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CERTIFIED IQNet MANAGEMENT SYSTEM

UTECO

PRODUCTS

2002

2003



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Contents

HANDHELD TDR(Time Domain Reflectometry) METERS

*901 TDR LAN Cable Tester 4
*900 TDR Cable Length Meter 5

HANDHELD DMMs

Series 700 World-Class DMMs 6
525 4 1/2 Digit, True-RMS DMM 10
509 Autoranging True-RMS DMM with RS-232C 11
Series 500 True-RMS DMMs with THD @50/60Hz® 12
Series 500 Low Cost DMMs 13
Series 220 Compact DMMs 14
215 4 1/2 Digit, Programmable DMM 16
Series 200 3 3/4 Digit, Programmable DMMs 18
Series 200 Two Button DMMs 20
25 HVAC/R DMM 22
Series 20 Low Cost DMMs 23

HANDHELD AUTOMOTIVE MULTIMETERS

*716 Dual Display Professional Automotive DMM 24
*706 New Generation Automotive DMM 25
226/228/229 Compact Automotive Multimeters 26
506/516 Professional Automotive Multimeters 28
206 General Purpose Automotive Multimeter 30

HANDHELD CLAMP-ON METERS

*850 Open Jaw AC Clamp Meter for Multi/Single Core Measurement 32
*830 Open Jaw AC Clamp Meter 33
*CA83 Open Jaw AC Current Probe 33
Series 110 General Purpose Clamp Meters 34
Series 120 Professional Clamp Meters 35
Series 130 Professional True-RMS Clamp Meters 36
157 AC/DC Leakage Current Tester 38
170 True-RMS Power Meter 39
CA113 OS/AT mA Current Probe for Osilloscope Application 40
CA113 DC/AC Current Probe 41

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HANDHELD CABLE LENGTH METER

CLM33 Cable Length Meter for Single Core 42

POCKET SIZE DMM & TEMPERATURE ADAPTOR

PDM-11 Pocket Size Autoranging DMM 43

TM24K Thermocouple Module (K-Type) 43

TORQUE ADAPTOR & ACCURACY IMPROVER

Series TQ-800 Torque Extensions 44

*Torque Extension's Accuracy Improver 45

WORLD-CLASS OEM PRODUCTS **

Next Generation Digital Automotive Tester 46

*Digital Pressure/Vacuum Adaptor 47

*Photo Tachometer 47

Value-Pricing Accessories 48-51

Warranty & Limitation of Liability 52

ISO Certification ..... Inside Back Cover

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** OEM (Original Equipment Manufacturer) products are world-exclusively distributed by specific OEM customers.

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UTECO

Series 900 Precision TDR Meters

901 TDR LAN Cable Tester

New

3 Year Warranty!



MODEL 901

These two precision TDR(Time Domain Reflectometry) meters are advanced instruments capable of measuring cable lengths and finding distance to an open or a short using Time Domain Reflectometry. They offers exceptional features and a range capability normally associated with far more expensive instruments.

Both meters can be used for any cable consisting of at least two insulated metallic elements, one of which may be the sheath or shield of the cable. The meters have automatic internal matching networks to allow testing of 25 Ω, 50 Ω, 75 Ω, 100 Ω, 125 Ω, or 150 Ω cables. (These correspond to power, telephony, CATV, and LAN cables.)

They can be closely matched to the cable under test using the menu selection keys. The propagation velocity value can be similarly adjusted to match the cable under test; thus ensuring an accurate distance measurement. The other user adjustable setting is changing the distance measurement units.

All Series 900 models are housed in a rugged ABS enclosure which is dust and weatherproof to IP42. The unit also comes with a soft carrying case and each model's particular accessories. It is powered by 4 AA (NEDA 15A or NR 6) batteries, which are stored in a compartment on the back of the meter. The batteries are held in a carrier for a quick and easy replacement of them. 3 year warranty.

ACCESSORIES	PART NO.
Batteries, 1.5 V X 4	BT9
Alligator Clip adapter	AC9
Male BNC to Female RJ45 adapter	TDR MBF45
Female RJ45 to Female BNC	
Remote Identifier #1	TDR ID 1
Remote Identifier #2(Optional)	TDR ID 2
Remote Identifier #3(Optional)	TDR ID 3
Remote Identifier #4(Optional)	TDR ID 4
RJ45 to RJ45 Patch Cable	TDR 45 PC
RJ45-RJ45 Female Coupler	TDR 45 FC
Soft Carrying Case	S2C

FEATURES

< Model 901 >

- *CE-mark Certificated.*
- *Accurate to 2"(5 cm) throughout the entire range up to 2,000 ft(600 m).*
- *Digital Display shows 5 common wiring faults : Open Pair, Shorted Pair, Crossed Pair, Split Pair, and Reversed Pair.*
- *Includes 1 remote identifier for wiremapping.*
- *Extra-large backlit (ICON type 7 segment) LCD.*
- *Automatic output impedance control, auto-range, auto-zero, and auto-sensitivity allows for closely matching to a wide range of cables under test. Only V.O.P(Velocity of propagation) settings required.*
- *User-friendly menu on screen operation for easy-to-use.*
- *Measuring capability of the V.O.P of a sample cable.*
- *20 internal memory locations store up to 20 traces for future analysis.*
- *Internal library of 39 standard cables.*
- *Tone Generator(Oscillating 910 to 1100 Hz with 5 $V_{p\text{-}p}$).*
- *Line Voltage Detection : Displays "OUCH" message and stops operation if line voltage exceeds 6.5 V.*
- *Safety Protection (up to 250 V RMS).*

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UTECO

Series 900 Precision TDR Meters

900 TDR Cable Length Meter



New

MODEL 900

3 Year Warranty!

Model 901 is specially designed to speed up the onsite testing of data networks and production testing of cable assemblies. The meter quickly tests shielded and unshielded LAN cables and identifies all commonly found wiring faults including : Open Pair, Shorted Pair, Crossed Pair, Split Pair, and Reversed Pair. Digital display shows these 5 common wiring faults and the provided 1 Female RJ45 to Female BNC remote identifier will make wiremapping a breeze.

Model 900 is primarily designed for cable wholesalers & retailers, contractors, electricians, and cable & alarm installers who need to measure the cable lengths and test for opens and shorts in all types of cable.

SPECIFICATIONS (at 23°C ± 5°C : < 85% RH)

Model 901
Range : 2,000 ft (600 m)
Accuracy : ± [1 % of reading + 4" (10 cm)]
Resolution: 2" (5 cm)
Dead Zone: 10 ft (3 m)

Model 900
Range : Depends upon the V.O.P of the cable under test
12,000 ft (3.7 km)@ V.O.P ≤ 99.9 %
9,800 ft (3.0 km)@ V.O.P ≤80.0 %
8,000 ft (2.4 km)@ V.O.P ≤66.0 %
6,200 ft (1.9 km)@ V.O.P ≤ 50.0 %
Accuracy* : ± [2 % of reading + 20" (50 cm)] < 300 ft (100 m)
± [2 % of reading] ≥ 300 ft (100 m)
* This accuracy is effective for Coaxial Cables up to 8,000 ft, Telephony Cables up to 6,000 ft, and Structured Wiring up to 3,000 ft.
Resolution: 20" (50 cm)
Dead Zone: 15 ft (5 m)

General

Display : ICON type (7 segment) backlit LCD **Operating Temperature** : 0 °F to 140 °F(-18 °C to 60 °C) **Operating Humidity** : < 85 % RH at 95 °F(35 °C) **Storage Temperature** : -4 °F to 158 °F(-20 °C to 70 °C) **Dust & Weather Proof** : IP42 **Battery Type** : Four 1.5 V (LR 6 or NEDA 15A) **Battery Life** : Approx. 5,000 tests **Dimensions (H x W x D)** : 235 x 100 x 44 mm **Weight** : about 16 oz (450 g) **Warranty** : 3 years **Safety Conformance** : Designed to IEC 1010-1 **EMC** : BS/EN 61326-1 **Standard Equipment** : **Model 901**-Meter, Alligator Clip adapter, Male BNC to Female RJ45 adapter, Female RJ45 to Female BNC Remote Identifier #1, RJ45 to RJ45 Patch Cable, RJ45-RJ45 Female Coupler, User's manual, 4 x 1.5 V batteries(installed), and Soft carrying case. **Model 900**-Meter, Alligator Clip adapter, User's manual, 4 x 1.5 V batteries(installed), and Soft carrying case.

< Model 900 >

- *CE-mark Certificated.*
- *Accurate to 20" (50 cm) throughout the entire range up to 10,000 ft (3 km).*
- *Extra-large backlit (ICON type7 segment) LCD.*
- *Automatic output impedance control, auto-range, auto-zero, and auto-sensitivity allows for closely matching to a wide range of cables under test. Only V.O.P(Velocity of propagation) settings required.*
- *User-friendly menu on screen operation for easy-to-use.*
- *Measuring capability of the V.O.P of a sample cable.*
- *20 internal memory locations store up to 20 traces for future analysis.*
- *Internal library of 39 standard cables allows of quick and easy measurements of the length of the 39 standard cable types.*

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UTECO

Series 700 World-Class DMMs

707 $4^{4}/_{5}$ Digit, True-RMS DMM with RS-232C

These two world-class DMMs deliver breakthrough performance with a wealth of new features, ranges, speed, accuracy and resolution. You get temperature measurement, data logging and PC communication. They represent the next generation of powerful and accurate industry leading handheld DMMs.

Both meters boast 0.05% accuracy and 50,000 counts of resolution on a dual reading display enhancing troubleshooting with the ability to correlate two relevant events. Their 50 kHz ac bandwidth opens the possibilities of modern applications not possible with conventional DMMs. Users also can enjoy the unprecedented speed of turning a meter on and finding it ready for instant operation.

They have a bright LED backlight as well as enhanced LCD with larger digits, wide viewing angle and on screen menu selection. Convenient closed case calibration allows adjustments to be made directly through the RS-232C port. A battery access door allows users to replace the battery and fuses without voiding calibration seals.
All Series 700 models meet the CAT III 1000V safety ratings to withstand overvoltage transients up to 8kV per IEC 1010-1. And also they enjoy the OmniSelector™* rotary switch system, which enables the rotary selector to be turned in any direction without damaging the meter while signals less than ac/dc 1,000 V are input into the meter.

Model 707 measures volts (dc to 1µV), ohms, amps, conductance, and capacitance (up to 5mF) as well as temperature in °C and °F. Other features include continuity and diode test. The user friendly case design houses a dual reading display with bargraph for simultaneous readouts such as true-rms ac+dc and Hz, dB, mV dc and more. Besides relative mode and Min/Max Average, you get a 1mS Fast Min Max for capturing peak transients. In addition, Model 707 can store up to 20 measurements in stand-alone operation. Overmoulding technology in the case disperses various shock over more of the case than a conventional rubber boot design. The 707 carries a dust-poof and splash-proof environmental rating.

Model 705 measures volts (dc to 10µV), ohms, amps, and capacitance (up to 10mF) as well as temperature in °C and °F. Other features are just same as those of the Model 707.

* OmniSelector™ is a registered trademark of Fine Instruments Corporation.

c UL us LISTED 45ZK

3 Year Warranty!

CAT IV 600V
CAT III 1000V
IEC 1010-1



MODEL 707

ACCESSORIES	PART NO.
Battery, 9V	BT1
Fuse (440 mA, 1000 V RMS)	F_{71}
Fuse (11 A, 1000 V RMS)	F_{72}
Silicone Test Lead Set	FTL-500V1
Alligator Clips	AC7
K-type Thermocouple	TP7
RS-232C Interface Cable	RS70
Sample Software Diskette	WS70

FEATURES

- *UL-Listed & CE-mark Certificated.*
- *707-$4^{4}/_{5}$ digit, 50000 count with bar graph.*
  705-$3^{4}/_{5}$ digit, 5000 count with bar graph.
- *Dual displays.*
- *Closed case calibration through the phototronic serial port.*
- *Auto hold.*
- *Auto fuse detector.*
- *Continuity check/beeper.*
- *dBm/dBV readings with selectable reference impedance.*
- *Relative mode.*
- *Diode test.*
- *1mS fast min max.*
- *Duty cycle/pulse width.*
- *50mV low voltage and 50Ω low ohms ranges.*

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UTECO

Series 700 World-Class DMMS

705 3⁴/₅ Digit, True-RMS DMM with RS-232C



MODEL 705

c UL us LISTED 45ZK

3 Year Warranty!

CAT IV 600V
CAT III 1000V
IEC 1010-1

SPECIFICATIONS (See Data Sheets.)

Basic Accuracy (% of reading + number of counts)	705	707
DC Voltage	0.1% + 2	0.05% + 2
AC Voltage (@40Hz - 50kHz)	0.5% + 2	0.3% + 10
Ohms	0.3% + 2	0.1% + 5
DC Current	0.5% + 2	0.1% + 5
AC Current (@40Hz - 50kHz)	0.5% + 2	0.3% + 5
Frequency	0.01% + 3	0.002% + 3
Capacitance	1.0% + 5	1.0% + 5
Conductance	0 ~ 50nS	0 ~ 50nS
Temperature	3.0°C	3.0°C

General

Display : 707-4⁴/₅digit (50000 counts) with 25 segment bar graph, updates 1.25 times/sec. **705-**3⁴/₅digit (5000 counts) with 25 segment bar graph, updates 5 times/sec. **Temperature Coefficient :** nominal 0.15 x (specified accuracy)/°C (<18°C or >28°C) **Operating Temperature :** 0°C to 45°C **Operating Humidity :** < 80% RH **Storage Temperature :** -20°C to 60°C **Altitude :** 2000m **Pollution Degree :** 2 **Shock & Vibration :** Per MIL-T-28800 for a class 2 instrument **Splash Proof and Dust Proof Case Battery Type :** Single Alkaline 9V battery, NEDA 1604, JIS 006P or IEC 6F22 **Battery Life :** 150 hrs typical **Dimensions (H x W x D) :** 208 x 103 x 54 mm **Weight :** About 655g **Warranty :** 3 years **Safety Conformance :** Designed to UL 3111-1, CSA C 22.2 No.1010.1-92, and IEC 1010-1, CATIII 1000V & CATIV 600V **Standard Equipment :** Meter, silicone test leads, user's manual, 9V battery (installed), K-type thermocouple, RS-232C interface cable and sample software diskette.

- *Memory store and recall.*
- *Min / Max / Average.*
- *True RMS (AC, AC + DC).*
- *1000V high energy fuses.*
- *Backlighted display.*
- *Auto-power-off.*
- *RS-232C phototronic serial port.*
- *On screen menu selection.*
- *Overmolded case.*
- *IEC 1010-1, CAT III 1000V & CAT IV 600V safety protection.*
- *3 year warranty.*

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UTECO

Series 700 World-Class DMMs

703 3³/₄ Digit, Auto-ranging DMM (True-RMS)

These two world-class DMMs are built tough inside and out with overvoltage protection to guard against spikes up to 8kV per IEC 1010-1, CATIII 1000V. And also they enjoy the OmniSelector™* rotary switch system, which enables the rotary selector to be turned in any direction without damaging the meter while signals less than ac/dc 1000 V are input into the meter. They even protect against measuring voltage if the knob is set on ohms accidentally. They are designed to withstand falling from benchtops, ladders or other work areas.

These DMMs are perfect for technicians in field service, facilities maintenance and production equipment maintenance / installation. Utilize them in bench service and repair plus manufacturing environments. The input ranges and functions are protected to the meter's rated voltage so that user will not blow a fuse or destroy the meter if connected to a live circuit while measuring ohms.

To be easy to read from a distance, the high-contrast display is larger with extra large characters and backlighting. Replace battery and fuses without voiding the internal calibration seal. Default autorange mode is easy to change to manual by simply touching the Range button.

Model 703 is Finest's top-of-the-line DMM that features true-rms ac readings so you get the correct measurement even when harmonics are present.

Model 701 is a average responding DMM that meets IEC 1010-1 safety standards for CAT III 1000V application.

* OmniSelector™ is a registered trademark of Fine Instruments Corporation.

c UL us LISTED 45ZK

3 Year Warranty!

CAT III 1000V IEC 1010-1



MODEL 703

ACCESSORIES	PART NO.
Battery, 9V	BT1
Fuse (440 mA, 1000V RMS)	F_{71}
Fuse (11 A, 1000V RMS)	F_{72}
Test Lead Set	FTL-500V1
Alligator Clips	AC7
K-type Thermocouple	TP7

FEATURES

- *UL-Listed & CE-mark Certificated.*
- *3³/₄ digit, 4000 count, autoranging.*
- *Data hold.*
- *Relative mode.*
- *Continuity check/beeper.*
- *Diode test.*
- *Duty cycle.*
- *Backlighted display.*
- *Auto-power-off.*

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UTECO

Series 700 World-Class DMMs

701 3¾ Digit, Auto-ranging DMM



MODEL 701

c UL us LISTED 45ZK

3 Year Warranty!

CAT III 1000V IEC 1010-1

- *1000V high energy fuses.*
- *Capacitance measurement (40 nF to 100.0 µF, Max.Resolution 10pF)*
- *Frequency measurement (0.5 Hz to 10 MHz, Max. Resolution 0.001 Hz)*
- *Temperature measurement (-40°C to 1300°C) [Finest 703 only]*
- *Overmolded case.*
- *IEC 1010-1, CAT III 1000V safety protection.*
- *3 year warranty.*

SPECIFICATIONS (See Data Sheets.)

Basic Accuracy (% of reading + number of counts)	701	703
DC Voltage	0.5% + 2	0.5% + 2
AC Voltage	0.75% + 3 (@40Hz - 400Hz)	2.0% + 3 (@40Hz - 20kHz)
Ohms	0.5% + 3	0.5% + 3
DC Current	1.0% + 2	1.0% + 2
AC Current	1.0% + 5 (@40Hz - 400Hz)	1.5% + 5 (@40Hz - 20kHz)
Frequency	0.05% + 3	0.05% + 3
Capacitance	2.5% + 10	2.5% + 10
Temperature	No	1% + 3°C

General

Display : 3¾ digit (4000 counts), updates 5 times/sec. **Temperature Coefficient:** nominal 0.15 x (specified accuracy)/°C (<18°C or >28°C) **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Altitude :** 2000m **Pollution Degree :** 2 **Shock & Vibration :** Per MIL-T-28800 for a class 2 instrument **Splash Proof and Dust Proof Case Battery Type :** Single 9V battery, NEDA 1604, JIS 006P or IEC 6F22 **Battery Life :** 750 hrs typical [701], 250 hrs typical [703] **Dimensions with Holster (H X W X D) :** 188mm X 98mm x 45mm **Weight :** About 525g **Warranty :** 3 years **Safety Conformance :** Designed to UL 3111-1, CSA C 22.2 No.1010.1-92, and IEC 1010-1, CATIII, 1000V **Standard Equipment :** Meter, test leads, user's manual, 9V battery (installed)and K-type thermocouple (703 Only).

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DIGITAL MULTIMETERS

525 4½ Digit, True-RMS DMM

The Finest 525 4½-digit handheld programmable DMM is a Finest's very precision 20000 count True-RMS DMM. This model has very accurate measurement capabilities and user programming capability for GO-NO GO tests.

True-RMS Measurement. The 525 ensures true-rms ac voltage and current measurement which yields accurate results on sinewaves as well as non-sinusoidal waveforms with the crest factor of 1:1 through 3:1 for the frequency range of 45Hz to 1KHz.

Test Level Programmable Feature For GO-NO GO Tests. When this meter is the Compare, Relative or Percentage mode, user may program the reference test levels by using the arrow (↑ . ↓ . → . ←) buttons. An external reference source is not needed.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Fuse (1A, 600V RMS)	F11
Fuse (15A, 600V RMS)	F2
Test Lead Set	FTL-500
Alligator Clips	AC7
K-type Thermocouple (Optional)	TP1
Thermocouple Adaptor	TP1A
Rubber Boot (Yellow)	C2Y
Soft Carrying Case (Optional)	S1C
Hard Carrying Case (Optional)	H1C

SPECIFICATIONS (See Data Sheets.)

Basic Accuracy (% of reading + number of counts)

DC Voltage	0.05% + 1
AC Voltage (@45Hz - 1KHz)	0.5% + 3
Ohms	0.1% + 3
DC Current	0.5% + 3
AC Current (@45Hz - 1KHz)	0.75% + 5
Frequency	0.05% + 2
Capacitance	1.9% + 2
Temperature (@0°C -400°C)	1.0%+ 1°C

General

Display : 4½ digits, (20000 counts) with 41 segment bar graph, updates 3 times/sec. **Temperature Coefficient:** 0.05 x (specified accuracy)/°C (<18°C or >28°C) **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Shock & Vibration :** Per MIL-T-28800 for a class 2 instrument **Splash Proof and Dust Proof Case Battery Type :** 9V, NEDA 1604 or 6F22 **Battery Life :** 200hrs typical (alkaline) **Dimensions with Holster (H X W X D) :** 208 X 103 x 54 mm **Weight :** About 655g **Warranty :** One year parts & labour **Safety Standards :** Designed to UL 1244, ANSI / ISA-DS82, CSA C 22.2 No.231, VDE 0411, and IEC 1010-1 & the EMC Directive **Standard Equipment :** Meter, test leads, holster, thermocouple adaptor, user's manual, 9V battery (installed)



MODEL 525

FEATURES

- *CE- mark Certificated.*
- *4½ digit, 20000 count with bar graph.*
- *Manual ranging.*
- *True-RMS on AC voltage and current ranges.*
- *Fused 10Amps range.*
- *Surge (Transient) voltage protection.*
- *Auto-Power-Off.*
- *DC voltage basic accuracy within 0.05%.*
- *Fix hold ™ (Automatic reading hold).*
- *Capacitance measurement (0.001 µF to 999µF).*
- *Frequency measurement (0.5Hz to 200KHz, Max. Resolution 0.01Hz).*
- *Temperature measurement (-40°C to 1,370°C, Accuracy: 1% + 1°C for 0°C to 400°C).*
- *Continuity beeper and diode test.*
- *Record, offset and relative mode.*
- *Comparator, GO-NO GO and percentage programming capabilities.*
- *600 volt input protection on Ohm range and Continuity & Diode test.*
- *Large LCD (68.5mm X 32.7mm).*

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DIGITAL MULTIMETERS

509 Autoranging True-RMS DMM with RS-232C



MODEL 509

FEATURES

- *CE- mark Certificated.*
- *THD-R (Total Harmonic Distortion as a percent of the Total RMS values) measurement of Voltage or Current in a 50Hz or 60Hz power line.*
- *RS-232C interface capability.*
- *Backlit display.*
- *3¾ digit, 4000 count with bar graph.*
- *Autoranging.*
- *Safety shutter protection for current terminals.*
- *Surge (Transient) voltage protection.*
- *Fused 10Amps range.*
- *True-RMS on AC voltage and current ranges.*
- *Auto-Power-Off.*
- *DC voltage basic accuracy within 0.3%.*
- *Fix hold ™ (Automatic reading hold).*
- *Capacitance, Frequency, and Temperature measurement.*
- *Record, offset and relative mode.*
- *Comparator, GO-NO GO and percentage programming capabilities.*
- *Continuity beeper and diode test.*
- *600 volt input protection on Ohm range and Continuity & Diode test.*
- *Large LCD (68.5mm X 32.7mm).*

The Finest 509 True-RMS DMM is a special version of the Series 500 designed to provide it with the RS-232C interface capability, for which a bi-directional RS-232C interface cable and a sample software diskette are supplied as optional accessories.

The backlit Finest 509 True-RMS DMM has all the advanced features you expect, plus GO-NO GO programming and harmonic distortion (THD) measurement is very simple and accurate.

THD@ 50/60Hz®. Non-linear electrical loads in Power Distribution systems distort currents and voltages which generate HARMONICS at odd multiples of the fundamental frequency. Harmonics may cause overheating of transformers, neutral conductors of star-connected power distribution systems, and motors, as well as premature tripping of circuit breakers. The Finest 509 is designed to measure THD-R of Voltage or Current in a 50Hz or 60Hz power line only. This feature is typically found only in much more expensive power analyzing instruments.

Test Level Programmable Feature For GO-NO GO Tests. (See page 10.)

ACCESSORIES	PART NO.
Battery, 9V	BT1
Fuse (1A, 600V RMS)	F11
Fuse (15A, 600V RMS)	F2
Test Lead Set	FTL-500
Alligator Clips	AC7
K-type Thermocouple (Optional)	TP1
Thermocouple Adaptor	TP1A
Rubber Boot (Yellow)	C2Y
RS-232C Interface Cable (Optional)	RS50
Sample Software Diskette (Optional)	DS509/WS 509
Soft Carrying Case (Optional)	S1C
Hard Carrying Case (Optional)	H1C
AC/DC Clamp Adaptor (Optional)	CA113

SPECIFICATIONS (See Data Sheets.)

Basic Accuracy (% of reading + number of counts)	
DC Voltage	0.3% + 2
AC Voltage (@45Hz - 1KHz)	2.5% + 5
Ohms	0.5% + 3
DC Current	0.5% + 1
AC Current (@45Hz - 1KHz)	1.0% + 5
Frequency	0.05% + 2
Capacitance	1.9% + 2
Temperature (@0°C -400°C)	1.0% + 1°C
THD @50/60Hz	2.0% + 2

General

Display : 3¾ digits (4000 counts) with 41 segment bar graph, updates 4 times/sec. **Temperature Coefficient:** 0.05 x (specified accuracy)/°C (<18°C or>28°C) **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Shock & Vibration :** Per MIL-T-28800 for a class 2 instrument **Splash Proof and Dust Proof Case Battery Type :** 9V, NEDA 1604 or 6F22 **Battery Life :** 200hrs typical (alkaline) **Dimensions with Holster (H X W X D) :** 208 X 103 x 54 mm **Weight :** About 655g **Warranty :** One year parts & labour **Safety Standards :** Designed to UL 1244, ANSI / ISA-DS82, CSA C 22.2 No.231, VDE 0411, and IEC 1010-1 & the EMC Directive **Standard Equipment :** Meter, test leads, holster, thermocouple adaptor, user's manual, 9V battery (installed)

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UTECO

DIGITAL MULTIMETERS

Series 500 True-RMS DMMs with THD @50/60Hz®

The Series 500 True-RMS DMMs is a family of 3¾ digit handheld autoranging DMMs with an impressive range of capabilities and a couple of very unique features.

THD @50/60Hz®. The Finest 503THD and 507THD are designed to measure THD-R of Voltage or Current in a 50Hz or 60Hz power line. This feature is typically found only in much more expensive power analyzing instruments. (See page 11.)

Test Level Programmable Feature For GO-NO GO Tests. [Finest 507 & 507THD] (See page 10.)

ACCESSORIES	PART NO.
Battery, 9V	BT1
Fuse (1A, 600V RMS)	F11
Fuse (15A, 600V RMS)	F2
Test Lead Set	FTL-500
Alligator Clips	AC7
K-type Thermocouple (Optional)	TP1
Thermocouple Adaptor	TP1A
Rubber Boot (Yellow)	C2Y
Soft Carrying Case (Optional)	S1C
Hard Carrying Case (Optional)	H1C
AC/DC Clamp Adaptor (Optional)	CA113

SPECIFICATIONS (See Data Sheets.)

Basic Accuracy (% of reading + number of counts)	503	507	503THD & 507 THD
DC Voltage	0.3% + 2	0.3% + 2	0.3% + 2
AC Voltage (@45Hz - 1KHz)	2.5% + 5	2.5% + 5	3.5% + 5 (>4V)
Ohms	0.5% + 3	0.5% + 3	0.5% + 3
DC Current	0.5% + 1	0.5% + 1	0.5% + 3
AC Current (@45Hz - 1KHz)	1.0% + 5	1.0% + 5	1.0% + 5
Frequency	0.05% + 2	0.05% + 2	0.05% + 2
Capacitance	1.9% + 2	1.9% + 2	1.9% + 2
Temperature (@0°C -400°C)	No	1.0% + 1°C	1.0% + 1°C (503THD No)
THD @50/60Hz	No	No	2.0% + 2

General

Display : 3¾ digits (4000 counts) with 41 segment bar graph, updates 4 times/sec. **Temperature Coefficient:** 0.05 x (specified accuracy)/°C (<18°C or >28°C) **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Shock & Vibration :** Per MIL-T-28800 for a class 2 instrument **Splash Proof and Dust Proof Case Battery Type :** 9V, NEDA 1604 or 6F22 **Battery Life :** 200hrs typical (alkaline) **Dimensions with Holster (H X W X D) :** 208 X 103 x 54 mm **Weight :** About 655g **Warranty :** One year parts & labour **Safety Standards :** Designed to UL 1244, ANSI / ISA-DS82, CSA C 22.2 No.231, VDE 0411, and IEC 1010-1 & the EMC Directive **Standard Equipment :** Meter, test leads, holster, thermocouple adaptor(507 &507THD), user's manual, 9V battery (installed)



FEATURES

- *CE- mark Certificated.*
- *3¾ digit, 4000 count with bar graph.*
- *Autoranging.*
- *Safety shutter protection for current terminals.*
- *Surge (Transient) voltage protection.*
- *Fused 10Amps range.*
- *True-RMS on AC voltage and current ranges.*
- *Auto-Power-Off.*
- *DC voltage basic accuracy within 0.3%.*
- *Fix hold ™ (Automatic reading hold).*
- *Capacitance measurement (Autoranging, 0.001µF to 999µF).*
- *Frequency measurement (0.5Hz to 200KHz, Max. Resolution 0.01Hz).*
- *Continuity beeper and diode test.*
- *600 volt input protection on Ohm range and Continuity & Diode test.*
- *Large LCD (68.5mm X 32.7mm).*

[Finest 507 & 507THD]

- *Temperature measurement (-40°C to 1,370°C, Accuracy: 1% + 1°C for 0°C to 400°C).*
- *Record, Offset and relative mode.*
- *Comparator, GO-NO GO and percentage programming capabilities.*

[Finest 503THD & 507THD]

- *THD-R (Total Harmonic Distortion as a percent of the Total RMS values) measurement of Voltage or Current in a 50Hz or 60Hz power line.*

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UTECO

DIGITAL MULTIMETERS

Series 500 Low Cost DMMs



MODEL 500



MODEL 501

These two meters deliver superior Finest quality at a price of " disposable meters". The Finest 500 manual ranging DMM makes accurate measurements of raw DC line signals (or non-filtered full-wave rectified AC line signals) and the Finest 501 autoranging DMM makes very accurate measurements of non-filtered DC signals when working with motors, switching supplies and other petroleum/oil industry applications.

Safety Shutter. Prevents user from making inadvertent connections to the current terminals. But, always remove inputs before turning the rotary switch.

Auto-Power-Off mode. If this meter is on and inactive for approximately 10 minutes, this meter will automatically switch to Auto-Power-Off mode.

Accurate Measurements of Raw DC Signals of Low Frequencies. In the oil industry there are many opportunities to measure DC voltage (typically 1.2V DC), on which noises of 16Vp-p (≅ 5.7V RMS) are superimposed, at the frequency of 16Hz. The Finest 501 is designed to make accurate measurements of impure DC voltages at low frequencies (> 16Hz). This is especially important for the petroleum/oil industry.

FEATURES

- *CE- mark Certificated.*
- *500-3½ digit, 2000 count.*
  501-3¾ digit, 3260 count with bar graph.
- *Accurate measurement of non-filtered DC signals.*
- *500-Manual ranging.*
  501-Autoranging.
- *Fused 10Amps range.*
- *Surge (Transient) voltage protection.*
- *DC voltage basic accuracy within 0.5%.*
- *Data hold.*
- *Continuity beeper and diode test.*
- *600 volt input protection on Ohm range and Continuity & Diode test.*
- *Hold and Low-battery annouciators.*
- *Safety holster with a stand rest.*
- *Large LCD (68.5mm X 32.7mm)*

[Finest 501 Only]

- *Safety shutter protection for current terminals.*
- *Auto-Power-Off .*

ACCESSORIES

	PART NO.
Battery, 9V [500 Only]	BT1
Battery, 1.5V x 2 [501 Only]	BT2
Fuse (1A, 600V RMS) [501 Only]	F11
Fuse (2A, 600V RMS) [500 Only]	F1
Fuse (15A, 600V RMS)	F2
Test Lead Set	FTL-500
Alligator Clips	AC7
Rubber Boot (Yellow)	C2Y
Soft Carrying Case (Optional)	S1C

SPECIFICATIONS (See Data Sheets.)

Basic Accuracy (% of reading + number of counts)	500	501
DC Voltage	0.5% + 1	0.5% + 2
AC Voltage	0.8% + 3	0.75% + 3
Ohms	0.5% + 3	0.5% + 3
DC Current	0.8% + 1	0.5% + 1
AC Current	1.0% + 5	1.0% + 5

General

Display : 500-3½digit, 2000 count digital display, updates 3 times/sec. 501-3¾digit (3260 counts) with 34 segment bar graph, updates 3 times/sec. **Temperature Coefficient:** 0.1 x (specified accuracy)/°C (<18°C or >28°C) **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Shock & Vibration :** Per MIL-T-28800 for a class 2 instrument **Splash Proof and Dust Proof Case Battery Type :** 9V, NEDA 1604 or 6F22 [500], 2 x 1.5V AAM or R6 [501] **Battery Life :** 350hrs typical (alkaline) [500], 2000 hrs typical (alkaline) [501], **Dimensions with Holster (H X W X D) :** 208 X 103 x 54 mm **Weight :** About 655g **Warranty :** One year parts & labour **Safety Standards :** Designed to UL 1244, ANSI / ISA-DS82, CSA C 22.2 No.231, VDE 0411, and IEC 1010-1 & the EMC Directive **Standard Equipment :** Meter, test leads, holster, user's manual, 9V [500], 2 x 1.5V [501] batteries (installed)

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Series 220 Compact DMMs

The Finest Series 220 compact Digital Multimeter is designed to efficiently support the first level electronic and electrical trouble-shooting with an easy and automatic operation. These four meters deliver superior Finest quality at a price of "disposable meters".

AC and DC Voltage Measurements
Voltage measurements can be made in a wide range of situations up to 750 volts dc and 750 volts ac RMS.

Ohms to 20MΩ and Diode Test
The Finest Series 220 Measures resistance over a wide range and displays the voltage drop of properly working diodes.

Fast Continuity Beeper
No need to watch the display, just listen for the beep when checking continuity.

4000 Count Digital Display, High Resolution Analog Display
Large, ease-to-read-digits give better resolution than common 2000 count meters .

Auto and Manual Ranging
For quick reading, the Finest Series 220 automatically selects the range with the best resolution for the job. For repetitive measurements, manual ranging can increase the measurement speed.

Capacitance
The Finest Series 220 automatically measures capacitance with a range of guaranteed specification from 0.001µF to 999µF, and up to 9999µF with a typical specification.

[Finest 225 & 227]
Logic Probe Function
This function is ideal for analyzing digital logic levels and serial communications. The Meter measures logic levels at frequencies up to 400KHz and detects pulses as narrow as 2.5µS for those high speed logic circuits. When this function is working, the display shows whether the test point is at a logic level high or low or is pulsing or is not active.

[Finest 221 & 222]
V Dtek™
When the rotary switch is in the ohms/diode position, and there is a voltage greater than 2.5 volts at the input jacks, the Meter will automatically switch to either the AC or DC volts function depending upon which is greater. What is more, in this mode the input impedance of the Meter is approximately 2KΩ so that the user will know whether the voltage being measured is from leakage or not. When V Dtek™ function is working, the Meter provides a symbolic display Low Z.

Continuity Intermittents Capture
The Finest 221 and 222 captures intermittent opens and shorts as short as 100µS. The Meter provides a symbolic display of whether the condition was an open or a short.

[Finest 222 Only]
MAX / MIN Record with Elapsed Time
The Finest 222 can be on the job even when you are not. In addition the Max/Min, which records the highest and lowest voltage readings during a 100 hour period, the Finest 222 includes an elapsed time clock that time stamps those readings to the nearest minute.



MODEL 225



MODEL 227

Safety Designed
Finest s superior overload protection and safety designed test leads are standard with the Series 220. It is designed to meet recognized safety standards the world over.

Warranty
Finest s quality is backed up with a worldwide one year warranty.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Test Lead Set	FTL-500
Alligator Clips	AC7
Rubber Boot (Yellow)	C3Y

General

Display : 3¾ digits 4000 count LCD with 41 segment bar graph **Temperature Coefficient:** 0.1 x (specified accuracy)/°C (<18°C or >28°C) **Operating Temperature :** 0°C to 40°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Battery Type :** 9V, NEDA 1604 or 6F22 **Battery Life :** 200hrs typical (alkaline) **Dimensions with Holster (H X W X D) :** 154 X 80 x 54 mm **Weight :** About 425g **Safety Standards :** Designed to IEC 1010-1 and the EMC Directive, UL 1244, ANSI/ISA-S82, CSA C 22.2 No.231, and VDE 0411 **EMI Regulations :** Complies with FCC part 15, class B, and VDE 0871 B **Standard Equipment :** Meter, test leads, holster, user s manual, 9V battery (installed)

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MODEL 221



MODEL 222

FEATURES

- *CE- mark Certificated.*
- *3¾ digits 4000 count digital display with 41 segment bar graph.*
- *Standby mode.*
- *Fast continuity beeper, diode test.*
- *Data Hold.*
- *0.9% basic DC volts accuracy.*
- *1.9% basic AC volts accuracy.*
- *Surge (Transient) voltage protection.*
- *0.9% basic ohms accuracy [Finest 221 & 225].*
- *0.75% basic ohms accuracy [Finest 222 & 227].*
- *Capacitance-0.001 to 9,999µF.*
- *Frequency-1 Hz to 200 KHz.*
- *Max/Min recording function [Finest 222 & 227].*

[Finest 225 & 227]

- *Logic Probe Function - Measurements logic levels at frequencies up to 400 KHz and detects pulses as narrow as 2.5µS for those high speed logic circuits.*

[Finest 221 & 222]

- *V Dtek ™*
- *Continuity intermittents capture.*
- *Max/Min recording with elapsed-time mode (Finest 222 only).*

* *The FInest 221 and 222 are not available in the U.S.A., Canada, the U.K., Germany, France, the Netherlands, Italy, and Sweden.*

SPECIFICATIONS (at 23°C ±5°C; < 80% RH.)

(% of reading + number of digits)

DC Volts

Ranges	400mV, 4V, 40V, 400V, 750V
Accuracy	0.9% + 2
Max. Resolution	0.1mV
Input Impedance	>10MΩ <100pF
In V Dtek & Low Z	>2KΩ <200pF*1
NMRR	>30dB at 50Hz or 60Hz
CMRR	>90dB at DC, 50Hz or 60Hz
Max. Input	750V DC

(*1 in the 4V range, this accuracy is guaranteed for 50Hz to 200Hz)

AC Volts (50Hz to 400Hz)

Ranges	4V, 40V, 400V, 750V
Accuracy*	1.9% + 3
Max. Resolution	0.1mV
Input Impedance	>10MΩ <100pF (ac-coupled)
In V Dtek & Low Z	>2KΩ <200pF*1
CMRR	>60dB, dc to 60Hz
Max. Input	750V AC PEAK

(*1 in the 4V range, this accuracy is guaranteed for 50Hz to 200Hz)

Resistance

Ranges	400Ω, 4KΩ, 40KΩ, 400KΩ, 4MΩ	20MΩ,
Accuracy221 & 225	0.9%+2	1.5%+3
222 & 227	0.75%+2	1.5%+3
Max. Resolution	0.1Ω	
Overload Protection	600V DC/AC	
Open Circuit Test Voltage	<3.5V DC	
Short Circuit Current	<1.5mA	

Diode Test

Overload Protection	600V DC/AC
Open Circuit Test Voltage	3.5V DC
Short Circuit Current	1.5mA

Capacitance

Ranges	0.1µF, 1µF, 10µF, 100µF, 1000µF	10.000µF
Accuracy	1.9%+2*2	10%+90*3
Max. Resolution	0.001µF	
Overload Protection	250V DC/AC	

*2 The accuracy specification is for capacitors that have negligible dielectric absorption
*3 Functionally, 1000µF is in the same range as 10,000µF.

Frequency

Ranges	20KHz, 200KHz (Autoranging)
Accuracy	0.2%+2
Max. Resolution	1Hz
Overload Protection	600V DC/AC

Continuity Test

Buzzer <100VV

Logic Probe (Finest 225 & 227)

Low Threshold	1.2V
High Threshold	1.6V
Input Impedance	10MΩ
Frequency Response	400KHz
Detects Pulses as narrow as	2.5µS
Max. Signal Input Protection	600V DC/AC for 15 sec

Continuity Intermittents Capture (Finest 221 & 222)

Detects opens or shorts of 100µS or longer

MAX/MIN Recording Accuracy and Response Time (Finest 222 & 227)

Specified accuracy of the measurement function ±20 digits for changes > 200mS in duration (± 60 digits in ac). Typical 100mS response 80%.

MAX MIN Recording with Elapsed Time (Finest 222 Only)

Elapsed Time	0 to 100 hours (99:59)
Resolution	1 minute
Accuracy	0.5% typical

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215 4½-Digit Programmable DMM

The Finest 215 4½-digit handheld programmable DMM is a Finest s very accurate handheld DMM. This model has very precise measurement capabilities and a number of unique features. The relative reference level is adjustable using the front panel buttons. The 215 also have CMP function which can be used to make GO-NO GO tests. Again the test levels are entered using the front panel keys.

True-RMS Measurement
The 215 measures true-rms ac voltage and current, which yields accurate measurement results on sinewaves as well as non-sinusoidal waveforms.

Adjustable Relative Reference
The 215 can display only the difference between a stored reference value and a measured value for all functions and ranges, when the relative reference is adjustable using the front panel s arrow buttons.

Compare Function
The 215 has a compare function for fast in-tolerance limits testing. Upper- and lower- limits are entered using the front panel s arrow buttons, that is, we don t need any external test levels source. Readouts show a Hi/Lo/Pass evaluation.

Max Min Average Recording Mode
Stores the highest, lowest, and 24 hour average of all readings, allowing you to monitor a signal fluctuation for seconds or a day. An audible tone is given for a new maximum or minimum.

Frequency, Capacitance and Temperature Measurement
The 215 has a counter for frequency measurement from 1Hz to 200 KHz and measures capacitance from 1pF to 40µF. And also measures temperatures from -40°C to +1,370°C (-40°F to +2,498°F) using the optional K-type thermocouple.

4½-Digit, 20000 Count Digital Display, 41 Segments Analog Display
Digital display updates 3 times per second. For changing or unstable signals, the 215 features 41segments higher resolution analog readings. Analog displays update 7 times per second.

Rugged Construction
Dust proof, splash proof, and heavy-duty case provides protection for years of use under the harsh operating conditions. The yellow protective rubber boot protects the 215 very efficiently and makes it easy to find the 215.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Fuse (2A, 600V RMS)	F1
Fuse (15A, 600V RMS)	F2
Test Lead Set	FTL-500
Alligator Clips	AC7
Rubber Boot (Yellow)	C1Y
K-type Thermocouple (Optional)	TP1
Soft Carrying Case (Optional)	S1C



MODEL 215

FEATURES

- *CE- mark Certificated.*
- *True-RMS AC Voltage and Current measurement.*
- *Surge (Transient) voltage protection.*
- *Adjustable relative reference level using the front panel buttons.*
- *Compare function can be used to make GO-NO GO tests, when the test levels are entered using the front panel buttons.*
- *Max Min Average recording mode with audible tone.*
- *Frequency, Capacitance, and Temperature measurement.*
- *4½ digit, 20000 count digital display updates 3 times per second, analog display updates 7 times per second.*
- *Protective holster with stand.*

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SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

(% of reading + number of digits)

DC Volts			
Ranges	200mV, 2V, 20V, 200V, 1000V		
Accuracy	0.1% + 1		
Max. Resolution	10µV		
Input Impedance	10MΩ in parallel with < 100pF		
NMRR	>31dB at 50Hz or 60Hz		
CMRR	>82dB at dc, 50Hz or 60Hz		
Max. Input	1000V DC		
AC Volts [True-RMS]			
Ranges	200mV, 2V, 20V, 200V, 750V		
Accuracy (45Hz to 1KHz)	0.5% + 3		
Max. Resolution	10µV		
Input Impedance	10MΩ in parallel with < 100pF		
CMRR	> 65 dB, dc to 60Hz		
Max. Input	750V AC RMS		
DC Amps			
Ranges	2mA, 200mA		100A
Accuracy	0.5% + 1		2% + 10
Max. Resolution	0.1µA		
Overload Protection	fuse protection using a 2A/600V fuse (mA ranges) and a 15A/600V (A range)		
AC Amps [True-RMS]			
Ranges	2mA	200mA	10A
Accuracy (45Hz to 1KHz)	0.75% + 3	0.75% + 5	2% + 10
Max. Resolution	0.1µA		
Overload Protection	Same as DC Amps		
Resistance			
Ranges	200 Ω	20KΩ	20MΩ
	200KΩ,	2MΩ	
Accuracy	0.2% + 3	0.1% + 3	0.75% +5
Max. Resolution	0.01Ω		
Overload Protection	600V DC/AC		
Capacitance			
Ranges	4000pF	400nF, 4µF	40µF
Accuracy	3% + 5	2% + 3	3% + 5
Max. Resolution	1pF		
Overload Protection	600V DC/AC		
Frequency			
Ranges	20KHz, 200KHz		
Accuracy	0.2% + 2		
Max. Resolution	1Hz		
Overload Protection	500V DC or AC RMS		
Temperature			
Ranges	-40°C to + 1,370°C		
Accuracy	3°C + 1 digit for -40°C to +300°C, 3% for all other temp.		
Resolution	1°C		
Continuity Test	Buzzer < 100Ω		
Crest Factor for True -RMS (45Hz to 1KHz)	1:1 thru 3:1		
Counter Sensitivity	150mV		

General

Display : 4½ digits, 20000 count LCD **Operating Temperature :** 0°C to 40°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Battery Type :** 9V, NEDA 1604 or 6F22 **Battery Life :** 200hrs typical (alkaline) **Dimensions with Holster (H X W X D) :** 20.3cm X 10.0cm x 4.7cm **Weight :** 645g **Warranty :** One year **Safety Standards :** Designed to IEC 1010-1 and the EMC Directive, UL 1244, CSA C22.2 No.231, ISA-DS82 **Standard Equipment :** Meter, test leads, holster, user s manual, 9V battery (installed)

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Series 200 3¾ Digit Programmable DMMs

c UL us LISTED 6Z52

The Series 200 is a family of 3¾-digit handheld programmable DMMs with an impressive range of capabilities, including frequency, temperature, and capacitance (205 only) measurement. The Series 200 is designed for professional and heavy-duty use and has a couple of very unique programmable features.

Programmable Relative Mode
The Relative Mode remembers a reading and shows the difference between it and any reading that follows. In the relative mode of the Series 200, you can adjust the relative reference level using the front panel buttons.

Programmable Compare Function
The Series 200 has a compare function for fast in-tolerance limits testing. Upper-and lower-limits are adjustable using the front panel buttons, that is, we don t need any external test levels source. Readouts show a Hi/Lo/Pass evaluation.

Max Mln Average Recording Mode
Stores the highest, lowest, and 24 hour average of all readings, allowing you to monitor a signal fluctuation for seconds or a day. An audible tone is given for a new maximum or minimum.

Frequency, Temperature, and Capacitance [205 Only] Measurement
The 205 and 207 have a counter for frequency measurement from 1Hz to 200KHz (2 ranges, Max. Resolution 1Hz) and the 209 from 0.5Hz to 200KHz (5 ranges, Max. Resolution 0.01Hz).
The Series 200 measures temperatures from -40°C to +1,370°C (-40°F to + 2,498°F) using the optional K-type thermocouple.
The 205 only measures capacitance from 1pF to 40µF.

3¾ Digit, 4000 Count Digital Display, 41 Segments Analog Display
Digital display updates 3 times per second. For changing or unstable signals, the Series 200 features 41 segment higher resolution analog readings. Analog displays update 20 times per second.

True-RMS Measurement
The 209 and True-RMS version of the 207 measure true-RMS AC voltage and current.

Fix hold™ [209 Only]
Automatically captures a stable reading, beeps to acknowledge, and holds it on the LCD until you are ready to view it. It automatically updates with each new measurement.

Rugged Construction
Dust proof, splash proof, and heavy-duty case provides protection for years of use under the harsh operating conditions. The yellow protective rubber boot protects the Series 200 very efficiently and makes it easy to find them.



MODEL 205

c UL us LISTED 6Z52



MODEL 207

FEATURES

- *CE- mark Certificated.*
- *True-RMS AC measurement (209-standard, 207-optional).*
- *Surge (Transient) voltage protection.*
- *Adjustable relative reference level using the front panel buttons.*
- *Compare function can be used to make GO-NO GO tests, when the test levels are entered using the front panel buttons.*
- *Max Min Average recording mode with audible tone.*
- *Frequency,Temperature, and Capacitance [Finest 205 Only] measurement.*
- *3¾ digit, 4000 count digital display updates 3 times per second, analog display updates 20 times per second.*
- *Fix Hold™ [Finest 209 Only]-Automatically captures a stable reading, beeps to acknowledge, and holds it on the LCD.*
- *Protective holster with stand.*

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MODEL 209

ACCESSORIES — PART NO.

Battery, 9V	BT1
Fuse (2A, 600V RMS)	F1
Fuse (15A, 600V RMS)	F2
Test Lead Set	FTL-500
Alligator Clips	AC7
Rubber Boot (Yellow)	C1Y
K-type Thermocouple (Optional)	TP1
Soft Carrying Case (Optional)	S1C
AC/DC Clamp Adaptor (Optional)	CA113

General

Display : 3¾ digits, 4000 count LCD **Operating Temperature :** 0°C to 40°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Battery Type :** 9V, NEDA 1604 or 6F22 **Battery Life :** 200hrs typical (alkaline) **Dimensions with Holster (H X W X D) :** 20.3cm X 10.0cm x 4.7cm **Weight :** 645g **Warranty :** One year **Safety Standards :** Designed to IEC 1010-1 and the EMC Directive, UL 1244, CSA C22.2 No.231, ISA-DS82 **Standard Equipment :** Meter, test leads, holster, user s manual, 9V battery (installed)

SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

(% of reading + number of digits)

DC Volts

Ranges	400mV,	4V, 40V, 400V	1000V
Accuracy 205		0.3% + 1	
207(207T)	0.3% + 2	0.3% + 1	0.75% + 3
209	0.3% + 2	0.3% + 1	0.75% + 3
Max. Resolution		100µV	
Input Impedance	10MΩ in parallel with < 100pF		
NMRR	>20dB at 50Hz or 60Hz		
CMRR 205	>90dB at dc, 50Hz or 60Hz		
207 &209	>100dB at dc, 50Hz or 60Hz		
Max. Input	1000V DC		

AC Volts (205 & 207) [True-RMS (207T & 209)]

Ranges	400mV,	4V, 40V,400V	750V
Accuracy 205		0.75% + 3 (up to 750V)	
207	NONE	0.5% + 3	0.75% + 5
207T & 209 (45Hz to 1KHz)	NONE	2.5% + 5	2.5% + 5
Max. Resolution	100µV (205 only), 1mV		
Input Impedance	10MΩ in parallel with < 100pF		
CMRR 205	> 60 dB, dc to 60Hz		
207 & 209	> 85 dB, dc to 60Hz		
Max. Input	750V AC RMS		

DC Amps

Ranges 205	4mA,	400mA	10A
207 & 209	400µA, 4000µA, 40mA, 400mA	4A, 10A	
Accuracy 205	0.5% + 1	2.0% + 10	
207 & 209	0.5% + 1	1.0% + 5	
Max. Resolution	1µA (205 only), 0.1µA		
Overload Protection	fuse protection using a 2A/600V fuse (mA ranges) and a 15A/600V (A range)		

AC Amps (205 & 207) [True-RMS (207T & 209)]

Ranges 205	4mA	400mA	10A
207 & 209	400µA,4000µA,40mA,400mA,4A,10A		
Accuracy 205	0.75% + 3	0.75% + 5	2.0% + 10
207		1.0% + 5	
207T & 209	1.0% + 5 (45Hz to 2KHz)		
Max. Resolution	1µA (205 only), 0.1µA		
Overload Protection	Same as DC Amps		

Resistance

Ranges	400Ω	4K, 40K 200K, 4MΩ	40MΩ
Accuracy 205	0.5% + 3	0.5% + 1	1.0% +5
207 (207T)	0.5% + 10	0.5% + 3	1.0% +10
209	0.5% + 3	0.5% + 3	1.0% +10
Max. Resolution		0.1VV	
Overload Protection	600V DC/AC		

Capacitance (205 Only)

Ranges	4000pF	400nF, 4µF	40µF
Accuracy	3% + 5	2% + 3	3% + 5
Max. Resolution		1pF	
Overload Protection	600V DC/AC		

Frequency

Ranges 205 & 207 (207T)	20KHz, 200KHz	
209	200Hz, 2KHz, 20KHz, 200KHz	>200KHz
Accuracy 205 & 207 (207T)		0.2% + 2
209	0.1% + 2	
Max. Resolution		
205 & 207 (207T)	1Hz	
209		0.01Hz
Overload Protection	500V DC or AC	

Temperature

Ranges	-40°C to + 1,370°C
Accuracy	3°C + 1 digit for -40°C to +300°C, 3% for all other temp.
Resolution	1°C

Continuity Test	Buzzer < 100Ω
Crest Factor for True -RMS (207T & 209)	1:1 thru 3:1 (45Hz to 1KHz)
Counter Sensitivity	150mV

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Series 200 Two Button DMMs

The Simple-to-Use Finest 201 and 203
These two meters deliver superior Finest quality at a price of "disposable meters". The excellent reliability and accuracy can be verified by the sales quantity of more than 0.7 Million sets for the last 10 years without even advertising. These two meters offer very exceptional performances with the simple-to-use and rugged construction.

Audible Continuity Test
The continuity testing mode is extremely fast and can be used to detect either shorts or opens of electrical wiring or circuit connections.

Autoranging/Manual Ranging [203 Only]
Autorange automatically selects the range with the best accuracy and resolution for any function. The decimal point is automatically placed for easy readout. Optional manual ranging is included.

Automatic Polarity
Reverse polarity is indicated by a "–" sign next to the reading.

Analog/Digital Display [203 Only]
The 3260 count digital display delivers better accuracy than conventional 3½-digit DMMs (1999 count).

A 34-segment analog bar graph reacts 3 times faster than the numerical display, making peaking and nulling adjustments easy.

Rugged Construction
Dust proof,splash proof, and heavy-duty case provides protection for years of use under the harsh operating conditions. The yellow protective rubber boot protects the Series Two Button DMMs very efficiently and makes it easy to find them.

ACCESSORIES	PART NO.
Battery, 9V [201 Only]	BT1
Battery, 1.5V x 2 [203 Only]	BT2
Fuse (2A, 600V RMS)	F1
Fuse (15A, 600V RMS)	F2
Test Lead Set	FTL-500
Alligator Clips	AC7
Rubber Boot (Yellow)	C1Y
Soft Carrying Case (Optional)	S1C

General

Display : 201-3½ digits, 2000 count LCD, 203-3¾ digits, 3260 count LCD **Operating Temperature :** 0°C to 40°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Battery Type :** 201-9V, NEDA 1604 or 6F22, 203-1.5V x 2. AAM or R6 **Battery Life :** 201-200 hrs typical (alkaline), 203-2000 hrs typical (alkaline) **Dimensions with Holster (H X W X D) :** 20.3cm X 10.0cm x 4.7cm **Weight :** 615g **Warranty :** One year **Safety Standards :** Designed to IEC 1010-1 and the EMC Directive, UL 1244, CSA C22.2 No.231, ISA-DS82 **Standard Equipment :** Meter, test leads, holster, users manual, 9V [201], 2 x 1.5V [203] batteries (installed)



MODEL 201

FEATURES

- *CE- mark Certificated.*
- *201-3½ digit 2000 count digital display.*
- *203-3¾ digit 3260 count analog/digital display.*
- *DC voltage to 1000V and AC voltage to 750V RMS.*
- *Surge (Transient) voltage protection.*
- *Two pushbuttons and rotary dial to select all functions.*

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MODEL 203

- *Audible continuity test.*
- *203-34 segment bar graph, updates 10 times/second.*
- *Display Hold.*
- *203-Autoranging, Battery-saving auto power off (optional).*
- *600V protection in ohms and diode test.*
- *Protective holster with stand.*

SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

(% of reading + number of digits)

DC Volts			
Ranges	201	200mV, 2V, 20V, 200V,	1000V
	203	326mV, 3.26V, 32.6V, 326V	1000V
Accuracy	201	0.5% + 1	0.5% + 1
	203	0.3% + 1	0.75% + 3
Max. Resolution		100μV	
Input Impedance		10MΩ in parallel with < 100pF	
NMRR	201	>46dB at 50Hz or 60Hz	
	203	>60dB at 50Hz or 60Hz	
CMRR	201	>104dB at dc, 50Hz or 60Hz	
	203	>100dB at dc, 50Hz or 60Hz	
Max. Input		1000V DC	
AC Volts			
Ranges	201	200mV, 2V, 20V, 200V	750V
	203	3.26V, 32.6V, 326V,	750V
Accuracy	201	0.8% + 3	1.2% + 3
	203	0.75% + 3	1% + 3
Max. Resolution		100μV (201), 1mV (203)	
Input Impedance		10MΩ in parallel with < 100pF	
CMRR	201	> 80 dB, dc to 60Hz	
	203	> 60 dB, dc to 60Hz	
Max. Input		750V AC RMS	
DC Amps			
Ranges	201	200μA, 2mA, 20mA, 200mA, 2A	10A
	203	326μA, 3.26mA, 32.6mA, 326mA	10A
Accuracy	201	0.8% + 1	2% + 10
	203	0.5% + 3	1% + 5
Max. Resolution		0.1μA	
Overload Protection		fuse protection using a 2A/600V fuse (mA ranges) and a 15A/600V (A range)	
AC Amps			
Ranges	201	200μA, 2mA, 20mA, 200mA, 2A	10A
	203	326μA, 3.26mA, 32.6mA, 326mA	10A
Accuracy	201	1% + 3	3% + 10
	203	0.75% + 3	1% + 5
Max. Resolution		0.1μA	
Overload Protection		Same as DC Amps	
Resistances			
Ranges	201	200Ω 2KΩ, 20KΩ, 200KΩ, 2MΩ 20MΩ	
	203	326Ω,3.26KΩ,32.6KΩ,326KΩ 3.26MΩ 32.6MΩ	
Accuracy	201	0.5% + 10	0.5% + 1 1% + 2
	203	0.5% + 3	1% +10
Max. Resolution		0.1Ω	
Overload Protection		600V DC/AC	
Continuity Test	201	Buzzer < 150Ω	
	203	Buzzer < 20Ω	

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25 HVAC/R DMM

The Finest 25 is ideally suited for the HVAC /R and electrical maintenance professionals. This instrument is ideal for tradesmen who need to make quick, accurate measurements of voltage, resistance, temperature, capacitance and low current amperage.

A Thermometer
The Finest 25 measures temperature from -40°C to 400°C quickly and accurately.
Standard equipment includes a TPI type K thermocouple and a TPIA temperature adaptor, which is compatible with most of type K thermocouples.

A Flame Rod Circuit Tester
The microamp function is included for measuring flame safeguard device current draw down to 0.1 microamps.

A Multimeter with Capacitance

Use the Finest 25 to test motor run / start capacitors up to 10,000 microfarads.

Dust / Water Proof Construction
Dust / Water Protection IP Rating (IP 67) of the enclosures provides heavy - duty uses under the extremely harsh operating conditions.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Fuse (0.5A, 250V RMS)	F202
Test Lead Set	FTL-500
Alligator Clips	AC7
Rubber Boot (Blue)	C4B
K-type Thermocouple	TPI
Temperature Adaptor	TPIA
Soft Carrying Case (Optional)	S1C
AC/DC Clamp Adaptor (Optional)	CA113

SPECIFICATIONS (at 23°C ±5°C : <80% RH)

(% of reading + number of counts)

Function	Range	Resolution	Accuracy	Overload protection
DC Volts	4V 40V 400V 600V	1mV 10mV 100mV 1V	0.9% ± 2 dgts	600V RMS
AC Volts (50Hz to 400Hz)	4V 40V 400V 600V	1mV 10mV 100mV 1V	1.9% ± 3 dgts	
DC Low Amps	40µA 400µA	0.01µA 0.1µA	1.0% ± 5 dgts 0.5% ± 5 dgts	400µA/250V
AC (50Hz to 400Hz) Low Amps	40µA 400µA	0.01µA 0.1µA	1.5% ± 15 dgts 1.0% ± 5 dgts	400µA/250V
Ohms	400Ω 4KΩ 40KΩ 400KΩ	100mΩ 1Ω 10Ω 100Ω	0.9% ± 3 dgts	600V
	4MΩ	1KΩ	1.2% ± 3 dgts	
	40MΩ	10KΩ	1.5% ± 5 dgts	
Capaci-tance	1µF 10µF 100µF	0.001µF 0.01µF 0.1µF	1.7% ± 5dgts	600V
	1000µF	1µF	2.5% ± 15 dgts	
	10000µF	1µF	15% ± 100 dgts	
Tempera -true	-40°F to -15°F -15°F to 750°F	0.1°F 0.1°F	5% ± 5°F 1% ± 3°F	30V ac or 60Vdc
Continuity	Open Circuit Test Voltage : < 2.7V Threshold : Approx. < 50			600V
Diode Check	Open Circuit Test Voltage : < 3.3V Max. Test Current : 3.0mA			600V



MODEL 25

FEATURES

- *CE- mark Certificated.*
- *3¾ digit, 4000 count display.*
- *Autoranging with manual override.*
- *Fused microamperes range.*
- *MAX / MIN Record mode with time stamp.*
- *Data Hold.*
- *Auto - Power - off.*
- *DC voltage basic accuracy within 0.9%.*
- *Continuity beeper and diode test.*
- *Double alerting over-range protection.*
- *600 Volt input protection on all ranges.*
- *Dust / Water Protection IP Rating : IP67.*

General

Display : 3¾ digits, 4000 count LCD **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Altitude :** 2000m **Battery Type :** 9V, NEDA 1604 or 6LR61 **Battery Life :** 350hrs typical (alkaline) **Dimensions with Holster (H X W X D) :** 168 X 85 x 50 (mm) **Weight :** 466 g **Warranty :** One year **Pollution Degree :** 2 **IP Code :** IP67 **Safety Standards :** Designed to IEC 1010-1 and the EMC Directive, UL 3111-1, CSA C 22.2 No.1010-1 **Standard Equipment :** Meter, test leads, K-type thermocouple, temperature adaptor, holster, user s manual, 9V battery (installed)

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Series 20 Low Cost DMMs



MODEL 22



MODEL 24

c UL us LISTED 25PJ

The Finest 22 is a very low cost 3½-digit, 2000 count DMM designed for electrical professionals. The surface mounting technology delivers superior Finest quality at a price of "disposable meters".

The Finest 24 is a low cost 3¾-digit, 4000 count basic autoranging DMM with exceptional value. It is ideally suited for field, lab, shop, and home applications. By using the state-of-the-art surface mounting technology, the meter delivers superb measuring capability as well as the highest possible reliability. Especially, the IP 67 Dust and water proof O-Ring sealed enclosures provide heavy-duty uses under the extremely harsh operating conditions.

ACCESSORIES	PART NO.
Battery, 9V [22 Only]	BT1
Battery, 1.5V X2 [24 Only]	BT2
Fuse (12.5A, 250V RMS) [24 Only]	F201
Fuse (0.5A, 250V RMS) [24 Only]	F202
Test Lead Set	FTL-500
Alligator Clips [24 Only]	AC7
Rubber Boot (Blue)	C4B
Soft Carrying Case (Optional)	S1C

SPECIFICATIONS (See Data Sheets.)

Basic Accuracy (% of reading + number of counts)

	22	24
DC Voltage	1.5% + 3	0.5% + 3
AC Voltage	1.5% + 5	1.5% + 5
Ohms	1.5% + 3	0.75% + 3
DC Current	No	1.2% + 3
AC Current	No	1.5% + 5

General

Display : 22 - 3½ digits, 2000 count LCD, 24 - 3¾ digit, 4000 count LCD **Temperature Coefficient :** 0.1 X (Specified accuracy) / °C (<18°C or >28°C) **Operating Temperature :** 22 - 0°C to 40°C, 24 - 0°C to 50°C **Operating Humidity:** < 80% RH **Storage Temperature :** 22- -10°C to 50°C, 24- -20°C to 60°C **Shock & Vibration :** Per MIL - T- 28800 for a Class II instrument **Pollution Degree :** 2 **IP Code :** IP 67 **Dust and Waterproof [24 Only] Installation Category :** CAT III (600V) **Battery Type :** 9V, NEDA 1604 or 6LR61 [22], 2 X 1.5V AAM or R6 [24] **Battery Life :** 200hrs.(alkaline) [22], 1000 hrs.(alkaline) [24] **Dimensions with Holster (H X W X D) :** 158 X 80 X 54mm [22], 168 X 85 X 50mm [24] **Weight :** 380g [22], 466g [24] **Warranty :** One year **Safety Standards :** Designed to UL 3111-1, CSA C 22.2 No.1010-1, IEC 1010-1 and the EMC Directive **Standard Equipment :** Meter, test leads, holster, users manual, 9V [22] , 2 X 1.5V [24] batteries (installed)

FEATURES

- *CE- mark Certificated.*
- *UL / cUL - Listed [Finest 24 Only].*
- *22 - 3½ digit, 2000 count, Manual ranging.*
- *24 - 3¾ digit, 4000 count. Auto ranging with manual override.*
- *Surge (Transient) voltage protection.*
- *DC voltage basic accuracy ; 22 - within 1.5%, 24 - within 0.5%.*
- *Continuity beeper.*
- *600V input protection on all ranges.*
- *Safety holster with a stand rest.*

[Finest 24 Only]

- *Max / Min recording function.*
- *Fused 10 Amps range.*
- *Data hold.*
- *Diode test.*
- *IP 67 Dust and Waterproof with O-Ring sealed case.*

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AUTOMOTIVE MULTIMETERS

716 Dual Display Professional DMM

The 716 & 706 automotive multimeters are designed to provide troubleshooting solutions to the most complicated problems encountered with today s sophisticated automotive electronic systems.

The large digits are easy to see and some unique features make these meters very efficient ones.

These meters are much more than a standard multimeter. Especially, Model 716 can replace the following several testers.

- Full Function Multimeter
- O_2 Sensor Tester
- (PFI type or TBI type) Fuel Injector Tester
- Battery Drain Tester
- Ground Tester
- Charging System Tester

Model 716 gets a quick and accurate diagnosis of the complete O_2 circuit. This meter is capable of sending a Rich/Lean signal to the ECM, and displaying crossing-per-second(CC) and O_2 voltage simultaneously, when the secondary display shows test results.

Both meters can also measure injector on-time for both the PFI type and the TBI type fuel injector by using the trigger level adjusting feature.

They have a bright LED backlight as well as enhanced LCD with larger digits, wide viewing angle and on screen menu selection(716 Only). A battery access door allows users to replace the battery and fuses without voiding calibration seals. Both meters meet the CAT II 1000 V safety ratings to with stand overvoltage transients up to 8 kV per IEC 1010-1. 3 year warranty.

ACCESSORIES	PART NO.
Batteries, 9 V	BT1
Fuse (15 A, 600 V RMS)	F 2
Silicone Test Lead Set (3 colors)	FTL-716
Alligator Clips	AC 7
K-type Thermocouple	TP 7
Inductive Pickup	RPM 206
RS-232C Interface Cable (Optional)	RS 70
Sample Software Diskette (Optional)	WS 716
AC/DC Clamp Adaptor(Optional)	CA113
Capacitance Adaptor(Optional)	CAP 7

New



3 Year Warranty!

CAT II 1000V IEC 1010-1

MODEL 716

FEATURES

< Model 716 >

- *CE-mark Certificated.*
- *4 ⅛ digit, 50000 count(primary) and 9999 count(secondary) dual display with bar-graph. (Frequency range : 99999 counts)*
- *Closed case calibration through the phototronic serial port.*
- *Accurate RPM measurement for 2- and 4-stroke automotive engines with 1 to 12 Cylinders using the Inductive Pickup.*
- *ms-Pulse Width function to test on-time of both PFI type and TBI type fuel injectors, idle air control motors, and electronic transmission controls.*
- *Duty Cycle and direct DWELL reading for electronic fuel injection, feedback carburetors, and ignition systems.*
- *4 steps adjustable triggers on 1 to 12 Cylinders, either 2 or 4 Cycle for outboards, motorcycles and conventional engines.*
- *Measure temperature of fan switch and catalytic converters up to 2,372 °F(or 1,300 °C).*
- *O_2 Sensor test for a quick diagnosis and simulation of the complete O_2 Sensor.*
- *Ground test to locate bad ground, voltage drops, intermittent connections, or any source of high resistance in an automotive electrical circuits and grounds.*
- *Charging system test to diagnose the battery and the alternator.*
- *Battery Drain test to measure the car s battery current when it is turned off.*
- *Auto Hold, 50 ms highspeed MIN/MAX/AVG, and Relative mode.*
- *1 ms peak mode.*

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706 New Generation Automotive DMM



New

3 Year Warranty!

CAT II 1000V IEC 1010-1

MODEL 706

- *Memory store and recall (20 locations).*
- *Backlit display.*
- *Auto-power-off.*
- *RS-232C phototronic serial port.*
- *Overmolded case.*

< Model 706 >

- *CE-mark Certificated.*
- *3¾ digit, 4000 count display with bar-graph. (Frequency range : 19999 counts)*
- *Accurate RPM measurements for 2- and 4-stroke automotive engines with 1 to 8 Cylinders using the Inductive Pickup.*
- *ms-Pulse Width function to test on-time of both PFI type and TBI type fuel injectors.*
- *Duty Cycle and direct DWELL reading.*
- *4 steps adjustable triggers on 1 to 8 Cylinders.*
- *Temperature measurement up to 2,498 °F (or 1,370 °C).*
- *Data Hold, MIN/MAX/AVG, and Relative mode.*
- *Backlit display.*
- *Auto-power-off.*
- *Overmolded case.*

SPECIFICATIONS (at 23°C ± 5°C : < 80% RH)

Frequency, RPM, and Dwell

Function	Range	Resolution	Accuracy
Frequency (**716**-0.5 Hz to 1000 kHz, **706**-0.5 Hz to 200 kHz)	(Model 716) 99.999 Hz 999.99 Hz 9.9999 kHz 99.999 kHz 999.99 kHz	 0.001 Hz 0.01 Hz 0.1 Hz 1 Hz 0.01 kHz	0.005% + 3 d
	(Model 706) 199.99 Hz 1999.9 Hz 19.999 kHz 199.99 kHz	 0.01 Hz 0.1 Hz 1 Hz 0.01 kHz	0.02% + 3 d
RPM	4-stroke	120-20000 RPM	2 RPM
	2-stroke	60-10000 RPM	2 RPM
DWELL	0.0°-356.4°	0.1°	1.2°/krpm + 2 d

ms-Pulse Width and Duty Cycle

Mode	Range	Accuracy
Multi-Point-Injection	(Model 716) 0.50 ms - 250.00 ms 0.0 % - 100.0 % (Model 706) 0.5 ms - 1999.9 ms 0.0 % - 100.0 %	0.05 ms + 1 d 0.04 %/krpm + 2 d 0.5 ms + 1 d 0.2 %/krpm + 2 d
Single-Point-Injection	(Model 716) 0.00 ms - 250.00 ms 0.0 % - 100.0 % (Model 706) 0.5 ms - 1999.9 ms 0.0 % - 100.0 %	0.05 ms + 1 d 0.04 %/krpm/cyl + 2 d 0.5 ms + 1 d 0.2 %/krpm/cyl + 2 d

Volts, Ohms, Amps, and Temperature

Basic Accuracy (% of reading + number of counts)

	716	706
DC Voltage	0.1 % + 2	0.5 % + 2
AC Voltage (@ 40 Hz - 400 Hz)	0.5 % + 10	0.75 % + 3
Ohms	0.1 % + 2	0.75 % + 3
DC Current	0.5 % + 10	0.75 % + 3
AC Current (@ 40 Hz - 400 Hz)	0.75 % + 10	1.5 % + 3
Temperature	1.0 °C	1.0 % + 2.0 °C

General

Display : **716**-4½ digit (50000 counts) with 21 segment bar-graph, updates 40 times/sec. **706**-3¾ digit (4000 counts) with 41 segments bar-graph, updates 3 times/sec. **Temperature Coefficient** : nominal 0.15 x (Specified accuracy)/°C (< 18°C or > 28°C) **Operating Temperature** : 0°C to 50°C **Operating Humidity** : < 80 % RH **Storage Temperature** : -20°C to 60°C **Altitude** : 2000 m **Pollution Degree** : 2 **Shock & Vibration** : Per MIL-T-28800 for a class 2 instrument **Splash Proof and Dust Proof Case Battery Type** : Single Alkaline 9 V battery, NEDA 1604, JIS 006 P or IEC 6F22 **Battery Life** : **716**-150 hrs. typical, **706**-180 hrs. typical **Dimensions (H x W x D)** : **716**-208 x 103 x 54 mm, **706**-40.5 x 92 x 172 mm **Weight** : **716**-about 655 g, **706**-about 386 g **Warranty** : 3 years **Safety Conformance** : Designed to UL3111-1, CSA C22.2 No.1010.1-92, and IEC 1010-1, CAT II 1000 V **Standard Equipment** : Meter, silicone test leads, user's manual, 9 V battery(installed), Inductive Pickup, and K-type thermocouple(716 Only)

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226/228/229 Compact Automotive Multimeters

c UL us LISTED 6Z52



MODEL 226



MODEL 228



MODEL 229

The Finest 226/228/229 automotive multimeters are ideal for first-level automotive troubles shooting.
Some unique features make these meters very efficient ones.

Inductive Pickup. Converts the magnetic field generated by the current in the spark plug wire into a pulse that triggers the meters RPM measurement for either 2 or 4 cycle automotive ignitions.

mS-Pulse Width/Duty Cycle. Measure easily the pulse width in milliseconds and the duty cycle to test on-time of electronic fuel injectors and idle air control motors.

Dwell. Reads the dwell directly to test electronic fuel injectors, feedback carburetors and ignition systems.

4 Step Adjustable Trigger. Enables the meter to obtain stable reading if reading is too high or unstable when measuring RPM, Dwell, mS-Pulse Width or Duty Cycle. The change of the trigger level is indicated by the step number shown on the lower left corner of the LCD.

Fix Hold ™. Automatically captures a stable reading, beeps to acknowledge, and holds it on the LCD. Very convenient for taking remote measurement under hard-to-reach areas.

Temperature [228 & 229]. Allows you to test temperature from -40°C to +1,370°C by using a type K thermocouple and its adaptor, which comes with the meter.

FEATURES

- *CE- mark Certificated.*
- *UL / cUL - Listed. [226 Only]*
- *Accurate mS-Pulse Width measurement function to test on-time of fuel injectors, idle air control motors, and electronic transmission controls.*
- *RPM measurement for automotive engines with 1 to 8 Cylinders using the Inductive Pickup.*
- *Direct reading of Dwell when testing electronic fuel injection, feedback carburetors and ignition systems.*
- *Exercises 4 step adjustable +/- triggers on 1 to 8 Cylinders, motorcycles and conventional engines for accurate measurements of RPM, mS-Pulse Width, Dwell and Duty cycle.*
- *HIgh-speed 41 segment Analog Pointer display updates 20 times/sec. [226 & 228].*
- *Accurate automotive electronics test and advanced measurements with volts dc/ac, resistance, amperes [229 Only], etc. ..... .*
- *Accurate non-automotive Frequency measurements with 20000 count on the high resolution 4000 count display [226 Only].*
- *Temperature measurement up to1,370°C (2,498°F) for catalytic converters, fan switch on/off... [228 & 229].*
- *Fix hold ™ (Automatic reading hold).*
- *Continuity beeper.*
- *Standby mode indicator.*
- *Protective holster.*

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SPECIFICATIONS (at 23°C ± 5°C; <80%RH)

Frequency, RPM, Duty Cycle, Dwell and Pulse Width

Function	Range	Resolution	Accuracy	Pulse Width Range (ms)	Resolution (ms)
Frequency* (0.5Hz to 200kHz Pulse Width >2µS)	199.9**	0.01Hz	± (0.05% + 2)	1999.9	0.1
	1999.9**	0.1Hz	± (0.05% + 2)	5.00	0.01
	19.999kHz	0.001kHz	± (0.05% + 2)		
	199.99kHz	0.01kHz	± (0.05% + 2)		
	200kHz	0.1kHz	Unspecified		
RPM	30-9 000	1RPM	±2 RPM		
% Duty Cycle*	0.0-99.9% (30 RPM to 19.999 RPM, Pulse width >2µS)				
Dwell*	0.0-356.4° (30 RPM to 19.999 RPM, Pulse width >2µS)				
Pulse Width*	0.002-1999.9mS (30 RPM to 19.999 RPM, Pulse width >2µS)				

Pulse Width range is determined by RPM.
For use > 1µS, Duty Cycle accuracy: Width ± (0.2% per kHz +0.1%).
Pulse Width accuracy : Duty Cycle accuracy + 1 digit
The automotive Frequency (Hz) measurement mode has only these 2 range specifications.

Voltage

Function	Range	Resolution	Accuracy	Input Impedance
DC V	400mV	100µV	± (0.5% + 2 digits)	>100MΩ
	4V	1mV		Approx. 11MΩ
	40V	10mV		
	400V	0.1V		Approx. 10MΩ
	600V	1V		

Function	Range	Resolution	Accuracy 50Hz-60Hz	Accuracy 45Hz-1kHz	Input Impedance
AC V (45Hz to 1kHz)	4V	1mV	± (1.0% + 30digits)	Unspecified	Approx 11MΩ
	40V	10mV	± (1.0%+ 30digits)	± (3%+ 30digits)	Approx.10MΩ
	400V	0.1V			
	600V	1V			

Ohms

Function	Range	Resolution	Accuracy	Open Circuit Voltage
Ohms	400Ω	0.1Ω	± (0.5% + 2 digits)	<1.2V
	4KΩ	1Ω		
	40KΩ	10Ω	0.75% + 3digits	
	400KΩ	0.1KΩ		
	4MΩ	1KΩ		
	40MΩ	10KΩ	1.0% + 10digits	
Continuity	Open Circuit Voltage : <1.2V Threshold Approx. <100 Ω			

Current [229 Only]

Function	Range	Resolution	Accuracy	Input Impedance
DC Amps	4A	1mA	± (1.2% + 3 digits)	0.01Ω
	10A	10mA		0.01Ω
AC Amps	4A	1mA	± (1.5% + 3 digits)	0.01Ω
	10A	10mA		0.01Ω

Overload Protection : 600V RMS for circuits < 0.3 A short circuit, 400V for high energy circuits.

Temperature [228 & 229]
Probe : K-type thermocouple with adaptor.
Range : -40° C to + 1,370°C
Resolution : 0.1°C up to 400°C
Accuracy : ± (3°C + 1) for -40°C to 20°C
± (1% + 2°C) for 20°C to 400°C
± 3% of reading for 400°C to 1,370°C
※ This accuracy is effective at the ambient temperature of 23°C.
Max. Input : 60V dc or 24V ac RMS

ACCESSORIES PART NO.

Battery, 9V	BT1
Fuse (12.5A, 250V RMS) [229 Only]	F201
Test Lead Set	FTL-500
Alligator Clips	AC7
K-type Thermocouple [228 &229]	TP1
Thermocouple Adaptor [228 & 229]	TIPA
Inductive Pickup	RPM 206
Rubber Boot (Yellow) [226 & 228]	C3Y
Rubber Boot (Blue) [229 Only]	C4B
AC/DC Clamp Adaptor (Optional)	CA113

General

Display : 3¾ digits, 4000 counts, LCD **Operating Temperature** : 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature** : -20°C to 60°C **Shock & Vibration** : Per MIL-T-28800 for a Class II instrument **Splash Proof and Dust Proof Case Battery Type** : 9V, NEDA 1604 or 6LR61 **Battery Life** : 200hrs.(alkaline) **Pollution Degree** : 2 **Installation Category** : CAT III (600V) **Dimensions with Holster (H X W X D)** : 158 X 80 X 54mm [226 & 228], 168 X 85 X 50mm [229] **Weight with Holster** : 425g [226 & 228], 466g [229] **Warranty** : One year **Safety Standards** : Designed to UL 3111-1, CSA C 22.2 No.1010-1, IEC 1010-1 and the EMC Directive **Standard Equipment** : Meter, test leads, holster, inductive pickup, users manual, 9V Battery (installed) and K-type thermocouple & its adaptor [228 & 229]

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506 & 516 Professional Automotive Multimeters

The Finest 506 & 516 automotive multimeters are designed to provide troubleshooting solutions to the most difficult problems encountered with today s sophisticated automotive electronic systems.
The large digits are easy to see and some unique features make these meters very efficient ones.

Inductive Pickup. Converts the magnetic field generated by the current in the spark plug wire into a pulse that triggers the meters RPM measurement for either 2 or 4 cycle automotive ignitions.

mS-Pulse Width/Duty Cycle. Measures easily the duty cycle on-times for electronic fuel injectors and idle air control motors.
7 Steps Adjustable Trigger. Enables the meter to obtain stable reading if reading is too high or unstable when measuring RPM, Dwell, mS-Pulse or Duty Cycle.
The bar graph is a good indication of the trigger level.

Conductive Shield. Allows the meter to work well with Marine Engines, the ignition levels of which are much higher than those of automotive engines.

Safety Shutters. Prevents user from making inadvertent connection to the current terminals.

Max/Min Record. Records over 24 hours, monitors major fluctuations in current, voltage, frequency and temperature, and calculates the average value over time.

Rel (Zero). Displays the difference between the currently measured value and a previously stored value. Low resistance measurements are made more accurate because it zeroes out test lead resistance.

Fix Hold ™. Automatically captures a stable reading, beeps to acknowledge, and holds it on the LCD. Each new measurement is automatically updated. Very convenient for taking remote measurement under hard-to reach areas.

Temperature. Allows you to test temperatures, from -40°F to +2,498°F (-40°C to +1,370°C), using K-type thermocouple and its adaptor, which comes with the meter. Can be used to measure temperature of fan switch and catalytic converters.

Hard Carrying Case. Provides the meter with maximum protection against rough handling and bad weather conditions. Separate storage compartments are provided for Inductive Pickup, Clamp Adaptor and other compact accessories.

Capacitance. Allows you to test all capacitors, from 0.001µF to 999µF, that are suspect in performance, using the test leads. [516 Only].

Back-light. Allows easy reading in dark work area [516 Only].
RS-232C . Enables the meter to interface with a DOS or WINDOWS computer by using its bi-directional RS-232C serial interface cable and its DOS or WINDOWS software supplied as optional accessories along with this meter. [516 Only].



MODEL 506



Inductive Pickup

FEATURES

- *CE- mark Certificated.*
- *Designed to meet UL 3111-1, UL201, IEC1010-1, and the EMC Directive Standards.*
- *Accurate frequency and pulse measurement with 20000 count on the high resolution 4000 count display.*
- *Accurate automotive electronics test and advanced measurements with DC/AC Amps, and Resistance.*
- *Direct reading of DWELL without using Duty Cycle to Dwell conversion chart when testing electronic fuel injection, feedback carburetors, and ignition systems.*
- *RPM measurement for automotive engines with 1 to 12 Cylinders using test leads or the Inductive Pickup.*
- *mS-Pulse Width function to test on-time of fuel injectors, idle air control motors, and electronic transmission controls.*
- *7 steps adjustable triggers on 1 to 12 Cylinders, either 2 or 4 Cycle for outboards, motorcycles and conventional engines.*
- *Measure temperature of fan switch and catalytic converters up to 2,498°F (or 1,370°C).*
- *Shielded for testing Marine Engines.*
- *Surge (Transient) voltage protection.*

[Finest 516 Only]

- *Capacitance and non-automotive Frequency measurement.*
- *Back-light and RS-232C.*

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ACCESSORIES — PART NO.

Battery, 9V	BT1
Fuse (1A, 600V RMS)	F11
Fuse (15A, 600V RMS)	F2
Test Lead Set	FTL-500
Alligator Clips	AC7
K-type Thermocouple	TP1
Thermocouple Adaptor	TP1A
Inductive Pickup	RPM 206
Rubber Boot (Yellow)	C2Y
Hard Carrying Case	H1C
Soft Carrying Case (Optional)	C1C
AC/DC Clamp Adaptor (Optional)	CA113

General

Display : 3¾ digits (4000 counts)with 41segment bar graph, updates 4 time/sec. **Temperature Coefficient :** 0.05 x (specified accuracy)/°C (<18 °C or > 28°C) **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Shock & Vibration :** Per MIL-T-28800 for a class 2 instrument **Splash Proof and Dust Proof Case Battery Type :** 9V, NEDA 1604 or 6F22 **Battery Life :** 200hrs typical (alkaline) **Dimensions with Holster (H X W X D) :** 208 X 103 x 54mm Weight : about 655 g **Warranty :** One year parts & labour **Safety Standards :** Designed to UL 3111-1, IEC 1010-1, and the EMC Directive Standards **Standard Equipment :** Automotive Meter, test leads, holster, inductive pickup, hard carrying case, K-type thermocouple, thermocouple adaptor, user's manual, 9V battery (installed)



MODEL 516

SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

Frequency, RPM, Duty Cycle, Dwell, and Pulse Width

Function	Range	Resolution	Accuracy	Pulse Width Range (ms)	Resolution (ms)
Frequency* (0.5Hz to 200kHz Pulse Width >2µS)	199.99**	0.01Hz	± (0.05% + 2)	1999.9	0.1
	1999.9**	0.1Hz	± (0.05% + 2)	±.00	0.01
	19.999kHz	0.001kHz	± (0.05% + 2)		
	199.99kHz	0.01kHz	± (0.05% + 2)		
	200kHz	0.1kHz	Unspecified		
RPM IP	30-9,000	1RPM	±2 RPM		
RPM IG	60-12,000	1RPM	±2 RPM		
% Duty Cycle*	0.0-99.9% (30 RPM to 19,999 RPM, Pulse width >2µS)				
Dwell*	0.0-359.4° (30 RPM to 19,999 RPM, Pulse width >2µS)				
Pulse Width*	0.002-1999.9mS (30 RPM to 19,999 RPM, Pulse width >2µS)				

*Pulse Width range is determined by RPM.
**For rise > 1µS, Duty Cycle accuracy : Width ± (0.2% per kHz +0.1%), Pulse Width accuracy : Duty Cycle accuracy + 1 digit
***The FREQ of RPM mode has only these 2 range specifications.

Voltage

Function	Range	Resolution	Accuracy	Input Impedance
DC V	400mV	100µV	[illegible]	>100MΩ
	4V	1mV		Approx 11MΩ
	40V	10mV		Approx 10MΩ
	400V	0.1V		
	1000V	1V	[illegible]	

Function	Range	Resolution	Accuracy 50Hz-60Hz	Accuracy 45Hz-1kHz	Input Impedance
AC V (45Hz to 1kHz)	4V	1mV	[illegible]	± 3% + 5digits	Approx 11MΩ
	40V	10mV			Approx 10MΩ
	400V	0.1V			
	750V	1V	[illegible]		

AC Conversion : Inputs are ac-coupled and calibrated to the RMS value of a sinewave input. AC conversion is True-RMS responding and specified from 5% to 100% of range.

Crest Factor : 1:1 through 3:1 (peak/RMS ratio).

DC V Normal Mode Rejection Ratio : > 20dB at 50Hz or 60Hz

DC V Common Mode Rejection Ratio: > 100dB at dc 50Hz or 60Hz

AC V Common Mode Rejection Ratio : > 85dB at dc to 60Hz

Overload Protection :
1000V DC, 750V AC RMS (SINE).

Current

Function	Range	Resolution	Accuracy	Voltage Drop
DC A	400µA	0.1µA	[illegible]	100µV/µA
	4000µA	1µA		
	40mA	0.01mA		1.2mV/mA
	400mA	0.1mA		
	4A	0.001A	[illegible]	75mV/A
	10A	0.01A		
AC A (45Hz to 1kHz)	400µA	0.1µA	[illegible]	100µV/µA
	4000µA	1µA		
	40mA	0.01mA		1.2mV/mA
	400mA	0.1mA		
	4A	0.001A		75mV/A
	10A	0.01A		

AC Conversion : Same as voltage.

Ohms and Diode Test

Function	Range	Resolution	Accuracy	Open Circuit Voltage
Ohms	400Ω	0.1Ω	0.5% + 10dgts	<1.2V
	4KΩ	1Ω	0.5% + 3dgts	
	40KΩ	10Ω		
	400KΩ	0.1Ω		
	4MΩ	1KΩ		
	40MΩ	10KΩ	1.0% + 10dgts	
Continuity	Open Circuit Voltage: <1.2 Threshold: Approx: <100Ω			
Diode Check	Open Circuit Voltage: <3V Max. Test Current: 2.5mA			

Overload Protection : 600V RMS for circuits < 0.3A short circuit, 400V for high energy circuits.

Temperature

Probe : K-type thermocouple with adaptor.

Range : -40°C to +1,370°C (-40°F to +2,498°F)

Resolution : 0.1°C (0.1°F) up to 400°C

Accuracy : ±(3°C + 1) for -40°C to 0°C
±(1% + 1°C) for 0°C to 400°C
±3% of reading for 400°C to 1,370°C

Max. Input : 60V DC or 24V AC RMS

Max Min Average Recording

Response Time : 250 mS to 80%

Accuracy : ±20 digits for changes > 250mS in duration (±60 digits in AC).

Capacitance [Autoranging] [516 Only]

Range : 1µF, 10µF, 100µF, 1000µF

Max. Resolution : 0.001µF in the 1µF range

Accuracy : ±(1.9% + 2) for capacitances with negligible dielectric absorption.

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206 General Purpose Automotive Multimeter

The Finest 206 automotive meter is designed for automotive electronics. This meter can be used as a very efficient troubleshooter to most of the complicated problems encountered with today s sophisticated automotive electronic systems. The rugged construction of the 206 is suitable for the heavy-duty use at the automotive shops.

Inductive RPM Pickup
Converts the magnetic field generated by the current flowing in the spark plug wire into a pulse that triggers the 206 s RPM measurement for the 2 or 4 strokes automotive engine s ignitions.

mS-Pulse Width/Duty Cycle
Measurements easily the duty cycle on-times for electronic fuel injectors and idle air control motors.

Max/Min Record
Records over 24 hours, monitors major fluctuations in current, voltage, frequency and temperature, and calculates the average value over time.

REL (Zero)
Displays the difference between the currently measured value and a previously stored value. Low resistance measurements are made more accurate because test lead resistance can be canceled out.

Flx Hold™
Automatically captures a stable reading, beeps to acknowledge,and holds it on the LCD. Automatically updates with each new measurement. Very convenient for taking remote measurement under the hood or the dash-board, in the trunk, and other hard-to-reach areas.

Temperature
Measures temperature from -40°C to +1,370°C (-40°F to + 2,498°F) with the K-type temperature probe. Can be used to test the temperature for fan switch on/off.

Rugged Construction
Dust proof, splash proof, and heavy-duty case provides protection for years of use under the severe automotive shop conditions. The yellow protective rubber boot makes it easy to find the 206 under the hood.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Fuse (2A, 600V RMS)	F1
Fuse (15A, 600V RMS)	F2
Test Lead Set	FTL-500
Alligator Clips	AC7
K-type Thermocouple	TP1
Inductive Pickup	RPM 206
Rubber Boot (Yellow)	C1Y
Soft Carrying Case	S1C
Hard Carrying Case (Optional)	H1C
AC/DC Clamp Adaptor (Optional)	CA113



UL LISTED 6Z52

MODEL 206

FEATURES

- *CE- mark Certificated and UL-Listed.*
- *Accurate measurements for AC & DC Voltage, AC & DC Amperes, and Resistance.*
- *RPM measurement for Automotive Engines with 1 to 8 cylinders using the Test Leads.*
- *RPM measurement for Automotive Engines with 2 or 4 strokes using the Inductive RPM pickup.*
- *Dir ect r eading of DWELL without using Duty Cycle to Dwell conver sion chart for electronic fuel injection, feedback carburetors and ignition.*
- *mS-PULSE WIDTH to test on- time of fuel injectors, idle air control motors, and electronic transmission controls.*
- *Precision ANALOG DISPLAY for watching oxygen sensor voltage, sweeping throttle position sensors.*
- *Protective 10 Megohm Impedance for sensitive automotive computers circuitry.*
- *Temperature test for fan switch ON/OFF.*
- *Surge (Transient) voltage protection.*

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SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

(% of reading + number of digits)

AC Amps [True-RMS]

Ranges	400µA 4000µA	40mA 400mA	4A, 10A
Accuracy (45Hz to 1KHz)	1% + 3	1% + 3	1.5% + 5
Max. Resolution		0.1µA	
Overload Protection		fuse protection using a 2A/600V fuse (mA ranges) and a 15A/600V (A ranges)	

DC Amps

Ranges	400µA 4000µA	40mA 400mA	4A, 10A
Accuracy	0.75% + 2	0.75% + 2	1% + 5
Max. Resolution		0.1µA	
Overload Protection		fuse protection using a 2A/600V fuse (mA ranges) and a 15A/600V (A ranges)	

AC Volts [True-RMS]

Ranges	4V,	40V, 400V, 750V
Accuracy (45Hz to 1KHz)	2.5% + 5	1% + 5
Max. Resolution		1mV
Input Impedance	10MΩ in parallel with < 100pF	
CMRR	> 80 dB, dc to 60Hz	
Max. Input	750V AC RMS	

DC Volts

Ranges	400mV,	4V, 40V, 400V	750V
Accuracy	0.3% + 2	0.3% + 2	0.75% + 3
Max. Resolution		100µV	
Input Impedance	10MΩ in parallel with < 100pF		
NMRR	> 30 dB at 50Hz or 60Hz		
CMRR	> 120 dB at dc, 50Hz or 60Hz		
Max. Input	750V DC		

Resistance

Ranges	400Ω, 4KΩ, 40KΩ, 400KΩ, 4MΩ		40MΩ
Accuracy	0.5% + 3		1% + 10
Max. Resolution	0.1Ω		
Overload Protection	600V DC/AC		

Frequency (0.5 Hz to 200KHz)

Ranges	200Hz, 2KHz, 20KHz, 200KHz
Accuracy	0.05% + 2
Max. Resolution	0.01Hz
Overload Protection	500V DC or AC RMS

RPM

Ranges	30 to 12,000
Accuracy	2 RPM
Max. Resolution	1 RPM

Continuity Test

Buzzer < 100Ω

Counter Sensitivity

150mV

General

Display : 3¾ digits, 4000 count LCD **Operating Temperature :** 0°C to 40°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Battery Type** 9V, NEDA 1604 or 6F22, **Battery Life :** 200 hrs typical (alkaline), **Dimensions with Holster (H X W X D) :** 20.3cm X 10.0cm x 4.7cm **Weight :** 640g **Warranty :** One year **Safety Standards :** Designed to IEC 1010-1 and the EMC Directive, UL 1244, ANSI/ISA-S82, **Standard Equipment :** Automotive meter, test leads, holster, inductive pickup, soft carrying case, K-type temperature probe, user s manual, 9V battery (installed)

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850 Open Jaw AC Clamp Meter Using Planar Magnetic Sensor Coils for Multi-/Single-Core Current Measurement

The new Finest 850 Open Jaw ac clamp meter does what you always thought ideal clamp meters should do - measure current in multi-wire and single-wire cables and power cords without the need to split them.

The conventional current measurements by inserting a shunt resistor or using a current transducer have the disadvantage of having to break the conductor to be measured. Furthermore, the traditional current measurements can only be performed on single conductors and also it is often very cumbersome to get sufficient cable free in order to reach the jaws of the clamp.

With the Model 850, it is not necessary to split cables or remove covers. The jaws of the 850 simply clamp around the outside insulation of the cable.

The 850 can measure current in 2- or 3-wire, round, flat or oval cables to 100 A with a resolution of 0.1 A. The 850 can also function in the manner of a conventional clamp-on meter when measuring current in single-wire applications with measurements up to 199.9 A as well as measuring volts, ohms, and frequency, etc..

The 850 meets IEC 1010-2-032, CAT III 600 V standards. The 850 s jaw opening can handle US power cables with the conductor gauge up to 18 AWG and European power cables with the conductor area up to 16 mm².

Model CA83 is an open jaw type ac current probe that can measure AC currents of various single-wire cables with very high accuracy and linearity. The CA83 is compatible with any instrument (including oscilloscopes) capable of 4000 count ac millivolt measurements providing an output of 10 mV per Amp (ac 40 A range) and 1 mV per Amp (ac 400 A range)

Model 830 is an open jaw type ac current meter. The 830 is a stand-alone version of the Model CA83. The meter is very accurate for the frequency response of 45 Hz to 10 kHz.

ACCESSORIES	PART NO.
Batteries, 9 V	BT 1
Test Lead Set	FTL-500V
Alligator Clips	AC 7
Banana Plug Adaptor	PN CA 8301

New



2 Year Warranty!

CAT III 600V IEC 1010-1

MODEL 850

FEATURES

< Model 850>

- *CE-mark Certificated.*
- *3½ digit, 2000 count.*
- *AC current measurement in 1,2, or 3-core cable.*
- *Use on flat, round or oval cables.*
- *Measures up to 199.9 A on single-core cables.*
- *Measures up to 100 A on multi-core cables.*
- *Jaw opening : 13 mm (0.51").*
- *AC/DC voltage measurement (2 ranges : 200 V/ 600 V).*
- *Ohms measurement up to 2 kΩ .*
- *Frequency measurement (2 ranges : 2 kHz/ 20 kHz).*
- *Continuity check & Diode test.*
- *Data Hold.*
- *Backlighted LCD.*
- *IEC 1010-2-032, CAT III 600 V safety protection.*
- *2 year warranty.*

< Model CA83>

- *CE-mark Certificated.*

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830 Open Jaw AC Clamp Meter & CA83 Open Jaw AC Current Probe Using Planar Magnetic Sensor Coils

New



MODEL 830



MODEL CA83

2 Year Warranty!

- *AC current measurement (2 ranges : 0 A to 40.00 A with a resolution of 0.01 A/ 0 A to 399.9 A with a resolution of 0.1 A).*
- *Frequency response : 45 Hz to 10 kHz.*
- *Jaw opening : 13 mm (0.51").*
- *Detachable banana adapter for oscilloscope applications.*
- *Low battery indicator (LED).*
- *2 year warranty.*

< Model 830>

- *CE-mark Certificated.*
- *3¾ digit, 4000 count.*
- *AC current measurement (2 ranges : 0 A to 40.00 A with a resolution of 0.01 A/ 0 A to 399.9 A with a resolution of 0.1 A).*
- *Frequency response : 45 Hz to 10 kHz.*
- *Jaw opening : 13 mm (0.51").*
- *Data Hold.*
- *Backlighted LCD.*
- *2 year warranty.*

SPECIFICATIONS (at 23°C ± 5°C ; < 80% RH)

(Model 850)
ac Amps

Mode	Range	Resolution	Accuracy	Frequency Response
Single-Core Mode	200 A	0.1 A	1.5% + 3 d	45 Hz ~ 1 kHz
Multi-Core Mode	100 A	0.1 A	5% + 10 d	45 Hz ~ 400 Hz

dc/ac Volts, Ohms & Frequency

Function	Range	Resolution	Accuracy
DC V	200 V	0.1 V	0.5 % + 3 d
	600 V	1 V	1.0 % + 3 d
AC V (45 Hz - 400 Hz)	200 V	0.1 V	0.8 % + 3 d
	600 V	1 V	1.2 % + 3 d
Ohms	2 kΩ	1Ω	1.0 % + 5 d
Frequency	2 kHz	1 Hz	1.0 % + 5 d
	20 kHz	10 Hz	1.0 % + 5 d

(Model CA83 & Model 830)
ac Amps

Range	Resolution	Accuracy*	
		45 Hz to 1 kHz	1 kHz to 10 kHz
40 A	0.01 A	1.5% + 8 d	2.5% + 8 d
400 A	0.1 A	1.5% + 3 d	2.5% + 3 d

* Interference with external sources : < 0.3 % when the sources are 0.5 to 1 cm away from the sensor coils.

General

Display : 850-3½ digit, 2000 count LCD, updates 3 times/sec. 830-3¾ digit, 4000 count LCD, updates 3 times/sec. **Operating Temperature :** 0 °C to 40 °C **Operating Humidity :** < 80 % RH **Storage Temperature :** -20 °C to 60 °C **Altitude :** 1000 m **Pollution Degree :** 2 **Battery Type :** Single 9 V battery, NEDA 1604, JIS 006 P or IEC 6F22 **Battery Life :** 180 hrs. typical Maximum **Jaw Opening :** 13 mm **Dimensions (H x W x D) :** 850-227 x 94 x 44.5 mm, 830 & CA83-199 x 65 x 28 mm **Weight :** 850-about 350 g, 830-about 200 g, CA83-about 220 g **Warranty :** 2 years **Safety Conformance :** Designed to UL 3111-1, CSA C22.2 No.1010-2-032 : 96, and IEC 1010-2-032 : 96, CAT III 600 V **Standard Equipment :** 850-Meter, Test leads, user s manual, and 9 V battery(installed). 830-Meter, Instruction Sheet, and 9 V battery(installed). CA83-Meter, Banana Adapter, instruction sheet and 9 V battery(installed)

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Series 110 General Purpose Clamp Meters

The Series 110 provides the combination of true-RMS (Model 115) and average sensing (Model 110 & Model 113) measurements, rugged construction, easy & singlehanded operation and reliable performance indispensable to troubleshoot various general electrical problems.

True-RMS Readings [115 Only]
Model 115 allows the True-RMS value of an input to be displayed. This feature is highly desirable for today s engineers and technicians working with signals that contain harmonics from nonlinear loads, for example, switching power supplies, adjustable speed motor drives and other type of equipment that draw current in short pulses. Non-linear loads may result in an abrupt tripping of a circuit breaker or dangerous overheating of neutral transformers because they draw high peak currents causing harmonics in the load current. Currents containing harmonics can be accurately measured only with a true-RMS measuring device like the 115.
The frequency measurement function of the 115 can detect the presence of harmonics in neutral currents and helps to determine whether they result from unbalanced phases or nonlinear loads.

Designed for Heavy Duty Use
Teardrop jaw design allows easy access in crowded junction boxes, and can accept one 750 MCM cable or two 350 MCM cables.
Protective hand guard helps prevent an accidental contact with conductors and rugged construction withstands heavy duty job site abuse.

Data Hold [110 Only]
Makes it easier to get accurate readings in difficult areas where you can t see the display.

Peak Hold [113 & 115]
Recalls the highest the point of the start up current of motors and relays, and tests for voltage spikes over set period of time.

DC Ampere Measurement [113 & 115]
Using advanced Hall-effect technology, these models accurately measure DC Amperes without disturbing the test circuits, when the Zero adjustment is conducted by the DCA Zero Adjustment thumbwheel.

Low Battery Indication
The BAT annunciator will be displayed on the LCD to indicate battery voltage is low.
The battery should be changed immediately to ensure proper function and accuracy.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Test Lead Set	FTL-500
Alligator Clips	AC7
Carrying Case	C110
Soft Carrying Case (Optional)	S1C



MODEL 110



MODEL 113



MODEL 115

FEATURES

- *CE- mark Certificated.*
- *Conform to IEC 1010-2-032 & UL 3111-1 Safety Standards.*
- *Rugged, Easy & Single-Handed operational, and Reliable.*
- *Protective Hand Guard to prevent an accidental contact with conductor.*
- *Frequency measurement capability.*
- *Model 110 & 113-Average sensing clamp meter.*
  Model 115-True-RMS clamp meter.
- *Surge (Transient) voltage protection.*
- *Model 110-Data hold.*
  Model 113 & 115-Peak hold & DC A Zero Adjustment thumbwheel.
- *Low-Battery annunciator.*
- *Maximum conductor size : 1 ea ø38mm (1.5").*
- *Carrying case included.*

General

Display : 3½ digits, 2000 count LCD [110] 3¾ digits, 4000 count LCD [113 & 115] **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Battery Type** 9V, NEDA 1604 or IEC 6LR61 **Battery Life :** 200 hrs typical (alkaline), **Maximum Conductor Size :** ø38mm (1.5") **Maximum Jaw Opening :** 32mm (1.25") **Dimensions (H X W X D) :** 20.8cm X 8.5cm x 3.4cm **Weight :** 380g **Warranty :** One year **Safety Standards :** Designed to both IEC 1010-2-032 (Overvoltage Category III) and the EMC Directive, UL 3111-1, CAN/CSA C22.2 No. 1010.1-92 and ISA-DS 82 **Standard Equipment :** Clamp-on Meter, test leads, user s manual, 9V battery (installed) and carrying case.

SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

Function	Range	Resolution	Basic Accuracy Model 110	Basic Accuracy Model 113	Basic Accuracy Model 115	Overload Protection
AC Current	1000 A	1 A	NA	2.5% ± 10	2.5% ± 10	(113 & 115)
	600 A	1 A	2.0% ± 5	NA	NA	1000A
	400 A	0.1 A	NA	2.0% ± 5	2.0% ± 5	Continuous
	200 A	0.1 A	1.5% ± 5	NA	NA	(110)
DC Current	1000 A	1 A	NA	2.0% ± 10	1.5% ± 10	600A
	400 A	0.1 A	NA	1.5% ± 5	1.5% ± 5	Continuous
AC Volts	600 V	1 V	1.0% ± 5	1.2% ± 5	1.2% ± 5	600V RMS
	400 V	0.1 V	NA	1.0% ± 3	1.0% ± 3	
	200 V	0.1 V	0.5% ± 5	NA	NA	
DC Volts	600 V	1 V	NA	1.0% ± 3	0.8% ± 3	
	400 V	0.1 V	NA	0.5% ± 3	0.5% ± 2	
Ohms	400 Ω	0.1 Ω	NA	1.0% ± 5	0.8% ± 5	
	200 Ω	0.1 Ω	1.0% ± 5	NA	NA	
Continuity Beeper			≤ 20 Ω	≤ 40 Ω	≤ 40 Ω	600V
Frequency	4MHz	1kHz	NA	1.0% ± 5		600V
	400kHZ	100Hz				
	40kHZ	10Hz		0.5% ± 3		
	4kHZ	1Hz				
	2kHZ	1Hz	1.0% ± 5	NA	NA	

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Series 120 Professional Clamp Meters



MODEL 121



MODEL 123

c UL us LISTED 25PJ

The Finest 121 is an economical, but professional, autoranging ac clamp-on meter designed for accepting 2 parallel 500 MCM cables. The Peak Hold function works up to 1000A/600V ac.

The Finest 123 is ideally suited for the HVAC/R and electrical maintenance professionals.
The convenience of clamp-on current measurement, coupled with the wide range of functions and features, makes this instrument an excellent choice for HVAC/R and electrical technicians. The Finest 123 measures temperature from -40°C to 400°C quickly and accurately and dc microamperes down to 0.1 microamps for measuring flame safeguard device current draw. It also measures capacitance up to 10,000 microfarads.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Test Lead Set	FTL-500
Alligator Clips	AC 7
Belt Clip Holster [123 Only]	CI30
Soft Carrying Case [121 Only]	S1C

FEATURES

- *CE-mark Certificated.*
- *UL/cUL - Listed [Model 123 Only].*
- *3¾ digit, 4000 count, auto ranging with manual override.*
- *600 Volt input protection on all ranges.*
- *Continuity beeper.*
- *Hand guard design.*

[Finest 121 Only]

- *Peak hold function to capture the peak value of AC and freeze it on the LCD.*
- *Maximum conductor size : 1ea Ø51mm.*
- *Protective soft carrying case.*

[Finest 123 Only]

- *Fused microamperes range.*
- *MAX/MIN Record mode with time stamp.*
- *Data hold.*
- *Auto - Power - Off.*
- *Diode test.*
- *Double alerting over-range protection.*
- *Protective clip-on holster.*

SPECIFICATIONS (See Data Sheets.)

Basic Accuracy (% of reading + number of counts)

		121	123
AC Current	40A	NO	3.0% + 20
	400A	2.0% + 7	2.0% + 5
	1000A	2.0% + 10	NO
DC Low Current	40µA	NO	1.0% + 5
	400µA	NO	1.5% + 2
AC Voltage		1.2% + 5	1.9% + 3
DC Voltage		NO	0.9% + 2
Ohms		0.8% + 5	0.9% + 3
Capacitance		NO	1.7% + 5
Temperature		NO	1.0% +2°C
Continuity	Buzzer	<40Ω	<50Ω

General

Display : 3¾digits, 4000 count LCD **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Altitude :** 2000m **Temperature Coefficient :** 0.1 X (Specified Accuracy)/°C <18°C or > 28°C) **Battery Type :** 9V NEDA 1604 or IEC 6LR61 **Battery Life :** 200hrs.(alkaline) [121], 80hrs. (alkaline) [123] **Dimensions (H X W X D) :** 34.5 X 9.75 x 4.39cm [121], 23.5X 8.65 x 4.5cm [123] **Weight :** 450g [121], 430g [123] **Maximum Conductor size :** Ø51mm [121], Ø38mm[123] **Maximum Jaw Opening :** Ø52mm[121], Ø32mm [123] **Warranty :** One year **Safety Standards :** Designed to IEC 1010-1 & the EMC Directive, UL3111-1 CAT III 600V and CSA C22.2 No. 1010-1 **Standard Equipment :** Clamp Meter, test leads, user s manual, soft carrying case [121], clip-on holster [123], 9V battery (installed)

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Series 130 Professional True-RMS Clamp Meters

The Series 130 provides the combination of true-RMS measurements, rugged construction and reliable performance indispensable to troubleshoot various problems associated with non-linear loads.

True-RMS Readings
The Series 130 allow the True-RMS value of an input to be displayed. This feature is highly desirable for todays engineers and technicians working with signals that contain harmonics from non-linear loads, for example, switching power supplies (or UPS s), adjustable speed motor drives and other types of equipment that draw current in short pulses. Non-linear loads may result in an abrupt tripping of a circuit breaker or dangerous overheating of neutral transformers because they draw high peak currents causing harmonics in the load current. Currents containing harmonics can be accurately measured only with a true-RMS measuring tool like the Series 130.

Frequency (Hz) Counter
Detects the presence of harmonics in neutral currents and helps to determine whether they result from unbalanced phases or non-linear loads. Also measures the frequency output of a non-linear current.

Designed for Heavy Duty Use
Jaw opening can handle 2 parallel 500MCM cables and protective hand guard helps prevent accidental contact with conductors. Rugged construction withstands heavy duty job site abuse.

Easy-to-Use
No rotary switch and one touch function modes make the Series 130 easy-to-use clamp-on meters.

Analog/Digital Display
The extra large liquid crystal display shows necessary user information for fast, easy operation.
Digital display helps eliminate the guesswork of interpreting readings while analog bar graph updating 20 times per second provides a clear understanding.

Data Hold
Makes it easier to get accurate readings in difficult areas where you can t see the display.

Beeper
Acknowledges key presses with a beep sound. Also indicates new highs or lows detected while recording and that an incorrect sequence of functions has been selected.

Power Lock
Disables the Auto Power Off mode of the Series 130 by pressing the ON OFF pushbutton while measuring.

Auto Power Off
Saves battery after 10 minutes of inactivity.

Max/Min Record [133 & 135]
Records over 24 hours, monitors major fluctuations in current or voltage or frequency, and calculates the average value over time.

c UL us LISTED 6Z52



MODEL 131

FEATURES

- *CE- mark Certificated.*
- *UL/cUL-Listed [Model 131 & Model 135]*
- *True-RMS current measurement for testing Harmonic current flows.*
- *Protective Hand Guard to prevent an accidental contact with conductors.*
- *Surge (Transient) voltage protection.*
- *10KHz Frequency Counter.*
- *Dual display for AC Ampere (Analog)/Frequency (Digital).*
- *Data Hold.*
- *Beeper to acknowledge key presses and new highs/lows while recording.*
- *Power Up/Self Test: All LCD segments turns on to verify proper functioning and estimates battery life.*

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Soft [133 & 135]
Provides stable digital readings when loaded currents are fluctuating.
Displays a running 3 second average.

Crest [133 & 135]
Measures the instantaneous half-cycle peak values of current waveforms. The ratio of the instantaneous half-cycle peak current value to the RMS current value is the crest factor which can be an indicator of the presence of harmonics.

DC Ampere Measurement [135 Only]
Using advanced Hall-effect technology, the 135 accurately measures AC and DC Amperes without disturbing the test circuit, when the Zero adjustment is conducted by the built-in microprocessor.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Test Lead Set	FTL-500
Alligator Clips	AC7
Belt Clip Holster	C130
Hard Carrying Case (Optional)	H1C

General

Display : 3¾ digits, 4000 count LCD **Operating Temperature :** -10°C to 55°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Battery Type :** 9V, NEDA 1604 or 6F22, **Battery Life :** 80 hrs typical (alkaline), **Dimensions (H X W X D) :** 24.5cm X 9.75cm x 4.39cm **Weight :** 545g **Warranty :** One year **Safety Standards :** Designed to UL 1244, IEC 1010-2 - 032 and the EMC Directive, CSA C22.2 No.231, ANSI/ISA-DS82,VDE 0411 **Standard Equipment :** Clamp-on Meter, test leads, user's manual, 9V battery (installed). and holster.



MODEL 133



MODEL 135

- *Auto and Manual ranging.*
- *Additional measurements for DC Voltage and Resistance.*
  Additional functions for Continuity check, Power Lock and Auto Power Off.
- *Holster with a belt clip.*
- *A sealed, splash-proof and dust-proof case.*

[Finest 133 & 135]

- *Min/Max/Average Recording mode.*
- *Soft mode: 3 second running average of current or voltage or frequency.*
- *Crest mode: Measures the instantaneous half-cycle peak current.*

[Finest 135 Only]

- *Additional measurement for DC Amperes using Hall-effect technology.*
- *Microprocessor based DCA Zero Adjustment.*

SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

(% of reading + number of digits)

AC Amps [True-RMS]			
Ranges	40A	400A	700A
Accuracy (45Hz to 65Hz)	2% + 20	2% + 2	5%
Max. Resolution		0.01A	
Frequency Range		10Hz to 1KHz	
DC Amps [135 Only]			
Ranges		40A, 400A, 700A	
Accuracy		2% + 10	
Max. Resolution		0.01A	
AC Volts [True-RMS]			
Ranges		40V, 400V, 750V	
Accuracy		1% + 3	
Max. Resolution		0.01V	
Frequency Range		0.5Hz to 10KHz	
CMRR		>80dB, dc to 60Hz	
DC Volts			
Ranges		40V, 400V, 750V	
Accuracy		1% + 3	
Max. Resolution		0.01V	
NMRR		>11dB at 50Hz or 60Hz	
CMRR		>84dB at dc, 50Hz or 60Hz	
Resistance			
Ranges	400Ω	4KΩ	
Accuracy	1% +10	1% + 3	
Max. Resolution		0.1Ω	
Continuity Test	Buzzer < 35Ω		
Crest Factor for True-RMS	1:1 thru 5:1		
Conductor Size	2" (51mm)		

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UTECO 157 AC/DC Leakage Current Tester

with Filtering Function for Measuring Currents of Fundamental Frequency

The Finest 157 is a professional AC/DC leakage current tester designed for both electrical industry and automotive industry. This meter has a frequency filtering function for measuring currents of fundamental frequency. This filter function is useful when we check whether the leakage breaker was tripped by leakage currents or by effects of harmonics.

The Finest 157 meets IEC 1010-1 CATIII 600V standards.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Test Lead Set	FTL-500
Alligator Clips	AC7
Soft Carrying case	S2C

SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

(% of reading + number of digits)

Function	Range	Resolution	Basic Accuracy	Overload Protection
AC Current (50Hz to 400Hz)	40 A	10 mA	1.5% + 8	600V
	600 A	1 A	1.5% + 5	
DC Current	40 A	10 mA	1.5% + 8	
	600 A	1 A	1.5% + 5	

AC Volts (Autoranging)

Ranges	4V, 40V, 400V, 600V
Accuracy	1.5% + 3
Max. Resolution	1mV
Frequency Range	50Hz to 400Hz

DC Volts (Autoranging)

Ranges	4V, 40V, 400V, 600V
Accuracy	0.9% + 2
Max. Resolution	1mV

Ohms (Autoranging)

Ranges	400Ω, 4kΩ, 40kΩ, 400kΩ	4MΩ, 40MΩ
Accuracy	0.9% + 3	1.2% + 5
Max. Resolution	0.1Ω	

Continuity Test Buzzer < 50Ω

Maximum Conductor Size Ø33mm

General

Display : 3¾ digit, 4000 count LCD, updates 3 times/sec. **Operating Temperature :** 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -10°C to 50°C **Altitude :** 2000m **Pollution Degree :** 2 **Battery Type :** Single 9V battery, NEDA 1604, JIS 006P or IEC 6F 22 **Battery Life :** 60 hrs typical **Maximum Conductor Size :** ø33mm **Maximum Jaw Opening :** 36mm **Dimensions (H X W X D) :** 190 X 76.8 x 42.5mm **Weight :** Approx. 320g **Warranty :** 2 years **Safety Conformance :** Designed to UL 3111-1, CSA C22.2 No. 1010.1-92, and IEC 1010-1, CAT III 600V **Standard Equipment :** Meter, Test leads, instruction manual, 9V battery(installed), and soft carry case.



MODEL 157

FEATURES

- *CE- mark Certificated.*
- *3¾ digit, 4000 count.*
- *AC/DC current measurement (2 ranges: 40A/600A with 10mA Max. resolution).*
- *AC/DC voltage measurement (Autoranging: 4V/40V/400V/600V)*
- *AC frequency response (50Hz to 400Hz)*
- *Ohms measurement (Autoranging : 400Ω/4kΩ/40kΩ/400kΩ/4MΩ/40MΩ)*
- *Continuity check/beeper.*
- *Filter ON/OFF function.*
- *DC amps zero adjustment.*
- *Data hold.*
- *Auto-power-off.*
- *IEC 1010-1, CATIII 600V safety protection.*
- *2 year warranty.*

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UTECO 170 True-RMS Power Meter

with 3-Phase Adaptor (Optional)



MODEL 170



3-Phase Adapter

FEATURES

- *CE- mark Certificated.*
- *3¾ digit, 4000 count display for power, updates 4 times/sec. (6 digits display for energy integrator.)*
- *True power, apparent power and reactive power (AC to 750 kW/kVA/kVAR) measurement.*
- *Power Factor (cos O) [0.3 Cap ··· 1 ··· 0.3 Ind] measurement.*
- *Energy (kWh, kVAh, kVARh) Integrator for maximum 80 hours.*
- *3-Phase adaptor (Optional Accessory).*
- *IEC 1010-1, CATIII 600V safety protection.*
- *Time stamp for the Energy Integrator.*
- *True-RMS reading.*
- *Autoranging*
- *MAX/MIN Record mode.*
- *Data hold.*
- *Auto-power-off.*
- *2 year warranty.*

The Finest 170 is a True-RMS digital power meter including the energy integration function. This user friendly meter has many applications; appliance testing, checking industrial and commercial power systems, plant maintenance and inspection, and electric utility testing, etc..

The Finest 170 meets IEC 1010-1, CATIII 600V standards.

The Finest 170 comes with the **Optional** 3-Phase adaptor, which generates an artificial neutral point when measuring true power, apparent power or power factor in a either Balanced or Unbalanced 3 phase / 3 wire power distribution system.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Test Lead Set	FTL-500
Alligator Clips	AC7
Clip-on Holster	C130
3-phase Adapter (Optional)	PA170

SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

(% of reading + number of digits)

True Power [kW]

Range	400kW	750kW
Max. Resolution	0.1kW	1kW
Accuracy (45Hz to 450Hz)	1.5% + 2	1.5% + 2

Apparent Power [kVA]

Range	400kVA	750kVA
Max. Resolution	0.1kVA	1kVA
Accuracy (45Hz to 450Hz)	1.5% + 2	1.5% + 2

Reactive Power [kVAR]

$$kVAR = \sqrt{(kVA)^2 - (kW)^2}$$

Power Factor [cos O]

Range	0.3 (Cap) ··· 1 ··· 0.3 (Ind)
Max. Resolution	0.001
Accuracy (10Hz to 60Hz)	2% + 20

* Voltage Range : 20V to 750V RMS
Current Range : 20A to 1000A Peak

AC Amps

Range	400A	700A
Max. Resolution	0.1A	1A
Accuracy (45Hz to 450Hz)	1.5% + 2	1.5% + 2

*Crest Factor : ≤ 5 (for the continuos waveform of 45Hz to 65Hz).
Additional Crest Factor Errors: (Crest Factor) (Error % of reading)

1 ~ 3	0.5%
3 ~ 5	3%

AC Volts

Range	400V	750V
Max. Resolution	0.1V	1V
Accuracy (45Hz to 450Hz)	1.0% + 3	1.0% + 3

*Crest Factor : same as that of AC Amps.

True Power Energy Integrator

Range	40000 kWh	75000kWh
Max. Resolution	0.1 kWh	1kWh
Accuracy (45Hz to 450Hz)	1.5% + 2	1.5% + 2

*Maximum Integration Period : 80hrs.

Apparent Power Energy Integrator

Range	40000 kWh	75000kWh
Max. Resolution	0.1 kWh	1kWh
Accuracy (45Hz to 450Hz)	1.5% + 2	1.5% + 2

*Maximum Integration Period : 80hrs.

Reactive Power Energy Integrator

Range	40000kVARh	75000kVARh
Max. Resolution	0.1 kVARh	1kVARh
Accuracy (45Hz to 450Hz)	4% + 2	4% + 2

*Maximum Integration Period : 80hrs.

General

Display : 3¾ digit, 4000 count display for power, updates 4 times/sec. (6 digit display for energy integrator) **Operating Temperature :** 0°C to 50°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Altitude :** 2000m **Pollution Degree :** 2 **Battery Type :** Single 9V battery, NEDA 1604, JIS 006P or IEC 6F 22 **Battery Life :** 80 hrs typical **Maximum Conductor Size :** ø 51mm **Maximum Jaw Opening :** 52mm **Dimensions (H X W X D):** 245 X 97.5 x 43.9mm **Weight :** Approx. 545g **Warranty :** 2 years **Safety Conformance :** Designed to UL 3111-1, CSA C22.2 No. 1010.1-92, and IEC 1010-1 CAT III 600V **Standard Equipment :** Meter, Test leads, instruction manual, 9V battery (installed), and clip-on holster.

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CA113 OS/AT DC/AC mA Current Probe for Oscilloscope & Automotive Applications

The CA113 OS/AT is a clamp-on dc/ac mA current probe that is designed to be used to expand your OSCILLOSCOPE/MULTIMETERS capabilities to read dc/ac Amps from 0.001A to 60A.

The CA113 OS/AT is designed and tested according to IEC 1010-1 CAT III 600V and other safety standards.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Detachable Banana plugs to Female BNC Adapter	CA113 BA

SPECIFICATIONS (at 23°C ±5°C; <70% RH)

Effective Measurement Range

1mV/10mA : For OSCILLOSCOPE use;
10mA to 2A dc/ac (rms) for 10mV range of the oscilloscope.
2A to 20A dc/ac (rms) for 100mA range of the oscilloscope.

For AUTOMOTIVE use;
10mA to 20A dc/ac (rms) for 200mV range of the multimeter.

1mV/100mA : For OSCILLOSCOPE use;
100mA to 20A dc/ac (rms) for 100,V range of the oscilloscope.
20A to 60A dc/ac (rms) for 1V range of the oscilloscope.

For AUTOMOTIVE use;
100mA to 60A dc/ac (rms) for 2V range of the multimeter.

System accuracy : Current Probe accuracy + OSCILLOSCOPE/ MULTIMETER accuracy.

Current Probe accuracy:

1mV/10mA ;	DC Amps	10mA to 20A	1.5% ± 5mA
	AC Amps	10mA to 10A	2% ± 5mA (@ 40 Hz to 1kHz)
			4% ± 30mA (@ 2kHz to 10kHz)
			6% ± 30mA (@ 10kHz to 20kHz)
		10A to 15A	8% ± 30mA (@ 40 Hz to 20kHz)
1mV/100mA ;	DC Amps	100mA to 40A	2% ± 20mA
		40A to 60A	4% ± 0.3A
	AC Amps	100mA to 40A	2% ± 30mA (@ 40 Hz to 1kHz)
			4% ± 30mA (@ 1kHz to 2kHz)
			6% ± 30mA (@ 3kHz to 5kHz)
		40A to 60A	8% ± 0.3mA (@ 40Hz to 5kHz)

Input Impedance : 10kV/V typical

General

Operating Temperature : 0°C to 50°C **Operating Humidity:** < 70% RH **Storage Temperature :** -20°C to 60°C **Battery Type :** Single 9V battery, NEDA 1604, JIS 006P or IEC 6F 22 **Battery Life :** 100 hrs typical **Maximum Conductor Size :** ø9mm **Dimensions (H X W X D) :** 200 X 85 x 45mm **Weight :** Approx. 300g **Output :** Coaxial Cable with a BNC connector **Warranty :** 1 year **Safety Conformance :** Designed to UL 3111-1, CSA C22.2 No. 1010.1-92, and IEC 1010-1, CAT III 600V **Standard Equipment :** Current Probe, 9V battery (installed), banana adapter, and instruction sheet



CA113OS/AT

FEATURES

- *CE- mark Certificated.*
- *Compatible with any 4000 count millivolts measuring device.*
- *Maximum resolution of 1mA dc/ac measurement.*
- *60A dc/ac current measurement capability (AC frequency range : 40Hz to 20kHz).*
- *DC A Zero Adjustment thumbwheel.*
- *Low-battery indicator (LED).*
- *Maximum conductor size : ø 9mm*
- *Insulated BNC adapter for automotive uses.*
- *IEC 1010-1, CAT III 600V safety protection.*
- *1 year warranty.*

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CA113 Clamp-on DC/AC Current Probe



MODEL CA113

The CA113 is a clamp-on dc/ac current probe that is designed to be used to expand a multimeter s capabilities to read dc/ac Amps from 0.1A to 1000A.

The CA113 is designed and tested according to IEC publication 1010-2-032 (1994.12) (Overvoltage Category III), Safety Requirements for Handheld Current Clamps for Electrical Measurement and Test, the EMC Directive (EN50081-1 and EN 50082-1), and other safety standards.

ACCESSORIES	PART NO.
Battery, 9V	BT1

SPECIFICATIONS (at 23°C ±5°C; < 80% RH)

Current Ranges	: 0.1A to 400A dc/ac (400A range), 1A to 1000A dc/ac (1000A range)
Output Signals	: 1mV per A dc/ac in the 400A range, 0.1mV per A dc/ac in the 1000A range
Accuracy (dc to 400Hz)	: ±(2% of reading + 5 digits)
Working Voltage	: 600V dc/ac rms

FEATURES

- *CE- mark Certificated.*
- *Compatible with any 4000 count millivolts measuring device.*
- *Range and resolution capable of displaying 1mV output per Amp of measured current (400A range) and 0.1 mV output per Amp of measured current (1000A range).*
- *1000A dc/ac current measurement capability.*
- *DCA Zero Adjustment thumbwheel.*
- *Low-battery indicator (LED).*
- *Maximum conductor size : 1ea ø51mm (2.0").*
- *Safety hand guard.*
- *Conforms to IEC 1010-2-032 (Overvoltage category III) and UL 3111-1.*

General

Operating Temperature : 0°C to 45°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Battery Type :** 9V, NEDA 1604 or IEC 6LR61 **Battery Life :** 200 hrs typical (alkaline) **Maximum Conductor Size :** ø 51mm (2.00") **Maximum Jaw Opening :** 52mm (2.04") **Output Cable :** 1.6m **Dimensions (H X W X D) :** 20.5cm X 9.7cm x 4.4cm **Weight :** 410g **Warranty :** One year **Safety Standards :** Designed to both IEC 1010-2 -032 (Overvoltage Category III) and the EMC Directive, UL 3111-1 CAN/CSA C22.2 No. 1010.1-92 and ISA DS 82 **Standard Equipment :** Clamp-on current probe, 9V battery (installed) and instruction sheet.

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CLM33 Cable Length Meter



AWG Version



Metric Version

The CLM33 quickly measures the length of any reeled wire up to 9,000m (30,000ft) and with the gauges from 26 AWG to 500MCM. Within seconds, cables up to 9,000m can be measured and digitally displayed without the cumbersome unrolling of cable reels. Very useful for electrical contractors, utilities and distributors to control inventories of wire.

ACCESSORIES	PART NO.
Battery, 9V	BT1
Kelvin Clip test leads	KCTL
Rubber Boot (Yellow)	C1Y
Soft Carrying Case (Optional)	S1C

SPECIFICATIONS

Measurement Range	: 0 to 9,000m (0 to 30,000ft)
Cross section ranges	: 26AWG to 4/0AWG and 200 MCM to 500 MCM
Basic accuracy	: ±2% of reading at <65°F (18.3°C) to 75°F (23.8°C). ±3% of reading at <65°F (18.3°C) to 75°F (23.8°C).
Measurement accuracy	: Dependent upon manufacturing tolerance of the wire producer
Resistance range	: 0 to 65Ω, resolution 1mΩ (accuracy: ±2% of reading)
Battery type	: 9V, NEDA 1604 or 6F22 or 006P
Size (H x W x D)	: 203 x 100 x 47mm with holster
Weight	: 587g with holster.

FEATURES

- *UL/cUL-Listed and CE-mark Certificated.*
- *Easy-to-use, handheld and battery operated.*
- *3 digit display with annunciators.*
- *Measures in FEET (ft) or METERS (m).*
- *Direct readout for both COPPER (Cu) or ALUMINUM (Al) wire.*
- *Resistance range for milliohm measurements.*
- *Automatic internal temperature compensation for changes in ambient temperature.*
- *User calibration mode, Calibration standard wire included.*
- *Low battery indicator.*
- *Kelvin clips (test leads) included.*

**The CLM33 is not available for the distributors in North America.*

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PDM-11 Pocket Size DMM & TM24K Thermocouple Module

The Finest PDM-11 is a very low cost 3¾digit, 3200 count autoranging DMM designed for general purpose testing. It comes with a convenient handy carrying case storing the test lead probes.

The Finest TM24K enables the user to measure surface, air or liquid temperatures when use with a type K thermocouple and most digital multimeters having standard input jack spacing of 19mm (¾") and 10MVVor greater input impedance. Either the Fahrenheit (°F) or the Celsius (°C) scale can be selected. The LED near the control switch indicates if the module is ON (LED glows) or OFF. This LED also indicates low battery voltage when it glows dimly.



MODEL PDM-11





MODEL TM24K

ACCESSORIES — PART NO.

Battery, 9V [TM24K]	BT1
Battery, 2 XLR-44 or 357 cells [PDM-11]	BT3
Type K Thermocouple [TM24K]	TP1

SPECIFICATIONS (at 23°C ± 5°C ; < 80% RH)

[PDM-11] (% of reading + number of counts)

DC Voltage	300mV (1.3% + 2)	3V (0.7% + 2)	30V/300V/450V (1.3% + 2)	
AC Voltage	3V/30V/300V/450V (2.3% + 5)			
Resistance	300Ω (2% + 4)	3kΩ/30kΩ/300kΩ (2% + 2)	3MΩ (6% + 2)	30MΩ (10% + 5)
Continuity Test	Buzzer < 20Ω			

[TM24K]

RANGE	ACCURACY
-40°C to 1000°C -40°F to 1832°F)	± (1% + 1°C) ± (1% + 2°F)

※ The accuracy is effective at the ambient temperature of 23°C.

FEATURES

[PDM-11]

- *CE-mark Certificated.*
- *UL-Listed.*
- *3¾ digit, 3200 count LCD with bargraph.*
- *Auto ranging*
- *Auto - Power - Off.*
- *Data hold.*
- *Continuity beeper and diode test.*
- *Low battery annunciator.*
- *Convenient carrying case with test probe storage.*

[TM24K]

- *CE-mark Certificated.*
- *Low battery indicator (LED)..*
- *OFF - °C - °F control switch.*
- *Standard accessory-a type K thermocouple.*
- *Output Signal : 1 millivolt per degree C or F.*

General

Display : 3¾ digit, 3200 count LCD [PDM-11] **Operating Temperature :** 0°C to 40°C **Operating Humidity:** < 80% RH **Storage Temperature :** -20°C to 60°C **Battery Type :** 2 X LR-44 or 357 cells [PDM-11] 9V, NEDA 1604 or 6F22[TM24K] **Battery Life :** 600hrs. [PDM-11], 350hrs.(alkaline) [TM24K] **Dimensions (H X W X D) :** 108X 54 x 12mm [PDM-11], 104X 42 x 37mm [TM24K] **Weight :** About 100g [PDM-11], 127g [TM24K] **Warranty :** One year **Safety Standards :** Designed to UL 1244, CSA C22.2 No. 231, and IEC 1010-1 & the EMC Directive **Standard Equipment :** Meter, carrying case [PDM-11], user s manual, type K thermocouple [TM24K], 2XLR-44 Cells [PDM-11], 9V battery [TM24K] (installed)

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UTECO

TORQUE ADAPTOR & ACCURACY IMPROVER

Series TQ-800 Torque Extensions



MODEL TA98



TQ 806



TQ 804



TQ 803



TQ 802



The Finest TA98 is a very economical torque adaptor designed to work with socket extension torque sensors on the millivolt scale of a DMM. The TA98 is especially designed for automotive uses.

The Series TQ 800 is a very easy - to - use socket extension torque sensor that has the zero adjustment on the shaft. The Series TQ800 is designed for automotive heavy - duty uses.

FEATURES

[TA 98]

- *Designed to work with socket extension torque sensors on the millivolt scale of a DMM.*
- *Low battery indicator (LED).*
- *OFF- lb•ft - N•m control switch.*
- *Optional accessory - Series TQ800 Socket Extension Torque Sensor.*
- *Easy connection with Series TQ800 socket extension torque sensor.*

[Series TQ800]

- *Ideal for installation between a drive tool and a standard drive socket to measure or verify bolt or nut torque.*
- *Low cost, high accuracy and outstanding frequency response.*
- *Zero adjustment on the torque sensor using a screwdriver.*
- *Capacities range from 20 ft - lbs to 750 ft - lbs.*
- *Available in 1/4", 3/8", 1/2" and 3/4" square drives.*

SPECIFICATIONS (at 23°C ±5°C < 80% RH)

[TA 98]

Capacity Range : 20 ft - lbs to 750 ft - lbs
Accuracy : ± 5% of reading including the transducer errors
Temperature Range : 10°C to 40°C for full accuracy
Battery Type : 9V, NEDA 1604 or 6F 22
Dimensions (H X W X D) : 104 X 42 X 37mm
Weight (TA98 Only) : 127g

[Series TQ 800]

Rated Output : 1mV / V nominal
Excitation : 10V dc (20V dc max.)
Accuracy : ± 3.75% F.S.
Bridge Resistance : 350 ohms
Angular Deflection at F.S. : ± 2°
Construction : Nickel - plated tool steel
Dimensions :

MODEL	DRIVE SIZE	CAPACITY
TQ 806	3/4"	9000 in-lbs
TQ 804	1/2"	3000 in-lbs
TQ 803	3/8"	1200 in-lbs
TQ 802	1/4"	200 in-lbs

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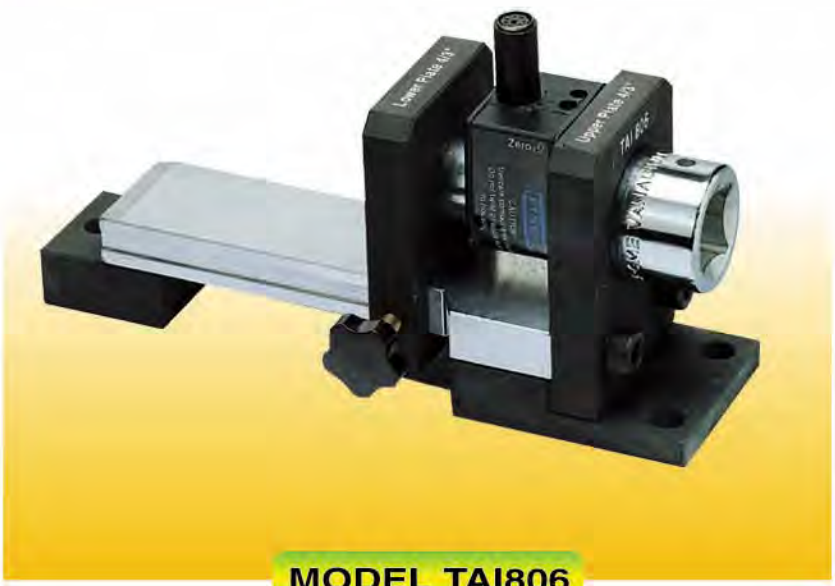
Torque Extension s Accuracy IMPROVER



MODEL TAI432

New

The TAI432 kit and the TAI806 kit are jigs to improve the accuracy of the Series TQ-800 torque extensions to +/- 1 %. These jigs are installed on a wall or a working table by using wrench bolts supplied. If we will use these jigs when calibrating the torque extensions by using a very accurate torque wrench,the accuracy of the extensions can be improved to +/- 1 % because we can remove the Side Loading effect as much as possible. When calibrating the extensions, you need to adjust the Span VR on each extension through its hole while applying the maximum load to the extension under calibration.



MODEL TAI806

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Next Generation Digital Automotive Tester



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Digital Pressure/Vaccum Adaptor & Photo Tachometer



CHECK THE PRESSURE ON FUEL SYSTEMS, AIR CONDITIONERS, AUTOMATIC TRANSMISSIONS, BRAKES AND FLUID POWER SYSTEMS. (Range : 500 psi / 3000 psi, Accuracy : +/- 0.5 %)

New



SIMPLY AIM THE PHOTO TACHOMETER AT RETROFLECTIVE TAPE PLACED ON THE ROTATING OBJECT AND READ THE RPM DISPLAYED ON THE COMPATIBLE DMM. (Range : 0 to 9999 RPM, Accuracy : +/- 0.5 %)

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Value - Pricing Accessories

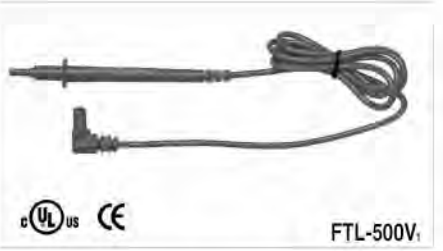
This section includes the value-pricing Finest accessories that are unsurpassed in quality of design and workmanship.
Please note that some of the Finest accessories are not compatible with other manufacturers DMMs.



FTL-2000 Double Skin Silicone Test Lead Kit for Automotive Application
With safety shrouded right angle banana plug to retractable straight banana plug and superior strain relief.
Rated for IEC 1010-1, CAT III 1000V, 10A maximum.
One red / one black / one blue



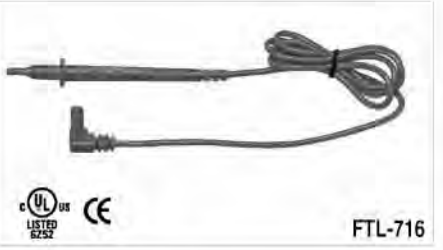
FTL-1000 Double Skin Test Lead Set
With fixed lead prod to 4mm safety plug kit and superior strain relief.
1.05m, CATIII 1000V, 15V maximum.
One red, one black. Conforms to UL 3111-1 & CSA C22.2 NO. 1010-1, IEC 1010-1, and IEC 1010-2-031. UL/cUL-listed and CE-mark certificated



FTL-500V1 Test Lead Set
Safety-shrouded right-angle inputs. 48" (1.2m), 1000V, 10A maximum. One red, one black. Conforms to IEC 1010-1 and UL 3111-1.
UL/cUL-listed and CE-mark certificated.



FTL-500 Test Lead Set
Safety-shrouded right-angle inputs. 48"(1.2m), 1000V, 10A maximum. One red, one black.
Conforms to IEC 1010-1 and CE-mark Cetificated.



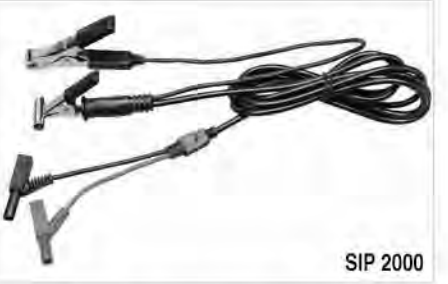
FTL-716 Test Lead Set
Safety-shrouded right-angle inputs. 48"(1.2m), 1000V, 10A maximum. One red, one black, one green.
Conforms to UL 3111-1 and IEC 1010-1.
For the Finest 716 automotive meter only.



5 Way Alligator Clips
Industry-standard for Automotive and Telecom applications. 5 ways to connect.
With banana plug, large penetrator and bed of nails.
Rated for 600V, 10A maximum.
Available in red, black, yellow, green, and blue.



Alligator Clips
Slip-on alligator clips for the Finest test leads.
Standard jaw opening of 0.313" (8mm).
Rated for IEC 1010-1, CAT III 1000V, 10A maximum.
One red, one black.



Single Cylinder Secondary Ignition Probe
Capacitive pickup to measure automotive high voltage ignition signals from the plug wire.
With safety banana plugs, RG58 cable, ground clip and molded connector clip. 6.6 ft, Wt. I lb.8 oz.

System Connection:
- Standard Ignition – Connect to coil wire.
- Integrated Coil – Connect to central location on distributor cap.
- **DIS** – Connect to one plug wire at a time.



RPM206 Inductive Pickup
For use with Finest 206, Finest 506/516 and Finest 226/228/229 Automotive meters. The Inductive Pickup converts the magnetic field generated by the current in the spark plug wire to a pulse that triggers the Automotive meter s RPM measurement.

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K-Type Temperature Probe with Banana Plug
General purpose. Teflon tape insulation.
Usable without TP1A Temperature Probe Adaptor.
Not suitable for liquid immersion.
Measurement Range : -40°C to + 1,370°C
(-40°F to + 2,498°F)
Accuracy : ±(3°C + 1dgt) for -40°C to 9°C
±(1% + 1°C) for -10°C to 400°C
±3% of reading for 401°C to 1,370°C



TP1 K-Type Temperature Probe
General purpose. Teflon tape insulation.
Not suitable for liquides.
Measurement Range: -40°C to +1,370°C
(-40°F to +2,498°F).
Accuracy : ±(3°C +1 digit) for -40°C to 9°C
±(1% +1°C) for 10°C to 400°C
±3% of reading for 401°C to 1,370°C
Restrictions : Must be used in Teflon-compatible environments and is not suitable for liquid immersion.



TP1A Temperature Probe Adaptor
K-type thermocouple adaptor designed to use with TP1.
Measurement Range : -40°C to +1,370°C
(-40°F to +2,498°F)
Plug directly into "COM" and "TEMP" input terminals. against rough handling and adverse weather conditions.



Safety - Designed Dual Banana Plug to Female BNC Adapter
+ (Signal) and –(ground;GND) shrouded 4mm banana plugs connect to a shrouded female BNC connector. Maximum voltage to ground of 600V.



Kelvin Clip Test Leads Set
For Finest CLM33 cable length meter.



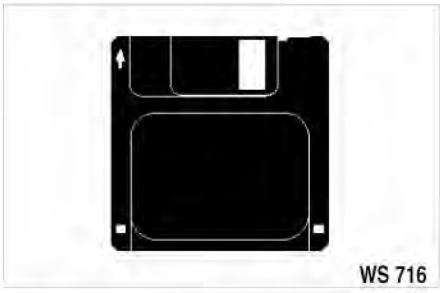
RS50 RS-232C Interface Cable (1.5m)
For use only with 509/516.
DB-9 male connector to DB-25 female connector.



RS70 Phototronic RS-232C Interface Cable (1.5m)
For use only with 716/707/705.
Phototronic connector to DB-9 female connector.



Software Diskett for the 707/705 s Calibration & RS-232C Interface
For both the closed case calibration and the RS-232C interface of the 707/705 through the phototronic serial port. WS 70 is WINDOWS version.



Software Diskett for the 716 s Calibration & RS-232C Interface
For both the closed case calibration and the RS-232C interface of the 716 through the phototronic serial port. WS 716 is WINDOWS version.



Capacitance Adapter
The CAP 7 capacitance adapter enables the user to measure capacitances when using with most digital multimeters having the DC 400 mV range.
(Range : 40 µF/400 µF, Accuracy : 2.5 % + 5 d)

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Value - Pricing Accessories



WS 516/DS 516, WS 509/DS 509

Sample Software Diskettes
For demonstration of RS-232C interface between 509/516 and PC. DS509 is a DOS disc for the 509. WS 509 is a WINDOWS disc for the 509. WS516 is a WINDOWS disc for the 516 and DS516 is a DOS disc for the 516.



H1C

H1C Hard Carrying Case
This rugged case provides any Finest DMM or clamp meter & most Finest accessories with maximum protection against rough handling and adverse weather conditions.



S1C

S1C Soft Carrying Case
Thickly padded vinyl with tough exterior and interior and heavy-duty zipper. Holds DMM and test leads. For use with any Finest DMM or Automotive Meters. Includes an inside pocket for test leads or small accessories.
Size : Various



S2C

S2C Soft Carrying Case
Thickly padded nylon with tough exterior and interior and rugged velcro closure.
Holds clamp meters and test leads. Includes an inside pocket for test leads or small accessories.
Size : Various



C1G/C1Y

C1G/C1Y Holster with Stand
The C1G/C1Y fit Finest 200 Series, Two Button Series, 215 and 206 multimeters. Yellow version (C1Y) is standard and Gray version (C1G) is optional.
The C1G/C1Y includes tilt stand, belt loop, pipe hook, etc. for best viewing position of meter.



C2G/C2Y

C2G/C2Y Holster with Stand
The C2G/C2Y fit any DMM of DMM of Finest 500 Series. Yellow version (C2Y) is standard and Gray version (C2G) is optional. The C2G/C2Y includes a stand rest for best viewing position of meter.



C3G/C3Y

C3G/C3Y Holster with Stand
The C3G/C3Y fit any DMM of Finest 220 Series. Yellow version(C3Y) is standard and G ray version (C3G) is optional. The C3G/C3Y includes a stand rest for best viewing position of meter and test leads holders.



C4B/C4G

C4B/C4G Holster with Stand
The C4B/C4G fit the Finest 24/25/229 multimeters.
Blue version (C4B) is standard and Grey version(C4G) is optional. The C4B/C4G includes a stand rest for best viewing position of meter.



C130

C130 Replacement Holster
For Finest 130 Series clamp-on meters. Protects meter display, and has a convenient belt clip for hands free carrying. Rugged velcro closure makes it easy to access meter even when wearing gloves.

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Value - Pricing Accessories



C110S Carrying Case
For Finest 110 Series clamp-on meters. Protects meter and all accessories.



TLH 12 Test Leads Holder
For Finest 200/500 Series DMMs.
Enables you to store the test leads set on the stand while unused.



Hand-Free™ Holster
Enables you to use your two hands very conveniently when taking remote measurement under hard-to-stand areas of a Finest digital multimeter. The holster is equipped with a Magnetic stand.
Size : same as C1G/C1Y/C2G/C2Y.



3-Phase Adapter for the 170 Power Meter Only
Generates an artificial neutral point when measuring true power, apparent power or power factor with the Finest 170 in a either Balanced or Unbalanced 3 phase / 3 wire power distribution system.



Alligator Clip Adapter
With two alligator clips to the male BNC connector and superior strain relief.
20 cm(7.9"). 250 V RMS protected.
For Series 900 TDR meters only.



RJ45 to RJ45 Patch Cable & Female Coupler
With RJ45 connectors on both ends of the 60 cm(23.7") patch cable and the RJ45 s female coupler.
For the 901 TDR LAN Cable Tester only.



Male BNC to Female RJ45 Adapter
Male BNC to female RJ45 adapter with a rotary selector to select 4 pairs of a twisted pair cable. Very useful for measuring the length of each pair.
For Series 900 TDR meters only.



Female RJ45 to Female BNC Remote Identifier
These Remote Identifiers will make WIRE MAP tests for twisted pair cables a breeze.
For the 901 TDR LAN Cable Tester only.

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