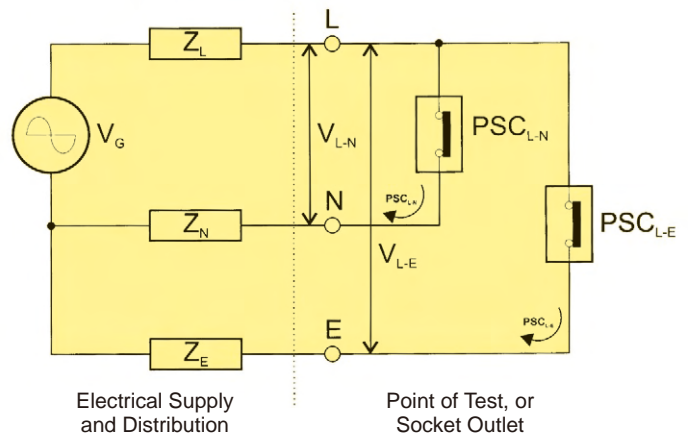
FEATURES

- 2 Lines x 16 Characters LCD.
- Auto-ranging/Auto-off.
- One Push Button Operation.
- Very Low Consumption.
- Microprocessor Controlled.
- Better than 3% Accuracy(0.05-50Ω).
- Wiring Integrity Check(display + LEDs).
- Over Temperature Protection and Indication.
- Stores Previous readings.
- Measures : L-E and L-N AC voltages.
L-E and L-N Loop Impedance.
Prospective Short Circuits L-E and L-N.
Earth Spike, Line and Neutral Impedances.
- EN 61010-1 CAT III 300V
EN 61326-1.

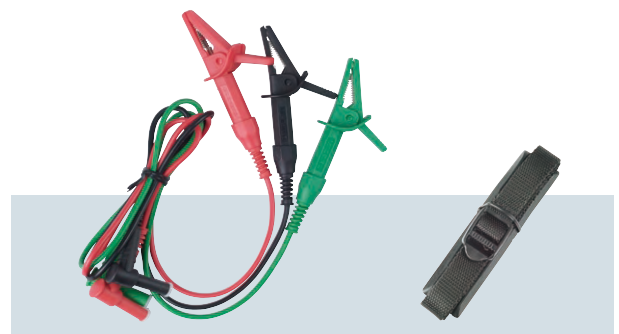
SPECIFICATIONS

Loops / Earth / Wires	0.03-2000Ω Auto-ranging
Prospective Short Circuit	0-6KA @ 230Vac
Operating Voltage	50-275Vac (50 Hz)
Best Performance at Rated Voltage	230Vac ±20% Max.10A
Operating Temperature	0°C ~ 40°C
Operating Humidity	80% Maximum
Storage Temperature	-20°C ~ 60°C
Storage Humidity	85% Maximum
Accuracy of Voltages	±1% (210~250V) ±3% otherwise
Accuracy Loops / Earth And Wires Impedances	±2%(0.05~50Ω)±3%(50~500Ω) ±15% (above 500Ω)
Dimensions	250(L) x 190(W) x 110(D)mm
Weight	Approx.1500g (battery included)
Power Source	1.5V(AA) x 8 Batteries
Accessories	Test leads (AL-34) Instruction manual Shoulder belt

FAULT FINDING AND ANALYZING THE ELECTRICAL NETWORK



- V_G = Voltage of the generator (supply transformer) (internal impedance of transformer = X-Form)
- Z_L = Impedance of the line wire from the transformer, up to the test point (Z_L displayed by Instrument also includes X-Form). If this impedance is too high, check the connections of the line wiring, check the quality of the line wiring and the switches / contacts in the line circuit.
- Z_N = Impedance of the neutral wire from the transformer, up to the test point. If this impedance is too high, check the connections of the neutral wiring, check the quality of the line wiring and the switches or contacts in the neutral circuit.
- Z_E = Impedance of the earth wire, including the earth impedance itself, as seen by the protection system. similar checking, specially at the bounding points should be done is this path impedance is too high.



AL-34

BET-2800



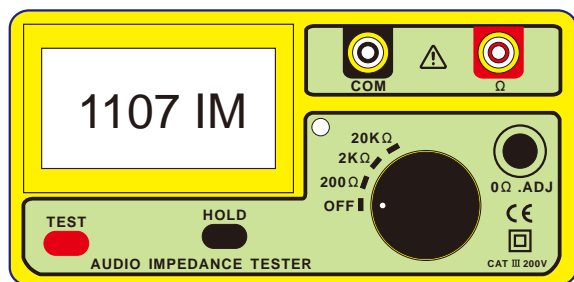
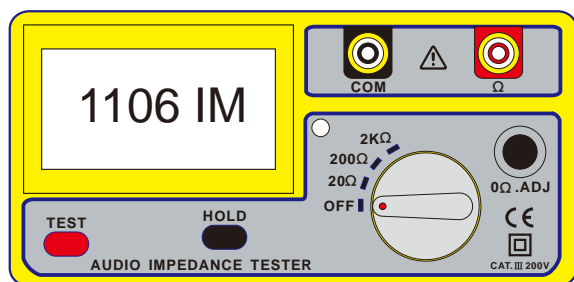


CE

1106 IM

FEATURES

- Large LCD display 68 x 34mm(1.338" x 2.677").
- True measurement of speaker systems actual impedance at 1kHz.
- Three test ranges allow testing of home theatre and commercial sound systems.
- Measures transformer impedances.
- Battery operation.
- Low battery indication.
- Data hold function.
- 0Ω adjustment.
- EN 61010-1 CAT III 200V.
EN 61326-1



SPECIFICATIONS

Model	1106 IM	1107 IM
Measuring Ranges	0-20Ω /0-200Ω /0-2kΩ	0-200Ω /0-2kΩ /0-20kΩ
Test Frequency	1kHz	
Accuracy	20Ω : ±2%rdg ±2dgt or ±0.1Ω Which is greater 200Ω/2kΩ : ±2%rdg ±2dgt	200Ω/2kΩ : ±2%rdg ±2dgt 20KΩ : ±3%rdg ±2dgt
Low Battery Indication	" " Symbol appears on the display	
Data Hold Indication	" " Symbol appears on the display	
Display	LCD 3 digit (2000 counts)	
Dimensions	175(L) x 85 (W) x 75(D)mm	
Weight	Approx. 600g (battery included)	
Power Source	1.5V (AA) x 8 or equivalent	
Accessories	Test leads Carrying case Instruction manual Batteries	

HOW TO USE

- It is recommended a drawing be first made of the speaker system to verify proper installation.
- Take care to ensure that the system is not connected to the amplifier.
- Ensure the system under test is not live.
- Check battery, if " " symbol appears on the display, replace with new batteries.
- Short the tips of the leads, adjust the "0Ω. ADJ", control to set the reading of zero.
- Connect test leads to speaker or speaker leads.
Note : Speakers may be connected together either in series or parallel to achieve desired final impedance.
- Rotary the function switch to suitable range then press the push button to test and take the reading.

Example : Measure system power-an 10W up (1106 IM)

$$P=ZI^2$$

$$P=V^2 / Z$$

For example on a 100V system :

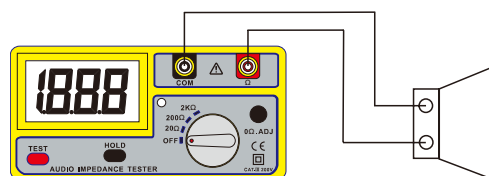
$$\text{If } P=50W \quad Z=V^2 / P=100^2 / 50=200\Omega$$

(1)The tester can measure load down to 2kΩ. (5W at 100V line).

(2)The tester can't measure 100V system with power lower than 5W.

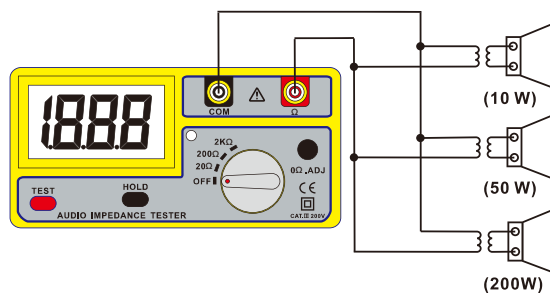
- Checking a speaker :

Speakers are general from 2 to 16Ω, use 20Ω range or for higher impedance speaker, use 200Ω or 2kΩ range.



● Checking a PA system :

PA system example, using a 100V configuration:



$$Z = V^2 / P = 100^2 / P = 10000 / (10 + 50 + 200) = 38.46\Omega$$

(1) If Z measured is lower, check for short circuited wires or faulty speakers or transformers.

(2) If Z measured is higher, check for wiring or components (speakers, transformers or connections).

Most amplifiers are designed for use with total loads between 4Ω and 8Ω . Total loads in excess of 8 will not cause damage to the amplifier but may cause a reduction in volume output. However, loads that are less than 4Ω will cause the amplifier to generate excessive heat, and will ultimately cause permanent damage.

Speaker systems with 70.7V or 25V transformers large building commercial sound and PA systems typically utilize a 70.7 volt or 25 volt transformers at each speaker and must be connected to PA amplifiers with such outputs. The benefit of this system is that it greatly eases the connection of large numbers of speakers to a single amplifier, and it allows the use of smaller gauge speaker wire over greater distances without signal loss.

Speakers equipped with such transformers will typically have multiple inputs at varying wattages. If all speakers in a given system use the same input wattage tap, the volume at each speaker will be equal. If more sound volume is desired at particular speakers, a higher wattage tap may be used at those speakers. The total wattage of all speakers added together must not exceed the wattage output of the amplifier channel in which they are connected.

To measure speaker systems of this type, the impedance reading must be converted to Watts for your specific system.

To ease the calculation of this type of system, the following charts are provided

Voltage System	★ 1 Impedance Reading(Ω)								
25V	63	48	39	33	28	25	22	20	18
70.7V	500	384	312	263	227	200	179	161	147
100V	1000	769	625	526	455	400	357	323	294
Wattage(W)	10	13	16	19	22	25	28	31	34

Voltage System	★ 2 Impedance Reading(Ω)												
25V	2500	1250	625	63	31	21	16	13	10	9	8	7	6
70.7V	20K	10K	5K	500	250	167	125	100	83	71	62	56	50
100V		20K	10K	1000	500	333	250	200	167	143	125	111	100
Wattage(W)	0.25	0.5	1	10	20	30	40	50	60	70	80	90	100

★1 : $P = V^2 / Z = 100^2 / 1000 = 10000 / 1000 = 10W$

★2 : $P = V^2 / Z = 70.7^2 / 5000 = 5000 / 5000 = 1W$



AL-24A

CAC-1132



CE

1506 IM



CE

2706 IM

FEATURES

- High quality Taut Band movement.
- Battery-powered audio impedance tester.
- Timer function for hand free use.
- Battery indicator.
- The tester measure with a frequency of 1kHz.
- Measure speaker's impedance.
- Measure speaker lines(connected to load).
- Help to calculate and check audio power systems.
- Ideal for public address installation and maintenance.
- Measure transformer impedances.
- IEC 1010 CAT III 100V.

SPECIFICATIONS

Measuring System	Constant current inverter with 1KHz approx. 2mA
Measuring Ranges	20Ω/200Ω/2KΩ
Accuracy	±2.5% of full scale
Power Source	1.5V (AA)x6
Dimensions	163(L) x 100(W) x 50(D)mm
Weight	Approx.420g (battery included)
Accessories	Test leads Heavy-duty case Instruction manual Batteries

FEATURES

- True measurement of speaker systems actual impedance at 1kHz.
- Tree test ranges (20Ω/200Ω/2000Ω) allow testing of home theater and commercial sound systems.
- Measures transformer impedances.
- Battery operation.
- Low battery indication.
- Data hold function.
- Timer function for continuous hands free operation.
- The timer can last about 3-5 minutes when users press
- TEST ON/OFF button.
- EN 61010-1 CAT III 100V
EN 61326-1.

SPECIFICATIONS

Measuring Ranges	0-20 / 0-200 / 0-2000Ω
Test Frequency	1kHz
Accuracy	20Ω : ±2%rdg ±2dgt or ±0.1Ω ,which is greater 200Ω /2000Ω : ±2%rdg ±2dgt
Low Battery Indication	""
Data Hold Indication	""
Display	LCD 3½ digit (2000 counts)
Dimensions	205(L) x 90 (W) x 55(D)mm
Weight	Approx. 530g (battery included)
Power Source	1.5V (AA) x 6 or equivalent
Accessories	Test leads Heavy-duty case Instruction manual Batteries



AL-24A

TOC-1504



Power Source : 110V AC or 230V AC

Power Source : 12V DC

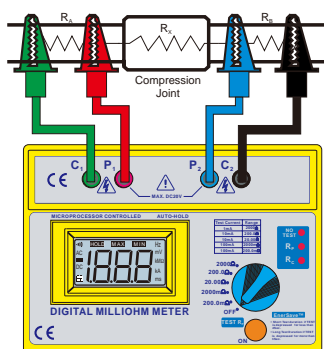
FEATURES

- Four terminal measurement.
- Measures down to 100 $\mu\Omega$.
- 5 Ranges from 200.0m Ω to 2000 Ω .
- Maximum resolution of 100 $\mu\Omega$
- Three test currents with over-temperature protection.
- Protection against inadvertent connection to over-voltage.
- Large LCD.
- Potential lead resistance, current lead resistance checks.
- "Full-Featured" EnerSave™ inside.
- EnerSave™ AUTO-HOLD.
- EnerSave™ AUTO-OFF.
- Lightweight, robust & compact.
- Indicators show if reading may be invalid (R_p , R_c , and temperature).
- "O-Ring" sealed case.
- Future optional rechargeable battery.
- EN 61010-1 CAT III 20V
- EN 61326-1.

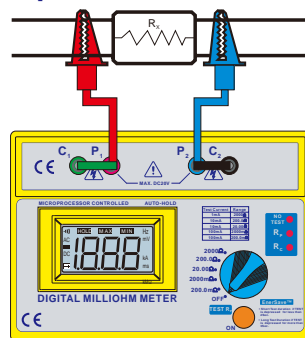
SPECIFICATIONS

Measuring Ranges	0-200.0m Ω in steps of 100 $\mu\Omega$ 0-2000m Ω in steps of 1m Ω 0-20.00 Ω in steps of 10m Ω 0-200.0 Ω in steps of 100m Ω 0-2000 Ω in steps of 1 Ω
Accuracy	$\pm 0.5\%$ of reading ± 2 digits over the operating temperature range, -15°C to $+55^\circ\text{C}$, with the supplied test leads
Test Current	1mA \Rightarrow 2000 Ω range 10mA \Rightarrow 200/ 20 Ω ranges 100mA \Rightarrow 2000m / 200m Ω ranges
Test Current Accuracy	$\pm 0.1\%$
Protection Fuses	Mains = 0.5A, HBC, 5 x 20mm, DIN Current = 0.5A, HBC, 5 x 20mm, DIN Voltage = 0.5A, HBC, 5 x 20mm, DIN
Maximum Output Voltage (C1-C2)	20V
Dimensions	250(L) x 190(W) x 110(D)mm
Weight	4136mO:1530 g 4137mO:1500 g
Accessories	Test Leads Instruction manual Shoulder belt (BET-2800) 1.5V(AA) x 8 Batteries(4137mO)

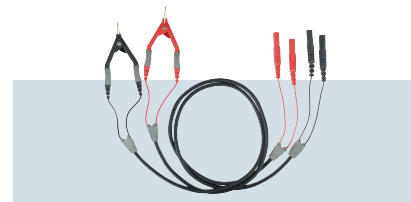
4 Terminal Test



Simplified Measurement



TEL-4136C A (option)



TEL-4136C B (option)



ISL-2811(only 4136 mO)





CE

6237 DLRO

FEATURES

- Microprocessor controlled.
- Measure down to $1\mu\Omega$.
- 6 ranges from $2.000m\Omega$ to 200.0Ω .
- Maximum resolution of $1\mu\Omega$.
- Three Test Current with Over- Temperature Protection.
- Four Terminal Measurement.
- Protection against inadvertent connection to over-voltage.(crow bars for current and vorage)
- Clear & large LCD.
- Potential lead resistance, current lead resistance checks.
- "Full Featured" EnerSave™ Inside.
- EnerSave™ AUTO-HOLD.
- EnerSave™ AUTO-OFF.
- Rechargeable battery operated, robust & compact.
- Indicators shows if reading may be invalid (R_p , R_c).
- "O-Ring" sealed case.
- Portable - Rechargeable battery.
- EN 61010-1
- EN 61326-1



ISL-6237

CHA-17V

AL-34

The **6237 DLRO** is a "full feature professional instrument". The **RUGGED and "O-RING" SEALED** Digital Low Resistance Ohm and Contact Meter is specially designed to **measure very low resistance** accurately and give the result directly on the **large and clear LCD**. The 6237 DLRO makes measurements by passing a **constant current** through the device under test (generally a conductor, contact or low resistance) and measuring the voltage across it. The Low Resistance is then calculated by ohm's law.

This superb instrument is powered by rechargeable battery. It is **supplied complete** with instruction manual.

This ensure that every product is not just fully functional and calibrated after the assembly lines, but also within tight specifications tolerances before leaving the **strict quality control** of Standard Electric Works.

It has visual LED checks for excessive; potential lead resistance (R_p) and current lead resistance (R_c). Should the instrument become too warm, the temperature sensor will shut down the current (ISCOFF).

This instrument is indispensable to laboratory applications and to field applications to measure bonding joints, circuit breakers contact resistance, fuse resistance, testing earth bonds in mines, rail bond when a rail is used as part of a communication system or for power transmission, Checking the plating quality on PCBs, contacts of relays, continuity or ring circuits and of protective conductors etc...

SPECIFICATIONS

Low Resistance Ranges / Resolution	0-2.000m Ω / $1\mu\Omega$ 0-20.00m Ω / $10\mu\Omega$ 0-200.0m Ω / $100\mu\Omega$ 0-2.000 Ω / $1m\Omega$ 0-20.00 Ω / $10m\Omega$ 0-200.0 Ω / $100m\Omega$
Accuracy	0-2.000m Ω : $\pm(5\%+5dgt)$ 0-20.00m Ω : $\pm(4\%+4dgt)$ 0-200.0m Ω : $\pm(4\%+4dgt)$ 0-2.000 Ω : $\pm(3\%+4dgt)$ 0-20.00 Ω : $\pm(2\%+4dgt)$ 0-200.0 Ω : $\pm(2\%+4dgt)$
Test Current (dc)	2.000m Ω to 200.0m Ω : $1A\pm3\%$ 200.0m Ω to 20.0 Ω : $100mA\pm2\%$ 200.0 Ω : $10mA\pm1.5\%$
Maximum Output Voltage (C1-C2)	10V
Power Source	Rechargeable battery
Dimension	330(L) x 260(W) x 160(D) mm
Weight	Approx. 3.2kg(battery included)
Accessories	Test leads Charger Instruction manual





PC 7K
 PC11K
 PC22K
 PC33K
 PC44K
 (No CE Approval)

FEATURES

- Designed to Exceeds VDE 0681 part 5.
- No user's assembled parts.
- Dual Color Coded Scale (% , Vac).
- Neon indicator lit when >1200Vac.
- Light weight, Robust & Compact.
- Carry Case included.
- Compare between Phases.
- Measure and test Phase to Earth.
- High Quality Fibreglass wound Rod.
- Self Powered operation -No Battery-
- DC version available.
- Measure Phase to Phase.
- Hi immunity to interference fields.
- Suitable for indoor and outdoor use.
- Current is limited to ± 1 milli-ampere
- Grounded or Ungrounded systems.
- Voltage Color Coded -O-Y-G-B-R.
- Factory Test Certificates.
- Meets IEC 61481 : 2001

This NEW PC range of High Voltage Multifunction Phasing Sticks are: all-in-one, a Phase Comparator with color coded scale indication, a Voltage Detector with Neon Indication and a Scaled Voltmeter. They are available in five models for applications up to 44kV systems (6.6kV, 11kV, 22kV, 33kV and 44kV).

The NEW PC range of Multifunction Phasing Sticks utilizes a long established technique to detect and measure High Voltages and perform phasing tests. These Dual Poles instruments incorporates modern, high quality glass fiber front end, composite polyurethane main body molding to give tough and very light weight construction and superior safety features. They have Analog Color Coded Dual Scales and Neon indication.

They are not just VDE0681 part 5 compliant and IEC1243-2. They are practical and efficient. Because of their multifunction capabilities, you do not need to buy separates instruments, You can therefore stay within your budget without compromise.

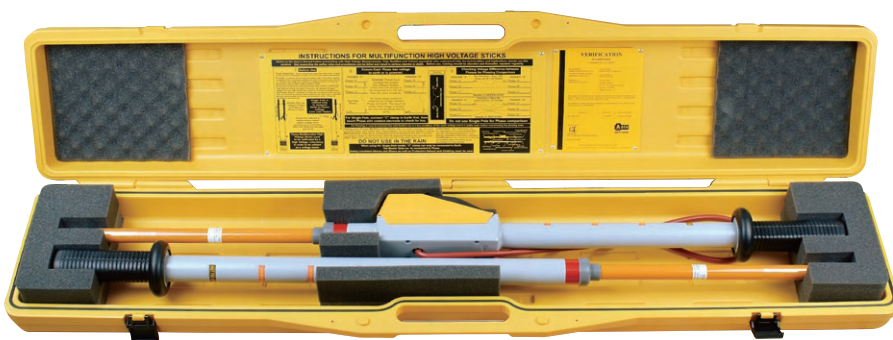
They are supplied complete with instruction manual and two FACTORY test report certificates and, optionally, a calibration certificate. They are housed in a superb High Quality modern Plastic Case with shock absorbing foam. The New PS range is self powered and does not requires battery. They are suitable for indoor and outdoor use (in dry weather). They do not require dismantling or re-assembling and do not have any user's assembled parts, so eliminating the risks of assembly mistake and accidents during High Voltage Work in a breakdown situation.

The NEW PC range does not have any dangerous, user selectable/assembled metal parts exposed to high voltage, thus, the user can't be exposed to lethal voltage while handling or testing with the new PC range. They are over-designed for increased user protection and are lighter than any other sticks on the market today. The indicator has been screened for high immunity to interference fields.

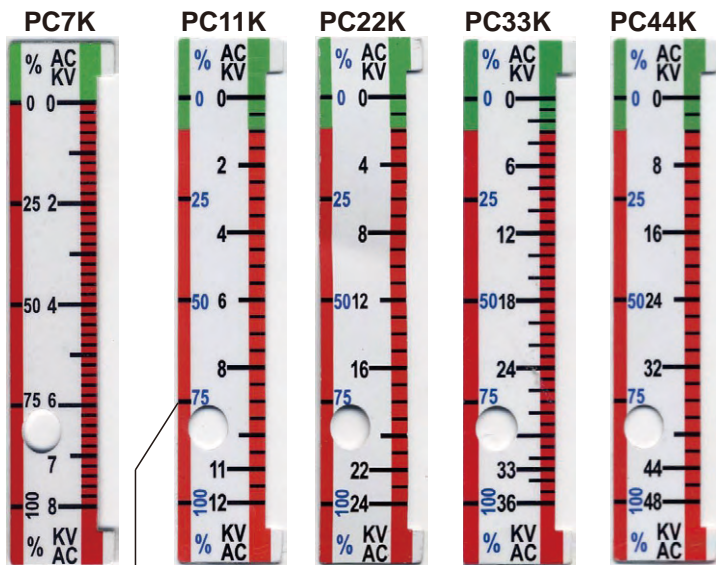
They determine the voltage and positively identify phases up to 44kV. We have measuring ranges from 6.6kV up to 44kV systems but others voltages can be manufactured on request.

Fiberglass is of hot stick quality and tested to IEC specs (100kV / 300mm for 1 min). All front end (resistors) are encapsulated. These analog Multifunction Phasing Sticks are ideally suited for testing of grounded or ungrounded systems. Important applications include checking voltage fuses, testing for correct phase connections, and for absence of high voltage on de-energized lines or apparatus. The Dual scale read direct (no multiplier) in kVac or in % of full scale and is color coded (Green = in phase Red = out of phase). A Bright neon is included on the scale for easy visibility indoor and it has dual purpose. The neon is also a detector and start to lit when the voltage across the poles is higher than 1200Vac. In case of unlikely failure of the analog scale indicator, the neon can be used as voltage detector.

Our Manufacturing process and method ensure that every product is not just fully functional and calibrated after the assembly lines, but also within tight specifications tolerances before leaving the strict quality control of the factory. They are then re-checked, re-calibrated (optionally) and certified by an independent recognized authority. All our PC testers are versatile and single range for added safety. They have low metal content and nylon is used wherever possible. They are equipped with two fixed-length poles connected by a strong flexible, insulated cable. Hand guards are standard on all models. They are easy to handle, light weight, well insulated and designed to ensure maximum operator safety.



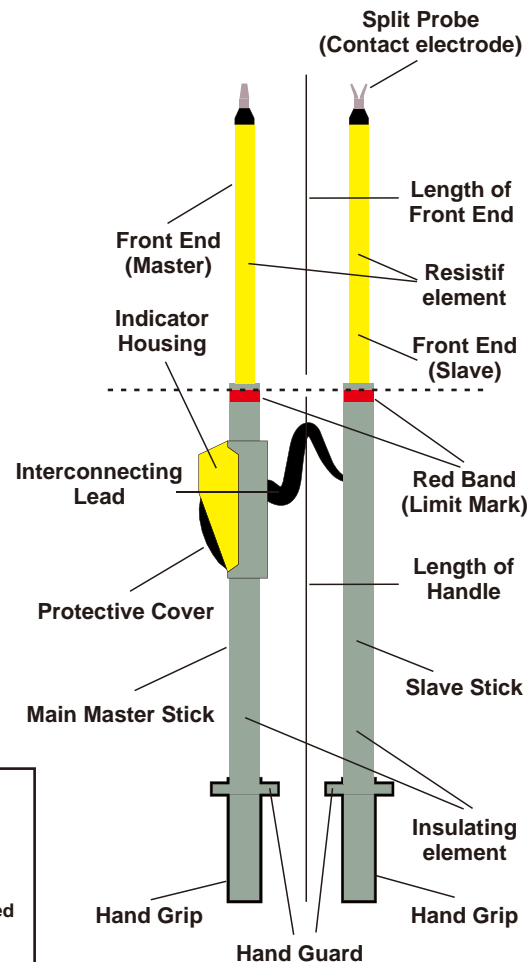
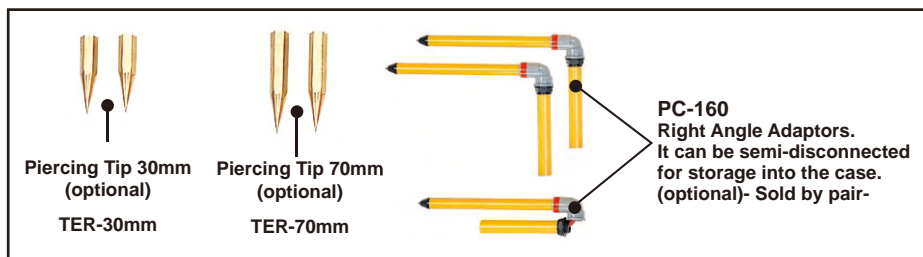
Scales (samples)



Neon Indicator

ACCESSORIES(OPTIONAL) :

The Piercing Tips are utilized to pierce through Silicon, Silicon, Silicon grease or Insulating Material when required.



Range of Models

- Models are available to cover system voltages from 1kV to 44kV @50 or 60Hz.
- Contact the factory for information on models suitable for other Voltages.
- All models have Neon and Analog Panel Meter Indicators.
- The following models are available as standard Instruments :

Model	System Voltage Voltage	Full Scale Voltage	Maximum Voltage
PC7K	6.6kV	8kV	9kV
PC11K	11kV	12kV	15kV
PC22K	22kV	24kV	30kV
PC33K	33kV	36kV	40kV
PC44K	44kV	48kV	55kV

SPECIFICATIONS

Electrical	PC7K	PC11K	PC22K	PC33K	PC44K
Total Resistance	4.48MΩ	6.78MΩ	10.82MΩ	19.68MΩ	26.8MΩ
Response time	<1Sec	<1Sec	<1Sec	<1Sec	<1Sec
Neon Threshold	1.2kV	1.2kV	1.2kV	1.2kV	1.2kV
Neon Lit Fully @	1.5kV	1.5kV	1.5kV	1.5kV	1.5kV

Mechanical	PC7K	PC11K	PC22K	PC33K	PC44K
Length of Handle	775mm	775mm	775mm	775mm	775mm
Length Front End	400mm	400mm	500mm	665mm	820mm
Total Length	1.175m	1.175m	1.275m	1.440m	1.595m
Total Weight	2.1kg	2.1kg	2.2kg	2.4kg	2.5kg

Handle Materia Composite Material with Polyurethane
Front End Fiber Glass Wound Tubing

Environmental

Operating temperature : -25°C to +55°C
Operating Humidity : 20 to 96% RH.

Due to our policy of constant improvement and development, we reserve the right to change specifications without notice.
Contact the factory for the latest product specifications.





2713 PU

The high voltage proving unit for high voltage testers is utilized to determine if the devices under test are functionally working.

The high voltage proving unit is not a calibrator and can't be utilized for calibration.

The high voltage proving unit for high voltage testers can be utilized to proof contact devices on a momentary basis (press on, check, release).

FEATURES

- Designed to proof :
 - phasing sticks.
 - high voltage detectors (contact type only, not to be used with non contact proximity detectors).
 - high voltage and voltage testers.
- Battery operated.
- Led indicates when power is "ON".
- Small and hand held.
- Quick connection with normal 4mm test leads.

SPECIFICATIONS

Voltage Settings (Internal Jumpers Selectable)	500 Vdc 1000 Vdc 2500 Vdc 5000 Vdc (default setting)
Over-Current Protection	Yes
Power on Indicator	Yes
Operating Temperature	- 5°C to 45°C
Storage Temperature	- 10°C to 85°C
Dimensions	205(L) x 90(W) x 55(D)mm
Weight	Approx. 510 g (battery included)
Power Source	1.5V (AA) x6 or equivalent
Accessories	Test leads (AL-30AR+AL-30AB) Heavy-dutybase (TOC-2751) Batteries

Proving second source equivalents or compatible models

The high voltage proving unit for voltage testers output a DC voltage of around 5000Vdc (factory setting).

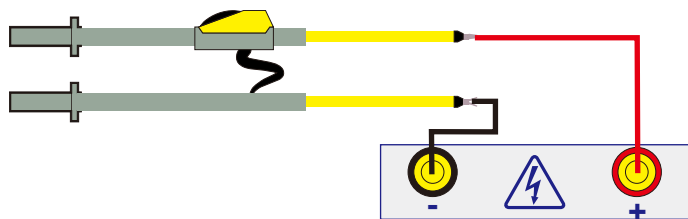
This unit has been designed to deviate most of the voltage testers and the voltage detectors. It can be used with most of the phasing sticks and voltage testers which can accept 5000V input. This unit is basically a low current 5000Vdc supply. The output current is limited. To save battery life, it is recommended to depress the test button for short period of time only.

Proofing PC xxk - Multifunction Voltage Testers

The master pole must be connected to the positive socket of the proofing unit.

The slave pole must be connected to the negative socket of the proofing unit.

The test button of the proofing unit must be depressed for a short time only. During that short time, the neon voltage detector must lit and the panel meter must deviate and show increase in the voltage, then come back down.

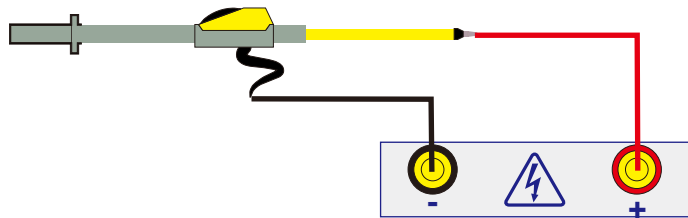


Proofing PC xxk - Voltage Testers

The master pole must be connected to the positive socket of the proofing unit.

The earth prod (or earth wire) must be connected to the negative socket of the proofing unit.

The test button of the proofing unit must be depressed for a short time only. During that short time, the neon voltage detector must lit and the panel meter must deviate and show increase in the voltage, then come back down.





CE

213 HVD

FEATURES

- Excellent Shock Resistance.
- Rugged Nylon moulding.
- Auto-ON(when Voltage Detected).
- Excellent Drop Resistance.
- Good Vibration Resistance.
- Loud Sound Alarm Indication.
- Built-in Proving and self-test circuit.
- High Bright Color Coded LEDS.
- Works from normal 9V battery.
- Interchangeable Contact Electrode.
- Use in All Whether Conditions.
- Compatible with all link sticks.
- Lightweight, Robust & Compact.
- Models available from 11kV to 132kV.
- Suitable for indoor and outdoor use.
- Self(Auto-ON) or Manual Arming.
- Easy access to batteries.
- Customized threshold on demand.
- Auto-Off(if no voltage detected).
- Meets IEC 61243-1
IEC 60068-2-2
IEC 60068-2-6
IEC 60068-2-32
IEC 60529

This family of Capacitive High Voltage Detectors have been designed to meet the latest IEC standards.

Our HVD are self starting and automatically activated when the High Voltage is applied to the contact electrode.

They can also be manually armed before use by depressing the "TEST/ARMING" button.

These detectors are intended for use on sinusoidal (50 or 60Hz) High Voltage Systems.

Models are available to cover systems voltage from 11kV to 132kV.

Our Detectors are utilized to determine if a system is live or not, so that it maybe safely earthed/grounded.

All our models are designed for outdoor, but can be utilized indoor and in all wheather condition.

This family of capacitive High Voltage Detectors are housed in a rugged, reinforced nylon moulded casing and are shock drop and vibration resistant.

Non-standard threshold voltages can be customized to suit applications requirements

The HVD have a low battery detection which inhibit manual arming when the battery is too low.

The Nylon case is easy to clean and maintain and the HVDs are supplied with the cleaning kit.

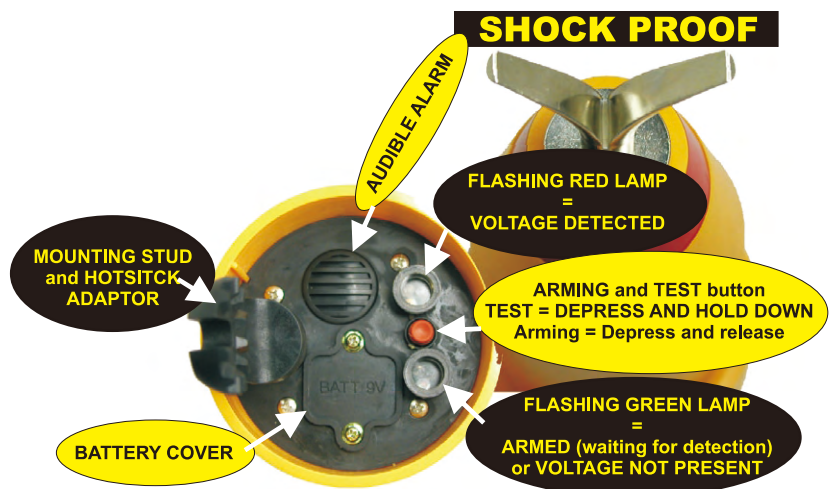
A visual indication shows when the HVD is armed. When armed, the Green Leds flashes about twice per second.

When HV is detected, the Red leds flashes about twice per second and the buzzer also buzz intermittently.

A range of accessories is available.

Dimensions : 300(L) x 100(W) x 100(D)mm

Weight : Approx. 550g(battery included)



CLEAR INDICATION OF VOLTAGE DETECTED



MODELS AND COMPARISON TABLE

PART#	213HVD	214HVD	215HVD	216HVD	217HVD	218HVD	219HVD	220HVD	221HVD	222HVD	223HVD	224HVD	225HVD
System Voltage	11kV	33kV	66kV	132kV	11/33kV	44/132kV	66/132kV	6.6/132kV	11/132kV	11/44kV	33/132kV	44kV	KV USER DEFINED
Threshold Set within Range	1.65kV To 4.4kV	4.95kV To 13.2kV	9.9kV To 26.4kV	19.8kV To 52.8kV	3.3kV To 4.95kV	13.2kV To 19.8kV	19.8kV To 26.4kV	2 kV To 3 kV	4.4 kV To 6.6 kV	4.4 kV To 5 kV	13.2kV To 29.7kV	6.6kV To 17.6 kV	Xx kV To Xx KV
Response Time	<1 Sec	<1 Sec	<1 Sec	<1 Sec	<1 Sec	<1 Sec	<1 Sec	<1 Sec	<1 Sec	<1 Sec	<1 Sec	<1 Sec	<1 Sec
Auto-OFF ¹	3Min	3Min	3Min	3Min	3Min	3Min	3Min	3Min	3Min	3Min	3Min	3Min	±3Min
Bridging Protection ²	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Spark Protection ³	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Battery Low ⁴	<7V	<7V	<7V	<7V	<7V	<7V	<7V	<7V	<7V	<7V	<7V	<7V	<7V
Threshold ⁵	3.02kV	9.07kV	18.15kV	36.3kV	4.12kV	16.5kV	23.1kV	2.5kV	5kV	4.75kV	15kV	12.1kV	User's Spec.
Battery Current ⁶	<30mA	<30mA	<30mA	<30mA	<30mA	<30mA	<30mA	<30mA	<30mA	<30mA	<30mA	<30mA	<30mA
Green = Armed ⁷	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Red = V Detected ⁸	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Test / Arming Button ⁹	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Please note the internal proofing circuit does not test the contact electrode and the protection devices.

HOT STICK



CE

HS-120

BRIEF DESCRIPTION AND WHERE TO USE IT

The Hot Stick kit can be used for the extraction of House Service Fuses, it can also be used for disconnecting dropout fuses, isolators & fuse switch disconnections.

The Hot Sticks can be attached to the 275 HP Proximity Detectors. These stick are the perfect companion for our Contact Capacitive Detectors 21x HVD.

Our Hot Sticks can be used for many other applications, for example on overhead power lines or any application which requires insulating sticks made of high quality fiber glass to protect and insulate personal from High Voltage.

A wide variety of specialised fittings and tools are available to fit the "sunrise" head attachment.

The Head Section is rated at 100kV per 300mm. It is make out of Orange, High Quality Fiber glass, Super Polished, Filled and tested to IEC60855.

If comes complete with Sunrise Fitting and Fuse Extractor as shown below.

- The Complete Household Service Extraction Kit.
- The hot stick consists of - 3 x 1.8 meter sticks 1 x 1.2 meter head section complete with universal sunrise fitting.
- 1 x carry bag.
- IEC 60855



Disconnect Hook for attachment to Sunrise Fitting

(Option)



Fuse Extractor Head, also called Pig Tail



CE

275 HP

United States Design Patent : US D474, 705 S

FEATURES

- Sealed by "O" rings
- 8 voltage settings : 240Vac, 2kV, 6kV, 11kV, 22kV, 33kV, 132kV, and 275kV
- High bright LEDs visual indication
- Sound indication
- Easy-to-prove method
- Self-test selection
- Use 3 x 1.5V "C" batteries
- High impact nylon casing
- Non-contact work by proximity
- Compatible with most link sticks
- Light weight, robust, & compact
- Suitable for indoor and outdoor use
- Detect low voltage on any systems
- Easy access to batteries
- No special parts needed
- Simple and efficient to use
- Meets EN61326-1 EN55011
EN61000-4-2 EN61000-4-3

The SEW275 HP is a high voltage proximity detector. It has eight voltage detection settings from 240Vac to 500kVac. The 275 HP consists of an internal pickup sensor plate, a sensitivity selector, a visual and a sound annunciator. With the 275 HP, physical contact with electrical conductors is not necessary when testing for live lines. This tester works by proximity.

Its sensor senses the radiated field which surrounds live conductors. Radiated field strength increases with voltage and decreases quickly with distance or earth shielding. The radiated field from a cable of closely bunched conductors supplied by three phase power tends to cancel (See "Limitations of use" paragraph). Detecting distance of a 250Vac single live wire is approximately 10cm. With a bunched neutral and earth cable, as in a flexible cable, the distance is reduced to 5cm.

Some of the typical uses are : identify and check live cables ; find fault in flexible cables ; check earth equipment ; service neon lightning ; trace live wires ; check high frequency radiation ; detect residual or induced voltages. For example, faults in damaged flexible cables are found by applying low voltage to each conductor. Earthing the remainder and moving the tester along the cable until the change in condition is obtained. (Flexible cables which are used in mining and building industries, are readily repairable when the break in the cable is located.)

When testing for high voltage, the rotary switch (attenuator) is used to identify and differentiate various HV live cables. The tester must be used in conjunction with a long and insulation rod when measuring high voltage (kV). However, the 275 HP is a non-contact tester and it is advised that the tester should never come into contact with cables (kV) as this tester is merely a non-contact AC proximity tester.

Checking or proofing the tester is easy. Switch the sensitivity to 240V and place the dome against a low voltage live conductor or rub the dome with a cloth or against an item of clothing as this generates a static DC which triggers the detection of circuit. The light and beeper should go "on" as if a live wire is being.

Expected test results (laboratory testing) :

Range	Operated from
240V	Variable from 80V or depending on the type of source
2kV	250V
6kV	500V
11kV	1000V
22kV	1500V
33kV	4000V
132kV	8000V
275kV	22kV

Typical observation of test results made in the field :

Range	Min. Detection Voltage (MDV)	MDV as % of Line Voltage
11kV	1kV	9.1%
22kV	2kV	9.1%
33kV	3.1kV	9.4%
132kV	12.5kV	9.5%
275kV	22.5kV	8.2%



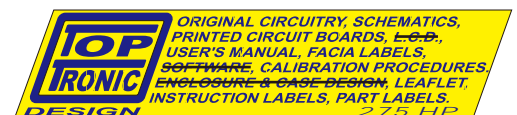
CAZ-275Y

TOC-275

LIMITATIONS OF USE :

It is recommended that the 275 HP is not used in HV yards of mixed voltages, In the presence of mixed voltages, the tester can become unreliable.

Problems can arise when the tertiary circuit of a 275/133/11kV transformer is tested. The electric field of the HV and MV bus bars can trigger the detector when it is about 3m above the ground. This common with most of the electric field voltage detectors, and the users should be aware of it. The tester can pick up adjacent circuit to the one being tested and indicate the wrong information to the user.





RATINGS AND SPECIFICATIONS

- **Working voltage range :**
H.V. : 3kV~24kV AC..... hold grip portion to detect.
L.V. : 80V~600V AC..... hold nameplate portion to detect.
- **Frequency :** 50Hz / 60Hz
- **Operation Test : (Initial voltage)**
 - (a)When stretched, hold the grip portion.
Put the sensing tip in contact with the voltage : 250V AC \pm 0V the LED and buzzer should work.
 - (b)When retracted, hold the nameplate portion.
Put the sensing tip in contact with the voltage : 80VAC or below the LED and buzzer should work.
- **Operation start distance**
Distance at which operation starts when front metal is brought near \varnothing 5mm O.C. wire with grip portion held by hand.
Where 24kV / \varnothing 3mm(voltage to ground)abt 20cm.
Where 6.6kV / \varnothing 3mm (voltage to ground)abt 3cm.
Where 3.3kV / \varnothing 3mm (voltage to ground)abt 1cm.
- **Dielectric Strength :**
 - (a)Between Sensing tip ~ Grip portion : 50kV AC, 1 min
(The detector has to be stretched)
 - (b)Between Sensing tip ~ Nameplate portion : 4kV AC, 1min.
- **Construction :**
Waterproof (detecting head impervious to water).
- **Insulation resistance :**
Measure the insulation resistance with the high voltage insulation tester.
The areas we measure are the same as Dielectric strength test.
 - (a)Between Sensing tip ~ Grip portion : 1kV
(The detector has to be stretched)
The insulation resistance has to be more than 2000 M Ω
 - (b) Between Sensing tip ~ Nameplate portion : 1kV The insulation resistance has to be more than 2000 M Ω
- **Leakage Current Test :**
Put high voltage on the parts listed below.
 - (a) Between Sensing tip ~ Grip portion : 50kV AC, 1 min
(The detector has to be stretched)
The leakage current has to be 100 uA or less than 100 uA
 - (b) Between Sensing tip~Nameplate portion : 4kV AC, 1min. The leakage current has to be 100 uA or less than 100 uA.
- **Working temperature range :** -10°C ~ +50°C
- **Battery :** 2 button-cells LR44(1.5V)

This Model 276HD detects the presence of voltage in AC lines. An elongate insulation rod permits checking of high tension circuits at safe distance for voltage. The equipment is compact, light weight, and easy to handle, and is also available for voltage detection in low-tension circuits.

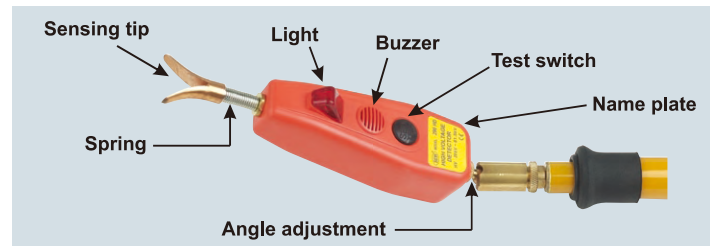
FEATURES

- **Telescopic, compact, light-weight**
The length is elastic from 354mm to 1005mm, The Equipment is light-weight (180g), easy to handle, and handy to carry.
- **High-voltage detectable**
The equipment, whether in stretched state is available for voltage detection in high-tension circuits (3.3kV, 6.6Kv and 24kV) whether the wires involved are naked or insulated.
- **Low-voltage detectable**
The equipment can be used for voltage detection in low-tension circuits (80V ~ 600V) by holding the nameplate portion of the detecting head. Before-use check can easily be done by plugging in an AC 100V plug socket, without using a tester.
- **Easy to recognize indication**
Intermittent lighting in red of a high intensity light-emitting diode and intermittent audible sound of an electronic buzzer are readily recognizable at a full daylight, noisy location.
- **Waterproof**
The detecting head, being tightly enclosed, is free from any trouble due to dust, dirt, water or the like.
- Meets EN 61010-1 EN 50081-1 EN 55082-1
EN 55022 EN 61000-4-2 EN 61000-4-3

The detector detects a high and extra high voltage in AC lines. An elongate insulation rod permits checking of high tension circuits at safe distance for voltage. Also it is telescopic compact, light-weight, easy to use and handy.

FEATURES

- Telescopic, compact, light-weight.
- Light weight easy to use and handy.
- High-voltage detectable
The equipment, whether in stretched state is available for voltage detection in high-tension.
- Easy to recognize indication
Intermittent lighting in red of a high intensity light emitting diode and intermittent audible sound of an electronic buzzer are easy recognizable at a full daylight, noisy location.
- Water proof
The detecting head, being tightly enclosed, is free from any trouble due to dust, water.
- IEC / EN 61243-1



SPECIFICATIONS

Model	230 HD	290 HD	
Measuring voltage range	6kV ~36.5kV	6kV~81.5kV	
Operation start voltage (To ground)	2.7kV	2.7kV	
Display	Light : Flashing red light. Sound : Intermittent sound 50 dB apart 3 m.		
Overall length	Retracted	893 ± 50mm	1370 ± 50mm
	Extracted	1520 ± 50mm	2450 ± 50mm
Frequency	50/60Hz		
Operating temperature	-10°C~50°C		
Battery	2 button-cells LR44(1.5V)		
Weight	485g (battery included)	590g (battery included)	
Accessory	Instruction manual Carrying case		

SPECIFICATIONS

Withstand voltage (On insulating rod)	100kV / 300mm : 5 minutes
Insulation resistance	2000M min by 1kV / DC megger at the same testing location as withstand voltage
Leakage current	100uA or less than 100uA at withstand voltage test
Construction	Water proof (detecting head impervious to water)



230 HD

290 HD



CE

288 SVD

FEATURES

- Warning Proximity of AC Voltage (240V~50 kV).
- Water Proof.
- Easy to wear on Body, Belt.
- Ultra High bright LED indication.
- High Pitch Sound indication.
- Test & Diagnostic Circuitry.
- Friendly Priority Alert Reporting.
- Circuit Test Function.
- High impact type casing.
- Different Alerting Sound & Light.
- Can be adapted to Sunrise (stick).



The **Body-Prox 288SVD** is a **Personal Safety Voltage Proximity Detector**.

It is a designed to alert the user that they are approaching live equipment where dangerous voltage is present.

The **Body-Prox** tells the user to stay at a safe distance from live equipments, therefore it protect and safeguard people from approaching dangerous Live High Voltage equipment or cable. **Live Alert** is shown by a ultra bright **LED** on the front panel and heard via a **Buzzer**.

When Live equipment is detected near the user's body, the user will be alerted of the PROXIMITY OF LIVE equipment by the AUDIO ALERT (beeping) and the VISUAL ALERT (LED flashing) twice per second. The 288SVD is an ultra low consumption product and can be used for months without replacing the 9V battery. It can be tested by pressing both front panel buttons to proof the tester is working properly.

Should the battery become too low, a low battery indication will keep the buzzer and lit the led shortly every 5 seconds.

The **Body-Prox** is water proof and can be used in all weathers. It has no voltage selection and the user does not need to know how to operate complicated test equipment. It is designed to be simple to use. It only require to proof it's good working condition.

This is done by simply depressing the two push buttons situated on the front panel.

A very easy to understand "Priority Alert" Reporting System (Audio and Visual) let the user know if an ac signal has been detected in the proximity (Buzzer and Red Light, BOTH "operates shortly twice per second"). Body-Prox, alert if battery is Low (Buzzer and Red LED, BOTH "operates shortly every 5 seconds) per second".

- Removable neck belt.
- Suitable for indoor and outdoor use.
- Detect voltage on any systems.
- Low Battery Indication.
- All OK test indication.
- Ultra low power consumption.
- Meets EN 61326 EN 55011 EN 61000-4-2 EN 61000-4-3

Body-Prox FACTS & TIPS

- Worn on the outside of clothing facing the direction of movement.
- Safety Warning for Utility, Industrial or Rescue Personal.
- Clip to Belt, Pocket, Safety Helmet or any other safety gear.
- Worn around the neck using the removable neck lace/strap.
- Rugged for outdoor use.
- All Circuit integrity Test Buttons.
- Small and Light in weight.
- Never Sleeps - It is always "ON" and ready to warn you of danger.
- Alerted before touching.
- Detect the presence of High Voltage in the vicinity.
- Body-Prox is a necessary tool for the protection of human life.
- Used by non electrical employees which must work around HV or in an environment unknown to them.
- Does not require any knowledge of electricity to use.

GENERAL DESCRIPTION

The **288SVD** consist of an internal pickup AC sensor plate, a test (oscillator) and diagnostic circuit, an adjustable threshold comparator, a sound annunciator (buzzer), a visual indicator (super high bright led) and a 9V battery, all enclosed into the robust "beeper" style case.

The enclosure has a built-in clip to be able to be attached on the outer garments / external clothing or belt.

PRINCIPLE OF HOW IT WORK

The **288SVD** detects AC voltages using its internal AC sensor plate. The AC sensor plate pick up part of the radiated electric field in volts per meter (V/M). The electric field is amplified and processed by the internal circuitry and once the processed signal is above the threshold, triggers the input of a integrated circuit, which start the oscillator for the buzzer and led. The Buzzer beeps and Led lit intermittently at a rate of 2 beeps/flash per second. The "Self-test" diagnostic is actioned by depressing simultaneously both push button on the front panel. The battery monitoring is always ON. Please see the priority of alert on the front panel.

It is recommended that when the 288SVD is used in HV yards of mixed voltages: In the presence of mixed voltages, it could become difficult to determine exactly which source has been detected or which source created the alert. Always treat all sources as LIVE.





CE

286 SVD

286 SVD is a sensor for sensing AC High Voltage. It provides electric engineering personnel, power engineering personnel, firefighting personnel and instrument equipment workers with prominent warning when approaching high voltage and for taking necessary safety action, preventing illusion and misjudgment which could lead to electric shock to person.

When a person wearing 286 SVD is approaching high voltage source or equipment, the sensor will detect automatically and buzzer will generate a "Bi-Bi" short for warning and LED will give flash light to remind operators that the user is approaching a high voltage and special attention shall be given to the safety of operations.

FEATURES

- Compact, easy to wear and convenient in use.
- Usable both indoor and outdoor.
- Water-proof design.
- Equipped with self-testing functions.
- Sound and flash light warning of different frequencies varied positively with sensed voltages.
- Able to sense all kinds of AC High Voltage System.
- Low power consumption.
- EN 61326-1



SPECIFICATIONS

- Distance of starting warning : 80 cm for 11.4KV (6.6KV voltage to earth)
- Applicable frequency : 50 / 60 Hz
- Volume : 70dB or higher at 1 meter distance
- Operating Temp & Humidity : 5°C - 45°C/ 80% RH.
- Outside dimensions : 59(L) x 56(W) x18(H) mm
- Weight : 35g (incl. battery)
- Battery type : CR2032
- Battery life : 50 hours for continuous use.
- Accessories :
 - Elastic cord.
 - Band.
 - Bracket.
 - Instruction manual.
 - Battery.

METHOD OF USE

- **Inspection before use**
 - (1) Check the appearance and structure for any abnormality.
 - (2) Press Self-Test switch (about 10 seconds) to confirm all functions are working normally.
 - (3) To be careful and to avoid misjudgment, test the unit by contacting AC 110V insulated wire with its front side to see if it sounds and flashes.
- **Wearing**

Wear the unit to the outer side of fore arm with the sensing side faces outwardly, as shown in the following figure :

The effect is best when the sensing side is facing high voltage in right angle (90 Deg.). When it is worn at the inner side of arm or is covered by cloth, the sensitivity is poorer.





CE

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285 HD

285 HD High Voltage Detector is primarily used to detect the presence of an alternating field.

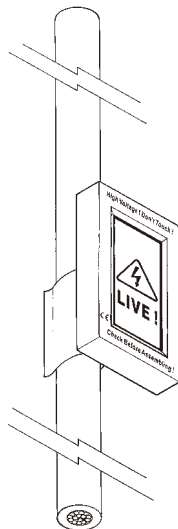
It shows identification of AC voltages. 285 HD has a large LCD that is housed in an ABS enclosure. 285 HD can be attached to the cable by a large metal clip and can be secured with a cable tie. The high voltage detector senses the radiated magnetic field surrounding the cable and shows a LIVE warning sign on the LCD.

FEATURES

- Three different ranges of identification of AC voltage:
 - 285-A HD : 3~7 kV
 - 285-B HD : 6.6~11 kV
 - 285-C HD : 10~22 kV
- The LCD will "flash continuously" for high voltage testing.
- Physical contact with electrical conductors is not necessary when testing for live wires.
- The 285 HD senses the radiated field that surrounds live conductors.
- Radiated field strength increases with voltage and decreases quickly with distance.
- Large LCD.
- Continuous monitoring.
- Easy to install.
- No batteries required.
- Weight: Approx. 80g.
- Meets EN 61326-1
EN 55011
EN 61000-4-2
EN 61000-4-3

APPLICATION

- Identify and check live cables.
- Check live wires at high voltage.



CE

UL US LISTED TESTING EQUIPMENT 10FX

PD-40AM

PD-40AM is a high voltage probe meter. It measures positive polarity DC voltages up to 40kV.

It consists of 2 kinds of contact tips, a meter, a test clip for the ground and a high quality enclosure.

The enclosure has very good insulation properties. It is lightweight and rugged.

2 kinds of contact tips are available. One is a round needle tip for normal use. Another is a special flat spring type for CRT anode.

PD-40AM is typically used to measure high voltages in TV sets, power supplies and instruments in laboratories. Before taking any measurements, first connect the alligator clip of this probe to earth ground and make sure connection is proper.

SPECIFICATIONS

Input Impedance	600 MΩ
Attenuation Ratio	40000 : 1
Accuracy	DCV (0 ~ 20kV) ±2% DCV (20kV ~ 40kV) ±3%
Max. Working Voltage	DC 40kV
Operating Temperature	0°C ~ 50°C
Storage Temperature	-10°C ~ 60°C
Cable Length	1 m
Weight	Approx. 400g
Note	For Positive Polarity only Not for Microwave ovens

- Meets EN 61010-1
EN 61010-2-031

PD-20 PD-20S and PD-28 are high voltage probes. They measure both AC and DC voltages with your multimeter. They consist of 2 kinds of contact tips, a test clip for the ground, a set of test leads for multimeter and a high quality enclosure.

The enclosure has very good insulation properties.

They are light-weight and rugged.

2 kinds of contact tips are available.

One is a round special flat spring type for CRT anode.

Before taking any measurements, first connect the alligator clip of this probe to earth ground and make sure connection is proper.

Meets IEC/EN 61010-1
IEC/EN 61010-2-031



PD-20

● PD-20 and PD-28 have the same shape and color but different specifications.

PD-20S

● For scope

SPECIFICATIONS

PD-20

Input Impedance	500 MΩ
Attenuation Ratio	1000 : 1
Accuracy	DCV (0 ~ 20kV) ±1%, DCV (20kV ~ 30kV) ±2% ACV (0 ~ 20kV) typically ±5% at 50/60 Hz
Max.Working Voltage	30kV DC or 20kV AC
Operating Temperature	0°C ~ 50°C
Storage Temperature	-10°C ~ 60°C
Cable Length	1 m
Weight	Approx. 260g

● Note: PD-20 is a high voltage probe that is used with DMM

PD-28

Input Impedance	1000 MΩ
Attenuation Ratio	1000 : 1
Accuracy	DCV (0 ~ 20kV) ±1%, DCV (20kV ~ 40kV) ±2% ACV (0 ~ 28kV) typically ±5% at 50/60 Hz
Max.Working Voltage	40kV DC or 28kV AC
Operating Temperature	0°C ~ 50°C
Storage Temperature	-10°C ~ 60°C
Cable Length	1 m
Weight	Approx. 260g

● Note: PD-28 is a high voltage probe that is used with DMM

Accessories





CE

LVD-15



CE

LVD-17

The non-contact Voltage Detector is intended to check for the presence of AC Voltage, signaling the user with an intermittent tone and a flashing LED. They are used to detect voltage in outlets, lighting fixtures, circuit breakers, wires, and cables or to find a break in a wire.

FEATURES

- Bright LED and audible alarm sound when voltage is present.
- Designed for non-contact voltage detection. It's safer.
- Can be used to find a break in a wire.
- Flash light function.
- ON/OFF switch for longer battery life.
- EN 61010-1 CAT III 600V
EN 61326-1

SPECIFICATIONS

1. Voltage detection : 50V~1000V AC
2. Frequency : 50~500 Hz
3. Measurement category : CAT III 600V
4. Indication : LED and Tone
5. Operating Conditions
Temperature : 0~40°C
Humidity : Less than 80% R.H.
Altitude : 2000m maximum
6. For indoor use only.
7. Pollution degree : 2
8. Dimension : 142(L) x 28(W) x 27(D) mm
9. Weight : 45g(batteries included)
10. Power supply : 1.5V (AAA) x 2

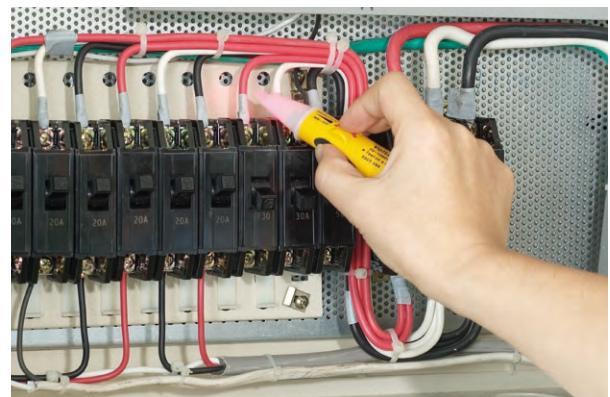


FEATURES

- Designed for non-contact voltage detection. It's safer.
- Microprocessor controlled smart voltage detector.
- Bright LED and audible alarm sound when voltage is present.
- Sensitivity adjustable with a thumbwheel.
- Adjustable for use on power wiring plus lighting, thermostats and other low voltage circuits.
- LED indication for battery condition.
- Identify Hot and Neutral.
- EN 61010-1 CAT IV 1000V
EN 61326-1

SPECIFICATIONS

1. Voltage detection : 5V~1000V AC
2. Frequency : 50~500 Hz
3. Measurement category : CAT IV 1000V
4. Indication : LED and Tone
5. Operating Conditions
Temperature : 0~40°C
Humidity : Less than 80% R.H.
Altitude : 2000m maximum
6. For indoor use only.
7. Pollution degree : 2
8. Dimension : 142(L) x 28(W) x 27(D) mm
9. Weight : Approx. 39g(battery included)
10. Power supply : 1.5V (AAA) x 1





CE

LVD-415

FEATURES

- Requires No Batteries.
- Every Circuit is Doubled.
- Buzzer Indicates Voltage Detected.
- Led Indicates Voltage Detected .
- Neon Scale Indicates Voltage.
- Dual HBC Fuses.
- High Grade Fiber Glass Probes.
- Super Polished Fiber Glass.
- High Strength Connecting Cord.
- Heavy Duty Rated.
- Replaceable tips.
- Choice of tips available.
- Light Weight.
- Small Storage Space.
- Strong Strength Reliefs.
- Double Poles Non Polarized.
- Suitable for 45 to 70Hz Networks.
- Contact Detector Type.
- Passive Circuitry.
- Fiber Glass 1.6mm - CU 35um PCB.
- Super Bright Neon Lights and Leds.
- Ergonomically Designed.
- EN 61010-031 CAT IV 500V.



Have you ever try to measure the voltage between overhead lines or between Line and Earth ?

Did you do it using a normal meter with normal test leads? Were you scared while doing it? I bet you were and you have all the right reasons to be.

This is why the Double Check (LVD415) was initially designed. Double Check is a **Visual Voltmeter** with a **Neon Lights scale** which lit proportionally to the voltage between the sticks, it also a **Detector** with bright **Led** and loud **Sound** indication on each side. The Double check has both sides identical, with at least, everything **Doubled**.

It's a **CAT.IV** Double pole Measurement System which has its poles long enough to be clear of the lines while testing them. These poles are made out of highly insulating **Super Polished High Grade Fiber Glass**. Their color is highly visible and it's strong and durable.

Both poles are electrically connected by a **High Strength Spiraled and Highly Insulated Cord** which is **securely held by customized strenght reliefs** . Each circuit is fully fused by **High Breaking Capacity Fuses**.

Safety has been the most important factor while developing this product.

Each circuit is present on the left pole as well as on the right pole. Each circuit works independently from each other.

The cord connecting the poles is doubled as well, so each circuit has it's own conductor going from one pole to the other.

The LVD415 has Visual Voltage Indicators (neons) which lit when the voltage between the poles is superior or equal to 110V, 220V, 280V and 415Vac.

Length:1000mm

weight:Approx.670g

Some applications for the Double Check are:

Measure and confirm Overhead Voltage between Lines in all Safety due to the clearance from the probes contacts. This is done when, for example, using a bucket on a truck, then from the bucket, you can reach all the phases and check voltage between each phases.

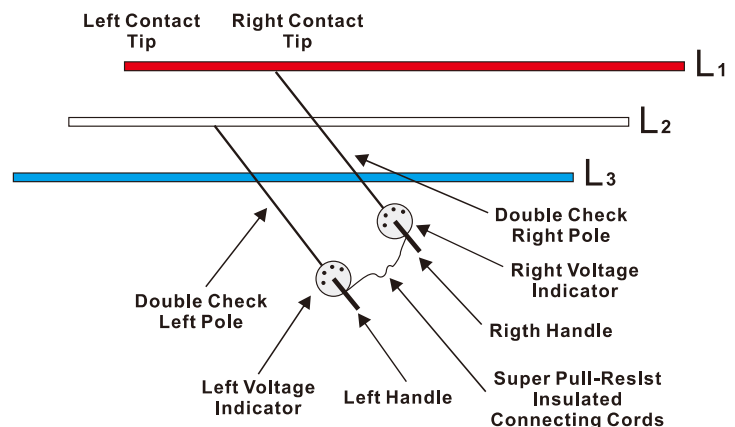
Check Voltage Presence between two conductors or between Phase and Earth.

Measure and Detect Voltage between Bus bars and between Bus bar Earth.

Use where you are not comfortable with your normal test leads.

Tips can be changed for different types.

Available tips: Fork type, Piercing trough Insulation, Cone, Flat tip, Other on on Demand.





FEATURES

- Max. & Min. function.
- Over & Under range indication.
- 4-digit LCD with bar graph.
- Frequency weighting characteristic for 2 times per second.
- AC signal output.
- Low battery indication.
- IEC 651 Type 2 & ANIS S1.4 Type 2.

SPECIFICATIONS

Measuring Ranges	Lo : 30dB~80dB Med : 50dB~100dB Hi : 80dB~130dB
Accuracy	±1.5dB (at Reference Range)
Reference sound level & frequency	94dB , 1kHz
Resolution	0.1dB
Detector-indicator characteristic	Fast : 125ms Slow : 1s
Analog signal output	AC 1Vrms for each range
Dimensions	235(L) x 58.4(W) x 34(D)mm
Weight(prox)	220g(battery included)
Power source	9V(6F22.006p)x1 battery
Accessories	Instruction manual Adjusting bar Battery Sponge cover Heavy-duty case



TOC-2310

FEATURES

- Wide range for measurements up 40000 lux and 4000 fc.
- 0.01 lux and 0.001 fc resolution for accurate low light level measurements.
- Light sensor cover is included for preserving sensor life.
- Auto off function.
- Data hold and peak hold function.
- Low battery indication.
- Over range indication.
- Auto-ranged.
- Manual-ranged.
- Calibration mode is provided.
- 9V battery system.
- Selection key for lux and fc.
- The spectral sensitivity close to CIE photopic curve.
- Ideal tool for workplace, clean-room and computer room light testing.
- Video, photographic, office, classroom, and architectural uses.
- Meets EN 61326-1

SPECIFICATIONS

Measuring Ranges	39.99 / 399.9 / 3999 / 39990 lux 3.999 / 39.99 / 399.9 / 3999fc
Resolution	0.01 lux - 10 lux 0.001 fc - 1 fc
Accuracy	±(3%rdg+5dgt) Calibrated to standard incandescent lamp, 2856°K.
Display	40000 - count LCD
Photosensor	Silicon photodiode
Operating / Storage conditions	0°C - 40°C < 80% RH -10°C - 50°C < 70% RH
Power source	9V(6F22.006p)x1 battery
Dimensions	194(L) x 62(W) x 34(D)mm
Weight(prox)	245g(battery is included)
Accessories	Instruction manual Battery Carrying case



180 CB



181 CB

AMPLIFIER PROBE(180 CB-A 181CB-A)

- The Amplifier Probe is designed to identify and trace wires or cables within a group without damaging the insulation.
- Work with any Tone Generator to identify wires.
- Volume control for increased sensitivity and adjustable to suit work environment.
- Recessed ON/OFF button prevents battery drain.
- Power supply is in any 9V battery with a life of approximately 100 hours.
- A phone jack is designed for headset or handset.

TONE GENERATOR(180 CB-G)

- Tone Generator is great tool for locating and identifying cable pairs or individual conductors.
- 180 CB-G doesn't only provide the function for a tone generator, but also serves as a continuity and polarity tester.
- Test results are displayed by a three-colored led.

TONE GENERATOR(181 CB-G)

- Tone Generator is a great tool for locating and identifying cable pairs or individual conductors.
- 181 CB-G doesn't only provide the function for a tone generator, but also serves as a continuity and polarity tester.
- A tone selector switch located inside the unit for selection of the fast tone or slow tone.
- Two bi-colored LED for Line1 and Line 2 indication of the polarities of the telephone lines.
- The unit has alligator type terminals, a modular cable of 4 conductors with a strong connector.
- The tone and continuity functions are only applied to Line1. (modular connector)

Amplifier Probe (180CB-A &181CB-A)

Frequency Detection	1Hz~12kHz
Receiver Distance	<50cm
Sensitivity Control	V

Tone Generator 180CB-G 181CB-G

Waveform	Square wave	
Frequency	1kHz±15%	
Over Voltage Protection	100V DC	80V DC
Single Tone	V	—
Alternating Tone	V	Fast and slow
Connection	RJ11 connector RJ45 connector (optional)	RJ11 connector

General

Operating Temperature & Humidity	0°C ~ 40°C, 80% Max
Storage Temperature & Humidity	-10°C ~ 50°C, 80% Max
Power Source	Amplifier Probe : 9V battery Tone Generator : 9V battery
Dimensions	Amplifier Probe : 270(L) x 50(W) x 25(H)mm Tone Generator : 64(L) x 58(W) x 34(H)mm (180 CB-G) 86(L) x 63(W) x 26(H)mm (181 CB-G)
Weight	Amplifier Probe : 125g Tone Generator : 120g (180 CB-G) 130g (181 CB-G)
Safety Standard	EN 61326-1 EN 55011 EN 61000-4-2 EN 61000-4-3
Accessories	Instruction manual Batteries Carry pouch



BLC-180CB-1

CAC-180CB



CE

185 LCT

INTRODUCTION

- The 185 LCT Lan cable tester is a newly designed tool that can easily test the correct pin configuration of the RJ45/RJ11 modular cables, 10/100 base-T cable and Token Ring cable etc.
- By comparing one transmitting end and the corresponding receiving end, the 185 LCT Lan cable tester also can test installed cable far away by using the remote receiving unit.
- The 185 LCT provides the variety for wiring check, such as cable continuity, open status, short status and miss-wired.

FEATURES

- Designed for RJ45/RJ11 modular cables, 10/100 base-T cable and Token Ring cable etc.
- The Lan cable tester can verify cable continuity, open, short circuit and miss-wired.
- The remote receiving unit is available for installed cables far away either on the wall plates or on the patch panels.
- Auto and manual scan function.
- Ground wire test.
- Lock status function.
- Buzzer sound warning for wire status.
- Display: LED indication for wire status.
- EN61326-1

SPECIFICATIONS

Display	LED
Operating Temperature	0°C~40°C
Power Source	9V (6F22,006P) battery x1
Dimensions	Master unit 132(L)x 55(W)x 39(D)mm Remote receiving unit 74(L)x 30(W)x 25(D)mm
Weight	Master unit: 148 g Remote receiving unit: 33g
Accessories	Instruction manual Pouch Battery

OPERATION

Loopback test

- Plug one end of the testing cable into the Rj45 jack of sourcing end on the master unit and another end of the testing cable into the RJ-45 jack of receiving end on the master unit.
 - Press the "⏻" button, the master unit will start a sequential scanning process if the master unit is in "auto-scanning" mode.
 - Press the "⏻" button, the pin1 LED lamps of the LED indicators will be alight if the master unit is in "manual-scanning" mode.
- Note: When the battery power is low, the testing results may not be correct. Please replace with a new battery.
- You can choose a auto-scanning mode or a manual-scanning mode by pressing the "AUTO" button or the "MANU" button.
 - The Lock function is available in "auto-scanning" mode.
 - When the loop is "OPEN", you will hear the sound of the buzzer.

Remote test

- Plug one end of the testing cable into the Rj45 jack of sourcing end on the master unit and another end of the testing cable into the RJ-45 jack of the remote receiving unit, then make tests.
- Read the testing results from the LED indicator on the remote receiving unit.

Test result

a. Continuity

Pin 3 is continued



c. Short

Pin 5 and 6 are shorted



b. Open

Pin 4 is opened



d. Miss-wired

Pin 1 and 7 are miss-wired



Loopback Test



Remote Test



188 FFF

The 188FFF is a Fuse and Fault Finder which comprises of two parts:

The Receiver and the Transmitter.

The Transmitter, draws a current from the mains supply circuit to which it is connected to. The Signal Current from the Tx is at about 10kHz. The Transmitter is powered by the mains and requires no batteries.

The 10kHz signal current generated by the Transmitter is then searched (sniffed) by the Receiver to detect the Fuse, Circuit Breaker or the faulty circuit.

The Receiver is a tuned circuit which has its center frequency tuned to about 10kHz. The sensor is located in the tip of the Receiver.

The amplitude of the received signal is shown on a bar-graph type Leds.

The more Leds ON, the stronger the signal.

The Receiver uses one 9V battery.

SPECIFICATIONS

Receiver

Tuner circuit mid Frequency	10kHz
Bar Graph Leds	9
Battery indicator Led	1
On button	1
Off button	1
Buzzer	1
Auto-off (Min) approx	1
Power source	9V(6F22 006P)x1
Dimensions	200(L)x50(W)x40(H)mm
Weight	112g(battery included)
Material	Polycarbonate/ABS

FINDING CIRCUIT BREAKER

Use the tip of the Sniffer to scan the circuit breakers. Please note that the Sniffer is designed to be held vertically for the vertical circuit breakers and horizontally for the horizontal circuit breakers

MAKE SURE ALL THE CIRCUIT BREAKERS ARE ON

Now, for example, start scanning from the top left row, then go down etc.... But you can scan the breakers in any order. While you are scanning, observe the bar-graph and listen to the buzzer.

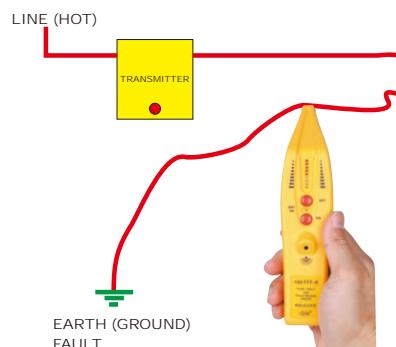


The Circuit breaker that supplies the Transmitter circuitry is the one, that (when pointed out by the tip) has the most LEDs lit on the bar-graph and the fastest buzz.

FINDING EARTH FAULT

To find an earth fault, or the trace faulty wire, you must connect the transmitter in serie with the fault. For example, say, you have a short between Line and Earth, but you don't know where the short is.

Connect the Transmitter, using an adaptor, in serie, in the line. If the Protection device trips, then you will have to bypass the protection device for the duration of this test. Use the optional leads for this use.



Transmitter

Working Voltage	110 to 240 Vac (50/60Hz)
Frequency of Sourced signal	10 kHz
Dimensions	60(L)x50(W)x30(H)mm
Weight	134g
Connection	Specify type of plug

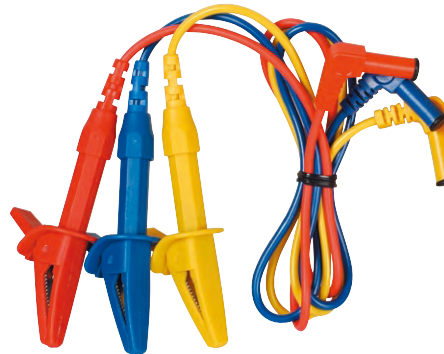




191 CBI



190 CBI



ST-860



● **190 CBI and 191 CBI have the same shape but different Specifications.**

190 CBI is an easy tool to find the circuit breaker or fuse supplying electrical power to an outlet or lighting fixture. Just plug the transmitter into the outlet.

Use the receiver to scan the circuit breaker panel box. An audible tone will be clearly heard when the right circuit breaker is scanned.

It is not necessary to shut off power to find the right circuit breaker or fuse.

190 CBI is an ideal tool for both automated office environments where disruption of power is not practical, as well as in residential applications.

The plug of transmitter is changeable. The plug of transmitter could be changed for customers' requirement from different countries.

Quickly identifies and locates 110 ~ 125 VAC circuit breakers and fuses. It is not necessary to interrupt power.

Audible tone generated when matching breaker is located. It is an easy way to identify location of circuit breaker on the circuit breaker panel box which is connected to a specific outlet.

SPECIFICATIONS

Model	190 CBI	191 CBI
Operation Voltage	110 ~ 120 VAC	220 ~ 240 VAC
Operation Frequency	50 / 60 Hz	
Transmitter Power	Powered by wall outlet	
Receiver Power	9V battery	
Accessories	Instruction manual 9V battery	
Safety Standard	EN 61010-1:01	

FEATURES

- Three functions in one unit. Including open phase, phase sequence and motor rotation indication.
- Large size alligator clips. Can easily clip on switchboards terminals.
- Highly reliable. Identifies 3 phase sequence and open phase check.
- Functional design. This model is ideal for installing conveyor lines, pump systems and interconnected drivers.
- IEC 1010 CAT.III 600V

SPECIFICATIONS

Input Voltage	100-600V AC
Frequency Range	45-70 Hz
Circuit Structure	All electronic (not mechanical)
Power Requirement	9V DC (006P) battery
Power Consumption	Consumption current approx. 14mA of motor rotation field tester
AC Power Consumption	Approx. 7mA per phase rotation filed indicator
Dimensions	153(L) x 72(W) x 35(D)mm
Weight	Approx. 200g (battery included)
Accessories	Test leads (AL-34) Vinyl case Battery Instruction manual



CE

ST-850



CE

855 PR

FEATURES

- Two functions in one unit. It is designed to check phase sequence. Lamps provided on the unit will tell you whether phase is Open or which phase is open at a glance.
- Large size alligator clips. Can easily hold terminals of switchboards.
- Highly reliable. Allow you to check a wide range of 3-phase power source from 90V to 600V.
- Special test leads length are available on request.

SPECIFICATIONS

Model	ST-850	855 PR
Voltage	90V-600V AC	200V-600V AC
Frequency Response	50/60 Hz	50/60 Hz
Storage Temperature & Humidity	-20°C~60°C at 90% max. relative humidity	-20°C~60°C at 90% Max. relative humidity
Operating Temperature & Humidity	-10°C~40°C at 80% max. relative humidity	-10°C~40°C at 80% Max. relative humidity
Dimensions	134(L) x 85(W) x 45(D)mm	134(L) x 85(W) x 45(D)mm
Weight	Approx. 510g	Approx. 530g
Cord	1.1m each of red(R), White(S) and black(T) cord	1.1m each of red(R), White(S) and black(T) cord
Accessories	Instruction manual Vinyl case	Instruction manual Vinyl case
Safety Standard	IEC 1010 CAT.II	EN 61010-1 EN 61010-2-31 CAT III 600V

FEATURES

Sealed against dust, the unit ensures highly dependable and trouble-free performance.

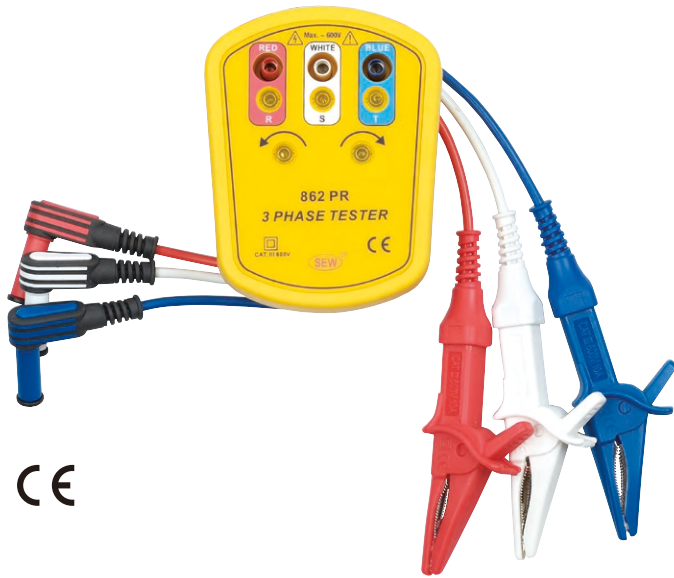
- Functional design.
Small, lightweight and portable. Designed for maximum ease of operation.
- Safety design.
No exposed metal parts. Safety features are incorporated Throughout, including the pushbutton switch designed to minimize damage due to negligence.



CE

855 PRA

- Silicone wire 2m + Fuse + Alligator
- EN 61010-1 EN 61010-2-31 CAT III 1000V/ CAT IV 600V



CE

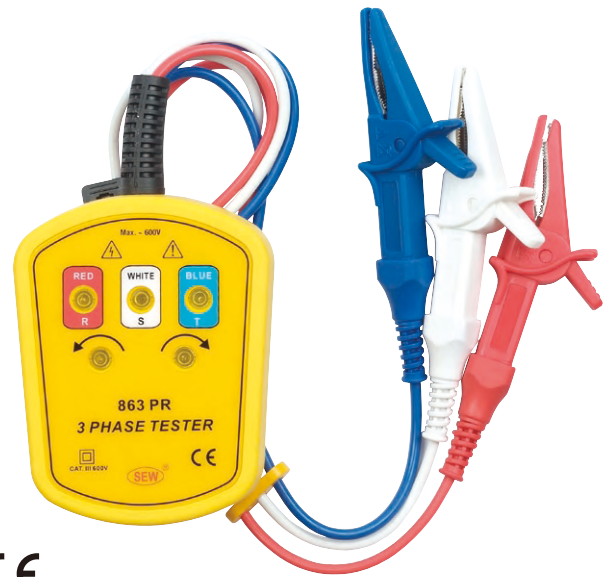
862 PR

FEATURES

- Two functions in one unit.
Including open phase and phase sequence.
- Large size alligator clips.
Can easily clip on switch-boards terminals.
- Highly reliable.
Identifies 3 phase sequence and open phase check.
- Functional design
This model is ideal for installing conveyor lines, pump systems and interconnected drivers.
- Water proof.
- EN 61010-1 CAT.III 600V/CAT IV300V
- Special test leads length are available on request.

SPECIFICATIONS

Input Voltage	100-600V AC
Frequency Range	45-70 Hz
Circuit Structure	All electronic (not mechanical)
AC Power Consumption	Approx. 7mA per phase rotation filed indicator
Dimensions	102(L) x 78(W) x 32.5(D)mm
Weight	862 PR : 115g test leads : 97g Total : 212g
Accessories	Test leads (AL-34) Vinyl case Instruction manual



CE

863 PR

FEATURES

- Two functions in one unit.
Including open phase and phase sequence.
- Large size alligator clips.
Can easily clip on switch-boards terminals.
- Highly reliable.
Identifies 3 phase sequence and open phase check.
- Functional design
This model is ideal for installing conveyor lines, pump systems and interconnected drivers.
- EN 61010-1 CAT.III 600V
- Special test leads length are available on request.

SPECIFICATIONS

Input Voltage	100-600V AC
Frequency Range	45-70 Hz
Circuit Structure	All electronic (not mechanical)
AC Power Consumption	Approx. 7mA per phase rotation filed indicator
Dimensions	102(L) x 78(W) x 32.5(D)mm
Weight	Approx. 228g
Accessories	Vinyl case Instruction manual



CE

887 PR

The **887 PR** is a 3 Phases Presence and Rotation Indicator.

It does not need any battery as it derives its power from the system under test.

It can be utilized on a **3 Phases Powered System** without having to worry about damage to the tester or the system.

Once connected to a 3 phase power system, it indicates the Phase presence by showing its corresponding LCD symbol. It displays the rotation (clockwise or anti-clockwise) on the LCD.

This instrument represents the quickest and easiest way for verifying the presence and rotation of a 3 Phase System.

You can, before connecting Supply to Load, and from the supply side;

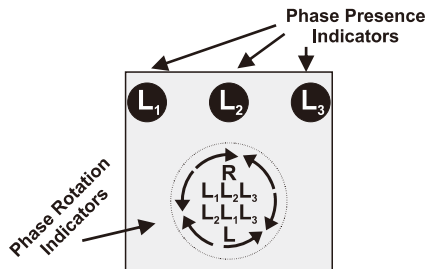
Quickly and easily verify the presence of the three Phases on a 3 Phase Power System.

Confirm the Phase Rotation on a Powered 3 Phase System.

3 Phase Presence Indication circuit:

This circuit uses the LCD to indicate if a phase is present.

These LCD indicators will light up when the voltage across any two phases are more than 40Vac.



3 Phase sequence Rotation indicator circuit:

This circuit has also a LCD indication This product does not require any battery as it takes its power from the circuit under test.



FEATURES

- Indicates Phase Rotation.
- Indicates Phase Presence.
- Requires NO BATTERY.
- Phase Rotation Indicated on Large Liquid Crystal Display.
- Small and Rugged Enclosure.
- Phase Presence Indicated on Large Liquid Crystal Display.
- Color Coded Test Leads.
- Phase Presence Indication from as low as 40Vac to as high as 700Vac.
- Fused.
- Lightweight, Robust & Compact.
- EN 61010-1 CAT III 600V EN 61010-2-032

SPECIFICATIONS

ELECTRICAL

Determination of the Phase Presence

Nominal Voltage for Phase Presence Indication (the voltage required for the LCD L₁, L₂, L₃ indicators to come on).....

From 40Vac to 700Vac.

Frequency Range From 15Hz to 400Hz.

Determination of the Phases Rotary Field Direction :

Direction Indication by LCD Display (the voltage required to have the LCD Direction Arrows to indicates and the L₁L₂L₃ or L₃L₂L₁ indicators to show)

From 40 to 700Vac.

Frequency Range From 15Hz to 400Hz

Protection

Over Load..... 700V (between all terminals)

Over Voltage Class III - 700V towards ground.

Fuses..... 2 x 0.5A, 6 x 31mm, HBC,600V Fast Blow

General

Current Consumption Max 3 mA.

MECHANICAL

Dimensions..... 72 x 150 x 33.8 (mm)

Material..... Poly carbonate /ABS

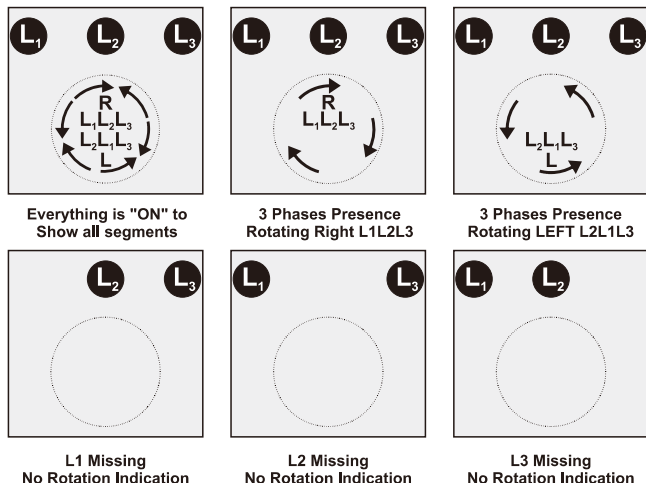
Weight (less carrying case)..... 158.5g

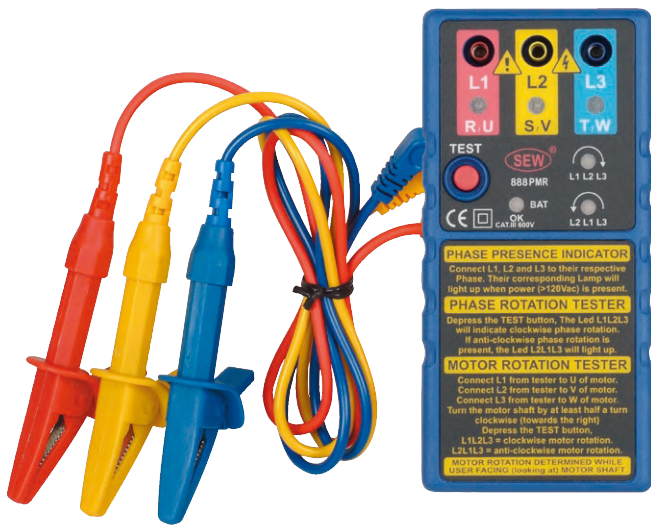
Display..... Liquid Crystal Display

ENVIRONMENTAL

Operating temperature Range : 1°C to + 55°C not in full sun!!!

Storage Temperature : -20°C to + 70°C





CE

888 PMR

FEATURES

- Indicates Phase Presence.
- Indicates Phase Rotation.
- Indicates Motor Rotation / Wiring.
- Indicates Battery Status.
- Phase Rotation and Motor Rotation Indication works from as low as 1Vac.
- Small and rugged enclosure.
- Color Coded test Leads.
- Phase Presence Indication from as low as 100Vac.
- Very Low Consumption.
- Fused.
- Lightweight, Robust & Compact.
- Works from 2 Hz to 400Hz Sine.
- EN 61010-1 CAT III 600V

With this equipment, you can, before connecting Supply to Load:

On the supply side;

Quickly verify the presence of the three Phases on a 3 Phases Power system.

Confirm the Phase Rotation on a Powered 3 Phase System.

On the Motor Side (Load);

Confirm the Phase Rotation on a unpowered 3 Phase Motor 3 Phases Alternator.

Confirm that each winding is connected to the terminals of the motor, when the rotation Leds light up.

The **888 PMR** is a 3 Phases Presence and Rotation Indicator combined with a 3 Phases Motor Rotation Tester.

It can be utilized on a **3 Phases Powered System** (the supply side) or on a **Three Phases Unpowered Motor** (the load side) without having to worry about damage to the tester.

When utilized on a 3 Phases Powered System, the instrument is then utilized as a 3 Phases Presence and Rotation Indicator.

When utilized on a Three Phases Unpowered Motor, the instrument is then utilized as a 3 Phases Motor Rotation Tester.

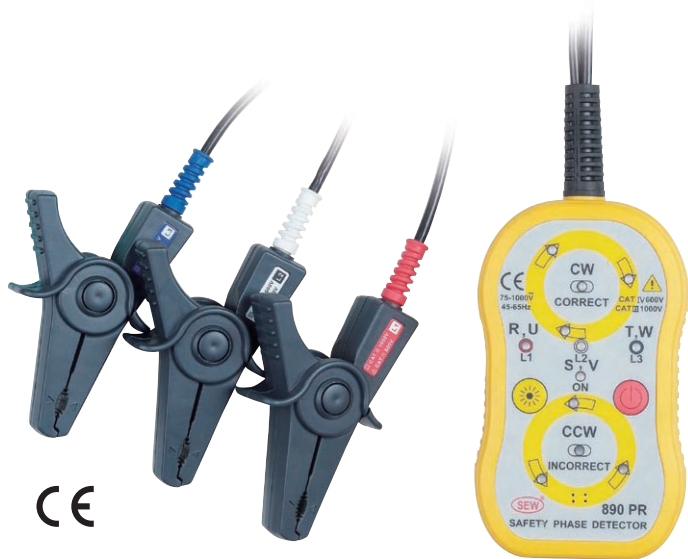
When utilized on a 3 Phases Powered System, this instrument is a rotary field indication instrument which display all three phases by lighting up it's corresponding lamp. It display the rotation (clockwise or anti-clockwise) on a LED.

When utilized on a 3 Phases Unpowered Motor, it is also possible to determine the motor connections U, V, W without a live circuit to avoid subsequent damages of e.g. pumps to reversed motor rotation. It displays the rotation (clock-wyze or anti-clock-wyze) on a LED.

This instrument represents the quickest and easiest way for servicing, repairing and electrical maintenance of 3 phase systems and 3 phase rotating machinery.

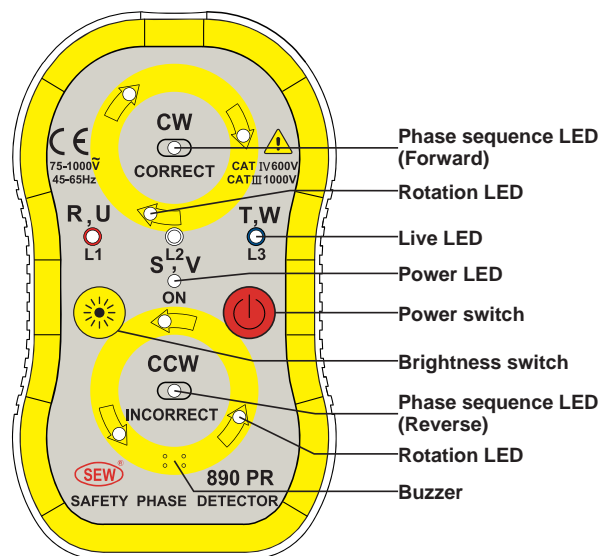
SPECIFICATIONS

Phase Presence	From	100Vac
Nominal Voltage for Phase	To	600Vac
Presence Indication (The voltage required for the neon Lamps L1, L2, L3 to light up).	Freq	10-400Hz
Determination of Phase	From	1Vac
Rotation Field Direction	To	600Vac
	Frequency	2-400Hz
Determination of Motor Connections (requires > 1/2 turn of the shaft)	From	1Vac
	To	600Vac
	Freq	2-400Hz
Maximum Current Consumption		18mA
OverVoltage CLASS III		600V
Over Load between all terminals		600V
Battery OK goes off when battery voltage		<6.5Vdc
Power Source		9V(6F22.006P) x1 battery
Dimensions		153(L)x72(W)x35(D) mm
Weight		Approx.185g (battery included)
Accessories		Test leads(AL-34) Vinyl case Instruction manual Battery



890 PR

INSTRUMENT LAYOUT



FEATURES

- The 890 PR is a Non-Contact phase detector with flashing LEDs and a beeping buzzer to show the detection of AC 3-phase sequence.
- Two functions in one unit, including open phase and phase sequence.
- Clipping the right 3-phase lines (up to color) over the jacket with non-contact sensor clips which promote safety of measurement.
- Brightness switch is convenient to make the indication visible in dim areas or sunlight.
- Back cover magnet fix the instrument onto the AC distribution panel offer easy measurement.
- 3-Phase AC 150 to 1000V is fitted for detection.
- Detect frequency range is from 45 to 65 Hz.
- Safety standard : EN 61010-1 CAT III 1000V/ CAT IV 600V. EN 61326-1.

SPECIFICATIONS

Measurement Principle	Static induction
Input Voltage	75~1000Vac
Frequency Range	45-65Hz
Auto-Off	5 min. after power on without detection
Low Battery Warning	Power LED flashes at 4.6±0.1V or less
Operating Temperature & Humidity	-10°C~50°C Max. 80% R.H.
Storage temperature & Humidity	-20°C~60°C Max. 80% R.H.
Power Source	1.5V(AA) x 4 or alkaline battery
Dimensions	118(L) x 69(W) x 38(H)mm
Cable Length	Approx. 800mm
Weight	Approx. 370g (battery included)
Accessories	Instruction manual Soft case Battery

LIVE WIRE CHECK

State	Indication
Live	Phase with L1,L2,L3 "ON" is live state
Missing line of Earth line	LED doesn't light up for missing line of earth line
Earth line (Delta connection)	Phase with flashing LED is an earth phase
Positive phase	When the Green Rotation LED flashes in clockwise direction orderly as indicated with "arrow" mark, the circuit will be forward under test. The buzzer sounds intermittently.
Reversed phase	When the Red Rotation LED flashes in anti-clockwise direction orderly as indicated with "arrow" mark, the circuit will be reverse under test. The buzzer sounds continuously.
Detect Indications	L1,L2,L3 LED ON is live phase indication. Open phase which LED is off.
	CW ON is correct phase sequence.
	CCW ON is incorrect phase sequence.



CE

4183 CP

The 4183 CP is a Cable Phasing Meter that offers a quick method of measuring voltage and determining phase rotation of underground distribution systems using the capacitive test point of elbow connectors. Most manufacturers of high voltage cable terminations incorporate capacitive test points in their elbow connectors. These test points are designed for measuring purposes.

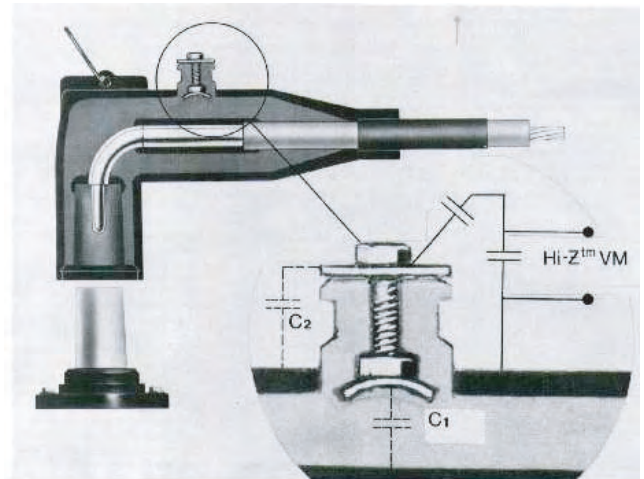
This instrument is battery powered and is supplied with a ground and two measuring leads.

FEATURES

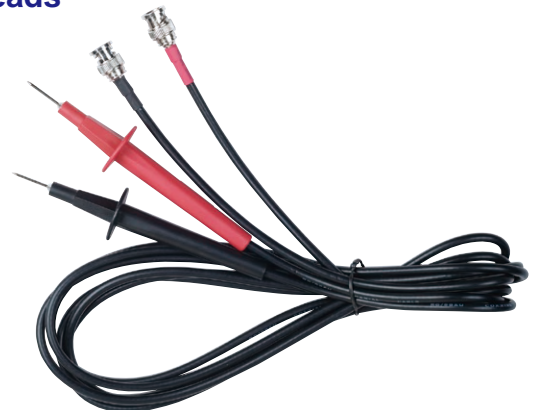
- Safe operates at low voltage.
- Measures system voltage.
- Measures capacitance of test point if system voltage is known.
- Checks phase rotation of cables.
- Phases out cables.
- Rugged - comes with portable case.
- Operates from potential test point of elbow connectors.
- Battery operated.
- Meets EN 61326-1

SPECIFICATIONS

Voltage Ranges	0~16kV / 0~32kV
Accuracy	±8% (exclusive of tap capacitance variations)
Tap Capacitance Setting	0.4 to 3.0 pF continuous per channel
Frequency	50 or 60 Hz
Dimensions	250(L) x 190(W) x 110(D)mm
Weight	Approx. 1420g (battery included)
Power Source	1.5V (AA) x 4 Batteries
Accessories	Test Leads Instruction manual Shoulder belt (BET-2800) Batteries



Test leads





4156 PR

APPLICATIONS

The **4156 PR** is used to identify the leads of a disconnected motor so that when the motor is in true phase sequence, it will run in the desired direction. The identification process is necessary before a motor can be connected. The tester is also used to identify true phase sequence of energized AC power lines up to 600 AC volts. The other functions of the **4156 PR** include the determination of transformer polarity and testing of circuit continuity.

DESCRIPTION

The three red terminals on the right side (R,S,T) are used to be connected to **energized** AC power systems up to **600 volts**. The other three yellow terminals on the left side (L1, L2, L3) are for connection to **de-energized** equipment. **Do not connect to Live Voltage !**

The *Momentary Test* push-button is used to identify transformer polarity. Deflection of the rotation pointer indicates transformer polarity. Read either *Subtractive* on the right, or *Additive* to the left. The *Zero Adjustment knob* is used to check continuity.

SPECIFICATIONS

Measuring Ranges	0~200kΩ
Test Leads	AL-34 length: 50cm
Power Source	1.5V (AA)x4
Dimensions	250(L)x190(W)x110(D)mm
Weight	Approx. 1280g (battery included)

OPERATION

● Motor Rotation Test

Set the rotary switch to **Motor** position. Use the yellow terminals on the left of the meter. Connect the test leads to the motor in any order. Operate the **ZERO** adjustment to set the meter pointer at the center of the scale. Manually turn the motor shaft slightly in the desired operating direction (clockwise or counter- clockwise). Observe the meter. The meter will deflect (kick) in one direction then in the opposite direction.

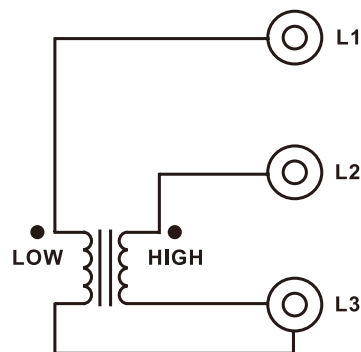
The first direction is significant. Ignore the second or opposite direction. The first direction is the correct direction for users to identify the motor rotation.

● Phase Rotation Test

Set the rotary switch to **Phase Rotation** position. Use the red terminals on the right of the meter. Connect the test leads to the three terminals of the line system in any order. Observe the meter. If the pointer deflects to the right, that means the Rotation is clockwise. The phase sequence is R, S and T in order of the power source terminals where the test leads are connected. If the pointer deflects to the left, that means the Rotation is counter-clockwise.

● Transformer Polarity - Single Phase

Set the rotary switch to **OFF** position. Connect test leads to the yellow terminals on the left of the panel. Connect two adjacent high and low voltage transformer terminals using a suitable jumper. Connect the L3 terminal to one of the terminals where the jumper connected. Connect the L2 terminal to the remaining high voltage terminal. Connect the L1 terminal to the remaining low voltage terminal. Set the rotary switch to **TRANS** position. Press the **Momentary Test** push button and release. Observe the meter on release. Deflection of the meter indicates transformer polarity. Read either **Subtractive** to the right, or **Additive** to the left. If sensitivity is not adequate on low ratio transformers, switch to **MOTOR** position without changing test leads, operate **Zero ADJ.** knob to set pointer at center, then test As above.

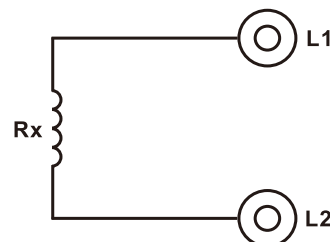


Transformer Polarity Test

● Continuity Check

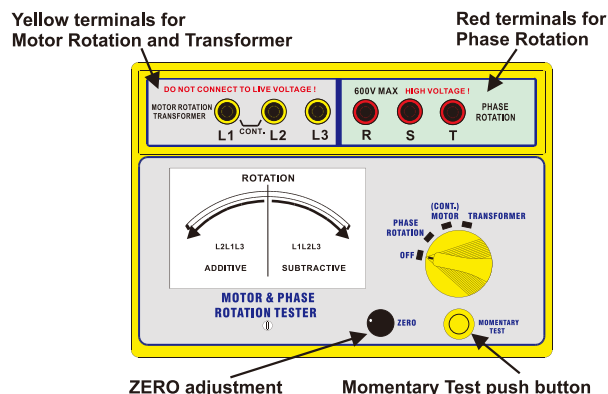
Set the rotary switch to **MOTOR (CONT.)** Position. Use the L1 and the L2 terminal for continuity checking. At first, connect the two test leads together. Then operate **Zero ADJ.** knob until the meter reads zero on the scale plate.

Connect the two test leads to the resistance we want to measure. Then read the value on the meter.



Continuity Check

INSTRUMENT LAYOUT





ALS-1

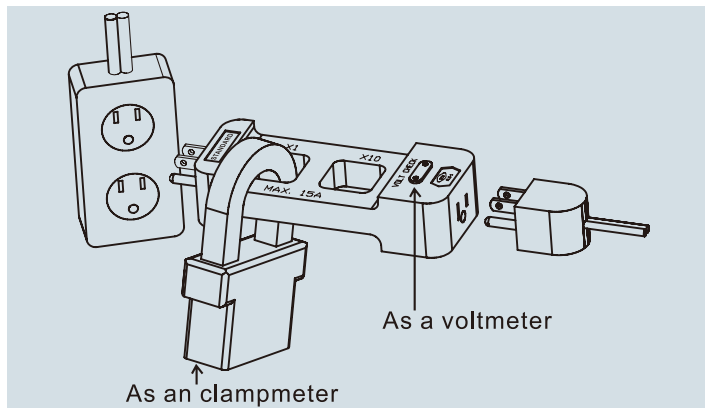
With the aid of the AC line separator, the AC current from any appliance can be determined by plugging the appliance directly into the separator. By doing so, you are able to separate the neutral from hot/live conductor.

The advantage of using this separator allows the appliance to remain plugged in, thus providing a constant current and separation of the conductors.

- (1)×1. which is used for direct reading and.
- (2)×10. Which is used for actual readings multiplied by factor of 10.

The separator also includes a voltage check function.

The opening specification is 0.95"×0.95"



CE

HLV-1

The HLV-1 for AC Voltage Detectors and AC Voltage Testers utilized to determine if the devices under test are functionally working. The HLV-1 is not a calibrator and can not be utilized for calibration.

The HLV-1 for AC Voltage Detectors can be proof contact devices on a momentary basis (Press, check, release)

FEATURES

- Designed to proof:
 - AC voltage detectors,
 - AC voltage testers
- Small and hand held, easy to carry on and use.
- Battery operated.
- Led indicates when power is "ON".
- Normal 4mm test leads.

SPECIFICATIONS

Output Voltage	H terminal: AC 400V±20% L terminal: AC 100V±20%
Frequency	50~60Hz
Frequency	H terminal: >5MΩ L terminal: >500kΩ
Power on indicator	YES
Operaiong Temperature	-10°~-50°C
Power source	9V (006p)x1
Dimensions	124(L)x69(W)x42(D)mm
Weight	Approx.350g (battery included)
Accessories	Test leads (20cm)x2 Battery



CE

ST-375



CE

ST-600



1010 CL

FEATURES

- Designed for measuring AC current, AC voltage resistance and DC voltage (only ST-375)
- Rotary scale which presents only one scale in windows at one time to avoid any possible reading errors.
- Pointer lock function freezes the reading in dimly lit or hard to reach places.
- Ω range ideal for checking the continuity of relays, transformers and motor coils.

- TAUT BAND movement (1010CL)

Model	ST-375	ST-600	1010 CL
ACA	▲300A	▲600A	▲1000A
ACV	▲600V	▲600V	▲750V
DCV	▲75V	—	—
Ω	▲2K Ω	▲2K Ω	▲2K Ω
POINTER LOCK	▲	▲	▲

SPECIFICATIONS

Model	ST-375	ST-600	1010 CL
ACA	6/15/60/150/300A $\pm 3\%$ of F.S.(50/60Hz)	6/30/60/300/600A $\pm 3\%$ of F.S.(50/60Hz)	10/30/100/300/1000A $\pm 3\%$ of F.S.(50/60Hz)
ACV	300/600V $\pm 3\%$ of F.S.	150/300/600V $\pm 3\%$ of F.S.	150/300/750V $\pm 3\%$ of F.S.
DCV	75V $\pm 3\%$ of F.S.	—	—
	2K $\pm 3\%$ of F.S. length	2K $\pm 3\%$ of F.S. length	2K $\pm 3\%$ of F.S. length
Frequency Response	50/60Hz for ACA 6A 50-400Hz for ACA 15/60/150/300 A	50/60Hz for ACA 6A 50-400Hz for ACA 30/60/300/600A	50/60Hz for ACA 10A 50-400Hz for ACA 30/100/300/1000A
Dimensions	230(L) x 72(W) x 37(D)mm	230(L) x 72(W) x 37(D)mm	227(L) x 73(W) x 33(D)mm
Conductor Size	38mm Max.	38mm Max.	52mm Max.
Weight (Battery Included)	420g Approx.	420g Approx.	460g Approx.
Accessories	Test leads (AL-26) Carrying case (CAC-600) Instruction manual	Test leads (AL-26) Carrying case (CAC-600) Instruction manual	Test leads (TEL-AL11-1+OTL-1000) Ohm test probe Carrying case (CAC-600) Instruction manual
Safety Standard	EN 61010-1 EN61010-2-32 CAT II 600V	EN 61010-1 EN61010-2-32 CAT II 600V	—



CE

2660 CL

FEATURES

- 4000- count LCD.
- Full automatic measurement. Voltage measurement
Current measurement. Resistor measurement
Frequency counter. Capacitor measurement.
- Bargraph indication.
- Range change function.
- Data Hold function freezes the reading.
- REL function.
- Peak function.
- VAHz mode measures frequency in ACV and ACA mode.
- Diode measurement.
- Max/Min function.
- Continuity check.
- Low battery indication.
- Auto Power Off (APO) function.
- Safety design throughout with no exposed metal parts,
shielded banana plugs and recessed input terminals.
- EN 61010-1 CAT III 600V
EN 61326-1

SPECIFICATIONS (All at 23°C±5°C, ≤80%R.H.)

DC Voltage :

Range	Resolution	Accuracy
400 mV	0.1 mV	±(1.0%rdg+3dgt)
4 V	1 mV	
40 V	10 mV	
400 V	100 mV	
600 V	1 V	

Overload protection : 650V DC

AC Voltage :

Range	Resolution	Accuracy
400 mV	0.1 mV	±(2.0%rdg+3dgt)
4 V	1 mV	
40 V	10 mV	±(1.5%rdg+3dgt)
400 V	100 mV	
600 V	1 V	

Overload protection : 650V AC rms

Frequency Response : 0~400mV at 40Hz~120Hz
4V~600V at 40Hz~500Hz

AC Current :

Range	Resolution	Accuracy
400 A	0.1 A	±(1.5%rdg+4dgt)
600 A	1 A	±(2.0%rdg+4dgt)

Frequency Response: 40Hz~500Hz

DC Current :

Range	Resolution	Accuracy
400 A	0.1 A	±(1.5%rdg+4dgt)
600 A	1 A	±(2.0%rdg+4dgt)

Resistance :

Range	Resolution	Accuracy
400Ω	0.1Ω	±(1.5%rdg+3dgt)
4kΩ	1Ω	
40kΩ	10Ω	
400kΩ	100Ω	
4MΩ	1kΩ	±(2.0%rdg+4dgt)
40MΩ	10kΩ	

Continuity :

Range	Audible Threshold
400Ω	Less than 35Ω

Buzzer sounds below 35Ω

Frequency :

Range	Resolution	Accuracy	Trigger Level
4 kHz	1 Hz	±(0.3%rdg+2dgt)	0.2 V
40 kHz	10 Hz		
400 kHz	100 Hz	±(0.4%rdg+2dgt)	0.3 V
4 MHz	1 kHz		
40 MHz	10 kHz	±(0.5%rdg+2dgt)	0.4 V

Diode :

Range	Resolution	Accuracy
2V	1 mV	(1.5%rdg+3dgt)

Capacitor :

Range	Resolution	Accuracy
4 nF	1 pF	±(2.5%rdg+4dgt)
40 nF	10 pF	
400 nF	100 pF	±(2.0%rdg+4dgt)
4 μF	1 nF	
40 μF	10 nF	±(2.5%rdg+4dgt)
400 μF	100 nF	
4 mF	1 μF	
40 mF	10 μF	±(3.0%rdg+4dgt)

GENERAL

- **Conductor Size** : Approx. 35mm max
- **Operating Principle** : Dual slope integration.
- **Over range indication** : " O.L " indicated.
- **Low Battery Indication** : " " sign appears on the display when the battery voltage drops below accurate operating level.
- **Response Time** : Approx. 1 second.
- **Sample Rate** : Approx. 2 times per second.
- **Temperature & Humidity for Guaranteed** : 0°C to 50°C
80% Max.
- **Storage Temperature & Humidity** : -10°C to 60°C 80% Max.
- **Dimensions** : 210mm(L) x 90mm(W) x 40mm(D)
- **Weight** : Approx. 330g (battery included)
- **Power source** : One type PP3, 6F22, 006P(or equivalent), 9V manganese.
- **Battery Life** : Approx. 100 hours on continuous use. (Alkaline)
- **Accessories** : Test leads, Carrying Case, instruction Manual, Battery (one 006P 9V)



ST-2600



3800 CL



3810 CL
TRUE RMS

FEATURES

- Full autorange for V.A and Ω functions.
- Data hold function freezes the reading in dimly lit or hard to reach places.
- Low battery indication.
- Built-in buzzer for continuity test.
- Safety design throughout with no exposed metal parts. Shielded banana plugs and recessed input terminals.
- Ohm function ideal for checking continuity of relays, transformers and motor coils

SPECIFICATIONS

Model	ST-2600 (Auto-Ranges)	3800 CL (Auto-Ranges)	3810 CL (Auto-Ranges)
ACA	400A $\pm(2.0\%rdg+3dgt):50/60Hz$	400/1000A $\pm(1.5\%rdg+3dgt):40-500Hz$	400/1000A $\pm(1.5\%rdg+3dgt):40-500Hz$
ACV	400/600V $\pm(1.2\%rdg+3dgt):40-500Hz$	400/600V $\pm(1.0\%rdg+3dgt):40-500Hz$	400/600V $\pm(1.0\%rdg+3dgt):40-500Hz$
DCA	—	400/1000A $\pm(1.5\%rdg+3dgt)$	400/1000A $\pm(1.5\%rdg+3dgt)$
DCV	—	400/600V $\pm(0.75\%rdg+3dgt)$	400/600V $\pm(0.75\%rdg+3dgt)$
Ω	4K $\pm(1.5\%rdg+3dgt)$	2000 $\pm(1.0\%rdg+3dgt)$	2000 $\pm(1.0\%rdg+3dgt)$
Buzzer Sounds	<100	<100	<100
Conductor Size	27mm Max.	40mm Max.	40mm Max.
Low Battery Indication			
Dimensions	197(L) x 65(W) x 33(D)mm	255(L) x 80(W) x 35(D)mm	255(L) x 80(W) x 35(D)mm
Weight (Battery Included)	Approx. 250g	Approx. 420g	Approx. 420g
Power Source	9V (6F22.006p) x 1 battery	9V (6F22.006p) x 1 battery	9V (6F22.006p) x 1 battery
Accessories	Test leads (TEL-AL11-1) Carrying case (CAC-600) Instruction manual Battery	Test leads (TEL-AL28-1) Carrying case (CAC-3600) Instruction manual Battery	Test leads (TEL-AL28-1) Carrying case (CAC-3600) Instruction manual Battery
Safety Standard	EN 61010-1 EN61010-2-32 CAT II 600V	EN 61010-1 EN61010-2-32 CAT III 600V	EN 61010-1 EN61010-2-32 CAT III 600V



ST-3600



ST-3602



ST-3620

FEATURES

- Display 3½ digit, liquid crystal display with maximum reading of 1999.
- Over range indication : "1" is displayed on highest digit.
- Low battery indication : "B" sign appears on the display.
- Response time : approx.1 second.
- Data hold : for all ranges

SPECIFICATIONS

Model	ST-3600	ST-3602 (Auto-Ranges)	ST-3620
ACA	200/1500 ±(2%rdg+4dgt) (40Hz-1KHz)	200/1500 ±(2%rdg+4dgt) (40Hz-1KHz)	200/1500 ±(2%rdg+4dgt) (40Hz-1KHz)
ACV	200/750 ±(1.5%rdg+2dgt) (40Hz-1KHz)	200/750 ±(1.5%rdg+2dgt) (40Hz-1KHz)	200/750 ±(1.5%rdg+2dgt) (40Hz-1KHz)
DCA	200/1500 ±(2%rdg+4dgt)	200/1500 ±(2%rdg+4dgt)	————
DCV	20/200/1000 ±(1%rdg+2dgt)	200/1000 ±(1%rdg+2dgt)	————
	200/1500 ±(1.5%rdg+2dgt)	200/1500 ±(1.5%rdg+2dgt)	200 ±(1.5%rdg+2dgt)
Diode check	0-1500mV ±(1.5%rdg+2dgt)	0-1500mV ±(1.5%rdg+2dgt)	————
Buzzer	————	Resistance is less then 100	Resistance is less then 30
Peak Hold	————	————	V
Conductor Size	ø55mm Max.	ø55mm Max.	ø55mm Max.
Dimensions	245(L) x 70(W) x 41.7(D)mm	245(L) x 70(W) x 41.7(D)mm	245(L) x 70(W) x 41.7(D)mm
Power Source	9V(6F22) x 1	9V(6F22) x 1	9V(6F22) x 1
Weight (Battery Included)	480g Approx.	480g Approx.	480g Approx.
Operating Temperature	-10°C~50°C	-10°C~50°C	-10°C~50°C
Humidity	85%	85%	85%
Current Consumption	10mA Approx.	10mA Approx.	10mA Approx.
Accessories	Test leads (AL-26) Carrying case (CAC-3600) Instruction manual Battery	Test leads (AL-26) Carrying case (CAC-3600) Instruction manual Battery	Test leads (AL-26) Carrying case (CAC-3600) Instruction manual Battery



CE

3900 CL



CE

3902 CL



CE

3904 CL

SPECIFICATIONS

Model	3900 CL	3902 CL	3904 CL
ACV	400.0mV ±(1.5%rdg+3dgt) 4.000/40.00/400.0/600V ±(1.0%rdg+3dgt) 40~500Hz	200.0mV ±(2.0%rdg+3dgt) 2.000/20.00/200.0/600V ±(1.5%rdg+3dgt) 40~500Hz	400.0mV ±(2.0%rdg+3dgt) 4.000/40.00/400.0/600V ±(1.5%rdg+3dgt) 40~500Hz
DCV	400.0mV/4.000/40.00/400.0/600V ±(0.75%rdg+2dgt)	200.0mV/2.000/20.00/200.0/600V ±(1.0%rdg+3dgt)	400.0mV/4.000/40.00/400.0/600V ±(1.0%rdg+3dgt)
ACA	400.0/2000A 0~1500A ±(2.0%rdg+4dgt) 1500A~2000A ±(2.5%rdg+4dgt)	200.0/2000A 0~1500A ±(2.0%rdg+4dgt) 1500A~2000A ±(2.5%rdg+4dgt)	400.0/2000A 0~1500A ±(2.0%rdg+4dgt) 1500A~2000A ±(2.5%rdg+4dgt)
DCA	400.0/2000A 0~1500A ±(2.0%rdg+4dgt) 1500A~2000A ±(2.5%rdg+4dgt)	200.0/2000A 0~1500A ±(2.0%rdg+4dgt) 1500A~2000A ±(2.5%rdg+4dgt)	400.0/2000A 0~1500A ±(2.0%rdg+4dgt) 1500A~2000A ±(2.5%rdg+4dgt)
Ω + Continuity	400.0Ω/4.000/40.00/400.0kΩ/4.000MΩ ±(1.5%rdg+3dgt) 40.00MΩ ±(2.0%rdg+4dgt)	200.0Ω/2.000/20.00/200.0kΩ/2.000MΩ ±(1.5%rdg+3dgt) 20.00MΩ ±(2.0%rdg+4dgt)	400.0Ω/4.000/40.00/400.0kΩ/4.000MΩ ±(1.5%rdg+3dgt) 40.00MΩ ±(2.0%rdg+4dgt)
Hz	4.000/40.00/400.0kHz/4.000/40.00MHz ±(1.0%rdg+2dgt)	2.000/20.00/200.0kHz/20.00MHz ±(0.5%rdg+2dgt)	4.000/40.00/400.0kHz/40.00MHz ±(0.5%rdg+2dgt)
Capacitor	—————	2.000/20.00/200.0nF/2.000/20.00/ 200.0uF/2.000mF ±(3.0%rdg+5dgt)	4.000/40.00/400.0nF/4.000/40.00/ 400.0uF/4.000mF ±(3.0%rdg+5dgt)
Bargraph	V	—————	—————
Display	3¾ (4000 counts)	3½ (2000 counts)	3¾ (4000 counts)
Auto-Ranges	V	V	V
Data Hold	V	V	V
Low Battery Indication	V	V	V
Auto Power-off	V	V	V
Max/Min. Mode	V	—————	—————
Relative Mode	V	—————	—————
Conductor Size	55mm Max.	55mm Max.	55mm Max.
Operating Temperature & Humidity	-10°C~50°C at <80% RH	-10°C~50°C at <80% RH	-10°C~50°C at <80% RH
Power Source	9V(6F22.006p) x 1 battery	9V(6F22.006p) x 1 battery	9V(6F22.006p) x 1 battery
Dimensions	265(L) x 100(W) x 42(D)mm	265(L) x 100(W) x 42(D)mm	265(L) x 100(W) x 42(D)mm
Weight	520g (battery included)	510g (battery included)	510g (battery included)
Accessories	Test leads (TEL-AL28-1) Carrying case (CAC-3600) Instruction manual Battery	Test leads (TEL-AL28-1) Carrying case (CAC-3600) Instruction manual Battery	Test leads (TEL-AL28-1) Carrying case (CAC-3600) Instruction manual Battery
Safety Standard	EN 61010-1 EN 61010-2-32 CAT III 600V EN 61326-1		

FEATURES

- Designed for testing AC current and AC voltage.
- AC current testing has 5 ranges.
- The minimum resolution of leakage current is 0.1mA.
- Frequency selection : 50/60 Hz and Wide.
- Data hold function.
- Maximum reading.
- Low battery indication.

SPECIFICATIONS

● AC Current :

Ranges		Accuracy	
		50/60Hz	WIDE
200mA(0~199.9mA)		±(1.5%rdg+2dgt)	50/60Hz : ±(1.0%rdg+2dgt)
2A(0~1.999A)			40/1000Hz : ±(3.0%rdg+2dgt)
20A(0~19.99A)			
200A(0~199.9A)		±(2.0%rdg+2dgt)	50/60Hz : ±(1.5%rdg+2dgt)
			40/1000Hz : ±(3.5%rdg+2dgt)
1000A	0~500A	±(2.0%rdg+2dgt)	50/60Hz : ±(1.5%rdg+2dgt)
			40/1000Hz : ±(3.5%rdg+2dgt)
	501~1000A		
			40/1000Hz : ±10%rdg

● AC Voltage : 3920 CL

Ranges	Resolution	Accuracy
AC 200V	0.1V	±(1.5%rdg+3dgt)
AC 600V	1V	±(1.5%rdg+3dgt)

3921 CL

Ranges	Resolution	Accuracy
AC 600V	1V	±(1.5%rdg+3dgt)
DC 600V	1V	±(1.0%rdg+2dgt)

(All at 23°C±5°C , ≤80%R.H)

● General :

- **Display :**
3½ digit (2000 counts).
- **Low Battery Indication :**
" " sign appears on the display when the battery voltage drops below accurate operating level.
- **Operating Principle :** Dual slope integration.
- **Conductor Size :** Approx. 55mm max
- **Overload protection :** AC 600V, DC 600V
- **Data Hold Indication :** HOLD
- **Response Time :** Approx. 1 second.
- **Sample Rate :** Approx. 2 times per second.
- **Dimensions :** 260(L) x 95(W) x 43(D)mm
- **Weight :** Approx. 540g (battery included)
- **Power source :**
One type PP3, 6F22, 006P(or equivalent), 9V manganese.
- **Temperature & Humidity for Guaranteed :**
23°C ± 0°C at < 80% max. relative humidity.
- **Storage Temperature & Humidity :**
-20°C to 60°C at < 80% max. relative humidity.
- **Battery Life :**
Approx. 100 hours on continuous use. (Alkaline)
- **Meets :** EN 61010-1 61010-2-32 CAT III 600V
EN 61326-1

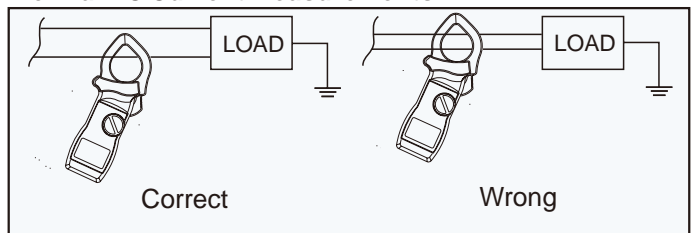


3920 CL

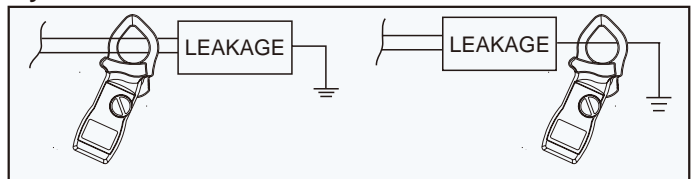
3921 CL

AC Current Measurement

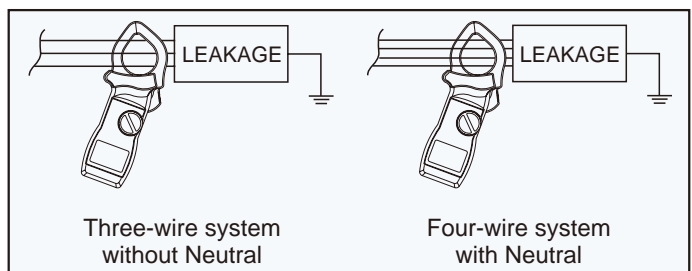
Normal AC Current Measurements



Leakage Current Measurements on the Single-Phase System



Leakage Current Measurement on Three-Phase System





CE

506 EL

507 EL

506 EL and 507 EL are special purpose AC milli-ammeter. Designed to measure hazardous leakage current from electrical appliances and other power line operated equipment.

IT'S USED FOR

● Motor operated appliances

Washing machine, electrical pump, lawn mower, refrigerator, electric drill, electric fan, vending machine.

● Electrothermal appliances

Toaster, electric stove, electric curling iron, hair dryer.

● Electronic appliances

Microwave ranges, TV receiver, welding machine.

● Light source appliances

Projector, duplicator and photographic enlarger.

● Other appliances

Portable generator, burglar alarm, medical and dental equipment....

FEATURES

- High quality movement.
- Small and lightweight, easy to use and storage.
- Mirror scale : for easier viewing & reading.
- With stand : makes reading and measuring easily.
- 200 μ A full scale value.
- Fuse protected.
- Low battery indication.
- Meets : EN 61010-1 CAT.III 600V
EN 61326-1

SPECIFICATIONS

AC Leakage Current	506 EL	507 EL
Measuring Range	0.3mA-1mA-3mA-10mA-30mA	
Accuracy	$\pm 2\%$ F.S.	
Input Resistance	1.5K Ω	1.5K Ω / 2K Ω

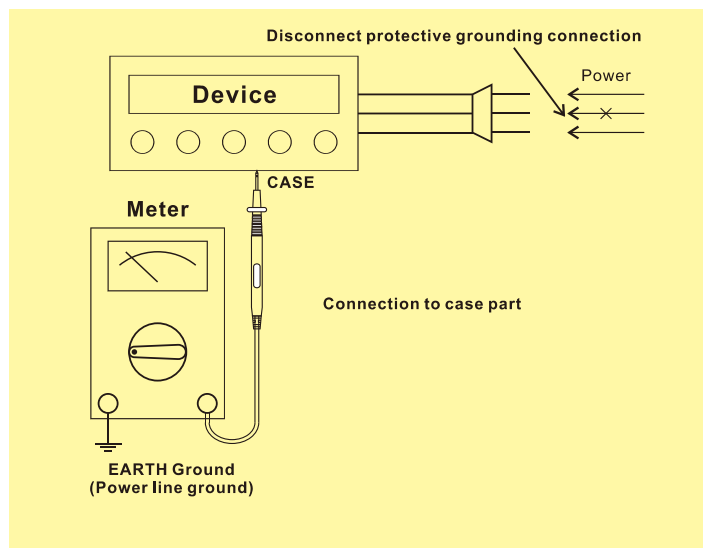
AC Voltage

Measuring Range	0-300 / 0-600V	0-150 / 0-300V
Accuracy	$\pm 2\%$ F.S.	
Input Impedance	300V 1M Ω 600V 2M Ω	150V 500K Ω 300V 1M Ω

General

Low Battery Indication	Battery check indicate good battery from 7Vdc to 9Vdc during a load test of 2mA	
Dimensions	160(L) x 100(W) x 45(D)mm	
Weight (Battery Included)	360g	370g
Power source	9V (006P) x 1 battery	
Accessories	Test leads Battery Instruction Manual	

TESTING DIAGRAM



AL-24A



CE

2108 EL

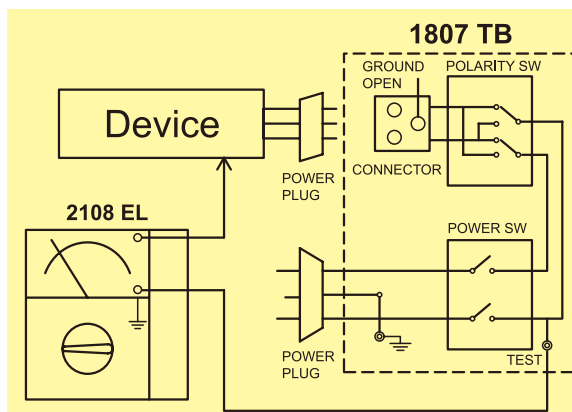
FEATURES

- High quality Taut Band movement.
- Four functions : DC current. AC current. AC+DC current and ACV measurement.
- Three input resistance ranges : 1k Ω , 1.5k Ω and 2k Ω
- 200uA full scale value.
- $\pm 2.5\%$ full scale value accuracy.
- Built-in overload protection circuit.
- Robust, Compact and easy to carry.
- Meets : EN 61010-1 CAT III 600V. EN 61326-1

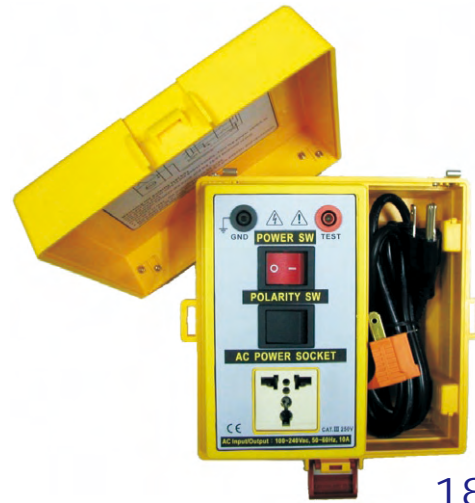
SPECIFICATIONS

- **Range :**
DC Current : 0.1-1-10mA
AC Current : 0.1-1-10mA
AC+DC current : 0.1-1-10mA
AC Voltage : 150-300V(50/60Hz)
Accuracy : $\pm 2.5\%$ of full scale value
- **Input Impedance :**
Current Ranges : 1k Ω , 1.5k Ω and 2k Ω .
Voltage Ranges : 150V/500k Ω , 300V/1M Ω
- **Working Frequency :** 20Hz~5kHz
- **Overload Protection :** Withstands 30mA AC for 10 minutes for each current measuring range.
- **Operating Temperature :** 0°C~ 50°C
- **Operating Humidity :** Max. 80% R.H.
- **Dimensions :** 210(L) x 210(W) x 100(D)mm.
- **Weight : Approx. :** 1395g(battery included).
- **Power source :** 1.5V(AA) x 8 or equivalent.

CONNECTION DIAGRAM



TEST BOX (1807 TB)
(Work with 2108 EL. 506 EL. 507 EL)



1807 TB

HOW TO USE

Matching the polarity test box

Connect the power cord to the power supply. Turn the power switch to ON and measure. If the voltage between the earth and the TEST terminal of this instrument :

- AC30 V or less : the instrument can be used.
- More than AC30 V : use the accessory 3-2 pin adapter and reconnect the power plug opposite.

1. Set the measuring range selector switch to ACV position of Model 2108 EL. Connect the "GROUND" terminal of Model 2108 EL to the "TEST" terminal of Model 1807 TB, then close switch POWER SW.
2. Connect the "LINE" terminal of Model 2108 EL to either of the "CONNECTOR" of Model 1807 TB, and measure the power voltage to check that the voltage is as rated. (If the polarity is opposite, the meter pointer will be zero; in this case use switch POLARITY SW to change the polarity.)
3. Open switch POWER SW, and connect all the simultaneously accessible exposed conductive surfaces of the to-be-tested appliance together to the "LINE" terminal of Model 2108 EL.
4. Input "DEVICE" power plug of the to-be-tested appliance, and turn on all the appliance's switches.
5. Leakage current is not necessarily only in the AC spectrum, therefore set the measuring range selector switch to AC + DC mA range.
6. Close switch POWER SW of Model 1807 TB, and read the meter of Model 2108 EL. This reading will tell you the approximate value of the leakage current.
7. Referring to the value obtained in number 6. above, set the range of the AC mA to the optimum range, and read the meter of Model 2108 EL.
8. Change switch POLARITY SW of Model 2108 EL, read the meter of Model 2108 EL, and use the greater one of the above meter readings as the leakage current value.
9. Set the measuring range selector switch of Model 2108 EL to the DC mA range, and read the meter of Model 2108 EL.
10. Repeat the measurement conducted in number 8. above.
11. Start operating the appliance. When the appliance has reached its steady operating status, measure its leakage current. When not using the Model 1807 TB Test Box.



6400 DM

FEATURES

- 3-3/4 digital LCD with a maximum display of 3999.
- An angled-display design helps the user to identify the reading of value easier.
- Auto-ranging designed.
- Rang change function.
- Continuity check.
- Diode measurement.
- Data Hold Function.
- Low battery indication.
- Over range indication.
- Fuse protection.
- Hook design included makes it easy to use no matter for standing or hanging purpose.
- Meets EN 61010-1 CAT III 600V.
EN 61326-1

SPECIFICATIONS

DC Voltage :

Range	Resolution	Accuracy	Input Protection
400.0 mV	100 μ V	$\pm (0.5\%rdg+3dgt)$	1000V DC
4.000 V	1 mV		
40.00 V	10 mV		
400.0 V	100 mV		
1000 V	1 V		

Input impedance : 10 M Ω

AC Voltage :

Range	Resolution	Accuracy	Input Protection
400.0 mV	100 μ V	$\pm (1\%rdg+5dgt)$	800V AC
4.000 V	1 mV		
40.00 V	10 mV		
400.0 V	100 mV		
750V	1 V		

Input impedance : 10 M Ω

DC Current :

Range	Resolution	Accuracy	Input Protection
400.0 μ A	0.1 μ A	$\pm (1\%rdg+5dgt)$	500 mA
4000 μ A	1 μ A		
40.00 mA	0.01 mA		
400.0 mA	0.1 mA		
10 A	10 mA	$\pm (2\%rdg+3dgt)$	12.5A

- Overload Protection 0.5 A/ 250 V fast blow fuse for 400mA
12.5A/500V fast blow fuse for 10A

AC Current :

Range	Resolution	Accuracy	Input Protection
400.0 μ A	0.1 μ A	$\pm (1\%rdg+5dgt)$	500 mA
4000 μ A	1 μ A		
40.00 mA	0.01 mA		
400.0 mA	0.1 mA		
10A	10 mA	$\pm (2\%rdg+3dgt)$	12.5A

- Overload Protection 0.5 A/ 250 V fast blow fuse for 400mA
12.5A/500V fast blow fuse for 10A

Resistance :

Range	Resolution	Accuracy	Max Test Current	Max Open Circuit Voltage
400.0 Ω	0.1 Ω	$\pm (1.5\%rdg+3dgt)$	0.55mA	0.5V
4.000 K Ω	1 Ω			
40.00 K Ω	10 Ω			
400.0 K Ω	100 Ω			
4.000 M Ω	1 K Ω			
40.00 M Ω	10 K Ω	$\pm (2\%rdg+4dgt)$		

Overload Protection 500 DC

Frequency :

Range	Resolution	Accuracy
4.000 KHz	1 Hz	$\pm (1\%rdg+2dgt)$
40.00 KHz	10 Hz	
400.0 KHz	100 Hz	
4.000 MHz	1 KHz	
40.00 MHz	10 KHz	

Continuity :

Range	Resolution	Continuity beeper	Test Current
400.0 Ω	0.1 Ω	< 25 Ω	0.55mA

General :

Low battery indication	"BATT"
Operating Temperature	0°C ~ 40°C, 80% Max.
Storage Temperature & Humidity	-10°C ~ 50°C, 80% Max.
Dimensions	192(L) x 88.5(W) x 45(D)mm
Weight	Approx. 350g(battery included)
Power Source	1.5V x 2(AAA)
Accessories	Test leads Instruction manual Batteries Holster (optional)



AL-26

CCO-6400
Optional (for 6400DM
6410DM, 6420DM)



6410 DM

FEATURES

- 3000-count LCD with a maximum display of 2999.
- An angled-display design helps the user to identify the reading of value easier.
- Auto scanning function for AC/DC Voltage, Current.
- Auto detection function for Resistance, Diode, Capacitance.
- Auto-ranging designed.
- Ranging change function.
- Continuity check.
- Data Hold Function.
- Low battery detection.
- Over range indication.
- Fuse protection.
- Hook design included makes it easy to use no matter for standing or hanging purpose.
- Meets EN 61010-1 CAT III 600V.
EN 61326-1

SPECIFICATIONS

DC Voltage :

Range	Resolution	Accuracy	Input Protection
300.0 mV	100 μ V	$\pm(0.5\%rdg+3dgt)$	1000V DC
3.000 V	1 mV		
30.00 V	10 mV		
300.0 V	100 mV		
1000 V	1 V		

Input impedance : 10 M Ω

AC Voltage :

Range	Resolution	Accuracy	Input Protection
300.0 mV	100 μ V	$\pm(1\%rdg+5dgt)$	800V AC
3.000 V	1 mV		
30.00 V	10 mV		
300.0 V	100 mV		
750V	1 V		

Input impedance : 10 M Ω

DC Current :

Range	Resolution	Accuracy	Input Protection
300.0 μ A	0.1 μ A	$\pm(1\%rdg+5dgt)$	500 mA
3000 μ A	1 μ A		
30.00 mA	0.01 mA		
300.0 mA	0.1 mA	$\pm(2\%rdg+3dgt)$	12.5 A
10A	10 mA		

- Overload Protection 0.5 A/250 V fast blow fuse for 300 mA
12.5 A/500 V fast blow fuse for 10 A

AC Current :

Range	Resolution	Accuracy	Input Protection
300.0 μ A	0.1 μ A	$\pm(1\%rdg+5dgt)$	500 mA
3000 μ A	1 μ A		
30.00 mA	0.01 mA		
300.0 mA	0.1 mA	$\pm(2\%rdg+3dgt)$	12.5 A
10A	10 mA		

- Overload Protection 0.5 A/250 V fast blow fuse for 300 mA
12.5 A/500 V fast blow fuse for 10 A

Resistance :

Range	Resolution	Accuracy	Max Test Current	Max Open Circuit Voltage
300.0 Ω	0.1 Ω	$\pm(1.5\%rdg+3dgt)$	0.51mA	0.39 V
3000 Ω	1 Ω			
30.00 K Ω	10 Ω			
300.0 K Ω	100 Ω	$\pm(2\%rdg+4dgt)$		
3.000 M Ω	1 K Ω			
30.00 M Ω	10 K Ω			

Overload Protection 500V DC

Continuity :

Range	Resolution	Continuity beeper	Test Current
300 Ω	0.1 Ω	<30 Ω	0.51 mA

Capacitance :

Range	Resolution	Accuracy
3000 pF	1 pF	$\pm(3\%rdg+10dgt)$
30 nF	10 nF	
300 nF	100 nF	
3 μ F	1 nF	
30 μ F	10 nF	
300 μ F	100 nF	
3 mF	1 μ F	
30 mF	10 μ F	

Frequency :

Range	Resolution	Accuracy
3.000 KHz	1 Hz	$\pm(1\%rdg+2dgt)$
30.00 KHz	10 Hz	
100.0 KHz	100 Hz	

General :

Low battery indication	"BATT"
Operating Temperature	0°C ~ 40°C, 80% Max.
Storage Temperature & Humidity	-10°C ~ 50°C, 80% Max.
Dimensions	192(L) x 88.5(W) x 45(D)mm
Weight	Approx. 345g(battery included)
Power Source	1.5V x 2(AAA)
Accessories	Test leads (AL-26) Instruction manual Batteries Holster (optional)



6420 DM

FEATURES

- 3-3/4 digital LCD with a maximum display of 3999.
- An angled-display design helps the user to identify the reading of value easier.
- Bar graph LCD display.
- Auto-ranging designed.
- Ranging change function.
- Relative/Maximum/Minimum modes.
- Peak hold mode.
- VAHz mode measures frequency in voltage or current mode.
- 40M Hz frequency counter.
- Auto power off.
- Continuity check.
- Data Hold Function.
- Low battery detection.
- Over range indication.
- Fuse protection.
- Hook design included makes it easy to use no matter for standing or hanging purpose.
- Meets EN 61010-1 CAT III 600V.
EN 61326-1

SPECIFICATIONS

DC Voltage :

Range	Resolution	Accuracy	Input Protection
400.0 mV	100 μ V	$\pm(0.5\%rdg+3dgt)$	1000V DC
4.000 V	1 mV		
40.00 V	10 mV		
400.0 V	100 mV		
1000 V	1 V		

Input impedance : 10 M

AC Voltage :

Range	Resolution	Accuracy	Input Protection
400.0 mV	100 μ V	$\pm(1\%rdg+5dgt)$	800V AC
4.000 mV	1 mV		
40.00 mV	10 mV		
400.0 mV	100 mV		
750 V	1 V		

Input impedance : 10 M

DC Current :

Range	Resolution	Accuracy	Input Protection
400.0 μ A	0.1 μ A	$\pm(1\%rdg+5dgt)$	500 mA
4000 μ A	1 μ A		
40.00 mA	0.01 mA		
400.0 mA	0.1 mA		
10 A	10 mA	$\pm(2\%rdg+2dgt)$	12.5 A

- Overload Protection 0.5 A / 250 V fast blow fuse for 400 mA
12.5A / 500V fast blow fuse for 10 A

AC Current :

Range	Resolution	Accuracy	Input Protection
400.0 μ A	0.1 μ A	$\pm(1\%rdg+5dgt)$	500 mA
4000 μ A	1 μ A		
40.00 mA	0.01 mA		
400.0 mA	0.1 mA		
10A	10 mA	$\pm(2\%rdg+3dgt)$	12.5 A

- Overload Protection 0.5 A / 250 V fast blow fuse for 400 mA
12.5A / 500V fast blow fuse for 10 A

Resistance :

Range	Resolution	Accuracy	Max Test Current	Max Open Circuit Voltage
400.0	0.1	$\pm(1.5\%rdg+3dgt)$	0.55mA	0.5A
4.000 K	1			
40.00 K	10			
400.0 K	100			
4.000 M	1 K	$\pm(2\%rdg+4dgt)$		
40.00 M	10 K			

Overload Protection 500V DC

Frequence :

Range	Resolution	Accuracy
400.0 Hz	0.1 Hz	$\pm(1\%rdg+2dgt)$
4.000 KHz	1 Hz	
40.00 KHz	10 Hz	
400.0 KHz	100 Hz	
4.000 MHz	1 KHz	
40.00 MHz	10 KHz	

Continuity Check :

Range	Resolution	Continuity beeper	Test Current
400	0.1	< 35	0.55 mA

General :

Low battery indication	BATT
Operating Temperature	0°C ~ 40°C, 80% Max.
Storage Temperature & Humidity	-10°C ~ 50°C, 80% Max.
Dimensions	192(L) x 88.5(W) x 45(D)mm
Weight	Approx. 350g(battery included)
Power Source	1.5V x 2(AAA)
Accessories	Test leads (AL-26) Instruction manual Batteries Holster (optional)



ST-3201 ST-3501

FEATURES

- **Display:** 3½ digit liquid crystal display (LCD) with max. reading of 1999.
- **Polarity:** Automatic, (-) negative polarity indication.
- **Zero Adjustment:** Automatic.
- **Over Range Indication:** Highest digit of (1) or (-1) is displayed.
- **Low Battery Indication:** The (BAT) is displayed when the battery voltage drops below the operating voltage.
- **Measurement Rate:** 3 measurements per second, nominal.
- **Operating Temperature:** 0°C to ±50°C, 0-70% RH.
- **Storage Temperature:** -20°C to +60°C, 0-80% RH, with battery removed.
- **Accuracy:** Accuracy specifications at 23 ±5°C, less than 75% RH.
- **Power:** Single, 006P 9 volt battery
- **Dimensions:** 128(L)×72(W)×33(D)mm.
- **Weight:** Appro.200g(ST-3501), 183G(ST-3201)

SPECIFICATIONS

DC Voltage :

Range	Resolution	Accuracy	Over voltage Protection
200mV	100nV	±(0.5%rdg+1dgt)	DC500V
2V	1mV		AC350V
20V	10mV		
200V	100mV		DC1200V
1000V	1V		AC800V

Input impedance: 10MΩ

AC Voltage :

Model	Range	Resolution	Accuracy	Over voltage Protection
3501	200mV	100uV	45Hz to 400Hz ±(1.2%rdg+4dgt)	DC500V
	2V	1mV		AC350V
	20V	10mV		
	200V	100mV		
	1000V	1V		DC1200V
3201	750V	1V	±(1.5%rdg+4dgt)	AC800V

Input impedance: 10MΩ(3501)

DC Current :

Range	Resolution	Accuracy	Over voltage Protection
200uA	100nA	±(1.0%rdg+1dgt)	325mV max
2mA	1uA		
20mA	10uA		
200mA	100uA		
10A	10mA	±(2.0%rdg+3dgt)	700mV max

Overload Protection 0.8A (250V) fast blow fuse

AC Current(3501) :

Range	Resolution	Accuracy 45Hz to 400Hz	Over voltage Protection
200uA	100nA	±(1.2%rdg+1dgt)	325mV max
2mA	1uA		
20mA	10uA		
200mA	100uA		
10A	10mA	±(2.0%rdg+3dgt)	700mV max

Overload Protection 0.8A (250V) fast blow fuse

Resistance :

Range	Resolution	Accuracy	Max Test Current	Max Open Circuit Voltage
200Ω	0.1Ω	±(1.0%rdg+3dgt)	3mA	3.2V
2KΩ	1Ω	±(0.8%rdg+1dgt)	250uA	0.3V
20KΩ	10Ω		50uA	
200KΩ	100Ω		5uA	
2MΩ	1KΩ		500nA	
20MΩ	10KΩ	±(3.0%rdg+1dgt)	50nA	

Continuity (ST-6501) :

Range	Resolution	Accuracy	Max Test Current	Max Open Circuit Voltage
200Ω	0.1Ω	Built Buzzer sounds when resistance is less then 80Ω	1.5mA	3.2V

Capacitance (3501):

Range	Resolution	Accuracy	Over voltage Protection
2000PF	1pF	±(3%rdg+10dgt)	500mV 400Hz
20nF	10pF		
200nF	100pF		
2uF	1nF		
20uF	10nF		

Frequency :

Test	Accuracy	BATT Range	TEST(3201) Load
HFE Test			
Base DC Current	10uA		
Vce	2.8±0.4V		
HFE	0 to 1000	1.5V	10
Diode		9V	900
Test Current	1.0 ±0.6mA		
Test Voltage	3.2Max	1.5V	4



ST-3502

FEATURES

DIGITAL DISPLAY

- 3½ digit, high contrast LCD, with a maximum display of 1999.
- Automatic polarity indication, zero adjust.
- Low battery (BAT) indication.
- Overrange indication: highest digit of (1) or (-1).

ANALOG DISPLAY

- Large 90° wide and 84mm long mirror scale.
- (adapted to digital, analog maximum indication 2400).
- Shock and vibration resistant TAUT BAND movement.
- Switch selection normal (left hand side) zero or center (galvo-mode) zero. Polarity + or-, pointer turn to right hand side, avoid opposite direction.
- Centre zero and ohm zero: automatic
- DIMENSIONS: 102mm(W)×167mm(H)×39mm(D)

SPECIFICATIONS

DC Voltage :

Range	Analog Maximum	Resolution Digital	Accuracy		Protection
			Digital	Analog	
200m	240mV	100uV	±(0.5%rdg+dgt)	±2%FSD	DC500V AC350V
2V	2.4V	1mV			
20V	24V	10mV			
200V	240V	100mV			
1000V	1000V	1V	±(1.5%rdg+5dgt)		DC1200V AC800V

Input impedance: 10M

AC Voltage :

Range	Analog Maximum	Resolution Digital	Accuracy		Protection
			Digital	Analog	
200m	240mV	100uV	±(1%rdg+5dgt)	±3%FSD	DC500V AC350V
2V	2.4V	1mV			
20V	24V	10mV			
200V	240V	100mV			
1000V	750V	1V	±(1.5%rdg+5dgt)		DC1200V AC800V

Input impedance: 10M

DC Current :

Range	Analog Maximum	Resolution Digital	Accuracy		Protection
			Digital	Analog	
200uA	240uA	100nA	±(1%rdg+5dgt)	±3%FSD	800mA
2mA	2.4mA	1uA			
20mA	24mA	10uA			
200mA	240mA	100uA			
10A	10A	10mA	±(2%rdg+3dgt)		10A

AC Current :

Range	Analog Maximum	Resolution Digital	Accuracy		Protection
			Digital	Analog	
200uA	240uA	100nA	±(1%rdg+5dgt)	±3%FSD	800mA
2mA	2.4mA	1uA			
20mA	24mA	10uA			
200mA	240mA	100uA			
10A	10A	10mA	±(2%rdg+3dgt)		10A

Resistance :

Range	Analog Maximum	Resolution Digital	Accuracy		Protection
			Digital	Analog	
200	5K	100m	±(1%rdg+5dgt)	±4%arc	50V DC
2K	50K	1m		-10	
20K	500K	10	±(1%rdg+5dgt)	±4%arc	
200K	5M	100			
2000K	50M	1K			
20M	500M	10K	±(1.5%rdg+5dgt)		

Capacitance :

Range	Analog Maximum	Resolution Digital	Accuracy		Protection
			Digital	Analog	
2000pF	2400pF	1pF	±(3%rdg+10dgt)	±5%FSD	50mV 400Hz
20nF	24nF	10pF			
200nF	240nF	100pF			
2uF	2.4nF	1nF			
20uF	24uF	10nF			

Instant Continuity:

Range	Analog Maximum	Resolution Digital	Continuity Indication	Protection
200	5K	100m	Built Buzzer sounds when Resistance is less than 40	3.2V MAX

Frequency :

Range	Analog Maximum	Resolution Digital	Accuracy		Protection
			Digital	Analog	
2000Hz	2400Hz	1Hz	±(2%rdg+3dgt)	±3%FSD	350Vrms

Diode Test

Test Current 3.0 ±0.6mA
Test Voltage 3.2Max

HFE Test

Base DC Current 10A
Vce 2.8±0.4V
HFE 1000



PT-30

FEATURES

- Light in weight, compact in size, and easy to use.
- 4000 - count LCD.
- Full automatic measurement.
 - Voltage measurement.
 - Resistor measurement.
- Data Hold function.
- Auto-off function.
- Continuity check.
- Diode measurement.
- Low battery indication.
- Pen light provided.
- Back light LCD.
- 3V DC power supply.
- Safety Standard :
 - EN 61010-1 CAT III 600V,
 - EN 61326-1

SPECIFICATIONS

AC Voltage :

Range	Resolution	Accuracy
4 V	1 mV	$\pm(1.5\%rdg+5dgt)$
40 V	10 mV	$\pm(1.5\%rdg+5dgt)$
400 V	100 mV	$\pm(1.5\%rdg+5dgt)$
600 V	1 V	$\pm(1.5\%rdg+5dgt)$

Input impedance : 10M Ω

DC Voltage :

Range	Resolution	Accuracy
4 V	1 mV	$\pm(1\%rdg+3dgt)$
40 V	10 mV	$\pm(1\%rdg+3dgt)$
400 V	100 mV	$\pm(1\%rdg+3dgt)$
600 V	1 V	$\pm(1\%rdg+3dgt)$

Input impedance : 10M Ω

Resistance :

Range	Resolution	Accuracy
400 Ω	0.1 Ω	$\pm(1.5\%rdg+3dgt)$
4 k Ω	1 Ω	$\pm(1.5\%rdg+3dgt)$
40 k Ω	10 Ω	$\pm(1.5\%rdg+3dgt)$
400 k Ω	100 Ω	$\pm(1.5\%rdg+3dgt)$
4 M Ω	1 k Ω	$\pm(1.5\%rdg+3dgt)$
40 M Ω	10 k Ω	$\pm(2.5\%rdg+4dgt)$

Overload Protection 500V DC

Continuity Test:

Range	Audible threshold
400 Ω	Less than 25 Ω

Diode test: Test voltage approx. 0.3V to 2V

General

● Dimensions :

196mm(L) x 35.8mm(W) x 28.3mm(D)

● Weight :

Approx. 105g (battery included)

● Power source :

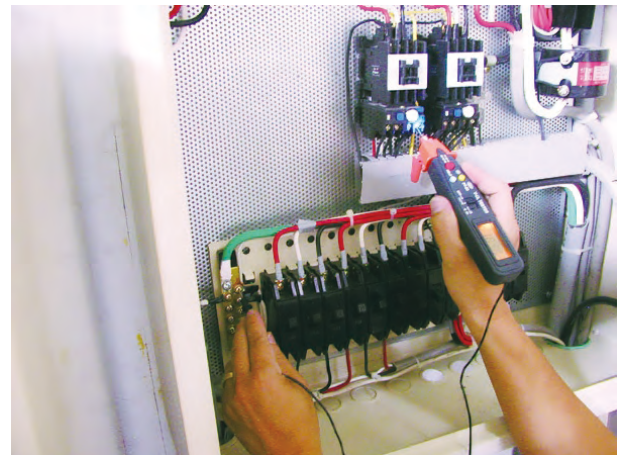
CR2032 battery 3V x 1

● Low Battery Indication :

"BATT" sign appears on the display when the battery voltage drops below accurate operating level.

● Accessories :

Battery,
Carrying case.
Instruction Manual,
Fixture.





CE

ST-365 TR

DC Volts : 0-0.01/0.5/2.5/10/50/250/1000V(20kΩ/V)
 AC Volts : 0-10/50/250/1000V
 DC mA : 50uA/2.5/25/250mA
 OHMS : 2K/20K/200K/2M/20M (20 Mid-Scale)
 Accuracy : ±3% F.S. DC. ±4% F.S. AC.
 Sensitivity : 20kΩ/V DC. 8kΩ/V AC.
 DB : -10 to ±50dB
 Hfe : 0-1000
 ICEO : 150uA, 1.5mA, 15mA, 150mA
 LV : 3V
 Dimension : 100(L) x 150(W) x 41(D)mm
 Weight : 300g
 Power : Two "AA" 1.5V Batteries.
 One 006P 9V Battery.

● IEC 1010-1 CAT.II 1000V



CE

ST-360 TRn

DC Volts : 0-0.01/0.5/2.5/10/50/250/1000V(20kΩ/V)
 AC Volts : 0-10/50/250/1000V
 DC mA : 50uA/2.5/25/250mA
 OHMS : 2K/20K/2M/20M (20 Mid-Scale)
 Accuracy : ±3% F.S. DC. ±4% F.S. AC.
 Sensitivity : 20kΩ/V DC. 8kΩ/V AC.
 Db : -10 to ±50dB
 Hfe : 0-1000
 ICEO : 150uA, 15mA, 150mA
 Lv : 3V
 Dimension : 102(L) x 148(W) x 46(D)mm
 Weight : 300g
 Power : Two "AA" 1.5V Batteries.
 One 006P 9V Battery.

● IEC 1010-1 CAT II 1000V



ST-520

● For telecom and audio work,

DCV : 0-0.25/1/2.5/10/25/100/250/1000V
 (50kΩ/V) ±3%
 ACV : 0-2.5/10/25/100/250/500/1000V
 (13kΩ/V) ±4%
 DCA : 0.05/5/50/500mA. 0-12 ±3%
 Resistance : 2kΩ, 20kΩ, 2MΩ, 20MΩ
 (Midscale 20, 200, 20k, 200kΩ)
 Decibel : -20 to 56dB(0dB=1MW, 600Ω)
 Dimension : 110(L) x 160(W) x 52(D)mm
 Weight : 480g
 Power : Two "AA" 1.5V Batteries.
 One 006P 9V Battery.



CE

ST-505N

This 50k Ω /V analog multitester with its wide range of measurement capabilities, which includes a 10A AC range, is particularly designed for the requirement of electrical and electronic specialists and engineers. This instrument is also provided with meter over load protection and shock proof device.

FEATURES

- High quality Taut Band movement.
- Easy to read 3-color scale : for mistake proof reading.
- Mirror scale : makes reading pointer easy.
- Safety features : on all ranges.
- Safety features : safety fused, safety "OFF" position.
- dB measurement.
- With stand : makes reading and measuring Easy.
- EN 61010-1 CAT III 600V.
EN 61326-1

SPECIFICATIONS

DC Voltage :

Ranges	0.25/1/2.5/10/50/250/1000V
Accuracy	$\pm 2\%$ F.S.
Sensitivity	50k Ω /V

AC Voltage :

Ranges	2.5/10/50/250/1000V
Accuracy	$\pm 3\%$ F.S.
Sensitivity	10k Ω /V
Decibelmeter	-20 to 62dB 0dB=1mW/600 Ω Direct Scale:-20 to+10dB

DC Current :

Ranges	25 μ A-1mA-25mA/500mA, 10A(on separate input)
Accuracy	$\pm 2\%$ F.S.
Sensitivity	250mV

AC Current :

Ranges	10A
Accuracy	$\pm 3\%$ F.S.

Resistance :

Ranges	R x 10.2 to 20k Ω R x 102 to 200k Ω R x 10020 to 2M Ω R x 1K200 to 20M Ω
Accuracy	$\pm 3\%$ of F.S. Length

General :

Power Source	1.5V(AA) x 2
Dimension	160(L) x 100(W) x 45(D)mm
Weight	380g(battery included)
Accessories	Test Leads Instruction manual Batteries



AL-26



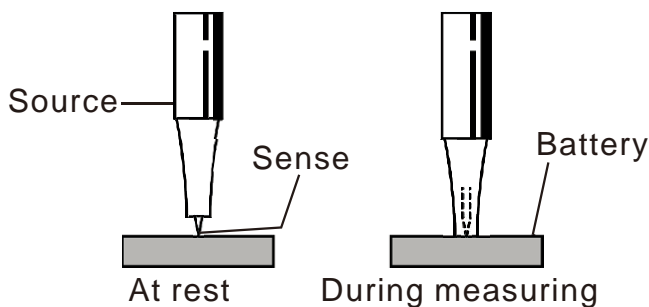
6470 BT

6470BT battery resistance tester can measure rechargeable secondary battery resistance and DC voltage at on line. Resistance measure signal used 1kHz AC frequency. Test lead used 4-wire measurement method can reduce contact resistance and lead resistance, measuring secondary batteries including Ni-cd, Ni-MH Li-ion.

FEATURES

- 2000-count LCD
- DC Voltage measurement.
- 4-wire resistance measurement.
- Data Hold function.
- Low battery indication.
- 9VDC power supply.
- Measure batteries type: Li-ion, Ni-Cd, Ni-MH
- Simple operation.
- Lead resistance and contact resistance eliminated.

When contacting the probes with the battery terminals, press so that the inner pin conductors are pushed inside, and all of the SOURCE and SENSE conductors make good contact.



SPECIFICATIONS

(All at 23°C±5°C, ≤ 80%R.H)

● DC Voltage :

Range	Resolution	Accuracy
2V	1mV	± (1% rdg+1dgt)
20V	10mV	± (1% rdg+1dgt)
100V	100mV	± (1% rdg+1dgt)

● Resistance :

Range	Resolution	Accuracy
200mΩ	0.1 mΩ	± (3% rdg+3dgt)
2000mΩ	1mΩ	± (3% rdg+3dgt)
20Ω	10 mΩ	± (3% rdg+3dgt)

● Dimensions:

192mm(L) x 88.6mm(W) x 45.2mm(D)

● Weight

Approx. 360g (battery included)

● Power source

battery 9V x1.

● Low Battery Indication

"+" sign appears on the display when the battery voltage drops below accurate operating level.

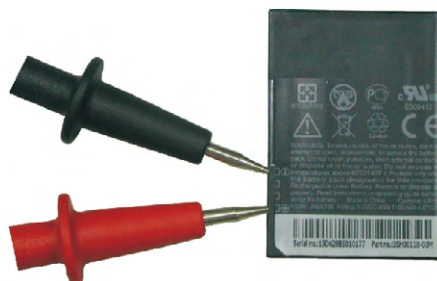
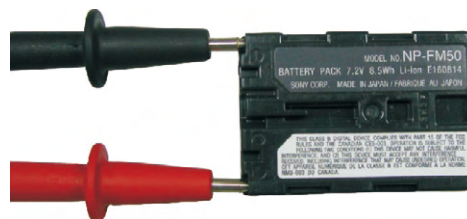
● Accessories

- Test leads
- Instruction Manual
- Battery
- Holster (optional)

● Meeting :

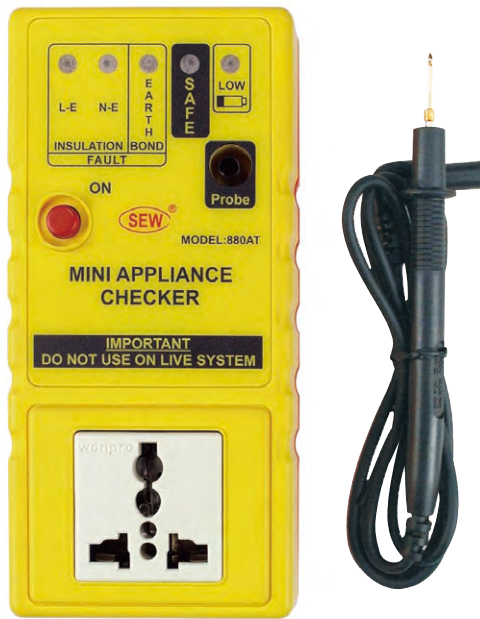
- EN 61010-1 CAT I 100V
- EN 61326-1

Li-ion battery measurement



Ni-MH battery measurement





880 AT

The Mini Appliance Checker 880 AT is a simplified version of an appliance tester which use low voltage and low current to perform it's checks.

This is not intended to be used to perform certification testing.

It has been designed to be low cost and simple to use, But still has all the necessary basic functions to check a normal appliance.

It has been designed to be utilized by people who need to check the good status fo insulation and plug wiring, for example, before delivery of an appliance to a customer.

This Mini Appliance Checker also can be utilized to confirm the problematic status of an appliance which need servicing.

This checker verify that the resistance between the Line and Earth conductor connected to the appliance is more than 1M ohm.

If this is not the case, the L-E LED will light up, showing a likely insulation fault between L-E.

This checker verify that the resistance between the Neutral and Earth conductor connected to the appliance is more than 1M ohm.

If this is not the case, the N-E LED will light up, showing a likely insulation fault between N-E.

This checker verify that the resistance between the Earth Chassis of the appliance and the Earth conductor (at the plug) connected to the appliance is less than 10 ohms. If this is not the case, the EARTH BOND LED will light up, showing a likely continuity fault between the earth at the plug and the chassis of the appliance.

When these three conditions are satisfied, the GREEN SAFE LED will lights up, showing that the appliance has

checked SAFE according to the checker method of testing.

Always use the appliance simulator before and after using the checker on a real appliance, to ensure proper working condition of the checker.

Please note that due to the fact that this checker uses less than 10V for it's test, faulty voltage dependent devices could be undetected.

Application Example

The appliance is plugged into the mini appliance checker, then the probe make contact with the protective conductor.



Other appliance checking

Washing Machine Toaster Iron Dish Washer Stove





RCB-1



RCB-3



RCB-3-1T

The RCB is used to verify and proof any High Voltage Insulation Testers. It can be utilized to calibrate all High Voltage Insulation Testers very accurately Analogs or Digitals.

Some institutions and large industries requested their own calibrator too, therefore, SEW started manufacturing the RCB for special customers.

TYPE	RCB-1	RCB-3	RCB-3-1T
Resistance Range (Ω)	1M.2M.7M.10M.20M. 30M.50M.100M.200M. 500M.1G.2G.5G.10G. 20G.50G.100G.200G. 500G	1M.10M.100M.1G.5G. 10G.100G.500G	1M.10M.100M.1G.5G. 10G.100G.1T
Resistance Tolerances	$\pm 1\%$ (F)		
	$\pm 25\text{ppm}/^\circ\text{C}$: 1M Ω .2M Ω .7M Ω .10M Ω .20M Ω .30M Ω .50M Ω .100M Ω $\pm 50\text{ppm}/^\circ\text{C}$: 200M Ω .500M Ω $\pm 100\text{ppm}/^\circ\text{C}$: 1G Ω .2G Ω .5G Ω $\pm 200\text{ppm}/^\circ\text{C}$: 10G Ω .20G Ω .50G Ω .100G Ω $\pm 400\text{ppm}/^\circ\text{C}$: 200G Ω .500G Ω $\pm 1000\text{ppm}/^\circ\text{C}$: 1T Ω		
Max. Working Voltage	DC 10kV		
Operating Temperature	-30 $^\circ\text{C}$ ~75 $^\circ\text{C}$		
Power Coefficient	Below 3W		
Connecting Terminals	Binding Post: Resistance circuit and guard		
Dimensions	430(L) x 324(W) x 127(D)mm		
Weight	Approx. 5.2kg	Approx. 4.14kg	Approx. 4.14kg



ITC 8

The ITC 8 can be utilized to check calibration of resistance ranges of insulation testers and multimeters. The resistance checker box is also used to verify insulation testers and multimeters.

Resistance Ranges :
0.5 Ω , 1 Ω , 2 Ω , 20 Ω , 200 Ω , 1k Ω , 10k Ω ,
20k Ω , 100k Ω , 1M Ω , 2M Ω , 10M Ω

Accuracy :

0.5 Ω - 2 Ω : $\pm 0.05\%$
20 Ω - 10M Ω : $\pm 1\%$

Dimensions : 150(L) x 72(W) x 60(D)mm

Weight : Approx. 180g

Safety Standard : IEC/EN 61010-1 CAT III 1000Vdc



MAX 1000VDC

INTRODUCTION

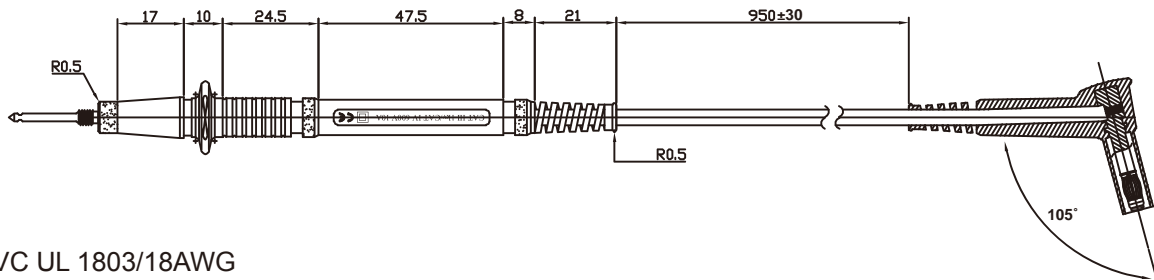


Comparison of conventional and patented terminal cover

The biggest vulnerability of the leads for a meter or tester is the terminal connections, which could often have bad contact. Our patented screw end has completely offset the bending oppression, which makes it lasts at least ten times longer.

● Patent No.

U.S.A	US 6,265,668 B1
GERMANY	299 12 812 • 1
CHINA	ZL 99 2 16904 • 6



- **Wire :** PVC UL 1803/18AWG
length : 1100±30mm
Out diameter : 4.0mm
Temperature tolerance range : -40°~105°
Braid copper wires : 170/0.08mm
- **Terminal :**
105° angle 4mm brass banana plug(nickel plated) with caged and insulated Sheathing to avoid the brass oxidation.
- **Rating :**
EN 61010-031
CAT III 1000V 15A(170/0.08) / CAT IV 1000V 15A(200/0.08)



TEL-AL11-1

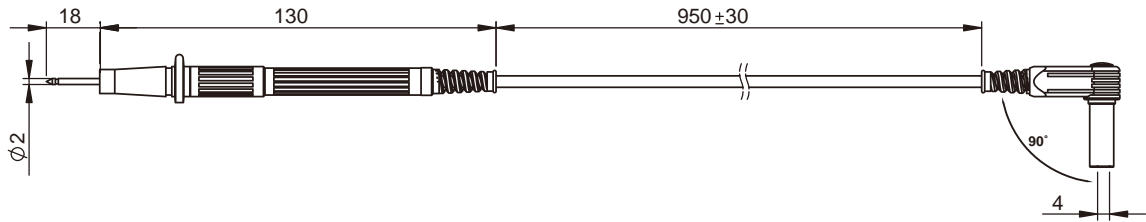
TEL-AL11-2A

TEL-AL11-3

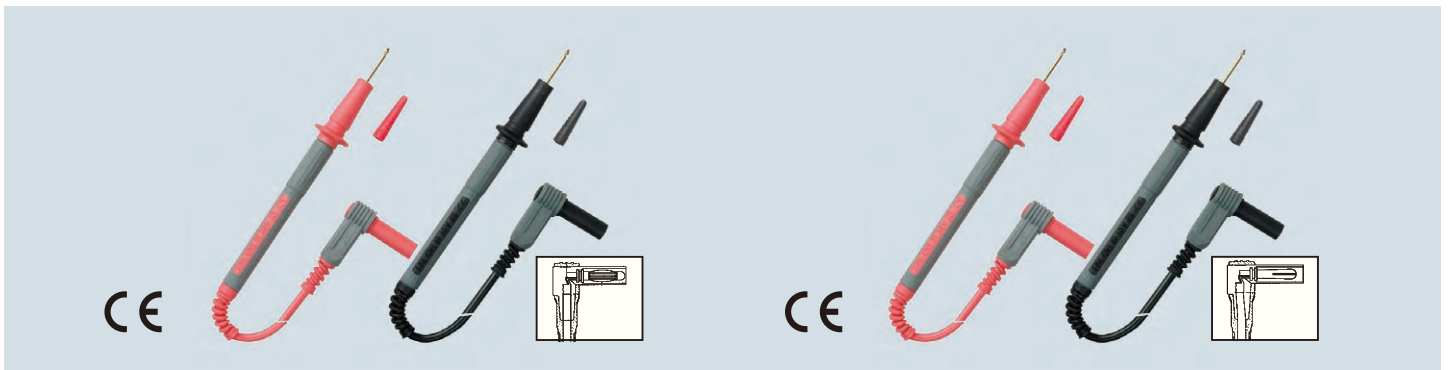


TEL-AL11-4

TEL-AL11-5

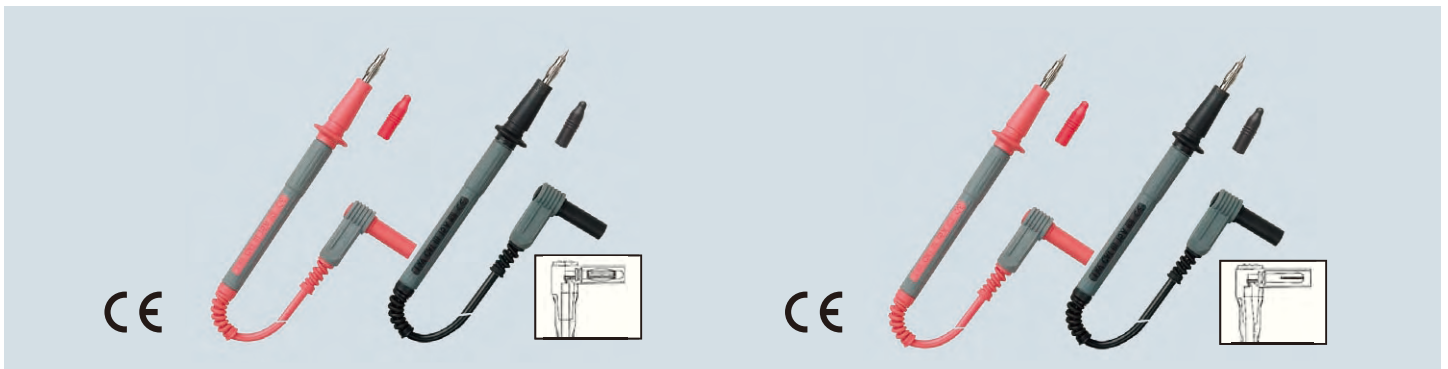


- **Wire :** PVC UL 1803/18AWG
length : 1100±30mm
Out diameter : 4.0mm
Temperature tolerance range : -40°~105°
Braid copper wires : 170/0.08mm
- **Terminal :**
4mm with brass nickel plated
- **Rating :**
EN 61010-31 CAT IV 1000V 10A



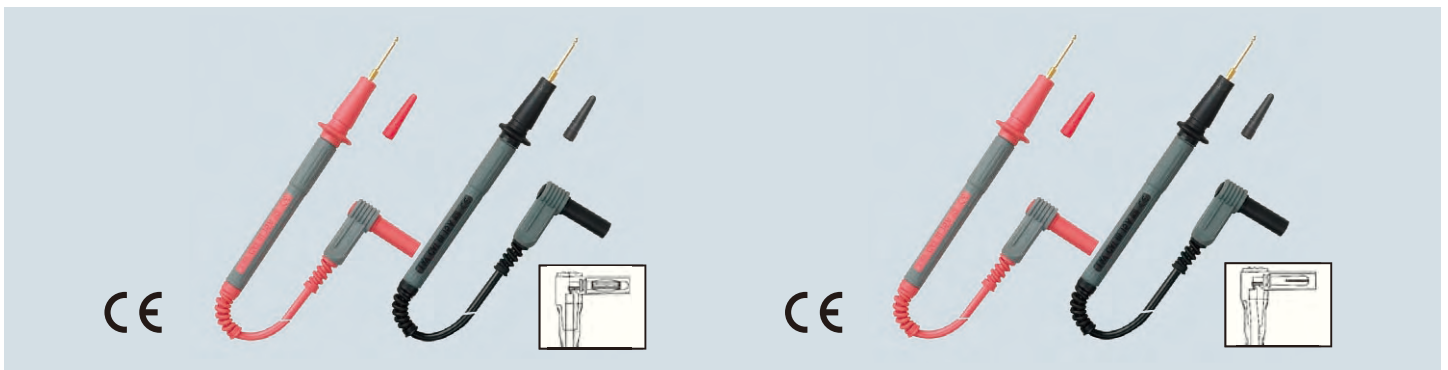
TEL-AL28-1

TEL-AL28-2



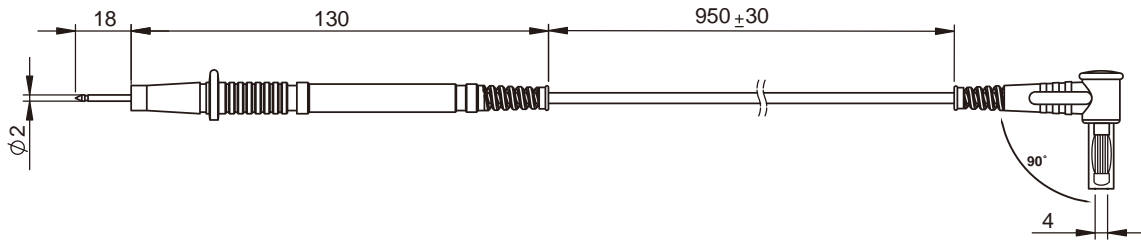
TEL-AL28-3

TEL-AL28-4



TEL-AL28-5

TEL-AL28-6



- **Wire** : PVC UL 1803/18AWG
length : 1100±30mm
Out diameter : 3.50mm
Temperature tolerance range : -40°~105°
Braid copper wires : 64/0.12mm
- **Terminal** :
Right-angle 4mm brass (Nickel plated) banana plug with caged and insulated sheathing to avoid the brass oxidation.
- **Probe tip** :
4mm (gold plated) : AL-24A (AL-24 without alligator clip)
4mm (nickel plated) : AL-25A (AL-25 without alligator clip)
2mm (gold plated) : AL-26
- **Rating** :
EN 61010-031
CAT III 1000V 10A/CAT IV 600V 10A



AL-24A

AL-25A

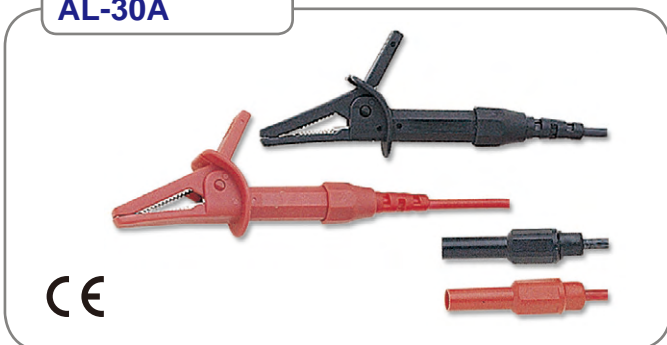
AL-26

AL-30, AL-30F



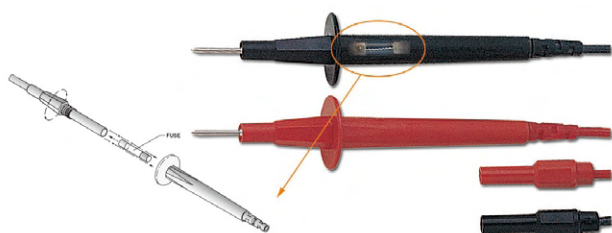
- The spring-shrouded 4mm brass caged banana probe tip.
- Double Insulated silicone wire 1m.
- Safety straight input plug.
- Rating : EN 61010-1 EN61010-2-31 CAT III 1000V 10A
AL-30R Red, AL-30B Black, AL-30G Green
<AL-30F> It is the fused version for AL-30.
- Fuse size : 6x32mm 6x46mm
AL-30FR Red, AL-30FB Black

AL-30A



- Wide grip alligator clips with integral finger guard, large 35mm high tension spring month.
- Double insulated silicone wire 1m.
- Safety straight input plug.
- Rating : EN 61010-1 EN61010-2-31 CAT III 1000V 10A
AL-30AR Red
AL-30AB Black
AL-30AG Green

AL-32, AL-32F



- 2mm probe tip
- Double insulated silicone wire 1m.
- Safety straight input plug.

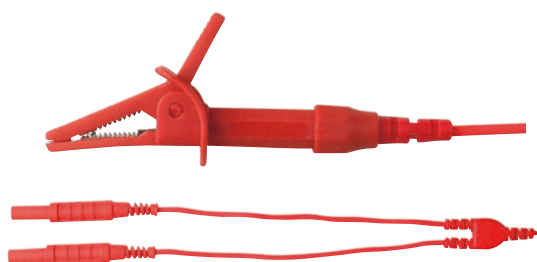
AL-32R Red, AL-32B Black
<AL-32F>

- Fuse size : 6x32mm 6x46mm

It is the fused version for **AL-32**.

AL-32FR Red, AL-32FB Black

AL-33



- Wide grip alligator clips with integral finger guard, large 35mm high tension spring month.
- PVC-insulated wire 1m with branched straight input plugs.

AL-34

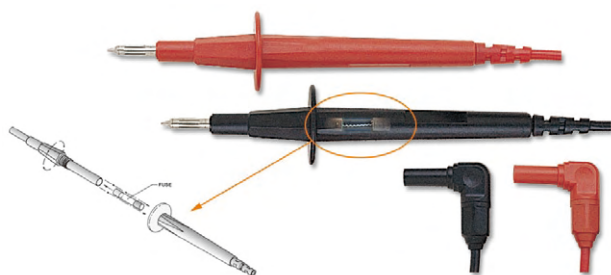


- Wide grip alligator clips with integral finger guard, large 35mm high tension spring month.
- PVC-insulated wire 60cm (0.127/65).
- Right-angle connectors.

AL-34AR Red AL-34AB Black
AL-34Abu Blue AL-34AW White
AL-34AY Yellow

- EN 61010-031 CAT III 600V 10A

AL-35, AL-35F



- The spring-shrouded 4mm brass caged banana probe tip.
- Double insulated silicone wire 1m.
- Shrouded right-angle connector.

AL-35R Red, AL-35B Black
<AL-35F> It is the fused version for **AL-35**.

- Fuse size : 6x32mm 6x46mm

AL-35FR Red, AL-35FB Black

AL-36



- Wide grip alligator clips with integral finger guard, large 35mm high tension spring month.
- PVC-insulated wire (Red-15m, Yellow-10m, Green-5m)
- Right-angle connector.
- EN 61010-031 CAT III 600V 2A

AL-36R Red
AL-36Y Yellow
AL-36G Green

AL-36L



- Wide grip alligator clips with integral finger guard, large 35mm high tension spring mouth.
- PVC-insulated wire (Red-30m, Yellow-20m, Green-5m)
- Right-angle connector.

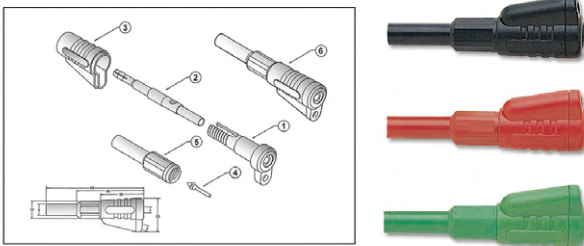
AL-37



- Stacking shrouded plug each end.
- Silicone wire 50cm.
- Axial mount 4mm banana jack.

AL-37R Red
AL-37B Black
AL-37G Green

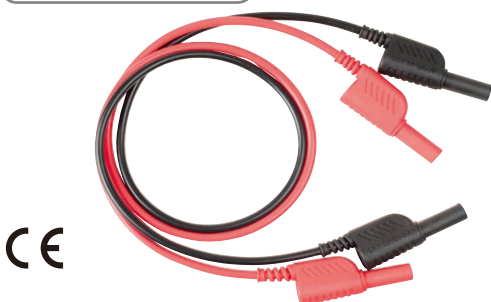
AL-37H



- Stacking shrouded plug.
- Axial mount 4mm banana jack.

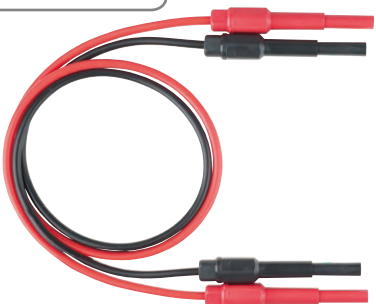
AL-37HR Red
AL-37HB Black
AL-37HG Green

AL-37S



- Stacking shrouded plug each end.
- PVC insulated wire 50cm(0.08/170).
- Axial mount 4mm banana jack.
- EN 61010-031 CAT III 600V 10A

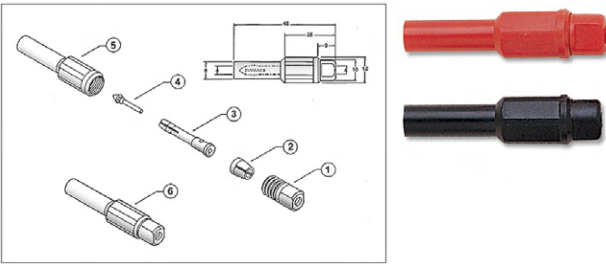
AL-39



- Stacking shrouded banana plug, each end on 1.2m long Silicone wire.

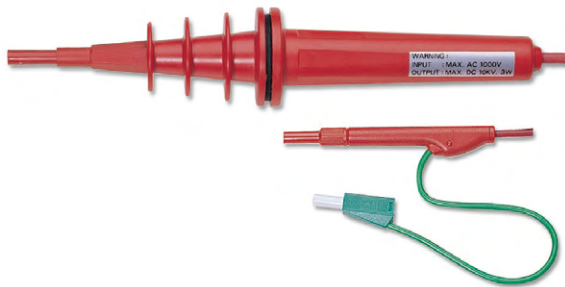
AL-39R Red
AL-39B Black

AL-39H



- Stacking shrouded plug.
- AL-39HR Red**
AL-39HB Black

AL-50

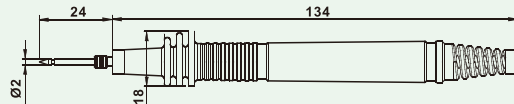


- Large test probe handle with shrouded 4mm brass caged banana plug tip.
 - super insulated silicone wire 2.7m.
 - safety straight input plug connect with extra green guard.
 - color : Red
- WARNING :**
INPUT : MAX. AC 1000V
OUTPUT : MAX. DC 10KV. 3W
ONLY AVAILABLE FOR INSULATION TESTER.

AL-51



- **Terminal** : 4mm banana plug
- **Wire** : PVC UL1803
Temperature tolerance range $-40^{\circ}\sim 105^{\circ}\text{C}$
Out dimension : 4mm
Braid copper wires (180 of 0.12mm)
Length : $1100\pm 30\text{mm}$
- EN 61010-031 CAT IV 1000V 15A



AL-55



DISCHARGE ROD

- Large test probe handle with shrouded 4mm brass caged banana plug tip.
- Super insulated silicone wire 1.5m, safety straight input plug.
- color : black

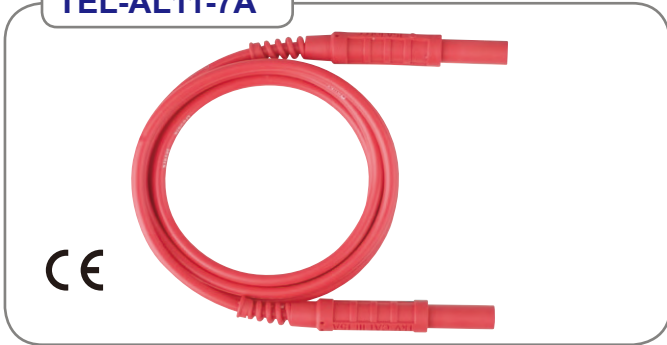
TEL-AL11-6A



- **Terminal** : 4mm banana plug
- **Wire** : PVC UL1803
Length : $1100\pm 30\text{mm}$
Braid copper wires(200 of 0.08mm)
Temperature tolerance range : $-40^{\circ}\sim 105^{\circ}\text{C}$
Color : Red and Black each(set)
- EN 61010-031 CAT IV 1000V 10A

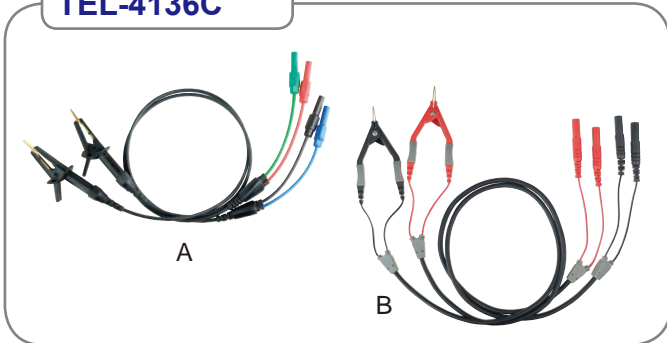
CE

TEL-AL11-7A



- **Terminal** : 4mm banana plug
- **Wire** : PVC UL1803
Length : 1100±30mm
Out diameter : 4mm
Braid copper wires(200 of 0.08mm)
Temperature tolerance range : -40° ~ 105°C
Color : Red•Green•Black

TEL-4136C



- **Model Name** : Kelvin clip test leads
- **Wire** :
Length : 700±30mm
PVC insulated wire (60mm) with connected
Straight input plugs(10mm silicon wire)
Out diameter : 4mm
- **Input plug color** : Red•Green•Black•Blue

TEL-EWR-50F



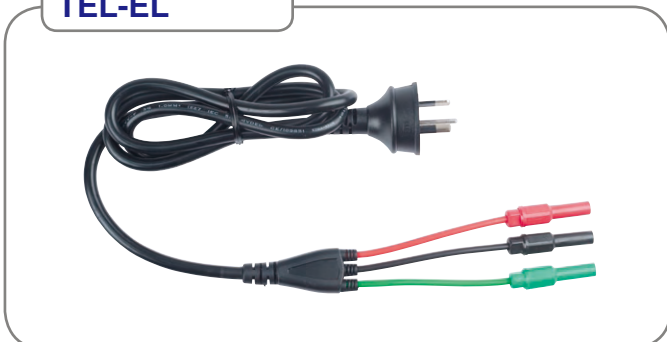
- **Terminal** : 4mm brass banana plug.
- **Wire** : PVC light and soft.
Out dimension : 4mm
Braid copper wires(30 of 0.254mm)
Length : 50m
Color : green
- **Accessories** :
Auxiliary earth bar x 1
Alligator clip (AL-38CG) x 1

AL-4WER



- **For earth tester (Four wires).**
- **Terminal** : 4mm brass banana plug.
- **Wire** : PVC
Out dimension : 3.5mm
Braid copper wires : 0.127/65mm
length :
Black : 3 m Blue : 20 m
Red : 36 m Green : 50 m
- **Auxiliary earth spikes** : 45cm

TEL-EL

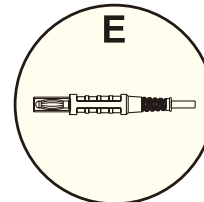
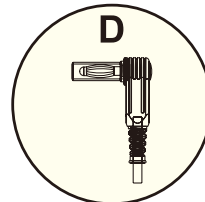
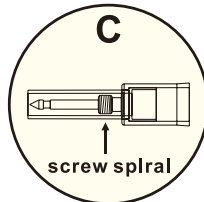
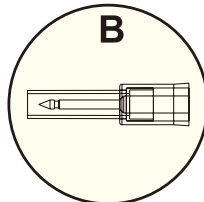
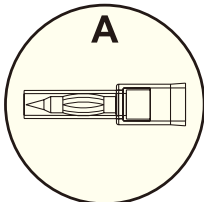
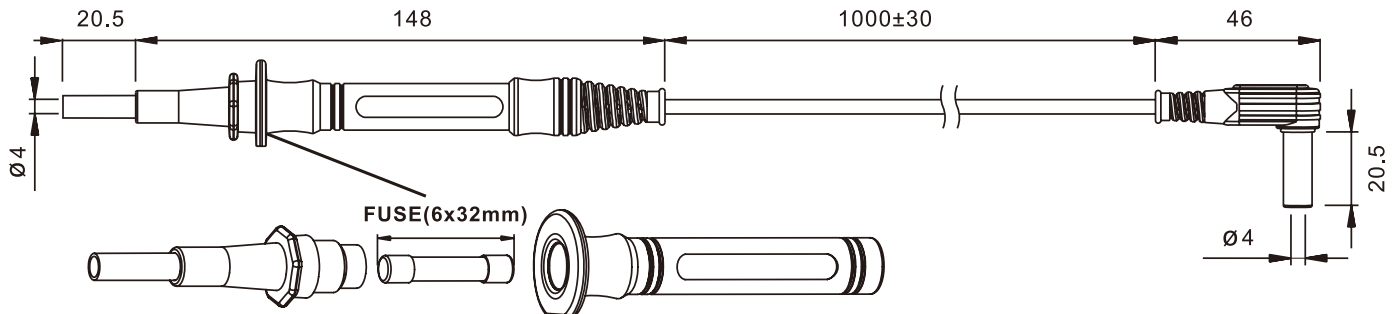


ELCB Test leads

AL-52F series



- Stacking shrouded tip
- Probes tip for 4mm or 2mm
- **Terminal** : 4mm banana plug
- **Wire** : PVC UL1803
Length 1100±30mm
Out diameter 4mm
Braid copper wires 170/0.08mm
Temperature tolerance range -40°~105°C
- Fuse protection available (size 6x32mm)
- EN 61010-031 CAT IV 600V 10A

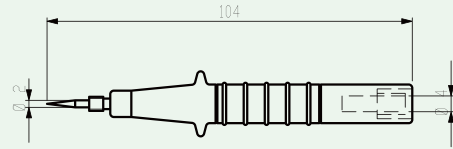


Model	Tip	Terminal	Wire(1100±30mm)	Fuse(6x32mm)
AL52F-L4	A	D	✓	✓
AL52F-L2	B	D	✓	✓
AL52F-L2-4	C	D	✓	✓
AL52F- 4	A	E	✓	✓
AL52F- 2	B	E	✓	✓
AL52F- 2-4	C	E	✓	✓

TEL-AL11-C2



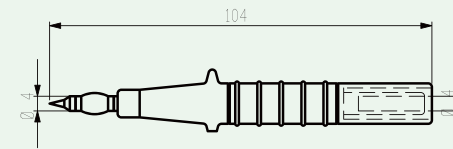
- Red and Black each(set)
- Tip : Stainless Steel, sharp tip.
- Jack : Nickel Plated, 4mm banana Jack.
- The probe tip could screw into crocodile clips.
- Probes can be used with all SEW 4mm jack test leads.



TEL-AL11-C4



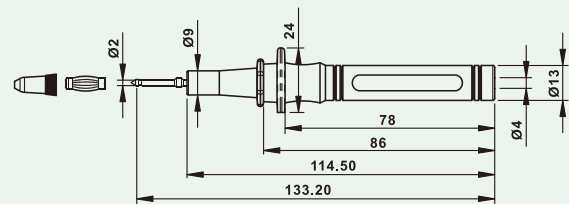
- Red and Black each(set)
- Tip : 4mm Stainless Steel caged banana probe tip.
- Jack : Nickel Plated, 4mm banana Jack.
- The probe tip could be used into non-screw crocodile clips.
- Probes can be used with all SEW 4mm jack test leads.



AL11-C5FP



- Red and Black each(set)
- Tip with protection caps.
- Lantern tip (removable) for use with sockets(4mm).
- Lantern tip can be removed for easy access to terminal blocks(2mm).
- Fuse protection available.
- Probes can be used with all sew 4mm jack test leads.
- **Meets EN 61010-031 with amendment A1 : 2008**
- Fuse size 6 x 32mm



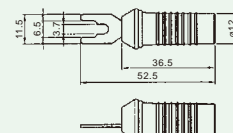
AL11-C5FPL

- Fuse size 6 x 46mm

Insulated Spade Lug



Solid copper spade lug. Designed to fasten housing or screws for measurement.
Fully insulated, axial mount 4mm banana jack.
Designed especially for terminal posts,
The Y-shaped tip accepts housings or screws that have a diameter of 6.5mm or less.

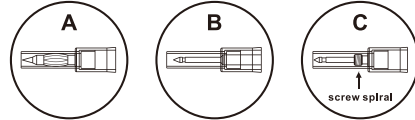
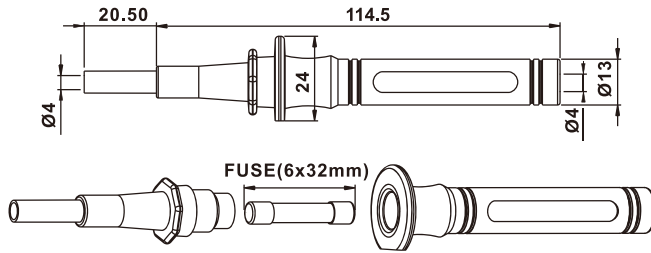


AL11-C5F series



CE

- Body Nylon
- Stacking shrouded probe tip
- Probes tips for 4mm or 2mm
- length 135mm
- Fuse protection available
- EN 61010-031 CAT IV 600V 10A



Model	Tip	Fuse
AL11-C5F4	A	6 x 32mm
AL11-C5F2	B	6 x 32mm
AL11-C5F2-4	C	6 x 32mm

AL19C



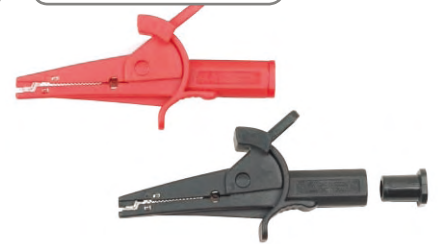
For 4mm banana plug

AL-20C



For 4mm screw

AL-22C



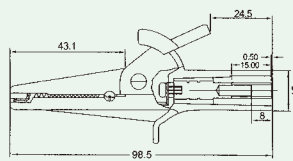
The same size as TEL-AL-23C

TEL-AL-23C

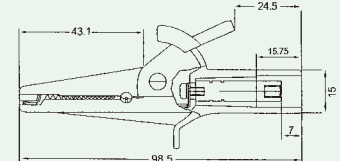


CE

AL-24C



- For 4mm banana plug
- EN 61010-031
- CAT III 1000V/CAT IV 600V 10A



- For 4mm screw

TEL-AL-25C

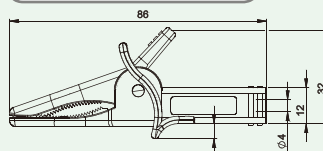


CE

CCO-25C

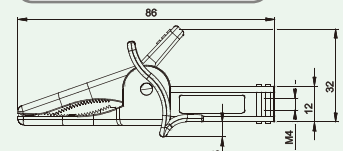
- For AL-23C AL-25C insulation extension

AL-25C



- For 4mm banana plug
- EN 61010-031 CAT III 600V 10A

AL-25C2-4



- For 4mm screw
- EN 61010-031 CAT III 600V 10A

AL-30C



CE

- Wide grip alligator clips with integral finger guard, large 35mm high tension spring mouth.
- Hexagonal Anti-rotation part fits all compatible 4mm male leads.

AL-30CR Red

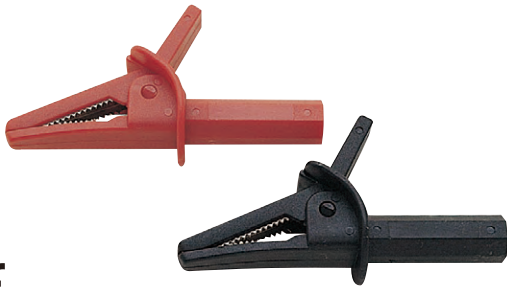
AL-30CB Black

AL-CW White

AL-30CBu Blue

- EN 61010-031 CAT III 1000V 12A

AL-38C



CE

- Wide grip alligator clips with integral finger guard, large 35mm high tension spring mouth.
- Fits all compatible 4mm standard banana terminal.

AL-38CR Red

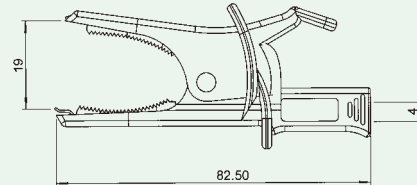
AL-38CB Black

AL-38CE

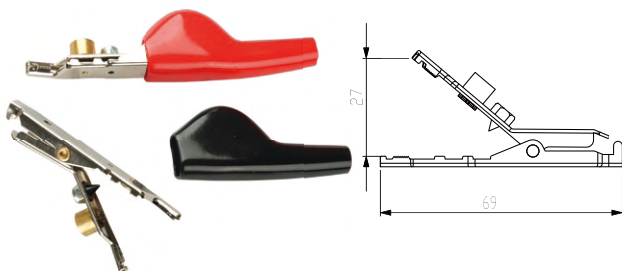


CE

- **Color** : Red, Black, Green, Yellow, White, Blue
- EN 61010-031 CAT III 1000V 10A

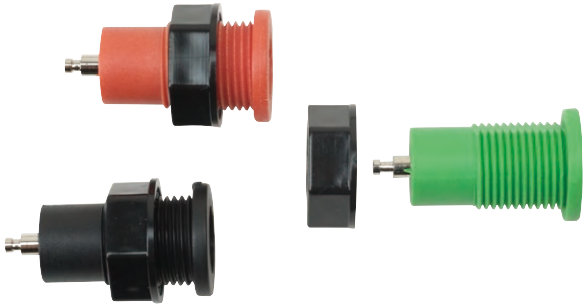


AL21C



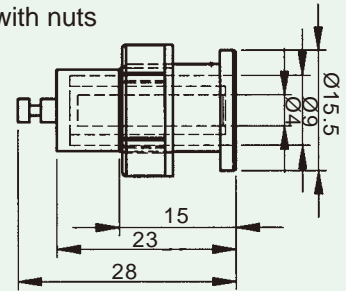
This clip has 20 degree offset jaws to guard against shorting. The TEL-AL21C clip in addition to a single penetrator pin near the fulcrum has a cluster of hardened needles (nickel plated to prevent rust) which insures penetration of insulation on 22 gauge, 24 gauge etc. wire. Two or more wires may be penetrated at once for a temporary "splice". The insulation "heals" as needles are withdrawn. Stripping of insulation is unnecessary.

TER-6200

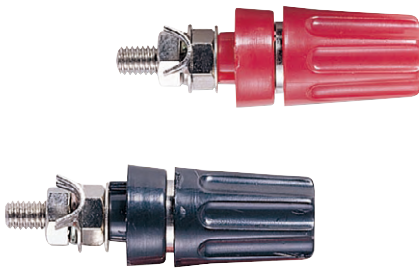


Sockets nylon
4 m/m sockets with shrouded contact compatible with shrouded plugs and leads supplied with nuts for panel mounting.

TER-6200B Black,
TER-6200R Red,
TER-6200G Green

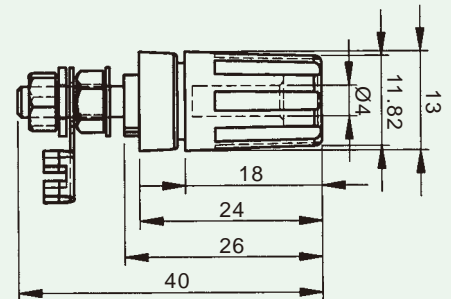


TER-205

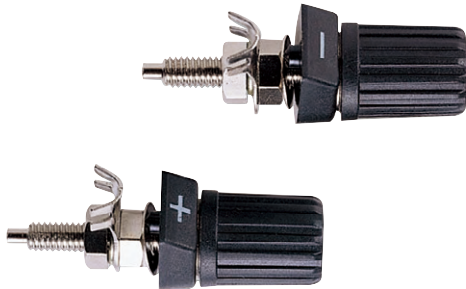


4 m/m sockets with insulated head and base for installation in unit.

ABS resin head.
TER-205B Black
TER-205R Red

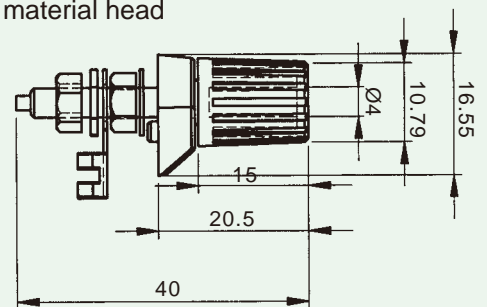


TER-305

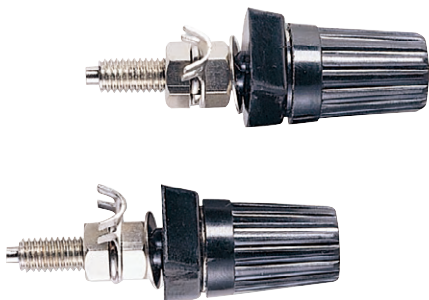


4 m/m banana socket captive head suitable for wire or pin-type test head bakelite material head and base.

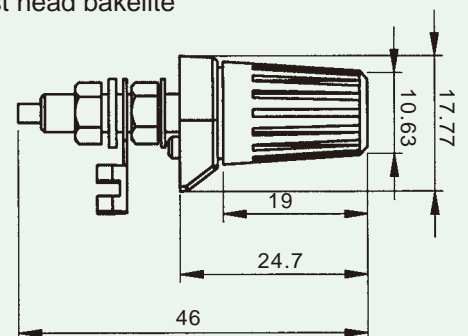
TER-305B Black



TER-2000

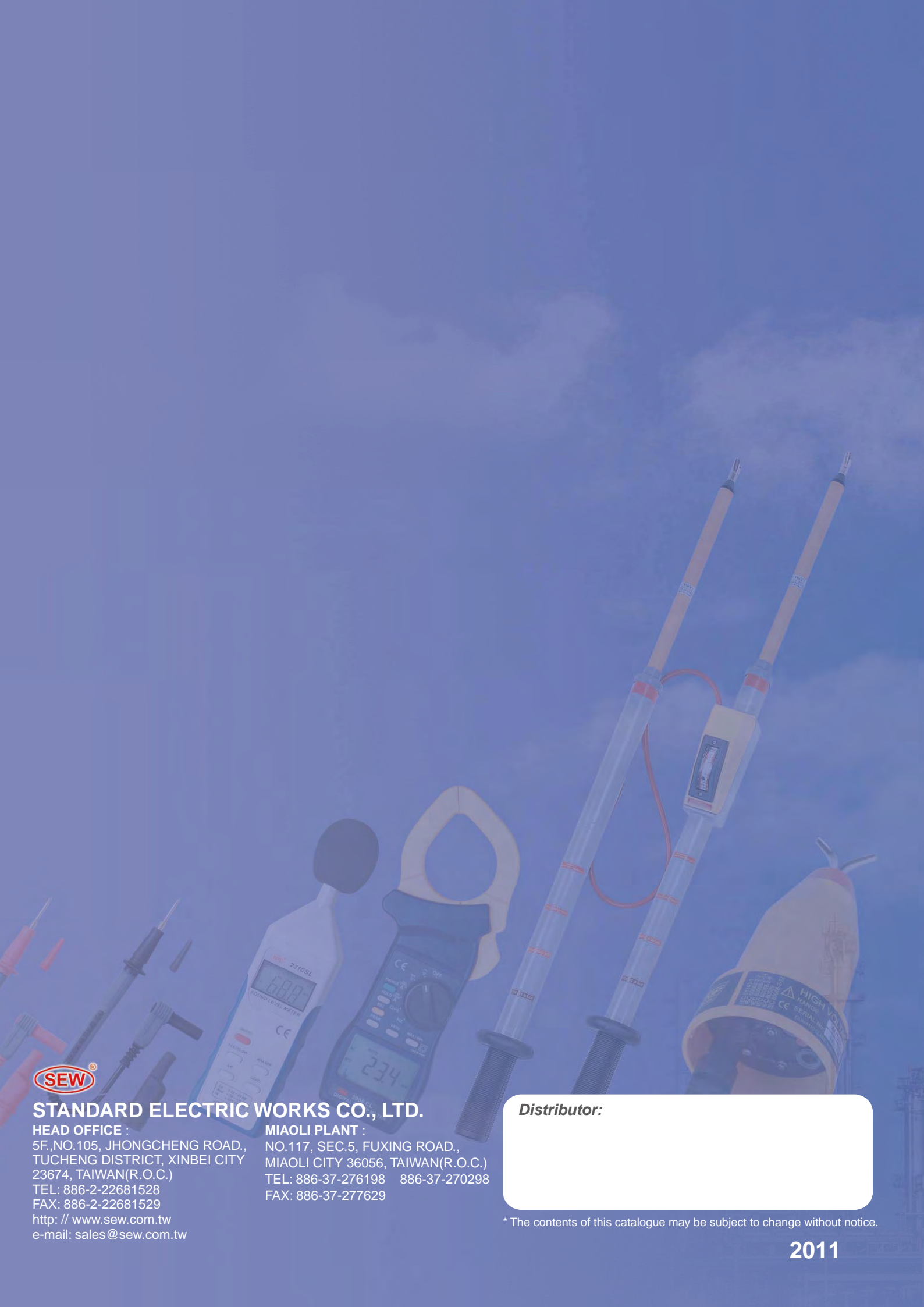


5 m/m captive head suitable for wire or pin-type test head bakelite material base.



MODEL	QTY/CTN	N.W	G.W	GUFF	PAGE
1010 CL	20	15.0	16.0	3.08	92
1106 IM	10	10.5	11.5	2.57	60
1107 IM	10	10.5	11.5	2.57	60
1120 ER	8	16.5	17.5	4.41	36
1125 IN	8	8.5	9.5	2.57	10
1126 IN	8	8.5	9.5	2.57	10
1132 IN	10	11.0	12.0	2.57	11
1151 IN	10	12.0	13.0	2.57	24
1152 MF	10	12.0	13.0	2.57	24
1154 TMF	10	12.0	13.0	2.57	24
1155 TMF	10	12.0	13.0	2.57	24
1160 IN	10	11.0	12.0	2.57	8
1161 IN	10	11.0	12.0	2.57	9
1506 IM	5	6.5	7.5	2.39	62
180 CB	20	8.5	9.5	2.14	80
181 CB	20	9.0	10.0	2.14	80
1800 IN	12	15.5	16.5	3.16	14
1801 IN	12	15.5	16.5	3.16	14
1805 ER	8	19.0	20.0	4.41	41
1820 ER	8	19.5	20.5	4.41	40
1810 EL	12	15.5	16.5	3.16	45
1811 EL	12	15.5	16.5	3.16	46
1812 EL	12	17.0	18.0	3.16	46
1813 EL	12	17.0	18.0	3.16	47
1824 LP	12	16.0	17.0	3.16	53
1825 LP	12	16.0	17.0	3.16	54
1826 NA	12	19.0	20.0	3.16	56
1832 IN	12	16.0	17.0	3.16	15
1851 IN	12	16.0	17.0	3.16	16
188 FFF	20	12.0	13.0	3.63	82
190 CBI	20	10.5	11.5	3.01	83
191 CBI	20	12.5	13.5	3.01	83
2105 ER	8	24.0	25.0	4.41	42
2120 ER	8	24.0	25.0	4.41	42
2108 EL	8	14.5	15.5	3.13	99
2126 NA	8	15.0	16.0	3.13	57
2132 IN	8	15.0	16.0	3.13	20
2151 IN	8	15.0	16.0	3.13	19
213 HVD	10	21.5	22.5	5.52	68
230 HD	5	7.0	8.0	3.09	72
2310 SL	10	8.5	9.5	2.90	79
2330 LX	10	8.0	9.0	2.14	79
2660 CL	20	14.0	15.0	2.92	93
2705 ER	6	15.0	16.0	3.08	38
2720 ER	6	15.5	16.5	3.08	39
2706 IM	8	12.0	13.0	3.13	62
2712 EL	8	12.5	13.5	3.13	48
2726 NA	8	12.5	13.5	3.13	58
2732 IN	8	11.0	12.0	3.13	18
275 HP	10	19.5	20.5	5.52	70
2751 IN	8	12.0	13.0	3.13	17
276 HD	20	8.0	9.0	2.39	71
276S HD	24	10.0	11.0	3.13	71
2801 IN	10	12.0	13.0	3.13	21
2803 IN	10	17.0	18.0	3.13	1
2804 IN	10	17.0	18.0	3.13	1
2811 LP	10	12.0	13.0	3.13	55
2820 EL	10	13.0	14.0	3.13	49
288 SVD	20	5.0	6.0	1.33	73
290 HD	5	8.5	9.5	3.09	72
ST-3600	20	17.0	18.0	2.14	95
ST-3602	20	17.0	18.0	2.14	95
ST-3620	20	17.0	18.0	2.14	95
3800 CL	20	16.0	17.0	2.92	94
3810 CL	20	16.0	17.0	2.92	94
3900 CL	20	18.0	19.0	2.92	96
3902 CL	20	18.0	19.0	2.92	96

MODEL	QTY/CTN	N.W	G.W	GUFF	PAGE
3904 CL	20	18.0	19.0	2.92	96
3920 CL	20	19.0	20.0	2.92	97
4101 IN	8	16.0	17.0	4.41	26
4103 IN	8	19.0	20.0	4.41	2
4104 IN	8	19.0	20.0	4.41	2
4105 ER	8	23.0	24.0	4.41	43
4120 ER	8	23.0	24.0	4.41	43
4112 EL	8	16.5	17.5	4.41	50
4126 NA	8	17.0	18.0	4.41	59
4132 IN	8	16.0	17.0	4.41	22
4136 mO	8	21.0	22.0	4.41	63
4137 mO	8	19.0	20.0	4.41	63
4167 MF	8	25.0	26.0	4.41	33
4156 PR	8	14.5	15.5	4.41	90
4234 ER	2	9.0	10.0	2.02	34
506 EL	20	11.5	12.5	2.39	98
507 EL	20	11.5	12.5	2.39	98
6200 IN	4	16.5	17.5	4.41	3
6201 IN	4	16.5	17.5	4.41	3
6210A IN	4	16.5	17.5	4.41	4
6211A IN	4	16.5	17.5	4.41	4
6212A IN	4	16.5	17.5	4.41	5
6213A IN	4	16.5	17.5	4.41	6
6213B IN	4	18.0	19.0	4.41	6
6220 EL	4	18.5	19.5	4.41	51
6221 EL	4	18.5	19.5	4.41	52
6237 DLRO	4	20.5	21.5	4.41	64
6400 DM	20	10.5	11.5	2.14	100
6410 DM	20	10.5	11.5	2.14	101
6420 DM	20	10.5	11.5	2.14	102
810 EL	20	10.5	11.5	2.90	45
855 PR	20	16.0	17.0	2.90	84
862 PR	20	8.5	9.5	2.90	85
863 PR	20	8.5	9.5	2.90	85
887 PR	20	9.5	10.5	3.16	86
888 PMR	20	10.0	11.0	2.90	87
ST-860	20	10.5	11.5	2.90	83
ALS-1	100	13.5	14.5	2.14	91
HS-120	1	5.5	6.5	2.85	68
LVD-15	40	5.0	6.0	1.56	77
PC 7K	1	6.5	11.0	3.30	65
PC 11K	1	7.0	11.5	3.30	65
PC 22K	1	7.5	13.0	3.96	65
PC 33K	1	8.0	13.5	3.96	65
PC 44K	1	8.5	14.0	5.32	65
PD-20	8	5.0	6.0	2.57	76
PD-28	8	5.0	6.0	2.57	76
PD-40AM	10	7.0	8.0	2.57	75
PT-30	40	8.0	9.0	1.33	105
RCB-1	1	5.5	6.5	2.00	110
RCB-3	1	4.0	4.5	0.91	110
ST-1503	8	10.5	11.5	3.13	13
ST-1504	8	10.5	11.5	3.13	13
ST-1505	8	17.0	18.0	3.13	38
ST-1520	8	17.0	18.0	3.13	37
ST-2550	8	11.0	12.0	3.13	12
ST-2551	8	11.0	12.0	3.13	12
ST-3201	40	13.5	14.5	2.39	103
ST-3501	40	13.5	14.5	2.39	103
ST-3502	20	16.5	17.5	2.90	104
ST-360TRN	20	10.0	11.0	2.02	106
ST-365TR	20	10.0	11.0	2.02	106
ST-375	20	16.0	17.0	3.08	92
ST-505N	20	12.0	13.0	2.02	107
ST-600	20	16.0	17.0	3.08	92



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