MECO®

SINCE 1962

+60 YEARS

ONE MISSION


Reliable Long-Lasting Affordable

Bureau Veritas Certification

**MECO INSTRUMENTS PVT.LTD.**

MECO SINCE 1962

PLOT NO. EL-1, MIDC ELECTRONIC ZONE, TTC INDL AREA, MAHAPE,
NAVI MUMBAI – 400 710, MAHARASHTRA, INDIA.

*Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the Management System Standard detailed below.*

*Standard*

**ISO 9001:2015**

*Scope of certification*

**MARKETING, DESIGN AND MANUFACTURING OF VARIOUS ELECTRICAL / ELECTRONIC MEASURING INSTRUMENTS, ELECTRICAL TRANSDUCERS AND ACCESSORIES**

Original cycle start date: **14 December 2002**
Recertification cycle start date: **05 December 2023**
Subject to the continued satisfactory operation of the organisation's Management System, this certificate is valid until: **13 December 2026**
Certificate No. **IND.23.7327/QM/U** Version: **1** Issue date: **05 December 2023**

For certificate authenticity, click here https://certcheck.ukas.com/

ISO 9001 IN044898

*Signed on behalf of BVCH SAS UK Branch*
*Jagdheesh N. MANIAN*
*Director – CERTIFICATION, South Asia*
*Commodities, Industry & Facilities Division*

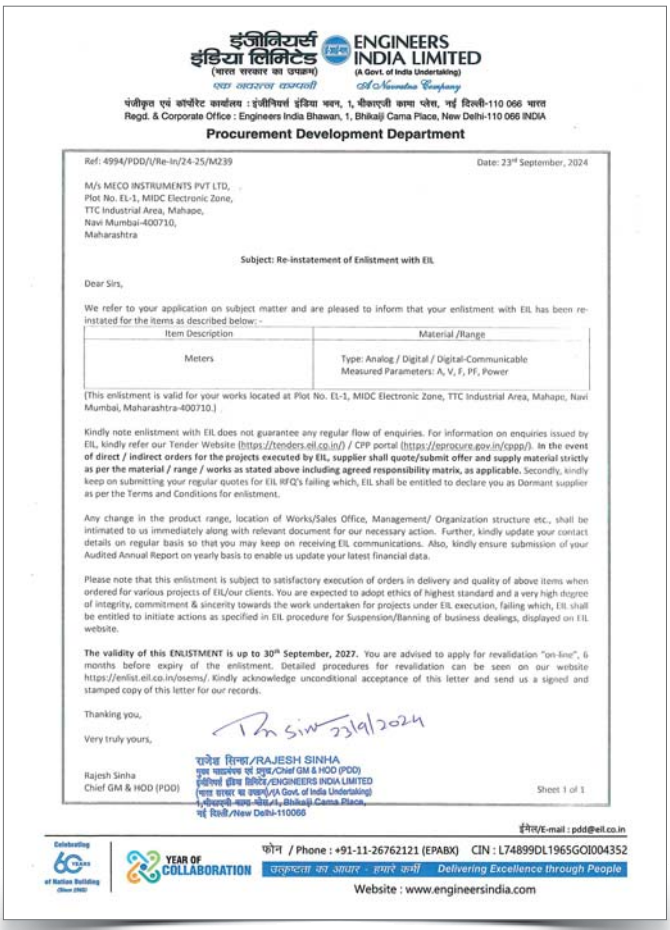
UKAS MANAGEMENT SYSTEMS 0008

*Certification body address: 5th Floor, 66 Prescot Street, London, E1 8HG, United Kingdom.*

*Local office: Bureau Veritas (India) Private Limited (Certification Business) 72 Business Park, Marol Industrial Area, MIDC Cross Road "C", Andheri (East), Mumbai – 400 093, India.*

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.
To check this certificate validity please call + 91 22 6274 2000.

ISO 9001:2015 CERTIFICATE



इंजीनियर्स इंडिया लिमिटेड (भारत सरकार का उपक्रम) ENGINEERS INDIA LIMITED (A Govt. of India Undertaking)

पंजीकृत एवं कॉर्पोरेट कार्यालय : इंजीनियर्स इंडिया भवन, 1, भीकाजी कामा प्लेस, नई दिल्ली-110 066 भारत
Regd. & Corporate Office : Engineers India Bhawan, 1, Bhikaiji Cama Place, New Delhi-110 066 INDIA

**Procurement Development Department**

Ref: 4994/PDD/I/Re-In/24-25/M239 Date: 23rd September, 2024

M/s MECO INSTRUMENTS PVT LTD,
Plot No. EL-1, MIDC Electronic Zone,
TTC Industrial Area, Mahape,
Navi Mumbai-400710,
Maharashtra

**Subject: Re-instatement of Enlistment with EIL**

Dear Sirs,

We refer to your application on subject matter and are pleased to inform that your enlistment with EIL has been re-instated for the items as described below: -

| Item Description | Material /Range |
|---|---|
| Meters | Type: Analog / Digital / Digital-Communicable<br>Measured Parameters: A, V, F, PF, Power |

(This enlistment is valid for your works located at Plot No. EL-1, MIDC Electronic Zone, TTC Industrial Area, Mahape, Navi Mumbai, Maharashtra-400710.)

Kindly note enlistment with EIL does not guarantee any regular flow of enquiries. For information on enquiries issued by EIL, kindly refer our Tender Website (https://tenders.eil.co.in/) / CPP portal (https://eprocure.gov.in/cppp/). **In the event of direct / indirect orders for the projects executed by EIL, supplier shall quote/submit offer and supply material strictly as per the material / range / works as stated above including agreed responsibility matrix, as applicable.** Secondly, kindly keep on submitting your regular quotes for EIL RFQ's failing which, EIL shall be entitled to declare you as Dormant supplier as per the Terms and Conditions for enlistment.

Any change in the product range, location of Works/Sales Office, Management/ Organization structure etc., shall be intimated to us immediately along with relevant document for our necessary action. Further, kindly update your contact details on regular basis so that you may keep on receiving EIL communications. Also, kindly ensure submission of your Audited Annual Report on yearly basis to enable us update your latest financial data.

Please note that this enlistment is subject to satisfactory execution of orders in delivery and quality of above items when ordered for various projects of EIL/our clients. You are expected to adopt ethics of highest standard and a very high degree of integrity, commitment & sincerity towards the work undertaken for projects under EIL execution, failing which, EIL shall be entitled to initiate actions as specified in EIL procedure for Suspension/Banning of business dealings, displayed on EIL website.

**The validity of this ENLISTMENT is up to 30th September, 2027.** You are advised to apply for revalidation "on-line", 6 months before expiry of the enlistment. Detailed procedures for revalidation can be seen on our website https://enlist.eil.co.in/osems/. Kindly acknowledge unconditional acceptance of this letter and send us a signed and stamped copy of this letter for our records.

Thanking you,

Very truly yours,

23/9/2024

Rajesh Sinha
Chief GM & HOD (PDD)

राजेश सिन्हा/RAJESH SINHA
मुख्य महाप्रबंधक एवं प्रमुख/Chief GM & HOD (PDD)
इंजीनियर्स इंडिया लिमिटेड/ENGINEERS INDIA LIMITED
(भारत सरकार का उपक्रम)/(A Govt. of India Undertaking)
1, भीकाजी कामा प्लेस, Bhikaji Cama Place,
नई दिल्ली/New Delhi-110066

Sheet 1 of 1

ईमेल/E-mail : pdd@eil.co.in

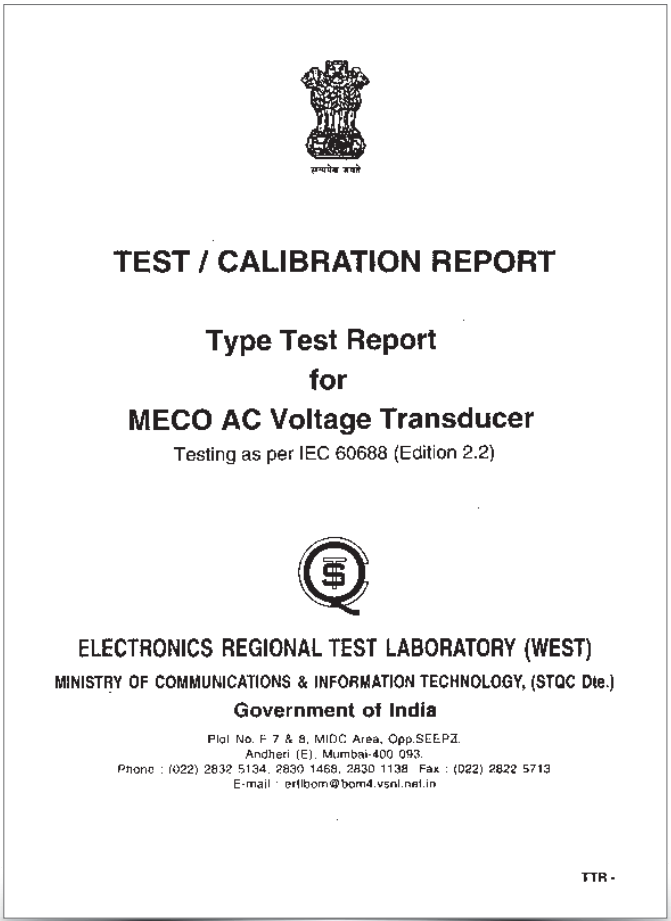
Celebrating 60 YEARS of Nation Building (Since 1965) | YEAR OF COLLABORATION

फोन / Phone : +91-11-26762121 (EPABX) CIN : L74899DL1965GOI004352

उत्कृष्टता का आधार : हमारे लोग Delivering Excellence through People

Website : www.engineersindia.com

EIL APPROVAL



सत्यमेव जयते

**TEST / CALIBRATION REPORT**

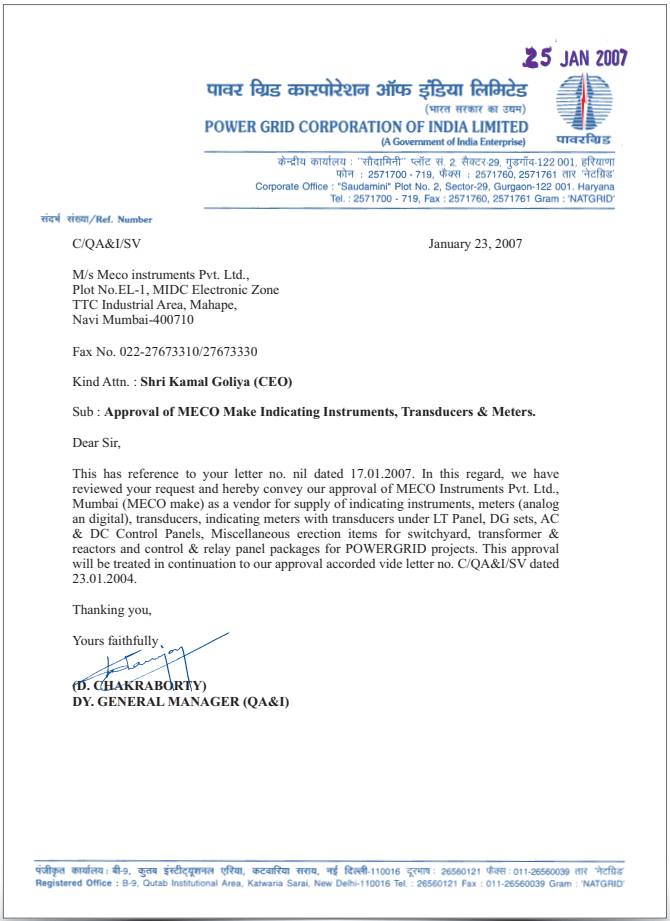
**Type Test Report**
**for**
**MECO AC Voltage Transducer**
Testing as per IEC 60688 (Edition 2.2)

**ELECTRONICS REGIONAL TEST LABORATORY (WEST)**
**MINISTRY OF COMMUNICATIONS & INFORMATION TECHNOLOGY, (STQC Dte.)**
**Government of India**

Plot No. F 7 & 8, MIDC Area, Opp.SEEPZ,
Andheri (E), Mumbai-400 093.
Phone : (022) 2832 5134, 2830 1468, 2830 1138 Fax : (022) 2822 5713
E-mail : erlbom@bom4.vsnl.net.in

TTR -

STQC TYPE TEST REPORT



25 JAN 2007

पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)
पावरग्रिड

केन्द्रीय कार्यालय : "सौदामिनी" प्लॉट सं. 2, सैक्टर-29, गुडगाँव-122 001, हरियाणा
फोन : 2571700 - 719, फैक्स : 2571760, 2571761 तार 'नेटग्रिड'
Corporate Office : "Saudamini" Plot No. 2, Sector-29, Gurgaon-122 001, Haryana
Tel. : 2571700 - 719, Fax : 2571760, 2571761 Gram : 'NATGRID'

संदर्भ संख्या/Ref. Number

C/QA&I/SV January 23, 2007

M/s Meco instruments Pvt. Ltd.,
Plot No.EL-1, MIDC Electronic Zone
TTC Industrial Area, Mahape,
Navi Mumbai-400710

Fax No. 022-27673310/27673330

Kind Attn. : **Shri Kamal Goliya (CEO)**

Sub : **Approval of MECO Make Indicating Instruments, Transducers & Meters.**

Dear Sir,

This has reference to your letter no. nil dated 17.01.2007. In this regard, we have reviewed your request and hereby convey our approval of MECO Instruments Pvt. Ltd., Mumbai (MECO make) as a vendor for supply of indicating instruments, meters (analog an digital), transducers, indicating meters with transducers under LT Panel, DG sets, AC & DC Control Panels, Miscellaneous erection items for switchyard, transformer & reactors and control & relay panel packages for POWERGRID projects. This approval will be treated in continuation to our approval accorded vide letter no. C/QA&I/SV dated 23.01.2004.

Thanking you,

Yours faithfully,

**(D. CHAKRABORTY)**
**DY. GENERAL MANAGER (QA&I)**

पंजीकृत कार्यालय : बी-9, कुतब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली-110016 दूरभाष : 26560121 फैक्स : 011-26560039 तार 'नेटग्रिड'
Registered Office : B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110016 Tel. : 26560121 Fax : 011-26560039 Gram : 'NATGRID'

PGCIL APPROVAL

MECO is a pioneering ISO 9001 : 2015 certified company offering reliable, long - lasting and affordable instruments for over 63 years. Our team of skilled and trained personnel is equipped with complete in-house facility for design, development and manufacturing world class products with innovative features. Customer focus, product innovation and technological excellence are the prime concern of each and every member at MECO.

Many of our products have been designed / upgraded by our R & D Department which is recognized by Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India, New Delhi. We hold over 37 design patents which are registered with The Controller General of Patents, Designs and Trade Marks, Government of India. Our products are certified by India's most reputed testing laboratories including ERTL, IDEMI, Karindikar Laboratories & NPL. The high quality of our products experience is always a great value addition for the end user.

To support our manufacturing process, we have SMT Pick & Place Machine, Solder Reflow Machine, PCB Optical Inspection Machine, Robotic Screw Fitting Machine, Dial Printing and Pad Printing Machines to name a few. We have one of the latest and largest range of Testing Equipment and Standards which act as a backbone to our QA & Calibration System with 8.5 Digit Digital Multimeter as a master standard. Using state - of - the - art electronics circuit designs, firmware, software and mechanical infrastructure along with dedicated, skilled and experienced work force, MECO also acts as an OEM to manufacturers in India, Germany, Italy, UK and USA.

Keeping pace with the requirements of various industry sectors, we have instruments in the following major categories:

- Multifunction Meters
- Digital Panel Meters & Modules
- Power Line Transducers
- Analog Panel & Switchboard Meters
- Digital Multiemeters
- Digital Clampmeters / Tong Testers
- Digital & Analog Insulation Testers
- Testing & Measuring Instruments
- Earth / Ground Resistance & Leakage Current Testers
- LCR Meters & Micro / Milli Ohm Meters
- Automotive Meters & Battery Capacity Testers
- Solar Analyzer & Solar Power Meter
- Infrared Thermometers
- Environment Testing Instruments
- Power & Harmonic Analyzer & Clamp-On Power Meter
- Calibrating Equipment / CT's / Decade Resistance Box

We have a network of over 75 authorized dealers / distributors and more than 1000 resellers who effectively channel our products in the entire Indian subcontinent with good penetration. Our products are exported to almost all the continents of the world through local agents and representatives.

We seek strategic alliances with companies worldwide, who can either efficiently market our products in their local markets or with companies who wish to channel their products in India through our marketing network.

As part of our CSR initiative we organize eye check-up camps, distribute of baby kits (for the new- born), install water coolers in government hospitals, assistance to blind children and unprivileged, among other welfare activities.

Every member and associate of our organization strongly believes in **"GIVE THE WORLD THE BEST YOU HAVE AND THE BEST IN THE WORLD COMES BACK TO YOU"**. We wish for a world where peace, happiness and harmony prevail, allowing everyone to live a healthy and purposeful life.

**Late. Parasmal Goliya**
(Founder)

**Mr. Premchand Goliya**
(Chairman & Mg. Director)

**Dr. Kamal P. Goliya**
(Director & CEO)

## Analog Panel & Switchboard Meters



## Digital Multimeters



## Digital Clampmeters / Tong Testers

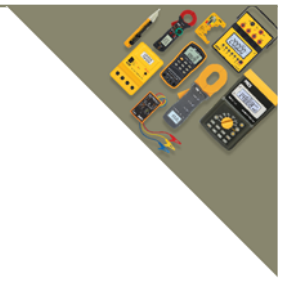


## Insulation Testers



## Testing & Measuring Instruments





## Automotive Meters & Battery Capacity Testers



## Solar Analyzers



## Environment Testing Instruments



## Power & Harmonics Analyzers



## Calibrating Equipment / CT's / Decade Resistance Box



**Chairman & Managing Director**

**Mr. Premchand Goliya**

**Associated with Professional Bodies / Associations**

- **Former President**
  - IEEMA (Indian Electrical & Electronics Manufacturers Association), Mumbai
  - All India Instrument Manufactures & Dealers Association, Mumbai
  - AOTS Alumni Association of Western India (AAAWI)
- **Former Chairman**
  - CII (Instrumentation Division), New Delhi
- **Member**
  - Instrumentation Experts Club, Mumbai
  - Governing Council, Institute for Design of Electrical Measuring Instruments, Mumbai
  - Bureau of Indian Standards, Electrical Instruments Sectional Committee, New Delhi
  - Engineering Expert Promotion Council, New Delhi
- **Former Member**
  - R & D Instruments Advisory Council, Ministry of Science & Technology, New Delhi
  - Development Council for Instrument Industry, Government of India
  - Technology Information Forecasting & Assessment Council, Government of India
- **Honoured with Life Time Achievement Award By**
  - Instrumentation Expert's Club in 2017
  - Electronic Maker in 2017

**Directors**

**Dr. Kamal Premchand Goliya**

**Director & C.E.O.**

- Member of IEEMA's NEC: 2019-2020, 2021-2022, 2022-2023 & 2023-2024
- Member of Organizing Committee for ELECRAMA - 2023 & 2025
- Chairman of IEEMA's MSME Division for 2023-2024 and 2024-2025
- Chairman of Roadshow Committee for ELECRAMA - 2025
- Chairman of Visitor Experience Committee for ELECRAMA - 2023 & 2025
- Member of O.C. for BUILDELEC - 2022
- Co. Chairman for BUILDELEC - 2024
- Member of O.C. for IEEMA's MEP Consultant Meet 2022, 2023 & 2025
- Member of Audit, Finance, Investment and Taxation Committee of IEEMA for 2021-2022, 2022-2023, 2023-2024 and 2024-2025
- Member of IEEMA's Public Policy Committee for 2022-2023 & 2023-2024
- Member of RBSM Committee for ELECRAMA - 2020
- Member of BCCI, COSMA, IEC.
- Member of Association of Overseas Technical Services (AOTS - Japan)
- Member of Mahavir International Trust

**Mr. Jhanwarlal Sipani** (Administration)

**Ms. Nandita Goliya** (Personnel & HR)

**Ms. Shivani Mehta** (Management)

**Ms. Suvarna Goliya** (Management)

**Ms. Yasha Goliya** (Management)

**Registered Office & Works**

EL-1, MIDC Electronic Zone, TTC Industrial Area, Mahape, Navi Mumbai - 400710, Maharashtra (INDIA)
Tel : +91 - 93233 32435 (Sales)
Email : info@mecoinst.com Web : www.mecoinst.com

**Authorised Service Centre** Navi Mumbai

**Awards and Certifications**

Engineering Export Promotion Council
(Government of India)
Awards For Highest Export Of Panel Instruments

**1984-85 1994-95 1995-96 1996-97**


EFY'S BEST MULTIMETERS AWARD


BEST CALIBRATING EQUIPMENT AWARD


AUTOMATION'S BEST PROCESS INDICATOR MADE IN INDIA AWARD


BEST MULTIMETERS AWARD


EIL APPROVAL

EEPC AWARD

EEPC APPROVAL


BEST INSULATION TESTER AWARD


BEST DIGITAL CLAMP METER AWARD


BEST ELECTRONIC EARTH RESISTANCE TESTER AWARD


BEST DIGITAL PANEL METER AWARD

Government of Maharashtra
Award in Appreciation of Export Achievement
**1999-2000**

**Year of Establishment** 1962

**Banker**

Canara Bank, Vashi Branch, Sector 12, Navi Mumbai-400703
A/C : 0110261020612, IFSC Code : CNRB0003302

**MSME Registration (SMALL Enterprise)**

UDYAM - MH-33-0032349

**Recogonised In - House R&D Unit**

Recognized by Department of Scientific & Industrial Research, Ministry of Science & Technology GOI, N.D. TU/IV-RD/1973/2022 Date 18.05.2022
Renewed till 31.03.2028

**Registrations :**

**ISO 9001 : 2015**

- Certificate No. IND 23-7327/QM/U
- Original Approval Date 14.12.2002 - BVQI

**NSIC** PMT : NSIC/GP/MUM/2018/63072 Date 16.08.2024

**GST** 27AAACM2883Q1ZU

**Permanent Income Tax No. (PAN)**

AAA CM 2883 Q

**Company's Act** 14477 Date 15.12.1969

CIN : U33120MH1969PTC014477

**Factory Act**

Thane -121704520000M-1 Date 01.01.2020 to 31.12.2025

**Import Export Code Number** 0388036184

**Gem Government e Market Place**

VA-323168157897169 Date 23.04.2024

## Product Profile

- Panel & Switchboard Instruments
- Testing & Measuring Instruments
- Automotive Meters & Battery Testers
- Solar Analyzers
- Environment Testing Instruments
- Power & Harmonic Analyzers
- Calibrating Equipments

## Industry Segments

| | | |
|---|---|---|
| Automobile | Renewables | R & D Organization |
| Automation | Food & Fertilizer | Railway |
| Aviation | Hotel & Tourism | Rubber & Plastic |
| Cement & Steel | Mining & Metallurgy | SCADA |
| Chemical | Oil / Gas / Petroleum | Sugar & Distilleries |
| Defence | Paper | System Integrators |
| Educational & Labs | Pharmaceutical | Telecommunication |
| EEE Manufacturer | Power Utilities | Textile Plants/Mills |

## Exports To Over 30 Countries

| | | | |
|---|---|---|---|
| Bahrain | Germany | Oman | UAE |
| Denmark | Indonesia | Philippines | UK |
| Egypt | Israel | Qatar | USA |
| Ethiopia | Kenya | Saudi Arabia | Many More... |
| Finland | Kuwait | Singapore | |
| France | Malaysia | Thailand | |

**Dealer Network**
**More than 75 Authorised Dealers all over India**


## On Approved List of Major Consultants and Customers

| | | | | | |
|---|---|---|---|---|---|
| ABB | C & S Group | Honeywell | Maruti | Osaw | Tata Power |
| Airport Authority [AAI] | DMRC | HPCL | Ministry Of Defence | Panasonic | TELCO |
| Amara Raja Group | ECIL | ICIC Bank | MPEB | Phillips | TISCO |
| APGENCO | EIL | IIT's | MRPL | PGCIL | TNEB |
| Areva T & D India Ltd. | EMERSON | IOCL | MSEDCL | Polycab | TOYOTA |
| Bajaj Auto Limited | GAIL | Indian Ordance Factory | MSETCL | Popular Switchgear | TUV |
| BARC | GE | Indian Railways | MTNL | Raychem | TVS |
| BEST | GERMI | ISRO | NPC | RIL | Venson |
| Bharti Airtel Ltd. | Godrej | JIO | NALCO | Rockwell | Vikram Sarabhai Space |
| BHEL | Grasim | JVVNL | NHPC | RRVPNL | Centre |
| Blue Star Limited | GSEB | Jyoti | NIT | SAIL | WIPRO |
| BPCL | HARTEK GROUP | L & T | Nitya Electro | Stelmec | Yokogawa |
| Chloride | HBL | MGL | NTPC | Siemens | Many More.... |
| CREDA | Hindalco | Mahindra | ONGC | SUZLON | |

## Plant and Machinery

| | | |
|---|---|---|
| JUKI SMT Machine | Ultrasonic Cleaner | Batliboi Shaping Machine |
| ETA Solder Paste Mixer | Oil Dispenser | Radial Drilling Machine |
| ETA Solder Paste Printer | In House CAD Facility | Tapping Machines 6.5mm |
| ETA REFLOW Machine | Dial Designer | Pantograph |
| JUKI Automated Optical Inspection Machine (AOI) | Belt Conveyor System | Tanabe (Japan) Coil Winding Machines |
| JANOME Robot with Screw Feeder | Dial Printing Machine | Industrial Ovens |
| Dehumidifiers | Pad Printing Machine | DC Regulated Power Supply cum Rectifier Unit |
| Manual Stacker | BFW Miling Machine with 3 axis DRO | Air Compressors with Refrigerated Air Dryer |
| | Kirloskar Lathe Machine | Box Strapping Machine |

## Quality Control Facilities

**Master Standards**
- FLUKE 8588A 8½ Digit Multimeter
- Temperature Calibrator
- DY HTY3 (30°C ~ 45 °C)
- BBTSC 3045 (30°C ~ 45 °C)
- CEM BX 500 (50°C ~ 500°C)
- HP 34401A 6½ Digit Multimeter
- YEW 2885 Watt Convertor
- FLUKE 5500A AC / DC Calibrator
- MECO 90DR HV Resistance Box (0.01MΩ - 5GΩ)
- MECO FS 216 Ammeter
- MECO DIT 918 Digital Insulation Tester
- MECO Current Transformer (1000 / 5A)
- MECO Clampmeter Coil (1000A DC with 100 Turns)
- Shunt (50A / 100mV)
- Quick 191A Thermometer

**Mechanical (Dimensional) QC**
- World class Measuring Instruments with an In - House Tool Room

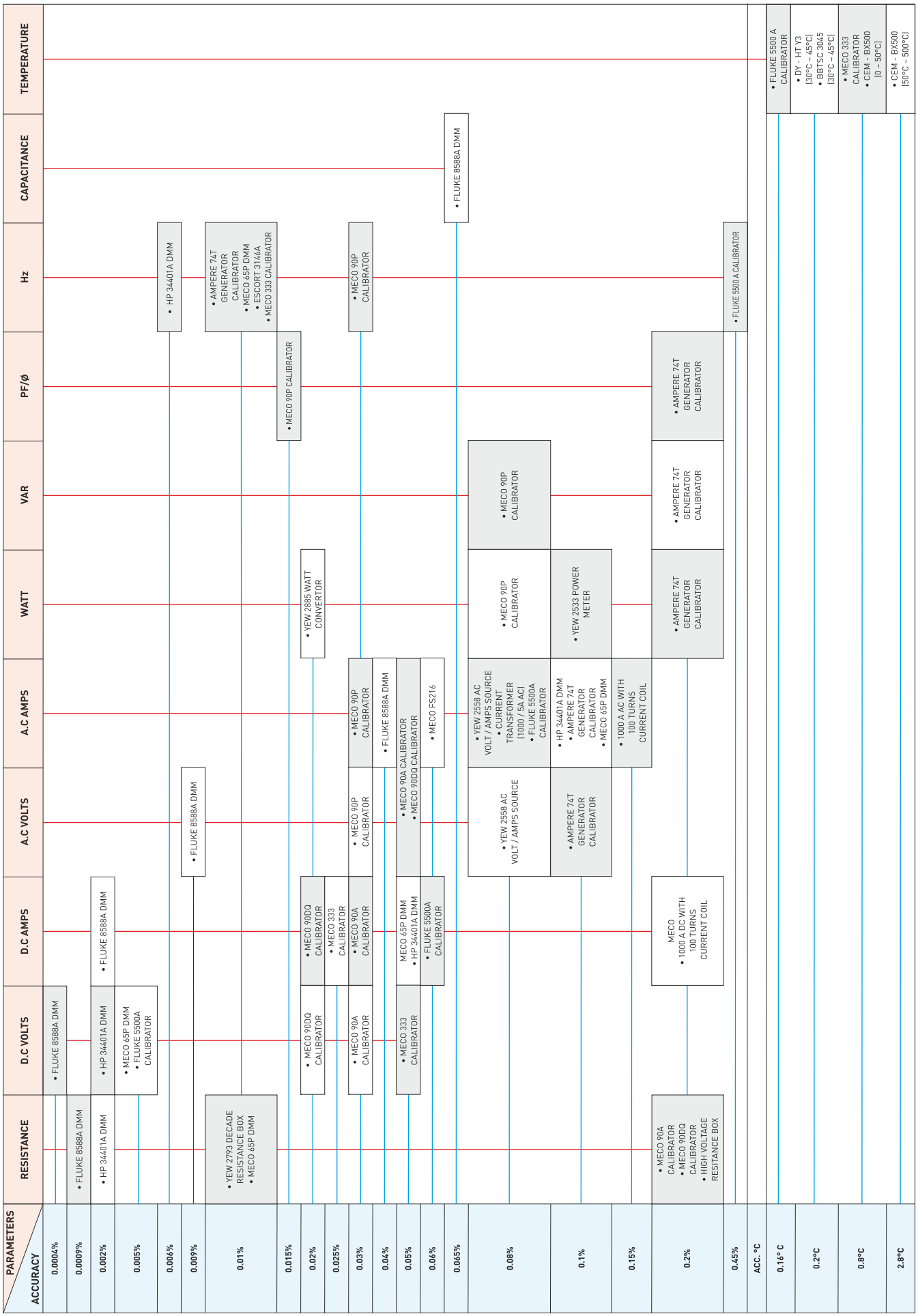
**In House Calibrators**
- MECO 90DQ Multifunctional Calibrator
- MECO 90A Universal Calibrator
- MECO 90P AC Multifunction Calibrator
- MECO 333 Process Calibrator
- AMPERE 74T 3 Phase V & I Generator
- MECO 90DR45D High Voltage Resistance Box
- YEW Decade Resistance Box
- MECO 65P 6½ Digit Multimeter
- MECO LCR999A LCR Meter
- ESCORT 3146A 6½ Digit Multimeter

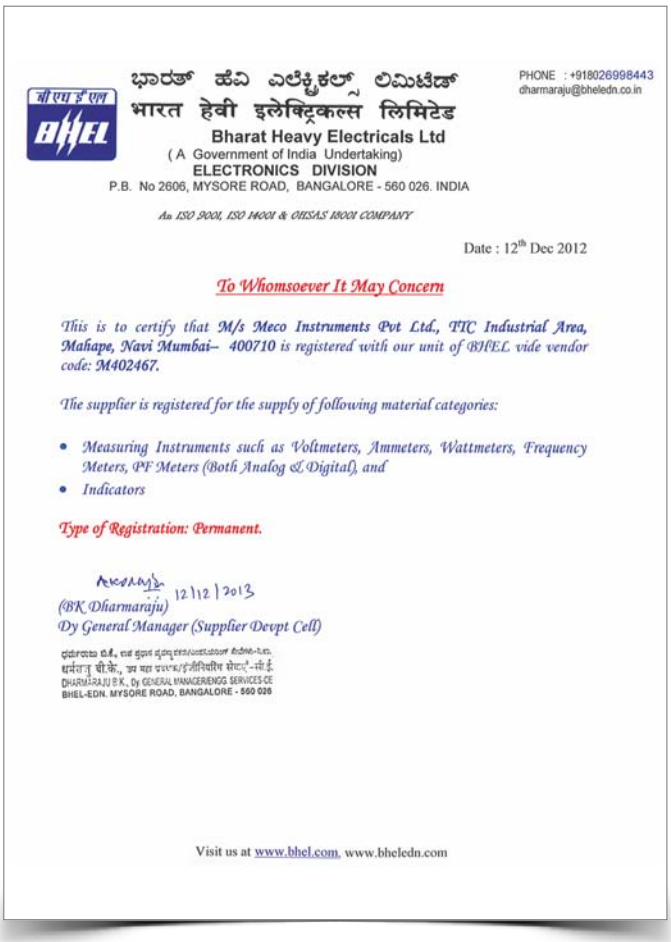
**Type Tests**
- Vibration Table
- Life Tester
- High Voltage Tester
- Oscilloscopes, DMM etc.
- Environmental Chamber
- Insulation Tester
- Stereo Microscopes 40X, e -Microscope
- Bursting Strength Machine

## Product Testing / Certification by Accredited Laboratories

| Particulars | Certificate No |
|---|---|
| **Analog Instruments** | |
| **Type Test Reports** | |
| ■ Moving Iron AC Panel Meter – SQ72 / SQ96 | ERTL (W)/2002 E & S 294 & ERTL (W)/2002 E & S 295 |
| ■ Moving Coil AC Rectifier Type Meter – MLC96 | ERTL (W)/2002 E & S 290 |
| ■ Moving Coil AC Rectifier Type Meter – C72 / C96 | ERTL (W)/2002 E & S 288 & ERTL (W)/2002 E & S 287 |
| ■ Moving Coil DC Volt Meter – M72 / M96 | ERTL (W)/2002 E & S 285 & ERTL (W)/2002 E & S 286 |
| ■ Moving Coil Panel Meter – ML96 | ERTL (W)/2002 E & S 289 |
| ■ Electronic Analog Type Watt Meter - 96QW33 | ERTL (W)/2002 E & S 291 |
| ■ Electronic Analog Type Frequency Meter - F96 | ERTL (W)/2002 E & S 293 |
| ■ Electronic Analog Type Power Factor Meter - 96QF31 | ERTL (W)/2002 E & S 292 |
| ■ Electronic Analog Insulation Tester - MC904A-2 / MC907A-2 | ERTL (W)/2004 E & S 284 & ERTL (W)/2004 E & S 285 |
| **EMI and EMC Test Reports** | |
| ■ Electronic Analog Type Frequency Meter - F72 | ERTL (W)/1998 EMI 00088 |
| ■ Moving Coil AC Rectifier Type Meter - MLC96 | ERTL (W)/1998 EMI 00089 |
| ■ Maximum Demand Ammeter - BM96S | ERTL (W)/1998 EMI 00090 |
| **Safety Test Reports** | |
| ■ Electronic Analog Type Frequency Mete - F72 | ERTL (W)/1998 SAF 0046 |
| ■ Moving Coil AC Rectifier Type Meter - MLC96 | ERTL (W)/1998 SAF 0047 |
| ■ Maximum Demand Ammeter - BM96S | ERTL (W)/1998 SAF 0048 |
| ■ Moving Coil DC Voltmeter - ML96 | TE/ETUO22/14-15 |
| **Digital Instruments** | |
| **Type Test Reports / Calibration Report** | |
| ■ Digital Multi-Range AC Portable Voltmeter–PM-VAC-5R | CC/ECL/1814/21-22 |
| ■ Digital Multi-Range AC Portable Ammeter – PM-AAC-5R | CC/ECL/1816/21-22 |
| ■ Digital Multi-Range DC Portable Voltmeter – PM-VDC-5R | CC/ECL/1815/21-22 |
| ■ Digital Multi-Range DC Portable Ammeter – PM-ADC-5R | CC/ECL/1817/21-22 |
| ■ Digital AC & DC Volt Meter - SMP35S | ERTL (W)/2004 E & S 276 & ERTL (W)/2004 E & S 282 |
| ■ Digital AC Current Meter - SMP35SRS | ERTL (W)/2004 E & S 277 |
| ■ Digital Frequency Meter (5 Digit) FDM5 | ERTL (W)/2004 E & S 278 & ERTL (W)/2004 E & S 289 |
| ■ Digital Power Factor Meter - DPF 31 | ERTL (W)/2004 E & S 281 |
| ■ Digital Watt Meter - DWM9634 | ERTL (W)/2004 E & S 280 |
| ■ Clamp-On TRMS Power Meter - 3510PHW | ERTL (W)/2008 E & S 357 |
| ■ AC Digital Tong Tester / Clamp-On TRMS Power Meter - 3510RHW | TR/ETU229/16-17 |
| ■ Clamp-On Earth / Ground Resistance & Leakage Current Tester - 4680 | ERTL (W)/2003 E & S 258 & ERTL (W)/2004 E & S 46 |
| ■ AC Digital Clampmeter - 3150+ | KLPL/BTG/20/10-88 |
| ■ Digital Insulation Tester - DIT99E | CC/ECU0603/17-18 |
| ■ Digital Insulation Tester - DIT99C | ERTL (W)/2004 E & S 286 |
| ■ Digital Insulation Tester - DIT99D | ERTL (W)/2004 E & S 287 |
| ■ Multifunction Calibrator - 90DQ | CC/ECU1021/08-09 |
| ■ AC Multifunction Calibrator - 90P | CC/EC U979/09-10 |
| ■ 4 Digit Frequency Meter | ERTL (W)/2011 E & S 11 |
| **EMI and EMC Test Reports** | |
| ■ Digital Multi meter - 9A02 | ERTL (W)/2002 EMI 150 |
| ■ Power Line Supervisor / Universal Electrical Analyzer - SVPR- 96 | ERTL (W)/2002 EMI 147 |
| ■ Digital Watt Meter - DWM33 | ERTL (W)/2002 EMI 148 |
| ■ Digital AC Current Meter - SMP35SRS | ERTL (W)/2004 EMI 365 |
| ■ Clamp-On Earth / Ground Resistance & Leakage Current Tester - 4680 | ERTL (W)/2004 EMI 234 |
| ■ Clampmeter Standard Coil with Multifunction Calibrator - Current Coil | CC/ECU01414/17-18 |
| **Safety Test Reports** | |
| ■ Power Line Supervisor / Universal Electrical Analyzer SPVR-96 | ERTL (W)2002 SAF 46 |
| **Power Line Transducers** | |
| **Type Test Reports** | |
| ■ AC Current Transducer - CMT | ERTL (W)/2003 E & S 117 |
| ■ AC Voltage Transducer - VMT | ERTL (W)/2003 E & 5 26 |
| ■ Frequency Transducer - FT | ERTL (W)/2003 E & 5 27 |
| ■ AC Current Transducer (Self Powered) - CMT | ERTL (W)/2004 E & S 283 |
| **EMI and EMC Test Reports** | |
| ■ Active (Watt) Power Transducer - WT34 | ERTL (W)/2002 EMI 149 |
| ■ AC Voltage Transducer - VMT | ERTL (W)/2003 EMI 262 |
| ■ Frequency Transducer - FT | ERTL (W)/2003 EMI 263 |
| ■ Current Transducer with 19V to 90V DC Aux. Supply - CMT | ERTL (W)/2003 EMI 324 |
| ■ Current Transducer with 85V to 265V AC Aux. Supply - CMT | ERTL (W)/2003 EMI 327 |
| ■ Voltage Transducer with 19V to 90V DC Aux. Supply - VMT | ERTL (W)/2003 EMI 325 |
| ■ Voltage Transducer with 85V to 265V AC Aux. Supply - VMT | ERTL (W)/2003 EMI 328 |
| ■ Watt Transducer with 19V to 90V DC Aux. Supply - WT11 | ERTL (W)/2003 EMI 326 |
| ■ Watt Transducer with 85V to 265V AC Aux. Supply - WT11 | ERTL (W)/2003 EMI 329 |
| ■ Current Transducer with Self Powered Aux. Supply - CMT | ERTL (W)/2004 EMI 366 |
| ■ Current Transducer - CMT | ERTL (W)/2004 EMI 346 |
| ■ AC Voltage Transducer - VMT | ERTL (W)/2004 EMI 347 |
| ■ Frequency Transducer FT | ERTL (W)/2004 EMI 348 |
| ■ Power Factor Transducer - PFT31 | ERTL (W)/2004 EMI 349 |
| ■ Active Power Transducer - WT33 | ERTL (W)/2004 EMI 350 |
| ■ Reactive Power Transducer - RPT33 | ERTL (W)/2004 EMI 351 |

## Echelon of Standards at MECO (Traceable to NPL Standards)





ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड
**Bharat Heavy Electricals Ltd**
( A Government of India Undertaking)
**ELECTRONICS DIVISION**
P.B. No 2606, MYSORE ROAD, BANGALORE - 560 026. INDIA

PHONE : +918026998443
dharmaraju@bheledn.co.in

*An ISO 9001, ISO 14001 & OHSAS 18001 COMPANY*

Date : 12th Dec 2012

**To Whomsoever It May Concern**

*This is to certify that M/s Meco Instruments Pvt Ltd., TTC Industrial Area, Mahape, Navi Mumbai– 400710 is registered with our unit of BHEL vide vendor code: M402467.*

*The supplier is registered for the supply of following material categories:*

- *Measuring Instruments such as Voltmeters, Ammeters, Wattmeters, Frequency Meters, PF Meters (Both Analog & Digital), and*
- *Indicators*

*Type of Registration: Permanent.*

12/12/2013
(BK Dharmaraju)
Dy General Manager (Supplier Devpt Cell)

DHARMARAJU B.K., Dy GENERAL MANAGER(ENGG. SERVICES-CE
BHEL-EDN. MYSORE ROAD, BANGALORE - 560 026

Visit us at www.bhel.com, www.bheledn.com

**SYSTRONICS**
Division of Systronics (India) Ltd.
89-92, Naroda Industrial Area
Naroda, Ahmedabad-382 330, India

☎ : 079 - 2281 3117 / 2755 6077
FAX : 079 - 2755 2902
✉ : admn@systronicsindia.com
Web : www.systronicsindia.com

Date: 21.01.2023

To,
**M/s. Meco Instruments Pvt. Ltd.**
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710
Tel. No. 022 – 27673300

Dear Sir/Madam

Kind Attn : Dr. Kamal Goliya - CEO

**Sub Products Appreciation letter for Digital LCD & LED Modules**

We thank you for your support extended to us for supply of MECO Digital LCD & LED Modules regularly for our various projects.

We are very much satisfied with the performance of these modules.

The presales and post-sales service and support offered are prompt and timely.

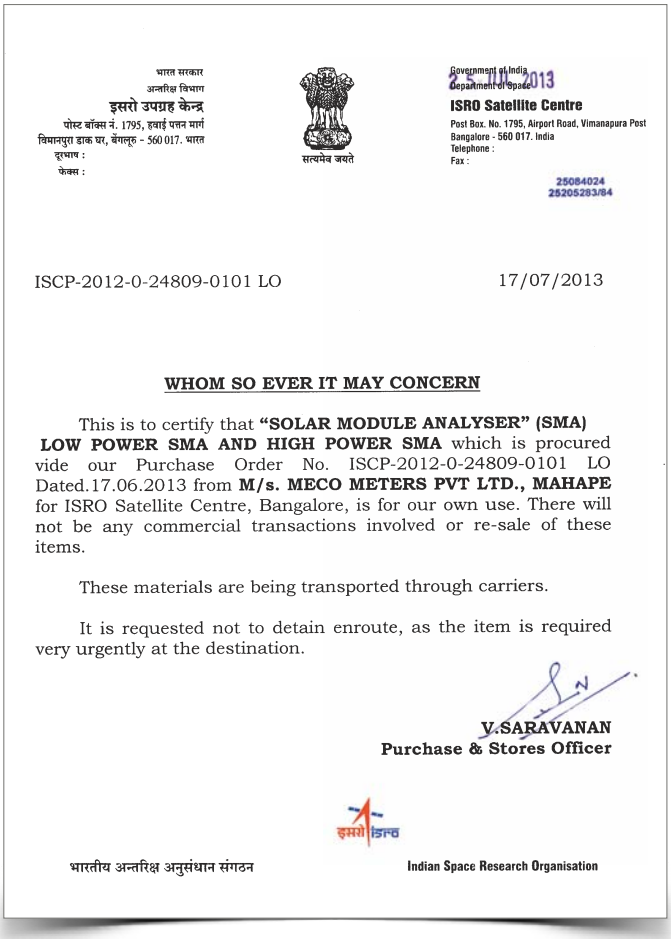
We hope to have good and strong business relationship with you in future as well.

Thanking You,
Your Faithfully,
M/s. Systronics

Authorised Signature

c.c.
Mr. Amol Bharnuke – Marketing Executive
Email : amol.bharnuke@mecoinst.com Mobile No. : 9987466629

Regd. Office / Head Office : B/116 - 129, Supath-II Complex, Near Juna Wadaj Bus Terminus, Ashram Road, Ahmedabad-380 013. India • Phone : 91-79-27556077, 27553589 • E-mail : admn@systronicsindia.com
Website : www.systronicsindia.com • CIN U32201 GJ1973 PLC002437
Manufactures of Electronic Instruments & Scientific Equipments.
Branches : Bengaluru, Bhaubaneshwar, Chennai, Hydersbad, Kolkata, Mumbai, New Delhi, Patna & Thiruvananthapuram.



भारत सरकार
अन्तरिक्ष विभाग
**इसरो उपग्रह केन्द्र**
पोस्ट बॉक्स नं. 1795, हवाई पत्तन मार्ग
विमानपुरा डाक घर, बेंगलूरु - 560 017. भारत
दूरभाष :
फेक्स :

सत्यमेव जयते

Government of India
Department of Space
25 JUL 2013
**ISRO Satellite Centre**
Post Box. No. 1795, Airport Road, Vimanapura Post
Bangalore - 560 017. India
Telephone :
Fax :
25084024
25205283/84

ISCP-2012-0-24809-0101 LO 17/07/2013

**WHOM SO EVER IT MAY CONCERN**

This is to certify that **"SOLAR MODULE ANALYSER" (SMA) LOW POWER SMA AND HIGH POWER SMA** which is procured vide our Purchase Order No. ISCP-2012-0-24809-0101 LO Dated.17.06.2013 from **M/s. MECO METERS PVT LTD., MAHAPE** for ISRO Satellite Centre, Bangalore, is for our own use. There will not be any commercial transactions involved or re-sale of these items.

These materials are being transported through carriers.

It is requested not to detain enroute, as the item is required very urgently at the destination.

**V.SARAVANAN**
**Purchase & Stores Officer**

इसरो ISRO

भारतीय अन्तरिक्ष अनुसंधान संगठन

Indian Space Research Organisation

CHLORIDE

Date: 11.01.2023

To,
**M/s. Meco Instruments Pvt. Ltd.**
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710
Tel. No. 022 – 27673300

Dear Sir/Madam

Kind Attn : Dr. Kamal Goliya - CEO

**Sub Products Appreciation letter for Digital Panel Meters and Analog Panel Meters.**

We thank you for your support extended to us for supply of MECO Digital Panel Meters and Analog Panel Meters regularly for our various projects in India and for many export projects.

We are very much satisfied with the performance of these meters.

The presales and post-sales service and support offered are prompt and timely.

We hope to have good and strong business relationship with you in future as well.

Thanking You,

Your Faithfully,

**M/s. Chloride Power Systems & Solutions Ltd.**

Surajit Maity
Head Purchase
Phone: 9591070389

**Chloride Power Systems & Solutions Limited** (A wholly owned subsidiary of Exide Industries Ltd.)
**Works & Address of Communication :** Plot No. Y-21, Block EP, Sector - V, Salt Lake Electronics Complex, Kolkata - 700 091. W.B., India
Phone : +91 33 2357-5851/52/53/54, Fax : +91 33 2357-7062, CIN : U31100WB1980PLC032796
E-MAIL : info@chloridepower.co.in, Web : www.chloridepowersystems.com
**Regd. Office :** "Exide House", 59E, Chowringhee Road, Kolkata - 700 020

SOLAR IDEA
hope for tomorrow

T +91 - 40 - 4946 4332 (IDEA)
F +91 - 40 - 4946 4333
Toll Free 1-800-102-4332 (IDEA)
info@solaridea.com
www.solaridea.com

4th January, 2016

To,
M/s. MECO Meters Pvt. Ltd.
Plot No. EL – 60, MIDC , Electronic Zone,
TTC Industrial Area, Mahape,
Navi Mumbai – 400710 (India)
Tel. No. 022 – 27673300
Fax No. 022 – 27673310

**Kind Attention:** Mr. Kamal Goliya / Mr. Prashant Thakkar

**Subject:** Performance of MECO Solar System Analyzer – 9018BT

Dear Sir,

We are pleased to inform you that performance of MECO Solar System Analyzer 9018BT supplied to us is working well and is meeting our expectations.

We are using the MECO Solar System Analyzer for analyzing and improving the efficiency of our Solar Inverters, Solar pumps, and other solar systems. We are also able to assess the PV panel performance and furthermore, we are able to adjust the panels spacing and tilt angel to obtain optimum power from the PV panels.

The analyzer is found to be reliable and we have pleasure in recommending the same to others.

We look forward to having similar kind of service and support from you in the future.

With Best Regards
For M/s. Solar Idea Pvt. Ltd.

SOLAR IDEA PRIVATE LIMITED Hyderabad

Managing Director

SOLAR IDEA PRIVATE LIMITED, CIN : U40106TG2014PTC094915
Registered Office : Door No. 8-2-277/A/7, Plot No. 126, Road No. 2, Banjara Hills, Hyderabad -500034, Telangana State, India.

Survey No. 351, Thumkunta (Vill.)
Sheerpet (Mdl.), R.R. Dist.
Hyderabad - 500 078. India.
Phone : +91-8418-325556/247680/1/2
Fax : +91-8418-247683

HBL®
HBL Power Systems Ltd.

Date : 06.06.2022

To,
M/s. Meco Instruments Pvt. Ltd.
EL-1, MIDC Electronic Zone, TTC Industrial Area,
Mahape, Navi Mumbai - 400710

Kind Attn : Mr. Kishorkumar Thakare (Marketing Manager - South India)

Subject : Appreciation Letter

Dear Sir

We thank you for your excellent support extended to us for supply of MECO Digital Panel Meters regularly for our various projects in India and for many export projects.

We are very much satisfied with the performance of these meters.

The presales and post sales service and support offered are prompt and timely.

We hope to have good strong business relationships with you in future as well.

With Best Regards

P.N.V. Lakshmana Rao
Sr. Manager

HBL POWER SYSTEMS LTD HYD-78

Regd. Office :
HBL Power Systems Limited
Road No.10, Banjara Hills, Hyderabad - 500 034.
Website : www.hbl.in
CIN : L40109TG1986PLC006745

**Panasonic**

Panasonic India Pvt. Ltd.
Industrial Plot No. 1,
Village Bid Dadri, Jhajjar
Haryana - 124103, India

24 MAY 2022

20 May 2022

**To,**
**M/s. Meco Instruments Pvt. Ltd.**
Plot No. EL – 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape,
Navi Mumbai – 400 710 (INDIA)

**Subject :** Certificate of Appreciation

**Dear Shri Premchand Goliya Ji (C.M.D.),**

We are using following components: Digital Panel Meters, Analog Panel Meters manufactured by you in our machines since about 7 years. These components have helped our supply chain in increasing local content in our products thereby creating import substitution.

During the use we have found the performance of these products satisfactory. Also the delivery, sales, technical and service support of your team is up to our expectation.

We thank MECO Team for their professional approach and look forward to stronger cooperation in future too.

**Thanking You,**
**For Panasonic India Pvt. Ltd.,**

**Prashant Yadav**
**Head – Procurement**

Registered Office : 12th Floor, Ambience Tower, Ambience Island, NH-8, Gurgaon-122002, Haryana.
Website : www.panasonic.in Email : contact.pi@in.panasonic.com CIN No. U51395TN2006PTC060554

MAHANAGAR GAS
ISO 9001:2000

**MAHANAGAR GAS LTD.**
(Joint Venture of GAIL, British Gas, U.K. & Govt. of Maharashtra)

City Gate Station,
Opp. Anik Depot,
Sion, Mumbai - 400 022.
Tel. : 2404 5785 • Fax : 2401 0080

30 DEC 2011

**Date:December 26, 2011**

To,
**Mr. Kamal Goliya – C.E.O.**
**M/s. Meco Instruments Pvt. Ltd.**
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710
Tel. No. 022 – 27673300 Fax No. 022 – 27673310

Dear Sir,

**Sub.:**Training, Live Demonstration at MECO – Mahape Work and Performance of MECO Make Power & Harmonics Analyser Model PHA- 5850 – B.
**Ref.:** Purchase Order No. MGL/C&P/4500001382/10-11/BB Dated 26 June 2011 for Supply of Three Phase Power Quality Analyzer (MECO-Power & Harmonics Analyser, PHA-5850B)

We thank Mr. Haren Shah–Marketing Executive for imparting Satisfactory Training and Demonstration to all our following Engineers who were present at your work on 14th October'2011. Our Engineer team member were also satisfied with the interaction and question / answer session.

| Name: | Designation | Name: | Designation |
|---|---|---|---|
| Ms. Dipti Lohchab | Executive | Mr. Manish Gupta | Asst. Manager |
| Mr. Vinkal Kotangale | Executive | Mr. Mahesh Kolte | Asst. Manager |
| Mr. Manas Khaire | Asst. Manager | Mr. Ganesh Patil | Asst. Manager |
| Mr. Vaibhav Pagnis | Asst. Manager | Mr. Pramod Kamble | Asst. Manager |
| Mr. Bhushan Kamble | Asst. Manager | Mr. Suhas Mandh | Sr.Asst. |
| Mr. Abhinav Nigam | Asst. Manager | Mr. Mahesh Kolte | Sr.Asst. |
| Mr. Manish Gupta | Asst. Manager | | |

We are pleased to inform you that MECO Make Power & Harmonics Analyser Model PHA- 5850B Kit supplied to us against above purchase order is working satisfactory. Purpose of purchasing the same instruments gives us satisfactory results as per our requirements and application.

We look forward in future to have similar technical support as and when require.

Thanking You,
**For Mahanagar Gas Limited.**

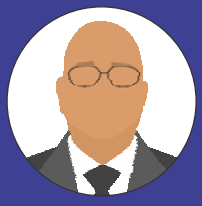
**Pratap Ayarekar**
**Manager – O & M**

Regd. Office : MGL House, Block No. G - 33, Bandra Kurla Complex, Opp. ICICI Tower, Bandra (E), Mumbai - 400 051. Tel. : 6678 500

MECO®
SINCE 1962

## Multifunction Meters

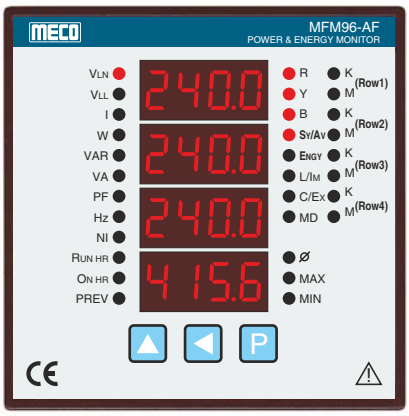
- ✓ 3 Phase VAF / VIF Meter – TRMS
- ✓ 3 Phase Multifunction Power & Energy Meter / Powerline Supervisor
- ✓ 1 Phase & 3 Phase Multifunction Power & Energy Meter / Transducer
- ✓ 1 Phase Multifunction Meters – TRMS
- ✓ 1 Phase Multifunction Appliance Meter – TRMS With RS-485 Port
- ✓ Power Guard – TRMS



+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable

| FEATURES / PARAMETERS | | MFM-96AFN | MFT-96AFN DIN RAIL | MFM-96AF | MFM-96S | SPVR-96S | MFM Din Rail | MFM-96U/ MFM-96UMT | SPVR-96U/ SPVR-96UMT |
|---|---|---|---|---|---|---|---|---|---|
| TRMS Measurement | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Display | LED- Super Bright | ✓ | ✓ | ✓ | ✓ | - | - | ✓ | - |
| | LCD- With Backlight | - | - | - | - | ✓ | ✓ | - | ✓ |
| Communication | RS 485 MODBUS, 4KV Isolated Port | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| System | 1 Phase 2 Wire System | ✓ | ✓ | - | - | - | - | - | - |
| | 3 Phase 3 Wire System | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 3 Phase 4 Wire System (Balanced / Unbalanced) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Aux. Supply | 85-265V AC / DC (Standard) | ✓ | ✓ | ✓ | ✓ | ✓ | - | 230V AC ±20% or 110V AC ±20% | |
| | 19 - 90V AC / DC (Optional) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Current | I1, I2, I3, I Average | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | I12 , I31, I Average | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Neutral Current | ✓ | ✓ | ✓ | - | - | - | - | - |
| Voltage | V1N, V2N, V3N, V Average | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | V12, V23, V31, V Average | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| | V12, V31, V Average | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | - |
| Frequency | Hz | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Active Power | W1, W2, W3, W System | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Reactive Power | Var1, Var2, Var3, Var System | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Apparent Power | VA1, VA2, VA3, VA System | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Power Factor | PF1, PF2, PF3, PF System | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Active Energy | KWh1, KWh2, KWh3, KWh Total (Import) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | KWh1, KWh2, KWh3, KWh Total (Export) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Reactive Energy | KVARh1, KVARh2, KVARh3, KVARh Total (Ind.) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | KVARh1, KVARh2, KVARh3, KVARh Total (Cap.) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Apparent Energy | KVAh1, KVAh2, KVAh3, KVAh Total | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Previous Energy | Active (Import / Export) | ✓ | ✓ | ✓ | - | - | - | - | - |
| | Reactive (Ind. / Cap.) | ✓ | ✓ | ✓ | - | - | - | - | - |
| | Apparent | ✓ | ✓ | ✓ | - | - | - | - | - |
| Energy Retention & Reset | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| MAX. Demand | KW System / KVA System | ✓ | ✓ | ✓ | - | - | - | MFM96S UMT | SPVR96S UMT |
| THD | V1, V2, V3, I1, I2, I3 | ✓ | ✓ | - | - | - | - | - | - |
| Scroll - Auto / Manual | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | MFM96S UMT | SPVR96S UMT |
| Password Protection | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | MFM96S UMT | SPVR96S UMT |
| CT / PT Primary & Secondary Programmable | | ✓ | ✓ | - | - | - | - | - | - |
| Baud Rate | 2.4 - 19.2 kbps (Selectable) | ✓ | ✓ | - | - | - | - | - | - |
| | 9.6 kbps (Standard) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Inbuilt Memory to Programme, Store And Reset For | CTR | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | PTR | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Instrument Address | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | MD Period | ✓ | ✓ | ✓ | - | - | - | MFM96S UMT | SPVR96S UMT |
| | Password | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | MFM96S UMT | SPVR96S UMT |
| Phase Angle | R, Y, B | ✓ | ✓ | ✓ | - | - | - | - | - |
| Phasor Angle | RY, YB, BR | ✓ | ✓ | ✓ | - | - | - | - | - |
| RUN Hour | Import | ✓ | ✓ | ✓ | - | - | - | - | - |
| | Export | ✓ | ✓ | ✓ | - | - | - | - | - |
| | Total (Import + Export) | ✓ | ✓ | ✓ | - | - | - | - | - |
| ON Hours | | ✓ | ✓ | ✓ | - | - | - | - | - |
| Voltage | Min. Value, Max Value | ✓ | ✓ | ✓ | - | - | - | - | - |
| Current | Min. Value, Max Value | ✓ | ✓ | ✓ | - | - | - | - | - |




**MFM-96AF**

## Features

- TRMS Measurement
- 23 Parameters on 46 Pages
- 4 Rows of 4 Digit Super Bright RED LED Display
- 3 Phase 3 Wire / 3 Phase 4 Wire System (User Selectable)
- Programable CTR, PTR, Instrument Address, Password & MD Period
- Energy Import-Export (4 Quadrant Operation)
- POWER MASTER Software (Optional)
- RS485 Port, 4KV Isolated with MODBUS RTU Protocol (Optional)
- CE Compliance with EN61010-1, EN61326-1
- Inbuilt Memory to Store CTR, PTR, Instrument Address, Password & MD period
- Auto Scroll (5 sec.) / Manual Scroll Display
- Built in 20 Energy Meters of 8 Digit Resolution
- Energy Retention & Password Protected Energy Reset Facility
- Max. Demand for KW or KVA with user Selectable Demand Interval 5-30 Minutes
- Password for Protection of Programmable Parameters
- RUN Hours, ON Hours
- Phase Angle & Phasor Angle Measurement
- Display Previous Energies
- Set Date & Time
- Measurement of Min. & Max. Voltage & Current Values

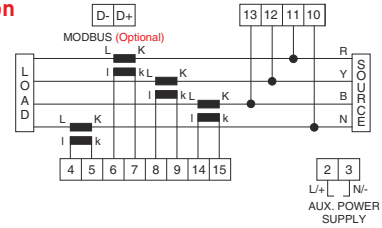
| Parameters Measured | Accuracy ±(FS +5Digit) | | Phase | System |
|---|---|---|---|---|
| | Standard | Optional | | |
| **Voltage** | ± 0.5% | ± 0.2% | V1N, V2N, V3N, V12, V23, V31 | V (System) |
| **Current** | ± 0.5% | ± 0.2% | I1, I2, I3, NI | I (Average) |
| **Active Power** | ± 1% | ± 0.5% | W1, W2, W3 | W (System) |
| **Reactive Power** | ± 1% | ± 0.5% | Var1, Var2, Var3 | Var (System) |
| **Apparent Power** | ± 1% | ± 0.5% | VA1, VA2, VA3 | VA (System) |
| **Maximum Demand** | ± 0.5% | | W1, W2, W3, VA1, VA2, VA3 | W (System), VA (System) |
| **Frequency** | ± 0.2 Hz | | NA | Hz (System) |
| **Power Factor** | ± 1⁰ Electrical | | PF1, PF2, PF3 | PF (System) |
| **Active Energy** | Class 1 | | KWh1, KWh2, KWh3 | KWh Total (Imp.), KWh Total (Exp.) |
| **Reactive Energy** | | | KVarh1, KVarh2, KVarh3 | KVarh Total (Ind.), KVarh Total (Cap.) |
| **Apparent Energy** | | | KVAh1, KVAh2, KVAh3 | KVAh Total |
| **Phase Angle** | NA | | V1V2, V1V3, V1I1, V2I2, V3I3 | NA |

## Specifications

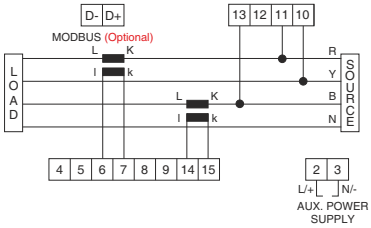
| | | | | |
|---|---|---|---|---|
| **Display** | Simultaneous Display of 4 Parameters, 4 Digits Resolution, 0.36" / 9.2mm Digit Height | | Current Input | <0.2VA / Phase |
| | | | **System** | 3P2E3W / 3P3E4W |
| **Auxiliary Supply** | 85 - 265V AC / DC, Optional : 19 - 90V AC / DC | | **Standard** | |
| **Input** | | | Installation Category | Cat II (IEC / EN61010-1) |
| Voltage/Phase | 51 - 300VAC (Max.) PH-N | Any one | Pollution | Degree 2 (IEC / EN61010-1) |
| | 17 - 138VAC (Max.) PH-N | | **Environment** | |
| | 88 - 519VAC (Max.) PH-PH | Any one | Calibration | 27°C ± 5°C |
| | 30 - 239VAC (Max.) PH-PH | | Operating | 0 to 50°C, RH < 70% |
| Current/Phase | 0.050A to 1.2A (Max.) | Any one | Storage | -10 to 60°C, RH < 70% |
| | 0.250A to 6A (Max.) | | **Terminal Block** | Plug in type |
| | | | **Dimensions (mm)** | |
| Frequency | 45 - 65 Hz | | Front | 96 x 96mm |
| Power Factor | 0.300 Lag (L) - 1 .000 - 0.300 Lead (C) | | Depth (Behind Bezel) | 90mm |
| **VA Burden (Typical)** | | | Panel Cut-Out | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |
| Auxiliary | <2.5VA | | **Dielectric Strength** | 2.5kV at 50Hz for 1 min. |
| Voltage Input | <0.3VA / Phase | | **Insulation Resistance** | >20MOhms at 500V DC |

**Ordering Information :** Model, Input Voltage, Input Current, Input Frequency, Accuracy (Standard / Optional) and RS485 MODBUS Communication (Optional)

## Terminal Connection




3 Phase 3 Element 4 Wire

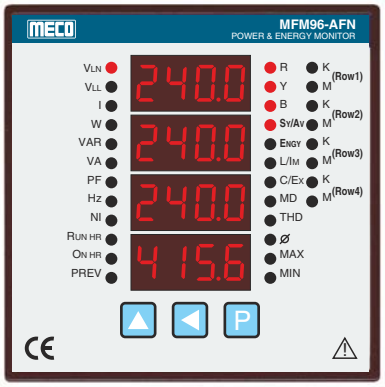



3 Phase 2 Element 3 Wire

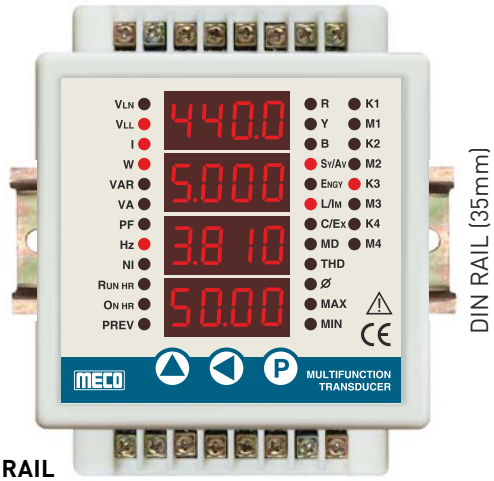
new

Preliminary Data

RS 485




**MFM-96AFN**




**MFT-96AFN DIN RAIL**

DIN RAIL (35mm)

## Features

- TRMS Measurement
- 23 Parameters on 46 Pages
- 4 Rows of 4 Digit Super Bright RED LED Display
- 1 Phase 2 Wire / 3 Phase 3 Wire / 3 Phase 4 Wire System (User Programmable)
- CT/PT Primary & Secondary Programmable
- Programmable CT, PT, Instrument Address, Password & MD Period
- Inbuilt Memory to Store CT, PT, Instrument Address, Password & MD period
- Display Digit Height 0.36" / 9.2mm
- Energy Import-Export (4 Quadrant Operation)
- RS485 Port, 4KV Isolated with MODBUS RTU Protocol (Optional)
- CE Compliance with EN61010-1, EN61326-1
- Baud Rate (2.4-19.2kbps)
- Auto Scroll (5 sec.) / Manual Scroll Display
- Built in 20 Energy Meters of 8 Digit Resolution
- Energy Retention & Password Protected Energy Reset Facility
- Max. Demand for KW and KVA with user Selectable Demand Interval 1-30 Minutes
- THD for Voltage & Current (1 to 63rd Order)
- Password for Protection of Programmable Parameters
- RUN Hours, ON Hours (9999 9999 9999 :59:59)
- Phase Angle & Phasor Angle Measurement
- Display Previous Energies
- Set Date & Time
- Measurement of Min. & Max. Voltage & Current Values
- Sleep Mode for the Display

## Specifications

| Parameters Measured | Accuracy ± (FS +5Digit) | Phase | System |
|---|---|---|---|
| **Voltage** | 0.2% | V1N, V2N, V3N, V12, V23, V31 | V (System) |
| **Current** | | I1,I2,I3, NI | I (Average) |
| **Active Power** | 0.5% | W1, W2, W3 | W (System) |
| **Reactive Power** | | Var1, Var2, Var3 | Var (System) |
| **Apparent Power** | | VA1, VA2, VA3 | VA (System) |
| **Maximum Demand** | 0.5% | NA | W (System), VA (System) |
| **Harmonic Distortion (1-63) THD (upto 63rd Order)** | 5% | RVH1-63, YVH1-63, BVH1-63 RIH1-63,Y1H1-63, BIH1-63 | THD - V, THD -I |
| **Frequency** | ± 0.2 Hz | NA | Hz (System) |
| **Power Factor** | ± 1° Electrical | PF1, PF2, PF3 | PF (System) |
| **Active Energy** | 0.5% | KWh1, KWh2, KWh3 | KWh Total (Import), KWh Total (Export) |
| **Reactive Energy** | | KVarh1, KVarh2, KVarh3 | KVarh Total (Ind.), KVarh Total (Cap.) |
| **Apparent Energy** | | KVAh1, KVAh2, KVAh3 | KVAh Total |
| **Phase Angle** | NA | V1V2, V1V3, V1I1, V2I2, V3I3 | NA |

## Specifications

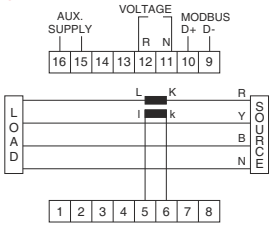
| | | |
|---|---|---|
| **Display** | Simultaneous Display of 4 Parameters, 4 Digits Resolution, 0.36" / 9.2mm Digit Height | |
| **Auxiliary Supply** | 85 - 265V AC / DC @ 50/60Hz (Standard) | |
| | 19 - 90V AC / DC @ 50/60Hz (Optional) | |
| **Input** | | |
| Voltage / Phase | 26 - 520VAC (Max.) PH-PH | Programmable |
| | 15 - 300VAC (Max.) PH-N | |
| Current / Phase | 0.100A - 1.2A (Max.) for 1A AC | |
| | 0.100A - 6.0A (Max.) for 5A AC | |
| Frequency | 40 - 70 Hz | |
| Power Factor | 0.300 Lag (L) - 1 .000 - 0.300 Lead (C) | |
| **VA Burden (Typical)** | | |
| Auxiliary | <2.5VA | |
| Voltage Input | <1VA / Phase | |
| Current Input | <1VA / Phase | |

| | | |
|---|---|---|
| **System** | 1P1E2W / 3P2E3W / 3P3E4W | |
| **Standard** | | |
| Installation Category | Cat II (IEC / EN61010-1) | |
| Pollution | Degree 2 (IEC / EN61010-1) | |
| **Environment** | | |
| Calibration | 27°C ± 5°C | |
| Operating | 0 to 50°C, RH < 70% | |
| Storage | -10 to 60°C, RH < 70% | |
| **Terminal Block** | 1) Plug in type for Flush Mounting<br>2) Screw type for DIN RAIL Mounting | |
| **Dimensions (mm)** | **Panel Mount** | **DIN Rail** |
| Front | 96 x 96mm | 96 x 120mm |
| Depth (Behind Bezel) | 90mm | 93mm |
| Panel Cut-Out / Mounting | $92^{(+0.8, -0.0)}$ x $92^{(+0.8, -0.0)}$ | 35mm DIN Rail |
| **Dielectric Strength** | 2.5kV at 50Hz for 1min. | |
| **Insulation Resistance** | >20MOhms at 500V DC | |

**Ordering Information :** Model, Input Voltage, Input Current, Input Frequency, Auxiliary Supply and RS485 MODBUS Communication (Optional)

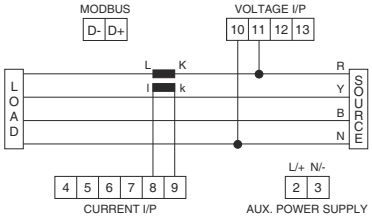
## Terminal Connection

**MFT-96AFN**
**DIN RAIL**

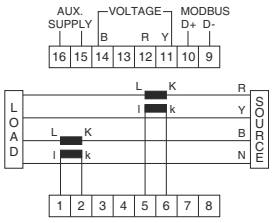



1 Phase 1 Element 2 Wire

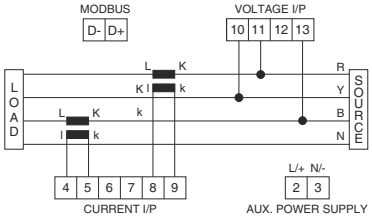
**MFM-96AFN**



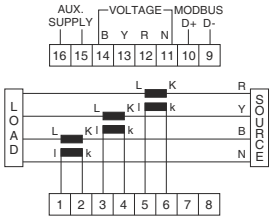

1 Phase 1 Element 2 Wire



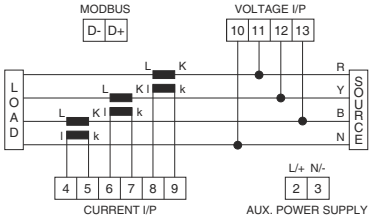

3 Phase 2 Element 3 Wire



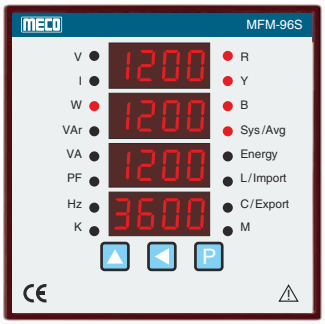

3 Phase 2 Element 3 Wire



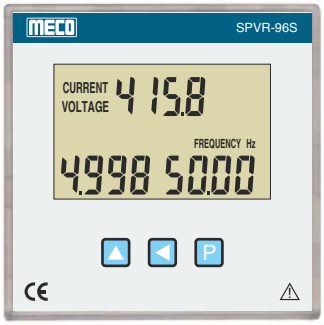

3 Phase 3 Element 4 Wire



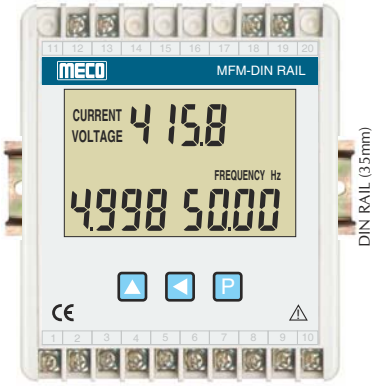

3 Phase 3 Element 4 Wire




**MFM-96S**




**SPVR-96S**




**MFM-DIN RAIL**

## Features

- 10 Parameters, 48 Values on 16 Pages (MFM-96S)
- 10 Parameters, 50 Values on 34 Pages (Others)
- TRMS Measurement
- 3 Phase 3 Wire / 3 Phase 4 Wire (User Selectable)
- Auto / Manual Scroll Display (Programmble)
- POWER MASTER Software (Optional)
- RS485 Port, 4KV Isolated with MODBUS RTU Protocol (Optional)
- CE Compliance as per EN61010-1, EN61326-1
- Inbuilt Memory to Store CTR, PTR, Inst. Address & Password
- CTR, PTR, Inst. Address, Password & Energy Reset (Programmble)
- Energy Import - Export (4 Quadrant Operation) & Energy Retention
- Energy Reset & Programmable Parameters (Password Protected)

| Parameters Measured | Accuracy ± (FS +5 Digit) | | Phase | System |
|---|---|---|---|---|
| | Standard | Optional | | |
| Voltage | ± 0.5% | ± 0.2% | V1N, V2N, V3N, V12, V23, V31 | V (System) |
| Current | ± 0.5% | ± 0.2% | I1, I2, I3 | I (Average) |
| Active Power | ± 1.0% | ± 0.5% | W1, W2, W3 | W (System) |
| Reactive Power | ± 1.0% | ± 0.5% | Var1, Var2, Var3 | Var (System) |
| Apparent Power | ± 1.0% | ± 0.5% | VA1, VA2, VA3 | VA (System) |
| Frequency | ± 0.2 Hz | ± 0.2 Hz | NA | Hz (System) |
| Power Factor | ± 1° Electrical | | PF1, PF2, PF3 | PF (System) |
| Active Energy | Class 1 | | KWh1, KWh2, KWh3 | Kwh Total (Import) & Kwh Total (Export) |
| Reactive Energy | | | KVarh1, KVarh2, KVarh3 | KVarh Total (IND.) & KVarh Total (CAP.) |
| Apparent Energy | | | KVAh1 , KVAh2, KVAh3 | KVAh Total |

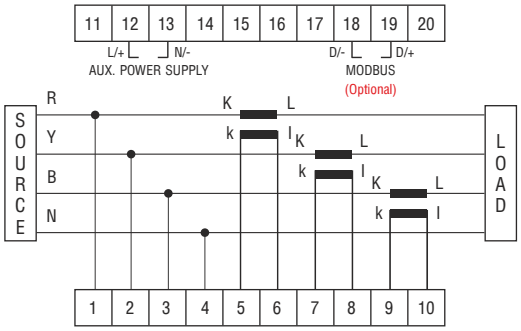
## Specifications

| | | | | |
|---|---|---|---|---|
| Auxiliary Supply | 85 - 265VAC / DC (Standard) | | Current I/P | < 0.2 VA / Phase |
| | 19 - 90VAC / DC (Optional) | | System | 3P2E3W / 3P3E4W ( User Selectable ) |
| Voltage / Phase | 51 - 300VAC (Max.) (PH-N) | Any one | Standard | |
| | 16 - 138VAC (Max.) (PH-N) | | Installation Category | CAT II ( IEC / EN61010 - 1) |
| | 88 - 519VAC (Max.) (PH-PH) | Any one | Pollution | Degree 2 ( IEC / EN61010 - 1) |
| | 28 - 239VAC (Max.) (PH-PH) | | Environment | |
| Current / Phase | 0.03A to 1.2A (Max.) | Any one | Calibration | 27°C ±5°C |
| | 0.110A to 6A (Max.) | | Operating | 0 to 50°C , RH < 70% |
| Frequency | 45 - 55Hz | | Storage | -10 to 60°C , RH < 70% |
| Power Factor | 0.300 Lag (L) - 1.000 - 0.300 Lead (C) | | Terminal Block | Screw Type |
| VA Burden ( Typical ) | | | Dielectric Strength | 2.5KV at 50 Hz for 1 min. |
| Auxiliary | < 3 VA | | Insulation Resistance | > 20 MOhms at 500VDC |
| Voltage I / P | < 0.3 VA / Phase | | | |

## Dimension (mm)

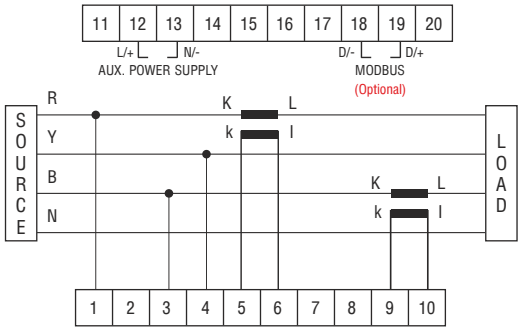
| Model | MFM-96S / SPVR-96S | MFM-DIN RAIL |
|---|---|---|
| Front | 96 x 96 | 115 (L) x 96(W) x 60(D) |
| Depth ( Behind Bezel panel ) | 43 | |
| Cut - out | $92^{(+0.8,-0.0)}$ x $92^{(+0.8,-0.0)}$ | |
| Case / Housing Material | DIN Black ABS, Dimension as per DIN 43700 | ABS Gray |
| Mounting | Panel | DIN RAIL (35mm) |
| Mounting Clamps | Sturdy, Moulded Derlin with Suitable Hardware | |
| Terminals / Connectors | Terminal Block : Thermo Plastic (UL94V-0) with Tin Plated Brass Terminal | |

## Terminal Connection

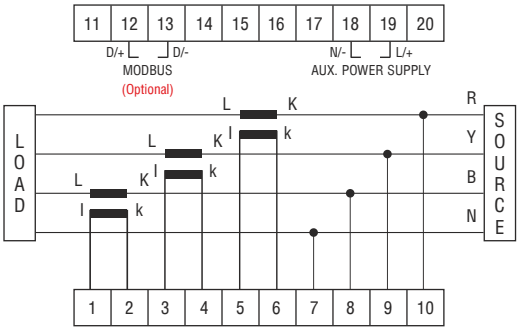



3 Phase 3 Element 4 Wire

**MFM-96S**
**SPVR-96S**

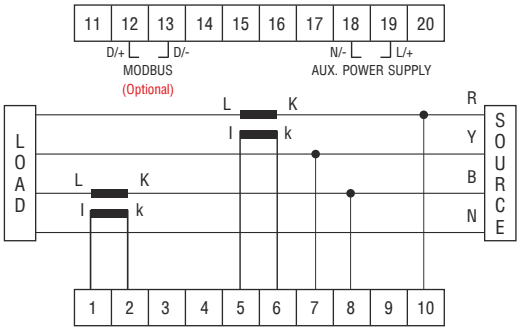



3 Phase 2 Element 3 Wire



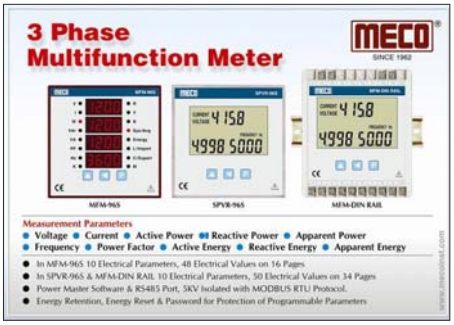

3 Phase 3 Element 4 Wire

**MFM-DIN RAIL**

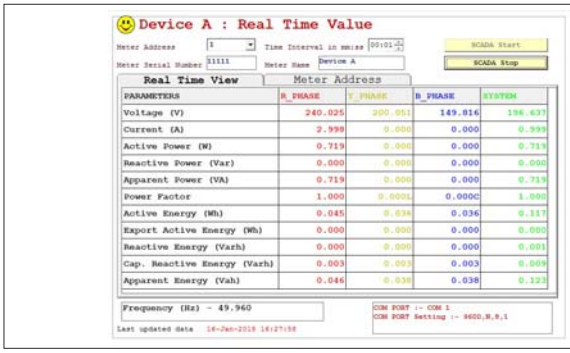



3 Phase 2 Element 3 Wire

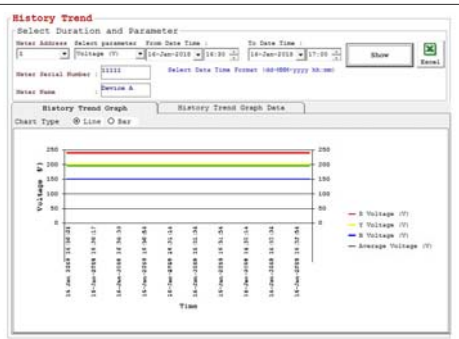
**Ordering Information:** Model, Input Voltage, Input Current, Input Frequency, Accuracy (Standard / Optional), System 3P3E4W / 3P2E3W, CTR / PTR (if any), Auxiliary Supply & RS485 MODBUS Communication Port (Optional)



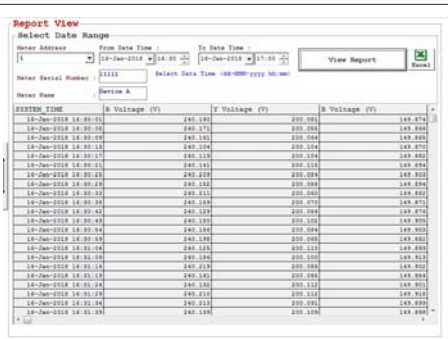

**POWER MASTER SOFTWARE**



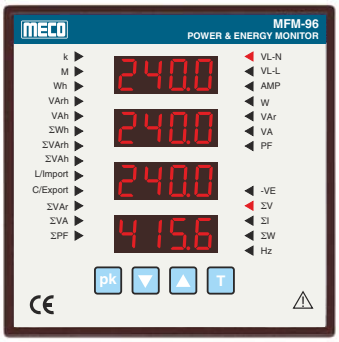

**REAL TIME DISPLAY**



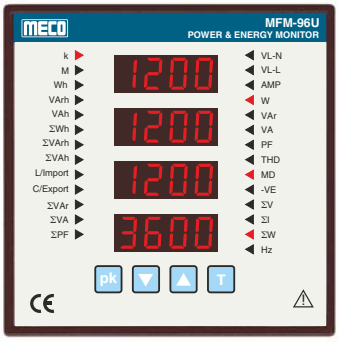

**HISTORY TREND**




**REPORT VIEW DISPLAY**




MFM-96U




MFM-96UMT

## Features

- TRMS Measurement
- More than 65 Electrical Parameters on 20 display pages
- 4 Rows of 4 Digit Super Bright Red LED Display
- 3 Phase 3 Wire / 3 Phase 4 Wire (User Selectable)
- Programmable CTR, PTR & Instrument Address
- 8 digits Resolution for Energy
- Energy Import-Export (4 Quadrant Operation)
- IP54 (for meter front)
- POWER MASTER Software
- MODBUS RTU Protocol
- RS 485 Port, 4kV Isolated (Optional for MFM-96U, Standard for MFM-96UMT)
- CE Compliance with EN61010-1, EN61326-1
- Inbuilt Microcontroller Memory to store CTR, PTR & Instrument Address
- Max. Demand for KW & KVA with User Selectable Demand Interval (1 - 9999 min. for MFM-96UMT)
- THD for Voltage & Current (for MFM-96UMT)
- Password for Protection of Programmable Parameters (MFM-96UMT)
- Auto Scroll (5 sec.) / Manual Scroll Display (for MFM-96UMT)

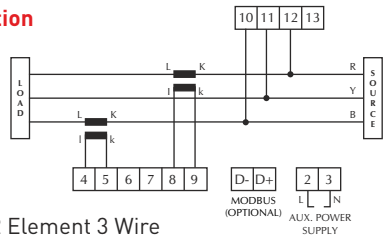
| Parameters Measured | Accuracy ± (FS +5Digit) | Phase | System |
|---|---|---|---|
| Voltage | ± 0.5% | V1N, V2N, V3N, V12, V23, V31 | V (System) |
| Current | | I1, I2, I3 | I (System) |
| Active Power | ± 0.5% | W1, W2, W3 | W (System) |
| Reactive Power | ± 1% | Var1, Var2, Var3 | Var (System) |
| Apparent Power | ± 0.5% | VA1, VA2, VA3 | VA (System) |
| Frequency | ± 0.2 Hz | - | Hz (System) |
| Power Factor | $1^0$ Electrical | PF1, PF2, PF3 | PF (System) |
| Active Energy | ± 1% | KWh1, KWh2, KWh3 | KWh Total (Imp), KWh Total (Exp) |
| Reactive Energy | ± 1% | KVarh1, KVarh2, KVarh3 | KVarh Total (Ind.), KVarh Total (Cap.) |
| Apparent Energy | ± 1% | KVAh1, KVAh2, KVAh3 | KVAh Total |

| | |
|---|---|
| **Display** | Simultaneous Display of 4 Parameters, 4 Digits Resolution, 0.36" / 9.2mm Digit Height |
| **Auxiliary Supply** (any one only) | 230V AC ±20% @50Hz (Standard)<br>110V AC ±20% @50Hz (Optional) |
| **Input** | |
| Voltage/Phase | 50 - 300V (max.) (Phase to Neutral) |
| Current/Phase | 0.2A to 1.2 A (max.) or<br>1A to 6A (max.) (any one only) |
| Frequency | 45-55 Hz |
| Power Factor | 0.300 Lag (L) - 1.000 - 0.300 Lead (C) |
| **VA Burden (Typical)** | |
| Auxiliary | <5VA |
| Voltage Input | <0.1VA / Phase |
| Current Input | <0.5VA / Phase |

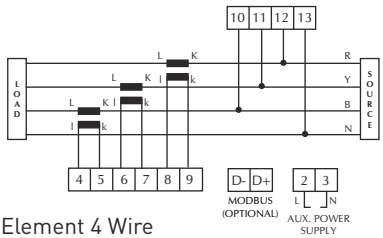
| | |
|---|---|
| **System** | 3P2E3W / 3P3E4W (user selectable) |
| **Standard** | |
| Installation Category | Cat II (IEC / EN61010-1) |
| Pollution | Degree 2 (IEC / EN61010-1) |
| **Environment** | |
| Calibration | $27^0C \pm 5^0C$ |
| Operating | $0$ to $50^0C$, RH < 70% |
| Storage | $-10$ to $60^0C$, RH < 70% |
| Terminals | Plug in type |
| **Dimensions (mm)** | |
| Front | 96 x 96mm |
| Depth (Behind Bezel) | 90mm |
| Panel Cut-Out | $92^{[+0.8,\ 0.0]}$ x $92^{[+0.8,\ 0.0]}$ |
| Dielectric Strength | 2.5kV at 50Hz for 1 min. |
| Insulation Resistance | >20MOhms at 500V DC |

**Ordering Information :** Model, Input Voltage, Input Current, Input Frequency, System (3P2E3W or 3P3E4W), CTR / PTR (if any), RS485 MODBUS Communication (Optional) & Auxiliary Supply (Standard / Optional)

**Terminal Connection**
(under revision)




3 Phase 2 Element 3 Wire




3 Phase 3 Element 4 Wire


VIF96U

## Features

- TRMS Measurement
- Measures V, A, Hz, Run Hour, ON Hour & RPM
- RUN Hour / ON Hour (Max. 99999 Hours, 59 Minutes, 59 Second)
- RUN Hour / ON Hour Reset Facility
- Auto Scroll / Manual Scroll Display
- 3 Phase 4 wire
- 3 Rows of 3 Digits Super Bright Red LED Display
- Programmable CTR, PTR, Number of Pole Setting
- Auto Indication for 'KV' & 'KA'
- Auto Selection of Decimal Point

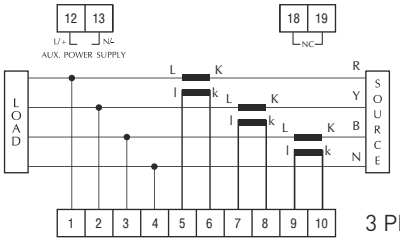
| Parameters Measured | Accuracy ±(%FS) | Phase | System |
|---|---|---|---|
| **Voltage** | ± 0.5% | VRN, VYN, VBN, VRY, VYB, VBR | V (System) |
| **Current** | ± 0.5% | IR, IY, IB | I (Average) |
| **Frequency** | ± 0.2 Hz | NA | Hz (System) |
| **RPM** | ± 0.5% | NA | RPM (System) |
| **RUN Hour** | NA | NA | RUN Hour (System) |
| **ON Hour** | NA | NA | ON Hour (System) |

## Specifications

| | | | | |
|---|---|---|---|---|
| **Display** | 3 Rows of 3 Digit RED Seven Segment Display 0.56" / 14.2mm Digit Height | | **Voltage Input** | < 0.2 VA / Phase |
| | | | **Current Input** | < 0.2 VA / Phase |
| **Auxiliary Supply** | 85 - 265 V AC/DC (SMPS) | | **System** | 3 Phase 3 Element 4Wire |
| | 19 - 90 V AC/DC (SMPS) (Optional) | | **Standard** | |
| | | | **Installation Category** | Cat II (IEC / EN61010 - 1) |
| **Input Voltage** | 51 - 300 V AC ( Max.) (PH - N) | Any one | **Pollution** | Degree 2 (IEC / EN61010 - 1) |
| | 21 - 150 V AC ( Max.) (PH - N) | | **Environment** | |
| | 88 - 519 V AC ( Max.) (PH - PH) | Any one | **Calibration** | 27°C ± 5°C |
| | 36 - 258 V AC ( Max.) (PH - PH) | | **Operating** | 0 to 50°C, RH < 70% |
| **Input Current** | 0.25 A to 6 A ( Max.) For 5A Meter | Any one | **Storage** | -10 to 60°C, RH < 70% |
| | 0.05 A to 1.2 A (Max.) For 1A Meter | | **Dimensions (mm)** | |
| **Frequency** | 45 - 55 Hz | | **Front** | 96 x 96 mm |
| **RPM** | As per Number of Pole Setting. Fully Programmable (1 - 255) | | **Depth (Behind Bezel)** | 43 mm |
| | | | **Panel Cutout** | 92 (+0.8, - 0.0) x 92 (+0.8, - 0.0) |
| **VA Burden (Typical)** | | | **Dielectric Strength** | 2.5 KV at 50 Hz for 1 min |
| **Auxiliary** | < 2.5 VA | | **Insulation Resistance** | > 20 MOhms at 500 V DC |

**Ordering Information :** Model, Input Voltage, Input Current, Input Frequency, System 3P3E4W & Auxiliary Supply

## Terminal Connection




3 Phase 3 Element 4 Wire

| FEATURES / PARAMETERS | | EM-08S (1A/5A AC) | EM-09 (1A/5A/ 20A AC) | EM-08/ EM-08D (1A/5A AC) | PG-09 (1A/5A/ 20A AC) |
|---|---|---|---|---|---|
| TRMS MEASUREMENT | | ✓ | ✓ | ✓ | ✓ |
| DISPLAY | LCD (With Backlight) | ✓ | ✓ | ✓ | ✓ |
| COMMUNICATION | RS 485 MODBUS, 4KV Isolated Port | ✓ (Optional) | ✓ (Optional) | - | - |
| SYSTEM | 1 Phase | ✓ | ✓ | ✓ | ✓ |
| AUX. SUPPLY | 230V AC | - | - | ✓ | ✓ |
| | SMPS (85-265V AC/DC) | ✓ | ✓ | - | - |
| CURRENT | I | ✓ | ✓ | ✓ | ✓ |
| VOLTAGE | V (P-N) | ✓ | ✓ | ✓ | ✓ |
| FREQUENCY | Hz | ✓ | ✓ | ✓ | ✓ |
| ACTIVE POWER | W / KW | ✓ | ✓ | ✓ | ✓ |
| REACTIVE POWER | Var / KVar | ✓ | ✓ | ✓ | ✓ |
| APPARENT POWER | VA / KVA | ✓ | ✓ | ✓ | ✓ |
| POWER FACTOR | PF | ✓ | ✓ | ✓ | ✓ |
| ACTIVE ENERGY | KWh (Import) | ✓ | ✓ | ✓ | ✓ |
| REACTIVE ENERGY | KVARh (Ind) | ✓ | ✓ | ✓ | - |
| APPARENT ENERGY | KVAh | ✓ | ✓ | ✓ | - |
| $CO_2$ | KG | - | - | - | ✓ |
| TUT | HOUR / MIN | - | - | - | ✓ |
| MONEY | CU | - | - | - | - |
| TARIFF | CU / KWh | - | - | - | - |
| TIMER & RELAY | - | - | - | - | - |
| ENERGY RETENTION & RESET | | ✓ | ✓ | ✓ | ✓ |
| AUTO SCROLLING | | ✓ | ✓ | ✓ | - |
| MANUAL SCROLLING | | ✓ | ✓ | ✓ | ✓ |
| INBUILT MEMORY TO PROGRAM, STORE AND RESET FOR | CTR | ✓ | - | ✓ | - |
| | INSTRUMENT ADDRESS | ✓ | ✓ | - | - |

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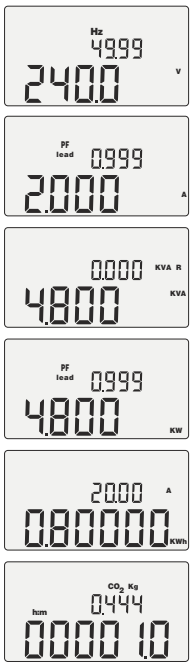
**PG09 - 20A**
**PG09 - 5A**
**PG09 - 1A**

## Display Pages




POWERGUARD is a simple to use and easy to handle product which is widely used because of its portability and light weight

## Measures

- TRMS Voltage (V)
- Frequency (Hz)
- TRMS Current (A)
- Power Factor (PF)
- Apparent Power (KVA)
- Reactive Power (KVAr)
- Active Power (KW)
- Energy Consumption (KWh)
- Energy Usage Time (EUT)
- Carbon Emission ($CO_2$ in kg)

## Features

- Three Pin Socket & Plug Suitable for Indian Socket
- Large Dual Row LCD Display with Backlight & Annunciator
- Memory Retention (KWh, EUT)
- Simple, Easy & Accurate
- Continuous Measurement
- Counts $CO_2$ generated by Electrical Equipment (0.555kg $CO_2$ is generated by using 1KWh Energy)

## General Specifications

- Accuracy : Class 1.0
- Power Consumption : Less than 2W (with backlight)
- Working Temperature : -10°C to +55°C, <70% RH
- Dimensions : 156 x 78 x 48mm (approx.)
- Weight : 300gms (approx.)

## Specifications

| Function | PG09 - 20A | PG09 - 5A | PG09 - 1A | Accuracy |
|---|---|---|---|---|
| **RMS Voltage (V)** | 240V AC (Nominal) (195V ~ 265Vrms) | | | ± 0.5% of FS |
| **RMS Current (A)** | (0.110 ~ 20.00) Arms | (0.100 ~ 6.000) Arms | (0.010 ~ 1.200) Arms | ± 0.5% of FS |
| **Active Power @240VAC (KW)** | (0.026 ~ 4.800) KW | (0.024 ~ 1.440) KW | (2.400 ~ 288.0) W | ±1.0% of FS |
| **Apparent Power @240VAC (KVA)** | (0.026 ~ 4.800) KVA | (0.024 ~ 1.440) KVA | (2.400 ~ 288.0) VA | ±1.0% of FS |
| **Reactive Power @240VAC (KVAr)** | (0.026 ~ 4.800) KVAr | (0.024 ~ 1.440) KVAr | (2.400 ~ 288.0) VAr | ±1.0% of FS |
| **Power Factor (PF)** | (0.026 ~ 0.120) KW | (0.024 ~ 0.096) KW | (021.6 ~ 048.0) W | > 0.03 PF |
| | (0.120 ~ 4.800) KW | (0.096 ~ 1.440) KW | (048.0 ~ 288.0) W | < 0.03 PF |
| **Line Frequency (Hz)** | 45.00 ~ 55.00 Hz | | | ± 0.2 Hz |
| **Active Energy (KWh)** | 000000 ~ 999999 KWh | | | Class 1 |
| **Energy Usage Time (EUT)** | Hours / Minutes | | | NA |
| **Carbon Emission ($CO_2$ in kg)** | $CO_2$ (Kg) | | | NA |
| **Applications** | Teaching, Demonstration & Testing of Electrical Energy Consumption of Residential & Commercial Appliances. It can be used in Houses, Offices, Shops, Schools, Laboratories etc. | | | |

**Ordering Information :** Model & Range

SOFTWARE

RS 485 + −

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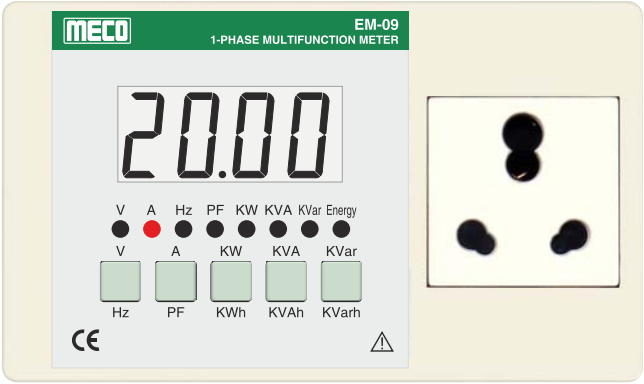



**EM-09 (20A), EM-09 (5A), EM-09 (1A)**

## Features

- Measures V, A, PF, Hz, KW, KVA, KVAr, KWh, KVAh & KVArh
- TRMS Measurement
- Can be used for Continuous Monitoring
- Auto / Manual Scroll Display (User Selectable)
- State of Art Microcontroller Design
- Portable, Easy to Carry and Simple to Use
- LCD Display with Backlight (White)
- RS 485 Port (4kV Isolated) with MODBUS RTU Protocol (Optional)
- POWER MASTER Software for MIS Reports (Optional)

## Specification

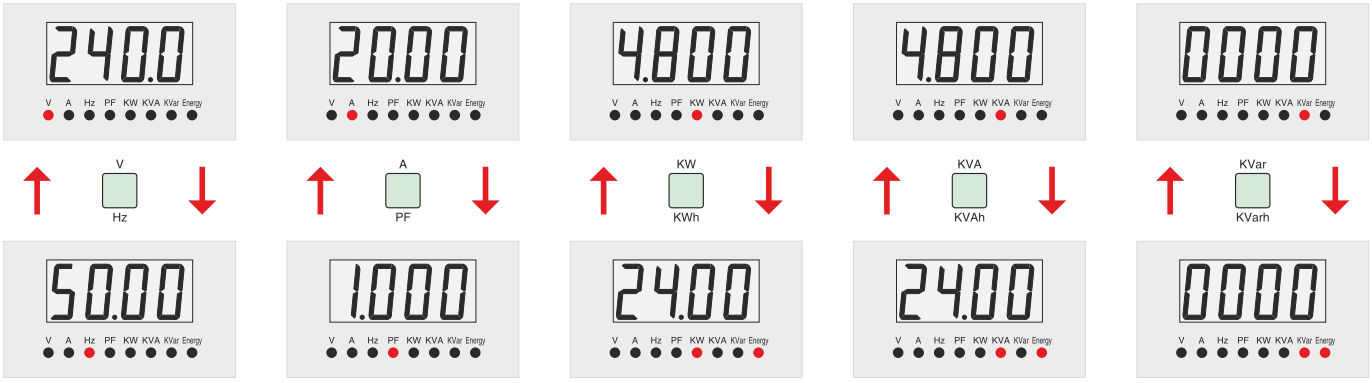
| Functions | EM-09 (20A) | EM-09 (5A) | EM-09 (1A) | Accuracy |
|---|---|---|---|---|
| RMS Voltage | 85~265Vrms | | | ±(0.5% FS +1 dgt.) |
| RMS Current | (0.900A ~ 24Arms) | (0.125A ~ 6.0Arms) | (0.025A ~ 1.2Arms) | |
| Active Power | 0.216 ~ 5.300 KW | 0.030 ~ 1.590 KW | 0.006 ~ 0.318 KW | ±(0.5% FS +1 dgt.) [Cosφ=0.3 to 1.000] |
| Apparent Power | 0.216 ~ 5.300 KVA | 0.030 ~ 1.590 KVA | 0.006 ~ 0.318 KVA | ±(0.5% FS +1 dgt.) |
| Reactive Power | 0.216 ~ 5.300 KVAr | 0.030 ~ 1.590 KVAr | 0.006 ~ 0.318 KVAr | ±(1.0% FS +1 dgt.) [Sinφ=0.3 to 1.000] |
| Power Factor | 0.3 Lag ~ 1.0 ~ 0.3 Lead | | | ±(0.01 PF +1 dgt.) |
| Line Frequency | 45.00 ~ 55.00 Hz | | | ±0.1 Hz |
| Active Energy (KWh) | 0000 ~ 9999 KWh | | | Class 1 |
| Apparent Energy (KVAh) | 0000 ~ 9999 KVAh | | | |
| Reactive Energy (KVArh) | 0000 ~ 9999 KVArh | | | |

**Note :** KW / KVA / KVAr Measurements require Vrms x Irms x Cosφ/Sinφ ≥ 0.006 (for 1A Meter), ≥ 0.030 (for 5A Meter) and ≥ 0.216 (for 20A Meter)

| Model | EM-09 (20A) | EM-09 (1A/5A) |
|---|---|---|
| Case / Housing | ABS Case Suitable for Desktop Mounting / Portable / Wall Mounting Application | |
| Socket & Plug | 6A / 20A Multi Socket & 20A Plug | 6A Socket & 6A Plug |
| Auxiliary Power Supply | 85-265V AC Supplied with 1 Phase Power Cord | |
| Dimensions (mm) | 164 x 100 x 65mm (approx.) | |

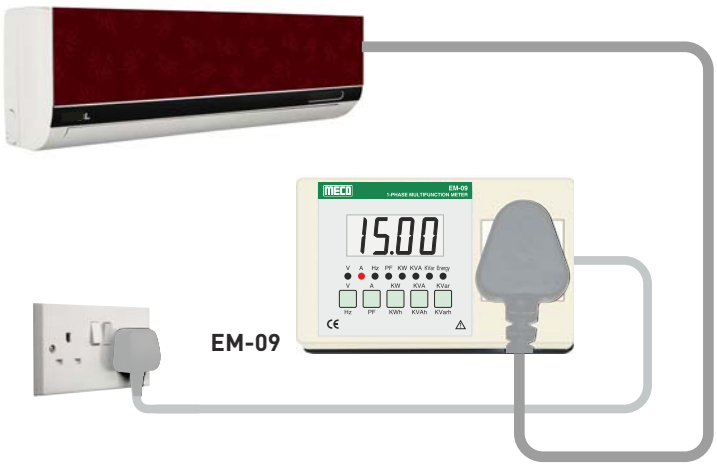
**Ordering Information :** Model, Input Current (20A or 5A or 1A any one only) & RS485 Port (Optional)

## Display Pages



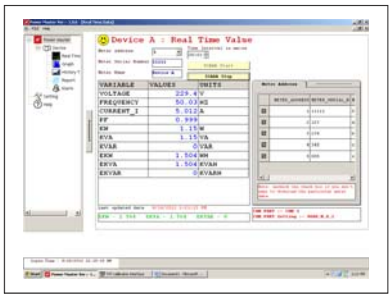
## Application

- Appliances Testing (AC, Refrigerator, Washing Machine etc.)
- LED Lights Testing
- Can be given to Field Technicians in their Tool Kit
- Energy Audit and Plant Maintenance
- Studying Energy Efficiency of Electrical Equipment
- Building Management Systems
- Power Management
- Product Quality Testing

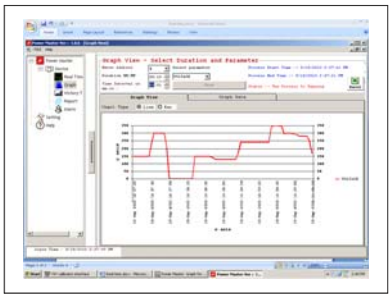



many more ...

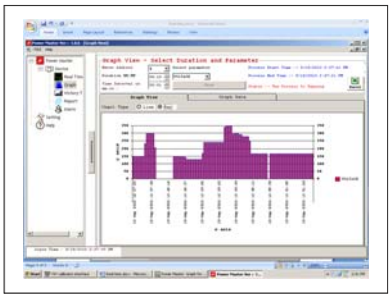
## POWER MASTER Software



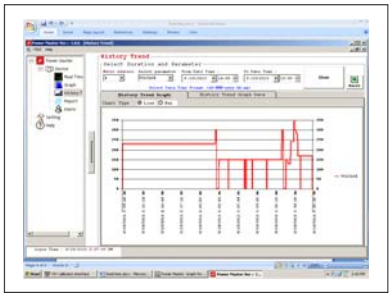
REAL TIME DISPLAY



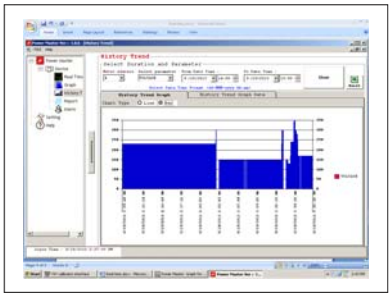
LINE GRAPH DISPLAY



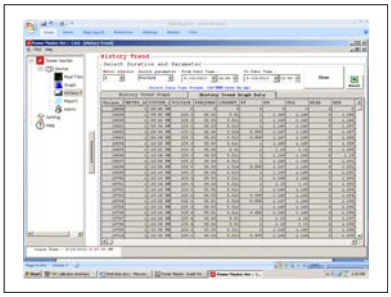
BAR GRAPH DISPLAY



HISTORY TREND - LINE GRAPH DISPLAY



HISTORY TREND - BAR GRAPH DISPLAY



REPORT VIEW DISPLAY

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**EM-08(5A)**
**EM-08(1A)**


**EM-08D(5A)**
**EM-08D(1A)**

## Features

- 10 Parameters on 10 Display Pages
- Measures V, A, PF, Hz, KW, KVA, KVAr, KWh, KVAh & KVArh
- Auto / Manual Scroll Display (User Selectable)
- Reduces Panel Space and Wiring Time
- State of The Art Microcontroller Design
- TRMS Measurement
- Ideal for Testing of Electrical Appliances
- User Programmable CT Ratio (1.00 - 99.99)
- LCD Display with Backlight (20mm Digit Height)

## Application

- Appliance Testing
- Energy Audit
- QC
- Studying Energy Efficiency of Electrical Equipment
- Building Management Systems
- Power Management
- Generator / Motor Characteristics
- Plant Maintenance

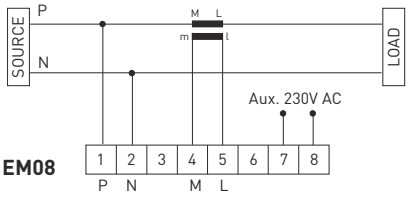
## Specification

| Functions | | EM-08/EM-08D(1A) | Accuracy |
|---|---|---|---|
| **RMS Voltage** | **50.0 ~ 300 Vrms** | | ±(0.5% FS +1 dgt.) |
| **RMS Current** (any one range only) | (0.25 ~ 6.0 Arms) | (0.05 ~ 1.2 Arms) | ±(0.5% FS +1 dgt.) |
| **Active Power** | 0.012 ~ 1.800 KW | 0.002 ~ 0.360 KW | ±(0.5% FS +1 dgt.) [Cosφ=0.3 to 1.000] |
| **Apparent Power** | 0.012 ~ 1.800 KVA | 0.002 ~ 0.360 KVA | ±(0.5% FS +1 dgt.) |
| **Reactive Power** | 0.012 ~ 1.800 KVAr | 0.002 ~ 0.360 KVAr | ±(1.0% FS +1 dgt.) [Sinφ=0.3 to 1.000] |
| **Power Factor** | 0.3 Lag ~ 1.0 ~ 0.3 Lead | | ±(0.01 PF +1 dgt.) |
| **Line Frequency** | 45.00 ~ 65.00 Hz | | ±0.1 Hz |
| **Active Energy (KWh)** | 0000 ~ 9999 KWh | | Class 1 |
| **Apparent Energy (KVAh)** | 0000 ~ 9999 KVAh | | |
| **Reactive Energy (KVArh)** | 0000 ~ 9999 KVArh | | |

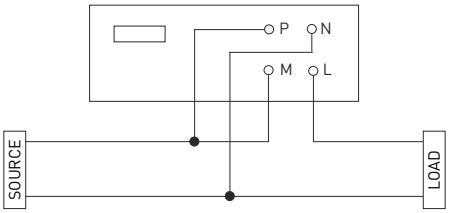
| Model | | EM08 | EM08D |
|---|---|---|---|
| **Case / Housing Material** | | DIN Black ABS, Dimension as per DIN 43700 | Portable Type, Desk Top Case with Tilt Stand |
| **Mounting Clamps** | | Sturdy, Moulded Derlin with suitable Hardware | Desk Top Type |
| **Terminals / Connectors** | | Terminal Block : Thermoplastic (UL94V-0) with Tin Plated Brass Terminal | For Input connections 10Amps Binding Post Terminals on the Front panel. |
| **Auxiliary Power Supply** | | 230VAC ±20%, 50Hz | 230VAC ±20% 50Hz, Switch & Fuse for Aux. Supply at the Back, Supplied with 1-Phase Power Cord |
| **Dimension (mm)** | **Front** | 96 x 96 | 160 (W) x 110 (H) x 190 (D) |
| | **Depth ( Behind Bezel Panel )** | 90 | |
| | **Cut-Out** | 92 (+0.8, -0.0) x 92 (+0.8, -0.0) | |

**Ordering Information:** Model, Input Voltage, Input Current (1A or 5A - any one only), CTR & Auxillary Supply

## Connection Diagram




**EM08**




**EM08D**


**EM-08S (5A)**
**EM-08S (1A)**

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## Features

- 10 Parameters on 10 Display Pages
- Measures V, A, PF, Hz, KW, KVA, KVAr, KWh, KVAh & KVArh
- Auto / Manual Scroll Display (User selectable)
- SMPS Power Supply (85 - 265VAC/DC)
- Ideal for Testing of Electrial Appliances
- User Programmable CT Ratio (1.00 - 99.99)
- TRMS Measurement
- 4 Digit LCD Display with Backlight (20mm Digit Height)
- LED Indicator for Parameter Indication
- RS 485 Port (4KV Isolated) (Optional)
- MODBUS RTU Protocol (Optional)
- POWER MASTER Software (Optional)

## Application

- Home Appliance Testing
- Energy Audit
- QC
- Studying Energy Efficiency of Electrical Equipement
- Building Management - Systems
- Power Management
- Generator/ Motor Characteristics
- Plant - Maintenance

## Specification

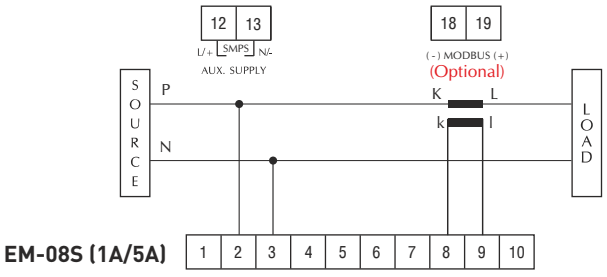
| Functions | EM-08S (5A) | EM-08S (1A) | Accuracy |
|---|---|---|---|
| RMS Voltage | 50.0 ~ 300Vrms | | ±(0.5% FS +1 dgt.) |
| RMS Current (Any One Range Only) | (0.125A ~ 6.0Arms) | (0.025A ~ 1.2Arms) | |
| Active Power | 0.030 ~ 1.800 KW | 0.006 ~ 0.360 KW | ±(0.5% FS +1 dgt.) [Cosφ=0.3 to 1.000] |
| Apparent Power | 0.030 ~ 1.800 KVA | 0.006 ~ 0.360 KVA | ±(0.5% FS +1 dgt.) |
| Reactive Power | 0.030 ~ 1.800 KVAr | 0.006 ~ 0.360 KVAr | ±(1.0% FS +1 dgt.) [Sinφ=0.3 to 1.000] |
| Power Factor | 0.3 Lag ~ 1.0 ~ 0.3 Lead | | ±(0.01 PF +1 dgt.) |
| Line Frequency | 45.00 ~ 55.00 Hz | | ±0.1Hz |
| Active Energy (KWh) | 0000 ~ 9999 KWh | | Class 1 |
| Apparent Energy (KVAh) | 0000 ~ 9999 KVAh | | |
| Reactive Energy (KVArh) | 0000 ~ 9999 KVArh | | |

**Note :** KW / KVA / KVAr Measurements require Vrms x Irms x Cosφ / Sinφ ≥ 0.006 (for 1A Meter), ≥ 0.030 (for 5A Meter)

| | | |
|---|---|---|
| Case / Housing Material | | DIN Black ABS, Dimension as per DIN 43700 |
| Mounting Clamps | | Sturdy, Moulded Derlin with suitable Hardware |
| Terminals / Connectors | | Terminal Block : Thermoplastic (UL94V-0) with Tin Plated Brass Terminal |
| Auxiliary Power Supply | | SMPS (85 - 265 VAC/DC) |
| Dimension (mm) | Front | 96 x 96 |
| | Depth ( Behind Bezel Panel ) | 43 |
| | Cut-Out | 92 (+0.8, -0.0) x 92 (+0.8, -0.0) |

**Ordering Information:** Model, Input Voltage, Input Current (1A or 5A any one only) & RS485 Port (Optional)

## Connection Diagram



14 DEC 2015

SECURENS™
Prevent crime before it happens

Date: 7 December 2015

To,
Mr. Premchand Goliya – C.M.D.
M/s. Meco Instruments Pvt. Ltd.
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710

Dear Sir,

**Sub : Testimonial for Supply of MECO Multifunction Meter (Energy Modules) Model MFM96S-ICICI for CMS Project of ICICI Bank Branch on Pan India basis.**

**Ref : PO No./15-16/0121 Dt. 22/06/2015 Supply of MECO-MFM96S-ICICI Qty. 500 Nos.**

Refer our above Purchase order for Supply of MECO Make Multifunction Meter (Energy Modules) Model MFM96S-ICICI for CMS Project of ICICI Bank Branch on Pan India basis.

We like to inform you that M/s. MECO Instruments Pvt. Ltd. has executed the above purchase order satisfactory as per delivery schedule given by us.

We are already in process of Installing of MECO Make MFM-96S Meter (Energy Module) in MFM Panel at our customer' difference sites. We find MECO Multifunction Meter (Energy Modules) Model MFM96S-ICICI & MECO-V Make Current Transformer is working satisfactory where ever it has been installed.

We also appreciate Mr. Haren Shah for extending his timely service and support and sincerer effort during Training, Installation & Commissioning of MFM Panel several times.

We look forward to have similar kind of support from MECO Team member in future as and when require.

Thanking You,

Your Faithfully,

Kalpana Mane
Head – Purchases
Securens Systems Pvt. Ltd.

Member of CSAA
Certified with

Securens Systems Pvt. Ltd.
3rd floor, B-Wing, Greenscape Technocity, Plot No. X-4/1 & X-4/2, Mahape, Navi Mumbai – 400 701
+91 22 6178 9400 www.securens.in CIN-U74999MH2011PTC225909

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nelco
unlock potential

Date: 17/12/2014

To,
Director,
**M/s. Meco Instruments Pvt. Ltd.**
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710
Tel. No. 022 – 27673300 Fax No. 022 – 27673310

Dear Sir,

Sub Visit at NELCO'S Mahape Work to Monitor & Record Power Consumption Data at 2 X 160KVA UPS Output Panel with MECO Power & Harmonics Analyzer Model PHA 5850 Kit.

Please refer visit of Mr. Haren Shah - Senior Marketing Executive of Meco Instruments Pvt. Ltd. Navi Mumbai at our above work as on 28/11/2014 with MECO Power & Harmonics Analyzer Model PHA 5850A for the above subject.

The visit was in accordance with request by Mr. Sanjay Sinvhal to MECO to Monitor and Record the Power consumption at various points of 160KVA UPS Output Panel installed at NELCO'S Server Room.

Mr. Shah showed us Online Power Parameters on PHA 5850 which were witnessed by Mr. Sanjay Sinvhal and Mr. Nitin Kulkarni. The recorded data with reports were then sent to us by Email from Mr. Shah very next day. The Reports and data received by us were very satisfactory and as per our expectation.

We thanks Mr. Haren Shah to carry out such activity in short notice. We also appreciate Mr. Shah for excellent service provided to us with report and data.

We find MECO Analyzer Model 5850 Kit is very useful for Online monitoring and recording the Power and Harmonics data. This instrument is also helpful for Energy Monitoring purpose at several locations and time to time.

Thanking You,
Yours Faithfully,

**Nelco Ltd.**

**Nitin Kulkarni**
**Officer Maintenance**

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GE
Intelligent Platforms

CIN: U72200KA1997PTC022158
Velankani Tech Park, No.43
1st floor, Building 9
Electronics City, Hosur Road
Bangalore 560 100
Website: www.ge.com
T: +91 80 4251 5300-09
F: +91 80 6751 5300-06

**Ref: Vendor/Appraisal/15-16**

**Date : 01/15/2015.**

**To,**
**M/S. Meco Instruments Pvt. Ltd.**
Plot NO. EL- 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape
Navi Mumbai – 400 710.
Tel No. : 022 27673300
Fax No. : 022 27673330
Email : kamal@mecoinst.com

**Kind Attn. : Mr. Kamal Goliya / P. Gawade**

**Sub: Vendor Appraisal**

We thank you for your support extended to us for supply of various Electrical and Electronic Testing and Measuring Instruments and Transducers.

We have been using MECO Multifunction Meters, Digital Panel Meters, Power Line Transducers, Testing and Measuring Instruments. Since more than past 5 years in our DMRC projects to our complete satisfaction.

The presales and post-sales service and support offered are prompt and timely.

We hope to have similar support from your organization for future years too so that we can all mutually achieve higher targets.

We once again thank you for your support extended to fulfill our customer needs.

Yours faithfully,
For GE Intelligent Platforms Pvt Ltd.

Gunashekar KM
Sourcing Leader

Registered Office: GE Intelligent Platforms, CIN: U72200KA1997PTC022158, Velankani Tech Park, 1st Floor, Building 9, MAC Electronics City, Hosur Road, Bangalore – 560 100, India. T: +91 80 4251 5300-04 F: +91 80 6751 5300-06

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Functional Safety Management (TÜV Rheinland) IEC 61511:2016 SIS Integration (Phase 4) FSM 115

CERTIFIED LR ISO 9001:2015

UKAS MANAGEMENT SYSTEMS 001

**Yokogawa India Limited**

Regd. Office:
Plot No. 96, Electronics City Complex,
Hosur Road,
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YOKOGAWA

YIL/APP/20923/2022
10th May, 2022

**M/s. Meco Instruments Pvt. Ltd.**
EL-1, MIDC Electronic Zone, TTC Industrial Area,
Mahape,
**Navi Mumbai – 400710**

Subject: Certificate of Appreciation

Dear Mr. Kishorkumar Thakare,

We are glad to inform you that we are very much satisfied with the performance of your Multifunction Meters, Transducers and Panel Meters.

We thank you for your exceptional sales and service support and attending our queries / requests in a professional and timely manner.

We hope that the same support will be extended to us in future also and will strengthen our business relations.

Thanking you, we remain

Very truly yours,
For YOKOGAWA INDIA LIMITED,

**Chandrashekar Hegde,**
Manager – Procurement
Centralized Materials Management

For Internal Use Only

CIN No.: U74210KA1987FLC008304 Email ID: YIL-contactus@yokogawa.com Website: http://www.yokogawa.com/in

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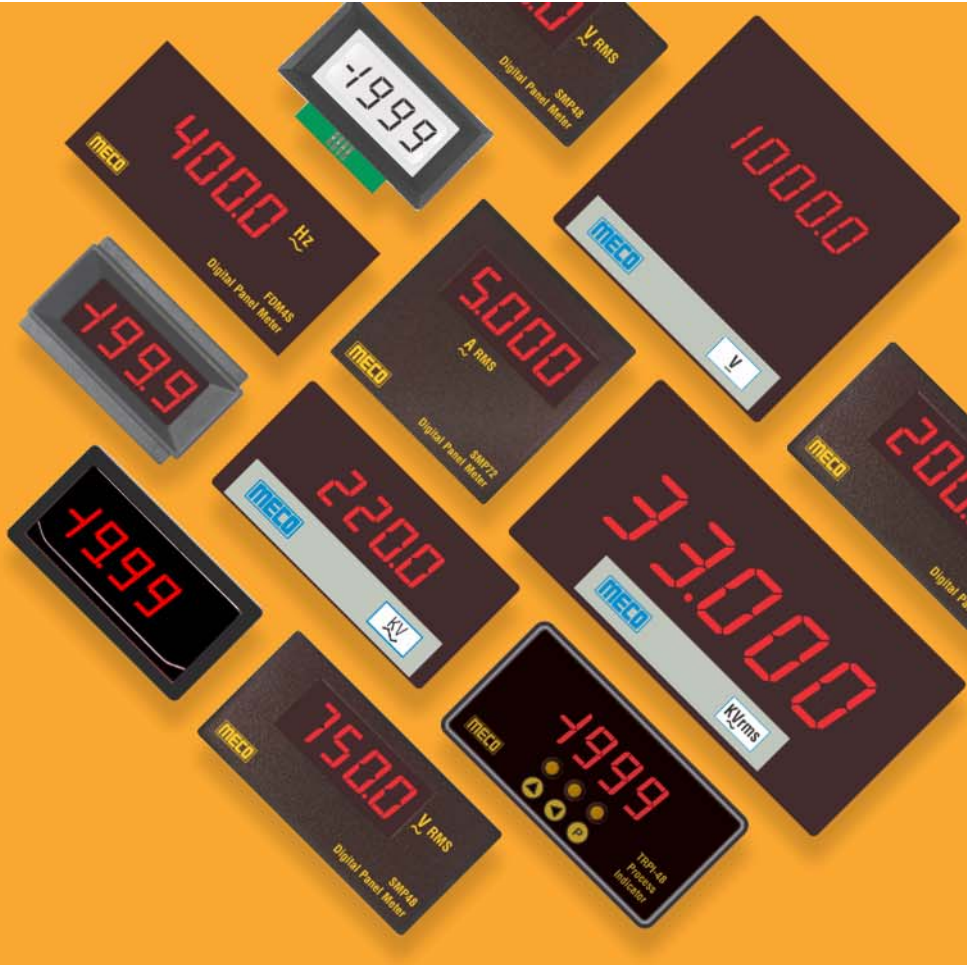
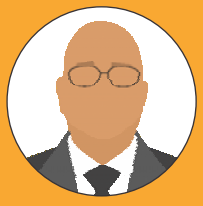



## Digital Panel Meters

- ✓ Ammeter & Voltmeter - TRMS
- ✓ Process Indicators
- ✓ Frequency Meters
- ✓ RPM Meters
- ✓ Power Factor Meters
- ✓ Watt, VAR and VA Meters
- ✓ LCD & LED Modules



+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable


SMP35


SMP9635

## Specification

- **Measuring Method** — 3½ Digit - Dual Slope A/D Conversion
- **Sampling Rate** — 2.5 Samples per Second
- **Display Type** — Red LED (Standard)
- **Display Height** — 14.2mm / 0.56" (Standard) 20mm / 0.8" (Optional)
- **Maximum Display** — 1999 Counts
- **Resolution** — 0.001 to 1 Count
- **Polarity Indication** — " - " is indicated for Negative Input
- **Decimal Selection** — Field Selectable
- **Over Range Indication** — " 1 " or " -1 "
- **Maximum Overload** — Voltage : 1.2 times continuous Current : 2 times continuous
- **Frequency Response** — 40 - 400Hz
- **Faceplate / Lens** — Red Antiglare Faceplate with Annunciators
- **VA Burden (Typical)** — Auxiliary : < 5VA Voltage Input : < 0.1VA Current Input : < 0.5VA, < 0.2VA in 20A
- **Environmental Conditions** — 0 to 50°C, <70% RH (Operation) -10 to 70°C, <70% RH (Storage)
- **Dielectric Strength** — 2.5 kV at 50Hz for 1 min. between Input - Auxiliary and Case - Terminals
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **Bezel** — Snap-Fit, Dimension as per DIN 43718
- **Connectors** — Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals
- **Mounting Clamps** — Sturdy, Moulded ABS with suitable Hardware

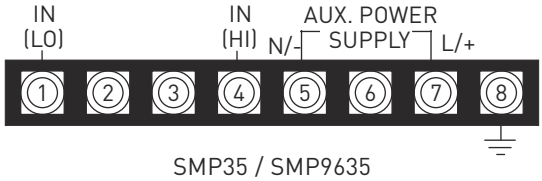
| Model | Input | | Range | Aux. Power Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|
| SMP35/ SMP9635 | DC | mV | 0-200 | 230V AC ± 10% @ 50Hz (Standard) OR 110V AC ± 10% @ 50Hz (Optional) | ± 0.5% of FSD + 2 digits |
| | | V | 0-2, 20, 200, 1000 | | |
| | | mA | 0-2, 20, 200 | | |
| | | A | 0 - 2, 5, 20 | | |
| | | Zero Supp. | 4 - 20mA | | |
| | AC | mV | 0 - 200 | | |
| | | V | 0 - 2, 20, 200, 750 | | |
| | | mA | 0 - 2, 20, 200 | | |
| | | A | 0 - 2, 5, 20 | | |

**Dimensions (mm)**

| Model | SMP35 | SMP9635 |
|---|---|---|
| Front | 48 x 96 | 96 x 96 |
| Depth (Behind Bezel) | 135 | 135 |
| Panel Cut-Out | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |

**Ordering Information :** Model, Input Range, CTR / PTR (if any), Scale Display, Auxillary Supply & Optionals

**Terminal Connection**




SMP35 / SMP9635


SMP35S


SMP9635S

## Specifications

- **Measuring Method** Dual Slope A/D Conversion
- **Sampling Rate** 2.5 Samples per Second
- **Display Type** 0.56" / 14.2mm Red LED Super Bright Display
- **Maximum Display** 3½ Digit / 1999 Counts (Max)
- **Display Stability** Within ± 2 Digits
- **Resolution** 0.001 to 1 Count depending on range
- **Polarity Indication** " - " is indicated for Negative Input
- **Decimal Selection** Field Selectable
- **Over Range Indication** " 1 " or " -1 "
- **Maximum Overload** Voltage : 1.2 times continuous<br>Current : 2 times continuous
- **Faceplate / Lens** Red Antiglare Faceplate with Annunciators
- **Frequency Response** 40 - 400Hz
- **VA Burden (Typical)** Auxiliary (230V AC) : < 5VA<br>Auxiliary (Others) : < 2.5VA<br>Voltage : < 1.0VA<br>Current : < 1.0VA
- **Dielectric Strength** 2.5 kV at 50Hz for 1 min. between Input - Auxiliary - Case - Terminals
- **Case / Housing Material** DIN Black ABS, Dimension as per DIN 43700
- **Mounting Clamps** Sturdy, Moulded ABS with suitable Hardware
- **Connectors** Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals
- **Environmental Conditions** Calibration : 27°C ± 5°C,<br>Operating : 0 to 50°C, RH < 70%<br>Storage : -10 to 60°C, RH < 70%

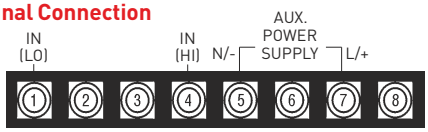
| Model | Input | | Range | Auxiliary Power Supply (Any One Only) | | | Accuracy Class |
|---|---|---|---|---|---|---|---|
| | | | | 230V AC | 19-90V AC/DC | 85-265V AC/DC | 0.5 |
| SMP35S / SMP9635S | DC | mV | 0 - 200 | ✓ | ✓ | ✓ | ✓ |
| | | V | 0 - 2, 20, 200, 1000 | ✓ | ✓ | ✓ | ✓ |
| | | mA | 0 - 2, 20, 200 | - | ✓ | ✓ | ✓ |
| | | A | 0 - 1, 2, 5, 20 | ✓ | ✓ | ✓ | ✓ |
| | | Zero Supp. | 4-20mA or 1 - 5V | - | ✓ | ✓ | ✓ |
| | | Re-Scaleable | 0 - 5V / 10V DC, 1 - 5V DC, 0 - 20mA DC, 0 - 50 / 60 / 75mV, 4 - 20mA (any one) to display 0.100 to1600 in 64 steps. Please suffix these models with RS as SMP35SRS or SMP9635SRS | ✓ | ✓ | ✓ | ✓ |
| | AC | V | 0 - 2, 20, 200, 750 | ✓ | ✓ | ✓ | ✓ |
| | | A | 0 - 1, 2, 5, 20 | ✓ | ✓ | ✓ | ✓ |
| | | Re-Scaleable | 0 - 1A or 0 -5A (any one) to display 0.100 to 1600 in 64 steps. Please suffix models with RS as SMP35SRS or SMP9635SRS | ✓ | ✓ | ✓ | ✓ |

**Ordering Information :** Model, Input Range, Auxiliary Supply & Scale Display

**Note :** Tap Change Meter On Request

**Standard :** As per IS 13875

**Terminal Connection**




SMP35S / SMP9635S

**Dimensions (mm)**

| Model | SMP35S | SMP9635S |
|---|---|---|
| Front | 48 x 96 | 96 x 96 |
| Depth (Behind Bezel) | 88 | 90 |
| Panel Cut-Out | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |


SMP35SW


SMP9635SW

## Features

- High Accuracy Across the Entire Range
- User Programmable Display (CT Primary / PTR / Shunt Value)
- 9999 Count (Max) High Resolution Display
- Auto Selection of Decimal Point

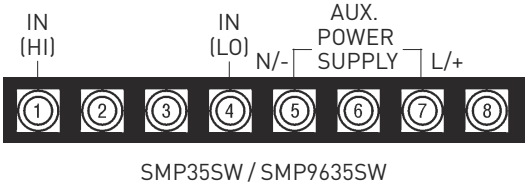
## Specifications

- **Measuring Method** — TRMS Using Microcontroller
- **Display Type** — 0.56" / 14.2 mm Red LED Super Bright Display
- **Maximum Display** — 4 Digit / 9999 (Max.) Counts
- **Display Stability** — Within ±2 Digit
- **Resolution** — 0.001 to 1 Count Depending on Range / Scale Display
- **Decimal Point** — Auto Selection
- **Over Range Indication** — " Or "
- **Under Range Indication** — NA
- **Maximum Overload** — Voltage : 1.2 Times Continuous<br>Current : 1.5 Times Continuous
- **VA Burden (Typical)** — Auxiliary : ⩽ 1.5VA<br>Voltage Input : ⩽ 1.0VA<br>Current Input : ⩽ 1.0VA
- **Frequency Response** — 40 - 400Hz
- **Sampling Rate** — 3 Samples / Second .
- **Response Time** — 250ms
- **Environmental Conditions** — 0°C to + 55°C, < 70% RH (Operation)<br>-10°C to + 70°C, < 70% RH (Storage)<br>27°C ±5°C (Calibration)
- **Dielectric Strength** — 2.5KV @ 50Hz for 1 minute between Input - Auxiliary & Case -Terminals
- **Impulse Withstand** — 3.5KV, 1.2 / 50 micro second
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **Faceplate / Lens** — Red Antiglare Face Plate with Annunciators
- **Mounting Clamps** — Sturdy, Moulded ABS with Suitable Hardware
- **Connectors / Terminal** — Terminal Block : Thermoplastic (UL94V-0) with Tin Plated Brass Terminal

| Model | Input | | Range (Any One Only) | Programmable Display Key Inside Facia | Aux Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|---|
| SMP35SW / SMP9635SW | DC | mV | 0 - 75 (Shunt Operated ) | ✓(*) | 85 -265V AC/DC @50/60Hz OR 19-90V AC/DC @50/60Hz (Optional) | ±0.5% of FSD |
| | | | 0 - 200 | - | | |
| | | V | 0 - 2, 20, 200 | - | | |
| | | | 0 - 1000 | - | | |
| | | mA | 0 - 2, 20 , 200 | - | | |
| | | A | 0 - 2, 5, 20 | - | | |
| | | Re-Scaleable | 4 - 20mA, 0 - 20mA, 0 - 10V | ✓ | | |
| | AC | V | 0 - 110 (PTR Operated) | ✓(#) | | |
| | | | 0 - 2, 20, 200, 750 | - | | |
| | | mA | 0 - 200, 500 | - | | |
| | | A | 0 - 1 (CT Operated) | ✓(*) | | |
| | | | 0 - 5 (CT Operated) | ✓(*) | | |
| | | | 0 - 20 (Direct) | - | | |

**Standard :** As per IS 13875

**Terminal Connection**




SMP35SW / SMP9635SW


SMP35SW


SMP9635SW

**# User Programmable PTR Display Value (Using Internal Key Inside Facia)**

| Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0.110 | 5 | 30 | 3.300 | 9 | 300 | 33.00 | 13 | 2000 | 220.0 |
| 2 | 3.77 | 0.415 | 6 | 60 | 6.600 | 10 | 600 | 66.00 | 14 | 4000 | 440.0 |
| 3 | 4 | 0.440 | 7 | 100 | 11.00 | 11 | 1000 | 110.0 | - | - | - |
| 4 | 20 | 2.200 | 8 | 200 | 22.00 | 12 | 1200 | 132.0 | - | - | - |

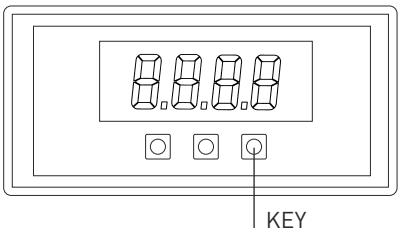
*** User Programmable CT Primary / Shunt Display Value (Using Internal Key Inside Facia)**

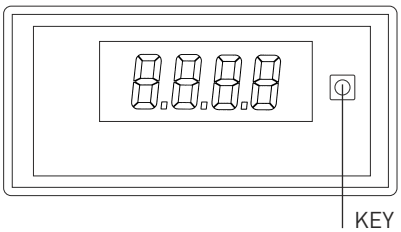
| CT Primary / Shunt Display Value | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 25 | 70 | 150 | 350 | 700 | 1500 | 4000 | 8000 |
| 5 | 30 | 75 | 175 | 400 | 750 | 1600 | 5000 | 9000 |
| 10 | 40 | 80 | 200 | 450 | 800 | 2000 | 6000 | - |
| 15 | 50 | 100 | 250 | 500 | 1000 | 2500 | 7000 | - |
| 20 | 60 | 125 | 300 | 600 | 1200 | 3000 | 7500 | - |

| **Dimensions (mm)** | | |
|---|---|---|
| **Model** | **SMP35SW** | **SMP9635SW** |
| Front | 48 x 96 | 96 x 96 |
| Depth (Behind Bezel) | 88 | 90 |
| Panel Cut-Out | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |

**Ordering Information :** Model, Input, Range, CTR / PTR (if any), Scale Display & Aux. Supply.

**NOTE :** This is an Upgraded Version of SMP35S

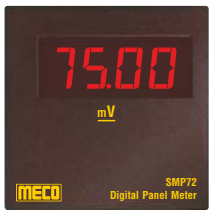


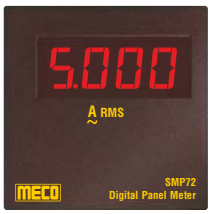

For Setting Please Refer Instruction Manual
For Range Input 4-20mA DC / 0-20mA DC / 0-10V DC

**For Setting CTP / Shunt / PTR**

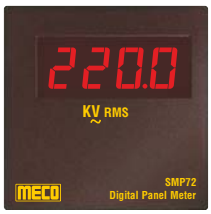
- Power on DPM
- Remove Front Facia
- Press Key on Display Card once
- Meter will Show Present Set Display Value
- Press-Release until the Desired Value is Displayed




SMP72 - DC




SMP72 - AC




SMP72 - AC


SMP48 - DC


SMP48 - AC

## Features

- High Accuracy Across the Entire Range
- User Programmable Display (CT Primary / PTR / Shunt Value)
- 9999 Count (Max) High Resolution Display
- Auto Selection of Decimal Point

## Specifications

- **Measuring Method** — TRMS Using Microcontroller
- **Display Type** — 0.56" / 14.2mm Red LED Super Bright Display
- **Maximum Display** — 4 Digit / 9999 (Max.) Counts
- **Display Stability** — Within ±1 Digit
- **Resolution** — 0.001 to 1 Count Depending on Range / Scale Display
- **Over Range Indication** — " Or "
- **Under Range Indication** — NA
- **Sampling Rate** — 3 Samples / Second
- **Response Time** — 250ms
- **Maximum Overload** — Voltage : 1.2 Times Continuous<br>Current : 1.5 Times Continuous
- **Frequency Response** — 40 - 400Hz
- **VA Burden (Typical)** — Auxiliary : ≤ 1.5VA<br>Voltage Input : ≤ 1.0VA<br>Current Input : ≤ 1.0VA
- **Environmental Conditions** — 0°C to + 55°C, < 70% RH (Operation)<br>-10°C to + 70°C, < 70% RH (Storage)<br>27°C ±5°C (Calibration)
- **Dielectric Strength** — 2.5KV @ 50Hz for 1 minute between Input - Auxiliary & Case -Terminals
- **Impulse Withstand** — 3.5KV, 1.2 / 50 micro second
- **Case / Housing Material** — Polycarbonate, Black
- **Faceplate / Lens** — Polycarbonate Transparent Red
- **Connectors / Terminal** — Nylon 66, 33% GF, Black / Brass
- **Mounting Clamps** — Sturdy, Moulded Derlin with Suitable Hardware

| Model | Input | | Range (Any One Only) | Programmable Display Key | Aux Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|---|
| SMP48 / SMP72 / SMP96 | DC | mV | 0 - 75 (Shunt Operated) | ✓(*) | 85-265V AC / DC @ 50 / 60Hz (Standard) OR 24V & 48V DC (Optional) OR 230V AC @ 50 / 60Hz (Optional for SMP72 / SMP96) | ± 0.5% of FSD |
| | | | 0 - 200 | - | | |
| | | V | 0 - 2, 20, 200, 1000 | - | | |
| | | mA | 0 - 2, 20, 200 | - | | |
| | | A | 0 - 2, 5A | - | | |
| | | | 0 - 20 (Direct) | - | | |
| | AC TRMS | V | 0 - 110 (PT Operated) | ✓(#) | | |
| | | | 0 - 2, 20, 200, 750 | - | | |
| | | A | 0 - 1 (CT Operated) | ✓(*) | | |
| | | | 0 - 5 (CT Operated) | ✓(*) | | |
| | | | 0 - 20 (Direct) | - | | |

**Standard :** As per IS 13875

### Terminal Connection

| AUX 85-265V AC/DC | | INPUT | |
|---|---|---|---|
| P | N | LO | HI |
| 1 | 2 | 3 | 4 |

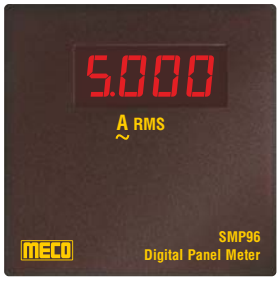
SMP72

| INPUT | | AUX 85-265V AC/DC | |
|---|---|---|---|
| HI | LO | N | P |
| 1 | 2 | 3 | 4 |

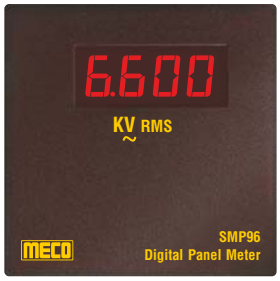
SMP48 / SMP96


SMP48 - AC


SMP96 - DC




SMP96 - AC




SMP96 - AC

## # User Programmable PTR Display Value (Using Key)

| Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0.110 | 5 | 30 | 3.300 | 9 | 300 | 33.00 | 13 | 2000 | 220.0 |
| 2 | 3.77 | 0.415 | 6 | 60 | 6.600 | 10 | 600 | 66.00 | 14 | 4000 | 440.0 |
| 3 | 4 | 0.440 | 7 | 100 | 11.00 | 11 | 1000 | 110.0 | - | - | - |
| 4 | 20 | 2.200 | 8 | 200 | 22.00 | 12 | 1200 | 132.0 | - | - | - |

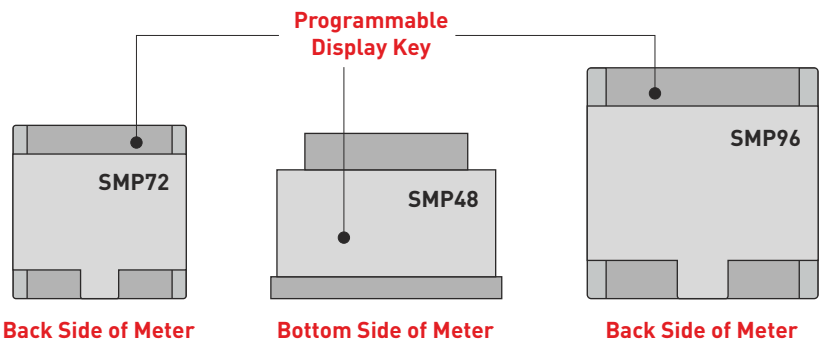
## * User Programmable CT Primary / Shunt Display Value (Using Key)

| CT Primary / Shunt Display Value | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 25 | 70 | 150 | 350 | 700 | 1500 | 4000 | 8000 |
| 5 | 30 | 75 | 175 | 400 | 750 | 1600 | 5000 | 9000 |
| 10 | 40 | 80 | 200 | 450 | 800 | 2000 | 6000 | - |
| 15 | 50 | 100 | 250 | 500 | 1000 | 2500 | 7000 | - |
| 20 | 60 | 125 | 300 | 600 | 1200 | 3000 | 7500 | - |

**Dimensions (mm)**

| Model | SMP72 | SMP48 | SMP96 |
|---|---|---|---|
| Front | 72 x 72 | 48 x 96 | 96 x 96 |
| Depth (Behind Bezel) | 43 | 58 | 39.5 |
| Panel Cut-Out | 68 x 68 | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |

**Ordering Information :** Model, Input Range, Aux. Supply & Scale Display (CTR / PTR / Shunt Value)




**For Setting CTP / Shunt / PTR**

- Power on DPM
- Press Key On Back Side of Meter
- Meter will Show Present Set Display Value
- Press-Release until the Desired Value is Displayed


SMP45SW


SMP9645SW

## Features

- High Accuracy Across the Entire Range
- User Programmable Display (CT Primary / PTR / Shunt Value)
- 19999 Count (Max) High Resolution Display
- Auto Selection of Decimal Point

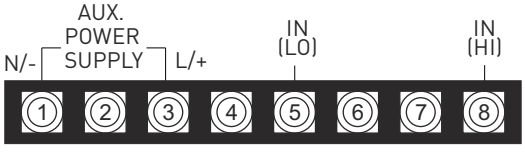
## Specifications

- **Measuring Method** — TRMS Using Microcontroller
- **Display Type** — 0.56"/ 14.2mm Red LED Super Bright Display
- **Maximum Display** — 4½ Digit / 19999 (Max.) Counts
- **Display Stability** — Within ±2 Digit
- **Resolution** — 0.0001 to 1 Count Depending on Range / Scale Display
- **Decimal Point** — Auto Selection
- **Over Load Indication** — "-OL-"
- **Under Load Indication** — NA
- **Sampling Rate** — 3 Samples / Second
- **Response Time** — 250ms
- **Maximum Overload** — Voltage : 1.2 Times Continuous<br>Current : 1.2 Times Continuous
- **Frequency Response** — 40 - 400Hz
- **Auxiliary Supply** — 85 - 265V AC / DC (Standard)<br>19 - 90V AC / DC (Optional)<br>24V & 48V DC (Optional)
- **Polarity Indication** — "-" is Indicated for Negative Input
- **VA Burden (Typical)** — Auxiliary : ≤ 1.5VA<br>Voltage Input : ≤ 1VA<br>Current Input : ≤ 0.5VA
- **Environmental Conditions** — 0°C to + 55°C, < 70% RH (Operation)<br>-10°C to + 70°C, < 70% RH (Storage)<br>27°C ±5°C (Calibration)
- **Dielectric Strength** — 2.5KV @ 50Hz for 1 Minute between Input - Auxiliary & Case -Terminals
- **Impulse Withstand** — 3.5KV, 1.2 / 50 Micro Second
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **Faceplate / Lens** — Red Antiglare Face plate with Annuciators
- **Connectors / Terminal** — Terminal Block : Thermoplastic (UL94V-0) with Tin Plated Brass Terminal
- **Mounting Clamps** — Sturdy, Moulded ABS with Suitable Hardware

| Model | Input | | Range | Programmable Display Key (inside facia) | 4½ Digit | 5 Digit | Aux. Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|---|---|---|
| SMP45SW / SMP9645SW | DC | mV | 0 - 75 (Shunt Operated) | ✓(*) | ✓ | - | 85-265V AC / DC @ 50 / 60Hz OR 19-90V AC / DC @ 50 / 60Hz (Optional) OR 24V & 48V DC (Optional) | ± 0.5% of FSD |
| | | | 0 - 200 | - | ✓ | - | | |
| | | V | 0 - 2, 20, 200 | - | ✓ | - | | |
| | | | 0 - 1000 | - | ✓ | - | | |
| | | mA | 0 - 2, 20, 200 | - | ✓ | - | | |
| | | A | 0 - 2, 5 | - | ✓ | - | | |
| | AC TRMS | V | 0 - 110 (PT Operated) | ✓(#) | - | ✓ | | |
| | | | 0 - 2, 20, 200, 750 | - | ✓ | - | | |
| | | I | 0 - 1 (CT Operated) | ✓(*) | - | ✓ | | |
| | | | 0 - 5 (CT Operated) | ✓(*) | - | ✓ | | |

**Standard :** As per IS 13875

## Terminal Connection




SMP45SW / SMP9645SW


SMP45SW


SMP9645SW

**# User Programmable PTR Display Value (Using Internal Key Inside Facia)**

| Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0.1100 | 5 | 30 | 3.3000 | 9 | 300 | 33.000 | 13 | 2000 | 220.00 |
| 2 | 3.77 | 0.4150 | 6 | 60 | 6.6000 | 10 | 600 | 66.000 | 14 | 4000 | 440.00 |
| 3 | 4 | 0.4400 | 7 | 100 | 11.000 | 11 | 1000 | 110.00 | - | - | - |
| 4 | 20 | 2.2000 | 8 | 200 | 22.000 | 12 | 1200 | 132.00 | - | - | - |

*** User Programmable CT Primary / Shunt Display Value (Using Internal Key Inside Facia)**

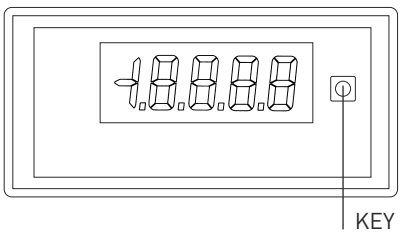
| CT Primary / Shunt Display Value | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 30 | 80 | 250 | 600 | 1500 | 5000 | 10000 |
| 5 | 40 | 100 | 300 | 700 | 1600 | 6000 | 12000 |
| 10 | 50 | 125 | 350 | 750 | 2000 | 7000 | 15000 |
| 15 | 60 | 150 | 400 | 800 | 2500 | 7500 | 20000 |
| 20 | 70 | 175 | 450 | 1000 | 3000 | 8000 | - |
| 25 | 75 | 200 | 500 | 1200 | 4000 | 9000 | - |

**Dimensions (mm)**

| Model | SMP45SW | SMP9645SW |
|---|---|---|
| Front | 48 x 96 | 96 x 96 |
| Depth (Behind Bezel) | 88 | 90 |
| Panel Cut-Out | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |

**Ordering Information :** Model, Input Range, CTR / PTR / SHUNT (if any), Scale Display & Auxiliary Supply

**NOTE :** This is an Upgraded Version of SMP45S




**For Setting CTP / Shunt / PTR**

- Power on DPM
- Remove Front Facia
- Press Key on Display Card once
- Meter will Show Present Set Display Value
- Press-Release until the Desired Value is Displayed


SMP45

## Specification

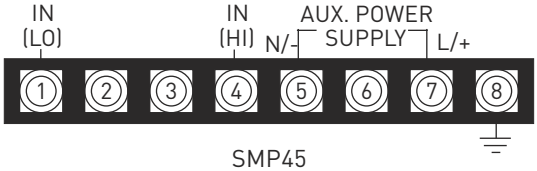
- **Measuring Method** Dual Slope A/D Conversion
- **Sampling Rate** 2.5 Samples per Second
- **Display Type** Red LED (Standard)
- **Display Height** 14.2mm / 0.56" (Standard)
- **Maximum Display** 19999 Counts
- **Resolution** 0.0001 to 1 Count depending on the range
- **Polarity Indication** " - " is indicated for negative input
- **Decimal Selection** Field Selectable
- **Over Range Indication** "0000" blinking
- **Maximum Overload** Voltage : 1.2 times continuous
  Current : 2 times continuous
- **Frequency Response** 40 - 400Hz
- **External Start Hold** Optional
- **Faceplate / Lens** Red Antiglare Faceplate with Annunciators
- **VA Burden (Typical)** Auxiliary : < 5VA
  Voltage Input : < 0.1VA
  Current Input : < 0.5VA, < 0.2VA in 20A
- **Environmental Conditions** 0 to 50°C, <70% RH (Operation)
  -10 to 70°C, <70% RH (Storage)
- **Dielectric Strength** 2.5 kV at 50Hz for 1 min. between Input - Auxiliary and Case - Terminals
- **Case / Housing Material** DIN Black ABS, Dimension as per DIN 43700
- **Bezel** Snap-Fit, Black ABS, Dimension as per DIN 43718
- **Mounting Clamps** Sturdy, Moulded ABS with suitable Hardware
- **Connectors** Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals

| Model | Input | | Range | Aux. Power Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|
| SMP45 | DC | mV | 0-200 | 230V AC ± 10% OR 220V DC (Optional) | ± 0.5% of FSD + 2 digits |
| | | V | 0-2, 20, 200, 1000 | | |
| | | mA | 0-2, 20, 200 | | |
| | | A | 0 - 2, 5 | | |
| | | Zero Supp. | 4 - 20mA | | |
| | AC | mV | 0 - 200 | | |
| | | V | 0 - 2, 20, 200, 750 | | |
| | | A | 0 - 2, 5, 20 | | |

| Dimensions (mm) | |
|---|---|
| **Model** | **SMP45** |
| **Front** | 48 x 96 |
| **Depth (Behind Bezel)** | 135 |
| **Panel Cut-Out** | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |

**Ordering Information :** Model, Input Range, CTR / PTR (if any), Scale Display, Auxillary Supply & Optionals

### Terminal Connection




SMP45


SMP45SW


SMP9645SW

## Features

- High Accuracy Across the Entire Range
- User Programmable Display -19999 to 19999
- ZERO and SPAN Adjustment through Software
- 19999 Count (Max) High Resolution Display
- Decimal Point : Selectable

## Specifications

- **Display Type** — 0.56"/ 14.2mm Red LED Super Bright Display
- **Maximum Display** — 4½ Digit / 19999 (Max.) Counts
- **Display Stability** — Within ±2 Digit
- **Resolution** — 0.0001 to 1 Count Depending on Range / Scale Display
- **Over Load Indication** — "-OL-"
- **Under Load Indication** — "-UL-"
- **Sampling Rate** — 3 Samples / Second
- **Maximum Overload** — Voltage : 1.2 Times Continuous<br>Current : 1.2 Times Continuous
- **Auxiliary Supply** — 85 - 265V AC / DC (Standard)<br>19 - 90V AC / DC (Optional)<br>24 & 48V DC (Optional)
- **VA Burden (Typical)** — Auxiliary : ⩽ 1.5VA<br>Voltage Input : ⩽ 1.0VA<br>Current Input : ⩽ 1.0VA
- **Response Time** — 250ms
- **Polarity Indication** — Yes
- **Environmental Conditions** — 0°C to + 55°C, < 70% RH (Operation)<br>-10°C to + 70°C, < 70% RH (Storage)<br>27°C ±5°C (Calibration)
- **Dielectric Strength** — 2.5KV @ 50Hz for 1 Minute between Input - Auxiliary & Case -Terminals
- **Impulse Withstand** — 3.5KV, 1.2 / 50 Micro Second
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **Faceplate / Lens** — Red Antiglare Face plate with Annuciators
- **Connectors / Terminal** — Terminal Block : Thermoplastic (UL94V-0) with Tin Plated Brass Terminal
- **Mounting Clamps** — Sturdy, Moulded ABS with Suitable Hardware

| Model | Input | | Range | Programmable Display Key (inside facia) | Aux Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|---|
| SMP45SW / SMP9645SW | DC | mA | 4 - 20 | ✓ | 85-265V AC/DC @ 50/60Hz (Standard) OR 19-90V AC/DC @ 50/60Hz (Optional) OR 24V & 48V DC (Optional) | ±0.5% of FSD |
| | | | -20 / 0 / 20 | ✓ | | |
| | | | 0 - 20 | ✓ | | |
| | | V | -10 / 0 / 10 | ✓ | | |
| | | | 0 - 10 | ✓ | | |

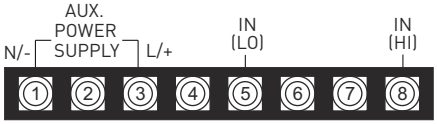
**Ordering Information :** Model, Input Range, Scale Display, Annunciator & Auxiliary Supply

**Standard :** As per IS 13875

## Annunciators

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| °C | rpm | Hz | pH | kmph | db | mmhg | N/m² | MPM | sph | x100 | Ft/s | °F | rad |
| % | mm | kg | MW | kvar | cosφ | psi | bar | CPS | Rev/s | m³/min | Ltr/hr | TON | Lux |

## Terminal Connection




SMP45SW / SMP9645SW

## Dimensions (mm)

| Model | SMP45SW | SMP9645SW |
|---|---|---|
| Front | 48 x 96 | 96 x 96 |
| Depth (Behind Bezel) | 88 | 90 |
| Panel Cut-Out | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |


**TRPI-48**
**4-20mA / 0-20mA / 0-10V**


**TRPI-48 (IP-65)**
**4-20mA / 0-20mA / 0-10V**

**TRPI-48 (IP-65)**
**[Mounting & Protection]**

## General Description

MECO 4 Digit Triple Range Programmable Process Indicator having three input ranges in the same meter. These input ranges are programmable by the user. The display from -1999 to 9999 is also User Programmable. Thus the user has a wide choice of inputs and displays which makes this meter truly flexible and versatile for applications in Process Industry, Automation, Refinery Plants, Variable Drives, Process Equipment etc.

## Features

- IP-65 Protection on Front (Optional)
- 3 Input Ranges in One Meter (User Programmable)
- Decimal Point : Selectable
- 9999 Count (Max.) High Resolution Display
- User Programmable Display -1999 to 9999
- Zero & Span Adjustment through Software
- High Accuracy Across the Entire Range

## Specifications

- **Maximum Display** — 0.56" / 14.2mm 4 Digit, 9999 (Max), 7 Segment 0.56" LED Display
- **Input Signal** — 4 - 20mA DC, 0 - 20mA DC & 0 - 10V DC (User Programmable)
- **Display Range** — -1999 To 9999 (Scale Display can be set from -1999 to 9999)
- **Display Stability** — Within ± 2 Digits
- **Resolution** — 0.001 - 1 Count depending on Range / Scale Display
- **Overload Indication** — -OL-
- **Underload Indication** — -UL- (for 4-20mA DC only)
- **Sampling Rate** — 3 Samples / Second
- **Response Time** — 250ms
- **Maximum Overload** — Voltage : 1.2 Times Continuous, Current : 1.2 Times Continuous
- **Mounting Clamps** — Sturdy, Moulded Polyacetal [TRPI-48] & Polycarbonate [TRPI-48 (IP-65)], with Suitable Hardware
- **VA Burden** — Auxillary : ⩽ 1.5VA, Voltage Input : ⩽ 0.5VA, Current Input : ⩽ 0.5VA
- **Environmental Conditions** — 0 to 55°C, <70% RH (Operation), -10 to 70°C, <70% RH (Storage), 27°C ± 5°C (Calibration)
- **Dielectric Strength** — 2.5KV @ 50Hz for 1 minute between Input-Auxiliary & Case-Terminals
- **Impulse Withstand** — 3.5kV, 1.2 / 50µ seconds
- **Case / Housing Material** — Black Polycarbonate, Dimension as per DIN 43700 / Refer Below Table
- **Connectors** — Terminal Block : Nylon 66, 33% G/F, Black (UL 94V - 0 ) with Tin Plated Brass Terminals
- **Faceplate / Lens** — Red Transparent Polycarbonate Antiglare Faceplate with Annunciators
- **IP-65 Cover** — Polycarbonate [TRPI-48 (IP-65)]
- **Gasket** — EPDM Rubber [TRPI-48 (IP-65)]

| Model | Input | Triple Range (User Programmable) | Programmable Display Key | Aux Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|
| **TRPI-48 / TRPI-48 (IP-65)** | DC | 4 - 20mA, 0 - 20mA & 0 - 10V | ✓ | 85-265V AC / DC (Standard) OR 24V & 48V DC (Optional) | ± 0.5% of FSD |

**Ordering Information :** Model, Input Range, Auxiliary Supply, Scale Display & IP-65 Protection (Optional)

**Note :** Default Input Range and Default Scale Display is 4 – 20mA DC.

**Standard :** As per IS 13875 & IS / IEC 60529 : 2001 (RA 2019)

### Terminal Connection


### Dimensions (mm)

| Models | TRPI-48 | TRPI-48 (IP-65) |
|---|---|---|
| **Front** | 48 x 96 | 54.5 x 102.5 |
| **Depth** (Behind Bezel) | 59 | 59 |
| **Panel** Cut-Out | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |


DPI-72x14445SN


DPI-72x14445SN


DPI-14445SN

## Features

- High Accuracy Across the Entire Range
- User Programmable Display -19999 to 19999 (adjustable)
- ZERO and SPAN Adjustment through Software
- 19999 Count (Max) High Resolution Display
- Decimal Point : Selectable
- RS485 Port, 5KV Isolated with Modbus RTU Protocol (Optional)

## Specifications

- **Display Type** — 1"/ 25.4mm Red LED Super Bright Display
- **Maximum Display** — 4½ Digit / 19999 (Max.) Counts
- **Display Stability** — Within ±2 Digit
- **Resolution** — 0.0001 to 1 Count Depending on Range / Scale Display
- **Over Load Indication** — "-OL-"
- **Under Load Indication** — "-UL-"
- **Sampling Rate** — 3 Samples / Second
- **Response Time** — 250ms
- **Maximum Overload** — Voltage : 1.2 Times Continuous<br>Current : 1.2 Times Continuous
- **Auxiliary Supply** — 85 - 265V AC / DC (Standard)<br>19 - 90V AC / DC (Optional)
- **Polarity Indication** — Yes
- **VA Burden (Typical)** — Auxiliary : ≤ 1.5VA<br>Voltage Input : ≤ 1.0VA<br>Current Input : ≤ 1.0VA
- **Environmental Conditions** — 0°C to + 55°C, < 70% RH (Operation)<br>-10°C to + 70°C, < 70% RH (Storage)<br>27°C ±5°C (Calibration)
- **Dielectric Strength** — 2.5KV @ 50Hz for 1 Minute between Input - Auxiliary & Case -Terminals
- **Impulse Withstand** — 3.5KV, 1.2 / 50 Micro Second
- **Case / Housing Material** — Polycarbonate, Black
- **Faceplate / Lens** — Polycarbonate Transparent Red
- **Mounting Clamps** — Sturdy, Moulded Derlin with Suitable Hardware
- **Connectors / Terminal** — Nylon 66, 33% GF, Black / Brass

| Model | Input | | Range (Any One Only) | Programmable Display Key (inside facia) | Aux Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|---|
| DPI-72x14445SN / DPI-14445SN | DC | mA | 4 - 20 | ✓ | 85-265V AC/DC @ 50/60Hz OR 19-90V AC/DC @ 50/60Hz | ±0.5% of FSD |
| | | | -20 / 0 / 20 | ✓ | | |
| | | | 0 - 20 | ✓ | | |
| | | V | -10 / 0 / 10 | ✓ | | |
| | | | 0 - 10 | ✓ | | |

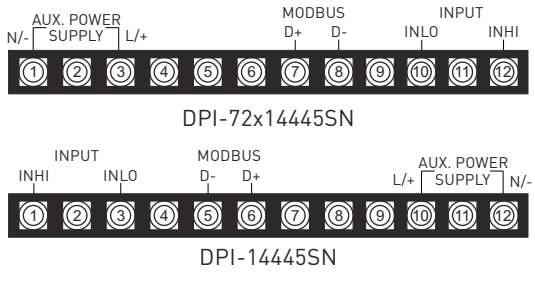
**Ordering Information :** Model, Input Range, Scale Display, Annunciator, Auxiliary Supply & RS 485 Modbus Communication (Optional).

## Annunciators

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| °C | rpm | Hz | pH | kmph | db | mmhg | N/m² | MPM | sph | x100 | Ft/s | °F | rad |
| % | mm | kg | MW | kvar | cosφ | psi | bar | CPS | Rev/s | m³/min | Ltr/hr | TON | Lux |

**Standard :** As per IS 13875

## Terminal Connection




| Dimensions (mm) | DPI-72x14445SN | DPI-14445SN |
|---|---|---|
| Front | 72 x 144 | 144 x 144 |
| Depth (Behind Bezel) | 93 | 72 |
| Panel Cut-Out | $68^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ | $138^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ |


**SMP72x14445SN**
**Voltmeter - TRMS**


**SMP72x14445SN**
**Voltmeter - DC**


**SMP14445SN**
**Voltmeter - DC**

## Features

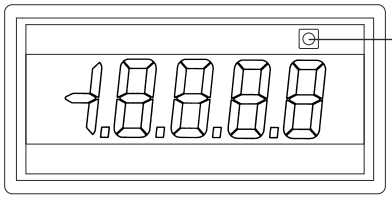
- High Accuracy Across the Entire Range
- User Programmable Display (CT Primary / PTR / Shunt Value)
- 19999 Count (Max) High Resolution Display
- Auto Selection of Decimal Point
- RS485 Port, 5KV Isolated with Modbus RTU Protocol (Optional)

## Specifications

- **Measuring Method** — TRMS Using Microcontroller
- **Display Type** — 1"/ 25.4mm Red LED Super Bright Display
- **Maximum Display** — 4½ Digit / 19999 (Max.) Counts
- **Display Stability** — Within ±2 Digit
- **Resolution** — 0.0001 to 1 Count Depending on Range / Scale Display
- **Over Load Indication** — "-OL-"
- **Under Load Indication** — NA
- **Sampling Rate** — 3 Samples / Second
- **Response Time** — 250ms
- **Maximum Overload** — Voltage : 1.2 Times Continuous<br>Current : 1.2 Times Continuous
- **Frequency Response** — 40 - 400Hz
- **Polarity Indication** — "-" is Indicated for Negative Input
- **VA Burden (Typical)** — Auxiliary : ≤ 1.5VA<br>Voltage Input : ≤ 1VA<br>Current Input : < 0.5VA
- **Environmental Conditions** — 0°C to + 55°C, < 70% RH (Operation)<br>-10°C to + 70°C, < 70% RH (Storage)<br>27°C ±5°C (Calibration)
- **Dielectric Strength** — 2.5KV @ 50Hz for 1 Minute between Input - Auxiliary & Case -Terminals
- **Impulse Withstand** — 3.5KV, 1.2 / 50 Micro Second
- **Case / Housing Material** — Polycarbonate, Black
- **Faceplate / Lens** — Polycarbonate Transparent Red
- **Connectors / Terminal** — Nylon 66, 33% GF, Black / Brass
- **Mounting Clamps** — Sturdy, Moulded Derlin with Suitable Hardware

| Model | Input | | Range | Programmable Display Key | 4½ Digit | 5 Digit | Aux Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|---|---|---|
| SMP72x14445SN / SMP14445SN | DC | mV | 0 - 75 (Shunt Operated) | ✓(*) | ✓ | - | 85-265V AC / DC @ 50 / 60Hz (Standard) OR 19-90V AC/DC @ 50 / 60Hz (Optional) | ± 0.5% of FSD |
| | | | 0 - 200 | - | ✓ | - | | |
| | | V | 0 - 2, 20, 200 | - | ✓ | - | | |
| | | | 0 - 1000 | - | ✓ | - | | |
| | | mA | 0 - 2, 20, 200 | - | ✓ | - | | |
| | | A | 0 - 2, 5 | - | ✓ | - | | |
| | AC | V | 0 - 110 (PT Operated) | ✓(#) | - | ✓ | | |
| | | | 0 - 2, 20, 200, 750 | - | ✓ | - | | |
| | | I | 0 - 1 (CT Operated) | ✓(*) | - | ✓ | | |
| | | | 0 - 5 (CT Operated) | ✓(*) | - | ✓ | | |

**Standard :** As per IS 13875




**For Setting CTP / Shunt / PTR**

- Power on DPM
- Remove Front Facia
- Press Key on Display Card once
- Meter will Show Present Set Display Value
- Press-Release until the Desired Value is Displayed


**SMP72x14445SN**
**Voltmeter - TRMS**


**SMP72x14445SN**
**Ammeter - TRMS**


**SMP14445SN**
**Ammeter - DC**

## # User Programmable PTR Display Value (Using Key)

| Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) | Sr. | Ratio | PTR (KV AC) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0.1100 | 5 | 30 | 3.3000 | 9 | 300 | 33.000 | 13 | 2000 | 220.00 |
| 2 | 3.77 | 0.4150 | 6 | 60 | 6.6000 | 10 | 600 | 66.000 | 14 | 4000 | 440.00 |
| 3 | 4 | 0.4400 | 7 | 100 | 11.000 | 11 | 1000 | 110.00 | - | - | - |
| 4 | 20 | 2.2000 | 8 | 200 | 22.000 | 12 | 1200 | 132.00 | - | - | - |

## * User Programmable CT Primary / Shunt Display Value (Using Key)

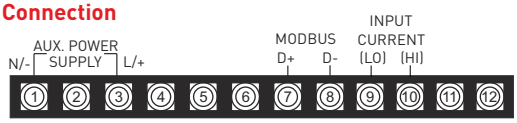
| CT Primary / Shunt Display Value | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 30 | 80 | 250 | 600 | 1500 | 5000 | 10000 |
| 5 | 40 | 100 | 300 | 700 | 1600 | 6000 | 12000 |
| 10 | 50 | 125 | 350 | 750 | 2000 | 7000 | 15000 |
| 15 | 60 | 150 | 400 | 800 | 2500 | 7500 | 20000 |
| 20 | 70 | 175 | 450 | 1000 | 3000 | 8000 | - |
| 25 | 75 | 200 | 500 | 1200 | 4000 | 9000 | - |

## Dimensions (mm)

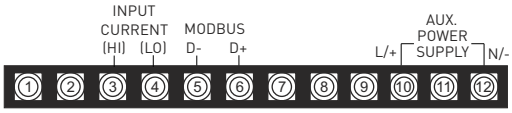
| Model | SMP72x14445SN | SMP14445SN |
|---|---|---|
| Front | 72 x 144 | 144 x 144 |
| Depth (Behind Bezel) | 93 | 72 |
| Panel Cut-Out | $68^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ | $138^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ |

**Ordering Information :** Model, Input Range, CTR / PTR / SHUNT (if any), Scale Display, Auxiliary Supply & RS 485 Modbus Communication (Optional).

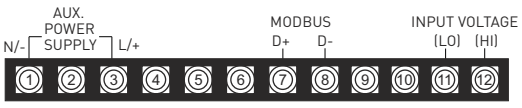
## Terminal Connection



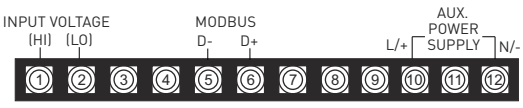

SMP72x14445SN - Ammeter (CT Operated)



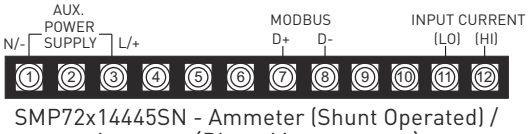

SMP14445SN - Ammeter (CT Operated)



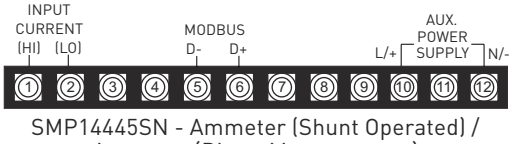

SMP72x14445SN - Voltmeter / PT Operated




SMP14445SN - Voltmeter / PT Operated




SMP72x14445SN - Ammeter (Shunt Operated) / Ammeter (Direct Measurement)




SMP14445SN - Ammeter (Shunt Operated) / Ammeter (Direct Measurement)


FDM964SD


SMP9635SWD


SMP14445SND


FDM1444SAD, FDM1444SBD

## Specifications

- **Measuring Method** — Dual Slope A/D Conversion (Voltmeter) Interval Measurement Method using Microcontroller (Frequency Meter)
- **Display Type** — Red LED Super Bright Display
- **Maximum Display** — 19999 Counts (Voltmeter) 9999 Counts (Frequency Meter)
- **Display Stability** — Within ± 2 Digits
- **Maximum Overload** — Voltage : 1.2 times continuous Current : 2 times continuous
- **Dielectric Strength** — 2.5 kV at 50Hz for 1 min. between Input - Auxiliary Case - Terminals
- **Frequency Response** — 40 - 400Hz (Voltmeter)
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **VA Burden (Typical) Per Display** — Auxiliary : < 5VA; Voltage Input : < 0.1VA; Current Input : < 0.5VA
- **Environmental Conditions** — Calibration : 27°C ± 5°C, Operating : 0 to 50°C, RH < 70%; Storage : -10 to 60°C, RH < 70%
- **Mounting Clamps** — Sturdy, Moulded ABS with Hardware
- **Connectors** — Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals
- **Faceplate / Lens** — Red Antiglare Faceplate with Annunciators

| Model | Input 1 Input 2 | | Range | Auxiliary Power Supply (Any One Only) | Accuracy Class | Digits (max.) | | Display Digit Height | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 3½ | 4½ | 0.56"/14.2mm | 1.0"/25.4mm |
| SMP14445SND | DC | Zero Supp. | 4 - 20mA | 85-265V AC/DC (Standard) OR 19-90V AC/DC (Optional) | 0.5 | - | ✓ | - | ✓ |
| | AC | V | 0 - 20, 200, 750V | | | - | ✓ | - | ✓ |
| | | I | 0 - 1, 2, 5A | | | - | ✓ | - | ✓ |
| SMP9635SWD | AC | V | 0 - 2, 20, 200, 750V | | | ✓ | - | ✓ | - |
| | | I | 0 - 1, 2, 5, 20A | | | ✓ | - | ✓ | - |
| | DC | Zero Supp. | 4 - 20mA | | | ✓ | - | ✓ | - |
| | | I | 0 - 1, 2, 5, 20A | | | ✓ | - | ✓ | - |

| Model | Input 1 Input 2 | | Auxiliary Power Supply (Any One Only) | | | | Accuracy Class | | | Display Digit Height | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 85-265V AC/DC | 110 / 230V AC | 24 / 48 / 110 / 220V DC | Self Powered | ±0.1 Hz | ±0.5 Hz | ±2.0 Hz | 0.56" / 14.20mm | 1.0" / 25.4mm |
| FDM1444SAD | 40 - 99.99Hz | @20 - 500V AC | - | ✓ | - | ✓ | ✓ | - | - | - | ✓ |
| FDM1444SBD | | | - | - | ✓ | - | ✓ | - | - | - | ✓ |
| FDM964SD | 40 - 99.99Hz | | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - |
| | 40 - 5000Hz | | ✓ | ✓ | - | ✓ | - | - | ✓ | ✓ | - |

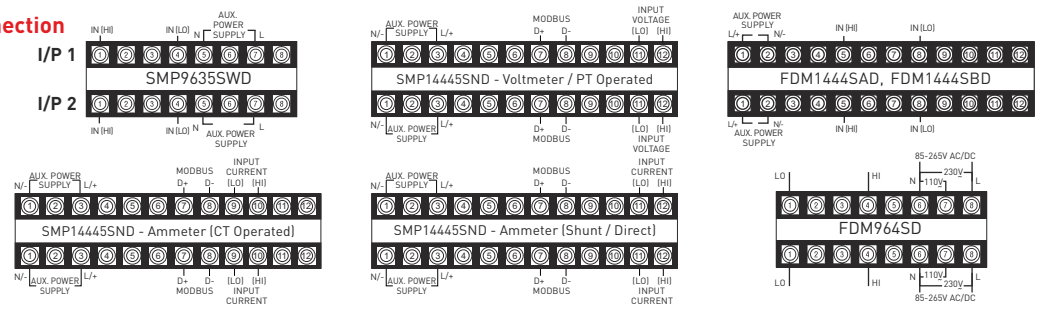
**Note :** For Self Powered Input variation is ±20% of Aux. **Standard :** As per IS 13875

**Dimensions (mm)**

| Model | SMP9635SWD | FDM964SD | SMP14445SND | FDM1444SAD FDM1444SBD |
|---|---|---|---|---|
| Front | 96 x 96 | 96 x 96 | 144 x 144 | 144 x 144 |
| Depth (Behind Bezel) | 90 | 90 | 93 | 93 |
| Panel Cut-Out | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $138^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ | $138^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ |

**Ordering Information :** Model, Input Range, PTR/CTR (if any), Scale Display, Auxillary Supply & Accuracy Class

**Terminal Connection**




SMP72x14445S, SMP72x14445ST


SMP96x28845

## Specifications

- **Measuring Method** — Dual Slope A/D Conversion
- **Sampling Rate** — 2.5 Samples per Second
- **Display Type** — Red LED Super Bright Display
- **Maximum Display** — 4½ Digit / 19999 Counts (Max.)
- **Resolution** — 0.0001 to 1 Count depending on the range
- **Polarity Indication** — " - " is indicated for negative input
- **Decimal Selection** — Field Selectable
- **Over Range Indication** — "0000" blinking
- **Maximum Overload** — Voltage : 1.2 times continuous<br>Current : 2 times continuous
- **VA Burden (Typical)** — Auxiliary : < 2.5VA<br>Voltage Input : < 1.0VA<br>Current Input : < 1.0VA
- **Frequency Response** — 40 - 400Hz
- **Crest Factor** — 4 (max.) TRMS accuracy specified for sine wave input
- **Faceplate / Lens** — Red Antiglare Faceplate with Annunciators
- **Environmental Conditions** — Calibration : 27°C ± 5°C,<br>Operating : 0 to 50°C, RH < 70%<br>Storage : -10 to 60°C, RH < 70%
- **Dielectric Strength** — 2.5 kV at 50Hz for 1 min. between Input - Auxiliary - Case - Terminals
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **Mounting Clamps** — Sturdy, Moulded ABS with suitable Hardware
- **Connectors** — Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals
- **Display Stability** — Within ± 2 Digits

| Model | Input | | Range | Auxiliary Power Supply (Any One Only) | | Accuracy Class | | Display Digit Height | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 0.5 | 1 | 1.0"/ 25.4mm | 2.3"/ 58mm |
| SMP72x14445S / SMP96x28845S SMP72x14445 | DC | mV | 0 - 200 | 230V AC ±10% @ 50Hz | 85-265V AC/DC @ 50/60Hz (Standard) OR 19-90V AC/DC @ 50/60Hz (Optional) | ✓ | ✓ | ✓ | ✓ |
| | | V | 0 - 2, 20, 200 | | | ✓ | ✓ | ✓ | ✓ |
| | | V | 0 - 1000 | | | ✓ | ✓ | ✓ | ✓ |
| | | mA | 0 - 2, 20, 200 | | | ✓ | ✓ | ✓ | ✓ |
| | | A | 0 - 1, 2, 5 | | | ✓ | ✓ | ✓ | ✓ |
| | AC | V | 0 - 2, 20, 200, 750 | | | ✓ | ✓ | ✓ | ✓ |
| | | A | 0 - 1, 2, 5 | | | ✓ | ✓ | ✓ | ✓ |
| SMP72x14445ST | AC TRMS | V | 0 - 2, 20, 200, 750 | | | - | ✓ | ✓ | ✓ |
| | | A | 0 - 1, 2, 5 | | | - | ✓ | ✓ | ✓ |

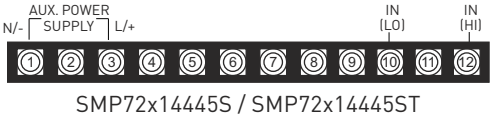
**Ordering Information**: Model, Input Range, CTR / PTR (if any), Scale Display, Data Hold (Optional), Auxillary Supply & Accuracy Class

**Standard :** As per IS 13875

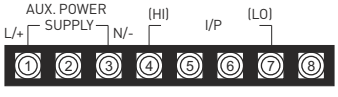
### Dimensions (mm)

| Model | SMP72x14445S / SMP72x14445ST | SMP72x14445 | SMP96x28845 |
|---|---|---|---|
| Front | 72 x 144 | 72 x 144 | 96 x 288 |
| Depth (Behind Bezel) | 93 | 130 | 77 |
| Panel Cut-Out | $68^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ | | $92^{(+0.8,\ -0.0)}$ x $282^{(+0.8,\ -0.0)}$ |

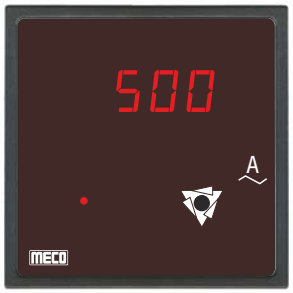
### Terminal Connection



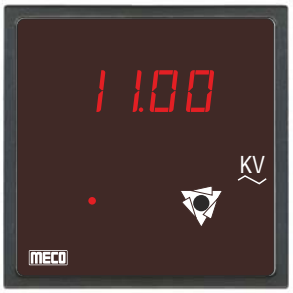

SMP72x14445S / SMP72x14445ST



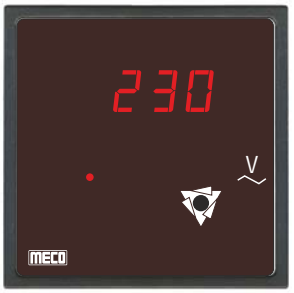

SMP96x28845




SMP9635AS




SMP9635VS33




SMP9635VS34

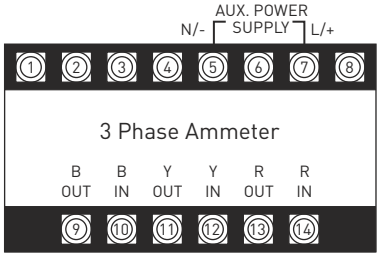
| Model | Input | Range | Aux. Power Supply (Any One Only) | Accuracy | | Digit Max. | Display Digit Height |
|---|---|---|---|---|---|---|---|
| | | | | 0.5 | 1 | 3½ | 0.56"/14.2mm |
| **SMP9635AS** | A - 3 Phase | 1A or 5A (any one only) | 230V AC ± 10% @ 50/60Hz (Standard) OR 110/220V DC ± 10% (Optional) | ✓ | ✓ | ✓ | ✓ |
| **SMP9635VS33** | V - 3 Phase 3 WIRE | 500V AC | | ✓ | ✓ | ✓ | ✓ |
| **SMP9635VS34** | V - 3 Phase 4 WIRE | 500V AC | | ✓ | ✓ | ✓ | ✓ |

**Dimensions (mm)**

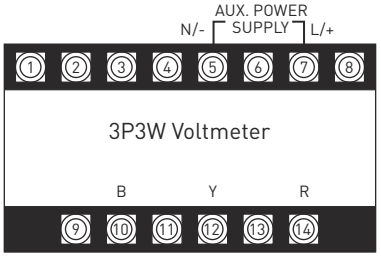
| Model | SMP9635AS / SMP9635VS33 / SMP9635VS34 |
|---|---|
| **Front** | 96 x 96 |
| **Depth (Behind Bezel)** | 135 |
| **Panel Cut-Out** | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |

Model, Input Range, CTR / PTR (if any), Scale Display, Auxiliary Supply, Accuracy Class & Display Digit Height

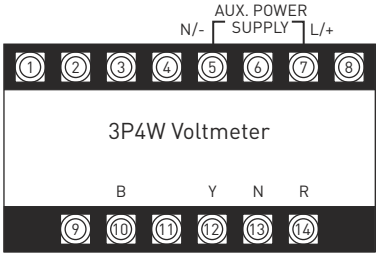
**Terminal Connection**




SMP9635AS




SMP9635VS33




SMP9635VS34


SMP35ASN - Ammeter


SMP35VSN - Voltmeter


SMP9635ASN - Ammeter


SMP9635VSN - Voltmeter

## Features

- 1A / 5A Input in same Meter (User Selectable)
- High Accuracy Across the Entire Range
- 9999 Count High Resolution Display
- Auto / Manual Scroll Display (User Selectable)
- 3P3W / 3P4W (User Selectable)
- LED Indication for R, Y, B, RY, YB, BR
- User Programmable Display / CTP / PTR
- Auto Selection of Decimal Point
- Auto Indication of KV & KA
- Setup / Programming Protected by Password

## Specifications

- **Measuring Method** — TRMS using Microcontroller
- **Display Type** — 0.56" / 14.2mm Red LED Super Bright Display
- **Maximum Display** — 4 Digit / 9999 Counts
- **Display Stability** — Within ± 2 Digits
- **Overload / Underload** — - OL - / - UL - Indication
- **Resolution** — 0.001 to 1 Count Depending on Range
- **Sampling Rate** — 3 Samples / Second
- **Maximum Overload** — Voltage : 1.2 times continuous; Current : 2 times continuous
- **VA Burden (Typical)** — Auxiliary : ⩽ 2VA / Phase; Voltage Input : ⩽1.0VA / Phase; Current Input : ⩽ 1.0VA / Phase
- **Frequency Response** — 45 - 65Hz
- **Environmental Conditions** — 0 to 55°C, < 70% RH (Operation); -10 to 70°C, < 70% RH (Storage); 27°C ± 5 °C (Calibration)
- **Dielectric Strength** — 2.5 kV at 50Hz for 1 min. between Input - Auxiliary & Case - Terminals
- **Impulse Withstand** — 3.5kV, 1.2 / 50µs
- **Case / Housing Material** — Black ABS, Dimension as per DIN 43700
- **Connectors** — Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals
- **Faceplate / Lens** — Red Antiglare Faceplate with Annunciators
- **Mounting Clamps** — Sturdy, Derline (Engineering plastic)

| Model | Input AC | Range (Any One Only) | Programmable Display / CTP / PTR | Aux. Power Supply (Any One Only) | Accuracy |
|---|---|---|---|---|---|
| SMP35VSN SMP9635VSN | V | 51 - 300V AC (PH-N) 88 - 519V AC (PH-PH) | 1 - 9999 | 85-265V AC/DC OR 19-90V AC/DC (Optional) | ± (0.5% FSD + 2 Digits) |
| SMP35ASN SMP9635ASN | A | For 1A Range : 0.080 - 1.200A AC | 1 - 9999 | | |
| | | For 5A Range : 0.200 - 6.000A AC | 1 - 9999 | | |

**Dimensions (mm)**

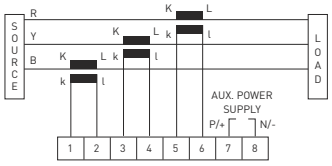
| Model | SMP35VSN / SMP35ASN | SMP9635VSN / SMP9635ASN |
|---|---|---|
| Front | 48 x 96 | 96 x 96 |
| Depth (Behind Bezel) | 88 | 90 |
| Panel Cut-Out | $44^{(+0.5, -0.0)}$ x $92^{(+0.8, -0.0)}$ | $92^{(+0.8, -0.0)}$ x $92^{(+0.8, -0.0)}$ |

**Ordering Information** : Model and Aux. Supply.

**Standard :** As per IS 13875

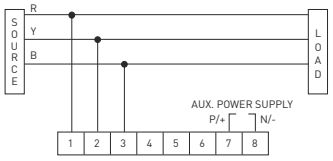
## Terminal Connection

3Phase System

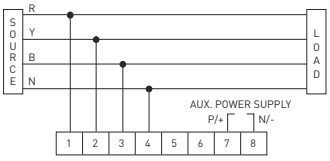



SMP35ASN / SMP9635ASN

3Phase 3Wire System




3Phase 4Wire System




SMP35VSN / SMP9635VSN


**FDM3A / FDM3B**

## Specification

- **Measuring Method** 3 Digit - Digital Circuit
- **Gate Time** 1 Second
- **Display Type** 14.2mm/0.56" digit height, Red LED (standard)
- **Maximum Display** 999 counts for 3 Digit Meters
- **Resolution** 0.1 to 1 count for 3 Digit depending in the range
- **Decimal Selection** Factory Set
- **Maximum Overload** Voltage : 1.2 times continuous
- **Time Base** 32.768kHz for 3 digit meters
- **VA Burden (Typical)** Aux. : <4.5 VA Voltage Input : <0.5VA,
- **Environment Conditions** 0 to 50°C,<70% RH (Operation) -10 to 70°C, <70% RH (Storage)
- **Dielectric Strength** 2.5kV at 50Hz for 1 Min. between Input - Auxiliary and Case - Terminals
- **Case / Housing Material** DIN Black ABS, Dimension as per DIN 43700
- **Bezel** Snap-Fit, Black ABS, Dimensionas per DIN 43718
- **Mounting Clamps** Sturdy, Moulded ABS with suitable Hardware
- **Connectors** Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals
- **Faceplate / Lens** RED Antiglare Faceplate with Annuciators

| Model | Input | | Aux. Power Supply (Any One Only) | | Accuracy | |
|---|---|---|---|---|---|---|
| | | | 230V AC ±10% | Self (#) Powered | ± 0.1 Hz | ±1.0 Hz |
| FDM3A | 40 - 99.9Hz | 110V AC OR 230V AC (Any One Only) | - | ✓ | ✓ | - |
| FDM3B | 0 - 99.9 Hz | 10 ~ 500V AC | ✓ | - | ✓ | - |
| | 0 - 999Hz | | ✓ | - | - | ✓ |

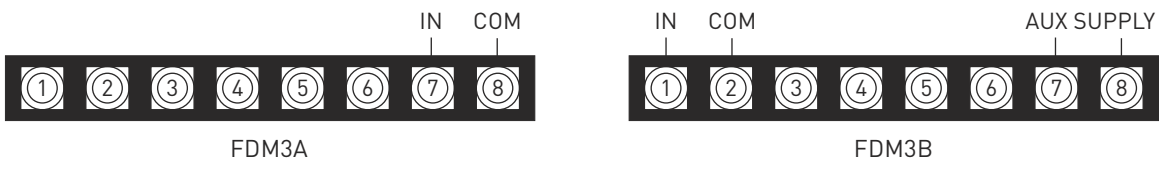
**Note :** For (#) Self Powered Meters input Variation is ±20% of Aux.

**Dimensions (mm)**

| Model | FDM3A / FDM3B |
|---|---|
| Front | 48 x 96 |
| Depth (Behind Bezel) | 135 |
| Panel Cut-Out | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |

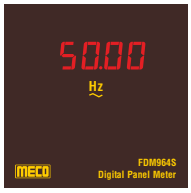
**Ordering Information :** Model, Input Range, CTR / PTR (if any), Scale Display, Auxillary Supply & Optionals

**Terminal Connection**




FDM4S


RPM4AS (48x96)
RPM964AS (96x96)




FDM964S


FDM72x1444SA
FDM72x1444SB


FDM1444SA
FDM1444SB

## Specifications

- **Measuring Method** — Interval Measurement Method using Microcontroller
- **Display Type** — Red LED (Standard)
- **Maximum Display** — 9999 Counts for 4 Digit Meters
- **Display Stability** — Within ± 2 Digits
- **Resolution** — 0.01 to 1 for 4 Digit depending on range 1 RPM for RPM Meter
- **Decimal Selection** — Auto (FDM4S & FDM964S) / Factory Set (For Others)
- **Maximum Overload** — Voltage : 1.2 times continuous
- **VA Burden (Typical)** — Auxiliary : < 4.5 VA Voltage Input : < 0.5VA
- **Environmental Conditions** — Calibration : 27°C ± 5°C, Operating : 0 to 50°C, RH < 70% Storage : -10 to 60°C, RH < 70%
- **Dielectric Strength** — 2.5 kV at 50 Hz for 1 min. between Input - Auxiliary - Case - Terminals
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **Mounting Clamps** — Sturdy, Moulded ABS with suitable Hardware
- **Connectors** — Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals
- **Faceplate / Lens** — Red Antiglare Faceplate with Annunciators

| Model | Input | | Auxiliary Power Supply (Any One Only) | | | | Accuracy Class | | | Display Digit Height | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 85-265V AC/DC | 110 / 230V AC | 24 / 48 / 110 / 220V DC | Self (#) Powered | ± 0.1 Hz | ± 0.5 Hz | ± 2.0 Hz | 0.56" / 14.20mm | 1.0" / 25.4mm |
| FDM4S / FDM964S | 40 - 99.99Hz | @ 20 - 500V AC | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - |
| | 40 - 5000Hz (Auto Ranging) | | ✓ | ✓ | - | ✓ | - | - | ✓ | ✓ | - |
| FDM1444SA | 40 - 99.99Hz | | - | ✓ | - | ✓ | ✓ | ✓ | - | - | ✓ |
| FDM1444SB | | | - | - | ✓ | - | ✓ | ✓ | - | - | ✓ |
| FDM72x1444SA | | | - | ✓ | - | ✓ | ✓ | ✓ | - | - | ✓ |
| FDM72x1444SB | | | - | - | ✓ | - | ✓ | ✓ | - | - | ✓ |
| RPM4AS/ RPM964AS | 300 -1500RPM for 10 - 50Hz | | ✓ | ✓ | - | ✓ | - | ✓ | - | ✓ | - |

**Note :** For (#) Self Powered Meters Input Variation is ±20% of Aux.

**Dimensions (mm)**

| Model | FDM4S RPM4AS | FDM964S RPM964AS | FDM72X1444SA FDM72X1444SB | FDM1444SA FDM1444SB |
|---|---|---|---|---|
| Front | 48 x 96 | 96 x 96 | 72 x 144 | 144 x 144 |
| Depth (Behind Bezel) | 88 | 90 | 93 | 72 |
| Panel Cut-Out | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $68^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ | $138^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ |

**Ordering Information**: Model, Input Frequency Range / RPM Range (for RPM Meter), Input Voltage, Auxillary Supply & Accuracy Class

**Standard :** As per IS 13875

## Terminal Connection


FDM72x1444SA (AC Aux.) / FDM72x1444SB (DC Aux.)


FDM1444SB (DC Aux.) / FDM1444SA (AC Aux.)


FDM4S / FDM964S / RPM4AS / RPM964AS


DPF9611S, DPF9631S


DPF72x14411, DPF72x14431


DPF14411, DPF14431

## Specifications

- **Measuring Method** — Cosine of Phase Shift between Voltage and Current
- **Sampling Rate** — 2.5 Samples per Second
- **Display Type** — Red LED (Standard)
- **Maximum Display** — 4 Digits to indicate PF
- **Resolution** — 0.001 PF
- **Under Current Indication** — Error Code".01 " Blinking when current < 20% of Nominal is detected
- **Polarity Indication** — L (Lagging/Inductive) or C (Leading/ Capacitive)
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **VA Burden (Typical)** — Auxiliary : < 5 VA<br>Voltage Input : < 1.0VA / Phase<br>Current Input : < 1.0VA / Phase
- **Maximum Overload** — Voltage : 1.2 times continuous<br>Current : 2 times continuous
- **Environmental Conditions** — Calibration : 27°C ± 5°C,<br>Operating : 0 to 50°C, RH < 70%<br>Storage : -10 to 60°C, RH < 70%
- **Dielectric Strength** — 2.5 kV at 50Hz for 1 min. between Case - Terminals
- **Mounting Clamps** — Sturdy, Moulded ABS with Hardware
- **Connectors** — Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals
- **Faceplate / Lens** — Red Antiglare Faceplate with Annunciators
- **Display Stability** — Within ± 2 Digits

| Model | System (Phase, Element, Wire) | Input (Nominal) | Auxiliary Power Supply (Any One Only) | | | | Accuracy Class | Display Digit Height | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 85-265V AC/DC | 110 / 230V AC | 24 / 48 / 110 / 220V DC | Self Powered | ± 1 Degree | 0.56" / 14.20mm | 1.0" / 25.4mm |
| **DPF9611S** | 1P 1E 2W | V for 1P1E2W = 110 / 230 V (P-N); V for 3P1E2W = 110 / 440 V (P-P); A = 1, 2 or 5A AC; Hz = 50Hz (V Range = ± 20% of Nominal A Range = 20 - 120% of Nominal) PF Range = 0.500 Lag (L) - 1 - 0.500 Lead (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| **DPF9631S** | 3P 1E 2W (Balanced Load) | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| ***DPF72x14411** ***DPF14411** | 1P 1E 2W | | - | ✓ | ✓ | ✓ | ✓ | - | ✓ |
| ***DPF72x14431** ***DPF14431** | 3P 1E 2W (Balanced Load) | | - | ✓ | ✓ | ✓ | ✓ | - | ✓ |

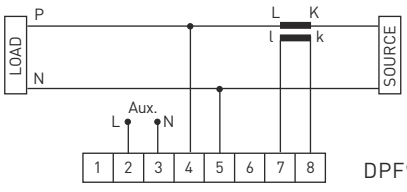
**Dimensions (mm)**

| Model | DPF9611S / DPF9631S | DPF72x14411 / DPF72x14431 | DPF14411 / DPF14431 |
|---|---|---|---|
| Front | 96 x 96 | 72 x 144 | 144 x 144 |
| Depth (Behind Bezel) | 90 | 130 | 59 |
| Panel Cut-Out | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $68^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ | $138^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ |

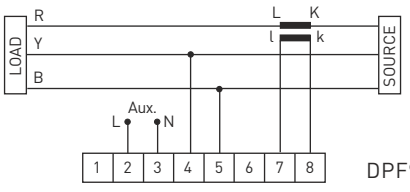
**Ordering Information** : Model, Input Voltage, Input Current, Input Frequency, CTR / PTR (if any), Auxillary Supply & Display Digit Height

**Standard :** As per IS 13875

**Terminal Connection**




DPF9611S




DPF9631S

***Note :**
For Terminal Connection of DPF72x14411, DPF14411, DPF72x14431, DPF14431 Please Refer Page of Digital Wattmeter / Varmeter (with Built-In Transducer) - Connection Diagram 49


DWM96


DVM96

## Specifications

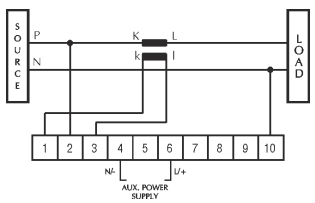
- **Measuring Method** — Multiplication of Pulse Width and Pulse Height
- **Sampling Rate** — 2.5 Samples per Second
- **Display Type** — Red LED (Standard)
- **Resolution** — 0.001 to 1 depending on range for 3½ digit
  0.0001 to 1 depending on range for 4½ digit
- **Maximum Overload** — Voltage : 1.2 times continuous
  Current : 2 times continuous
- **VA Burden (Typical)** — Auxiliary : < 5VA
  Voltage Input : < 0.5VA, < 5VA for R Phase in Self Powered
  Current Input : < 0.5 VA / Phase
- **Environmental Conditions** — Calibration : 27°C ± 5°C,
  Operating : 0 to 50°C, RH < 70%
  Storage : -10 to 60°C, RH < 70%
- **Over Range** — " 1 " or " -1 "
- **Dielectric Strength** — 2.5 kV at 50Hz for 1 min. between Case - Terminals
- **Polarity Indication** — " - " is Displayed to indicate Export of Power
- **Faceplate / Lens** — Red Antiglare Faceplate with Annunciators
- **Note** — Digital Watt /Var Meters with External Transducer Against Inquiry
- **Display Stability** — Within ± 2 Digits
- **Case/Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **Mounting Clamps** — Sturdy, Moulded Derlin with suitable Hardware
- **Connectors** — Detachable Connectors

| Model | Input (Nominal) A = 1, 2 or 5A AC PF 0.3 Lag - 1 - 0.3 Lead Hz = 50Hz | | | Auxiliary Power Supply (Any One Only) | | Accuracy Class | | Digits (max.) | Bi Directional | | Display Digit Height |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 110 / 230V AC | Self Powered | 0.5 | 1.0 | 3½ | Input | Display | 0.56" / 14.2mm |
| DWM963511 DVM963511 | 1P 1E 2W | V Range = ± 20% of Nominal; A Range = 20 - 120% of Nominal | For 1P1E2W : 63.5 / 110 / 230 V (P–N); For 3P1E2W : 110 / 440 V (P–P); For 3P2E3W : 110 / 440 V (P–P) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DWM963531 DVM963531 | 3P 1E 2W (Balanced Load) | | | | | | | | | | |
| DWM963533 DVM963533 | 3P 2E 3W (Balanced & Unbalanced Load) | | | | | | | | | | |

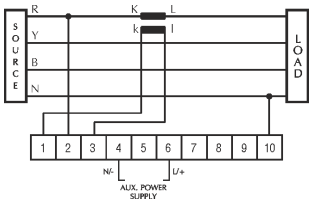
| Dimensions (mm) | |
|---|---|
| Model | DWM9635 / DVM9635 |
| Front | 96 x 96 |
| Depth (Behind Bezel) | 135 |
| Panel Cut-Out | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |

**Ordering Information**: Model, Input Voltage, Input Current, Input Frequency, CTR / PTR (if any), Scale Display, Auxillary Supply, Accuracy Class, Digits, Uni or Bi-Directional Input & Display Digit Height

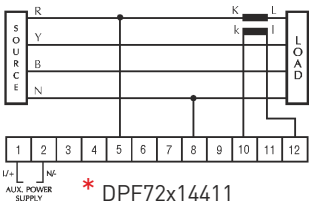
## Terminal Connection



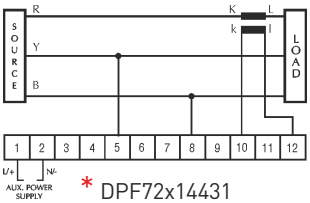

DWM9611, DVM9611



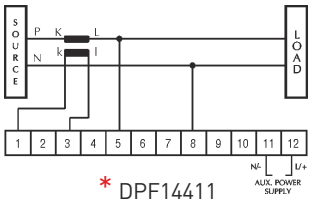

DWM9631, DVM9631



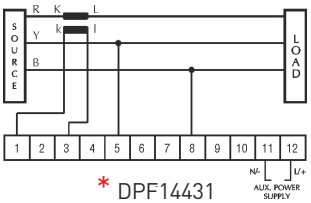

* DPF72x14411




* DPF72x14431




* DPF14411




* DPF14431


**SMPW35SW, SMPV35SW**


**SMPW9635SW, SMPV9635SW**


**SMPW72x14445SN, SMPV72x14445SN**


**SMPW14445SN, SMPV14445SN**

## Specifications

MECO 1-Phase & 3-Phase Digital Watt / Var Meters (with External Transducer) are available in Sizes 48 x 96 / 96 x 96 / 72 x 144 / 144 x 144mm etc. with choice of AC / DC Aux. Supply and Display of Digit Height 0.56 / 1 / 2.3 inches. For detailed specifications, please refer catalog of Digital Panel Meters and respective pages of DIN Transducers. Below are listed some of the more popular Models. However several other types of V, A, W, Var, PF, Hz etc. meters with External Transducers are also available.

| **Display / Digits (max.)** | | 3½ Digits, 1999 Counts | | 4½ Digits, 19999 Counts | |
|---|---|---|---|---|---|
| **Display Height** | | 14.2mm / 0.56" | | 25.4mm / 1" | |
| **Type** | **System** | 48 x 96mm | 96 x 96mm | 72 x 144mm | 144 x 144mm |
| **Watt Meter** | 1P1E2W | **SMPW3511SW** | **SMPW963511SW** | **SMPW72x1444511SN** | **SMPW1444511SN** |
| | 3P1E2W | **SMPW3531SW** | **SMPW963531SW** | **SMPW72x1444531SN** | **SMPW1444531SN** |
| | 3P2E3W | **SMPW3533SW** | **SMPW963533SW** | **SMPW72x1444533SN** | **SMPW1444533SN** |
| | 3P3E4W | **SMPW3534SW** | **SMPW963534SW** | **SMPW72x1444534SN** | **SMPW1444534SN** |
| **Var Meter** | 1P1E2W | **SMPV3511SW** | **SMPV963511SW** | **SMPV72x1444511SN** | **SMPV1444511SN** |
| | 3P1E2W | **SMPV3531SW** | **SMPV963531SW** | **SMPV72x1444531SN** | **SMPV1444531SN** |
| | 3P2E3W | **SMPV3533SW** | **SMPV963533SW** | **SMPV72x1444533SN** | **SMPV1444533SN** |
| | 3P3E4W | **SMPV3534SW** | **SMPV963534SW** | **SMPV72x1444534SN** | **SMPV1444534SN** |
| **V** (Any One) | Nominal Input | **For 1P1E2W : 63.5 / 230 V (P-N); For 3P1E2W : 110 / 440 V (P-P); For 3P2E3W / 3P3E4W : 110 / 440 V (P-P)** | | | |
| | Range | 20 - 120% of Nominal | | | |
| **A** (Any One) | Nominal Input | 1, 2, or 5A AC (also 10A AC for 1 Phase) | | | |
| | Range | 5 - 120% of Nominal | | | |
| **Hz** | | **Standard** : 50Hz, **Optional** : 60Hz | | | |
| **PF** | | **Standard Range** : 0.3 Lag - 1 - 0.3 Lead | | | |
| **Auxiliary Power Supply** | | **48 x 96mm, 96 x 96mm,** 85-265V AC/DC (Standard) OR 19-90V AC/DC (Optional) | | **72x14445SN / 144x144SN** 85-265V AC/DC (Standard) OR 19-90V AC/DC (Optional) | |
| **Accuracy** (Calibrated at 27°C ±5°C) | | ±(0.5% of Full Scale + 2 Digits) | | | |

**Ordering Information**: Model, Input Voltage, Input Current, Input Frequency, CTR / PTR (if any), Scale Display, Auxillary Supply, Accuracy Class, Digits, Uni or Bi Directional & Display Digit Height.

## Dimensions (mm)

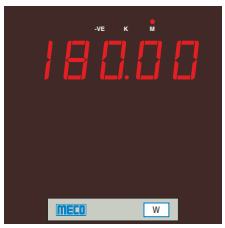
| **Model** | **SMPW14445SN SMPV14445SN** | **SMPW9635SW SMPV9635SW** | **SMPW35SW SMPV35SW** | **SMPW72x14445SN SMPV72x14445SN** |
|---|---|---|---|---|
| Front | 144 x 144 | 96 x 96 | 48 x 96 | 72 x 144 |
| Depth (Behind Bezel) | 72 | 90 | 88 | 93 |
| Panel Cut-Out | $138^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $68^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ |
| External Transducer (approx.) | As per DIN Series Transducers | | | |

# 5 Digit 3P Watt / VAR / VA Meter (with Built-In Transducer) - TRMS with RS-485 Comm.
# 4 Digit 3P PF Meter (with Built-In Transducer) - TRMS with RS-485 Comm.


**DWM96534S**
**DVM96534S**


**DWM72x144533-TRMS**
**DWM72x144534-TRMS**


**DPF72x144433-TRMS**
**DPF72x144434-TRMS**




**DWM144533-TRMS**
**DWM144534-TRMS**

## Features :

- TRMS Measurement
- 1"/25.4mm Digit Height Display
- 0.56"/14.2mm Digit Height Display
- 5 Digits 99999 Counts (Max.), Super Bright Display
- 3 Phase 3 Wire / 3 Phase 4 Wire System
- CE Compliance with EN61010-1, EN61326-1
- Stable & Accurate
- " -VE " is Displayed to Indicate Export of Power
- Auto Indication of K & M for Kilo & Mega Respectively
- Auto Selection of Decimal Point
- RS485 Port, 4KV Isolated with Modbus RTU Protocol (Optional)

| Model | Parameter Measured (System) | Accuracy ±(%FS + 3 Digit) |
|---|---|---|
| **DWM96534S-TRMS** | 3 Phase Active Power | ±0.5% |
| **DVM96534S-TRMS** | 3 Phase Reactive Power | ±1.0% |
| **DWM72x144533-TRMS/DWM72x144534-TRMS** | 3 Phase Active Power | ±0.5% |
| **DVM72x144533-TRMS/DVM72x144534-TRMS** | 3 Phase Reactive Power | ±1.0% |
| **DVAM72x144533-TRMS/DVAM72x144534-TRMS** | 3 Phase Apparent Power | ±0.5% |
| **DPF72x144433-TRMS/DPF72x144434-TRMS** | 3 Phase Power Factor | ±1° Electrical |
| **DWM144533-TRMS/DWM144534-TRMS** | 3 Phase Active Power | ±0.5% |
| **DVM144533-TRMS/DVM144534-TRMS** | 3 Phase Reactive Power | ±1.0% |

## Specifications

| | | | | |
|---|---|---|---|---|
| **Auxillary Supply** | 85 - 265VAC / DC (Standard) | | **Current I/P** | <0.2VA / Phase |
| | 19 - 90VAC / DC (Optional) | | **System** | 3P2E3W / 3P3E4W |
| **Voltage / Phase** PT Ratio : 1-2500 (Max.) | 190V - 290VAC (Max.) (PH-N) | Any One Only | **Standard** | |
| | 50.8V - 96.2VAC (Max.) (PH-N) | | **Installation Category** | CAT II (IEC / EN61010-1) |
| | 330V - 500VAC (Max.) (PH-PH) | Any One Only | **Pollution** | Degree 2 (IEC / EN61010-1) |
| | 88V - 132VAC (Max.) (PH-PH) | | **Environment** | |
| **Current / Phase** CT Ratio : 1-9000 (Max.) | 0.1A to 1.2A (Max.) | Any One Only | **Calibration** | 27°C ± 5°C |
| | 0.5A to 6A (Max.) | | **Operating** | 0 to 50°C, RH <70% |
| **Frequency** | 45 - 55Hz | | **Storage** | -10 to 60°C, RH <70% |
| **Power Factor** | 0.300 Lag(L) - 1.000 - 0.300 Lead(C) | | **Terminal Block** | Screw Type |
| **VA Burden (Typical)** | | | **Dielectric Strength** | 2.5KV @ 50Hz for 1min. |
| **Auxiliary** | <2.5VA | | **Insulation Resistance** | >20MOhms at 500VDC |
| **Voltage I/P** | <0.5VA / Phase | | | |

## Dimensions (mm)

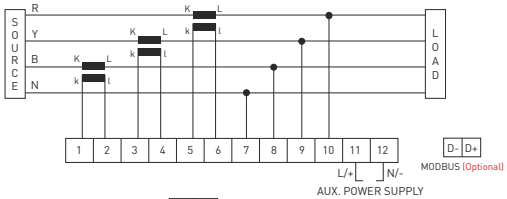
| | | | |
|---|---|---|---|
| **Front** | 96x96 | 72 x 144 | 144x144 |
| **Depth** (Behind Bezel) | 43 | 130 | 59 |
| **Panel Cut-Out** | $92^{(+0.8,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ | $68^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ | $138^{(+0.8,\ -0.0)}$ x $138^{(+0.8,\ -0.0)}$ |

**Ordering Information** Model, Input Voltage, Input Current, Input Frequency, System 3P3E4W / 3P2E3W, CTR / PTR (if any), Auxiliary Supply & RS485 MODBUS Communication Port (Optional)

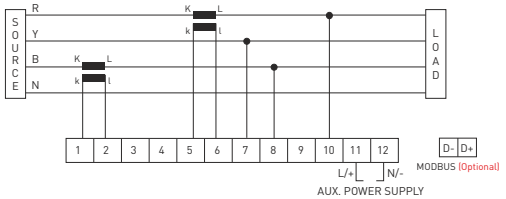
**Standard :** As per IS 13875

## Terminal Connection

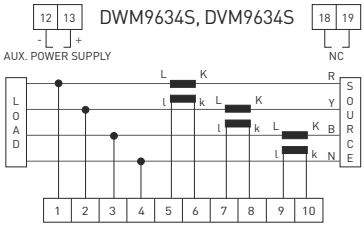
**3 Phase 3 Element 4 Wire** (DWM/DVM/DVAM/DPF 72x144)



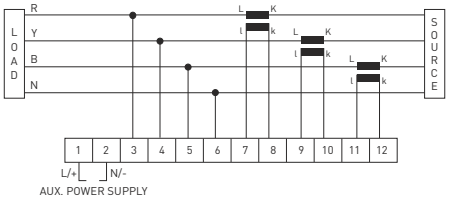

**3 Phase 2 Element 3 Wire** (DWM/DVM/DVAM/DPF 72x144)



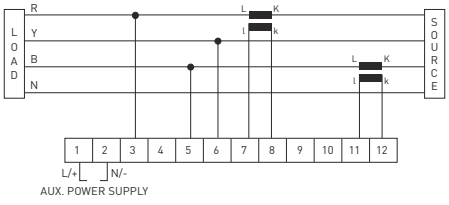

DWM9634S, DVM9634S




**3 Phase 3 Element 4 Wire** (DWM/DVM 144x144)




**3 Phase 2 Element 3 Wire** (DWM/DVM 144x144)




SM9635SD


SM35SD

## Specifications

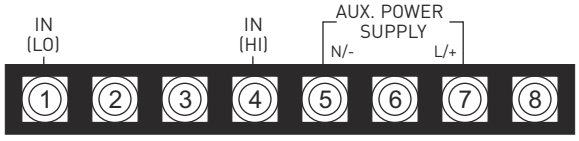
- **Measuring Method** — Dual Slope A/D Conversion
- **Sampling Rate** — 2.5 Samples per Second
- **Display Type** — 14.2mm / 0.56" Digit Height, Red LED (Standard)
- **Maximum Display** — 1999 Counts for 3½ Digit Meters
- **Resolution** — 0.001 to 1 Count for 3½ depending on the Range
- **Polarity Indication** — " - " is indicated for Negative Input
- **Decimal Selection** — Field Selectable
- **Over Range Indication** — " 1 " or " -1 " for 3½ Digit Meters
- **Maximum Overload** — Voltage : 1.2 times continuous<br>Current : 2 times continuous
- **Environmental Conditions** — Calibration : 27°C ± 5°C,<br>Operating : 0 to 50°C, RH < 70%<br>Storage : -10 to 60°C, RH < 70%
- **VA Burden (Typical)** — Auxiliary : < 1.0VA<br>Voltage Input : < 1.0VA,<br>Current Input : < 1.0VA
- **Faceplate / Lens** — Red Antiglare Faceplate with Annunciators
- **Dielectric Strength** — 2.5 kV at 50Hz for 1 min. between Case - Terminals
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **Mounting Clamps** — Sturdy, Moulded ABS with suitable Hardware
- **Connectors** — Terminal Block : Thermoplastic (UL 94V-0) with Tin Plated Brass Terminals
- **Display Stability** — Within ± 2 Digits

| **Display / Digits (max.)** | | 3½ Digits, 1999 Counts | |
|---|---|---|---|
| **Digit Height** | | 14.2mm / 0.56" | |
| **Ranges** | **Input** | **SM9635SD** | **SM35SD** |
| **DC** | mV | 0 - 200 mV | |
| | V | 0 - 2, 20, 200, 1000 V | |
| | µA | 0 - 200µA | |
| | mA | 0 - 2, 20, 200 mA | |
| | A | 0 - 2, 5, 20 A | |
| | Zero Suppressed | 4 - 20 mA or 1 - 5 V | |
| **Auxiliary Power Supply** | | **Standard** : 5VDC ± 10% | |
| **Accuracy** (Specified at 27± 5°C) ±(%FSD + dgt) | V DC | (0.1 + 2) | |
| | A DC | (0.2 + 2) in all ranges except<br>(0.3 + 2) in 2 A & 5 A<br>(0.5 + 2) in 20 A | |
| **Dimensions (mm)** | Front | 96 x 96 | 48 x 96 |
| | Depth (Behind Bezel) | 90 | 88 |
| | Panel Cut-Out | 92 (+0.8, -0.0) x 92 (+0.8, -0.0) | 44 (+0.5, -0.0) x 92 (+0.8, -0.0) |

**Ordering Information** : Model, Input Range & Scale Display

**Standard :** As per IS 13875

## Terminal Connection




SM9635SD / SM35SD


**SM35E**

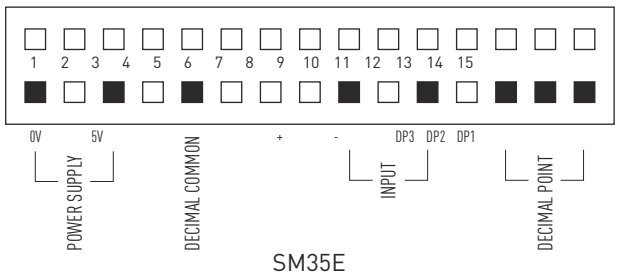
## Specification

- **Measuring Method** — Dual Slope A/D Conversion
- **Sampling Rate** — 2.5 Samples per Second
- **Display Type** — 14.2mm/0.56" Digit Height, Red LED (Standard)
- **Maximum Display** — 1999 Counts for 3½ Digit Meters
- **Resolution** — 0.001 to 1 Count for 3½ depending on the Range
- **Polarity Indication** — " - " is indicated for Negative Input
- **Decimal Selection** — Field Selectable
- **Over Range Indication** — " 1 " or " -1 " for 3½ Digit Meters
- **Maximum Overload** — Voltage : 1.2 times continuous<br>Current : 2 times continuous
- **VA Burden (Typical)** — Auxiliary : < 1.0VA<br>Voltage Input : < 0.1VA,<br>Current Input : < 0.5VA
- **Faceplate / Lens Annunciators** — Red Antiglare Faceplate with
- **Environmental Conditions** — 0 to 50°C, <70% RH (Operation)<br>-10 to 70°C, <70% RH (Storage)
- **Dielectric Strength Case - Terminals** — 2.5 kV at 50Hz for 1 min. between
- **Case / Housing Material** — DIN Black ABS, Dimension as per DIN 43700
- **Bezel** — Snap-Fit, Black ABS, Dimension as per DIN 43718
- **Mounting Clamps** — Sturdy, Moulded ABS with suitable Hardware
- **Connectors** — SM35E : PCB Edge Connectors Provided with the Meters

| **Display / Digits (max.)** | 3½ Digits, 1999 Counts | |
|---|---|---|
| **Ranges** | **Models** | **SM35E** |
| **DC** | mV | 0 - 75, 0 - 200 mV |
| | V | 0 - 2, 20, 200 V |
| **Auxiliary Power Supply** | Standard : 5VDC ± 10% | |
| **Accuracy** (Specified at 27 ± 5°C) ± (%rdg + dgt) | V DC | (0.5 + 2) |
| **Dimensions** (mm) | Front | 96 x 48 |
| | Depth (Behind Bezel) | 95 |
| | Panel Cut-Out | $44^{(+0.5,\ -0.0)}$ x $92^{(+0.8,\ -0.0)}$ |

**Ordering information :** Model, Input Range, Scale Display & Optionals

## Terminal Connection




SM35E


**GM035-BL**

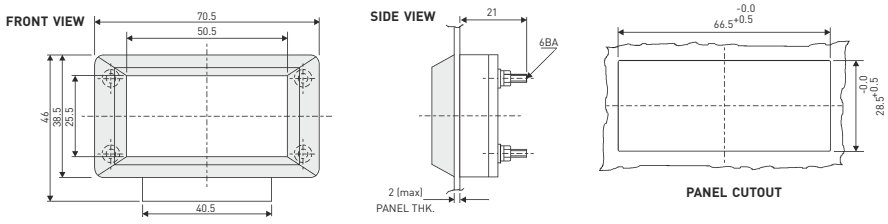

**GM035/ DH035**


**GM135**


**GM045**

## Specifications

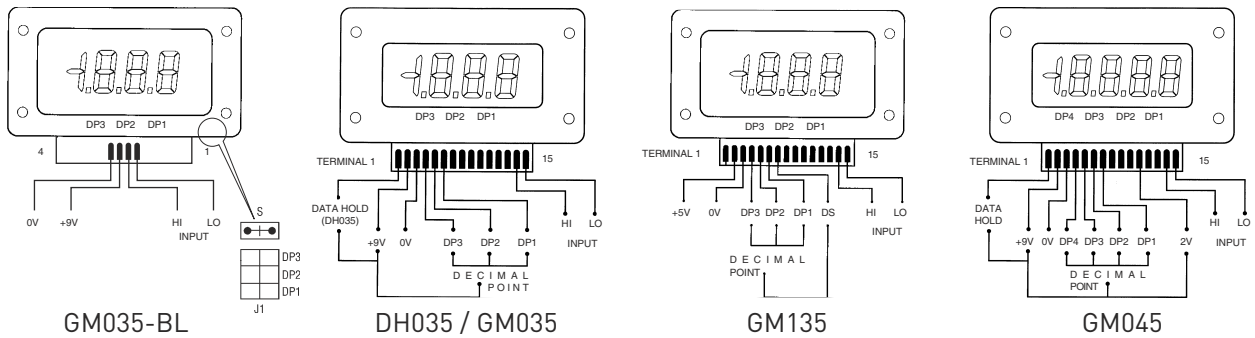
- **Measuring Method** 3½ Digit-Dual Slope A/D Conversion
  4½ Digit-Successive Integration A/D Conversion
- **Sampling Rate** 2.5 Samples per Second
- **Display Type** 12.4 mm/0.48" Digit Height LCD for GM035/ DH035, GM035-BL (with Backlight)
  11.0 mm/0.43" Digit Height LCD for GM045
  14.2 mm/0.56" Digit Height Red LED for GM135
- **Maximum Display** 1999 counts for 3½ Digit Meters
  19999 counts for 4½ Digit Meters
- **Resolution** 0.001 to 1 count for 3½ depending on the range
  0.0001 to 1 count for 4½ depending on the range
- **Polarity Indication** " - " is indicated for negative input
- **Decimal Selection** Field Selectable
- **Over Range Ind.** " 1 " or " -1 "
- **Display Stability** Within ± 2 Digits
- **Maximum Overload** Voltage : 1.2 times continuous
  Current : 2 times continuous
- **Low Batt. Indication** "LO BAT" in LCD Modules
- **External Start Hold** Provided in Models DH035 and GM045
- **VA Burden (Typical)** Auxiliary : < 20mVA (LCD) & <1VA (LED)
  Voltage : < 0.1VA, Current : < 0.25VA
- **Environment** Calibration : 27°C ± 5°C,
  Operating : 0 to 50°C, RH < 70%
  Storage : -10 to 60°C, RH < 70%
- **Mounting Bezel** Elegant Black ABS Bezel with 4 fixing screws and necessary hardware
- **Connectors** PCB Edge Connector (Optional)
- **Faceplate** Red Antiglare Lens - LED
  LCD Glass - LCD

| Display / Digits (max.) | | 3½ Digits, 1999 Counts | | | 4½ Digits, 19999 Counts |
|---|---|---|---|---|---|
| **Ranges** | **Input** | **GM035-BL** | **GM035/DH035** | **GM135** | **GM045** |
| **DC** | mV<br>V<br>µA<br>mA | 0 - 200 mV<br>0 - 2, 20, 200 V<br>0 - 200 µA<br>0 - 2, 20, 200 mA | | | |
| **Auxiliary Power Supply** | | **Standard :** 9VDC ± 10% for GM035, GM035-BL, DH035 and GM045, 5VDC ± 10% for GM135<br>Note : Power Supply must be Isolated. Supply Ground must not be connected to IN-LO Signal. Please ensure when a shunt is used, it must be connected on Ground / Common side of the load and not on the Supply side. | | | |
| **Accuracy** (Specified at 27 ± 5°C) ± (% FSD + DGT) | V DC<br>A DC | ± 0.5% of FS + 3 digit | | | |
| **Dimensions (mm)** | Front | 70.5 x 46 | | | |
| | Depth (Behind Panel) | 21 | | | |
| | Panel Cut-Out | 66.5 (+0.5, -0.0) x 28.5 (+0.5, -0.0) | | | |
| | Drawing |  | | | |



**Ordering Information** : Model, Input Range & Scale Display

### Terminal Connection




GM035-BL | DH035 / GM035 | GM135 | GM045

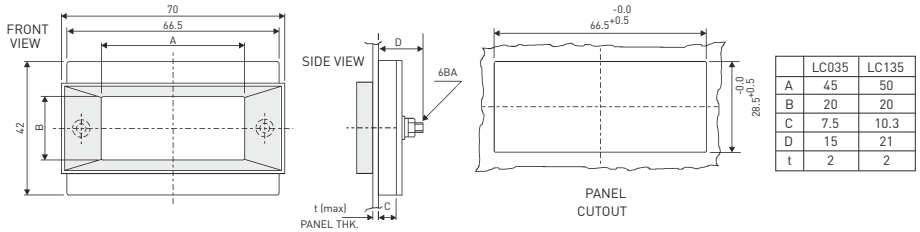
**Note** : External Start Hold - Provided for GM045 and DH035


LC035


LC135

## Specifications

- **Measuring Method** — 3 ½ Digit - Dual Slope A/D Conversion
- **Sampling Rate** — 2.5 Samples per Second
- **Display Type** — 12.4 mm/0.48" Digit Height LCD for LC035<br>14.2 mm/0.56" Digit Height Red LED for LC135
- **Maximum Display** — 1999 Counts
- **Resolution** — 0.001 to 1 Counts depending on the Range
- **Polarity Indication** — " - " is Indicated for Negative Input
- **Decimal Selection** — Field Selectable
- **Over Range Indication** — " 1 " or " -1 "
- **Maximum Overload** — Voltage : 1.2 times continuous<br>Current : 2 times continuous
- **VA Burden (Typical)** — Auxiliary : < 20mVA (LCD) & <1VA (LED)<br>Voltage : < 0.1VA, Current : < 0.25VA
- **Environment** — Calibration : 27°C ± 5°C,<br>Operating : 0 to 50°C, RH < 70%<br>Storage : -10 to 60°C, RH < 70%
- **Mounting Bezel** — Elegant ABS Bezel with 2 fixing screws and necessary hardware
- **Connectors** — Header Pins on the PCB
- **Faceplate** — Red Antiglare Lens - LED<br>LCD Glass - LCD
- **Display Stability** — Within ± 2 Digits

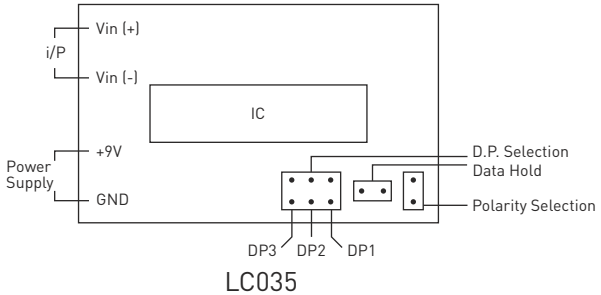
| **Display / Digits (max.)** | | 3½ Digits, 1999 Counts LCD | 3½ Digits, 1999 Counts LED |
|---|---|---|---|
| **Ranges** | **Input** | **LC035** | **LC135** |
| **DC** | mV<br>V<br>µA<br>mA | 0 - 200 mV<br>0 - 2, 20, 200 V<br>0 - 200 µA<br>0 - 2, 20, 200 mA | |
| **Auxiliary Power Supply** | | **Standard**: 9VDC ± 10% | **Standard**: 5VDC ± 10% |
| | | Note : Power Supply must be Isolated. Supply Ground must not be connected to IN-LO Signal. Please ensure when a shunt is used, it must be connected on Ground / Common side of the load and not on the Supply side. | Note : IN-LO Signal and Supply Ground may be connected Commonly |
| **Accuracy** (Specified at 27 ± 5°C) | V DC<br>A DC | ± 0.5% of Full Scale + 3 digit | |
| **Dimensions (mm)** | Front | 70 x 42 | |
| | Depth (Behind Panel) | 15 | 21 |
| | Panel Cut-Out | 66.5 (+0.5, -0.0) x 28.5 (+0.5, -0.0) | |
| | Drawing |  | |



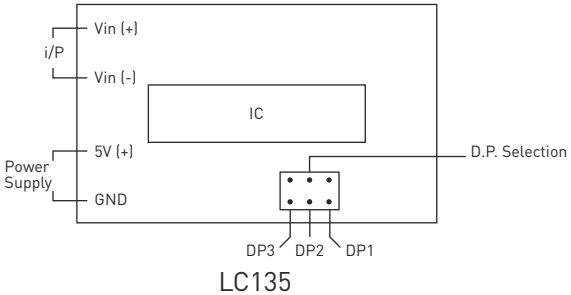
| | LC035 | LC135 |
|---|---|---|
| A | 45 | 50 |
| B | 20 | 20 |
| C | 7.5 | 10.3 |
| D | 15 | 21 |
| t | 2 | 2 |

**Ordering Information** : Model, Input Range & Scale Display

### Terminal Connection




LC035




LC135

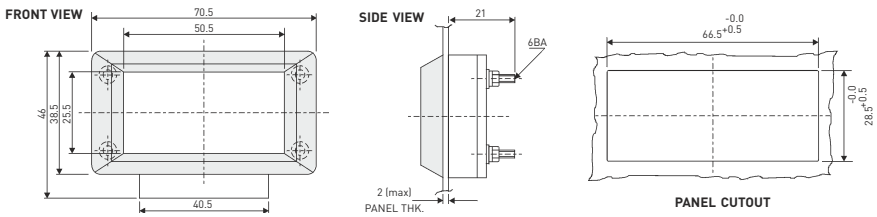
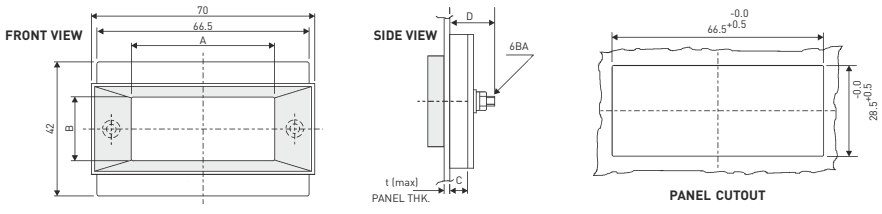


**GM035N / GM035N-BL**


**LC035N / LC035N-BL**

## Specifications

- **Measuring Method** — 3½ Digit- LCD Micro-controller based design
- **Sampling Rate** — 2.5 Samples per Second
- **Display Type** — 0.78" / 20 mm Digit height LCD
- **Display Stability** — ±2 Digit
- **Resolutions** — 0.001 to 1 counts depends on Range / Scale Display
- **Over - Range Indication** — " 1 "
- **Under -range indication** — NA
- **Maximum Overload** — 1.2 times continuous, Do not overload the module above 1.2 times
- **Common Ground** — For Auxiliary & Input Supply
- **Polarity Control** — Yes
- **Low Batt Indication** — " ⊟ " in LCD Modules
- **Maximum Display** — 1999 Counts (Max.)
- **Decimal Selection** — Field Selectable
- **VA Burden (Typical)** — Aux. : <20mVA (LCD) Voltage : <0.1VA, Current : <0.25V
- **Environment** — Calibration : 27°C ±5°C, Operating : 0 to 50°C, RH<70% Storage : -10 to 60°C, RH<70%:
- **Mounting Bezel** — Elegant Black ABS Bezel with fixing screws & necessary hardware
- **Connectors** — PCB Edge Connector (Optional) Header Pins on the PCB
- **Faceplate** — LCD Glass - LCD

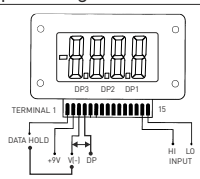
| **Display / Digits (max.)** | | | | |
|---|---|---|---|---|
| **Ranges** | **Input** | **GM035N** | **GM035N-BL** | **LC035N / LC035N-BL** |
| **DC** | mV | 0 - 75mV, 200mV | | |
| | V | 0 - 2, 20, 200V | | |
| | mA | 0 - 2, 20, 200mA | | |
| **Auxiliary Power Supply** | | Standard : 9V DC ±10%for GM035N / GM035N-BL, LC035N / LC035N-BL<br>Note : Common Ground for Aux. & Input supply | | |
| **Accuracy** | | ± 0.5% FSD + 3 Digit | | |
| **Dimensions (mm) GM035N / GM035N-BL** | Front | 70.5 x 46 | | |
| | Depth (Behind Panel) | 21 | | |
| | Panel Cut - Out | 66.5 (+0.5, -0.0) x 28.5 (+0.5, -0.0) | | |
| **Dimensions (mm) GM035N / GM035N-BL** | Drawing For GM035N, GM035N-BL |  | | |
| **Dimensions (mm) LC035N / LC035N-BL** | Front | 70 x 42 | | |
| | Depth (Behind Panel) | 15 | | |
| | Panel Cut - Out | 66.5 (+0.5, -0.0) x 28.5 (+0.5, -0.0) | | |
| **Dimensions (mm) LC035N / LC035N-BL** | Drawing For LC035N, LC035N-BL |  | | |



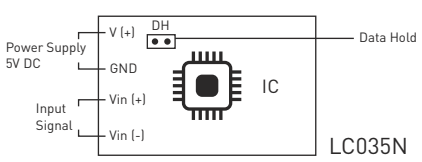


**Ordering Information** : Model, Input Range & Scale Display

**Terminal Connection**




GM035N




LC035N

**Note** : Decimal Point selection is not applicable for shunt operated 75mV DC Range.

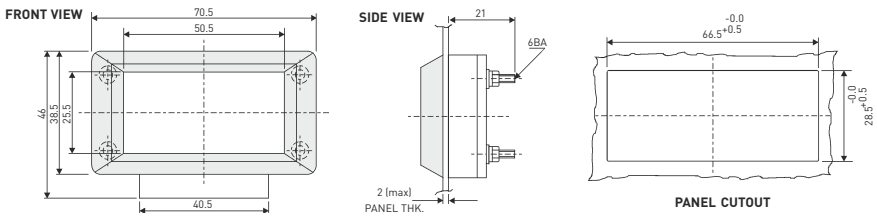
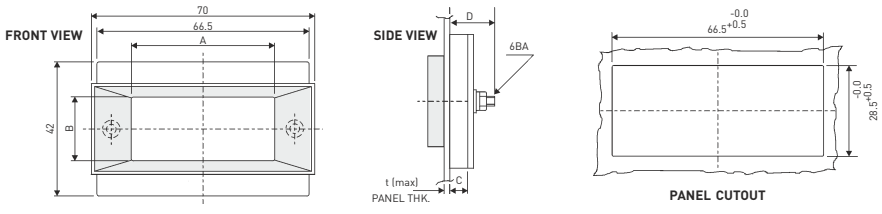


**GM135N**


**LC135N**

## Specifications

- **Measuring Method** — 3½ Digit- LED Micro-controller based design
- **Sampling Rate** — 2.5 Samples per Secon
- **Display Type** — 0.56" / 14.2 mm Red LED Super Bright Display for 3½ Digit.
- **Display Stability** — ±2 Digits
- **Resolutions** — 0.001 to 1 counts depends on Range / Scale Display
- **Over - Range Indication** — " 1 "
- **Under -range indication** — NA
- **Maximum Overload** — 1.2 times continuous, Do not overload the module above 1.2 times
- **Common Ground** — for Auxiliary & Input Supply
- **Polarity Control** — Yes
- **Decimal Point** — Field Selectable
- **Maximum Display** — 1999 Counts (Max.)
- **VA Burden (Typical)** — Aux. : <1VA (LED) Voltage : <0.1VA, Current : <0.25V
- **Environment** — Calibration : 27°C ±5°C, Operating : 0 to 50°C, RH<70% Storage : -10 to 60°C, RH<70%:
- **Mounting Bezel** — Elegant Black ABS Bezel with fixing screws & necessary hardware
- **Connectors** — PCB Edge Connector (Optional) Header Pins on the PCB
- **Faceplate** — Red Antiglare Lens - LED

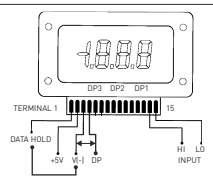
| **Display / Digits (max.)** | | | |
|---|---|---|---|
| **Ranges** | **Input** | **GM135N** | **LC135N** |
| **DC** | mV | 0 - 75mV, 200mV | |
| | V | 0 - 2, 20, 200V | |
| | mA | 0 - 2, 20, 200mA | |
| **Auxiliary Power Supply** | | Standard : 5V DC ±10%for GM135N / LC135N<br>Note : Common Ground for Aux. & Input supply | |
| **Accuracy** | | ± 0.5% FSD + 3 Digit | |
| **Dimensions (mm) GM135N** | Front | 70.5 x 46 | |
| | Depth (Behind Panel) | 21 | |
| | Panel Cut - Out | 66.5 (+0.5, -0.0) x 28.5 (+0.5, -0.0) | |
| **Dimensions (mm) GM135N** | Drawing For GM135N |  | |
| **Dimensions (mm) LC135N** | Front | 70 x 42 | |
| | Depth (Behind Panel) | 21 | |
| | Panel Cut - Out | 66.5 (+0.5, -0.0) x 28.5 (+0.5, -0.0) | |
| **Dimensions (mm) LC135N** | Drawing For LC135N |  | |



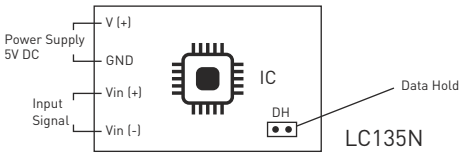


**Ordering Information** : Model, Input Range & Scale Display

**Terminal Connection**




GM135N



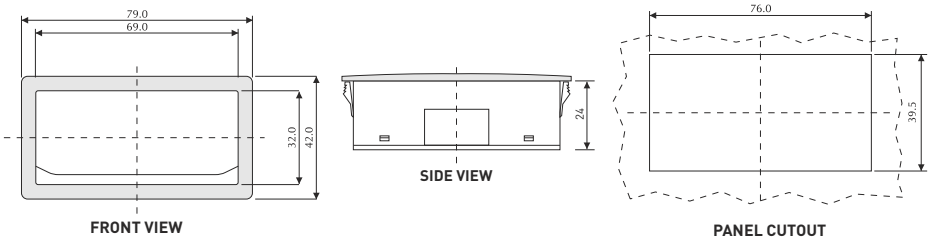

LC135N

**Note** : Decimal Point selection is not applicable for shunt operated 75mV Range.


**SM35MS**

## Specifications

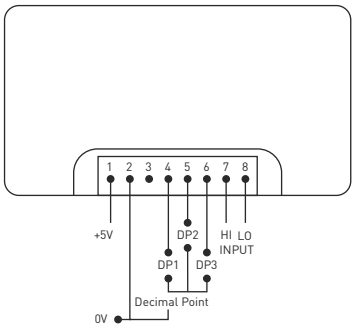
- **Measuring Method** — 3½ Digit - Dual Slope A/D Conversion
- **Sampling Rate** — 2.5 Samples per Second
- **Display Type** — 14.2 mm / 0.56" Digit Height Red LED
- **Maximum Display** — 1999 Counts
- **Resolution** — 0.001 to 1 Counts depending on the Range
- **Polarity Indication** — " - " is Indicated for Negative Input
- **Decimal Selection** — Field Selectable
- **Over Range Indication** — " 1 " or " -1 "
- **Maximum Overload** — Voltage : 1.2 times continuous<br>Current : 2 times continuous
- **VA Burden (Typical)** — Auxiliary : <1VA<br>Voltage : < 0.1VA, Current : < 0.25VA
- **Environmental Conditions** — Calibration : 27°C ± 5°C,<br>Operating : 0 to 50°C, RH < 70°/0<br>Storage : -10 to 60°C, RH < 70%
- **Mounting** — Flush Mounting
- **Connectors** — Header Pins on the PCB
- **Faceplate** — Red Antiglare Lens - LED
- **Display Stability** — Within ± 2 Digits

| **Display / Digits (max.)** | | 3½ Digits, 1999 Counts LED |
|---|---|---|
| **Ranges** | **Input** | **SM35MS** |
| **DC** | V | 0 - 2, 20, 200 V |
| **Auxiliary Power Supply** | | **Standard :** 5V DC + 10%<br>**Note :** IN-LO Signal & Supply Ground may be Connected Commonly |
| **Accuracy** (Specified at 27 ± 5°C) | V DC | ± 0.5% of Full Scale |
| **Dimensions (mm)** | Front | 79 x 42 |
| | Depth (Behind Bezel) | 24 |
| | Panel Cut-Out | 76.5 (+0.5, -0.0) x 39.5 (+0.5, -0.0) |
| | Drawing |  |



**Ordering Information :** Model, Input Range & Scale Display

### Terminal Connection




SM35MS

• Short Pin No.2 to Display Corresponding Decimal Point

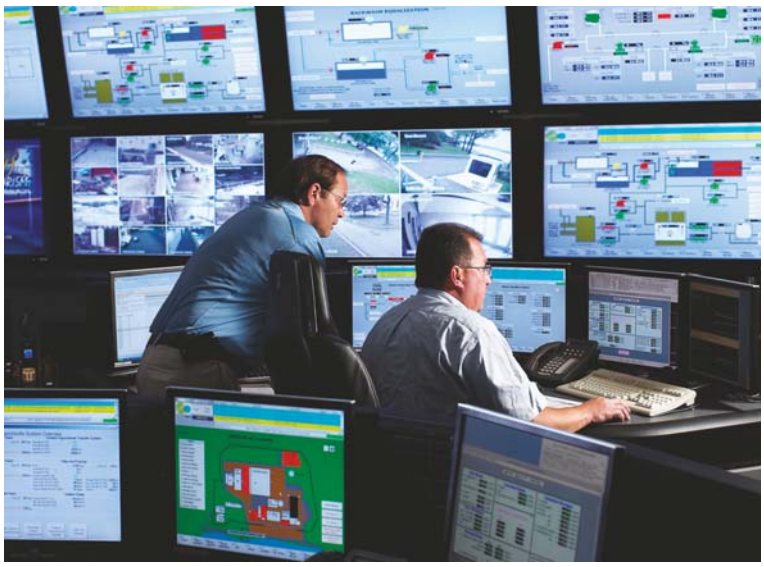
MECO®
SINCE 1962

## Power Line Transducers

- ✓ AC Current Transducer
- ✓ AC Voltage Transducer
- ✓ Frequency Transducer
- ✓ DC Isolation Transducer / DC – DC Converter
- ✓ Active Power (Watt) / Reactive Power (Var) Transducer
- ✓ Power Factor Transducer
- ✓ Tap Position Transducer

+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable



## Introduction

MECO Power Line Transducers were designed by MICRO DENSHI CORPORATION of Japan for AC Power Line parameters like Voltage, Current, Wattage, Var, Power Factor, Frequency, DC Isolation and TAP Position.

These reliable and accurate Transducers are in applications in all sectors of the power and process industry since over 25 years.

These Transducers give a load independent and isolated DC output directly proportional to the input parameters.

MECO Transducers are widely used for automation and control of the power and process systems as well as for local and remote monitoring of the electrical parameters at every stage of electricity generation, transmission & distribution. They are ideal for SCADA, energy management, telemetering, data-logging as well as central monitoring systems.

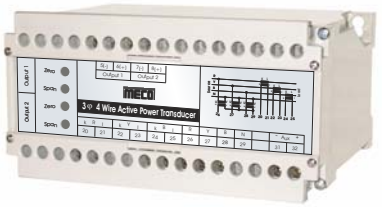
MECO Transducers are generally designed to comply to the requirements of IEC 688 / EN 60688, EN 61010-1, EN 61326-1 and I.S. 12784 (Part 1). All MECO Transducers pass through a stringent manufacturing and in-house quality control process consisting of vibration, burn-in and calibration tests to ensure complete reliability and accuracy during the continuous operation.

MECO Transducers can also be supplied mounted in Panel with complete wiring and accessories upto termination point for applications in various industries like Power Utilities, SEB's, Cement, Steel, Aluminum, Chemicals, Fertilizers, Sugar, Petrochemicals etc.

## Features

- Terminal Protection Cover
- Reliable & Rugged Static Circuits
- Low Ripple in Output Signal
- Flame Retardant Polycarbonate Case
- Choice of Multiple Asymmetrical Outputs
- Wide Choice of Suppressed Ranges
- Open and Short Circuit Protection for Outputs
- Dual Output (Non Isolated)
- Self-Powered, AC, DC, SMPS Auxiliary Supply
- Din Rail Mounting
- Bi-Directional Outputs
- Fast Response Time
- Bi-Directional Inputs for Import / Export






DIN Rail cum Back Panel Mounting


Terminal Protection Strip


Flame Retardant Polycarbonate (UL94V-0) Self Extinguishing, Non Drip Casing

Reliable, Rugged & Static Electronic Circuit using High Stability Components

## Types

- AC Current (Average / TRMS)
- AC Voltage (Average / TRMS)
- Frequency
- Active Power (TRMS) (1 P & 3P - Balanced or Unbalanced System)
- Reactive Power (TRMS) (1 P & 3P - Balanced or Unbalanced System)
- Power Factor (Zero Crossing / TRMS) (1 P & 3P - Balanced or Unbalanced System)
- DC Isolation for Voltage & Current
- Tap Position / OLTC

## Specifications

| | |
|---|---|
| **Accuracy** | ± 0.5% of Span (standard)<br>Others on request (optional) |
| **Accuracy Range** | 0 to 120% |
| **Zero Adjustment** | ± 2% of Span (min.) |
| **Span Adjustment** | ± 10% of Span (min.) |
| **Response Time** | < 250 ms for 0 to 90% of Output<br>< 1 s for 0 to 90% of Output for PF |
| **Output Ripple** | < 0.5% of Full Scale |
| **Compliance Voltage** | 12VDC (max.) |
| **Overload -** Continuous<br><br>**Overload -** Short Duration ( 1 sec.) | Voltage : 1.2 x Un<br>Current : 2 x In<br><br>Voltage : 2 x Un<br>Current : 20 x In (one time) |
| **Max. Open Circuit Voltage** | < 30VDC |
| **Stability** | ± 0.25% Per Annum, Non Cumulative |
| **Environmental Conditions**<br>Operating Temperature<br>Storage Temperature<br>Calibrated At | As per IEC 688 User Group II<br>0 to 55$^0$C, RH < 95% (non condensing)<br>-20 to 70$^0$C, RH < 95% (non condensing)<br>27$^0$C ± 5$^0$C |
| **Temperature Coefficient** | 0.02% / $^0$C |
| **Isolation** | Complete (Input/Output/Auxiliary/ Case) |
| **Insulation Resistance** | >100MΩ at 500VDC |
| **Self Powered (optional)** | Max.Variation of ± 20% in input voltage |

| | |
|---|---|
| **Warm Up Time** | 20 min. (approx.) |
| **Dielectric Strength** | 2.5kV at 50 Hz for 1 min.(Standard)<br>4kV (Optional), across<br>Casing - Input/Output/Auxiliary<br>Input - Output<br>Input - Auxiliary<br>Output - Auxiliary |
| **Impulse Test** | 5kV, 1.2 / 50µS |
| **Casing**<br>DIN Series | <br>Flame Retardant, Polycarbonate (UL 94V-0) Self Extinguishing, Non Drip, DIN Rail cum Wall Mounting Casing |
| **Applicable Standards**<br>IEC 688 / EN 60688<br>EN 61010-1<br>EN 61326-1<br>IS12784 (Part-1)1989 | <br>Electrical Measuring Tranducers for converting AC Electrical Quantities to Analog or Digital Signals<br>Safety requirments for Electrical Equipment for Measurement Control & Laboratory use<br>Electrical Equipment for Measurement Control & Laboratory use - EMC requirements<br>Electrical Measuring Transducers for converting AC Electrical Quantities into DC Electrical Quantities : General Purpose Transducer |

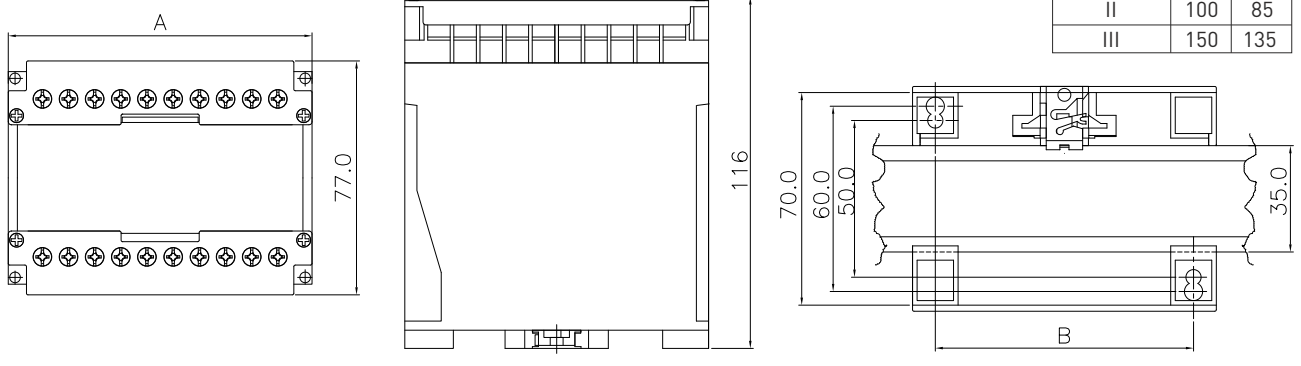
## Ordering Information

Model, Input Range, Input Voltage, Input Current, PTR, CTR, Frequency, Auxiliary Supply, Output 1, Output 2 & Optionals

## Dimensions (in mm)

**DIN Series**

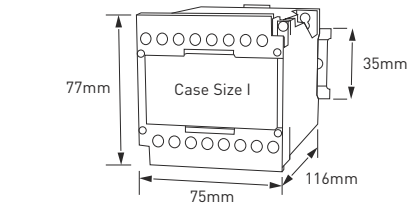
| Case Size | A | B |
|---|---|---|
| I | 75 | 60 |
| II | 100 | 85 |
| III | 150 | 135 |

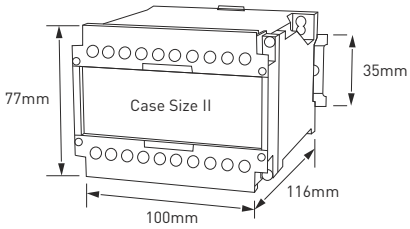


| Sr. |  <br>DIN Series | Auxilliary Power Supply | | | Type of Input | | Type of Output | | | | Isolation | Other | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 230V AC | SMPS - LV (19-90V AC / DC)<br>SMPS - HV (85-265V AC / DC) | Self Powered | Bi Directional | Expanded / Suppressed | Single / Dual (Symmetrical / Asymmetrical) | Dual (Non-Isolated) | Bi-Directional | Expanded / Suppressed | 2.5KV Between Input / Output / Aux. / Case | Average | TRMS | External Zero & Span Adjustment |
| 1 | AC Current | ✓ | ✓ | ✓ | NA | ✓ | ✓ | ✓ | NA | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2 | AC Voltage | ✓ | ✓ | ✓ | NA | ✓ | ✓ | ✓ | NA | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3 | W/ KW/ MW (1P1E 2W)- TRMS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 4 | W / KW / MW (3P 1E - Balanced Load)- TRMS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 5 | W / KW / MW (3P 2E 3W - Balanced & Unbalanced Load) - TRMS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 6 | W / KW / MW (3P 3E 4W - Balanced & Unbalanced Load) - TRMS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 7 | Var / KVar / MVar (1P 1E 2W)-TRMS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 8 | Var / KVar / MVar (3P 1E - Balanced Load)- TRMS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 9 | Var / KVar / MVar (3P 2E 3W - Bal. & Unbal. Load) - TRMS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 10 | Var / KVar / MVar (3P 3E 4W - Bal. & Unbal. Load) - TRMS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 11 | Frequency Transducer | ✓ | Under development, Please inquire with sales@mecoinst.com | ✓ | NA | NA | ✓ | ✓ | NA | ✓ | ✓ | ✓ | NA | ✓ |
| 12 | PF(1P 1E 2W) - Zero Crossing | ✓ | | ✓ | ✓ | NA | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ |
| 13 | PF(3P 1E 2W - Balanced Load) - Zero Crossing | ✓ | | ✓ | ✓ | NA | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ |
| 14 | PF(3P 2E 3W - Balanced & Unbalanced Load)- TRMS | ✓ | | ✓ | ✓ | NA | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 15 | PF(3P 3E 4W - Balanced & Unbalanced Load)- TRMS | ✓ | | ✓ | ✓ | NA | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | ✓ |
| 16 | DC Isolation / DC-DC Converter for Current and Voltage | ✓ | ✓ | NA | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ |
| 17 | TAP Position Transducer | ✓ | ✓ | NA | NA | ✓ | ✓ | ✓ | NA | ✓ | ✓ | ✓ | NA | ✓ |

Note : ✓Indicates choice of Standard / Optional features possible for DIN Series. Please specify your requirement of all Standard / Optional specifications clearly at the time of ordering. NA denotes not applicable.


**CMT, CMT - TRMS**




MECO AC Current Transducers measure AC Current and converts it to an industry standard output signal which is directly proportional to the measured input. These Transducers provide an output which is load independent and isolated from the input. The output can be connected to Controllers, Data-Loggers, PLC's, Analog / Digital Indicators, Recorders for display, analysis or control. They are ideal for SCADA, Energy Management, Telemetering for Remote, Local as well as Central Monitoring Systems.

| Type | DIN Series | Accuracy |
|---|---|---|
| Current - Average | CMT | ±0.5% of Span |
| Current - TRMS | CMT - TRMS | |

| AC Input | |
|---|---|
| Input Ranges | 0 - 5A (Direct)<br>0 - 1A (Direct)<br>CTR / 5A<br>CTR / 1A |
| Measuring Range | 0 - 1.2 In |
| Overload (continuous) | 2 x In |
| Burden | <0.5 VA<br>*2<6 VA for Self Powered |

| DC Output *1,*2 | | | |
|---|---|---|---|
| Current | | Voltage | |
| Output | Load | Output | Load |
| 0-1 mA | 0-10 KΩ | 0-1 V | > 1 kΩ |
| 0-5 mA | 0-2 KΩ | 0-5 V | > 5 kΩ |
| 0-10 mA | 0-1 KΩ | 1-5 V | |
| 2-10 mA | | 0-10 V | >10 kΩ |
| 0-20 mA | *0-500Ω | 2-10 V | |
| 4-20 mA | | | |

| Auxiliary Power Supply | | |
|---|---|---|
| Tolerance | | Burden |
| SMPS - HV | 85 - 265V AC / DC | < 2 VA |
| SMPS - LV | 19 - 90V AC / DC | |
| Self Powered *1 | *1 For Input 1A & 5A AC, Output 0-10 or 0-20mA DC Available Only | Refer Input Burden |
| AC Linear Power Supply | 230V AC ± 20 % | < 4 VA |

**Optional**
- Expanded or Suppressed Input Ranges
  Example : 0 - 0.8 - 1.2 In
- Other input ranges available subject to technical feasibility

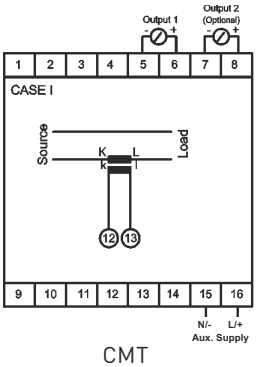
**Optional**
- Dual Non-Isolated Outputs
- Expanded / Suppressed Output
  Example : 4 - 6 - 20 mA for 0 - 0.8 - 1.2 In
- Dual Symmetrical / Asymmetrical Outputs
- Other output ranges available subject to technical feasibility
- *0-600Ω / 0-750Ω on Request

**Optional**
- Other Auxiliary Power Supplies available subject to technical feasibility

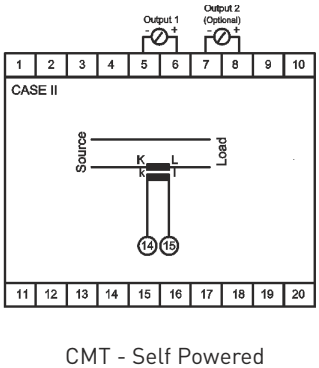
**Dimension**

**DIN Series** : ■ Case Size II for Self Powered ■ Case Size I for others
**Note** : ■ For Details refer General & Technical Specifications Page

**Connection Diagram**

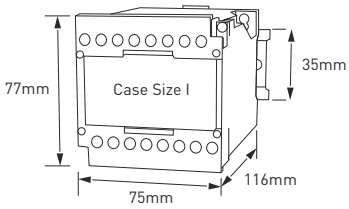



CMT




CMT - Self Powered


**VMT, VMT - TRMS**




MECO AC Voltage Transducer measures AC Voltage and converts it to an industry standard output signal which is directly proportional to the measured input. These Transducers provide an output which is load independent and isolated from the input. The output can be connected to Controllers, Data-Loggers, PLC's, Analog / Digital Indicators, Recorders for display, analysis or control. They are ideal for SCADA, Energy Management, Telemetering for Remote, Local as well as Central Monitoring Systems.

| Type | DIN Series | Accuracy |
|---|---|---|
| Voltage - Average | VMT | ±0.5% of Span |
| Voltage - TRMS | VMT - TRMS | |

| AC Input | |
|---|---|
| Input Ranges | 0 - 63.5 V<br>0 - 110 V<br>0 - 230 V<br>0 - 300 V<br>0 - 440 V<br>0 - 500 V |
| Measuring Range | 0 - 1.2Un |
| Overload (continuous) | 1.2 x Un |
| Burden | < Un x 6mA |
| | < 6 VA for Self Powered |

| DC Output | | | |
|---|---|---|---|
| Current | | Voltage | |
| Output | Load | Output | Load |
| 0-1 mA | 0-10 KΩ | 0-1 V | > 1 kΩ |
| 0-5 mA | 0-2 KΩ | 0-5 V | > 5 kΩ |
| 0-10 mA | 0-1 KΩ | 1-5 V | |
| 2-10 mA | | 0-10 V | >10 kΩ |
| 0-20 mA | *0-500 Ω | 2-10 V | |
| 4-20 mA | | | |

| Auxiliary Power Supply | | |
|---|---|---|
| Tolerance | | Burden |
| SMPS - HV | 85 - 265V AC / DC | < 2 VA |
| SMPS - LV | 19 - 90V AC / DC | |
| Self Powered | Max. Variation of ± 20% allowed in Input Voltage | Refer Input Burden |
| AC Linear Power Supply | 230V AC ± 20 % | < 4 VA |

**Optional**
- Expanded or Suppressed Input Ranges also available. Example : 0 - 0.8 - 1.2 Un
- Above Input Ranges with suitable PTR also available·
- Other input ranges available subject to technical feasibility

**Optional**
- Dual Non-Isolated Outputs
- Expanded or Suppressed Output Example : 4 - 6 - 20 mA for 0 - 0.8 - 1.2 Un
- Dual Symmetrical & Asymmetrical Outputs
- Other output ranges available subject to technical feasibility
- *0-600 Ω / 0-750 Ω on Request

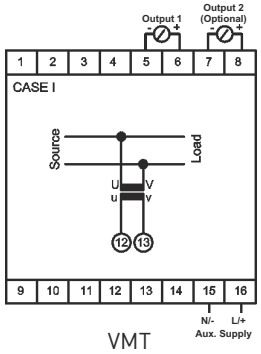
**Optional**
- Other Auxiliary Power Supplies available subject to technical feasibility

**Dimension**

**DIN Series** : ■ Case Size I

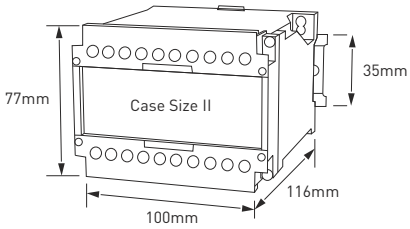
**Note** : ■ For Details refer General & Technical Specifications Page

**Connection Diagram**




VMT


FT




MECO Frequency Transducer measures Power Frequency over a specified Frequency Range and converts it to an industry standard output signal which is directly proportional to the measured input. These Transducers provide an output which is load independent and isolated from the input. The output can be connected to Controllers, Data-Loggers, PLC's, Analog / Digital Indicators, Recorders for display, analysis or control. They are ideal for SCADA, Energy Management, Telemetering for Remote, Local as well as Central Monitoring Systems.

| **Model : FT** (DIN Series) | **Accuracy :** ±0.5% of Span |
|---|---|

| **AC Input** | |
|---|---|
| Input Ranges | 45 - 55 Hz<br>45 - 65 Hz<br>55 - 65 Hz |
| Input Voltage | 63.5/110/230/440 V (any one only) |
| Measuring Range | 0.8 - 1.2 Un |
| Overload (continuous) | 1.2 x Un |
| Burden | < Un x 5.5mA |
| | < 6 VA for Self Powered |

| **DC Output** | | | |
|---|---|---|---|
| Current | | Voltage | |
| Output | Load | Output | Load |
| 0-1 mA | 0-10 KΩ | 0-1 V | > 1 kΩ |
| 0-5 mA | 0-2 KΩ | 0-5 V | > 5 kΩ |
| 0-10 mA | 0-1 KΩ | 1-5 V | |
| 2-10 mA | | 0-10 V | >10 kΩ |
| 0-20 mA | 0-500Ω | 2-10 V | |
| 4-20 mA | | | |

| **Auxiliary Power Supply** | | |
|---|---|---|
| Tolerance ( ± 20 %) | | Burden |
| AC Linear Power Supply | 110 V | < 4 VA |
| | 230 V | |
| DC | 24 V | |
| | 48 V | |
| | 110 V | |
| | 220 V | |
| Self Powered | Max. Variation of ± 20% allowed in Input Voltage | Refer Input Burden |

**Optional**
- Above Input Ranges with suitable PTR also available
- Other input ranges available subject to technical feasibility

**Optional**
- Dual Non-Isolated Outputs
- Dual Symmetrical & Asymmetrical Outputs
- Other output ranges available subject to technical feasibility

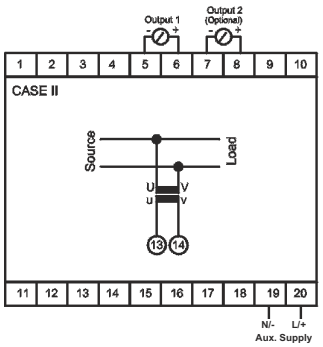
**Optional**
- Other Auxiliary Power Supplies available subject to technical feasibility

## Dimension

**DIN Series** : ■ Case Size II

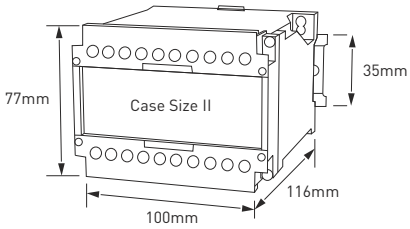
**Note** : ■ For Details refer General & Technical Specifications Page

## Connection Diagram




FT


DTI




MECO DC Isolation Transducer takes various DC Voltage or DC Current signal inputs and provides a Stable, Ripple-Free and Optically Isolated DC load independent output in the form of current or voltage. The output can be connected to Controllers, Data-Loggers, PLC's, Analog / Digital Indicators, Recorders for display, analysis or control. They are ideal for SCADA, Energy Management, Telemetering for Remote, Local as well as Central Monitoring Systems.

| **Model : DTI** (DIN Series) | **Accuracy :** ±0.5% of Span |
|---|---|

| **DC Input** | | |
|---|---|---|
| Input Ranges | 0-100 mV<br>0-1 V<br>0-5 V<br>1-5 V<br>0-10 V<br>2-10 V<br>0-1000 V | 4-20 mA<br>2-10 mA<br>1-5 mA<br>0-1 mA<br>0-10 mA<br>0-16 mA<br>0-20 mA |
| Measuring Range | 0-1.2 In, 0-1.2 Un | |
| Overload (continuous) | 1.2 x Un, 2 x In | |
| Burden | 10 kOhm/V for Voltage<br>100 mV for Current | |
| **Bi-directional Inputs** | -50/0/50 mV DC to -300/0/300 V DC | |

| **DC Output** | | | |
|---|---|---|---|
| Current | | Voltage | |
| Output | Load | Output | Load |
| 0-1 mA | 0-10 KΩ | 0-1 V | > 1 kΩ |
| 0-5 mA | 0-2 KΩ | 0-5 V | > 5 kΩ |
| 0-10 mA | 0-1 KΩ | 1-5 V | |
| 2-10 mA | | 0-10 V | >10 kΩ |
| 0-20 mA | *0-500Ω | 2-10 V | |
| 4-20 mA | | | |
| 4-12-20 mA | *0-500Ω | 0-5-10 V | >10 kΩ |

| **Auxiliary Power Supply** | | |
|---|---|---|
| Tolerance | | Burden |
| SMPS - HV | 85 - 265V AC / DC | < 2.5 VA |
| SMPS - LV | 19 - 90V AC / DC | |
| AC Linear Power Supply | 110 V ± 20 % | < 4 VA |
| | 230 V ± 20 % | |

**Optional**
- Bi-directional Inputs available
- Other input ranges available subject to technical feasibility

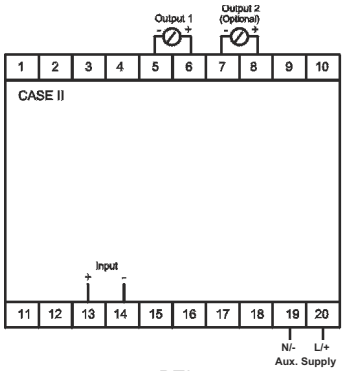
**Optional**
- Dual Non-Isolated Outputs
- Dual Symmetrical & Asymmetrical Outputs
- Bi-directional Outputs
- Other output ranges available subject to technical feasibility
- *0-600Ω / 0-750Ω on Request

**Optional**
- Other Auxiliary Power Supplies available subject to technical feasibility

**Dimension**

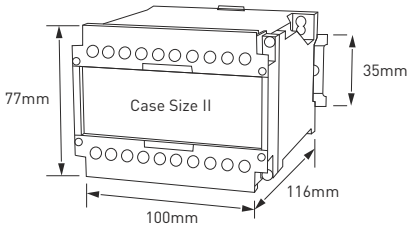
**DIN Series** : ■ Case Size II
**Note** : ■ For Details refer General & Technical Specifications Page

**Connection Diagram**




DTI


TPT




MECO Tap position Transducer takes various Resistance inputs and provides a Stable, Ripple-Free and Optically Isolated DC load independent output in the form of current or voltage. The output can be connected to Controllers, Data-Loggers, PLC's, Analog / Digital Indicators, Recorders for display, analysis or control. They are ideal for SCADA, Energy Management, Telemetering for Remote, Local as well as Central Monitoring Systems.

| **Model : TPT** (DIN Series) | **Accuracy :** ±0.5% of Span |
|---|---|

**Resistance Input**

Resistance input from potentiometric transformer tap positions upto 99 transformer taps. 100 KOhms max.

**DC Output**

| Current | | Voltage | |
|---|---|---|---|
| Output | Load | Output | Load |
| 0-1 mA | 0-10 KΩ | 0-1 V | > 1 kΩ |
| 0-5 mA | 0-2 KΩ | 0-5 V | > 5 kΩ |
| 0-10 mA | 0-1 KΩ | 1-5 V | |
| 2-10 mA | | 0-10 V | >10 kΩ |
| 0-20 mA | *0-500Ω | 2-10 V | |
| 4-20 mA | | | |

**Auxiliary Power Supply**

| Tolerance | | Burden |
|---|---|---|
| SMPS - HV | 85 - 265V AC / DC | < 2.5 VA |
| SMPS - LV | 19 - 90V AC / DC | |
| AC Linear Power Supply | 110 V ± 20 % | < 4 VA |
| | 230 V ± 20 % | |

**Optional**

- Other input ranges available subject to technical feasibility

**Optional**

- Dual Non-Isolated Outputs
- Dual Symmetrical & Asymmetrical Outputs
- Bi-directional Outputs
- Other output ranges available subject to technical feasibility
- *0-600Ω / 0-750Ω on Request

**Optional**

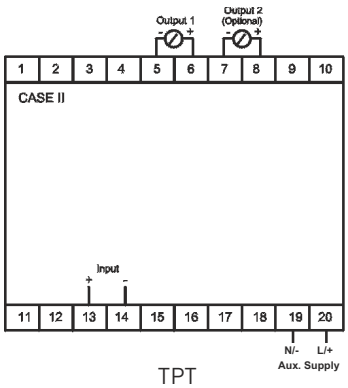
- Other Auxiliary Power Supplies available subject to technical feasibility

**Dimension**

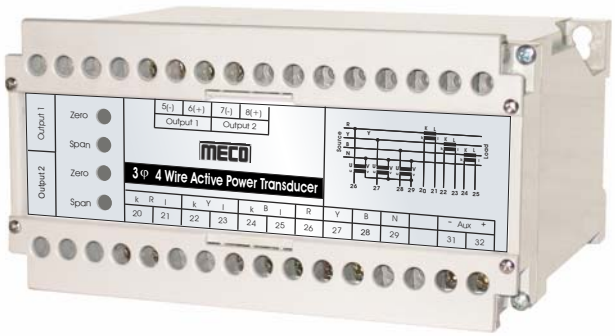
**DIN Series** : ■ Case Size II

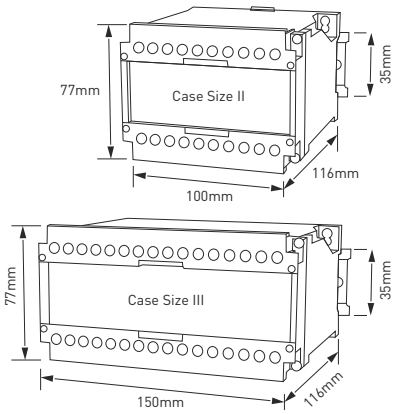
**Note** : ■ For Details refer General & Technical Specifications Page

**Connection Diagram**




TPT




**WT, RPT**

MECO AC Active Power (Watt) & Reactive Power (Var) Transducers measure Power in 1 Phase, 3 Phase 3 Wire and 3 Phase 4 Wire in balanced or unbalanced electrical systems and converts it to an industry standard output signal which is directly proportional to the measured input. These Transducers provide an output which is load independent and isolated from the input. These Transducers can measure both Import and Export of Power. The output can be connected to Controllers, Data-Loggers, PLC's, Analog / Digital Indicators, Recorders for display, analysis or control. They are ideal for SCADA, Energy Management, Telemetering for Remote, Local as well as Central Monitoring Systems.

| Type | Watt | Var | Accuracy |
|---|---|---|---|
| 1Phase 1Element 2Wire - TRMS | WT11 | RPT11 | ±0.5% of Span |
| 3Phase 1Element 2Wire (Balanced) - TRMS | WT31 | RPT31 | |
| 3Phase 2Element 3Wire (Balanced & Unbalanced) - TRMS | WT33 | RPT33 | |
| 3Phase 3Element 4Wire (Balanced & Unbalanced) - TRMS | WT34 | RPT34 | |

| AC Input | |
|---|---|
| Input Voltage | 0-63.5/110/230/440 V (any one only) |
| Input Current | 0-1/5 A (any one only) |
| Input Frequency | 50/60/400 Hz (any one) |
| Input PF Range | 0 (Lag) - 1 - 0 (Lead) |
| Measuring Range | 0-1.2 x Un x In |
| Overload (continuous) | 2 x In and 1.2 x Un |
| Burden (Voltage) | < Un x 6mA/Phase<br>< 6 VA for Self Powered |
| Burden (Current) | < 0.5VA / Phase |

| DC Output | | | |
|---|---|---|---|
| Current | | Voltage | |
| Output | Load | Output | Load |
| 0-1 mA | 0-10 KΩ | 0-1 V | > 1 kΩ |
| 0-5 mA | 0-2 KΩ | 0-5 V | > 5 kΩ |
| 0-10 mA | 0-1 KΩ | 1-5 V | |
| 2-10 mA | | 0-10 V | >10 kΩ |
| 0-20 mA | *0-500Ω | 2-10 V | |
| 4-20 mA | | | |

| Auxiliary Power Supply | | |
|---|---|---|
| Tolerance | | Burden |
| AC Linear Power Supply | 230 V ± 20% | < 4 VA |
| SMPS-HV | 85-265 V AC/DC | < 2 VA |
| SMPS-LV | 19-90 V AC/DC | |
| Self Powered | Max. Variation of ± 20% allowed in Input Voltage | Refer Input Burden |

**Optional**
- Above Input Ranges with suitable CTR/PTR also available
- Bi-directional inputs for Import / Export of Power

**Optional**
- Dual Non-Isolated Outputs
- Dual Symmetrical & Asymmetrical Outputs
- Bi-directional Outputs
- *0-600Ω / 0-750Ω on Request

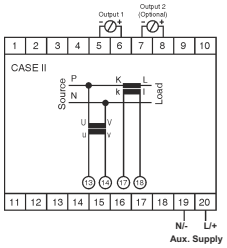
**Optional**
- Other Auxiliary Power Supplies available subject to technical feasibility

**Dimension**

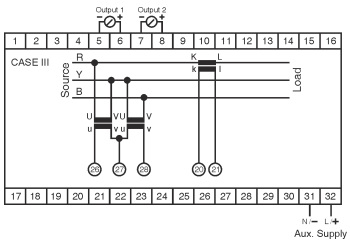
**DIN Series** :
- Case Size II for 1 Phase
- Case Size III for 3 Phase

**Note** :
- For Details refer General & Technical Specifications Page

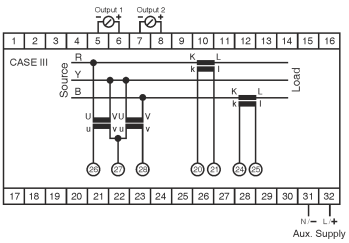
**Connection Diagram**



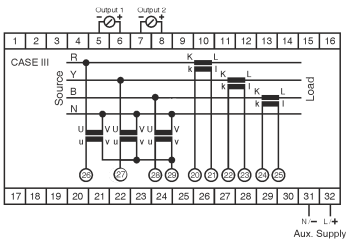

WT11
Case Size II



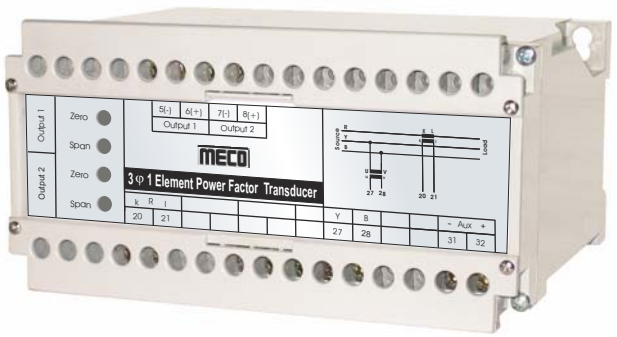

WT31
Case Size III



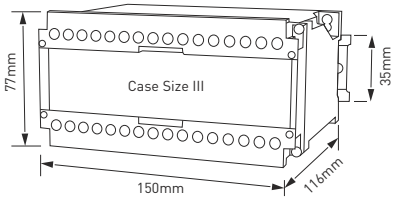

WT33/RPT33
Case Size III




WT34/RPT34
Case Size III




PFT




MECO AC Power Factor Transducers measure the Power Factor in 1 Phase and 3 Phase electrical systems. The resulting output signal is directly proportional to the system power factor. These Transducers provide an output which is load independent and isolated from the input. The output can be connected to Controllers, Data-Loggers, PLC's, Analog / Digital Indicators, Recorders for display, analysis or control. They are ideal for SCADA, Energy Management, Telemetering for Remote, Local as well as Central Monitoring Systems.

| Type | DIN Series | Accuracy |
|---|---|---|
| 1Phase 1Element 2Wire - Zero Crossing | PFT11 | ±0.5% of Span |
| 3Phase 1Element 2Wire (Balanced) - Zero Crossing | PFT31 | |
| 3Phase 2Element 3Wire (Balanced & Unbalanced) - TRMS | PFT33-TRMS | |
| 3Phase 3Element 4Wire (Balanced & Unbalanced) - TRMS | PFT34-TRMS | |

| AC Input | |
|---|---|
| Input Voltage | 63.5/110/230/440 V (any one only) |
| Input Current | 1/5 A (any one only) |
| Input Frequency | 50/60 Hz (any one) |
| Input PF Range | 0.5 (Lag) -1.0 - 0.5 (Lead) |
| Measuring Range | 0.8Un~1.2Un, 0.2In~1.2In |
| Overload (continuous) | 2 x In and 1.2 x Un |
| Burden (Voltage) | < Un x 6mA/Phase<br>< 6 VA for Self Powered |
| Burden (Current) | < 0.5VA / Phase |

| DC Output | | | |
|---|---|---|---|
| Current | | Voltage | |
| Output | Load | Output | Load |
| 0-1 mA | 0-10 KΩ | 0-1 V | > 1 kΩ |
| 0-5 mA | 0-2 KΩ | 0-5 V | > 5 kΩ |
| 0-10 mA | 0-1 KΩ | 1-5 V | |
| 2-10 mA | | 0-10 V | >10 kΩ |
| 0-20 mA | 0-500Ω | 2-10 V | |
| 4-20 mA | | | |

| Auxiliary Power Supply | | |
|---|---|---|
| Tolerance ( ± 20 %) | | Burden |
| AC Linear Power Supply | 110 V | < 4 VA |
| | 230 V | |
| DC | 24 V | |
| | 48 V | |
| | 110 V | |
| | 220 V | |
| Self Powered | Max. Variation of ± 20% allowed in Input Voltage | Refer Input Burden |

**Optional**
- Above Input Ranges with suitable CTR/PTR also available
- Bi-directional inputs for Import / Export of Power

**Optional**
- Dual Non-Isolated Outputs
- Dual Symmetrical & Asymmetrical Outputs
- Bi-directional Outputs

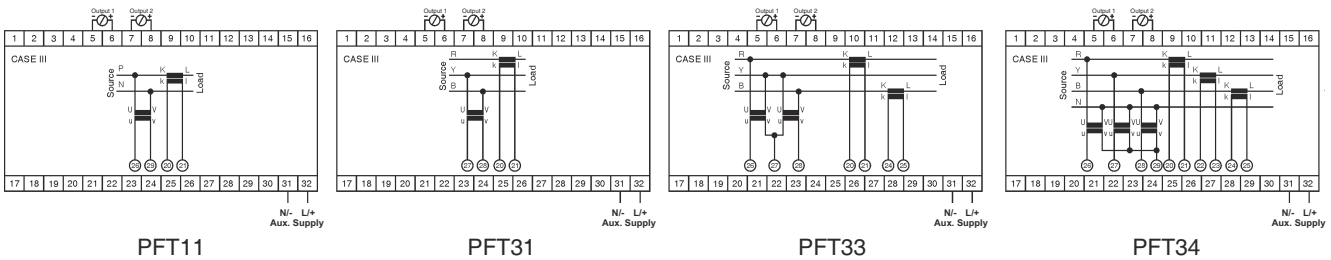
**Optional**
- Other Auxiliary Power Supplies available subject to technical feasibility

**Dimension**

**DIN Series** : ■ Case Size III

**Note** : ■ For Details refer General & Technical Specifications Page

**Connection Diagram**




PFT11 PFT31 PFT33 PFT34

BLUE STAR

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Dt 16.12.2015

**M/s. Meco Instruments Pvt. Ltd.**
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710
Tel. No. 022 – 27673300 Fax No. 022 – 27673310

Kind Attn Mr Haren Shah

**Sub** Performance of MECO Make Power Line Transducers for Delhi Metro Rail Corporation (DMRC – Delhi)

Please refer our Purchase orders to MECO Instruments Pvt. Ltd. Mahape, Navi Mumbai for Supply of MECO Make Power Line Transducers for Delhi Metro Rail Corporation (DMRC – Delhi) Projects.

Performance of MECO Make Power Line Transducers ( Current, Voltage, Power Factor, Active Power, Reactive Power & Frequency Transducers) supplied to us are as per specification and working satisfactory at DMRC Sites.

We look forward to have similar kind of service and support in future also.

Thanking You,

**Gaurav Khator**
**Blue Star Ltd, Gurgaon**

Registered Office: Kasturi Buildings, Mohan T Advani Chowk, Jamshedji Tata Road, Mumbai 400 020, India. Tel : +91 22 6665 4000 Fax : +91 22 6665 4152
CIN: L 28920MH1949PLC 006870

ABB

## Certificate of Appreciation

This is in appreciation towards the contribution of **M/s Meco Instruments Pvt. Ltd.**
to **ABB Ltd., LV- Drives** for adopting good quality systems in meeting
ABB business growth during the years 2006 & 2007.

**GNV Subba Rao**
Business Head
Drives - ABB Ltd.,

stelmec
beyond boundaries

ISO 9001 REGISTERED

**Stelmec Limited**
(CIN : U31200MH2000PLC124565)
MV SWITCHGEAR DIVISION-II
Survey No. 90 & 92/1,
Virar - Vajreshwari Road, At. Usgaon,
P. O. Bhatane, Tal. Vasai,
Dist. Palghar - 401 303, Maharashtra, India.
Phone : 8291947259, 8291947260
E-mail : sales@stelmec.com
Website : www.stelmec.com

Date: 09.01.2023

To,
**M/s. Meco Instruments Pvt. Ltd.**
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710
Tel. No. 022 – 27673300

Dear Sir,

Kind Attn : Dr. Kamal Goliya - CEO

Sub Satisfactory Executions of Supply of MECO Panel Meters against Purchase order No. STEL/110/GST0500/22-23 Dt. 26.08.2022.

Please refer our above and several Purchase order for Supply of MECO Make Analog Panel Meters. We are thank full to M/s. MECO Instruments Pvt. Ltd. Navi Mumbai for honouring timely delivery as per given schedule for all items.

We also appreciate Mr. Haren Shah and Mr. Amol Bharnuke for extending their excellent service during completion of order and providing / updating us time to time the proceeding in executing this order.

We look forward to have similar kind of service and support from your organization in our upcoming projects and orders.

Thanking You,
Your Faithfully,
**M/s. Stelmec Ltd.**

**Authorised Signatory**

**c.c.**
**Mr. Haren Shah – Senior Marketing Executive**
Email : haren.shah@mecoinst.com & harenvshah@yahoo.com Mobile No. : 9820093232
Mr. Amol Bharnuke – Marketing Executive
Email : amol.bharnuke@mecoinst.com Mobile No. : 9987466629

Registered & Corporate Office : 506/507, 55 Corporate Avenue, Saki Vihar Road, Andheri (E), Mumbai - 400 072.
Phone: 022 2803 4500 Email: corporate@stelmec.com Website: www.stelmec.com

HI TECH CALIBRATION SERVICES

No. 209, VGP Nagar, Mugappair West, Chennai - 600 037, INDIA.
Phone : 044 - 26 5 6 7 8 9 0 (5 Lines), Mobile : 95970 95960
enquiry@hitechcalibration.com | www.hitechcalibration.com

Ref No. HT/LT/2022-23/008 16-Apr-2022

**CERTIFICATE OF APPRECIATION**

**To**

Kishor Kumar Thakare (Marketing Manager – South India)
MECO Instruments Private Limited,
Navi Mumbai – 400710.

Dear Sir / Madam,

It is with great pleasure to inform you that your product **(Universal Calibrator MECO 90A)** we have purchased on **March 2022** is working properly and all the values are within the accuracy limit which is mentioned in the product manual. It is very user-friendly product and we are pleasure to recommend this product to other laboratories also.

We hope to have similar support from your organization so that it will strengthen our business relation.

For Hi Tech Calibration Services,

R. Shobana,

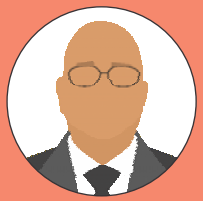
Calibration Engineer.

End of Letter

MECO®
SINCE 1962


## Analog Panel and Switchboard Meters

- ✓ AC Moving Iron Meters
- ✓ DC Moving Coil Meters
- ✓ AC Moving Coil Rectifier Type Meters
- ✓ Electronic Type W / VAR / PF / Hz Meters
- ✓ Rectangular AC & DC Meters
- ✓ Educational Desk Stand Meters



+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable

## General Specifications

### Standards

All instruments are designed in accordance with the following international and national regulations : IS-1248; IEC-51; IEC-1010; BS89; EN60051 respectively various instruments. The overall dimensions comply with DIN43700 - 43718.

## Technical Specifications

### Materials

Case : Complies to DIN 43700
Colour : White
Front Frame : Complies with DIN 43718
Colour : Black
Front Glass : Flat glass

### Protection

Case : IP52
Terminals : IP00
IP20 (with terminal cover)

### Overload Capabilities

Withstand continuous overloads of 1.2 times for Ammeter and Voltmeter the nominal value and short duration overloads of upto 10 times for Ammeter and upto 2 times for Voltmeter the nominal values for 5 seconds.

### Climatic Conditions

Reference temperature for these instruments is $27^{0}C \pm 2^{0}C$. The standard instruments can operate at a maximum relative humidity of 90%.

### Operating Temperature

$-10^{0}C$ to $+ 55^{0}C$, RH<90%

### Storage Temperature

$-20^{0}C$ to $+ 70^{0}C$, RH<90%

### Accuracy Class

All instruments are calibrated according to Accuracy Class specified below as per applicable international standards :

- Moving Iron Meters : 1.5
- Moving Coil Meters : 1.0, 1.5, 2.5
- Electronic Analog Watt / Var Meters : 1.5,1.0
- Power Factor Meters : $\pm 2^{0}$ Phase Angle
- Frequency Meters : 1.0

### Influence of External Magnetic Fields

Moving Iron Meters are provided with an internal shield cup in order to prevent the influence of stray and low intensity magnetic fields.

Moving Coil and all other instruments have a center core self-shielding construction which protects against stray and external low intensity magnetic fields.

### Mounting Position

The nominal operating position of the panel meters is vertical. The required mounting position is shown on the scale of the instrument. Instruments with horizontal and angular mounting positions can be supplied on request.

### High Voltage Test

All instruments are designed to withstand 2.5kV RMS, 50Hz, for 1min.

### Shock and Vibration Resistance

All meter movements are mounted on spring loaded shock absorbing type of jewel bearings which make the instrument capable of offering good resistance to shocks and vibration. This mechanism is much superior to traditional Taut-Band construction which is highly fragile. The Pivot Jewel mechanism is ideal for aviation, traction and marine applications.

### Pointer

The pointers are in accordance with DIN 43802.

### Zero Adjustment

A screw for zero adjustment is located on the front glass.

### Scales

Instrument scales are in accordance with DIN43802 regulations. Special scales are available on request.

## Markings and Symbols on Instruments / Meters

According to IEC51 requirements, all measuring instruments and their accessories bear on the dial, or on the external surface of the case, the markings indicating :

- Manufacturers name or trade mark
- Symbol of the measured parameter
- Accuracy / Accuracy Class
- Type of power supply and the number of measuring elements
- Test Voltage
- Operating method of the instrument
- Rated value
- Symbol for mounting position
- Symbol of the accessory or the transformer ratio for which the instrument has been calibrated.

## Moving Iron Meters

These instruments consist of a moving piece of ferro magnetic material, which is under influence of a current carrying fixed coil. Considering the above mentioned operating process, these instruments are ideally suited for measuring TRMS current and voltage in alternating current circuits. Accuracy for these meters is applicable only within the nominal working range and not in the overscale range. When using external current transformer, please ensure that the secondary current value of the CT must be the rated current of the Ammeter i.e., In.

## Moving Coil Meters

The operation of these instruments depends on the reaction of the current circulating in a moving coil and the field of a fixed permanent magnet. They can be used on alternating current with a suitable rectifier inserted in the circuit.

Moving Coil instruments above 50A, the ammeters are to be used with external Shunts having 60mV or 75mV drop. The Shunts are usually calibrated for a lead resistance of usually less than 0.07 Ohm. When lead resistance is greater than 0.1 Ohm, it is advisable to use shunts of 100, 150 or 300mV drop.

## Electronic Analog Watt, Var, PF & Hz Meters

These instruments are available for measuring Active and Reactive Power in single phase and three phase balanced or unbalanced load conditions. In addition to these we manufacture Power Factor Meters for single phase and three phase balanced load systems and line Frequency meters for different voltage ratings and different frequency bands.

Electronic Power meters use multiplier circuits which multiply instantaneous voltage and current.

The average of the product is in the form of analog DC current directly proportional to the AC power. This power is measured with DC moving coil meter. Scale is adjusted to indicate power. Sometimes these meters are used along with CTs and PTs. Bi-directional Watt/Var Meters to indicate export / import can be supplied on request.

In Frequency meter a DC current proportional to the input frequency is obtained by using an electronic circuit. This output is calibrated in terms of frequency.

The circuit for Powerfactor meter gives current output proportional to phase angle. This output is bidirectional to discriminate between leading and lagging Powerfactor. Scale is marked in terms of $\cos\varphi$, $\varphi$ being the phase angle between voltage and current vector.

Since these Watt meters and Var meters are self powered, it is essential that the input voltage is within ±15% of the nominal value. At lower voltage, the instrument will function erratically.

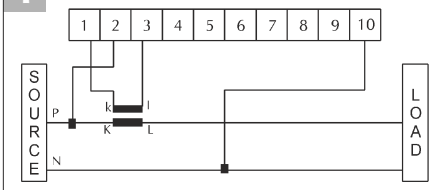
To get proper accuracy from Powerfactor meter, please ensure input voltage is within ±15% of the rated value & current is between 20% to 120% of the rated value.

## Note

Power meters and Powerfactor meters are normally supplied for 47 to 53 Hz operation. On request meters to suit 60Hz or 400 Hz can be supplied.

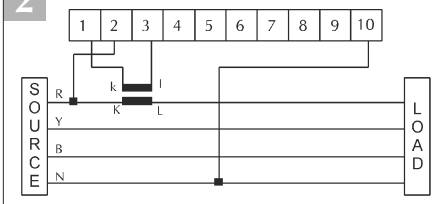
Active power, Reactive power & Low Powerfactor Wattmeter are calibrated at $\cos\varphi = 1$, $\sin\varphi = 1$ and $\cos\varphi = 0.2$ Lag respectively.

**1**



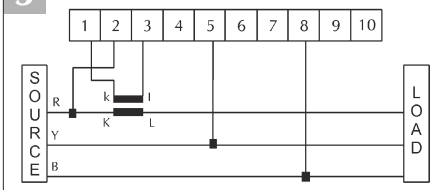

1φ 1 Element Watt Meter and Var Meter

**2**



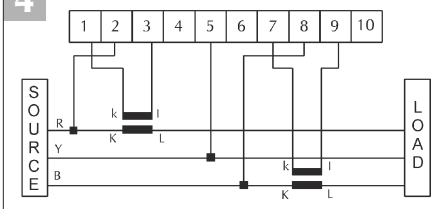

3φ 1 Element Watt Meter and Var Meter
for balanced load only

**3**



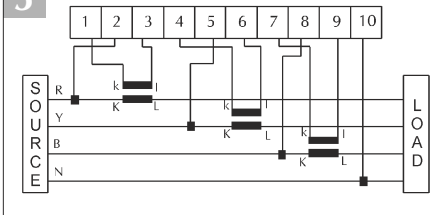

3φ 1 Element - D Type Watt Meter and Var Meter
for balanced load only

**4**



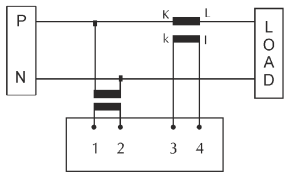

3φ 2 Element - D Type Watt Meter and Var Meter
for balanced and unbalanced load

**5**




3φ 3 Element Watt Meter and Var Meter
for balanced and unbalanced load

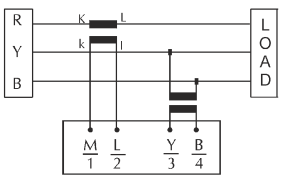
**6**




**Note : P=2, N=4, k=7 & l=9 only for 144LF11**

1φ 1 Element Pf Meter

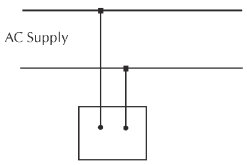
**7**




**Note : M=2, L=4, Y=7 & B=9 only for 144LF31**

3φ 1 Element Pf Meter
for balanced load only

**8**




Frequency Meter

## Burden

Electronic meters impose lower burden on supply than the conventional meters. Typical values are given below.

| **Watt & Var Meters** | |
|---|---|
| Voltage Rating | Total Burden(VA) |
| 1-Phase, 63.5V | < 0.5 |
| 1-Phase, 230/250V | < 2.0 |
| 3-Phase, 110V | < 3x0.5 |
| 3-Phase, 400/440V | < 3x2.0 |
| Current Rating | Total Burden (VA) |
| 1.0A | < 1VA/Phase |
| 5.0A | < 1VA/Phase |

| **Powerfactor Meters** | |
|---|---|
| Voltage Rating | Total Burden (VA) |
| 1-Phase, 63.5V | < 0.25 |
| 1-Phase, 230/250V | < 1.0 |
| 3-Phase, 110V | < 0.4 |
| 3-Phase, 400/440V | < 1.5 |
| Current Rating | Total Burden (VA) |
| 1.0 A | < 0.5 |
| 5.0 A | < 0.5 |

| **Frequency Meters** | |
|---|---|
| Voltage Rating | Total Burden (VA) |
| 63.5V | < 0.7 |
| 110V | < 1.2 |
| 230/250V | < 2.5 |
| 400/440V | < 4.5 |

## Scale

**Watt & Var Meters**

Upper limits of measuring range is one of the decimal or subdecimal values from the following,

1, 1.2, 1.5, 2, 2.5, 3, 4, 5, 6, 7.5 & 8.

In the interest of standardisation it is recommended that the maximum value of the measuring range is chosen accordingly. Following examples will illustrate the method of working out these values.

i) Single Phase

V=250V , I = 5A, Cosφ =1

Power = V.I.Cosφ =250x5x1 = 1250W

Maximum limit in this case should be 1200 or 1500W.

ii) Three Phase

V = 110V, PTR = 33k V/110V

I = 5A, CTR = 500/5A, Cosφ= 1

Power = $\sqrt{3}$.V.I.Cosφ.PTR.CTR

Power = $\sqrt{3}$ x 110 x 5 x 1 x $\frac{33 \times 1000}{110} \times \frac{500}{5}$

Power = 28.578MW

Maximum & Minimum limit of Scaling ± 10%

Maximum limit in this case : 30MW & Minimum limit in this case : 25MW.

## Ordering Information

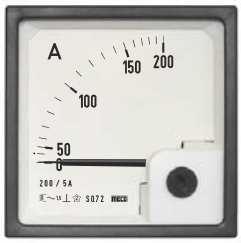
Please give the following details while ordering :

| | |
|---|---|
| Model | :_____ |
| Full Scale Range | :_____ |
| CTR | :_____ |
| Voltage (Ph-Ph or Ph-N) | :_____ |
| PTR ( if any ) | :_____ |
| Connection diagram number | :_____ |

**Example :**

| | |
|---|---|
| Model | : 96QW32 |
| Full Scale Range | : 0-6 MW |
| CTR | : 600/5A |
| Voltage Ph-Ph | : 110V AC |
| PTR | : 6.6KV/110V |
| Connection diagram number | : 4 |

Interchangeable Scale

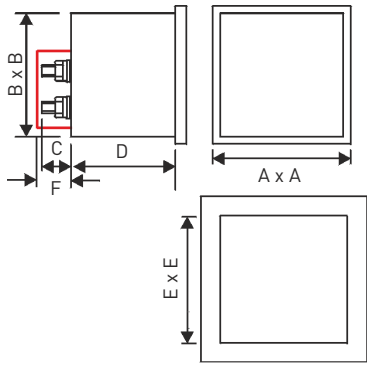



**SQ72**


**SQ96**

| **Model** | **SQ72, SQ96** |
|---|---|
| Description | Moving iron meter of 90° deflection with interchangeable scale facility |
| Movement Type | Moving iron spring-mounted jewel bearing suspension |
| Accuracy | ±1.5% of full scale as per IS 1248; EN 60051 |
| Self Consumption | Ammeters (upto 5A AC) ≤ 0.6VA; Voltmeters (upto 500V AC) ≤ 5VA |
| Operating Voltage | 600V RMS max. |
| Test Voltage | 2.5KV AC for 1 minute at 50 Hz, 4KV AC (Optional) |
| Construction & Design | According to IS 1248; EN 60051 |
| Scale | According to DIN 43802 |
| Case/Housing Material | White ABS, dimensions as per DIN 43700 |
| Bezel | Black ABS, dimensions as per DIN 43718 |
| Glass Faceplate | Flat Glass |
| Mounting Fasteners/Clamps | Ergonomic easy mountable clamps and nuts for easy installation on Switchboards, Panels, Mosaics etc. |
| Temperature Conditions | – 10°C to + 55°C, RH < 90% (Operating) and – 20°C to + 70°C, RH < 90% (Storage) EN60051 |
| Front Protection | IP52 protection as per IS2147 |
| Terminal Protection | Back cover for IP20 terminal protection as per IS2147 (optional) |

**Dimension and Panel Cutout**




— Optional Terminal Protection Cover

| Model | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C Max | D | E +0.8 -0.0 | F |
| **SQ72** Voltmeter & Ammeter upto 20A | 72 | 67 | 17 | 51.5 | 68 | 21 |
| **SQ72** Ammeter above 20A | 72 | 67 | 23 | 51.5 | 68 | - |
| **SQ96** Voltmeter & Ammeter upto 20A | 96 | 90 | 17 | 51.5 | 92 | 21 |
| **SQ96** Ammeter above 20A | 96 | 90 | 23 | 51.5 | 92 | - |

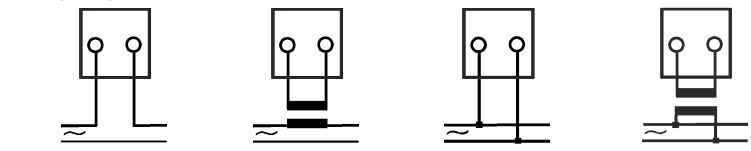
| **Ammeters** | | | | | | **Voltmeters** | | |
|---|---|---|---|---|---|---|---|---|
| **1 x In (A)** | | **2x In (A)** | | **6 x In (A)** | | | **with PT** | |
| **Direct** | **with CT** | **Direct** | **with CT** | **Direct** | **with CT** | **Direct** | **Ratio and Scale** | |
| 1A | CTR/5A | 1/2A | CTR/5A | 1/6A | CTR/5A | | | |
| 5A | CTR/1A | 5/10A | CTR/1A | 5/30A | CTR/1A | 50V | PTR/63.5V | |
| 10A | 10/— | 10/20A | 10/20/— | 10/60A | 10/60/— | 60V | PTR/110V | 10KV/— |
| 15A | 15/— | 15/30A | 15/30/— | 15/90A | 15/90/— | 75V | PTR/230V | 15KV/— |
| 20A | 20/— | 20/40A | 20/40/— | 20/120A | 20/120/— | 100V | PTR/250V | 20KV/— |
| 25A | 25/— | 25/50A | 25/50/— | 25/150A | 25/150/— | 110V | PTR/400V | 25KV/— |
| 30A | 30/— | 30/60A | 30/60/— | 30/180A | 30/180/— | 150V | PTR/440V | 30KV/— |
| 40A | 40/— | 40/80A | 40/80/— | 40/240A | 40/240/— | 250V | | 40KV/— |
| 50A | 50/— | 50/100A | 50/100/— | 50/300A | 50/300/— | 300V | 1KV/— | 50KV/— |
| 60A | 60/— | 60/120A | 60/120/— | 60/360A | 60/360/— | 500V | 1.2KV/— | 60KV/— |
| 75A | 75/— | 75/150A | 75/150/— | 75/450A | 75/450/— | 600V | 1.5KV/— | 75KV/— |
| 80A | 100/— | 80/160A | 100/200/— | 80/480A | 100/600/— | 750V | 2KV/— | 80KV/— |
| 100A | 150/— | 100/200A | 150/300/— | 100/600A | 150/900/— | | 2.5KV/— | 100KV/— |
| | 250/— | | 250/500/— | | 250/1500/— | | 3KV/— | and |
| | 400/— | | 400/800/— | | 400/2400/— | | 3.5KV/— | higher |
| | 500/— | | 500/1000/— | | 500/3000/— | | 4KV/— | |
| | 600/— | | 600/1200/— | | 600/3600/— | | 5KV/— | |
| | 1000/— | | 1000/2000/— | | 1000/6000/— | | 6KV/— | |
| | 1500/— | | 1500/3000/— | | 1500/9000/— | | 7.5KV/— | |
| | and higher | | and higher | | and higher | | 8KV/— | |

**Ordering Information:** Model, Input Range, CTR/PTR, Scale

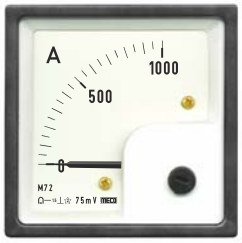
**Notes**

a) Double stamping / non-standard marking available.
b) Gaskets (optional) for vibration proof available.
c) Terminal protection cover (optional) on request for Voltmeter & Ammeter upto 20 A.
d) AC instruments calibrated @ 50Hz. (400Hz on request.)
e) Other ranges subject to technical feasibility.

**Wiring Diagram**



Ammeter with direct connection | Ammeter with CT | Voltmeter with direct connection | Voltmeter with PT




M72, M96


ML72, ML144


ML96


ML110

| Model | M72, M96 | ML72, ML96, ML144, ML110 |
|---|---|---|
| Description | Full Scale deflection 90° | Full Scale deflection 240° |
| Movement Type | Moving-coil with central magnetic Core; spring-mounted bearing jewel suspension | Moving-coil with central magnetic Core; spring-mounted bearing jewel suspension |
| Accuracy | ± 1.5% of Full Scale | ± 1.5% of Full Scale for ML96, ML144, ML110<br>± 2.5% of Full Scale for ML72 |
| Sensitivity | 1000Ω/V (Voltmeter); 200Ω/V (Ammeter) | 1000Ω/V (Voltmeter); 200Ω/V (Ammeter) |
| Operating Voltage | 600 V RMS max. | 600 V RMS max. |
| Test Voltage | 2.5 KV AC for 1 minute at 50 Hz, 4KV AC (Optional) | 2.5 KV AC for 1 minute at 50 Hz, 4KV AC (Optional) |
| Construction & Design | According to IS 1248; EN 60051 | According to IS 1248; EN 60051 |
| Scale | According to DIN 43802 | Accordingto DIN 43802 |
| Casing | Size 72, 96 ABS Case with Glass Front | Size 72, 96, 144 ABS Case with Glass Front<br>Size 110 ABS Case with Clear Polycarbonate Cover |
| Dimensions and Panel cutout | Refer Dimensions Page Overleaf | Refer Dimensions Page Overleaf |

| Ammeters | | | | Voltmeters | |
|---|---|---|---|---|---|
| µA | mA | A* | On shunt | mV | V |
| | 1 mA | 1 A | —A/60 mV | | 1 V |
| | 1.5 mA | 1.5 A | —A/75 mV | | 1.5 V |
| | 2 mA | 2 A | —A/100 mV | | 2 V |
| | 2.5 mA | 2.5 A | | | 2.5 V |
| | 4 mA | 4 A | | | 4 V |
| | 5 mA | 5 A | 5A/75 mV | | 5 V |
| | 6 mA | 6 A | 6A/75 mV | | 6 V |
| | 10 mA | 10 A | 10A/75 mV | | 10 V |
| | 15 mA | 15 A | 15A/75 mV | | 15 V |
| | 20 mA | 20 A | 20A/75 mV | | 20 V |
| | 25 mA | 25 A | 25A/75 mV | | 25 V |
| | 30 mA | 30 A | 30A/75 mV | | 30 V |
| | 40 mA | 40 A | 40A/75 mV | | 40 V |
| | 50 mA | 50 A | 50A/75 mV | 50 mV | 50 V |
| | 60 mA | | 60A/75 mV | 60 mV | 60 V |
| | 75 mA | | 75A/75 mV | 75 mV | 75 V |
| | 100 mA | | 100A/75 mV | 100 mV | 100 V |
| | 150 mA | | 150A/75 mV | 150 mV | 150 V |
| | 250 mA | | 250A/75 mV | 250 mV | 250 V |
| 400 µA | 400 mA | | 400A/75 mV | 400 mV | 400 V |
| 500 µA | 500 mA | | 500A/75 mV | 500 mV | 500 V |
| 600 µA | 600 mA | | 600A/75 mV | 600 mV | 600 V |
| 800 µA | 800 mA | | 800A/75 mV | 800 mV | 800 V |
| | | | and higher | | 1000 V |

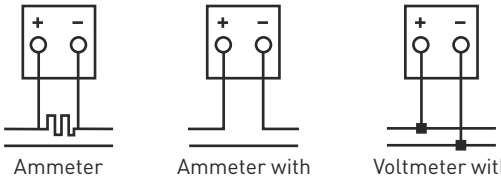
**Ordering Information :** Model, Input Range, Scale

**Notes**

☐ Ranges common to M and ML Series
▨ All other refer to M Series only

* For ML72 DC direct current upto 1A. Above 1A use with external shunt.
a) Double stamping / non-standard / centre zero marking available.
b) Zero supp. DC ammeter for 4-20mA & voltmeter for 1-5V available.
c) Rubber gaskets for vibration proof available.
d) Other ranges subject to technical feasibility.
e) Terminal Protection Cover (Optional) on request for all Models except ML144

**Wiring Diagram**




Ammeter on Shunt | Ammeter with direct connection | Voltmeter with direct connection


C72, C96


MLC72, MLC144


MLC96


MLC110

**Model**

| | | |
|---|---|---|
| Description | Moving Coil measuring instruments with AC rectifier; Full Scale deflection 90° | Moving coil measuring instruments with AC rectifier; Full Scale deflection 240° |
| Movement Type | Moving-coil with central magnetic Core; spring-mounted bearing jewel suspension | Moving-coil with central magnetic Core; spring-mounted bearing jewel suspension |
| Accuracy | ± 1.5% of Full Scale | ± 1.5% of Full Scale for MLC96, MLC144, MLC110<br>± 2.5% of Full Scale for MLC72 |
| Operating Voltage | 600 V RMS max. | 600 V RMS max. |
| Test Voltage | 2.5 KV AC for 1 minute at 50 Hz , 4KV AC (Optional) | 2.5 KV AC for 1 minute at 50 Hz , 4KV AC (Optional) |
| Self-Consumption | < 1 VA | < 1 VA |
| Frequency Range | 45 Hz to 1 KHz (Voltmeter & Ammeter)<br>1 KHz to 10KHz (Voltmeter - Optional) | 45 Hz to 1 KHz (Voltmeter & Ammeter)<br>1 KHz to 10KHz (Voltmeter - Optional) |
| Construction & Design | According to IS 1248; EN 60051 | According to IS 1248; EN 60051 |
| Scale | According to DIN 43802 | According to DIN 43802 |
| Casing | Size 72, 96 ABS Case with Glass Front | Size 72, 96, 144 ABS Case with Glass Front<br>Size 110 ABS Case with Clear Polycarbonate Cover |
| Dimensions and Panel cutout | Refer Dimensions Page Overleaf | Refer Dimensions Page Overleaf |

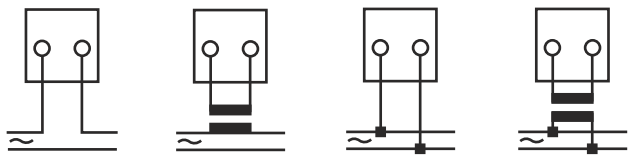
| Ammeters @ | | | | | | Voltmeters | | |
|---|---|---|---|---|---|---|---|---|
| 1 x In (A) | | 2 x In (A) | | 6 x In (A) | | | On PT | |
| Direct | On CT | Direct | On CT | Direct | On CT | Direct | Ratio and Scale | |
| 1A | (/-) | 1/2 A | (/-) | 1/6 A | (/-) | | | |
| 5A | (5A or 1A) | 5/10A | (5A or 1A) | 5/30 A | (5A or 1A) | | -V/63.5 V | |
| | 10/- | | 10/20/- | | 10/60/- | 10 V | -V/110 V | 10 KV |
| | 15/- | | 15/30/- | | 15/90/- | 15 V | -V/230 V | 15 KV |
| | 20/- | | 20/40/- | | 20/120/- | 20 V | -V/250 V | 20 KV |
| | 25/- | | 25/50/- | | 25/150/- | 25 V | -V/400 V | 25 KV |
| | 30/- | | 30/60/- | | 30/180/- | 30 V | -V/440 V | 30 KV |
| | 40/- | | 40/80/- | | 40/240/- | 40 V | | 40 KV |
| | 50/- | | 50/100/- | | 50/300/- | 50 V | 1 KV | 50 KV |
| | 60/- | | 60/120/- | | 60/360/- | 60 V | 1.2 KV | 60 KV |
| | 75/- | | 75/150/- | | 75/450/- | 75 V | 1.5 KV | 75 KV |
| | 100/- | | 100/200/- | | 100/900/- | 100 V | 2 KV | 100 KV |
| | 150/- | | 150/300/- | | 150/900/- | 150 V | 2.5 KV | |
| | 250/- | | 250/500/- | | 250/1500/- | 250 V | 3 KV | |
| | 400/- | | 400/800/- | | 400/2400/- | 400 V | 3.5 KV | |
| | 500/- | | 500/1000/- | | 500/3000/- | 500 V | 4 KV | |
| | 600/- | | 600/1200/- | | 600/3600/- | 600 V | 5 KV | |
| | 1000/- | | 1000/2000/- | | 1000/6000/- | 750 V | 6 KV | |
| | 1500/- | | 1500/3000/- | | 1500/9000/- | 800 V | 7.5 KV | |
| | and higher | | and higher | | and higher | 1000 V | 8 KV | |

**Ordering Information**: Model, Input, CTR/PTR, Scale

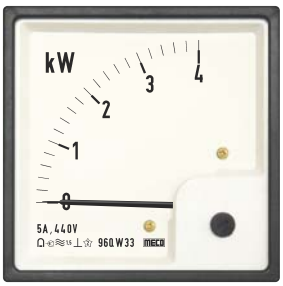
**Notes**

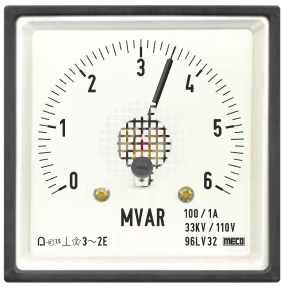
a) Double stamping / non-standard marking available.
b) Rectifier type meters caliberated for AC sine wave.
c) Rubber gaskets for vibration proof available.
d) AC instruments normally caliberated at 50 Hz.
e) Other ranges available subject to technical feasibility.
f) Terminal Protection Cover (Optional) on request for all Models except MLC144
@ From 1mA to 750mA AC (50Hz) meters are also available

**Wiring Diagram**



Ammeter (direct) Ammeter on CT Voltmeter (direct) Voltmeter on PT






**Rated Accuracy :** ± 1.5% of F.S. for Watt & Var Meter (standard)
± 1.0% of F.S. for Watt & Var Meter(optional)
± $2^0$ Phase Angle for Powerfactor Meter
± 1% of Full Scale for Frequency Meter

**Test Voltage** : 2.5KVAC for 1 min. @ 50 Hz, 4KV AC (optional)

**Insulation Resistance** : Over 20MOhm at 500V DC

**Power Supply** : Self-Powered

**Casing** : Size 72, 96, 144 ABS Case with Glass Front
Size 110 ABS Case with Clear Polycarbonate Cover

**Continuous Over Load :** 1.2 Times Rated Current / Voltage

| **Deflection** | | | $90^0$ | | $240^0$ | | | |
|---|---|---|---|---|---|---|---|---|
| **Size in mm** | | | 72x72 | 96x96 | 72x72 | 96x96 | 110x110 | 144x144 |
| **Scale Length (mm)** | | | 60 | 90 | 110 | 155 | 175 | 230 |
| **System** | Current Range (Amp) | Voltage Range (Volt) |  |  |  |  |  |  |
| **Watt Meters & Var Meters** | | | Model Codes | | | | | |
| **1 Phase 1 Element** | 1,5,10 | 63.5, 230 | *72QW11 *72QV11 | 96QW11 96QV11 | *72LW11 *72LV11 | 96LW11 96LV11 | *110LW11 *110LV11 | 144LW11 144LV11 |
| **3 Phase 1 Element Balanced Load only** | 1,5,10 | 110, 440 | *72QW31 *72QV31 | 96QW31 96QV31 | *72LW31 *72LV31 | 96LW31 96LV31 | *110LW31 *110LV31 | 144LW31 144LV31 |
| **3 Phase 2 Element [3 Wire] Balanced or Unbalanced Load** | 1, 5 | 110, 440 | *72QW32 *72QV32 | 96QW32 96QV32 | *72LW32 *72LV32 | 96LW32 96LV32 | *110LW32 *110LV32 | 144LW32 144LV32 |
| **3 Phase 3 Element [4 Wire] Balanced or Unbalanced Load** | 1, 5 | $110/\sqrt{3}$ $440/\sqrt{3}$ | *72QW33 *72QV33 | 96QW33 96QV33 | *72LW33 *72LV33 | 96LW33 96LV33 | *110LW33 *110LV33 | 144LW33 144LV33 |
| **Powerfactor & Phase Angle Meter** | | | | | | | | |
| **Single Phase** | 1, 5 | 63.5, 230 | #72QF11 | 96QF11 | #72LF11 | 96LF11 | 110LF11 | 144LF11 |
| **3 Phase Balanced Load** | 1, 5 | 110, 440 | #72QF31 | 96QF31 | #72LF31 | 96LF31 | 110LF31 | 144LF31 |
| **Frequency Meter** | | | | | | | | |
| **40 - 60 Hz, 45 - 55 Hz, 45 - 65 Hz, 55 - 65 Hz, 360 - 440 Hz** | NA | 63.5, 110, 240, 440 | F72 | F96 | #FL72 | FL96 | FL110 | FL144 |

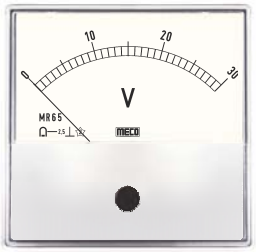
**Notes**

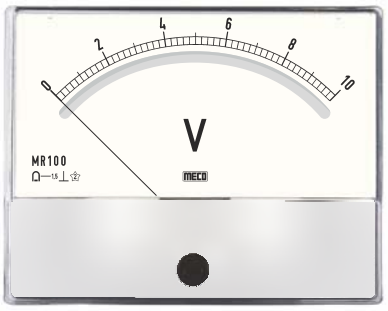
* These Meters supplied with DIN Series Power Line Transducers.
- Meters with Dual scale / Tripple scale stamping can be supplied.
- Meters with centre zero or offset zero scale can be supplied.
- Rubber Gaskets for vibration protection available on request.
- Other Voltage and Current ranges available subject to technical feasibility.

\# These Meters Supplied with External Box. (Refer Dimension Page, Drawing 5)

Model, Input Voltage, Input Current, CTR / PTR, Scale, Accuracy Class


MR60, CR60


MR65, CR65


MR100, CR100


MR120, CR120

| Model | MR60, MR65, MR100, MR120 | CR60, CR65, CR100, CR120 AC |
|---|---|---|
| Description | DC Ammeters and Voltmeters full scale deflection 90° | Ammeters and Voltmeters full scale deflection 90° |
| Movement Type | Moving coil, central magnetic core, spring mounted bearing jewel suspension. | Moving coil, central magnetic core, spring mounted bearing jewel suspension with rectifier circuit. |
| Accuracy | ± 1.5% of Full Scale for MR100, MR120<br>± 2.5% of Full Scale for MR60, MR65 | ± 1.5% of Full Scale for CR100, CR120<br>± 2.5% of Full Scale for CR60, CR65 |
| Sensitivity | 1000Ω/V (Voltmeter); 200Ω/V (Ammeter) | - |
| Operating Voltage | 600 V RMS max. | 600 V RMS max. |
| Test Voltage | 2.5 KV AC for 1 minute at 50 Hz, 4KV AC (Optional) | 2.5 KV AC for 1 minute at 50 Hz, 4KV AC (Optional) |
| Frequency | - | 45Hz to 1KHz (Volt), 45-100Hz (Amp) |
| Construction & Design | According to IS 1248; EN 60051 | According to IS 1248; EN 60051 |
| Scale | According to DIN 43802 | According to DIN 43802 |
| Casing | ABS case with Clear Polycarbonate Cover | ABS case with Clear Polycarbonate Cover |
| Dimensions and Panel cutout | Refer Dimensions Page Overleaf | Refer Dimensions Page Overleaf |

## DC Ranges : MR Series

| Ammeters* | | | | | | Voltmeters | | |
|---|---|---|---|---|---|---|---|---|
| µA | mA | | A* | On Shunt | | mV | V | |
| | 1 mA | 50 mA | 1 A | —A/60 mV | 50A/75 mV | 50 mV | 1 V | 50 V |
| | 1.5 mA | 60 mA | 1.5 A | —A/75 mV | 60A/75 mV | 60 mV | 1.5 V | 60 V |
| | 2 mA | 75 mA | 2 A | —A/100 mV | 75A/75 mV | 75 mV | 2 V | 75 V |
| | 2.5 mA | 100 mA | 2.5 A | | 100A/75 mV | 100 mV | 2.5 V | 100 V |
| | 4 mA | 150 mA | 4 A | | 150A/75 mV | 150 mV | 4 V | 150 V |
| | 5 mA | 250 mA | 5 A | 5A/75 mV | 250A/75 mV | 250 mV | 5 V | 250 V |
| 400 µA | 6 mA | 400 mA | 6 A | 6A/75 mV | 400A/75 mV | 400 mV | 6 V | 400 V |
| 500 µA | 10 mA | 500 mA | 10 A * | 10A/75 mV | 500A/75 mV | 500 mV | 10 V | 500 V |
| 600 µA | 15 mA | 600 mA | 15 A | 15A/75 mV | 600A/75 mV | 600 mV | 15 V | 600 V |
| | 20 mA | | 20 A | 20A/75 mV | and higher | | 20 V | |
| | 25 mA | | 25 A | 25A/75 mV | | | 25 V | |
| | 30 mA | | 30 A | 30A/75 mV | | | 30 V | |
| | 40 mA | | 40 A | 40A/75 mV | | | 40 V | |
| | | | 50 A | | | | | |

* MR60 direct upto 10A DC only. Above 10A use with external shunt, for MR60, MR65, MR100 4-20mA DC range use with external box supplied with the instrument.

## AC Ranges : CR Series

| Ammeters @ | | | | | | | | Voltmeters | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 x In (A) | | | 2 x In (A) | | | 6 x In (A) | | | | On PT | | |
| Direct | On CT | | Direct | On CT | | Direct | On CT | | Direct | | Ratio and Scale | | |
| | (/-) (5A or 1A) | | | (/-) (5A or 1A) | | | (/-) (5A or 1A) | | | | -V/63.5 V | | |
| 1 A | 10/- | 100/- | 1/2 A | 10/20/- | 100/200/- | 1/6 A | 10/60/- | 100/600/- | 10 V | 100 V | -V/110 V | 2 KV | 10 KV |
| 5 A | 15/- | 150/- | 5/10 A | 15/30/- | 150/300/- | 5/30 A | 15/90/- | 150/900/- | 15 V | 150 V | -V/230 V | 2.5 KV | 15 KV |
| | 20/- | 250/- | | 20/40/- | 250/500/- | | 20/120/- | 250/1500/- | 20 V | 250 V | -V/250 V | 3 KV | 20 KV |
| | 25/- | 400/- | | 25/50/- | 400/800/- | | 25/150/- | 400/2400/- | 25 V | 400 V | -V/400 V | 3.5 KV | 25 KV |
| | 30/- | 500/- | | 30/60/- | 500/1000/- | | 30/180/- | 500/3000/- | 30 V | 500 V | -V/440 V | 4 KV | 30 KV |
| | 40/- | 600/- | | 40/80/- | 600/1200/- | | 40/240/- | 600/3600/- | 40 V | 600 V | | 5 KV | 40 KV |
| | 50/- | 1000/- | | 50/100/- | 1000/2000/- | | 50/300/- | 1000/6000/- | 50 V | | 1 KV | 6 KV | 50 KV |
| | 60/- | 1500/- | | 60/120/- | 1500/3000/- | | 60/360/- | 1500/9000/- | 60 V | | 1.2 KV | 7.5 KV | 60 KV |
| | 75/- | and higher | | 75/150/- | and higher | | 75/450/- | and higher | 75 V | | 1.5 KV | 8 KV | 75 KV |

@ From 100mA to 5A AC, use with External CT Box, supplied with the instrument.

**Ordering Information:** Model, Input range, Scale, CTR/PTR

**Notes**

a) Double stamping /non-standard / centre zero marking available. b) Zero suppressed DC ammeter for 4-20mA and voltmeter for 1-5V available.
c) Other ranges available subject to technical feasibility.

## Moving Coil Educational Desk Stand Meters

MECO Educational Desk Stand Meters are ideal for laboratory use. These meters are made of an unbreakable ABS desk stand with two or three terminals and fitted with MR65, MR100, CR65 or CR100 meters.

MR65EDM

MR100EDM

| Model | MR65EDM (DC) | MR100EDM (DC) |
|---|---|---|
| Accuracy | ±2.5% of Full Scale | ±1.5% of Full Scale |
| Scale Length | 68mm | 80mm |

| Ranges | MR65EDM / MR100EDM |
|---|---|
| Microamps | 500µA to 0-1000µA |
| Milliamps | 0-1mA to 0-1000mA |
| Amps | 0-1A to 0-30A |
| Millivolts | 0-50mV to 0-1000mV |
| Volt | 0-1V to 0-1000V |
| Galvanometer | 30-0-30 G or 50-0-50 G with 20 µA/Div |

Note : Dual ranges available subject to techincal feasibility.

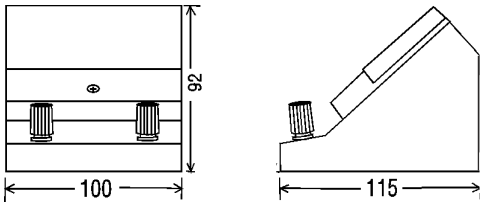
CR65EDM

CR100EDM

| Model | CR65EDM (AC) | CR100EDM (AC) |
|---|---|---|
| Accuracy | ±2.5% of Full Scale | ±1.5% of Full Scale |
| Scale Length | 68mm | 80mm |

| Ranges | CR65EDM / CR100EDM |
|---|---|
| Microamps | ---- |
| Milliamps | 0-1mA to 0-1000mA |
| Amps | 0-1A to 0-5A |
| Millivolts | ---- |
| Volt | 0-10V to 0-1000V |
| Galvanometer | ---- |

## Dimension (mm)

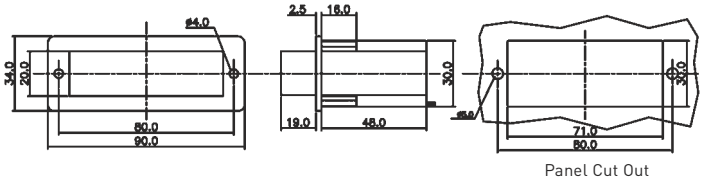



## Edge Mounting Rectangular AC & DC Panel Meter

DC : ME70, AC : CE70

**Casing** : Clear transparent Polycarbonate Cover
**Accuracy** : ±2.5% of Full Scale
**Ranges & details** : Similar to models MR60 and CR60, Current Range max. 1.5 A
**Scale Length** : 52mm

### Dimensions (mm)



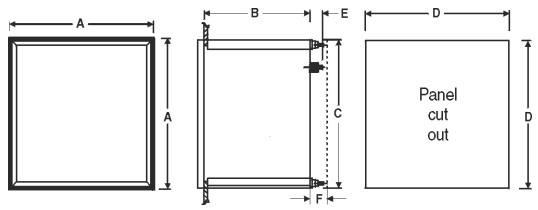

Panel Cut Out

| MODELS | SCALE LEHGTH (mm) | REFER DRAWING | A | B | C | D | E | F | EXT. BOX # DRAWING |
|---|---|---|---|---|---|---|---|---|---|
| SQ72 (VOLTMETER & AMMETER UPTO 20A) | 64 | 1 | 72 | 51.5 | 67 | 68 | 17 | 19.5 | - |
| SQ72 (AMMETER ABOVE 20A) | 64 | 1 | 72 | 51.5 | 67 | 68 | 23 | 19.5 | - |
| M72,F72,C72(#),72QF11(#),71QF31(#) | 60 | 1 | 72 | 37 | 66 | 68 | 13 | 19.5 | 5 |
| 72QW11,31,32,33, (72QV11,31,32,33) | 60 | 1 | 72 | 37 | 66 | 68 | 13 | 19.5 | 4 |
| 72LW11,31,32,33, (72LV11,31,32,33) | 110 | 1 | 72 | 37 | 66 | 68 | 13 | 20.5 | 4 |
| ML72,MLC72 (Voltmeter),72LF11(#),72LF31(#), FL72(#) | 110 | 1 | 72 | 37 | 66 | 68 | 13 | 20.5 | 5 |
| MLC72 (Ammeter) | 110 | 1 | 72 | 62 | 66 | 68 | 16 | 18 | - |
| SQ96 (VOLTMETER & AMMETER UPTO 20A) | 97 | 1 | 96 | 51.5 | 90 | 92 | 17 | 19 | - |
| SQ96 (AMMETER ABOVE 20A) | 97 | 1 | 96 | 51.5 | 90 | 92 | 23 | 19 | - |
| M96 (Above 10A, E=18) | 90 | 1 | 96 | 30 | 90 | 92 | 13 | 19.5 | - |
| 96QW11,31,32,33, (96QV11,31,32,33) | 90 | 1 | 96 | 102 | 90 | 92 | 16 | 12 | - |
| 96LW11,31,32,33, (96LV11,31,32,33), 96LF11,31,FL96 | 155 | | | | | | | | |
| C96,96QF11,31,F96,M96 (4-20mA DC) | 90 | 1 | 96 | 48 | 90 | 92 | 13 | 19.5 | - |
| ML144,MLC144,144LF11,31,FL144 | 230 | 1 | 144 | 54 | 136 | 138 | 4 | 19 | - |
| 144LW11,31,32,33 (144LV11,31,32,33) | 230 | 2 | 144 | 103 | 136 | 138 | - | - | - |
| ML110,MLC110,110LF11,31,FL110 | 175 | 3 | ----As Per Drawing---- | | | | | | - |
| 110LW,11,31,32,33, (110LV11,31,32,33) | 175 | 3 | | | | | | | 4 |
| ML96 / MLC96 (Above 10A, E=18) | 155 | 1 | 96 | 48 | 90 | 92 | 13 | 22 | - |

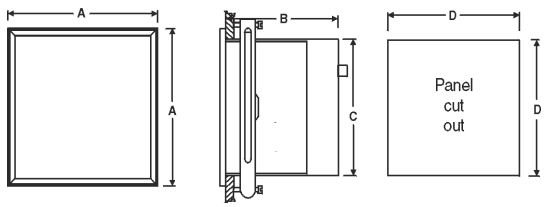
| MODELS | SCALE LENGTH (mm) | REFER DRAWING | A | B | C | D | E | F | G | H | I | J | L | O | R | EXT. BOX # DRAWING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MR60,CR60 | 57 | 6 | 60 | 60 | 33 | 24 | 48 | 48 | 51.5 | 12 | - | - | 54 | 4BA | 4.5 | 5 (CR60) |
| MR65,CR65 | 68 | 6 | 81 | 81 | 33 | 22 | 64 | 64 | 64 | 12 | - | - | 67 | 4BA | 4.5 | 5 (CR65) |
| MR100,CR100 | 80 | 6 | 100 | 80 | 34 | 21 | 84 | 64 | 64 | 12 | - | 7 | 67 | 4BA | 4.5 | 5 (CR100) |
| MR120,CR120 | 96 | 6 | 120 | 100 | 38 | 25 | 100 | 80 | 65 | 12 | - | 16 | 67 | 4BA | 4.5 | 5 (CR120) |

## Dimensions (mm)

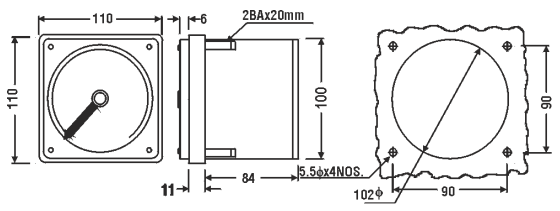
**1**




**2**

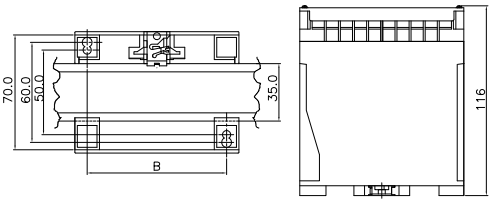



**3**

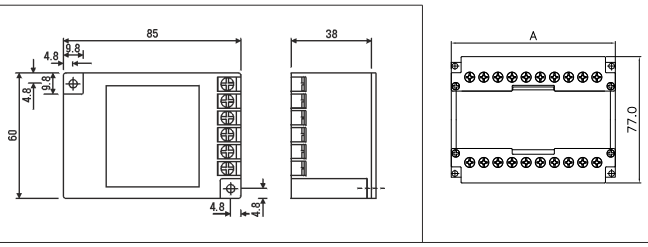



**4** Dimension of DIN Series Power Line Transducers

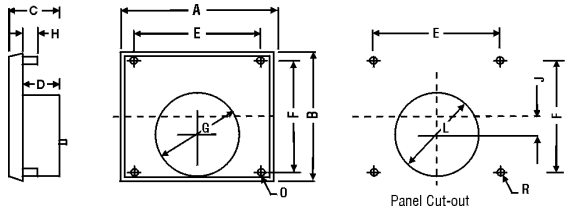
| Case Size | A | B |
|---|---|---|
| II | 100 | 85 |
| III | 150 | 135 |




**5**




**6**




**Note :** # For ranges greater than 100 mA & upto 5A AC use Models CR60, CR65, CR100, CR120 & C72 with External CT Box supplied with the instruments (Drawing 5).

MECO®

SINCE 1962

## Digital Multimeters

- ✓ Palm / Pocket Size
- ✓ Professional Type

+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable


**DMM 830L**

| 3½ Digit 2000 Counts, Audiable Continuty, Diode Test, hFE Test, Backlight & Data Hold | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 200mV/2/20/200/600V |
| Accuracy | ±(0.5% rdg + 3 dgt) 200mV |
| | ±(0.8% rdg + 5 dgt) 2V, 20V, 200V |
| | ±(1.0% rdg + 5 dgt) 600V |
| **AC Voltage** | 200/600V [45~450Hz) |
| Accuracy | ± (2.0% rdg + 10 dgt) |
| **DC Current** | 200 µA/2mA/20mA/ 200mA/10A |
| Accuracy | ±(1.8% rdg + 2 dgt) 200µA, 2mA, 20mA |
| | ±(2.0% rdg + 2 dgt) 200mA |
| | ±(2.0% rdg + 10 dgt) 10A |
| **Resistance** | 200Ω/2kΩ/20kΩ/200kΩ/ 2MΩ |
| Accuracy | ±(1.0%rdg+4dgt) on all ranges, except |
| | ±(1%rdg+10dgt) on 200Ω |
| **Sp. Function** | Audible Continuity, Diode Test, hFE Test |
| **Power** | One 9V Battery |
| **Low Battery** | " ⊟+ " is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 145 x 76 x 43mm (approx.) |
| **Weight** | 207gms Including Battery (approx) |
| **Accessories** | One Pair of Test Leads, Battery [installed], Instruction Manual & Holster |


**DMM 63+**

| 3½ Digit 2000 Counts, Audiable Continuty, Diode Test, hFE Test, Backlight, Data Hold & Battery Test | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 200mV/2/20/200/1000V |
| Accuracy | ±(0.5% rdg + 3 dgt) 200mV |
| | ±(0.8% rdg + 5 dgt) 2V, 20V, 200V |
| | ±(1.0% rdg + 5 dgt) 1000V |
| **AC Voltage** | 200/750V [45~450Hz) |
| Accuracy | ± (2.0% rdg + 10 dgt) |
| **DC Current** | 200 µA/2mA/20mA/ 200mA/10A |
| Accuracy | ±(1.8% rdg + 2 dgt) 200µA, 2mA, 20mA |
| | ±(2.0% rdg + 2 dgt) 200mA |
| | ±(2.0% rdg + 10 dgt) 10A |
| **Resistance** | 200Ω/2kΩ/20kΩ/200kΩ/ 2MΩ |
| Accuracy | ±(1.0%rdg+4dgt) on all ranges, except |
| | ±(1%rdg+10dgt) on 200Ω |
| **Battery Test** | Ranges : 1.5V, 9V |
| | Resolution : 1mV, 10mV |
| | Internal Resistance : 10.5Ω ±1.0Ω, 780Ω ±200Ω |
| **Sp. Function** | Audible Continuity, Battery Test, Diode Test, hFE Test |
| **Power** | Two 1.5V "AAA" Battery |
| **Low Battery** | " ⊟+ " is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 160 x 76 x 32mm (approx.) |
| **Weight** | 155gms Including Battery (approx) |
| **Accessories** | One Pair of Test Leads, Battery [installed], Instruction Manual |


**DMM 603+**

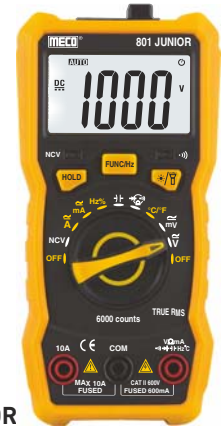
| 3½ Digit 2000 Counts, Audiable Continuty, Diode Test, hFE Test, Backlight, Data Hold & APO | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 200mV/2/20/200/1000V |
| Accuracy | ±(0.5% rdg + 3 dgt) 200mV |
| | ±(0.8% rdg + 5 dgt) 2V, 20V, 200V |
| | ±(1.0% rdg + 5 dgt) 1000V |
| **AC Voltage** | 200/750V [45~450Hz) |
| Accuracy | ± (2.0% rdg + 10 dgt) |
| **DC Current** | 200 µA/2mA/20mA/ 200mA/20A |
| Accuracy | ±(1.8% rdg + 2 dgt) 200µA, 2mA, 20mA |
| | ±(2.0% rdg + 2 dgt) 200mA |
| | ±(2.0% rdg + 10 dgt) 20A |
| **AC Current** | 20mA/200mA/20A (45~450Hz) |
| | ±(1.8% rdg + 2 dgt) 20mA |
| | ±(2.0% rdg + 2 dgt) 200mA |
| | ±(2.0% rdg + 10 dgt) 20A |
| **Resistance** | 200Ω/2kΩ/200kΩ/20MΩ 200MΩ |
| Accuracy | ±(1.2% rdg + 8 dgt) on all ranges, except |
| | ±(1%rdg+10dgt) on 200Ω |
| **Sp. Function** | Audible Continuity, Diode Test, hFE Test |
| **Power** | Two 1.5V "AAA" Battery |
| **Low Battery** | " ⊟+ " is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 160 x 76 x 32mm (approx.) |
| **Weight** | 155gms Including Battery (approx) |
| **Accessories** | One Pair of Test Leads, Battery [installed], Instruction Manual |

new

Preliminary Data

CE


603P+ TRMS




801 JUNIOR

TORCH LIGHT

HOLSTER WITH MAGNET

TEST LEAD GRIPPER


603 JUNIOR

**TRMS, 3½ Digit 2000 Counts, 17mm Large LCD with Backlight, Audiable Continuty, Diode & hFE Test, Live Test, Capacitance, Frequency, REL Δ, Data Hold, APO**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 200mV/2/20/200/1000V |
| Accuracy | ±(0.5%rdg+3dgt) |
| **AC Voltage** TRMS | 200 mV/2/20/200/1000V |
| Accuracy | ±(1%rdg+3dgt) |
| AC Response | 40Hz ~ 1kHz |
| **DC Current** | 2000uA/20/200mA/2/20A |
| Accuracy | ±(0.8%rdg+3dgt) on all ranges except ±(1.0%rdg+3dgt) on 2/20A |
| **AC Current** TRMS | 2000uA/20/200mA/2/20A |
| Accuracy | ±(1.0%rdg+3dgt) on all ranges except ±(1.2%rdg+3dgt) on 2/20A |
| AC Response | 40Hz ~ 1kHz |
| **Resistance** | 200Ω/2kΩ/20kΩ/200kΩ/ 2MΩ/20MΩ/200MΩ |
| Accuracy | ±(0.5%rdg+2dgt) on all ranges except ±(1%rdg+3dgt) on 200Ω ±(1.5%rdg+3dgt) on 20MΩ/200MΩ |
| **Capacitance** | 1.999/19.99/199.9nF/1.999/ 19.99/199.9µF |
| Accuracy | ±(3.5%rdg+5dgt) on all ranges except ±(5%rdg+20dgt) on 1.999nF |
| **Frequency** | 19.99/199.9Hz/1.999/19.99/ 199.9KHz |
| Accuracy | ±(2%rdg+2dgt) |
| **Measuring Catagory** | CAT II 1000V, CAT III 600V |
| **Sp. Function** | Audible Continuity, Diode Test, hFE Test |
| **Power** | Two 1.5V "AAA" Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 170 x 80 x 43mm (approx.) |
| **Weight** | 240gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Carrying Case, Battery (installed), Instruction Manual and Spare Fuse |

**TRMS, Auto Ranging, 3⅝ Digits 6000 Counts LCD with Backlight, Torchlight, APO, Capacitance, Frequency, Duty Cycle, NCV (LED, Buzzer & EF Strength), Temperature & Holster with Magnet**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 60 / 600mV / 6 / 60 / 600 / 1000V |
| Accuracy | ± (0.8% rdg + 5 dgt) |
| **AC Voltage** TRMS | 60 / 600mV / 6 / 60 / 600 / 750V (40Hz ~ 1KHz) |
| Accuracy | ± (1.0% rdg + 10 dgt) on 60 / 600mV ± (1.0% rdg + 4 dgt) on all other ranges |
| **DC Current** | 60 / 600mA / 6 / 10A |
| Accuracy | ± (1.2% rdg + 4 dgt) on 60 / 600mA ± (3.0% rdg+ 2 dgt) on 6A ±(5.0% rdg +10 dgt) on 10A |
| **AC Current** TRMS | 60 / 600mA / 6 / 10A |
| Accuracy | ± (1.5% rdg + 3 dgt) on 60 / 600mA ± (3.0% rdg + 5 dgt) on 6A ±(5.0% rdg +10 dgt) on 10A |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 600Ω to 60MΩ |
| Accuracy | ± (0.8% rdg + 5 dgt) |
| **Capacitance** | 60.00nF to 100.0mF |
| Accuracy | ± (3.0% rdg + 5 dgt) on all ranges except ± (5.0% rdg + 20 dgt) on 60nF ± (5.0% rdg + 5 dgt) on 60.00 / 100.0 mF |
| **Frequency** | 60.00Hz to 10.00MHz |
| **Sensitivity** | 200mV to 10V AC |
| Accuracy | ± (1.5% rdg + 5 dgt) |
| **Duty Cycle** | 1% ~ 99% |
| Accuracy | ± (1.5% rdg + 5 dgt) |
| **Temperature** | -20°C ~ 1000°C / -4°F ~ 1832°F |
| Accuracy | ± (1.0% rdg + 3 dgt) |
| **Measuring Category** | CAT II 600V |
| **SP Function** | Diode Test, Data Hold, Continuity Test & NCV Test |

**Manual Ranging, 3½ Digits 2000 Counts LCD with Backlight, Torchlight, APO, NCV (LED, Buzzer & EF Strength), HFE & Holster with Magnet**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 200mV / 2 / 20 / 200 / 1000V |
| Accuracy | ± (0.5% rdg + 5 dgt) |
| **AC Voltage** | 200 / 750V (40Hz ~ 400Hz) |
| Accuracy | ± (1.2% rdg + 10 dgt) |
| **DC Current** | 200mA / 10A |
| Accuracy | ± (1.0% rdg + 5 dgt) on 200mA ± (3.0% rdg+ 2 dgt) on 10A |
| **AC Current** | 200mA / 10A (40Hz ~ 400Hz) |
| Accuracy | ± (3.0% rdg + 2 dgt) |
| **Resistance** | 200Ω / 2 / 200KΩ / 2 / 20MΩ |
| Accuracy | ± (1.0% rdg + 3 dgt) |
| **Measuring Category** | CAT II 600V |
| **Sp. Function** | Diode Test, Data Hold, Continuity Test & NCV Test |
| **Power** | Three 1.5V 'AAA' Battery |
| **Low Battery** | '⊟' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 147 x 71 x 45mm (approx.) |
| **Weight** | 230gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Spare Fuse (0.2A/250V) x 2, Holster, Battery (installed) & Instruction Manual |

| | |
|---|---|
| **Power** | Three 1.5V 'AAA' Battery |
| **Low Battery** | '⊟' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 147 x 71 x 45mm (approx.) |
| **Weight** | 230gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Spare Fuse (0.6A/250V) x 2, Holster, Battery (installed), Instruction Manual & K Type Thermocouple (upto 260°C) |

new
Preliminary Data
CE


101P+ TRMS


108P+TRMS

**Pocket Size**

**TRMS, Auto Ranging, 3¾ Digits 4000 Counts LCD with Backlight, APO, Capacitance, REL Δ, Frequency**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 40 / 400mV / 4 / 40 / 400 / 1000V |
| Accuracy | ± (0.5% rdg + 3 dgt) |
| **AC Voltage**$^{TRMS}$ | 40 / 400mV / 4 / 40 / 400 / 750V |
| Accuracy | ± (1.0% rdg + 3 dgt) |
| AC Response | 10Hz ~ 1KHz |
| **DC Current** | 400 / 4000µA / 40 / 400mA / 4 / 10A |
| Accuracy | ± (0.8% rdg + 3 dgt) on 400 / 4000µA, 40 / 400mA<br>± (1.0% rdg + 3 dgt) on 4 / 10A |
| **AC Current**$^{TRMS}$ | 400 / 4000µA / 40 / 400mA / 4 / 10A |
| Accuracy | ± (1.0% rdg + 3 dgt) on 400 / 4000µA, 40 / 400mA<br>± (1.2% rdg + 3 dgt) on 4 / 10A |
| AC Response | 10Hz ~ 1KHz |
| **Resistance** | 400Ω / 4 / 40 / 400KΩ / 4 / 40MΩ |
| Accuracy | ± (0.5% rdg + 3 dgt) on all ranges except<br>± (1.0% rdg + 3 dgt) on 400Ω<br>± (1.5% rdg + 3 dgt) on 40MΩ |
| **Capacitance** | 4.000 / 40.00 / 400.0nF / 4.000 / 40.00 / 400.0µF / 4.000mF |
| Accuracy | ± (3.5% rdg + 4 dgt) on all ranges except<br>± (5.0% rdg + 5 dgt) on 4mF<br>± (5.0% rdg + 50 dgt) on 4.000nF, 40.00nF |
| **Frequency** | 4.000 / 40.00 / 400.0Hz / 4.000 / 40.00 / 400.0KHz / 4.000MHz |
| Sensitivity | 1V to 36V AC |
| Accuracy | ±(1.5% rdg + 3 dgt) |
| **Measuring Category** | CAT III 600V, CAT II 1000V |
| **SP Function** | Diode Test, Audible Continuity, Data Hold |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | '⊟+' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 142 x 68 x 36mm (approx.) |
| **Weight** | 173gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Battery (installed), Carrying Case & Instruction Manual |

**TRMS, Auto Ranging, 3⅝ Digits 6000 Counts LCD with Backlight, APO, Capacitance, Frequency, Duty Cycle, Temperature, NCV, LIVE Test, REL Δ**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 60 / 600mV / 6 / 60 / 600 / 1000V |
| Accuracy | ± (0.5% rdg + 3 dgt) |
| **AC Voltage**$^{TRMS}$ | 60 / 600mV / 6 / 60 / 600 / 1000V |
| Accuracy | ± (1.0% rdg + 3 dgt) |
| AC Response | 1Hz ~ 1KHz |
| **DC Current** | 600 / 6000µA / 60 / 600mA / 6 / 10A |
| Accuracy | ± (0.8% rdg+3 dgt) on all ranges except<br>± (1.0% rdg+3 dgt) on 6 / 10A |
| **AC Current**$^{TRMS}$ | 600 / 6000µA / 60 / 600mA / 6 / 10A |
| Accuracy | ± (1.0% rdg+3 dgt) on all ranges except<br>± (1.2% rdg+3 dgt) on 6 / 10A |
| AC Response | 1Hz ~ 1KHz |
| **Resistance** | 600Ω / 6 / 60 / 600KΩ / 6 / 60MΩ |
| Accuracy | ± (1.0% rdg + 3 dgt) on 600Ω<br>± (0.5% rdg + 2 dgt) on 6 / 60 / 600kΩ / 6MΩ<br>± (1.5% rdg + 3 dgt) on 60MΩ |
| **Capacitance** | 9.999 / 99.99 / 999.9nF / 9.999 / 99.99 / 999.9µF / 9.999mF |
| Accuracy | ± (3.5% rdg + 5 dgt) on all ranges except<br>± (5.0% rdg + 5 dgt) on 9.999mF<br>± (5.0% rdg + 20 dgt) on 9.999nF |
| **Frequency** | 99.99Hz ~ 10.00MHz |
| Accuracy | ±(0.08% rdg + 2 dgt) |
| **Duty Cycle** | 0.1% ~ 99.9% |
| Accuracy | ± (0.08% rdg + 2 dgt) |
| **Temperature** | -20°C ~ 1000°C / -4°F ~ 1832°F |
| Accuracy | ±(1.0% rdg + 5 dgt) on <400°C / <752°F<br>±(1.5% rdg + 15 dgt) on >400°C / >752°F |
| **Measuring Category** | CAT III 600V, CAT II 1000V |
| **SP Function** | NCV Test, LIVE Test, Diode Test, Audible Continuity, Data Hold |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | '⊟+' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 142 x 68 x 36mm (approx.) |
| **Weight** | 173gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Battery (installed), Carrying Case, Instruction Manual & K Type Thermocouple (upto 260°C) |


153B+TRMS


171B+TRMS

**TRMS, Auto Ranging, 3⅝ Digits 6000 Counts LCD with Backlight, APO, Capacitance, Frequency, Duty Cycle & Holster**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 60 / 600mV / 6 / 60 / 600 / 1000V |
| Accuracy | ± (1.0% rdg + 4 dgt) on 60 / 600mV<br>± (0.5% rdg + 2 dgt) on 6 / 60 / 600V<br>± (1.0% rdg + 3 dgt) on 1000V |
| **AC Voltage** TRMS | 60 / 600mV / 6 / 60 / 600 / 750V |
| Accuracy | ± (1.0% rdg + 5 dgt) on all ranges except<br>± (1.2% rdg + 5 dgt) on 60 / 600mV<br>± (1.5% rdg + 5 dgt) on 750V |
| AC Response | 40Hz ~ 1KHz |
| **DC Current** | 600 / 6000µA / 60 / 600mA / 6 / 20A |
| Accuracy | ± (1.0% rdg + 2 dgt) on 600 / 6000µA<br>± (1.2% rdg + 3 dgt) on 60 / 600mA<br>± (1.5% rdg+ 5 dgt) on 6 / 20A |
| **AC Current** TRMS | 600 / 6000µA / 60 / 600mA / 6 / 20A |
| Accuracy | ± (1.5% rdg + 5 dgt) on 600 / 6000µA<br>± (2.0% rdg + 5 dgt) on 60 / 600mA<br>± (2.5% rdg + 5 dgt) on 6 /20A |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 600Ω / 6 / 60 / 600KΩ / 6 / 60MΩ |
| Accuracy | ± (1.2% rdg + 2 dgt) on 600Ω & 6MΩ<br>± (1.0% rdg + 2 dgt) on 6 / 60 / 600kΩ<br>± (1.5% rdg + 2 dgt) on 60MΩ |
| **Capacitance** | 9.999 / 99.99 / 999.9nF / 9.999 / 99.99 / 999.9µF / 9.999mF |
| Accuracy | ± (2.0% rdg + 4 dgt) on all ranges except<br>± (3.0% rdg + 4 dgt) 9.999mF |

**TRMS, Auto / Manual, 3⅝ Digits 6000 Counts LCD with Backlight, APO, Capacitance, REL Δ, Max / Min, Frequency, Duty Cycle, Temperature & Holster**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 60 / 600mV / 6 / 60 / 600 / 1000V |
| Accuracy | ± (1.0% rdg + 4 dgt) on 60 / 600mV<br>± (0.5% rdg + 2 dgt) on 6 / 60 / 600V<br>± (1.0% rdg + 3 dgt) on 1000V |
| **AC Voltage** TRMS | 60 / 600mV / 6 / 60 / 600 / 750V |
| Accuracy | ± (1.0% rdg + 5 dgt) on all ranges except<br>± (1.2% rdg + 5 dgt) on 60 / 600mV<br>± (1.5% rdg + 5 dgt) on 750V |
| AC Response | 40Hz ~ 1KHz |
| **DC Current** | 600 / 6000µA / 60 / 600mA / 6 / 20A |
| Accuracy | ± (1.0% rdg + 2 dgt) on 600 / 6000µA<br>± (1.2% rdg + 3 dgt) on 60 / 600mA<br>± (1.5% rdg+ 5 dgt) on 6 / 20A |
| **AC Current** TRMS | 600 / 6000µA / 60 / 600mA / 6 / 20A |
| **Frequency** | 99.99Hz ~ 10.00MHz |
| Sensitivity | 1V ~ 36V AC |
| Accuracy | ±(0.05% rdg + 4 dgt) |
| **Duty Cycle** | 0.1% ~ 99.9% |
| Sensitivity | 1V ~ 36V AC |
| Accuracy | ± (0.05% rdg + 4 dgt) |
| **Measuring Category** | CAT III 1000V, CAT IV 600V |
| **SP Function** | Diode Test, Audible Continuity, Data Hold |
| **Power** | Two 1.5V 'AA' Battery |
| **Low Battery** | '🔋' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 180 x 90 x 52mm (approx.) |
| **Weight** | 370gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Holster, Battery (installed) & Instruction Manual |
| Accuracy | ± (1.5% rdg + 5 dgt) on 600 / 6000µA<br>± (2.0% rdg + 5 dgt) on 60 / 600mA<br>± (2.5% rdg + 5 dgt) on 6 / 20A |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 600Ω / 6 / 60 / 600KΩ / 6 / 60MΩ |
| Accuracy | ± (1.2% rdg + 2 dgt) on 600Ω & 6MΩ<br>± (1.0% rdg + 2 dgt) on 6 / 60 / 600kΩ<br>± (1.5% rdg + 2 dgt) on 60MΩ |
| **Capacitance** | 9.999 / 99.99 / 999.9nF / 9.999 / 99.99 / 999.9µF / 9.999mF |
| Accuracy | ± (2.0% rdg + 4 dgt) on all ranges except<br>± (3.0% rdg + 4 dgt) on 9.999mF |
| **Frequency** | 99.99Hz ~ 10.00MHz |
| Accuracy | ±(0.05% rdg + 4 dgt) |
| **Duty Cycle** | 0.1% ~ 99.9% |
| Accuracy | ± (0.05% rdg + 4 dgt) |
| **Temperature** | -40°C ~ 1000°C / -40°F ~ 1832°F |
| Accuracy | ± (3.0% rdg + 4 dgt) on -40°C ~ 0°C / -40°F ~32°F<br>± (1.0% rdg + 3 dgt) on 0°C ~ 400°C / 32°F ~ 750°F<br>± (2.0% rdg + 5dgt) on 400°C ~ 1000°C / 750°F ~ 1832°F |
| **Measuring Category** | CAT III 1000V, CAT IV 600V |
| **SP Function** | Diode Test, Audible Continuity, Data Hold |
| **Power** | Two 1.5V 'AA' Battery |
| **Low Battery** | '🔋' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 180 x 90 x 52mm (approx.) |
| **Weight** | 370gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Holster, Battery (installed), Instruction Manual & K Type Thermocouple (upto 260°C) |

new
Preliminary Data
CE

**450B+TRMS**

**45CF+**

1) Above 60.00 V DC

2) Above 36.00 V AC

**Red Backlight for High Voltage Alert**

**TRMS, Auto / Manual, 4½ Digit 20000 Count LCD with Backlight, APO, Capacitance, Frequency, Duty Cycle, DATA HOLD, MIN / MAX, Δ ZERO / REL, Diode Test, Audible Continuity & NCV**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 19.999 / 199.99mV / 1.9999 / 19.999 / 199.99 / 1000.0V |
| Accuracy | ±(0.5% rdg + 3 dgt) |
| **AC Voltage** TRMS | 19.999 / 199.99mV / 1.9999 / 19.999 / 199.99 / 750.0V |
| Accuracy | ± (1.0% rdg + 3 dgt) |
| AC Response | 40Hz ~ 1KHz |
| **DC Current** | 199.99 / 1999.9µA / 19.999 / 199.99mA / 1.9999 / 10.000A |
| Accuracny | ± (0.8% rdg + 3 dgt) on 199.99 / 1999.9µA<br>± (1.0% rdg + 3 dgt) on all other ranges |
| **AC Current** TRMS | 199.99 / 1999.9µA / 19.999 / 199.99mA / 1.9999 / 10.000A |
| Accuracy | ± (1.0% rdg + 3 dgt) on 199.99 / 1999.9µA<br>± (1.2% rdg + 3 dgt) on all other ranges |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 199.99Ω / 1.9999 / 19.999 / 199.99kΩ / 1.9999 / 19.999 / 199.99MΩ |
| Accuracy | ± (1.0% rdg + 3 dgt) on 199.99Ω<br>± (0.5% rdg + 3 dgt) on 1.9999 / 19.999 / 199.99kΩ<br>± (1.5% rdg + 3 dgt) on 1.9999 / 19.999MΩ<br>± (3% rdg + 5 dgt) on 199.99MΩ |
| **Capacitance** | 9.999 / 99.99 / 999.9nF / 9.999 / 99.99 / 999.9µF/ 9.999mF |
| Accuracy | ± (5.0% rdg + 20 dgt) on 9.999nF<br>± (2.0% rdg + 5 dgt) on 99.99 / 999.9nF / 9.999 / 99.99 / 999.9µF |
| | ± (5.0% rdg + 5 dgt) on 9.999mF |
| **Frequency** | 99.99 / 999.9Hz / 9.999 / 99.99 / 999.9KHz / 9.999MHz |
| Accuracy | ± (0.1% rdg + 2 dgt) |
| **Duty Cycle** | 1% ~ 99% |
| Accuracy | ± (0.1% rdg + 2 dgt) |
| **Sp. Function** | Diode Test, Audible Continuity, Data Hold |
| **Power** | Two 1.5V 'AA' Battery |
| **Low Battery** | '🪫' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 161 x 81 x 39 mm (approx.) |
| **Weight** | 230gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Battery (installed), Instruction Manual & Drawstring Pouch |

**TRMS, Manual Ranging, 4 Digits 9999 Counts Digital Dual Display LCD with Auto Backlight, APO, Resistance, Capacitance, hFE, LoZ, ⎓V, Frequency, Duty Cycle, Infrared Remote Control Check, Δ REL, Data Hold, Max/Min, Red & Green Light Indication for Input Terminal Selection, NCV, Torchlight & Bargraph**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 999.9mV / 9.999 / 99.99 / 999.9V |
| Accuracy | ± (0.5% rdg + 5 dgt) on all ranges except<br>± (0.8% rdg + 5 dgt) on 999.9V |
| **AC Voltage** TRMS | 999.9mV / 9.999 / 99.99 / 750.0V |
| Accuracy | ± (1.0% rdg + 4 dgt) on all ranges except<br>± (1.2% rdg + 4 dgt) on 750.0V |
| AC Response | 10Hz ~ 1KHz |
| **DC Current** | 999.9µA / 99.99 / 999.9mA / 9.999A |
| Accuracy | ± (1.2% rdg + 5 dgt) on all ranges except<br>± (2.0% rdg + 5 dgt) on 9.999A |
| **AC Current** TRMS | 99.99 / 999.9mA / 9.999A |
| Accuracy | ± (1.5% rdg + 5 dgt) on all ranges except<br>± (2.0% rdg + 5 dgt) on 9.999A |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 999.9Ω / 9.999 / 99.99 / 999.9KΩ / 9.999 / 99.99MΩ |
| Accuracy | ± (0.8% rdg + 5 dgt) on all ranges except<br>± (1.2% rdg + 5 dgt) on 99.99MΩ |
| **Capacitance** | 9.999 / 99.99 / 999.9nF / 9.999 / 99.99 / 999.9µF / 9.999 / 99.99mF |
| Accuracy | ± (4.0% rdg + 5 dgt) on all ranges except<br>± (5.0% rdg + 5 dgt) on 9.999 / 99.99mF |
| **Frequency** | 9.99Hz ~ 9.99MHz |
| Accuracy | ±(1.5% rdg + 5 dgt) |
| **Duty Cycle** | 0.1% ~ 99.9% |
| Accuracy | ± (1.5% rdg + 5 dgt) |
| **Temperature** | -55°C ~ 1000°C / -67°F ~ 1832°F |
| Accuracy | ± (1.0% rdg + 3 dgt) |
| **Loz** | 750V AC / 1000V DC |
| Accuracy | ± (2.0% rdg + 5 dgt) |
| **Measuring Category** | CAT II 1000V, CAT III 600V |
| **SP Function** | Diode Test, Audible Continuity |
| **Power** | Three 1.5V 'AAA' Battery |
| **Low Battery** | '🪫' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 187 x 95 x 55 mm (approx.) |
| **Weight** | 350gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Holster, Battery (installed), Instruction Manual, Carrying Case & K Type Thermocouple (upto 260°C) |


135P+


LCR99


1) Above 60.00V DC


2) Above 36.00V AC

**Red Backlight for High Voltage Alert**

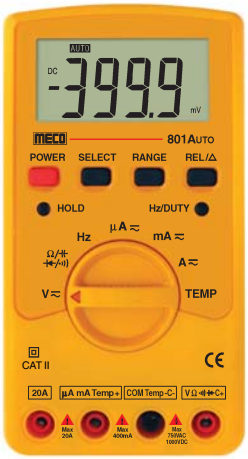
**TRMS, Auto / Manual, 4 Digits 9999 Counts Digital Dual Display LCD with Backlight, APO, Resistance, Capacitance, Frequency, Duty Cycle, ΔREL, Data Hold, Max/Min, Peak, Red & Green Light Indication for Input Terminal Selection, NCV, Torchlight & Bargraph**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 99.99 / 999.9mV / 9.999 / 99.99 / 999.9V |
| Accuracy | ± (0.5% rdg + 5 dgt) on all ranges except ± (0.8% rdg + 5 dgt) on 999.9V |
| **AC Voltage** (TRMS) | 99.99 / 999.9mV / 9.999 / 99.99 / 750.0V |
| Accuracy | ± (1.0% rdg + 4 dgt) on all ranges except ± (1.2% rdg + 4 dgt) on 750.0V |
| AC Response | 10Hz ~ 1KHz |
| **DC Current** | 999.9µA / 999.9mA / 9.999A |
| Accuracy | ± (1.2% rdg + 5 dgt) on 999.9µA, 999.9mA ± (2.0% rdg + 5 dgt) on 9.999A |
| **AC Current** (TRMS) | 999.9µA / 999.9mA / 9.999A |
| Accuracy | ± (1.5% rdg + 5 dgt) on 999.9µA, 999.9mA ± (2.0% rdg + 5 dgt) on 9.999A |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 999.9Ω / 9.999 / 99.99 / 999.9KΩ / 9.999 / 99.99MΩ |
| Accuracy | ± (0.8% rdg + 5 dgt) on all ranges except ± (1.2% rdg + 5 dgt) on 99.99MΩ |
| **Capacitance** | 9.999 / 99.99 / 999.9nF / 9.999 / 99.99 / 999.9µF / 9.999 / 99.99mF |
| Accuracy | ± (4.0% rdg + 5 dgt) on all ranges except ± (5.0% rdg + 5 dgt) on 9.999 / 99.99mF |
| **Frequency** | 9.99Hz ~ 9.99MHz |
| Accuracy | ±(1.5% rdg + 5 dgt) |
| **Duty Cycle** | 0.1% ~ 99.9% |
| Accuracy | ± (1.5% rdg + 5 dgt) |
| **Temperature** | -55°C ~ 1000°C / -67°F ~ 1832°F |
| Accuracy | ± (1.0% rdg + 3 dgt) |
| **Measuring Category** | CAT II 1000V, CAT III 600V |
| **SP Function** | Diode Test, Audible Continuity |
| **Power** | Three 1.5V 'AAA' Battery |
| **Low Battery** | '🪫' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 187 x 95 x 55 mm (approx.) |
| **Weight** | 350gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Holster, Battery (installed), Instruction Manual, Carrying Case & K Type Thermocouple (upto 260°C) |

**TRMS, Auto / Manual, 4 Digits 9999 Counts Digital Dual Display LCD with Auto Backlight, APO, Resistance, Capacitance, Inductance, Frequency, Duty Cycle, ΔREL, Data Hold, Max/Min, Peak, Red & Green Light Indication for Input Terminal Selection, NCV, Torchlight & Bargraph**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 99.99 / 999.9mV / 9.999 / 99.99 / 999.9V |
| Accuracy | ± (0.5% rdg + 5 dgt) on all ranges except ± (0.8% rdg + 5 dgt) on 999.9V |
| **AC Voltage** (TRMS) | 99.99 / 999.9mV / 9.999 / 99.99 / 750.0V |
| Accuracy | ± (1.0% rdg + 4 dgt) on all ranges except ± (1.2% rdg + 4 dgt) on 750.0V |
| AC Response | 10Hz ~ 1KHz |
| **DC Current** | 99.99 / 999.9mA / 9.999A |
| Accuracy | ± (1.2% rdg + 5 dgt) on 99.99 / 999.9mA ± (2.0% rdg + 5 dgt) on 9.999A |
| **AC Current** (TRMS) | 99.99 / 999.9mA / 9.999A |
| Accuracy | ± (1.5% rdg + 5 dgt) on 99.99 / 999.9mA ± (2.0% rdg + 5 dgt) on 9.999A |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 999.9Ω / 9.999 / 99.99 / 999.9KΩ / 9.999 / 99.99MΩ |
| Accuracy | ± (0.8% rdg + 5 dgt) on all ranges except ± (1.2% rdg + 5 dgt) on 99.99MΩ |
| **Capacitance** | 9.999 / 99.99 / 999.9nF / 9.999 / 99.99 / 999.9µF / 9.999 / 99.99mF |
| Accuracy | ± (4.0% rdg + 5 dgt) on all ranges except ± (5.0% rdg + 5 dgt) on 9.999 / 99.99mF |
| **Inductance** | 9.999mH ~ 99.99H |
| Accuracy | ±(4.0% rdg + 5 dgt) |
| **Frequency** | 9.99Hz ~ 9.99MHz |
| Accuracy | ±(1.5% rdg + 5 dgt) |
| **Duty Cycle** | 0.1% ~ 99.9% |
| Accuracy | ± (1.5% rdg + 5 dgt) |
| **Temperature** | -55°C ~ 1000°C / -67°F ~ 1832°F |
| Accuracy | ± (1.0% rdg + 3 dgt) |
| **Measuring Category** | CAT II 1000V, CAT III 600V |
| **SP Function** | Diode Test, Audible Continuity |
| **Power** | Three 1.5V 'AAA' Battery |
| **Low Battery** | '🪫' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 187 x 95 x 55 mm (approx.) |
| **Weight** | 350gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Holster, Battery (installed), Instruction Manual, Carrying Case & K Type Thermocouple (upto 260°C) |


**9A06**




**801AUTO**

**Auto / Manual, 3½ Digit, 2000 Counts LCD, APO & Temperature**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 200mV/2/20/200/1000V |
| Accuracy | ± (0.5%rdg + 4dgt) on 200mV & 2V, ± (0.7%rdg + 4dgt) on 20V & 200V, ± (1%rdg + 4dgt) on 1000V |
| **AC Voltage** | 200mV/2/20/200/750V (200mV Manual only) |
| Accuracy | ± (1.0%rdg + 8dgt) on all ranges except ± (1.5%rdg + 8dgt) on 750V |
| **DC Current** | 200/2000µA/20/200mA/2/10A |
| Accuracy | ± (1.5%rdg + 4dgt) |
| **AC Current** | 200/2000µA/20/200mA/2/10A |
| Accuracy | ± (2.2%rdg + 4dgt) |
| **Resistance** | 200Ω/2/20/200kΩ/2/20MΩ |
| Accuracy | ± (0.7°/ordg + 4dgt) on all ranges except ± (1.2%rdg + 4dgt) on 2MΩ ± (2.5%rdg + 4dgt) on 20MΩ |
| **Temperature** | -20°C-1300°C / -4°F-1999°F |
| Accuracy | ± (2%rdg + 4dgt) |
| **Measuring Category** | CAT II |
| **Sp. Function** | Diode Test, Audible Continuity, Data Hold |
| **Power** | Two 1.5V 'AA' Battery |
| **Low Battery** | "⊟" Indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 161 x 86 x 43 mm (approx.) |
| **Weight** | 250gms Including Battery (approx.) |
| **Accessories** | One Pair of Test Leads, Battery (installed), K Type Thermocouple (upto 260°C), Inst. Manual & Carrying Case |

**Auto / Manual, 3¾ Digit, 4000 Counts LCD, APO, Capacitance, Frequency, Duty Cycle & Temperature**

| | |
|---|---|
| **Ranges** | |
| **DC Voltage** | 400mV/4/40/400/1000V |
| Accuracy | ± (0.5% rdg + 4 dgt) on 400mV/4V ± (0.7% rdg + 4 dgt) on 40/ 400V ± (1.0% rdg + 4 dgt) on 1000V |
| **AC Voltage** | 4/40/400/750V |
| Accuracy | ± (1.0% rdg + 5 dgt) on all ranges except ± (1.5% rdg +8 dgt) on 750V |
| **DC Current** | 400/4000µA/40/400mA/4/20A |
| Accuracy | ± (1.5% rdg + 4 dgt) |
| **AC Current** | 400/4000µA/40/400mA/4/20A |
| Accuracy | ± (2.2% rdg + 4 dgt) |
| **Resistance** | 400Ω/4/40/400kΩ/4/40MΩ |
| Accuracy | ± (0.7% rdg + 4 dgt) on all ranges except ± (1.2% rdg + 4 dgt) on 4MΩ ± (2.5% rdg + 4 dgt) on 40MΩ |
| **Capacitance** | 40/400nF/4/40/100µF |
| Accuracy | ± (5.0% rdg + 10 dgt) |
| **Frequency** | 9.999Hz ~9.999MHz |
| Accuracy | ± (0.5% rdg + 2 dgt) |
| **Duty Cycle** | 0.1% ~ 99.9% |
| Accuracy | ± (0.5% rdg + 2 dgt) |
| **Temperature** | -20°C-1300°C |
| Accuracy | ± (2% rdg + 4 dgt) |
| **Measuring Category** | CAT II |
| **Sp. Function** | Diode Test, Audible Continuity, Data Hold |
| **Power** | Two 1.5V 'AA' Battery |
| **Low Battery** | "▮" is indicated |
| **Battery Life** | 200 hours typical |
| **Dimensions** | 161 x 86 x 43 mm (approx.) |
| **Weight** | 250gms Including Battery (approx.) |

| | |
|---|---|
| **Accessories** | One Pair of Test Leads, Battery (installed), K Type Thermocouple (upto 260°C), Inst. Manual & Carrying Case |

**Accessories**

K Type Bead Probe (upto 260°C)
**Model : TPK-B**

K Type Stick Probe (upto 500°C)
**Model : TP-02**

Pair of Test Leads suitable for DMM/DTT
**Model : TL-DMM/DTT**

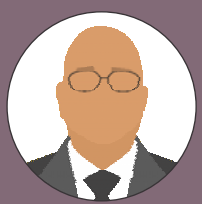
Pair of Test Leads suitable for Insulation Tester
**Model : TL-IT**

MECO®

SINCE 1962

## Digital Clampmeters / Tong Testers

- ✓ AC – Small
- ✓ AC / TRMS
- ✓ DC / AC - Small
- ✓ DC / AC / TRMS



+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable


27-AUTO BL


27T-AUTO BL


2502T-AUTO BL

**600A AC TRMS**
**Auto Ranging, 3½ Digit, 2000 Counts, Data Hold, Max, Backlight, Torchlight, NCV (LED, Buzzer & EF Strength), APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 2A, 20A, 200A, 600A (Auto Ranging) |
| Accuracy | ±(3%rdg+5dgt) on 2A<br>±(2%rdg+3dgt) on 20A<br>±(2%rdg+5dgt) on 200A & 600A |
| AC Response | 40Hz ~ 1KHz |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 200mV, 2V, 20V, 200V, 600V (Auto Ranging) |
| Accuracy | ±(0.8%rdg+3dgt) |
| **AC Voltage** TRMS | 2V, 20V, 200V, 600V (Auto Ranging) |
| Accuracy | ±(1.2%rdg+3dgt) |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 200Ω, 2kΩ, 20KΩ, 200kΩ, 2MΩ, 20MΩ (Auto Ranging) |
| Accuracy | ±(1.2%rdg+3dgt) |
| **Safety Standard** | CAT II 600V |
| **Audible Continuity** | 40Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊞" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 185 x 65 x 28 mm (approx.) |
| **Weight** | 170gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 25mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed) |

**600A AC TRMS**
**Auto Ranging, 3½ Digit, 2000 Counts, Temperature, Data Hold, Max, Backlight, Torchlight, NCV (LED, Buzzer & EF Strength), APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 2A, 20A, 200A, 600A (Auto Ranging) |
| Accuracy | ±(3%rdg+5dgt) on 2A<br>±(2%rdg+3dgt) on 20A<br>±(2%rdg+5dgt) on 200A & 600A |
| AC Response | 40Hz ~ 1KHz |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 200mV, 2V, 20V, 200V, 600V (Auto Ranging) |
| Accuracy | ±(0.8%rdg+3dgt) |
| **AC Voltage** TRMS | 2V, 20V, 200V, 600V (Auto Ranging) |
| Accuracy | ±(1.2%rdg+3dgt) |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 200Ω, 2kΩ, 20KΩ, 200kΩ, 2MΩ, 20MΩ (Auto Ranging) |
| Accuracy | ±(1.2%rdg+3dgt) |
| **Temperature** | -20°C to 750°C / -4°F to 1382°F |
| Accuracy | ±(3%rdg+5dgt) |
| **Safety Standard** | CAT II 600V |
| **Audible Continuity** | 40Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | " ⊞ " is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 185 x 65 x 28 mm (approx.) |
| **Weight** | 170gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia .25mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed), K Type Thermocouple (upto 260°C) |

**1000A AC TRMS**
**Auto / Manual, 3½ Digit, 2000 Counts, APO Temperature, Data Hold, Max, Backlight, Torchlight, NCV (LED, Buzzer & EF Strength)**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 2A, 20A, 200A, 1000A |
| Accuracy | ±(3%rdg+5dgt) on 2A & 20A<br>±(2%rdg+5dgt) on 200A & 1000A |
| AC Response | 40Hz ~ 1KHz |
| Overload | 1000A AC max. for 1 min. |
| **DC Voltage** | 200mV, 2V, 20V, 200V, 1000V |
| Accuracy | ±(0.8%rdg+3dgt) |
| **AC Voltage** TRMS | 2V, 20V, 200V, 750V |
| Accuracy | ±(1.2%rdg+3dgt) |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 200Ω, 2kΩ, 20KΩ, 200kΩ, 2MΩ, 20MΩ |
| Accuracy | ±(1.2%rdg+3dgt) |
| **Temperature** | -20°C to 750°C/ -4°F to 1382°F |
| Accuracy | ±(3%rdg+5dgt) |
| **Safety Standard** | CAT III 600V |
| **Audible Continuity** | 30Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AA' Battery |
| **Low Battery** | " ⊞ " is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 245 x 95 x 35 mm (approx.) |
| **Weight** | 309gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 52mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed), K Type Thermocouple (upto 260°C) |


72-AUTO BL


72T-AUTO BL


2520THz-AUTO BL

**600A AC TRMS**
**Auto Ranging, 3¾ Digit, 4000 Counts, Data Hold, Rel.Test, Backlight, Torchlight, NCV (LED, Buzzer & EF Strength), APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 40A, 400A, 600A (Auto Ranging) |
| Accuracy | ±(2.5%rdg+5dgt) |
| AC Response | 40Hz ~ 1KHz |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 400mV, 4V, 40V, 400V, 600V (Auto Ranging) |
| Accuracy | ±(0.8%rdg+3dgt) |
| **AC Voltage** TRMS | 4V, 40V, 400V, 600V (Auto Ranging) |
| Accuracy | ±(1.2%rdg+3dgt) |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 400Ω, 4kΩ, 40KΩ, 400kΩ, 4MΩ, 40MΩ (Auto Ranging) |
| Accuracy | ±(1.2%rdg+3dgt) |
| **Frequency** | 4Hz ~ 1MHz (Auto Ranging) |
| Accuracy | ±(0.5%rdg+2dgt) |
| **Safety Standard** | CAT II 600V |
| **Audible Continuity** | 40Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 185 x 65 x 28 mm (approx.) |
| **Weight** | 170gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 25mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed) |

**600A AC TRMS**
**Auto Ranging, 3¾ Digit, 4000 Counts, Temperature, Capacitance, Data Hold, Rel.Test, Backlight, Torchlight, NCV (LED, Buzzer & EF Strength), APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 40A, 400A, 600A (Auto Ranging) |
| Accuracy | ±(2.5%rdg+5dgt) |
| AC Response | 40Hz ~1KHz |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 400mV, 4V, 40V, 400V, 600V (Auto Ranging) |
| Accuracy | ±(0.8%rdg+3dgt) |
| **AC Voltage** TRMS | 4V, 40V, 400V, 600V (Auto Ranging) |
| Accuracy | ±(1.2%rdg+3dgt) |
| AC Response | 40Hz ~1KHz |
| **Resistance** | 400Ω, 4kΩ, 40KΩ, 400kΩ, 4MΩ, 40MΩ (Auto Ranging) |
| Accuracy | ±(1.2%rdg+3dgt) |
| **Capacitance** | 5nF, 50nF, 500nF, 5µF, 50µF, 200µF |
| Accuracy | ±(3%rdg+2dgt) |
| **Frequency** | 4Hz ~ 1MHz (Auto Ranging) |
| Accuracy | ±(0.5%rdg+2dgt) |
| **Temperature** | -20°C to 750°C / -4°F to 1382°F |
| Accuracy | ±(3%rdg+5dgt) |
| **Safety Standard** | CAT II 600V |
| **Audible Continuity** | 40Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 185 x 65 x 28 mm (approx.) |
| **Weight** | 170gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 25mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed), K Type Thermocouple (upto 260°C) |

**1000A AC TRMS**
**Auto / Manual, 3⅝ Digit, 6000 Counts, Temperature, Capcitance, Data Hold, Backlight, Hz/ Duty, Torchlight, NCV (LED, Buzzer & EF Strength), APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 60A, 600A, 1000A |
| Accuracy | ±(2.5%rdg+5dgt) |
| AC Response | 40Hz ~ 1KHz |
| Overload | 1000A AC max. for 1 min. |
| **DC Voltage** | 600mV, 6V, 60V, 600V, 1000V |
| Accuracy | ±(0.8%rdg+3dgt) |
| **AC Voltage** TRMS | 6V, 60V, 600V, 750V |
| Accuracy | ±(1.2%rdg+3dgt) |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 600Ω, 6kΩ, 60KΩ, 600kΩ, 6MΩ, 60MΩ |
| Accuracy | ±(1.2%rdg+3dgt) |
| **Capacitance** | 6nF, 60nF, 600nF, 6µF, 60µF, 600µF (Auto Ranging) |
| Accuracy | ±(3%rdg+7dgt) >6µF ±(5%rdg+5dgt) >100µF Not Applicable |
| **Frequency** | 10Hz ~ 10MHz (Auto Ranging) |
| Accuracy | ±(0.5%rdg+2dgt) |
| **Duty Cycle** | 0.1% ~ 99.9% |
| Accuracy | ±(0.5%rdg+2dgt) |
| **Temperature** | -20°C to 750°C / -4°F to 1382°F |
| Accuracy | ±(3%rdg+5dgt) |
| **Safety Standard** | CAT III 600V |
| **Audible Continuity** | 30Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AA' Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 245 x 95 x 35 mm (approx.) |
| **Weight** | 309gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 52mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed), K Type Thermocouple (upto 260°C) |

DT 2727+

54+

90+

**400A AC TRMS**
**3½ Digit, 1999 Counts, NCV (Buzzer & EF Strength), Data Hold, Backlight & APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 400A |
| Accuracy | ± (2.5%rdg+ 10dgt) (50 ~ 60Hz) |
| Overload | 400A AC max. for 1 min. |
| **DC Voltage** | 600V |
| Accuracy | ± (1.0%rdg+ 5dgt) |
| **AC Voltage** TRMS | 600V |
| Accuracy | ± (1.2%rdg+ 8dgt) (50 ~ 60Hz) |
| **Resistance** | 2MΩ |
| Accuracy | ± (1.5%rdg + 3dgt) |
| **Sp. Function** | Audible Continuity, Diode Test |
| **Power** | Two 1.5V "AAA" Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 175 x 60 x 34 mm (approx.) |
| **Weight** | 150gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 23mm (max.) |
| **Accessories** | One Pair of Test Leads, Carrying Case, Battery (installed) Instruction Manual |

**Pair of Test Leads Suitable for DMM / DTT (Optional)**

**Model : TL-DMM / DTT (N)**
Category : CAT III
Max. Voltage : 1000V
Max. Current : 10A (Upto 1 min.)
Length : 1000mm (approx.)

**600A AC TRMS**
**Auto Ranging, 3¾ Digit, 4000 Counts, Capacitance, Data Hold, Backlight, Torchlight, NCV (LED, Buzzer & EF Strength), APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 4A, 40A, 400A, 600A (Auto Ranging) |
| Accuracy | ±(2.0%rdg+5dgt) on all ranges except ±(3.0%rdg+5dgt) on 4A |
| AC Response | 40Hz ~ 2KHz |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 400mV, 4V, 40V, 400V, 600V (Auto Ranging) |
| Accuracy | ±(0.8%rdg+5dgt) |
| **AC Voltage** TRMS | 4V, 40V, 400V, 600V (Auto Ranging) |
| Accuracy | ±(1.2%rdg+5dgt) |
| AC Response | 40Hz ~ 2KHz |
| **Resistance** | 400Ω, 4kΩ, 40KΩ, 400kΩ, 4MΩ, 40MΩ (Auto Ranging) |
| Accuracy | ±(1.2%rdg+5dgt) |
| **Capacitance** | 4nF, 40nF, 400nF, 4µF, 40µF, 400µF, 4mF (Auto) |
| Accuracy | ±(3%rdg+5dgt) |
| **Safety Standard** | CAT II 600V |
| **Audible Continuity** | 50Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 190 x 71 x 30 mm (approx.) |
| **Weight** | 190gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 30mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed) |

**600A AC TRMS**
**Auto Ranging, 3¾ Digit, 4000 Counts, Temperature, Capcitance, Data Hold, Backlight, Torchlight, NCV (LED, Buzzer & EF Strength), APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 4A, 40A, 400A, 600A (Auto Ranging) |
| Accuracy | ±(2.0%rdg+5dgt) on all ranges except ±(3.0%rdg+5dgt) on 4A |
| AC Response | 40Hz ~ 2KHz |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 400mV, 4V, 40V, 400V, 600V (Auto Ranging) |
| Accuracy | ±(0.8%rdg+5dgt) |
| **AC Voltage** TRMS | 4V, 40V, 400V, 600V (Auto Ranging) |
| Accuracy | ±(1.2%rdg+5dgt) |
| AC Response | 40Hz ~ 2KHz |
| **Resistance** | 400Ω, 4kΩ, 40KΩ, 400kΩ, 4MΩ, 40MΩ (Auto Ranging) |
| Accuracy | ±(1.2%rdg+5dgt) |
| **Capacitance** | 4nF, 40nF, 400nF, 4µF, 40µF, 400µF, 4mF |
| Accuracy | ±(3%rdg+5dgt) Note : 4nF for Reference only |
| **Frequency** | 4Hz ~ 4KHz (Auto Ranging) |
| Accuracy | ±(0.5%rdg+5dgt) |
| **Temperature** | -20°C to 1000°C / -4°F to 1832°F |
| Accuracy | ±(3%rdg+5dgt) |
| **Safety** | CAT II 600V |
| **Audible Cont.** | 50Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 190 x 71 x 30 mm (approx.) |
| **Weight** | 190gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 30mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed) K Type Thermocouple (upto 260°C) |

new
Preliminary Data
CE


2250 Jr


2250-Hz AUTO


1008-TRMS

**1000A AC TRMS**
**Manual Ranging, 3½ Digit, 1999 Counts, Data Hold, Torchlight, Backlight, NCV (LCD, Buzzer & EF Strength), Live Test, APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 20A, 200A, 1000A |
| Accuracy | ±(2.0%rdg+5dgt) on 20A/200A<br>±(2.5%rdg+8dgt) on 1000A |
| AC Response | 45Hz ~ 450Hz |
| Overload | 1000A AC max. for 1 min. |
| **DC Voltage** | 1000V |
| Accuracy | ±(1.5%rdg+8dgt) |
| **AC Voltage** TRMS | 1000V<br>±(1.5%rdg+8dgt) |
| AC Response | 45Hz ~ 450Hz |
| **Resistance** | 200Ω, 2kΩ |
| Accuracy | ±(1.0%rdg+5dgt) |
| Over Volt Protection | 250V DC or AC RMS |
| **Audible Cont.** | 50Ω (approx.) |
| Over Volt Protection | 250V DC or AC RMS |
| **Diode Test** | 1.0 ± 0.6mA (approx.) |
| Over Volt Protection | 250V DC or AC RMS |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "▭" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 241 x 89 x 43 mm (approx.) |
| **Weight** | 281gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 38mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed) |

**1000A AC TRMS**
**Auto Ranging, 3¾ Digit, 4200 Counts, Data Hold, Frequency, Duty Cycle, APO**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 4A, 40A, 400A, 1000A |
| Accuracy | ±(3%rdg+4dgt) on 4A/40A<br>±(2%rdg+4dgt) on 400A, 1000A |
| AC Response | 40Hz ~ 1KHz |
| Overload | 1000A AC max. for 1 min. |
| **DC Voltage** | 4V, 40V, 400V, 1000V (Auto) |
| Accuracy | ±(0.5%rdg+4dgt) on 4V<br>±(0.7%rdg+4dgt) on 40V & 400V<br>±(1 %rdg+4dgt) on 1000V |
| **AC Voltage** TRMS | 4V, 40V, 400V, 750V (Auto) |
| Accuracy | ±(1.0%rdg+8dgt) on all ranges except ±(1.5%rdg+8dgt) on 750V |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 400Ω ~ 40MΩ (Auto) |
| Accuracy | ±(0.7%rdg+4dgt) on all ranges except ±(1.2%rdg+4dgt) on 4MΩ<br>±(2.5%rdg+4dgt) on 40MΩ |
| Protection | 600V DC or AC RMS |
| **Frequency** | 9.999Hz to 9.999MHz (Auto) |
| **% Duty Cycle** | 1% to 90% (Auto) |
| Accuracy | ±(0.5%rdg+2dgt) |
| Protection | 600V DC or AC RMS |
| **Continuity** | 40Ω (approx.) |
| Protection | 600V DC or AC RMS |
| **Diode Test** | 1.0 ± 0.6mA (approx.) |
| Protection | 600V DC or AC RMS |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "▭" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 250 x 98 x 35 mm (approx.) |
| **Weight** | 375gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 55mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed) |

**1000A AC TRMS**
**Auto / Manual, 3⅝ Digit, 6000 Counts LCD with Backlight, APO, Capacitance, Frequency, Duty Cycle & Temperature**

| | |
|---|---|
| **Ranges** | |
| **AC Current** TRMS | 600/6000µA / 600 / 1000A |
| Accuracy | ± (2.0% rdg + 30dgt) |
| AC Response | 40 Hz ~ 1000Hz |
| Overload | 1000A AC Max. for 1min. (A) |
| **DC Voltage** | 600mV/6/60/600/1000V |
| Accuracy | ± (0.5%rdg + 3dgt) |
| **AC Voltage** TRMS | 600mV/6/60/600/750V |
| Accuracy | ± (1.0% rdg + 5dgt) |
| AC Response | 40Hz ~ 1000Hz |
| **DC Current** | 600/6000µA |
| Accuracny | ± (0.8% rdg + 10dgt) |
| **Resistance** | 600Ω/6/60/600kΩ/6/60MΩ |
| Accuracy | ± (0.8% rdg + 5dgt) on 600Ω<br>± (0.8% rdg + 3dgt) on 6/60/600kΩ/6MΩ<br>± (1.0% rdg + 25dgt) (60MΩ) |
| **Capacitance** | 9.999/99.99/999.9nF/9.999/99.99/999.9µF/9.999mF |
| Accuracy | ± (3.5% rdg + 60dgt) on all ranges except ± (5.0% rdg + 10dgt) on 999.9µF& 9.999mF |
| **Frequency** | 99.99Hz ~10.00MHz |
| **& Duty Cycle** | 0.1% ~ 99.9% |
| Accuracy | ± (0.01% rdg + 3dgt) |
| **Temperature** | -20°C ~ 1000°C / 0°F ~ 1832°F |
| **HVAC Flame Sensors** | 600.0µA / 6000µA |
| Accuracy | ± (1% rdg + 20 dgt) |
| **Safety** | CAT IV 600V |
| **Sp. Function** | Diode Test, Audible Continuity, Data Hold |
| **Power** | Two 1.5V 'AA' Battery |
| **Low Battery** | "▭" is indicated |
| **Battery Life** | 200 hours typical |
| **Dimension** | 238 x 90 x 48mm (approx.) |
| **Weight** | 351gms Including Battery |
| **Jaw Opening** | 30mm |
| **Accessories** | One Pair of Test Leads, Battery (installed), K Type Thermocouple (upto 260°C), Instruction Manual & Carrying Case |

18 SMART

DTT 266

3150+

| 400A AC<br>**Auto Ranging, 3½ Digit, 2000 Counts, Data Hold for Resistance & Continuity** | |
|---|---|
| **Ranges** | |
| **AC Current** | 2A, 20A, 200A, 400A (Auto Ranging) |
| Accuracy | ±(2.5%rdg+10dgt) on 2A & 20A<br>±(2.0%rdg+5dgt) on 200A & 400A<br>(Measures above 700mA AC) |
| AC Response | 40 - 200Hz |
| Overload | 400A AC max. for 1 min. |
| **DC Voltage** | 2V, 20V, 200V, 600V (Auto) |
| Accuracy | ±(0.5%rdg+2dgt) on all ranges except<br>±(1.0%rdg+5dgt) on 600V<br>(Measures above 1V DC) |
| **AC Voltage** | 2V, 20V, 200V, 600V (Auto) |
| Accuracy | ±(1.2%rdg+3dgt) on all ranges except<br>±(1.2%rdg+8dgt) on 600V<br>(Measures above 1V AC) |
| AC Response | 40 - 400Hz |
| **Resistance** | 200Ω, 2kΩ, 20KΩ 200kΩ, 2MΩ, 20MΩ (Auto) |
| Accuracy | ±(1.5%rdg+3dgt) |
| **Measuring Catagory** | CAT III 600V |
| **Audible Continuity** | 30Ω Approx |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 175 x 65 x 28 mm (approx.) |
| **Weight** | 130gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 25mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (Installed) |

| 1000A AC<br>**Manual Ranging, 3½ Digit, 2000 Counts, Data Hold** | |
|---|---|
| **Ranges** | |
| **AC Current** | 200A, 1000A |
| Accuracy | ±(2.5% + 13dgt) on 200A<br>±(2.5% + 8dgt) upto 800A<br>Above 800A the reading are only for reference |
| Overload | 1200A AC max. for 1 min. |
| AC Response | 50 ~ 60Hz |
| **DC Voltage** | 1000V |
| Accuracy | ±(1%rdg+5dgt) |
| **AC Voltage** | 750V |
| Accuracy | ±(1.2%rdg+5dgt) |
| AC Response | 45 ~ 450Hz |
| **Resistance** | 200Ω, 20KΩ |
| Accuracy | ±(1.0%rdg+10dgt) on 200Ω<br>±(1.0%rdg+4dgt) on 20KΩ |
| Over Volt Protection | 250V DC / 220V AC RMS |
| **Audible Cont.** | 30Ω ± 20Ω (approx.) |
| Over Volt Protection | 250V DC / 220V AC RMS |
| **Insulation Test** | 20MΩ, 2000MΩ (With Optional Unit) |
| Accuracy | ±(2% of rdg + 2 dgt) on 20MΩ<br>±(4% of rdg + 2 dgt) upto 500MΩ<br>± (5% of rdg + 2 dgt) above 500MΩ |
| **Power** | 9V Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 230 x 68 x 37mm (approx.) |
| **Weight** | 240gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 53mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, 9V Battery (installed) x 1, 500V Insulation Tester Unit x 1 (optional) |

| 1000A AC<br>**Manual Ranging, 3½ Digit, 2000 Counts, Data Hold, APO** | |
|---|---|
| **Ranges** | |
| **AC Current** | 200A, 1000A |
| Accuracy | ±(3%rdg+4dgt) on 200A<br>±(2%rdg+4dgt) on 1000A |
| Overload | 1000A AC max. for 1 min. |
| AC Response | 40 ~ 500Hz |
| **DC Voltage** | 200V, 1000V |
| Accuracy | ±(0.8%rdg+4dgt) on 200V<br>±(1%rdg+4dgt) on 1000V |
| **AC Voltage** | 200V, 1000V |
| Accuracy | ±(1.0%rdg+8dgt) on 200V<br>±(1.5%rdg+8dgt) on 1000V |
| AC Response | 40 ~ 500Hz |
| **Resistance** | 200kΩ, 20MΩ |
| Accuracy | ±(1.2%rdg+4dgt) on 200KΩ<br>±(2.5%rdg+4dgt) on 20MΩ |
| Over Volt Protection | 250V DC or AC RMS |
| **Audible Cont.** | 40Ω (approx.) |
| Over Volt Protection | 250V DC or AC RMS |
| **Diode Test** | 1.0 ± 0.6mA (approx.) |
| Over Volt Protection | 250V DC or AC RMS |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 247 x 90 x 40 mm (approx.) |
| **Weight** | 380gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 43mm (max.)<br>Bus Bar 16mm x 65mm |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, 1.5V Battery (installed) |


**3690 AUTO**


**3690P+ AUTO**

1) Above 80.0V DC & AC


2) NCV

**Orange Backlight for High Voltage Alert**

**600A DC / AC**
**Auto / Manual, 3¾ Digit, 4000 Counts, Frequency, Data Hold, Audible Continuity, Diode Test, Δ Zero Button (for DCA)**

| Ranges | |
|---|---|
| **DC Current** | 400A, 600A |
| Accuracy | ±(1.5%rdg + 5dgt) for 400A<br>±(2%rdg + 5dgt) for 600A |
| Overload | 600A DC max. for 1 min. |
| **AC Current** | 400A, 600A |
| Accuracy | ±(1.75%rdg + 5dgt) |
| AC Response | (50-60Hz) |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 400mV, 4V, 40V, 400V, 600V |
| Accuracy | ±(0.5%rdg + 8dgt)<br>(400mV to 400V)<br>±(0.7%rdg + 2dgt) for 600V |
| **AC Voltage** | 4V, 40V, 400V, 600V |
| Accuracy | ±(1.2%rdg + 4dgt)<br>±(4%rdg + 5dgt) for 600V |
| AC Response | (50-60Hz) |
| **Resistance** | 400Ω ~ 40MΩ |
| Accuracy | ±(0.75%rdg + 8dgt)<br>400Ω to 400kΩ<br>±(1%rdg + 6dgt) 4MΩ<br>±(2%rdg + 4dgt) 40MΩ |
| Overload | 600V DC / AC RMS |
| **Over Range** | "OL" or "-OL" is indicated |
| **Frequency** | 100Hz, 1KHz, 10KHz, 100KHz, 500KHz |
| Accuracy | ±(0.3%rdg + 2dgt) |
| **Duty Cycle** | 1% to 90 % |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊟" is Indicated |
| **Battery Life** | 150 hours (typical) |
| **Dimension** | 220 x 85 x 46 mm (approx.) |
| **Weight** | 280gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 30mm max. |
| **Accessories** | One Pair of Test Leads, Battery (installed), Instr. Manual & Carrying Case |

**600A DC /AC TRMS**
**Auto Ranging, 3⅝ Digit, 6000 Counts, Capacitance, Data Hold, Back Light (White & Orange), Torch Light, Hz / Duty, NCV (Buzzer & EF Strength), APO**

| Ranges | |
|---|---|
| **DC Current** | 60A/ 600A |
| Accuracy | ±(2.5%rdg + 10dgt) |
| Overload | 600A DC max. for 1 min. |
| **AC Current**$^{TRMS}$ | 60A / 600A |
| Accuracy | ±(2.5%rdg + 10dgt) |
| AC Response | 40Hz ~ 400Hz |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 6V, 60V, 600V (Auto) |
| Accuracy | ±(0.8%rdg + 3dgt) |
| **AC Voltage**$^{TRMS}$ | 6V, 60V, 600V (Auto) |
| Accuracy | ±(1.0%rdg + 8dgt) |
| AC Response | 40Hz ~ 400Hz |
| **Resistance** | 600Ω, 6kΩ, 60KΩ, 600kΩ, 6MΩ, 60MΩ (Auto) |
| Accuracy | ±(1.5%rdg + 5dgt) |
| **Capacitance** | 6nF, 60nF, 600nF, 6µF, 60µF, 600µF, 6mF, 60mF (Auto) |
| Accuracy | ±(5%rdg + 8dgt)<br>Note : 6nF for Reference only |
| **Frequency** | 9.999Hz ~ 9.999MHz (Auto) |
| Accuracy | ±(1.0%rdg + 3dgt) |
| **Duty Cycle** | 0.1% - 99.9% |
| Accuracy | ±(1.0%rdg + 3dgt) |
| **Safety Standard** | CAT III 600V |
| **Audible Continuity** | 50Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊟" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 203 x 71 x 33 mm (approx.) |
| **Weight** | 193gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 35mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed) |

**Accessories**

K Type Bead Probe (upto 260°C)
**Model : TPK-B**

K Type Stick Probe (upto 500°C)
**Model : TP-02**

Pair of Test Leads suitable for DMM/DTT
**Model : TL-DMM/DTT**

Pair of Test Leads suitable for Insulation Tester
**Model : TL-IT**


**36-AUTO BL**


**99+**

**600A DC /AC TRMS**
**Auto Ranging, 3¾ Digit, 6000 Counts, Temperature, Capacitance, Data Hold, Back Light, Torch Light, Hz / Duty, NCV (LED, Buzzer & EF Strength), APO**

| Ranges | |
|---|---|
| **DC Current** | 60A/ 600A |
| Accuracy | ±(3%rdg+3dgt) |
| Overload | 600A DC max. for 1 min. |
| **AC Current** TRMS | 60A / 600A |
| Accuracy | ±(2.5%rdg+8dgt) on 60A<br>±(2.5%rdg+5dgt) on 600A |
| AC Response | 40Hz ~ 1KHz |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 600mV, 6V, 60V, 600V (Auto) |
| Accuracy | ±(0.8%rdg+3dgt) |
| **AC Voltage** TRMS | 6V, 60V, 600V (Auto) |
| Accuracy | ±(1.2%rdg+3dgt) |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 600Ω, 6kΩ, 60KΩ, 600kΩ, 6MΩ, 60MΩ (Auto) |
| Accuracy | ±(1%rdg+3dgt) |
| **Capacitance** | 60nF, 600nF, 6µF, 60µF, 600µF, 6mF, 60mF (Auto) |
| Accuracy | ±(4%rdg+3dgt) |
| **Frequency** | 60Hz, 600Hz, 6KHz, 60KHz, 600KHz, 1MHz (Auto) |
| Accuracy | ±(0.5%rdg+2dgt) |
| **Duty Cycle** | 0.1% - 99.9% |
| Accuracy | ±(0.5%rdg+2dgt) |
| **Temperature** | -20°C to 750°C /<br>-4°F to1382°F |
| Accuracy | ±(3%rdg+5dgt) |
| **Safety Standard** | CAT II 600V |
| **Audible Continuity** | 30Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AAA' Battery |
| **Battery Life** | 200 Hours Typical |
| **Low Battery** | "⊟+" is indicated |
| **Dimension** | 185 x 65 x 28 mm (approx.) |
| **Weight** | 170 gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 25mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed), K Type Thermocouple (upto 260°C) |

**600A DC /AC TRMS**
**Auto Ranging, 3¾ Digit, 6000 Counts, Temperature, Capacitance, Data Hold, Back Light, Torch Light, Hz / Duty, NCV (LED, Buzzer & EF Strength), LoZ (DCV/ACV), VFC, APO**

| Ranges | |
|---|---|
| **DC Current** | 60A/ 600A |
| Accuracy | ±(3%rdg+3dgt) |
| Overload | 600A DC max. for 1 min. |
| **AC Current** TRMS | 60A / 600A |
| Accuracy | ±(2.5%rdg+3dgt) |
| AC Response | 40Hz ~ 1KHz |
| Overload | 600A AC max. for 1 min. |
| **DC Voltage** | 600mV, 6V, 60V, 600V (Auto) |
| Accuracy | ±(0.5%rdg+5dgt) on all ranges except<br>±(0.8%rdg+5dgt) on 600V |
| **AC Voltage** TRMS | 6V, 60V, 600V (Auto) |
| Accuracy | ±(1.0%rdg+4dgt) on 6V, 60V<br>±(1.2%rdg+10dgt) on 600V |
| AC Response | 40Hz ~ 1KHz |
| **Resistance** | 600Ω, 6kΩ, 60KΩ, 600kΩ, 6MΩ, 60MΩ (Auto) |
| Accuracy | ±(0.8%rdg+5dgt) on all ranges except<br>±(1.2%rdg+5dgt) on 60MΩ |
| **Capacitance** | 6nF, 60nF, 600nF, 6µF, 60µF, 600µF, 6mF, 60mF, 100mF (Auto) |
| Accuracy | ±(4%rdg+5dgt)<br>on all ranges except<br>±(5%rdg+5dgt) on 100mF<br>Note : 6nF for Reference only |
| **Frequency** | 60Hz, 600Hz, 6KHz, 60KHz, 100KHz (Auto) |
| Accuracy | ±(1.5%rdg+5dgt) |
| **Duty Cycle** | 0.1% - 99.9% |
| Accuracy | Reference only |
| **Temperature** | -20°C to 1000°C /<br>-4°F to1832°F |
| Accuracy | ±(1.0%rdg+3dgt) |
| **Safety Standard** | CAT II 600V |
| **Audible Continuity** | 50Ω (approx.) |
| **Diode Test** | 1.0 ±0.6mA (approx.) |
| **Power** | Two 1.5V 'AAA' Battery |
| **Low Battery** | "⊟+" is indicated |
| **Battery Life** | 200 Hours Typical |
| **Dimension** | 190 x 71 x 30 mm (approx.) |
| **Weight** | 180gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia. 30mm (max.) |
| **Accessories** | One Pair of Test Leads, Instruction Manual, Carrying Case, Battery (installed), K Type Thermocouple (upto260°C) |

**Accessories**

K Type Bead Probe (upto 260°C)
**Model : TPK-B**

K Type Stick Probe (upto 500°C)
**Model : TP-02**

Pair of Test Leads suitable for DMM/DTT
Model :
**TL-DMM/DTT**

Pair of Test Leads suitable for Insulation Tester
**Model : TL-IT**

3600BL+

1080-TRMS

**1200A DC / 1000A AC TRMS**
**3¾ Digit, 4200 Counts LCD with Backlight, Auto Ranging, Frequency, Duty Cycle, MAX / MIN, Δ REL, DATA HOLD, APO**

| | |
|---|---|
| **Ranges** | |
| **DC Current** | 400A, 1200A |
| Accuracy | ±(3.0%rdg+8dgts) |
| Overload | 1200A DC/AC RMS max. 1 min. |
| **AC Current** TRMS | 400A, 1000A |
| Accuracy | ±(3.0%rdg + 8dgt) 50~60Hz<br>±(3.5%rdg + 8dgt) 40Hz~1KHz |
| Overload | 1200A DC/AC RMS max. 1 min. |
| **DC Voltage** | 400mV, 4V, 40V, 400V, 1000V (Auto) |
| Accuracy | ±(0.8%rdg + 5dgts) |
| **AC Voltages** TRMS | 4V, 40V, 400V, 750V (Auto) |
| Accuracy | ±(1.5%rdg + 5dgt) 50~60Hz<br>±(2.0%rdg + 8dgt) 40Hz~1KHz |
| **Resistance** | 400Ω, 4kΩ, 40kΩ, 400kΩ, 4MΩ, 40MΩ (Auto) |
| Accuracy | ±(1.5%rdg + 5dgt) on 400V<br>±(1.5%rdg + 3dgt) on 4kΩ~400kΩ<br>±(2.0%rdg + 5dgt) on 4MΩ, 40MΩ |
| **Capacitance** | 4nF, 40nF, 400nF, 4µF, 40µF (Auto) |
| Accuracy | ±(3%rdg + 10dgt) on all ranges except<br>±(4%rdg + 40dgt) on 4nF<br>±(4%rdg + 10dgt) on 40nF<br>Note : on 4nF (Use Δ REL) |
| Frequency | 9.999, 99.99, 999.9Hz, 9.999, 99.99, 999.9KHz, 9.999MHz (Auto) |
| Accuracy | ±(0.5%rdg + 4dgts) |
| **Duty Cycle** | 10~90% |
| Accuracy | ±(0.5%rdg + 4dgts) |
| **Temperature** | -20°C ~ 750°C / -4°F ~ 1400°F |
| Accuracy | +(1.0%rdg + 5dgts) on -20°C ~ 400°C / -4°F ~ 650°F<br>+(1.5%rdg + 5dgts) on 401°C ~ 750°C / 651°F ~ 1400°F |

**1200A DC/AC TRMS**
**Auto / Manual, 3⅝ Digit, 6000 Counts LCD with Backlight, APO, Capacitance, Frequency, Duty Cycle & Temperature**

| | |
|---|---|
| **Ranges** | |
| **DC Current** | 600 / 6000µA / 60 / 600 / 1200A |
| Accuracy | ± (1.2% rdg + 10dgt) on 600 / 6000µA<br>± (2.0% rdg + 30dgt) on 60 / 600 / 1200A |
| Overload | 1200A DC Max. for 1min. for A |
| **AC Current** TRMS | 600 / 6000µA / 60 / 600 / 1200A |
| Accuracy | ± (2.0% rdg + 30dgt) |
| AC Response | 40 Hz~1000Hz |
| Overload | 1200A AC Max. for 1min. for A |
| **DC Voltage** | 600mV / 6 / 60 / 600 / 1000V |
| Accuracy | ± (0.5%rdg + 3dgt) |
| **AC Voltage** TRMS | 6 / 60 / 600 / 750V |
| Accuracy | ± (1.0% rdg + 5dgt) |
| AC Response | 40Hz~1000Hz |
| **Resistance** | 600Ω / 6 / 60 / 600kΩ / 6 / 60MΩ |
| Accuracy | ± (0.8% rdg + 5dgt) on 600Ω<br>± (0.8% rdg + 3dgt) on 6 / 60 / 600kΩ / 6MΩ<br>± (1.0% rdg + 25dgt) on 60MΩ |
| **Capacitance** | 9.999 / 99.99 / 999.9nF / 9.999 / 99.99 / 999.9µF / 9.999mF |
| Accuracy | ± (3.5% rdg + 60dgt) on all ranges except<br>± (5.0% rdg + 10dgt) on 9.999mF |
| **Frequency** | 9.999Hz~10.00MHz |
| Accuracy | ± (0.01% rdg + 3dgt) |
| **Duty Cycle** | 0.1%~99.9% |
| Accuracy | ± (0.01% rdg + 3dgt) |
| **Temperature** | -20°C~1000°C / 0°F~1832°F |
| Accuracy | ± (1% rdg + 5dgt) on - 20°C~400°C<br>± (1.5% rdg + 15dgt) on 400°C~1000°C<br>± (0.75% rdg + 5 dgt) on 0°F~750°F<br>± (1.5% rdg + 15 dgt) on 750°F~1832°F |
| **HVAC Flame Sensors** | 600.0µA / 6000µA |
| Accuracy | ± (1% rdg + 20 dgt) |
| **Measuring Catagory** | CAT IV 600V |
| **Sp. Function** | Diode Test, Audible Continuity, Data Hold |
| **Power** | One 9V Battery |
| **Low Battery** | '⊟' is indicated |
| **Battery Life** | 200 hours typical |
| **Dimension** | 238 x 90 x 48mm (approx.) |
| **Weight** | 320gms Including Battery (approx.) |
| **Jaw Opening** | 30mm |
| **Accessories** | One Pair of Test Leads, Battery (installed), K Type Thermocouple (upto 260°C), Instruction Manual & Carrying Case |

| | |
|---|---|
| **Sp. Function** | Audible Continuity, Diode Test |
| **Protection** | 600VDC or AC RMS overload protection in Capacitance, Diode, Ohms, Hz, Duty Cycle, Continuity, Temperature |
| **Power** | Two 1.5V "AAA" Battery |
| **Low Battery** | '⊟' is indicated. |
| **Battery Life** | 150 hours (typical) |
| **Dimensions** | 250 x 100 x 46 mm (approx.) |
| **Weight** | 386gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia 55mm max. |
| **Accessories** | One Pair of Test Leads, Carrying Case, Battery (installed), K Type Thermocouple (upto 260°C) & Inst. Manual |

2003A+

4455

**2000A DC / 2000A AC TRMS**
**3⅝ Digit, 6000 Counts, 60 Segment Bargraph, Auto / Manual, Δ ZERO, Hz / Duty, RPM, MIN-MAX, Data Hold, Audible Continuity, APO**

| | |
|---|---|
| **Ranges** | |
| **DC Current** | 600A, 2000A |
| Accuracy | ±(2.5%rdg + 5dgt) |
| Overload | 2000A DC max. for 1 min. |
| **AC Current** TRMS | 600A, 2000A |
| Accuracy | ±(3.5%rdg + 5dgt) |
| Overload | 2000A AC max. for 1 min. |
| **DC Voltage** | 600mV, 6V, 60V, 600V (Auto & Manual) |
| Accuracy | ±(0.5%rdg + 5dgt) |
| Overload | 600V DC / AC RMS |
| **AC Voltage** TRMS | 6V, 60V, 600V (Auto & Manual) |
| Accuracy | ±(1%rdg + 6dgt) (50 ~ 60Hz)<br>±(2%rdg + 4dgt) (40 ~ 500Hz) |
| Overload | 600V DC / AC RMS |
| **Resistance** | 600Ω, 6kΩ, 60kΩ, 600kΩ, 6MΩ, 60MΩ, (Auto & Manual) |
| Accuracy | ±(0.3%rdg + 8dgt) 600Ω<br>±(0.3%rdg + 5dgt) 6~600kΩ<br>±(0.5%rdg + 5dgt) 6MΩ<br>±(2%rdg + 5dgt) 60MΩ |
| Overload | 600V DC/AC RMS |
| **Capacitance** | 40nF, 400nF, 4µF, 40µF (Auto) |
| Accuracy | ±(3%rdg + 40dgt) on 40nF (Use Δ ZERO)<br>±(3%rdg + 10dgt) on 400nF to 4µF<br>±(6%rdg + 10dgts) on 40µF |
| Overload | 600V DC / AC rms. |
| **Frequency** | 9.999Hz ~ 999.9KHz (Auto) |
| Accuracy | ±(0.1 %rdg + 2dgt) (for non distorted waveforms only) |

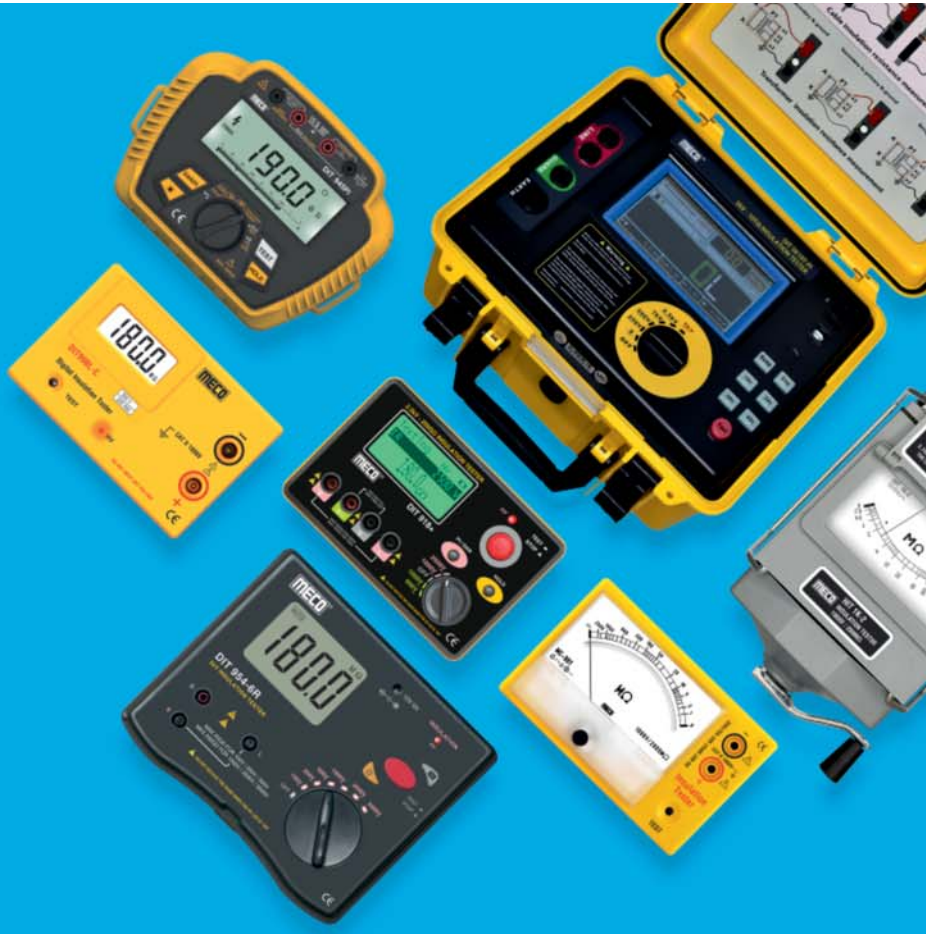
**2000A DC / 2000A AC (TRMS)**
**3½ Digit, 1999 Counts, Auto & Manual Ranging, Inrush Current, Backlight, Torch light, DATA HOLD, APO**

| | |
|---|---|
| **Ranges** | |
| **DC Current** | 20A, 200A, 2000A (Auto & Manual Ranging) |
| Accuracy | ±(1.90%rdg+10dgts) |
| Overload | 2000 A DC/AC RMS max. for 1 min. |
| **AC Current** TRMS | 20A, 200A, 2000A (Auto & Manual Ranging) |
| Accuracy | ±(1.90%rdg + 10dgt) |
| AC Response | AC Conversion Type : TRUE RMS responding, Calibrated readings consistent with sinusoidal waveform RMS. Frequency Range : 50 ~ 60Hz |
| Overload | 2000A DC/AC RMS max. for 1 min. |
| **DC Voltage** | 2V, 20V, 200V, 2000V (Auto & Manual Ranging) |
| Accuracy | ±(0.50%rdg + 5dgts) on all rages except ±(2.00% rdg + 5dgts) on 2000V |
| **AC Voltages** TRMS | 2V, 20V, 200V, 2000V (Auto & Manual Ranging) |
| Accuracy | ±(0.80% rdg + 10 dgts) 2V<br>±(0.80% rdg + 5 dgts) 20V, 200V<br>±(2.0% rdg + 5 dgts) 2000V |
| AC Response | Frequency : 10Hz ~ 1KHz (200V : 10Hz to 400Hz), Display : TRUE RMS (Sinusoidal waveform RMS Calibration) |
| **Resistance** | 200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 20MΩ (Auto & Manual Ranging) |
| Accuracy | ±(1.00%rdg + 5dgt) on 200Ω<br>±(0.80%rdg + 5dgt) on 2kΩ~2MΩ<br>±(1.50%rdg + 5dgt) on 20MΩ |
| **Capacitance** | 20nF, 200nF, 2µF, 20µF, 200µF, 2000µF (Auto Ranging) |
| Accuracy | ±(3%rdg + 10dgt) on all ranges except ±(5%rdg + 10dgt) on 2000µF |
| **Special Function** | Audible Continuity, Diode Test function |
| **Protection** | 220VDC or AC RMS overload protection in Capacitance, Diode, Ohms, Continuity |
| **Power** | One 9V Battery |
| **Low Battery** | "⊟" is indicated. |
| **Battery Life** | 150 hours (typical) |
| **Dimensions** | 270 x 100 x 46 mm (approx.) |
| **Weight** | 460gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia 55mm max. |
| **Accessories** | One Pair of Test Leads, Carrying Case, Battery (installed) & Inst. Manual |

| | |
|---|---|
| **% Duty Cycle** | 1% to 90% |
| Accuracy | ±(0.5%rdg + 5dgt) |
| **RPM** | 9.999K RPM, 99.99K RPM (Auto) |
| Accuracy | ±0.5%rdg of fullscale |
| **Sp. function** | Audible Continuity, Diode Test |
| **Over Range** | "OL" or "-OL" is indicated |
| **Power** | One 9V Battery |
| **Low Battery** | "⊟" is Indicated |
| **Battery Life** | 150 hours (typical) |
| **Dimensions** | 250 x 100 x 46 mm (approx.) |
| **Weight** | 410 gms Including Battery (approx.) |
| **Jaw Opening** | Cable Dia 55mm max. |
| **Accessories** | One Pair of Test Leads, Battery (installed), Instruction Manual & Carrying Case |

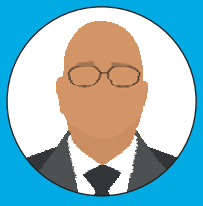
MECO®

SINCE 1962




## Insulation Testers

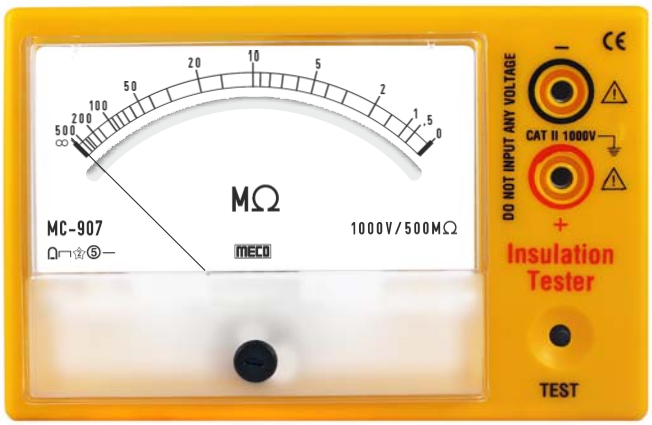
- ✓ Analog Insulation Testers (Hand Cranking Type)
- ✓ Analog Insulation Testers (Electronic Type)
- ✓ Digital Insulation Testers



+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable

TYPE TEST Confirming to BIS 10656-83




**MC-900 Series / MC-900BA Series**

**Carrying Case**

**Test Leads**

**Batteries**

**Adaptor (MC-900BA Series) (Optional)**

## Features

- Single Person Push Button Operation
- High Accuracy ± 5% of Indicated Value in Effective Range
- Scale Length : 80mm (approx.)
- Terminal Voltage : The terminal voltage shall be with in ± 25% of rated voltage corresponding to the rated resistance & not less than 75% of rated voltage for the central scale mark
- ABS Yellow Case with Polycarbonate Transparent Meter Front Cover
- Meets Requirement of IEC 61010, Installation Category II, 1000VPhase Earth
- Designed to Generally Confirm to IS 10656-1983
- 7 Models with various Voltage & MOhm Ranges
- Battery Adaptor (Optional) for MC-900BA Series

## Applications

Ideal for Insulation Resistance Measurement of

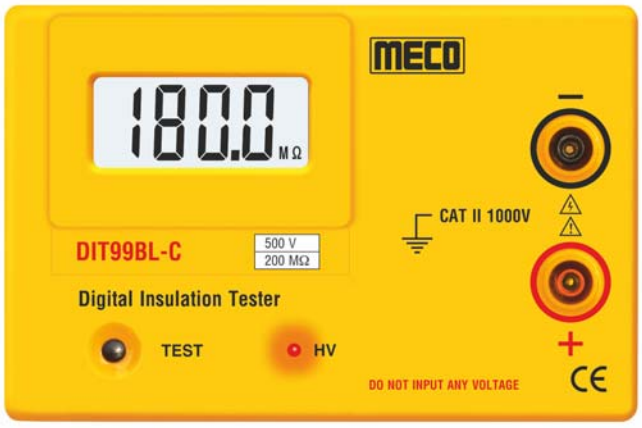
- Electrical Equipment (Motors, Transformers, Machines, etc.)
- Cables for Communication Networks
- Industrial, Commercial & Residential Installations
- Electrical Cables for Distribution Networks
- House Hold Appliances (Washing Machines, Mixer, Toaster, etc.)

| Model | Range | Test Voltage DC |
|---|---|---|
| **MC-901 / MC-901BA** | 0 - 20 M Ohms | 100 V |
| **MC-903 / MC-903BA** | 0 - 100 M Ohms | 500 V |
| **MC-904 / MC-904BA** | 0 - 500 M Ohms | 500 V |
| **MC-941 / MC-941BA** | 0 - 1000 M Ohms | 500 V |
| **MC-906 / MC-906BA** | 0 - 200 M Ohms | 1000 V |
| **MC-907 / MC-907BA** | 0 - 500 M Ohms | 1000 V |
| **MC-981 / MC-981BA** | 0 - 2000 M Ohms | 1000 V |

## Specifications

| | |
|---|---|
| **Accuracy** | ± 5% of Indicated Value at 27°C ± 5°C |
| **Operating Temperature** | 0° to 50°C |
| **Storage Temperature** | -10°C to 60°C |
| **Relative Humidity** | 80% Maximum |
| **Low Battery** | When Battery Voltage Drops below Operating Voltage, Pointer cannot reach zero after shorting the Output Terminals. |
| **Dielectric Strength** | 3.5 KV @ 50Hz for 1 min. between Input Terminals & Case |
| **Insulation Resistance** | More than 50M Ohm at 500V between Circuit & Case |
| **Power** | 9V (6 x 1.5V AA) Battery |
| **Dimensions** | 145 (L) x 95 (H) x 73 (W) mm (approx.) |
| **Weight** | Less than 440 gms Including Battery (approx.) |
| **Accessories** | Test and Calibration Certificate, Pair of Crocodile / Alligator Test Leads (Red & Black) x 1, Carrying Case x 1, 1.5V AA Batteries x 6 (Fitted - In), Battery Adaptor (Optional) for MC-900BA Series [AC/DC Adaptor Input 100 - 240V, 50 / 60Hz, 0.3A, Output : 9V⎓500mA] |
| **Ordering Information** | Model, Battery Adaptor (optional) |

TYPE TEST Confirming to BIS 10656-83




**DIT99BL Series / DIT99BL-BA Series**

**Carrying Case**

**Test Leads**

**Batteries**

**Adaptor (DIT99BL-BA Series) (Optional)**

## Features

- 3½ Digit 15mm Digit Height LCD Display with Backlight
- High Voltage LED Indication
- High Accuracy ± (3% rdg + 2 dgt)
- 5 Models with various Voltage & MOhm Ranges
- Single Person Push Button Operation
- Designed to Generally Confirm to IS 10656 -1983
- Meets Requirement of IEC 61010, Installation Category II, 1000V Phase - Earth
- Terminal Voltage : The terminal voltage shall be with in ± 25% of rated voltage corresponding to the rated resistance & not less than 75% of rated voltage for the central scale mark
- Carrying Case
- Battery Adaptor (Optional) for DIT99BL-BA Series

## Applications

Ideal for Insulation Resistance Measurement of

- Electrical Equipment (Motors, Transformers, Machines, etc.)
- Electrical Cables for Distribution Networks
- Cables for Communication Networks
- House Hold Appliances (Washing Machines, Mixer, Toaster, etc.)
- Industrial, Commercial & Residential Installations

| Model | Range | Test Voltage DC | Resolution |
|---|---|---|---|
| DIT99BL-A / DIT99BL-A (BA) | 0 - 20 M Ohms | 100 V | 0.01 M Ohms |
| DIT99BL-B / DIT99BL-B (BA) | 0 - 200 M Ohms | 250 V | 0.1 M Ohms |
| DIT99BL-C / DIT99BL-C (BA) | 0 - 200 M Ohms | 500 V | 0.1 M Ohms |
| DIT99BL-D / DIT99BL-D (BA) | 0 - 200 M Ohms | 1000 V | 0.1 M Ohms |
| DIT99BL-E / DIT99BL-E (BA) | 0 - 2000 M Ohms | 1000 V | 1 M Ohms |

## Specifications

| | |
|---|---|
| **Display** | 3½ Digit LCD Display with Backlight, 15mm Digit Height, 1999 Count (Max.) |
| **H.V. Warning** | Red LED Indicator for High Voltage Warning |
| **Accuracy** | ± (3% rdg + 2 dgt) at 27°C ± 5°C |
| **Conversion Rate** | 2.5 sec |
| **Over-Range Indication** | "1" is Displayed |
| **Operating Temperature** | 0° to 50°C |
| **Storage Temperature** | -20°C to 60°C |
| **Relative Humidity** | 80% Maximum |
| **Low Battery** | ' ⊟ ' is Displayed when Battery Voltage drops below Operating Voltage |
| **Dielectric Strength** | 3.5 KV @ 50Hz for 1 min. between Input Terminals & Case |
| **Insulation Resistance** | More than 50MOhm at 500V between Circuit & Case |
| **Power** | 1.5V 'AA' x 6 Batteries |
| **Dimensions** | 145 (L) x 93 (H) x 58 (W) mm (approx.) |
| **Weight** | 370gms Including Battery (approx.) |
| **Accessories** | Test and Calibration Certificate, Pair of Crocodile / Alligator Test Leads (Red & Black) x 1, Carrying Case x 1, 1.5V AA Batteries (Fitted - In) x 6, Instruction Manual x 1, Battery Adaptor (Optional) for DIT99BL-BA Series [AC/DC Adaptor Input : 100 - 240V, 50 / 60Hz, 0.3A, Output : 9V⎓500mA] |
| **Ordering Information** | Model, Battery Adaptor (optional) |

new
Preliminary Data

Test Leads

Carrying Case


HIT Series

## Features

- Single Person Hand Driven
- High Accuracy ± 1% FS
- Scale Length : 65mm (approx.)
- Steady and Accurate Readings
- Steady Output Voltage
- "Guard" Terminal to Prevent Errors Due to Surface Leakage
- Measurement from 10% to 100% of the Insulation Resistance Range
- Rugged Plastic / Metal Case to Prevent the Ingress of Moisture
- 6 Models with Various Voltage & MOhm Ranges

## Applications

Ideal for Insulation Resistance Measurement of

- Electrical / Electronic Equipment (Motors, Transformers, Generators, Panels, Machines etc.)
- Cables for Communication / Telecom Networks
- Industrial, Commercial & Residential Installations
- Electrical Cables for Distribution Networks
- House Hold Appliances (Washing Machines, Mixer, Toaster etc.)

| Model | Range | Test Voltage |
|---|---|---|
| HIT 5 - 1 | 0 ~ 100MΩ | 500V |
| HIT 5 - 2 | 0 ~ 200MΩ | 500V |
| HIT 1K - 2 | 0 ~ 200MΩ | 1000V |
| HIT 1K - 5 | 0 ~ 500MΩ | 1000V |
| HIT 2K5 - 50 | 0 ~ 5000MΩ | 2500V |
| HIT 5K - 50 | 0 ~ 5000MΩ | 5000V |

## Specifications

| | |
|---|---|
| **Accuracy** | ± 1% FS |
| **Operating Temperature** | 0° to 50°C |
| **Storage Temperature** | -10°C to 60°C |
| **Relative Humidity** | 80% Maximum |
| **Insulation Resistance** | More than 20M Ohm at 500V Between Circuit & Case |
| **Cranking Speed** | 120rpm (approx.) |
| **Inclination Variation** | ± 1% FS at 10°C Inclination |
| **Temperature Variation** | ± 0.8% FS for every ± 10°C Change of Ambient Temperature |
| **External Magnetic** | ± 2.5% FS to Magnetic |
| **Field Influence** | Field Defect of 5 A/M (Ampere Per Meter) |
| **Dimensions & Weight** | 225 x 130 x 140 mm (approx.), 550gms (approx.) HIT 2K5-50 & HIT 5K-50 |
| | 210 x 120 x 150 mm (approx.), 950gms (approx.) for other models |
| **Accessories** | Test and Calibration Certificate, Pair of Crocodile / Alligator Test Leads (Red & Black) x 1, Carrying Case x 1, Instruction Manual |

# 1kV - 20GΩ Digital Insulation Tester with P.I., D.A.R., Low Ohms & AC Voltage Functions

new

Preliminary Data

CE


DIT 936PI

**Product Kit**

Insulation Resistance Measurement Test Leads

Alligator Clip

Connector Cable for 12V DC

Batteries

Carrying Bag

## Introduction

MECO DIT 936PI is a 1KV Digital Insulation Tester with 4 Digit (2000 Counts) Large Screen LCD Display. It measures Insulation Resistance upto 20GΩ, Low Resistance upto 60Ω and AC Voltage upto 600VAC. It has Special functions to Measure P.I. (Polarization Index) and D.A.R. (Dielectric Absorption Ratio). It is ideally suited for testing of Insulation Resistance and Voltage of Transformers, Switches, High Voltage Systems, Generator, Cables, Appliances, Motors, Power Capacitors etc.

## Features

- 4 Digit (2000 Counts) Large LCD Display with Backlight
- High Accuracy for Insulation Resistance, AC Voltage & Low Resistance Measurement
- Range Selection & Single Person Push Button Operation
- P.I. & D.A.R. Functions
- Measurement of Voltage upto 600V AC
- Low Resistance upto 60Ω
- Auto Range (Insulation Test)
- APO & Data Hold Functions
- ϟ Sign for HV (High Voltage)
- Battery / 12V DC Operated
- As per Safety Standard IEC/EN 61010-1
- Catagory CAT II 1000V, CAT III 600V
- Over Range Alarm
- Shock, Dust & Moisture Resistant Casing
- Heavy Duty Rubber Holster

## Electrical Specifications

Accuracy : ±(% reading + digits) at 23°C±5°C; RH≤75%

| Specification | Test Voltage | Range | Resolution | Test Current | Accuracy |
|---|---|---|---|---|---|
| **Insulation Test** | 100V (±10%) | 0~20MΩ | 0.01MΩ | 2mA (Maximum) | ±(3% + 5) |
| | | 20~200MΩ | 0.1MΩ | | |
| | 250V (±10%) | 0~20MΩ | 0.01MΩ | | |
| | | 20~200MΩ | 0.1MΩ | | |
| | 500V (±10%) | 0~20MΩ | 0.01MΩ | | |
| | | 20~200MΩ | 0.1MΩ | | |
| | | 0.2G~2GΩ | 0.001GΩ | | |
| | 1000V (±10%) | 0~20MΩ | 0.01MΩ | | |
| | | 20~200MΩ | 0.1MΩ | | |
| | | 0.2G~2GΩ | 0.001GΩ | | ±(5% + 5) |
| | | 2G~20GΩ | 0.01GΩ | | ±(10% + 5) |
| **AC Voltage** (40 ~ 60Hz) | - | 600V | 1V | - | ±(1.5% + 5) |
| **Resistance** | - | 60Ω | 0.01Ω | - | ±(1.2% + 5) |

## General Specifications

| | | | |
|---|---|---|---|
| **Display** | 4 Digit (2000 Counts) Large Screen LCD Display | **Dimensions** | 179 x 133 x 70mm (approx.) |
| **High Voltage Indication** | ✓ | **Weight** | 650gms including batteries (approx.) |
| **Data Hold** | ✓ | **Standard Accessories** | Test and Calibration Certificate, Insulation Resistance Measurement Test Leads x 1 Set, Pair of Alligator Clips, 1.5V AA Batteries x 8 pcs, Connector Cable for 12V DC x 1pc, Carrying Bag x 1 pc, Instruction Manual x 1 pc |
| **Low Battery Indication** | ✓ | | |
| **D.A.R. Function** | ✓ | | |
| **P.I. Function** | ✓ | | |
| **Operating Temperature** | 0°C to 40°C (RH ≤ 80%) | | |
| **Storage Temperature** | -10°C to 50°C (RH ≤ 85%) | | |
| **Power** | 12V (Eight 1.5V "AA" Battery) | | |

# 2.5kV - 200GΩ Digital Insulation Tester with P.I., D.A.R., Low Ohms & AC Voltage Functions



**DIT 945PI**

Connector Cable for 12V DC

**Product Kit**

Insulation Resistance Measurement Test Leads

Alligator Clip

Batteries

Carrying Bag

## Introduction

MECO DIT 945PI is a 2.5KV Digital Insulation Tester with 4 Digit (2000 Counts) Large Screen LCD Display. It measures Insulation Resistance upto 200GΩ, Low Resistance upto 60Ω and AC Voltage upto 600VAC. It has Special functions to Measure P.I. (Polarization Index) and D.A.R. (Dielectric Absorption Ratio). It is ideally suited for testing of Insulation Resistance and Voltage of Transformers, Switches, High Voltage Systems, Generator, Cables, Appliances, Motors, Power Capacitors etc.

## Features

- 4 Digit (2000 Counts) Large LCD Display with Backlight
- High Accuracy for Insulation Resistance, AC Voltage & Low Resistance Measurement
- Range Selection & Single Person Push Button Operation
- P.I. & D.A.R. Functions
- Measurement of Voltage upto 600V AC
- Low Resistance upto 60Ω
- Auto Range (Insulation Test)
- APO & Data Hold Functions
- ⚡ Sign for HV (High Voltage)
- Battery / 12V DC Operated
- As per Safety Standard IEC/EN 61010-1
- Catagory CAT II 1000V, CAT III 600V
- Over Range Alarm
- Shock, Dust & Moisture Resistant Casing
- Heavy Duty Rubber Holster

## Electrical Specifications

Accuracy : ±(% reading + digits) at 23°C±5°C; RH≤75%

| Specification | Test Voltage | Range | Resolution | Test Current | Accuracy |
|---|---|---|---|---|---|
| **Insulation Test** | 250V (±10%) | 0~20MΩ | 0.01MΩ | 2mA (Maximum) | ±(3% + 5) |
| | | 20~200MΩ | 0.1MΩ | | |
| | 500V (±10%) | 0~20MΩ | 0.01MΩ | | |
| | | 20~200MΩ | 0.1MΩ | | |
| | | 0.2G~2GΩ | 0.001GΩ | | |
| | 1000V (±10%) | 0~20MΩ | 0.01MΩ | | |
| | | 20~200MΩ | 0.1MΩ | | |
| | | 0.2G~2GΩ | 0.001GΩ | | ±(5% + 5) |
| | | 2G~20GΩ | 0.01GΩ | | ±(10% + 5) |
| | 2500V (±10%) | 0~20MΩ | 0.01MΩ | | ±(3% + 5) |
| | | 20~200MΩ | 0.1MΩ | | |
| | | 0.2G~2GΩ | 0.001GΩ | | ±(5% + 5) |
| | | 2G~20GΩ | 0.01GΩ | | ±(10% + 5) |
| | | 20G~200GΩ | 0.1GΩ | | |
| **AC Voltage** (40 ~ 60Hz) | - | 600V | 1V | - | ±(1.5% + 5) |
| **Resistance** | - | 60Ω | 0.01Ω | - | ±(1.2% + 5) |

## General Specifications

| | | | |
|---|---|---|---|
| **Display** | 4 Digit (2000 Counts) Large Screen LCD Display | **Dimensions** | 179 x 133 x 70mm (approx.) |
| **High Voltage Indication** | ✓ | **Weight** | 676gms including batteries (approx.) |
| **Data Hold** | ✓ | **Standard Accessories** | Test and Calibration Certificate, Insulation Resistance Measurement Test Leads x 1 Set, Pair of Alligator Clips, 1.5V AA Batteries x 8 pcs, Connector Cable for 12V DC x 1pc, Carrying Bag x 1 pc, Instruction Manual x 1 pc |
| **Low Battery Indication** | ✓ | | |
| **D.A.R. Function** | ✓ | | |
| **P.I. Function** | ✓ | | |
| **Operating Temperature** | 0°C to 40°C (RH ≤ 80%) | | |
| **Storage Temperature** | -10°C to 50°C (RH ≤ 85%) | | |
| **Power** | 12V (Eight 1.5V "AA" Battery) | | |

new

Preliminary Data

CE

**Product Kit**

Insulation Resistance Measurement Test Leads


**DIT 918+**

Batteries

Carrying Bag

## Introduction

MECO DIT 918+ is a 2.5KV Digital Insulation Tester with Large LCD Display. It measures Insulation Resistance upto 200GΩ AC Voltage upto 600V and DC Voltage up to 1000V. It has Special functions to Measure P.I. (Polarization Index) and D.A.R. (Dielectric Absorption Ratio). It is ideally suited for testing of Insulation Resistance and Voltage of Transformers, Switches, High Voltage Systems, Cables, Appliances, Motors etc.

## Features

- Large LCD Display (128 x 64 Dot-Matrix)
- High Accuracy for Insulation Measurement and for AC/DC Voltage Measurement
- Suitable for P.I. & D.A.R. Measurement
- Range Selection & Single Person Push Button Operation
- Data Holding Function
- Measurement of Voltage upto 600VAC and 1000VDC
- Auto Range (Insulation Test)
- Red LED Indicator and Red Backlight for HV (High Voltage)
- Battery Operated
- As per IS10656-1983
- As per Safety Standard IEC/EN 61010-1 & 61010-31
- Over Voltage CAT II, 600V
- As per EMC Standard IEC 61326 Class B

## Electrical Specifications

Accuracy : ±(% reading + digits) at 23°C±5°C; RH≤75%

| Specification | Test Voltage | Range | Resolution | Test Current | Accuracy |
|---|---|---|---|---|---|
| Insulation Resistance | 1000V / 2500V DC | 0.1MΩ to 200MΩ | 0.01MΩ to 0.1GΩ | 2mA (Maximum) | ±(3% + 5) |
| | | 200MΩ to 10GΩ | | | ±(5% + 5) |
| | | 10GΩ to 200GΩ | | | ±(10% + 5) |
| AC Voltage Measurement | - | 0 ~ 600VAC (40 ~ 60Hz) | 1V | - | ±(2% + 5) |
| DC Voltage Measurement | - | 0 ~ 1000VDC | | - | |

## General Specifications

| | |
|---|---|
| Display | Large LCD Display (128 x 64 Dot-Matrix) |
| High Voltage LED Indication | ✓ |
| Terminal Voltage (E&L) Indication on LCD Display | ✓ |
| Data Hold | ✓ |
| Low Battery Indication | ✓ |
| Low Resistance Warning | ✓ |
| Operating Temperature | 0°C to 40°C (RH ≤ 80%) |
| Storage Temperature | - 10°C to 50°C (RH ≤ 85%) |
| Power | 9V (Six 1.5V "AA" Battery) |
| Dimensions | 150 x 100 x 70mm (approx.) |
| Weight | 680 gms including batteries (approx.) |
| Standard Accessories | Test and Calibration Certificate, Insulation Resistance Measurement Test Leads x 1 Set, 1.5V AA Batteries x 6 pcs, Carrying Bag x 1 pc, Instruction Manual x 1 pc |


**Product Kit**

Batteries

Insulation Resistance Measurement Test Leads


**DIT 954-6R**


Heavy Duty Carrying Bag

AC Adaptor

## Introduction

MECO DIT 954-6R is 5KV Digital Insulation Testers with 3½ Digit (1999 Counts) Large Display and Backlight. This Measures Insulation Resistance upto 200GΩ. It is ideally suited for testing of Insulation Resistance of Transformers, Switches, High Voltage Systems, Generator, Cables, Appliances, Motors, Power Capacitors etc.

## Features

- 3½ Digit (1999 Counts) Large LCD Display
- Range Selection & Single Person Push Button Operation
- LCD with Green Backlight
- Data Holding Function
- Display with Annunciators
- Auto Range (Insulation Test)
- Red LED Indicator for HV (High Voltage)
- Inbuilt Protection Circuit to prevent the harm of reverse Voltages.
- Battery Operated with AC Adaptor
- As per IS10656-1983
- As per EMC Standard IEC 61326-1 Class B
- Over Voltage CAT III, 600V
- As per Safety Standard IEC/EN 61010-1 & 61010-31
- IP 44 Protection

## Electrical Specifications

Accuracy : ±(% reading + digits) at 23°C ±5°C; RH≤75%

| Specification | Test Voltage | Range | Resolution | Test Current | Accuracy |
|---|---|---|---|---|---|
| Insulation Resistance | 100V / 250V / 500V DC | 0.1MΩ to 200MΩ | 0.01MΩ to 0.01GΩ | 2mA (Maximum) | ±(3% + 5) |
| | | 200MΩ to 10GΩ | | | ±(5% + 5) |
| | | 10GΩ to 20GΩ | | | ±(10% + 5) |
| | 1000V / 2500V / 5000V DC | 0.1MΩ to 200MΩ | 0.01MΩ to 0.1GΩ | | ±(3% + 5) |
| | | 200MΩ to 10GΩ | | | ±(5% + 5) |
| | | 10GΩ to 200GΩ | | | ±(10% + 5) |

## General Specifications

| | |
|---|---|
| **Display** | 3½ Digit (1999 Counts) Large LCD Display with 29mm Digit Height |
| **Over-Range Indication** | '1' is displayed |
| **Operating Temperature** | 0°C to 40°C (RH ≤ 80%) |
| **Storage Temperature** | - 10°C to 50°C (RH ≤ 75%) |
| **Power** | 12V (Eight x 1.5V "AA" Battery) with AC Adaptor |
| **Dimensions** | 190 x 155 x 75mm (approx.) |
| **Weight** | 900 gms including batteries (approx.) |
| **Standard Accessories** | Test and Calibration Certificate, Insulation Resistance Measurement Test Leads for High Voltage x 1 Set, AC Adaptor x 1 pc, 1.5V "AA" Batteries x 8 pcs, Heavy Duty Carry Bag x 1 pc, Instruction Manual x 1 no. |

# 5kV - 200GΩ Digital Insulation Tester with AC Voltage, Phase Sequence & Phase Status Indicator

**Product Kit**

Batteries | Insulation Resistance Measurement Test Leads


**DIT 954**

AC Adaptor

Phase Sequence Measurement Wire

Heavy Duty Carrying Bag

## Introduction

MECO DIT 954 is a 5KV Digital Insulation Testers with 3½ Digit (1999 Counts) Large Display and Backlight. This Measures Insulation Resistance upto 200GΩ, AC Voltage upto 600VAC and check Phase Sequence and Phase Status Indication. It is ideally suited for testing of Insulation Resistance and Voltage of Transformers, Switches, High Voltage Systems, Generator, Cables, Appliances, Motors, Power Capacitors etc.

## Features

- 3½ Digit (1999 Counts) Large LCD Display
- Range Selection & Single Person Push Button Operation
- LCD with Green Backlight
- Data Holding Function
- Display with Annunciators
- Measurement of AC Voltage upto 600V
- Measurement of Phase Sequence Between (Phase - Phase Voltage) with LED Indicators & Beep Facility
- Auto Range (Insulation Test)
- Red LED Indicator for HV (High Voltage)
- Inbuilt Protection Circuit to prevent the harm of reverse Voltages.
- Battery Operated with AC Adaptor
- Suitable for Calculating PI & DAR (Manually)
- As per IS10656-1983
- As per EMC Standard IEC 61326-1 Class B
- Over Voltage CAT III, 600V
- As per Safety Standard IEC/EN 61010-1 & 61010-31
- IP 44 Protection

## Electrical Specifications

Accuracy : ±(% reading + digits) at 23°C ±5°C; RH≤75%

| Specification | Test voltage | Range | Resolution | Test Current | Accuracy |
|---|---|---|---|---|---|
| **Insulation Resistance** | 1000V / 2500V / 5000V DC | 0.1MΩ to 200MΩ | 0.01MΩ to 0.1GΩ | 2mA (Maximum) | ±(3% + 5) |
| | | 200MΩ to 10GΩ | | | ±(5% + 5) |
| | | 10GΩ to 200GΩ | | | ±(10% + 5) |
| **AC Voltage Measurement** | - | 0 ~ 600VAC (40 ~ 60Hz) | 1V | - | ±(2% + 5) |
| **Phase Sequence Test** | - | 100V ~ 450V (Phase to Phase) 40 ~ 60Hz | - | - | - |

## General Specifications

| | |
|---|---|
| **Display** | 3½ Digit (1999 Counts) Large LCD Display with 29mm Digit Height |
| **Over-Range Indication** | '1' is displayed |
| **Operating Temperature** | 0°C to 40°C (RH ≤ 80%) |
| **Storage Temperature** | - 10°C to 50°C (RH ≤ 75%) |
| **Power** | 12V (Eight x 1.5V "AA" Battery) with AC Adaptor |
| **Dimensions** | 190 x 155 x 75mm (approx.) |
| **Weight** | 900 gms including batteries (approx.) |
| **Standard Accessories** | Test and Calibration Certificate, Insulation Resistance Measurement Test Leads for High Voltage x 1 Set, Phase Sequence Measurement Wires x 1 set, AC Adaptor x 1 pc, 1.5V "AA" Batteries x 8 pcs, Heavy Duty Carry Bag x 1 pc, Instruction Manual x 1 no. |


**DIT 5K10T-PI**

## Intoduction

MECO DIT 5K10T-PI is a 5KV-10TΩ Digital Insulation Resistance Tester which measures Insulation Resistance upto 10TΩ and has selectable Test Voltage from 250V to 5KV. It measures AC / DC Voltage upto 1000V. It perfoms Polorization Index Test (P.I.), Dielectric Absorption Ratio Test (D.A.R.) and Ramp Test apart from many other functions.

This Instrument has perfect Test Functions and excellent anti-interface ability with high noise interference immunity, which makes it ideal for use in switchyards of power utilities and to check electrical insulation resistance of cables, motors, transformers switches etc. in power generation, transmission and distribution. The instrument has TFT Touch Screen Backlight Display. All test data and battery power are displayed on the TFT screen. The combination of knob switch and keys makes the operation very simple. The user has no need to memorize the operation method, as " HELP" is available on the screen by just a click and the Operation manual POPS up on the screen to effectively guide the user to operate the instrument. The instrument has the function of rapid discharge and automatically monitors the Live Voltage of the measured object to safeguard the instrument and operators safety.

## Features

- Colour TFT Touch Screen Display
- Range Selection and Touch Screen Operation
- Insulation Resistance Measurment (IR) upto 10T Ohms
- Has Measurement of P.I. & D.A.R.
- Ramp Test Mode (RAMP)
- Filtered Resistance Test Mode (FR)
- Measure AC / DC Voltage upto 1000V
- Capacitance Range upto 25µF
- Measure Short Circuit Current 0.01nA ~ 7mA (max)
- IP 65 Protection
- GUARD Test Lead for Surface Leakage Current Compensation
- The Instrument has hard double shell structure with outer casing which helps to prevent moisture and dust and corrosion.
- Safety Standards IEC 61010-1, IEC 61326-1
- Large Capacity Rechargeable Lithium Battery
- PC Communication - USB Cable
- Store Data upto 1000 set (Real Time Test Data with Date & Time)
- Low Battery Indication and APO Function

## Application

- Power Utilities
- HV Switchyards
- Generation
- Transmission
- Distribution
- Transformers (High and Medium Voltage)
- Cables (High and Medium Voltage)
- Motors and Generators (High and Medium Voltage)
- Switchgears and Electronic Equipments
- Breakers

## Electrical Specifications

Accuracy : ±(% reading + digits) at 23°C ± 5°C; RH <75%

| Specifications | Ranges | Accuracy |
|---|---|---|
| **Test Voltage** | 250V / 500V / 1000V / 2500V / 5000V | ±(5%rdg ± 10dgt) ±10V |
| **AC / DC Voltage Measurement** | 0 ~ 1000V | ±(5%rdg ± 3V) |
| **Short Circuit Current** | 0.01nA ~ 7mA (max.) | ±(5%rdg ± 0.5nA) |
| **Capacitance Range** | 10nF ~ 25µF | ±(10%rdg ± 10nF) |

## Insulation Resistance Measurment Accuracy

| Description | Ranges | | | | | Accuracy |
|---|---|---|---|---|---|---|
| **Test Voltages** | 250V | 500V | 1000V | 2500V | 5000V | ±(5%rdg ± 10dgt) ±10V |
| **Insulation Resistance** | 50.0GΩ | 100GΩ | 200GΩ | 500GΩ | 1.00TΩ | ±(5%rdg) |
| | 500GΩ | 1.00TΩ | 2.00TΩ | 5.00TΩ | 10.0TΩ | ±(20%rdg) |

## General Specification

| | |
|---|---|
| **PI & DAR Test** | Yes |
| **Ramp Test** | The output voltage will start at 10% of the preset voltage and increase in step of 10% until preset voltage is reached. |
| **Filtered Resistance Test** | 10S, 20S, 30S & 40S (4 Selection) |
| **Insulation Resistance** | More than 50M Ohms at1000V Between Test Circuit and Case |
| **Dielectric Strength** | 3 KV @ 50Hz for 1 minute between Input Terminals and Case |
| **Working Temperature** | -20°C ~ 50°C (RH ⩽ 80%) |
| **Storage Temperature** | -25°C ~ 65°C (RH ⩽ 80%) |
| **Test Timer** | Time Range : 0 ~ 9999s (Automatic Record Test Time) |
| **Storage Function** | Range : 1000 Groups (Automatically store Test Data with Test Date & Time) |
| **Upload Function** | Upload the stored data to computer via UBS communication cable. |
| **Auto Power Off** | After 15 minutes start up will shut down automatically without any operation. |
| **Safety Standard** | IEC 61010 - 1, IEC 61326 - 1 |
| **Ingress Protection** | IP65 (with Close Case) & IP40 (with Open Case) |
| **Low Battery Indication** | Yes |
| **Battery Type** | Rechargeable Lithium Battery |
| **Dimension** | 280 x 260 x 160mm (approx.) |
| **Weight** | 4900gms including battery (approx.) |
| **Standard Accessories** | Insulation Resistance Measurement Test Leads x 1 set, Alligator Type Test Leads x 1 set, USB Communication Cable x 1 No., AC Adaptor x 1 No., Power Cord x 1 No., Heavy Duty Carry Bag x 1 No., Rechargeable Lithium Battery x 1 No. (installed), Instruction Manual x 1 No. |

## Product Kit

S&T, CENTRAL RAILWAY,

SIGNAL & TELECOOM WORKSHOP, BYCULLA, MUMBAI

Date: 19/11/2014

To,

Director,

**M/s. Meco Instruments Pvt. Ltd.**

Plot No. 1, MIDC Electronic Zone,

TTC Industrial Area, Mahape, Navi Mumbai – 400 710

Tel. No. 022 – 27673300 Fax No. 022 – 27673310

Dear Sir,

**Sub** Performance of MECO Digital Panel Meters & Frequency Meters in our **Power Indication Panel** System.

Ref Our Several Purchase Order to M/s. Ajanta Enterprise, Andheri, Mumbai and M/s. Everest Trading Company, Tardeo, Mumbai.

Please refer our several purchase order in last few months to M/s. Ajanta Enterprise & M/s. Everest Trading Company, Tardeo, Mumbai for following products.

- MECO Model SMP35SN 4 Digit Programmable AC Voltmeters Range 50 - 200V AC
- MECO Model SMP35SN 4 Digit Programmable AC Voltmeters Range 50 – 300V AC
- MECO Model SMP35S 3-1/2 Digit Voltmeters Range 0 – 200V DC
- MECO Model FDM 3AS 4 Digit Frequency Meters Range 40 – 99.99Hz at 20 – 500V AC

We have found the working of above meters in our **Relay Test Room** Unit is as per our requirement.

Overall the Performance of MECO meters are very satisfactory and as per accuracy specified in catalogue.

We appreciate and thanks Mr. Haren Shah of M/s. Ajanta Enterprise, Andheri, Mumbai & Mr. Ajay Shah of M/s. Everest Trading Company, Tardeo, Mumbai for their timely service with quick delivery of the above ordered meters as and when released to them.

We also thank M/s. MECO Instruments for extending timely support to our testing team as an when it was required in past. We look forward in future also to have similar kind of service and support as and when require from Mr. Haren Shah, Mr. Ajay Shah and MECO Team members.

Thanking You,

Your Faithfully,

Central Railway, S & T Workshop, BYCULLA
AEE (S&T)
C.RLY; BYCULLA, MUMBAI-27.

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2 7 AUG 2016

सीएसआईआर–केन्द्रीय खनन एवं ईंधन अनुसंधान संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्)
बरवा रोड , धनबाद – 826015 , झारखण्ड, भारत

CSIR-Central Institute of Mining & Fuel Research
(Council of Scientific & Industrial Research)
Barwa Road, Dhanbad - 826015 , Jharkhand , India

Shri Prasad Bhukya
Scientist
Electrical Design Section
Electrical Design & Safety Research Group

*SPEED POST*

Ref. No.: CIMFR/EDS/PB/MIS/001 / 510

Dated: 24/08/2016

To

MECO Instruments Private limited.
Plot EL-1, MIDC Electronic Zone,
TTC Industrial Area, Mahape,
Navi Mumbai-400710 (INDIA)
Tel: +91 -22-27673311-16(sales)

Your ref: E-mail dated 09.08.2016 from MECO (Haren Shah), Mumbai

Dear Sir,

I would like to express gratitude for providing solution to the software installation issue come across during operation of the Power and Harmonics Analyzer-5850C model to MECO Instruments Private Limited, Mumbai.

I would like to express my special thanks to Mr. Haren Shah who attended the technical problem very positively on phone and by E-mail also and later he has provided solution to software installation issue in very less time.

Thank you for your great support in minimum time.

Yours faithfully,

(Prasad Bhukya)

EPABX : 0091-326-229-6027/6028/6029
Fax : 0091-326-229-6025 , email : dcmrips@yahoo.co.in
Working Days : Monday to Friday, Website : www.cimfr.nic.in

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INDOSAW
*Committed to Excellence*

Date: 24.01.2023

To,
**M/s. Meco Instruments Pvt. Ltd.**
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710.
Tel. No. 022 – 2767 33 00 / 093233 32435

**Kind Attn :** Dr. Kamal Goliya – CEO / Mr. Prashant Thakkar (Marketing Manager – North India)

**Sub : Products Appreciation letter for Digital LED and LCD Modules.**

Dear Sir,

We thank you for your support extended to us for supply of MECO Digital LED and LCD Modules regularly for our various projects in India and for many export projects.

We are very much satisfied with the performance of these meters.

The presales and post-sales service and support offered are prompt and timely.

We hope to have good and strong business relationship with you in future as well.

Thanking You,

**Your Faithfully,**

**M/s. Osaw Industrial Products Pvt. Ltd., Ambala**
Name : AJAY SAGAR
Designation : MANAGING DIRECTOR

c.c.
**Mr. Prashant Thakkar (Marketing Manager – North India)**
Email : prashant.thakkar@mecoinst.com Mobile No. : 098672 66639

CIN U29100HR1992PTC031570 OSAW INDUSTRIAL PRODUCTS PVT. LTD.
P.O. BOX NO. 42, OSAW COMPLEX, JAGADHRI ROAD AMBALA CANTT - 133001, HR (INDIA), TEL: +91-171-2699347, 2699267,
E-mail: enquiry@indosaw.com (Foreign), denquiry@indosaw.com (Indian Agnt), deducation@indosaw.com (Indian Edu.) Website: www.indosaw.com

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Deals in Educational, Industrial & Research Equipments
**Associated Scientific Corporation**
www.ascindore.in

Date: 14.01.2023

To,
**M/s. Meco Instruments Pvt. Ltd.**
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710
Tel. No. 022 – 27673300

Dear Sir,

**Kind Attn : Dr. Kamal Goliya - CEO**

Sub Satisfactory Executions of Supply of MECO Panel Meters Model SMP48 against Purchase order No. ASC/22-23 Dt. 18.10.2022.

Please refer our above and several Purchase order for Supply of MECO Make Digital Panel Meters.
We are thank full to M/s. MECO Instruments Pvt. Ltd. Navi Mumbai for honouring timely delivery as per given schedule for all items.

We also appreciate Mr. Haren Shah for extending their excellent service during completion of order and providing / updating us time to time the proceeding in executing this order.

We look forward to have similar kind of service and support from your organization in our upcoming projects and orders.

Thanking You,
Your Faithfully,
**M/s. Associated Scientific Corporation.**

(Mukesh Jain)
c.c.
**Mr. Haren Shah – Senior Marketing Executive**
Email : haren.shah@mecoinst.com & harenvshah@yahoo.com Mobile No. : 9820093232

3A, Electronic Complex, Pardeshipura,
Indore-452003 (MP) India
Phone-0731-2539980, +91-9424885043,
Email: asc.indore@gmail.com, info@ascindore.in,

MECO®
SINCE 1962

## Testing & Measuring Instruments

- ✓ Digital Multi-Range Portable Meter
- ✓ Digital Earth Resistance Tester
- ✓ Leakage Current Tester
- ✓ Clamp-On Earth / Ground Resistance & Leakage Current Tester
- ✓ Micro – Ohmmeter / Milli – Ohmmeter
- ✓ Transformer Turns Ratio Meter
- ✓ LCR Meter
- ✓ Phase Sequence Indicator
- ✓ Inverter Analyzer
- ✓ Non-Contact Voltage Detector
- ✓ Battery / Cell Tester

+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable


**PM-VAC-5R**
**PM-VDC-5R**
**PM-AAC-5R**
**PM-ADC-5R**

Digital Multi-Range Portable Meters are ideal for continuous AC TRMS and DC measurements. These precision meters are of Class 0.5 and have a backlight display with annunciators for ease of reading. The meters can be used in horizontal, vertical or inclined position and there are no parallax errors. These are housed in a strong, compact and rugged casing with a tilt handle for ease of carrying. These are designed using advanced microcontrollers and SMT technology and there are no moving parts which could cause loss of accuracy or errors. There are 4 models, one each for A AC, A DC, V AC and V DC. Each model has 5 ranges thereby eliminating the need for having separate instrument for each range. There is overload indication and overload protection against accidental misuse. USB connectivity and user interface software is provided for ease of data handling and analysis. These Digital Multi-Range Portable Meters are most suitable for use in Laboratories, Engineering Schools/ Colleges Workshops and Field Measurements Applications for continuous use and can serve as a master standard meter for verification or re-calibration of secondary standard meters.

## Features

- Precision Class 0.5
- TRMS Measurement
- Microcontroller Design (No Moving Parts)
- Backlight Display with Annunciators (No Parallax Errors)
- USB Port (Standard) with User Interface Software (Under development)
- Data Hold, Auto Power Off and Low Battery Indication
- Overload Indication
- Strong Rugged Casing with Tilt Stand

## Specification

- 5 Digits (Except for 750V AC)
- 0.0001 to 1 Count Resolution (Depending on Range)
- 1" / 25.4 mm Digit Display
- Sampling Rate : 3 Samples / Sec
- Accuracy : ± (0.5% rdg + 3 dgt)
- Maximum Overload : 1.2 Times (Continuous)
- Polarity Indication : " – " for Negative Input
- Power : 1.5V 'AA' Battery x 4 pcs
- Power : 6V DC Adaptor (Optional)
- Power Consumption : < 0.2 VA
- Dimension (mm) : 170 x 74 x 240 (approx.)
- Weight (Including Battery) : 850 gms approx. (Ammeter) 780 gms approx. (Voltmeter)
- Environment : 22 to 32°C, < 70% RH (Calibration) 0 to +50°C, < 70% RH (Operation) -10 to +60°C, < 70% RH (Storage)

**Accuracy :** ± (0.5% rdg + 3dgt)

| Model | Input | Ranges | Resolution |
|---|---|---|---|
| **PM-VAC-5R** | AC TRMS | 0 – 200mV | 0.01 |
| | | 0 – 2V | 0.0001 |
| | | 0 – 20V | 0.001 |
| | | 0 – 200V | 0.01 |
| | | 0 – 750V | 0.1 |
| **PM-VDC-5R** | DC | 0 – 200mV | 0.01 |
| | | 0 – 2V | 0.0001 |
| | | 0 – 20V | 0.001 |
| | | 0 – 200V | 0.01 |
| | | 0 – 1000V | 0.1 |
| **PM-AAC-5R** | AC TRMS | 0 – 2mA | 0.0001 |
| | | 0 – 20mA | 0.001 |
| | | 0 – 200mA | 0.01 |
| | | 0 – 2A | 0.0001 |
| | | 0 – 20A | 0.001 |
| **PM-ADC-5R** | DC | 0 – 2mA | 0.0001 |
| | | 0 – 20mA | 0.001 |
| | | 0 – 200mA | 0.01 |
| | | 0 – 2A | 0.0001 |
| | | 0 – 20A | 0.001 |

## Accessories

**Standard :** 1.5V 'AA' Battery x 4 pcs (installed), Test Leads (Red & Black for 2A continuous) x 1 pair, Instruction Manual x 1 pc. and Spare Fuse x 2 pcs (for Ammeter Only)

**Optional :** Test Leads (Red & Black for 20A continuous) x 1 pair, USB Cable x 1 pc, User Interface Software x 1pc



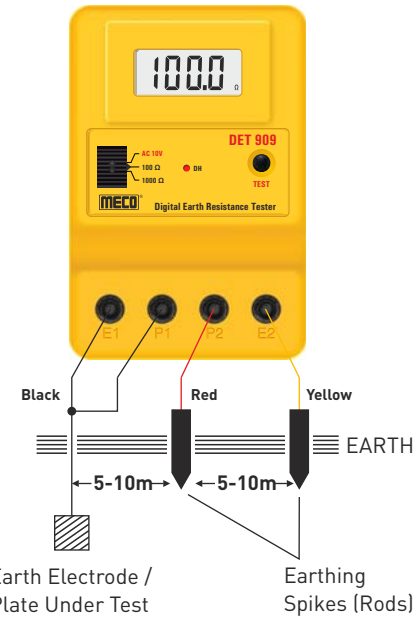


## Ordering Information

Model, Test Leads (Red & Black suitable for 20A continuous) x 1 pair (Optional), USB Cable x 1 pc (Optional), User Interface Software x 1pc (Optional).


DET 909

## Precision Earth Resistance Measurment




Earth Electrode / Plate Under Test

Earthing Spikes (Rods)


Optional

## Introduction

**MECO DET909 is designed with technical know how from FUSO Electric Company of Japan.** It is useful for measurement of Earth Resistance of Earthing in the Electrical System. This Instrument finds wide applications for testing Earthing of installations in Power Industries, Telecommunication Networks & Electrical Systems etc. It also measures Earth Voltage. DET 909 has 820Hz test frequency which eliminates the interference due to harmonics & noise.

## Features

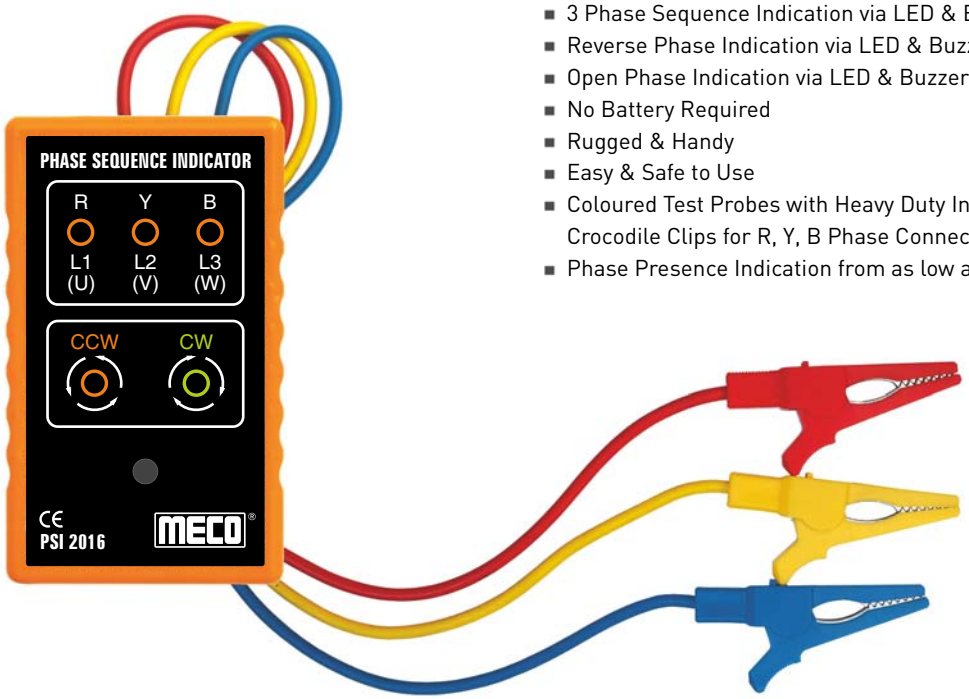
- 3½ Digit (1999 Counts) 14 mm LCD Display with Backlight
- Auto Power Off Function (after 3-5 min.)
- Measurement Frequency 820Hz
- Capable of Measuring Earth Voltage (0 - 10V AC)
- Light Weight & Portable
- Extremely Simple to Operate Connect - Press - Read
- Designed to Reject High Levels of Noise & Interference
- Data Hold (DH) & Low Battery Indication
- Designed to Generally Confirm to IS10656-1983
- Range Selection & Single Person Push Button Operation Switches
- Two Ranges for Earth Resistance Measurement
- Functions Icons on Display
- Re-Chargeable Battery Operated with Built-in Charger
- IEC 1010 CAT III 200V
- Sturdy, Elegant & Compact Body

## Electrical Specifications

| Specification | Range | Resolution |
|---|---|---|
| Earth Resistance | 100Ω (0.3 ~ 100.0) | 0.1 Ω |
| | 1000Ω (3 ~ 1000) | 1 Ω |
| Earth Voltage | 10V AC (0 ~ 10.00) | 0.01V AC |

## General Specifications :

| | | |
|---|---|---|
| Accuracy | ±(3% rdg.+5 dgt.) For Earth Resistance Vaiid from 5% of Reading to 95% of Range | at 23°C ±5°C |
| | ± (1% rdg. + 2 dgt.) For Earth Voltage | |
| Test Current | 10mA AC (MAX.) | |
| Conversion Rate | 2.5 Sec | |
| Over Range Indication | "1" is displayed | |
| Operating Temperature | 0° to 50°C | |
| Storage Temperature | -20° to 60°C | |
| Relative Humidity | 80% Maximum | |
| Low Battery | '⊟' Is Displayed when Battery Voltage drops below Operating Voltage | |
| Dielectric Strength | 2.5KV @ 50Hz for 1min, between Input Terminals & Case | |
| Insulation Resistance | More than 50MΩ @ 500V between Input Terminals & Case | |
| VA-Power | < 3.0VA | |
| Power Supply | Internal Rechargeable 1.2V 'AA' x 8 Batteries | |
| Dimensions | 166 x 111 x 75mm (approx.) | |
| Weight | 525gms. Including Battery (approx.) | |
| Accessories (Standard) | Carrying Case x 1, 1.2V 'AA' Rechargeable Batteries (fitted in) x 8, Instruction Manual x 1, Carton x 1, 2 Pin Male-Female Wire for Battery Charging | |
| Accessories (Optional) | Test Leads x 1 Set (Red, Yellow, Black), Earthing Spikes (Rods) x 2 | |



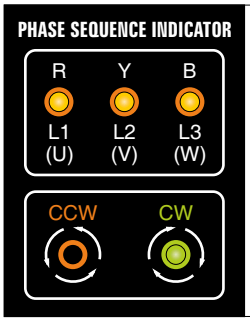

PSI 2016

## Features

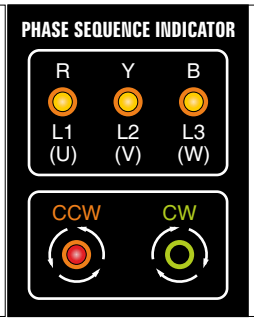
- 3 Phase Sequence Indication via LED & Buzzer
- Reverse Phase Indication via LED & Buzzer
- Open Phase Indication via LED & Buzzer
- No Battery Required
- Rugged & Handy
- Easy & Safe to Use
- Coloured Test Probes with Heavy Duty Insulated Crocodile Clips for R, Y, B Phase Connections
- Phase Presence Indication from as low as 100V AC (PH-PH)

## Introduction

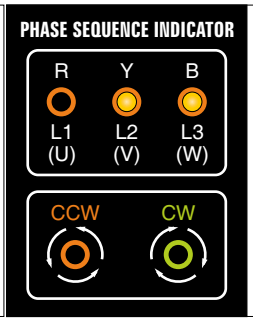
In Electrical Systems, sometimes without identification of Phase Sequence it is impossible to proceed further. The Phase Sequence Indicator is used to determine the Phase Sequence R, Y & B of 3 Phase Voltages. It is important that Phase Sequence is known properly prior to energizing electrical motors and other equipment, as incorrect connection could cause damage to the equipment. The correct operation of measuring instruments like 3 Phase Energy Meter, 3 Phase Power Meter & Automatic Control of devices also depends on the Phase Sequence.




**Correct Phase (CW)**
- All 3 Yellow LED's ON
- Green LED ON
- Intermittent Beep

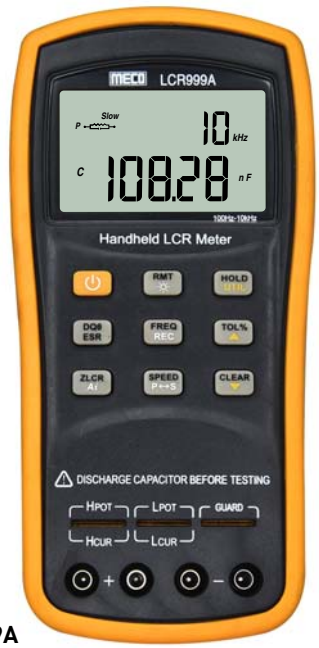



**Reverse Phase (CCW)**
- All 3 Yellow LED's ON
- Red LED ON
- Continuous Beep




**Open Phase (One Phase Only)**
- Yellow LED for Open Phase is OFF e.g. R Phase LED OFF
- Both Green & Red LED's OFF
- Continuous Beep

| | |
|---|---|
| **Electrical Specifications** | |
| Voltage Range (PH-PH) | 100 - 600V AC |
| Frequency Range | 40 - 400Hz |
| Operating time for continuous Measurement | 60 minutes Max. at 200VAC, 4 minutes Max. at 500VAC |
| Dielectric Strength | 2000 V for one minute |
| **Environmental Specifications** | |
| Storage Temperature | - 20°C ~ 60°C |
| Operating Temperature | - 10°C ~ 40°C |
| **Safety Specifications** | |
| Electrical Safety | EN 61010 - 1 |
| Over Voltage category | CAT III 600 V, CAT IV 300V |
| **Mechanical & General Specifications** | |
| Size | 100 x 60 x 25mm (approx.) |
| Weight | 185g (approx.) |
| Case & Housing Material | ABS |
| **Accessories** | Test Leads with Insulated Crocodile Clips & Carrying Case. |




**LCR999A**

## Features

- Basic measurement accuracy 0.1% & speed upto 10 meas / sec.
- Large LCD display with bright white backlight.
- Ultra low power consumption, battery powered for 24 hours of continuous use.
- Automatic identification function (Ai).
- Percentage display & 4 tolerance comparator : 1%, 5%, 10% & 20%
- 9V battery & External power supply
- Automatic correction function with datahold, max. / min. / average recording.
- Utility function configuration & current setup recovery after power off.
- Standard Mini-USB interface, SCPI compatible
- Auto power Off
- Constant output impedance : 100 ohm

## Application

- Field maintenance test & external carrying test.
- Fixation point on production line or mobile checkout.
- Warehouse & real time spot or batch inspection.
- Flow inspect and in field measurements.

## Specifications

| | | |
|---|---|---|
| **Function** | | |
| **Measurement Parameter** | Primary Parameters : L / C / R / Z | Secondary Parameter : D / Q / θ / ESR |
| **Equivalent Mode** | Series, Parallel | |
| **Auto LCR Function** | Manual / Auto | |
| **Ranging Mode** | Auto | |
| **Test Terminals** | 2-Terminal, 4-Terminal, 5-Terminal | |
| **Measurement Speed** | 10 meas/sec ( fast), 5 meas/sec (med), 2 meas/sec (slow) | |
| **Correction** | Short , Open | |
| **Tolerance Mode** | 1%, 5%, 10%, 20% | |
| **Input Protection Fuse** | 0.1A / 63V | |
| **Interface** | Mini-USB (Virtual Serial Port) | |
| **Test Signal** | | |
| **Signal Frequency** | 100Hz, 120Hz, 1KHz, 10KHz | |
| **Test Signal Level** | 0.6 Vrms | |
| **Output Impedance** | 100Ω | |
| **Basic Accuracy** | 0.1% | |
| **Measuring Range** | L | 4μH ~ 1000H Range for Display 0.001μH ~ 1000.0H |
| | C | 4pF ~ 20mF Range for Display 0.001pF ~ 20.000mF |
| | R / Z | 0.4Ω ~ 10MΩ Range for Display 0.0001Ω ~ 10.000MΩ |
| | ESR | Range for Display 0.0000Ω ~ 999.9Ω, Resolution : 0.0001Ω |
| | D | Range for Display 0.0000 ~ 9.999, Resolution : 0.0001 |
| | Q | Range for Display 0.0000 ~ 9999, Resolution : 0.0001 |
| | θ | Range for Display - 179.9° ~ 179.9°, Resolution : 0.01° |
| **Environment** | 0°C~40°C, ≤90% RH | |
| **Power Supply** | | |
| **Battery Model** | 7.2V Ni-MH 600mAH Rechargable Battery | |
| **AC Adaptor** | Input : 220V (1±10%), 50Hz (1±5%) : Output 12V DC | |
| **Charge Time & Current** | Continuous Charge Time : Max. 80min. | Charge Current : Max. 150mA |
| **Battery Capcity Indication** | Real Time Disaplay on LCD | |
| **General** | | |
| **Dimensions** | 193 x 93 x 48mm | |
| **Weight** | 395gms (approx.) | |
| **Safety and EMC compliance** | IEC 61010-1 : 2001, IEC 61326-2-1 : 2005 | |
| **Accessories** | Manual, Short Circuit Plate x 1, 7.2V Ni MH Rechargeable Battery (installed) x 1, 12V/300mA AC Adapter x 1, 5 Terminal Kelvin Test Leads x 1<br>**Optional :** SMD 4 Terminal Kelvin Test Tweezers x 1, Banana Plugs-Crocodile Clip Test Leads x 1, Mini USB Communication Cable & S/W CD | |


TTR 8100

**Transformer is a very important element in the Electric Power Distribution System. It needs to be maintained from time to time to guarantee smooth power supply at consumer end.**

**MECO TTR8100 is portable instrument for accurate measurement of 1-Phase & 3-Phase Transformer VT / CT Turns Ratio, Excitation Voltage, Current, Phase Angle and Deviation. TTR8100 ensures the Correct Turn Ratio and Quality of the Transformer.**

**It checks live Test Points, Short Circuit, Open Circuit and Reverse Polarity before each measurement.**

## Features

- Measurements of 1Φ and 3Φ Transformer / VT / CT Turns Ratio
- VT/PT Ratio 0.8~10000, CT Ratio 0.8~2000
- Graphical and Literal Illustration of Measurements and connections with Large Back-lighted Dot Matrix 240x128 LCD
- Displays Turns Ratio, Deviation, Secondary Output, Excitation Voltage and Current, Phase Angle and Nameplate Transformer / VT / CT Values in one page for easy quality interpretation.
- Check for Live Test Points, Short Circuit, Open Circuit and Reverse Polarity before each measurement.
- Store 4096 Files of Transformer Nameplate Values (VT / PT / CT, 1Φ / 3Φ, Test Frequency, Primary and Secondary Voltages or Ratio, RCF) and Measuring Data.
- Ten test Frequencies (50~400Hz)
- 9 Types of 3Φ Winding Connections pre-installed.
- Wireless Blue Tooth Communication with PC.
- Select Filter to Remove Field noise (Slow, Normal, Fast)
- Record with Date and Time Stamp
- Powerful lithium Battery (3400mAH) with built-in Charging Circuit
- User Programmable RCF (Reference Correction Factor, 0.99~1.01) to Correct Accuracy within 1% Error
- PC Application Software Included
- Friendly File System for Easy On-site Data Retrieval and Nameplate Values Management

Reference Conditions : 23°C±5°C (30 to 50% RH). Add 25ppm / °C for -0° to 18°C and 28° to 50°C to all Accuracy Specifications. No external electrical or magnetic fields. Output current ⩽ 150mA for VT / PT and ⩽ 50mA for CT. Calibration Cycle is 1 Year.

## Electrical

| | | |
|---|---|---|
| **Ratio Range (VT / PT)** | **Autoranging : 0.8000 to 10000:1** | |
| **Accuracy (70Hz)** | **Ratio Range** | **Accuracy (%of Reading)** |
| | 0.8000 to 999.99 | ±0.1% |
| | 1000.0 to 4999.9 | ±0.2% |
| | 5000.0 to 10000 | ±0.25% |
| **Ratio Range (CT)** | **Autoranging : 0.8000 to 2000.0** | |
| **Accuracy (70Hz)** | **Ratio Range** | **Accuracy (%of Reading)** |
| | 0.8000 to 2000.0 | ±0.5% |
| **Excitation Signal** | VT / PT Mode : 34Vrms max<br>CT Mode : Auto Level 0 to 1A, 0.1 to 20Vrms | |
| **Excitation Current Display** | Range : 0 to 1000mA<br>Accuracy : ±(2% of Reading +2mA) | |
| **Excitation Frequency (Hz)** | 50, 55, 60, 70, 100, 120, 200, 240, 300, 400 | |
| **Display** | 5" Large Dot Matrix LCD Display (240x128) with Backlight | |
| **Power** | Rechargeable Lithium Battery, 3400mAh | |
| **Battery Life** | Over 10Hrs of Continuous Operation. Battery life (%) Indication | |
| **Battery Charger** | Universal Input (90 to 264Vrms Input) | |
| **Charging Time** | <4Hrs | |
| **Data Storage** | 4096 Files Each (VTM, CTM, VTR, CTR, BMP) | |
| **Date/Time** | Battery-Backed, Real-time Calendar Clock | |
| **Measurement Method** | ANSI/IEEE C57.12.90 and IEC 600076.1 | |
| **Accessory** | Test Leads x 1 Pair, Alligator Clips x 4, Rechargeable Lithium Battery x 1, Instruction Manual x 1, AC Adaptor x 1, Power Cord x 1, Software CD and Manual x 1, Carrying Bag x 1 | |

## Application

## Accessories


7002, 7272

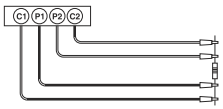
## Features

- Basic Accuracy 0.25%
- Max. Test Current : 10A (60mΩ) for 7272, 5A (120mΩ) for 7002
- Manual or Auto Range
- Four Terminal Kelvin Measurement
- 6 Ranges with 1μΩ Best Resolution
- Measurement of Resistive and Inductive Materials
- Setting for HI, LO & PASS Readings
- Memory of 3000 Measurements Data
- Programmable HI-LO Alarm with memory of 20 Data
- Large LCD with Backlight & HOLD Function
- Low Power Consumption
- Battery Operated (Rechargeable Battery)
- Low Battery indication
- LED indication for Invalid Resistance Measurement
- Cable Length Measurement in feet & meters
- User Interface Software for PC Communication via RS232C (to USB Bridge) Cable
- Built-in Battery Charging Circuit & Calendar Clock

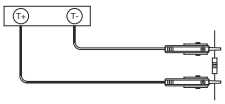
## General Specifications

- Battery Charging Time 10Hrs
- AC Adaptor : Input 110V or 220VAC, Output DC 15V/1-3A
- LCD Display 4 5/6 Digit + Backlight
- Dimension : 260 x 158 x 70mm (approx.)
- Weight : 1125gms Including Battery (approx.)
- Environment : 0°C - 50°C ≤ 85% RH (Operation)
  : -20°C - 60°C ≤ 75% RH (Storage)

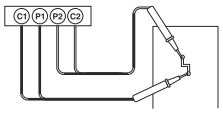
## Application




Measurement (with Alligator Clips)




Measurement (with Kelvin Clips)




Measurement (with 4 wire Test Leads)

## Accessories

- Users Manual x 1 ■ Software Manual x 1 ■ Software CD x 1
- RS232C (to USB Bridge) Cable x 1 ■ AC Adaptor x 1
- 11.1V Rechargeable Lithium Battery (3400mAh) x 1
- 1 Set of Kelvin Clips ■ Carrying Bag x 1
- **Optional** : 4 Wire Test Leads (Double Prods)

## Electrical Specifications (23°C ± 5°C)

**Manual Range**

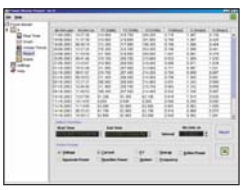
| | Resistance Range | Resolution | Accuracy |
|---|---|---|---|
| 10A (7272) | 400μΩ ~ 4000μΩ | 1μΩ | ±0.25% ±25μΩ |
| | 1.500mΩ ~ 16.000mΩ | 1μΩ | ±0.25% ±25μΩ |
| | 5.000mΩ ~ 60.000mΩ | 1μΩ | ±0.25% ±25μΩ |
| 5A (7002) | 1.000mΩ ~ 8.000mΩ | 1μΩ | ±0.25% ±25μΩ |
| | 5.00mΩ ~ 32.00mΩ | 10μΩ | ±0.25% ±250μΩ |
| | 10.00mΩ ~ 120.00mΩ | 10μΩ | ±0.25% ±250μΩ |
| 1A | 4.00mΩ ~ 40.00mΩ | 10μΩ | ±0.25% ±250μΩ |
| | 15.00mΩ ~ 160.00mΩ | 10μΩ | ±0.25% ±250μΩ |
| | 50.00mΩ ~ 600.00mΩ | 10μΩ | ±0.25% ±250μΩ |
| 100mA | 0.0400Ω ~ 0.4000Ω | 100μΩ | ±0.25% ±2.5mΩ |
| | 0.1500Ω ~ 1.6000Ω | 100μΩ | ±0.25% ±2.5mΩ |
| | 0.5000Ω ~ 6.0000Ω | 100μΩ | ±0.25% ±2.5mΩ |
| 10mA | 0.400Ω ~ 4.000Ω | 1mΩ | ±0.25% ±25mΩ |
| | 1.500Ω ~ 16.000Ω | 1mΩ | ±0.25% ±25mΩ |
| | 5.000Ω ~ 60.000Ω | 1mΩ | ±0.25% ±25mΩ |
| 1mA | 4.00Ω ~ 40.00Ω | 10mΩ | ±0.25% ±250mΩ |
| | 15.00Ω ~ 160.00Ω | 10mΩ | ±0.25% ±250mΩ |
| | 50.00Ω ~ 600.00Ω | 10mΩ | ±0.25% ±250mΩ |
| 100μA | 0.0400kΩ ~ 0.4000kΩ | 100mΩ | ±0.75% ±3Ω |
| | 0.1500kΩ ~ 1.6000kΩ | 100mΩ | ±0.75% ±3Ω |
| | 0.5000kΩ ~ 6.0000kΩ | 100mΩ | ±0.75% ±3Ω |

## Electrical Specifications (23°C ± 5°C)

**Auto Range**

| Resistance Range | | Resolution | Accuracy |
|---|---|---|---|
| 10A (7272) | 400μΩ ~ 60.000mΩ | 1μΩ | ±0.25%±25μΩ |
| 5A (7002) | 1.000mΩ - 8.000mΩ | 1μΩ | ±0.25%±25μΩ |
| | 8.00mΩ ~ 120.00mΩ | 10μΩ | ±0.25%±250μΩ |
| 1A | 4.00mΩ ~ 600.00mΩ | 10μΩ | ±0.25%±250μΩ |
| 100mA | 0.0400Ω ~ 6.0000Ω | 100μΩ | ±0.25%±2.5mΩ |
| 10mA | 0.400Ω ~ 60.000Ω | 1mΩ | ±0.25%±25mΩ |
| 1mA | 4.00Ω ~ 600.00Ω | 10mΩ | ±0.25%±250mΩ |
| 100μA | 0.0400kΩ ~ 6.0000kΩ | 100mΩ | ±0.75%±3Ω |

## Software



Application program to represent Real Time Values & Facility to open / save recorded data, plot data, export data, print display screen, parameter setting etc. The screen also displays current time, start time, system mode, sample rate, high limit, low limit, sample count & present sample value. The program also supports plotting of present or recorded data.

# Clamp - On Earth / Ground Resistance & Leakage Current Tester (55 x 32mm Jaw)

new

Preliminary Data

CE

JAW 55 mm


**4680SL, 4680SLC**

Resistance Verification Plate

Carry Bag

The faults in any Electrical System are unavoidable. Earthing plays an important role in Generation, Transmission & Distribution for safe and proper operation of any Electrical Installation. **MECO 4680SL/4680SLC Clamp-On Earth / Ground Resistance Tester** has long elliptical jaw suitable for flat as well as round earthing strips. It completely eliminates the use of ground and auxiliary rods thus saving lot of time and avoiding shutdown. Calibration check can be verified by using the Resistance Verification Plate provided. This is an extremely handy instrument especially at place where it is next to impossible to measure Earth / Ground Resistance by conventional methods. Substantial time saving and easy operating justify the investment in these instruments.

## Features

- Non Contact Ground Resistance Measurement
- No Auxillary Electrodes Needed
- Data Storing Memory
- Data Hold, Noise Signal & Continuity Loop Test
- Ground Resistance Measurement 0.01Ω ~500Ω
- Suitable for Earthing Strip upto 55mm
- Suitable for Round Conductor upto 20mm Φ
- Leakage Current (0.5mA~20.00A) (Model 4680SLC)
- Auto Ranging
- Auto Power Off

## General Specifications

| | | |
|---|---|---|
| **Jaw** | : | 55 x 32 mm (approx.) |
| **Conductor Size** | : | Upto 55 mm / 20 mm Φ |
| **Power** | : | Four 1.5V "AA" Battery |
| **Display** | : | 4 Digit 9999 counts LCD Back Light Display |
| **Range Selection** | : | Auto |
| **Memory** | : | 99 Sets |
| **Overload Indication** | : | OL |
| **Low Battery Indication** | : | - + |
| **Operating Environment** | : | -10°C ~ 55°C |
| **Measuring category** | : | CAT III 150V<br>IEC/EN 61010-1, Pollution Degree 2 |
| **Dimensions** | : | 275 x 85 x 56 mm (approx) |
| **Weight** | : | 868 gms Including Battery (approx) |
| **Accessories** | : | Resistance Verification Plate x 1,<br>Battery 1.5V (AA) x 4 (Installed),<br>User Manual x 1, Carry Bag x 1 |
| **Configurable Alarm** | : | Resistance : 1~199Ω & Current : 1~499mA |

## Electrical Specifications (23°C ± 5°C)

| **Ground Resistance (Auto Range)** (4680SL, 4680SLC) | | |
|---|---|---|
| **Range** | **Resolution** | **Accuracy of Reading** |
| 0.010 ~ 0.099 Ω | 0.001 Ω | ± (1%+0.01 Ω) |
| 0.10 ~ 0.99 Ω | 0.01 Ω | ± (1%+0.01 Ω) |
| 1.0 ~ 49.9 Ω | 0.1 Ω | ± (1.0%+0.1 Ω) |
| 50.0 ~ 99.5 Ω | 0.5 Ω | ± (1.5%+0.5 Ω) |
| 100 ~ 199 Ω | 1 Ω | ± (2%+1 Ω) |
| 200 ~ 395 Ω | 5 Ω | ± (5%+5 Ω) |
| 400 ~ 500 Ω | 10 Ω | ± (10%+10 Ω) |

| **Ground & Leakage Current** : Auto Ranging, 50/60Hz, RMS (4680SLC) | | |
|---|---|---|
| **Range** | **Resolution** | **Accuracy of Reading** |
| 0.00 ~ 9.95 mA | 0.05 mA | ± (2.5%+1 mA) |
| 10.0 mA ~ 99.0 mA | 0.1 mA | ± (2.5%+5 mA) |
| 100 mA ~ 299 mA | 1 mA | ± (2.5%+10 mA) |
| 0.30 A ~ 2.99 A | 0.01 A | ± (2.5%+0.1 A) |
| 3.0 A ~ 9.9 A | 0.1 A | ± (2.5%+0.3 A) |
| 10.0 A ~ 20 A | 0.1 A | ± (2.5%+0.5 A) |

# Clamp - On Earth / Ground Resistance & Leakage Current Tester (65 x 32mm Jaw)

JAW 65 mm


**4680BL, 4680BLC**

The faults in any Electrical System are unavoidable. Earthing plays an important role in Generation, Transmission & Distribution for safe and proper operation of any Electrical Installation. **MECO 4680BL/4680BLC Clamp-On Earth / Ground Resistance Tester** has long elliptical jaw suitable for flat as well as round earthing strips. It completely eliminates the use of ground and auxiliary rods thus saving lot of time and avoiding shutdown. Calibration check can be verified by using the Resistance Verification Plate provided. This is an extremely handy instrument especially at place where it is next to impossible to measure Earth / Ground Resistance by conventional methods. Substantial time saving and easy operating justify the investment in these instruments.

## Features

- Non Contact Ground Resistance Measurement
- No Auxillary Electrodes Needed
- Data Storing Memory
- Data Hold, Noise Signal
- Ground Resistance Measurement 0.01Ω ~1000Ω
- Suitable for Earthing Strip upto 65mm
- Suitable for Round Conductor upto 25mm Φ
- Leakage Current (0.5mA~30.00A) (Model 4680BLC)
- Auto Ranging
- Continuity Loop Test
- Auto Power Off

## General Specifications

| | | |
|---|---|---|
| **Jaw** | : | 65 x 32 mm (approx.) |
| **Conductor Size** | : | Upto 65 mm / 25 mm Φ |
| **Power** | : | Four 1.5V "AA" Battery |
| **Display** | : | 4 Digit 9999 counts LCD Back Light Display |
| **Range Selection** | : | Auto |
| **Memory** | : | 99 Sets |
| **Overload Indication** | : | OL |
| **Low Battery Indication** | : | − + |
| **Operating Environment** | : | -10°C ~ 55°C |
| **Dimensions** | : | 293 x 90 x 66 mm (approx) |
| **Weight** | : | 1250 gms Including Battery (approx) |
| **Accessories** | : | Resistance Verification Plate x 1, Battery 1.5V (AA) x 4 (Installed), User Manual x 1, Carry Bag x 1 |
| **Configurable Alarm** | : | Resistance : 1~199Ω<br>Current : 1~499mA |

## Electrical Specifications (23°C ± 5°C)

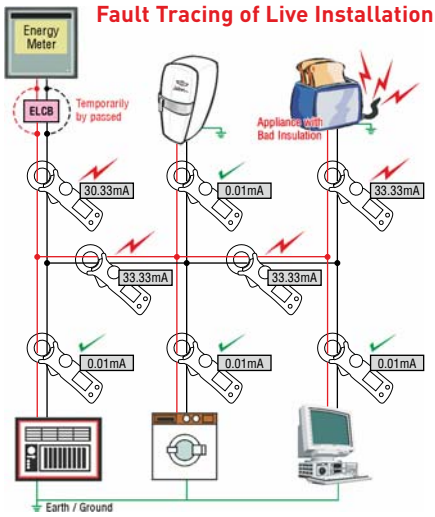
| **Ground Resistance (Auto Range)** (4680BL, 4680BLC) | | |
|---|---|---|
| **Range** | **Resolution** | **Accuracy of Reading** |
| 0.010 ~ 0.099 Ω | 0.001 Ω | ± (1%+0.01 Ω) |
| 0.10 ~ 0.99 Ω | 0.01 Ω | ± (1%+0.01 Ω) |
| 1.0 ~ 49.9 Ω | 0.1 Ω | ± (1.5%+0.1 Ω) |
| 50.0 ~ 99.5 Ω | 0.5 Ω | ± (2%+0.5 Ω) |
| 100 ~ 199 Ω | 1 Ω | ± (3%+1 Ω) |
| 200 ~ 395 Ω | 5 Ω | ± (6%+5 Ω) |
| 400 ~ 590 Ω | 10 Ω | ± (10%+10 Ω) |
| 600 ~ 1000 Ω | 20 Ω | ± (20%+20 Ω) |

| **Ground & Leakage Current** : Auto Ranging, 45/65Hz, RMS (4680BLC) | | |
|---|---|---|
| **Range** | **Resolution** | **Accuracy of Reading** |
| 0 ~ 80 mA | 0.05 mA | ± (2.5%+1 mA) |
| 80 mA ~ 650 mA | 0.5 mA | ± (2.5%+2 mA) |
| 650 mA ~ 4 A | 5 mA | ± (2.5%+10 mA) |
| 4 A ~ 30 A | 10 mA | ± (2.5%+20 mA) |

Resistance Verification Plate

Carry Bag

## Fault Tracing of Live Installation



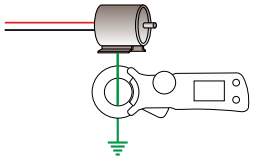

4671

4671A

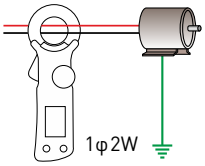
| | | |
|---|---|---|
| **Display** | 3¾ DIGIT 4000 COUNTS | 3½ DIGIT 1999 COUNTS |
| **Jaw Opening** | 30mm (Approx.) | 30mm (Approx.) |
| **AC Current** | **Range :** 40 / 400mA / 4 / 40 / 60A<br>**Resolution :**10 / 100µA / 1 / 10 / 100mA<br>**Accuracy : 50 / 60Hz**<br>±(1.0% rdg ± 3dgt) for 40mA to 40A<br>±(1.5% rdg ± 3dgt) for 60A (0~50A)<br>±(3.0% rdg ± 5dgt) for 60A (50~60A)<br>**Accuracy : (40Hz ~ 1KHz)**<br>±(2.0% rdg ± 5dgt) for 40mA to 40A<br>±(3.0% rdg ± 5dgt) for 60A (0~50A)<br>±(3.5% rdg ± 5dgt) for 60A (50~60A) | **Range :** 20 / 200mA / 2 / 60A<br>**Resolution :** 0.01 / 0.1mA / 0.001 / 0.1A<br>**Accuracy : 40Hz ~ 400Hz**<br>±(2.5% rdg ± 5dgt) for 20mA to 2A<br>±(3.0% rdg ± 8dgt) for 60A |
| **AC Voltage** | **Range :** 400V, **Resolution :** 0.1V<br>**Accuracy :** ±(1.5% rdg ± 2dgt) for 50 / 60Hz<br>±(2.0% rdg ± 4dgt) for 40 ~ 1KHz | **Range :** 600V, **Resolution :** 1V<br>**Accuracy :** ±(2.0% rdg ± 5dgt) for 40Hz ~ 400Hz |
| **DC Voltage** | - | **Range :** 600V DC , **Resolution :** 1V<br>**Accuracy :** ±(2.0%rdg ± 5dgt) |
| **Resistance And Continuity** | **Range :** 40 ~ 400Ω, Resolution : 0.1Ω<br>**Accuracy :** ±(1.0%rdg ± 2dgt), **Beeping :** <38.0Ω<br>**OL Protection :** 600V AC | - |
| **Frequency Response** | 40Hz ~ 1KHz | 40Hz ~ 400Hz |
| **Relative Measurement** | ✓ | - |
| **Data Hold** | ✓ | ✓ |
| **Max/ Min Hold** | ✓ | - |
| **Auto Power Off** | ✓ | ✓ |
| **Low Battery Indication** | ✓ | ✓ |
| **Sampling Time** | 3 Time/sec.(display), 30 Time / Sec (Bargraph) | 3 Time / Sec |
| **Power** | Two 1.5V 'AA' Battery | Two 1.5V 'AAA' Battery |
| **Operating Environment** | -10° to 50°C, RH < 85% | -10° to 50°C, RH < 85% |
| **Storage Environment** | -20° to 60°C, RH < 75% | -20° to 60°C, RH < 75% |
| **Altitude** | UP TO 2000M | UP TO 2000M |
| **Dimensions** | 210 x 72 x 36mm (Approx.) | 183 x 63 x 29mm (Approx.) |
| **Weight** | 210gms Including Battery (Approx.) | 160gms Including Battery (Approx.) |
| **Accessories** | Battery (Installed), Test Leads x 1 Pair, Carrying Case x 1, User Manual x 1 | Battery (Installed), Test Leads x 1 Pair, Carrying Case x 1, User Manual x 1 |

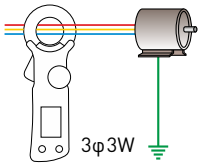
## Application

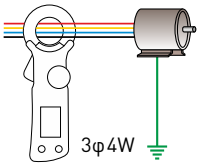
**AC Leakage Current of Earth / Ground**



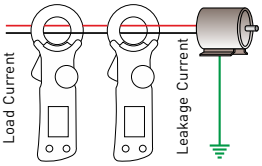
**Out of Balance Leakage Current**



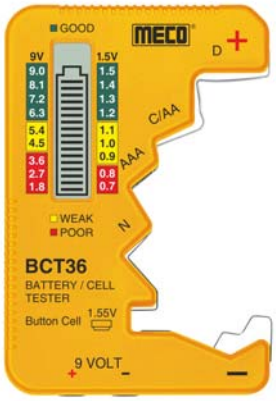




**AC Load Current**



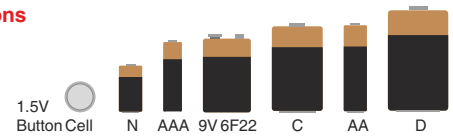

**NCVD-1000S**




**BCT36**

| | |
|---|---|
| **Functions** | Safe Non Contact Voltage Detection, Torch Light, Auto Power Off |
| **Voltage Range** | 90 ~ 1000V AC |
| **Frequency Range** | 50 ~ 60Hz |
| **Alarm Mode** | Bright RED LED with Audible Sound (Buzzer) |
| **Torch** | White LED Illumination |
| **NCV Sensitivity** | Fixed |
| **Measurement Category** | CAT III 1000V AC |
| **Power** | 1.5V AAA x 2 Batteries |
| **Auto Power Off** | 5 Min. (approx.) |
| **Dimension** | 148 x 26 x 18mm ( approx.) |
| **Weight** | 38gms ( approx.) Including Batteries |
| **Accessories** | 1.5V (AAA) x 2 Batteries, Blister |

## Applications




## Introduction

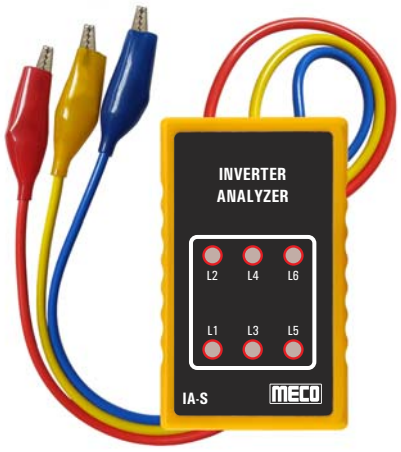
This compact Battery / Cell Tester checks the capacity condition of various type of batteries / cell i.e. Button Cell, N, AAA, 9V 6F22, C, AA, D etc. The Battery / Cell Tester helps to identify the WEAK and POOR batteries so that they can be weeded out from the system before they make the complete system unreliable.

The state of Battery / Cell is indicated on the tester display as Green "GOOD", Yellow "WEAK" and Red "POOR" directly.

## Battery / Cell Condition

| Indication | 1.5V Battery / Cell | 9V Battery |
|---|---|---|
| **GOOD** | 1.2V ~ 1.5V | 6.3V ~ 9V |
| **WEAK** | 0.9V ~ 1.1V | 4.5V ~ 5.4V |
| **POOR** | 0.7V ~ 0.8V | 1.8V ~ 3.6V |

| | |
|---|---|
| **Dimension** | 95 x 63 x 15mm ( approx.) |
| **Weight** | 30gms ( approx.) |




**IA-S**

## Features

- Helps to Diagnose Fault in Inverter Based Products
- 60 - 600V AC, 40 - 400Hz (Max. for 5 minutes)
- No Battery Required
- Rugged, Handy, Easy and Safe to Use
- Color Identified Test Probes with Insulated Crocodile Clips for R, Y, B Connections
- LED Based Instant Diagnosis

## Introduction

Inverter Analyzer is suitable to check all inverter products. It can be used to analyze the fault in Air Conditioners (AC's), Refrigerators etc. It helps to diagnose whether there is a Compressor failure or a PCB failure.

## Working

In case of a breakdown,

**Step 1 :** Turn the power off.

**Step 2 :** Remove the connections between the Compressor and PCB.

**Step 3 :** Check and ensure that the charged voltage of built-in smoothening electrolytic capacitor drops to < 10V DC or below while carrying out any service.

**Step 4 :** Connect Inverter Analyzer instead of Compressor by connecting the faston terminals of the PCB to the Crocodile Clips of the Inverter Analyzer (R, Y, B respectively). Be careful not to touch the Crocodile Clips (R, Y, B) with each other.

**Step 5 :** Turn the power on and operate the A.C. or Refrigerator.

**Step 6 (Diagnosis) :** When all LED's of the Inverter Analyzer are lit uniformly, it means the PCB is proper and Compressor is faulty. When any / all LED's are not uniformly lit, it means there is fault in the PCB.

**Step 7 :** On completion of diagnosis, be sure to switch off the power. Then remove the connections of the Crocodile Clips of the Inverter Analyzer. Re-connect the faston terminals of the PCB to Compressor firmly. Loose connections may lead to burning of the terminals.

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www.accoladeelectronics.com

24 DEC 2015

ACCOLADE®
ELECTRONICS PVT. LTD.
An ISO 9001:2008 Company

To,

21st December 2015.

**MECO METERS PRIVATE LTD.**

Plot No. EL-60, MIDC Electronic Zone, TTC Industrial

Area, Mahape, Navi Mumbai 400710. INDIA

**Subject: Customer appreciation letter.**

Dear Sir,

As one of your customers, we purchased a Universal Calibrator-90P from your company. We wanted to say thank you for the assistance you gave us in purchasing the product and training to our Technical Team. We can say that we are greatly satisfied with the Universal **Calibrator-90P** which we bought from your company.

Again, we wanted to let you know that we greatly appreciate the effort of your company especially your personal attention & your great customer service.

Thanking you,

Deepak Jagadale

Director

Accolade Electronics Pvt. Ltd.

Pune

Reg. Office : 19-20, Fly View, Near Fly Over, Warje, Pune - 411 058 (India).
Works : Ghare Complex, S. No. 78/1, Dangat Industrial Estate, Shivne, Pune - 411 023.

---

Phillips MACHINE TOOLS

Haas F1 Team

Date: 15.03.2022

To,
**Dr. Kamal Goliya - CEO**
**M/s. Meco Instruments Pvt. Ltd.**
Plot No. 1, MIDC Electronic Zone,
TTC Industrial Area, Mahape, Navi Mumbai – 400 710
Tel. No. 022 – 27673300

Dear Sir,

Sub Satisfactory Executions of Supply of MECO Testing Instruments against Purchase order No. PO-21-22-011442, 001443 dt. 07.08.2021 & PO 004512 Dt. 30.10.2021 for Karnataka Govt. ITI Projects with Tata Technologies Ltd.

Please refer our several above Purchase order for Supply of MECO Products against above mentioned projects. We are thank full to M/s. MECO Instruments for honouring timely delivery as per given schedule for all items.

We appreciate Mr. Haren Shah – Senior Marketing Executive for extending his excellent service during completion of order and providing / updating us time to time the proceeding in executing this order.

We look forward to have similar kind of service and support from your organization in our upcoming projects.

Thanking You,
Your Faithfully,
**For M/s. Phillips Machine Tools India Private Limited.**

**Mr. Shrikant Kumkar**
**Assistant Manager - Sales Support**

c.c.
**Mr. Haren Shah – Senior Marketing Executive**
Email : haren.shah@mecoinst.com & harenvshah@yahoo.com
Mobile No. : 9820093232

PHILLIPS MACHINE TOOLS INDIA PVT. LTD.
W-225, TTC Industrial Area, MIDC Khaime, Koparkhaime, Navi Mumbai - 400705. Maharashtra, India.
+022 6139 2800 | Email: support.india@phillipscorp.com | www.phillipscorp.com
CIN No.: U72200MH2008PTC186975

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TATA

28 NOV 2013

**TO WHOMSO EVER IT MAY CONCERNED**

We have purchased the Power and Harmonic Analyzer model PHA 5850 from Meco Instruments Pvt Ltd, Mumbai and the performance of the instrument during the energy audit was found to be excellent. I also appreciate the excellent service support provided by Mr Haren Shah during the last 2 years in formulating the Energy Audit reports and also software support in case of an emergency at the field.

I find the Analyzer PHA 5850 is a very cost effective and an efficient Electrical tool and is essential for an Energy auditor.

For Tata Global Beverages Ltd

Radhakrishnan Nair R
(Sr Manager- Engineering and Establishments)

Date 22.11.2013

TATA GLOBAL BEVERAGES LIMITED
Kirloskar Business Park Block C 3rd & 4th Floor Hebbal Bengaluru 560 024
Tel 91 80 67171200 Fax 91 80 67171201
Registered Office 1 Bishop Lefroy Road Kolkata 700 020

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NO RELIGION IS GREATER THAN TRUTH

**MAHATMA EDUCATION SOCIETY**

Dr. K. M. Vasudevan Pillai's Campus, 10, Sector 16, New Panvel - 410 206.
Tel : 2745 1700 / 2745 6100 / Fax : 9122 2748 3208 website : www.vpillaiscampus.ac.in

**TO WHOMSO EVER IT MAY CONCERNED**

We have purchased the Power and Harmonic Analyzer model PHA-5850 B from MECO Meters Pvt. Ltd, Navi Mumbai and the performance of the instrument during the energy audit was found to be excellent.

I also appreciate the excellent service support provided by Mr.Haren Shah during the last one year in formulating the Energy Audit report and also software support in case of an emergency at the field.

I find the Analyzer PHA 5850B is a very cost effective and an efficient Electrical tool and is useful for an Energy auditor.

For Mahatma Education Society,

M .V . Padmanabhan

FIE(I),Sr.M.IEEE(USA)

Consultant(Electrical System)

Dt.26thNov.2013.

Regd. Office : Chembur Naka, Mumbai - 400 071. Tel : 2522 4856 / 2522 8414 Fax : 91 22 2522 9587
email : vpillai@glasbm01.vsnl.net.in

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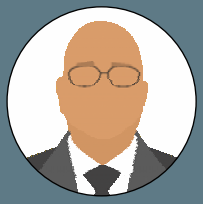
## Automotive and Battery Capacity Testers / Meters

- ✓ Battery (Load) Testers (Digital)
- ✓ Vehicle Battery System Meters
- ✓ Multifunction Automotive Meter
- ✓ Digital Automotive Multimeter
- ✓ Battery Capacity (Impedence) Testers



+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable


DBM72


MBM27

## Features

- 80A Discharge Current Load Test for 6V / 12V (40Ah ~ 200Ah) Lead Acid and Li-ion Battery
- Built-In 10 Seconds Timer to Auto Cut-off Load After Test
- Temperature Rise is Controlled (for Circuit Protection)
- Two Way Internal Resistance Measurement (Load Test Method & 4-Wires Method)
- Auto Data Hold

| Specifications | Range |
|---|---|
| Battery Type | Lead Acid & Li-ion Battery |
| Battery Voltage | 6V / 12V DC |
| Battery Capacity | 40 Ah ~ 200Ah |
| Battery Load Test Current | 80A |
| Load Test Time Control Timer | <10 Seconds |
| Battery Drop Voltage in Load Test | ✓ |
| Temperature Control in Load Test | ✓ |
| Battery Internal Resistance by Load Test | Dropped Voltage |
| Battery Internal Resistance by 4 - Wires Test | 0 ~ 99mΩ ±5% |
| Battery Conclusion by Load Test or by 4 - Wires Test | GOOD / WEAK / BAD |
| Reverse Polarity Protection | ✓ |
| Detect and Display Bad Cell | ✓ |
| Missing Lead Detection | ✓ |
| Overload Protection of Input Voltage | ✓ |
| Safety Standard | CAT I 48V |
| Cable Length | 300mm (approx.) |
| Dimension | 205 x 115 x 70mm (approx.) |
| Weight | 900g (approx.) |

## Features

- Key Parameters Measured for Diagnosis of Motorcycle / Two Wheeler Vehicle Battery and Electrical System.
- 12V (3 to 20Ah) Lead Acid Wet and Dry Charged Batteries of Motorcycle and Two Wheelers.
- Three Testing References by Battery Type (Wet Charged Battery), CCA Rating (Dry Charged Battery) and Ah Rating (General Purpose Cracking Battery).
- Display of Battery Condition [Good / Caution / Replace].
- Reverse Polarity Protection and Overload Voltage Protection to ensure Operator Safety.

| Specifications | Range |
|---|---|
| Battery Test | ✓ |
| Engine Cranking Load Test | ✓ |
| Charging System Test | ✓ |
| CCA Range | 100 ~ 1000 |
| Ah Range | 3 ~ 20Ah (not continuous) |
| State of Charge (SOC) | 0 ~ 100% |
| State of Health (SOH) | 0 ~ 100% |
| Voltage Range | 9 ~ 16V ± 3% |
| Internal Resistance | 0 - 99mΩ ± 5% |
| Display Battery Internal Resistance | Milli Ohms |
| Display Battery Voltage | Volts |
| Display Battery Condition | Good / Caution / Replace |
| Test 12V Batteries | ✓ |
| Battery Recharge Indication | ✓ |
| Reverse Polarity Protection | ✓ |
| Detect and Display Bad Cell | ✓ |
| Loose Lead Detection | ✓ |
| Overload Protection of Input Voltage | ✓ |
| Cable Length | 700mm (approx.) |
| Dimension | 146 x 82 x 25mm (approx.) |
| Weight | 266g (approx.) |


**VBSM6129B+**


**VBSM6246**


**VBSM6246P**

## Features

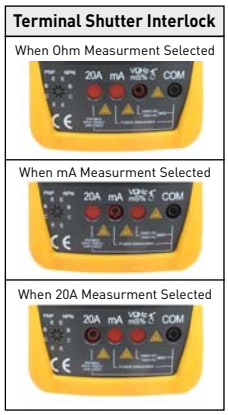
- Key Parameters Measured for Diagnosis of Vehicle Battery & Electrical System
- Overload Protection to ensure Operator Safety
- Loose Lead Detection
- Reverse Polarity Protection
- Internal Unit Conversion CCA / IEC / EN / DIN
- Battery Recharge Indicator, Detects and Displays Bad Cell and Overload Protection of Input Voltage

| Specifications | VBSM6129B+ | VBSM6246 | VBSM6246P |
|---|---|---|---|
| Battery Test | ✓ | ✓ | ✓ |
| Engine Activation Load Test | ✓ | ✓ | ✓ |
| Maximum Load Test | ✓ | ✓ | ✓ |
| Charging System Test | ✓ | ✓ | ✓ |
| CCA & EN Range | 100 ~ 1700 | 100 ~ 1700 | 100 ~ 1700 |
| IEC & DIN Range | 100 ~ 1000 | 100 ~ 1000 | 100 ~ 1000 |
| State of Charge (SOC) | 0 ~ 100% | - | - |
| State of Health (SOH) | 0 ~ 100% | 0 ~ 100% | 0 ~ 100% |
| JIS Range | Refer Table in Instruction Manual | Refer Table in Instruction Manual | Refer Table in Instruction Manual |
| Ah Range | 3 ~ 250Ah | - | - |
| Display Battery Internal Resistance | 0 ~99 Milli Ohms (±5%) | 0 ~99 Milli Ohms (±5%) | 0 ~99 Milli Ohms (±5%) |
| Display Battery Voltage | Volts | Volts | Volts |
| Display Battery Condition | Good / OK / Pay Attention / Replace | Good / OK / Pay Attention / Replace | Good / OK / Pay Attention / Replace |
| Thermal Printer | - | - | ✓ |
| Test Batteries | 12V | 12V / 24V | 12V / 24V |
| Battery Recharge Indication | ✓ | ✓ | ✓ |
| Reverse Polarity Protection | ✓ | ✓ | ✓ |
| Detect and Display Bad Cell | ✓ | ✓ | ✓ |
| Loose Lead Detection | ✓ | ✓ | ✓ |
| Internal Unit Conversion EN, IEC, DIN | ✓ | ✓ | ✓ |
| Overload Protection of Input Voltage | ✓ | ✓ | ✓ |
| LCD with Backlight | ✓ | ✓ | ✓ |
| Safety Standard | CAT III 600V | CAT III 600V | CAT III 600V |
| Cable Length | 700mm (approx.) | 700mm (approx.) | 700mm (approx.) |
| Dimension | 125 x 70 x 34mm (approx.) | 180 x 90 x 32mm (approx.) | 235 x 90 x 50mm (approx.) |
| Weight | 400g (approx.) | 400g (approx.) | 450g (approx.) |

User Changable Pinpoint or Hook Test Leads

MAM6138


LCD Screen



6255

## Features

- 3 in 1 Automotive Auto Ranging DMM, Power Probe & Logic Probe
- Pen Type Design Perfect for Automotive Diagnosis
- Hands - Free Test Leads for Excellent Convenience
- Flashlight for Operation of Automotive Diagnosis
- Auto Range, Auto Power Off, Low Battery Warning & Data Hold

| Specification | Range | Accuracy |
|---|---|---|
| **VDC** | 200mV / 2V / 20V / 200V / 600V | ± (0.5% + 5) |
| **VAC** | 2V / 20V / 200V / 600V | ± (1.2% + 5) |
| **Resistance** | 200 / 2000 / 20K / 200K / 2M / 20MΩ | ± (0.8% + 5) |
| **Continuity Buzzer & Diode** | ✓ | NA |
| **Logic Test** | 6V / 12V / 24V | |
| **Test Lighter (Bulb Style Circuit Tester)** | 12V / 24V | |
| **Flash Light, Data Hold, Auto Power Off** | ✓ | |
| **Auto & Manual Range, Low Battery Warning** | ✓ | |
| **Power Source** | 1.5V AA x 2 | |
| **Max. Display** | 1999 | |
| **Dimension** | 210 x 60 x 32mm (approx.) | |
| **Weight** | 240g (approx.) | |

**DMM Mode**

**Logic Probe Mode**

**Test Light Mode**

**Flash Light**

## Features

- Terminal Shutter Interlock Mechanism Prevents Wrong Opertions
- 11 Functions
- Heavy Duty Rubber Holster
- Data Hold, Auto Power Off
- Measurement of Duty, Ignition Frequency, Ms-Pulse Width, RPM & DWELL

| Specifications | Range | Accuracy |
|---|---|---|
| **Ignition Frequency** | 0.1Hz ~ 20KHz | ± (1.5% + 10) |
| **Pulse Width** | 0.1 ~ 999.9ms | ± (1.5% + 10) |
| **RPM** | 2STR : 300 ~ 19999 rpm | ± (3% + 5) |
| | 4STR : 600 ~ 19999 rpm | |
| **DC V** | 20V / 200V | ± (0.5% + 3) |
| | 1000V | ± (0.8% + 3) |
| **AC V** | 20V / 200V | ± (1% + 5) |
| | 700V | ± (1.2% + 5) |
| **DC A** | 20mA / 200mA | ± (1.5% + 5) |
| | 20A | ± (2% + 10) |
| **AC A** | 20mA / 200mA | ± (2% + 5) |
| | 20A | ± (3% + 10) |
| **Resistance** | 200Ω | ± (1% + 5) |
| | 2K / 20K / 200K / 2M | ± (1% + 1) |
| **Frequency** | 2KHz / 20KHz | ± (1.5% + 10) |
| **Temperature** | -40 ~ 0°C | ± (5% + 5) |
| | 0 ~ 400°C | ± (1% + 3) |
| | 400 ~1000°C | ± (2% + 3) |
| **DUTY** | 0.1% ~ 99.9% | NA |
| **DWELL** | 1 / 2 / 3 / 4 / 5 / 6 / 8 | ± (3% + 5) |
| **Continuity Buzzer** | ✓ | NA |
| **Diode Test** | ✓ | |
| **Transistor Test** | ✓ | |
| **Power Source** | 9V Battery | |
| **Dimension** | 200 x 85 x 38 mm (approx.) | |
| **Weight** | 800g (approx.) | |

## What is Internal Resistance of Battery?

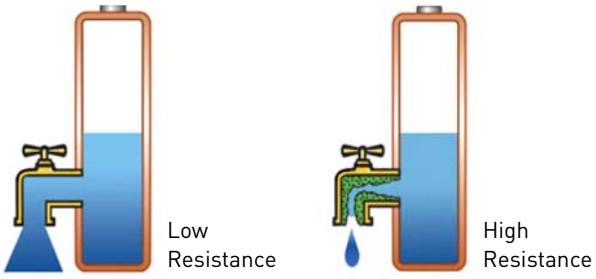
One of the basic requirements of a battery for digital applications is low internal resistance. Measured in milliohms, the internal resistance is the gatekeeper that, to a large extent, determines the runtime. The lower the resistance, the less restriction the battery encounters in delivering the needed power. The internal resistance (IR) of a battery is defined as the opposition to the flow of current within the battery. There are two basic components that impact the internal resistance of a battery; they are electronic resistance and ionic resistance. The electronic resistance plus the ionic resistance will be referred to as the total effective resistance.

## How does Internal Resistance affect Performance?

Storage batteries are repeatedly charged and discharged over a long interval. This tends to gradually deteriorate the battery performance and the internal resistance increases until charging is no longer possible. Faults may also be caused by internal short-circuits, reducing the battery voltage, making the battery over-heat or in the case of a short-circuit caused by corrosion, possibly even leading to a fire.

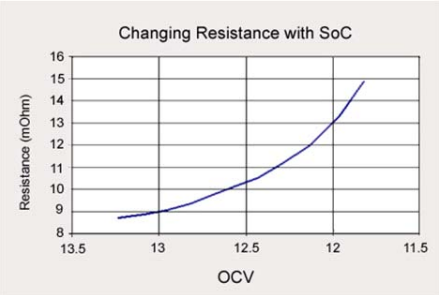
A high mW reading can trigger an early 'low battery' indication on a seemingly good battery because the available energy cannot be delivered in the required demand and remains inside the battery.

The internal resistance of a battery is dependent on the specific battery's size, chemical properties, age, temperature and the discharge current.




**Effects of internal battery resistance**

A battery with low internal resistance delivers current to the equipment (Load) as per requirement. High internal resistance causes battery voltage to drop. Because of drop in voltage, current flowing to the equipment (Load) gets cut-off leaving energy in the battery.




**Typical internal resistance readings of a lead acid battery**

The readings were taken at open circuit voltage (OCV).

## MECO Battery Capacity Tester

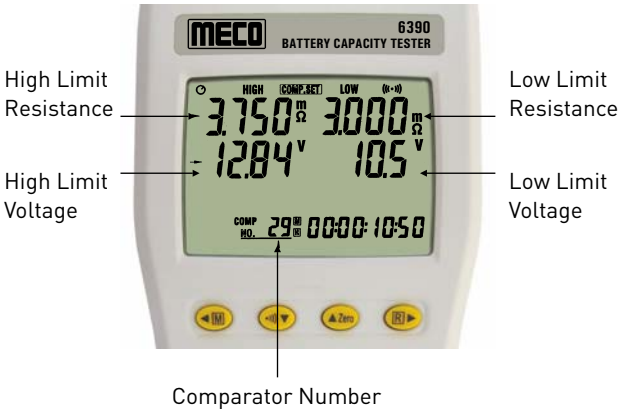
In the modern age with the increase in various portable devices, maintenance of batteries has become crucial as the performance of these devices depend on life of batteries. Because of continues charging and discharging of batteries their performance gradually deteriorates until charging is no longer possible which may result in sudden failure of the system.

MECO Batter Capacity Testers can give quick results on the state of a battery either as PASS, WARNING or FAIL which is based on comparator settings of internal resistance and the voltage for various batteries. MECO Battery Capacity Testers can check all types of batteries including Nickel-Metal Hydride batteries (NiMH), Nickel Cadmium batteries (NiCd), Lithium-Ion batteries (Li-ion), Alkaline batteries and Lead-Acid batteries. Users can choose from 2 models to suit their applications : Battery Capacity Tester Model 6363 for testing batteries upto 40V and 500Ah and Battery Capacity Tester Model 6390 for testing batteries upto 60V and 1200Ah.

The analysis of batteries state is PASS / WARNING / FAIL based on a six-way combination of comparisons against upper and lower limits of Internal Resistance and Voltage threshold. This result is then indicated by LEDs and a Beeper.

## Comparator Table

| Resistance / Voltage | Low Limit Resistance ↓ Lo | Middle | High Limit Resistance ↓ Hi |
|---|---|---|---|
| **Voltage ..... Lo** | WARNING Beeper | WARNING Beeper | FAIL Beeper |
| **Comparison →** | PASS | WARNING Beeper | FAIL Beeper |
| **Value .....Hi** | | | |




## Applications (For 6363 & 6390)

For Manufacturers, R & D Units, Service Centers, Technicians, Dealers & Service Excutives in following industries

- Battery
- UPS
- Automobile
- Emergency Power Backup
- Solar Energy
- Wind Energy
- Lift
- Crane & forklift
- IT
- Telecom
- Aircraft
- Railways


BCM 6300

## Features

- Right Device to Know the TRUE-LIFE of Battery Capacity (Internal Resistance / Voltage & Temperature) Simultaneously Measured
- 4 Wire Kelvin measurement
- On-line Testing without shutting down battery
- Auto Ranging
- Large LCD with backlight
- Built-in Comparator Function
- Rates Condition as PASS, WARNING or FAIL
- Compact and Lightweight
- Auto Power Off
- Data Hold and Low Battery Indication

## Specifications

| | |
|---|---|
| **Battery Types Tested** | Lithium Batteries, Nickel-Cadmium Batteries, Lead-Acid Batteries, Alkline batteries or other types of Batteries etc. |
| **Resistance** | **Ranges :** 19.999mΩ, 199.99mΩ, 1.9999Ω, 19.999Ω and 199.99Ω (Auto Ranging)<br>**Resolution :** 1μΩ, 10μΩ, 100μΩ, 1mΩ and 10mΩ<br>**Accuracy :** ± (0.8% + 10 dgt) on all ranges except ± (1% + 10 dgt) for 19.999mΩ |
| **Measurement Condition** | **Current :** 50mA, 5mA, 500μA and 50μA<br>**Frequency:** 1KHz AC ± 10% |
| **Voltage** | **Measurement :** ± 0.000V to 99.999V AC<br>**Resolution :** 1mV DC<br>**Accuracy :** ± (0.5% rdg + 5 dgt)<br>**Maximum Display Value :** ± 99.999V DC |
| **Ambient Temperature Measurment** | **Range :** -10°C to 50°C<br>**Resolution :** 0.1°C<br>**Accuracy :** ±1.5°C<br>**Maximum Display Value :** 50.0°C |
| **Measurment Speed** | 3 Times / Second |
| **Open Circuit Terminal Voltage (AC)** | ⩽ $2.5V_{pp}$ |
| **Comparator Settings** | Resistance High and Low Limits and Voltage Throughold Point |
| **Number of Comparator Settings** | 30 Sets |
| **Operating Environment** | 0°C to 40°C (32°F to 104°F1, 80% RH or Less, Non-Condensing |
| **Storage Environment** | -10°C to 50°C (10°F to 122°F1, 80% RH or Less, Non-Condensing |
| **Maximum Input Voltage** | 100V DC |
| **Power Supply** | Six 1.5V "AA" Size Batteries |
| **Battery Life** | 9 Hours (approx.) |
| **Dimensions** | 175 x 40 x 105 mm (approx.) |
| **Weight** | 490gms Including Batteries (approx.) |
| **Accessories** | Kelvin Four Wire Test Lead x 1 Pair, Kelvin Four Wire Pin Type Test Lead x 1 Pair, Kelvin Four Wire Big Alligator Test Lead x 1 Pair, Test Jig For Alkaline Batteries x 1 pc, Batteries (installed) and User Manual x 1 |

Product Kit



6363

Top Connections


Software Window

## Features

- Memory & Read Function
- Right Device to know the TRUE-LIFE of Battery Capacity (Resistance / Voltage) Simultaneously Measure
- On-line Testing without shutting down battery
- Built-in Comparator Function
- Rates Conditions as PASS, WARNING or FAIL
- Datalogging Memory Function
- Compact and Lightweight
- USB Interface & Software
- Auto Power Off

## Specifications

| | |
|---|---|
| **Battery Types Tested** | **UPS Battery, Motor Cycle** (6V/12V : 2 ~ 20Ah), **Car** (12V : 21 ~ 80Ah), **Truck** (12V : 83 ~ 160Ah) **Household Appliances** [(9V : upto 625mAh), (AA : upto 2850mAh), (AAA : upto 1250mAh), (C : upto 8350mAh), (D : upto 20500mAh)], **Lithium Notebook Battery** [(14.8V : 3600 ~ 4800mAh), (11.1V : 3600 ~ 7200mAh)], **Lithium Digital Camera Battery** (3.7V : 650 ~ 1350mAh), **Lithium Cordless Phone Battery** (3.7V : 800 ~ 1250mAh), |
| **Battery Capacity** | 0 to 500Ah |
| **Resistance** | **Ranges :** 40mΩ, 400mΩ, 4Ω, 40Ω<br>**Resolution :** 10μΩ, 100μΩ, 1mΩ, 10mΩ<br>**Accuracy :** ± (1% rdg + 10 dgt) on all Ranges |
| **Measurement Condition** | **Current :** 25mA, 2.5mA, 250μA, 25μA<br>**Frequency:** 1KHz ± 10% |
| **Voltage** | **Measurement :** 4V, 40V<br>**Resolution :** 1mV, 10mV<br>**Accuracy :** ± (0.1% rdg + 6 dgt) |
| **Open Circuit Terminal Voltage** | ≤ $3.5V_{pp}$ |
| **Manual Data Logging** | 500 Sets |
| **Continuous Data Logging** | 9600 Sets |
| **Comparator Settings** | Resistance High and Low Limits and Voltage Throughold Point |
| **Number of Comparator Settings** | 99 Sets |
| **Operating Environment** | 0°C to 40°C (32°F to 104°F1, 80% RH or Less, Non-Condensing |
| **Maximum Input Voltage** | 50V DC |
| **Power Supply** | Six 1.5V "AA" Size Batteries |
| **Battery Life** | 7 Hours |
| **Dimensions** | 250 x 100 x 45 mm (approx.) |
| **Weight** | 490gms Including Batteries (approx.) |
| **Accessories** | Instruction Manual x 1, Batteries (installed), Test Probe (Alligator Clips) x 1, USB Cable x 1, Software Disk x 1, Carrying Bag x 1 |

# Battery Capacity (Impedence) Tester with DC Current Adaptor for Batteries upto 1200Ah

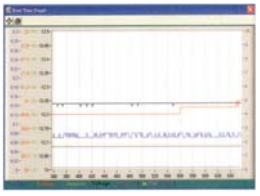

DC Current Adaptor

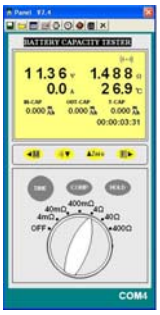

6390

## Features

- Right Device to know the TRUE-LIFE of Battery Capacity (Resistance / Voltage / Current & Temperature) Simultaneously
- Measure battery charge / discharge capacity (Ah)
- Measure battery State of Charge SOC (%)
- On-line Testing without shutting down battery
- Built-in Comparator Function
- Rates Conditions as PASS, WARNING or FAIL
- Auto Datalogging (Micro SD Card) upto 99 blocks
- Compact and lightweight
- USB Interface & Software
- Load Test Analysis (Charge / Discharge)
- Auto-Hold & Auto-Data Storage
- Wide Range 0 ~1200 Ah
- Auto Power Off
- Memory & Read Function

Software Window






## Specifications

| | |
|---|---|
| **Battery Types Tested** | **UPS Battery, Motor Cycle** (6V/12V : 2 ~ 20Ah), **Car** (12V : 21 ~ 80Ah), **Truck** (12V : 83 ~ 160Ah) **Household Appliances** [(9V : upto 625mAh), (AA : upto 2850mAh), (AAA : upto 1250mAh), (C : upto 8350mAh), (D : upto 20500mAh)], **Lithium Notebook Battery** [(14.8V : 3600 ~ 4800mAh), (11.1V : 3600 ~ 7200mAh)], **Lithium Digital Camera Battery** (3.7V : 650 ~ 1350mAh), **Lithium Cordless Phone Battery** (3.7V : 800 ~ 1250mAh), |
| **Battery Capacity** | 0 to 1200Ah |
| **Resistance** | **Ranges :** 4mΩ, 40mΩ, 400mΩ, 4Ω, 40Ω, 400Ω<br>**Resolution :** 1μΩ, 10μΩ, 100μΩ, 1mΩ, 10mΩ, 100mΩ<br>**Accuracy :** ± (0.8% rdg + 6 dgt) on all Ranges except ± (3% rdg + 20 dgt) on 4mΩ |
| **Measurement Condition** | **Current :** Approx.40mA, 4mA, 400μA, 40μA, 4μA<br>**Frequency:** 1KHz ± 30Hz |
| **DC Voltage** | **Range :** 6V, 60V; **Resolution :** 1mV, 10mV; **Accuracy :** ± (0.1% rdg + 6 dgt) |
| **Temperature** | **Range :** -20°C to 60°C (-4°F to 140°F); **Resolution :** 0.1°C / 0.1°F; **Accuracy :** ± (1°C/±1.8°F) |
| **DC Current** | **Range :** 600V; **Resolution :** 0.1A; **Accuracy :** ± (2% rdg + 2 dgt) |
| **Open Circuit Voltage** | 5V Max. |
| **Data Logging** | **Manual Datalogging :** 999 Sets (Can be read by Meter & Download by PC)<br>**Auto Datalogging :** Micro SD card (Max. 99 Blocks) |
| **Comparator** | **Setting :** Resistance Upper and Lower Limits and Voltage (Threshold) Upper and Lower Limit<br>**Memory :** 99 Sets of Values |
| **Operating Environment** | 0°C to 40°C (32°F to 104°F1, 80% RH or Less, Non-Condensing |
| **Power Supply** | Six 1.5V "AA" Size Alkaline Batteries |
| **Battery Life** | 5.5 Hours |
| **Standard** | IEC 61010-1, 1000V Insulation CAT III, Pollution Degree 2 |
| **Dimensions** | 198 x 94 x 49 mm (approx.) |
| **Weight** | 530 gms Including Battery (approx.) |
| **Accessories** | Alligator Clip Type Test Lead with Temperature Sensor x1, Pin Type Test Lead x 1, DC Current Adaptor x 1, Zero Adjustment Board x 1, Instruction Manual x 1, AA 1.5V Batteries x 6, AC Adaptor x 1, Micro SD Card (installed) x 1, USB Cable x 1, PC Software Disk x 1 & Carring Bag x 1 |

### Resistance Measurement

| Range | Resolution | Measurement Current | Accuracy |
|---|---|---|---|
| 4mΩ | 1μΩ | 40mA approx. | ± (3% rdg ± 20 dgt) |
| 40mΩ | 10μΩ | 40mA approx. | ± (0.8% rdg ± 6 dgt) |
| 400mΩ | 100μΩ | 4mA approx. | |
| 4Ω | 1mΩ | 400μA approx. | |
| 40Ω | 10mΩ | 40μA approx. | |
| 400Ω | 100mΩ | 4μA approx. | |

Measuring Current Frequency : 1KHz ± 30Hz

### Voltage Measurement

| Range | Resolution | Accuracy |
|---|---|---|
| 6V | 1mV | ± (0.1% rdg ± 6 dgt) |
| 60V | 10mV | |

Maximum Input Voltage : 60VDC maximum. No AC Voltage Input.

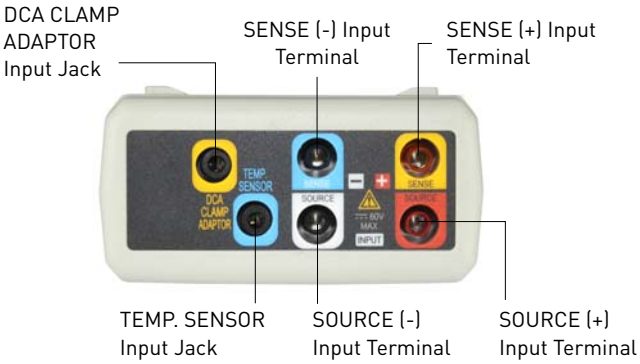
### Temperature Measurement

| Range | Resolution | Accuracy |
|---|---|---|
| -20°C to 60°C | 0.1°C | ± 1.0°C |
| -4°F to 140°F | 0.1°F | ± 1.8°F |

### DC Current Measurement

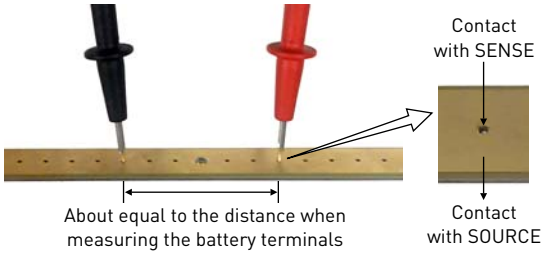
| Range | Sensitivity | Resolution | Accuracy |
|---|---|---|---|
| 600A | 0.6A ~ 600.0A | 0.1A | ± (2.0% rdg ± 2 dgts) |

### Input Terminals

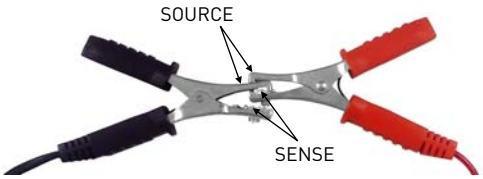



### Usage

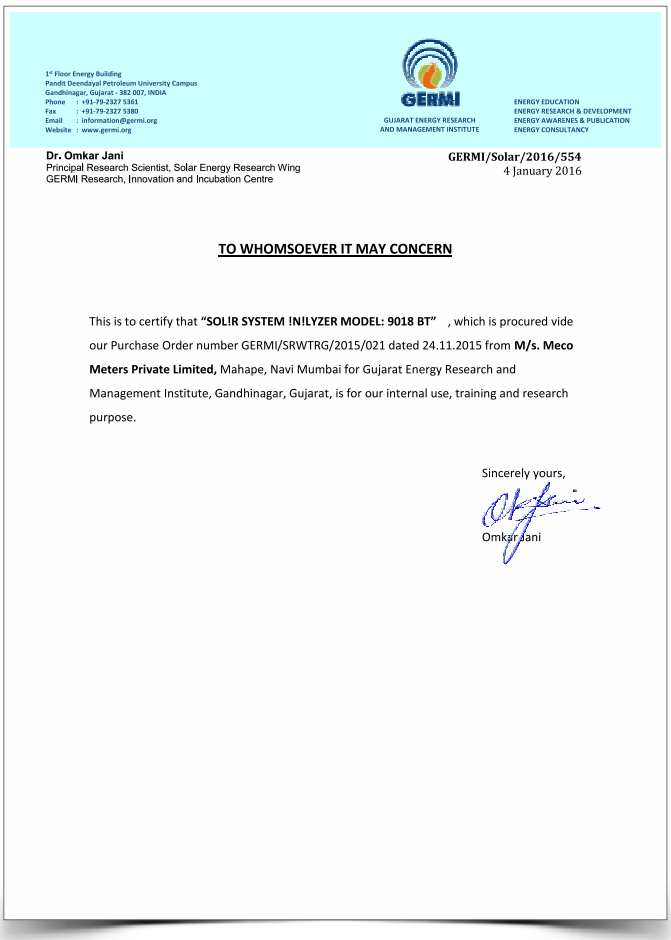
### Zero Adjustment Using Pin Type Test Lead




### Zero Adjustment Using Clip Type Test Lead




### Product Kit



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ENERGY CONSULTANCY

**Dr. Omkar Jani**
Principal Research Scientist, Solar Energy Research Wing
GERMI Research, Innovation and Incubation Centre

**GERMI/Solar/2016/554**
4 January 2016

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that **"SOLIR SYSTEM !N!LYZER MODEL: 9018 BT"** , which is procured vide our Purchase Order number GERMI/SRWTRG/2015/021 dated 24.11.2015 from **M/s. Meco Meters Private Limited,** Mahape, Navi Mumbai for Gujarat Energy Research and Management Institute, Gandhinagar, Gujarat, is for our internal use, training and research purpose.

Sincerely yours,

Omkar Jani

CREDA
CHHATTISGARH STATE RENEWABLE ENERGY DEVELOPMENT AGENCY
(Dept. of Energy, Govt. of Chhattisgarh)
2nd Floor, CSERC Building, Shanti Nagar, RAIPUR (C.G.)
Tel.: +91-771-4019230, 4019231, 4019227, 4019228, Fax: 0771-4268389
E-mail: info@creda.in Website: www.creda.in

CREDA/EC/F-8D/SJ/14624

Raipur, Date: 30 DEC 2015

**TO WHOMESOEVER IT MAY CONCERN**

It gives us immense pleasure & satisfaction to put on record our appreciation for M/s. Meco Meters Pvt. Ltd., Navi Mumbai from whom we had purchased "Battery Capacity Tester" model No.-6363.

The performance of the instrument found to be satisfactory & excellent during the field inspection & testing of lead acid battery of the solar photovoltaic plant.

We also express our appreciation to the team of M/s. Meco Meters Pvt. Ltd. for their excellent service support to CREDA.

I find the "Battery Capacity Tester" is very effective as well as essential electrical measuring instrument for testing & inspection of battery in solar photovoltaic plant.

Date: 30.12.2015
Place: Raipur

(Sanjeev Jain)
Chief Engineer, CREDA

*CREDA - Energetic agency with ever lasting energy sources*

Save Power. Save India. Arzoo Energy by Kushal Group

Date : 17.01.2023

To
**Mr. Haren Shah – Senior Marketing Executive**
**M/s. MECO METERS PVT. LTD.**
Mahape, Navi Mumbai.
Maharashtra

Dear Sir,

Hope all Fine at your side.

We are using MECO Power & Harmonics Aanalyzer Model PHA 5850-B since many years. The Analyzer is working to our satisfaction without any issue till date.

We have witness Testing with PHA5850 the monitoring, data logging, downloading data to prepare the reports are seems to be key features of this analyzer. Purpose of procuring this analyzer is served to our satisfaction.

We thanks and appreciate Mr. Haren Shah for extending timely technical support as and when require. Hope the support service will continue from MECO in future also.

Also to be noted that we are able to conduct the Energy Study /Audit with MECO PHA 5850 time to time as it is given with user friendly software.

Thanking you in advance
Yours faithfully

Arzoo Energy .....

c.c. For Information :

Mr. Haren Shah – Senior Ma

Arzoo Energy (I) Pvt. Ltd.
301, 3rd Floor, Parasmani Tower, 95 M.M.G.S. Marg, Near Dadar Station, Dadar (E), Mumbai - 400014
Tel: 022 - 2417 2663 / 9867711509 • Web: www.arzooenergy.in • Email:info@arzooenergy.in

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E-mail service.acis@gmail.com

**APPRECIATION LETTER**

16th-Dec-2015.

**To Whomsoever It May Concern**

We Have Purchased the Universal Calibrator Model No.90A From **Meco Instruments Pvt. Ltd.** Mahape Navi Mumbai. The performance of the Instrument during calibration from IDEMI Mumbai was found within claimed accuracy from Meco.

The Instrument is user friendly. We are thanking to Meco Instruments to Support us for growing our calibration Laboratories.

We hope to have similar support from your organization in future also. So it will strengthen our business relations.

For :-
Accutech Calibration & Instrument Solution.

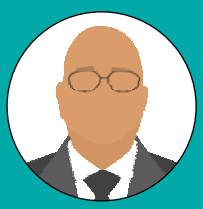
Name: Sainath [illegible]
Managing Partner

MECO®

SINCE 1962

## Solar Analyzers

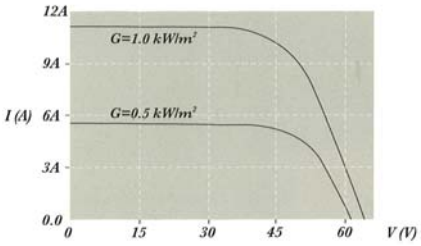
- ✓ Solar Module Analyzer
- ✓ Solar Power Meter

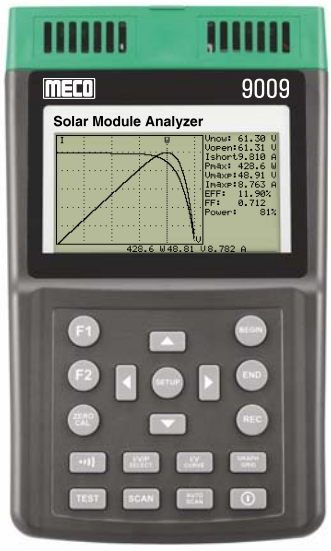


+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable

**IV-Curve**




**9009**

**Solar Cell**

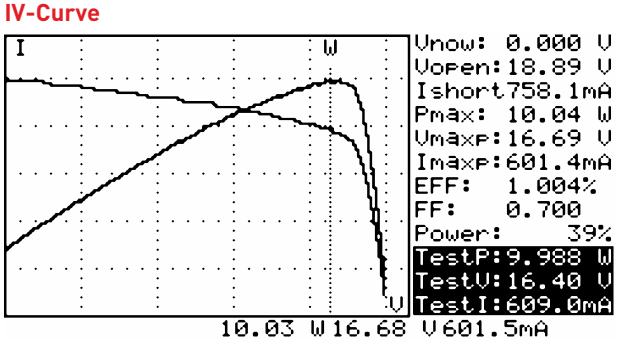
**Solar Panels**

MECO Solar Module Analyzer Model 9009 is a portable analyzer used for testing, maintenance and finding efficiency of various parameters of solar panels and cells. Analyzer can be used to design Solar System to generate specific power. It can identify Solar Power System requirement, best angle of Solar Panel installation and Broken / Worn-out cells

## Features

- I-V Curve Test for Solar Panel / Module / Cell
- Max. Solar Panel / Module / Cell Power (Pmax) search by Auto-Scan : 60V, 12A (500W Capability)
- Best Resolution : 1mV, 1mA
- Manual Single Point I-V Test
- Max. Voltage (Vmaxp) at Pmax
- Max. Current (Imaxp) at Pmax
- Voltage at Open Circuit (Vopen)
- Current at Short Circuit (Ishort)
- I-V Curve with Cursor to Display each Data Point
- Efficiency (%) Calculation of Solar Panel
- Solar Panel Area Setting : 0.001 $m^2$ ~ 9999 $m^2$
- Standard Light Source Setting : 10 $W/m^2$ ~ 1000 $W/m^2$
- Communicate with PC via USB Cable
- AC Adaptor and Rechargeable Lithium Battery
- Memory Size : 100 Records
- Sampling Time of Data Logging : 0 ~ 99 min.
- Large LCD with Backlight

## IV-Curve




## General Specifications

| | |
|---|---|
| **Battery Type** | Rechargeable Lithium Battery, 3400mAh |
| **Battery Life** | 400 times of linear scan from 60V to 0V and 0A to 12A. |
| **Data Logging Memory Size** | 100 records |
| **AC Adaptor** | AC 110 ~ 240V Input, DC 15V / 1 ~ 3A Output |
| **Standards** | EN 61326 - 1:2013<br>EN 61010 - 1:2010<br>CAT I 60V<br>Pollution Degree 2 |
| **Operation Environment** | 5°C ~ 50°C, <85% RH |
| **Temperature Coefficient** | 0.1% of full scale / °C(<18°C or >28°C) |
| **Storage Environment** | -20°C ~ 60°C, <75% RH |
| **Dimension** | 257 x 155 x 57mm (approx.) |
| **Weight** | 1160gms Including Battery (approx.) |
| **Accessories** | User Manual x 1, AC Adaptor x 1,<br>Optical USB Cable x 1,<br>Rechargeable Lithium Battery (installed) x 1,<br>Software CD x 1, Software Manual x 1,<br>Kelvin Clips (12A max) x 1 Set,<br>4 Wire to 2 Wire Connector (10A Max and 12A for 1minute) x 1 set,<br>Carrying Bag x 1 |

**Electrical Specifications** (23°C ± 5°C, Four-Wire Measurement Maximum Power Limit is 500W)

## DC Voltage Measurement

| Range | Resolution | Accuracy |
|---|---|---|
| 0 ~ 10V | 0.001V | ± 1% ± (1% of Vopen ± 0.1V) |
| 10 ~ 60V | 0.01V | ± 1% ± (1% of Vopen ± 0.1V) |

**Vopen :** Open Circuit Voltage of Solar Cell or Module

## DC Current Measurement

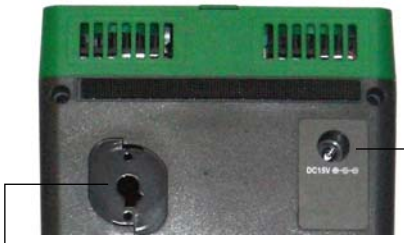
| Range | Resolution | Accuracy |
|---|---|---|
| 0.01 ~ 10A | 1mA | ± 1% ± (1% of Ishort ± 9mA) |
| 10 ~ 12A | 10mA | ± 1% ± (1% of Ishort ± 0.09A) |

**Ishort :** Short Circuit Current of Solar Cell or Module

## DC Current Simulation

| Range | Resolution | Accuracy |
|---|---|---|
| 0.01 ~ 10A | 1mA | ± 1% ± 9mA |
| 10 ~ 12A | 10mA | ± 1% ± 0.09A |

## Rear Panel Connections



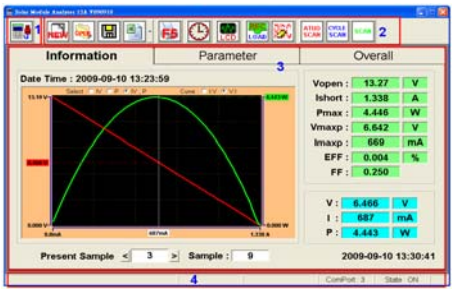

## Applications

- Quality Control at Production Line, Warehouse or Site of Installation
- Identify Requirements of Solar Power System
- Maintenance of Solar Panels
- Verify the Best Installation Angles of Solar Panels
- Research and Development

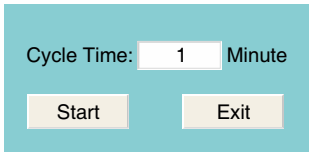
## User Interface & Data Acquisition Software

Solar Module Analyzer is supplied with user friendly software for Data Storing and Analysis. Users can store Data (.CSV/.TAB) that can be read in MS EXCEL and Print Waveform / Graph via Printer

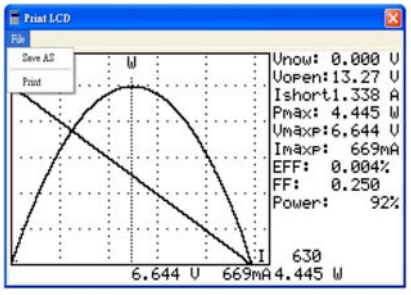
## Software Window




## Cycle Scan



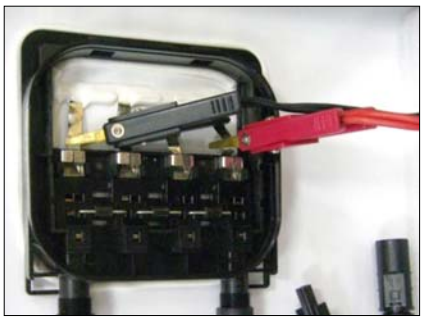

## Print LCD




## Product Kit


## 4 Wire Measurement


## Solar Panel Connections




936

## Applications

- Solar Power Plant
- Solar Radiation Measurements
- Solar Power Research for Location of the Solar Panels or Solar Water Heaters
- Physics and Optical Laboratories
- Meteorology
- Agriculture
- Windows Performance Calculate the Rate of Daylight Penetration

## Features

- Solar Power Measurement with Orientation and Tilt Angle
- Measurement : Solar Power (illuminance), Orientation, Tilt Angle
- Solar Power Measurement Range : 2000 W/$m^2$ or 634 BTU / ($ft^2$.h).
- Easy Measurement for Rate of Daylight Penetration
- Auto Change for Measuring Range
- Auto Power off with Disable Function
- Instantaneous, Average, Min/Max Values, Data Hold
- 20 Points Memory, Low Battery Indicator
- Socket for Tripod Mounting
- Operation with 9V Battery
- Magnetic Mount
- Backlight LCD and 4 Digits Triple Display

## Specifications

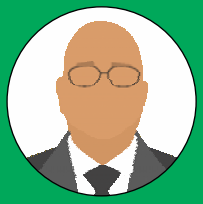
| | |
|---|---|
| **Sensor** | High Sensitivity Silicon Photodiode |
| **Spectral Response** | 400 ~ 1100 nm |
| **Range** | 0 ~ 2000 W/$m^2$ (0 ~ 634 BTU / $ft^2$.h) |
| **Accuracy (at 23°C, 60% RH)** | ± 10W/$m^2$ (± 3 BTU / $ft^2$.h) or ± 5% (whichever is greater) |
| **Resolution** | 0.00 ~ 99.99 W / $m^2$ : 0.01 W / $m^2$, |
| | 100.0 ~ 999.9 W / $m^2$ : 0.1 W / $m^2$ ,1000 ~ 2000 W / $m^2$ : 1 W/$m^2$ |
| | 0.00 ~ 99.99 BTU / $ft^2$.h : 0.01 BTU / $ft^2$.h, |
| | 100.0 ~ 634.0 BTU / $ft^2$.h : 0.1 BTU / $ft^2$.h |
| **Angular Accuracy** | Cosine Corrected < 7% (angle < 60°) |
| **Tilt Angle Range** | 0 ~ 90° |
| **Tilt Angle Accuracy (at 23°C, 60% RH)** | ± 1.2°(< 60°), Additional Temperature Induced Error ± 0.1° / °C from 23°C |
| **Sample Time** | Approx. 0.4 Second |
| **Operation Temp. & Relative Humidity** | 0°C ~ 50°C (32°F ~ 122°F) Less than 80% RH |
| **Store Temp. & Relative Humidity** | -10°C ~ 60°C (14°F ~ 140°F) Less than 85% RH |
| **Auto Power Off** | Enable or Disable (Auto Power off after approx. 10 minutes) |
| **Battery Life** | Approx. 30 Hours for Continuous Use |
| **Max / Min / Avg** | Yes |
| **Data Hold** | Yes |
| **Low Battery Indication** | Yes |
| **Backlight Function** | Yes |
| **Zero Adjustment** | Yes |
| **Over Range Indication** | Yes ("--HI--") |
| **Memory** | Yes ( 20 Points Memory ) |
| **Compass** | Yes |
| **Solar Transmission Measurement** | Yes |
| **Tripod Socket** | Yes |
| **Weight** | 220gms Including Battery (approx.) |
| **Dimensions** | Main Instrument : 140 x 49 x 29 mm (approx.) |
| | Sensor Probe : 83 x 54 x 26 mm (approx.) |
| **Accessories** | 9V Battery, Instruction Manual, Carrying Case |

MECO®

SINCE 1962

## Environment Testing Instruments

- ✓ Infrared Thermometer (Body & Industrial)
- ✓ Humidity & Temperature Meter
- ✓ Air Flow Anemometer
- ✓ Digital Sound Level Meter
- ✓ Digital Lux Meter
- ✓ Laser Distance Meter
- ✓ Combustible Gas Leak Detector
- ✓ Tachometer
- ✓ Coating Thickness Gauge

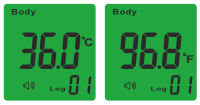


+60 YEARS
ONE MISSION

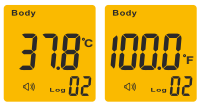

Reliable  Long-Lasting  Affordable


- Warranty One Year
- Annual Re-calibration service available at extra cost "As per requirements of Legal Metrology Act."

**BT-99**




**Green**
Normal Temperature
(Less than 37.5°C / 99.5°F)




**Orange**
Marginally High Temperature
(Between 37.5°C to 38°C / 99.5°F to 100.4°F)


**Red**
Very High Temperature
(Above 38°C / 100.4°F)


**MBT-99**


**Green**
Normal Temperature
(Less than 37.3°C / 99.2°F)


**Orange**
Marginally High Temperature
(Between 37.4°C to 37.9°C / 99.3°F to 100.3°F)


**Red**
Very High Temperature
(Above 37.9°C / 100.3°F)

## Features

- Handheld
- Precise non-contact measurements
- Measures temperature from distance
- Reduces risk of virus spread
- Body Temperature Measurements
- Surface Temperature Measurements
- Fast response
- 34 (BT-99) & 32 (MBT-99) Measuring Data can be stored
- Alarm for higher or lower body temperature (BT-99)
- LCD display with backlight
- Green, Orange and Red backlights to classify level of Body temperature
- °C / °F switchable
- Auto power off

## Applications

- Home
- Office
- Hospitals
- Schools / Colleges
- Airports
- Restaurants / Hotels
- Supermarkets
- Gymnasiums
- Temples, Churches, Mosques
- Exhibitions
- Railway / Bus Stations
- Construction Sites


| General Specifications | BT-99 | MBT-99 |
|---|---|---|
| Body Temperature Measuring Range | 36°C ~ 42.9°C (97°F ~ 109°F) | 32.0°C ~ 43.0°C (89.6°F ~ 109.4°F) |
| Body Temperature Measuring Accuracy | ± 0.3°C (± 0.6°F) | ± 0.3°C (± 0.6°F) |
| Surface Temperature Measuring Range | 0 ~ 100°C (32 ~ 212°F) | 0.0°C ~ 100.0°C (32.0°F ~ 212.0°F) |
| Surface Temperature Measuring Accuracy | ± 1°C (± 1.8°F) | ± 1°C (± 1.8°F) |
| Resolution | 0.1°C / 0.1°F | 0.1°C / 0.1°F |
| Response Time | 0.5 Sec | 5 Sec. |
| Measuring Distance | 5 ~ 8 cm | 5 ~ 8 cm |
| Auto Power Off | 7 Sec (approx.) | 10 Sec (approx.) |
| Operating Temperature | 10°C ~ 40°C (50°F ~ 104°F) | 10°C ~ 40°C (50°F ~ 104°F) |
| Storage Temperature | -10°C ~ 60°C (14°F ~ 140°F) | -10°C ~ 60°C (14°F ~ 140°F) |
| Relative Humidity | 10% ~ 90% RH operating, <80% RH storage | 10% ~ 90% RH operating, <80% RH storage |
| Power | 1.5V AA Battery x 2 pcs. | 1.5V AAA Battery x 2 pcs. |
| Weight | 140gms (including battery approx.) | 140gms (including battery approx.) |
| Dimension | 145 x 80 x 40mm (approx.) | 165 x 95 x 45mm (approx.) |
| Accessories | Carrying Pouch, Instruction Manual, 1.5V AA Battery x 2 pcs. | Carrying Pouch, Instruction Manual, 1.5V AAA Battery x 2 pcs. |

**Note :** Infrared Thermometer has advantage of measuring temperature from a distance and without contact with the object. Hence the reading may be approximate and used for surveillance / segregation only. For more accurate and confirmatory reading, please use Contact Type Thermometer.

IRT600TC

IRT1050P

| | | |
|---|---|---|
| **Temperature Range** | –50°C ~ 600°C | –50°C ~ 1050°C |
| | –58°F ~ 1112°F | –58°F ~ 1922°F |
| **Accuracy** | For <0°C (32°F) : ±3°C (±5.4°F) or ±3%<br>For ⩾0°C (32°F) : ±1.5°C (±2.7°F) or ±1.5% | ±1.5°C |
| **Distance Spot Ratio** | 12 : 1 | 50 : 1 |
| **Emissivity** | 0.1 ~ 1.0 (Adjustable) | 0.10 ~ 1.00 (Adjustable) |
| **Repeatability** | ±1% or ±1°C / ±1.8°F | ±1% or ±0.5°C |
| **Wavelength** | - | 630 ~ 670nm |
| **Resolution** | 0.1°C / 0.1°F | 0.1°C / 0.1°F |
| **Spectral Response** | 8µm ~ 14µm | 8µm ~ 14µm |
| **Special Function** | | |
| **°C / °F Selection** | ✓ | ✓ |
| **Laser Switch** | ✓ | ✓ |
| **Auto Power Off** | ✓ | ✓ |
| **Low Battery Indication** | ✓ | ✓ |
| **Backlight Display** | ✓ | ✓ |
| **MAX Function** | - | ✓ |
| **MIN Function** | - | ✓ |
| **DIF Function** | - | ✓ |
| **AVG Function** | - | ✓ |
| **Data Storage** | - | ✓ |
| **High / Low Temperature Alarm Settings Function** | - | ✓ |
| **LCD Size** | 24 x 26mm (Colour) | 36 x 27mm |
| **Packing Information** | | |
| **Power** | 1.5V AAA x 2 Batteries | 9V Battery |
| **Product Color** | Yellow + Black | Yellow + Black |
| **Dimensions** | 150 x 82 x 45mm (approx.) | 235 x 130 x 54mm (approx.) |
| **Product Net Weight** | 122gms including battery (approx.) | 278gms including battery (approx.) |
| **Accessories** | Drawstring Pouch x 1,<br>Instruction Manual x 1,<br>1.5V AAA Battery (installed) x 2 | Heavy Duty Carry Box x 1,<br>Instruction Manual x 1,<br>Tripod Stand x 1,<br>9V Battery (installed) x 1 |

920P

### Humidity & Temperature Meter

| Humidity Measuring | |
|---|---|
| **Functions** | °C / °F / RH Selection, MAX / MIN, Auto Power Off |
| **Range** | 0% ~ 100% RH |
| **Accuracy** | ± 3%RH (25°C , 20 ~ 80% RH)<br>± 3.5%RH (At Other Ranges) |
| **Resolution** | 0.01%RH |
| **Temperature Measuring** | |
| **Range** | - 20°C ~ 80°C / - 4°F ~ 176°F |
| **Accuracy** | ±0.5°C / ±0.9°F (25°C)<br>±0.8°C / ±1.5°F (At Other Ranges) |
| **Resolution** | 0.01°C / 0.01°F |
| **Power** | 9V Battery |
| **Dimensions** | 173 x 56 x 39mm (approx.) |
| **Weight** | 139gms Including Battery (approx.) |
| **Accessories** | Carrying Case, Inst. Manual, 9V Battery (installed) |

961P

### Air Flow Anemometer

| Air Flow Measuring | |
|---|---|
| **Functions** | m / Sec, Ft / min, Knots, Km / h, MPH, CFM, MAX / MIN / HOLD, Auto Power Off |
| **Range** | 1 ~ 25m/s |
| **Accuracy** | ± (3% rdg ± 0.2m/s) |
| **Resolution** | 0.01m/s |
| **Temperature Measuring** | |
| **Range** | 0 ~ 50°C, 32 ~ 122°F |
| **Accuracy** | ± 2°C / ± 4.0°F |
| **Resolution** | 0.1°C / 0.1°F |
| **Power** | 9V Battery |
| **Dimensions** | 202 x 56 x 39mm (approx.) |
| **Weight** | 155gms Including Battery (approx.) |
| **Accessories** | Carrying Case, Inst. Manual, 9V Battery (installed) |

970P

### Digital Sound Level Meter

| | |
|---|---|
| **Functions** | MAX / MIN / HOLD, Auto Power Off |
| **Range** | 35dB ~ 130dB (31.5Hz ~ 8 Khz) |
| **Accuracy** | ± 1.5dB (under reference conditions) |
| **Resolution** | 0.1dB |
| **Selection** | - |
| **Power** | 9V Battery |
| **Dimensions** | 172 x 56 x 39 mm (approx.) |
| **Weight** | 144gms Including Battery (approx.) |
| **Accessories** | Carrying Case, Inst. Manual, 9V Battery (installed) |

930P

930T

### Digital LUX Meter

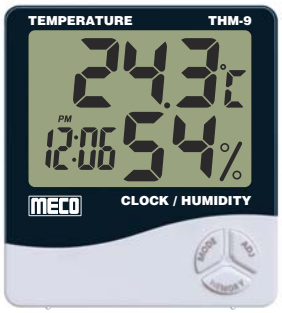
### Digital LUX Meter with Flexible Sensor

| | |
|---|---|
| **Functions** | MAX / MIN, Backlight, Auto Power Off with Disable Feature, Data Hold (930T) |
| **Range** | 0.1 ~ 200,000 lux , 0.1 ~ 20,000 fc |
| **Accuracy** | ±5% rdg+10 dgt (<10.000 lux/fc) 930P<br>±10% rdg+10 dgt (>10.000 lux/fc) 930P<br>±3% + 30 dgt (930T) |
| **Resolution** | 0.1 lux or 0.1 fc |
| **Selection** | lux / fc |
| **Power** | 9V Battery (930P)<br>1.5V AAA x 2 Batteries (930T) |
| **Dimensions** | 190 x 56 x 39mm (approx.) 930P<br>157 x 54 x 34mm (approx.) 930T |
| **Weight** | 135gms (930P), 70gms (930T) Including Battery (approx.) |
| **Accessories** | Carrying Case, Inst. Manual, Batteries (installed) |

new
Preliminary Data
CE

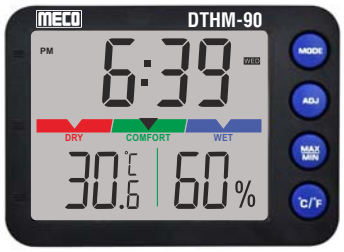
PTHM-90

PTHM-90C



THM-9

| Model | PTHM-90 | PTHM-90C | THM-9 |
|---|---|---|---|
| Functions | Auto Measure Temperature & Humidity, Alarm °C / °F Selection, MAX / MIN, Calendar, Time, Date | | °C / °F Selection, MAX / MIN, Clock & Calendar, Integral Hour Alarm |
| Backlight | - | ✓ | - |
| Display | Temperature, Humidity, Calendar and Time | | Temperature, Humidity and Time |
| Temperature Range | -20°C ~ 90°C | -40°C ~ 90°C / -40°F ~ 194°F | -10°C ~ 50°C / 14°F ~ 122°F |
| Temperature Accuracy | ±1.0°C | ±1.0°C / 1.8°F | ±2.0°C / 3.6°F |
| Temperature Resolution | 0.1°C | 0.6°C / 1.0°F | 0.1°C / 0.1°F |
| Humidity Range | 10% ~ 95% | 10% ~ 99% | 10% RH ~ 99% RH |
| Humidity Accuracy | ±5% | | ±10% RH |
| Humidity Resolution | 1% | | 1% RH |
| Power | 3V (1 pc CR2032) | | One 1.5V "AAA" Battery |
| Dimensions | 63 x 29 x 13.5mm | 80 x 40 x 15mm with holster | 103 x 93 x 24mm |
| Weight (approx.) | 23gms Including Battery | 36gms Including Battery | 106gms Including Battery |
| Accessories | Manual, Velcro, Box, Compass (PTHM-90C), Battery Installed | | Battery : 1.5V AAA x 1, Blister & Manual |



DTHM-90

MTP-9

**Desk Temp. & RH Meter with Clock & Calender**

| | |
|---|---|
| Functions | Auto Measure Temperature and Humidity, MAX/MIN, Calendar, Alarm, Time & Date, °C/°F Selection |
| Display | Temperature, Humidity, Calendar, Date and Time |
| Temperature Range | -20°C ~ 90°C |
| Temperature Accuracy | ±1.0°C |
| Temperature Resolution | 0.1°C |
| Humidity Range | 10% ~ 95% |
| Humidity Accuracy | ±3% (50% ~ 80%)<br>±5% (10% ~ 50%, 80% ~ 95%) |
| Humidity Resolution | 1% |
| Power | 3V (1 pc CR2032) |
| Dimensions | 91 x 67 x 11mm (approx.) |
| Weight | 60gms (approx.) Including Battery |
| Accessories | Manual, PP Bag, Battery Installed White Box |

**Features**
- °C/°F, MAX/ MIN, Hold
- Water Resistance
- APO & Low Power Consumption
- Suitable for Air & Liquid
- Stainless Steel Sensor Probe

**Application**
- Food Processing
- Refrigeration
- Brewing
- Pharmaceutical

**Long Probe Handy Multipurpose Thermometer**

| | |
|---|---|
| Functions | °C / °F Selection, MAX/ MIN, Data Hold, Auto Power Off |
| Temperature Range | -50°C ~ 300°C/ -58°F ~ 572°F |
| Accuracy | ±1°C(-20°C ~ 80°C) and ±5°C(Other) |
| Resolution | 0.1°C / 0.1°F |
| Power Supply | 1.5V DC Ah13/ LR44 Button Cell x 1 |
| Dimensions | 230 x 20.5 x 20.5mm (approx.) |
| Product Net Weight | 35gms (approx.) (With Battery and Carrying Tube) |
| Accessories | Carrying Tube x 1, Wristlet x 1, Instruction Manual x 1, 1.5V DC Button Cell(installed) x 1 |

## Humidity & Temperature Meter


920K

| Specifications | Range | Resolution | Accuracy |
|---|---|---|---|
| Ambient Temperature / Wet Bulb Temperature / Dew-Point Temperature | -20 ~ 0°C | 0.1°C | ±1.0°C (0 ~ 45°C) ±1.5°C (-20 ~ 0°C, 45 ~ 60°C) |
| | 0 ~ 60°C | 0.01°C | |
| | -4 ~ 0°F | 0.1°F | ±2.0°F (32 ~ 113°F) ±2.7°F (-4 ~ 32°F, 113 ~ 140°F) |
| | 0 ~ 99.99°F | 0.01°F | |
| | 100 ~ 140°F | 0.1°F | |
| Humidity | 0 ~ 100% RH | 0.1% | ±3.0% RH (20 ~ 80%) |
| | | | ±4.0% RH (0 ~ 20%, 80 ~ 100%) |
| Auto Ranging | Yes | | |
| Refresh Rate | 3 Times / Second | | |
| Unit | °C / °F Selectable | | |
| Comfort Indicator | Yes | | |
| Data Hold | Yes | | |
| Backlight | Yes | | |
| Auto Power Off | Yes | | |
| Low Battery Indicator | Yes | | |
| Power | 1.5V AAA x 2 Batteries | | |
| Operating Altitude | < 2000m | | |
| Operating Temperature | -10°C ~ +50°C | | |
| Storage Temperature | -20°C ~ +60°C | | |
| Operating Humidity | < 80% RH | | |
| Weight | 90gms Including Battery (approx.) | | |
| Dimension | 155 x 40 x 27mm (approx.) | | |
| Accessories | Carrying Case, Inst. Manual, 1.5V AAA x 2 Batteries (Installed) | | |

## Lux Meter


930K

| Specifications | Range | Resolution | Accuracy |
|---|---|---|---|
| Lux / Fc | 0 ~ 20.00 | 0.01 | ±(3% + 2) |
| | 20.00 ~ 200.0 | 0.1 | |
| | 200.0 ~ 2000 | 1.0 | |
| | 2.000K ~ 20.00K | 0.01K | |
| Lux | 20.00K ~ 200.0K | 0.1K | |
| Auto Ranging | Yes | | |
| Spectral Measurement Range | 320 ~ 730nm | | |
| Response Time | 3 Times / Second | | |
| Min / Max | Yes | | |
| Unit | Lux / Fc | | |
| Data Hold | Yes | | |
| Backlight | Yes | | |
| Auto Power Off | Yes | | |
| Low Battery Indicator | Yes | | |
| Power | 1.5V AAA x 2 Batteries | | |
| Operating Altitude | < 2000m | | |
| Operating Temperature | -10°C ~ +50°C | | |
| Storage Temperature | -20°C ~ +60°C | | |
| Operating Humidity | < 80% RH | | |
| Weight | 110gms Including Battery (approx.) | | |
| Dimension | 155 x 40 x 40mm (approx.) | | |
| Accessories | Carrying Case, Inst. Manual, 1.5V AAA x 2 Batteries (Installed) | | |

## Anemometer

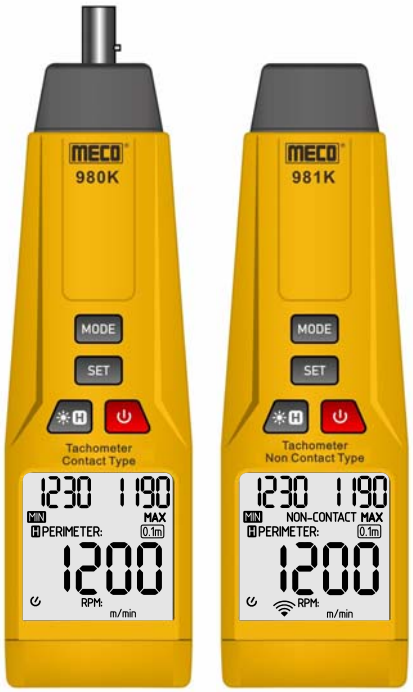
| Specifications | Range | Resolution | Accuracy |
|---|---|---|---|
| **m/s** | 0.80 ~ 30.00 m/s | 0.01 m/s | ±(2.0% + 50) |
| **(meter per second)** | 30.00 ~ 40.00 m/s | 0.01 m/s | Reference |
| **Km/h** | 2.88 ~ 108.0 km/h | 0.01 km/h | ±(2.0% + 50) |
| **(kilometer per hour)** | 108.0 ~ 144.0 km/h | 0.1 km/h | Reference |
| **ft/s** | 2.62 ~ 98.50 ft/s | 0.01 ft/s | ±(2.0% + 50) |
| **(feet per second)** | 98.50 ~ 131.2 ft/s | 0.01 ft/s | Reference |
| **knots** | 1.6 ~ 58.30 knots | 0.01 knots | ±(2.0% + 50) |
| **(nautical miles per hour)** | 58.30 ~ 77.70 knots | 0.01 knots | Reference |
| **mile/h** | 1.80 ~ 67.20 mil/h | 0.01 mil/h | ±(2.0% + 50) |
| **(mile per hour)** | 67.20 ~ 90.00 mil/h | 0.01 mil/h | Reference |
| **ft/m** | 157.5 ~ 5900 ft/m | 1 ft/m | ±(2.0% + 50) |
| **(feet per minute)** | 5900 ~ 7874 ft/m | 1 ft/m | Reference |
| **Auto Ranging** | Yes | | |
| **Refresh Rate** | 3 Times / Second | | |
| **Min/Max/Avg** | Yes | | |
| **Wind Scale** | Level 0 ~ 12 | | |
| **Unit** | m/s, km/h, ft/s, knots, mile/h, ft/m, CMM, CFM, CMS | | |
| **Data Hold** | Yes | | |
| **Backlight** | Yes | | |
| **Auto Power Off** | Yes | | |
| **Low Battery Indicator** | Yes | | |
| **Power** | 1.5V AAA x 2 Batteries | | |
| **Operating Altitude** | < 2000m | | |
| **Operating Temperature** | -10°C ~ +50°C | | |
| **Storage Temperature** | -20°C ~ +60°C | | |
| **Operating Humidity** | < 80% RH | | |
| **Weight** | 100gms Including Battery (approx.) | | |
| **Dimension** | 176 x 40 x 27mm (approx.) | | |
| **Accessories** | Carrying Case, Inst. Manual, 1.5V AAA x 2 Batteries (Installed) | | |


**961K**

## Sound Meter

| Specifications | Range | Resolution | Accuracy |
|---|---|---|---|
| **dB** | 30dB ~ 130dB | 0.1dB | ±1.5dB (In the Reference Sound Pressure Level 94dB 1KHz) |
| **Sampling Rate** | Fast : 125ms, Slow : 1000ms | | |
| **Frequency Range** | 31.5Hz ~ 8KHz | | |
| **Noise** | A weighting | | |
| **Min /Max** | Yes | | |
| **Unit** | dB | | |
| **Data Hold** | Yes | | |
| **Backlight** | Yes | | |
| **Auto Power Off** | Yes | | |
| **Low Battery Indicator** | Yes | | |
| **Power** | 1.5V AAA x 2 Batteries | | |
| **Operating Altitude** | < 2000m | | |
| **Operating Temperature** | -10°C ~ +50°C | | |
| **Storage Temperature** | -20°C ~ +60°C | | |
| **Operating Humidity** | < 80% RH | | |
| **Weight** | 120gms Including Battery (approx.) | | |
| **Dimension** | 175 x 40 x 27mm (approx.) | | |
| **Accessories** | Carrying Case, Inst. Manual, 1.5V AAA x 2 Batteries (Installed) | | |


**970K**




980K 981K

**Tachometer (Contact Type and Non-Contact Type)**

| Specifications | Range | Resolution | Accuracy |
|---|---|---|---|
| RPM | 50.00 ~ 99.99 | 0.01 | ±(0.03% + 2) |
| | 100.00 ~ 999.9 | 0.1 | |
| | 10000 ~ 19999 | 1.0 | |
| Auto Ranging | Yes | | |
| Working Principle | Contact Measurement (980K) | | |
| | Non- Contact Measurement (981K) | | |
| Measuring Distance | 50 ~ 250mm (981K) | | |
| Refresh Rate | 3 Times / Second | | |
| Min / Max | Yes | | |
| Unit | m/min, m/sec, ft/min, ft/sec, in/min | | |
| Data Hold | Yes | | |
| Backlight | Yes | | |
| Auto Power Off | Yes | | |
| Low Battery Indicator | Yes | | |
| Power | 1.5V AAA x 2 Batteries | | |
| Operating Altitude | < 2000m | | |
| Operating Temperature | -10°C ~ +50°C | | |
| Storage Temperature | -20°C ~ +60°C | | |
| Operating Humidity | < 80% RH | | |
| Weight | 100gms Including Battery (approx.) | | |
| Dimension | 980K : 150 x 40 x 27mm (approx.), | | |
| | 981K : 135 x 40 x 27mm (approx.) | | |
| Accessories | Carrying Case, Inst. Manual, 1.5V AAA x 2 Batteries (Installed) | | |


990K

**Coating Thickness Gauge**

| Specifications | Range | Resolution | Accuracy |
|---|---|---|---|
| Measuring | 0 ~ 99.9 µm | 0. 1 µm | ± (3%+1) µm |
| | 100 ~ 1250 µm | 1.0 µm | ± (3%+1) µm |
| | 0 ~ 4.99 mil | 0.01 mil | ± (3%+0.04) mil |
| | 5.0 ~ 49.2 mil | 1.0 mil | ± (3%+0.04) mil |
| Auto Ranging | Yes | | |
| Display Type | 1.44 inches TFT LCD | | |
| Metal Type | Ferrous / Non-Ferrous | | |
| Measurement Method | Single / Continuous | | |
| Min/Max/Avg | Yes | | |
| Unit | µm / mil | | |
| Data Hold | Yes | | |
| Backlight | Yes | | |
| Audio Alarm | Yes | | |
| Data Storage | 100 Groups | | |
| Rotatable Screen | Manual Control by setting (0° / 90° / 180° / 270°) | | |
| Auto Power Off | Yes | | |
| Low Battery Indicator | Yes | | |
| Power | 1.5V AAA x 2 Batteries | | |
| Operating Altitude | < 2000m | | |
| Operating Temperature | -10°C ~ +50°C | | |
| Storage Temperature | -20°C ~ +60°C | | |
| Operating Humidity | < 80% RH | | |
| Weight | 108gms Including Battery (approx.) | | |
| Dimension | 140 x 40 x 27mm (approx.) | | |
| Accessories | Carrying Case, Inst. Manual, 1.5V AAA x 2 Batteries (Installed), Calibration Kit | | |


940K

**Brake Fluid Tester**

| Specifications | Range | Resolution |
|---|---|---|
| Brake Oil Type | DOT3 / DOT4 / DOT5.1 | |
| Brake Oil Status Test | GOOD | Water Content < 1% |
| | CAUTION | Water Content < 3% |
| | STOP | Water Content > 3% |
| Auto Ranging | Yes | |
| Data Hold | Yes | |
| Backlight | Yes | |
| Work light | Yes | |
| Magnet Function | Yes | |
| Warning Tone | Yes | |
| Auto Power Off | Yes | |
| Low Battery Indicator | Yes | |
| Power | 1.5V AAA x 2 Batteries | |
| Operating Altitude | < 2000m | |
| Operating Temperature | -10°C ~ +50°C | |
| Storage Temperature | -20°C ~ +60°C | |
| Operating Humidity | < 80% RH | |
| Weight | 250gms Including Battery (approx.) | |
| Dimension | 350 (with probe) x 40 x 27mm (approx.) | |
| Accessories | Carrying Case, Inst. Manual, 1.5V AAA x 2 Batteries (Installed) | |


950K

**Combustible Gas Leak Detector**

| Specifications | Range | Resolution | Accuracy |
|---|---|---|---|
| Combustible Gas | 0 ~ 999.9 ppm | 0.1 ppm | ⩽10% FS (Methane) |
| | 1000 ~ 9999 ppm | 1.0 ppm | |
| | 0 ~ 20.00% LEL | 0.01% LEL | |
| Auto Ranging | Yes | | |
| Sensitivity | ⩽50 ppm (Methane) | | |
| Response Time | ⩽2 Seconds | | |
| Warm-up time | 30 Sec (approx.) | | |
| Refresh Rate | 400 ms | | |
| Flexible Probe | 16 inch | | |
| Min / Max / Avg | Yes | | |
| Unit | ppm, %LEL | | |
| Data Hold | Yes | | |
| Backlight | Yes | | |
| Auto Power Off | Yes | | |
| Low Battery Indicator | Yes | | |
| Power | 1.5V AAA x 2 Batteries | | |
| Operating Altitude | < 2000m | | |
| Operating Temperature | -10°C ~ +50°C | | |
| Storage Temperature | -20°C ~ +60°C | | |
| Operating Humidity | < 80% RH | | |
| Weight | 300gms Including Battery (approx.) | | |
| Dimension | 420 (with probe) x 40 x 27mm (approx.) | | |
| Accessories | Carrying Case, Inst. Manual, 1.5V AAA x 2 Batteries (Installed) | | |

new
Preliminary Data

## Function

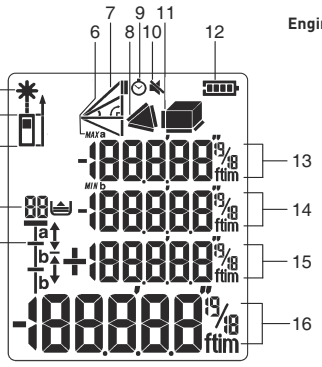
- Display Illumination [Backlight]
- Min / Max, Measurement / Continuous Measurement
- Addition / Subtraction
- Pythagoras Measurement
- Area / Volume Calculation
- Wall Area Measurement
- Triangular Area Measurement
- Stake out Measurement
- Front / Back Benchmark Measuring Datum Selection


LDM60+


LDM100+

## Display Screen

1. Laser Emission Indicator
2. Reference Edge [Front]
3. Reference Edge [Behind]
4. Stored Data Indicator
5. Stake out Function
6. MAX / MIN Measurement
7. Indirect measuring / Pythagoras Theorem Measurement
8. Triangular Area
9. Timer
10. Silence
11. Area / Volume Function.
12. Battery Indicator
13. The third Display Line
14. The Second Display Line
15. The First Display Line
16. Main Display Line (Result)



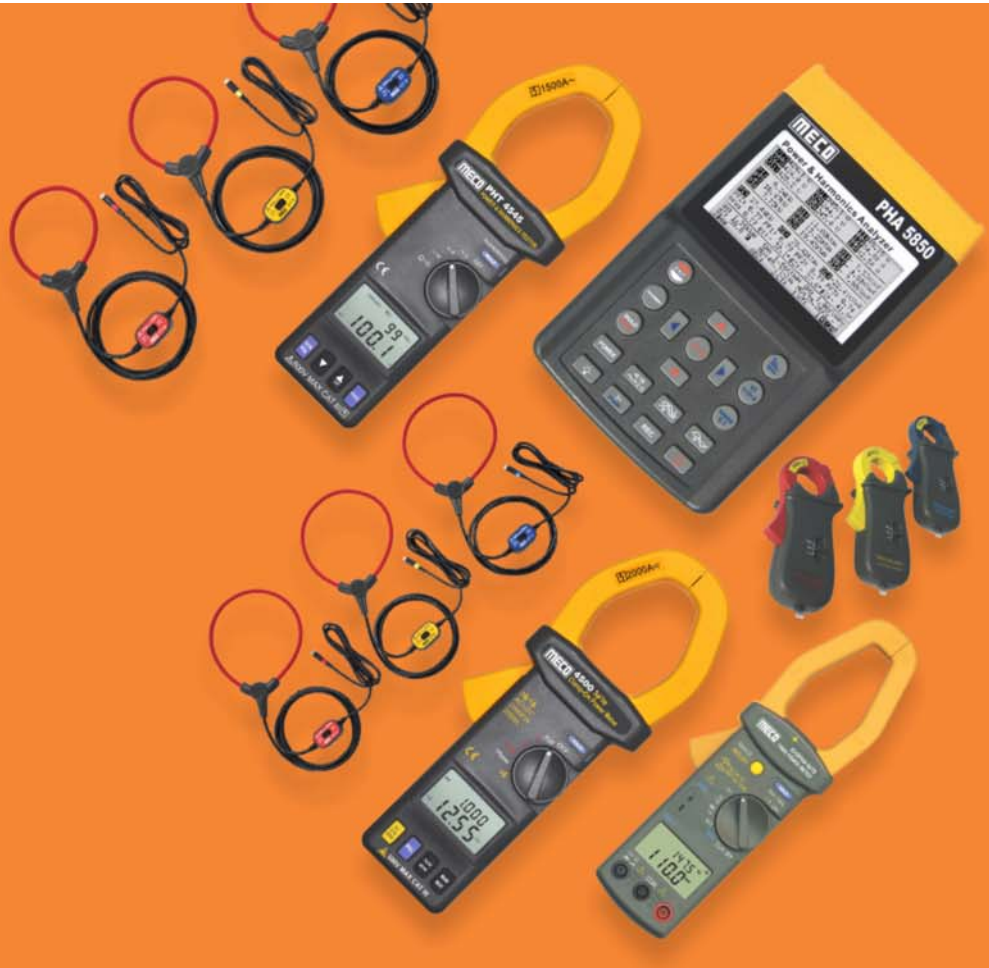

## Applications


## Specifications

| Model | LDM60+ | LDM100+ |
|---|---|---|
| Range | 0.05 ~ 60m | 0.05 ~ 100m |
| Measuring Accuracy upto 60 / 100m [in the room] | ±1.5mm | ±1.5mm |
| Measurement Time | 0.25 ~ 1s | 0.25 ~ 1s |
| Units | m / in / ft / ft'in" | m / in / ft / ft'in" |
| Smallest Unit Displayed | 1mm | 1mm |
| Laser Class | Class II | Class II |
| Laser Type | 630 ~ 670, <1mW | 630 ~ 670, <1mW |
| Auto Laser Switch Off | After 30 second | After 30 second |
| Automatic Switch Off | After 3 Minutes of Inactivity | After 3 Minutes of Inactivity |
| Timer (Self-Triggering) | ✓ | ✓ |
| Historical Storage | 99 | 99 |
| Storage Temperature | -20°C ~ 60°C | -20°C ~ 60°C |
| Operating Temperature | -10°C ~ 50° C | -10°C ~ 50° C |
| Power | 1.5V AAA x 2 Batteries | 1.5V AAA x 2 Batteries |
| Battery Life | Up to 5000 Measurements | Up to 5000 Measurements |
| Rating [ Dust Proof & Splash Proof ] | IP40 | IP40 |
| Dimensions | 110 x 44 x 26mm [approx.] | 110 x 44 x 26mm [approx.] |
| Weight | 70gms [Including Batteries] approx. | 70gms [Including Batteries] approx. |
| Accessories | 1.5V AAA X 2 Batteries [Installed], Drawstring Pouch, Inst. Manual, Wristlet | 1.5V AAA X 2 Batteries [Installed], Drawstring Pouch, Inst. Manual, Wristlet |

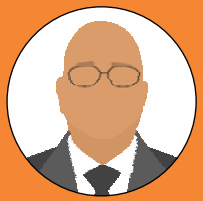
MECO®

SINCE 1962




## Power & Harmonics Analyzer & Clamp-On Power Meter

- ✓ Power & Harmonics Analyzer
- ✓ AC Clamp-On Power & Harmonics Tester
- ✓ Clamp-On TRMS Power Meter
- ✓ 3φ/1φ Clamp-On TRMS Power Meter for AC/DC Power Measurement



+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable

MECO supports Bureau of Energy Efficiency (BEE), Govt. of India's mission to institutionalize certification of Electric / Electronic goods for ECOMARK under Gazette of India


PHA 5850

**Under BEE's PAT Scheme (Perform, Achieves & Trade) it is mandated to compulsorily improve their Energy Efficiency by adopting all the available measures including replacement of their old Equipments with New and Energy Efficient Equipments**

**Versatile Handy instrument using micro controller technology and easy to use software program for recording and downloading.**

**Useful for time to time monitoring of Power Parameters, Energy and Presence of Harmonics at several Location / Machines.**

**Cost Effective & Efficient Tool for Energy Auditor, Maintenance Persons, Service Providers, Site / Plant Engineers.**

MECO Power and Harmonics Analyser Model PHA-5850 can Analyze, Measure, Monitor & Data Log values of Power Quality & Consumption (Energy). Capable of analyzing IT standby power consumption to the maximum demand of factory. It comes with a user friendly application software that increases the utility & performance of this instrument. The analyzer is ideal for an any Engineer/ Inspector for carrying out Periodic Visits, Maintainance of Plant, Vigilance checks, Surveys and Energy Audits for checking at Industrial and Consumers end.

## Features :

- Analysis of 3P4W, 3P3W, 1P2W, 1P3W Systems
- Display of 35 Parameters in one screen (3P4W)
- Programmable CT (1 to 600) and PT (1 to 3000) Ratios
- Graphic Phasor Diagram
- RMS, PEAK Value & Crest Factor
- True RMS value, Active Power, Apparent & Reactive Power (KVA, KVAR)
- Power Factor, Phase Angle (Φ) & Energy (WH, KWH, KVARH, PFH)
- Average / Maximum Demand (KW, MW, KVA, MVA) with Programmable Period
- Analysis of Total Harmonic Distortion **(THD-F)**
- Display of 50 Harmonics in one Screen with Wave form with Peak value (1024 Sample / Period)
- Capture 28 Transient Events with Programmable Threshold (%) (DIP, SWELL & OUTAGE)
- Built in timer & Calendar for Data Logging
- Facility to retrieve Power Data & Harmonics on Meter Screen
- 512K Memory with Programmable Interval (2 to 3000 seconds, 17000 records for 3P4W System)
- Optical Isolated RS-232C~USB Interface
- Software for easy download of Recorded Data & Transient events
- Calculated Unbalanced Current through Neutral line

## General Specification : PHA5850

| | |
|---|---|
| **Power** | Eight x 1.5V "AA" Batteries |
| **External DC Input** | Power supply adapter 12 Volts. DC |
| **Display** | Dot Matrix LCD (240x128) with backlight |
| **LCD Update Rate** | 1 time / second |
| **Power Consumption** | 140mA (approx.) |
| **No. Of Samples** | 1024 samples / period |
| **Data Logging Files** | 85 |
| **Max. File Capacity** | 17474 records (3P4W, 3P3W)<br>26210 records (1P3W)<br>52420 records (1P2W)<br>4096 records (50 Harmonics / record) |
| **Sampling Time** | 2 to 3000 seconds for data logging |
| **Low battery Indication** | B |
| **Overload Indication** | OL |
| **Operating Condition** | -10°C to 50°C ⩽ 85% RH |
| **Storage Condition** | -20°C to 60°C ⩽ 75% RH |
| **Dimensions** | 257 x 155 x 57 mm |
| **Weight** | 1160 g (Batteries included) |
| **Accessories** | Voltage Test Leads x 4 (3 meter long)<br>Alligator Clips (Voltage) x 4 (R.Y.B.N.)<br>Carrying Bag x1<br>Batteries 1.5V x8<br>External DC Adaptor x1<br>Software CD x1<br>Users Manual x1<br>Software Manual x1<br>Optical USB Cable x1<br>Current Clamps x 3 (Any One CT Set) |

**Specifications :** (23°C ± 5°C)

**AC Current**
(50Hz or 60Hz, Auto Range, True RMS, Crest Factor <4, CT=1)

**Model : PHA-5850A (100A)** (Overload Protection AC 200A)

| Range | Resolution | Accuracy of Readings |
|---|---|---|
| 0.04 - 1A | 0.1mA / 1mA | ± 0.5% ± 0.05A |
| 0.4 - 10A | 0.001A / 0.01A | ± 0.5% ± 0.05A |
| 4 - 100A | 0.01A / 0.1A | ± 1.0% ± 0.5A |

**Model : PHA-5850B (1000A)** (Overload Protection AC 2000A)

| Range | Resolution | Accuracy of Readings |
|---|---|---|
| 10.00A | 0.001A / 0.01A | - |
| 5A - 100.0A | 0.01A / 0.1A | ± 0.5% ± 0.5A |
| 50A - 1000.0A | 0.1A / 1A | ± 0.5% ± 5A |

**Model : PHA-5850C (3000A)** (Overload Protection AC 3000A)

| Range | Resolution | Accuracy of Readings |
|---|---|---|
| 10.0 - 300.0A | 0.01A / 0.1A | ± 1% of range |
| 300.0 - 3000A | 0.1A / 1A | |

**Model : PHA-5850D (1200A)** (Overload Protection AC 1200A)

| Range | Resolution | Accuracy of Readings |
|---|---|---|
| 6.0 - 120.0A | 0.01A / 0.1A | ± 1% of range |
| 120.0 - 1200A | 0.1A / 1A | |

**Harmonic of AC Voltage in Percentage**

| Range | Resolution | Accuracy |
|---|---|---|
| 1 - 20th | 0.1% | ± 2% |
| 21 - 49th | | ± 4% of reading ± 2.0% |
| 50 - 99th | | ± 6% of reading ± 2.0% |

**Harmonic of AC Current in Percentage**
**Model : PHA-5850A (100A)**

| Range | Resolution | Accuracy |
|---|---|---|
| 1 - 10th | 0.1% | ± 0.2% of reading ± 1% |
| 11 - 20th | | ± 2% of reading ± 1% |
| 21 - 50th (A range) | | ± 5% of reading ± 1% |
| 21 - 50th (mA range) | | ± 10% of reading ± 1% |
| 51 - 99th | | ± 35% of reading ± 1% |

**Model : PHA-5850B (1000A)**

| Range | Resolution | Accuracy |
|---|---|---|
| 1 - 20th | 0.1% | ±2% |
| 21 - 49th | | ± 4% of reading ± 2.0% |
| 50 - 99th | | ± 6% of reading ± 2.0% |

**Model : PHA-5850C (3000A) & PHA-5850D (1200A)**

| Range | Resolution | Accuracy |
|---|---|---|
| 1 - 20th | 0.1% | ±2 % |
| 21 - 50th | | ± 6% |
| 51 - 99th | | ± 10% |

**AC Watt**
(50Hz or 60Hz, PF 0.5~1, CT=1, continuous waveform)

**Model : PHA-5850A (100A)**

| Range (0 to 100A) | Resolution | Accuracy of Readings |
|---|---|---|
| 5.0 - 999.9W | 0.1W | ± 1% ± 0.8W |
| 1.000 - 9.999KW | 0.001KW | ± 1% ± 8W |
| 10.00 - 99.99KW | 0.01KW | ± 1% ± 80W |
| 100.0 - 999.9KW | 0.1KW | ± 1% ± 0.8KW |
| 1000 - 9999KW | 1KW | ± 1% ± 8KW |

**Model : PHA-5850B (1000A)**

| Range (0 to 1000A) | Resolution | Accuracy of Readings |
|---|---|---|
| 5.0 - 999.9W | 0.1W | ± 1% ± 0.8W |
| 1.000 - 9.999KW | 0.001KW | ± 1% ± 8W |
| 10.00 - 99.99KW | 0.01KW | ± 1% ± 80W |
| 100.0 - 999.9KW | 0.1KW | ± 1% ± 0.8KW |
| 1000 - 9999KW | 1KW | ± 1% ± 8KW |
| 0.000 - 9.999MW | 0.001MW | ± 1% ± 80KW |

**Model : PHA-5850C (3000A)**
**Model : PHA-5850D (1200A)**

| Range (0 to 3000A or 0 to 1200A) | Resolution | Accuracy of Readings | |
|---|---|---|---|
| | | >20V & >30A | <20V or <30A |
| 10.0 - 999.9W | 0.1W | ± 1% of range | ± 2% of range |
| 1.000 - 9.999KW | 0.001KW | | |
| 10.00 - 99.99KW | 0.01KW | | |
| 100.0 - 999.9KW | 0.1KW | | |
| 1000 - 9999KW | 1KW | | |

**AC Voltage**
(50Hz or 60Hz, Auto Range, True RMS,Crest Factor<4, Input Impedance 10MΩ, VT (PT) = 1, Overload Protection AC 800V)

| Range | Resolution | Accuracy of Readings |
|---|---|---|
| 20.0V - 500.0V (Phase to Neutral) | 0.1V | ± 0.5% ± 5dgts |
| 20.0V - 600.0V (Phase to Phase) | | |

**Power Factor (PF)**
**Model : PHA-5850A (100A) & PHA-5850B (1000A)**

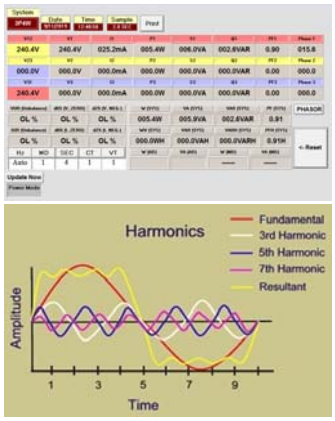
| Range | Resolution | Accuracy |
|---|---|---|
| 0.00 - 1.00 | 0.01 | ± 0.04 |

**Model : PHA-5850C (3000A) & PHA-5850D (1200A)**

| Range | Resolution | Accuracy | |
|---|---|---|---|
| | | >20V & >30A | <20V or <30A |
| 0.000 - 1.000 | 0.001 | ± 0.04 | ± 0.1 |

### Testing for Energy Study & Audit

### Power & Harmonics




### Harmonic Filter Panel

### Data Logging

### Ordering Information

**Model : PHA 5850A** = PHA 5850 + CT set A
**Model : PHA 5850B** = PHA 5850 + CT set B
**Model : PHA 5850C** = PHA 5850 + CT set C
**Model : PHA 5850D** = PHA 5850 + CT set D

**Model : CT set A**
**3 pcs (R,Y,B) Clamp - On CTs**
**Range :** 1 / 10 / 100A
**Conductor Size :** 30mm (approx.)

OR

**Model : CT set B**
**3 pcs (R,Y,B) Clamp - On CTs**
**Range :** 10 / 100 / 1000A
**Conductor Size :** 55mm (approx.)
Busbar 64 x 24mm

OR

**Model : CT set C**
**3 pcs Flexible CTs**
**Range :** 300 / 3000A
**Probe Length :** 24" / 637mm (approx.)
**Minimum bending Diameter :** 16mm
**Connector Diameter :** 12.3mm
**Coil Diameter :** 8.5mm
**Cable Length from Probe to Box :** 1700mm
**Cable Length from Box to Output :** 1700mm
**Inner Diameter / Window Size :** 190mm (approx.)

OR

**Model : CT set D**
**3 pcs Flexible CTs**
**Range :** 120 / 1200A
**Probe Length :** 18" / 477mm (approx.)
**Minimum bending Diameter :** 16mm
**Connector Diameter :** 12.3mm
**Coil Diameter :** 8.5mm
**Cable Length from Probe to Box :** 1700mm
**Cable Length from Box to Output :** 1700mm
**Inner Diameter / Window Size :** 140mm (approx.)


**PHT 4545**

## Power Analysis

■ W, KW, HP, VA, KVA, VAR, KVAR ■ PF, Phase Angle (Φ) ■ Energy (WH, KWH) ■ Balanced 3Phase Power Quality ■ Balanced 3Phase Sequence ■ Programmable CT Ratio (1 to 250) ■ Dual Displays (W + PF, VA + KVAR...) ■ Active Power in HP ■ Resistance and Continuity with Beeper

## Harmonic Analysis

■ True RMS value (V and A) at 0.5% basic accuracy ■ 1500A AC ■ Harmonic Analysis (V and A) to the 99th Order in % and in magnitude ■ Better Understanding of High Frequency Harmonic Analysis (up to 5/6 KHz) ■ Non-interrupted Harmonic Analysis ■ Analysis of Total Harmonic Distortion (%THD-F) ■ Analysis of Crest Factor (C.F.) ■ Fast Peak Function (33µs for 60Hz and 39µs for 50Hz) ■ Max, Min and Data Hold Function

## General Specifications

| | | |
|---|---|---|
| **Jaw Opening** | : | Cable Dia 55mm (approx.), 64 x 24mm (Bus Bar) |
| **Power** | : | Two 1.5V "AA" Battery |
| **Display** | : | 4 + 4 Digits LCD |
| **Auto-Power-Off** | : | 30 minutes |
| **LCD Update Rate** | : | 2 times / sec. |
| **Operating Temperature** | : | -10°C to 50°C |
| **Storage Temperature** | : | -20°C to 60°C |
| **Option** | : | Alligator Clips |
| **Power Consumption** | : | 10mA (approx.) |
| **No. of Samples / Period** | : | 512 (V & A), 256 (W) |
| **Operating Humidity** | : | < 85% Relative |
| **Storage Humidity** | : | < 75% Relative |
| **Weight** | : | 650gms Including Battery (approx.) |
| **Dimension** | : | 271 x 112 x 46mm (approx.) |
| **Accessories** | : | Test Leads, Carry Bag, Users Manual, Batteries (Installed) |

## Specifications (23°C ± 5°C)

**Harmonics of AC Current in % & Magnitude** (1~99th order)

| Range | Resolution in % | Accuracy in % | Resolution in Magnitude | Accuracy in Magnitude |
|---|---|---|---|---|
| 1 ~ 20th | 0.1% | ±2% | 0.1A | ± 2% of reading ± 0.4A |
| 21 ~ 49th | | 4% of reading ± 2.0% | | ± 4% of reading ± 0.4A |
| 50 ~ 99th | | 6% of reading ± 2.0% | | ± 6% of reading ± 0.4A |

**Harmonics of AC Voltage in % & Magnitude (1~99th order)**

| Range | Resolution in % | Accuracy in % | Resolution in Magnitude | Accuracy in Magnitude |
|---|---|---|---|---|
| 1 ~ 20th | 0.1% | ± 2% | 0.1V | ± 2% of reading ± 0.5V |
| 21 ~ 49th | | 4% of reading ± 2.0% | | ± 4% of reading ± 0.5V |
| 50 ~ 99th | | 6% of reading ± 2.0% | | ± 6% of reading ± 0.5V |

**Crest Factor** (C.F., Accuracy of Readings)

| Range | Resolution | Accuracy |
|---|---|---|
| 1.00 ~ 99.99 | 0.01 | ± 5% ± 30 dgt |

**AC Watt** (50 or 60Hz)

| Range | Resolution | Accuracy |
|---|---|---|
| 10.0 ~ 999.9W | 0.1W | ± 2% ± 20 dgt (>20V & >20A) ± 2% ± 40 dgt (<20V or <20A) |
| 1.000 ~ 9.999KW | 0.001KW | |
| 10.00 ~ 99.99KW | 0.01KW | |
| 100.0 ~ 999.9KW | 0.1KW | |
| 1000 ~ 9999KW | 1KW | |

**AC Current** (50 or 60Hz, True RMS)

| Range | Resolution | Accuracy |
|---|---|---|
| 10.0 ~ 1500.0A | 0.1A | ± 2% ± 5 dgts |

**AC Voltage** (50 or 60Hz, True RMS)

| Range | Resolution | Accuracy |
|---|---|---|
| 10.0 ~ 600.0V | 0.1V | ± 0.5% ± 5 dgts |

**Power Factor & Phase Angle**

| Range | Resolution | Accuracy |
|---|---|---|
| 0.000 ~ 1.000 | 0.001 | ± 0.04 |
| -180°to180° & 0°to360° | 0.1° | ± 2° |

**Total Harmonic Distortion** (THD-F, 1 to 50th order)

| Range | Resolution | Accuracy |
|---|---|---|
| 0.0 ~ 20% | 0.1% | ± 2% |
| 20.1 ~ 100% | | ± 6% of reading ± 1% |
| 100.1 ~ 999.9% | | ±10% of reading ± 1% |

**Resistance (Ω) and Continuity (Beep if less than 50Ω)**

| Range | Resolution | Accuracy |
|---|---|---|
| * 7.0 ~ 999.9Ω | 0.1Ω | ± 5Ω |
| 1000 ~ 1200Ω | 1Ω | |

* If reading is less than 7Ω, it is displayed as 0Ω

# Clamp-On TRMS Power Meter with Automatic Computation of 1φ and 3φ (3φ3W/3φ4W) Parameters


**3510PHW-AUTO**

## Features

- Check 3φ Phase Sequence
- 4 Digit LCD, 9999 Count, Autoranging
- Data Hold, Auto Power Off
- Dual Display KW+HP, KW+PF, KW+KVAR, KVA+φ, V+A, A+Hz, V+Hz
- Cable of Diameter upto 43mm / Busbar upto 65mm x 16mm

## Applications

- 1φ & 3φ (3φ3w / 3φ4w) Power Analyzer
- Ideal for Electrical Audit of Heating, Ventilation & Aircon Systems (HVAC)
- Check Current drawn in Motors and Compressors
- Test Run / Start Capacitors
- Check for Energized Circuits & Balance Loads
- Capture Motor In-Rush Current Readings
- Determine Peak Power Demand Periods
- Analyze Temperature Data with the Aid of the Time Stamp
- Resistance upto 100MΩ
- Use MAX / MIN / REC in Temperature Mode to Assess Efficiency
- Evaluate Electrical Contacts
- Verify the Stability of Voltage
- Check Motor Run / Start Capacitor Values
- To Identify Low Voltage Control Signal
- To Identify Power Sources

**1φ/3φ TRUE Power (KW) : (PF lag 1.000~0.000~lead 1.000 or 00.00°~360.0°) (1 hp=0.7457KW)**

| Range | Resolution | Accuracy ±(%rdg+dgts) | Overload Protection |
|---|---|---|---|
| 99.99KW | 0.01KW | ±(5% + 30) (50, 60Hz) | 600VAC/ 1000AAC |
| 600.0KW | 0.1KW | | |

**1φ/3φ HP (1HP=745.7W) : (PF lag 1.000~0.000~lead 1.000 or 00.00°~360.0°)**

| Range | Resolution | Accuracy ±(%rdg+dgts) | Overload Protection |
|---|---|---|---|
| 99.99HP | 0.01 HP | ±(5% + 30) (50, 60Hz) | 600VAC/ 1000AAC |
| 800.0HP | 0.1 HP | | |

**1φ/3φ Apparent Power (KVA)**

| Range | Resolution | Accuracy ±(%rdg+dgts) | Overload Protection |
|---|---|---|---|
| 99.99KVA | 0.01 KVA | ±(2.5% + 30) | 600VAC/ 1000AAC |
| 600.0KVA | 0.1 KVA | | |

**1φ/3φ Reactive Power (KVAR) : (PF lag 1.000~0.000~lead 1.000 or 00.00°~360.0°)**

| Range | Resolution | Accuracy ±(%rdg+dgts) | Overload Protection |
|---|---|---|---|
| 99.99KVAR | 0.01KVAR | ±(5% + 50dgts) (50, 60Hz) | 600V AC/1000AAC |
| 600.0KVAR | 0.1KVAR | | |

**3φ Phase Sequence Indication**

| Range | Frequency Response | Overload Protection |
|---|---|---|
| 80V to 480V | (50Hz / 60Hz) | 600V |

**ACA Inrush Current**

| Range | Resolution | Sensitivity | Measurement Time | Overload Protection |
|---|---|---|---|---|
| 99.99A | 0.01A | >5A | 100ms | 1000A AC |
| 999.9A | 0.1A | >50A | | |

**1φ/3φ PF & Phase Angle (50Hz, 60Hz)**

| Range | Resolution | Accuracy | Sensitivity |
|---|---|---|---|
| 00.00°~99.99° | 0.01° | ± 6.0° | ACV>100V, ACA>10A |
| 100.0°~360.0° | 0.1° | | |
| lag 1.000~0.000~lead 1.000 | 0.001 | | |

**Frequency**

| Range | Resolution | Accuracy ±(%rdg+dgts) | Sensitivity |
|---|---|---|---|
| 40.00Hz~999.9Hz | 0.01Hz/0.1Hz | ±(0.5% + 2) | ACV>1.2V, ACA>6A |

**AC Current (50Hz to 400Hz) : TRMS**

| Range | Resolution | Accuracy ±(%rdg+dgts) | Sensitivity | Overload Protection |
|---|---|---|---|---|
| 99.99A | 0.01A | ±(2% + 30) (50,60Hz) | 0.10A | 1000A |
| 999.9A | 0.1A | ±(4% + 30) (40-400Hz) | 1.0A | |

**μA : DC + AC TRMS (Burden Voltage : 5mV/μA) (50Hz to 400Hz)**

| Range | Resolution | Accuracy ±(%rdg+dgts) | Sensitivity | Overload Protection |
|---|---|---|---|---|
| 99.99μA | 0.01μA | ±(1% + 30) | 0.20 μA | 500V DC or AC rms for 1 min. |
| 999.9μA | 0.1μA | | 2.0μA | |

**AC Voltage (50Hz to 400Hz) : TRMS**

| Range | Resolution | Accuracy ±(%rdg+dgts) | Sensitivity | Overload Protection |
|---|---|---|---|---|
| 999.9mV | 0.1mV | ±(1% + 30) (50, 60Hz) ±(2% + 30) (40-400Hz) | 2.0mV | 600V |
| 9.999V | 0.001V | | 0.020V | |
| 99.99V | 0.01V | | 0.20V | |
| 600.0V | 0.1V | | 2V | |

Input Impedance : 3MΩ

# Clamp-On TRMS Power Meter with Automatic Computation of 1φ and 3φ (3φ3W/3φ4W) Parameters

| DC Voltage | | | | |
|---|---|---|---|---|
| **Range** | **Resolution** | **Accuracy ±(%rdg+dgts)** | **Sensitivity** | **Overload Protection** |
| 999.9mV | 0.1mV | ±(1% + 30) | 2.0mV | 600V |
| 9.999V | 0.001V | | 0.020V | |
| 99.99V | 0.01V | | 0.20V | |
| 600.0V | 0.1V | | 2V | |
| Input Impedance : 3MΩ | | | | |

| Resistance (Continuity < 40Ω on the 999.9Ω range) | | | |
|---|---|---|---|
| **Range** | **Resolution** | **Accuracy ±(%rdg+dgts)** | **Overload Protection** |
| 999.9Ω | 0.1Ω | ±(1% + 10) | 500V DC or AC rms for 1 min. |
| 9.999KΩ | 0.001KΩ | | |
| 99.99KΩ | 0.01KΩ | | |
| 999.9KΩ | 0.1KΩ | | |

| MΩ (Auto Ranging) | | | |
|---|---|---|---|
| **Range** | **Resolution** | **Accuracy ±(%rdg+dgts)** | **Overload Protection** |
| 9.999MΩ | 0.001MΩ | ±(5% + 10) | 500V DC or AC rms for 1 min. |
| 99.99MΩ | 0.01MΩ | | |

| Capacitance | | | |
|---|---|---|---|
| **Range** | **Resolution** | **Accuracy ±(%rdg+dgts)** | **Overload Protection** |
| 10.000µF | 0.001µF | ±(3.0% + 5) | 500V DC or AC rms for 1 min. |
| 100.00µF | 0.01µF | ±(1.5% + 5) | |
| 1000.0µF | 0.1µF | | |
| 7000µF | 1µF | ±(2.5% + 15) | |

| Diode (Continuity < 40mV) | | | |
|---|---|---|---|
| **Range** | **Resolution** | **Accuracy ±(%rdg+dgts)** | **Overload Protection** |
| 2.000V | 0.001V | ±(2% + 1) | 500V DC or AC rms for 1 min. |

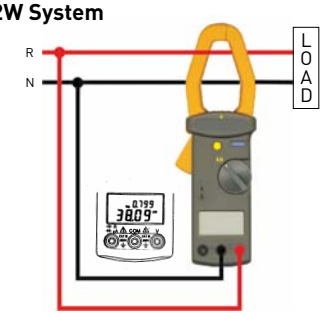
| Temperature (K-Type Thermocouple) | | | |
|---|---|---|---|
| **Range** | **Resolution** | **Accuracy ±(%rdg+dgts)** | **Overload Protection** |
| -50°C to 900°C | 0.1°C | ±(.2% + 4°C) | 30VAC or 60VDC |
| -58°F to 1000°F | 0.1°F | ±(.2% + 6°F) | |

## General Specifications

**Numerical Dual Display** : 4 Digit 9999 Count LCD
**Low Battery Indication** : ▭ is displayed
**Power** : 9V Battery x 1
**Sampling Rate** : 2.5 times/sec. (Digital Display)
1 times/6 sec. (on KW, KVA)
**Operating Temperature and Humidity** : 0°C to 50°C (32°F to 122°F)
RH < 80% non-condensing
**Storage Temperature and Humidity** : -10°C to 60°C (14°F to 140°F)
RH < 70% non-condensing
**Dimensions** : 247 x 90 x 40mm
**Weight** : 425gms Including Battery (approx.)
**Jaw Opening** : Cable Dia 43mm (max.)
Bus Bar 16mm x 65mm
**Accessories** : Carrying Case, Battery (installed), Test Leads Pair, K Type Thermocouple (Upto 260°C) (Optional), Instruction Manual
**Auto Power off Time** : Approx. 30 minutes
**Temperature Coefficient** : 0.1 x (specified accuracy) / °C (<18 or>28°C, <64 or >82°F)

## Usage

### 1φ2W System

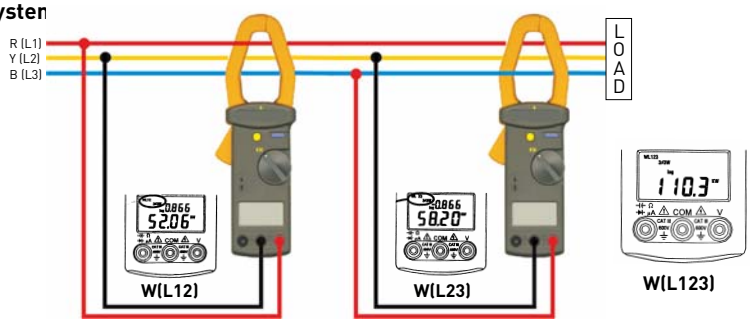



Press "RANGE" Key to Select KW+HP, KW+PF, KW+KVAR, KVA+θ or A+V

$PF = \frac{KW}{KVA} = COS\theta$

HP = 746 watts
KVA = (V x A) / 1000
KVAR = KVA x Sinθ

### 3φ3W System

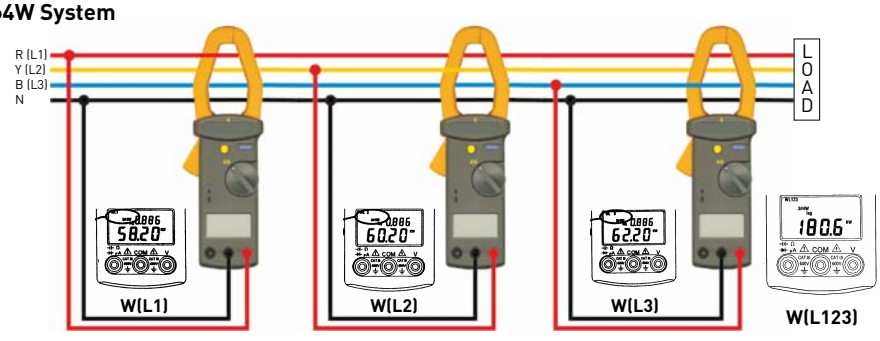



$W_{3\Phi3W} = W_{RY\,(L1L2)} + W_{BY\,(L3L2)}$

$KVA_{3\Phi3W} = \sqrt{KW^2_{3\Phi3W} + KVAR^2_{3\Phi3W}}$

$PF_{3\Phi3W} = \frac{KW_{3\Phi3W}}{KVA_{3\Phi3W}}$

### 3φ4W System

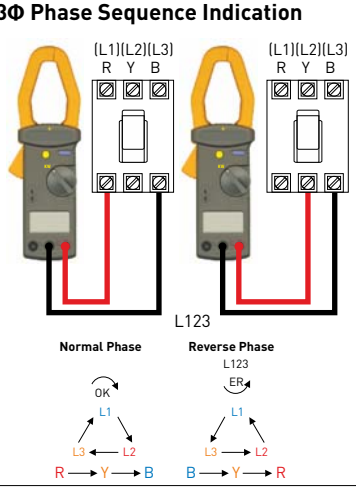



$W_{3\Phi4W} = W_{R\,(L1)} + W_{Y\,(L2)} + W_{B\,(L3)}$

$KVA_{3\Phi4W} = \sqrt{KW^2_{3\Phi4W} + KVAR^2_{3\Phi4W}}$

$PF_{3\Phi4W} = \frac{KW_{3\Phi4W}}{KVA_{3\Phi4W}}$

### 3Φ Phase Sequence Indication




R:L1, Y:L2, B:L3


4500

How one wished, one could measure 3φ power with a single clamp meter without any manual calculations; well now it is a reality. MECO 4500 Clamp-On Power Meter does this with absolute ease and reliability. Be it 3φ4W, 3φ3W, balanced or unbalanced system. Needless to add, it also works for 1φ2W and 1φ3W systems. Handy and ideal for on-site measurement, energy audit, data recording, Q.C. testing and maintenance of the entire plant.

## Features

- 3φ4 W, 3φ3 W, 3φBalanced, 1φ2 W, 1φ3 W
- AC + DC 2000 KW (3φ), 1200 KW (1φ)
- Dual display KW + PF, KVA + KVAR, V+A, V+ Hz, A+ Hz
- Phase Angle Measurment (±90°), Phase Sequence Indication (R,S,T)
- AC 600V, DC 600V, AC + DC 2000A
- Power Factor
- AC/DC Auto Detection
- TRMS Values
- Memory of 4 records
- Auto Range

KVA + KVAR


V + Hz


Power Factor (PF) $PF = \frac{KW}{KVA}$

AC + DC KVA (Apparent Power) $KVA = \frac{V \times A}{1000}$

AC + DC KVAR (Reactive Power) $KVAR = \sqrt{(KVA)^2 - (KW)^2}$

## General Specifications

| | |
|---|---|
| **Jaw Opening** | Cable Dia. 55mm. (approx.)<br>Bus Bar 65 (D) x 24 (W) mm |
| **Power** | 9V Battery |
| **Display** | 2 x 4 Digits Dual Display LCD |
| **Range Selection** | Auto |
| **Overload Indication** | OL |
| **Power Consumption** | 25mA (approx.) |
| **Low Battery Indication** | B |
| **Sampling Time** | 0.5 sec. (V and A)<br>1.6 sec. (W) |
| **Operating Temp.** | 4° to 50°C |
| **Operating Humidity** | <85% RH |
| **Storage Temperature** | -20°C to 60°C |
| **Storage Humidity** | <75% RH |
| **Dimensions** | 271 x 112 x 46 mm |
| **Weight** | 650gms Battery Including (approx.) |
| **Accessories** | Carry Bag x 1,<br>Users Manual x 1,<br>Battery (Installed) x 1,<br>Test Lead x 1 Pair |

## Electrical Specification (23°C ± 5°C)

**AC+DC True Power (PF 0.2~1.0, 3φ3W, 3φ4W, 1φ2W, and 1φ3W)**

| Range | Resolution | Accuracy (of rdg) | Range |
|---|---|---|---|
| 0~99.99KW | 0.01KW | ± 2.0% ± 0.05KW | AC 600V, DC 600V, ACA/DCA 2000A |
| 100~999.9KW | 0.1KW | ± 2.0% ± 0.5KW | AC 600V, DC 600V, ACA/DCA 2000A |
| 1000~1200KW | 1KW | ± 2.0% ± 5KW | AC 600V, DC 600V, ACA/DCA 2000A |

**AC+DC True Power (Power Factor 0.2~1.0, 3φ Balanced Power)**

| Range | Resolution | Accuracy (of rdg) | Range |
|---|---|---|---|
| 0~99.99KW | 0.01KW | ±2.0%±0.5KW | AC 600V, DC 600V, ACA/DCA 2000A |
| 100~999.9KW | 0.1KW | ±2.0%±0.5KW | AC 600V, DC 600V, ACA/DCA 2000A |
| 1000~2000KW | 1KW | ±2.0%±5KW | AC 600V, DC 600V, ACA/DCA 2000A |

**AC+DC Voltage (True RMS, Crest Factor<4, Autorange, Overload Protection 800VAC for all range)**

| Range | Resolution | Accuracy (of reading) | | Input Impedance |
|---|---|---|---|---|
| | | DC, 50/60 Hz | 40 - 400 Hz | |
| 0~200V | 0.1V | ±1.5% ±5 dgt | ±2.0% ±5 dgt | 10MΩ |
| 200~500V | 0.1V | ±1.5% ±5 dgt | ±2.0% ±5 dgt | |
| 500~600V | 1V | ±1.5% ±5 dgt | ±2.0% ±5 dgt | |

**AC+DC Current (True RMS, Crest Factor <4)**

| Range | Resolution | Accuracy (of reading) | | Overload Protection |
|---|---|---|---|---|
| | | DC, 50/60 Hz | 40-400 Hz | |
| 0~200A | 0.1A | ± 1.5% ± 5 dgt | ± 2.0% ± 5 dgt | AC 3000A |
| 200~500A | 0.1A | ± 2.0% ± 5 dgt | ± 2.5% ± 5 dgt | AC 3000A |
| 500~2000A | 1A | ± 2.5% ± 5 dgt | ± 3.0% ± 5 dgt | AC 3000A |

**Phase Angle (Must zero the current reading before measurement)**

| Range | Accuracy | Sensitivity | Remark |
|---|---|---|---|
| -90° to + 90° (50/60 Hz) | ± 2.0° | V> 100V, A> 10A | Zero Crossing Detection |

* If current signal is not detected, the phase angle will be left blank in LCD.

**Frequency (if <10 Hz, Hz = 0)**

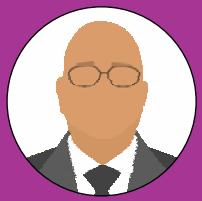
| Range | Accuracy | Sensitivity |
|---|---|---|
| 50/60 Hz | ± 2dgts | V > 1V, A > 5A |
| 10-400 Hz | ± 0.5% ± 2dgt | V > 1V, A > 5A |

MECO®

SINCE 1962

## Calibrating Equipment / CT's / Decode Resistance Box

- ✓ Universal Calibrator
- ✓ Multifunctional Calibrator
- ✓ AC Multifunctional Calibrator
- ✓ Multifunction Process Calibrator
- ✓ High Voltage Resistance Box
- ✓ Clamp – On CT'S & Flexible AC Current Probe



+60 YEARS
ONE MISSION


Reliable  Long-Lasting  Affordable

90A

90DQ

90P

| FEATURES / PARAMETERS | | 90A | 90DQ | 90P |
|---|---|---|---|---|
| DISPLAY | 5½ Digit Display | ✓ | ✓ | ✓ |
| SYSTEM (1 PHASE) | DC | ✓ | ✓ | - |
| | AC | ✓ | ✓ | ✓ |
| VOLTAGE (V) | AC/DC V : (0 - 200mV to 1000V) | ✓ | - | - |
| | AC/DC V : (0 - 250mV to 1000V) | - | ✓ | - |
| | AC V : (0 - 1V to 1000V) | - | - | ✓ |
| CURRENT (A) | AC/DC A : (0 - 100µA to 20A) | ✓ | - | - |
| | AC/DC A : (0 - 100µA to 50A) | - | ✓ | - |
| | AC A : (0 - 10mA to 100A) | - | - | ✓ |
| FREQUENCY (Hz) | SYNCH | - | ✓ | - |
| | 50 Hz | ✓ | ✓ | - |
| | 60 Hz | ✓ | ✓ | - |
| | 400 Hz | ✓ | ✓ | - |
| | 1 KHz | - | ✓ | - |
| | 40 Hz to 70 Hz | - | - | ✓ |
| RESISTANCE | 10Ω to 24k x 1kΩ | ✓ | ✓ | - |
| PHASE ANGLE | 0 to 359.99° | - | - | ✓ |
| POWER (1 PHASE) | Range : 0 to 100kW | - | - | ✓ |
| POWER FACTOR | Range : -1 to +1 | - | - | ✓ |
| COMMUNICATION PORT | RS232 | ✓ | ✓ | ✓ |
| KEY ADJUSTOR | | ✓ | ✓ | ✓ |
| WORKS CALIBRATION CERTIFICATE TRACEABLE TO NPL | | ✓ | ✓ | ✓ |
| STANDARD CURRENT COIL (OPTIONAL) | Input 5A (Max.), Turn Ratio 100 / 1 | - | ✓ | ✓ |
| | Input 10A (Max.), Turn Ratio 100 / 1 | - | ✓ | ✓ |
| | Input 20A (Max.), Turn Ratio 50 / 1 | ✓ | - | - |

**Applications**

- R & D Labs
- NABL Labs
- Educational Institutes
- Paper & Pulp Industires
- Automobile Industries
- Textile Industries
- Calibration Labs
- Chemical Process Industries
- Cement Plants
- Instrument Manufacturing Companies
- Medical Industries
- Petrochemical Industries

Voltmeter

Ammeter

Wattmeter Varmeter

PF Meter

Hz Meter

Multifunction Meter

Transducer

Multimeter

Clamp Meter

RS-232


90A

Key Adjuster

MODEL 90A Universal Calibrator gives a standard output for AC Voltage, DC Voltage, AC Current & DC Current. Keys or Knob help to adjust the magnitude of the output signals. Important features include wide range, high accuracy, good stabilization, easy operation and portability. The Calibrator is ideal for testing ammeters and voltmeters upto 0.2 accuracy class.

## Applications

- Calibration of AC Volt, Amp, Frequency Meters
- Calibration of DC Volt, Amp Meters
- Calibration of Resistance Meters, Clamp Meters, Multimeters

## Standard Accessories

- 1 x Key Adjuster
- 1 x Power Cord
- 1 x Pair of Output Leads
- 2 x Fuse (2A)
- 1 x Data Cable for PC Connectivity
- 1 x Operation Manual

## Optional Accessories

- Standard Current Coil

| | |
|---|---|
| **Turns Ratio** | 50 / 1 |
| **Input Max.** | 20A |
| **Current** | 1000A |
| **Clamp Jaw** | > 28mm |
| **DC Impedance** | 0.9Ω |
| **DC Burden** | 20A / 1.3V |
| **AC Burden** | 20A / 3V |
| **Frequencies** | DC to 60Hz |
| **Accuracy** | ± 0.3% rdg |

## Technical Specifications

| | | |
|---|---|---|
| **Voltage Control** | Output Voltage Range :<br><br>Basic Error : | 200mV, 1V, 2V, 5V, 10V, 20V, 50V, 100V, 200V, 500V, 1000V<br>DCV : ± (0.03 %RD + 0.02 %FS)<br>ACV : ± (0.05 %RD + 0.03 %FS) |
| **Current Control** | Output Current Range :<br><br>Basic Error : | 100µA, 500µA, 2mA, 5mA, 20mA, 50mA, 200mA, 500mA, 2A, 5A, 20A<br>DCI : ± (0.05 %RD + 0.02 %FS)<br>ACI : ± (0.07 %RD + 0.03 %FS) |
| **Frequency Control** | Frequency Range :<br>Frequency Error : | 50Hz, 60Hz, 400Hz<br>< 1 % |
| **Resistance Control** | Resistance Range :<br><br><br><br>Basic Error : | 10, 24, 50, 100, 240, 500 (Ω), 1, 2.4, 5, 10, 24 (kΩ), 10x1k, 24x1k, 50x1k, 100x1k, 240x1k, 500x1k, 1kx1k, 2.4kx1k, 5kx1k, 10kx1k, 24kx1k<br>± 0.2 % +20mΩ |

**Note -** RD : Reading, FS : Full Scale

## General Specifications

- Stability DC : < 0.01 %FS / 2 min, AC : < 0.03 %FS / 2 min
- Ripple : < 0.1 %
- Power Supply : 230 VAC, 50 (60) Hz
- Power Consumption : < 180 VA
- Operating Temperature : 5°C to 35°C
- Relative Humidity : ≤ 80 %
- Distortion : < 0.5 %
- Display : 5½ Digit LED Digital Display
- Step adjustment of Output Signal : 10 %FS, 1 %FS, 0.1 %FS, 0.05 %FS
- Dimensions : 147 x 480 x 480mm (approx.)
- Total Weight : 17 kgs (approx.)

RS-232


90DQ

Key Adjustor

MODEL 90DQ Multifunctional Calibrator can output standard AC Voltage, DC Voltage, AC Current & DC Current. Output actual value, percent and FS display at the same time. Calibrator may select FS (full scale) and relevant step in according with scale of UUT (unit under test). Keys or knobs adjust magnitude of the output signals. Wide range, high accuracy, good stabilization, easy operation and portable. The calibrator is ideal to test amperemeter and voltmeter upto 0.2 class.

## Applications

- Calibration of AC Volt, Amp, Frequency Meters
- Calibration of DC Volt, Amp Meters
- Calibration of Resistance Meters, Clampmeters & Multimeters

## Standard Accessories

- 1 x Key Adjuster
- 1 x Power Cord
- 1 x Pair of Output Leads
- 1 x Pair of Output Leads (50A)
- 2 x Fuse (4A)
- 1 x Data Cable for PC Connectivity
- 1 x Operation Manual

## Optional Accessories

- Standard Current Coil

| | | |
|---|---|---|
| **Turns Ratio** | 100 / 1 | 100 / 1 |
| **Input Max.** | **5A** | **10A** |
| **Current** | **500A** | **1000A** |
| **Clamp Jaw** | > 20mm | > 28mm |
| **DC Impedance** | 0.7Ω | 0.9Ω |
| **DC Burden** | 5A / 3.5V | 10A / 2.5V |
| **AC Burden** | 5A / 6V | 10A / 5V |
| **Frequencies** | DC to 60Hz | DC to 60Hz |
| **Accuracy** | ± 0.3% rdg | ± 0.3% rdg |

## Technical Specifications

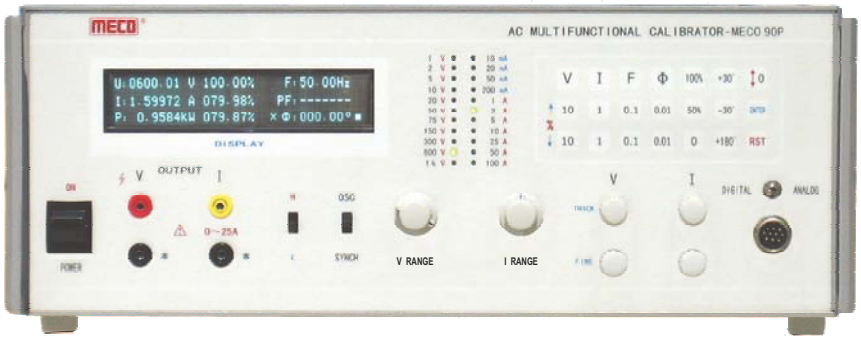
| | | |
|---|---|---|
| **Voltage Control** | Output Voltage Range :<br><br>Basic Error : | 250mV, 1V, 2.5V, 5V, 10V, 25V, 50V, 100V, 250V, 500V, 1000V<br>DCV : ± (0.02 %RD + 0.01 %FS)<br>ACV : ± (0.05 %RD + 0.02 %FS) |
| **Current Control** | Output Current Range :<br><br>Basic Error : | 100µA, 500µA, 2.5mA, 10mA, 25mA, 100mA, 250mA, 1A, 2.5A, 10A, 50A<br>DCI : ± (0.03 %RD + 0.02 %FS)<br>ACI : ± (0.05 %RD + 0.03 %FS) |
| **Frequency Control** | Frequency Range :<br>Frequency Error : | 50Hz, 60Hz, 400Hz, 1kHz<br>< 0.1 % |
| **Resistance Control** | Resistance Range :<br><br><br><br>Basic Error : | 10, 24, 50, 100, 240, 500 (Ω), 1, 2.4, 5, 10, 24 (kΩ), 10x1k, 24x1k, 50x1k, 100x1k, 240x1k, 500x1k, 1kx1k, 2.4kx1k, 5kx1k, 10kx1k, 24kx1k<br>± 0.2 % +20mΩ |

**Note -** RD : Reading, FS : Full Scale

## General Specifications

- Stability DC : < 0.01 %FS / 3 min, AC : < 0.02 %FS / 3 min
- Ripple : < 0.2 %
- Power Supply : 230 VAC, 50 (60) Hz
- Power Consumption : < 250 VA
- Operating Temperature : 5°C to 35°C
- Relative Humidity : ≤ 80 %
- Distortion : < 0.5 %
- Display : 5½ Digit LED Digital Display
- Step adjustment of Output Signal : 100 %FS/N, 10 %FS/N, 1 %FS/N, 0.1 %FS/N (N = 4, 5, 6, 10 and 15)
- Dimensions : 190 x 480 x 545mm (approx.)
- Total Weight : 22.5 kgs (approx.)

RS-232




**90P**

**Key Adjustor**

MODEL 90P AC Multifunctional Calibrator can output standard AC Voltage and AC Current. It measures AC Voltage, AC Current, Power, Phase Angle, Power Factor and Frequency (40Hz - 70Hz ). Wide output range of Current and Voltage; High reliability and low wave distortion.

## Applications

- Calibration of Power Meters, AC Volt, Amp, Watt, Var, Frequency, Powerfactor, Phase Angle and Energy Meters.
- Calibration of Voltage, Current, Active & Reactive Power, Frequency, Powerfactor, Phase Angle and Energy Transducers.

## Standard Accessories

- 1 x Key Adjuster
- 1 x Power Cord
- 1 x Pair of Output Leads
- 1 x Pair of Output Leads (50A/100A)
- 2 x Fuse (4A)
- 1 x Data Cable for PC Connectivity
- 1 x Operation Manual

## Optional Accessories

- Standard Current Coil

| | | |
|---|---|---|
| **Turns Ratio** | 100 / 1 | 100 / 1 |
| **Input Max.** | **5A** | **10A** |
| **Current** | **500A** | **1000A** |
| **Clamp Jaw** | > 20mm | > 28mm |
| **DC Impedance** | 0.7Ω | 0.9Ω |
| **DC Burden** | 5A / 3.5V | 10A / 2.5V |
| **AC Burden** | 5A / 6V | 10A / 5V |
| **Frequencies** | DC to 60Hz | DC to 60Hz |
| **Accuracy** | ± 0.3% rdg | ± 0.3% rdg |

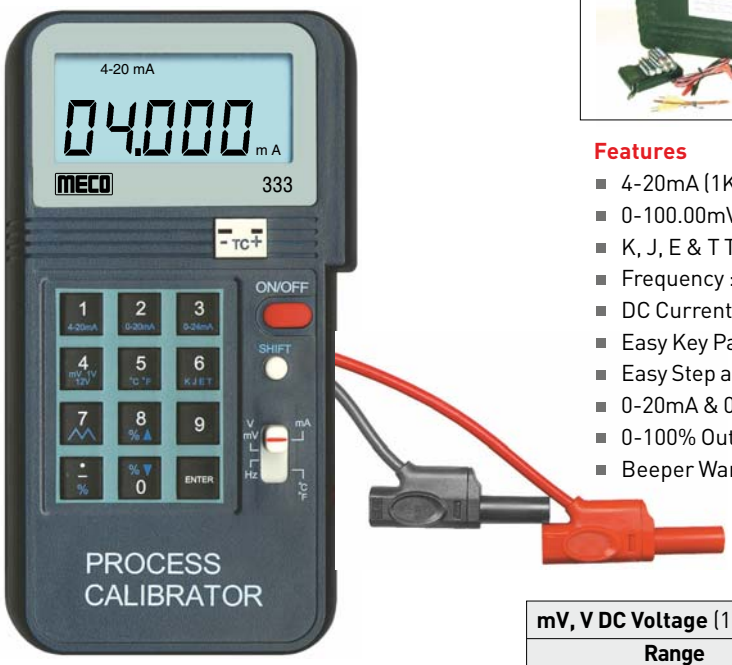
## Technical Specifications

| | | |
|---|---|---|
| **Voltage Control** | Output Voltage Range :<br><br>Min. Resolution :<br>Basic Error : | 1V, 2V, 5V, 10V, 20V, 50V, 75V, 150V, 300V, 600V, 1000V<br><br>0.02mV<br>AC V : ± (0.03 %RD + 0.02 %FS) |
| **Current Control** | Output Current Range :<br><br>Min. Resolution :<br>Basic Error : | 10mA, 20mA, 50mA, 200mA, 1A, 2A, 5A, 10A, 25A, 50A, 100A<br><br>0.2µA<br>AC I : ± (0.03 %RD + 0.02 %FS) |
| **Frequency Control** | Frequency Range :<br>Frequency Error : | 40Hz to 70Hz<br>± 0.02 Hz |
| **Phase Control** | Resistance Range :<br>Phase Error : | 0 to 359.99°<br>± 0.05° |

**Note -** RD : Reading, FS : Full Scale

## General Specifications

- Power Range : 0 to 100kW
- Power Basic Error : ± (0.07 %RD + 0.03 %FS)
- Stability V, I : < 0.01 %FS / 2 min, P : < 0.02 %FS / 2 min
- Distortion : < 0.5 %
- Power Factor Range : -1 to +1
- Power Factor Basic Error : ± 0.001 (PF 0 to ±0.8); ±0.0005 (PF -0.8 to -1, +0.8 to +1)
- Power Supply : 230 VAC, 50 (60) Hz
- Power Consumption : < 300 VA
- Display 5½ Digit VFD Digital Display
- Operating Temperature : 5°C to 35°C
- Relative Humidity : ≤80 %
- Dimensions : 192 x 480 x 540mm (approx.)
- Total Weight : 23 kgs (approx.)




333

## Features

- 4-20mA (1KΩ Load, 24V Loop Supply) with 1µA Resolution
- 0-100.00mV, 0-1.0000V, 0-12.000V
- K, J, E & T Thermocouples ($^0$C and $^0$F)
- Frequency : 1-62500 Hz
- DC Current Basic Accuracy : 0.025%
- Easy Key Pad Number Operation
- Easy Step and Auto Ramp Functions
- 0-20mA & 0-24mA Selectable
- 0-100% Output (mA, mV, V)
- Beeper Warning when Output is Open (mA) or Short (mV, V)

## Electrical Specifications (23$^0$C ± 5$^0$C, 10 minutes after power is on)

| **mA DC Current** (1KΩ max. Load, 24V Loop Supply) | | |
|---|---|---|
| **Range** | **Resolution** | **Accuracy** |
| 4-20 mA, 0-20 mA, 0-24 mA | 1 µA | ± 0.025%rdg ± 3µA |

Beeper Warning when Output is Open and specified Current Output >1mA

| **mV, V DC Voltage** (1mA Supply Current) | | |
|---|---|---|
| **Range** | **Resolution** | **Accuracy** |
| 0-100.00 mV | 10 µV | ± 0.05%rdg ± 30 µV |
| 0-1.0000 V | 100 µV | ± 0.05%rdg ± 300 µV |
| 0-12.000 V | 1 mV | ± 0.05%rdg ± 3mV |

Beeper Warning when Output is short and specified Voltage Output >10mV

| **Frequency** (1KΩ Load Min.) | | |
|---|---|---|
| **Range** | **Resolution** | **Accuracy** |
| 1-125 Hz | 1 Hz | ± 0.04 Hz |
| 126-62500 Hz | 1 Hz | ± 0.01% ± 0.04 Hz |

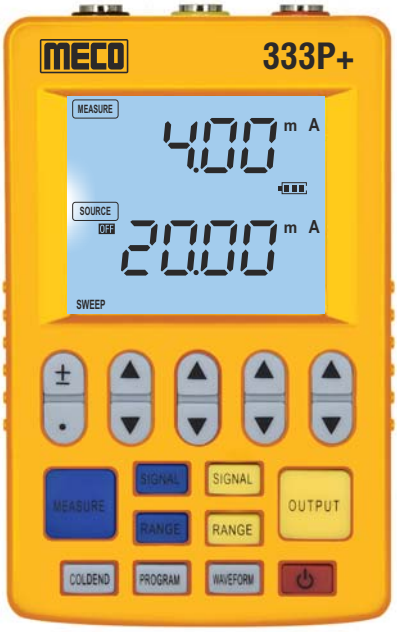
| **K, J, E and T Type Thermocouples** (1$^0$C, 1$^0$F Resolution, 1KΩ Load Min.) | | | |
|---|---|---|---|
| **Range** | **Accuracy** | **Range** | **Accuracy** |
| K : -200 to -100$^0$C | ± 2.0$^0$C | K : -328 to -148$^0$F | ± 3.6$^0$F |
| K : -100 to 0$^0$C | ± 1.1$^0$C | K : -148 to 32$^0$F | ± 1.8$^0$F |
| K : 0 to 1370$^0$C | ± 0.8$^0$C | K : 32 to 2400$^0$F | ± 1.5$^0$F |
| J : -100 to 0$^0$C | ± 0.9$^0$C | J : -148 to 32$^0$F | ± 1.6$^0$F |
| J : 0 to 760$^0$C | ± 0.7$^0$C | J : 32 to 1400$^0$F | ± 1.2$^0$F |
| E : -100 to 0$^0$C | ± 0.9$^0$C | E : -148 to 32$^0$F | ± 1.6$^0$F |
| E : 0 to 700$^0$C | ± 0.7$^0$C | E : 32 to 1292$^0$F | ± 1.2$^0$F |
| T : -200 to 0$^0$C | ± 1.0$^0$C | T : -328 to 32$^0$F | ± 1.8$^0$F |
| T : 0 to 400$^0$C | ± 0.8$^0$C | T : 32 to 752$^0$F | ± 1.5$^0$F |

## General Specifications

| | |
|---|---|
| **Power** | 9V Battery & External Battery Pack (Six x 1.5V "AA" Batteries) |
| **Display** | 4 and 5 Digits LCD Display with Annunciator |
| **Operating Environment** | 0$^0$ to 50$^0$C (32 to 122 $^0$F), RH <85% |
| **Storage Environment** | -20$^0$C to 60$^0$C (-4 to 140$^0$F), RH <85% |
| **Dimensions** | 88 x 168 x 38 mm (approx.) |
| **Weight** | 330gms Including Battery (approx.) |
| **Accessories** | Carrying Case x 1, Users Manual x 1, K type Thermocouple Connector x 1, External Battery Pack Holder, 9V Battery, Pair of Alligator Test Leads x 1 |

new

Preliminary Data




333P+

## Introduction

Model 333P+ Multifunction Process Calibrator has Multiple Signal Measurement and Output Functions, including Voltage, Current, Thermocouple, Resistance. It is with Large LCD Screen and Key Pad for Easy Operation. Key features are long standby time, high accuracy and Programmable Output function.

## Accessories

## Applications

- Used in the Debugging of PLCs
- Process Instruments
- Electric Valves
- Industrial Sites
- Laboratories
- Two Wire Transmitter Simulator

## Features

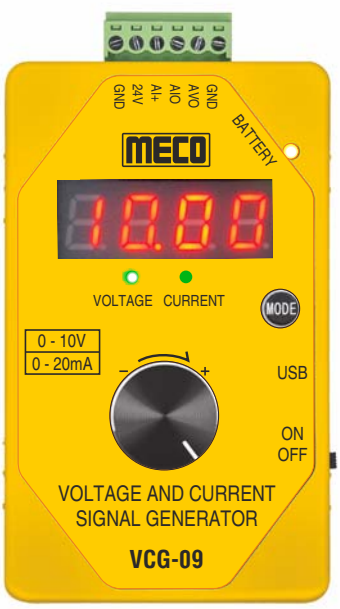
- Voltage Signal : 0 - 30V, 0 - 25mV, 0 - 100mV DC
- Current Signal : 0 - 25mA, 4 - 20mA DC
- K, E, J, T, R, B, S, N Thermocouples
- Reverse Connection and Process Protection: 30V
- Cold End and Programming Function
- Auto Power OFF
- Range Conversion Function
- Numeric Modifier Keys
- Drive Current 24mA
- Range Conversion Function
- PT100 Thermistor

## General Specifications

| | |
|---|---|
| **Unit** | mA / mV / V / °C / Ω |
| **Operating Environment** | -10°C to 55°C |
| **Storage Environment** | -20°C to 70°C |
| **Humidity** | 20 to 80% RH |
| **Dimensions** | 115 x 70 x 26mm (approx.) |
| **Accessories** | Signal Generator x 1, Users Manual x 1, Signal Cable x 3, USB Cable x 1, Charging Plug x 1, Tool Kit x 1, Test Leads (Red and Black) x 1 |

## Electrical Specifications

| Signal | Type | Range | Accuracy | Resolution Ratio |
|---|---|---|---|---|
| DC Voltage | 20mv | 0.00 to 24.00mV | ±0.1% | 0.01mV |
| | 100mv | 0.0 to 100.0mV | ±0.1% | 0.1mV |
| | V | Output : 0.00 to 15.00V | ±0.1% | 0.01mV |
| | | Measure : 0.00 to 30.00V | ±0.1% | 0.01mV |
| DC Current | mA | 0.00 to 24.00mA | ±0.1% | 0.01mA |
| | 4 - 20mA | 4/8/12/16/20mA | ±0.1% | 0.01mA |
| Passive Current | mA | 0.00 to 24.00mA | ±0.1% | 0.01mA |
| Power Distribution Output | 24V LOOP | 24V / 16V | 10% | 0.1V |
| TC | K | -270 to 1372°C | ±1% | 1°C |
| | E | -270 to 1000°C | ±1% | 1°C |
| | J | -210 to 1200°C | ±1% | 1°C |
| | T | -270 to 400°C | ±1% | 1°C |
| | R | -50 to 1768°C | ±1% | 1°C |
| | B | 250 to 1820°C | ±1% | 1°C |
| | S | -50 to 1768°C | ±1% | 1°C |
| | N | -270 to 1300°C | ±1% | 1°C |
| RTD | PT100 | -200 to 850°C | ±0.5% | 0.1°C |
| Resistance | Ω | 20 to 400Ω | ±0.5% | 0.1Ω |




**VCG-09**

## Introduction

MECO VCG-09 Signal Generator has a Multiple Measurement of Current or Voltage range output with Bright LED Display. Rotary Knob with Easy Operation is key feature.

## Applications

- Equipment Debugging in Laboratories
- Industrial Sites
- Electric Valves

## Features

- Built-in 3.7V, 1000mAh lithium Battery Power Supply (Optional)
- 4 Hours at Internal Lithium Battery Full Power Supply, Active Output 20mA
- Connecting Terminal
- Battery Indicator
- External 9 ~ 30V DC Input Power Supply
- External Micro-USB 5V Power Supply

## Specifications

| | |
|---|---|
| **Operating Environment** | -10°C ~ 55°C |
| **Relative Humidity** | 10% ~ 90% RH |
| **Voltage Output** | |
| **Output Range** | 0 ~ 10V |
| **Output Resolution** | 0.1V |
| **Output Load** | >10KΩ |
| **Current Output** | |
| **Output Range** | 0 ~ 20mA |
| **Output Resolution** | 0.1mA |
| **Output Load** | < 350Ω |

**FCT Series**

## Model FCT Series

MECO FCT is a Flexible Current Transformer based on the Rogowski principle. It is suitable to conveniently measure Single / Three Phase AC and Pulsed DC Currents. After approximate signal conditioning, it can be used with Digital Multimeters, Recorders and other suitable equipment to measure current from very low frequencies up to 1MHz.

The probes comprises of a flexible air-cored sensor which can be opened and installed around a primary conductor without interrupting the circuit. The flexible and lightweight measuring head allows quick and easy installation in hard to reach areas and over large conductors. Inner Diameter / Window Size and leads can be customized.

**Flexible AC Current Probe**

| | |
|---|---|
| **Typical Voltage Output VoRMS (Sinusoidal Current)** | (2.183 x $10^{-6}$) x IRMS x Frequency |
| **VoRMS ( at 3000ARMS, 50 Hz)** | 300mV AC |
| **Rated Current (RMS)** | 3000A |
| **Inner Diameter / Window Size** | 100mm (5") |
| **Coil Diameter** | 9 mm |
| **Internal Resistance per Probe** | 120Ω |
| **Operating Temperature Range** | -10°C to + 60°C |
| **Storage Temperature Range** | -20°C to + 70°C |

| | |
|---|---|
| **Bandwidth** | 5Hz ~1MHz |
| **Accuracy** | ± 0.2%(Most accurate position, 25°C) |
| **Phase Shift** | 90 ± 0.2 degrees |
| **Temperature Sensitivity** | 0.08% per °C |
| **Position Sensitivity** | ± 0.5% |
| **Working Voltage** | 1000V AC RMS |

**Ordering Information** : Model, Rated Input (A AC) & Rated Output


CCT50


CCT602

MECO CCT Series of Clamp-On Current Transformer's are designed for fast and easy installation. Clamp-On Current Transformer uses Permalloy Magnetic Core or Silicon Amorphous Core, with characteristics of small size, high precision, good stability and strong anti-interference ability.These sensor's give a standard AC Current output which is suitable to conveniently measure on Single Phase / Three Phase Circuits with good stability and high anti-interference ability. It is ideal for power and energy measurement with high precision and small phase angle error in applications related to electric power, communication, monitoring and control. It can measure a variety of electric parameters without removing cables.The Standard length of Output Leads is 2 Meter. However Output and Leads Cable can be customized.

## Features

- Clamp-On Design, Safe, Easy to Install, Portable.
- Wide Inner Window, Allowing Clamping of Big Cables or Bus-Bars.
- Silicon Steel / Permalloy Core
- Operating Temperature -25°C to 75°C
- Operating Humidity < 85%
- Output Connection UL1015 22AWG Wire (Twisted Wire) 2m

## Applications

- Current Measurement, Monitoring and Protection for Electrical Wiring and Equipment.
- Current and Power Measurement for Electric Motors, Lighting, Air Compressor, Heating and Ventilation System, Air-Condition Equipment and Automation-Control System.
- Current, Power and Energy Monitoring Device.

## Electrical Specifications

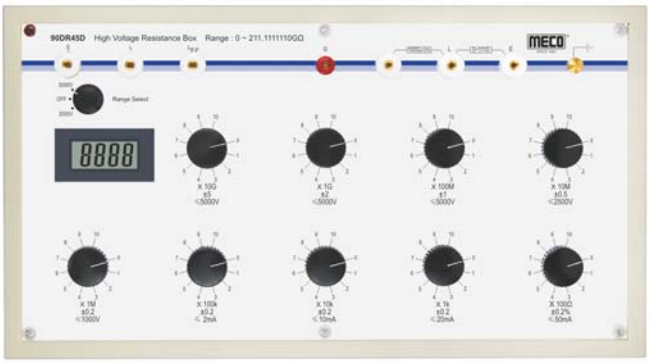
| | |
|---|---|
| **Frequency** | 50 - 400Hz |
| **Rated Input** | As Below |
| **Measuring Range** | 5% In - 130% In |
| **Rated Output** | 0 - 5A AC (Standard) |
| | 0 -1A AC or 0-10V AC (Optional) |
| **Ratio** | ≤ ± 0.1 % |
| **Phase Angle** | ≤ ± 10min |
| **Dielectric Strength** | 3.0KV / 1mA / 1min |
| **Insulation Resistance** | DC500V / 100MΩ min |

## Specification

| Model | Rated Input (A AC) | Rated Output | Accuracy | Window Size (mm) (ID) |
|---|---|---|---|---|
| **CCT50** | 0 - 100A | 5A AC | 2.5% ⩽60A, 1.0% >60A | 50 |
| | 0 - 500A | | 1.0% | |
| | 0 - 1000A | | | |
| **CCT602** | 0 ~ 2000A | | | 60 |

**Ordering Information :** Model, Rated Input (A AC) & Rated Output


90DR




90DR45D

| Parameters | Specifications |
|---|---|
| **Resistance Range** | 0.01MΩ ~ 5GΩ |
| **17 Selectable Fixed Resistance Values** | 0.01MΩ, 0.05MΩ, 0.1MΩ, 0.2MΩ, 0.5MΩ, 1MΩ, 2MΩ, 5MΩ, 10MΩ, 20MΩ, 50MΩ, 100MΩ, 200MΩ, 500MΩ, 1kMΩ, 2kMΩ, 5kMΩ |
| **Accuracy** | ±0.2%, ±0.2%, ±0.2%, ±0.2%, ±0.2%, ±0.2%, ±0.2%, ±0.5%, ±0.5%, ±0.5%, ±1%, ±1%, ±1%, ±2%, ±2%, ±2% (respectively) |
| **Voltage Range (DC)** | 100V, 200V, 300V, 400V, 500V, 1kV, 1kV, 1kV, 1kV, 2.5kV, 2.5kV, 2.5kV, 2.5kV, 2.5kV, 2.5kV, 2.5kV, 2.5kV (respectively) |
| **Insulation Resistance between Circuit and Housing** | >500GΩ |
| **Maximum With Stand Voltage Between Circuit and Housing** | 2000V AC For <60 Seconds |
| **Working Temperature** | 20 ± 5°C (Typical)<br>20 ± 5°C (Reference) |
| **Storage Temperature** | -10 ~ 40°C, ≤ 75% RH |
| **Humidity** | 25% ~ 75% (Typical)<br>30% ~ 60% (Reference) |
| **Dimension** | 310 x 240 x 160mm (approx.) |
| **Weight** | 3.6Kg (approx.) |
| **Applications** | ■ Checking of HV Insulation Testers<br>■ Research Laboratories<br>■ Factories<br>■ School & Institute<br>■ Accreditation Laboratories<br>■ Certification Agencies |

| Parameters | Specifications |
|---|---|
| **Display** | 4½ Digit Display |
| **Resistance Range** | 0 ~ 211.1111110GΩ |
| **10 Adjustable Potentiometric Resistance** | $x10^2$, $x10^3$, $x10^4$, $x10^5$, $x10^6$, $x10^7$ $x10^8$, $x10^9$, $x10^{10}$, $x10^{11}$ |
| **Accuracy** | ±0.2%, ±0.2%, ±0.2%, ±0.2%, ±0.2%, ±0.5%, ±1%, ±2%, ±5%, ±10% (respectively) |
| **Current / Voltage Value of Each Resistance** | 50mA, 20mA, 10mA, 2mA, 1000V, 2500V, 5000V, 5000V, 5000V (respectively) |
| **Voltage Range** | 0 ~ 1999.9V ~ 5000V (RMS / $V_{PP}$) |
| **Accuracy** | ±(1% rdg +2digits) |
| **Input Impedance** | 10GΩ ± 10% |
| **Insulation Resistance between Circuit and Housing** | 1TΩ |
| **Maximum With Stand Voltage Between Circuit and Housing** | 10000V AC(RMS) For <60 Seconds |
| **Working Temperature and Humidity** | 20 ± 5°C, ≤ 65% RH |
| **Storage Temperature and Humidity** | -10 ~ 55°C, ≤ 80% RH |
| **Dimension** | 520 x 285 x 180 mm (approx.) |
| **Power** | 9V Battery |
| **Weight** | 5.3Kg (approx.) |
| **Applications** | ■ Checking of HV Insulation Testers<br>■ Research Laboratories<br>■ Factories<br>■ School & Institute<br>■ Accreditation Laboratories<br>■ Certification Agencies |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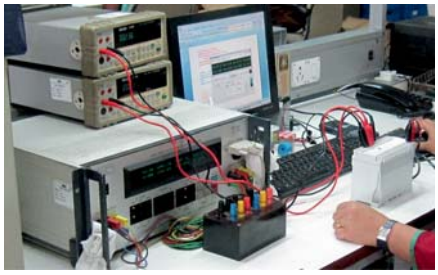

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